Deep Sea Electronics Ltd,
Highfield House,
Hunmanby Industrial Estate,
North Yorkshire YO14 0PH,
England

GenComm standard for use with generating set control equipment

Author: **Greg Middleton**
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Table of contents

1. Changes from previous version

Version 2.0
This is a heavily revised version that includes many pages that were not previously in the public domain.

Version 2.1
In page 153: register numbers for 2131 and 2133 corrected.

Version 2.2
In page 170: separate register allocation table for 332,334 created (registers 0 to 21 only)

Version 2.3
In page 153: For 8xxx the reserved registers are now unimplemented and the number of alarms has been corrected.

Version 2.4
In page 4: added 2 new registers (193and 194) for S1 and S2 phase rotation.

Version 2.5
In page 180: added register mapping for 335 transfer switch
In page 190: added register mapping for 335 transfer switch

Version 2.6
In pages 3, 16, 153, 154, 160, 170, 190, 200-249: Registers and tables added/amended for 335 transfer switch
In pages 180,181: Common family register allocation (registers 64 to 255 as detailed in notes) documented in separate table

Version 2.7
In page 2: removed redundant 'Modem dial back string' and shifted up the remaining strings for consistency with module implementations

Version 2.8
In page 152: Indication of numbers and types of expansion modules for 335
In page 154: Expansion unit watchdog alarm added to 335 register table
In page 160,170: Clarification of expansion digital/analogue inputs
In page 180: Digital outputs and LED colours added for 335; Corrections to 334/335register order
In page 190:Common family register table (as detailed in notes) re-labelled
In pages 225-231: 335 PLC function strings moved
Version 2.9
In pages 153, 160, 170, 222-239, 240-246: Corrections to 7xxx tables.
In page 152: Numbers of expansion modules for 335 amended
In page 153: Register matrix added for 3xx family
In page 154: 330,331,333 module documented and unimplemented/reserved registers corrected for 3xx
In page 156: Register matrix added to identify expansion module support for 8xxx/73xx/335
In page 158: Register matrix added to identify expansion module support for 8xxx/73xx/335
In page 160: Register matrix added to identify expansion module support for 3xx
In page 170: Numbers of expansion modules for 335 amended and Register matrix added to identify expansion module support for 3xx
In page 171: Register matrix added to identify expansion module and PLC support for 3xx
In page 180: 330,331 and 333 modules documented; Register matrix added to identify allocation for 3xx family; Matrix added to common family register table to identify implemented registers for each family/module; LED colour table amended
In page 181: Matrix added to common family register table to identify implemented registers for each family/module;
In page 190: 330,331, and 333 modules documented; Matrix added to common family register table to identify implemented registers for each family/module;unimplemented/reserved registers corrected for 3xx
In pages 200-239: 330,331 and 333 modules documented;334 and 335 module tables separated; 335 table amended

Version 2.10
In Page 153: Tables amended to showdetails of registersand layout required for first expansion module for each set and summaries for subsequent modules of the same type; PLC functions numbered 1 to 20 and referred to as functions instead of alarms; Corrections to 3xx tables.
In Pages 158: Corrections to 335 tables.
In Page 160: PLC functions numbered 1 to 20 and referred to as functions instead of alarms; Registers reserved for 2130 expansion modules 4-9 added to 3xx table.
In Page 170: Correction to 8xxx 2131 expansion modules 1-3 description; Correction to numbers of digital inputs available for use on 3xx;

In Page 171:Correction to 8xxx table for 2133 Expansion modules 2 and 3 registers start addresses; Registers reserved for 2130 expansion modules 4-9 added to 3xx table.
In Page 180: Correction to 330/331/334, 335, and 332/333 tables.
In Page 190: Corrections to 335 tables.
In Pages 200-239: Correction to 7xxx reserved page numbers; Modification to 8xxx pages 208-213 for clarity; Corrections to 335 page 201 and 226 tables; PLC functions numbered 1 to 20 and referred to as functions strings for consistent terminology.
In Pages 240-246:Corrections to 335 pages 241-246 tables.
In Page 2:Re-instated modem dial back string

Version 2.11
In Page 6: Added derived instrumentation for 335

Version 2.12
Throughout: - all relevant descriptions changed from"7xxx" to"72xx/73xx"and from "8xxx" to "74xx/8xxx" to differentiate between 72xx/73xx and 74xx.

Version 2.13
Added Page 9 – Total Harmonic Distortion measurements (on 88xx/84xx only)

Version 2.14
Added notes 7 to section 8.2 – stating maximum allowable write frequency

Version 2.15
In Page 4: Registers 195 and 196 added.
In Page 6: Average, difference, min and max values added and notes extended.

Version 2.16
Support for 7450 DC Generator Controller added:
In Page 4: Register 5 renamed for clarity (to distinguish between 2 batteries); Registers 197 to 213 added.
In page 6: New table for 7450 added; 8xxx/74xx table title changed to indicate 8xxx/7410/7420 register allocation
In page 7: Existing maintenance registers renamed to indicate engine maintenance; Registers added for 7450 plant battery maintenance/accumulated data
In page 153: Registers 51 and 52 renamed to indicate engine maintenance alarms; register 100 added for 7450 Plant battery maintenance alarms to 8xxx/74xx table
In page 154: Added registers 26 to 28 for 7450 to 8xxx/74xx table
In page 160: Added registers 225 to 227 for 7450 to 8xxx/74xx table
In page 171: 8xxx/74xx registers 148 to 153 are marked as unimplemented
In page 225: Renamed registers in 8xxx/74xx table to indicate Engine Maintenance strings
In page 228: Added registers 32 to 127 for 7450 to 8xxx/74xx table

Version 2.17
In page 6: All Var registers now signed to reflect what has always been the case in practice.

Version 2.19
In page 6: Registers 142-145 are unsigned.

Version 2.20
In page 4: 32 bit values aligned to an even address (register 204 to 213).
In page 6: 7450 table – registers are signed.

Version 2.21
In page 16: Added system control keys for plant battery maintenance alarms.
In page 4: register 200 renamed for clarity.
In page154: register 27 fields renamed for clarity.
In page 160: Page title renamed and preliminary page comments amended for clarity.

Version 2.22
In page 4: Added register for Plant Battery Temperature. DC current registers now all 32 bit signed (load, battery, total); added 2 registers for DC shunt currents
In page 6: Appended 7450 table to re-titled 86xx/74xx table. Added DC Power percentage (to 0.01%)
In page 7: Added new registers for plant battery maintenance cycles and capacity
In page 154: Added new alarms for the 73xx Var
In page 153: Note added to indicate number of unnamed alarms required in 86xx, 7410, 7420 and 7450
In pages 200-239; Moved Plant Battery Maintenance strings into page 232, and added note to indicate there are 17 pages used/reserved for PLC function strings.

Version 2.23
In page 154: 86xx/74xx register 25 now contains DC Total Watts Overload (moved from register 28)

Version 2.24
In page 153: Added notes to indicate that page 153 is used in conjunction with pages 160 to 165
In page 160: Added notes to indicate that this page is used in conjunction with page 153 registers 1 to 64
Added page 161: to be used in conjunction with page 153 registers 65 to 128. Plant Battery Maintenance alarm functions moved into registers 140 to 142 from page 160.

Version 2.25
In page 6: Removed unused registers 212-215 (Depth of Discharge, Full Charge)
In page 6: Add registers 212,213 as 32 bit 'Time to empty' (time in seconds until the engine runs out of fuel): 87xx v5.3
In page 154: Edit register 28 to include named alarms for high fuel level & low kW load (wet stacking): 87xx v5.3

Version 2.26
In page 4: Zero, positive and negative sequence voltages added.
In page 6: Mains voltage rolling averages added.

Version 2.27
In page 5: Auto DPF Regeneration Inhibit status added.
In page 16: Control keys for Inhibiting auto regeneration and starting manual regeneration.

Version 2.28
In page 180: P100 table added.
In page 190: P100 output table added.

Version 2.29
In page 5: Added register 185 as DPTC Active Regen Inhibit switch

Version 2.30
In page 3: Add register for charging states
In page 4: added new DC Battery cycle state value and table
In page 7:Added register for 7450 Battery Charge state percentage
Added register allocation matrix for E800
In page 153: Added register allocation matrix for E800
In page 154: Added register allocation matrix for E800
In page 160: Added register allocation matrix for E800
In page 161: Added register allocation matrix for E800
In page 170: Added register allocation matrix for E800
In page 180: Added register allocation matrix for E800
In page 181: Added register allocation matrix for E800
In page 190 Added register allocation matrix for E800
In page 200-239: Added register allocation matrix for E800
In pages 240-246: Added register allocation matrix for E800

Version 2.31
In page 3: Added new control mode for E800 'Off Mode'
In page 16: Added system control function code to stop E800 engine, for speed control of E800 Engine and to select E800 Off mode
In page 154: P100 alarms defined. Corrections to E800 register allocation.
In page 160: P100 defined.
In page 170: P100 defined.
In page 190: Added E800 MUTE/LAMP TEST LED status register.
In page 200: P100 defined.

Version 2.32
In page 170-171: Added register allocation for 6010, 6020

Version 2.33
In page 6: Added register Mains voltage asymmetry

Version 2.34
Added PLC maths registers to Page 192

Added Heater fitted to Page 3

Version 2.35
In page 153: Noted that the P100 has no unnamed alarms.
In page 154: Auxiliary mains failure added.
In page 160: Note about P100 not having unnamed inputs added
In page 170: Note about P100 not having unnamed inputs added

Version 2.36
In page 154: Register numbering typo corrected for P100.

Version 2.37
In page 16: Changes to 87xx display register commands to stop them conflicting with the Synclock command numbers.

Version 2.38
In page 153: Amended E800 unnamed alarms.
In page 154: Added E800 LCD Heater fault ids.
In pages 160-163 Amended E800 unnamed alarm function tables
In pages 170-171: Amended E800 unnamed input status tables and clarified E800 sender category ranges
In pages 180: Amended E800 unnamed output source and polarities table
Added page 185: E800 PWM analogue outputs including configuration data (control type, output type, frequency and source)
In page 190: Amended E800 Unnamed output status table

Version 2.38
In page 16: Battery Charger Lamp Test fn.
In page 154: New Battery Charger Alarm ID's

Version 2.39
Page 16: Updated for battery chargers
Page 154: Updated for battery chargers

Version 2.40
Page 185: Amended E800 table to re-order the blocks of values such that the Analogue output source and type are in contiguous registers with the source on an even boundary.

Version 2.41
Page 185: Amended E800 table to return duty cycle values in registers 32-35 and to add scaling factors
Page 3: Amended register 6 to add controlled shutdown (used in Exxx) in same bit position as electrical trip
Page 154: Amended alarm condition code table to indicate condition 4 is also used for controlled shutdown (Exxx)

Version 2.43
Page 3: Added register 33 for 8661 to indicate whether the module is operating as a bus controller or a mains controller

Version 2.44
Page 153: Amended E800 registers 45 to 50 to match page 227

Version 2.45
Pages 201,202,203: E800 tables corrected to match page 153

Version 2.46
Page 16: Changes for E800: Function codes 0, 76, 77 and78 amended

Version 2.47
Page 155: Description of new page on the 73xx.

Version 2.48
Page 5: Separated 94xx Battery charger registers from main modules.

Version 2.49
Page 137: added generator nominal

Version 2.50
Page 16: Added several control keys to Page 16, for the battery charger auxiliary output.

Version 2.51

Include reference o page 130 for new end of line MTS tests for 86xx modules (v6+) – register descriptions etc. are included in other GENCOMM documentation & are not for public use.

Version 2.52
Page 3: Added some items for the battery charger auxiliary output.
Page 4: Added battery charger auxiliary voltage and current, this page is now full.
Page 5: Added auxiliary output current limit value.
Page 154: Added some new alarms

Version 2.53
Page 171: Added 60xx MkII flexible sender categories and values.

Version 2.54
Page 192: Added PLC elements

Version 2.55
Page 10 added to support AVRs.

Version 2.56
Page 6, Page 153, Page 154, Page 160, Page 170, Page 171, Page 180, Pages 200-239 : Added 61xxMk II register tables

Version 2.57
In section 3, note 8 changed.

Version 2.58
In section 10.38, 'Boot in tripped mode' alarm added.

Version 2.59
Page 10 register 11 resolution corrected to 0.1 degrees.
Page 10 register 12 renamed Auxiliary Supply voltage

Version 2.60
Added references for the L40x series.

Page 6: Added L40x to "8xxx/74xx/P100" register allocation title
Page 7: Added L40x to "8xxx/74xx" register allocation title
Page 153: Added L40x unnamed alarm conditions table
Page 154: Added L40x named alarm conditions table
Page 160: Added L40x unnamed alarm function table
Page 170: Added L40x unnamed input status table
Page 180: Added L40x to "72xx/73xx" register allocation title
Page 190: Added L40x to "72xx/73xx" register allocation title

Version 2.61
Added references for the 4xxx series.

Page 6: Added 4xxx to "8xxx/74xx/P100/L40x" register allocation title
Page 7: Added 4xxx to "8xxx/74xx/L40x" register allocation title
Page 153: Added 4xxx to "L40x" register allocation title
Page 154: Added 4xxx to "L40x" register allocation title
Page 160: Added 4xxx to "L40x" register allocation title
Page 170: Added 4xxx to "L40x" register allocation title
Page 171: Added "L40x/4xxx" Unnamed input status continued table
Page 180: Added 4xxx to "72xx/73xx/L40x" register allocation title
Page 190: Added 4xxx to "72xx/73xx/L40x" register allocation title

Version 2.62
Added references for the 66xx series

Page 6: Added 66xx to "8xxx/74xx/P100/L40x/4xxx" register allocation title
Page 7: Added 66xx to "8xxx/74xx/L40x/4xxx" register allocation title
Pages 153,154,160,170,171,180 + 190: Added 66xx to register allocation titles containing "L40x/4xxx"

Version 2.63
Added references for the 71xx series

Page 6: Changed 74xx to 7xxx in the “8xxx/74xx/66xx/P100/L40x/4xxx” register allocation title
Page 7: Changed 74xx to 7xxx in the “8xxx/74xx/66xx/P100/L40x/4xxx” register allocation title
Pages 153,154,160,170,171,180 + 190: Added 71xx to register allocation titles containing “L40x/4xxx”

Version 2.64
Added references for the 60xx series

Page 6: Changed 66xx to 6xxx in the “8xxx/7xxx/66xx/P100/L40x/4xxx” register allocation title
Page 7: Changed 66xx to 6xxx in the “8xxx/7xxx/66xx/P100/L40x/4xxx” register allocation title
Page 153: Added 60xx to the register allocation title containing “L40x/4xxx”, also included additional elements
Page 154: Added 60xx to the register allocation title containing “L40x/4xxx”
Page 160: Added 60xx to the register allocation title containing “L40x/4xxx”, also included additional elements
Page 170: Removed existing register allocation table containing “L40x/4xxx”, combined with existing 60xx table.
Page 180 + 190: Added 60xx to the register allocation title containing “L40x/4xxx”

Version 2.65
Added references for the 61xx series

Page 153: Changed 66xx/60xx to 6xxx in the register allocation title containing “L40x/4xxx”
Page 154: Added 61xx to the “72xx/73xx” family register allocation title
Page 160: Changed 66xx/60xx to 6xxx in the register allocation title containing “L40x/4xxx”
Page 170: Changed 66xx/60xx to 6xxx in the register allocation title containing “L40x/4xxx”
Page 171: Added 61xx to the register allocation title containing “L40x/4xxx”
Page 180 + 190: Changed 66xx/60xx to 6xxx in the register allocation title containing “L40x/4xxx”

Version 2.66
Page 10 Register 7 voltage and frequency flags swapped to match V2 PCB to avoid confusion.
Page 10 Register 22 added.

Version 2.67
Page 10 register 64 added.

Version 2.68
In page 16: Added control keys for Stopping Manual/Forced DPF Regeneration.
In page 154: Amended alarm condition code table to add new code 5 for Controlled Shutdown

Version 2.69
In page 5: Added engine instruments for T4 Selective Catalytic Reduction – Diesel Exhaust Fuel (SCR – DEF).

Version 2.70
In page 5: Swap 947x registers 188 + 189 (ambient/PCB temperatures) around.

Version 2.71
Page 245: 61xx flexible sensor strings

Version 2.72
Page 10: Registers 23-26 added and AVR status 6 and 7 added.

Version 2.73
Page 5: Registers 191-205 (SCR-DEF instruments) amended.

Version 2.74
Page 154: Added DEF and SCR alarms for E800.

Version 2.75
Page 154: Added Generator Under Loaded alarm.

Version 2.76
Page 5: Registers 206-209 added for P100.

Version 2.77
Page 228: Amended table for 8xxx/74xx Registers 32 to 63 to add string for Low load (to reflect the current 86xx usage)
Page 228: Amended table for 8xxx/74xx Registers 64 to 95 to add string for Generator Under loaded (for the 77xx Magnum module)
Page 154: Removed register bits for Generator Under Loaded alarm from 8xxx/74xx named alarm page

Page 153: Added register bits for Low load alarm to 8xxx/74xx unnamed alarm page to reflect the current usage
Page 153: Added register bits for Generator Under Loaded alarm to 8xxx/74xx unnamed alarm page
Version 2.78
Page 160: Added Low kW load and Under Loaded unnamed alarm functions to 8xxx/74xx tables

Version 2.79
Page 154 : New P100 alarms added.

Version 2.80
Page 154 : New P100 alarm added.

Version 2.81
Page 154: Duplication of P100 alarm removed.

Version 2.82
Page 17 : Cummins modbus DTC decode format added

Version 2.83
Page 3: Register 6 bit 12 is now only for electrical trips. Bit 7 is now used for controlled shutdowns.
Page 153: Amended alarm condition code table to add new code 5 for Controlled Shutdown

Version 2.84
Page 5: Register 210 added to allow wide range signed oil pressure for Exxx.

Version 2.85
Page 10: PWM output duty cycle changed to 0.01% resolution.

Version 2.86
Page 154: Amended 72xx/73xx/61xx family register allocation table to add DEF Level Low and SCR Inducement named alarms

Version 2.87
Page 154: Amended 72xx/73xx/61xx family register allocation table to insert VAr and LCD heater named alarms

Version 2.88
Page 10: Amended website reference from www.modbus-ida.org to www.modbus.org

Version 2.89
Page 160: Corrections to Exxx table to match order of page 153
Page 227-229 Inserted unimplemented registers to match order of page 153 registers 176 to 199

Version 2.90
Page 10: Alternator excitation current added.
Page 10: Current limit active flag added
Page 10: Excitation overload trip state added

Version 2.91
Page 5: added register 211

Version 2.92
Page 171:Correction to page 171 for E800, registers 230 to 254 for 2131 expansion modules 1 to 3 inputs A to H

Version 2.93
Page 180, 190: added registers to support output I and J on the 73xx
Added new alarms for the 73xx MKII P153, P154 and strings

Version 2.94
Page 5: added registers 212 to 216 to support Engine Interface v7

Version 2.95
Page 10: 'Integral limit reached' flag added.

Version 2.96
Page 171: added registers 146 to 177 to support new flex senders on the 73xx MKII
Corrections to page 153 and 154
Added Register 18 to P154

Version 2.97
Page 154: P100 ROCOF stages 2 and 3 added.

Version 2.98
Page 3 : add register 38 (86xx Mk II: Panel Lock Status)
Page 5: added registers 217 to 228

Version 2.99
Page 137: Renamed page, set registers 0-31 as reserved, added register 78 Cummins CM850 Governor gain, amended note to indicate 8xxx only.

Version 2.100
Page 153: Exxx – Flex sensor IDs now labelled A-L. Flex sensor fault registers added.
Page 154: Exxx – Alarm Conditions for PWMi and Incorrect Speed alarm added. Number of named alarms set to 58.
Page 160: Exxx – Flex sensor IDs now labelled A-L. Flex sensor fault registers added.
Page 172: Exxx – New page. Continuation of page 170/171 containing unnamed input status registers for internal flexible sensor faults
Page 185: Exxx – Renamed page to indicate analogue outputs. Additional analogue output control types and output range/types. Registers 32-35 now contain analogue output value (according to output range); Additional registers for Analogue output/governor output
Page 224-226: Exxx – Flex sensor IDs now labelled A-L
Page 230-231: Exxx – New pages containing Flexible Sensors sensor fault alarm strings
Page 184: Renamed page description to indicate expansion analogue output sources, differentiating it from new Page 185
Page 185: Renamed page description to indicate internal analogue output sources, differentiating it from Page 184

Version 2.101
Page 250: Added onboard analogue output string

Version 2.102
Page 7: Added new accumulators for DC modules.
Page 137: Added current limit register.

Version 2.103
Page 5: Added missing DC Charger Current.

Version 2.104
Page 10: Reg 15 is now signed.

Version 2.105
Page 185: Corrected voltage scaling in analogue output table, to 0.001. Also corrected ranges for voltage.

Version 2.106
Page 10: Added registers 28-30.

Version 2.107
Page 185: Correction to registers 32-35 to indicate unsigned 16 bit values (as per range specified in Page 185 Analogue Output Range Table). Correction to page 185 register 44 to indicate signed 16 bit value (as per range specified in Page 185 Analogue Output Range Table).

Version 2.108
Page 201: added flex sensor strings for sensor B to F

Version 2.109
Page 153: Added alarms for 45xx MKII
Page 154: Added alarms for 45xx MKII

Version 2.110
Page 185: Analogue Output Table amended to clarify PWMi reading and to correct max values used in Exxx

Version 2.111
Page 70: Added Extended PLC Stores 1-100
Page 72: Added Extended PLC Registers 1-100
Page 74: Added Extended PLC Timers 1-50
Page 76: Added Extended PLC Counters 1-50

Version 2.112
Page 154: Added Electrical Trip Reset –Engine Stop Inhibitedregister

Version 2.113
Page 16: Corrections to available commands

Version 2.114
Page 160: Add registers 9 to 13, 217 to 255
Page 161: add registers 0 to 144 for the 73xx
Page 170: add registers 12 to 27
Page 171: registers 106 to 145
Page 172: Registers 112 to 191

Version 2.115
Page 170: Added missing Digital code to Sender Category Enumeration
Page 171: Added Sender Category Enumeration
Page 172:Added Sender Category Enumeration

Version 2.116
Page 154: Renamed 86xx table register 33 bits 9-12 to indicate E-Trip Stop Inhibited

Version 2.117
Page 154: added battery charger common alarms
Page 156, 158 Added DSENet charger status registers

Version 2.118
Page 153: Unnamed Alarm Conditions (74xx MKII)
Page 170: Unnamed Input Status (74xx MKII)
Page 171:Unnamed Input Status (74xx MKII)
Page 172:Unnamed Input Status (74xx MKII)
Page 160:Unnamed Input Function (74xx MKII)
Page 161: Unnamed Input Function (74xx MKII)
Page 178 : Internal Analogue Sensor Readings and Config values (74xx MKII)
Page 179 : Expansion Module Analogue Sensor Limits (74xx MKII)

Version 2.119
Page 137: DSENet battery charger Modbus ID's (73xx MKII)

Version 2.120
Page 25: Added names for Modbus Gateway ID's(73xx MKII)

Version 2.121
Page 178: Added detail for generic Analogue Inputs Unit Info registers (Exxx, 86xx MK2)
Page 179: Added detail for generic Expansion Modules Input Ranges (Exxx, 8610 MK2)
Page 170: 86xx/74xx, Exxx max sender category amended
Page 171: 86xx/74xx, Exxx max sender category amended

Version 2.122
Page 10: Added 'Auto frequency selection state'

Version 2.123
Page 5: Added Fuel Efficiency kWH/Litre instruments
Page 7: Added Fuel Efficiency accumulated kWH/Litreinstrument

Version 2.124
Page 153: Added registers 56 to 103 Expansion alarms
Page 154: Removed DSENet common alarms
Page 161: Added DSENet charger registers 145-155
Page 172: Added register 192-207 DSENet charger alarms status
Page 228: Added page

Version 2.125
Page 170: Amended table for 8xxx / 74xx MKI family registers 32-41 to indicate registers allocated for Flex sensor as Digital input

Version 2.126
Page 137 – Registers 90, 122 and 123 added.

Version 2.127
Page 137 – Registers 91, 124 and 125 added.

Version 2.128
In section 8.1 Note 5 extended to permit the returning of a sentinel for a reserved register.

Version 2.129
Page 154: Exxx named alarms register 13 bits 1-4 renamed as ECU DEF Level Low; Register 15 bits 5-8 used for DEF Level Low

Version 2.130
Page 160/161: 73xx MKII expansion registers renumbered for analogue alarm functions.

Version 2.131
Page 154: Exxx named alarms register 13 bits 1-4 renamed as DEF Level Low (now used for combined ECU and module alarms), and register 15 bits 5-8 set to unimplemented.

Version 2.132
Page 127 reg 91 scale corrected.

Version 2.133
Page 250: AVR allocation added.

Version 2.134
In page 137 Registers 36/37 now signed

Version 2.135
In page 5 Added registers 195 and 196 for battery charger status codes required by 73xx MkII

Version 2.136
Pages 29, 30, 175, 176, 177 Added new pages to document the Configurable CAN Instrumentation for 61xx MkII v2.0 (74xx MKII v1.1 uses pages 175-177 but isn't documented for some reason).
Update pages 150 & 154 with the new named alarms for 61xx MKII v2.0

Version 2.137
Make page 29, register 255 reserved, and move items into page 30

Version 2.138
Page 177 updated for 74xx MKII V1.1
Page 153 reg 47added 61xx MKII low load alarm
Page 160 reg 187 added for 61xx MKII low load alarm
Page 223 regs 96 to 127 for 61xx MKII low load alarm (user-supplied string)

Version 2.139
Page 190 Moved 6xxx into a separate table and corrected digital outputs A – F

Version 2.140
Page 156 & 158 Added DSENet chargers to the 86xx

Version 2.141
Page 154 Added Fuel Tank Bund Level Alarm to the 86xx

Version 2.142
Page 0 Added Registers 15 to 21, comms port status

Version 2.143
Page 0 Added Registers 22 to 30, DSENet / MSC port status

Version 2.144
Add page 194, 195 Configurable CAN descriptions.

Version 2.145
Page 5, register 233 fuel distance has been added for the 7450 Ausonia v2.2.0 upgrade.

Version 2.146
Page 153 – 86xx/74xx MKI table 13eparated to 86xx MKII and 7450 table
Page 154 – 86xx/74xx MKI table 13eparated to 86xx MKII and 7450 table

Version 2.147
Page 154 – 86xx MKII renamed to 8xxx and 8680 implementation added
Page 154 – Corrected 7450 table
Page 153 – 86xx MKII renamed to 8xxx to incorporate 8680 alarms

Version 2.148
Page 5, register 233 scaling changed for fuel distance due to engine file change (7450 Ausonia v2.2.0).

Version 2.149
Pages 16, 19, 20 – Added Modbus exception codes 10 and 11 to the list of supported exception responses.

Version 2.150
Page 0 – Added MSC quality instrumentation (reg 32).

Version 2.151
Page 137 – Amended comment so page applies to modules other than the 8xxx range, also added register 147 for target speed (used in the Exxx range)

Version 2.152
Page 137 – Split registers 147 onwards to be generic and module specific for the Exxx range

Version 2.153
Page 160/161 tables for 86xx MKII added.

Version 2.154
Page 154 – Breaker alarms added for 335.

Version 2.155
Page 154 – Added MSC link alarms for MSC link 1 and MSC link 2 (Reg 34-36)

Version 2.156
Page 137 – Added ramp rate registers (Reg 169-172)

Version 2.157
Page 5 – Added battery charger registers 202 (configured digital input) and 203 (manual boost)

Version 2.158
Page 154 – Added “Electrical Trip from 8660” alarm into 86xx table

Version 2.159
Section 3 added notes 19 to 26 to support Ethernet connections and gateway connected devices

Version 2.160
Page 10 – added items for A108 AVR
Page 250 – added string definitions for A108

Version 2.161
Page 153 – added Flex A fault for 45xxMKII

Version 2.162
Page 19 (extended instrumentation) added

Version 2.163
Page 136 – Register 113 added
Page 137 – Note 3 added
Page 137 – Renamed registers 83-85 and added 86-88
Page 137 – Renamed registers 115-117 and added 118-120

Version 2.164
Page 5 – Registers235 to 243 added to provide Bus Sequence instruments, and registers 245 to 253 to provide Gen Sequence instruments. Note that register groups are in same order as page 4 Mains sequence registers (223 – 231). Also note that 234 and 244 are unimplemented to provide padding,ensuring alignment of 32 bit values.

Version 2.165
Page 154 – 8xxx family: Register 0 amended and register 37 added for Gen Sequence and Asymmetry alarms.

Version 2.166
Page 3 – Registers 208-219 & 240-245 added.
Page 153 – Registers 104-106 added for 73xx.
Page 154 – Registers 18 & 19 amended.
Page 160 – Register 217 added for 73xx.
Page 161 – Registers 156-165 added for 73xx.
Page 171 – Registers 178 & 179 added for 73xx.
Page 173 added.
Page 227 – Registers 32-63 added for 73xx/74xx.
Pages 29, 30, 70, 72 & 175-177 made applicable to 73xx MkII.
Page 192 made unapplicable to 73xx MkII.

Version 2.167
Page 16 – Control key 35786 added.

Version 2.168
Page 10 – 86xx Registers renamed to Controller Registers. Unused registers between 69 – 82 removed and others shuffled up.

Version 2.169
Page 137 –Register 32 range corrected

Version 2.170
Page 137 – Registers 51 and 99 now reserved

Version 2.171
Page 137 – Notes 5 and 6 added.

Version 2.172
Page 137 – Registers 49, 81, 97 and 113 minimum value changed.

Version 2.173
Page 5 – Battery Chargers Register 202 – return values modified for each charger range

Version 2.174
Page 0 – Added MSC disgnositcs registers 28,29,31,32,34

Version 2.175
Page 16 – Added droop control keys

Version 2.176
In page 16 - Control keys 93-94 added
In page 154 - Remote Mains Fail added
In page 193 - Note 2 added.

Version 2.177
In page 16 - Control key 95 added

Version 2.178
In page 160 – Register 5 added.
In Page 170 – Registers 10-11 added.
In page 193 - Note 2 corrected

Version 2.179
In page 193 - Note 2 changed.
Version 2.180
Page 19 – Register 53 (Escape Mode Status) added – for 73xx MKII v5.0.

Version 2.181
Page 137- Added Registers 172 to 197
Page 175- Added multibyte string read mechanism for 8610 V4.2 only

Version 2.182
Page 180: Added L401MKII to “8xxx/74xx” register allocation title

Version 2.183
Table standardisation pass 1

Version 2.184
Page 10 – Additional registers for A109 AVR (registers 36-38 and registers 65-68)

Version 2.185
Table standardisation pass 2

Version 2.186
Page 137 – Added registers for Exxx engine speed PID control (registers 151 – 172)

Version 2.187
Page 5 - Registers 19-47, 56-63, 188-189 now return unimplemented sentinels rather than actually generating a Modbus exception response for 73xx MKII/74xx MKII v5.0 & later
Page 10 – Clarification that registesr 39-63 return unimplemented sentinel values rather than a Modbus exception response. Include details for registesr 69 to 76 inclusive
Page 154 - New alarm Ids for 73xx/74xx MKII v5.0
Page 156 – Add register 49 to report 25xx MKII ID #0 on DSENet enable statusfor 73xx/74xx MKII v5.0
Page 158 – Add register 49 to report 25xx MKII ID #0 on DSENet comms failure statusfor 73xx/74xx MKII v5.0
Page 171 – Added information that flex sensor readings are 16 bit signed for 73xx MKII/74xx MKII. Included revised sensor category for these sensors as well. (Response to Redmine #6991 – WebNet not reading the flex sensor values correctly)

Version 2.188
Page 16 – Injection testing added.

Version 2.189
Section 3 note 8 updated to record that 86xx MKII & 73xx/74xx MKII families also only sue 1 stop bit.

Version 2.190
Page 7 - Fault Ride Through event count added.

Version 2.191
Page 154 – Mains decoupling stage 2 alarms and FRT event alarm added.

Version 2.192
Page 16 – Notes on signal injection updated

Version 2.193
Page 153 – Added notes for 86xx MKII

Version 2.194
Added Page 3 Register 39 for transducer supply.

Version 2.195
Page 10 – Added registers 39 to 44 to indicate the preset pot positions but returning unimplemented sentinels if the pot is not enabled.

Version 2.196
Page 137, Register 125 is unitless, not %

Version 2.197
Page 5 registers 254,255 – Added for E400 v4.0 (Manual Run Time Remaining)
Page 72 – registers now marked as read only (instead of read/write).

Version 2.198
Page 71 – PLC strings - Added for 86xx MKII v7.0+
Page 73 – PLC Flags - Added for 86xx MKII v7.0+

Version 2.199
Page 136, Added registers for 86xx MKII Droop y intercept

Version 2.200
Page 137 – Added the de-rating section

Version 2.201
Page 137 – Revised the de-rating section

Version 2.202
Page 67 added, which was implemented in the 86xx MkII previously

Version 2.203
Page 19 registers 41-44 GPS resolution changed to uDegrees, used by 890-A2

Version 2.204
Page 5: Register 244 added to allow signed fuel level for negative values to be displayed.

Version 2.205
Page 3: Register 246 added to allow feedback of MPU calibration process.

Version 2.206
Page 153-154 'Load demand incompatibility' added.

Version 2.207
Page 137: De-rating registers revised.
Section 3 note 8: Add 61xx MKIII & 63xx to list of modules only supporting one stop bit
Page 4: Added note about signed version of fuel level register being available in page 5; existing page 4 register 3 will only return positive values & will return the under-range sentinel for negative values (73/74xx MKII v6.0)

Version 2.208
Page 7: E800 table renamed Exxx and amended to add Registers for Maintenance Alarms 4 and 5
Page 16: System control keys added to reset maintenance alarms 4 and 5.
Page 153: Exxx table amended to add column for E400 alarms and add register 45 Maintenance 4 and register 54 Engine Maintenance 5 alarms
Page 160: Exxx table amended to add column for E400 alarms and add register 45 Maintenance 4 and register 54 Engine Maintenance 5 alarm functions
Page 170: Exxx table amended to add column for E400 alarms
Page 171: Exxx table amended to add column for E400 alarms
Page 180: Exxx table register 7 name correction and addition of E400 column
Page 185: Exxx table amended to add columns for E800, E400
Page 190: Exxx table amended to add column for E400 alarms
Page 200-239: Exxx table amended to add columns for E800,E400 alarms
Page 227: Exxx table amended to add register 96 Engine Maintenance 4 alarm string
Page 231: Exxx table amended to add register 128 Engine Maintenance 5 alarm string

Version 2.209
Correction to Page 154 8xxx MKII alarms

Version 2.210
Page 16:Function codes 43 and 44 (35743&35744) are reserved
Function code 98 (35798) is reserved
Function codes 99 and 100 (35799 & 35800) added to reset maintenance alarms 4 and 5.
Page 160: Exxx table amended to add register 212 for Engine Maintenance 5 alarm functions

Version 2.211
In page 16: Signal Injection Registers changed.

Version 2.212
Added high precision fuel units for use on Page 5 Register 18

Version 2.213
Page 137 – Added register 173 to indicate required Exxx Display Units

Version 2.214
Page 137 – Added register 174 to provide required Exxx Maintain value target source and renamed “control sensor” as “control source” in registers 157 to 172.

Version 2.215
Page 135 added.
Page 137 – Added registers 218-236

Version 2.216
Page 135 – Reserved page
Page 137 – Reserved registers 218-236

Version 2.217
Page 10 Register 6 – Added states to the AVR status to indicate idle mode and de-excite mode

Version 2.218
Page 3 Register 247 – Added

Version 2.219
Updates for 86xx MKII v7.0
Added page 10 (including new registers 36-38 for individual phase voltage measurement for A109).
Also, for 86xx only, Gencomm override supported on the writes to page 10
Page 154 – added status of new alarms for AVR Data Fail & AVR Red Lamp
Added Gencomm override for 8660 bus frequency/voltage adjust when running in island mode in manual

Version 2.220
Reserved registers in Page 137 for new development

Version 2.221
Various typographical corrections.

Version 2.222
Page 7 reg 102-103 added.

Version 2.223
Page 12 – 73xx / 74xx MkII v7.0 changes added
Page 13 – 73xx / 74xx MkII v7.0 changes added
Pages 71 to 76 – Extended PLC registers now apply to 73xx / 74xx MkII v7.0

Version 2.224
Page 154 – New alarms added for 8xxx

Version 2.225
Page 7 – New maintenance instruments 6-10 added for E400
Page 16 – New maintenance 6-10 reset control functions added for E400
Page 153 – New Maintenance alarms 6-10 added for E400
Page 153 – Configurable CAN instrument alarms added for Exxx
Page 153 – PLC functions marked as available for E400
Page 160 - PLC functions marked as available for E400
Page 160 – Engine Maintenance alarm function 5-10 added for E400
Page 160 – Configurable CAN instrument alarms added for Exxx
Page 29 – Note added to indicate also used on E800 (v3.0 &later) andE400 (v7.0 & later)
Page 30 – Note added to indicate also used on E800 (v3.0 &later) andE400 (v7.0 & later)
Page 175 – Note added to indicate also used on E800 (v3.0 &later) andE400 (v7.0 & later)
Page 176 – Note added to indicate also used on E800 (v3.0 & later) and E400 (v7.0 & later)
Page 177 – Note added to indicate also used on E800 (v3.0 & later) and E400 (v7.0 & later)
Page 227-228 – PLC functions strings marked as available for E400
Page 231-232 – Engine Maintenance alarm strings 6-10 added for E400

Version 2.226
Page 3 Updated
Page 254 Updated

Version 2.227
Several areas marked as “Reserved, do not allocate”

Version 2.228
Page 74 – Added PLC timer initial values for registers 100-199
Page 76 – Added PLC counter initial values for registers 100-199

Acknowledgements
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2. Introduction

The purpose of this standard is to provide a uniform protocol for communicating with any generating set control equipment. It allows all telemetry information relevant to a generating set to be read from the control equipment, regardless of manufacturer or specification, and allows basic operations such as starting and stopping the engine, transferring the load etc. to be performed remotely.

This standard does not define how to program the control equipment, or transfer manufacturer specific information such as configurations to or from the equipment.

This standard does not define the physical link, but is compatible with RS232, RS423, RS485, modem links or any similar system.

This standard uses the Modbus protocol, complete details of which can be found on the Modbus web site http://www.modbus.org/

3. General Definitions and Requirements

Notes

1. A single piece of generating set control equipment is referred to as a 'control unit'.
2. A control unit is always a slave device as defined in the Modbus protocol.
3. A PC, building management system or similar system is referred to as a 'master device' as defined in the Modbus protocol.
4. A hub is a device which connects a master device to one or more control units, to a master it appears as a slave and to a control unit it appears as a master.
5. A control unit connected to a hub is referred to as a satellite device of the hub.
6. The term 'slave device' refers either to a control unit or to a hub when it is viewed from a masters point of view.
7. The transmission mode used shall be RTU not ASCII.
8. The byte format over an RS485 link shall be 1 start bit, 8 data bits, no parity bit and 2 stop bits as defined by the Modbus protocol, the 73xx family is an exception to this rule as they always use 1 stop bit. The 86xx MKII family, 61xx MKIII family, 63xx family& 73xx/74xx MKII family also use 1 stop bit.
9. The byte format over an RS232 link to a modem or direct to a PC shall be 1 start bit, 8 data bits, no parity bit and 1 stop bit which is the de-facto standard for modems.
10. The baud rate used will be one of those listed in Page 1 – Communications Configuration.
11. Bus time-outs must be detected by the master, as defined in the Modbus protocol.
12. For details of the Unicode character representation refer to the Unicode standard version 2.0 published by the Unicode Consortium.
13. Unicode strings may contain the control code 0x000A which shall be interpreted as "move to the beginning of the next line down".
14. Any software that reads a Unicode string may either use the control code 0x000A to split the string into separate lines or may replace it with 0x0020 if it is desired to display the string on a single line, it must not be ignored as this may lead to the concatenation of words.
15. In this standard the term 'ASCII character' refers to an 8 bit character following the sub-set of Unicode from 0 to 255, it does not refer to any other published standard of character representation to avoid the ambiguities in such standards.
16. The form 0x12AB refers to a hexadecimal number, all other numbers are in decimal.
17. This document describes GenComm version 1, future upgrades of this standard will increase this version number by 1 and must be fully backwards compatible with all previous versions.
18. Any software written to interface with a GenComm version *n* slave device will be able to interface with a GenComm version *n*+1, *n*+2 etc. slave device without modification, and will be able to perform any operation defined in version *n*, but will not, of course, be able to perform functions added in later versions.
19. Any software written to interface with a GenComm version *n* slave devices will recognise a GenComm version *n*-1 slave device (from the 'Communications Status Information' page) and perform all operations defined in version *n*-1 on that slave device, it will not attempt to perform any operations added in later versions of GenComm on that slave device.
20. Some controllers support the broadcast address of 0, a responce is not sent for Modbus packets sent to this address
21. Where a connection over Ethernet is available to a controller, the Modbus RTU packet is encapsulated in a Ethernet packet
22. Modbus IP connections are defaulted to use IP Port 502 as specified by the IANA, if however this settingis changed, port 502 will not longer be monitored.
23. The Modbus address must still be used as part of an IP packet, this is fixed as Modbus address 10 for the host controller (Modbus slave device)
24. Where a controller has other slave devices connected, (e.g. 8610 MKII with DSENet chargers), the slave devices can be accessed using the Modbus address assigned to them. This results in a single physical network node will respond to several Modbus addresses.
25. Where a controller supports gateway access to connected devices, each device has its own virtual connection to the bus, however this connection may be slow as the messages are forwarded to a new physical connected device.
26. Where a controller has slave devices connected, a Modbus request written to Modbus address 0 (broadcast address) the request is only processed by the Modbus slave (controller) not sent to the connected slaves (DSENetchargers).

4. Hubs and Protocol Conversions

A hub may be designed to connect to satellite devices of one of 3 types, ones that recognise the GenComm protocol directly, ones that recognise another Modbus based protocol, or ones that use an entirely unrelated protocol. In the second and third cases the hub must provide protocol conversion which is not defined in this standard.

Notes

1. A hub recognises queries from a master device for a range of slave addresses, e.g. a hub with its own slave address set to 20 and 8 satellite sockets will recognise slave addresses 20 to 28. Address 20 corresponds to the hub itself, 21 to its first satellite socket, 22 to its second satellite socket, etc. The hub will respond to all these slave addresses even if there is no satellite connected to a particular satellite socket.
2. A hub will accept queries to its own slave address where appropriate, for example a hub may have some auxiliary digital inputs and outputs.
3. A valid password must be entered into a hub (at its own slave address) before any of its satellite devices or its own registers can be accessed in any way, thus the hub provides security for the entire installation via a single password.
4. A hub designed for GenComm satellites recognises a query from a master that has a slave address corresponding to one of its satellites, checks that the password privilege level is adequate for the specified operation, passes this query on to the satellite, and then returns any response back to the master.
5. A hub designed for other Modbus satellites recognises a query from a master that has a slave address corresponding to one of its satellites, checks that the password privilege level is adequate for the specified operation, converts the protocol as necessary, passes the query on to the satellite, and then returns any response with appropriate conversion. Note that such a hub may not be able to provide security for the satellite as it may not fully understand the satellites protocol, in which case it simply passes the message on regardless of password levels and delegates security to the satellite.
6. A hub designed for non-Modbus satellites must provide complete protocol conversion and must emulate the GenComm registers so that it appears to the master as a GenComm satellite. All security will also appear to work in exactly the same way as for a GenComm satellite.
7. For a description of password privilege levels refer to the Password status register in Page 1 – Communications configuration and status.
8. A hub designed for GenComm satellites will set the slave addresses of all satellites when it initialises, or of a particular satellite when it does not respond. For example a hub with slave address 20 will set its satellites to slave addresses 21, 22 etc. This is achieved without knowing the satellites current slave address by sending broadcast messages (slave address 0) to the satellite to set its slave address. This ensures that the hub will not have to convert the slave addresses in queries from a master or in responses from a satellite. This process can only function if the satellites passwords are completely disabled, which is normally the case for a satellite.
9. A hub designed for Modbus satellites may not be able to set the satellites slave address in this way, the addresses may have to be set manually on each satellite or the hub may have to convert the addresses in each query and response.
10. Although this standard talks about ‘satellite sockets’ the connection between a hub and satellite may be of any form, a single socket for each satellite, an RS485 bus with the hub as the master, or some other method.

5. Multiple Masters

GenComm is based on Modbus which is a protocol that is only intended for a simple single master network, therefore it does not support multiple masters accessing a slave simultaneously.

If a slave device has more than one interface that can act as a master, it must only serve one master at once. Whenever it changes masters it must completely re-initialise the status of the port, in particular it must clear the password status to 0 (Invalid) and the extended exception information to 0 (No error), thus ensuring that there can be no interaction between masters of any kind. Any master that makes a query while its port is not being served must either be answered by exception 6 (Slave device busy) whatever the query was, or not answered at all.

The mechanism used by a slave device to decide which master to serve is not defined in this standard, it may be a physical switch, a configuration option or an automatic switch using some mechanism to decide which master to serve. An example of an automatic switch would be a slave device that had an RS485 port to a building management system and an RS232 port to a modem, in this case it might be decided that whenever a modem link is established the RS485 port will be disabled and when the modem link was broken the RS485 port was re-enabled. In such a case it would have to be accepted that the RS485 port would be unavailable whenever the modem link was in use.

GenComm does not support multiple communications configurations for multiple master ports.

6. Exception Responses

Any function may return an exception response if it does not complete successfully, as define in the Modbus protocol.

Notes

1. The Modbus Protocol Reference Guide defines the meanings of exception codes 1 to 8 and the Open Modbus/TCP Specification defines error codes 10 and 11, but unfortunately these meanings are ambiguous, so cannot convey accurate information about the error. This standard, therefore, defines an extended exception code and exception address which can be read from the slave device at registers 0 and 1 respectively.
2. A slave device will only return exception code 1, 2 or 6 if a function fails, in the case of exceptions 1 and 2 the extended exception code and address should then be read to find more information about the exception.
3. The extended exception code will be set to the result of the last message, which implies that a successful read of this register will clear it, this occurs after the read has been performed.
4. The extended exception address will be set to the address of the register that caused the exception, or to 0 if inappropriate. This allows precise identification of the cause when reading or writing multiple registers.
5. The extended exception code and address must both be read by a single message, reading them individually would meaningless as they would each refer to different messages.
6. Extended exception codes 1-255 can be generated by any slave device but codes above 256 can only be generated by a hub.
7. Exception code 6 (Slave device busy) will be returned whenever a slave device is completely unable to reply to a query because it is occupied, in this case the extended exception codes cannot necessarily be read. An example of this is when a slave device is serving a master of a higher priority than the one that made the query.
8. In the case of a hub the extended exception registers contain the result of a query to the hub, they are not changed by a query to a satellite. The corresponding registers in the satellite must be read to obtain the result of such a query.

Exception response message

Byte	Field name	Notes
0	Slave address	
1	Function code +128	Top bit is set
2	Exception code	1 – Illegal function code 2 – Illegal data address 6 – Slave device busy 10 – Gateway path unavailable 11 – Gateway target failed to respond
3-4	Error check CRC	

Extended exception codes

Exception code	Extended exception code	Extended exception name	Notes
Not applicable	0	No error	The last function completed successfully.
1	1	Function not defined	The function requested is not defined in this standard and is not recognised as a manufacturer specific function, no actions were taken
1	2	Function not implemented	The function is defined in this standard but not implemented on this slave device, no actions were taken. This will currently never be returned as both functions 3 and 16 must be implemented.
2	3	Register not defined	The register specified is not defined in this standard and is not recognised as a manufacturer specific register, no actions were taken
2	4	Register not implemented	The register specified is defined in this standard but not implemented on this slave device, no actions were taken. This will never be returned by function 3 as all defined registers must return an 'unimplemented' value, see the description of function 3 below. It may be returned by function 16 if a defined register is not implemented.
2	5	Read from a write only register	An attempt was made to read a write only register, no actions were taken..
2	6	Write to a read only register	An attempt was made to write to a read only register, the register was not changed and no actions were taken. If this occurred due to insufficient privilege then the 'insufficient privilege' exception will be returned instead
2	7	Illegal value written to register	An attempt was made to write a value that is not within the allowable range, the register was not changed and no actions were taken
1	8	Inappropriate circumstances	An operation was requested that is not appropriate in the present circumstances, for example a start attempt when a shutdown alarm is present.
1	9	Insufficient privilege	An operation was attempted without sufficient privilege, such as writing when the read only password has been entered.
6	10	Slave device too busy	The slave device was too busy to perform the operation, try it again later if it is still required. Note that it may not be possible to read the extended exception code in this situation.
1	11	Unsupported language	The selected language is not supported, the language has not been changed.
1	12	Reserved register	The specified register is defined as reserved in this standard
2	13	Block violation	The specified range of registers in invalid, no actions were taken. An attempt to read part of a state string would cause this error for example.
	14-255	Reserved	Reserved for future use in this standard
1	256	No satellite socket	Returned by a hub only. The specified satellite state is 'No socket'.
1	257	Satellite disabled	Returned by a hub only. The specified satellite state is 'Disabled'.
1	258	Satellite error	Returned by a hub only. The specified satellite state is 'Error'.
	259-32767	Reserved	Reserved for future use in this standard
½	32767-65535	Manufacturer specific error	An error occurred in a manufacturer specific operation either using register pages 128-255 or functions other than 3 and 16. The meaning of these exception codes is manufacturer specific, any software not knowing the meaning for a particular slave must print the message 'Manufacturer specific error n' where n is the exception code.

7. Modbus Functions Used

This standard only uses Modbus functions 3 and 16 as recommended in the Open Modbus/TCP Specification draft 2.

Notes:

1. Any other functions may be implemented if required, for example for configuration of the slave device, but are not defined in this standard.
2. Any device which requires other functions to be implemented in order to perform a task which can be performed by function 3 or 16 is deemed to be non-compliant with this standard.

Functions used

Function number	Function name	Defined by Modicon	Notes
03	Read multiple registers	Yes	Reads one or more registers.
16	Write multiple registers	Yes	Writes one or more registers.

8. Description of Each Function

8.1 Function 3 – Read Multiple Registers

Reads one or more 16 bit registers from the slave device.

Notes:

1. The limit of 125 registers is to comply with the Modbus specification which requires that a message must not exceed 256 bytes including all fields.
2. Any request for a register that is defined in this standard must return a normal response, if the register is not implemented by a particular product it must return the unimplemented value from the table below to indicate this fact, it must not return an exception.
3. A request for a register that is defined in this standard as contain some unimplemented bits must return a normal response, the unimplemented bits will contain the unimplemented value from the table below.
4. A request for a register that is defined in this standard as unimplemented will return the unimplemented value from the table below.
5. A request for a register that is defined as reserved in this standard will either return extended exception code 12 (Reserved register), or the 16 bit unsigned unimplemented sentinel (0xFFFF), i.e. not an exception. This option permits efficiency improvements by allowing reading across gaps in the register map. In exceptional circumstances the option to return a sentinel may be problematic for a particular page so should not be used, this will be documented in the description of the page.
6. A read from a multi-register value such as a 32 bit value or a string must be performed by a single message, not by multiple ones. This avoids the possibility of a value being partly current and partly old data.
7. The instrumentation values can return the sentinel values described in the table below to indicate a value that is over or under the measurable range, that a transducer is faulty, that the data is bad for some other reason or that the transducer is actually a digital type.
8. The sentinel value ‘high digital input’ means that the instrumentation value is high (high oil pressure, high temp, etc), similarly ‘Low digital input’ means the instrumentation value is low. They do not refer to voltage levels on the inputs.

Query message

Byte	Field name	Notes
0	Slave address	
1	Function code (3)	
2	First register address – high byte	16 bit register address
3	First register address – low byte	
4	Number of registers to read – high byte	16 bit number of registers, must be in the range 1 to 125
5	Number of registers to read – low byte	
6/7	Error check CRC	

Normal response message

Byte	Field name	Notes
0	Slave address	
1	Function code (3)	
2	Byte count (n)	8 bit even number in the range 2 to 250 (number of registers *2)
3	First register – high byte	16 bit register
4	First register – low byte	
…		
1+n	Last register – high byte	16 bit register
2+n	Last register – low byte	
3+n/4+n	Error check CRC	

Exception response message

Byte	Field name	Notes
0	Slave address	
1	Function code +128 (131)	Top bit is set
2	Exception code	1 – Illegal function code 2 – Illegal data address 6 – Slave device busy 10 – Gateway path unavailable 11 – Gateway target failed to respond
¾	Error check CRC	

Unimplemented register and field values

Size of register	Value returned	Notes
1 bit flag within a register	0	No third state exists for a flag to indicate it is not valid
2 bit named digital input/output code	3	Unimplemented input/output
4 bit alarm condition codes	0xF	Unimplemented alarm
4 bit LED colour code	0xF	Unimplemented LED
16 bit unsigned, any scale	0xFFFF	The largest number
16 bit signed, any scale	0x7FFF	The largest positive number
32 bit unsigned, any scale	0xFFFFFFFF	The largest number
32 bit signed, any scale	0x7FFFFFFF	The largest positive number
ASCII strings	“ ”	A string of spaces (Unicode 0x0020), NULL terminators are not used
Unicode strings	“ ”	A string of spaces (Unicode 0x0020), NULL terminators are not used

Sentinel values for instrumentation

Size of register	Sentinel values	Notes
16 bit unsigned, any scale	0xFFFF	Unimplemented
	0xFFFE	Over measurable range
	0xFFFD	Under measurable range
	0xFFFC	Transducer fault
	0xFFFB	Bad data
	0xFFFA	High digital input
	0xFFF9	Low digital input
	0xFFF8	Reserved
16 bit signed, any scale	0x7FFF	Unimplemented
	0x7FFE	Over measurable range
	0x7FFD	Under measurable range
	0x7FFC	Transducer fault
	0x7FFB	Bad data
	0x7FFA	High digital input
	0x7FF9	Low digital input
	0x7FF8	Reserved
32 bit unsigned, any scale	0xFFFFFFFF	Unimplemented
	0xFFFFFFFE	Over measurable range
	0xFFFFFFFD	Under measurable range
	0xFFFFFFFC	Transducer fault
	0xFFFFFFFB	Bad data
	0xFFFFFFFA	High digital input
	0xFFFFFFF9	Low digital input
	0xFFFFFFF8	Reserved
32 bit signed, any scale	0x7FFFFFFF	Unimplemented
	0x7FFFFFFE	Over measurable range
	0x7FFFFFFD	Under measurable range
	0x7FFFFFFC	Transducer fault
	0x7FFFFFFB	Bad data
	0x7FFFFFFA	High digital input
	0x7FFFFFF9	Low digital input
	0x7FFFFFF8	Reserved

8.2 Function 16 – Write Multiple Registers

Writes one or more 16 bit registers to the slave device.

Notes:

1. The limit of 123 registers is to comply with the Modbus specification which requires that a message must not exceed 256 bytes including all fields.
2. A write to a register that is defined in this standard but not implemented on this slave device will return extended exception 4 (Register not implemented) and have no other affect.
3. A write to a register that is defined in this standard as unimplemented will return extended exception 4 (Register not implemented) and have no other affect.
4. A write to a register that is defined in this standard as containing some unimplemented bits will only affect the implemented bits, the state of the unimplemented bits is irrelevant.
5. An attempt to write to a register that is defined as reserved in this standard will return extended exception code 12 (Reserved register) and have no other affect.
6. A write to a multi-register value such as a 32 bit value, a password or a string must be performed by a single message, not by multiple ones. This avoids the possibility of a value being partly current and partly old data.
7. The maximum allowable writing frequency to 25odbus registers should be limited to 10 times per second, to prolong the life of the module it is recommended that registers are only written to when their value needs to be changed (avoid writing the same data repeatedly).

Query message

Byte	Field name	Notes
0	Slave address	
1	Function code (16)	
2	First register address – high byte	16 bit register address
3	First register address – low byte	
4	Number of registers to write – high byte	16 bit number of registers, must be in the range 1 to 123
5	Number of registers to write – low byte	
6	Byte count (n)	8 bit even number in the range 2 to 246 (number of registers *2)
7	First register – high byte	16 bit register
8	First register – low byte	
…		
5+n	Last register – high byte	16 bit register
6+n	Last register – low byte	
7+n/8+n	Error check CRC	

Normal response message

Byte	Field name	Notes
0	Slave address	
1	Function code (16)	
2	First register address – high byte	16 bit register address
3	First register address – low byte	
4	Number of registers written – high byte	16 bit number of registers, must be in the range 1 to 123
5	Number of registers written – low byte	
6/7	Error check CRC	

Exception response message

Byte	Field name	Notes
0	Slave address	
1	Function code +128 (144)	Top bit is set
2	Exception code	1 – Illegal function code 2 – Illegal data address 6 – Slave device busy 10 – Gateway path unavailable 11 – Gateway target failed to respond
¾	Error check CRC	

9. Language Codes

Notes:

1. Language codes follow the Windows definition, the primary language code is stored in the least significant 10 bits and the sub-language code is stored in the most significant 6 bits of the 16 bit language code.
2. Microsoft add to this list periodically but have reserved sections of the list for custom languages and sub-languages. Primary language codes 0x200-0x3FF can be used for additional languages and sub-language codes 0x20-0x3F can be used for additional dialects of a primary languages but these should only be used where none of the defined codes is appropriate.

Language codes

Primary language	Sub-language	Primary language code	Sub-language code	Language code
Neutral	Neutral	0x00	0x00	0x0000
Arabic	Saudi Arabia	0x01	0x01	0x0401
	Iraq		0x02	0x0801
	Egypt		0x03	0x0C01
	Libya		0x04	0x1001
	Algeria		0x05	0x1401
	Morocco		0x06	0x1801
	Tunisia		0x07	0x1C01
	Oman		0x08	0x2001
	Yemen		0x09	0x2401
	Syria		0x0A	0x2801
	Jordan		0x0B	0x2C01
	Lebanon		0x0C	0x3001
	Kuwait		0x0E	0x3401
	United Arab Emerates		0x0E	0x3801
	Bahrain		0x0F	0x3C01
	Qatar		0x10	0x4001
Bulgarian	Standard	0x02	0x01	0x0402
Catalan	Standard	0x03	0x01	0x0403
Chinese	Taiwan	0x04	0x01	0x0404
	PeoplesRepublic		0x02	0x0804
	Hong Kong		0x03	0x0C04
	Singapore		0x04	0x1004
	Macau		0x05	0x1405
Czech	Standard	0x05	0x01	0x0405
Danish	Standard	0x06	0x01	0x0406
German	Standard	0x07	0x01	0x0407
	Swiss		0x02	0x0807
	Austrian		0x03	0x0C07
	Luxembourg		0x04	0x1007
	Liechtenstein		0x05	0x1407
Greek	Standard	0x08	0x01	0x0408

Language codes continued

Primary language	Sub-language	Primary language code	Sub-language code	Language code
English	United states	0x09	0x01	0x0409
	United kingdom		0x02	0x0809
	Australia		0x03	0x0C09
	Canada		0x04	0x1009
	New Zealand		0x05	0x1409
	Ireland		0x06	0x1809
	South Africa		0x07	0x1C09
	Jamaica		0x08	0x2009
	Caribbean		0x09	0x2409
	Belize		0x0A	0x2809
	Trinidad		0x0B	0x2C09
	Zimbabwe		0x0C	0x3009
	Philippines		0x0D	0x3409
Spanish	Traditional	0x0A	0x01	0x040A
	Mexican		0x02	0x080A
	Modern		0x03	0x0C0A
	Guatemala		0x04	0x100A
	Costa Rica		0x05	0x140A
	Panama		0x06	0x180A
	Dominican Republic		0x07	0x1C0A
	Venezuela		0x08	0x200A
	Colombia		0x09	0x240A
	Peru		0x0A	0x280A
	Argentina		0x0B	0x2C0A
	Ecuador		0x0C	0x300A
	Chile		0x0D	0x340A
	Uruguay		0x0E	0x380A
	Paraguay		0x0F	0x3C0A
	Bolivia		0x10	0x400A
	El Salvador		0x11	0x440A
	Honduras		0x12	0x480A
	Nicaragua		0x13	0x4C0A
	Puerto Rico		0x14	0x500A
Finnish	Standard	0x0B	0x01	0x040B
French	Standard	0x0C	0x01	0x040C
	Belgian		0x02	0x080C
	Canadian		0x03	0x0C0C
	Swiss		0x04	0x100C
	Luxembourg		0x05	0x140C
	Monaco		0x06	0x180C
Hebrew	Standard	0x0D	0x01	0x040D
Hungarian	Standard	0x0E	0x01	0x040E
Icelandic	Standard	0x0F	0x01	0x040F
Italian	Standard	0x10	0x01	0x0410
	Swiss		0x02	0x0810
Japanese	Standard	0x11	0x01	0x0411
Korean	Extended Wansung	0x12	0x01	0x0412
	Johab		0x02	0x0812
Dutch	Standard	0x13	0x01	0x0413
	Belgian		0x02	0x0813
Norwegian	Bokmal	0x14	0x01	0x0414
	Nynorsk		0x02	0x0814

Language codes continued

Primary language	Sub-language	Primary language code	Sub-language code	Language code
Polish	Standard	0x15	0x01	0x0415
Portuguese	Brazilian	0x16	0x01	0x0416
	Standard		0x02	0x0816
Rhaeto-romanic	Standard	0x17	0x01	0x0417
Romanian	Standard	0x18	0x01	0x0418
	Moldavia		0x02	0x0818
Russian	Standard	0x19	0x01	0x0419
	Moldavia		0x02	0x0819
Croatian	Standard	0x1A	0x01	0x041A
Serbian	Latin	0x1A	0x02	0x081A
	Cyrillic		0x03	0x0C1A
Slovak	Standard	0x1B	0x01	0x041B
Albanian	Standard	0x1C	0x01	0x041C
Swedish	Standard	0x1D	0x01	0x041D
	Finland		0x02	0x081D
Thai	Standard	0x1E	0x01	0x041E
Turkish	Standard	0x1F	0x01	0x041F
Urdu	Standard	0x20	0x01	0x0420
Indonesian	Standard	0x21	0x01	0x0421
Ukrainian	Standard	0x22	0x01	0x0422
Byelorusian	Standard	0x23	0x01	0x0423
Slovenian	Standard	0x24	0x01	0x0424
Estonian	Standard	0x25	0x01	0x0425
Latvian	Standard	0x26	0x01	0x0426
Lithuanian	Standard	0x27	0x01	0x0427
	Classic		0x02	0x0827
Reserved		0x28		0x0428
Farsi	Standard	0x29	0x01	0x0429
Vietnamese	Standard	0x2A	0x01	0x042A
Reserved		0x2B		0x042B
Reserved		0x2C		0x042C
Basque	Standard	0x2D	0x01	0x042D
Sorbian	Standard	0x2E	0x01	0x042E
Macedonian	Standard	0x2F	0x01	0x042F
Sutu	Standard	0x30	0x01	0x0430
Tsonga	Standard	0x31	0x01	0x0431
Tswana	Standard	0x32	0x01	0x0432
Venda	Standard	0x33	0x01	0x0433
Xhosa	Standard	0x34	0x01	0x0434
Zulu	Standard	0x35	0x01	0x0435
Afrikaans	Standard	0x36	0x01	0x0436
Reserved		0x37		0x3700
Faeroese	Standard	0x38	0x01	0x0438
Hindi	Standard	0x39	0x01	0x0439
Maltese	Standard	0x3A	0x01	0x043A

Language codes continued

Primary language	Sub-language	Primary language code	Sub-language code	Language code
Sami (Lapland)	Standard	0x3B	0x01	0x043B
Scots Gaelic	Standard	0x3C	0x01	0x043C
Reserved		0x3D		0x043D
Malay	Standard	0x3E	0x01	0x043E
	Brunei Darussalam		0x02	0x083E
Reserved		0x3F		0x043F
Reserved		0x40		0x0440
Swahili	Standard	0x41	0x01	0x0441
Reserved		0x42-0x1FF		
Custom languages		0x200-0x3FF		0x0200-0x03FF
Custom language	English for pumps	0x20	0x00	0x0200

10. Modbus Registers Defined

Notes:

1. The register array is divided into 256 pages each containing up to 256 registers, the actual register address is obtained from the formula: register_address=page_number*256+register_offset.
2. All unused parts of pages 0-127 are defined as reserved for expansion of this standard, any attempt to access them will result in an exception response with extended exception code 12 (Reserved register).
3. Pages 128-255 are available for manufacturer specific applications such as configuration of the control equipment, these are not defined by this standard.
4. Any device which requires registers in pages 128-255 to be implemented in order to perform a task which can be performed by registers defined in this standard is deemed to be non-compliant with this standard.
5. This document always refers to register addresses which start at 0 as defined in the Modbus protocol. Register numbers, which start at 1, are not used in this document in order to avoid confusion.
6. The additional instrumentation pages are to be defined.
7. S.M. means state machine.
8. A letter S in the bits/sign column indicates a signed value using two's compliment arithmetic, all others are unsigned.
9. A double number in the bits/sign column indicates a bit within a register of a specific size e.g. 16/16 is the most significant bit and 1/16 is the least significant bit of a 16 bit register.
10. Bits within registers are numbered from 1 not 0 to avoid the confusion that would be caused if the sixteenth bit of a 16 bit register were labelled 15/16.
11. For an integer type register the register contents should be multiplied by the scaling factor to obtain the actual value.
12. For a flag type register (1 bit) the minimum value column indicates the meaning if the flag is 0, the maximum column indicates the meaning if the flag is 1.
13. For an integer type register the minimum and maximum value columns indicate the minimum and maximum values after multiplying by the scaling factor.
14. Any software that reads an integer type register must be able to process and display correctly over the full range specified in the minimum and maximum value columns.
15. 32 bit values are stored with the most significant bits in the register with the lowest address.
16. Where two ASCII characters are stored in a single register the first character is in the most significant bits.
17. The first register of a 32 bit number is always aligned at an even address for the benefit of some 32 bit CPUs.

10.1 Index of Register Pages

Page number	Description	Read/write
0	Communications status information	Read only
1	Communications configuration	Read/write and write only
2	Modem configuration	Read/write
3	Generating set status information	Read only
4	Basic instrumentation	Read only
5	Extended instrumentation	Read only
6	Derived Instrumentation	Read only
7	Accumulated Instrumentation	Read/write
8	Alarm conditions	Read only
9	Total Harmonic Distortion information	Read only
10	Reserved	
11	Diagnostic – general	Read only
12	Diagnostic – digital inputs	Read only
13	Diagnostic – digital outputs	Read only and read write
14	Diagnostic – LEDs	Read only and read write
15	Diagnostic – Reserved	
16	Control registers	Read only and write only
17	J1939 active diagnostic trouble codes in decoded format	Read only
18	J1939 active diagnostic trouble codes in raw format	Read only
19	Reserved	
20	Various strings	Read only
24	Identity strings	Read/write
26	State machine name strings	Read only
28	State machine state strings	Read only
29-31	Reserved	

Index of register pages continued

32-95	Alarm strings (Old alarm system)	Read only
32-36	2131 Expansion module name strings	Read only
37-40	2133 Expansion module name strings	Read only
41-43	2152 Expansion module name strings	Read only
44-48	2131 Expansion module digital alarm strings	Read only
49-58	2131 Expansion module analogue alarm strings	Read only
59-66	2133 Expansion module analogue alarm strings	Read only
142	ECU Trouble Codes	Read only
143-149	ECU Trouble Code short description string	Read only
152	User calibration of expansion module analogue inputs	Read/write
153	Unnamed alarm conditions	Read only
154	Named Alarm Conditions	Read only
156	Expansion module enable status	Read only
158	Expansion module communications status	Read only
160	Unnamed input function	Read only
166-169	User configurable pages	Read only
170	Unnamed input status	Read only
171	Unnamed input status continued	Read only
180	Unnamed output sources & polarities	Read only
181	Unnamed output sources & polarities continued	Read only
182	Virtual output sources & polarities	Read only
183	Configurable output sources & polarities	Read only
184	Analogue output sources, types and values	Read only
190	Unnamed output status	Read only
191	Virtual output status	Read only
192	Configurable output status	Read only
193	Remote control sources	Read/write
200-239	Unnamed alarm strings	Read only
240-246	Analogue Input Name Strings	Read only
250	Misc strings	Read only
251-255	Reserved	

10.2 Page 0 – Communications Status Information

Notes:

1. These are read only registers.
2. Registers 0 and 1 must both be read with a single message for them to be meaningful since they are set after each message.
3. Registers 2 and 3 contain copies of the telemetry alarm flags of all satellites so that the satellite that caused a dial out can be ascertained without reading the telemetry alarm flags from all the satellites individually. This register is not latched, clearing the telemetry alarm flag of a satellite will clear the corresponding bit in these registers when the hub updates them. The hub will not assume that sending a system control message to a satellite to clear its telemetry alarm flag will necessarily succeed, instead it builds registers 2 and 3 by reading the state of all the satellites telemetry alarm flags periodically.
4. Registers 4 and 5 contain communication error flags for all the satellites. A flag is set if, and only if, the corresponding satellite socket is fitted, it is enabled by the corresponding 'satellite socket enable flag' in page 1 – Communications Configuration, and the hub is not able to communicate successfully with the satellite for any reason.
5. If any communication error flag changes from 0 to 1 the hub's telemetry alarm flag will be set and so cause a dial out if a modem is connected with dial out enabled, the satellites telemetry alarm flag in register 2 or 3 will not be set since this would contradict its non-latching operation as described in note 3 above. A system control function must be used to clear the hub's telemetry alarm flag before the connection is broken or the dial out will be repeated.
6. The meaning of the password status is shown in the table below.
7. If the password status is 0 (no valid password) then it is not possible to read the extended exception information..
8. If the number of satellite sockets is 1-32 the unit is a hub, otherwise it is not. A hub with 8 sockets, for example, returns a value of 8 regardless of what is actually plugged into the sockets or what the satellites state is, and will always respond to 8 consecutive slave addresses starting with its own slave address +1.
9. The GenComm version number allows a master to recognise the version of GenComm supported by a slave device and act accordingly. 72xx/73xx modules are identified by the GenComm version of 2, 53xx/55xx etc modules have a GenComm version of 1.
10. Registers 10 and 11 contain flags that indicate the available baud rates, bit 1 corresponds to baud rate code 0 etc. If a bit is set the corresponding Baud rate is available.
11. The list of language codes that are available on a particular slave device can be obtained by first reading the number of languages available and then reading that number of registers from the beginning of the list of language codes available. Reading any further registers from the list will return the unimplemented register value 0xFFFF. The order of the language codes in the list has no significance and no assumptions should be made.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign
0	Extended exception code	0	65535			16
1	Extended exception address	0	65535			16
2	Telemetry alarm flag for satellite 1	0	1			16/16
	Telemetry alarm flag for satellite 2	0	1			15/16
	Telemetry alarm flag for satellite 3	0	1			14/16
	Telemetry alarm flag for satellite 4	0	1			13/16
	Telemetry alarm flag for satellite 5	0	1			12/16
	Telemetry alarm flag for satellite 6	0	1			11/16
	Telemetry alarm flag for satellite 7	0	1			10/16
	Telemetry alarm flag for satellite 8	0	1			9/16
	Telemetry alarm flag for satellite 9	0	1			8/16
	Telemetry alarm flag for satellite 10	0	1			7/16
	Telemetry alarm flag for satellite 11	0	1			6/16
	Telemetry alarm flag for satellite 12	0	1			5/16
	Telemetry alarm flag for satellite 13	0	1			4/16
	Telemetry alarm flag for satellite 14	0	1			3/16
	Telemetry alarm flag for satellite 15	0	1			2/16
	Telemetry alarm flag for satellite 16	0	1			1/16
3	Telemetry alarm flag2 for satellites 17-32	0	65535			16
4	Communication error flag for satellite 1	0	1			16/16
	Communication error flag for satellite 2	0	1			15/16
	Communication error flag for satellite 3	0	1			14/16
	Communication error flag for satellite 4	0	1			13/16
	Communication error flag for satellite 5	0	1			12/16
	Communication error flag for satellite 6	0	1			11/16
	Communication error flag for satellite 7	0	1			10/16
	Communication error flag for satellite 8	0	1			9/16
	Communication error flag for satellite 9	0	1			8/16
	Communication error flag for satellite 10	0	1			7/16
	Communication error flag for satellite 11	0	1			6/16
	Communication error flag for satellite 12	0	1			5/16
	Communication error flag for satellite 13	0	1			4/16
	Communication error flag for satellite 14	0	1			3/16
	Communication error flag for satellite 15	0	1			2/16
	Communication error flag for satellite 16	0	1			1/16
5	Communication error flags for satellites 17-32	0	65535			16
6	Password status	0	3			16
7	Number of satellite sockets available	0	32			16
8	Number of languages available for telemetry	0	128			16
9	GenComm version number	1	2			16
10-11	Baud rates available	0				32
12-14	Unimplemented					
15	USB connection status	0	1			16
16	RS232 port received rate counter	0	65535			16
17	RS232 port lost rate counter	0	65535			16
18	RS232 port quality instrument	0	100		%	16
19	RS485 port 1 received rate counter	0	65535			16
20	RS485 port 1 lost rate counter	0	65535			16
21	RS485 port 1 quality instrument	0	100		%	16
22-26	Unimplemented					
27	DSENet quality instrument	0	100		%	16
28	8x10 on MSC 1	0	32			16
29	8x60 on MSC 1	0	16			16
30	MSC Connection 1 quaily instrument	0	100		%	16
31	8x10 on MSC 2	0	32			16
32	8x60 on MSC 2	0	16			16

33	MSC Connection 2 quaily instrument	0	100		%	16
34	Active MSC link	0	1	0-MSC1 1-MSC2/CAN		16
35-127	Unimplemented					
128-255	List of language codes available	0	65534			16

Password status

Status	Meaning
0	No valid password has been entered, no operations can be performed on the slave device except writing a password using function 16 (write multiple registers). In the case of a hub no queries will be passed to its satellites at all.
1	A valid read password has been entered, all readable registers (including manufacturer specific ones above page 127) can be read on the slave device using function 3 (read multiple registers). All write operations using function 16 (write multiple registers) and all non-GenComm functions (those other than 3 and 16) are blocked. In the case of a hub only queries using function 3 (read multiple registers) will be passed to its satellites.
2	A valid control password has been entered, as level 1 except that all registers in page 16 (control registers) can be written to in the slave device using function 16 (write multiple registers). In the case of a hub only queries using function 3 (read multiple registers), and function 16 (write multiple registers) to registers in page 16, will be passed to its satellites.
3	A valid configure password has been entered, as level 1 except that all writeable registers (including manufacturer specific ones above page 127) can be written to in the slave device, and all non-GenComm functions (those other than 3 and 16) can be used for configuration of the slave device. In the case of a hub all queries will be passed to a satellite. The configuration of units using non-GenComm functions is not defined in this standard.

10.3 Page 1 – Communications Configuration

Notes:

1. These are a mixture of read/write and write only registers (except on 72xx/73xx where registers 0-9 are read-only, not read/write).
2. The current slave address is fixed at 10 in the case of an RS232 link to a modem, or direct to a PC, since there is no point in changing a slave address on a 1 to 1 link. Address 10 was chosen so that that satellite 1 has slave address 1 etc. Register 0 specifies the current slave address in all other cases.
3. The site identity code is user definable and is used to identify a site.
4. The device identity code is user definable and is used to identify a device within a site.
5. The meaning of the baud rate is shown in the table below, a slave device may not necessarily support all baud rates, writing an unsupported value will return extended exception 7 (Illegal value written to register) and will not change the Baud rate. Some systems may not allow the Baud rate to be changed at all, it may be set by switches or from a user interface for example. The baud rates available on a particular slave can be obtained by reading a register in the communications status page.
6. The current language applies only to strings read by telemetry, it is quite separate from the language selected for any user interface on the unit. The meaning of the code is defined in the language codes section.
7. The satellite socket enable flags allow each satellite socket to be enabled or disabled, a socket that is fitted but not in use must be disabled or the hub will think that the lack of response indicates a problem and set the corresponding satellite error flag and telemetry alarm flag. The enable flag for a socket that is not fitted will always be 0, any attempt to set it will be ignored.
8. The master inactivity time-out is used to detect the loss of communication from the master, if a query is not received for this period the slave device assumes the link to the master has been lost. The link is assumed to have been established as soon as a query arrives from the master.
9. The password time-out is used to disable the password automatically, if a valid password is not written for this period the password status will be set to 0 (invalid) or the highest disabled password level.
10. The display unit connected to module indicates which type of unit is connected to the 8700. A zero value indicates there is no display unit connected and the module is locked.

Notes on passwords:

1. Passwords are intended to control access to control equipment via telemetry, they are not necessarily the same as passwords used to access the same equipment from a user interface. Such user interfaces are not defined in this standard in any way.
2. Passwords are 4 digit numbers similar to 'PIN numbers' which are widely accepted and easier to enter via a limited user interface than alphanumeric strings.
3. One of the 3 valid passwords is written into register 32 and its ones-compliment written into register 33 with a single function 16 (write multiple registers) to set the current password status.
4. The password status in the communications status information page indicates which level of access has been granted, when the password times out the status becomes 0 (invalid) or the highest disabled password level.
5. Entering a password that does not match one of the 3 valid passwords will cause the password status to be set to 0 (invalid) or the highest disabled password level and return extended exception 7 (Illegal value written to register)
6. The password status can be cleared to 0 (invalid) or the highest disabled password level either by writing a password that is known to be invalid or by writing any value to register 32 without writing to register 33.
7. If an invalid password is entered 3 times the slave device will then reject any further attempt to enter a password for a 1 minute lockout period, returning extended exception 8 (Inappropriate circumstances) at the third attempt (so it is immediately clear what has happened) and whenever a further attempt is made to enter a password during the lockout period. The password lockout period will double after every 3 unsuccessful attempts to enter a password, up to a maximum of 64 minutes, thus minimising the risk of a deliberate attack being able to find a valid password. When a valid password is entered the count of invalid entries will be reset to 0. The count of invalid entries and the current lockout timer will not be reset by loss of the communication link as it would be possible for an attacker to drop the link to reset them and then immediately re-establish the link.
8. When the link to a master is lost (a phone line is dropped or the master inactivity timer expires for example) the password status is set to 0 (invalid) or the highest disabled password level.
9. The 'read only' password is changed by writing the new value to register 34 and its ones-compliment to register 35 with a single function 16 (write multiple registers), any other operation will fail to change the password and return extended exception 7 (Illegal value written to register). The 'control' and 'configure' passwords are changed in the same way using the appropriate registers. The current 'configure' password must have been entered before any passwords can be changed.
10. If a password is changed to 0000 then that password level will be disabled, the password status will then default to the highest level that is disabled rather than 0 when an invalid password is entered, the password times out or the link to the master is lost. Even if one or more of the passwords has been changed to 0000, any attempt to write a password of 0000 to register 32 and 33 will be treated exactly as if an invalid password was entered.
11. A hub is intended to provide security for all its satellites using its own passwords, thus avoiding the complexity of managing passwords in every satellite separately, to facilitate this each satellite must have all its passwords disabled by setting them to 0000. If this is not done it is not possible to enter any password into a satellite unless the configure password is entered into the hub first, this is necessary to simplify the message filtering mechanism needed in the hub but is not a problem if the hub is used to provide security to the satellites as intended.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
0	Current slave address	1	247			16	Read/write
1	Site identity code	0	65534			16	Read/write
2	Device identity code	0	65534			16	Read/write
3	Baud rate	0	12			16	Read/write
4	Current language code	0	65534			16	Read/write
5	Unimplemented	0xFFFF	0xFFFF			16	Read only
6	Satellite socket 1 enable flag	0	1			16/16	Read/write
	Satellite socket 2 enable flag	0	1			15/16	Read/write
	Satellite socket 3 enable flag	0	1			14/16	Read/write
	Satellite socket 4 enable flag	0	1			13/16	Read/write
	Satellite socket 5 enable flag	0	1			12/16	Read/write
	Satellite socket 6 enable flag	0	1			11/16	Read/write
	Satellite socket 7 enable flag	0	1			10/16	Read/write
	Satellite socket 8 enable flag	0	1			9/16	Read/write
	Satellite socket 9 enable flag	0	1			8/16	Read/write
	Satellite socket 10 enable flag	0	1			7/16	Read/write
	Satellite socket 11 enable flag	0	1			6/16	Read/write
	Satellite socket 12 enable flag	0	1			5/16	Read/write
	Satellite socket 13 enable flag	0	1			4/16	Read/write
	Satellite socket 14 enable flag	0	1			3/16	Read/write
	Satellite socket 15 enable flag	0	1			2/16	Read/write
	Satellite socket 16 enable flag	0	1			1/16	Read/write
7	Satellite socket 17-32 enable flags	0	65535			16	Read/write
8	Master inactivity time-out, 0 means never time-out	0	36,000	0.1	Seconds	16	Read/write
9	Password time-out, 0 means never time-out	0	36,000	0.1	Seconds	16	Read/write
10-31	Reserved						
32	Current password	0	9999	1		16	Write only
33	Compliment of current password	55536	65535	1		16	Write only
34	Set new read only password	0	9999	1		16	Write only
35	Compliment of new read only password	55536	65535	1		16	Write only
36	Set new control password	0	9999	1		16	Write only
37	Compliment of new control password	55536	65535	1		16	Write only
38	Set new configure password	0	9999	1		16	Write only
39	Compliment of new configure password	55536	65535	1		16	Write only
40	Display unit type connected to module	0	65535	1		16	Read only
41-255	Reserved						

Baud rate

Code	Rate
0	110
1	150
2	300
3	600
4	1200
5	2400
6	4800
7	9600
8	14400
9	19200
10	28800
11	38400
12	57600
13	115200
14-99	Reserved

10.4 Page 2 – Modem Configuration

Notes

1. These are read/write registers (except on 72xx/73xx where they are read-only& only updated by writing a configuration file).
2. Modem control strings can contain any ASCII characters and are padded with spaces (ASCII 0x20), NULL terminators are not used.
3. Each string is automatically suffixed with <CR><LF> so these should not be included in the string, strings are not automatically prefixed with 'AT' so these must be included when required.
4. A string may contain a meta character consisting of 3 tildes (~~~) which indicates that a pause of 1 second should be introduced before the rest of the string is sent to the modem. This meta character may be repeated if longer delays are required. The tildes will not be sent to the modem.
5. If a dialling string contains only spaces (ASCII 0x20) it will not be used in the dialling sequence.
6. The meaning of the modem's mode is described in the table below.
7. The modem dial back string can be used by a master to call the slave device, it is never used by the slave device..
8. The SMS enable flag enables the transmission of SMS messages over a GSM modem, the method of transmission, circumstances that trigger a transmission and contents of the messages are not defined in this standard.
9. The SMS message centre number and recipient number are in the same format as the other modem control strings and are only used when the SMS system is activated by the SMS enable flag, their use is not defined in this standard.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign
0	Modem mode	0				16
1	Connect delay time	1	60	1	Seconds	16
2	Number of retries on each number	0	99	1		16
3	Delay between retries	0	60	1	Seconds	16
4	Delay before repeat cycle	0	3600	1	Seconds	16
5	Short message service (SMS) enabled	No	Yes			16
6-63	Reserved					
64-79	First dialling string	ASCII	ASCII			256
80-95	Second dialling string	ASCII	ASCII			256
96-111	Third dialling string	ASCII	ASCII			256
112-127	Fourth dialling string	ASCII	ASCII			256
128-143	Modem initialisation string – not auto-answer	ASCII	ASCII			256
144-159	Modem initialisation string – auto-answer	ASCII	ASCII			256
160-175	Modem hang-up string	ASCII	ASCII			256
176-191	Modem dial back string	ASCII	ASCII			256
192-207	Short message service (SMS) message center number	ASCII	ASCII			256
208-223	Short message service (SMS) recipient number 1	ASCII	ASCII			256
224-239	Short message service (SMS) recipient number 2	ASCII	ASCII			256
240-255	Short message service (SMS) recipient number 3	ASCII	ASCII			256

Modem mode

Mode	Meaning
0	No modem fitted.
1	Answer incoming calls, do not dial out.
2	Answer incoming calls and dial out when the telemetry alarm flag is set. Use the dialling strings in sequence separated by the delay between retries, then repeat the sequence for the specified number of retries. If connection has not been established wait for the delay between repeat cycles and then repeat the cycle. If connection is made and broken without clearing the telemetry alarm flag then repeat the previous sequence.
3	As mode 2 but the first dialling string will be used for the specified number of retries then the second string will be used etc.
4	As mode 2 but do not answer incoming calls.
5	As mode 3 but do not answer incoming calls

10.5 Page 3 – Generating Set Status Information

Notes:

1. These are read only registers.
2. A unique manufacturer code is assigned to each manufacturer.
3. The meaning of the model number is manufacturer specific, e.g. two manufacturers may have a model 100.
4. The manufacturer code and model number must be used together to identify a particular product unambiguously.
5. The meaning of the control mode is shown in the table below.
6. The shutdown flag on a control unit indicates that one or more of the alarm codes has been set to 'shutdown alarm', it will clear automatically when no alarm codes are set to shutdown alarm. A system control function is used to clear shutdown alarms. In some situations it may not be possible to set one of the alarm codes to indicate the type of shutdown alarm because the type is not known, in this case only the shutdown flag will be set and the master should consider it an undefined shutdown alarm.
7. The shutdown alarm flag on a hub indicate that state of the hub itself, not the state of any satellite. The state of a satellite must be read from the satellite itself.
8. The electrical trip/controlled shutdown and warning alarm flags operate in the same way as the shutdown alarm flag but for the corresponding alarm codes.
9. The telemetry alarm flag on a control unit is set when the control unit decides that a dial-out is required, the logic behind this is product specific. It can only be cleared by a system control function.
10. The telemetry alarm flag on a hub is only set if the hub itself has a problem, and can only be cleared by a system control function. It is edge triggered i.e. once it is cleared it will not be set unless the internal error is cleared and then happens again. An example of a situation that will set this flag is if the hub loses communication with a satellite.
11. The satellite telemetry alarm flag is the OR of all the satellite telemetry alarm flags in the 'telemetry status and configuration' page and indicates that one or more satellites requires servicing.
12. Whenever the telemetry alarm flag (or one of the satellite telemetry alarm flags in the case of a hub) is set it will cause continual dial outs if a modem is fitted and dial out is enabled.
13. The meaning of the state machine status is described in the table below.
14. The string checksum is the sum of every character in every fixed string in the slave device, it is used to detect the substitution of a slave device that differs only in its strings and thus check the validity of any copies of these strings held by a master. This number must not change during the normal operation of the slave device. The exact method of calculating the checksum must not be assumed and it must not be compared with a checksum generated my a master, it must only be compared with a previously read checksum to determine change.
15. The state machine state (registers 18-25) indicate the current state of each state machine, the conversion between state code and string is specific to each model and not covered in this document, refer to DSE for documentation.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign
0	Manufacturer code	0	65534	1		16
1	Model number	0	65534	1		16
2-3	Serial number	0	999999999	1		32
4	Control mode	0	65535	1		16
5	Control mode selection (330/331/334/335)	0	65535	1		16
6	Control unit not configured	No	Yes			16/16
	Unimplemented	0	0			15/16
	Control unit failure	No	Yes			14/16
	Shutdown alarm active	No	Yes			13/16
	Electrical trip	No	Yes			12/16
	Warning alarm active	No	Yes			11/16
	Telemetry alarm flag	Not active	Active			10/16
	Satellite telemetry alarm flag	Not active	Active			9/16
	No font file	No	Yes			8/16
	Controlled shutdown alarm active	No	Yes			7/16
	Unimplemented	0	0			1/16-6/16
7	S.M. 1 status	0	3			16/16-15/16
	S.M. 2 status	0	3			14/16-13/16
	S.M. 3 status	0	3			12/16-11/16
	S.M. 4 status	0	3			10/16-9/16
	S.M. 5 status	0	3			8/16-7/16
	S.M. 6 status	0	3			6/16-5/16
	S.M. 7 status	0	3			4/16-3/16
	S.M. 8 status	0	3			2/16-1/16
8-9	String checksum	0	0xFFFFFFFF			32
10	S.M. 1 timer	0	65534	1	Seconds	16
11	S.M. 2 timer	0	65534	1	Seconds	16
12	S.M. 3 timer	0	65534	1	Seconds	16
13	S.M. 4 timer	0	65534	1	Seconds	16
14	S.M. 5 timer	0	65534	1	Seconds	16
15	S.M. 6 timer	0	65534	1	Seconds	16
16	S.M. 7 timer	0	65534	1	Seconds	16
17	S.M. 8 timer	0	65534	1	Seconds	16
18	S.M. 1 state	0	65535	1		16
19	S.M. 2 state	0	65535	1		16
20	S.M. 3 state	0	65535	1		16
21	S.M. 4 state	0	65535	1		16
22	S.M. 5 state	0	65535	1		16
23	S.M. 6 state	0	65535	1		16
24	S.M. 7 state	0	65535	1		16
25	S.M. 8 state	0	65535	1		16
26	Change in event log contents	No	Yes			
27	Battery Charger Mode	0	12	1		16
28	Battery Charger De-Rating Mode	0	2	1		16
29	Battery Charger Active Cell Count	0	24	1	Cells	16
30	Battery Chemistry ID	0	100	1		16
31	Charging Stages	0	4	1		16
32	Heater fitted	No	Yes			
33	Controller mode (8661)	0 (Bus)	1 (mains)			16
34	Battery Charger Mode (Auxiliary)	0	12	1		16
35	Active Cell Count (Auxiliary)	0	24		Cells	16
36	Battery Chemistry ID (Auxiliary)	0	100			16
37	Charging Stages (Auxiliary)	0	4			16
38	External Panel Lock Active	No	Yes			16/16
	Stop & Panel Lock Active	No	Yes			15/16
	Lock user controls Active	No	Yes			14/16
	Telemetry Panel Lock Active	No	Yes			13/16

	Unimplemented	0	0			1/16-12/16
39	Transducer Supply	0	1	1		16
40-207	Reserved					
208-209	Flex sensor A volume level	0	999,999,999	1	Litre/Imp Gal/US Gal	32
210-211	Flex sensor B volume level	0	999,999,999	1	Litre/Imp Gal/US Gal	32
212-213	Flex sensor C volume level	0	999,999,999	1	Litre/Imp Gal/US Gal	32
214-215	Flex sensor D volume level	0	999,999,999	1	Litre/Imp Gal/US Gal	32
216-217	Flex sensor E volume level	0	999,999,999	1	Litre/Imp Gal/US Gal	32
218-219	Flex sensor F volume level	0	999,999,999	1	Litre/Imp Gal/US Gal	32
220-239	Reserved					
240	Flex sensor A selected units	0	2	See table below		16
241	Flex sensor B selected units	0	2	See table below		16
242	Flex sensor C selected units	0	2	See table below		16
243	Flex sensor D selected units	0	2	See table below		16
244	Flex sensor E selected units	0	2	See table below		16
245	Flex sensor F selected units	0	2	See table below		16
246	State of MPU Calibration Process	0	6	See table below		16
247	Reserved, do not allocate	0	4	See table below		16
248-255	Reserved					

9462 – Dual Output Battery Charger

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign
27	Battery Charger Mode Output 1	0	12	1		16
38	Battery Charger Mode Output 2	0	12	1		16

Control modes

Mode	Description
0	Stop mode
1	Auto mode
2	Manual mode
3	Test on load mode
4	Auto with manual restore mode/Prohibit Return
5	User configuration mode
6	Test off load mode
7	Off Mode
8-65534	Reserved
65535	Unimplemented

Notes on control modes:

1. 'Stop mode' means stop the engine (generator) and in the case of 'automatic mains failure units' transfer the load to the mains if possible.
2. 'Auto mode' means automatically start the engine (generator) in the event of a remote start signal or a mains-failure, and in the case of 'automatic mains failure units' transfer the load to the generator when available. When the remote start signal is removed or the mains returns, stop the engine (generator) and in the case of 'automatic mains failure units' transfer the load back to the mains.
3. 'Manual mode' means start the engine (generator) With some control units it will also be necessary to press the start button before such a manual start is initiated. In the case of 'automatic mains failure units' do not transfer the load to the generator unless the mains fails.
4. 'Test on load mode' means start the engine (generator) With some control units it will also be necessary to press the start button before such a manual start is initiated. Transfer the load to the generator when it is available, regardless of the mains condition. This mode is only provided on automatic mains failure units.
5. 'Auto with manual restore mode' means the same as 2 above but when the remote start signal is removed or the mains returns, the engine (generator) will not stop and the load will not be transferred back to the mains. This mode is only provided on automatic mains failure units.
6. 'User configuration mode' means that the unit is being configured from its user interface and is not available for normal operation, there is no method of entering or leaving this mode by telemetry, it must be done from the user interface.
7. Any control unit that does not have a control mode will return the unimplemented value.
8. Register 5 is used to select control modes for use with SCADA mimic screens on modules that have a single mode button (currently 330/331/334/335) in conjunction with page 16. System control code 35714 causes this value to scroll though the available control mode values. System control code 35715 causes the selected control mode to be applied. If neither of these two control modes are received for a period of two minutes then the value will revert to the value stored in register 4.
9. 'Test off load mode' means start the engine (generator/S2). The load will not be transferred to S2.
10. Register 6 bit 12 is used as controlled shutdown in E800 v1.1

State machine status

Status	Description
0	Implemented but not changed since last read of state string
1	Implemented and changed since last read of state string
2	Reserved
3	Unimplemented

Notes on state machine status:

1. A state machine that is implemented (status 0 or 1) has a fixed name string in page 27 that can be used in a status display, the name strings for unimplemented state machines will contain 32 spaces (Unicode 0x0020).
2. A state machine that is implemented has a state string in page 28 which may be used in a status display. The contents of this string will change when the state machine changes state and this is indicated by the status changing from 0 to 1, when the state string is read the status will change back from 1 to 0. This means that the string only has to be read when there is a change in state, thus minimising the volume of traffic.

State machine states

State	Description
0-65534	Reserved
65535	Unimplemented

Battery Charger Specific Registers

Number	Battery Charger Mode Description	De-Rating Mode Description	Battery Chemistry ID
0	Start Up		
1	Initialisation	Standard De-Rating	
2	Boost/Bulk Charge	Low Mains Voltage De-Rating	Wet (Vented) Lead Acid
3	Absorption/Boost Run On Charge		Calcium
4	Float/Trickle Charge		Lead Acid Antimony
5	Storage Charge		VRLA (AGM)
6	Battery Test Mode		VRLA (GEL)
7	DC Alarm		NiCd 10/20 Cell
8	Mains Alarm		NiCd 9/18 Cell
9	Temperature Alarm		
10	Lamp Test		
11	Charging Stopped		
255			Custom Profile

Fuel Level codes

Type code	Type
0	Litres
1	Imperial Gallons
2	US Gallons
3	Litres (High Precision)
4	Imperial Gallons (High Precision)
5	US Gallons (High Precision)
3-65535	Reserved

MPU Calibration States

Number	Description
0	Idle
1	Waiting
2	Calibration
3	Stopping
4	Writing
5	Reset Fault
6	Reset OK

10.6 Page 4 – Basic Instrumentation

Notes:

1. These are read only registers.
2. The meaning of the mains, generator and bus phase rotation codes is given in the table below.
3. Registers 95-123 have been added to support the 8680 although not all will be implemented initially.
4. Registers 180 to 192 added to allow mimics of either S1 or S2 load/watts/lead-lag registers according to which side is on load.
5. If oil pressure is set to wide range signed value, this instrument is available in page 5. Register 0 in page 4 will reflect all positive values and will be set to the under measureable range sentinel for negative values.
6. If fuel level is set to wide range signed value, this instrument is available in page 5. Register 3 in page 4 will reflect all positive values and will be set to the under measureable range sentinel for negative values.

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign
0	Oil pressure	0	10000	1	Kpa	16
1	Coolant temperature	-50	200	1	Degrees C	16 S
2	Oil temperature	-50	200	1	Degrees C	16 S
3	Fuel level	0	130	1	%	16
4	Charge alternator voltage	0	40	0.1	V	16
5	Engine Battery voltage	0	40	0.1	V	16
6	Engine speed	0	6000	1	RPM	16
7	Generator frequency	0	70	0.1	Hz	16
8-9	Generator L1-N voltage	0	18,000	0.1	V	32
10-11	Generator L2-N voltage	0	18,000	0.1	V	32
12-13	Generator L3-N voltage	0	18,000	0.1	V	32
14-15	Generator L1-L2 voltage	0	30,000	0.1	V	32
16-17	Generator L2-L3 voltage	0	30,000	0.1	V	32
18-19	Generator L3-L1 voltage	0	30,000	0.1	V	32
20-21	Generator L1 current	0	99,999.9	0.1	A	32
22-23	Generator L2 current	0	99,999.9	0.1	A	32
24-25	Generator L3 current	0	99,999.9	0.1	A	32
26-27	Generator earth current	0	99,999.9	0.1	A	32
28-29	Generator L1 watts	-99,999,999	99,999,999	1	W	32 S
30-31	Generator L2 watts	-99,999,999	99,999,999	1	W	32 S
32-33	Generator L3 watts	-99,999,999	99,999,999	1	W	32 S
34	Generator current lag/lead	-180	+180	1	degrees	16 S
35	Mains frequency	0	70	0.1	Hz	16
36-37	Mains L1-N voltage	0	18,000	0.1	V	32
38-39	Mains L2-N voltage	0	18,000	0.1	V	32
40-41	Mains L3-N voltage	0	18,000	0.1	V	32
42-43	Mains L1-L2 voltage	0	30,000	0.1	V	32
44-45	Mains L2-L3 voltage	0	30,000	0.1	V	32
46-47	Mains L3-L1 voltage	0	30,000	0.1	V	32
48	Mains voltage phase lag/lead	-180	+180	1	degrees	16 S
49	Generator phase rotation	0	3			16
50	Mains phase rotation	0	3			16
51	Mains current lag/lead	-180	+180	1	degrees	16 S
52-53	Mains L1 current	0	99,999.9	0.1	A	32
54-55	Mains L2 current	0	99,999.9	0.1	A	32
56-57	Mains L3 current	0	99,999.9	0.1	A	32
58-59	Mains earth current	0	99,999.9	0.1	A	32
60-61	Mains L1 watts	-99,999,999	99,999,999	1	W	32 S
62-63	Mains L2 watts	-99,999,999	99,999,999	1	W	32 S
64-65	Mains L3 watts	-99,999,999	99,999,999	1	W	32 S
66	Bus current lag/lead	-180	+180	1	degrees	16 S
67	Bus frequency	0	70	0.1	Hz	16
68-69	Bus L1-N voltage	0	18,000	0.1	V	32
70-71	Bus L2-N voltage	0	18,000	0.1	V	32
72-73	Bus L3-N voltage	0	18,000	0.1	V	32
74-75	Bus L1-L2 voltage	0	30,000	0.1	V	32
76-77	Bus L2-L3 voltage	0	30,000	0.1	V	32
78-79	Bus L3-L1 voltage	0	30,000	0.1	V	32

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign
80-81	Bus L1 current	0	99,999.9	0.1	A	32
82-83	Bus L2 current	0	99,999.9	0.1	A	32
84-85	Bus L3 current	0	99,999.9	0.1	A	32
86-87	Bus earth current	0	99,999.9	0.1	A	32
88-89	Bus L1 watts	-999,999,999	999,999,999	1	W	32 S
90-91	Bus L2 watts	-999,999,999	999,999,999	1	W	32 S
92-93	Bus L3 watts	-999,999,999	999,999,999	1	W	32 S
94	Bus phase rotation	0	3			16
95	Bus 2 frequency	0	70	0.1	Hz	16
96-97	Bus 2 L1-N voltage	0	18,000	0.1	V	32
98-99	Bus 2 L2-N voltage	0	18,000	0.1	V	32
100-101	Bus 2 L3-N voltage	0	18,000	0.1	V	32
102-103	Bus 2 L1-L2 voltage	0	30,000	0.1	V	32
104-105	Bus 2 L2-L3 voltage	0	30,000	0.1	V	32
106-107	Bus 2 L3-L1 voltage	0	30,000	0.1	V	32
108-109	Bus 2 L1 current	0	99,999.9	0.1	A	32
110-111	Bus 2 L2 current	0	99,999.9	0.1	A	32
112-113	Bus 2 L3 current	0	99,999.9	0.1	A	32
114-115	Bus 2 earth current	0	99,999.9	0.1	A	32
116-117	Bus 2 L1 watts	-999,999,999	999,999,999	1	W	32 S
118-119	Bus 2 L2 watts	-999,999,999	999,999,999	1	W	32 S
120-121	Bus 2 L3 watts	-999,999,999	999,999,999	1	W	32 S
122	Bus 2 phase rotation	0	3			16
123	Bus 2 current lag/lead	-180	+180	1	degrees	16 S
124	S1 frequency	0	70	0.1	Hz	16
125-126	S1 L1-N voltage	0	18,000	0.1	V	32
127-128	S1 L2-N voltage	0	18,000	0.1	V	32
129-130	S1 L3-N voltage	0	18,000	0.1	V	32
131-132	S1 L1-L2 voltage	0	30,000	0.1	V	32
133-134	S1 L2-L3 voltage	0	30,000	0.1	V	32
135-136	S1 L3-L1 voltage	0	30,000	0.1	V	32
137-138	S1 L1 current	0	99,999.9	0.1	A	32
139-140	S1 L2 current	0	99,999.9	0.1	A	32
141-142	S1 L3 current	0	99,999.9	0.1	A	32
143-144	S1 earth current	0	99,999.9	0.1	A	32
145-146	S1 L1 watts	-99,999,999	99,999,999	1	W	32 S
147-148	S1 L2 watts	-99,999,999	99,999,999	1	W	32 S
149-150	S1 L3 watts	-99,999,999	99,999,999	1	W	32 S
151	S1 current lag/lead	-180	+180	1	degrees	16 S
152	S2 frequency	0	70	0.1	Hz	16
153-154	S2 L1-N voltage	0	18,000	0.1	V	32
155-156	S2 L2-N voltage	0	18,000	0.1	V	32
157-158	S2 L3-N voltage	0	18,000	0.1	V	32
159-160	S2 L1-L2 voltage	0	30,000	0.1	V	32
161-162	S2 L2-L3 voltage	0	30,000	0.1	V	32
163-164	S2 L3-L1 voltage	0	30,000	0.1	V	32
165-166	S2 L1 current	0	99,999.9	0.1	A	32
167-168	S2 L2 current	0	99,999.9	0.1	A	32
169-170	S2 L3 current	0	99,999.9	0.1	A	32
171-172	S2 earth current	0	99,999.9	0.1	A	32
173-174	S2 L1 watts	-99,999,999	99,999,999	1	W	32 S
175-176	S2 L2 watts	-99,999,999	99,999,999	1	W	32 S
177-178	S2 L3 watts	-99,999,999	99,999,999	1	W	32 S
179	S2 current lag/lead	-180	+180	1	degrees	16 S
180-181	Load L1 current	0	99,999.9	0.1	A	32
182-183	Load L2 current	0	99,999.9	0.1	A	32
184-185	Load L3 current	0	99,999.9	0.1	A	32
186-187	Load L1 watts	-99,999,999	99,999,999	1	W	32 S
188-189	Load L2 watts	-99,999,999	99,999,999	1	W	32 S

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign
190-191	Load L3 watts	-99,999,999	99,999,999	1	W	32 S
192	Load current lag/lead	-180	+180	1	degrees	16 S
193	S1 phase rotation	0	3			16
194	S2 phase rotation	0	3			16
195	Governor output	-100.0	+100.0	0.1	%	16S
196	AVR output	-100.0	+100.0	0.1	%	16S
197	DC Plant Battery Charge State	0.0	100.0	0.1	%	16
198	DC Plant Battery Discharge State	0.0	100.0	0.1	%	16
199	DC Voltage	0.0	75.0	0.1	V	16
200-201	DC Shunt 1 Current	- 1,250,000.0	+ 1,250,000.0	0.1	A	32S
202-203	DC Shunt 2 Current	- 1,250,000.0	+ 1,250,000.0	0.1	A	32S
204-205	DC Load Current	- 2,500,000.0	+ 2,500,000.0	0.1	A	32S
206-207	DC Plant Battery Current	- 2,500,000.0	+ 2,500,000.0	0.1	A	32S
208-209	DC Total Current	- 2,500,000.0	+ 2,500,000.0	0.1	A	32S
210-211	DC Plant Battery Cycles	0	99999			32
212-213	DC Charger Watts	-99,999,999	99,999,999	1	W	32 S
214-215	DC Plant Battery Watts	-99,999,999	99,999,999	1	W	32 S
216-217	DC Load Watts	-99,999,999	99,999,999	1	W	32 S
218-219	DC Total Watts	-99,999,999	99,999,999	1	W	32 S
220	DC Charge Mode	0	2			16
221	DC Plant Battery temperature	-50	200	1	Degrees C	16 S
222	DC Battery Cycle State	0	2			16
223	Mains zero sequence voltage angle	-360.0	+360.0	0.1	Degrees	16S
224	Mains positive sequence voltage angle	-360.0	+360.0	0.1	Degrees	16S
225	Mains negative sequence voltage angle	-360.0	+360.0	0.1	Degrees	16S
226-227	Mains zero sequence voltage magnitude	0	30,000	0.1	V	32
228-229	Mains positive sequence voltage magnitude	0	30,000	0.1	V	32
230-231	Mains negative sequence voltage magnitude	0	30,000	0.1	V	32
232-233	Battery Charger Output Current	0	50,000	1	mA	32S
234-235	Battery Charger Output Voltage	0	100,000	1	mV	32S
236-237	Battery Open Circuit Voltage	0	100,000	1	mV	32S
238-239	Load L1-N voltage (8661)	0	18,000	0.1	V	32
240-241	Load L2-N voltage (8661)	0	18,000	0.1	V	32
242-243	Load L3-N voltage (8661)	0	18,000	0.1	V	32
244-245	Load L1-L2 voltage (8661)	0	30,000	0.1	V	32
246-247	Load L2-L3 voltage (8661)	0	30,000	0.1	V	32
248-249	Load L3-L1 voltage (8661)	0	30,000	0.1	V	32
250	Load frequency	0	70	0.1	Hz	16
251	Load phase rotation	0	3			16
252-253	Battery Charger Auxiliary Voltage	0	100,000	1	mV	32S
254-255	Battery Charger Auxiliary Current	0	50,000	1	mV	32S

Phase rotation codes

Code	Meaning
0	Indeterminate – the voltage on one or more phase is insufficient to measure the rotation
1	L1 leads L2 which leads L3
2	L3 leads L2 which leads L1
3	Phase error – two or more phase inputs are in phase
4-65534	Reserved
65535	Unimplemented

DC Charge Mode

Code	Meaning
0	Discharging
1	Charging
2	Floating
4-65534	Reserved
65535	Unimplemented

DC Battery Cycle State

Code	Meaning
0	Unknown
1	Full Discharged Reached
2	Full Charge Reached
3-65534	Reserved
65535	Unimplemented

9462 – Dual Output Battery Charger

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign
212-213	DC Charger Watts Output 1	-99,999,999	99,999,999	1	W	32 S
214-215	DC Charger Watts Output 2	-99,999,999	99,999,999	1	W	32 S
221	Battery temperature Output 1	-50	200	1	Degrees C	16 S
222	Battery temperature Output 2	-50	200	1	Degrees C	16 S
232-233	Battery Charger Output 1 Current	0	50,000	1	mA	32S
234-235	Battery Charger Output 1 Voltage	0	100,000	1	mV	32S
236-237	Battery Open Circuit Voltage Output 1	0	100,000	1	mV	32S
238-239	Battery Charger Output 2 Current	0	50,000	1	mA	32S
240-241	Battery Charger Output 2 Voltage	0	100,000	1	mV	32S
242-243	Battery Open Circuit Voltage Output 2	0	100,000	1	mV	32S

10.7 Page 5 – Extended Instrumentation

Notes:

1. These are read only registers.
2. Each auxiliary sender has a register describing its type as shown in the table below.
3. Auxiliary sender values are always signed regardless of the category.
4. An unused auxiliary sender should return the appropriate unimplemented sentinel in both the category and value registers, however, some products may return a 0 value in the category register to indicate that it is unimplemented.
5. Registers 12-15 have been added to 55xx from version 9 upwards
6. Registers 16-17 have been added to 8xxx from version 2 upwards
7. Registers 233 Fuel Depth has been added for the 7450 Ausonia v2.2.0 upgrade.
8. Registers 99 (Exhaust Gas Temp Port 14) and 106-107 (Total Revolutions) are no longer available on the 7450 (Ausonia v2.2.0 onwards).
9. Registers 19-47, 56-63, 188-189 now return unimplemented sentinels rather than actually generating a Modbus exception response for 73xx MKII/74xx MKII v5.0 & later

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0	Coolant pressure 1	0	10000	1	Kpa	16
1	Coolant pressure 2	0	10000	1	Kpa	16
2	Fuel pressure 1	0	10000	1	Kpa	16
3	Fuel pressure 2	0	10000	1	Kpa	16
4	Turbo pressure 1	0	10000	1	Kpa	16
5	Turbo pressure 2	0	10000	1	Kpa	16
6	Inlet manifold temperature 1	-50	10000	1	Degrees C	16 S
7	Inlet manifold temperature 2	-50	10000	1	Degrees C	16 S
8	Exhaust temperature 1	-50	10000	1	Degrees C	16 S
9	Exhaust temperature 2	-50	10000	1	Degrees C	16 S
10-11	Fuel consumption	0	10000	0.01	L/hour	32
12	Water in Fuel					16
13	CAN BIT data					16
14	Atmospheric pressure	0	10000	1	Kpa	16
15	Fuel temperature	-50	10000	1	Degrees C	16 S
16-17	Fuel level (Units) <8xxx phase 2>	0	999,999,999	1	Litre/Imp Gal/US Gal	32
18	Selected units for fuel level <8xxx phase 2>	0	2			16
19-47	Reserved					
48	Auxiliary sender 1 category	0	3			16
49	Auxiliary sender 1 value	See table below				16 S
50	Auxiliary sender 2 category	0	3			16
51	Auxiliary sender 2 value	See table below				16 S
52	Auxiliary sender 3 category	0	3			16
53	Auxiliary sender 3 value	See table below				16 S
54	Auxiliary sender 4 category	0	3			16
55	Auxiliary sender 4 value	See table below				16 S
56-63	Reserved					
64-65	Exhaust after treatment fuel used	0	2105	1	Litres	32 U
66	After treatment temperature T1	0	1734	1	Degrees C	16 S
67	After treatment temperature T3	0	1734	1	Degrees C	16 S
68-69	Engine reference torque	0	6425	1	Nm	32U
70-71	Engine percentage torque	-125	125	1	%	32S
72-73	Engine demand torque	-125	125	1	%	32S
74	Percentage load at speed	0	250	1	%	16 U
75	Accelerator position	0	100	1	%	16 U
76	Nominal friction percentage torque	-125	125	1	%	16 S
77	Oil level	0	100	1	%	16 U
78	Crank case pressure	-25000	25000	0.01	kPa	16 S
79	Coolant level	0	100	1	%	16 U
80	Injector Rail 1 pressure	0	2509	0.01	Mpa	16 U
81	Injector Rail 2 pressure	0	2509	0.01	Mpa	16 U
82	Engine EGR flow	0	3212	1	kg/h	16 U
83	Pre filter oil pressure	0	1000	1	kPa	16 U

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
84-85	Instant break power	0	3212	1	kW	32 U
86 -101	Exhaust gas port 1-16 temperature	-273	1734	1	Degrees C	16 S
102	Intercooler temperature	-40	210	1	Degrees C	16 S
103	Turbo oil temperature	-273	1734	1	Degrees C	16 S
104	ECU temperature	-273	1734	1	Degrees C	16 S
105	Fan speed	0	8031	1	rpm	16 U
106-107	Total engine revolutions	0	4211	0.001		32 U
108	Air inlet pressure	0	500	1	kPa	16 U
109	Air filter differential pressure	0	125	0.1	kPa	16 U
110	Air trap inlet pressure	0	125	1	kPa	16 U
111	Turbo pressure 3	0	8031	1	kPa	16 U
112	Turbo pressure 4	0	8031	1	kPa	16 U
113	Inlet manifold temperature 3	-40	210	1	Degrees C	16 S
114	Inlet manifold temperature 4	-40	210	1	Degrees C	16 S
115	Inlet manifold temperature 5	-40	210	1	Degrees C	16 S
116	Inlet manifold temperature 6	-40	210	1	Degrees C	16 S
117-118	Trip fuel	0	2105	1	Litres	32 U
119	Electrical potential			0.1	V	16 U
120	PGI Engine type					16 U
121	PGI Engine version number					16 U
122	DPTC filter lamp command	0	7	See table		16 U
123	Exhaust system high temperature lamp	0	7			16 U
124	DPTC Action regeneration forced	0	7	See table		16 U
125	Shutdown wait to start					16 U
126	Shutdown protection					16 U
127	Shutdown Approaching					16 U
128	Engine operating state	0	15	See table		16 U
129	Shutdown coolant override					16 U
130	Battle short override					16 U
131	Module engine hours					16 U
132	Module oil pressure					16 U
133	Module coolant temperature					16 U
134	Module engine RPM					16 U
135	Module charge alternator					16 U
136	Module speed feed					16 U
137	Frequency adjust					16 U
138	Engine operating state					16 U
139	Engine alarm warning					16 U
140	Engine alarm shutdown					16 U
141	Engine alarm electrical trip					16 U
142	CAN amber stop lamp					16 U
143	CAN amber lamp flash					16 U
144	CAN Red stop lamp					16 U
145	CAN red lamp flash					16 U
146	CAN protect lamp					16 U
147	CAN protect lamp flash					16 U
148	Malfunction Lamp					16 U
149	Malfunction lamp flash					16 U
150	Electrical potential					16 U
151	Battery potential			0.1	V	16 U
152	Charging potential			0.1	V	16 U
153	Charge alternator current			1	A	16 U
154	Battery current			1	A	16 S
155	Engine torque mode					16 U
156	Engine starter mode					16 U
157	CAN CI status					16 U
158	Demand speed					16 U
159	Speed up					16 U
160	Speed down					16 U

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
161	Speed fail					16 U
162	Current SD source					16 U
163	Feedback SD CAN					16 U
164	Feedback SD analogue					16 U
165	Failure codes					16 U
166	Actual droop					16 U
167	Start status					16 U
168	Protection override status					16 U
169	MTU running state					16 U
170	Cylinder cut off					16 U
171	Load gen status					16 U
172	Extended stop status					16 U
173	Current operating mode					16 U
174	MTU required torque					16 U
175	Trip average fuel			0.01	L/hour	16 U
176	ECU rated power			1	kW	16 U
177	ECU rated speed			1	RPM	16 U
178	ECU idle speed			1	RPM	16 U
179	ECU desired speed			1	RPM	16 U
180	ECU preheat status					16 U
181	Manifold pressure			1	kPa	16 U
182	Intercooler level			1	%	16 U
183	CAN link status					16U
184	Auto DPF Regeneration Inhibit					16U
185	DPTC Active Regeneration Inhibit Switch (received from engine) SPN 3703					16U
186	Soot Load	0		1	%	16U
187	Ash Load	0		1	%	16U
188-189	Reserved					
190	LCD Temperature	-100	200	1	Degrees C	16S
191	DEF Tank Level				%	16U
192	DEF Tank Temperature				Degrees C	16S
193	DEF Level Status					16U
194	DEF Consumption				L/hour	16U
195	Aftertreatment Status Reason					16U
196	Aftertreatment Status Severity					16U
197	Time left until action needed				s	16U
198	Time until Torque Reduction				s	16U
199	Time until Speed Reduction				s	16U
200	EGR Pressure				kPa	16U
201	EGR Temperature				Degrees C	16S
202	Ambient Air Temperature				Degrees C	16S
203	Air Intake Temperature				Degrees C	16S
204	DEF Lamps – SCR Inducement	0	15		See table below	16U
205	DEF Lamps – DEF Level Low	0	15		See table below	16U
206	Generator high-resolution frequency	0	70	0.01	Hz	16
207	Mains high-resolution frequency	0	70	0.01	Hz	16
208	Bus high-resolution frequency	0	70	0.01	Hz	16
209	Bus 2 high-resolution frequency	0	70	0.01	Hz	16
210	Oil Pressure	-100	10000	1	kPa	16 S
211	CAN Alternate engine speed selected	0	1	0		16
212-213	Generator Excitation Field Current				A	32U
214-215	Generator Excitation Field Voltage				V	32U
216	Generator Output Voltage Bias Percentage				%	16U

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
217-220	Exhaust gas port 17-20 temperature	-273	1734	1	Degrees C	16 S
221	Instant Fuel Rate					16U
222	DPTC Filter Status					16U
223	DPTC Active Regeneration Inhibit					16U
224	DPTC Active Regeneration Inhibit ET					16U
225	DEF Tank Status					16U
226	Gas Fuel Pressure					16U
227	Throttle Position 1					16U
228	Throttle Position 2					16U
229-230	DC Charger Current	- 2,500,000.0	+ 2,500,000.0	0.1	A	32S
231	Trip Average Fuel Efficiency	0	10.00	0.01	kW Hour/L	16U
232	Instantaneous Fuel Efficiency	0	10.00	0.01	kW Hour/L	16U
233	Fuel Distance (in mm)	0	3000	1	mm	16S
234	Unimplemented					
235	Bus zero sequence voltage angle	-360.0	+360.0	0.1	Degrees	16S
236	Bus positive sequence voltage angle	-360.0	+360.0	0.1	Degrees	16S
237	Bus negative sequence voltage angle	-360.0	+360.0	0.1	Degrees	16S
238-239	Bus zero sequence voltage magnitude	0	30,000	0.1	V	32
240-241	Bus positive sequence voltage magnitude	0	30,000	0.1	V	32
242-243	Bus negative sequence voltage magnitude	0	30,000	0.1	V	32
244	Fuel level (signed value)			1	%	16S
245	Gen zero sequence voltage angle	-360.0	+360.0	0.1	Degrees	16S
246	Gen positive sequence voltage angle	-360.0	+360.0	0.1	Degrees	16S
247	Gen negative sequence voltage angle	-360.0	+360.0	0.1	Degrees	16S
248-249	Gen zero sequence voltage magnitude	0	30,000	0.1	V	32
250-251	Gen positive sequence voltage magnitude	0	30,000	0.1	V	32
252-253	Gen negative sequence voltage magnitude	0	30,000	0.1	V	32
254-255	Manual Run Time Remaining (E400 v4.0)	0	432,000 (12h)	0.1	Seconds	32

94xx Battery charger register allocation

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0-185	Reserved					
186-187	Battery Charger Current Limit	0	50,000	1	mA	32S
188	Battery Charger Calculated Ambient Temperature	-255	255	1	Degrees C	16S
189	Battery Charger PCB Temperature	-300	255	1	Degrees C	16S
190-191	Auxiliary Current Limit	0	4000	1	mA	32S
192	Fan Speed 1	10	2400	1	rpm	16S
193	Fan Speed 2	10	2400	1	rpm	16S
194	Battery Voltage (when remote Sense connected)			0.1	V	16S
196	Battery Charger Output state	0	1	1	Off / On	16U
197	Battery Charger Alarm state	0	2	1	0 = no alarm 1 = Shutdown 2 = Warning	16U
198-199	Battery Charger maximum output volttage	0	2,147,483,647	1	mV	32S
200-201	Charge stage remaining time	0	4,294,967,295	1	10 ms	32U
202	Configured digital input function	16	20	1	Digial input function code (see table below)	16U
203	Charger in manual boost	0	1	1	Boost not active / active	16U
204	Digital Input Active	0	1	1	Digital input not active / active	16U
205-206	Time Until Battery Detection	0	4,294,967,295	1	10 ms	32U
207-208	Time Until Self Test	0	4,294,967,295	1	10 ms	32U
201-255	Reserved					

94xx Battery Charger Digital input code

Type code 10A Chargers	Type code 15A/20A Chargers	Type code 30A Chargers	Type	Scaling factor
16	16	12	Manual boost	1
17	17	16	Lamp test	1
18	N/A	N/A	Switch to alternative voltage mode	1
19	19	15	Enable battery detection	1
20	20	14	Charger off	1

Auxiliary & Flexible sender category codes

Type code	Type	Minimum value	Maximum value	Scaling factor	Units
0	Unused	0	0		
1	Pressure	0	10000	1	Kpa
2	Temperature	-50	10000	1	Degrees C
3	Level	0	200	1	%
4-65535	Reserved				

Fuel Level codes

Type code	Type
0	Litres
1	Imperial Gallons
2	US Gallons
3-65535	Reserved

Engine operating state

Type code	Type
0	Engine stopped
1	Pre-Start
2	Warming up
3	Running
4	Cooling down
5	Engine Stopped
6	Post run
7	
8-13	Available for SAE assignment
14	Reserved
15	Not available

DPTC filter lamp command

Type code	Type
0	Off
1	On – solid
2-3	Reserved for SAE assignment
4	On Fast blink (1Hz)
5-6	Reserved for SAE assignment
7	Not available

Exhaust system high temperature lamp

Type code	Type
0	Engine stopped
1	Pre-Start
2-6	Available for SAE assignment
7	Not available

DPTC Action regeneration forced

Type code	Type
0	Not active
1	Active forced by switch
2	Active forced by service tool
3-6	Not Available
7	Not available

CAN link status codes

Type code	Type
0	Link OK
1	Link Lost
2	Link Unknown
65535	Unimplemented
3-65534	Reserved

Auto DPF Regeneration Inhibit

Type code	Type
0	Auto regeneration permitted
1	Auto regeneration inhibited
3-65534	Reserved

DEF Lamps

Type code	Type
0	Off
1	On Steady (amber/yellow steady)
2	Flash Slow (red slow blink)
3	Flash Fast (red fast blink)
11	Bad Data
15	Unimplemented

10.8 Page 6 – Derived Instrumentation

Notes:

1. These are read only registers.
2. Registers 22, 23, 46, 47, 70 and 71 do indeed have limits of +/- 999.9%
3. Registers 78-81 return 0 for leading, 1 for indeterminate, 2 for lagging (72xx/73xx only)
4. Registers 85-108 have been added to support the 8680 although not all will be implemented initially.
5. Register 114 and similar: 'average' is the arithmetic average of all phases that are relevant to the current AC system.
6. Register 115 and similar: 'difference' is the difference between 'max' and min'.
7. Register 116 and similar: 'min' is the lowest of all phases that are relevant to the current AC system.
8. Register 117 and similar: 'max' is the highest of all phases that are relevant to the current AC system.
9. Registers 138-149: When the set is at full load, unity power factor and all phases are balanced, the average, max and min values will also be 100%, not 33.3% for a 3 phase system.
10. Register 150: This is a duplicate of register 21 to avoid mistakes if the register pattern were broken.
11. Registers 212,213: added as part of 87xx v5.3 development (time to empty in seconds)

61xx MkII register allocation

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0-1	Generator total watts	-99,999,999	99,999,999	1	W	32S
2-3	Generator L1 VA	0	99,999,999	1	VA	32
4-5	Generator L2 VA	0	99,999,999	1	VA	32
6-7	Generator L3 VA	0	99,999,999	1	VA	32
8-9	Generator total VA	0	99,999,999	1	VA	32S
10-11	Generator L1 Var	-99,999,999	99,999,999	1	Var	32S
12-13	Generator L2 Var	-99,999,999	99,999,999	1	Var	32S
14-15	Generator L3 Var	-99,999,999	99,999,999	1	Var	32S
16-17	Generator total Var	-99,999,999	99,999,999	1	Var	32S
18	Generator power factor L1	-1	1	0.01		16S
19	Generator power factor L2	-1	1	0.01		16S
20	Generator power factor L3	-1	1	0.01		16S
21	Generator average power factor	-1	1	0.01		16S
22	Generator percentage of full power	-999.9	+999.9	0.1	%	16S
23	Generator percentage of full Var	-999.9	+999.9	0.1	%	16S
24-25	Mains total watts	-99,999,999	999,999,999	1	W	32S
26-27	Mains L1 VA	0	99,999,999	1	VA	32
28-29	Mains L2 VA	0	99,999,999	1	VA	32
30-31	Mains L3 VA	0	99,999,999	1	VA	32
32-33	Mains total VA	0	999,999,999	1	VA	32
34-35	Mains L1 Var	-99,999,999	99,999,999	1	Var	32S
36-37	Mains L2 Var	-99,999,999	99,999,999	1	Var	32S
38-39	Mains L3 Var	-99,999,999	99,999,999	1	Var	32S
40-41	Mains total Var	-999,999,999	999,999,999	1	Var	32S
42	Mains power factor L1	-1	1	0.01		16S
43	Mains power factor L2	-1	1	0.01		16S
44	Mains power factor L3	-1	1	0.01		16S
45	Mains average power factor	-1	1	0.01		16S
46	Unimplemented	-999.9	+999.9	0.1	%	16S
47	Unimplemented	-999.9	+999.9	0.1	%	16S
48-49	Unimplemented	-999,999,999	999,999,999	1	W	32S
50-51	Unimplemented	0	99,999,999	1	VA	32
52-53	Unimplemented	0	99,999,999	1	VA	32
54-55	Unimplemented	0	99,999,999	1	VA	32
56-57	Unimplemented	0	999,999,999	1	VA	32
58-59	Unimplemented	-99,999,999	99,999,999	1	Var	32S
60-61	Unimplemented	-99,999,999	99,999,999	1	Var	32S
62-63	Unimplemented	-99,999,999	99,999,999	1	Var	32S
64-65	Unimplemented	-999,999,999	999,999,999	1	Var	32S
66	Unimplemented	-1	1	0.01		16S
67	Unimplemented	-1	1	0.01		16S

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
68	Unimplemented	-1	1	0.01		16S
69	Unimplemented	-1	1	0.01		16S
70	Unimplemented	-999.9	+999.9	0.1	%	16S
71	Unimplemented	-999.9	+999.9	0.1	%	16S
72-73	Unimplemented	-999,999,999	999,999,999	1	W	32S
74-75	Unimplemented	-999,999,999	999,999,999	1	Var	32S
76	Unimplemented	0	10.00	0.01	Hz/s	16
77	Unimplemented	0	360.0	0.1	Degrees	16
78	Gen L1 lead /lag	0	2			16
79	Gen L2 lead /lag	0	2			16
80	Gen L3 lead /lag	0	2			16
81	Gen total lead /lag	0	2			16
82	Gen L1 percentage of full power	-999.9	+999.9	0.1	%	16S
83	Gen L2 percentage of full power	-999.9	+999.9	0.1	%	16S
84	Gen L3 percentage of full power	-999.9	+999.9	0.1	%	16S
85	Unimplemented	-1	1	0.01		16S
86-87	Unimplemented	-999,999,999	999,999,999	1	W	32S
88-89	Unimplemented	0	99,999,999	1	VA	32
90-91	Unimplemented	0	99,999,999	1	VA	32
92-93	Unimplemented	0	99,999,999	1	VA	32
94-95	Unimplemented	0	999,999,999	1	VA	32
96-97	Unimplemented	-99,999,999	99,999,999	1	Var	32S
98-99	Unimplemented	-99,999,999	99,999,999	1	Var	32S
100-101	Unimplemented	-99,999,999	99,999,999	1	Var	32S
102-103	Unimplemented	-999,999,999	999,999,999	1	Var	32S
104	Unimplemented	-1	1	0.01		16S
105	Unimplemented	-1	1	0.01		16S
106	Unimplemented	-1	1	0.01		16S
107	Unimplemented	-999.9	+999.9	0.1	%	16S
108	Unimplemented	-999.9	+999.9	0.1	%	16S
109	Mains L1 lead/lag	0	2			16
110	Mains L2 lead/lag	0	2			16
111	Mains L3 lead/lag	0	2			16
112	Mains total lead/lag	0	2			16
113	Reserved	0	0			16
114-115	Generator L-N voltage average	0	18,000	0.1	V	32
116-117	Generator L-N voltage difference	0	18,000	0.1	V	32
118-119	Generator L-N voltage min	0	18,000	0.1	V	32
120-121	Generator L-N voltage max	0	18,000	0.1	V	32
122-123	Generator L-L voltage average	0	30,000	0.1	V	32
124-125	Generator L-L voltage difference	0	30,000	0.1	V	32
126-127	Generator L-L voltage min	0	30,000	0.1	V	32
128-129	Generator L-L voltage max	0	30,000	0.1	V	32
130-131	Generator current average	0	99,999.9	0.1	A	32
132-133	Generator current difference	0	99,999.9	0.1	A	32
134-135	Generator current min	0	99,999.9	0.1	A	32
136-137	Generator current max	0	99,999.9	0.1	A	32
138	Generator watts average	-999.9	999.9	0.1	%	16S
139	Generator watts difference	-999.9	999.9	0.1	%	16S
140	Generator watts min	-999.9	999.9	0.1	%	16S
141	Generator watts max	-999.9	999.9	0.1	%	16S
142	Generator VA average	0	999.9	0.1	%	16
143	Generator VA difference	0	999.9	0.1	%	16
144	Generator VA min	0	999.9	0.1	%	16
145	Generator VA max	0	999.9	0.1	%	16

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
146	Generator Var average	-999.9	999.9	0.1	%	16S
147	Generator Var difference	-999.9	999.9	0.1	%	16S
148	Generator Var min	-999.9	999.9	0.1	%	16S
149	Generator Var max	-999.9	999.9	0.1	%	16S
150	Generator power factor average	-1	1	0.01		16S
151	Generator power factor difference	-1	1	0.01		16S
152	Generator power factor min	-1	1	0.01		16S
153	Generator power factor max	-1	1	0.01		16S
154-155	Mains L-N voltage average	0	18,000	0.1	V	32
156-157	Mains L-N voltage difference	0	18,000	0.1	V	32
158-159	Mains L-N voltage min	0	18,000	0.1	V	32
160-161	Mains L-N voltage max	0	18,000	0.1	V	32
162-163	Mains L-L voltage average	0	30,000	0.1	V	32
164-165	Mains L-L voltage difference	0	30,000	0.1	V	32
166-167	Mains L-L voltage min	0	30,000	0.1	V	32
168-169	Mains L-L voltage max	0	30,000	0.1	V	32
170-171	Mains current average	0	99,999.9	0.1	A	32
172-255	Reserved					

8xxx/7xxx/6xxx/P100/L40x/4xxx register allocation

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0-1	Generator total watts	-99,999,999	99,999,999	1	W	32S
2-3	Generator L1 VA	0	99,999,999	1	VA	32
4-5	Generator L2 VA	0	99,999,999	1	VA	32
6-7	Generator L3 VA	0	99,999,999	1	VA	32
8-9	Generator total VA	0	99,999,999	1	VA	32S
10-11	Generator L1 Var	-99,999,999	99,999,999	1	Var	32S
12-13	Generator L2 Var	-99,999,999	99,999,999	1	Var	32S
14-15	Generator L3 Var	-99,999,999	99,999,999	1	Var	32S
16-17	Generator total Var	-99,999,999	99,999,999	1	Var	32S
18	Generator power factor L1	-1	1	0.01		16S
19	Generator power factor L2	-1	1	0.01		16S
20	Generator power factor L3	-1	1	0.01		16S
21	Generator average power factor	-1	1	0.01		16S
22	Generator percentage of full power	-999.9	+999.9	0.1	%	16S
23	Generator percentage of full Var	-999.9	+999.9	0.1	%	16S
24-25	Mains total watts	-99,999,999	999,999,999	1	W	32S
26-27	Mains L1 VA	0	99,999,999	1	VA	32
28-29	Mains L2 VA	0	99,999,999	1	VA	32
30-31	Mains L3 VA	0	99,999,999	1	VA	32
32-33	Mains total VA	0	999,999,999	1	VA	32
34-35	Mains L1 Var	-99,999,999	99,999,999	1	Var	32S
36-37	Mains L2 Var	-99,999,999	99,999,999	1	Var	32S
38-39	Mains L3 Var	-99,999,999	99,999,999	1	Var	32S
40-41	Mains total Var	-999,999,999	999,999,999	1	Var	32S
42	Mains power factor L1	-1	1	0.01		16S
43	Mains power factor L2	-1	1	0.01		16S
44	Mains power factor L3	-1	1	0.01		16S
45	Mains average power factor	-1	1	0.01		16S
46	Mains percentage of full power	-999.9	+999.9	0.1	%	16S
47	Mains percentage of full Var	-999.9	+999.9	0.1	%	16S
48-49	Bus total watts	-999,999,999	999,999,999	1	W	32S
50-51	Bus L1 VA	0	99,999,999	1	VA	32
52-53	Bus L2 VA	0	99,999,999	1	VA	32
54-55	Bus L3 VA	0	99,999,999	1	VA	32
56-57	Bus total VA	0	999,999,999	1	VA	32
58-59	Bus L1 Var	-99,999,999	99,999,999	1	Var	32S

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
60-61	Bus L2 Var	-99,999,999	99,999,999	1	Var	32S
62-63	Bus L3 Var	-99,999,999	99,999,999	1	Var	32S
64-65	Bus total Var	-999,999,999	999,999,999	1	Var	32S
66	Bus power factor L1	-1	1	0.01		16S
67	Bus power factor L2	-1	1	0.01		16S
68	Bus power factor L3	-1	1	0.01		16S
69	Bus average power factor	-1	1	0.01		16S
70	Bus percentage of full power	-999.9	+999.9	0.1	%	16S
71	Bus percentage of full Var	-999.9	+999.9	0.1	%	16S
72-73	Load total watts	-999,999,999	999,999,999	1	W	32S
74-75	Load total Var	-999,999,999	999,999,999	1	Var	32S
76	Mains R.O.C.O.F.	0	10.00	0.01	Hz/s	16
77	Mains vector shift	0	360.0	0.1	Degrees	16
78	Gen L1 lead /lag	0	2			16
79	Gen L2 lead /lag	0	2			16
80	Gen L3 lead /lag	0	2			16
81	Gen total lead /lag	0	2			16
82	Gen L1 percentage of full power	-999.9	+999.9	0.1	%	16S
83	Gen L2 percentage of full power	-999.9	+999.9	0.1	%	16S
84	Gen L3 percentage of full power	-999.9	+999.9	0.1	%	16S
85	Bus 2 average power factor	-1	1	0.01		16S
86-87	Bus 2 total watts	-999,999,999	999,999,999	1	W	32S
88-89	Bus 2 L1 VA	0	99,999,999	1	VA	32
90-91	Bus 2 L2 VA	0	99,999,999	1	VA	32
92-93	Bus 2 L3 VA	0	99,999,999	1	VA	32
94-95	Bus 2 total VA	0	999,999,999	1	VA	32
96-97	Bus 2 L1 Var	-99,999,999	99,999,999	1	Var	32S
98-99	Bus 2 L2 Var	-99,999,999	99,999,999	1	Var	32S
100-101	Bus 2 L3 Var	-99,999,999	99,999,999	1	Var	32S
102-103	Bus 2 total Var	-999,999,999	999,999,999	1	Var	32S
104	Bus 2 power factor L1	-1	1	0.01		16S
105	Bus 2 power factor L2	-1	1	0.01		16S
106	Bus 2 power factor L3	-1	1	0.01		16S
107	Bus 2 percentage of full power	-999.9	+999.9	0.1	%	16S
108	Bus 2 percentage of full Var	-999.9	+999.9	0.1	%	16S
109	Mains L1 lead/lag	0	2			16
110	Mains L2 lead/lag	0	2			16
111	Mains L3 lead/lag	0	2			16
112	Mains total lead/lag	0	2			16
113	Reserved	0	0			16
114-115	Generator L-N voltage average	0	18,000	0.1	V	32
116-117	Generator L-N voltage difference	0	18,000	0.1	V	32
118-119	Generator L-N voltage min	0	18,000	0.1	V	32
120-121	Generator L-N voltage max	0	18,000	0.1	V	32
122-123	Generator L-L voltage average	0	30,000	0.1	V	32
124-125	Generator L-L voltage difference	0	30,000	0.1	V	32
126-127	Generator L-L voltage min	0	30,000	0.1	V	32
128-129	Generator L-L voltage max	0	30,000	0.1	V	32
130-131	Generator current average	0	99,999.9	0.1	A	32
132-133	Generator current difference	0	99,999.9	0.1	A	32
134-135	Generator current min	0	99,999.9	0.1	A	32
136-137	Generator current max	0	99,999.9	0.1	A	32
138	Generator watts average	-999.9	999.9	0.1	%	16S
139	Generator watts difference	-999.9	999.9	0.1	%	16S
140	Generator watts min	-999.9	999.9	0.1	%	16S
141	Generator watts max	-999.9	999.9	0.1	%	16S
142	Generator VA average	0	999.9	0.1	%	16
143	Generator VA difference	0	999.9	0.1	%	16
144	Generator VA min	0	999.9	0.1	%	16

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
145	Generator VA max	0	999.9	0.1	%	16
146	Generator Var average	-999.9	999.9	0.1	%	16S
147	Generator Var difference	-999.9	999.9	0.1	%	16S
148	Generator Var min	-999.9	999.9	0.1	%	16S
149	Generator Var max	-999.9	999.9	0.1	%	16S
150	Generator power factor average	-1	1	0.01		16S
151	Generator power factor difference	-1	1	0.01		16S
152	Generator power factor min	-1	1	0.01		16S
153	Generator power factor max	-1	1	0.01		16S
154-155	Mains L-N voltage average	0	18,000	0.1	V	32
156-157	Mains L-N voltage difference	0	18,000	0.1	V	32
158-159	Mains L-N voltage min	0	18,000	0.1	V	32
160-161	Mains L-N voltage max	0	18,000	0.1	V	32
162-163	Mains L-L voltage average	0	30,000	0.1	V	32
164-165	Mains L-L voltage difference	0	30,000	0.1	V	32
166-167	Mains L-L voltage min	0	30,000	0.1	V	32
168-169	Mains L-L voltage max	0	30,000	0.1	V	32
170-171	Bus L-N voltage average	0	18,000	0.1	V	32
172-173	Bus L-N voltage difference	0	18,000	0.1	V	32
174-175	Bus L-N voltage min	0	18,000	0.1	V	32
176-177	Bus L-N voltage max	0	18,000	0.1	V	32
178-179	Bus L-L voltage average	0	30,000	0.1	V	32
180-181	Bus L-L voltage difference	0	30,000	0.1	V	32
182-183	Bus L-L voltage min	0	30,000	0.1	V	32
184-185	Bus L-L voltage max	0	30,000	0.1	V	32
186-187	Bus 2 L-N voltage average	0	18,000	0.1	V	32
188-189	Bus 2 L-N voltage difference	0	18,000	0.1	V	32
190-191	Bus 2 L-N voltage min	0	18,000	0.1	V	32
192-193	Bus 2 L-N voltage max	0	18,000	0.1	V	32
194-195	Bus 2 L-L voltage average	0	30,000	0.1	V	32
196-197	Bus 2 L-L voltage difference	0	30,000	0.1	V	32
198-199	Bus 2 L-L voltage min	0	30,000	0.1	V	32
200-201	Bus 2 L-L voltage max	0	30,000	0.1	V	32
202-203	DC Charger Watts	-99,999,999	99,999,999	1	W	32 S
204-205	DC Load Watts	-99,999,999	99,999,999	1	W	32 S
206-207	DC Battery Watts	-99,999,999	99,999,999	1	W	32 S
208-209	DC Total Watts	-99,999,999	99,999,999	1	W	32 S
210-211	DC percentage of full power	-999.99	+999.90	0.01	%	32S
212-213	Time To Empty (87xx v5.3)	-2.14×10^9	2.14×10^9	1	Seconds	32S
214-215	Mains L1-N voltage 10s rolling average	0	18,000	0.1	V	32
216-217	Mains L2-N voltage 10s rolling average	0	18,000	0.1	V	32
218-219	Mains L3-N voltage 10s rolling average	0	18,000	0.1	V	32
220-221	Mains L1-L2 voltage 10s rolling average	0	30,000	0.1	V	32
222-223	Mains L2-L3 voltage 10s rolling average	0	30,000	0.1	V	32
224-225	Mains L3-L1 voltage 10s rolling average	0	30,000	0.1	V	32
226-227	Mains voltage asymmetry	0	30000	0.1	V	32
228-255	Reserved					

3xx register allocation

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0-1	S2 total watts	-99,999,999	99,999,999	1	W	32S
2-3	S2 L1 VA	0	99,999,999	1	VA	32
4-5	S2 L2 VA	0	99,999,999	1	VA	32
6-7	S2 L3 VA	0	99,999,999	1	VA	32
8-9	S2 total VA	0	99,999,999	1	VA	32
10-11	S2 L1 Var	0	99,999,999	1	Var	32
12-13	S2 L2 Var	0	99,999,999	1	Var	32
14-15	S2 L3 Var	0	99,999,999	1	Var	32
16-17	S2 total Var	0	99,999,999	1	Var	32
18	S2 power factor L1	-1	1	0.01		16S
19	S2 power factor L2	-1	1	0.01		16S
20	S2 power factor L3	-1	1	0.01		16S
21	S2 average power factor	-1	1	0.01		16S
22	S2 percentage of full power	-999.9	+999.9	0.1	%	16S
23	S2 percentage of full Var	-999.9	+999.9	0.1	%	16S
24-25	S1 total watts	-99,999,999	999,999,999	1	W	32S
26-27	S1 L1 VA	0	99,999,999	1	VA	32
28-29	S1 L2 VA	0	99,999,999	1	VA	32
30-31	S1 L3 VA	0	99,999,999	1	VA	32
32-33	S1 total VA	0	999,999,999	1	VA	32
34-35	S1 L1 Var	0	99,999,999	1	Var	32
36-37	S1 L2 Var	0	99,999,999	1	Var	32
38-39	S1 L3 Var	0	99,999,999	1	Var	32
40-41	S1 total Var	0	999,999,999	1	Var	32
42	S1 power factor L1	-1	1	0.01		16S
43	S1 power factor L2	-1	1	0.01		16S
44	S1 power factor L3	-1	1	0.01		16S
45	S1 average power factor	-1	1	0.01		16S
46	S1 percentage of full power	-999.9	+999.9	0.1	%	16S
47	S1 percentage of full Var	-999.9	+999.9	0.1	%	16S
48-49	Unimplemented (signed 32)					32S
50-65	Unimplemented (unsigned 32)					32
66-71	Unimplemented (signed 16)					16S
72-73	Unimplemented (signed 32)					32S
74-75	Unimplemented (unsigned 32)					32
76-77	Unimplemented (unsigned 16)					16
78	S2 L1 lead /lag	0	2			16
79	S2 L2 lead /lag	0	2			16
80	S2 L3 lead /lag	0	2			16
81	S2 total lead /lag	0	2			16
82	S2 L1 percentage of full power	-999.9	+999.9	0.1	%	16S
83	S2 L2 percentage of full power	-999.9	+999.9	0.1	%	16S
84	S2 L3 percentage of full power	-999.9	+999.9	0.1	%	16S
85	Unimplemented (signed 16)					16S
86-87	Unimplemented (signed 32)					32S
88-103	Unimplemented (unsigned 32)					32
104-108	Unimplemented (signed 16)					16S
109	S1L1 lead/lag	0	2			16
110	S1L2 lead/lag	0	2			16
111	S1L3 lead/lag	0	2			16
112	S1total lead/lag	0	2			16
113-255	Reserved					

10.9 Page 7 – Accumulated Instrumentation

Notes:

1. These are read/write registers though some systems may not support writing to some registers.
2. The 'Engine run time for load demand' is used by the hours run balancing scheme, it can be reset independently of the 'Engine Run Time' to cope with hire sets being added to a site.

8xxx/7xxx/6xxx/L40x/4xxx register allocation

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0-1	Current time since 1/1/70	0	4.29×10^9	1	Seconds	32
2-3	Time to next engine maintenance	-2.14×10^9	2.14×10^9	1	Seconds	32S
4-5	Time of next engine maintenance since 1/1/70	0	4.29×10^9	1	Seconds	32
6-7	Engine run time	0	4.29×10^9	1	Seconds	32
8-9	Generator positive KW hours	0	4.29×10^9	0.1	KW hour	32
10-11	Generator negative KW hours	0	4.29×10^9	0.1	KW hour	32
12-13	Generator KVA hours	0	4.29×10^9	0.1	KVA hour	32
14-15	Generator KVAr hours	0	4.29×10^9	0.1	KVAr hour	32
16-17	Number of starts	0	99999			32
18-19	Mains positive KW hours	0	4.29×10^9	0.1	KW hour	32
20-21	Mains negative KW hours	0	4.29×10^9	0.1	KW hour	32
22-23	Mains KVA hours	0	4.29×10^9	0.1	KVA hour	32
24-25	Mains KVAr hours	0	4.29×10^9	0.1	KVAr hour	32
26-27	Bus positive KW hours	0	4.29×10^9	0.1	KW hour	32
28-29	Bus negative KW hours	0	4.29×10^9	0.1	KW hour	32
30-31	Bus KVA hours	0	4.29×10^9	0.1	KVA hour	32
32-33	Bus KVAr hours	0	4.29×10^9	0.1	KVAr hour	32
34-35	Fuel used	0	4.29×10^9	1	Litre	32
36-37	Maximum positive mains R.O.C.O.F.	0	10.00	0.01	Hz/s	32
38-39	Maximum negative mains R.O.C.O.F.	0	10.00	0.01	Hz/s	32
40-41	Maximum positive mains vector shift	0	360.0	0.1	Degrees	32
42-43	Maximum negative mains vector shift	0	360.0	0.1	Degrees	32
44-45	Time to next engine maintenance alarm 1	-2.14×10^9	2.14×10^9	1	Seconds	32S
46-47	Time of next engine maintenance alarm 1 since 1/1/70	0	4.29×10^9	1	Seconds	32
48-49	Time to next engine maintenance alarm 2	-2.14×10^9	2.14×10^9	1	Seconds	32S
50-51	Time of next engine maintenance alarm 2 since 1/1/70	0	4.29×10^9	1	Seconds	32
52-53	Time to next engine maintenance alarm 3	-2.14×10^9	2.14×10^9	1	Seconds	32S
54-55	Time of next engine maintenance alarm 3 since 1/1/70	0	4.29×10^9	1	Seconds	32
56-57	Time to next plant battery maintenance	-2.14×10^9	2.14×10^9	1	Seconds	32S
58-59	Time of next plant battery maintenance since 1/1/70	0	4.29×10^9	1	Seconds	32
60-61	Cycles to next plant battery maintenance	0	4.29×10^9	1	Numeric	32
62-63	Capacity remaining to next plant battery maintenance	0	4.29×10^9	1	Percentage	32
64-65	Time to next plant battery maintenance alarm 1	-2.14×10^9	2.14×10^9	1	Seconds	32S
66-67	Time of next plant battery maintenance alarm 1 since 1/1/70	0	4.29×10^9	1	Seconds	32
68-69	Cycles to next plant battery maintenance alarm 1	0	4.29×10^9	1	Numeric	32
70-71	Capacity remaining to next plant battery maintenance alarm 1	0	4.29×10^9	1	Percentage	32
72-73	Time to next plant battery maintenance alarm 2	-2.14×10^9	2.14×10^9	1	Seconds	32S
74-75	Time of next plant battery maintenance alarm 2 since 1/1/70	0	4.29×10^9	1	Seconds	32
76-77	Cycles to next plant battery maintenance alarm 2	0	4.29×10^9	1	Numeric	32
78-79	Capacity remaining to next plant battery	0	4.29×10^9	1	Percentage	32

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
	maintenance alarm 2					
80-81	Time to next plant battery maintenance alarm 3	-2.14×10^9	2.14×10^9	1	Seconds	32S
82-83	Time of next plant battery maintenance alarm 3 since 1/1/70	0	4.29×10^9	1	Seconds	32
84-85	Cycles to next plant battery maintenance alarm 3	0	4.29×10^9	1	Numeric	32
86-87	Capacity remaining to next plant battery maintenance alarm 3	0	4.29×10^9	1	Percentage	32
88-89	Plant Battery Run Time	0	4.29 x109	1	Seconds	32
90-91	Plant Battery Cycles	0	99999			32
92-93	Plant Battery Charge State	0	100.0	0.1	%	16
94-95	LoadkWh	0	4.29×10^9	0.1	kW hour	32
96-97	Battery charging kWh	0	4.29×10^9	0.1	kW hour	32
98-99	Battery discharging kWh	0	4.29×10^9	0.1	kW hour	32
100	Fuel Efficiency KWh/L (accumulated)	0	65535	0.01	kW hour/L	16
101	Fault Ride Through event count	0	65500	1	Event	16
102-103	Engine run time for load demand	0	4.29×10^9	1	Seconds	32
105-255	Reserved					

3xx register allocation

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0-1	Current time since 1/1/70	0	4.29×10^9	1	Seconds	32
2-7	Unimplemented (Reserved for future use)					32
8-9	S2 positive KW hours	0	4.29×10^9	0.1	KW hour	32
10-11	Unimplemented (Reserved for future use)					32
12-13	S2 KVA hours	0	4.29×10^9	0.1	KVA hour	32
14-15	S2 KVAr hours	0	4.29×10^9	0.1	KVAr hour	32
16-17	Unimplemented (Reserved for future use)					23
18-19	S1 positive KW hours	0	4.29×10^9	0.1	KW hour	32
20-21	Unimplemented (Reserved for future use)					23
22-23	S1 KVA hours	0	4.29×10^9	0.1	KVA hour	32
24-25	S1 KVAr hours	0	4.29×10^9	0.1	KVAr hour	32
26-55	Unimplemented (Reserved for future use)					32
56-255	Reserved					

Exxx register allocation

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0-1	Current time since 1/1/70	0	4.29×10^9	1	Seconds	32
2-3	Time to next engine maintenance	-2.14×10^9	2.14×10^9	1	Seconds	32S
4-5	Time of next engine maintenance since 1/1/70	0	4.29×10^9	1	Seconds	32
6-7	Engine run time	0	4.29×10^9	1	Seconds	32
8-9	Number of starts	0	99999			32
10-11	Fuel used	0	4.29×10^9	1	Litre	32
12-13	Time to next engine maintenance alarm 1	-2.14×10^9	2.14×10^9	1	Seconds	32S
14-15	Time of next engine maintenance alarm 1 since 1/1/70	0	4.29×10^9	1	Seconds	32
16-17	Time to next engine maintenance alarm 2	-2.14×10^9	2.14×10^9	1	Seconds	32S
18-19	Time of next engine maintenance alarm 2 since 1/1/70	0	4.29×10^9	1	Seconds	32
20-21	Time to next engine maintenance alarm 3	-2.14×10^9	2.14×10^9	1	Seconds	32S
22-23	Time of next engine maintenance alarm 3 since 1/1/70	0	4.29×10^9	1	Seconds	32
24-25	Time to next engine maintenance alarm 4	-2.14×10^9	2.14×10^9	1	Seconds	32S
26-27	Time of next engine maintenance alarm 4 since 1/1/70	0	4.29×10^9	1	Seconds	32
28-29	Time to next engine maintenance alarm 5	-2.14×10^9	2.14×10^9	1	Seconds	32S
30-31	Time of next engine maintenance alarm 5 since 1/1/70	0	4.29×10^9	1	Seconds	32
32-33	Time to next engine maintenance alarm 6	-2.14×10^9	2.14×10^9	1	Seconds	32S
34-35	Time of next engine maintenance alarm 6 since 1/1/70	0	4.29×10^9	1	Seconds	32
36-37	Time to next engine maintenance alarm 7	-2.14×10^9	2.14×10^9	1	Seconds	32S
38-39	Time of next engine maintenance alarm 7 since 1/1/70	0	4.29×10^9	1	Seconds	32
40-41	Time to next engine maintenance alarm 8	-2.14×10^9	2.14×10^9	1	Seconds	32S
42-43	Time of next engine maintenance alarm 8 since 1/1/70	0	4.29×10^9	1	Seconds	32
44-45	Time to next engine maintenance alarm 9	-2.14×10^9	2.14×10^9	1	Seconds	32S
46-47	Time of next engine maintenance alarm 9 since 1/1/70	0	4.29×10^9	1	Seconds	32
48-49	Time to next engine maintenance alarm 10	-2.14×10^9	2.14×10^9	1	Seconds	32S
50-51	Time of next engine maintenance alarm 10 since 1/1/70	0	4.29×10^9	1	Seconds	32
52-255	Reserved					

10.10 Page 8 – Alarm Conditions

Notes:

1. These are read only registers.
2. This is the old alarm system, for 72x/73xx and 8xxx/74xx families page 154 should be used instead.
3. Each alarm can be in one of 15 conditions as shown in the table below.
4. Registers 1-32 contain the status of named, internally generated, alarms and indications. These may be extended by future versions of GenComm and any software that reads them must be able to cope with such extensions. This is possible because register 0 specifies the number of pre-defined internal alarm conditions that are implemented on a slave device, the software should read and process the specified number. The software does not need to know the definitions of any new alarms since it can read the alarms strings and display them as specified by the alarm condition. All unimplemented pre-defined alarms return the unimplemented value 15, not an exception.
5. Registers 129-160 contain the status of unnamed digital inputs. Register 128 specifies the number of unnamed digital inputs and any software that reads them must be able to cope with all 128 in the same way as for the pre-defined alarms. All unimplemented digital inputs up to 128 will return the unimplemented value 15, not an exception.
6. Each alarm has 2 strings in pages 32-95 which can be displayed on a PC for example, the alarm code specifies which string it is appropriate to display.
7. The contents of alarm strings will never change while the slave device is operating so a copy can be held by the master to minimise traffic.

Registers

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of named alarms	97	128	16
1	Emergency stop	0	15	13/16-16/16
	Low oil pressure	0	15	9/16-12/16
	High coolant temperature	0	15	5/16-8/16
	High oil temperature	0	15	1/16-4/16
2	Under speed	0	15	13/16-16/16
	Over speed	0	15	9/16-12/16
	Fail to start	0	15	5/16-8/16
	Fail to come to rest	0	15	1/16-4/16
3	Loss of speed sensing	0	15	13/16-16/16
	Generator low voltage	0	15	9/16-12/16
	Generator high voltage	0	15	5/16-8/16
	Generator low frequency	0	15	1/16-4/16
4	Generator high frequency	0	15	13/16-16/16
	Generator high current	0	15	9/16-12/16
	Generator earth fault	0	15	5/16-8/16
	Generator reverse power	0	15	1/16-4/16
5	Air flap	0	15	13/16-16/16
	Oil pressure sender fault	0	15	9/16-12/16
	Coolant temperature sender fault	0	15	5/16-8/16
	Oil temperature sender fault	0	15	1/16-4/16
6	Fuel level sender fault	0	15	13/16-16/16
	Magnetic pickup fault	0	15	9/16-12/16
	Loss of AC speed signal	0	15	5/16-8/16
	Charge alternator failure	0	15	1/16-4/16
7	Low battery voltage	0	15	13/16-16/16
	High battery voltage	0	15	9/16-12/16
	Low fuel level	0	15	5/16-8/16
	High fuel level	0	15	1/16-4/16
8	Generator failed to close	0	15	13/16-16/16
	Mains failed to close	0	15	9/16-12/16
	Generator failed to open	0	15	5/16-8/16
	Mains failed to open	0	15	1/16-4/16
9	Mains low voltage	0	15	13/16-16/16
	Mains high voltage	0	15	9/16-12/16
	Bus failed to close	0	15	5/16-8/16
	Bus failed to open	0	15	1/16-4/16
10	Mains low frequency	0	15	13/16-16/16
	Mains high frequency	0	15	9/16-12/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
	Mains failed	0	15	5/16-8/16
	Mains phase rotation wrong	0	15	1/16-4/16
11	Generator phase rotation wrong	0	15	13/16-16/16
	Maintenance due	0	15	9/16-12/16
	Clock not set	0	15	5/16-8/16
	Local LCD configuration lost	0	15	1/16-4/16
12	Local telemetry configuration lost	0	15	13/16-16/16
	Control unit not calibrated	0	15	9/16-12/16
	Modem power fault	0	15	5/16-8/16
	Generator short circuit	0	15	1/16-4/16
13	Failure to synchronise	0	15	13/16-16/16
	Bus live	0	15	9/16-12/16
	Scheduled run	0	15	5/16-8/16
	Bus phase rotation wrong	0	15	1/16-4/16
14	Priority selection error	0	15	13/16-16/16
	Multiset communications (MSC) data error	0	15	9/16-12/16
	Multiset communications (MSC) ID error	0	15	5/16-8/16
	Multiset communications (MSC) failure	0	15	1/16-4/16
15	Multiset communications (MSC) too few sets	0	15	13/16-16/16
	Multiset communications (MSC) alarms inhibited	0	15	9/16-12/16
	Multiset communications (MSC) old version units	0	15	5/16-8/16
	Mains reverse power	0	15	1/16-4/16
16	Minimum sets not reached	0	15	13/16-16/16
	Insufficient capacity available	0	15	9/16-12/16
	Expansion input unit not calibrated	0	15	5/16-8/16
	Expansion input unit failure	0	15	1/16-4/16
17	Auxiliary sender 1 low	0	15	13/16-16/16
	Auxiliary sender 1 high	0	15	9/16-12/16
	Auxiliary sender 1 fault	0	15	5/16-8/16
	Auxiliary sender 2 low	0	15	1/16-4/16
18	Auxiliary sender 2 high	0	15	13/16-16/16
	Auxiliary sender 2 fault	0	15	9/16-12/16
	Auxiliary sender 3 low	0	15	5/16-8/16
	Auxiliary sender 3 high	0	15	1/16-4/16
19	Auxiliary sender 3 fault	0	15	13/16-16/16
	Auxiliary sender 4 low	0	15	9/16-12/16
	Auxiliary sender 4 high	0	15	5/16-8/16
	Auxiliary sender 4 fault	0	15	1/16-4/16
20	Engine control unit (ECU) link lost	0	15	13/16-16/16
	Engine control unit (ECU) failure	0	15	9/16-12/16
	Engine control unit (ECU) error	0	15	5/16-8/16
	Low coolant temperature	0	15	1/16-4/16
21	Out of sync	0	15	13/16-16/16
	Low Oil Pressure Switch	0	15	9/16-12/16
	Alternative Auxiliary Mains Fail	0	15	5/16-8/16
	Loss of excitation	0	15	1/16-4/16
22	Mains kW Limit	0	15	13/16-16/16
	Negative phase sequence	0	15	9/16-12/16
	Mains ROCOF	0	15	5/16-8/16
	Mains vector shift	0	15	1/16-4/16
23	Mains G59 low frequency	0	15	13/16-16/16
	Mains G59 high frequency	0	15	9/16-12/16
	Mains G59 low voltage	0	15	5/16-8/16
	Mains G59 high voltage	0	15	1/16-4/16
24	Mains G59 trip	0	15	13/16-16/16
	Generator kW Overload	0	15	9/16-12/16
	Engine Inlet Temperature high	0	15	5/16-8/16
	Bus 1 live	0	15	1/16-4/16
25	Bus 1 phase rotation wrong	0	15	13/16-16/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
	Bus 2 live	0	15	9/16-12/16
	Bus 2 phase rotation wrong	0	15	5/16-8/16
	Reserved	0	15	1/16-4/16
26-32	Unimplemented			
33-127	Reserved			
128	Number of unnamed digital inputs	0	128	16
129	Unnamed digital input 1	0	15	13/16-16/16
	Unnamed digital input 2	0	15	9/16-12/16
	Unnamed digital input 3	0	15	5/16-8/16
	Unnamed digital input 4	0	15	1/16-4/16
130	Unnamed digital input 5	0	15	13/16-16/16
	Unnamed digital input 6	0	15	9/16-12/16
	Unnamed digital input 7	0	15	5/16-8/16
	Unnamed digital input 8	0	15	1/16-4/16
131	Unnamed digital input 9	0	15	13/16-16/16
	Unnamed digital input 10	0	15	9/16-12/16
	Unnamed digital input 11	0	15	5/16-8/16
	Unnamed digital input 12	0	15	1/16-4/16
132	Unnamed digital input 13	0	15	13/16-16/16
	Unnamed digital input 14	0	15	9/16-12/16
	Unnamed digital input 15	0	15	5/16-8/16
	Unnamed digital input 16	0	15	1/16-4/16
133	Unnamed digital inputs 17-20	0	15	16
134	Unnamed digital inputs 21-24	0	15	16
135	Unnamed digital inputs 25-28	0	15	16
136	Unnamed digital inputs 29-32	0	15	16
137	Unnamed digital inputs 33-36	0	15	16
138	Unnamed digital inputs 37-40	0	15	16
139	Unnamed digital inputs 41-44	0	15	16
140	Unnamed digital inputs 45-48	0	15	16
141	Unnamed digital inputs 49-52	0	15	16
142	Unnamed digital inputs 53-56	0	15	16
143	Unnamed digital inputs 57-60	0	15	16
144	Unnamed digital inputs 61-64	0	15	16
145	Unnamed digital inputs 65-68	0	15	16
146	Unnamed digital inputs 69-72	0	15	16
147	Unnamed digital inputs 73-76	0	15	16
148	Unnamed digital inputs 77-80	0	15	16
149	Unnamed digital inputs 81-84	0	15	16
150	Unnamed digital inputs 85-88	0	15	16
151	Unnamed digital inputs 89-92	0	15	16
152	Unnamed digital inputs 93-96	0	15	16
153	Unnamed digital inputs 97-100	0	15	16
154	Unnamed digital inputs 101-104	0	15	16
155	Unnamed digital inputs 105-108	0	15	16
156	Unnamed digital inputs 109-112	0	15	16
157	Unnamed digital inputs 113-116	0	15	16
158	Unnamed digital inputs 117-120	0	15	16
159	Unnamed digital inputs 121-124	0	15	16
160	Unnamed digital inputs 125-128	0	15	16
161-255	Reserved			

Alarm condition codes

Condition	Meaning	Displayed string
0	Disabled digital input	None
1	Not active alarm	None
2	Warning alarm	Active string
3	Shutdown alarm	Active string
4	Electrical trip alarm	Active string
5-7	Reserved	
8	Inactive indication (no string)	None
9	Inactive indication (displayed string)	Inactive string
10	Active indication	Active string
11-14	Reserved	
15	Unimplemented alarm	None

Notes on alarm codes

1. An alarm that is fitted but disabled by the configuration of the slave device returns code 0.
2. An alarm that is not implemented on a particular control unit returns code 15.
3. An indication that does not require a message to be displayed when inactive returns either code 8 or 10.
4. An indication that does require a message to be displayed when inactive returns either code 9 or 10.
5. The inactive strings are only required for indications, in all other cases they will contain 32 spaces.

10.11 Page 9 – Total Harmonic Distortion

Notes:

1. These are read only registers.
2. Only supported on 88xx/84xx modules at present (introduced at version 1.0 of these modules)
3. 8810/8410 don't support registers 120-131 – they will return Unimplemented (sentinel value)

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0	V1 Voltage L1 THD	0	10000	0.01	%	16
1	V1 Voltage L1 Fundamental level	0	100	1		16
2	V1 Voltage L1 3rd harmonic level	0	100	1		16
3	V1 Voltage L1 5th harmonic level	0	100	1		16
4	V1 Voltage L1 7th harmonic level	0	100	1		16
5	V1 Voltage L1 9th harmonic level	0	100	1		16
6	V1 Voltage L1 11th harmonic level	0	100	1		16
7	V1 Voltage L1 13th harmonic level	0	100	1		16
8	V1 Voltage L1 15th harmonic level	0	100	1		16
9	V1 Voltage L1 17th harmonic level	0	100	1		16
10	V1 Voltage L1 19th harmonic level	0	100	1		16
11	V1 Voltage L1 21st harmonic level	0	100	1		16
12-23	V1 Voltage L2 THD etc					
24-35	V1 Voltage L3 THD etc					
36-47	V2 Voltage L1 THD etc					
48-59	V2 Voltage L2 THD etc					
60-71	V2 Voltage L3 THD etc					
72-83	Current L1 THD etc					
84-95	Current L2 THD etc					
96-107	Current L3 THD etc					
108-119	Current Neutral/Earth THD etc					
120-131	Current 5th CT THD etc					
132-255	Reserved					

10.12 Page 10 – Automatic Voltage Regulator (AVR) registers

Notes:

1. These are read only registers with the exception of the alarm reset.
2. Only supported on an AVR or when a controller is connected to an AVR via a CAN comms port, currently only 73xx/74xx MKII v5.0+ and 8610 MKII v7.0 controllers are capable of this.
3. The first generation 106 AVR has only a single feedback voltage sensing input which could be connected in many different configurations. Additional registers have been added for reporting the per phase sensing of each of the three-phase sensing (on A109 AVR only at this time). Note that the 3 phase sensing is only reported for the 86xx MKII , not yet available on 73xx/74xx MKII.
4. Writing the value 0x1234 to the alarm reset register will reset any latched alarm(s).
5. The P, I and D gain setpoint values in registers 65-67 return the fixed P, I and D gain values in the currently selected stability selection if that value is being used by the AVR. If the AVR is configured to obtain the gain setting from the preset pot then this value will return the unimplemented sentinel and any write to this register will be ignored. If the values are not saved (see note 6) then these gains will be lost when the AVR is powered down and the previous values will be used at the next power up.
6. This register will return a 1 to indicate that storing the P, I and D gain changes made using registers 65-67 is permitted, a 2 if they values have changed and writing is permitted, and a 0 if storing the values is not permitted. Writing a value of 0x1234 to this register will cause the updated gain values to be stored in non-volatile memory.
7. The raw pot positions in registers 16 to 21 will always return a pot position value even if the pot is not enabled (if no D pot is fitted then it will return 0). The values in registers 39 to 44 will only return a position value if the pot is enabled, otherwise it will return an unsigned unimplemented sentinel.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0	AVR Software major version	0	99	1		16
1	AVR Software minor version	0	99	1		16
2	AVR Software build	0	99	1		16
3	AVR boot-loader major version	0	99	1		16
4	AVR boot-loader minor version	0	99	1		16
5	AVR boot-loader build	0	99	1		16
6	AVR status (see below)	0	99	1		16
7	Reserved flags	0	0			8-16-16/16
	Integral limit reached	0	1			7/16
	Current limit active	0	1			6/16
	LED lit	0	1			5/16
	DIP Switch 1	0	1			4/16
	DIP Switch 2	0	1			3/16
	DIP Switch 3	0	1			2/16
	DIP Switch 4	0	1			1/16
8	Alternator frequency	0	70	0.1	Hz	16
9	Alternator average feedback voltage	0	600	0.1	V	16
10	Alternator droop current	0	10	0.001	A	16
11	Alternator droop current lag/lead	-180	+180	0.1	degrees	16 S
12	Auxiliary Supply voltage	0	20	0.1	V	16
13	Alternator excitation voltage	0	300	0.1	V	16
14	External pot. value	0	5000	1	Ohms	16
15	External control voltage	-10	10	0.001	V	16 S
16	Raw voltage preset position (See note 7)	0	100	0.1	%	16
17	Rawdroop preset position (See note 7)	0	100	0.1	%	16
18	RawUFRO preset position (See note 7)	0	100	0.1	%	16
19	RawP preset position (See note 7)	0	100	0.1	%	16
20	RawI preset position (See note 7)	0	100	0.1	%	16
21	Reserved for raw D preset position (See note 7)	0	100	0.1	%	16
22	PWM output duty cycle	0	100	0.01	%	16
23	Voltage set point	0	600	0.1	V	16
24	Droop set point	0	100	0.1	%	16
25	UFRO knee set point	0	60	0.1	Hz	16
26	Alternator auxiliary winding voltage	0	300	0.1	V	16
27	Alternator excitation current	0	30	0.001	A	16
28	P set point	0	100	0.1	%	16

29	I set point	0	100	0.1	%	16
30	D set point	0	100	0.1	%	16
31	Auto frequency selection state (see below)	0	2	1		16
32	Alternative Configuration Selection (A108)	0	5	1		16
33	Stability Selection (A108)	0	1	1		16
34	CAN setpoint offset	-100.0	100.0	0.1	%	16 S
35	CAN Address	0	255	1		16
36	Alternator voltage L1-L2	0	600	0.1	V	16
37	Alternator voltage L2-L3	0	600	0.1	V	16
38	Alternator voltage L3-L1	0	600	0.1	V	16
39	Voltage preset position (See note 7)	0	100	0.1	%	16
40	Droop preset position (See note 7)	0	100	0.1	%	16
41	UFRO preset position (See note 7)	0	100	0.1	%	16
42	P preset position (See note 7)	0	100	0.1	%	16
43	I preset position (See note 7)	0	100	0.1	%	16
44	Reserved for D preset position (See note 7)	0	100	0.1	%	16
45-63	Reserved (returns unimplemented sentinel)					
64	Alarm reset	0x1234	0x1234			16
65	P Gain Setpoint (see Note 5)	0.0	100.0	0.1		16
66	I Gain Setpoint (see Note 5)	0.0	100.0	0.1		16
67	D Gain Setpoint (see Note 5)	0.0	100.0	0.1		16
68	Save Changes (see note 6)					16
69	Droop maximum value					16
70	Off Load Duty Cycle Maximum					16
71	Soft Start Ramp Start Point Minimum					16
72	Soft Start Ramp Start Point Maximum					16
73	Soft Start Ramp Rate Minimum					16
74	Soft Start Ramp Rate Maximum					16
75	Alternative configuration Maximum	0	5	1		16
76	Stability selection Maximum	0	1	1		16
77-255	Reserved (returns unimplemented sentinel)					

AVR Status

Code	**Meaning**
0	Stopped
1	Running
2	Under Frequency Roll Off active
3	Over excitation trip
4	Loss of sensing trip
5	Failed to excite trip
6	Under frequency trip
7	Invalid configuration
8	Excitation overload trip
9	External pot open circuit
10	Idle mode
11	De-excite mode
12-	Reserved

Auto Frequency Selection State

Code	Meaning
0	Disabled
1	50Hz selected
2	60Hz selected
3-	Reserved

DIP switches

Switch Number	A106	A108
1	Voltage selection	Stability Selection
2	Frequency Selection	Alternative Configuration Switch 1
3	Stability Switch 1	Alternative Configuration Switch 2
4	Stability Switch 2	Alternative Configuration Switch 3

Controller Registers (73/74xx MKII v5+ 8610 MKII v7+)

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign	Read/Write
0	AVR Software major version	0	99	1		16	Read
1	AVR Software minor version	0	99	1		16	Read
2	AVR Software build	0	99	1		16	Read
3-7	Unimplemented						
8	Alternator frequency	0	70	0.1	Hz	16	Read
9	Alternator feedback voltage	0	600	0.1	V	16	Read
10	Alternator droop current	0	10	0.001	A	16	Read
11-12	Unimplemented						
13	Alternator excitation voltage	0	300	0.01	V	16	Read
14	External pot. value	0	5000	1	Ohms	16	Read
15	External control voltage	-10	10	0.001	V	16 S	Read
16-22	Unimplemented						
23	Voltage set point	0	600	0.1	V	16	Read
24	Droop set point	0	100	0.1	%	16	Read/Write
25	UFRO knee set point	0	60	0.1	Hz	16	Read
26	Alternator auxiliary winding voltage	0	300	0.1	V	16	Read
27	Unimplemented						
28	P set point	0	100	0.1	%	16	Read/Write
29	I set point	0	100	0.1	%	16	Read/Write
30	D set point	0	100	0.1	%	16	Read/Write
31	Unimplemented						
32	Alternative Configuration Selection (A108)	0	5	1		16	Read/Write
33	Stability Selection (A108)	0	1	1		16	Read/Write
34-35	Unimplemented						
36	Alternator voltage L1-L2 (8610 only)	0	600	0.1	V	16	Read
37	Alternator voltage L2-L3 (8610 only)	0	600	0.1	V	16	Read
38	Alternator voltage L3-L1 (8610 only)	0	600	0.1	V	16	Read
39-63	Reserved						
64	Alarm reset (has no effect on AVR)	0x1234	0x1234			16	Write
65	Off Load Duty Cycle	0	65535	0.1	%	16	Read/Write
66	Maximum Duty Cycle	0	65535	0.1	%	16	Read/Write
67	Soft Start Ramp Start Point	0	65535	0.1	%	16	Read/Write
68	Soft Start Ramp Rate	0	65535	0.1	%/s	16	Read/Write
69	Droop Set Point Maximum	0	65535	0.1	%	16	Read
70	Off Load Duty Cycle Maximum	0	65535	0.1	%	16	Read
71	Soft Start Ramp Start Point Minimum	0	65535	0.1	%	16	Read
72	Soft Start Ramp Start Point Maximum	0	65535	0.1	%	16	Read
73	Soft Start Ramp Rate Minimum	0	65535	0.1	%/s	16	Read
74	Soft Start Ramp Rate Maximum	0	65535	0.1	%/s	16	Read
75	Alternative configuration Maximum	0	99	1		16	Read
76	Stability selection Maximum	0	99	1		16	Read
77-127	Reserved						
128-169	CAN AVR alarm information						
170-255	Reserved						

Register 128 & 129 provide general alarm info
Registers 130 to 169 provide individual trouble code details (up to 10 in total)

The above registers are equivalent to the registers in page 142 to report ECU DTCs, lamp states etc. but the AVRs only currently send a red lamp state.
See page 142 for a description of the register organisation etc.

10.13 Page 11 - Diagnostic - General

Notes:

1. These are read only registers.
2. Register0 gives the version as major/minor, with the major version in the upper 8 bits, the minor version in the lower 8 bits.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0	Software version	0	9999	0.01		16
1	CPU power usage	0	200	1	%	16
2	Button number pressed, 0=none	0	255	1		16
3	Backup supply voltage	0	40	0.1	V	16
4-255	Reserved					

10.14 Page 12 - Diagnostic - Digital Inputs

Notes

1. These are read only registers.
2. These registers represent the state of the actual inputs to the control unit before the application of any time delays or other processing and are intended for diagnostic purposes only.
3. The number of named digital inputs may be increased in future versions of GenComm. Manufacturers may not add their own to the list of named inputs as there are no corresponding strings to identify them. Any inputs that are required but not named must be included in the list of unnamed digital inputs.
4. The meaning of the named digital input codes is shown in the table below.
5. Register 16 indicates the number of unnamed digital inputs that are supported, any software that displays these must cope with any number up to 128. Each is represented by only one bit as there is no need to indicate that it is unimplemented.
6. Unimplemented inputs (including totally unimplemented registers) return 3, not an exception.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0	Emergency stop input	0	3			15/16-16/16
	Low oil pressure switch input	0	3			13/16-14/16
	High engine temp. switch input	0	3			11/16-12/16
	Remote start input	0	3			9/16-10/16
	Remote fuel on input	0	3			7/16-8/16
	Lamp test input	0	3			5/16-6/16
	Reset input	0	3			3/16-4/16
	Panel lock input	0	3			1/16-2/16
1	Start button input	0	3			15/16-16/16
	Stop button input	0	3			13/16-14/16
	Transfer to generator button input	0	3			11/16-12/16
	Transfer to mains button input	0	3			9/16-10/16
	Unimplemented	3	3			7/16-8/16
	Unimplemented	3	3			5/16-6/16
	Unimplemented	3	3			3/16-4/16
	Unimplemented	3	3			1/16-2/16
2-15	Reserved					16
16	Number of unnamed digital inputs	0	128			16
17	Unnamed digital input 1	Open	Closed			16/16
	Unnamed digital input 2	Open	Closed			15/16
	Unnamed digital input 3	Open	Closed			14/16
	Unnamed digital input 4	Open	Closed			13/16
	Unnamed digital input 5	Open	Closed			12/16
	Unnamed digital input 6	Open	Closed			11/16
	Unnamed digital input 7	Open	Closed			10/16
	Unnamed digital input 8	Open	Closed			9/16
	Unnamed digital input 9	Open	Closed			8/16
	Unnamed digital input 10	Open	Closed			7/16
	Unnamed digital input 11	Open	Closed			6/16
	Unnamed digital input 12	Open	Closed			5/16
	Unnamed digital input 13	Open	Closed			4/16
	Unnamed digital input 14	Open	Closed			3/16
	Unnamed digital input 15	Open	Closed			2/16
	Unnamed digital input 16	Open	Closed			1/16
18	Unnamed digital input 17-32	Open	Closed			16
19	Unnamed digital input 33-48	Open	Closed			16
20	Unnamed digital input 49-64	Open	Closed			16
21	Unnamed digital input 65-80	Open	Closed			16
22	Unnamed digital input 81-96	Open	Closed			16
23	Unnamed digital input 97-112	Open	Closed			16
24	Unnamed digital input 113-128	Open	Closed			16
25-255	Reserved					

73xx / 74xx MKII (v7.0 & later) Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0	Emergency stop input	0	3			15/16-16/16
	Unimplemented	3	3			13/16-14/16
	Unimplemented	3	3			11/16-12/16
	Unimplemented	3	3			9/16-10/16
	Unimplemented	3	3			7/16-8/16
	Unimplemented	3	3			5/16-6/16
	Unimplemented	3	3			3/16-4/16
	Unimplemented	3	3			1/16-2/16
1	Unimplemented	3	3			15/16-16/16
	Unimplemented	3	3			13/16-14/16
	Unimplemented	3	3			11/16-12/16
	Unimplemented	3	3			9/16-10/16
	Unimplemented	3	3			7/16-8/16
	Unimplemented	3	3			5/16-6/16
	Unimplemented	3	3			3/16-4/16
	Unimplemented	3	3			1/16-2/16
2-15	Reserved					16
16	Number of unnamed digital inputs	8	8			16
17	Digital Input A status	0	1			16/16
	Digital Input B status	0	1			15/16
	Digital Input C status	0	1			14/16
	Digital Input D status	0	1			13/16
	Digital Input E status	0	1			12/16
	Digital Input F status	0	1			11/16
	Digital Input G status	0	1			10/16
	Digital Input H status	0	1			9/16
	Not used	0	0			8/16
	Not used	0	0			7/16
	Not used	0	0			6/16
	Not used	0	0			5/16
	Not used	0	0			4/16
	Not used	0	0			3/16
	Not used	0	0			2/16
	Not used	0	0			1/16
18	Analogue input A as Digital status	0	1			16/16
	Analogue input B as Digital status	0	1			15/16
	Analogue input C as Digital status	0	1			14/16
	Analogue input D as Digital status	0	1			13/16
	Analogue input E as Digital status	0	1			12/16
	Analogue input F as Digital status	0	1			11/16
	Not used	0	0			10/16
	Not used	0	0			9/16
	Not used	0	0			8/16
	Not used	0	0			7/16
	Not used	0	0			6/16
	Not used	0	0			5/16
	Not used	0	0			4/16
	Not used	0	0			3/16
	Not used	0	0			2/16
	Not used	0	0			1/16
19	Unimplemented					16
20	Unimplemented					16
21	Unimplemented					16
22	Unimplemented					16
23	Unimplemented					16
24	Unimplemented					16
25	Digital Input A processed state	0	1			16/16
	Digital Input B processed state	0	1			15/16

	Digital Input C processed state	0	1			14/16
	Digital Input D processed state	0	1			13/16
	Digital Input E processed state	0	1			12/16
	Digital Input F processed state	0	1			11/16
	Digital Input G processed state	0	1			10/16
	Digital Input H processed state	0	1			9/16
	Not used	0	0			8/16
	Not used	0	0			7/16
	Not used	0	0			6/16
	Not used	0	0			5/16
	Not used	0	0			4/16
	Not used	0	0			3/16
	Not used	0	0			2/16
	Not used	0	0			1/16
26	Analogue input A as Digital processed state	0	1			16/16
	Analogue input B as Digital processed state	0	1			15/16
	Analogue input C as Digital processed state	0	1			14/16
	Analogue input D as Digital processed state	0	1			13/16
	Analogue input E as Digital processed state	0	1			12/16
	Analogue input F as Digital processed state	0	1			11/16
	Not used	0	0			10/16
	Not used	0	0			9/16
	Not used	0	0			8/16
	Not used	0	0			7/16
	Not used	0	0			6/16
	Not used	0	0			5/16
	Not used	0	0			4/16
	Not used	0	0			3/16
	Not used	0	0			2/16
	Not used	0	0			1/16
27-255	Reserved					

Named digital input codes

Code	Meaning
0	Open
1	Closed
2	Reserved
3	Unimplemented

10.15 Page 13 - Diagnostic - Digital Outputs

Notes:

1. Generally these are read only registers to avoid conflict between the slave devices chosen output state and commands from a master. However, in some cases a slave device may accept write commands to these registers, e.g. a hub may have digital outputs which are not controlled by the hub itself but from a master device. A slave device may only accept write commands to these registers if this does not cause a conflict with internally generated controls of the outputs.
2. These registers represent the state of the actual digital outputs of the control unit after any internal processing and are primarily intended for diagnostic purposes only (but see note 1).
3. The number of named outputs may be increased in future versions of GenComm. Manufacturers may not add their own to the list of named outputs as there are no corresponding strings to identify them. Any outputs that are required but not named must be included in the list of unnamed digital outputs.
4. The meaning of the named digital output codes is shown in the table below.
5. Register 16 indicates the number of unnamed digital outputs that are supported, any software that displays these must cope with any number up to 128. Each is represented by only one bit as there is no need to indicate that it is unimplemented.
6. Unimplemented outputs (including totally unimplemented registers) return 3, not an exception.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0	Fuel relay	0	3			15/16-16/16
	Start relay	0	3			13/16-14/16
	Mains loading relay	0	3			11/16-12/16
	Generator loading relay	0	3			9/16-10/16
	Modem power relay	0	3			7/16-8/16
	Unimplemented	3	3			5/16-6/16
	Unimplemented	3	3			3/16-4/16
	Unimplemented	3	3			1/16-2/16
1-15	Reserved	3	3			16
16	Number of unnamed digital outputs	0	128			16
17	Unnamed digital output 1	De-energised	Energised			16/16
	Unnamed digital output 2	De-energised	Energised			15/16
	Unnamed digital output 3	De-energised	Energised			14/16
	Unnamed digital output 4	De-energised	Energised			13/16
	Unnamed digital output 5	De-energised	Energised			12/16
	Unnamed digital output 6	De-energised	Energised			11/16
	Unnamed digital output 7	De-energised	Energised			10/16
	Unnamed digital output 8	De-energised	Energised			9/16
	Unnamed digital output 9	De-energised	Energised			8/16
	Unnamed digital output 10	De-energised	Energised			7/16
	Unnamed digital output 11	De-energised	Energised			6/16
	Unnamed digital output 12	De-energised	Energised			5/16
	Unnamed digital output 13	De-energised	Energised			4/16
	Unnamed digital output 14	De-energised	Energised			3/16
	Unnamed digital output 15	De-energised	Energised			2/16
	Unnamed digital output 16	De-energised	Energised			1/16
18	Unnamed digital output 17-32	De-energised	Energised			16
19	Unnamed digital output 33-48	De-energised	Energised			16
20	Unnamed digital output 49-64	De-energised	Energised			16
21	Unnamed digital output 65-80	De-energised	Energised			16
22	Unnamed digital output 81-96	De-energised	Energised			16
23	Unnamed digital output 97-112	De-energised	Energised			16
24	Unnamed digital output 113-128	De-energised	Energised			16
25-255	Reserved					

Named digital output codes

Code	Meaning
0	De-energised
1	Energised
2	Reserved
3	Unimplemented

73xx / 74xx MKII (v7.0 & later) Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0	Unimplemented					16
1-15	Reserved	3	3			16
16	Number of unnamed digital outputs	10	10			16
17	Digital Output A status	0	1			16/16
	Digital Output B status	0	1			15/16
	Digital Output C status	0	1			14/16
	Digital Output D status	0	1			13/16
	Digital Output E status	0	1			12/16
	Digital Output F status	0	1			11/16
	Digital Output G status	0	1			10/16
	Digital Output H status	0	1			9/16
	Digital Output I status	0	1			8/16
	Digital Output I status	0	1			7/16
	Not used	0	0			6/16
	Not used	0	0			5/16
	Not used	0	0			4/16
	Not used	0	0			3/16
	Not used	0	0			2/16
	Not used	0	0			1/16
18	Unimplemented					16
19	Unimplemented					16
20	Unimplemented					16
21	Unimplemented					16
22	Unimplemented					16
23	Unimplemented					16
24	Unimplemented					16
25	Digital Output A output flag	0	1			16/16
	Digital Output Boutput flag	0	1			15/16
	Digital Output Coutput flag	0	1			14/16
	Digital Output Doutput flag	0	1			13/16
	Digital Output Eoutput flag	0	1			12/16
	Digital Output Foutput flag	0	1			11/16
	Digital Output Goutput flag	0	1			10/16
	Digital Output Houtput flag	0	1			9/16
	Digital Output Ioutput flag	0	1			8/16
	Digital Output Ioutput flag	0	1			7/16
	Not used	0	0			6/16
	Not used	0	0			5/16
	Not used	0	0			4/16
	Not used	0	0			3/16
	Not used	0	0			2/16
	Not used	0	0			1/16
25-255	Reserved					

10.16 Page 14 - Diagnostic - LEDs

Notes:

1. Generally these are read only registers to avoid conflict between the slave devices chosen LED state and commands from a master. However, in some cases a slave device may accept write commands to these registers, e.g. a hub may have LEDs which are not controlled by the hub itself but from a master device. A slave device may only accept write commands to these registers if this does not cause a conflict with internally generated controls of the outputs.
2. These registers represent the state of the actual LEDs on the control unit after any internal processing and are primarily intended for diagnostic purposes only (but see note 1).
3. Register 0 indicates the number of LEDs that are supported, any software that displays these must cope with any number up to 128.
4. Unimplemented LEDs (including totally unimplemented registers) return 15, not an exception.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0	Number of LEDs	0	128			16
1	LED 1 colour (see table below)	0	15			13/16-16/16
	LED 2 colour	0	15			9/16-12/16
	LED 3 colour	0	15			5/16-8/16
	LED 4 colour	0	15			1/16-4/16
2	LEDs 5-8 colour	0	15			16
3	LEDs 9-12 colour	0	15			16
4	LEDs 13-16 colour	0	15			16
5	LEDs 17-20 colour	0	15			16
6	LEDs 21-24 colour	0	15			16
7	LEDs 25-28 colour	0	15			16
8	LEDs 29-32 colour	0	15			16
9	LEDs 33-36 colour	0	15			16
10	LEDs 37-40 colour	0	15			16
11	LEDs 41-44 colour	0	15			16
12	LEDs 45-48 colour	0	15			16
13	LEDs 49-52 colour	0	15			16
14	LEDs 53-56 colour	0	15			16
15	LEDs 57-60 colour	0	15			16
16	LEDs 61-64 colour	0	15			16
17	LEDs 65-68 colour	0	15			16
18	LEDs 69-72 colour	0	15			16
19	LEDs 73-76 colour	0	15			16
20	LEDs 77-80 colour	0	15			16
21	LEDs 81-84 colour	0	15			16
22	LEDs 85-88 colour	0	15			16
23	LEDs 89-92 colour	0	15			16
24	LEDs 93-96 colour	0	15			16
25	LEDs 97-100 colour	0	15			16
26	LEDs 101-104 colour	0	15			16
27	LEDs 105-108 colour	0	15			16
28	LEDs 109-112 colour	0	15			16
29	LEDs 113-116 colour	0	15			16
30	LEDs 117-120 colour	0	15			16
31	LEDs 121-124 colour	0	15			16
32	LEDs 125-128 colour	0	15			16
33-255	Reserved					

LED colours

Code	Colour
0	Not lit
1	Reserved
2	Red
3	Orange
4	Yellow
5	Green
6	Blue
7	Purple
8	Reserved
9	White
10	Reserved
11	Reserved
12	Reserved
13	Reserved
14	Reserved
15	Unimplemented LED

10.17 Page 16 - Control Registers

Notes:

1. This is the public subsection of this page
2. These are a mixture of read only and write only registers.
3. Registers 0 to 7 contain flags that indicate the available system control functions. If a bit is set the corresponding function code is available.
4. One of the system control keys from the table below must be written into register 8 and its ones-compliment written into register 9 with a single function 16 (write multiple registers) to perform the specified system control function.
5. Writing any other value or using a function that is not available will return extended exception code 7 (Illegal value written to register) and have no affect.
6. Function codes 0 to 31 perform exactly the same function as pressing the equivalent button on the control unit.
7. Function 34 'reset alarms' is not the same as function 7. The former resets any alarm condition codes that can be reset. The latter simulates a button which may or may not exist on the control unit, if it does not exist it will have no affect. If all alarm condition codes are able to be reset the shutdown, electrical trip and warning alarm active flags (as appropriate) in page 3 will consequently reset.
8. Function 34 does not under any circumstances reset the telemetry alarm flag in page 3, function 35 must be used for this.
9. Locking the user controls stops the buttons corresponding to function codes 0-31 from operating and stops any attempt to configure the unit from the user controls. It does not stop the user from viewing status information and instrumentation values.
10. Function 38 resets the Page 7 values 'Time to next maintenance' and 'Time of next maintenance since 1/1/70'. The reset values are manufacturer specific, if it is desired to set one of these two items to a specific value then they can be directly written to in Page 7.
11. Function 10 resets only those alarms associated with the detection of mains failure while running in parallel with the mains, i.e. G59 alarms and ROCOF and vector shift.
12. Functions 96 and 97 enable and disable signal injection testing. When enabled, repeatedly writing to registers 32 and 33 will override the measurement channel(s) specified i.e. the module will behave exactly as if the measurement channel was reading the injected value.
13. Both register 32 and 33 must be written in a single function 16 (write multiple registers).
14. When registers 32/33 are not written to for 1s this overriding will stop and the measurement channel(s) will return to normal operation.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign	Read/write
0	System control function 0 supported	0	1			16/16	Read only
	System control function 1 supported	0	1			15/16	Read only
	System control function 2 supported	0	1			14/16	Read only
	System control function 3 supported	0	1			13/16	Read only
	System control function 4 supported	0	1			12/16	Read only
	System control function 5 supported	0	1			11/16	Read only
	System control function 6 supported	0	1			10/16	Read only
	System control function 7 supported	0	1			9/16	Read only
	System control function 8 supported	0	1			8/16	Read only
	System control function 9 supported	0	1			7/16	Read only
	System control function 10 supported	0	1			6/16	Read only
	System control function 11 supported	0	1			5/16	Read only
	System control function 12 supported	0	1			4/16	Read only
	System control function 13 supported	0	1			3/16	Read only
	System control function 14 supported	0	1			2/16	Read only
	System control function 15 supported	0	1			1/16	Read only
1	System control function 16-31 supported	0	65535			16	Read only
2	System control function 32-47 supported	0	65535			16	Read only
3	System control function 48-63 supported	0	65535			16	Read only
4	System control function 64-79 supported	0	65535			16	Read only
5	System control function 80-95 supported	0	65535			16	Read only
6	System control function 96-111supported	0	65535			16	Read only
7	System control function 112-127 supported	0	65535			16	Read only
8	System control key	0	65535			16	Write only
9	Compliment of system control key	0	65535			16	Write only
10-31	Reserved						
32	Injection channel (see table below)	0	9			16	Write only
33	Injection Value (see table below)	0 0	70 2	0.01 0.001	Hz PU	16	Write only
34-255	Reserved						

System control keys

Function code	System control function	System control key
0	Select Stop mode	35700
1	Select Auto mode	35701
2	Select Manual mode	35702
3	Select Test on load mode	35703
4	Select Auto with manual restore mode	35704
5	Start engine if in manual or test modes	35705
6	Mute alarm	35706
7	Reset alarms	35707
8	Transfer to generator	35708
9	Transfer to mains	35709
10	Reset mains failure	35710
11	Close Bus (Bus Tie Controller)	35711
12	Open Bus (Bus Tie Controller)	35712
13	Toggle Bus Open/Closed (Bus Tie Controller)	35713
14	Scroll through mode selections (mode button on 330/331/334/335)	35714
15	Enable selected mode (scroll button on 330/331/334/335)	35715
16-31	Reserved	35716-35731
32	Telemetry start if in auto mode	35732
33	Cancel telemetry start in auto mode	35733
34	Reset alarms	35734
35	Clear telemetry alarm flag	35735
36	Lock the user controls	35736
37	Unlock the user controls	35737
38	Reset the maintenance alarm 1 due times	35738
39	MSC alarm inhibit on	35739
40	MSC alarm inhibit off	35740
41	Reset the maintenance alarm 2 due times	35741
42	Reset the maintenance alarm 3 due times	35742
43	Reserved	35743
44	Reserved	35744
45	Reserved	35745
46	Start data logging (temporarily overrides the module state)	35746
47	Stop data logging (temporarily overrides the module state)	35747
48	Erase all data log files internal to the module (NOT on USB)	35748
49	Force USB drive to stop logging, ready to eject	35749
50-65	Reserved	35750 – 35765
66	Reset battery maintenance alarm 1	35766
67	Reset battery maintenance alarm 2	35767
68	Reset battery maintenance alarm 3	35768
69	Auto DPF regeneration inhibit on	35769
70	Auto DPF regeneration inhibit off	35770
71	Start manual DPF regeneration	35771
72	Battery Charger Boost Mode	35772
73	Battery Charger Stop Charging	35773
74	Battery Charger Battery Test	35774
75	Battery Charger Select Alternative Charging Voltage	35775
76	Select Off Mode	35776
77	Throttle Down	35777
78	Throttle Up	35778
79	Wake ECU	35779
80	Lamp Test	35780
81	Battery Charger Auxiliary Boost Mode	35781
82	Battery Charger Auxiliary Stop Charging	35782
83	Battery Charger Auxiliary Battery Test	35783
84	Battery Charger Auxiliary Select Alternative Charging Voltage	35784
85	Stop manual DPF regeneration	35785
86	DSE Proprietary	35786
87	Battery Charger Max Current Mode Timed	35787

Function code	System control function	System control key
88	Battery Charger max Current Mode Manual	35788
89	AVR Droop Enable	35789
90	AVR Droop Disable	35790
91	Governor Droop Enable	35791
92	Governor Droop Disable	35792
93	Remote Mains Fail Enable	35793
94	Remote Mains Fail Disable	35794
95	Remote Mains Fail Toggle (on then off, leaving the alarm latched but able to be reset)	35795
96	Enable signal injection	35796
97	Disable signal injection	35797
98	Reserved	35798
99	Reset maintenance alarm 4 due times	35799
100	Reset maintenance alarm 5 due times	35800
101	Battery Charger Stop Charging Out 1	35801
102	Battery Charger Stop Charging Out 2	35802
103	Battery Charger Stop Charging Out 1 and Out 2	35803
104	Reset maintenance alarm 6 due times	35804
105	Reset maintenance alarm 7 due times	35805
106	Reset maintenance alarm 8 due times	35806
107	Reset maintenance alarm 9 due times	35807
108	Reset maintenance alarm 10 due times	35808
109	Reserved, do not allocate	35809
110	Reserved, do not allocate	35810
111	Reserved, do not allocate	35811
112	Reserved, do not allocate	35812
113-65535	Reserved	

Signal Injection Registers

Injection channel	Function	Injection value
0	No override, module functions as normal	Ignored
1-3	Reserved	
4	Override voltage all L-N	Voltage in 0.001PU
5-7	Reserved	
8	Override voltage all L-L	Voltage in 0.001PU
9	Override frequency	Frequency in 0.01Hz
10-	Reserved	

10.18 Page 17 - J1939 active diagnostic trouble codes in decoded format

Notes:

1. These are read only registers.
2. Some Engine Control Units (ECUs) do not comply with J1939 with respect to trouble codes, the trouble code type must be read to determine the interpretation of the codes.
3. For an ECU that is fully compliant with J1939 this page contains the status as indicated by the last DM1 message, refer to J1939-73 section 5.7.1.
4. For an ECU that is not fully compliant with J1939 this page contains trouble codes as read by the mechanism appropriate to the ECU.
5. The meaning of the lamp status codes is shown in the table below.
6. For details of the Suspect Parameter Number (SPN) refer to J1939-04 Appendix C.
7. For details of the Failure Mode Indicator (FMI) refer to J1939-73 Appendix A.
8. For details of the Occurrence Count (OC) refer to J1939-73 section 5.7.1, a value of 127 indicates that no OC is available.
9. For details of the Fault Code Number, Status of Fault Code and Number of Occurrences refer to the Scania document 'Fault codes EMS S6'.
10. For details of the Fault Code Number refer to the MTU document “Part 3 Maintenance and repair E531 711 / 01 E”

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0	Number of active trouble codes	0	63			16
1	Malfunction indicator lamp status	0	3			15/16-16/16
	Red stop lamp status	0	3			13/16-14/16
	Amber warning lamp status	0	3			11/16-12/16
	Protect lamp status	0	3			9/16-10/16
	Reserved for SAE assignment	0	3			7/16-8/16
	Reserved for SAE assignment	0	3			5/16-6/16
	Reserved for SAE assignment	0	3			3/16-4/16
	Reserved for SAE assignment	0	3			1/16-2/16
2-6	Trouble code 1					80
7-11	Trouble code 2					80
12-16	Trouble code 3					80
17-21	Trouble code 4					80
22-246	Trouble codes 5-49					
247-251	Trouble code 50					80

Lamp status codes

Code	System control function
0	Lamp off
1	Lamp on
2	Undefined
3	Unimplemented

Trouble code type

Code	Format
0	J1939
1	Scania Keyword 2000 (KW2K)
2	MTU
3	Cummins Modbus
4-99	Reserved

J1939 type trouble code

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0--1	SPN	0	524287			32
2	FMI	0	31			16
3	OC	0	127			16
4	Trouble code type	0	0			16

Scania Keyword 2000 (KW2K) type trouble code

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0-1	Fault code Number	0	65535			32
2	Status of Fault Code	0	255			16
3	Number of Occurrences	0	255			16
4	Trouble code type	1	1			16

MTU type trouble code

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0-1	Fault code Number	0	400			32
2	Status of Fault Code	0	255			16
3	Number of Occurrences	0	255			16
4	Trouble code type	2	2			16

Cummins modbus type trouble code

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0-1	DTC Number	0	65535			32
2	DTC Type	0	255			16
3	Not used	0	255			16
4	Trouble code type	3	3			16

Cummins modbus DTC types

Code	System control function
1	Engine DTC Warning
2	Engine DTC Shutdown

10.19 Page 18 - J1939 active diagnostic trouble codes in raw format

Notes:

1. These are read only registers.
2. This page contains the status as indicated by the last DM1 message, refer to J1939-73 section 5.7.1.
3. The meaning of the lamp status codes is shown in the table below.
4. For details of the Suspect Parameter Number (SPN) refer to J1939-04 Appendix C.
5. For details of the Failure Mode Indicator (FMI) refer to J1939-73 Appendix A.
6. For details of the Occurrence Count (OC) refer to J1939-73 section 5.7.1, a value of 127 indicates that no OC is available.
7. For details of the Conversion Method (CM) refer to J1939-73 section 5.7.1

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0	Number of active trouble codes	0	126			16
1	Reserved	0	0			16
2	Reserved	0	0			16
3	Reserved for SAE assignment	0	3			15/16-16/16
	Reserved for SAE assignment	0	3			13/16-14/16
	Reserved for SAE assignment	0	3			11/16-12/16
	Reserved for SAE assignment	0	3			9/16-10/16
	Protect lamp status	0	3			7/16-8/16
	Amber warning lamp status	0	3			5/16-6/16
	Red stop lamp status	0	3			3/16-4/16
	Malfunction indicator lamp status	0	3			1/16-2/16
4	Trouble code 1: Least significant 16 bits of SPN	0	65535			16
5	Trouble code 1: CM	0	1			16/16
	Trouble code 1: OC	0	127			9/16-15/16
	Trouble code 1: FMI	0	31			4/16-8/16
	Trouble code 1: Most significant 3 bits of SPN	0	7			1/16-3/16
6-7	Trouble code 2 as above					
8-9	Trouble code 3 as above					
10-255	Trouble codes 4-126 as above					

Lamp status codes

Code	System control function
0	Lamp off
1	Lamp on
2	Undefined
3	Unimplemented

10.20 Page 19–Extended Instrumentation

Notes:

1. These are read only registers.
2. The meaning of all status codes is shown in the tables below.
3. For OBD compliance codes, refer to SAE J1939-73 section 5.7.5.3
4. Register 31 requires an offset of -273 deg C to be applied
5. Register 42-44 was originally implemented as decimal minutes on the 0890-A2 V1.1.5

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0-1	CAN TX count	0	4294967295	1		32 U
2-3	CAN RX count	0	4294967295	1		32 U
4	DPFactive regeneration status	0	3	1	See table	16 U
5	DEF tank level status	0	7	1	See table	16 U
6	SCR operator inducement severity	0	7	1	See table	16 U
7	Average DEF consumption	0	64255	0.05	L/h	16 U
8	Commanded DEF consumption	0	64255	0.05	L/h	16 U
9	Active trouble code count	0	250	1		16 U
10	Previously active trouble code count	0	250	1		16 U
11	OBD compliance	0	250	1		16 U
12	Engine alarm warning	0	3	1	See table	16 U
13	Engine alarm electrical trip	0	3	1	See table	16 U
14	Engine alarm shutdown	0	3	1	See table	16 U
15	Engine last rated frequency	0				16 U
16	DPF active regen. inhibited due to accelerator pedal off idle	0	3	1	See table	16 U
17	DPF active regen. inhibited due to out of neutral	0	3	1	See table	16 U
18	DPF active regen. inhibited due to parking brake not set	0	3	1	See table	16 U
19	DPF active regen. inhibited due to low exhaust gas temperature	0	3	1	See table	16 U
20	DPF active regen. inhibited due to system timeout	0	3	1	See table	16 U
21	DPF active regen. inhibited due to permanent stystem lockout	0	3	1	See table	16 U
22	DPF active regen. inhibited due to system fault active	0	3	1	See table	16 U
23	KBT glow relay flag	0	3	1	See table	16 U
24	KBT glow lamp flag	0	3	1	See table	16 U
25	KBT derating level	0	7	1	See table	16 U
26	KBT regen status	0	7	1	See table	16 U
27	Time since last service	-32127	32128	1	hr	16 S
28	Number of software identification fields	0	250	1		16 U
29	CAN bus state	0	3	1	See table	16 U
30	DPF 1 soot mass	0	4000	4	g/L	16 U
31	Aftertreatment 1 diesel oxidation catalyst intake gas temperature	0	64255	0.03125	Deg C	16 U
32	Engine emergency (immediate) shutdown indication	0	3	1	See table	16 U
33	Engine intake air mass flow rate	0	64255	0.05	Kg/h	16 U
34-35	DPF 1 time since last active regen	0	4211081215	1	s	32 U
36	Aftertreatment 1 DPF diff pressure	0	64255	0.1	kPa	16 U
37	Engine protection system timer state	0	3	1	See table	16 U
38	Engine protection system timer override	0	3	1	See table	16 U
39	Volvo preheat indication	0	3	1	See table	16 U
40	GPS Valid	0	1	1		16 U

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
41 - 42	GPS Longitude	-180000000	180000000	0.000001	degrees	32 S
43 - 44	GPS Latitude	-90000000	90000000	0.000001	degrees	32 S
45	GPS Number of Sattelites	0	99	1		16 U
46	GPS HDOP	0	99	0.1		16 U
47 - 48	Module Time since 1/1/1970	0	4.29×10^9	1	Seconds	32 U
49 - 50	GPS Last Time since 1/1/1970	0	4.29×10^9	1	Seconds	32 U
51	Speed	0	65535	0.1	Knots	16 U
52	Heading	0	360	0.1	Degrees	16 U
53	Escape Mode Status	0	1	1	bool	16 U

Engine alarm status codes

Code	System control function
0	Lamp off
1	Lamp on
2	Undefined
3	Unimplemented
4-65535	Reserved

DPF active regeneration status codes

Code	System control function
0	Not active
1	Active
2	Undefined
3	Unimplemented
4-65535	Reserved

DPF active regenerationinhibited status codes

Code	System control function
0	Not inhibited
1	Inhibited
2	Undefined
3	Unimplemented
4-65535	Reserved

DEF tank level status codes

Code	System control function
0	Off (DEF level adequate)
1	On solid (DEF level low)
2	Undefined
3	Undefined
4	On fast blink (DEF level lower than level indicated by state 1)
5	Undefined
6	Undefined
7	Unimplemented
8-65535	Reserved

SCR operator inducement severity codes

Code	System control function
0	Driver warning, low-level inducement
1	Inducement level 1
2	Inducement level 2
3	Inducement level 3
4	Inducement level 4
5	Inducement level 5
6	Temporary override of inducement
7	Unimplemented
8-65535	Reserved

KBT flag status codes

Code	System control function
0	Off
1	On
2	Error
3	Unimplemented
4-65535	Reserved

KBT derating level codes

Code	System control function
0	No derating
1	No derating warning
2	Derating level 1
3	Derating level 2
4	Derating level 3
5	Engine stop
6	Engine stop by ECU
7	Unimplemented
8-65535	Reserved

KBT regen status codes

Code	System control function
0	Out of active regen mode
1	Automatic active regen mode
2	Parked regen mode
3	Unimplemented
4-65535	Reserved

CAN bus state codes

Code	System control function
0	Bus OK
1	Bus off
2	Error passive
3	Error active
4-65535	Reserved

Engine emergency shutdown indication codes

Code	System control function
0	Off (no shutdown requested)
1	On (shutdown requested)
2	Reserved
3	Don’t care / take no action
4-65535	Reserved

Engine protection system timer (& Volvo preheat indication) states

Code	System control function
0	Inactve
1	Active
2	Error
3	Not available
4-65535	Reserved

10.21 Page 20 - Various Strings

Notes:

1. These are read only registers.
2. Each string consists of 32 Unicode characters with the first character at the lowest register address, NULL terminators are not used.
3. The manufacturer string and model string must not be used to identify a particular product as they may change from one unit to the next, e.g. a manufacturer may change its name in some way.
4. The remaining strings can be used in a status display.
5. The contents of these strings will never change while the slave device is operating so a copy can be held by the master to minimise traffic.

Registers

Register offset	Name	Minimum value	Maximum value	Bits
0	Manufacturer string	UNICODE	UNICODE	512
32	Model string	UNICODE	UNICODE	512
64	Control unit not configured string	UNICODE	UNICODE	512
96	Module variant	UNICODE	UNICODE	512
128	Control unit failure string	UNICODE	UNICODE	512
160	Shutdown alarm string	UNICODE	UNICODE	512
192	Electrical trip alarm string	UNICODE	UNICODE	512
224	Warning alarm string	UNICODE	UNICODE	512

10.22 Page 22- Auxiliary sender strings

Notes:

1. These are read only registers.
2. Each string consists of 32 Unicode characters with the first character at the lowest register address, NULL terminators are not used.
3. The strings can be used in a status display.
4. The contents of these strings will never change while the slave device is operating so a copy can be held by the master to minimise traffic.
5. Reading the string for an unimplemented sender will return 32 spaces (Unicode 0x0020).

Registers

Register offset	Name	Minimum value	Maximum value	Bits
0	Auxiliary sender 1 string	UNICODE	UNICODE	512
32	Auxiliary sender 2 string	UNICODE	UNICODE	512
64	Auxiliary sender 3 string	UNICODE	UNICODE	512
96	Auxiliary sender 4 string	UNICODE	UNICODE	512
128-255	Reserved	UNICODE	UNICODE	512

10.23 Page 24 - Identity Strings

Notes:

1. These may be read/write or read only registers depending on the product.
2. Each string consists of 32 Unicode characters with the first character at the lowest register address, NULL terminators are not used.
3. The strings are user defined but are intended to allow the site and unit to be identified.
4. The contents of these strings will never change while the slave device is operating so a copy can be held by the master to minimise traffic.

Registers

Register offset	Name	Minimum value	Maximum value	Bits
0	Identity string 1	UNICODE	UNICODE	512
32	Identity string 2	UNICODE	UNICODE	512
64	Identity string 3	UNICODE	UNICODE	512
96	Identity string 4	UNICODE	UNICODE	512
128	Identity string 5	UNICODE	UNICODE	512
160	Identity string 6	UNICODE	UNICODE	512
192	Identity string 7	UNICODE	UNICODE	512
224	Identity string 8	UNICODE	UNICODE	512

10.24 Page 25–Modbus Gate way Strings

Notes:

1. These are read only registers.
2. Each string consists of 32 Unicode characters with the first character at the lowest register address, NULL terminators are not used.
3. The strings are user defined but are intended to allow each Modbus gateway port to be identified without needting the device to be connected.
4. The contents of these strings will never change while the slave device is operating so a copy can be held by the master to minimise traffic.
5. The active modbus ID for each gateway device is available in Page 137 Register 160 onwards.

Registers

Register offset	Name	Minimum value	Maximum value	Bits
0	Modbus gateway port 0 device identity	UNICODE	UNICODE	512
32	Modbus gateway port 1 device identity	UNICODE	UNICODE	512
64	Modbus gateway port 2 device identity	UNICODE	UNICODE	512
96	Modbus gateway port 3 device identity	UNICODE	UNICODE	512
128	Modbus gateway port 4 device identity	UNICODE	UNICODE	512
160	Modbus gateway port 5 device identity	UNICODE	UNICODE	512
192	Modbus gateway port 6 device identity	UNICODE	UNICODE	512
224	Modbus gateway port 7 device identity	UNICODE	UNICODE	512

10.25 Page 26 - State Machine Name Strings

Notes:

1. These are read only registers.
2. Each string consists of 32 Unicode characters with the first character at the lowest register address, NULL terminators are not used.
3. The strings contain the names of the state machines that are implemented in a particular slave device.
4. The contents of these strings will never change while the slave device is operating so a copy can be held by the master to minimise traffic.
5. Reading the string for a unimplemented state machine will return 32 spaces (Unicode 0x0020).

Registers

Register offset	Name	Minimum value	Maximum value	Bits
0	S.M. 1 name string	UNICODE	UNICODE	512
32	S.M. 2 name string	UNICODE	UNICODE	512
64	S.M. 3 name string	UNICODE	UNICODE	512
96	S.M. 4 name string	UNICODE	UNICODE	512
128	S.M. 5 name string	UNICODE	UNICODE	512
160	S.M. 6 name string	UNICODE	UNICODE	512
192	S.M. 7 name string	UNICODE	UNICODE	512
224	S.M. 8 name string	UNICODE	UNICODE	512

10.26 Page 28 – StateMachineState Strings

Notes:

1. These are read only registers.
2. Each string consists of 32 Unicode characters with the first character at the lowest register address, NULL terminators are not used.
3. The contents of these strings may change at any time when the corresponding state machine changes state, refer to the 'generating set status information' page for details.
4. A complete string must be read with a single query to avoid the possibility of reading parts from different strings, any attempt to read part of a string will return extended exception 13 (Block violation).
5. Up to 3 complete consecutive strings can be read with a single query, limited only by the packet size limitations of Modbus.
6. Reading a string causes the corresponding state machine status code in the 'generating set status information' page to change to 0.
7. A string can be read regardless of the state machine status code.
8. Reading the string for a unimplemented state machine will return 32 spaces (Unicode 0x0020).
9. This page is not implemented on the 72xx/73xx and 8xxx/74xx families.

Registers

Register offset	Name	Minimum value	Maximum value	Bits
0	S.M. 1 state string	UNICODE	UNICODE	512
32	S.M. 2 state string	UNICODE	UNICODE	512
64	S.M. 3 state string	UNICODE	UNICODE	512
96	S.M. 4 state string	UNICODE	UNICODE	512
128	S.M. 5 state string	UNICODE	UNICODE	512
160	S.M. 6 state string	UNICODE	UNICODE	512
192	S.M. 7 state string	UNICODE	UNICODE	512
224	S.M. 8 state string	UNICODE	UNICODE	512

10.27 Page 29–Configurable CAN Instrument Units

Notes:

1. This page is currently only implemented on the 61xx MkII family (version 2.0 & later).
2. It provides the unit information for the received configurable CAN instruments (and is used by the PC SCADA display)
3. There is a 1:1 mapping between the configurable CAN instrument value (in page 177) and the units structure in this (and the following) page, so page 177 registers 0 & 1 use the units settings for registers 0 to 16 below & so on.
4. Each items uses 17 registers, so each page contains 15 items, plus one reserved register (#255)

61xx MKII (v2.0 & later), 86xx MKII, 73xx MKII (v4.0 & later), E800 (v3.0 & later), E400 (v7.0 & later)

Registers

Register offset	Name	Minimum value	Maximum value	Scaling Factor	Bits / sign	Read/ write
0-16	Unit info for configurable CAN receive instrument 1					
0	Category	0xffff (‘User defined’)				Read only
1	Multiplier	-128	127	1	16S	Read only
2	Precision	1	1			Read only
3-4	Range Min	Any	Any		32S	Read only
5-6	Range Max	Any	Any		32S	Read only
7-16	Unit suffix string	UNICODE	UNICODE			Read only
17-33	Unit info for configurable CAN receive instrument 2					
34-50	Unit info for configurable CAN receive instrument 3					
51-67	Unit info for configurable CAN receive instrument 4					
68-84	Unit info for configurable CAN receive instrument 5					
85-101	Unit info for configurable CAN receive instrument 6					
102-118	Unit info for configurable CAN receive instrument 7					
…						
238-254	Unit info for configurable CAN receive instrument 15					
255	Reserved					

10.28 Page 30–Configurable CAN Instrument Units (cont)

61xx MKII (v2.0 & later), 86xx MKII, 73xx MKII (v4.0 & later), E800 (v3.0 & later), E400 (v7.0 & later)

Registers

Register offset	Name	Minimum value	Maximum value	Scaling Factor	Bits / sign	Read/ write
0-16	Unit info for configurable CAN receive instrument 16					
17-33	Unit info for configurable CAN receive instrument 17					
34-50	Unit info for configurable CAN receive instrument 18					
51-67	Unit info for configurable CAN receive instrument 19					
68-84	Unit info for configurable CAN receive instrument 20					
85-101	Unit info for configurable CAN receive instrument 21					
102-118	Unit info for configurable CAN receive instrument 22					
…						
238-254	Unit info for configurable CAN receive instrument 30					
255	Reserved					

10.29 Pages 32 - 95 - Alarm Strings (Old alarm system)

1. Notes:
2. These are read only registers.
3. Each string consists of 32 Unicode characters with the first character at the lowest register address, NULL terminators are not used.
4. There are 2 strings corresponding to each alarm, refer to the alarm conditions page for details of their use.
5. The contents of these strings will never change while the slave device is operating so a copy can be held by the master to minimise traffic.
6. Reading the string for an unimplemented alarm will return 32 spaces (Unicode 0x0020).
7. The inactive string for an alarm may not be used, in which case it will return 32 spaces (Unicode 0x0020).
8. The old alarm system is not implemented on the 72xx/73xx and 8xxx/74xx families.

Registers

Page	Register offset	Name	Minimum value	Maximum value	Bits
32	0	Emergency stop inactive string	UNICODE	UNICODE	512
	32	Emergency stop active string	UNICODE	UNICODE	512
	64	Low oil pressure inactive string	UNICODE	UNICODE	512
	96	Low oil pressure active string	UNICODE	UNICODE	512
	128	High coolant temperature inactive string	UNICODE	UNICODE	512
	160	High coolant temperature active string	UNICODE	UNICODE	512
	192	High oil temperature inactive string	UNICODE	UNICODE	512
	224	High oil temperature active string	UNICODE	UNICODE	512
33	0	Under speed inactive string	UNICODE	UNICODE	512
	32	Under speed active string	UNICODE	UNICODE	512
	64	Over speed inactive string	UNICODE	UNICODE	512
	96	Over speed active string	UNICODE	UNICODE	512
	128	Fail to start inactive string	UNICODE	UNICODE	512
	160	Fail to start active string	UNICODE	UNICODE	512
	192	Fail to come to rest inactive string	UNICODE	UNICODE	512
	224	Fail to come to rest active string	UNICODE	UNICODE	512
34	0	Loss of speed sensing inactive string	UNICODE	UNICODE	512
	32	Loss of speed sensing active string	UNICODE	UNICODE	512
	64	Generator low voltage inactive string	UNICODE	UNICODE	512
	96	Generator low voltage active string	UNICODE	UNICODE	512
	128	Generator high voltage inactive string	UNICODE	UNICODE	512
	160	Generator high voltage active string	UNICODE	UNICODE	512
	192	Generator low frequency inactive string	UNICODE	UNICODE	512
	224	Generator low frequency active string	UNICODE	UNICODE	512
35	0	Generator high frequency inactive string	UNICODE	UNICODE	512
	32	Generator high frequency active string	UNICODE	UNICODE	512
	64	Generator high current inactive string	UNICODE	UNICODE	512
	96	Generator high current active string	UNICODE	UNICODE	512
	128	Generator earth fault inactive string	UNICODE	UNICODE	512
	160	Generator earth fault active string	UNICODE	UNICODE	512
	192	Generator reverse power inactive string	UNICODE	UNICODE	512
	224	Generator reverse power active string	UNICODE	UNICODE	512
36	0	Air flap inactive string	UNICODE	UNICODE	512
	32	Air flap active string	UNICODE	UNICODE	512
	64	Oil pressure sender fault inactive string	UNICODE	UNICODE	512
	96	Oil pressure sender fault active string	UNICODE	UNICODE	512
	128	Coolant temperature sender fault inactive string	UNICODE	UNICODE	512
	160	Coolant temperature sender fault active string	UNICODE	UNICODE	512
	192	Oil temperature sender fault inactive string	UNICODE	UNICODE	512
	224	Oil temperature sender fault active string	UNICODE	UNICODE	512
37	0	Fuel level sender fault inactive string	UNICODE	UNICODE	512
	32	Fuel level sender fault active string	UNICODE	UNICODE	512
	64	Magnetic pickup fault inactive string	UNICODE	UNICODE	512
	96	Magnetic pickup fault active string	UNICODE	UNICODE	512
	128	Loss of AC speed signal inactive string	UNICODE	UNICODE	512
	160	Loss of AC speed signal active string	UNICODE	UNICODE	512
	192	Charge alternator failure inactive string	UNICODE	UNICODE	512

Page	Register offset	Name	Minimum value	Maximum value	Bits
	224	Charge alternator failure active string	UNICODE	UNICODE	512
38	0	Low battery voltage inactive string	UNICODE	UNICODE	512
	32	Low battery voltage active string	UNICODE	UNICODE	512
	64	High battery voltage inactive string	UNICODE	UNICODE	512
	96	High battery voltage active string	UNICODE	UNICODE	512
	128	Low fuel level inactive string	UNICODE	UNICODE	512
	160	Low fuel level active string	UNICODE	UNICODE	512
	192	High fuel level inactive string	UNICODE	UNICODE	512
	224	High fuel level active string	UNICODE	UNICODE	512
39	0	Generator failed to close inactive string	UNICODE	UNICODE	512
	32	Generator failed to close active string	UNICODE	UNICODE	512
	64	Mains failed to close inactive string	UNICODE	UNICODE	512
	96	Mains failed to close active string	UNICODE	UNICODE	512
	128	Generator failed to open inactive string	UNICODE	UNICODE	512
	160	Generator failed to open active string	UNICODE	UNICODE	512
	192	Mains failed to open inactive string	UNICODE	UNICODE	512
	224	Mains failed to open active string	UNICODE	UNICODE	512
40	0	Mains low voltage inactive string	UNICODE	UNICODE	512
	32	Mains low voltage active string	UNICODE	UNICODE	512
	64	Mains high voltage inactive string	UNICODE	UNICODE	512
	96	Mains high voltage active string	UNICODE	UNICODE	512
	128	Bus failed to close inactive string	UNICODE	UNICODE	512
	160	Bus failed to close active string	UNICODE	UNICODE	512
	192	Bus failed to open inactive string	UNICODE	UNICODE	512
	224	Bus failed to open active string	UNICODE	UNICODE	512
41	0	Mains low frequency inactive string	UNICODE	UNICODE	512
	32	Mains low frequency active string	UNICODE	UNICODE	512
	64	Mains high frequency inactive string	UNICODE	UNICODE	512
	96	Mains high frequency active string	UNICODE	UNICODE	512
	128	Mains failed inactive string	UNICODE	UNICODE	512
	160	Mains failed active string	UNICODE	UNICODE	512
	192	Mains phase rotation wrong inactive string	UNICODE	UNICODE	512
	224	Mains phase rotation wrong active string	UNICODE	UNICODE	512
42	0	Generator phase rotation wrong inactive string	UNICODE	UNICODE	512
	32	Generator phase rotation wrong active string	UNICODE	UNICODE	512
	64	Maintenance due inactive string	UNICODE	UNICODE	512
	96	Maintenance due active string	UNICODE	UNICODE	512
	128	Clock not set inactive string	UNICODE	UNICODE	512
	160	Clock not set active string	UNICODE	UNICODE	512
	192	Local LCD configuration lost inactive string	UNICODE	UNICODE	512
	224	Local LCD configuration lost inactive string	UNICODE	UNICODE	512
43	0	Local telemetry configuration lost inactive string	UNICODE	UNICODE	512
	32	Local telemetry configuration lost active string	UNICODE	UNICODE	512
	64	Calibration lost inactive string	UNICODE	UNICODE	512
	96	Calibration lost active string	UNICODE	UNICODE	512
	128	Modem power fault inactive string	UNICODE	UNICODE	512
	160	Modem power fault active string	UNICODE	UNICODE	512
	192	Generator short circuit inactive string	UNICODE	UNICODE	512
	224	Generator short circuit active string	UNICODE	UNICODE	512
44	0	Failure to synchronise inactive string	UNICODE	UNICODE	512
	32	Failure to synchronise active string	UNICODE	UNICODE	512
	64	Bus live inactive string	UNICODE	UNICODE	512
	96	Bus live active string	UNICODE	UNICODE	512
	128	Scheduled run inactive string	UNICODE	UNICODE	512
	160	Scheduled run active string	UNICODE	UNICODE	512
	192	Bus phase rotation wrong inactive string	UNICODE	UNICODE	512
	224	Bus phase rotation wrong active string	UNICODE	UNICODE	512
45	0	Priority selection error inactive string	UNICODE	UNICODE	512

Page	Register offset	Name	Minimum value	Maximum value	Bits
	32	Priority selection error active string	UNICODE	UNICODE	512
	64	MSC data error inactive string	UNICODE	UNICODE	512
	96	MSC data error active string	UNICODE	UNICODE	512
	128	MSC ID error inactive string	UNICODE	UNICODE	512
	160	MSC ID error active string	UNICODE	UNICODE	512
	192	MSC failure inactive string	UNICODE	UNICODE	512
	224	MSC failure active string	UNICODE	UNICODE	512
46	0	MSC too few sets inactive string	UNICODE	UNICODE	512
	32	MSC too few sets active string	UNICODE	UNICODE	512
	64	MSC alarms inhibited inactive string	UNICODE	UNICODE	512
	96	MSC alarms inhibited active string	UNICODE	UNICODE	512
	128	MSC old version units inactive string	UNICODE	UNICODE	512
	160	MSC old version units active string	UNICODE	UNICODE	512
	192	Mains reverse power inactive string	UNICODE	UNICODE	512
	224	Mains reverse power active string	UNICODE	UNICODE	512
47	0	Minimum sets not reached inactive string	UNICODE	UNICODE	512
	32	Minimum sets not reached active string	UNICODE	UNICODE	512
	64	Insufficient capacity available inactive string	UNICODE	UNICODE	512
	96	Insufficient capacity available active string	UNICODE	UNICODE	512
	128	Expansion input unit not calibrated inactive string	UNICODE	UNICODE	512
	160	Expansion input unit not calibrated active string	UNICODE	UNICODE	512
	192	Expansion input unit failure inactive string	UNICODE	UNICODE	512
	224	Expansion input unit failure active string	UNICODE	UNICODE	512
48	0	Auxiliary sender 1 low inactive string	UNICODE	UNICODE	512
	32	Auxiliary sender 1 low active string	UNICODE	UNICODE	512
	64	Auxiliary sender 1 high inactive string	UNICODE	UNICODE	512
	96	Auxiliary sender 1 high active string	UNICODE	UNICODE	512
	128	Auxiliary sender 1 fault inactive string	UNICODE	UNICODE	512
	160	Auxiliary sender 1 fault active string	UNICODE	UNICODE	512
	192	Auxiliary sender 2 low inactive string	UNICODE	UNICODE	512
	224	Auxiliary sender 2 low active string	UNICODE	UNICODE	512
49	0	Auxiliary sender 2 high inactive string	UNICODE	UNICODE	512
	32	Auxiliary sender 2 high active string	UNICODE	UNICODE	512
	64	Auxiliary sender 2 fault inactive string	UNICODE	UNICODE	512
	96	Auxiliary sender 2 fault active string	UNICODE	UNICODE	512
	128	Auxiliary sender 3 low inactive string	UNICODE	UNICODE	512
	160	Auxiliary sender 3 low active string	UNICODE	UNICODE	512
	192	Auxiliary sender 3 high inactive string	UNICODE	UNICODE	512
	224	Auxiliary sender 3 high active string	UNICODE	UNICODE	512
50	0	Auxiliary sender 3 fault inactive string	UNICODE	UNICODE	512
	32	Auxiliary sender 3 fault active string	UNICODE	UNICODE	512
	64	Auxiliary sender 4 low inactive string	UNICODE	UNICODE	512
	96	Auxiliary sender 4 low active string	UNICODE	UNICODE	512
	128	Auxiliary sender 4 high inactive string	UNICODE	UNICODE	512
	160	Auxiliary sender 4 high active string	UNICODE	UNICODE	512
	192	Auxiliary sender 4 high inactive string	UNICODE	UNICODE	512
	224	Auxiliary sender 4 high active string	UNICODE	UNICODE	512
51	0	Engine control unit (ECU) link lost inactive string	UNICODE	UNICODE	512
	32	Engine control unit (ECU) link lost active string	UNICODE	UNICODE	512
	64	Engine control unit (ECU) failure inactive string	UNICODE	UNICODE	512
	96	Engine control unit (ECU) failure active string	UNICODE	UNICODE	512
	128	Engine control unit (ECU) error inactive string	UNICODE	UNICODE	512
	160	Engine control unit (ECU) error active string	UNICODE	UNICODE	512
	192	Low coolant temperature inactive string	UNICODE	UNICODE	512
	224	Low coolant temperature active string	UNICODE	UNICODE	512
52	0	Out of sync inactive string	UNICODE	UNICODE	512
	32	Out of sync active string	UNICODE	UNICODE	512
	64	Low Oil Pressure Switch inactive string	UNICODE	UNICODE	512

Page	Register offset	Name	Minimum value	Maximum value	Bits
	96	Low Oil Pressure Switch active string	UNICODE	UNICODE	512
	128	Alternative Aux Mains Fail inactive string	UNICODE	UNICODE	512
	160	Alternative Aux Mains Fail active string	UNICODE	UNICODE	512
	192	Loss of excitation inactive string	UNICODE	UNICODE	512
	224	Loss of excitation active string	UNICODE	UNICODE	512
53	0	Mains kW Limit inactive string	UNICODE	UNICODE	512
	32	Mains kW Limit active string	UNICODE	UNICODE	512
	64	Negative phase sequence inactive string	UNICODE	UNICODE	512
	96	Negative phase sequence active string	UNICODE	UNICODE	512
	128	Mains ROCOF inactive string	UNICODE	UNICODE	512
	160	Mains ROCOF active string	UNICODE	UNICODE	512
	192	Mains vector shift inactive string	UNICODE	UNICODE	512
	224	Mains vector shift active string	UNICODE	UNICODE	512
54	0	Mains G59 low frequency inactive string	UNICODE	UNICODE	512
	32	Mains G59 low frequency active string	UNICODE	UNICODE	512
	64	Mains G59 high frequency inactive string	UNICODE	UNICODE	512
	96	Mains G59 high frequency active string	UNICODE	UNICODE	512
	128	Mains G59 low voltage inactive string	UNICODE	UNICODE	512
	160	Mains G59 low voltage active string	UNICODE	UNICODE	512
	192	Mains G59 high voltage inactive string	UNICODE	UNICODE	512
	224	Mains G59 high voltage active string	UNICODE	UNICODE	512
55	0	Mains G59 trip inactive string	UNICODE	UNICODE	512
	32	Mains G59 trip active string	UNICODE	UNICODE	512
	64	Generator kW Overload inactive string	UNICODE	UNICODE	512
	96	Generator kW Overload active string	UNICODE	UNICODE	512
	128	Engine Inlet Temp High inactive string	UNICODE	UNICODE	512
	160	Engine Inlet Temp High inactive string	UNICODE	UNICODE	512
	192	Bus 1 live inactive string	UNICODE	UNICODE	512
	224	Bus 1 live active string	UNICODE	UNICODE	512
56	0	Bus 1 phase rotation wrong inactive string	UNICODE	UNICODE	512
	32	Bus 1 phase rotation wrong active string	UNICODE	UNICODE	512
	64	Bus 2 live inactive string	UNICODE	UNICODE	512
	96	Bus 2 live active string	UNICODE	UNICODE	512
	128	Bus 2 phase rotation wrong inactive string	UNICODE	UNICODE	512
	160	Bus 2 phase rotation wrong active string	UNICODE	UNICODE	512
	192	Reserved	UNICODE	UNICODE	512
	224	Reserved	UNICODE	UNICODE	512
57-63		Reserved			
64	0	Unnamed digital input 1 inactive string	UNICODE	UNICODE	512
	32	Unnamed digital input 1 active string	UNICODE	UNICODE	512
	64	Unnamed digital input 2 inactive string	UNICODE	UNICODE	512
	96	Unnamed digital input 2 active string	UNICODE	UNICODE	512
	128	Unnamed digital input 3 inactive string	UNICODE	UNICODE	512
	160	Unnamed digital input 3 active string	UNICODE	UNICODE	512
	192	Unnamed digital input 4 inactive string	UNICODE	UNICODE	512
	224	Unnamed digital input 4 active string	UNICODE	UNICODE	512
65		Unnamed digital input 5-8 strings			
66		Unnamed digital input 9-12 strings			
67		Unnamed digital input 13-16 strings			
68		Unnamed digital input 17-20 strings			
69		Unnamed digital input 21-24 strings			
70		Unnamed digital input 25-28 strings			
71		Unnamed digital input 29-32 strings			
72		Unnamed digital input 33-36 strings			
73		Unnamed digital input 37-40 strings			
74		Unnamed digital input 41-44 strings			
75		Unnamed digital input 45-48 strings			
76		Unnamed digital input 49-52 strings			

Page	Register offset	Name	Minimum value	Maximum value	Bits
77		Unnamed digital input 53-56 strings			
78		Unnamed digital input 57-60 strings			
79		Unnamed digital input 61-64 strings			
80		Unnamed digital input 65-68 strings			
81		Unnamed digital input 69-72 strings			
82		Unnamed digital input 73-76 strings			
83		Unnamed digital input 77-80 strings			
84		Unnamed digital input 81-84 strings			
85		Unnamed digital input 85-88 strings			
86		Unnamed digital input 89-92 strings			
87		Unnamed digital input 93-96 strings			
88		Unnamed digital input 97-100 strings			
89		Unnamed digital input 101-104 strings			
90		Unnamed digital input 105-108 strings			
91		Unnamed digital input 109-112 strings			
92		Unnamed digital input 113-116 strings			
93		Unnamed digital input 117-120 strings			
94		Unnamed digital input 121-124 strings			
95		Unnamed digital input 125-128 strings			

10.30 Pages 32-36 - 2131 Expansion module name strings

1. These registers provide the user defined names of each channel of each expansion module.
2. These pages are implemented on the 72xx/73xx, 8xxx/74xx and later families and replace the alarm strings from the old alarm system.

Page	Register offset	Name	Minimum value	Maximum value	Bits
32	0	2131 Expansion module 0 input A name string	UNICODE	UNICODE	512
	32	2131 Expansion module 0 input B name string	UNICODE	UNICODE	512
	64	2131 Expansion module 0 input C name string	UNICODE	UNICODE	512
	96	2131 Expansion module 0 input D name string	UNICODE	UNICODE	512
	128	2131 Expansion module 0 input E name string	UNICODE	UNICODE	512
	160	2131 Expansion module 0 input F name string	UNICODE	UNICODE	512
	192	2131 Expansion module 0 input G name string	UNICODE	UNICODE	512
	224	2131 Expansion module 0 input H name string	UNICODE	UNICODE	512
33	0	2131 Expansion module 0 input I name string	UNICODE	UNICODE	512
	32	2131 Expansion module 0 input J name string	UNICODE	UNICODE	512
	64	2131 Expansion module 1 input A name string	UNICODE	UNICODE	512
	96	2131 Expansion module 1 input B name string	UNICODE	UNICODE	512
	128	2131 Expansion module 1 input C name string	UNICODE	UNICODE	512
	160	2131 Expansion module 1 input D name string	UNICODE	UNICODE	512
	192	2131 Expansion module 1 input E name string	UNICODE	UNICODE	512
	224	2131 Expansion module 1 input F name string	UNICODE	UNICODE	512
34	0	2131 Expansion module 1 input G name string	UNICODE	UNICODE	512
	32	2131 Expansion module 1 input H name string	UNICODE	UNICODE	512
	64	2131 Expansion module 1 input I name string	UNICODE	UNICODE	512
	96	2131 Expansion module 1 input J name string	UNICODE	UNICODE	512
	128	2131 Expansion module 2 input A name string	UNICODE	UNICODE	512
	160	2131 Expansion module 2 input B name string	UNICODE	UNICODE	512
	192	2131 Expansion module 2 input C name string	UNICODE	UNICODE	512
	224	2131 Expansion module 2 input D name string	UNICODE	UNICODE	512
35	0	2131 Expansion module 2 input E name string	UNICODE	UNICODE	512
	32	2131 Expansion module 2 input F name string	UNICODE	UNICODE	512
	64	2131 Expansion module 2 input G name string	UNICODE	UNICODE	512
	96	2131 Expansion module 2 input H name string	UNICODE	UNICODE	512
	128	2131 Expansion module 2 input I name string	UNICODE	UNICODE	512
	160	2131 Expansion module 2 input J name string	UNICODE	UNICODE	512
	192	2131 Expansion module 3 input A name string	UNICODE	UNICODE	512
	224	2131 Expansion module 3 input B name string	UNICODE	UNICODE	512
36	0	2131 Expansion module 3 input C name string	UNICODE	UNICODE	512
	32	2131 Expansion module 3 input D name string	UNICODE	UNICODE	512
	64	2131 Expansion module 3 input E name string	UNICODE	UNICODE	512
	96	2131 Expansion module 3 input F name string	UNICODE	UNICODE	512
	128	2131 Expansion module 3 input G name string	UNICODE	UNICODE	512
	160	2131 Expansion module 3 input H name string	UNICODE	UNICODE	512
	192	2131 Expansion module 3 input I name string	UNICODE	UNICODE	512
	224	2131 Expansion module 3 input J name string	UNICODE	UNICODE	512

10.31 Pages 37-40 - 2133 Expansion module name strings

1. These registers provide the user defined names of each channel of each expansion module.
2. These pages are implemented on the 72xx/73xx, 8xxx/74xx and later families and replace the alarm strings from the old alarm system.

Page	Register offset	Name	Minimum value	Maximum value	Bits
37	0	2133 Expansion module 0 input A name string	UNICODE	UNICODE	512
	32	2133 Expansion module 0 input B name string	UNICODE	UNICODE	512
	64	2133 Expansion module 0 input C name string	UNICODE	UNICODE	512
	96	2133 Expansion module 0 input D name string	UNICODE	UNICODE	512
	128	2133 Expansion module 0 input E name string	UNICODE	UNICODE	512
	160	2133 Expansion module 0 input F name string	UNICODE	UNICODE	512
	192	2133 Expansion module 0 input G name string	UNICODE	UNICODE	512
	224	2133 Expansion module 0 input H name string	UNICODE	UNICODE	512
38	0	2133 Expansion module 1 input A name string	UNICODE	UNICODE	512
	32	2133 Expansion module 1 input B name string	UNICODE	UNICODE	512
	64	2133 Expansion module 1 input C name string	UNICODE	UNICODE	512
	96	2133 Expansion module 1 input D name string	UNICODE	UNICODE	512
	128	2133 Expansion module 1 input E name string	UNICODE	UNICODE	512
	160	2133 Expansion module 1 input F name string	UNICODE	UNICODE	512
	192	2133 Expansion module 1 input G name string	UNICODE	UNICODE	512
	224	2133 Expansion module 2 input G name string	UNICODE	UNICODE	512
39	0	2133 Expansion module 2 input A name string	UNICODE	UNICODE	512
	32	2133 Expansion module 2 input B name string	UNICODE	UNICODE	512
	64	2133 Expansion module 2 input C name string	UNICODE	UNICODE	512
	96	2133 Expansion module 2 input D name string	UNICODE	UNICODE	512
	128	2133 Expansion module 2 input E name string	UNICODE	UNICODE	512
	160	2133 Expansion module 2 input F name string	UNICODE	UNICODE	512
	192	2133 Expansion module 2 input G name string	UNICODE	UNICODE	512
	224	2133 Expansion module 2 input H name string	UNICODE	UNICODE	512
40	0	2133 Expansion module 3 input A name string	UNICODE	UNICODE	512
	32	2133 Expansion module 3 input B name string	UNICODE	UNICODE	512
	64	2133 Expansion module 3 input C name string	UNICODE	UNICODE	512
	96	2133 Expansion module 3 input D name string	UNICODE	UNICODE	512
	128	2133 Expansion module 3 input E name string	UNICODE	UNICODE	512
	160	2133 Expansion module 3 input F name string	UNICODE	UNICODE	512
	192	2133 Expansion module 3 input G name string	UNICODE	UNICODE	512
	224	2133 Expansion module 3 input H name string	UNICODE	UNICODE	512

10.32 Pages 41-43 - 2152 Expansion module name strings

1. These registers provide the user defined names of each channel of each expansion module.
2. These pages are implemented on the 72xx/73xx, 8xxx/74xx and later families and replace the alarm strings from the old alarm system.

Page	Register offset	Name	Minimum value	Maximum value	Bits
41	0	2152 Expansion module 0 input A name string	UNICODE	UNICODE	512
	32	2152 Expansion module 0 input B name string	UNICODE	UNICODE	512
	64	2152 Expansion module 0 input C name string	UNICODE	UNICODE	512
	96	2152 Expansion module 0 input D name string	UNICODE	UNICODE	512
	128	2152 Expansion module 0 input E name string	UNICODE	UNICODE	512
	160	2152 Expansion module 0 input F name string	UNICODE	UNICODE	512
	192	2152 Expansion module 1 input A name string	UNICODE	UNICODE	512
	224	2152 Expansion module 1 input B name string	UNICODE	UNICODE	512
42	0	2152 Expansion module 1 input C name string	UNICODE	UNICODE	512
	32	2152 Expansion module 1 input D name string	UNICODE	UNICODE	512
	64	2152 Expansion module 1 input E name string	UNICODE	UNICODE	512
	96	2152 Expansion module 1 input F name string	UNICODE	UNICODE	512
	128	2152 Expansion module 2 input A name string	UNICODE	UNICODE	512
	160	2152 Expansion module 2 input B name string	UNICODE	UNICODE	512
	192	2152 Expansion module 2 input C name string	UNICODE	UNICODE	512
	224	2152 Expansion module 2 input D name string	UNICODE	UNICODE	512
43	0	2152 Expansion module 2 input E name string	UNICODE	UNICODE	512
	32	2152 Expansion module 2 input F name string	UNICODE	UNICODE	512
	64	2152 Expansion module 3 input A name string	UNICODE	UNICODE	512
	96	2152 Expansion module 3 input B name string	UNICODE	UNICODE	512
	128	2152 Expansion module 3 input C name string	UNICODE	UNICODE	512
	160	2152 Expansion module 3 input D name string	UNICODE	UNICODE	512
	192	2152 Expansion module 3 input E name string	UNICODE	UNICODE	512
	224	2152 Expansion module 3 input F name string	UNICODE	UNICODE	512

10.33 Pages 44-48 - 2131 Expansion module digital alarm strings

1. These registers provide the user defined alarm names of each channel of each expansion module when configured as a digital input.
2. These pages are implemented on the 72xx/73xx, 8xxx/74xx, 74xx MKIIand later families and replace the alarm strings from the old alarm system.

Page	Register offset	Name	Minimum value	Maximum value	Bits
44	0	2131 Expansion module 0 digital input A string	UNICODE	UNICODE	512
	32	2131 Expansion module 0 digital input B string	UNICODE	UNICODE	512
	64	2131 Expansion module 0 digital input C string	UNICODE	UNICODE	512
	96	2131 Expansion module 0 digital input D string	UNICODE	UNICODE	512
	128	2131 Expansion module 0 digital input E string	UNICODE	UNICODE	512
	160	2131 Expansion module 0 digital input F string	UNICODE	UNICODE	512
	192	2131 Expansion module 0 digital input G String	UNICODE	UNICODE	512
	224	2131 Expansion module 0 digital input H string	UNICODE	UNICODE	512
45	0	2131 Expansion module 0 digital input I string	UNICODE	UNICODE	512
	32	2131 Expansion module 0 digital input J string	UNICODE	UNICODE	512
	64	2131 Expansion module 1 digital input A string	UNICODE	UNICODE	512
	96	2131 Expansion module 1 digital input B string	UNICODE	UNICODE	512
	128	2131 Expansion module 1 digital input C string	UNICODE	UNICODE	512
	160	2131 Expansion module 1 digital input D string	UNICODE	UNICODE	512
	192	2131 Expansion module 1 digital input E string	UNICODE	UNICODE	512
	224	2131 Expansion module 1 digital input F string	UNICODE	UNICODE	512
46	0	2131 Expansion module 1 digital input G string	UNICODE	UNICODE	512
	32	2131 Expansion module 1 digital input H string	UNICODE	UNICODE	512
	64	2131 Expansion module 1 digital input I string	UNICODE	UNICODE	512
	96	2131 Expansion module 1 digital input J string	UNICODE	UNICODE	512
	128	2131 Expansion module 2 digital input A string	UNICODE	UNICODE	512
	160	2131 Expansion module 2 digital input B string	UNICODE	UNICODE	512
	192	2131 Expansion module 2 digital input C string	UNICODE	UNICODE	512
	224	2131 Expansion module 2 digital input D string	UNICODE	UNICODE	512
47	0	2131 Expansion module 2 digital input E string	UNICODE	UNICODE	512
	32	2131 Expansion module 2 digital input F string	UNICODE	UNICODE	512
	64	2131 Expansion module 2 digital input G string	UNICODE	UNICODE	512
	96	2131 Expansion module 2 digital input H string	UNICODE	UNICODE	512
	128	2131 Expansion module 2 digital input I string	UNICODE	UNICODE	512
	160	2131 Expansion module 2 digital input J string	UNICODE	UNICODE	512
	192	2131 Expansion module 3 digital input A string	UNICODE	UNICODE	512
	224	2131 Expansion module 3 digital input B string	UNICODE	UNICODE	512
48	0	2131 Expansion module 3 digital input C string	UNICODE	UNICODE	512
	32	2131 Expansion module 3 digital input D string	UNICODE	UNICODE	512
	64	2131 Expansion module 3 digital input E string	UNICODE	UNICODE	512
	96	2131 Expansion module 3 digital input F string	UNICODE	UNICODE	512
	128	2131 Expansion module 3 digital input G string	UNICODE	UNICODE	512
	160	2131 Expansion module 3 digital input H string	UNICODE	UNICODE	512
	192	2131 Expansion module 3 digital input I string	UNICODE	UNICODE	512
	224	2131 Expansion module 3 digital input J string	UNICODE	UNICODE	512

10.34 Pages 49-58 - 2131 Expansion module analogue alarm strings

1. These registers provide the user defined alarm names of each channel of each expansion module when configured as an analogue input.
2. These pages are implemented on the 72xx/73xx, 8xxx/74xx, 74xx MKIIand later families and replace the alarm strings from the old alarm system.

Page	Register offset	Name	Minimum value	Maximum value	Bits
49	0	2131 Expansion module 0 input A (low) string	UNICODE	UNICODE	512
	32	2131 Expansion module 0 input A (high) string	UNICODE	UNICODE	512
	64	2131 Expansion module 0 input B (low) string	UNICODE	UNICODE	512
	96	2131 Expansion module 0 input B (high) string	UNICODE	UNICODE	512
	128	2131 Expansion module 0 input C (low) string	UNICODE	UNICODE	512
	160	2131 Expansion module 0 input C (high) string	UNICODE	UNICODE	512
	192	2131 Expansion module 0 input D (low) string	UNICODE	UNICODE	512
	224	2131 Expansion module 0 input D (high) string	UNICODE	UNICODE	512
50	0	2131 Expansion module 0 input E (low) string	UNICODE	UNICODE	512
	32	2131 Expansion module 0 input E (high) string	UNICODE	UNICODE	512
	64	2131 Expansion module 0 input F (low) string	UNICODE	UNICODE	512
	96	2131 Expansion module 0 input F (high) string	UNICODE	UNICODE	512
	128	2131 Expansion module 0 input G (low) string	UNICODE	UNICODE	512
	160	2131 Expansion module 0 input G (high) string	UNICODE	UNICODE	512
	192	2131 Expansion module 0 input H (low) string	UNICODE	UNICODE	512
	224	2131 Expansion module 0 input H (high) string	UNICODE	UNICODE	512
51	0	2131 Expansion module 0 input I (low) string	UNICODE	UNICODE	512
	32	2131 Expansion module 0 input I (high) string	UNICODE	UNICODE	512
	64	2131 Expansion module 0 input J (low) string	UNICODE	UNICODE	512
	96	2131 Expansion module 0 input J (high) string	UNICODE	UNICODE	512
	128	2131 Expansion module 1 input A (low) string	UNICODE	UNICODE	512
	160	2131 Expansion module 1 input A (high) string	UNICODE	UNICODE	512
	192	2131 Expansion module 1 input B (low) string	UNICODE	UNICODE	512
	224	2131 Expansion module 1 input B (high) string	UNICODE	UNICODE	512
52	0	2131 Expansion module 1 input C (low) string	UNICODE	UNICODE	512
	32	2131 Expansion module 1 input C (high) string	UNICODE	UNICODE	512
	64	2131 Expansion module 1 input D (low) string	UNICODE	UNICODE	512
	96	2131 Expansion module 1 input D (high) string	UNICODE	UNICODE	512
	128	2131 Expansion module 1 input E (low) string	UNICODE	UNICODE	512
	160	2131 Expansion module 1 input E (high) string	UNICODE	UNICODE	512
	192	2131 Expansion module 1 input F (low) string	UNICODE	UNICODE	512
	224	2131 Expansion module 1 input F (high) string	UNICODE	UNICODE	512
53	0	2131 Expansion module 1 input G (low) string	UNICODE	UNICODE	512
	32	2131 Expansion module 1 input G (high) string	UNICODE	UNICODE	512
	64	2131 Expansion module 1 input H (low) string	UNICODE	UNICODE	512
	96	2131 Expansion module 1 input H (high) string	UNICODE	UNICODE	512
	128	2131 Expansion module 1 input I (low) string	UNICODE	UNICODE	512
	160	2131 Expansion module 1 input I (high) string	UNICODE	UNICODE	512
	192	2131 Expansion module 1 input J (low) string	UNICODE	UNICODE	512
	224	2131 Expansion module 1 input J (high) string	UNICODE	UNICODE	512
54-58		2131 Expansion module 2-3 inputs A-J strings	UNICODE	UNICODE	512

10.35 Pages 59-66 - 2133 Expansion module analogue alarm strings

1. These registers provide the user defined alarm names of each channel of each expansion module when configured as an analogue input.
2. These pages are implemented on the 72xx/73xx, 8xxx/74xx, 74xx MKIIand later families and replace the alarm strings from the old alarm system.

Page	Register offset	Name	Minimum value	Maximum value	Bits
59	0	2133 Expansion module 0 input A (low) string	UNICODE	UNICODE	512
	32	2133 Expansion module 0 input A (high) string	UNICODE	UNICODE	512
	64	2133 Expansion module 0 input B (low) string	UNICODE	UNICODE	512
	96	2133 Expansion module 0 input B (high) string	UNICODE	UNICODE	512
	128	2133 Expansion module 0 input C (low) string	UNICODE	UNICODE	512
	160	2133 Expansion module 0 input C (high) string	UNICODE	UNICODE	512
	192	2133 Expansion module 0 input D (low) string	UNICODE	UNICODE	512
	224	2133 Expansion module 0 input D (high) string	UNICODE	UNICODE	512
60	0	2133 Expansion module 0 input E (low) string	UNICODE	UNICODE	512
	32	2133 Expansion module 0 input E (high) string	UNICODE	UNICODE	512
	64	2133 Expansion module 0 input F (low) string	UNICODE	UNICODE	512
	96	2133 Expansion module 0 input F (high) string	UNICODE	UNICODE	512
	128	2133 Expansion module 0 input G (low) string	UNICODE	UNICODE	512
	160	2133 Expansion module 0 input G (high) string	UNICODE	UNICODE	512
	192	2133 Expansion module 0 input H (low) string	UNICODE	UNICODE	512
	224	2133 Expansion module 0 input H (high) string	UNICODE	UNICODE	512
61-62		2133 Expansion module 1 input A-H strings	UNICODE	UNICODE	512
63-64		2133 Expansion module 2 input A-H strings	UNICODE	UNICODE	512
65-66		2133 Expansion module 3 input A-H strings	UNICODE	UNICODE	512

10.36 Page 67–DSENet Battery Chargercommon alarm strings

1. These registers provide the user defined alarm names of each expansion module when configured and enabled as common shutdown/warning alarms.
2. This page is implemented on the 86xx MKII, and replaces the alarm strings from the old alarm system.

Page	Register offset	Name	Minimum value	Maximum value	Bits
67	0	DSENet charger 0 common shutdown	UNICODE	UNICODE	512
	32	DSENet charger 0 common warning	UNICODE	UNICODE	512
	64	DSENet charger 1 common shutdown	UNICODE	UNICODE	512
	96	DSENet charger 1 common warning	UNICODE	UNICODE	512
	128	DSENet charger 2 common shutdown	UNICODE	UNICODE	512
	160	DSENet charger 2 common warning	UNICODE	UNICODE	512
	192	DSENet charger 3 common shutdown	UNICODE	UNICODE	512
	224	DSENet charger 3 common warning	UNICODE	UNICODE	512

10.37 Page 70 – Extended PLC Stores

1. This page returns the value of the extended plc stores.
2. This page is implemented on the 73xx MKII, 74xx MKII and the 86xx MKII andreplaces the plc stores in page 192.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
0-1	PLC Data store 1	-2147483648	2147483647			32 S	Read/write
2-3	PLC Data store 2	-2147483648	2147483647			32 S	Read/write
4-5	PLC Data store 3	-2147483648	2147483647			32 S	Read/write
6-7	PLC Data store 4	-2147483648	2147483647			32 S	Read/write
8-9	PLC Data store 5	-2147483648	2147483647			32 S	Read/write
10-11	PLC Data store 6	-2147483648	2147483647			32 S	Read/write
12-13	PLC Data store 7	-2147483648	2147483647			32 S	Read/write
14-15	PLC Data store 8	-2147483648	2147483647			32 S	Read/write
16-17	PLC Data store 9	-2147483648	2147483647			32 S	Read/write
18-19	PLC Data store 10	-2147483648	2147483647			32 S	Read/write
20-197	PLC Data store	-2147483648	2147483647			32 S	Read/write
198-199	PLC Data store 100	-2147483648	2147483647			32 S	Read/write
200-255	Reserved					32 S	Read Only

10.38 Page 71 – Extended PLC String

1. This page returns the value of the extended plc strings
2. The reading of strings from this page is different from other most pages in this document.
3. All reads must be function number 03, if more than 1 character is to be read this must be a multi register read.
4. The first register read will select the instrument that is read.
5. After the first register the following registers of a single read will be the contents of that string
6. A new transaction (Modbus) read will return the characters of a different string, indexed by the first register read.
7. Any number of registers can be read, but only the first 32 registers (characters) are implemented, further or unused charactes will be returned as space ‘ ‘
8. To read a character part way through the string, the string must be read starting at the register that indexs that string.
9. This page is implemented for the 86xx MKII v7.0, 73xx / 74xx MkII v7.0

Read Register offset	Name	String length	Minimum value	Maximum value	Bits	Read/write
0	PLC String 1	32	UNICODE	UNICODE	512	Read only
1	PLC String 2	32	UNICODE	UNICODE	512	Read only
2	PLC String 3	32	UNICODE	UNICODE	512	Read only
3	PLC String 4	32	UNICODE	UNICODE	512	Read only
4	PLC String 5	32	UNICODE	UNICODE	512	Read only
5	PLC String 6	32	UNICODE	UNICODE	512	Read only
6	PLC String 7	32	UNICODE	UNICODE	512	Read only
7	PLC String 8	32	UNICODE	UNICODE	512	Read only
8	PLC String 9	32	UNICODE	UNICODE	512	Read only
9	PLC String 10	32	UNICODE	UNICODE	512	Read only
10	PLC String 11	32	UNICODE	UNICODE	512	Read only
11	PLC String 12	32	UNICODE	UNICODE	512	Read only
12	PLC String 13	32	UNICODE	UNICODE	512	Read only
13	PLC String 14	32	UNICODE	UNICODE	512	Read only
14	PLC String 15	32	UNICODE	UNICODE	512	Read only
15	PLC String 16	32	UNICODE	UNICODE	512	Read only
16	PLC String 17	32	UNICODE	UNICODE	512	Read only
17	PLC String 18	32	UNICODE	UNICODE	512	Read only
18	PLC String 19	32	UNICODE	UNICODE	512	Read only
19	PLC String 20	32	UNICODE	UNICODE	512	Read only
20	PLC String 21	32	UNICODE	UNICODE	512	Read only
21	PLC String 22	32	UNICODE	UNICODE	512	Read only
22	PLC String 23	32	UNICODE	UNICODE	512	Read only
23	PLC String 24	32	UNICODE	UNICODE	512	Read only
24	PLC String 25	32	UNICODE	UNICODE	512	Read only
25	PLC String 26	32	UNICODE	UNICODE	512	Read only
26	PLC String 27	32	UNICODE	UNICODE	512	Read only
27	PLC String 28	32	UNICODE	UNICODE	512	Read only
28	PLC String 29	32	UNICODE	UNICODE	512	Read only
29	PLC String 30	32	UNICODE	UNICODE	512	Read only
30	PLC String 31	32	UNICODE	UNICODE	512	Read only
31	PLC String 32	32	UNICODE	UNICODE	512	Read only
32	PLC String 33	32	UNICODE	UNICODE	512	Read only
33	PLC String 34	32	UNICODE	UNICODE	512	Read only
34	PLC String 35	32	UNICODE	UNICODE	512	Read only
35	PLC String 36	32	UNICODE	UNICODE	512	Read only
36	PLC String 37	32	UNICODE	UNICODE	512	Read only
37	PLC String 38	32	UNICODE	UNICODE	512	Read only
38	PLC String 39	32	UNICODE	UNICODE	512	Read only
39	PLC String 40	32	UNICODE	UNICODE	512	Read only
40	PLC String 41	32	UNICODE	UNICODE	512	Read only
41	PLC String 42	32	UNICODE	UNICODE	512	Read only
42	PLC String 43	32	UNICODE	UNICODE	512	Read only
43	PLC String 44	32	UNICODE	UNICODE	512	Read only
44	PLC String 45	32	UNICODE	UNICODE	512	Read only
45	PLC String 46	32	UNICODE	UNICODE	512	Read only
46	PLC String 47	32	UNICODE	UNICODE	512	Read only
47	PLC String 48	32	UNICODE	UNICODE	512	Read only
48	PLC String 49	32	UNICODE	UNICODE	512	Read only
49	PLC String 50	32	UNICODE	UNICODE	512	Read only

10.39 Page 72 – Extended PLC Registers

1. This page returns the value of the extended plc registers.
2. This page is implemented on the 73xx MKII, 74xx MKII and the 86xx MKII andreplaces the plc registers in page 192.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
0-1	PLC Data Register 1	-2147483648	2147483647			32 S	Read Only
2-3	PLC Data Register 2	-2147483648	2147483647			32 S	Read Only
4-5	PLC Data Register 3	-2147483648	2147483647			32 S	Read Only
6-7	PLC Data Register 4	-2147483648	2147483647			32 S	Read Only
8-9	PLC Data Register 5	-2147483648	2147483647			32 S	Read Only
10-11	PLC Data Register 6	-2147483648	2147483647			32 S	Read Only
12-13	PLC Data Register 7	-2147483648	2147483647			32 S	Read Only
14-15	PLC Data Register 8	-2147483648	2147483647			32 S	Read Only
16-17	PLC Data Register 9	-2147483648	2147483647			32 S	Read Only
18-19	PLC Data Register 10	-2147483648	2147483647			32 S	Read Only
20-197	PLC Data Register	-2147483648	2147483647			32 S	Read Only
198-199	PLC Data Register 100	-2147483648	2147483647			32 S	Read Only
200-255	Reserved					32 S	Read Only

10.40 Page 73 – Extended PLC Flag

1. This page returns the value of the extended plc flags.
2. This page is implemented for the 86xx MKII v7.0, 73xx / 74xx MkII v7.0

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
0	PLC Flag value 1	0	1			16	Read Only
1	PLC Flag value 2	0	1			16	Read Only
2	PLC Flag value 3	0	1			16	Read Only
3	PLC Flag value 4	0	1			16	Read Only
4	PLC Flag value 5	0	1			16	Read Only
5	PLC Flag value 6	0	1			16	Read Only
6	PLC Flag value 7	0	1			16	Read Only
7	PLC Flag value 8	0	1			16	Read Only
8	PLC Flag value 9	0	1			16	Read Only
9	PLC Flag value 10	0	1			16	Read Only
	PLC Flag value	0	1			16	Read Only
49	PLC Flagvalue 50	0	1			16	Read Only
100-255	Reserved					16	Read Only

10.41 Page 74 – Extended PLC Timers

1. This page returns the value of the extended plc timers.
2. This page is implemented on the 73xx / 74xx MKII and the 86xx MKII andreplaces the plc timers in page 192.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
0-1	PLC Timer value 1	0	864000	0.1	s	32 S	Read Only
2-3	PLC Timer value 2	0	864000	0.1	s	32 S	Read Only
4-5	PLC Timer value 3	0	864000	0.1	s	32 S	Read Only
6-7	PLC Timer value 4	0	864000	0.1	s	32 S	Read Only
8-9	PLC Timer value 5	0	864000	0.1	s	32 S	Read Only
10-11	PLC Timer value 6	0	864000	0.1	s	32 S	Read Only
12-13	PLC Timer value 7	0	864000	0.1	s	32 S	Read Only
14-15	PLC Timer value 8	0	864000	0.1	s	32 S	Read Only
16-17	PLC Timer value 9	0	864000	0.1	s	32 S	Read Only
18-19	PLC Timer value 10	0	864000	0.1	s	32 S	Read Only
20-97	PLC Timer value	0	864000	0.1	s	32 S	Read Only
98-99	PLC Timer value 50	0	864000	0.1	s	32 S	Read Only
100-101	PLC Timer initial value 1	0	864000	0.1	s	32 S	Read Only
102-103	PLC Timer initial value 2	0	864000	0.1	s	32 S	Read Only
104-105	PLC Timer initial value 3	0	864000	0.1	s	32 S	Read Only
106-107	PLC Timer initial value 4	0	864000	0.1	s	32 S	Read Only
108-109	PLC Timer initial value 5	0	864000	0.1	s	32 S	Read Only
110-111	PLC Timer initial value 6	0	864000	0.1	s	32 S	Read Only
112-113	PLC Timer initial value 7	0	864000	0.1	s	32 S	Read Only
114-115	PLC Timer initial value 8	0	864000	0.1	s	32 S	Read Only
116-117	PLC Timer initial value 9	0	864000	0.1	s	32 S	Read Only
118-119	PLC Timer initial value 10	0	864000	0.1	s	32 S	Read Only
120-197	PLC Timer initial value	0	864000	0.1	s	32 S	Read Only
198-199	PLC Timer initial value 50	0	864000	0.1	s	32 S	Read Only
200-255	Reserved						

10.42 Page 76 – Extended PLC Counters

3. This page returns the value of the extended plc counters.
4. This page is implemented on the 73xx / 74xx MKII and the 86xx MKII andreplaces the plc counters in page 192.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
0-1	PLC Counter value 1	0	999 999			32 S	Read Only
2-3	PLC Counter value 2	0	999 999			32 S	Read Only
4-5	PLC Counter value 3	0	999 999			32 S	Read Only
6-7	PLC Counter value 4	0	999 999			32 S	Read Only
8-9	PLC Counter value 5	0	999 999			32 S	Read Only
10-11	PLC Counter value 6	0	999 999			32 S	Read Only
12-13	PLC Counter value 7	0	999 999			32 S	Read Only
14-15	PLC Counter value 8	0	999 999			32 S	Read Only
16-17	PLC Counter value 9	0	999 999			32 S	Read Only
18-19	PLC Counter value 10	0	999 999			32 S	Read Only
20-97	PLC Counter value	0	999 999			32 S	Read Only
98-99	PLC Counter value 50	0	999 999			32 S	Read Only
100-101	PLC Counter initial value 1	0	999 999			32 S	Read Only
102-103	PLC Counter initial value 2	0	999 999			32 S	Read Only
104-105	PLC Counter initial value 3	0	999 999			32 S	Read Only
106-107	PLC Counter initial value 4	0	999 999			32 S	Read Only
108-109	PLC Counter initial value 5	0	999 999			32 S	Read Only
110-111	PLC Counter initial value 6	0	999 999			32 S	Read Only
112-113	PLC Counter initial value 7	0	999 999			32 S	Read Only
114-115	PLC Counter initial value 8	0	999 999			32 S	Read Only
116-117	PLC Counter initial value 9	0	999 999			32 S	Read Only
118-119	PLC Counter initial value 10	0	999 999			32 S	Read Only
120-197	PLC Counter initial value	0	999 999			32 S	Read Only
198-199	PLC Counter initial value 50	0	999 999			32 S	Read Only
200-255	Reserved						

10.43 Page 130 – 86xx New MTS Test support

This applies to 86xx modules from v6.

For details see other GENCOMM documentation (not for Customer use)

10.44 Page 135 –Reserved, do not allocate

10.45 Page 137 - Active Speed Control, Voltage Control and load share configuration

1. These registers may be individually read and written at any time.
2. Registers 36/37 were previously defined as unsigned but a mains controller has always had the option to set negative power so these now reflect their true nature.
3. Registers 83-85 and 115-117 were used regardless of whether the set was in mains parallel on an 86xx MKII up to V4. From V5 these registers are only used when NOT in mains parallel mode and registers 86-88 and 118-120 are used when in mains parallel.
4. On an 86xx MKII from V5, when a value is written to a writeable register that is greater than the maximum value, the maximum value will be written into the register and no exception will be returned.
5. On an 86xx MKII from V5, when a value is written to a writeable register that is lower than the minimum value, the minimum value will be written into the register and no exception will be returned.

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign	Read/Write
	Local bus control (CAN port 0)						
0-31	Reserved, do not allocate	0	0			16	Read/Write
	Miscellaneous						
32	Generating set run priority	1	32	1	1	16	Read/Write
33	Frequency control offset	0	1.0	0.01	Hz	16	Read/Write
34	Reserved, do not allocate	0	0			16	Read/Write
35	Reserved, do not allocate	0	0			16	Read/Write
36	Load level setting (minimum)	-100	100	1	%	16 S	Read/Write
37	Load level setting (maximum)	-100	100	1	%	16 S	Read/Write
38	Reserved	0	0			16S	Read/Write
39	VAr level setting (maximum)	-100	100	1	%	16 S	Read/Write
40	Bus / Mains load setting	Bus	Mains			16	Read/Write
41	Internal governor IF gain	0	10	0.001	V	16	Read/Write
42	Internal governor IF offset	-10	10	0.001	V	16 S	Read/Write
43	Internal AVR IF gain	0	10	0.001	V	16	Read/Write
44	Internal AVR IF offset	-10	10	0.001	V	16 S	Read/Write
45	Commissioning screens enable flag	0 (no)	1 (yes)			16	Read/Write
46-47	Reserved	0	0			16	Read/Write
	Frequency synchroniser						
48	Reserved	0	0			16	Read/Write
49	Relay pulse rate	0.1	2.5	0.01	Hz	16	Read/Write
50	Relay pulse length	0.1	1.6	0.1	Sec	16	Read/Write
51	Reserved						
52	Compensation (integral gain)	0	100	1	%	16	Read/Write
52-63	Reserved						
	Phase synchroniser						
64-77	Reserved	0	0			16	Read/Write
78	Cummins CM850 Governor gain	0	63.999	0.1		16	Read/Write
79	Reserved	0	0			16	Read/Write
	Load share						
80	Reserved	0	0			16	Read/Write
81	Relay pulse rate	0.1	2.5	0.01	Hz	16	Read/Write
82	Relay pulse length	0.1	1.6	0.1	Sec	16	Read/Write
83	Proportional gain – NOT mains parallel	0	100	1		16	Read/Write
84	Integral gain – NOT mains parallel	0	100	1		16	Read/Write
85	Derivative gain – NOT mains parallel	0	100	1		16	Read/Write
86	Proportional gain – mains parallel	0	100	1		16	Read/Write
87	Integral gain – mains parallel	0	100	1		16	Read/Write
88	Derivative gain – mains parallel	0	100	1		16	Read/Write
89	Unimplemented						
90	Power control mode (see below)	0	2			16	Read/Write
91	Current power target	-100.0	+100.0	0.1	%	16S	Read Only
92-95	Reserved						
	Voltage matcher						
96	Reserved	0	0			16	Read/Write

97	Relay pulse rate	0.1	2.5	0.01	Hz	16	Read/Write
98	Relay pulse length	0.1	1.6	0.1	Sec	16	Read/Write
99	Reserved						
100	Compensation (integral gain)	0	100	1	%	16	Read/Write
101-111	Reserved						
	Reactive load control						
112	Reserved	0	0			16	Read/Write
113	Relay pulse rate	0.1	2.5	0.01	Hz	16	Read/Write
114	Relay pulse length	0.1	1.6	0.1	Sec	16	Read/Write
115	Proportional gain – NOT mains parallel	0	100	1	%	16	Read/Write
116	Integral gain – NOT mains parallel	0	100	1		16	Read/Write
117	Derivative gain – NOT mains parallel	0	100	1		16	Read/Write
118	Proportional gain – mains parallel	0	100	1		16	Read/Write
119	Integral gain – mains parallel	0	100	1		16	Read/Write
120	Derivative gain – mains parallel	0	100	1		16	Read/Write
121	Unimplemented						
122	Power factor setting	-1.00	+1.00	0.01		16s	Read/Write
123	Reactive power control mode (see below)	0	3			16	Read/Write
124	Current reactive power target	-100.0	+100.0	0.1	%	16S	Read Only
125	Current power factor target	-1.00	+1.00	0.01		16S	Read Only
125-127	Reserved						
	Manual frequency trim						
128	Manual frequency trim	-5.0	5.0	0.1	Hz	16S	Read/Write
129	Minimum frequency trim	-5.0	5.0	0.1	Hz	16S	Read
130	Maximum frequency trim	-5.0	5.0	0.1	Hz	16S	Read
131-141	Reserved						
	Generator Nominal						
142-143	Nominal voltage	53	357	1	V	32	Read only
144	Nominal voltage nudge	-1	1	1		16s	Write only
145	Nominal frequency	0.3	74.7	0.1	Hz	16	Read only
146	Nominal frequency nudge	-1	1	1		16s	Write only
	Current Limit						
147	Reserved						
148	Reserved						
149	Current limit	0	5000	1	A	16s	R/W
150-159	Reserved						
	Modbus Gateway						
160	DSENet Battery charger 0 Modbus ID	0	247			16	Read only
161	DSENet Battery charger 1 Modbus ID	0	247			16	Read only
162	DSENet Battery charger 2 Modbus ID	0	247			16	Read only
163	DSENet Battery charger 3 Modbus ID	0	247			16	Read only
164-7	Unimplemented					16	Read only
	Load share ramp rates						
168	Ramp on rate	0.0	100.0	0.1	%	16	Read only
169	Ramp off rate	0.0	100.0	0.1	%	16	Write only
170	Reactive power setpoint change ramp rate	0.0	100.0.	0.1	%	16	Read only
171	Real power setpoint change ramp rate	0.0	100.0	0.1	%	16	Write only
172	Reserved, do not allocate	0	100.0	0.1	%	16	Read / Write
173	Reserved, do not allocate	0	100.0	0.1	%	16	Read / Write
	Governor Droop						
174	Droop curve max (of nominal)	90.00	110.00	0.01	%	16	Read only
175	Droop curve min (of nominal)	90.00	110.00	0.01	%	16	Read only
176	Droop graph gradient	-20.0000	0.0000	0.0001		32s	Read only
178	Graph offset (% of nominal)	-20.00	+20.00	0.01	%	16s	Read / Write
179	Ramp Rate	0.1	100.0	0.1	%	16	Read / Write
180	Proportional gain	0	100	1	%	16	Read / Write
181	Integral gain	0	100	1	%	16	Read / Write
182	Unimplemented					16	Read / Write
183	Droop %	0	100.00	0.01	%	16	Read Only
184	Droop graph y intercept	0	110.00	0.01	%	16	Read Only
185-7	Unimplemented						

	AVR Droop						
188	Droop curve max (of nominal)	90.00	110.00	0.01	%	16	Read only
189	Droop curve min (of nominal)	90.00	110.00	0.01	%	16	Read only
190	Droop graph gradient	-20.0000	0.0000	0.0001		32s	Read only
192	Graph offset (% of nominal)	-20.00	+20.00	0.01	%	16s	Read / Write
193	Ramp Rate	0.1	100.0	0.1	%	16	Read / Write
194	Proportional gain	0	100	1	%	16	Read / Write
195	Integral gain	0	100	1	%	16	Read / Write
196	Unimplemented	0	100	1	%	16	Read / Write
197	Droop %	0	100.00	0.01	%	16	Read Only
198	Droop graph y intercept	0	110.00	0.01	%	16	Read Only
199-201	Unimplemented						
	De-Rating						
202	Power de-rating setting	0	100	1	%	16	Read / Write
203	Current de-rated power percentage	0	100	1	%	16	Read Only
204-205	Configured power rating	0	99,999	1	kW	32	Read Only
206-207	Current de-rated power rating	0	99,999	1	kW	32	Read Only
208	Power de-rating source	0				16	Read Only
209	Unimplemented					16	
210	Reactive power de-rating	0	100	1	%	16	Read / Write
211	Current de-rated reactive power percentage	0	100	1	%	16	Read Only
212-213	Configured reactive power rating	0	99,999	1	kVAr	32	Read Only
214-215	Current de-rated reactive power rating	0	99,999	1	kVAr	32	Read Only
216	Reactive power de-rating source	0				16	Read Only
217	Unimplemented					16	
218-255	Reserved, do not allocate						

De-rating sources (applies to both power and reactive power)

Code	**Source**
0	None
1	GenComm register
2-	Reserved

Exxx variation from the above

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign	Read/Write
147	Target Speed	0	8000	1	RPM	16	Read/Write
148-150	Reserved						
151	P gain	0	100.0	0.1		16	Read/Write
152	I gain	0	100.0	0.1		16	Read/Write
153	D gain	0	100.0	0.1		16	Read/Write
154	Set point					s16	Read/Write
155	Set point minimum					s16	Read only
156	Set point maximum					s16	Read only
157	Control source value					s16	Read only
158	Control source– Unit ID	See Unit ID table below				16	Read only
159	Control source- Multiplier	-128	127			16 S	Read only
160	Control source- Precision	0	65535			16	Read only
161	Control source– Range Min	-32750	32750			16 S	Read only
162	Control source– Range Max	-32750	32750			16 S	Read only
163-172	Control source– Suffix	UNICODE	UNICODE			160	Read only
173	Display Units	See Display Units table below				16	Read only
174	Set Point Target Source	See Set Point Target Source table below				16	Read only
175-255	Reserved						

Reactive power control mode	Description
0	Constant Power Factor mode
1	Voltage-Reactive Power mode
2	Power-Power Factor mode
3	Constant Reactive Power mode
4-	Reserved

Power control mode	Description
0	Constant power mode
1	Frequency-Power mode
2	Voltage-Power Mode
3-	Reserved

Control Sensor - Unit ID	
Value	**Meaning**
0	Not used
1	Temperature
2	Pressure
3	Percentage
0xFFFE	Digital Input
0xFFFF	User Defined

		Unit Id	
		1 (Temperature Sensor)	**2 (Pressure Sensor)**
Display Units	0	ºC	kPa
	1	ºF	Bar
	2	N/A	PSI

Exxx Reg 174 Set Point Target Source	
Value	**Meaning**
0	Specified Value
256	PLC Store 0
…	…
263	PLC Store 7
512	PLC Register 0
…	…
531	PLC Register 19
65535	Not Used

10.46 Page 138 – Active Speed Control, Voltage Control and load share configuration Continued

Page 137 Registers 86xx

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign	Read/Write
	Miscellaneous						
0	Synclock Timer	0	50	1	1	16	Read Only
1-255	Reserved						

10.47 Page 142 – ECU Trouble Codes

1. Reading register 0 effectively latches a copy of the trouble code list at that time and so allows the list to be read without risk of the contents changing until register 0 is re-read. This also applies to reading the short descriptive strings for the trouble codes (see following pages), so that the list of trouble codes can be read in one or more sections and then the associated strings read as needed. To see any updates to the list, the PC needs to re-read register 0 and so latch the list once more.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
0	Number of trouble codes	0	50			16	Read only
1	Amber warning lamp status	0	1			1/16	Read only
	Red stop lamp status	0	1			2/16	Read only
	Reserved for SAE assignment					3-16/16	Read only
2-5	Trouble Code 1					64	Read only
6-9	Trouble Code 2					64	Read only
10-13	Trouble Code 3					64	Read only
14-201	Trouble Codes 4-50						Read only
202-255	Reserved						Read only

Trouble code format

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0--1	Trouble code value	0	524287			9-32/32
	Additional trouble code status	0	255			1-8/32
2	Engine type code	0	31			16
3	reserved	0	0			16

10.48 Pages 143-149 – ECU Trouble Code short description string

1. Each short description string is provided with 32x 16 bit registers, one Unicode-16 character in each register. The order of the strings is directly related to the trouble code number position in the list, so trouble code 1 from page 142 will occupy registers 0-31 in page 143, trouble code 2 will occupy registers 32-63 and so on.

2. For now, only page 143 has been implemented to prove the idea, but if it's acceptable then the extra 6 pages to support a maximum of 50 trouble code strings can be added.

3. A point for discussion is whether we need to add similar look-up facilities for the additional trouble code status strings (FMI for J1939 errors, ACTIVE/PASSIVE indication for Keyword 2000 ECUs etc) for the cases where the PC software isn't able to locate the required engine module strings on disc as this would require another 7 GenComm pages to provide the look-up for all 50 entries in the list.

4. The reading of the strings is only required when the PC doesn't have access to its own long version of the strings (such as when the PC doesn't have the equivalent engine module on disc). The contents of the trouble code list is "frozen" when page 142 register 0 is read so that the PC can read all the trouble code list entries and any strings without the list changing.

10.49 Page 152 – User calibration of expansion module analogue inputs

1. This provides a similar interface to page 132 but for DSENet expansion modules.
2. The 8xxx/74xx family now supports 4x 2130, 10x 2157, 10x 2548, 4x 2131, 4x 2133 and 4x 2152.
3. The 335 module supports 2x 2130, 2x 2157, 2x 2548
4. No provision is made for more than these quantities of each type.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
0-1	2130 Expansion Module 0 input E user scale	0	200	0.1	%	32	Read / write
2-3	2130 Expansion Module 0 input F user scale	0	200	0.1	%	32	Read / write
4-5	2130 Expansion Module 0 input G user scale	0	200	0.1	%	32	Read / write
6-7	2130 Expansion Module 0 input H user scale	0	200	0.1	%	32	Read / write
8-15	2130 Expansion Module 1 inputs E-H user scale						Read / write
16-23	2130 Expansion Module 2 inputs E-H user scale						Read / write
24-31	2130 Expansion Module 3 inputs E-H user scale						Read / write
32-33	2131 Expansion Module 0 input A user scale	0	200	0.1	%	32	Read / write
34-35	2131 Expansion Module 0 input B user scale	0	200	0.1	%	32	Read / write
36-37	2131 Expansion Module 0 input C user scale	0	200	0.1	%	32	Read / write
38-39	2131 Expansion Module 0 input D user scale	0	200	0.1	%	32	Read / write
40-41	2131 Expansion Module 0 input E user scale	0	200	0.1	%	32	Read / write
42-43	2131 Expansion Module 0 input F user scale	0	200	0.1	%	32	Read / write
44-45	2131 Expansion Module 0 input G user scale	0	200	0.1	%	32	Read / write
46-47	2131 Expansion Module 0 input H user scale	0	200	0.1	%	32	Read / write
48-49	2131 Expansion Module 0 input I user scale	0	200	0.1	%	32	Read / write
50-51	2131 Expansion Module 0 input J user scale	0	200	0.1	%	32	Read / write
52-71	2131 Expansion Module 1 inputs A-J user scale						Read / write
72-91	2131 Expansion Module 2 inputs A-J user scale						Read / write
92-111	2131 Expansion Module 3 inputs A-J user scale						Read / write
112-113	2133 Expansion Module 0 input A user scale	0	200	0.1	%	32	Read / write
114-115	2133 Expansion Module 0 input B user scale	0	200	0.1	%	32	Read / write
116-117	2133 Expansion Module 0 input C user scale	0	200	0.1	%	32	Read / write
118-119	2133 Expansion Module 0 input D user scale	0	200	0.1	%	32	Read / write
120-121	2133 Expansion Module 0 input E user scale	0	200	0.1	%	32	Read / write
122-123	2133 Expansion Module 0 input F user scale	0	200	0.1	%	32	Read / write
124-125	2133 Expansion Module 0 input G user scale	0	200	0.1	%	32	Read / write
126-127	2133 Expansion Module 0 input H user scale	0	200	0.1	%	32	Read / write
128-143	2133 Expansion Module 1 inputs A-H user scale						Read / write
144-159	2133 Expansion Module 2 inputs A-H user scale						Read / write
160-175	2133 Expansion Module 3 inputs A-H user scale						Read / write
176-255	Reserved						

10.50 Page 153 – Unnamed alarm conditions

1. This indicates to the PC the current condition/status of all the unnamed alarm sources, including expansion modules.
2. Its operation is very similar to that of page 8 registers 128 & upwards except that the maximum number of supported sources has been increased to reflect the much larger number of inputs available.
3. The 8xxx/74xx family now supports 4x 2130, 10x 2157, 10x 2548, 4x 2131, 4x 2133 and 4x 2152.
4. No provision is made for more than these quantities of each type.
5. An alarm that is fitted but disabled by the configuration of the slave device returns code 0.
6. An alarm that is not implemented on a particular control unit returns code 15.
7. An indication that does not require a message to be displayed when inactive returns either code 8 or 10.
8. An indication that does require a message to be displayed when inactive returns either code 9 or 10.
9. 86xx/7410/7420 have 396 unnamed alarms spread over 99 registers => total number of unnamed alarms is 99*4; 7450 has 399 unnamed alarms spread over 100 registers => total number of unnamed alarms is 100*4 (see **8xxx family register allocation)**
10. This page is used in conjunction with pages 160 to 165 and the registers should be in the same order as those pages.
11. The P100 has no unnamed alarms.
12. The E800 has 396 unnamed alarms spread over 99 registers => total number of unnamed alarms is 99*4;
13. 86xx MKII modules have 404 unnamed alarms spread over 101 registers (see **8xxx family register allocation)**
14. The E400 has 228 unnamed alarms spread over 57 registers => total number of unnamed alarms is 57*4

72xx/73xx family register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of unnamed alarm sources	0	256	16
1	Unnamed digital input 1	0	15	13/16-16/16
	Unnamed digital input 2	0	15	9/16-12/16
	Unnamed digital input 3	0	15	5/16-8/16
	Unnamed digital input 4	0	15	1/16-4/16
2	Unnamed digital input 5	0	15	13/16-16/16
	Unnamed digital input 6	0	15	9/16-12/16
	Unnamed digital input 7	0	15	5/16-8/16
	Unnamed digital input 8	0	15	1/16-4/16
3	Unnamed digital input 9 (Flex sender A as digital input)	0	15	13/16-16/16
	Unnamed digital input 10 (Flex sender B as digital input)	0	15	9/16-12/16
	Unnamed digital input 11 (Flex sender C as digital input)	0	15	5/16-8/16
	Unnamed digital input 12 (Flex sender D as digital input)	0	15	1/16-4/16
4	Unnamed digital input 13 (Flex sender E as digital input)	0	15	13/16-16/16
	Unnamed digital input 14 (Flex sender F as digital input)	0	15	9/16-12/16
	Reserved for digital input 11	0	15	5/16-8/16
	Reserved for digital input 12	0	15	1/16-4/16
5	2130 expansion module 0 digital input A	0	15	13/16-16/16
	2130 expansion module 0 digital input B	0	15	9/16-12/16
	2130 expansion module 0 digital input C	0	15	5/16-8/16
	2130 expansion module 0 digital input D	0	15	1/16-4/16
6	2130 expansion module 0 digital input E	0	15	13/16-16/16
	2130 expansion module 0 digital input F	0	15	9/16-12/16
	2130 expansion module 0 digital input G	0	15	5/16-8/16
	2130 expansion module 0 digital input H	0	15	1/16-4/16
7-8	2130 expansion module 1 digital input A-H			
9-10	2130 expansion module 2 digital input A-H			
11-12	2130 expansion module 3 digital input A-H			
13-24	Reserved for expansion modules 4-9			
25	2130 expansion module 0 analogue input E low	0	15	13/16-16/16
	2130 expansion module 0analogue input E high	0	15	9/16-12/16
	2130 expansion module 0analogue input F low	0	15	5/16-8/16
	2130 expansion module 0analogue input F high	0	15	1/16-4/16
26	2130 expansion module 0 analogue input G low	0	15	13/16-16/16
	2130 expansion module 0analogue input G high	0	15	9/16-12/16
	2130 expansion module 0analogue input H low	0	15	5/16-8/16
	2130 expansion module 0analogue input H high	0	15	1/16-4/16
27-28	2130 expansion module 1 analogue inputs E-H			
29-30	2130 expansion module 2 analogue inputs E-H			

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
31-32	2130 expansion module 3 analogue inputs E-H			
33-44	Reserved for 2130 expansion module 4-9 analogue inputs E-H			
45	Internal flexible sender A analogue input low	0	15	13/16-16/16
	Internal flexible sender A analogue input high	0	15	9/16-12/16
	Maintenance alarm 1	0	15	5/16-8/16
	Maintenance alarm 2	0	15	1/16-4/16
46	Maintenance alarm 3	0	15	13/16-16/16
	PLC function 1	0	15	9/16-12/16
	PLC function 2	0	15	5/16-8/16
	PLC function 3	0	15	1/16-4/16
47	PLC function 4	0	15	13/16-16/16
	PLC function 5	0	15	9/16-12/16
	PLC function 6	0	15	5/16-8/16
	PLC function 7	0	15	1/16-4/16
48	PLC function 8	0	15	13/16-16/16
	PLC function 9	0	15	9/16-12/16
	PLC function 10	0	15	5/16-8/16
	PLC function 11	0	15	1/16-4/16
49	PLC function 12	0	15	13/16-16/16
	PLC function 13	0	15	9/16-12/16
	PLC function 14	0	15	5/16-8/16
	PLC function 15	0	15	1/16-4/16
50	PLC function 16	0	15	13/16-16/16
	PLC function 17	0	15	9/16-12/16
	PLC function 18	0	15	5/16-8/16
	PLC function 19	0	15	1/16-4/16
51	PLC function 20	0	15	13/16-16/16
	Internal flexible sender A fault alarm	0	15	9/16-12/16
	Internal flexible sender B analogue input low	0	15	5/16-8/16
	Internal flexible sender B analogue input high	0	15	1/16-4/16
52	Internal flexible sender B fault alarm	0	15	13/16-16/16
	Internal flexible sender C analogue input low	0	15	9/16-12/16
	Internal flexible sender C analogue input high	0	15	5/16-8/16
	Internal flexible sender C fault alarm	0	15	1/16-4/16
53	Internal flexible sender D analogue input low	0	15	13/16-16/16
	Internal flexible sender D analogue input high	0	15	9/16-12/16
	Internal flexible sender D fault alarm	0	15	5/16-8/16
	Internal flexible sender E analogue input low	0	15	1/16-4/16
54	Internal flexible sender E analogue input high	0	15	13/16-16/16
	Internal flexible sender E fault alarm	0	15	9/16-12/16
	Internal flexible sender F analogue input low	0	15	5/16-8/16
	Internal flexible sender F analogue input high	0	15	1/16-4/16
55	Internal flexible sender F fault alarm	0	15	13/16-16/16
	Unimplemented	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
56	2133 expansion module 0 analogue input A low	0	15	13/16-16/16
	2133 expansion module 0analogue input A high	0	15	9/16-12/16
	2133 expansion module 0analogue input B low	0	15	5/16-8/16
	2133 expansion module 0analogue input B high	0	15	1/16-4/16
57	2133 expansion module 0 analogue input C low	0	15	13/16-16/16
	2133 expansion module 0analogue input C high	0	15	9/16-12/16
	2133 expansion module 0analogue input D low	0	15	5/16-8/16
	2133 expansion module 0analogue input D high	0	15	1/16-4/16
58	2133 expansion module 0 analogue input E low	0	15	13/16-16/16
	2133 expansion module 0analogue input E high	0	15	9/16-12/16
	2133 expansion module 0analogue input F low	0	15	5/16-8/16
	2133 expansion module 0analogue input F high	0	15	1/16-4/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
59	2133 expansion module 0 analogue input G low	0	15	13/16-16/16
	2133 expansion module 0analogue input G high	0	15	9/16-12/16
	2133 expansion module 0analogue input H low	0	15	5/16-8/16
	2133 expansion module 0analogue input H high	0	15	1/16-4/16
60–63	2133 expansion module 1 analogue input A – J			
64 - 67	2133 expansion module 2 analogue input A – J			
68 - 71	2133 expansion module 3 analogue input A – J			
72	2131 expansion module 0 analogue input A low	0	15	13/16-16/16
	2131 expansion module 0analogue input A high	0	15	9/16-12/16
	2131 expansion module 0analogue input B low	0	15	5/16-8/16
	2131 expansion module 0analogue input B high	0	15	1/16-4/16
73	2131 expansion module 0 analogue input C low	0	15	13/16-16/16
	2131 expansion module 0analogue input C high	0	15	9/16-12/16
	2131 expansion module 0analogue input D low	0	15	5/16-8/16
	2131 expansion module 0analogue input D high	0	15	1/16-4/16
74	2131 expansion module 0 analogue input E low	0	15	13/16-16/16
	2131 expansion module 0analogue input E high	0	15	9/16-12/16
	2131 expansion module 0analogue input F low	0	15	5/16-8/16
	2131 expansion module 0analogue input F high	0	15	1/16-4/16
75	2131 expansion module 0 analogue input G low	0	15	13/16-16/16
	2131 expansion module 0analogue input G high	0	15	9/16-12/16
	2131 expansion module 0analogue input H low	0	15	5/16-8/16
	2131 expansion module 0analogue input H high	0	15	1/16-4/16
76	2131 expansion module 0 analogue input I low	0	15	13/16-16/16
	2131 expansion module 0analogue input I high	0	15	9/16-12/16
	2131 expansion module 0analogue input J low	0	15	5/16-8/16
	2131 expansion module 0 analogue input J high	0	15	1/16-4/16
77 – 81	2131 expansion module 1 analogue input A – H			
82 – 86	2131 expansion module 2 analogue input A - H			
87 – 91	2131 expansion module 3 analogue input A – H			
92	2131 expansion module 0 digital input A	0	15	13/16-16/16
	2131 expansion module 0 digital input B	0	15	9/16-12/16
	2131 expansion module 0 digital input C	0	15	5/16-8/16
	2131 expansion module 0 digital input D	0	15	1/16-4/16
93	2131 expansion module 0 digital input E	0	15	13/16-16/16
	2131 expansion module 0 digital input F	0	15	9/16-12/16
	2131 expansion module 0 digital input G	0	15	5/16-8/16
	2131 expansion module 0 digital input H	0	15	1/16-4/16
94	2131 expansion module 0 digital input I	0	15	13/16-16/16
	2131 expansion module 0 digital input J	0	15	9/16-12/16
	2131 expansion module 1 digital input A	0	15	5/16-8/16
	2131 expansion module 1 digital input B	0	15	1/16-4/16
95 – 96	2131 expansion module 1 digital input C – H			
97 – 99	2131 expansion module 2 digital input A - H			
99 – 101	2131 expansion module 3 digital input A – H			
102	DSENet Charger 0 Common Shutdown	0	15	13/16-16/16
	DSENet Charger 0 Common Warning	0	15	9/16-12/16
	DSENet Charger1Common Shutdown	0	15	5/16-8/16
	DSENet Charger1Common Warning	0	15	1/16-4/16
103	DSENet Charger2Common Shutdown	0	15	13/16-16/16
	DSENet Charger2Common Warning	0	15	9/16-12/16
	DSENet Charger3Common Shutdown	0	15	5/16-8/16
	DSENet Charger3Common Warning	0	15	1/16-4/16
104	Configurable CAN instrument 1	0	15	13/16-16/16
	Configurable CAN instrument 2	0	15	9/16-12/16
	Configurable CAN instrument 3	0	15	5/16-8/16
	Configurable CAN instrument 4	0	15	1/16-4/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
105	Configurable CAN instrument 5	0	15	13/16-16/16
	Configurable CAN instrument 6	0	15	9/16-12/16
	Configurable CAN instrument 7	0	15	5/16-8/16
	Configurable CAN instrument 8	0	15	1/16-4/16
106	Configurable CAN instrument 9	0	15	13/16-16/16
	Configurable CAN instrument 10	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
107-127	Unimplemented	0	15	16
128-255	Reserved			

8xxxfamily register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of unnamed alarm sources	Note 9	Note 9	16
1	Unnamed digital input 1	0	15	13/16-16/16
	Unnamed digital input 2	0	15	9/16-12/16
	Unnamed digital input 3	0	15	5/16-8/16
	Unnamed digital input 4	0	15	1/16-4/16
2	Unnamed digital input 5	0	15	13/16-16/16
	Unnamed digital input 6	0	15	9/16-12/16
	Unnamed digital input 7	0	15	5/16-8/16
	Unnamed digital input 8	0	15	1/16-4/16
3	Unnamed digital input 9	0	15	13/16-16/16
	Unnamed digital input 10	0	15	9/16-12/16
	Unnamed digital input 11	0	15	5/16-8/16
	Unnamed digital input 12	0	15	1/16-4/16
4	Unimplemented			
5	Analogue Input A (Digital)	0	15	13/16-16/16
	Analogue Input B (Digital)	0	15	9/16-12/16
	Analogue Input C (Digital)	0	15	5/16-8/16
	Analogue Input D (Digital)	0	15	1/16-4/16
6 - 8	Unimplemented			
9	2130 expansion module 0 digital input A	0	15	13/16-16/16
	2130 expansion module 0 digital input B	0	15	9/16-12/16
	2130 expansion module 0 digital input C	0	15	5/16-8/16
	2130 expansion module 0 digital input D	0	15	1/16-4/16
10	2130 expansion module 0 digital input E	0	15	13/16-16/16
	2130 expansion module 0 digital input F	0	15	9/16-12/16
	2130 expansion module 0 digital input G	0	15	5/16-8/16
	2130 expansion module 0 digital input H	0	15	1/16-4/16
11-12	2130 expansion module 1 digital input A-H			
13-14	2130 expansion module 2 digital input A-H			
15-16	2130 expansion module 3 digital input A-H			
17	2131 expansion module 0 digital input A	0	15	13/16-16/16
	2131 expansion module 0 digital input B	0	15	9/16-12/16
	2131 expansion module 0 digital input C	0	15	5/16-8/16
	2131 expansion module 0 digital input D	0	15	1/16-4/16
18	2131 expansion module 0 digital input E	0	15	13/16-16/16
	2131 expansion module 0 digital input F	0	15	9/16-12/16
	2131 expansion module 0 digital input G	0	15	5/16-8/16
	2131 expansion module 0 digital input H	0	15	1/16-4/16
19	2131 expansion module 0 digital input I	0	15	13/16-16/16
	2131 expansion module 0 digital input J	0	15	9/16-12/16
	2131 expansion module 1 digital input A	0	15	5/16-8/16
	2131 expansion module 1 digital input B	0	15	1/16-4/16
20	2131 expansion module 1 digital input C	0	15	13/16-16/16
	2131 expansion module 1 digital input D	0	15	9/16-12/16
	2131 expansion module 1 digital input E	0	15	5/16-8/16
	2131 expansion module 1 digital input F	0	15	1/16-4/16
21	2131 expansion module 1 digital input G	0	15	13/16-16/16
	2131 expansion module 1 digital input H	0	15	9/16-12/16
	2131 expansion module 1 digital input I	0	15	5/16-8/16
	2131 expansion module 1 digital input J	0	15	1/16-4/16
22	2131 expansion module 2 digital input A	0	15	13/16-16/16
	2131 expansion module 2 digital input B	0	15	9/16-12/16
	2131 expansion module 2 digital input C	0	15	5/16-8/16
	2131 expansion module 2 digital input D	0	15	1/16-4/16
23	2131 expansion module 2 digital input E	0	15	13/16-16/16
	2131 expansion module 2 digital input F	0	15	9/16-12/16
	2131 expansion module 2 digital input G	0	15	5/16-8/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
	2131 expansion module 2 digital input H	0	15	1/16-4/16
24	2131 expansion module 2 digital input I	0	15	13/16-16/16
	2131 expansion module 2 digital input J	0	15	9/16-12/16
	2131 expansion module 3 digital input A	0	15	5/16-8/16
	2131 expansion module 3 digital input B	0	15	1/16-4/16
25	2131 expansion module 3 digital input C	0	15	13/16-16/16
	2131 expansion module 3 digital input D	0	15	9/16-12/16
	2131 expansion module 3 digital input E	0	15	5/16-8/16
	2131 expansion module 3 digital input F	0	15	1/16-4/16
26	2131 expansion module 3 digital input G	0	15	13/16-16/16
	2131 expansion module 3 digital input H	0	15	9/16-12/16
	2131 expansion module 3 digital input I	0	15	5/16-8/16
	2131 expansion module 3 digital input J	0	15	1/16-4/16
27-28	Unimplemented	15	15	
29	2130 expansion module 0 analogue input E low	0	15	13/16-16/16
	2130 expansion module 0analogue input E high	0	15	9/16-12/16
	2130 expansion module 0analogue input F low	0	15	5/16-8/16
	2130 expansion module 0analogue input F high	0	15	1/16-4/16
30	2130 expansion module 0 analogue input G low	0	15	13/16-16/16
	2130 expansion module 0analogue input G high	0	15	9/16-12/16
	2130 expansion module 0analogue input H low	0	15	5/16-8/16
	2130 expansion module 0analogue input H high	0	15	1/16-4/16
31-32	2130 expansion module 1 analogue inputs E-H			
33-34	2130 expansion module 2 analogue inputs E-H			
35-36	2130 expansion module 3 analogue inputs E-H			
37-48	Unimplemented			
49	Internal FlexibleSensorAanalogue input low	0	15	13/16-16/16
	Internal FlexibleSensorAanalogue input high	0	15	9/16-12/16
	Internal FlexibleSensorBanalogue input low	0	15	5/16-8/16
	Internal FlexibleSensorBanalogue input high	0	15	1/16-4/16
50	Internal FlexibleSensorCanalogue input low	0	15	13/16-16/16
	Internal FlexibleSensorCanalogue input high	0	15	9/16-12/16
	Internal FlexibleSensorDanalogue input low	0	15	5/16-8/16
	Internal FlexibleSensorDanalogue input high	0	15	1/16-4/16
51	Unimplemented			
	Unimplemented			
	Engine Maintenance alarm 1	0	15	5/16-8/16
	Engine Maintenance alarm 2	0	15	1/16-4/16
52	Engine Maintenance alarm 3	0	15	13/16-16/16
	PLC function 1	0	15	9/16-12/16
	PLC function 2	0	15	5/16-8/16
	PLC function 3	0	15	1/16-4/16
53	PLC function 4	0	15	13/16-16/16
	PLC function 5	0	15	9/16-12/16
	PLC function 6	0	15	5/16-8/16
	PLC function 7	0	15	1/16-4/16
54	PLC function 8	0	15	13/16-16/16
	PLC function 9	0	15	9/16-12/16
	PLC function 10	0	15	5/16-8/16
	PLC function 11	0	15	1/16-4/16
55	PLC function 12	0	15	13/16-16/16
	PLC function 13	0	15	9/16-12/16
	PLC function 14	0	15	5/16-8/16
	PLC function 15	0	15	1/16-4/16
56	PLC function 16	0	15	13/16-16/16
	PLC function 17	0	15	9/16-12/16
	PLC function 18	0	15	5/16-8/16
	PLC function 19	0	15	1/16-4/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
57	PLC function 20	0	15	13/16-16/16
	Low Load	0	15	9/16-12/16
	Unimplemented			
	Unimplemented			
58-63	Unimplemented			
64	2131 expansion module 0 analogue input A low	0	15	13/16-16/16
	2131 expansion module 0analogue input A high	0	15	9/16-12/16
	2131 expansion module 0analogue input B low	0	15	5/16-8/16
	2131 expansion module 0analogue input B high	0	15	1/16-4/16
65	2131 expansion module 0 analogue input C low	0	15	13/16-16/16
	2131 expansion module 0analogue input C high	0	15	9/16-12/16
	2131 expansion module 0analogue input D low	0	15	5/16-8/16
	2131 expansion module 0analogue input D high	0	15	1/16-4/16
66	2131 expansion module 0 analogue input E low	0	15	13/16-16/16
	2131 expansion module 0analogue input E high	0	15	9/16-12/16
	2131 expansion module 0analogue input F low	0	15	5/16-8/16
	2131 expansion module 0analogue input F high	0	15	1/16-4/16
67	2131 expansion module 0 analogue input G low	0	15	13/16-16/16
	2131 expansion module 0analogue input G high	0	15	9/16-12/16
	2131 expansion module 0analogue input H low	0	15	5/16-8/16
	2131 expansion module 0analogue input H high	0	15	1/16-4/16
68	2131 expansion module 0 analogue input I low	0	15	13/16-16/16
	2131 expansion module 0analogue input I high	0	15	9/16-12/16
	2131 expansion module 0analogue input J low	0	15	5/16-8/16
	2131 expansion module 0analogue input J high	0	15	1/16-4/16
69 - 74	2131 expansion module 1 analogue input A – J			
74 - 78	2131 expansion module 2 analogue input A – J			
79 - 83	2131 expansion module 3 analogue input A – J			
84	2133 expansion module 0 analogue input A low	0	15	13/16-16/16
	2133 expansion module 0analogue input A high	0	15	9/16-12/16
	2133 expansion module 0analogue input B low	0	15	5/16-8/16
	2133 expansion module 0analogue input B high	0	15	1/16-4/16
85	2133 expansion module 0 analogue input C low	0	15	13/16-16/16
	2133 expansion module 0analogue input C high	0	15	9/16-12/16
	2133 expansion module 0analogue input D low	0	15	5/16-8/16
	2133 expansion module 0analogue input D high	0	15	1/16-4/16
86	2133 expansion module 0 analogue input E low	0	15	13/16-16/16
	2133 expansion module 0analogue input E high	0	15	9/16-12/16
	2133 expansion module 0analogue input F low	0	15	5/16-8/16
	2133 expansion module 0analogue input F high	0	15	1/16-4/16
87	2133 expansion module 0 analogue input G low	0	15	13/16-16/16
	2133 expansion module 0analogue input G high	0	15	9/16-12/16
	2133 expansion module 0analogue input H low	0	15	5/16-8/16
	2133 expansion module 0analogue input H high	0	15	1/16-4/16
88 – 91	2133 expansion module 1 analogue input A – H			
92 – 95	2133 expansion module 2 analogue input A - H			
96 – 99	2133 expansion module 3 analogue input A – H			
100	Charger ID0 Common Shutdown	0	15	13/16-16/16
	Charger ID0 Common Warning	0	15	9/16-12/16
	Charger ID1 Common Shutdown	0	15	5/16-8/16
	Charger ID1 Common Warning	0	15	1/16-4/16
101	Charger ID2 Common Shutdown	0	15	13/16-16/16
	Charger ID2 Common Warning	0	15	9/16-12/16
	Charger ID3 Common Shutdown	0	15	5/16-8/16
	Charger ID3 Common Warning	0	15	1/16-4/16
102-255	Reserved			

74xx MKII family register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of unnamed alarm sources	0	256	16
1	Unnamed digital input A	0	15	13/16-16/16
	Unnamed digital input B	0	15	9/16-12/16
	Unnamed digital input C	0	15	5/16-8/16
	Unnamed digital input D	0	15	1/16-4/16
2	Unnamed digital input E	0	15	13/16-16/16
	Unnamed digital input F	0	15	9/16-12/16
	Unnamed digital input G	0	15	5/16-8/16
	Unnamed digital input H	0	15	1/16-4/16
3	Flex sender A as digital input	0	15	13/16-16/16
	Flex sender B as digital input	0	15	9/16-12/16
	Flex sender C as digital input	0	15	5/16-8/16
	Flex sender D as digital input	0	15	1/16-4/16
4	Flex sender E as digital input	0	15	13/16-16/16
	Flex sender F as digital input	0	15	9/16-12/16
	Flex sender G as digital input	0	15	5/16-8/16
	Flex sender H as digital input	0	15	1/16-4/16
5	2130 expansion module 0 digital input A	0	15	13/16-16/16
	2130 expansion module 0 digital input B	0	15	9/16-12/16
	2130 expansion module 0 digital input C	0	15	5/16-8/16
	2130 expansion module 0 digital input D	0	15	1/16-4/16
6	2130 expansion module 0 digital input E	0	15	13/16-16/16
	2130 expansion module 0 digital input F	0	15	9/16-12/16
	2130 expansion module 0 digital input G	0	15	5/16-8/16
	2130 expansion module 0 digital input H	0	15	1/16-4/16
7-8	2130 expansion module 1 digital input A-H			
9-10	2130 expansion module 2 digital input A-H			
11-12	2130 expansion module 3 digital input A-H			
13-24	Reserved for expansion modules 4-9			
25	2130 expansion module 0 analogue input E low	0	15	13/16-16/16
	2130 expansion module 0analogue input E high	0	15	9/16-12/16
	2130 expansion module 0analogue input F low	0	15	5/16-8/16
	2130 expansion module 0analogue input F high	0	15	1/16-4/16
26	2130 expansion module 0 analogue input G low	0	15	13/16-16/16
	2130 expansion module 0analogue input G high	0	15	9/16-12/16
	2130 expansion module 0analogue input H low	0	15	5/16-8/16
	2130 expansion module 0analogue input H high	0	15	1/16-4/16
27-28	2130 expansion module 1 analogue inputs E-H			
29-30	2130 expansion module 2 analogue inputs E-H			
31-32	2130 expansion module 3 analogue inputs E-H			
33-44	Unimplemented	15	15	16
45	Internal flexible sender 1 analogue input low	0	15	13/16-16/16
	Internal flexible sender 1 analogue input high	0	15	9/16-12/16
	Engine Maintenance alarm 1	0	15	5/16-8/16
	Engine Maintenance alarm 2	0	15	1/16-4/16
46	Engine Maintenance alarm 3	0	15	13/16-16/16
	PLC function 1	0	15	9/16-12/16
	PLC function 2	0	15	5/16-8/16
	PLC function 3	0	15	1/16-4/16
47	PLC function 4	0	15	13/16-16/16
	PLC function 5	0	15	9/16-12/16
	PLC function 6	0	15	5/16-8/16
	PLC function 7	0	15	1/16-4/16
48	PLC function 8	0	15	13/16-16/16
	PLC function 9	0	15	9/16-12/16
	PLC function 10	0	15	5/16-8/16
	PLC function 11	0	15	1/16-4/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
48	PLC function 12	0	15	13/16-16/16
	PLC function 13	0	15	9/16-12/16
	PLC function 14	0	15	5/16-8/16
	PLC function 15	0	15	1/16-4/16
50	PLC function 16	0	15	13/16-16/16
	PLC function 17	0	15	9/16-12/16
	PLC function 18	0	15	5/16-8/16
	PLC function 19	0	15	1/16-4/16
51	PLC function 20	0	15	13/16-16/16
	Internal flexible sender A fault alarm	0	15	9/16-12/16
	Internal flexible sender B analogue input low	0	15	5/16-8/16
	Internal flexible sender B analogue input high	0	15	1/16-4/16
52	Internal flexible sender B fault alarm	0	15	13/16-16/16
	Internal flexible sender C analogue input low	0	15	9/16-12/16
	Internal flexible sender C analogue input high	0	15	5/16-8/16
	Internal flexible sender C fault alarm	0	15	1/16-4/16
53	Internal flexible sender D analogue input low	0	15	13/16-16/16
	Internal flexible sender D analogue input high	0	15	9/16-12/16
	Internal flexible sender D fault alarm	0	15	5/16-8/16
	Internal flexible sender E analogue input low	0	15	1/16-4/16
54	Internal flexible sender E analogue input high	0	15	13/16-16/16
	Internal flexible sender E fault alarm	0	15	9/16-12/16
	Internal flexible sender F analogue input low	0	15	5/16-8/16
	Internal flexible sender F analogue input high	0	15	1/16-4/16
55	Internal flexible sender F fault alarm	0	15	13/16-16/16
	Unimplemented	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
56	2133 expansion module 0 analogue input A low	0	15	13/16-16/16
	2133 expansion module 0analogue input A high	0	15	9/16-12/16
	2133 expansion module 0analogue input B low	0	15	5/16-8/16
	2133 expansion module 0analogue input B high	0	15	1/16-4/16
57	2133 expansion module 0 analogue input C low	0	15	13/16-16/16
	2133 expansion module 0analogue input C high	0	15	9/16-12/16
	2133 expansion module 0analogue input D low	0	15	5/16-8/16
	2133 expansion module 0analogue input D high	0	15	1/16-4/16
58	2133 expansion module 0 analogue input E low	0	15	13/16-16/16
	2133 expansion module 0analogue input E high	0	15	9/16-12/16
	2133 expansion module 0analogue input F low	0	15	5/16-8/16
	2133 expansion module 0analogue input F high	0	15	1/16-4/16
59	2133 expansion module 0 analogue input G low	0	15	13/16-16/16
	2133 expansion module 0analogue input G high	0	15	9/16-12/16
	2133 expansion module 0analogue input H low	0	15	5/16-8/16
	2133 expansion module 0analogue input H high	0	15	1/16-4/16
60 – 63	2133 expansion module 1 analogue input A – H			
64 – 67	2133 expansion module 2 analogue input A - H			
68 – 71	2133 expansion module 3 analogue input A – H			
72	2131 expansion module 0 analogue input A low	0	15	13/16-16/16
	2131 expansion module 0analogue input A high	0	15	9/16-12/16
	2131 expansion module 0analogue input B low	0	15	5/16-8/16
	2131 expansion module 0analogue input B high	0	15	1/16-4/16
73	2131 expansion module 0 analogue input C low	0	15	13/16-16/16
	2131 expansion module 0analogue input C high	0	15	9/16-12/16
	2131 expansion module 0analogue input D low	0	15	5/16-8/16
	2131 expansion module 0analogue input D high	0	15	1/16-4/16
74	2131 expansion module 0 analogue input E low	0	15	13/16-16/16
	2131 expansion module 0analogue input E high	0	15	9/16-12/16
	2131 expansion module 0analogue input F low	0	15	5/16-8/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
	2131 expansion module 0analogue input F high	0	15	1/16-4/16
75	2131 expansion module 0 analogue input G low	0	15	13/16-16/16
	2131 expansion module 0analogue input G high	0	15	9/16-12/16
	2131 expansion module 0analogue input H low	0	15	5/16-8/16
	2131 expansion module 0analogue input H high	0	15	1/16-4/16
76	2131 expansion module 0 analogue input I low	0	15	13/16-16/16
	2131 expansion module 0analogue input I high	0	15	9/16-12/16
	2131 expansion module 0analogue input J low	0	15	5/16-8/16
	2131 expansion module 0analogue input J high	0	15	1/16-4/16
77 – 81	2131 expansion module 1 analogue input A – J			
82 – 86	2131 expansion module 2 analogue input A – J			
87 – 91	2131 expansion module 3 analogue input A – J			
92	2131 expansion module 0 digital input A	0	15	13/16-16/16
	2131 expansion module 0 digital input B	0	15	9/16-12/16
	2131 expansion module 0 digital input C	0	15	5/16-8/16
	2131 expansion module 0 digital input D	0	15	1/16-4/16
93	2131 expansion module 0 digital input E	0	15	13/16-16/16
	2131 expansion module 0 digital input F	0	15	9/16-12/16
	2131 expansion module 0 digital input G	0	15	5/16-8/16
	2131 expansion module 0 digital input H	0	15	1/16-4/16
94	2131 expansion module 0 digital input I	0	15	13/16-16/16
	2131 expansion module 0 digital input J	0	15	9/16-12/16
	2131 expansion module 1 digital input A	0	15	5/16-8/16
	2131 expansion module 1 digital input B	0	15	1/16-4/16
95	2131 expansion module 1 digital input C	0	15	13/16-16/16
	2131 expansion module 1 digital input D	0	15	9/16-12/16
	2131 expansion module 1 digital input E	0	15	5/16-8/16
	2131 expansion module 1 digital input F	0	15	1/16-4/16
96	2131 expansion module 1 digital input G	0	15	13/16-16/16
	2131 expansion module 1 digital input H	0	15	9/16-12/16
	2131 expansion module 1 digital input I	0	15	5/16-8/16
	2131 expansion module 1 digital input J	0	15	1/16-4/16
97	2131 expansion module 2 digital input A	0	15	13/16-16/16
	2131 expansion module 2 digital input B	0	15	9/16-12/16
	2131 expansion module 2 digital input C	0	15	5/16-8/16
	2131 expansion module 2 digital input D	0	15	1/16-4/16
98	2131 expansion module 2 digital input E	0	15	13/16-16/16
	2131 expansion module 2 digital input F	0	15	9/16-12/16
	2131 expansion module 2 digital input G	0	15	5/16-8/16
	2131 expansion module 2 digital input H	0	15	1/16-4/16
99	2131 expansion module 2 digital input I	0	15	13/16-16/16
	2131 expansion module 2 digital input J	0	15	9/16-12/16
	2131 expansion module 3 digital input A	0	15	5/16-8/16
	2131 expansion module 3 digital input B	0	15	1/16-4/16
100	2131 expansion module 3 digital input C	0	15	13/16-16/16
	2131 expansion module 3 digital input D	0	15	9/16-12/16
	2131 expansion module 3 digital input E	0	15	5/16-8/16
	2131 expansion module 3 digital input F	0	15	1/16-4/16
101	2131 expansion module 3 digital input G	0	15	13/16-16/16
	2131 expansion module 3 digital input H	0	15	9/16-12/16
	2131 expansion module 3 digital input I	0	15	5/16-8/16
	2131 expansion module 3 digital input J	0	15	1/16-4/16
102-255	Reserved			

7450 register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of unnamed alarm sources	Note 9	Note 9	16
1	Unnamed digital input 1	0	15	13/16-16/16
	Unnamed digital input 2	0	15	9/16-12/16
	Unnamed digital input 3	0	15	5/16-8/16
	Unnamed digital input 4	0	15	1/16-4/16
2	Unnamed digital input 5	0	15	13/16-16/16
	Unnamed digital input 6	0	15	9/16-12/16
	Unnamed digital input 7	0	15	5/16-8/16
	Unnamed digital input 8	0	15	1/16-4/16
3	Unnamed digital input 9	0	15	13/16-16/16
	Unnamed digital input 10	0	15	9/16-12/16
	Unnamed digital input 11	0	15	5/16-8/16
	Unimplemented			
4	Unimplemented			
5	Analogue Input B (Digital)	0	15	13/16-16/16
	Analogue Input C (Digital)	0	15	9/16-12/16
	Analogue Input D (Digital)	0	15	5/16-8/16
	Unimplemented			
6 - 8	Unimplemented			
9	2130 expansion module 0 digital input A	0	15	13/16-16/16
	2130 expansion module 0 digital input B	0	15	9/16-12/16
	2130 expansion module 0 digital input C	0	15	5/16-8/16
	2130 expansion module 0 digital input D	0	15	1/16-4/16
10	2130 expansion module 0 digital input E	0	15	13/16-16/16
	2130 expansion module 0 digital input F	0	15	9/16-12/16
	2130 expansion module 0 digital input G	0	15	5/16-8/16
	2130 expansion module 0 digital input H	0	15	1/16-4/16
11-12	2130 expansion module 1 digital input A-H			
13-14	2130 expansion module 2 digital input A-H			
15-16	2130 expansion module 3 digital input A-H			
17	2131 expansion module 0 digital input A	0	15	13/16-16/16
	2131 expansion module 0 digital input B	0	15	9/16-12/16
	2131 expansion module 0 digital input C	0	15	5/16-8/16
	2131 expansion module 0 digital input D	0	15	1/16-4/16
18	2131 expansion module 0 digital input E	0	15	13/16-16/16
	2131 expansion module 0 digital input F	0	15	9/16-12/16
	2131 expansion module 0 digital input G	0	15	5/16-8/16
	2131 expansion module 0 digital input H	0	15	1/16-4/16
19	2131 expansion module 0 digital input I	0	15	13/16-16/16
	2131 expansion module 0 digital input J	0	15	9/16-12/16
	2131 expansion module 1 digital input A	0	15	5/16-8/16
	2131 expansion module 1 digital input B	0	15	1/16-4/16
20	2131 expansion module 1 digital input C	0	15	13/16-16/16
	2131 expansion module 1 digital input D	0	15	9/16-12/16
	2131 expansion module 1 digital input E	0	15	5/16-8/16
	2131 expansion module 1 digital input F	0	15	1/16-4/16
21	2131 expansion module 1 digital input G	0	15	13/16-16/16
	2131 expansion module 1 digital input H	0	15	9/16-12/16
	2131 expansion module 1 digital input I	0	15	5/16-8/16
	2131 expansion module 1 digital input J	0	15	1/16-4/16
22	2131 expansion module 2 digital input A	0	15	13/16-16/16
	2131 expansion module 2 digital input B	0	15	9/16-12/16
	2131 expansion module 2 digital input C	0	15	5/16-8/16
	2131 expansion module 2 digital input D	0	15	1/16-4/16
23	2131 expansion module 2 digital input E	0	15	13/16-16/16
	2131 expansion module 2 digital input F	0	15	9/16-12/16
	2131 expansion module 2 digital input G	0	15	5/16-8/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
	2131 expansion module 2 digital input H	0	15	1/16-4/16
24	2131 expansion module 2 digital input I	0	15	13/16-16/16
	2131 expansion module 2 digital input J	0	15	9/16-12/16
	2131 expansion module 3 digital input A	0	15	5/16-8/16
	2131 expansion module 3 digital input B	0	15	1/16-4/16
25	2131 expansion module 3 digital input C	0	15	13/16-16/16
	2131 expansion module 3 digital input D	0	15	9/16-12/16
	2131 expansion module 3 digital input E	0	15	5/16-8/16
	2131 expansion module 3 digital input F	0	15	1/16-4/16
26	2131 expansion module 3 digital input G	0	15	13/16-16/16
	2131 expansion module 3 digital input H	0	15	9/16-12/16
	2131 expansion module 3 digital input I	0	15	5/16-8/16
	2131 expansion module 3 digital input J	0	15	1/16-4/16
27-28	Unimplemented	15	15	
29	2130 expansion module 0 analogue input E low	0	15	13/16-16/16
	2130 expansion module 0analogue input E high	0	15	9/16-12/16
	2130 expansion module 0analogue input F low	0	15	5/16-8/16
	2130 expansion module 0analogue input F high	0	15	1/16-4/16
30	2130 expansion module 0 analogue input G low	0	15	13/16-16/16
	2130 expansion module 0analogue input G high	0	15	9/16-12/16
	2130 expansion module 0analogue input H low	0	15	5/16-8/16
	2130 expansion module 0analogue input H high	0	15	1/16-4/16
31-32	2130 expansion module 1 analogue inputs E-H			
33-34	2130 expansion module 2 analogue inputs E-H			
35-36	2130 expansion module 3 analogue inputs E-H			
37-48	Unimplemented			
49	Unimplemented			
	Unimplemented			
	Internal FlexibleSensorBanalogue input low	0	15	5/16-8/16
	Internal FlexibleSensorBanalogue input high	0	15	1/16-4/16
50	Internal FlexibleSensorCanalogue input low	0	15	13/16-16/16
	Internal FlexibleSensorCanalogue input high	0	15	9/16-12/16
	Internal FlexibleSensorDanalogue input low	0	15	5/16-8/16
	Internal FlexibleSensorDanalogue input high	0	15	1/16-4/16
51	Unimplemented			
	Unimplemented			
	Engine Maintenance alarm 1	0	15	5/16-8/16
	Engine Maintenance alarm 2	0	15	1/16-4/16
52	Engine Maintenance alarm 3	0	15	13/16-16/16
	PLC function 1	0	15	9/16-12/16
	PLC function 2	0	15	5/16-8/16
	PLC function 3	0	15	1/16-4/16
53	PLC function 4	0	15	13/16-16/16
	PLC function 5	0	15	9/16-12/16
	PLC function 6	0	15	5/16-8/16
	PLC function 7	0	15	1/16-4/16
54	PLC function 8	0	15	13/16-16/16
	PLC function 9	0	15	9/16-12/16
	PLC function 10	0	15	5/16-8/16
	PLC function 11	0	15	1/16-4/16
55	PLC function 12	0	15	13/16-16/16
	PLC function 13	0	15	9/16-12/16
	PLC function 14	0	15	5/16-8/16
	PLC function 15	0	15	1/16-4/16
56	PLC function 16	0	15	13/16-16/16
	PLC function 17	0	15	9/16-12/16
	PLC function 18	0	15	5/16-8/16
	PLC function 19	0	15	1/16-4/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
57	PLC function 20	0	15	13/16-16/16
	Unimplemented			
	Unimplemented			
	Unimplemented			
58-63	Unimplemented			
64	2131 expansion module 0 analogue input A low	0	15	13/16-16/16
	2131 expansion module 0analogue input A high	0	15	9/16-12/16
	2131 expansion module 0analogue input B low	0	15	5/16-8/16
	2131 expansion module 0analogue input B high	0	15	1/16-4/16
65	2131 expansion module 0 analogue input C low	0	15	13/16-16/16
	2131 expansion module 0analogue input C high	0	15	9/16-12/16
	2131 expansion module 0analogue input D low	0	15	5/16-8/16
	2131 expansion module 0analogue input D high	0	15	1/16-4/16
66	2131 expansion module 0 analogue input E low	0	15	13/16-16/16
	2131 expansion module 0analogue input E high	0	15	9/16-12/16
	2131 expansion module 0analogue input F low	0	15	5/16-8/16
	2131 expansion module 0analogue input F high	0	15	1/16-4/16
67	2131 expansion module 0 analogue input G low	0	15	13/16-16/16
	2131 expansion module 0analogue input G high	0	15	9/16-12/16
	2131 expansion module 0analogue input H low	0	15	5/16-8/16
	2131 expansion module 0analogue input H high	0	15	1/16-4/16
68	2131 expansion module 0 analogue input I low	0	15	13/16-16/16
	2131 expansion module 0analogue input I high	0	15	9/16-12/16
	2131 expansion module 0analogue input J low	0	15	5/16-8/16
	2131 expansion module 0analogue input J high	0	15	1/16-4/16
69 - 74	2131 expansion module 1 analogue input A – J			
74 - 78	2131 expansion module 2 analogue input A – J			
79 - 83	2131 expansion module 3 analogue input A – J			
84	2133 expansion module 0 analogue input A low	0	15	13/16-16/16
	2133 expansion module 0analogue input A high	0	15	9/16-12/16
	2133 expansion module 0analogue input B low	0	15	5/16-8/16
	2133 expansion module 0analogue input B high	0	15	1/16-4/16
85	2133 expansion module 0 analogue input C low	0	15	13/16-16/16
	2133 expansion module 0analogue input C high	0	15	9/16-12/16
	2133 expansion module 0analogue input D low	0	15	5/16-8/16
	2133 expansion module 0analogue input D high	0	15	1/16-4/16
86	2133 expansion module 0 analogue input E low	0	15	13/16-16/16
	2133 expansion module 0analogue input E high	0	15	9/16-12/16
	2133 expansion module 0analogue input F low	0	15	5/16-8/16
	2133 expansion module 0analogue input F high	0	15	1/16-4/16
87	2133 expansion module 0 analogue input G low	0	15	13/16-16/16
	2133 expansion module 0analogue input G high	0	15	9/16-12/16
	2133 expansion module 0analogue input H low	0	15	5/16-8/16
	2133 expansion module 0analogue input H high	0	15	1/16-4/16
88 – 91	2133 expansion module 1 analogue input A – H			
92 – 95	2133 expansion module 2 analogue input A - H			
96 – 99	2133 expansion module 3 analogue input A – H			
100	Battery Maintenance Alarm 1			
	Battery Maintenance Alarm 2			
	Battery Maintenance Alarm 3			
	Unimplemented			
101	Unimplemented			
	Unimplemented			
	Unimplemented			
	Unimplemented			
102-255	Reserved			

3xxfamily register allocation

1. Unimplemented registers within a family/module are shaded

Register offset	Name	Min value	Max value	Bits/ Sign	330	331	332	333	334	335
0	Number of unnamed alarm sources	0	256	16	✓	✓	✓	✓	✓	✓
1	Unnamed digital input A	0	15	13/16-16/16	✓	✓	✓	✓	✓	✓
	Unnamed digital input B	0	15	9/16-12/16	✓	✓	✓	✓	✓	✓
	Unnamed digital input C	0	15	5/16-8/16		✓	✓	✓	✓	✓
	Unnamed digital input D	0	15	1/16-4/16		✓	✓	✓	✓	✓
2	Unnamed digital input E	0	15	13/16-16/16			✓	✓	✓	✓
	Unnamed digital input F	0	15	9/16-12/16			✓	✓	✓	✓
	Unnamed digital input G	0	15	5/16-8/16			✓	✓	✓	✓
	Unnamed digital input H	0	15	1/16-4/16			✓	✓	✓	✓
3	Unnamed digital input I	0	15	13/16-16/16			✓	✓	✓	✓
	Unnamed digital input J	0	15	9/16-12/16			✓	✓	✓	✓
	Unnamed digital input K	0	15	5/16-8/16			✓	✓	✓	✓
	Unnamed digital input L	0	15	1/16-4/16						✓
4	Unimplemented (Reserved for future digital inputs)									
5	2130 expansion module 0 digital input A	0	15	13/16-16/16						✓
	2130 expansion module 0 digital input B	0	15	9/16-12/16						✓
	2130 expansion module 0 digital input C	0	15	5/16-8/16						✓
	2130 expansion module 0 digital input D	0	15	1/16-4/16						✓
6	2130 expansion module 0 digital input E	0	15	13/16-16/16						✓
	2130 expansion module 0 digital input F	0	15	9/16-12/16						✓
	2130 expansion module 0 digital input G	0	15	5/16-8/16						✓
	2130 expansion module 0 digital input H	0	15	1/16-4/16						✓
7 – 8	2130 expansion module 1 digital inputs A-H									✓
9 – 10	2130 expansion module 2 digital inputs A-H									
11-12	2130 expansion module 3 digital inputs A-H									
13-24	Reserved for expansion modules 4-9 digital inputs									
25	2130 expansion module 0 analogue input E low	0	15	13/16-16/16						✓
	2130 expansion module 0analogue input E high	0	15	9/16-12/16						✓
	2130 expansion module 0analogue input F low	0	15	5/16-8/16						✓
	2130 expansion module 0analogue input F high	0	15	1/16-4/16						✓
26	2130 expansion module 0 analogue input G low	0	15	13/16-16/16						✓
	2130 expansion module 0analogue input G high	0	15	9/16-12/16						✓
	2130 expansion module 0analogue input H low	0	15	5/16-8/16						✓
	2130 expansion module 0analogue input H high	0	15	1/16-4/16						✓
27 - 28	2130 expansion module 1 analogue inputs E-H									✓
29-30	2130 expansion module 2 analogue inputs E-H									
31-32	2130 expansion module 3 analogue inputs E-H									
33-44	Unimplemented (Reserved for 2130 expansion module 4-9 analogue inputs E-H)									
45	PLC function 1	0	15	13/16-16/16						✓
	PLC function 2	0	15	9/16-12/16						✓
	PLC function 3	0	15	5/16-8/16						✓
	PLC function 4	0	15	1/16-4/16						✓
46	PLC function 5	0	15	13/16-16/16						✓
	PLC function 6	0	15	9/16-12/16						✓
	PLC function 7	0	15	5/16-8/16						✓
	PLC function 8	0	15	1/16-4/16						✓
47	PLC function 9	0	15	13/16-16/16						✓
	PLC function 10	0	15	9/16-12/16						✓
	PLC function 11	0	15	5/16-8/16						✓
	PLC function 12	0	15	1/16-4/16						✓
48	PLC function 13	0	15	13/16-16/16						✓
	PLC function 14	0	15	9/16-12/16						✓
	PLC function 15	0	15	5/16-8/16						✓
	PLC function 16	0	15	1/16-4/16						✓

Register offset	Name	Min value	Max value	Bits/ Sign	330	331	332	333	334	335
49	PLC function 17	0	15	13/16-16/16						✓
	PLC function 18	0	15	9/16-12/16						✓
	PLC function 19	0	15	5/16-8/16						✓
	PLC function 20	0	15	1/16-4/16						✓
50-64	Unimplemented	0	15	16						
65-255	Reserved									

Exxx register allocation						
Register offset	Name	Min value	Maxvalue	Bits/ Sign	E 8 0 0	E 4 0 0
0	Number of unnamed alarm sources	Notes12,14	Notes 12,14	16	✓	✓
1	Unnamed digital input 1	0	15	13/16-16/16	✓	✓
	Unnamed digital input 2	0	15	9/16-12/16	✓	✓
	Unnamed digital input 3	0	15	5/16-8/16	✓	✓
	Unnamed digital input 4	0	15	1/16-4/16	✓	✓
2	Unnamed digital input 5	0	15	13/16-16/16	✓	
	Unnamed digital input 6	0	15	9/16-12/16	✓	
	Unnamed digital input 7	0	15	5/16-8/16	✓	
	Unnamed digital input 8	0	15	1/16-4/16	✓	
3	Unnamed digital input 9	0	15	13/16-16/16	✓	
	Unnamed digital input 10	0	15	9/16-12/16	✓	
	Unnamed digital input 11	0	15	5/16-8/16	✓	
	Unnamed digital input 12	0	15	1/16-4/16	✓	
4	Unnamed digital input 13	0	15	13/16-16/16	✓	
	Unnamed digital input 14	0	15	9/16-12/16	✓	
	Unnamed digital input 15	0	15	5/16-8/16	✓	
	Unnamed digital input 16	0	15	1/16-4/16	✓	
5	Flexible Digital Input A	0	15	13/16-16/16	✓	✓
	Flexible Digital Input B	0	15	9/16-12/16	✓	✓
	Flexible Digital Input C	0	15	5/16-8/16	✓	✓
	Flexible Digital Input D	0	15	1/16-4/16	✓	✓
6	Flexible Digital Input E	0	15	13/16-16/16	✓	✓
	Flexible Digital Input F	0	15	9/16-12/16	✓	✓
	Flexible Digital Input G	0	15	5/16-8/16	✓	
	Flexible Digital Input H	0	15	1/16-4/16	✓	
7	Flexible Digital Input I	0	15	13/16-16/16	✓	
	Flexible Digital Input J	0	15	9/16-12/16	✓	
	Flexible Digital Input K	0	15	5/16-8/16	✓	
	Flexible Digital Input L	0	15	1/16-4/16	✓	
8	Unnamed digital input 29	0	15	13/16-16/16	✓	
	Unnamed digital input 30	0	15	9/16-12/16	✓	
	Unnamed digital input 31	0	15	5/16-8/16	✓	
	Unnamed digital input 32	0	15	1/16-4/16	✓	
9	2130 expansion module 0 digital input A	0	15	13/16-16/16	✓	
	2130 expansion module 0 digital input B	0	15	9/16-12/16	✓	
	2130 expansion module 0 digital input C	0	15	5/16-8/16	✓	
	2130 expansion module 0 digital input D	0	15	1/16-4/16	✓	
10	2130 expansion module 0 digital input E	0	15	13/16-16/16	✓	
	2130 expansion module 0 digital input F	0	15	9/16-12/16	✓	
	2130 expansion module 0 digital input G	0	15	5/16-8/16	✓	
	2130 expansion module 0 digital input H	0	15	1/16-4/16	✓	
11-12	2130 expansion module 1 digital input A-H				✓	
13-14	2130 expansion module 2 digital input A-H				✓	
15-16	2130 expansion module 3 digital input A-H				✓	

Exxx register allocation (continued)						
Register offset	Name	Min value	Maxvalue	Bits/ Sign	E800	E400
17	2131 expansion module 0 digital input A	0	15	13/16-16/16	✓	
	2131 expansion module 0 digital input B	0	15	9/16-12/16	✓	
	2131 expansion module 0 digital input C	0	15	5/16-8/16	✓	
	2131 expansion module 0 digital input D	0	15	1/16-4/16	✓	
18	2131 expansion module 0 digital input E	0	15	13/16-16/16	✓	
	2131 expansion module 0 digital input F	0	15	9/16-12/16	✓	
	2131 expansion module 0 digital input G	0	15	5/16-8/16	✓	
	2131 expansion module 0 digital input H	0	15	1/16-4/16	✓	
19	2131 expansion module 0 digital input I	0	15	13/16-16/16	✓	
	2131 expansion module 0 digital input J	0	15	9/16-12/16	✓	
	2131 expansion module 1 digital input A	0	15	5/16-8/16	✓	
	2131 expansion module 1 digital input B	0	15	1/16-4/16	✓	
20	2131 expansion module 1 digital input C	0	15	13/16-16/16	✓	
	2131 expansion module 1 digital input D	0	15	9/16-12/16	✓	
	2131 expansion module 1 digital input E	0	15	5/16-8/16	✓	
	2131 expansion module 1 digital input F	0	15	1/16-4/16	✓	
21	2131 expansion module 1 digital input G	0	15	13/16-16/16	✓	
	2131 expansion module 1 digital input H	0	15	9/16-12/16	✓	
	2131 expansion module 1 digital input I	0	15	5/16-8/16	✓	
	2131 expansion module 1 digital input J	0	15	1/16-4/16	✓	
22	2131 expansion module 2 digital input A	0	15	13/16-16/16	✓	
	2131 expansion module 2 digital input B	0	15	9/16-12/16	✓	
	2131 expansion module 2 digital input C	0	15	5/16-8/16	✓	
	2131 expansion module 2 digital input D	0	15	1/16-4/16	✓	
23	2131 expansion module 2 digital input E	0	15	13/16-16/16	✓	
	2131 expansion module 2 digital input F	0	15	9/16-12/16	✓	
	2131 expansion module 2 digital input G	0	15	5/16-8/16	✓	
	2131 expansion module 2 digital input H	0	15	1/16-4/16	✓	
24	2131 expansion module 2 digital input I	0	15	13/16-16/16	✓	
	2131 expansion module 2 digital input J	0	15	9/16-12/16	✓	
	2131 expansion module 3 digital input A	0	15	5/16-8/16	✓	
	2131 expansion module 3 digital input B	0	15	1/16-4/16	✓	
25	2131 expansion module 3 digital input C	0	15	13/16-16/16	✓	
	2131 expansion module 3 digital input D	0	15	9/16-12/16	✓	
	2131 expansion module 3 digital input E	0	15	5/16-8/16	✓	
	2131 expansion module 3 digital input F	0	15	1/16-4/16	✓	
26	2131 expansion module 3 digital input G	0	15	13/16-16/16	✓	
	2131 expansion module 3 digital input H	0	15	9/16-12/16	✓	
	2131 expansion module 3 digital input I	0	15	5/16-8/16	✓	
	2131 expansion module 3 digital input J	0	15	1/16-4/16	✓	
27-28	Unimplemented	15	15			
29	2130 expansion module 0 analogue input E low	0	15	13/16-16/16	✓	
	2130 expansion module 0analogue input E high	0	15	9/16-12/16	✓	
	2130 expansion module 0analogue input F low	0	15	5/16-8/16	✓	
	2130 expansion module 0analogue input F high	0	15	1/16-4/16	✓	
30	2130 expansion module 0 analogue input G low	0	15	13/16-16/16	✓	
	2130 expansion module 0analogue input G high	0	15	9/16-12/16	✓	
	2130 expansion module 0analogue input H low	0	15	5/16-8/16	✓	
	2130 expansion module 0analogue input H high	0	15	1/16-4/16	✓	
31-32	2130 expansion module 1 analogue inputs E-H				✓	
33-34	2130 expansion module 2 analogue inputs E-H				✓	
35-36	2130 expansion module 3 analogue inputs E-H				✓	
37-38	Unimplemented	15	15	16		

Exxx register allocation (continued)						
Register offset	Name	Min value	Maxvalue	Bits/ Sign	E800	E400
39	Internal flexible sender A analogue input low	0	15	13/16-16/16	✓	✓
	Internal flexible sender A analogue input high	0	15	9/16-12/16	✓	✓
	Internal flexible sender B analogue input low	0	15	5/16-8/16	✓	✓
	Internal flexible sender B analogue input high	0	15	1/16-4/16	✓	✓
40	Internal flexible sender C analogue input low	0	15	13/16-16/16	✓	✓
	Internal flexible sender C analogue input high	0	15	9/16-12/16	✓	✓
	Internal flexible sender D analogue input low	0	15	5/16-8/16	✓	✓
	Internal flexible sender D analogue input high	0	15	1/16-4/16	✓	✓
41	Internal flexible sender E analogue input low	0	15	13/16-16/16	✓	✓
	Internal flexible sender E analogue input high	0	15	9/16-12/16	✓	✓
	Internal flexible sender F analogue input low	0	15	5/16-8/16	✓	✓
	Internal flexible sender F analogue input high	0	15	1/16-4/16	✓	✓
42	Internal flexible sender G analogue input low	0	15	13/16-16/16	✓	✓
	Internal flexible sender G analogue input high	0	15	9/16-12/16	✓	✓
	Internal flexible sender H analogue input low	0	15	5/16-8/16	✓	
	Internal flexible sender H analogue input high	0	15	1/16-4/16	✓	
43	Internal flexible sender I analogue input low	0	15	13/16-16/16	✓	
	Internal flexible sender I analogue input high	0	15	9/16-12/16	✓	
	Internal flexible sender J analogue input low	0	15	5/16-8/16	✓	
	Internal flexible sender J analogue input high	0	15	1/16-4/16	✓	
44	Internal flexible sender K analogue input low	0	15	13/16-16/16	✓	
	Internal flexible sender K analogue input high	0	15	9/16-12/16	✓	
	Internal flexible sender L analogue input low	0	15	5/16-8/16	✓	
	Internal flexible sender L analogue input high	0	15	1/16-4/16	✓	
45	Engine Maintenance alarm 1	0	15	13/16-16/16	✓	✓
	Engine Maintenance alarm 2	0	15	9/16-12/16	✓	✓
	Engine Maintenance alarm 3	0	15	5/16-8/16	✓	✓
	Engine Maintenance alarm 4	0	15	1/16-4/16		✓
46	PLC function 1	0	15	13/16-16/16	✓	✓
	PLC function 2	0	15	9/16-12/16	✓	✓
	PLC function 3	0	15	5/16-8/16	✓	✓
	PLC function 4	0	15	1/16-4/16	✓	✓
47	PLC function 5	0	15	13/16-16/16	✓	✓
	PLC function 6	0	15	9/16-12/16	✓	✓
	PLC function 7	0	15	5/16-8/16	✓	✓
	PLC function 8	0	15	1/16-4/16	✓	✓
48	PLC function 9	0	15	13/16-16/16	✓	✓
	PLC function 10	0	15	9/16-12/16	✓	✓
	PLC function 11	0	15	5/16-8/16	✓	✓
	PLC function 12	0	15	1/16-4/16	✓	✓
49	PLC function 13	0	15	13/16-16/16	✓	✓
	PLC function 14	0	15	9/16-12/16	✓	✓
	PLC function 15	0	15	5/16-8/16	✓	✓
	PLC function 16	0	15	1/16-4/16	✓	✓
50	PLC function 17	0	15	13/16-16/16	✓	✓
	PLC function 18	0	15	9/16-12/16	✓	✓
	PLC function 19	0	15	5/16-8/16	✓	✓
	PLC function 20	0	15	1/16-4/16	✓	✓
51	Internal Flexible Sensor A sensor fault	0	15	13/16-16/16	✓	✓
	Internal Flexible Sensor B sensor fault	0	15	9/16-12/16	✓	✓
	Internal Flexible Sensor C sensor fault	0	15	5/16-8/16	✓	✓
	Internal Flexible Sensor D sensor fault	0	15	1/16-4/16	✓	✓
52	Internal Flexible Sensor E sensor fault	0	15	13/16-16/16	✓	✓
	Internal Flexible Sensor F sensor fault	0	15	9/16-12/16	✓	✓
	Internal Flexible Sensor G sensor fault	0	15	5/16-8/16	✓	✓

Exxx register allocation (continued)						
Register offset	Name	Min value	Maxvalue	Bits/ Sign	E800	E400
	Internal Flexible Sensor H sensor fault	0	15	1/16-4/16	✓	
53	Internal Flexible Sensor I sensor fault	0	15	13/16-16/16	✓	
	Internal Flexible Sensor J sensor fault	0	15	9/16-12/16	✓	
	Internal Flexible Sensor K sensor fault	0	15	5/16-8/16	✓	
	Internal Flexible Sensor L sensor fault	0	15	1/16-4/16	✓	
54	Engine Maintenance alarm 5	0	15	13/16-16/16		✓
	Engine Maintenance alarm 6	0	15	9/16-12/16		✓
	Engine Maintenance alarm 7	0	15	5/16-8/16		✓
	Engine Maintenance alarm 8	0	15	1/16-4/16		✓
55	Configurable CAN instrument 1	0	15	13/16-16/16	✓	✓
	Configurable CAN instrument 2	0	15	9/16-12/16	✓	✓
	Configurable CAN instrument 3	0	15	5/16-8/16	✓	✓
	Configurable CAN instrument 4	0	15	1/16-4/16	✓	✓
56	Configurable CAN instrument 5	0	15	13/16-16/16	✓	✓
	Configurable CAN instrument 6	0	15	9/16-12/16	✓	✓
	Configurable CAN instrument 7	0	15	5/16-8/16	✓	✓
	Configurable CAN instrument 8	0	15	1/16-4/16	✓	✓
57	Configurable CAN instrument 9	0	15	13/16-16/16	✓	✓
	Configurable CAN instrument 10	0	15	9/16-12/16	✓	✓
	Engine Maintenance alarm 9	0	15	5/16-8/16		✓
	Engine Maintenance alarm 10	0	15	1/16-4/16		✓
58-63	Unimplemented	0	15	16		

Exxx register allocation (continued)						
Register offset	Name	Min value	Maxvalue	Bits/ Sign	E800	E400
64	2131 expansion module 0 analogue input A low	0	15	13/16-16/16	✓	
	2131 expansion module 0analogue input A high	0	15	9/16-12/16	✓	
	2131 expansion module 0analogue input B low	0	15	5/16-8/16	✓	
	2131 expansion module 0analogue input B high	0	15	1/16-4/16	✓	
65	2131 expansion module 0 analogue input C low	0	15	13/16-16/16	✓	
	2131 expansion module 0analogue input C high	0	15	9/16-12/16	✓	
	2131 expansion module 0analogue input D low	0	15	5/16-8/16	✓	
	2131 expansion module 0analogue input D high	0	15	1/16-4/16	✓	
66	2131 expansion module 0 analogue input E low	0	15	13/16-16/16	✓	
	2131 expansion module 0analogue input E high	0	15	9/16-12/16	✓	
	2131 expansion module 0analogue input F low	0	15	5/16-8/16	✓	
	2131 expansion module 0analogue input F high	0	15	1/16-4/16	✓	
67	2131 expansion module 0 analogue input G low	0	15	13/16-16/16	✓	
	2131 expansion module 0analogue input G high	0	15	9/16-12/16	✓	
	2131 expansion module 0analogue input H low	0	15	5/16-8/16	✓	
	2131 expansion module 0analogue input H high	0	15	1/16-4/16	✓	
68	2131 expansion module 0 analogue input I low	0	15	13/16-16/16	✓	
	2131 expansion module 0analogue input I high	0	15	9/16-12/16	✓	
	2131 expansion module 0analogue input J low	0	15	5/16-8/16	✓	
	2131 expansion module 0analogue input J high	0	15	1/16-4/16	✓	
69 - 74	2131 expansion module 1 analogue input A – J				✓	
74 - 78	2131 expansion module 2 analogue input A – J				✓	
79 - 83	2131 expansion module 3 analogue input A – J				✓	
84	2133 expansion module 0 analogue input A low	0	15	13/16-16/16	✓	
	2133 expansion module 0analogue input A high	0	15	9/16-12/16	✓	
	2133 expansion module 0analogue input B low	0	15	5/16-8/16	✓	
	2133 expansion module 0analogue input B high	0	15	1/16-4/16	✓	
85	2133 expansion module 0 analogue input C low	0	15	13/16-16/16	✓	
	2133 expansion module 0analogue input C high	0	15	9/16-12/16	✓	
	2133 expansion module 0analogue input D low	0	15	5/16-8/16	✓	
	2133 expansion module 0analogue input D high	0	15	1/16-4/16	✓	
86	2133 expansion module 0 analogue input E low	0	15	13/16-16/16	✓	
	2133 expansion module 0analogue input E high	0	15	9/16-12/16	✓	
	2133 expansion module 0analogue input F low	0	15	5/16-8/16	✓	
	2133 expansion module 0analogue input F high	0	15	1/16-4/16	✓	
87	2133 expansion module 0 analogue input G low	0	15	13/16-16/16	✓	
	2133 expansion module 0analogue input G high	0	15	9/16-12/16	✓	
	2133 expansion module 0analogue input H low	0	15	5/16-8/16	✓	
	2133 expansion module 0analogue input H high	0	15	1/16-4/16	✓	
88 – 91	2133 expansion module 1 analogue input A – H				✓	
92 – 95	2133 expansion module 2 analogue input A - H				✓	
96 – 99	2133 expansion module 3 analogue input A – H				✓	
100-255	Reserved					

71xx/6xxx/L40x/4xxx/45xx MKII family register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of unnamed alarm sources	0	256	16
1	Unnamed digital input A	0	15	13/16-16/16
	Unnamed digital input B	0	15	9/16-12/16
	Unnamed digital input C	0	15	5/16-8/16
	Unnamed digital input D	0	15	1/16-4/16
2	Unnamed digital input E	0	15	13/16-16/16
	Unnamed digital input F	0	15	9/16-12/16
	Unnamed analogue input A (Digital)	0	15	5/16-8/16
	Unnamed analogue input B (Digital)	0	15	1/16-4/16
3	Unnamed analogue input C (Digital)	0	15	13/16-16/16
	Reserved for analogue input D (Digital)	0	15	9/16-12/16
	Reserved for analogue input E (Digital)	0	15	5/16-8/16
	Reserved for analogue input F (Digital)	0	15	1/16-4/16
4-44	Unimplemented	0	15	16
45	Flexible Sensor C Low	0	15	13/16-16/16
	Flexible Sensor C High	0	15	9/16-12/16
	Oil Maintenance alarm	0	15	5/16-8/16
	Air Maintenance alarm	0	15	1/16-4/16
46	Fuel Maintenance alarm	0	15	13/16-16/16
	Flexible Sensor D Low	0	15	9/16-12/16
	Flexible Sensor D High	0	15	5/16-8/16
	Flexible Sensor A Low	0	15	1/16-4/16
47	Flexible Sensor A High	0	15	13/16-16/16
	Flexible Sensor A Sender Fault	0	15	9/16-12/16
	Flexible Sensor C Sender Fault	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
48-255	Reserved			

61xx MkII family register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of unnamed alarm sources	0	256	16
1	Unnamed digital input A	0	15	13/16-16/16
	Unnamed digital input B	0	15	9/16-12/16
	Unnamed digital input C	0	15	5/16-8/16
	Unnamed digital input D	0	15	1/16-4/16
2	Unnamed digital input E	0	15	13/16-16/16
	Unnamed digital input F	0	15	9/16-12/16
	Flex Sender A digital input	0	15	5/16-8/16
	Flex Sender B digital input	0	15	1/16-4/16
3	Flex Sender C digital input	0	15	13/16-16/16
	Flex Sender D digital input	0	15	9/16-12/16
	Reserved for digital input 11	0	15	5/16-8/16
	Reserved for digital input 12	0	15	1/16-4/16
4	Reserved for digital inputs 13-16			
5	2130 expansion module 0 digital input A	0	15	13/16-16/16
	2130 expansion module 0 digital input B	0	15	9/16-12/16
	2130 expansion module 0 digital input C	0	15	5/16-8/16
	2130 expansion module 0 digital input D	0	15	1/16-4/16
6	2130 expansion module 0 digital input E	0	15	13/16-16/16
	2130 expansion module 0 digital input F	0	15	9/16-12/16
	2130 expansion module 0 digital input G	0	15	5/16-8/16
	2130 expansion module 0 digital input H	0	15	1/16-4/16
7-8	2130 expansion module 1 digital input A-H			
9-10	Reserved for expansion module 2			
11-12	Reserved for expansion module 3			
13-24	Reserved for expansion modules 4-9			
25	2130 expansion module 0 analogue input E low	0	15	13/16-16/16
	2130 expansion module 0analogue input E high	0	15	9/16-12/16
	2130 expansion module 0analogue input F low	0	15	5/16-8/16
	2130 expansion module 0analogue input F high	0	15	1/16-4/16
26	2130 expansion module 0 analogue input G low	0	15	13/16-16/16
	2130 expansion module 0analogue input G high	0	15	9/16-12/16
	2130 expansion module 0analogue input H low	0	15	5/16-8/16
	2130 expansion module 0analogue input H high	0	15	1/16-4/16
27-28	2130 expansion module 1 analogue inputs E-H			
29-30	Reserved for expansion module 2			
31-32	Reserved for expansion module 3			
33-44	Reserved for 2130 expansion module 4-9 analogue inputs E-H			
45	Flex Sender A analogue input low	0	15	13/16-16/16
	Flex Sender A analogue input high	0	15	9/16-12/16
	Flex Sender B analogue input low	0	15	5/16-8/16
	Flex Sender B analogue input high	0	15	1/16-4/16
46	Flex Sender C analogue input low	0	15	13/16-16/16
	Flex Sender C analogue input high	0	15	9/16-12/16
	Flex Sender D analogue input low	0	15	5/16-8/16
	Flex Sender D analogue input high	0	15	1/16-4/16
47	Maintenance alarm 1	0	15	13/16-16/16
	Maintenance alarm 2	0	15	9/16-12/16
	Maintenance alarm 3	0	15	5/16-8/16
	Low Load	0	15	1/16-4/16
48-64	Unimplemented	0	15	16
65-255	Reserved			

61xx MKIII/63xx/6420 family register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of unnamed alarm sources	0	256	16
1	Unnamed digital input 1	0	15	13/16-16/16
	Unnamed digital input 2	0	15	9/16-12/16
	Unnamed digital input 3	0	15	5/16-8/16
	Unnamed digital input 4	0	15	1/16-4/16
2	Unnamed digital input 5	0	15	13/16-16/16
	Unnamed digital input 6	0	15	9/16-12/16
	Unnamed digital input 7	0	15	5/16-8/16
	Unnamed digital input 8	0	15	1/16-4/16
3	Unnamed digital input 9 (Flex sender A as digital input)	0	15	13/16-16/16
	Unnamed digital input 10 (Flex sender B as digital input)	0	15	9/16-12/16
	Unnamed digital input 11 (Flex sender C as digital input)	0	15	5/16-8/16
	Unnamed digital input 12 (Flex sender D as digital input)	0	15	1/16-4/16
4	Unnamed digital input 13 (Flex sender E as digital input)	0	15	13/16-16/16
	Unnamed digital input 14 (Flex sender F as digital input)	0	15	9/16-12/16
	Reserved for digital input 11	0	15	5/16-8/16
	Reserved for digital input 12	0	15	1/16-4/16
5	2130 expansion module 0 digital input A	0	15	13/16-16/16
	2130 expansion module 0 digital input B	0	15	9/16-12/16
	2130 expansion module 0 digital input C	0	15	5/16-8/16
	2130 expansion module 0 digital input D	0	15	1/16-4/16
6	2130 expansion module 0 digital input E	0	15	13/16-16/16
	2130 expansion module 0 digital input F	0	15	9/16-12/16
	2130 expansion module 0 digital input G	0	15	5/16-8/16
	2130 expansion module 0 digital input H	0	15	1/16-4/16
7-8	2130 expansion module 1 digital input A-H			
9-10	2130 expansion module 2 digital input A-H			
11-12	2130 expansion module 3 digital input A-H			
13-24	Reserved for expansion modules 4-9			
25	2130 expansion module 0 analogue input E low	0	15	13/16-16/16
	2130 expansion module 0analogue input E high	0	15	9/16-12/16
	2130 expansion module 0analogue input F low	0	15	5/16-8/16
	2130 expansion module 0analogue input F high	0	15	1/16-4/16
26	2130 expansion module 0 analogue input G low	0	15	13/16-16/16
	2130 expansion module 0analogue input G high	0	15	9/16-12/16
	2130 expansion module 0analogue input H low	0	15	5/16-8/16
	2130 expansion module 0analogue input H high	0	15	1/16-4/16
27-28	2130 expansion module 1 analogue inputs E-H			
29-30	2130 expansion module 2 analogue inputs E-H			
31-32	2130 expansion module 3 analogue inputs E-H			
33-44	Reserved for 2130 expansion module 4-9 analogue inputs E-H			
45	Internal flexible sender A analogue input low	0	15	13/16-16/16
	Internal flexible sender A analogue input high	0	15	9/16-12/16
	Maintenance alarm 1	0	15	5/16-8/16
	Maintenance alarm 2	0	15	1/16-4/16
46	Maintenance alarm 3	0	15	13/16-16/16
	PLC function 1	0	15	9/16-12/16
	PLC function 2	0	15	5/16-8/16
	PLC function 3	0	15	1/16-4/16
47	PLC function 4	0	15	13/16-16/16
	PLC function 5	0	15	9/16-12/16
	PLC function 6	0	15	5/16-8/16
	PLC function 7	0	15	1/16-4/16
48	PLC function 8	0	15	13/16-16/16
	PLC function 9	0	15	9/16-12/16
	PLC function 10	0	15	5/16-8/16
	PLC function 11	0	15	1/16-4/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
49	PLC function 12	0	15	13/16-16/16
	PLC function 13	0	15	9/16-12/16
	PLC function 14	0	15	5/16-8/16
	PLC function 15	0	15	1/16-4/16
50	PLC function 16	0	15	13/16-16/16
	PLC function 17	0	15	9/16-12/16
	PLC function 18	0	15	5/16-8/16
	PLC function 19	0	15	1/16-4/16
51	PLC function 20	0	15	13/16-16/16
	Internal flexible sender A fault alarm	0	15	9/16-12/16
	Internal flexible sender B analogue input low	0	15	5/16-8/16
	Internal flexible sender B analogue input high	0	15	1/16-4/16
52	Internal flexible sender B fault alarm	0	15	13/16-16/16
	Internal flexible sender C analogue input low	0	15	9/16-12/16
	Internal flexible sender C analogue input high	0	15	5/16-8/16
	Internal flexible sender C fault alarm	0	15	1/16-4/16
53	Internal flexible sender D analogue input low	0	15	13/16-16/16
	Internal flexible sender D analogue input high	0	15	9/16-12/16
	Internal flexible sender D fault alarm	0	15	5/16-8/16
	Internal flexible sender E analogue input low	0	15	1/16-4/16
54	Internal flexible sender E analogue input high	0	15	13/16-16/16
	Internal flexible sender E fault alarm	0	15	9/16-12/16
	Internal flexible sender F analogue input low	0	15	5/16-8/16
	Internal flexible sender F analogue input high	0	15	1/16-4/16
55	Internal flexible sender F fault alarm	0	15	13/16-16/16
	Low KW Load alarm	0	15	9/16-12/16
	ECU Software ID Error alarm (6310-A2 only)	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
56	2133 expansion module 0 analogue input A low	0	15	13/16-16/16
	2133 expansion module 0analogue input A high	0	15	9/16-12/16
	2133 expansion module 0analogue input B low	0	15	5/16-8/16
	2133 expansion module 0analogue input B high	0	15	1/16-4/16
57	2133 expansion module 0 analogue input C low	0	15	13/16-16/16
	2133 expansion module 0analogue input C high	0	15	9/16-12/16
	2133 expansion module 0analogue input D low	0	15	5/16-8/16
	2133 expansion module 0analogue input D high	0	15	1/16-4/16
58	2133 expansion module 0 analogue input E low	0	15	13/16-16/16
	2133 expansion module 0analogue input E high	0	15	9/16-12/16
	2133 expansion module 0analogue input F low	0	15	5/16-8/16
	2133 expansion module 0analogue input F high	0	15	1/16-4/16
59	2133 expansion module 0 analogue input G low	0	15	13/16-16/16
	2133 expansion module 0analogue input G high	0	15	9/16-12/16
	2133 expansion module 0analogue input H low	0	15	5/16-8/16
	2133 expansion module 0analogue input H high	0	15	1/16-4/16
60–63	2133 expansion module 1 analogue input A – J			
64 - 67	2133 expansion module 2 analogue input A – J			
68 - 71	2133 expansion module 3 analogue input A – J			
72	2131 expansion module 0 analogue input A low	0	15	13/16-16/16
	2131 expansion module 0analogue input A high	0	15	9/16-12/16
	2131 expansion module 0analogue input B low	0	15	5/16-8/16
	2131 expansion module 0analogue input B high	0	15	1/16-4/16
73	2131 expansion module 0 analogue input C low	0	15	13/16-16/16
	2131 expansion module 0analogue input C high	0	15	9/16-12/16
	2131 expansion module 0analogue input D low	0	15	5/16-8/16
	2131 expansion module 0analogue input D high	0	15	1/16-4/16
74	2131 expansion module 0 analogue input E low	0	15	13/16-16/16
	2131 expansion module 0analogue input E high	0	15	9/16-12/16
	2131 expansion module 0analogue input F low	0	15	5/16-8/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
	2131 expansion module 0analogue input F high	0	15	1/16-4/16
75	2131 expansion module 0 analogue input G low	0	15	13/16-16/16
	2131 expansion module 0analogue input G high	0	15	9/16-12/16
	2131 expansion module 0analogue input H low	0	15	5/16-8/16
	2131 expansion module 0analogue input H high	0	15	1/16-4/16
76	2131 expansion module 0 analogue input I low	0	15	13/16-16/16
	2131 expansion module 0analogue input I high	0	15	9/16-12/16
	2131 expansion module 0analogue input J low	0	15	5/16-8/16
	2131 expansion module 0 analogue input J high	0	15	1/16-4/16
77 – 81	2131 expansion module 1 analogue input A – H			
82 – 86	2131 expansion module 2 analogue input A - H			
87 – 91	2131 expansion module 3 analogue input A – H			
92	2131 expansion module 0 digital input A	0	15	13/16-16/16
	2131 expansion module 0 digital input B	0	15	9/16-12/16
	2131 expansion module 0 digital input C	0	15	5/16-8/16
	2131 expansion module 0 digital input D	0	15	1/16-4/16
93	2131 expansion module 0 digital input E	0	15	13/16-16/16
	2131 expansion module 0 digital input F	0	15	9/16-12/16
	2131 expansion module 0 digital input G	0	15	5/16-8/16
	2131 expansion module 0 digital input H	0	15	1/16-4/16
94	2131 expansion module 0 digital input I	0	15	13/16-16/16
	2131 expansion module 0 digital input J	0	15	9/16-12/16
	2131 expansion module 1 digital input A	0	15	5/16-8/16
	2131 expansion module 1 digital input B	0	15	1/16-4/16
95 – 96	2131 expansion module 1 digital input C – H			
97 – 99	2131 expansion module 2 digital input A - H			
99 – 101	2131 expansion module 3 digital input A – H			
102	DSENet Charger 0 Common Shutdown	0	15	13/16-16/16
	DSENet Charger 0 Common Warning	0	15	9/16-12/16
	DSENet Charger1Common Shutdown	0	15	5/16-8/16
	DSENet Charger1Common Warning	0	15	1/16-4/16
103	DSENet Charger2Common Shutdown	0	15	13/16-16/16
	DSENet Charger2Common Warning	0	15	9/16-12/16
	DSENet Charger3Common Shutdown	0	15	5/16-8/16
	DSENet Charger3Common Warning	0	15	1/16-4/16
104	Configurable CAN instrument 1	0	15	13/16-16/16
	Configurable CAN instrument 2	0	15	9/16-12/16
	Configurable CAN instrument 3	0	15	5/16-8/16
	Configurable CAN instrument 4	0	15	1/16-4/16
105	Configurable CAN instrument 5	0	15	13/16-16/16
	Configurable CAN instrument 6	0	15	9/16-12/16
	Configurable CAN instrument 7	0	15	5/16-8/16
	Configurable CAN instrument 8	0	15	1/16-4/16
106	Configurable CAN instrument 9	0	15	13/16-16/16
	Configurable CAN instrument 10	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
107-127	Unimplemented	0	15	16
128-255	Reserved			

P100 register allocation

The P100 has no unnamed alarms.

Alarm condition codes

Condition	Meaning	Displayed string
0	Disabled input	None
1	Not active alarm	None
2	Warning alarm	Active string
3	Shutdown alarm	Active string
4	Electrical trip alarm	Active string
5	Controlled shutdown alarm	Active string
6-7	Reserved	
8	Inactive indication (no string)	None
9	Inactive indication (displayed string)	Inactive string
10	Active indication	Active string
11-14	Reserved	
15	Unimplemented alarm	None

Notes

1. E800 v1.0 to v1.1 uses alarm condition code 4 as a “Controlled Shutdown alarm”

10.51 Page 154 – Named Alarm Conditions

2. This is part of the new alarm system from the 72xx/73xx onwards and replaces page 8.
3. Its operation is very similar to that of page 8 registers 0 to 127 except that the supported sources have been re-ordered and are family specific.
4. These are read only registers.
5. Each alarm can be in one of 15 conditions as shown in the table below.
6. All unimplemented pre-defined alarms return the unimplemented value 15, not an exception.
7. Each family has a different list of registers.
8. An alarm that is fitted but disabled by the configuration of the slave device returns code 0.
9. An alarm that is not implemented on a particular control unit returns code 15.
10. An indication that does not require a message to be displayed when inactive returns either code 8 or 10.
11. An indication that does require a message to be displayed when inactive returns either code 9 or 10.

61xx MkII

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of named alarms	30	256	16
1	Emergency stop	0	15	13/16-16/16
	Low oil pressure	0	15	9/16-12/16
	High coolant temperature	0	15	5/16-8/16
	Low coolant temperature	0	15	1/16-4/16
2	Under speed	0	15	13/16-16/16
	Over speed	0	15	9/16-12/16
	Generator Under frequency	0	15	5/16-8/16
	Generator Over frequency	0	15	1/16-4/16
3	Generator low voltage	0	15	13/16-16/16
	Generator high voltage	0	15	9/16-12/16
	Battery low voltage	0	15	5/16-8/16
	Battery high voltage	0	15	1/16-4/16
4	Charge alternator failure	0	15	13/16-16/16
	Fail to start	0	15	9/16-12/16
	Fail to stop	0	15	5/16-8/16
	Generator fail to close	0	15	1/16-4/16
5	Mains fail to close	0	15	13/16-16/16
	Oil pressure sender fault	0	15	9/16-12/16
	Loss of magnetic pick up	0	15	5/16-8/16
	Magnetic pick up open circuit	0	15	1/16-4/16
6	Generator high current	0	15	13/16-16/16
	Calibration lost	0	15	9/16-12/16
	Low fuel level	0	15	5/16-8/16
	CAN ECU Warning	0	15	1/16-4/16
7	CAN ECU Shutdown	0	15	13/16-16/16
	CAN ECU Data fail	0	15	9/16-12/16
	Low oil level switch	0	15	5/16-8/16
	High temperature switch	0	15	1/16-4/16
8	Low fuel level switch	0	15	13/16-16/16
	Expansion unit watchdog alarm	0	15	9/16-12/16
	kW overload alarm	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
9	Unimplemented	0	15	13/16-16/16
	Unimplemented	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16
	Maintenance alarm	0	15	1/16-4/16
10	Loading frequency alarm	0	15	13/16-16/16
	Loading voltage alarm	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
11	Unimplemented	0	15	13/16-16/16
	Unimplemented	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
	Unimplemented	0	15	1/16-4/16
12	Unimplemented	0	15	13/16-16/16
	Unimplemented	0	15	9/16-12/16
	ECU protect	0	15	5/16-8/16
	ECU Malfunction	0	15	1/16-4/16
13	ECU Information	0	15	13/16-16/16
	ECU Shutdown	0	15	9/16-12/16
	ECU Warning	0	15	5/16-8/16
	ECU HEST (was ECU Electrical Trip)	0	15	1/16-4/16
14	Unimplemented (was ECU After treatment)	0	15	13/16-16/16
	ECU Water In Fuel	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
15	Unimplemented	0	15	13/16-16/16
	High fuel level	0	15	9/16-12/16
	DEF Level Low	0	15	5/16-8/16
	SCR Inducement	0	15	1/16-4/16
65-255	Reserved			

72xx/73xx/61xx/74xx MKII family register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of named alarms	30	256	16
1	Emergency stop	0	15	13/16-16/16
	Low oil pressure	0	15	9/16-12/16
	High coolant temperature	0	15	5/16-8/16
	Low coolant temperature	0	15	1/16-4/16
2	Under speed	0	15	13/16-16/16
	Over speed	0	15	9/16-12/16
	Generator Under frequency	0	15	5/16-8/16
	Generator Over frequency	0	15	1/16-4/16
3	Generator low voltage	0	15	13/16-16/16
	Generator high voltage	0	15	9/16-12/16
	Battery low voltage	0	15	5/16-8/16
	Battery high voltage	0	15	1/16-4/16
4	Charge alternator failure	0	15	13/16-16/16
	Fail to start	0	15	9/16-12/16
	Fail to stop	0	15	5/16-8/16
	Generator fail to close	0	15	1/16-4/16
5	Mains fail to close	0	15	13/16-16/16
	Oil pressure sender fault	0	15	9/16-12/16
	Loss of magnetic pick up	0	15	5/16-8/16
	Magnetic pick up open circuit	0	15	1/16-4/16
6	Generator high current	0	15	13/16-16/16
	Calibration lost	0	15	9/16-12/16
	Low fuel level	0	15	5/16-8/16
	CAN ECU Warning	0	15	1/16-4/16
7	CAN ECU Shutdown	0	15	13/16-16/16
	CAN ECU Data fail	0	15	9/16-12/16
	Low oil level switch	0	15	5/16-8/16
	High temperature switch	0	15	1/16-4/16
8	Low fuel level switch	0	15	13/16-16/16
	Expansion unit watchdog alarm	0	15	9/16-12/16
	kW overload alarm	0	15	5/16-8/16
	Negative phase sequence current alarm	0	15	1/16-4/16
9	Earth fault trip alarm	0	15	13/16-16/16
	Generator phase rotation alarm	0	15	9/16-12/16
	Auto Voltage Sense Fail	0	15	5/16-8/16
	Maintenance alarm	0	15	1/16-4/16
10	Loading frequency alarm	0	15	13/16-16/16
	Loading voltage alarm	0	15	9/16-12/16
	Fuel usage running	0	15	5/16-8/16
	Fuel usage stopped	0	15	1/16-4/16
11	Protections disabled	0	15	13/16-16/16
	Protections blocked	0	15	9/16-12/16
	Generator Short Circuit	0	15	5/16-8/16
	Mains High Current	0	15	1/16-4/16
12	Mains Earth Fault	0	15	13/16-16/16
	Mains Short Circuit	0	15	9/16-12/16
	ECU protect	0	15	5/16-8/16
	ECU Malfunction	0	15	1/16-4/16
13	ECU Information	0	15	13/16-16/16
	ECU Shutdown	0	15	9/16-12/16
	ECU Warning	0	15	5/16-8/16
	ECU Electrical Trip	0	15	1/16-4/16
14	ECU After treatment	0	15	13/16-16/16
	ECU Water In Fuel	0	15	9/16-12/16
	Generator Reverse Power	0	15	5/16-8/16
	Generator Positive VAr	0	15	1/16-4/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
15	Generator Negative VAr	0	15	13/16-16/16
	LCD Heater Low Voltage	0	15	9/16-12/16
	LCD Heater High Voltage	0	15	5/16-8/16
	DEF Level Low	0	15	1/16-4/16
16	SCR Inducement	0	15	13/16-16/16
	MSC Old version	0	15	9/16-12/16
	MSC ID alarm	0	15	5/16-8/16
	MSC failure	0	15	1/16-4/16
17	MSC priority Error	0	15	13/16-16/16
	Fuel Sender open circuit	0	15	9/16-12/16
	Over speed runaway	0	15	5/16-8/16
	Over frequency run away	0	15	1/16-4/16
18	Coolant sensor open circuit	0	15	13/16-16/16
	Remote display link lost	0	15	9/16-12/16
	Fuel tank bund level	0	15	5/16-8/16
	Charge air temperature	0	15	1/16-4/16
19	Fuel level high	0	15	13/16-16/16
	Gen breaker failed to open (v5.0+)	0	15	9/16-12/16
	Mains breaker failed to open (v5.0+) – 7x20 only	0	15	5/16-8/16
	Fail to synchronise (v5.0+) – 7x20 only	0	15	1/16-4/16
20-64	AVR Data Fail (v5.0+)	0	15	13/16-16/16
	AVR DM1 Red Stop Lamp (v5.0+)	0	15	9/16-12/16
	Escape Mode (v5.0+)	0	15	5/16-8/16
	Coolant high temp electrical trip (v5.0+)	0	15	1/16-4/16
65-255	Reserved			

8xxx family register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of named alarms	148	256	16
1	Emergency stop	0	15	13/16-16/16
	Low oil pressure	0	15	9/16-12/16
	High coolant temperature	0	15	5/16-8/16
	Low coolant temperature	0	15	1/16-4/16
2	Under speed	0	15	13/16-16/16
	Over speed	0	15	9/16-12/16
	Generator Under frequency	0	15	5/16-8/16
	Generator Over frequency	0	15	1/16-4/16
3	Generator low voltage	0	15	13/16-16/16
	Generator high voltage	0	15	9/16-12/16
	Battery low voltage	0	15	5/16-8/16
	Battery high voltage	0	15	1/16-4/16
4	Charge alternator failure	0	15	13/16-16/16
	Fail to start	0	15	9/16-12/16
	Fail to stop	0	15	5/16-8/16
	Generator fail to close	0	15	1/16-4/16
5	Mains fail to close	0	15	13/16-16/16
	Oil pressure sender fault	0	15	9/16-12/16
	Loss of magnetic pick up	0	15	5/16-8/16
	Magnetic pick up open circuit	0	15	1/16-4/16
6	Generator high current	0	15	13/16-16/16
	Calibration lost	0	15	9/16-12/16
	Low fuel level	0	15	5/16-8/16
	CAN ECU Warning	0	15	1/16-4/16
7	CAN ECU Shutdown	0	15	13/16-16/16
	CAN ECU Data fail	0	15	9/16-12/16
	Low oil level switch	0	15	5/16-8/16
	High temperature switch	0	15	1/16-4/16
8	Low fuel level switch	0	15	13/16-16/16
	Expansion unit watchdog alarm	0	15	9/16-12/16
	kW overload alarm	0	15	5/16-8/16
	Negative phase sequence current alarm	0	15	1/16-4/16
9	Earth fault trip alarm	0	15	13/16-16/16
	Generator phase rotation alarm	0	15	9/16-12/16
	Auto Voltage Sense Fail	0	15	5/16-8/16
	Maintenance alarm	0	15	1/16-4/16
10	Loading frequency alarm	0	15	13/16-16/16
	Loading voltage alarm	0	15	9/16-12/16
	Fuel usage running	0	15	5/16-8/16
	Fuel usage stopped	0	15	1/16-4/16
11	Protections disabled	0	15	13/16-16/16
	Protections blocked	0	15	9/16-12/16
	Generator breaker failed to open	0	15	5/16-8/16
	Mains breaker failed to open	0	15	1/16-4/16
12	Bus breaker failed to close	0	15	13/16-16/16
	Bus breaker failed to open	0	15	9/16-12/16
	Generator reverse power alarm	0	15	5/16-8/16
	Short circuit alarm	0	15	1/16-4/16
13	Air flap closed alarm	0	15	13/16-16/16
	Failure to sync	0	15	9/16-12/16
	Bus live	0	15	5/16-8/16
	Bus not live	0	15	1/16-4/16
14	Bus phase rotation	0	15	13/16-16/16
	Priority selection error	0	15	9/16-12/16
	MSC data error	0	15	5/16-8/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
	MSC ID error	0	15	1/16-4/16
15	Bus low voltage	0	15	13/16-16/16
	Bus high voltage	0	15	9/16-12/16
	Bus low frequency	0	15	5/16-8/16
	Bus high frequency	0	15	1/16-4/16
16	MSC failure	0	15	13/16-16/16
	MSC too few sets	0	15	9/16-12/16
	MSC alarms inhibited	0	15	5/16-8/16
	MSC old version units on the bus	0	15	1/16-4/16
17	Mains reverse power alarm/mains export alarm	0	15	13/16-16/16
	Minimum sets not reached	0	15	9/16-12/16
	Insufficient capacity	0	15	5/16-8/16
	Out of sync	0	15	1/16-4/16
18	Alternative aux mains fail	0	15	13/16-16/16
	Loss of excitation	0	15	9/16-12/16
	Mains ROCOF	0	15	5/16-8/16
	Mains vector shift	0	15	1/16-4/16
19	Mains decoupling low frequency stage 1	0	15	13/16-16/16
	Mains decoupling high frequency stage 1	0	15	9/16-12/16
	Mains decoupling low voltage stage 1	0	15	5/16-8/16
	Mains decoupling high voltage stage 1	0	15	1/16-4/16
20	Mains decoupling combined alarm	0	15	13/16-16/16
	Inlet Temperature	0	15	9/16-12/16
	Mains phase rotation alarm identifier	0	15	5/16-8/16
	AVR Max Trim Limit alarm	0	15	1/16-4/16
21	High coolant temperature electrical trip alarm	0	15	13/16-16/16
	Temperature sender open circuit alarm	0	15	9/16-12/16
	Out of sync Bus	0	15	5/16-8/16
	Out of sync Mains	0	15	1/16-4/16
22	Bus 1 Live	0	15	13/16-16/16
	Bus 1 Phase Rotation	0	15	9/16-12/16
	Bus 2 Live	0	15	5/16-8/16
	Bus 2 Phase Rotation	0	15	1/16-4/16
23	Unimplemented	0	15	13/16-16/16
	ECU Protect	0	15	9/16-12/16
	ECU Malfunction	0	15	5/16-8/16
	Indication	0	15	1/16-4/16
24	Unimplemented	0	15	13/16-16/16
	Unimplemented	0	15	9/16-12/16
	HEST Active	0	15	5/16-8/16
	DPTC Filter	0	15	1/16-4/16
25	Water In Fuel	0	15	13/16-16/16
	ECU Heater	0	15	9/16-12/16
	ECU Cooler	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
26	Unimplemented			
	Unimplemented			
	Unimplemented			
	Unimplemented			
27	Unimplemented			
	Unimplemented			
	Unimplemented			
	Unimplemented			
28	High fuel level	0	15	13/16-16/16
	Unimplemented			
	Module Communication Fail (8661)	0	15	5/16-8/16
	Bus Module Warning (8661)	0	15	1/16-4/16
29	Bus Module Trip (8661)	0	15	13/16-16/16
	Mains Module Warning (8661)	0	15	9/16-12/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
	Mains Module Trip (8661)	0	15	5/16-8/16
	Load Live (8661)	0	15	1/16-4/16
30	Load Not Live (8661)	0	15	13/16-16/16
	Load Phase Rotation (8661)	0	15	9/16-12/16
	DEF Level Low	0	15	5/16-8/16
	SCR Inducement	0	15	1/16-4/16
31	Heater Sensor Failure Alarm	0	15	13/16-16/16
	Mains Over Zero Sequence Volts Alarm	0	15	9/16-12/16
	Mains Under Positive Sequence Volts Alarm	0	15	5/16-8/16
	Mains Over Negative Sequence Volts Alarm	0	15	1/16-4/16
32	Mains Asymmetry High Alarm	0	15	13/16-16/16
	Bus Over Zero Sequence Volts Alarm	0	15	9/16-12/16
	Bus Under Positive Sequence Volts Alarm	0	15	5/16-8/16
	Bus Over Negative Sequence Volts Alarm	0	15	1/16-4/16
33	Bus Asymmetry High Alarm	0	15	13/16-16/16
	E-Trip Stop Inhibited	0	15	9/16-12/16
	Fuel Tank Bund Level High	0	15	5/16 – 8/16
	MSC Link 1 Data Error	0	15	1/16-4/16
34	MSC Link 2 Data Error	0	15	13/16-16/16
	Bus 2 Low Voltage	0	15	9/16-12/16
	Bus 2 High Voltage	0	15	5/16 – 8/16
	Bus 2 Low Frequency	0	15	1/16-4/16
35	Bus 2 High Frequency	0	15	13/16-16/16
	MSC Link 1 Failure	0	15	9/16-12/16
	MSC Link 2Failure	0	15	5/16-8/16
	MSC Link 1 Too Few Sets	0	15	1/16-4/16
36	MSC Link 2Too Few Sets	0	15	13/16-16/16
	MSC Link 1 and 2 Failure	0	15	9/16-12/16
	Electrical Trip from 8660	0	15	5/16-8/16
	AVR CAN DM1 Red Stop Lamp Fault	0	15	1/16-4/16
37	Gen Over Zero Sequence Volts Alarm	0	15	13/16-16/16
	Gen Under Positive Sequence Volts Alarm	0	15	9/16-12/16
	Gen Over Negative Sequence Volts Alarm	0	15	5/16-8/16
	Gen Asymmetry High Alarm	0	15	1/16-4/16
38	Mains decoupling low frequency stage 2	0	15	13/16-16/16
	Mains decoupling high frequency stage 2	0	15	9/16-12/16
	Mains decoupling low voltage stage 2	0	15	5/16-8/16
	Mains decoupling high voltage stage 2	0	15	1/16-4/16
39	Fault Ride Through event	0	15	13/16-16/16
	AVR Data Fail	0	15	9/16-12/16
	AVR Red Lamp	0	15	5/16-8/16
	Reserved, Do Not Allocate	0	15	1/16-4/16
40	Reserved, Do Not Allocate	0	15	13/16-16/16
	Reserved, Do Not Allocate	0	15	9/16-12/16
	Reserved, Do Not Allocate	0	15	5/16 – 8/16
	Reserved, Do Not Allocate	0	15	1/16-4/16
41	Reserved, Do Not Allocate	0	15	13/16-16/16
	Reserved, Do Not Allocate	0	15	9/16-12/16
	Reserved, Do Not Allocate	0	15	5/16 – 8/16
	Reserved, Do Not Allocate	0	15	1/16-4/16
42	Reserved, Do Not Allocate	0	15	13/16-16/16
	Reserved, Do Not Allocate	0	15	9/16-12/16
	Reserved, Do Not Allocate	0	15	5/16-8/16
	Reserved, Do Not Allocate	0	15	1/16-4/16
43	Reserved, Do Not Allocate	0	15	13/16-16/16
	Reserved, Do Not Allocate	0	15	9/16-12/16
	Reserved, Do Not Allocate	0	15	5/16-8/16
	Reserved, Do Not Allocate	0	15	1/16-4/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
44	Reserved, Do Not Allocate	0	15	13/16-16/16
	Reserved, Do Not Allocate	0	15	9/16-12/16
	Reserved, Do Not Allocate	0	15	5/16-8/16
	Reserved, Do Not Allocate	0	15	1/16-4/16
45	Reserved, Do Not Allocate	0	15	13/16-16/16
	Reserved, Do Not Allocate	0	15	9/16-12/16
	Reserved, Do Not Allocate	0	15	5/16-8/16
	Reserved, Do Not Allocate	0	15	1/16-4/16
46	Reserved, Do Not Allocate	0	15	13/16-16/16
	Reserved, Do Not Allocate	0	15	9/16-12/16
	Reserved, Do Not Allocate	0	15	5/16-8/16
	Reserved, Do Not Allocate	0	15	1/16-4/16
47	Reserved, Do Not Allocate	0	15	13/16-16/16
	Reserved, Do Not Allocate	0	15	9/16-12/16
	Reserved, Do Not Allocate	0	15	5/16-8/16
	Reserved, Do Not Allocate	0	15	1/16-4/16
48-255	Reserved			

7450 register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of named alarms	99	256	16
1	Emergency stop	0	15	13/16-16/16
	Low oil pressure	0	15	9/16-12/16
	High coolant temperature	0	15	5/16-8/16
	Low coolant temperature	0	15	1/16-4/16
2	Under speed	0	15	13/16-16/16
	Over speed	0	15	9/16-12/16
	Generator Under frequency	0	15	5/16-8/16
	Generator Over frequency	0	15	1/16-4/16
3	Generator low voltage	0	15	13/16-16/16
	Generator high voltage	0	15	9/16-12/16
	Battery low voltage	0	15	5/16-8/16
	Battery high voltage	0	15	1/16-4/16
4	Charge alternator failure	0	15	13/16-16/16
	Fail to start	0	15	9/16-12/16
	Fail to stop	0	15	5/16-8/16
	Generator fail to close	0	15	1/16-4/16
5	Mains fail to close	0	15	13/16-16/16
	Oil pressure sender fault	0	15	9/16-12/16
	Loss of magnetic pick up	0	15	5/16-8/16
	Magnetic pick up open circuit	0	15	1/16-4/16
6	Generator high current	0	15	13/16-16/16
	Calibration lost	0	15	9/16-12/16
	Low fuel level	0	15	5/16-8/16
	CAN ECU Warning	0	15	1/16-4/16
7	CAN ECU Shutdown	0	15	13/16-16/16
	CAN ECU Data fail	0	15	9/16-12/16
	Low oil level switch	0	15	5/16-8/16
	High temperature switch	0	15	1/16-4/16
8	Low fuel level switch	0	15	13/16-16/16
	Expansion unit watchdog alarm	0	15	9/16-12/16
	kW overload alarm	0	15	5/16-8/16
	Negative phase sequence current alarm	0	15	1/16-4/16
9	Earth fault trip alarm	0	15	13/16-16/16
	Generator phase rotation alarm	0	15	9/16-12/16
	Auto Voltage Sense Fail	0	15	5/16-8/16
	Maintenance alarm	0	15	1/16-4/16
10	Loading frequency alarm	0	15	13/16-16/16
	Loading voltage alarm	0	15	9/16-12/16
	Fuel usage running	0	15	5/16-8/16
	Fuel usage stopped	0	15	1/16-4/16
11	Protections disabled	0	15	13/16-16/16
	Protections blocked	0	15	9/16-12/16
	Generator breaker failed to open	0	15	5/16-8/16
	Mains breaker failed to open	0	15	1/16-4/16
12	Bus breaker failed to close	0	15	13/16-16/16
	Bus breaker failed to open	0	15	9/16-12/16
	Generator reverse power alarm	0	15	5/16-8/16
	Short circuit alarm	0	15	1/16-4/16
13	Air flap closed alarm	0	15	13/16-16/16
	Failure to sync	0	15	9/16-12/16
	Bus live	0	15	5/16-8/16
	Bus not live	0	15	1/16-4/16
14	Bus phase rotation	0	15	13/16-16/16
	Priority selection error	0	15	9/16-12/16
	MSC data error	0	15	5/16-8/16
	MSC ID error	0	15	1/16-4/16

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
15	Bus low voltage	0	15	13/16-16/16
	Bus high voltage	0	15	9/16-12/16
	Bus low frequency	0	15	5/16-8/16
	Bus high frequency	0	15	1/16-4/16
16	MSC failure	0	15	13/16-16/16
	MSC too few sets	0	15	9/16-12/16
	MSC alarms inhibited	0	15	5/16-8/16
	MSC old version units on the bus	0	15	1/16-4/16
17	Mains reverse power alarm/mains export alarm	0	15	13/16-16/16
	Minimum sets not reached	0	15	9/16-12/16
	Insufficient capacity	0	15	5/16-8/16
	Out of sync	0	15	1/16-4/16
18	Alternative aux mains fail	0	15	13/16-16/16
	Loss of excitation	0	15	9/16-12/16
	Mains ROCOF	0	15	5/16-8/16
	Mains vector shift	0	15	1/16-4/16
19	Mains decoupling low frequency	0	15	13/16-16/16
	Mains decoupling high frequency	0	15	9/16-12/16
	Mains decoupling low voltage	0	15	5/16-8/16
	Mains decoupling high voltage	0	15	1/16-4/16
20	Mains decoupling combined alarm	0	15	13/16-16/16
	Charge Air Temperature	0	15	9/16-12/16
	Mains phase rotation alarm identifier	0	15	5/16-8/16
	AVR Max Trim Limit alarm	0	15	1/16-4/16
21	High coolant temperature electrical trip alarm	0	15	13/16-16/16
	Temperature sender open circuit alarm	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
22	Unimplemented	0	15	13/16-16/16
	Unimplemented	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
23	Unimplemented			
	ECU Protect	0	15	9/16-12/16
	ECU Malfunction	0	15	5/16-8/16
	Indication	0	15	1/16-4/16
24	ECU Red	0	15	13/16-16/16
	ECU Amber	0	15	9/16-12/16
	Electrical Trip	0	15	5/16-8/16
	Aftertreatment Exhaust	0	15	1/16-4/16
25	Water In Fuel	0	15	13/16-16/16
	ECU Heater	0	15	9/16-12/16
	ECU Cooler	0	15	5/16-8/16
	DC Total Watts Overload	0	15	1/16-4/16
26	High Plant Battery Temperature	0	15	13/16-16/16
	Low Plant Battery Temperature	0	15	9/16-12/16
	Low Plant Battery Voltage	0	15	5/16-8/16
	High Plant Battery Voltage	0	15	1/16-4/16
27	Plant Battery Depth Of Discharge	0	15	13/16-16/16
	DC Battery Over Current	0	15	9/16-12/16
	DC Load Over Current	0	15	5/16-8/16
	High Total DC Current	0	15	1/16-4/16
28-64	Unimplemented			
65-255	Reserved			

332/333 register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of named alarms	0	256	16
1	Battery High Voltage	0	15	13/16-16/16
	Battery Low Voltage	0	15	9/16-12/16
	Generator Failure Latched	0	15	5/16-8/16
	Generator Failure Unlatched	0	15	1/16-4/16
2	Mains Failure Latched	0	15	13/16-16/16
	Mains Failure Unlatched	0	15	9/16-12/16
	Fail to start	0	15	5/16-8/16
	Fail to stop	0	15	1/16-4/16
3	Failed to reach loading voltage	0	15	13/16-16/16
	Failed to reach loading frequency	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
4-64	Unimplemented			
65-255	Reserved			

330/331/334/335 register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of named alarms	0	256	16
1	Battery High Voltage	0	15	13/16-16/16
	Battery Low Voltage	0	15	9/16-12/16
	S2 Failure Latched	0	15	5/16-8/16
	S2 Failure Unlatched	0	15	1/16-4/16
2	S1 Failure Latched	0	15	13/16-16/16
	S1 Failure Unlatched	0	15	9/16-12/16
	Fail to start	0	15	5/16-8/16
	Fail to stop	0	15	1/16-4/16
3	Failed to reach loading voltage	0	15	13/16-16/16
	Failed to reach loading frequency	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16
	Calibration Lost (335 only)	0	15	1/16-4/16
4	S2 Gen Under Frequency (335 only)	0	15	13/16-16/16
	S2 Gen Over Frequency (335 only)	0	15	9/16-12/16
	S2 Gen Low Voltage (335 only)	0	15	5/16-8/16
	S2 Gen High Voltage (335 only)	0	15	1/16-4/16
5	S2 Mains Under Frequency (335 only)	0	15	13/16-16/16
	S2 Mains Over Frequency (335 only)	0	15	9/16-12/16
	S2 Mains Low Voltage (335 only)	0	15	5/16-8/16
	S2 Mains Voltage (335 only)	0	15	1/16-4/16
6	S1 Mains Under Frequency (335 only)	0	15	13/16-16/16
	S1 Mains Over Frequency (335 only)	0	15	9/16-12/16
	S1 Mains Low Voltage (335 only)	0	15	5/16-8/16
	S1 Mains High Voltage (335 only)	0	15	1/16-4/16
7	Load Scheding (335 only)	0	15	13/16-16/16
	Load Return (335 only)	0	15	9/16-12/16
	S1 Phase Rotation (335 only)	0	15	5/16-8/16
	S2 Phase Rotation (335 only)	0	15	1/16-4/16
8	S1 Breaker Aux Fail(335 only)	0	15	13/16-16/16
	S2 Breaker Aux Fail(335 only)	0	15	9/16-12/16
	S1 Failed to Open (335 only)	0	15	5/16-8/16
	S1 Failed to Close (335 only)	0	15	1/16-4/16
9	S2 Failed to Open (335 only)	0	15	13/16-16/16
	S2 Failed to Close (335 only)	0	15	9/16-12/16
	S1 and S2 Open(335 only)	0	15	5/16-8/16
	S1 and S2 Closed(335 only)	0	15	1/16-4/16
10-64	Unimplemented			
65-255	Reserved			

Load Phase Seq Wrong
Load Not Live
Mains Module Trip
Mains Module Warning
Bus Module Trip
Bus Module Warning
Module Communication Fail

94xx Battery Charger Range

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of named alarms	0	256	16
1	Mains High Voltage	0	15	13/16-16/16
	Mains Low Voltage	0	15	9/16-12/16
	High Output/Battery Voltage	0	15	5/16-8/16
	High Output Current	0	15	1/16-4/16
2	Short Circuit/Reverse Polarity Fault	0	15	13/16-16/16
	Battery Not Connected	0	15	9/16-12/16
	High Battery Temperature	0	15	5/16-8/16
	High Module Temperature	0	15	1/16-4/16
3	NTC Failure	0	15	13/16-16/16
	Battery Charger Internal Component Failure	0	15	9/16-12/16
	Battery Charger Output Stage Component Failure	0	15	5/16-8/16
	High Input Current	0	15	1/16-4/16
4	Low Battery Voltage	0	15	13/16-16/16
	Charging Cable Voltage Drop	0	15	9/16-12/16
	Fan Locked	0	15	5/16-8/16
	Auxiliary Supply Voltage High	0	15	1/16-4/16
5	Auxiliary Current High	0	15	13/16-16/16
	Auxiliary Output Short Circuit	0	15	9/16-12/16
	Fuse Blown	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
6	Unimplemented	0	15	13/16-16/16
	Unimplemented	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
6-64	Unimplemented			
65-255	Reserved			

Exxx register allocation				
Register offset	Name	Min value	Max value	Bits/ Sign
0	Number of named alarms	58	256	16
1	Emergency stop	0	15	13/16-16/16
	Low oil pressure	0	15	9/16-12/16
	High coolant temperature	0	15	5/16-8/16
	Low coolant temperature	0	15	1/16-4/16
2	Under speed	0	15	13/16-16/16
	Over speed	0	15	9/16-12/16
	Battery low voltage	0	15	5/16-8/16
	Battery high voltage	0	15	1/16-4/16
3	Charge alternator failure	0	15	13/16-16/16
	Fail to start	0	15	9/16-12/16
	Fail to stop	0	15	5/16-8/16
	Oil pressure sender fault	0	15	1/16-4/16
4	Loss of magnetic pick up	0	15	13/16-16/16
	Magnetic pick up open circuit	0	15	9/16-12/16
	Calibration lost	0	15	5/16-8/16
	Low fuel level	0	15	1/16-4/16
5	CAN ECU Warning	0	15	13/16-16/16
	CAN ECU Shutdown	0	15	9/16-12/16
	CAN ECU Data fail	0	15	5/16-8/16
	Low oil level switch	0	15	1/16-4/16
6	High temperature switch	0	15	13/16-16/16
	Low fuel level switch	0	15	9/16-12/16
	Expansion unit watchdog alarm	0	15	5/16-8/16
	Fuel usage running	0	15	1/16-4/16
7	Fuel usage stopped	0	15	13/16-16/16
	Protections disabled	0	15	9/16-12/16
	Protections blocked	0	15	5/16-8/16
	Air flap closed alarm	0	15	1/16-4/16
8	Charge air temperature	0	15	13/16-16/16
	High coolant temperature electrical trip alarm	0	15	9/16-12/16
	Temperature sender open circuit alarm	0	15	5/16-8/16
	ECU Protect	0	15	1/16-4/16
9	ECU Malfunction	0	15	13/16-16/16
	ECU Information	0	15	9/16-12/16
	ECU Shutdown	0	15	5/16-8/16
	ECU Warning	0	15	1/16-4/16
10	ECU Electrical Trip	0	15	13/16-16/16
	ECU After-treatment	0	15	9/16-12/16
	ECU Water In Fuel	0	15	5/16-8/16
	ECU Heater	0	15	1/16-4/16
11	ECU Cooler	0	15	13/16-16/16
	Unimplemented (Reserved for MSC data error)	0	15	9/16-12/16
	Unimplemented (Reserved for MSC ID error)	0	15	5/16-8/16
	Unimplemented (Reserved for MSC failure)	0	15	1/16-4/16
12	Unimplemented (Reserved for MSC too few sets)	0	15	13/16-16/16
	Unimplemented (Reserved for MSC alarms inhibited)	0	15	9/16-12/16
	Unimplemented (Reserved for MSC old version units on the bus)	0	15	5/16-8/16
	LCD Heater Low Voltage	0	15	1/16-4/16
13	LCD Heater High Voltage	0	15	13/16-16/16
	LCD Heater Temperature	0	15	9/16-12/16
	LCD Heater Sensor Failure	0	15	5/16-8/16
	DEF Level Low	0	15	1/16-4/16

Exxx register allocation				
Register offset	Name	Min value	Max value	Bits/ Sign
14	SCR Inducement	0	15	13/16-16/16
	PWM(i) 1 Active	0	15	9/16-12/16
	PWM(i) 2 Active	0	15	5/16-8/16
	PWM(i) 3 Active	0	15	1/16-4/16
15	PWM(i) 4 Active	0	15	13/16-16/16
	Incorrect Speed	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
16-64	Reserved			
65-255	Reserved			

P100 Mains Decoupling Module

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of named alarms	0	256	16
1	Low frequency stage 1	0	15	13/16-16/16
	Low frequency stage 2	0	15	9/16-12/16
	High frequency stage 1	0	15	5/16-8/16
	High frequency stage 2	0	15	1/16-4/16
2	Low voltage stage 1	0	15	13/16-16/16
	Low voltage stage 2	0	15	9/16-12/16
	High voltage stage 1	0	15	5/16-8/16
	High voltage stage 2	0	15	1/16-4/16
3	High average voltage	0	15	13/16-16/16
	ROCOF stage 1	0	15	9/16-12/16
	Vector Shift	0	15	5/16-8/16
	Loss of Mains	0	15	1/16-4/16
4	Zero sequence voltage high	0	15	13/16-16/16
	Positive sequence voltage low	0	15	9/16-12/16
	Negative sequence voltage high	0	15	5/16-8/16
	Asymmetry high	0	15	1/16-4/16
5	Phase rotation wrong	0	15	13/16-16/16
	Common mains decoupling	0	15	9/16-12/16
	Calibration lost	0	15	5/16-8/16
	Auxiliary mains failure	0	15	1/16-4/16
6	Boot in tripped mode	0	15	13/16-16/16
	Breaker failed to open	0	15	9/16-12/16
	Low voltage stage 3	0	15	5/16-8/16
	Low voltage stage 4	0	15	1/16-4/16
7	Low voltage stage 5	0	15	13/16-16/16
	High voltage stage 3	0	15	9/16-12/16
	High voltage stage 4	0	15	5/16-8/16
	High voltage stage 5	0	15	1/16-4/16
8	ROCOF stage 2	0	15	13/16-16/16
	ROCOF stage 3	0	15	9/16-12/16
	Remote Mains Failure	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
9-64	Unimplemented			
65-255	Reserved			

71xx/66xx/60xx/L40x/4xxx/45xx MKII family register allocation

1. The “Water in Fuel” alarm and onwards are not currently implemented in all modules.

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Number of named alarms	30	256	16
1	Emergency stop	0	15	13/16-16/16
	Low oil pressure	0	15	9/16-12/16
	High coolant temperature	0	15	5/16-8/16
	Low coolant temperature	0	15	1/16-4/16
2	Under speed	0	15	13/16-16/16
	Over speed	0	15	9/16-12/16
	Generator Under frequency	0	15	5/16-8/16
	Generator Over frequency	0	15	1/16-4/16
3	Generator low voltage	0	15	13/16-16/16
	Generator high voltage	0	15	9/16-12/16
	Battery low voltage	0	15	5/16-8/16
	Battery high voltage	0	15	1/16-4/16
4	Charge alternator failure	0	15	13/16-16/16
	Fail to start	0	15	9/16-12/16
	Fail to stop	0	15	5/16-8/16
	Generator fail to close	0	15	1/16-4/16
5	Mains fail to close	0	15	13/16-16/16
	Oil pressure sender fault	0	15	9/16-12/16
	Loss of Mag Pickup signal	0	15	5/16-8/16
	Magnetic pick up open circuit	0	15	1/16-4/16
6	Generator high current	0	15	13/16-16/16
	Calibration lost	0	15	9/16-12/16
	Unimplemented	0	15	5/16-8/16
	CAN ECU Warning	0	15	1/16-4/16
7	CAN ECU Shutdown	0	15	13/16-16/16
	CAN ECU Data fail	0	15	9/16-12/16
	Low oil level switch	0	15	5/16-8/16
	High temperature switch	0	15	1/16-4/16
8	Low fuel level switch	0	15	13/16-16/16
	Expansion unit watchdog alarm	0	15	9/16-12/16
	kW overload alarm	0	15	5/16-8/16
	Negative phase sequence alarm	0	15	1/16-4/16
9	Earth fault trip	0	15	13/16-16/16
	Generator phase rotation alarm	0	15	9/16-12/16
	Auto Voltage Sense fail	0	15	5/16-8/16
	Unimplemented	0	15	1/16-4/16
10	Temperature sensor open circuit	0	15	13/16-16/16
	Low fuel level	0	15	9/16-12/16
	High fuel level	0	15	5/16-8/16
	Water in Fuel	0	15	1/16-4/16
11	DEF Level Low	0	15	13/16-16/16
	SCR Inducement	0	15	9/16-12/16
	Hest Active	0	15	5/16-8/16
	DPTC Filter	0	15	1/16-4/16
11-64	Unimplemented			
36-255	Reserved			

Alarm condition codes

Condition	Meaning	Displayed string
0	Disabled input	None
1	Not active alarm	None
2	Warning alarm	Active string
3	Shutdown alarm	Active string
4	Electrical trip	Active string
5	Controlled Shutdown alarm	Active string
6-7	Reserved	
8	Inactive indication (no string)	None
9	Inactive indication (displayed string)	Inactive string
10	Active indication	Active string
11-14	Reserved	
15	Unimplemented alarm	None

Notes

1. E800 v1.0 to v1.1 uses alarm condition code 4 as a “Controlled Shutdown alarm ”

10.52 Page 155 – Previous ECU Trouble Codes

1. Currently supported in 73xx modules.
2. Functionally identical to page 142 but will return trouble codes that have been previously active (if supported by the engine file). Page 142 returns codes that are currently active.
3. Reading register 0 effectively latches a copy of the trouble code list at that time and so allows the list to be read without risk of the contents changing until register 0 is re-read. This also applies to reading the short descriptive strings for the trouble codes (see following pages), so that the list of trouble codes can be read in one or more sections and then the associated strings read as needed. To see any updates to the list, the PC needs to re-read register 0 and so latch the list once more.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
0	Number of previous trouble codes	0	50			16	Read only
1	Amber warning lamp status	0	1			1/16	Read only
	Red stop lamp status	0	1			2/16	Read only
	Reserved for SAE assignment					3-16/16	Read only
2-5	Trouble Code 1					64	Read only
6-9	Trouble Code 2					64	Read only
10-13	Trouble Code 3					64	Read only
14-201	Trouble Codes 4-50						Read only
202-255	Reserved						Read only

Trouble code format

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ Sign
0--1	Trouble code value	0	524287			9-32/32
	Additional trouble code status	0	255			1-8/32
2	Engine type code	0	31			16
3	reserved	0	0			16

10.53 Page 156 – Expansion module enable status

1. This page indicates which expansion modules are currently included in the configuration.
2. The 72xx does not support expansion modules so all registers return false.
3. The 73xx currently only supports the 2130, 2157 and 2548.
4. The 73xx MKII currently only supports the 2130, 2131, 2133, 2157, 2548, 2152, 2510/2520, DSENet chargers.
5. The 335 currently only supports the 2130, 2157 and 2548.
6. False = 0, True =1.
7. These registers are Read-Only
8. Unimplemented registers within a family/module are shaded

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	8xxx/74xx	73xx	335
0	2130 Expansion module 0 enable	False	True			16	✓	✓	✓
1	2130 Expansion module 1 enable	False	True			16	✓	✓	✓
2	2130 Expansion module 2 enable	False	True			16	✓	✓	
3	2130 Expansion module 3 enable	False	True			16	✓	✓	
4	2130 Expansion module 4 enable	False	True			16	✓	✓	
5	2130 Expansion module 5 enable	False	True			16			
6	2130 Expansion module 6 enable	False	True			16			
7	2130 Expansion module 7 enable	False	True			16			
8	2130 Expansion module 8 enable	False	True			16			
9	2130 Expansion module 9 enable	False	True			16			
10	2157 Expansion module 0 enable	False	True			16	✓	✓	✓
11	2157Expansion module 1 enable	False	True			16	✓	✓	✓
12	2157Expansion module 2 enable	False	True			16	✓	✓	
13	2157Expansion module 3 enable	False	True			16	✓	✓	
14	2157Expansion module 4 enable	False	True			16	✓	✓	
15	2157Expansion module 5 enable	False	True			16	✓	✓	
16	2157Expansion module 6 enable	False	True			16	✓	✓	
17	2157Expansion module 7 enable	False	True			16	✓	✓	
18	2157Expansion module 8 enable	False	True			16	✓	✓	
19	2157Expansion module 9 enable	False	True			16	✓	✓	
20	2548 Expansion module 0 enable	False	True			16	✓	✓	✓
21	2548Expansion module 1 enable	False	True			16	✓	✓	✓
22	2548Expansion module 2 enable	False	True			16	✓	✓	
23	2548Expansion module 3 enable	False	True			16	✓	✓	
24	2548Expansion module 4 enable	False	True			16	✓	✓	
25	2548Expansion module 5 enable	False	True			16	✓	✓	
26	2548Expansion module 6 enable	False	True			16	✓	✓	
27	2548Expansion module 7 enable	False	True			16	✓	✓	
28	2548Expansion module 8 enable	False	True			16	✓	✓	
29	2548Expansion module 9 enable	False	True			16	✓	✓	
30	2131 Expansion module 0 enable	False	True			16	✓	✓	
31	2131 Expansion module 1 enable	False	True			16	✓	✓	
32	2131 Expansion module 2 enable	False	True			16	✓	✓	
33	2131 Expansion module 3 enable	False	True			16	✓	✓	
34	2133 Expansion module 0 enable	False	True			16	✓	✓	
35	2133 Expansion module 1 enable	False	True			16	✓	✓	
36	2133 Expansion module 2 enable	False	True			16	✓	✓	
37	2133 Expansion module 3 enable	False	True			16	✓	✓	
38	2152 Expansion module 0 enable	False	True			16	✓	✓	
39	2152 Expansion module 1 enable	False	True			16	✓	✓	
40	2152 Expansion module 2 enable	False	True			16	✓	✓	
41	2152 Expansion module 3 enable	False	True			16	✓	✓	

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	8xxx/74xx	73xx	335
42	2510/20Expansion module 0 enable	NO	YES			16	✓	✓	
43	2510/20Expansion module 1 enable	NO	YES			16	✓	✓	
44	2510/20Expansion module 2 enable	NO	YES			16	✓	✓	
45	DSENet Charger 0 Enable	False	True			16	✓	✓	
46	DSENet Charger 1 Enable	False	True			16	✓	✓	
47	DSENet Charger 2 Enable	False	True			16	✓	✓	
48	DSENet Charger 3 Enable	False	True			16	✓	✓	
49	25xx MKII DSENet Expansion module 0 enable (73xxMKII/74xx MKII v5.0+)	NO	YES			16		✓	
50-255	Reserved								

10.54 Page 158 – Expansion module communications status

1. This indicates which expansion modules are failing to communicate with the host module.
2. If an expansion module is not enabled in the configuration, it will not report a failure to communicate.
3. False = 0, True =1.
4. These registers are Read-Only
5. Unimplemented registers within a family/module are shaded

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	8xxx/74xx	73xx	335
0	2130 Expansion module 0 comms failure	False	True			16	✓	✓	✓
1	2130 Expansion module 1 comms failure	False	True			16	✓	✓	✓
2	2130 Expansion module 2 comms failure	False	True			16	✓	✓	
3	2130 Expansion module 3 comms failure	False	True			16	✓	✓	
4	2130 Expansion module 4 comms failure	False	True			16	✓	✓	
5	2130 Expansion module 5 comms failure	False	True			16			
6	2130 Expansion module 6 comms failure	False	True			16			
7	2130 Expansion module 7 comms failure	False	True			16			
8	2130 Expansion module 8 comms failure	False	True			16			
9	2130 Expansion module 9 comms failure	False	True			16			
10	2157 Expansion module 0 comms failure	False	True			16	✓	✓	✓
11	2157Expansion module 1 comms failure	False	True			16	✓	✓	✓
12	2157Expansion module 2 comms failure	False	True			16	✓	✓	
13	2157Expansion module 3 comms failure	False	True			16	✓	✓	
14	2157Expansion module 4 comms failure	False	True			16	✓	✓	
15	2157Expansion module 5 comms failure	False	True			16	✓	✓	
16	2157Expansion module 6 comms failure	False	True			16	✓	✓	
17	2157Expansion module 7 comms failure	False	True			16	✓	✓	
18	2157Expansion module 8 comms failure	False	True			16	✓	✓	
19	2157Expansion module 9 comms failure	False	True			16	✓	✓	
20	2548 Expansion module 0 comms failure	False	True			16	✓	✓	✓
21	2548Expansion module 1 comms failure	False	True			16	✓	✓	✓
22	2548Expansion module 2 comms failure	False	True			16	✓	✓	
23	2548Expansion module 3 comms failure	False	True			16	✓	✓	
24	2548Expansion module 4 comms failure	False	True			16	✓	✓	
25	2548Expansion module 5 comms failure	False	True			16	✓	✓	
26	2548Expansion module 6 comms failure	False	True			16	✓	✓	
27	2548Expansion module 7 comms failure	False	True			16	✓	✓	
28	2548Expansion module 8 comms failure	False	True			16	✓	✓	
29	2548Expansion module 9 comms failure	False	True			16	✓	✓	
30	2131Expansion module 0 comms failure	False	True			16	✓	✓	
31	2131Expansion module 1 comms failure	False	True			16	✓	✓	
32	2131Expansion module 2 comms failure	False	True			16	✓	✓	
33	2131Expansion module 3 comms failure	False	True			16	✓	✓	
34	2133Expansion module 0 comms failure	False	True			16	✓	✓	
35	2134Expansion module 1 comms failure	False	True			16	✓	✓	
36	2135Expansion module 2 comms failure	False	True			16	✓	✓	
37	2136Expansion module 3 comms failure	False	True			16	✓	✓	
38	2152Expansion module 0 comms failure	False	True			16	✓	✓	
39	2152Expansion module 1 comms failure	False	True			16	✓	✓	
40	2152Expansion module 2 comms failure	False	True			16	✓	✓	
41	2152Expansion module 3 comms failure	False	True			16	✓	✓	
42	2510/20 Expansion module 0 comms failure	False	True			16	✓	✓	

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	8xxx/74xx	73xx	335
43	2510/20 Expansion module 1 comms failure	False	True			16	✓	✓	
44	2510/20 Expansion module 2 comms failure	False	True			16	✓	✓	
45	DSENet charger module 0 comms failure	False	True			16	✓	✓	
46	DSENet charger module 1 comms failure	False	True			16	✓	✓	
47	DSENet charger module 2 comms failure	False	True			16	✓	✓	
48	DSENet charger module 3 comms failure	False	True			16	✓	✓	
49	25xx MKII DSENet Expansion module 0 comms failure (73xxMKII/74xx MKII v5.0+)	False	True			16		✓	
49-255	Reserved								

10.55 Page 160 – Unnamed Alarm function

1. This indicates to the PC software how each unnamed alarm (digital inputs, both built in and in the expansion modules, maintenance alarms, flexible sendersetc) is configured.
2. The alarm function is the function field from the alarm block.
3. Each family has different register allocations.
4. Registers 112-159 return unimplemented on the 8xxx/74xx.
5. Registers 192-197 on the 8xxx/74xx actually return the function from the digital alarm blocks for the flexible senders; they duplicate the values returned in registers 16-18.
6. Registers 205-224 were not in this document but are in the 8xxx/74xx code, they need checking.
7. These registers are Read-Only.
8. This page is used in conjunction with page 153 and the registers should be in the same order as page 153 registers 1 to 64.
9. Although the P100 does not have any unnamed alarms this is needed to read the functions of digital inputs A-E
10. The 73xx MKI does not have registers 9-13

61xx MkII family register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0	Digital input A function	0	65535	16
1	Digital input B function	0	65535	16
2	Digital input C function	0	65535	16
3	Digital input D function	0	65535	16
4	Digital input E function	0	65535	16
5	Digital input F function	0	65535	16
6	Flex Sender A Digital input function	0	65535	16
7	Flex Sender B Digital input function	0	65535	16
8	Flex Sender C Digital input function	0	65535	16
9	Flex Sender D Digital input function	0	65535	16
10-15	Reserved			
16	2130 Expansion module 0 digital input A	0	65535	16
17	2130 Expansion module 0 digital input B	0	65535	16
18	2130 Expansion module 0 digital input C	0	65535	16
19	2130 Expansion module 0 digital input D	0	65535	16
20	2130 Expansion module 0 digital input E	0	65535	16
21	2130 Expansion module 0 digital input F	0	65535	16
22	2130 Expansion module 0 digital input G	0	65535	16
23	2130 Expansion module 0 digital input H	0	65535	16
24-31	2130 Expansion module 1 digital inputs A-H			
32-95	Reserved for 2130 expansion module 2-9 inputs A-H			
96	2130 Expansion module 0 analogue input E (low)	0	65535	16
97	2130 Expansion module 0 analogue input E (high)	0	65535	16
98	2130 Expansion module 0 analogue input F (low)	0	65535	16
99	2130 Expansion module 0 analogue input F (high)	0	65535	16
100	2130 Expansion module 0 analogue input G (low)	0	65535	16
101	2130 Expansion module 0 analogue input G (high)	0	65535	16
102	2130 Expansion module 0 analogue input H (low)	0	65535	16
103	2130 Expansion module 0 analogue input H (high)	0	65535	16
104-111	2130 Expansion module 1 analogue inputs E-H			
112-119	2130 Expansion module 2 analogue inputs E-H			
120-127	Reserved			
128-175	Reserved			
176	Flexible sender A input (low)	0	65535	16
177	Flexible sender A input (high)	0	65535	16
178	Flexible sender B input (low)	0	65535	16
179	Flexible sender B input (high)	0	65535	16
180	Flexible sender C input (low)	0	65535	16
181	Flexible sender C input (high)	0	65535	16
182	Flexible sender D input (low)	0	65535	16
183	Flexible sender D input (high)	0	65535	16
184	Maintenance alarm 1	0	65535	16
185	Maintenance alarm 2	0	65535	16

Register offset	Name	Minimum value	Maximum value	Bits/ sign
186	Maintenance alarm 3	0	65535	16
187	Low Load	0	65535	16
188-255	Reserved			

72xx/73xx/61xx MKIII/63xx/6420family register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0	Digital input A function	0	65535	16
1	Digital input B function	0	65535	16
2	Digital input C function	0	65535	16
3	Digital input D function	0	65535	16
4	Digital input E function	0	65535	16
5	Digital input F function	0	65535	16
6	Digital input G function	0	65535	16
7	Digital input H function	0	65535	16
8	Flex Sensor A Digital input function	0	65535	16
9	Flex SensorB Digital input function	0	65535	16
10	Flex SensorC Digital input function	0	65535	16
11	Flex Sensor D Digital input function	0	65535	16
12	Flex Sensor E Digital input function	0	65535	16
13	Flex Sensor F Digital input function	0	65535	16
14-15	Reserved			
16	2130 Expansion module 0 digital input A	0	65535	16
17	2130 Expansion module 0 digital input B	0	65535	16
18	2130 Expansion module 0 digital input C	0	65535	16
19	2130 Expansion module 0 digital input D	0	65535	16
20	2130 Expansion module 0 digital input E	0	65535	16
21	2130 Expansion module 0 digital input F	0	65535	16
22	2130 Expansion module 0 digital input G	0	65535	16
23	2130 Expansion module 0 digital input H	0	65535	16
24-31	2130 Expansion module 1 digital inputs A-H			
32-39	2130 Expansion module 2 digital inputs A-H			
40-47	2130 Expansion module 3 digital inputs A-H			
48-95	Reserved for 2130 expansion module 4-9 inputs A-H			
96	2130 Expansion module 0 analogue input E (low)	0	65535	16
97	2130 Expansion module 0 analogue input E (high)	0	65535	16
98	2130 Expansion module 0 analogue input F (low)	0	65535	16
99	2130 Expansion module 0 analogue input F (high)	0	65535	16
100	2130 Expansion module 0 analogue input G (low)	0	65535	16
101	2130 Expansion module 0 analogue input G (high)	0	65535	16
102	2130 Expansion module 0 analogue input H (low)	0	65535	16
103	2130 Expansion module 0 analogue input H (high)	0	65535	16
104-111	2130 Expansion module 1 analogue inputs E-H			
112-119	2130 Expansion module 2 analogue inputs E-H			
120-127	2130 Expansion module 3 analogue inputs E-H			
128-175	2130 Expansion module 4-9 analogue inputs E-H			
176	Internal flexible sender A input (low)	0	65535	16
177	Internal flexible sender A input (high)	0	65535	16
178	Maintenance alarm 1	0	65535	16
179	Maintenance alarm 2	0	65535	16
180	Maintenance alarm 3	0	65535	16
181	PLC function 1	0	65535	16
182	PLC function 2	0	65535	16
183	PLC function 3	0	65535	16
184	PLC function 4	0	65535	16
185	PLC function 5	0	65535	16
186	PLC function 6	0	65535	16
187	PLC function 7	0	65535	16
188	PLC function 8	0	65535	16
189	PLC function 9	0	65535	16
190	PLC function 10	0	65535	16
191	PLC function 11	0	65535	16
192	PLC function 12	0	65535	16
193	PLC function 13	0	65535	16
194	PLC function 14	0	65535	16

Register offset	Name	Minimum value	Maximum value	Bits/ sign
195	PLC function 15	0	65535	16
196	PLC function 16	0	65535	16
197	PLC function 17	0	65535	16
198	PLC function 18	0	65535	16
199	PLC function 19	0	65535	16
200	PLC function 20	0	65535	16
201	Internal flexible sender A input Open circuit	0	65535	16
202	Internal flexible sender B input (low)	0	65535	16
203	Internal flexible sender B input (high)	0	65535	16
204	Internal flexible sender B input Open circuit	0	65535	16
205	Internal flexible sender C input (low)	0	65535	16
206	Internal flexible sender C input (high)	0	65535	16
207	Internal flexible sender C input Open circuit	0	65535	16
208	Internal flexible sender D input (low)	0	65535	16
209	Internal flexible sender D input (high)	0	65535	16
210	Internal flexible sender D input Open circuit	0	65535	16
211	Internal flexible sender E input (low)	0	65535	16
212	Internal flexible sender E input (high)	0	65535	16
213	Internal flexible sender E input Open circuit	0	65535	16
214	Internal flexible sender F input (low)	0	65535	16
215	Internal flexible sender F input (high)	0	65535	16
216	Internal flexible sender F input Open circuit	0	65535	16
217	Low kW load function	0	65535	16
218	ECU Software ID Error function (6310-A2 only)	0	65535	16
219	Unimplemented	65535	65535	10
220	2133 Expansion module 0 analogue input A (low)	0	65535	16
221	2133 Expansion module 0 analogue input A (high)	0	65535	16
222	2133 Expansion module 0 analogue input B (low)	0	65535	16
223	2133 Expansion module 0 analogue input B (high)	0	65535	16
224	2133 Expansion module 0 analogue input C (low)	0	65535	16
225	2133 Expansion module 0 analogue input C (high)	0	65535	16
226	2133 Expansion module 0 analogue input D (low)	0	65535	16
227	2133 Expansion module 0 analogue input D (high)	0	65535	16
228	2133 Expansion module 0 analogue input E (low)	0	65535	16
229	2133 Expansion module 0 analogue input E (high)	0	65535	16
230	2133 Expansion module 0 analogue input F (low)	0	65535	16
231	2133 Expansion module 0 analogue input F (high)	0	65535	16
232	2133 Expansion module 0 analogue input G (low)	0	65535	16
233	2133 Expansion module 0 analogue input G (high)	0	65535	16
234	2133 Expansion module 0 analogue input H (low)	0	65535	16
235	2133 Expansion module 0 analogue input H (high)	0	65535	16
236-251	2133Expansion module 1 analogue input A-H	0	65535	16
252-255	2133Expansion module 2 analogue input A-B	0	65535	16

8xxx MKI/ 74xx MKI family register allocation

Register offset	Name	Min value	Max value	Bits/ sign
0	Digital input A function	0	65535	16
1	Digital input B function	0	65535	16
2	Digital input C function	0	65535	16
3	Digital input D function	0	65535	16
4	Digital input E function	0	65535	16
5	Digital input F function	0	65535	16
6	Digital input G function	0	65535	16
7	Digital input H function	0	65535	16
8	Digital input I function	0	65535	16
9	Digital input J function	0	65535	16
10	Digital input K function	0	65535	16
11	Digital input L function	0	65535	16
12	Digital input M function	0	65535	16
13	Digital input N function	0	65535	16
14	Digital input O function	0	65535	16
15	Digital input P function	0	65535	16
16	Digital input Q function	0	65535	16
17	Digital input R function	0	65535	16
18	Digital input S function	0	65535	16
19	Digital input T function	0	65535	16
20	Digital input U function	0	65535	16
21	Digital input V function	0	65535	16
22	Digital input W function	0	65535	16
23	Digital input X function	0	65535	16
24	Digital input Y function	0	65535	16
25	Digital input Z function	0	65535	16
26	Digital input AA function	0	65535	16
27	Digital input AB function	0	65535	16
28	Digital input AC function	0	65535	16
29	Digital input AD function	0	65535	16
30	Digital input AE function	0	65535	16
31	Digital input AF function	0	65535	16
32	2130 Expansion module 0 digital input A function	0	65535	16
33	2130 Expansion module 0 digital input B function	0	65535	16
34	2130 Expansion module 0 digital input C function	0	65535	16
35	2130 Expansion module 0 digital input D function	0	65535	16
36	2130 Expansion module 0 digital input E function	0	65535	16
37	2130 Expansion module 0 digital input F function	0	65535	16
38	2130 Expansion module 0 digital input G function	0	65535	16
39	2130 Expansion module 0 digital input H function	0	65535	16
40-47	2130 Expansion module 1 digital inputs A-H functions			
48-55	2130 Expansion module 2 digital inputs A-H functions			
56-63	2130 Expansion module 3 digital inputs A-H functions			
64	2131 Expansion module 0 digital input A function	0	65535	16
65	2131 Expansion module 0 digital input B function	0	65535	16
66	2131 Expansion module 0 digital input C function	0	65535	16
67	2131 Expansion module 0 digital input D function	0	65535	16
68	2131 Expansion module 0 digital input E function	0	65535	16
69	2131 Expansion module 0 digital input F function	0	65535	16
70	2131 Expansion module 0 digital input G function	0	65535	16
71	2131 Expansion module 0 digital input H function	0	65535	16
72	2131 Expansion module 0 digital input I function	0	65535	16
73	2131 Expansion module 0 digital input J function	0	65535	16
74-83	2131 Expansion module 1 digital inputs A-J functions			
84-93	2131 Expansion module 2 digital inputs A-J functions			
94-103	2131 Expansion module 3 digital inputs A-J functions			
104-111	Reserved			
~~112~~	~~2130 Expansion module 0 analogue input E (low)~~	~~0~~	~~65535~~	~~16~~

Register offset	Name	Min value	Max value	Bits/ sign
~~113~~	~~2130 Expansion module 0 analogue input E (high)~~	~~0~~	~~65535~~	~~16~~
~~114~~	~~2130 Expansion module 0 analogue input F (low)~~	~~0~~	~~65535~~	~~16~~
~~115~~	~~2130 Expansion module 0 analogue input F (high)~~	~~0~~	~~65535~~	~~16~~
~~116~~	~~2130 Expansion module 0 analogue input G (low)~~	~~0~~	~~65535~~	~~16~~
~~117~~	~~2130 Expansion module 0 analogue input G (high)~~	~~0~~	~~65535~~	~~16~~
~~118~~	~~2130 Expansion module 0 analogue input H (low)~~	~~0~~	~~65535~~	~~16~~
~~119~~	~~2130 Expansion module 0 analogue input H (high)~~	~~0~~	~~65535~~	~~16~~
~~120-127~~	~~2130 Expansion module 1 analogue inputs E-H~~			
~~128-135~~	~~2130 Expansion module 2 analogue inputs E-H~~			
~~136-143~~	~~2130 Expansion module 3 analogue inputs E-H~~			
~~144-159~~	~~Reserved for 2130 Expansion module 4-9 analogue inputs E-H~~			
112-159	Unimplemented (not used by PC)			
160-191	Unimplemented			
192	Internal flexible sender 1 input (low)	0	65535	16
193	Internal flexible sender 1 input (high)	0	65535	16
194	Internal flexible sender 2 input (low)	0	65535	16
195	Internal flexible sender 2 input (high)	0	65535	16
196	Internal flexible sender 3 input (low)	0	65535	16
197	Internal flexible sender 3 input (high)	0	65535	16
198	Internal flexible sender 4 input (low)	0	65535	16
199	Internal flexible sender 4 input (high)	0	65535	16
200	Internal flexible sender 5 input (low)	0	65535	16
201	Internal flexible sender 5 input (high)	0	65535	16
202	Engine Maintenance alarm 1 function	0	65535	16
203	Engine Maintenance alarm 2 function	0	65535	16
204	Engine Maintenance alarm 3 function	0	65535	16
205	PLC function 1	0	65535	16
206	PLC function 2	0	65535	16
207	PLC function 3	0	65535	16
208	PLC function 4	0	65535	16
209	PLC function 5	0	65535	16
210	PLC function 6	0	65535	16
211	PLC function 7	0	65535	16
212	PLC function 8	0	65535	16
213	PLC function 9	0	65535	16
214	PLC function 10	0	65535	16
215	PLC function 11	0	65535	16
216	PLC function 12	0	65535	16
217	PLC function 13	0	65535	16
218	PLC function 14	0	65535	16
219	PLC function 15	0	65535	16
220	PLC function 16	0	65535	16
221	PLC function 17	0	65535	16
222	PLC function 18	0	65535	16
223	PLC function 19	0	65535	16
224	PLC function 20	0	65535	16
225	Low kW Load	0	65535	16
226	Under Loaded	0	65535	16
227-255	Reserved			

86xx MKII family register allocation

Register offset	Name	Min value	Max value	Bits/ sign
0	Digital input A function	0	65535	16
1	Digital input B function	0	65535	16
2	Digital input C function	0	65535	16
3	Digital input D function	0	65535	16
4	Digital input E function	0	65535	16
5	Digital input F function	0	65535	16
6	Digital input G function	0	65535	16
7	Digital input H function	0	65535	16
8	Digital input I function	0	65535	16
9	Digital input J function	0	65535	16
10	Digital input K function	0	65535	16
11	Digital input L function	0	65535	16
12-15	Unimplemented digital input function			16
16	Flex Sender A Digital input function	0	65535	16
17	Flex Sender B Digital input function	0	65535	16
18	Flex Sender C Digital input function	0	65535	16
19	Flex Sender D Digital input function	0	65535	16
20-31	Unimplemented digital input function			16
32	2130 Expansion module 0 digital input A function	0	65535	16
33	2130 Expansion module 0 digital input B function	0	65535	16
34	2130 Expansion module 0 digital input C function	0	65535	16
35	2130 Expansion module 0 digital input D function	0	65535	16
36	2130 Expansion module 0 digital input E function	0	65535	16
37	2130 Expansion module 0 digital input F function	0	65535	16
38	2130 Expansion module 0 digital input G function	0	65535	16
39	2130 Expansion module 0 digital input H function	0	65535	16
40-47	2130 Expansion module 1 digital inputs A-H functions			
48-55	2130 Expansion module 2 digital inputs A-H functions			
56-63	2130 Expansion module 3 digital inputs A-H functions			
64	2131 Expansion module 0 digital input A function	0	65535	16
65	2131 Expansion module 0 digital input B function	0	65535	16
66	2131 Expansion module 0 digital input C function	0	65535	16
67	2131 Expansion module 0 digital input D function	0	65535	16
68	2131 Expansion module 0 digital input E function	0	65535	16
69	2131 Expansion module 0 digital input F function	0	65535	16
70	2131 Expansion module 0 digital input G function	0	65535	16
71	2131 Expansion module 0 digital input H function	0	65535	16
72	2131 Expansion module 0 digital input I function	0	65535	16
73	2131 Expansion module 0 digital input J function	0	65535	16
74-83	2131 Expansion module 1 digital inputs A-J functions			
84-93	2131 Expansion module 2 digital inputs A-J functions			
94-103	2131 Expansion module 3 digital inputs A-J functions			
104-111	Reserved			
112	2130 Expansion module 0 analogue input E (low) function	0	65535	16
113	2130 Expansion module 0 analogue input E (high) function	0	65535	16
114	2130 Expansion module 0 analogue input F (low) function	0	65535	16
115	2130 Expansion module 0 analogue input F (high) function	0	65535	16
116	2130 Expansion module 0 analogue input G (low) function	0	65535	16
117	2130 Expansion module 0 analogue input G (high) function	0	65535	16
118	2130 Expansion module 0 analogue input H (low) function	0	65535	16
119	2130 Expansion module 0 analogue input H (high) function	0	65535	16
120-127	2130 Expansion module 1 analogue inputs E-Hfunction			
128-135	2130 Expansion module 2 analogue inputs E-H function			
136-143	2130 Expansion module 3 analogue inputs E-H function			
144-191	Reserved for 2130 Expansion module 4-9 analogue inputs E-H functions			
192	Internal flexible sender 1 input (low) function	0	65535	16
193	Internal flexible sender 1 input (high) function	0	65535	16

Register offset	Name	Min value	Max value	Bits/ sign
194	Internal flexible sender 2 input (low) function	0	65535	16
195	Internal flexible sender 2 input (high) function	0	65535	16
196	Internal flexible sender 3 input (low) function	0	65535	16
197	Internal flexible sender 3 input (high) function	0	65535	16
198	Internal flexible sender 4 input (low) function	0	65535	16
199	Internal flexible sender 4 input (high) function	0	65535	16
200-201	Unimplemented Internal flexible sender			16
202	Engine Maintenance alarm 1 function	0	65535	16
203	Engine Maintenance alarm 2 function	0	65535	16
204	Engine Maintenance alarm 3 function	0	65535	16
205	PLC function 1	0	65535	16
206	PLC function 2	0	65535	16
207	PLC function 3	0	65535	16
208	PLC function 4	0	65535	16
209	PLC function 5	0	65535	16
210	PLC function 6	0	65535	16
211	PLC function 7	0	65535	16
212	PLC function 8	0	65535	16
213	PLC function 9	0	65535	16
214	PLC function 10	0	65535	16
215	PLC function 11	0	65535	16
216	PLC function 12	0	65535	16
217	PLC function 13	0	65535	16
218	PLC function 14	0	65535	16
219	PLC function 15	0	65535	16
220	PLC function 16	0	65535	16
221	PLC function 17	0	65535	16
222	PLC function 18	0	65535	16
223	PLC function 19	0	65535	16
224	PLC function 20	0	65535	16
225	Low kW Load alarm function	0	65535	16
226	Unimplemented			16
227-251	Reserved			
252	2131 Expansion module 0 analogue input A (low) function	0	65535	16
253	2131 Expansion module 0 analogue input A (high) function	0	65535	16
254	2131 Expansion module 0 analogue input B (low) function	0	65535	16
255	2131 Expansion module 0 analogue input B (high) function	0	65535	16

74xx MKII family register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0	Digital input A function	0	65535	16
1	Digital input B function	0	65535	16
2	Digital input C function	0	65535	16
3	Digital input D function	0	65535	16
4	Digital input E function	0	65535	16
5	Digital input F function	0	65535	16
6	Digital input G function	0	65535	16
7	Digital input H function	0	65535	16
8	Flex Sensor A Digital input function	0	65535	16
9	Flex SensorB Digital input function	0	65535	16
10	Flex SensorC Digital input function	0	65535	16
11	Flex Sensor D Digital input function	0	65535	16
12	Flex Sensor E Digital input function	0	65535	16
13	Flex Sensor F Digital input function	0	65535	16
14	Flex Sensor G Digital input function	0	65535	16
15	Flex Sensor H Digital input function	0	65535	16
16	2130 Expansion module 0 digital input A	0	65535	16
17	2130 Expansion module 0 digital input B	0	65535	16
18	2130 Expansion module 0 digital input C	0	65535	16
19	2130 Expansion module 0 digital input D	0	65535	16
20	2130 Expansion module 0 digital input E	0	65535	16
21	2130 Expansion module 0 digital input F	0	65535	16
22	2130 Expansion module 0 digital input G	0	65535	16
23	2130 Expansion module 0 digital input H	0	65535	16
24-31	2130 Expansion module 1 digital inputs A-H			
32-39	2130 Expansion module 2 digital inputs A-H			
40-47	2130 Expansion module 3 digital inputs A-H			
48-95	Reserved for 2130 expansion module 4-9 inputs A-H			
96	2130 Expansion module 0 analogue input E (low)	0	65535	16
97	2130 Expansion module 0 analogue input E (high)	0	65535	16
98	2130 Expansion module 0 analogue input F (low)	0	65535	16
99	2130 Expansion module 0 analogue input F (high)	0	65535	16
100	2130 Expansion module 0 analogue input G (low)	0	65535	16
101	2130 Expansion module 0 analogue input G (high)	0	65535	16
102	2130 Expansion module 0 analogue input H (low)	0	65535	16
103	2130 Expansion module 0 analogue input H (high)	0	65535	16
104-111	2130 Expansion module 1 analogue inputs E-H			
112-119	2130 Expansion module 2 analogue inputs E-H			
120-127	2130 Expansion module 3 analogue inputs E-H			
128-175	2130 Expansion module 4-9 analogue inputs E-H			
176	Internal flexible sender A input (low)	0	65535	16
177	Internal flexible sender A input (high)	0	65535	16
178	Maintenance alarm 1	0	65535	16
179	Maintenance alarm 2	0	65535	16
180	Maintenance alarm 3	0	65535	16
181	PLC function 1	0	65535	16
182	PLC function 2	0	65535	16
183	PLC function 3	0	65535	16
184	PLC function 4	0	65535	16
185	PLC function 5	0	65535	16
186	PLC function 6	0	65535	16
187	PLC function 7	0	65535	16
188	PLC function 8	0	65535	16
189	PLC function 9	0	65535	16
190	PLC function 10	0	65535	16
191	PLC function 11	0	65535	16
192	PLC function 12	0	65535	16
193	PLC function 13	0	65535	16

Register offset	Name	Minimum value	Maximum value	Bits/ sign
194	PLC function 14	0	65535	16
195	PLC function 15	0	65535	16
196	PLC function 16	0	65535	16
197	PLC function 17	0	65535	16
198	PLC function 18	0	65535	16
199	PLC function 19	0	65535	16
200	PLC function 20	0	65535	16
201	Internal flexible sender A input Open circuit	0	65535	16
202	Internal flexible sender B input (low)	0	65535	16
203	Internal flexible sender B input (high)	0	65535	16
204	Internal flexible sender B input Open circuit	0	65535	16
205	Internal flexible sender C input (low)	0	65535	16
206	Internal flexible sender C input (high)	0	65535	16
207	Internal flexible sender C input Open circuit	0	65535	16
208	Internal flexible sender D input (low)	0	65535	16
209	Internal flexible sender D input (high)	0	65535	16
210	Internal flexible sender D input Open circuit	0	65535	16
211	Internal flexible sender E input (low)	0	65535	16
212	Internal flexible sender E input (high)	0	65535	16
213	Internal flexible sender E input Open circuit	0	65535	16
214	Internal flexible sender F input (low)	0	65535	16
215	Internal flexible sender F input (high)	0	65535	16
216	Internal flexible sender F input Open circuit	0	65535	16
217-219	Reserved			
220	2133 Expansion module 0 analogue input A (low)	0	65535	16
221	2133 Expansion module 0 analogue input A (high)	0	65535	16
222	2133 Expansion module 0 analogue input B (low)	0	65535	16
223	2133 Expansion module 0 analogue input B (high)	0	65535	16
224	2133 Expansion module 0 analogue input C (low)	0	65535	16
225	2133 Expansion module 0 analogue input C (high)	0	65535	16
226	2133 Expansion module 0 analogue input D (low)	0	65535	16
227	2133 Expansion module 0 analogue input D (high)	0	65535	16
228	2133 Expansion module 0 analogue input E (low)	0	65535	16
229	2133 Expansion module 0 analogue input E (high)	0	65535	16
230	2133 Expansion module 0 analogue input F (low)	0	65535	16
231	2133 Expansion module 0 analogue input F (high)	0	65535	16
232	2133 Expansion module 0 analogue input G (low)	0	65535	16
233	2133 Expansion module 0 analogue input G (high)	0	65535	16
234	2133 Expansion module 0 analogue input H (low)	0	65535	16
235	2133 Expansion module 0 analogue input H (high)	0	65535	16
236-251	2133Expansion module 1 analogue input A-H	0	65535	16
252	2133 Expansion module 2 analogue input A (low)	0	65535	16
253	2133 Expansion module 2 analogue input A (high)	0	65535	16
254	2133 Expansion module 2 analogue input B (low)	0	65535	16
255	2133 Expansion module 2 analogue input B (high)	0	65535	16

3xx family register allocation

1. The 335 module supports expansion units (2130, 2157 and 2548) and PLC facilities.
2. Unimplemented registers within a family/module are shaded

Register offset	Name	Min value	Max value	Bits/ sign	330	331	332	333	334	335
0	Digital input A function	0	65535	16	✓	✓	✓	✓	✓	✓
1	Digital input B function	0	65535	16	✓	✓	✓	✓	✓	✓
2	Digital input C function	0	65535	16		✓	✓	✓	✓	✓
3	Digital input D function	0	65535	16		✓	✓	✓	✓	✓
4	Digital input E function	0	65535	16			✓	✓	✓	✓
5	Digital input F function	0	65535	16			✓	✓	✓	✓
6	Digital input G function	0	65535	16			✓	✓	✓	✓
7	Digital input H function	0	65535	16			✓	✓	✓	✓
8	Digital input I function	0	65535	16			✓	✓	✓	✓
9	Digital input J function	0	65535	16			✓	✓	✓	✓
10	Digital input K function	0	65535	16			✓	✓	✓	✓
11	Digital input L function	0	65535	16						✓
12-15	Unimplemented (reserved for future digital inputs)									
16	2130 Expansion module 0 digital input A function	0	65535	16						✓
17	2130 Expansion module 0 digital input B function	0	65535	16						✓
18	2130 Expansion module 0 digital input C function	0	65535	16						✓
19	2130 Expansion module 0 digital input D function	0	65535	16						✓
20	2130 Expansion module 0 digital input E function	0	65535	16						✓
21	2130 Expansion module 0 digital input F function	0	65535	16						✓
22	2130 Expansion module 0 digital input G function	0	65535	16						✓
23	2130 Expansion module 0 digital input H function	0	65535	16						✓
24-31	2130 Expansion module 1 digital inputs A-H functions	0	65535	16						✓
32-39	Reserved for 2130 Expansion module 2 digital inputs									
40-47	Reserved for 2130 Expansion module 3 digital inputs									
48-95	Reserved for 2130 expansion module 4-9 inputs A-H									
96	2130 Expansion module 0 analogue input E (low)	0	65535	16						✓
97	2130 Expansion module 0 analogue input E (high)	0	65535	16						✓
98	2130 Expansion module 0 analogue input F (low)	0	65535	16						✓
99	2130 Expansion module 0 analogue input F (high)	0	65535	16						✓
100	2130 Expansion module 0 analogue input G (low)	0	65535	16						✓
101	2130 Expansion module 0 analogue input G (high)	0	65535	16						✓
102	2130 Expansion module 0 analogue input H (low)	0	65535	16						✓
103	2130 Expansion module 0 analogue input H (high)	0	65535	16						✓
104-111	2130 Expansion module 1 analogue inputs E-H	0	65535	16						✓
112-119	Reserved for 2130 Expansion module 2 analogue inputs									
120-127	Reserved for 2130 Expansion module 3 analogue inputs									
128-175	Reserved for 2130 Expansion module 4-9 analogue inputs									
176	PLC function 1	0	65535	16						✓
177	PLC function 2	0	65535	16						✓
178	PLC function 3	0	65535	16						✓
179	PLC function 4	0	65535	16						✓
180	PLC function 5	0	65535	16						✓
181	PLC function 6	0	65535	16						✓
182	PLC function 7	0	65535	16						✓
183	PLC function 8	0	65535	16						✓
184	PLC function 9	0	65535	16						✓
185	PLC function 10	0	65535	16						✓
186	PLC function 11	0	65535	16						✓
187	PLC function 12	0	65535	16						✓
188	PLC function 13	0	65535	16						✓
189	PLC function 14	0	65535	16						✓
190	PLC function 15	0	65535	16						✓

Register offset	Name	Min value	Max value	Bits/ sign	330	331	332	333	334	335
191	PLC function 16	0	65535	16						✓
192	PLC function 17	0	65535	16						✓
193	PLC function 18	0	65535	16						✓
194	PLC function 19	0	65535	16						✓
195	PLC function 20	0	65535	16						✓
196-255	Reserved									

Exxx family register allocation

Register offset	Name	Min value	Max value	Bits/ sign	E800	E400
0	Digital input A function	0	65535	16	✓	✓
1	Digital input B function	0	65535	16	✓	✓
2	Digital input C function	0	65535	16	✓	✓
3	Digital input D function	0	65535	16	✓	✓
4	Digital input E function	0	65535	16	✓	
5	Digital input F function	0	65535	16	✓	
6	Digital input G function	0	65535	16	✓	
7	Digital input H function	0	65535	16	✓	
8	Digital input I function	0	65535	16	✓	
9	Digital input J function	0	65535	16	✓	
10	Digital input K function	0	65535	16	✓	
11	Digital input L function	0	65535	16	✓	
12	Digital input M function	0	65535	16	✓	
13	Digital input N function	0	65535	16	✓	
14	Digital input O function	0	65535	16	✓	
15	Digital input P function	0	65535	16	✓	
16	Flexible Sensor Digital input A function	0	65535	16	✓	✓
17	Flexible Sensor Digital input B function	0	65535	16	✓	✓
18	Flexible Sensor Digital input C function	0	65535	16	✓	✓
19	Flexible Sensor Digital input D function	0	65535	16	✓	✓
20	Flexible Sensor Digital input E function	0	65535	16	✓	✓
21	Flexible Sensor Digital input F function	0	65535	16	✓	✓
22	Flexible Sensor Digital input G function	0	65535	16	✓	✓
23	Flexible Sensor Digital input H function	0	65535	16	✓	
24	Flexible Sensor Digital input I function	0	65535	16	✓	
25	Flexible Sensor Digital input J function	0	65535	16	✓	
26	Flexible Sensor Digital input K function	0	65535	16	✓	
27	Flexible Sensor Digital input L function	0	65535	16	✓	
28-31	Reserved	0	65535	16		
32	2130 Expansion module 0 digital input A function	0	65535	16	✓	
33	2130 Expansion module 0 digital input B function	0	65535	16	✓	
34	2130 Expansion module 0 digital input C function	0	65535	16	✓	
35	2130 Expansion module 0 digital input D function	0	65535	16	✓	
36	2130 Expansion module 0 digital input E function	0	65535	16	✓	
37	2130 Expansion module 0 digital input F function	0	65535	16	✓	
38	2130 Expansion module 0 digital input G function	0	65535	16	✓	
39	2130 Expansion module 0 digital input H function	0	65535	16	✓	
40-47	2130 Expansion module 1 digital inputs A-H functions				✓	
48-55	2130 Expansion module 2 digital inputs A-H functions				✓	
56-63	2130 Expansion module 3 digital inputs A-H functions				✓	
64	2131 Expansion module 0 digital input A function	0	65535	16	✓	
65	2131 Expansion module 0 digital input B function	0	65535	16	✓	
66	2131 Expansion module 0 digital input C function	0	65535	16	✓	
67	2131 Expansion module 0 digital input D function	0	65535	16	✓	
68	2131 Expansion module 0 digital input E function	0	65535	16	✓	
69	2131 Expansion module 0 digital input F function	0	65535	16	✓	
70	2131 Expansion module 0 digital input G function	0	65535	16	✓	
71	2131 Expansion module 0 digital input H function	0	65535	16	✓	
72	2131 Expansion module 0 digital input I function	0	65535	16	✓	
73	2131 Expansion module 0 digital input J function	0	65535	16	✓	
74-83	2131 Expansion module 1 digital inputs A-J functions				✓	
84-93	2131 Expansion module 2 digital inputs A-J functions				✓	
94-103	2131 Expansion module 3 digital inputs A-J functions				✓	
104-111	Reserved					
112	2130 Expansion module 0 analogue input E (low)	0	65535	16	✓	
113	2130 Expansion module 0 analogue input E (high)	0	65535	16	✓	

Register offset	Name	Min value	Max value	Bits/ sign	E800	E400
114	2130 Expansion module 0 analogue input F (low)	0	65535	16	✓	
115	2130 Expansion module 0 analogue input F (high)	0	65535	16	✓	
116	2130 Expansion module 0 analogue input G (low)	0	65535	16	✓	
117	2130 Expansion module 0 analogue input G (high)	0	65535	16	✓	
118	2130 Expansion module 0 analogue input H (low)	0	65535	16	✓	
119	2130 Expansion module 0 analogue input H (high)	0	65535	16	✓	
120-127	2130 Expansion module 1 analogue inputs E-H				✓	
128-135	2130 Expansion module 2 analogue inputs E-H				✓	
136-143	2130 Expansion module 3 analogue inputs E-H				✓	
144-151	Unimplemented					
152	Internal flexible SensorA input (low)	0	65535	16	✓	✓
153	Internal flexible SensorA input (high)	0	65535	16	✓	✓
154	Internal flexible SensorB input (low)	0	65535	16	✓	✓
155	Internal flexible SensorB input (high)	0	65535	16	✓	✓
156	Internal flexible SensorC input (low)	0	65535	16	✓	✓
157	Internal flexible SensorC input (high)	0	65535	16	✓	✓
158	Internal flexible SensorD input (low)	0	65535	16	✓	✓
159	Internal flexible SensorD input (high)	0	65535	16	✓	✓
160	Internal flexible SensorE input (low)	0	65535	16	✓	✓
161	Internal flexible SensorE input (high)	0	65535	16	✓	✓
162	Internal flexible SensorF input (low)	0	65535	16	✓	✓
163	Internal flexible SensorF input (high)	0	65535	16	✓	✓
164	Internal flexible SensorG input (low)	0	65535	16	✓	✓
165	Internal flexible SensorG input (high)	0	65535	16	✓	✓
166	Internal flexible SensorH input (low)	0	65535	16	✓	
167	Internal flexible SensorH input (high)	0	65535	16	✓	
168	Internal flexible SensorI input (low)	0	65535	16	✓	
169	Internal flexible SensorI input (high)	0	65535	16	✓	
170	Internal flexible SensorJ input (low)	0	65535	16	✓	
171	Internal flexible SensorJ input (high)	0	65535	16	✓	
172	Internal flexible SensorK input (low)	0	65535	16	✓	
173	Internal flexible SensorK input (high)	0	65535	16	✓	
174	Internal flexible SensorL input (low)	0	65535	16	✓	
175	Internal flexible SensorL input (high)	0	65535	16	✓	
176	Engine Maintenance alarm 1 function	0	65535	16	✓	✓
177	Engine Maintenance alarm 2 function	0	65535	16	✓	✓
178	Engine Maintenance alarm 3 function	0	65535	16	✓	✓
179	Engine Maintenance alarm 4 function	0	65535	16		✓
180	PLC function 1	0	65535	16	✓	✓
181	PLC function 2	0	65535	16	✓	✓
182	PLC function 3	0	65535	16	✓	✓
183	PLC function 4	0	65535	16	✓	✓
184	PLC function 5	0	65535	16	✓	✓
185	PLC function 6	0	65535	16	✓	✓
186	PLC function 7	0	65535	16	✓	✓
187	PLC function 8	0	65535	16	✓	✓
188	PLC function 9	0	65535	16	✓	✓
189	PLC function 10	0	65535	16	✓	✓
190	PLC function 11	0	65535	16	✓	✓
191	PLC function 12	0	65535	16	✓	✓
192	PLC function 13	0	65535	16	✓	✓
193	PLC function 14	0	65535	16	✓	✓
194	PLC function 15	0	65535	16	✓	✓
195	PLC function 16	0	65535	16	✓	✓
196	PLC function 17	0	65535	16	✓	✓
197	PLC function 18	0	65535	16	✓	✓
198	PLC function 19	0	65535	16	✓	✓

Register offset	Name	Min value	Max value	Bits/ sign	E800	E4000
199	PLC function 20	0	65535	16	✓	✓
200	Internal flexible sensor A sensor fault	0	65535	16	✓	✓
201	Internal flexible sensor B sensor fault	0	65535	16	✓	✓
202	Internal flexible sensor C sensor fault	0	65535	16	✓	✓
203	Internal flexible sensor D sensor fault	0	65535	16	✓	✓
204	Internal flexible sensor E sensor fault	0	65535	16	✓	✓
205	Internal flexible sensor F sensor fault	0	65535	16	✓	✓
206	Internal flexible sensor G sensor fault	0	65535	16	✓	✓
207	Internal flexible sensor H sensor fault	0	65535	16	✓	
208	Internal flexible sensor I sensor fault	0	65535	16	✓	
209	Internal flexible sensor J sensor fault	0	65535	16	✓	
210	Internal flexible sensor K sensor fault	0	65535	16	✓	
211	Internal flexible sensor L sensor fault	0	65535	16	✓	
212	Engine Maintenance alarm 5 function	0	65535	16		✓
213	Engine Maintenance alarm 6 function	0	65535	16		✓
214	Engine Maintenance alarm 7 function	0	65535	16		✓
215	Engine Maintenance alarm 8 function	0	65535	16		✓
216	Configurable CAN instrument 1 Alarm	0	65535	16		✓
217	Configurable CAN instrument 2 Alarm	0	65535	16		✓
218	Configurable CAN instrument 3 Alarm	0	65535	16		✓
219	Configurable CAN instrument 4 Alarm	0	65535	16		✓
220	Configurable CAN instrument 5 Alarm	0	65535	16		✓
221	Configurable CAN instrument 6 Alarm	0	65535	16		✓
222	Configurable CAN instrument 7 Alarm	0	65535	16		✓
223	Configurable CAN instrument 8 Alarm	0	65535	16		✓
224	Configurable CAN instrument 9 Alarm	0	65535	16		✓
225	Configurable CAN instrument 10 Alarm	0	65535	16		✓
226	Engine Maintenance alarm 9 function	0	65535	16		✓
227	Engine Maintenance alarm 10 function	0	65535	16		✓
228-255	Reserved					

P100 register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0	Digital input A function	0	65535	16
1	Digital input B function	0	65535	16
2	Digital input C function	0	65535	16
3	Digital input D function	0	65535	16
4	Digital input E function	0	65535	16
5	Remote mains failure function	0	65535	16
6-255	Reserved			

71xx/6xxx/L40x/4xxx family register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ Sign
0	Digital input A	0	65535	16
1	Digital input B	0	65535	16
2	Digital input C	0	65535	16
3	Digital input D	0	65535	16
4	Digital input E	0	65535	16
5	Digital input F	0	65535	16
6	Analogue input A (Digital)	0	65535	16
7	Analogue input B (Digital)	0	65535	16
8	Analogue input C (Digital)	0	65535	16
9	Reserved for analogue input D (Digital)			
10	Reserved for analogue input E (Digital)			
11	Reserved for analogue input F (Digital)			
12-175	Unimplemented			
176	Internal flexible sender C input (low)	0	65535	16
177	Internal flexible sender C input (high)	0	65535	16
178	Oil Maintenance alarm	0	65535	16
179	Air Maintenance alarm	0	65535	16
180	Fuel Maintenance alarm	0	65535	16
181	Internal flexible sender D input (low)	0	65535	16
182	Internal flexible sender D input (high)	0	65535	16
183	Internal flexible sender A input (low)	0	65535	16
184	Internal flexible sender A input (high)	0	65535	16
185	Internal flexible sender A fault function	0	65535	16
186	Internal flexible sender C fault function	0	65535	16
187-255	Reserved			

10.56 Page 161 – Unnamed Alarm function (continued)

1. This indicates to the PC software how each unnamed alarm (digital inputs, both built in and in the expansion modules, maintenance alarms, flexible senders etc) is configured.
2. The alarm function is the function field from the alarm block.
3. Each family has different register allocations.
4. These registers are Read-Only.
5. This page is used in conjunction with page 153 and the registers should be in the same order as page 153 (registers 65 to 128)
6. Registers 0 to 139 are used for expansion modules analogue inputs (see page 153 registers 65 to 99) 86xx /74xx
7. Registers 0 to 144 are used for expansion modules analogue inputs (see page 153 registers 71 to 101) 73xx MKII V3.0
8. Registers 0 to 147 are used for expansion modules analogue inputs (see page 153 registers 65 to 101) 74xx MKII

73xx MKII family register allocation

Register offset	Name	Min value	Max value	Bits/ sign
0-11	2133 Expansion module 2 analogue input C-H	0	65535	16
12-27	2133Expansion module 3 analogue input A-H	0	65535	16
28-47	2131 Expansion module 0 analogue input A-J	0	65535	16
48-67	2131 Expansion module 1analogue input A-J	0	65535	16
68-87	2131 Expansion module 2analogue input A-J	0	65535	16
88-107	2131 Expansion module 3analogue input A-J	0	65535	16
108	2131 Expansion module 0 digital input A	0	65535	16
109	2131 Expansion module 0 digital input B	0	65535	16
110	2131 Expansion module 0 digital input C	0	65535	16
111	2131 Expansion module 0 digital input D	0	65535	16
112	2131 Expansion module 0 digital input E	0	65535	16
113	2131 Expansion module 0 digital input F	0	65535	16
114	2131 Expansion module 0 digital input G	0	65535	16
115	2131 Expansion module 0 digital input H	0	65535	16
116	2131 Expansion module 0 digital input I	0	65535	16
117	2131 Expansion module 0 digital input J	0	65535	16
118-127	2131 Expansion module 1 digital inputs A-J	0	65535	16
128-137	2131 Expansion module 2 digital inputs A-J	0	65535	16
138-147	2131 Expansion module 3 digital inputs A-J	0	65535	16
148	DSENet Charger 0 Common Shutdown Alarm	0	65535	16
149	DSENet Charger 0 Common Warning Alarm	0	65535	16
150	DSENet Charger 1 Common Shutdown Alarm	0	65535	16
151	DSENet Charger 1 Common Warning Alarm	0	65535	16
152	DSENet Charger 2 Common Shutdown Alarm	0	65535	16
153	DSENet Charger 2 Common Warning Alarm	0	65535	16
154	DSENet Charger 3 Common Shutdown Alarm	0	65535	16
155	DSENet Charger 3 Common Warning Alarm	0	65535	16
156	Configurable CAN instrument 1 Alarm	0	65535	16
157	Configurable CAN instrument 2 Alarm	0	65535	16
158	Configurable CAN instrument 3 Alarm	0	65535	16
159	Configurable CAN instrument 4 Alarm	0	65535	16
160	Configurable CAN instrument 5 Alarm	0	65535	16
161	Configurable CAN instrument 6 Alarm	0	65535	16
162	Configurable CAN instrument 7 Alarm	0	65535	16
163	Configurable CAN instrument 8 Alarm	0	65535	16
164	Configurable CAN instrument 9 Alarm	0	65535	16
165	Configurable CAN instrument 10 Alarm	0	65535	16
166-255	Reserved for future unnamed alarms			

8xxx / 74xx MKI family register allocation

Register offset	Name	Min value	Max value	Bits/ sign
0-139	Unimplemented (Reserved for expansion modules analogue inputs)	0	65535	16
140	Plant Battery Maintenance alarm 1 function	0	65535	16
141	Plant Battery Maintenance alarm 2 function	0	65535	16
142	Plant Battery Maintenance alarm 3 function	0	65535	16
143-255	Reserved for future unnamed alarms			

86xx MKII family register allocation

Register offset	Name	Min value	Max value	Bits/ sign
0	2131 Expansion module 0 analogue input C (low) function	0	65535	16
1	2131 Expansion module 0 analogue input C (high) function	0	65535	16
2	2131 Expansion module 0 analogue input D (low) function	0	65535	16
3	2131 Expansion module 0 analogue input D (high) function	0	65535	16
4	2131 Expansion module 0 analogue input E (low) function	0	65535	16
5	2131 Expansion module 0 analogue input E (high) function	0	65535	16
6	2131 Expansion module 0 analogue input F (low) function	0	65535	16
7	2131 Expansion module 0 analogue input F (high) function	0	65535	16
8	2131 Expansion module 0 analogue input G (low) function	0	65535	16
9	2131 Expansion module 0 analogue input G (high) function	0	65535	16
10	2131 Expansion module 0 analogue input H (low) function	0	65535	16
11	2131 Expansion module 0 analogue input H (high) function	0	65535	16
12	2131 Expansion module 0 analogue input I (low) function	0	65535	16
13	2131 Expansion module 0 analogue input I (high) function	0	65535	16
14	2131 Expansion module 0 analogue input J (low) function	0	65535	16
15	2131 Expansion module 0 analogue input J (high) function	0	65535	16
16-35	2131 Expansion module 1analogue inputs A-J functions			
36-55	2131 Expansion module 2analogue inputs A-J functions			
56-75	2131 Expansion module 3analogue inputs A-J functions			
76	2133 Expansion module 0 analogue input A (low) function	0	65535	16
77	2133 Expansion module 0 analogue input A (high) function	0	65535	16
78-91	2133 Expansion module 0 analogue input B-H functions	0	65535	16
92-107	2133 Expansion module 1analogue input A-H functions	0	65535	16
108-123	2133 Expansion module 2analogue input A-H functions	0	65535	16
124-139	2133 Expansion module 3analogue input A-H functions	0	65535	16
140-255	Reserved for future unnamed alarms			

74xx MKII family register allocation

Register offset	Name	Min value	Max value	Bits/ sign
0	2133 Expansion module 2 analogue input C (low)	0	65535	16
1	2133 Expansion module 2 analogue input C (high)	0	65535	16
2	2133 Expansion module 2 analogue input D (low)	0	65535	16
3	2133 Expansion module 2 analogue input D (high)	0	65535	16
4	2133 Expansion module 2 analogue input E (low)	0	65535	16
5	2133 Expansion module 2 analogue input E (high)	0	65535	16
6	2133 Expansion module 2 analogue input F (low)	0	65535	16
7	2133 Expansion module 2 analogue input F (high)	0	65535	16
8	2133 Expansion module 2 analogue input G (low)	0	65535	16
9	2133 Expansion module 2 analogue input G (high)	0	65535	16
10	2133 Expansion module 2 analogue input H (low)	0	65535	16
11	2133 Expansion module 2 analogue input H (high)	0	65535	16
12-27	2133Expansion module 3 analogue input A-H	0	65535	16
28-47	2131 Expansion module 0 analogue input A-J	0	65535	16
48-67	2131 Expansion module 1analogue input A-J	0	65535	16
68-87	2131 Expansion module 2analogue input A-J	0	65535	16
88-107	2131 Expansion module 3analogue input A-J	0	65535	16
108	2131 Expansion module 0 digital input A	0	65535	16
109	2131 Expansion module 0 digital input B	0	65535	16
110	2131 Expansion module 0 digital input C	0	65535	16
111	2131 Expansion module 0 digital input D	0	65535	16
112	2131 Expansion module 0 digital input E	0	65535	16
113	2131 Expansion module 0 digital input F	0	65535	16
114	2131 Expansion module 0 digital input G	0	65535	16
115	2131 Expansion module 0 digital input H	0	65535	16
116	2131 Expansion module 0 digital input I	0	65535	16
117	2131 Expansion module 0 digital input J	0	65535	16
118-127	2131 Expansion module 1 digital inputs A-J	0	65535	16
128-137	2131 Expansion module 2 digital inputs A-J	0	65535	16
138-147	2131 Expansion module 3 digital inputs A-J	0	65535	16
148-255	Reserved for future unnamed alarms			

Exxx register allocation					
Register offset	Name	Min value	Max value	Bits/ sign	E8000
0-139	Unimplemented (Reserved for expansion modules analogue inputs)	0	65535	16	✓
140-255	Reserved for future unnamed alarms				

10.57 Page 162 – Unnamed Alarm functions (continued)

1. This indicates to the PC software how each unnamed alarm (digital inputs, both built in and in the expansion modules, maintenance alarms, flexible senders etc) is configured.
2. The alarm function is the function field from the alarm block.
3. Each family has different register allocations.
4. These registers are Read-Only.
5. This page is used in conjunction with page 153 and the registers should be in the same order as page 153 (registers 129 to 192)

8xxx / 74xx family register allocation continued

0-255	Reserved for future unnamed alarms	0	65535	16

Exxx family register allocation continued					
Register offset	Name	Min value	Max value	Bits/ sign	E 8 0 0
0-255	Reserved for future unnamed alarms	0	65535	16	

10.58 Page 163 – Unnamed Alarm functions (continued)

1. This indicates to the PC software how each unnamed alarm (digital inputs, both built in and in the expansion modules, maintenance alarms, flexible senders etc) is configured.
2. The alarm function is the function field from the alarm block.
3. Each family has different register allocations.
4. These registers are Read-Only.
5. This page is used in conjunction with page 153 and the registers should be in the same order as page 153 (registers 193 to 255)

8xxx / 74xx family register allocation continued

0-255	Reserved for future unnamed alarms	0	65535	16

Exxx family register allocation continued					
Register offset	Name	Min value	Max value	Bits/ sign	E800
0-255	Reserved for future unnamed alarms	0	65535	16	

10.59 Pages 166-169 - User configurable pages

Refer to DSE for documentation of these pages.

10.60 Page 170 – Unnamed input status

1. This indicates to the PC software the current status of each digital input and the current value and units of each analogue input.
2. For digital inputs the raw status is the state of the physical input to the module and the processed status allows for configurable inversion.
3. For analogue inputs the 'sender category' indicates the units needed for the input and the value is the processed reading of the input, the category codes and corresponding reading ranges are shown in the table below.
4. Maintenance alarms return unimplemented on the 8xxx/74xx family.
5. Each input E-G of 2130 expansion modules appears twice, once as a digital and once as an analogue, because they can be configured as either.
6. Flexible sender inputs appear as both analogues and as digital inputs Q-S.
7. Refer to DSE for documentation on the PLC registers.
8. The 2133 inputs can only measure temperature so there is no requirement for sender category registers
9. The 2130 sender category and input reading registers (and some others) are indeed all duplicated. This was because originally page 170 lined up with the unnamed alarm list (page 153 etc). Since analogues have 'low' and 'high' alarm entries, there are duplicated entries in this page for the values for the 'low' and 'high' analogues (which will be the same). The same reason explains why some analogues have three entries – to match with low, high and sender fault alarms.
10. The 8xxx/74xx family now supports 4x 2130, 10x 2157, 10x 2548, 4x 2131, 4x 2133 and 4x 2152.
11. The 335 supports 2x2130, 2x2157, 2x2548
12. No provision is made for more than these quantities of each type.
13. Each family has different register allocations.
14. This is continued on page 171.
15. These registers are read-only
16. Although the P100 does not have any unnamed alarms this is needed to read the status of digital inputs A-E
17. The 73xx MKII supports 6 flex sensors, (registers 12 to 27), these are not available in the 73xx MKI

71xx/6xxx/L40x/4xxx register allocation

Register offset	Name	Min value	Max value	Bits/ sign
0	Digital input A raw status	0	1	16
1	Digital input A processed status	0	1	16
2	Digital input B raw status	0	1	16
3	Digital input B processed status	0	1	16
4	Digital input C raw status	0	1	16
5	Digital input C processed status	0	1	16
6	Digital input D raw status	0	1	16
7	Digital input D processed status	0	1	16
8	Digital input E raw status	0	1	16
9	Digital input E processed status	0	1	16
10	Digital input F raw status	0	1	16
11	Digital input F processed status	0	1	16
12	Digital input G raw status	0	1	16
13	Digital input G processed status	0	1	16
14	Digital input H raw status	0	1	16
15	Digital input H processed status	0	1	16
16	Digital input I raw status	0	1	16
17	Digital input I processed status	0	1	16
18	Unimplemented			
19	Unimplemented			
20-255	Reserved			

61xx MkII family register allocation

Register offset	Name	Min value	Max value	Bits/ sign
0	Digital input A raw status	0	1	16
1	Digital input A processed status	0	1	16
2	Digital input B raw status	0	1	16
3	Digital input B processed status	0	1	16
4	Digital input C raw status	0	1	16
5	Digital input C processed status	0	1	16
6	Digital input D raw status	0	1	16
7	Digital input D processed status	0	1	16
8	Digital input E raw status	0	1	16
9	Digital input E processed status	0	1	16
10	Digital input F raw status	0	1	16
11	Digital input F processed status	0	1	16
12	Flex Sender A Digital input raw status	0	1	16
13	Flex Sender A Digital input processed status	0	1	16
14	Flex Sender B Digital input raw status	0	1	16
15	Flex Sender B Digital input processed status	0	1	16
16	Flex Sender C Digital input raw status	0	1	16
17	Flex Sender C Digital input processed status	0	1	16
18	Flex Sender D Digital input raw status	0	1	16
19	Flex Sender D Digital input processed status	0	1	16
20-31	Reserved			
32	2130 Expansion module 0 digital input A raw status	0	1	16
33	2130 Expansion module 0 digital input A processed status	0	1	16
34	2130 Expansion module 0 digital input B raw status	0	1	16
35	2130 Expansion module 0 digital input B processed status	0	1	16
36	2130 Expansion module 0 digital input C raw status	0	1	16
37	2130 Expansion module 0 digital input C processed status	0	1	16
38	2130 Expansion module 0 digital input D raw status	0	1	16
39	2130 Expansion module 0 digital input D processed status	0	1	16
40	2130 Expansion module 0 digital input E raw status	0	1	16
41	2130 Expansion module 0 digital input E processed status	0	1	16
42	2130 Expansion module 0 digital input F raw status	0	1	16
43	2130 Expansion module 0 digital input F processed status	0	1	16
44	2130 Expansion module 0 digital input G raw status	0	1	16
45	2130 Expansion module 0 digital input G processed status	0	1	16
46	2130 Expansion module 0 digital input H raw status	0	1	16
47	2130 Expansion module 0 digital input H processed status	0	1	16
48-63	2130 Expansion module 1 digital inputs A-H raw & processed status			
64-191	Reserved for 2130 Expansion module 4-9			
192	2130 Expansion module 0 analogue input E sender category	0	3	16
193	2130 Expansion module 0 analogue input E input reading			16S
194	2130 Expansion module 0 analogue input E sender category	0	3	16
195	2130 Expansion module 0 analogue input E input reading			16S
196	2130 Expansion module 0 analogue input F sender category	0	3	16
197	2130 Expansion module 0 analogue input F input reading			16S
198	2130 Expansion module 0 analogue input F sender category	0	3	16
199	2130 Expansion module 0 analogue input F input reading			16S
200	2130 Expansion module 0 analogue input G sender category	0	3	16
201	2130 Expansion module 0 analogue input G input reading			16S
202	2130 Expansion module 0 analogue input G sender category	0	3	16
203	2130 Expansion module 0 analogue input G input reading			16S
204	2130 Expansion module 0 analogue input H sender category	0	3	16
205	2130 Expansion module 0 analogue input H input reading			16S
206	2130 Expansion module 0 analogue input H sender category	0	3	16
207	2130 Expansion module 0 analogue input H input reading			16S
208-223	2130 Expansion module 1 inputs E-H			
224-239	Reserved			
240-255	Reserved			

72xx/73xx family register allocation

Register offset	Name	Min value	Max value	Bits/ sign
0	Digital input A raw status	0	1	16
1	Digital input A processed status	0	1	16
2	Digital input B raw status	0	1	16
3	Digital input B processed status	0	1	16
4	Digital input C raw status	0	1	16
5	Digital input C processed status	0	1	16
6	Digital input D raw status	0	1	16
7	Digital input D processed status	0	1	16
8	Digital input E raw status	0	1	16
9	Digital input E processed status	0	1	16
10	Digital input F raw status	0	1	16
11	Digital input F processed status	0	1	16
12	Digital input G raw status	0	1	16
13	Digital input G processed status	0	1	16
14	Digital input H raw status	0	1	16
15	Digital input H processed status	0	1	16
16	Flex Sender A Digital input raw status	0	1	16
17	Flex Sender A Digital input processed status	0	1	16
18	Flex Sender A Digital input raw status	0	1	16
19	Flex Sender A Digital input processed status	0	1	16
20	Flex Sender A Digital input raw status	0	1	16
21	Flex Sender A Digital input processed status	0	1	16
22	Flex Sender A Digital input raw status	0	1	16
23	Flex Sender A Digital input processed status	0	1	16
24	Flex Sender A Digital input raw status	0	1	16
25	Flex Sender A Digital input processed status	0	1	16
26	Flex Sender A Digital input raw status	0	1	16
27	Flex Sender A Digital input processed status	0	1	16
28-31	Reserved			
32	2130 Expansion module 0 digital input A raw status	0	1	16
33	2130 Expansion module 0 digital input A processed status	0	1	16
34	2130 Expansion module 0 digital input B raw status	0	1	16
35	2130 Expansion module 0 digital input B processed status	0	1	16
36	2130 Expansion module 0 digital input C raw status	0	1	16
37	2130 Expansion module 0 digital input C processed status	0	1	16
38	2130 Expansion module 0 digital input D raw status	0	1	16
39	2130 Expansion module 0 digital input D processed status	0	1	16
40	2130 Expansion module 0 digital input E raw status	0	1	16
41	2130 Expansion module 0 digital input E processed status	0	1	16
42	2130 Expansion module 0 digital input F raw status	0	1	16
43	2130 Expansion module 0 digital input F processed status	0	1	16
44	2130 Expansion module 0 digital input G raw status	0	1	16
45	2130 Expansion module 0 digital input G processed status	0	1	16
46	2130 Expansion module 0 digital input H raw status	0	1	16
47	2130 Expansion module 0 digital input H processed status	0	1	16
48-63	2130 Expansion module 1 digital inputs A-H raw & processed status			
64-79	2130 Expansion module 2 digital inputs A-H raw & processed status			
80-95	2130 Expansion module 3 digital inputs A-H raw & processed status			
96-191	Reserved for 2130 Expansion module 4-9			
192	2130 Expansion module 0 analogue input E sender category	0	3	16
193	2130 Expansion module 0 analogue input E input reading			16S
194	2130 Expansion module 0 analogue input E sender category	0	3	16
195	2130 Expansion module 0 analogue input E input reading			16S
196	2130 Expansion module 0 analogue input F sender category	0	3	16
197	2130 Expansion module 0 analogue input F input reading			16S
198	2130 Expansion module 0 analogue input F sender category	0	3	16
199	2130 Expansion module 0 analogue input F input reading			16S
200	2130 Expansion module 0 analogue input G sender category	0	3	16

Register offset	Name	Min value	Max value	Bits/ sign
201	2130 Expansion module 0 analogue input G input reading			16S
202	2130 Expansion module 0 analogue input G sender category	0	3	16
203	2130 Expansion module 0 analogue input G input reading			16S
204	2130 Expansion module 0 analogue input H sender category	0	3	16
205	2130 Expansion module 0 analogue input H input reading			16S
206	2130 Expansion module 0 analogue input H sender category	0	3	16
207	2130 Expansion module 0 analogue input H input reading			16S
208-223	2130 Expansion module 1 inputs E-H			
224-239	2130 Expansion module 2 inputs E-H			
240-255	2130 Expansion module 3 inputs E-H			

8xxx / 74xx MKI familyregister allocation

Register offset	Name	Min value	Max value	Bits/ sign
0	Digital input A raw status	0	1	16
1	Digital input A processed status	0	1	16
2	Digital input B raw status	0	1	16
3	Digital input B processed status	0	1	16
4	Digital input C raw status	0	1	16
5	Digital input C processed status	0	1	16
6	Digital input D raw status	0	1	16
7	Digital input D processed status	0	1	16
8	Digital input E raw status	0	1	16
9	Digital input E processed status	0	1	16
10	Digital input F raw status	0	1	16
11	Digital input F processed status	0	1	16
12	Digital input G raw status	0	1	16
13	Digital input G processed status	0	1	16
14	Digital input H raw status	0	1	16
15	Digital input H processed status	0	1	16
16	Digital input I raw status	0	1	16
17	Digital input I processed status	0	1	16
18	Digital input J raw status	0	1	16
19	Digital input J processed status	0	1	16
20	Digital input K raw status	0	1	16
21	Digital input K processed status	0	1	16
22	Digital input L raw status	0	1	16
23	Digital input L processed status	0	1	16
24	Digital input M raw status	0	1	16
25	Digital input M processed status	0	1	16
26	Digital input N raw status	0	1	16
27	Digital input N processed status	0	1	16
28	Digital input O raw status	0	1	16
29	Digital input O processed status	0	1	16
30	Digital input P raw status	0	1	16
31	Digital input P processed status	0	1	16
32	Digital input Q / Flex sensor as Digital input raw status	0	1	16
33	Digital input Q / Flex sensor as Digital input processed status	0	1	16
34	Digital input R / Flex sensor as Digital input raw status	0	1	16
35	Digital input R / Flex sensor as Digital input processed status	0	1	16
36	Digital input S / Flex sensor as Digital input raw status	0	1	16
37	Digital input S / Flex sensor as Digital input processed status	0	1	16
38	Digital input T / Flex sensor as Digital input aw status	0	1	16
39	Digital input T / Flex sensor as Digital input processed status	0	1	16
40	Digital input U / Flex sensor as Digital input raw status	0	1	16
41	Digital input U / Flex sensor as Digital input processed status	0	1	16
42	Digital input V raw status	0	1	16
43	Digital input V processed status	0	1	16
44	Digital input W raw status	0	1	16

Register offset	Name	Min value	Max value	Bits/ sign
45	Digital input W processed status	0	1	16
46	Digital input X raw status	0	1	16
47	Digital input X processed status	0	1	16
48	Digital input Y raw status	0	1	16
49	Digital input Y processed status	0	1	16
50	Digital input Z raw status	0	1	16
51	Digital input Z processed status	0	1	16
52	Digital input AA raw status	0	1	16
53	Digital input AA processed status	0	1	16
54	Digital input AB raw status	0	1	16
55	Digital input AB processed status	0	1	16
56	Digital input AC raw status	0	1	16
57	Digital input AC processed status	0	1	16
58	Digital input AD raw status	0	1	16
59	Digital input AD processed status	0	1	16
60	Digital input AE raw status	0	1	16
61	Digital input AE processed status	0	1	16
62	Digital input AF raw status	0	1	16
63	Digital input AF processed status	0	1	16
64	2130 Expansion module 0 digital input A raw status	0	1	16
65	2130 Expansion module 0 digital input A processed status	0	1	16
66	2130 Expansion module 0 digital input B raw status	0	1	16
67	2130 Expansion module 0 digital input B processed status	0	1	16
68	2130 Expansion module 0 digital input C raw status	0	1	16
69	2130 Expansion module 0 digital input C processed status	0	1	16
70	2130 Expansion module 0 digital input D raw status	0	1	16
71	2130 Expansion module 0 digital input D processed status	0	1	16
72	2130 Expansion module 0 digital input E raw status	0	1	16
73	2130 Expansion module 0 digital input E processed status	0	1	16
74	2130 Expansion module 0 digital input F raw status	0	1	16
75	2130 Expansion module 0 digital input F processed status	0	1	16
76	2130 Expansion module 0 digital input G raw status	0	1	16
77	2130 Expansion module 0 digital input G processed status	0	1	16
78	2130 Expansion module 0 digital input H raw status	0	1	16
79	2130 Expansion module 0 digital input H processed status	0	1	16
80-95	2130 Expansion module 1 digital inputs A-H status			
96-111	2130 Expansion module 2 digital inputs A-H status			
112-127	2130 Expansion module 3 digital inputs A-H status			
128	2131Expansion module 0 digital input A raw status	0	1	16
129	2131Expansion module 0 digital input A processed status	0	1	16
130	2131Expansion module 0 digital input B raw status	0	1	16
131	2131Expansion module 0 digital input B processed status	0	1	16
132	2131Expansion module 0 digital input C raw status	0	1	16
133	2131Expansion module 0 digital input C processed status	0	1	16
134	2131Expansion module 0 digital input D raw status	0	1	16
135	2131Expansion module 0 digital input D processed status	0	1	16
136	2131Expansion module 0 digital input E raw status	0	1	16
137	2131Expansion module 0 digital input E processed status	0	1	16
138	2131Expansion module 0 digital input F raw status	0	1	16
139	2131Expansion module 0 digital input F processed status	0	1	16
140	2131Expansion module 0 digital input G raw status	0	1	16
141	2131Expansion module 0 digital input G processed status	0	1	16
142	2131Expansion module 0 digital input H raw status	0	1	16
143	2131Expansion module 0 digital input H processed status	0	1	16
144	2131Expansion module 0 digital input I raw status	0	1	16
145	2131Expansion module 0 digital input I processed status	0	1	16
146	2131Expansion module 0 digital input J raw status	0	1	16
147	2131Expansion module 0 digital input J processed status	0	1	16
148-167	2131Expansion module 1 digital inputs A-J status			

Register offset	Name	Min value	Max value	Bits/ sign
168-187	2131Expansion module 2 digital inputs A-J status			
188-207	2131Expansion module 3 digital inputs A-J status			
208-223	Reserved			
224	2130 Expansion module 0 analogue input E sender category	0	4	16
225	2130 Expansion module 0 analogue input E input reading			16S
226	2130 Expansion module 0 analogue input E sender category	0	4	16
227	2130 Expansion module 0 analogue input E input reading			16S
228	2130 Expansion module 0 analogue input F sender category	0	4	16
229	2130 Expansion module 0 analogue input F input reading			16S
230	2130 Expansion module 0 analogue input F sender category	0	4	16
231	2130 Expansion module 0 analogue input F input reading			16S
232	2130 Expansion module 0 analogue input G sender category	0	4	16
233	2130 Expansion module 0 analogue input G input reading			16S
234	2130 Expansion module 0 analogue input G sender category	0	4	16
235	2130 Expansion module 0 analogue input G input reading			16S
236	2130 Expansion module 0 analogue input H sender category	0	4	16
237	2130 Expansion module 0 analogue input H input reading			16S
238	2130 Expansion module 0 analogue input H sender category	0	4	16
239	2130 Expansion module 0 analogue input H input reading			16S
240-255	2130 Expansion module 1 analogue inputs E-H			

74xx MKIIfamily register allocation

Register offset	Name	Min value	Max value	Bits/ sign
0	Digital input A raw status	0	1	16
1	Digital input A processed status	0	1	16
2	Digital input B raw status	0	1	16
3	Digital input B processed status	0	1	16
4	Digital input C raw status	0	1	16
5	Digital input C processed status	0	1	16
6	Digital input D raw status	0	1	16
7	Digital input D processed status	0	1	16
8	Digital input E raw status	0	1	16
9	Digital input E processed status	0	1	16
10	Digital input F raw status	0	1	16
11	Digital input F processed status	0	1	16
12	Digital input G raw status	0	1	16
13	Digital input G processed status	0	1	16
14	Digital input H raw status	0	1	16
15	Digital input H processed status	0	1	16
16	Flex Sender A Digital input raw status	0	1	16
17	Flex Sender A Digital input processed status	0	1	16
18	Flex Sender B Digital input raw status	0	1	16
19	Flex Sender B Digital input processed status	0	1	16
20	Flex Sender C Digital input raw status	0	1	16
21	Flex Sender C Digital input processed status	0	1	16
22	Flex Sender D Digital input raw status	0	1	16
23	Flex Sender D Digital input processed status	0	1	16
24	Flex Sender E Digital input raw status	0	1	16
25	Flex Sender E Digital input processed status	0	1	16
26	Flex Sender F Digital input raw status	0	1	16
27	Flex Sender F Digital input processed status	0	1	16
28	Flex Sender G Digital input raw status	0	1	16
29	Flex Sender G Digital input processed status	0	1	16
30	Flex Sender H Digital input raw status	0	1	16
31	Flex Sender H Digital input processed status	0	1	16
32	2130 Expansion module 0 digital input A raw status	0	1	16
33	2130 Expansion module 0 digital input A processed status	0	1	16
34	2130 Expansion module 0 digital input B raw status	0	1	16
35	2130 Expansion module 0 digital input B processed status	0	1	16
36	2130 Expansion module 0 digital input C raw status	0	1	16
37	2130 Expansion module 0 digital input C processed status	0	1	16
38	2130 Expansion module 0 digital input D raw status	0	1	16
39	2130 Expansion module 0 digital input D processed status	0	1	16
40	2130 Expansion module 0 digital input E raw status	0	1	16
41	2130 Expansion module 0 digital input E processed status	0	1	16
42	2130 Expansion module 0 digital input F raw status	0	1	16
43	2130 Expansion module 0 digital input F processed status	0	1	16
44	2130 Expansion module 0 digital input G raw status	0	1	16
45	2130 Expansion module 0 digital input G processed status	0	1	16
46	2130 Expansion module 0 digital input H raw status	0	1	16
47	2130 Expansion module 0 digital input H processed status	0	1	16
48-63	2130 Expansion module 1 digital inputs A-H raw & processed status			
64-79	2130 Expansion module 2 digital inputs A-H raw & processed status			
80-95	2130 Expansion module 3 digital inputs A-H raw & processed status			
96-191	Reserved for 2130 Expansion module 4-9			
192	2130 Expansion module 0 analogue input E sender category	0	3	16
193	2130 Expansion module 0 analogue input E input reading			16S
194	2130 Expansion module 0 analogue input E sender category	0	3	16
195	2130 Expansion module 0 analogue input E input reading			16S
196	2130 Expansion module 0 analogue input F sender category	0	3	16
197	2130 Expansion module 0 analogue input F input reading			16S

Register offset	Name	Min value	Max value	Bits/ sign
198	2130 Expansion module 0 analogue input F sender category	0	3	16
199	2130 Expansion module 0 analogue input F input reading			16S
200	2130 Expansion module 0 analogue input G sender category	0	3	16
201	2130 Expansion module 0 analogue input G input reading			16S
202	2130 Expansion module 0 analogue input G sender category	0	3	16
203	2130 Expansion module 0 analogue input G input reading			16S
204	2130 Expansion module 0 analogue input H sender category	0	3	16
205	2130 Expansion module 0 analogue input H input reading			16S
206	2130 Expansion module 0 analogue input H sender category	0	3	16
207	2130 Expansion module 0 analogue input H input reading			16S
208-223	2130 Expansion module 1 inputs E-H			
224-239	2130 Expansion module 2 inputs E-H			
240-255	2130 Expansion module 3 inputs E-H			

3xxfamily register allocation

Register offset	Name	Min value	Max value	Bits / sign	330	331	332	333	334	335
0	Digital input A raw status	0	1	16	✓	✓	✓	✓	✓	✓
1	Digital input A processed status	0	1	16	✓	✓	✓	✓	✓	✓
2	Digital input B raw status	0	1	16	✓	✓	✓	✓	✓	✓
3	Digital input B processed status	0	1	16	✓	✓	✓	✓	✓	✓
4	Digital input C raw status	0	1	16		✓	✓	✓	✓	✓
5	Digital input C processed status	0	1	16		✓	✓	✓	✓	✓
6	Digital input D raw status	0	1	16		✓	✓	✓	✓	✓
7	Digital input D processed status	0	1	16		✓	✓	✓	✓	✓
8	Digital input E raw status	0	1	16			✓	✓	✓	✓
9	Digital input E processed status	0	1	16			✓	✓	✓	✓
10	Digital input F raw status	0	1	16			✓	✓	✓	✓
11	Digital input F processed status	0	1	16			✓	✓	✓	✓
12	Digital input G raw status	0	1	16			✓	✓	✓	✓
13	Digital input G processed status	0	1	16			✓	✓	✓	✓
14	Digital input H raw status	0	1	16			✓	✓	✓	✓
15	Digital input H processed status	0	1	16			✓	✓	✓	✓
16	Digital input I raw status	0	1	16			✓	✓	✓	✓
17	Digital input I processed status	0	1	16			✓	✓	✓	✓
18	Digital input J raw status	0	1	16			✓	✓	✓	✓
19	Digital input J processed status	0	1	16			✓	✓	✓	✓
20	Digital input K raw status	0	1	16			✓	✓	✓	✓
21	Digital input K processed status	0	1	16			✓	✓	✓	✓
22	Digital input L raw status	0	1	16						✓
23	Digital input L processed status	0	1	16						✓
24-31	Unimplemented (reserved for future digital inputs)									
32	2130 Expansion module 0 digital input A raw status	0	1	16						✓
33	2130 Expansion module 0 digital input A processed status	0	1	16						✓
34	2130 Expansion module 0 digital input B raw status	0	1	16						✓
35	2130 Expansion module 0 digital input B processed status	0	1	16						✓
36	2130 Expansion module 0 digital input C raw status	0	1	16						✓
37	2130 Expansion module 0 digital input C processed status	0	1	16						✓
38	2130 Expansion module 0 digital input D raw status	0	1	16						✓
39	2130 Expansion module 0 digital input D processed status	0	1	16						✓
40	2130 Expansion module 0 digital input E raw status	0	1	16						✓
41	2130 Expansion module 0 digital input E processed status	0	1	16						✓
42	2130 Expansion module 0 digital input F raw status	0	1	16						✓
43	2130 Expansion module 0 digital input F processed status	0	1	16						✓
44	2130 Expansion module 0 digital input G raw status	0	1	16						✓
45	2130 Expansion module 0 digital input G processed status	0	1	16						✓
46	2130 Expansion module 0 digital input H raw status	0	1	16						✓
47	2130 Expansion module 0 digital input H processed status	0	1	16						✓
48-63	2130 Expansion module 1 digital inputs A-H status									✓
64-79	Reserved for 2130 Expansion module 2 digital inputs A-H status)									
80-95	Reserved for 2130 Expansion module 3 digital inputs A-H status)									
96-191	Reserved for 2130 Expansion module 4-9									
192	2130 Expansion module 0 analogue input E sender category	0	3	16						✓
193	2130 Expansion module 0 analogue input E input reading			16S						✓
194	2130 Expansion module 0 analogue input E sender category	0	3	16						✓
195	2130 Expansion module 0 analogue input E input reading			16S						✓
196	2130 Expansion module 0 analogue input F sender category	0	3	16						✓
197	2130 Expansion module 0 analogue input F input reading			16S						✓
198	2130 Expansion module 0 analogue input F sender category	0	3	16						✓
199	2130 Expansion module 0 analogue input F input reading			16S						✓
200	2130 Expansion module 0 analogue input G sender category	0	3	16						✓
201	2130 Expansion module 0 analogue input G input reading			16S						✓

Register offset	Name	Min value	Max value	Bits / sign	330	331	332	333	334	335
202	2130 Expansion module 0 analogue input G sender category	0	3	16						✓
203	2130 Expansion module 0 analogue input G input reading			16S						✓
204	2130 Expansion module 0 analogue input H sender category	0	3	16						✓
205	2130 Expansion module 0 analogue input H input reading			16S						✓
206	2130 Expansion module 0 analogue input H sender category	0	3	16						✓
207	2130 Expansion module 0 analogue input H input reading			16S						✓
208-223	2130 Expansion module 1 analogue inputs E-H									✓
224-239	Reserved for 2130 Expansion module 2 analogue inputs E-H									
240-255	Reserved for 2130 Expansion module 3 analogue inputs E-H									

Exxx family register allocation

Register offset	Name	Min value	Max value	Bits/ sign	E800	E400
0	Digital input A raw status	0	1	16	✓	✓
1	Digital input A processed status	0	1	16	✓	✓
2	Digital input B raw status	0	1	16	✓	✓
3	Digital input B processed status	0	1	16	✓	✓
4	Digital input C raw status	0	1	16	✓	✓
5	Digital input C processed status	0	1	16	✓	✓
6	Digital input D raw status	0	1	16	✓	✓
7	Digital input D processed status	0	1	16	✓	✓
8	Digital input E raw status	0	1	16	✓	
9	Digital input E processed status	0	1	16	✓	
10	Digital input F raw status	0	1	16	✓	
11	Digital input F processed status	0	1	16	✓	
12	Digital input G raw status	0	1	16	✓	
13	Digital input G processed status	0	1	16	✓	
14	Digital input H raw status	0	1	16	✓	
15	Digital input H processed status	0	1	16	✓	
16	Digital input I raw status	0	1	16	✓	
17	Digital input I processed status	0	1	16	✓	
18	Digital input J raw status	0	1	16	✓	
19	Digital input J processed status	0	1	16	✓	
20	Digital input K raw status	0	1	16	✓	
21	Digital input K processed status	0	1	16	✓	
22	Digital input L raw status	0	1	16		
23	Digital input L processed status	0	1	16		
24	Digital input M raw status	0	1	16		
25	Digital input M processed status	0	1	16		
26	Digital input N raw status	0	1	16		
27	Digital input N processed status	0	1	16		
28	Digital input O raw status	0	1	16		
29	Digital input O processed status	0	1	16		
30	Digital input P raw status	0	1	16		
31	Digital input P processed status	0	1	16		
32	Flexible Digital input 1 raw status	0	1	16	✓	✓
33	Flexible Digital input 1 processed status	0	1	16	✓	✓
34	Flexible Digital input 2 raw status	0	1	16	✓	✓
35	Flexible Digital input 2 processed status	0	1	16	✓	✓
36	Flexible Digital input 3 raw status	0	1	16	✓	✓
37	Flexible Digital input 3 processed status	0	1	16	✓	✓
38	Flexible Digital input 4 raw status	0	1	16	✓	✓
39	Flexible Digital input 4 processed status	0	1	16	✓	✓
40	Flexible Digital input 5 raw status	0	1	16	✓	✓
41	Flexible Digital input 5 processed status	0	1	16	✓	✓
42	Flexible Digital input 6 raw status	0	1	16	✓	✓
43	Flexible Digital input 6 processed status	0	1	16	✓	✓
44	Flexible Digital input 7 raw status	0	1	16	✓	✓
45	Flexible Digital input 7 processed status	0	1	16	✓	✓
46	Flexible Digital input 8 raw status	0	1	16	✓	
47	Flexible Digital input 8 processed status	0	1	16	✓	
48	Flexible Digital input 9 raw status	0	1	16	✓	
49	Flexible Digital input 9 processed status	0	1	16	✓	
50	Flexible Digital input 10 raw status	0	1	16	✓	
51	Flexible Digital input 10 processed status	0	1	16	✓	
52	Flexible Digital input 11 raw status	0	1	16	✓	
53	Flexible Digital input 11 processed status	0	1	16	✓	
54	Flexible Digital input 12 raw status	0	1	16	✓	
55	Flexible Digital input 12 processed status	0	1	16	✓	

Register offset	Name	Min value	Max value	Bits/ sign	E 8 0 0	E 4 0 0
56-63	Reserved	0	1	16		
64	2130 Expansion module 0 digital input A raw status	0	1	16	✓	
65	2130 Expansion module 0 digital input A processed status	0	1	16	✓	
66	2130 Expansion module 0 digital input B raw status	0	1	16	✓	
67	2130 Expansion module 0 digital input B processed status	0	1	16	✓	
68	2130 Expansion module 0 digital input C raw status	0	1	16	✓	
69	2130 Expansion module 0 digital input C processed status	0	1	16	✓	
70	2130 Expansion module 0 digital input D raw status	0	1	16	✓	
71	2130 Expansion module 0 digital input D processed status	0	1	16	✓	
72	2130 Expansion module 0 digital input E raw status	0	1	16	✓	
73	2130 Expansion module 0 digital input E processed status	0	1	16	✓	
74	2130 Expansion module 0 digital input F raw status	0	1	16	✓	
75	2130 Expansion module 0 digital input F processed status	0	1	16	✓	
76	2130 Expansion module 0 digital input G raw status	0	1	16	✓	
77	2130 Expansion module 0 digital input G processed status	0	1	16	✓	
78	2130 Expansion module 0 digital input H raw status	0	1	16	✓	
79	2130 Expansion module 0 digital input H processed status	0	1	16	✓	
80-95	2130 Expansion module 1 digital inputs A-H status				✓	
96-111	2130 Expansion module 2 digital inputs A-H status				✓	
112-127	2130 Expansion module 3 digital inputs A-H status				✓	
128	2131Expansion module 0 digital input A raw status	0	1	16	✓	
129	2131Expansion module 0 digital input A processed status	0	1	16	✓	
130	2131Expansion module 0 digital input B raw status	0	1	16	✓	
131	2131Expansion module 0 digital input B processed status	0	1	16	✓	
132	2131Expansion module 0 digital input C raw status	0	1	16	✓	
133	2131Expansion module 0 digital input C processed status	0	1	16	✓	
134	2131Expansion module 0 digital input D raw status	0	1	16	✓	
135	2131Expansion module 0 digital input D processed status	0	1	16	✓	
136	2131Expansion module 0 digital input E raw status	0	1	16	✓	
137	2131Expansion module 0 digital input E processed status	0	1	16	✓	
138	2131Expansion module 0 digital input F raw status	0	1	16	✓	
139	2131Expansion module 0 digital input F processed status	0	1	16	✓	
140	2131Expansion module 0 digital input G raw status	0	1	16	✓	
141	2131Expansion module 0 digital input G processed status	0	1	16	✓	
142	2131Expansion module 0 digital input H raw status	0	1	16	✓	
143	2131Expansion module 0 digital input H processed status	0	1	16	✓	
144	2131Expansion module 0 digital input I raw status	0	1	16	✓	
145	2131Expansion module 0 digital input I processed status	0	1	16	✓	
146	2131Expansion module 0 digital input J raw status	0	1	16	✓	
147	2131Expansion module 0 digital input J processed status	0	1	16	✓	
148-167	2131Expansion module 1 digital inputs A-J status				✓	
168-187	2131Expansion module 2 digital inputs A-J status				✓	
188-207	2131Expansion module 3 digital inputs A-J status				✓	
208-223	Reserved					
224	2130 Expansion module 0 analogue input E sender category	0	4	16	✓	
225	2130 Expansion module 0 analogue input E input reading			16S	✓	
226	2130 Expansion module 0 analogue input E sender category	0	4	16	✓	
227	2130 Expansion module 0 analogue input E input reading			16S	✓	
228	2130 Expansion module 0 analogue input F sender category	0	4	16	✓	
229	2130 Expansion module 0 analogue input F input reading			16S	✓	
230	2130 Expansion module 0 analogue input F sender category	0	4	16	✓	
231	2130 Expansion module 0 analogue input F input reading			16S	✓	
232	2130 Expansion module 0 analogue input G sender category	0	4	16	✓	
233	2130 Expansion module 0 analogue input G input reading			16S	✓	
234	2130 Expansion module 0 analogue input G sender category	0	4	16	✓	
235	2130 Expansion module 0 analogue input G input reading			16S	✓	
236	2130 Expansion module 0 analogue input H sender category	0	4	16	✓	

Register offset	Name	Min value	Max value	Bits/ sign	E800	E400
237	2130 Expansion module 0 analogue input H input reading			16S	✓	
238	2130 Expansion module 0 analogue input H sender category	0	4	16	✓	
239	2130 Expansion module 0 analogue input H input reading			16S	✓	
240-255	2130 Expansion module 1 analogue inputs E-H				✓	

P100 register allocation

Register offset	Name	Min value	Max value	Bits/ sign
0	Digital input A raw status	0	1	16
1	Digital input A processed status	0	1	16
2	Digital input B raw status	0	1	16
3	Digital input B processed status	0	1	16
4	Digital input C raw status	0	1	16
5	Digital input C processed status	0	1	16
6	Digital input D raw status	0	1	16
7	Digital input D processed status	0	1	16
8	Digital input E raw status	0	1	16
9	Digital input E processed status	0	1	16
10	Remote Mains Failure raw status	0	1	16
11	Remote Mains Failure processed status	0	1	16
12-255	Reserved			

Sender category codes and value ranges

Type code	Type	Minimum value	Maximum value	Scaling factor	Units
0	Unused	0	0		
1	Pressure	0	10000	1	KPa
2	Temperature	-200	10000	1	Degrees C
3	Level	0	200	1	%
4	Digital				
4-65535	Reserved				

10.61 Page 171 – Unnamed input status continued

1. This page is a continuation of page 170; refer to that page for notes.
2. Each family has different register allocations.
3. These registers are Read-Only
4. For 60xx, Flexible sensor scaled level value is only implemented for the percentage sensor category

60xx family register allocation

Register offset	Name	Min value	Max value	Bits/ sign
0-15	Unimplemented			16
1	Unimplemented (signed)			16
2-15	Unimplemented (odd numbered registers are signed 16)			
16	Oil pressure transducer category	0	4	16
17	Engine Temperature transducer category	0	4	16
18	Flexible Sensor transducer category	0	4	16
19	Flexible Sensor transducer value	0	250	16
20	Flexible sensor level units	0	2	16
21-22	Flexible sensor level value scaling	0	999999	32
23-24	Flexible sensor scaled level value			32
25-255	Reserved			16

60xx MkII family register allocation

Register offset	Name	Min value	Max value	Bits/ sign
0-15	Unimplemented			16
1	Unimplemented (signed)			16
2-15	Unimplemented (odd numbered registers are signed 16)			
16	Flexible sender A category	0	4	16
17	Flexible sender A value	0	65535	16
18	Flexible sender B category	0	4	16
19	Unimplemented	0	65535	16
20	Flexible sender C category	0	4	16
21	Flexible sender C value	0	65535	16
22	Flexible sender D category	0	4	16
23	Flexible sender D value	0	65535	16
24-255	Reserved			16

61xx MkII family register allocation continued

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0-95	Reserved for 2130 Expansion module 4-9 inputs E-H			
96	Flexible sender A analogue input sender category	0	1	16
97	Flexible sender A analogue input reading	0	1	16
98	Flexible sender B analogue input sender category	0	1	16
99	Flexible sender B analogue input reading	0	1	16
100	Flexible sender C analogue input sender category	0	1	16
101	Flexible sender C analogue input reading	0	1	16
102	Flexible sender D analogue input sender category	0	1	16
103	Flexible sender D analogue input reading	0	1	16
104	Unimplemented U16	0	1	16
105	Unimplemented U16	0	1	16
106	Unimplemented U16	0	1	16
107	Unimplemented U16	0	1	16
108	Unimplemented U16	0	1	16
109	Unimplemented U16	0	1	16
110-255	Reserved			

72xx/73xx family register allocation continued

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0-95	Reserved for 2130 Expansion module 4-9 inputs E-H			
96	Internal flexible sender A analogue input sender category	0	1	16
97	Internal flexible sender A analogue input reading	0	1	16
98	Internal flexible sender A analogue input sender category	0	1	16
99	Internal flexible sender A analogue input reading	0	1	16
100	Maintenance alarm 1 (raw)	0	1	16
101	Maintenance alarm 1 (processed)	0	1	16
102	Maintenance alarm 2 (raw)	0	1	16
103	Maintenance alarm 2 (processed)	0	1	16
104	Maintenance alarm 3 (raw)	0	1	16
105	Maintenance alarm 3 (processed)	0	1	16
106	PLC Function 1 (Raw)	0	1	16
107	PLC Function 1 (processed)	0	1	16
108	PLC Function 2 (Raw)	0	1	16
109	PLC Function 2 (processed)	0	1	16
110-145	PLC Functions 3 to 20			
146	Internal flexible sender A Fault raw	0	1	16
147	Internal flexible sender A Fault processed	0	1	16
148	Internal flexible sender Banalogue input sender category	0	1	16
149	Internal flexible sender B analogue input reading	0	1	16
150	Internal flexible sender B analogue input sender category	0	1	16
151	Internal flexible sender B analogue input reading	0	1	16
152	Internal flexible sender B Fault raw	0	1	16
153	Internal flexible sender B Fault processed	0	1	16
154	Internal flexible sender C analogue input sender category	0	1	16
155	Internal flexible sender C analogue input reading	0	1	16
156	Internal flexible sender C analogue input sender category	0	1	16
157	Internal flexible sender C analogue input reading	0	1	16
158	Internal flexible sender C Fault raw	0	1	16
159	Internal flexible sender C Fault processed	0	1	16
160	Internal flexible sender D analogue input sender category	0	1	16
161	Internal flexible sender D analogue input reading	0	1	16
162	Internal flexible sender D analogue input sender category	0	1	16
163	Internal flexible sender D analogue input reading	0	1	16
164	Internal flexible sender D Fault raw	0	1	16
165	Internal flexible sender D Fault processed	0	1	16
166	Internal flexible sender E analogue input sender category	0	1	16
167	Internal flexible sender E analogue input reading	0	1	16
168	Internal flexible sender E analogue input sender category	0	1	16
169	Internal flexible sender E analogue input reading	0	1	16
170	Internal flexible sender E Fault raw	0	1	16
171	Internal flexible sender E Fault processed	0	1	16
172	Internal flexible sender F analogue input sender category	0	1	16
173	Internal flexible sender F analogue input reading	0	1	16
174	Internal flexible sender F analogue input sender category	0	1	16
175	Internal flexible sender F analogue input reading	0	1	16
176	Internal flexible sender F Fault raw	0	1	16
177	Internal flexible sender F Fault processed	0	1	16
178	Low KW load raw	0	1	16
179	Low KW load processed	0	1	16
180-255	Reserved			

8xxx / 74xx MKI family register allocation continued

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0-15	2130 Expansion module 2 analogue inputs E-H			
16-31	2130 Expansion module 3 analogue inputs E-H			
32	2131 Expansion module 0 analogue input A sender category	0	4	16
33	2131 Expansion module 0 analogue input A input reading			16S
34	2131 Expansion module 0 analogue input B sender category	0	4	16
35	2131 Expansion module 0 analogue input B input reading			16S
36	2131 Expansion module 0 analogue input C sender category	0	4	16
37	2131 Expansion module 0 analogue input C input reading			16S
38	2131 Expansion module 0 analogue input D sender category	0	4	16
39	2131 Expansion module 0 analogue input D input reading			16S
40	2131 Expansion module 0 analogue input E sender category	0	4	16
41	2131 Expansion module 0 analogue input E input reading			16S
42	2131 Expansion module 0 analogue input F sender category	0	4	16
43	2131 Expansion module 0 analogue input F input reading			16S
44	2131 Expansion module 0 analogue input G sender category	0	4	16
45	2131 Expansion module 0 analogue input G input reading			16S
46	2131 Expansion module 0 analogue input H sender category	0	4	16
47	2131 Expansion module 0 analogue input H input reading			16S
48	2131 Expansion module 0 analogue input I sender category	0	4	16
49	2131 Expansion module 0 analogue input I input reading			16S
50	2131 Expansion module 0 analogue input J sender category	0	4	16
51	2131 Expansion module 0 analogue input J input reading			16S
52-71	2131 Expansion module 1 analogue inputs A-J			
72-91	2131 Expansion module 2 analogue inputs A-J			
92-111	2131 Expansion module 3 analogue inputs A-J			
112-127	Reserved			
128	Internal flexible sender 1 analogue input sender category	0	1	16
129	Internal flexible sender 1 analogue input reading	0	1	16
130	Internal flexible sender 1 analogue input sender category	0	1	16
131	Internal flexible sender 1 analogue input reading	0	1	16
132	Internal flexible sender 2 analogue input sender category	0	1	16
133	Internal flexible sender 2 analogue input reading	0	1	16
134	Internal flexible sender 2 analogue input sender category	0	1	16
135	Internal flexible sender 2 analogue input reading	0	1	16
136	Internal flexible sender 3 analogue input sender category	0	1	16
137	Internal flexible sender 3 analogue input reading	0	1	16
138	Internal flexible sender 3 analogue input sender category	0	1	16
139	Internal flexible sender 3 analogue input reading	0	1	16
140	Internal flexible sender 4 analogue input sender category	0	1	16
141	Internal flexible sender 4 analogue input reading	0	1	16
142	Internal flexible sender 4 analogue input sender category	0	1	16
143	Internal flexible sender 4 analogue input reading	0	1	16
144	Internal flexible sender 5 analogue input sender category	0	1	16
145	Internal flexible sender 5 analogue input reading	0	1	16
146	Internal flexible sender 5 analogue input sender category	0	1	16
147	Internal flexible sender 5 analogue input reading	0	1	16
148	Unimplemented - reserved for Engine Maintenance alarm 1 (raw)	0	1	16
149	Unimplemented - reserved for Engine Maintenance alarm 1 (processed)	0	1	16
150	Unimplemented - reserved for Engine Maintenance alarm 2 (raw)	0	1	16
151	Unimplemented - reserved for Engine Maintenance alarm 2 (processed)	0	1	16
152	Unimplemented - reserved for Engine Maintenance alarm 3 (raw)	0	1	16
153	Unimplemented - reserved for Engine Maintenance alarm 3 (processed)	0	1	16

Register offset	Name	Minimum value	Maximum value	Bits/ sign
154	PLC alarm 1 trigger			16
155	PLC alarm 1 condition			16
156	PLC alarm 2 trigger			16
157	PLC alarm 2 condition			16
158	PLC alarm 3 trigger			16
159	PLC alarm 3 condition			16
160	PLC alarm 4 trigger			16
161	PLC alarm 4 condition			16
162	PLC alarm 5 trigger			16
163	PLC alarm 5 condition			16
164	PLC alarm 6 trigger			16
165	PLC alarm 6 condition			16
166	PLC alarm 7 trigger			16
167	PLC alarm 7 condition			16
168	PLC alarm 8 trigger			16
169	PLC alarm 8 condition			16
170	PLC alarm 9 trigger			16
171	PLC alarm 9 condition			16
172	PLC alarm 10 trigger			16
173	PLC alarm 10 condition			16
174	PLC alarm 11 trigger			16
175	PLC alarm 11 condition			16
176	PLC alarm 12 trigger			16
177	PLC alarm 12 condition			16
178	PLC alarm 13 trigger			16
179	PLC alarm 13 condition			16
180	PLC alarm 14 trigger			16
181	PLC alarm 14 condition			16
182	PLC alarm 15 trigger			16
183	PLC alarm 15 condition			16
184	PLC alarm 16 trigger			16
185	PLC alarm 16 condition			16
186	PLC alarm 17 trigger			16
187	PLC alarm 17 condition			16
188	PLC alarm 18 trigger			16
189	PLC alarm 18 condition			16
190	PLC alarm 19 trigger			16
191	PLC alarm 19 condition			16
192	PLC alarm 20 trigger			16
193	PLC alarm 20 condition			16
194	2133 Expansion module 0 analogue input A input reading			16S
195	2133 Expansion module 0 analogue input B input reading			16S
196	2133 Expansion module 0 analogue input C input reading			16S
197	2133 Expansion module 0 analogue input D input reading			16S
198	2133 Expansion module 0 analogue input E input reading			16S
199	2133 Expansion module 0 analogue input F input reading			16S
200	2133 Expansion module 0 analogue input G input reading			16S
201	2133 Expansion module 0 analogue input H input reading			16S
202-209	2133 Expansion module 1 analogue inputs A-H input readings			16S
210-217	2133 Expansion module 2 analogue inputs A-H input readings			16S
218-225	2133 Expansion module 3 analogue inputs A-H input readings			16S
226-255	Reserved			

73xx/74xx/61xx MKIII/63xx/6420 MKII family register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0-95	Reserved for 2130 Expansion module 4-9 inputs E-H			
96	Internal flexible sender A analogue input sensorcategory	0	1	16
97	Internal flexible sender A analogue input reading	0	1	16S
98	Internal flexible sender A analogue input sensorcategory	0	1	16
99	Internal flexible sender A analogue input reading	0	1	16S
100	Maintenance alarm 1 (raw)	0	1	16
101	Maintenance alarm 1 (processed)	0	1	16
102	Maintenance alarm 2 (raw)	0	1	16
103	Maintenance alarm 2 (processed)	0	1	16
104	Maintenance alarm 3 (raw)	0	1	16
105	Maintenance alarm 3 (processed)	0	1	16
106	PLC alarm 1 trigger	0	1	16
107	PLC alarm 1 condition	0	1	16
108	PLC alarm 2 trigger	0	1	16
109	PLC alarm 2 condition	0	1	16
110-145	PLC alarms 3 to 20			
146	Internal flexible sender A Fault raw	0	1	16
147	Internal flexible sender A Fault processed	0	1	16
148	Internal flexible sender Banalogue input sensor category	0	1	16
149	Internal flexible sender B analogue input reading	0	1	16S
150	Internal flexible sender B analogue input sensorcategory	0	1	16
151	Internal flexible sender B analogue input reading	0	1	16S
152	Internal flexible sender B Fault raw	0	1	16
153	Internal flexible sender B Fault processed	0	1	16
154	Internal flexible sender C analogue input sensorcategory	0	1	16
155	Internal flexible sender C analogue input reading	0	1	16S
156	Internal flexible sender C analogue input sensorcategory	0	1	16
157	Internal flexible sender C analogue input reading	0	1	16S
158	Internal flexible sender C Fault raw	0	1	16
159	Internal flexible sender C Fault processed	0	1	16
160	Internal flexible sender D analogue input sensorcategory	0	1	16
161	Internal flexible sender D analogue input reading	0	1	16S
162	Internal flexible sender D analogue input sensorcategory	0	1	16
163	Internal flexible sender D analogue input reading	0	1	16S
164	Internal flexible sender D Fault raw	0	1	16
165	Internal flexible sender D Fault processed	0	1	16
166	Internal flexible sender E analogue input sensorcategory	0	1	16
167	Internal flexible sender E analogue input reading	0	1	16S
168	Internal flexible sender E analogue input sensorcategory	0	1	16
169	Internal flexible sender E analogue input reading	0	1	16S
170	Internal flexible sender E Fault raw	0	1	16
171	Internal flexible sender E Fault processed	0	1	16
172	Internal flexible sender F analogue input sensorcategory	0	1	16
173	Internal flexible sender F analogue input reading	0	1	16S
174	Internal flexible sender F analogue input sensorcategory	0	1	16
175	Internal flexible sender F analogue input reading	0	1	16S
176	Internal flexible sender F Fault raw	0	1	16
177	Internal flexible sender F Fault processed	0	1	16
178	Low kW load alarm raw	0	1	16
179	Low kW load alarm processed	0	1	16
180	ECU Software ID Error raw (6310-A2 only)	0	1	16
181	ECU Software ID Error processed (6310-A2 only)	0	1	16
182-255	Reserved			

3xx family register allocation continued

Register offset	Name	Minimum value	Maximum value	Bits/ sign	330	331	332	333	334	335
0-95	Reserved for 2130 Expansion modules 4-9analogue inputs E-H									
96	PLC alarm 1 trigger			16						✓
97	PLC alarm 1 condition			16						✓
98	PLC alarm 2 trigger			16						✓
99	PLC alarm 2 condition			16						✓
100	PLC alarm 3 trigger			16						✓
101	PLC alarm 3 condition			16						✓
102	PLC alarm 4 trigger			16						✓
103	PLC alarm 4 condition			16						✓
104	PLC alarm 5 trigger			16						✓
105	PLC alarm 5 condition			16						✓
106	PLC alarm 6 trigger			16						✓
107	PLC alarm 6 condition			16						✓
108	PLC alarm 7 trigger			16						✓
109	PLC alarm 7 condition			16						✓
110	PLC alarm 8 trigger			16						✓
111	PLC alarm 8 condition			16						✓
112	PLC alarm 9 trigger			16						✓
113	PLC alarm 9 condition			16						✓
114	PLC alarm 10 trigger			16						✓
115	PLC alarm 10 condition			16						✓
116	PLC alarm 11 trigger			16						✓
117	PLC alarm 11 condition			16						✓
118	PLC alarm 12 trigger			16						✓
119	PLC alarm 12 condition			16						✓
120	PLC alarm 13 trigger			16						✓
121	PLC alarm 13 condition			16						✓
122	PLC alarm 14 trigger			16						✓
123	PLC alarm 14 condition			16						✓
124	PLC alarm 15 trigger			16						✓
125	PLC alarm 15 condition			16						✓
126	PLC alarm 16 trigger			16						✓
127	PLC alarm 16 condition			16						✓
128	PLC alarm 17 trigger			16						✓
129	PLC alarm 17 condition			16						✓
130	PLC alarm 18 trigger			16						✓
131	PLC alarm 18 condition			16						✓
132	PLC alarm 19 trigger			16						✓
133	PLC alarm 19 condition			16						✓
134	PLC alarm 20 trigger			16						✓
135	PLC alarm 20 condition			16						✓
136-255	Reserved									

Exxx family register allocation continued

Register offset	Name	Min value	Max value	Bits/ sign	E8000	E4000
0	2130 Expansion module 2 analogue input E sender category				✓	
1	2130 Expansion module 2 analogue input E input reading				✓	
2	2130 Expansion module 2 analogue input E sender category				✓	
3	2130 Expansion module 2 analogue input E input reading				✓	
4	2130 Expansion module 2 analogue input F sender category				✓	
5	2130 Expansion module 2 analogue input F input reading				✓	
6	2130 Expansion module 2 analogue input F sender category				✓	
7	2130 Expansion module 2 analogue input F input reading				✓	
8	2130 Expansion module 2 analogue input G sender category				✓	
9	2130 Expansion module 2 analogue input G input reading				✓	
10	2130 Expansion module 2 analogue input G sender category				✓	
11	2130 Expansion module 2 analogue input G input reading				✓	
12	2130 Expansion module 2 analogue input H sender category				✓	
13	2130 Expansion module 2 analogue input H input reading				✓	
14	2130 Expansion module 2 analogue input H sender category				✓	
15	2130 Expansion module 2 analogue input H input reading				✓	
16-31	2130 Expansion module 3 analogue inputs E-H				✓	
32	2131 Expansion module 0 analogue input A sender category	0	4	16	✓	
33	2131 Expansion module 0 analogue input A input reading			16S	✓	
34	2131 Expansion module 0 analogue input B sender category	0	4	16	✓	
35	2131 Expansion module 0 analogue input B input reading			16S	✓	
36	2131 Expansion module 0 analogue input C sender category	0	4	16	✓	
37	2131 Expansion module 0 analogue input C input reading			16S	✓	
38	2131 Expansion module 0 analogue input D sender category	0	4	16	✓	
39	2131 Expansion module 0 analogue input D input reading			16S	✓	
40	2131 Expansion module 0 analogue input E sender category	0	4	16	✓	
41	2131 Expansion module 0 analogue input E input reading			16S	✓	
42	2131 Expansion module 0 analogue input F sender category	0	4	16	✓	
43	2131 Expansion module 0 analogue input F input reading			16S	✓	
44	2131 Expansion module 0 analogue input G sender category	0	4	16	✓	
45	2131 Expansion module 0 analogue input G input reading			16S	✓	
46	2131 Expansion module 0 analogue input H sender category	0	4	16	✓	
47	2131 Expansion module 0 analogue input H input reading			16S	✓	
48	2131 Expansion module 0 analogue input I sender category	0	4	16	✓	
49	2131 Expansion module 0 analogue input I input reading			16S	✓	
50	2131 Expansion module 0 analogue input J sender category	0	4	16	✓	
51	2131 Expansion module 0 analogue input J input reading			16S	✓	
52-71	2131 Expansion module 1 analogue inputs A-J				✓	
72-91	2131 Expansion module 2 analogue inputs A-J				✓	
92-111	2131 Expansion module 3 analogue inputs A-J				✓	
112-127	Reserved					
128	Internal flexible sender 1 analogue input sender category	0	4	16	✓	✓
129	Internal flexible sender 1 analogue input reading			16 S	✓	✓
130	Internal flexible sender 1 analogue input sender category	0	4	16	✓	✓
131	Internal flexible sender 1 analogue input reading			16 S	✓	✓
132	Internal flexible sender 2 analogue input sender category	0	4	16	✓	✓
133	Internal flexible sender 2 analogue input reading			16 S	✓	✓
134	Internal flexible sender 2 analogue input sender category	0	4	16	✓	✓
135	Internal flexible sender 2 analogue input reading			16 S	✓	✓
136	Internal flexible sender 3 analogue input sender category	0	4	16	✓	✓
137	Internal flexible sender 3 analogue input reading			16 S	✓	✓
138	Internal flexible sender 3 analogue input sender category	0	4	16	✓	✓
139	Internal flexible sender 3 analogue input reading			16 S	✓	✓
140	Internal flexible sender 4 analogue input sender category	0	4	16	✓	✓
141	Internal flexible sender 4 analogue input reading			16 S	✓	✓

Register offset	Name	Min value	Max value	Bits/ sign	E 8 0 0	E 4 0 0
142	Internal flexible sender 4 analogue input sender category	0	4	16	✓	✓
143	Internal flexible sender 4 analogue input reading			16 S	✓	✓
144	Internal flexible sender 5 analogue input sender category	0	4	16	✓	✓
145	Internal flexible sender 5 analogue input reading			16 S	✓	✓
146	Internal flexible sender 5 analogue input sender category	0	4	16	✓	✓
147	Internal flexible sender 5 analogue input reading			16 S	✓	✓
148	Internal flexible sender 6 analogue input sender category	0	4	16	✓	✓
149	Internal flexible sender 6 analogue input reading			16 S	✓	✓
150	Internal flexible sender 6 analogue input sender category	0	4	16	✓	✓
151	Internal flexible sender 6 analogue input reading			16 S	✓	✓
152	Internal flexible sender 7 analogue input sender category	0	4	16	✓	✓
153	Internal flexible sender 7 analogue input reading			16 S	✓	✓
154	Internal flexible sender 7 analogue input sender category	0	4	16	✓	✓
155	Internal flexible sender 7 analogue input reading			16 S	✓	✓
156	Internal flexible sender 8 analogue input sender category	0	4	16	✓	
157	Internal flexible sender 8 analogue input reading			16 S	✓	
158	Internal flexible sender 8 analogue input sender category	0	4	16	✓	
159	Internal flexible sender 8 analogue input reading			16 S	✓	
160	Internal flexible sender 9 analogue input sender category	0	4	16	✓	
161	Internal flexible sender 9 analogue input reading			16 S	✓	
162	Internal flexible sender 9 analogue input sender category	0	4	16	✓	
163	Internal flexible sender 9 analogue input reading			16 S	✓	
164	Internal flexible sender 10 analogue input sender category	0	4	16	✓	
165	Internal flexible sender 10 analogue input reading			16 S	✓	
166	Internal flexible sender 10 analogue input sender category	0	4	16	✓	
167	Internal flexible sender 10 analogue input reading			16 S	✓	
168	Internal flexible sender 11 analogue input sender category	0	4	16	✓	
169	Internal flexible sender 11 analogue input reading			16 S	✓	
170	Internal flexible sender 11 analogue input sender category	0	4	16	✓	
171	Internal flexible sender 11 analogue input reading			16 S	✓	
172	Internal flexible sender 12 analogue input sender category	0	4	16	✓	
173	Internal flexible sender 12 analogue input reading			16 S	✓	
174	Internal flexible sender 12 analogue input sender category	0	4	16	✓	
175	Internal flexible sender 12 analogue input reading			16 S	✓	
176-181	Reserved				✓	
182	PLC alarm 1 trigger			16	✓	
183	PLC alarm 1 condition			16	✓	
184	PLC alarm 2 trigger			16	✓	
185	PLC alarm 2 condition			16	✓	
186	PLC alarm 3 trigger			16	✓	
187	PLC alarm 3 condition			16	✓	
188	PLC alarm 4 trigger			16	✓	
189	PLC alarm 4 condition			16	✓	
190	PLC alarm 5 trigger			16	✓	
191	PLC alarm 5 condition			16	✓	
192	PLC alarm 6 trigger			16	✓	
193	PLC alarm 6 condition			16	✓	
194	PLC alarm 7 trigger			16	✓	
195	PLC alarm 7 condition			16	✓	
196	PLC alarm 8 trigger			16	✓	
197	PLC alarm 8 condition			16	✓	
198	PLC alarm 9 trigger			16	✓	
199	PLC alarm 9 condition			16	✓	
200	PLC alarm 10 trigger			16	✓	
201	PLC alarm 10 condition			16	✓	
202	PLC alarm 11 trigger			16	✓	
203	PLC alarm 11 condition			16	✓	

Register offset	Name	Min value	Max value	Bits/ sign	E800	E400
204	PLC alarm 12 trigger			16	✓	
205	PLC alarm 12 condition			16	✓	
206	PLC alarm 13 trigger			16	✓	
207	PLC alarm 13 condition			16	✓	
208	PLC alarm 14 trigger			16	✓	
209	PLC alarm 14 condition			16	✓	
210	PLC alarm 15 trigger			16	✓	
211	PLC alarm 15 condition			16	✓	
212	PLC alarm 16 trigger			16	✓	
213	PLC alarm 16 condition			16	✓	
214	PLC alarm 17 trigger			16	✓	
215	PLC alarm 17 condition			16	✓	
216	PLC alarm 18 trigger			16	✓	
217	PLC alarm 18 condition			16	✓	
218	PLC alarm 19 trigger			16	✓	
219	PLC alarm 19 condition			16	✓	
220	PLC alarm 20 trigger			16	✓	
221	PLC alarm 20 condition			16	✓	
222	2133 Expansion module 0 analogue input A input reading			16S	✓	
223	2133 Expansion module 0 analogue input B input reading			16S	✓	
224	2133 Expansion module 0 analogue input C input reading			16S	✓	
225	2133 Expansion module 0 analogue input D input reading			16S	✓	
226	2133 Expansion module 0 analogue input E input reading			16S	✓	
227	2133 Expansion module 0 analogue input F input reading			16S	✓	
228	2133 Expansion module 0 analogue input G input reading			16S	✓	
229	2133 Expansion module 0 analogue input H input reading			16S	✓	
230-237	2133 Expansion module 1 analogue inputs A-H input readings			16S	✓	
238-245	2133 Expansion module 2 analogue inputs A-H input readings			16S	✓	
246-253	2133 Expansion module 3 analogue inputs A-H input readings			16S	✓	
254-255	Reserved					

71xx/66xx/61xx/L40x/4xxx family register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0-15	Unimplemented			
16	Oil pressure transducer category	0	4	16
17	Engine Temperature transducer category	0	4	16
18	Internal flexible sender C category	0	1	16
19	Internal flexible sender C reading	0	1	16
20	Internal flexible sender D category	0	1	16
21	Internal flexible sender D reading	0	1	16
22-255	Reserved			

Sender category codes and value ranges

Type code	Type	Minimum value	Maximum value	Scaling factor	Units
0	Unused	0	0		
1	Pressure	0	10000	1	KPa
2	Temperature	-200	10000	1	Degrees C
3	Level	0	200	1	%
4	Digital				
4-65535	Reserved				

Sender category codes (73xx/74xx MKII)

Type code	Type	Units
0	Unused	
1	Temperature	Degrees C
2	Pressure	KPa
3	Level	%
4-0xfffd	Reserved	
0xfffe	Digital	
0xffff	User/open active/closed active	

10.62 Page 172 – Unnamed input status continued

1. This page is a continuation of page 170/171; refer to that page for notes.
2. Each family has different register allocations.
3. These registers are Read-Only

Exxx Page172 register allocation						
Register offset	Name	Min value	Max value	Bits/ sign	E800	E400
0	Internal flexible sensor A sensor fault raw	0	1	16	✓	✓
1	Internal flexible sensor A sensor fault processed	0	1	16	✓	✓
2	Internal flexible sensor B sensor fault raw	0	1	16	✓	✓
3	Internal flexible sensor B sensor fault processed	0	1	16	✓	✓
4	Internal flexible sensor C sensor fault raw	0	1	16	✓	✓
5	Internal flexible sensor C sensor fault processed	0	1	16	✓	✓
6	Internal flexible sensor D sensor fault raw	0	1	16	✓	✓
7	Internal flexible sensor D sensor fault processed	0	1	16	✓	✓
8	Internal flexible sensor E sensor fault raw	0	1	16	✓	✓
9	Internal flexible sensor E sensor fault processed	0	1	16	✓	✓
10	Internal flexible sensor F sensor fault raw	0	1	16	✓	✓
11	Internal flexible sensor F sensor fault processed	0	1	16	✓	✓
12	Internal flexible sensor G sensor fault raw	0	1	16	✓	✓
13	Internal flexible sensor G sensor fault processed	0	1	16	✓	✓
14	Internal flexible sensor H sensor fault raw	0	1	16	✓	
15	Internal flexible sensor H sensor fault processed	0	1	16	✓	
16	Internal flexible sensor I sensor fault raw	0	1	16	✓	
17	Internal flexible sensor I sensor fault processed	0	1	16	✓	
18	Internal flexible sensor J sensor fault raw	0	1	16	✓	
19	Internal flexible sensor J sensor fault processed	0	1	16	✓	
20	Internal flexible sensor K sensor fault raw	0	1	16	✓	
21	Internal flexible sensor K sensor fault processed	0	1	16	✓	
22	Internal flexible sensor L sensor fault raw	0	1	16	✓	
23	Internal flexible sensor L sensor fault processed	0	1	16	✓	

73xx MKII

Register offset	Name	Min value	Max value	Bits/ sign
0-111	Reserved			
112	2131 Expansion module 0 digital input A raw status	0	1	16
113	2131 Expansion module 0 digital input A processed status	0	1	16
114	2131 Expansion module 0 digital input B raw status	0	1	16
115	2131 Expansion module 0 digital input B processed status	0	1	16
116	2131 Expansion module 0 digital input C raw status	0	1	16
117	2131 Expansion module 0 digital input C processed status	0	1	16
118	2131 Expansion module 0 digital input D raw status	0	1	16
119	2131 Expansion module 0 digital input D processed status	0	1	16
120	2131 Expansion module 0 digital input E raw status	0	1	16
121	2131 Expansion module 0 digital input E processed status	0	1	16
122	2131 Expansion module 0 digital input F raw status	0	1	16
123	2131 Expansion module 0 digital input F processed status	0	1	16
124	2131 Expansion module 0 digital input G raw status	0	1	16
125	2131 Expansion module 0 digital input G processed status	0	1	16
126	2131 Expansion module 0 digital input H raw status	0	1	16
127	2131 Expansion module 0 digital input H processed status	0	1	16
128	2131 Expansion module 0 digital input I raw status	0	1	16
129	2131 Expansion module 0 digital input I processed status	0	1	16
130	2131 Expansion module 0 digital input J raw status	0	1	16
131	2131 Expansion module 0 digital input J processed status	0	1	16
132-151	2131 Expansion module 1 digital inputs A-H raw & processed status	0	1	16
152-171	2131 Expansion module 2 digital inputs A-H raw & processed status	0	1	16
172-191	2131 Expansion module 3 digital inputs A-H raw & processed status	0	1	16
192	DSENet charger 0 Common shutdown raw status	0	1	16
193	DSENet charger 0 Common shutdown processed status	0	1	16
194	DSENet charger 0 Common warning raw status	0	1	16
195	DSENet charger 0 Common warning processed status	0	1	16
196	DSENet charger 1 Common shutdown raw status	0	1	16
197	DSENet charger 1 Common shutdown processed status	0	1	16
198	DSENet charger 1 Common warning raw status	0	1	16
199	DSENet charger 1 Common warning processed status	0	1	16
200	DSENet charger 2 Common shutdown raw status	0	1	16
201	DSENet charger 2 Common shutdown processed status	0	1	16
202	DSENet charger 2 Common warning raw status	0	1	16
203	DSENet charger 2 Common warning processed status	0	1	16
204	DSENet charger 3 Common shutdown raw status	0	1	16
205	DSENet charger 3 Common shutdown processed status	0	1	16
206	DSENet charger 3 Common warning raw status	0	1	16
207	DSENet charger 3 Common warning processed status	0	1	16
208-255	Reserved			

74xx MKII family register allocation

Register offset	Name	Min value	Max value	Bits/ sign
0	2133 Expansion module 0 digital input A input reading			16S
1	2133 Expansion module 0 digital input B input reading			16S
2	2133 Expansion module 0 digital input C input reading			16S
3	2133 Expansion module 0 digital input D input reading			16S
4	2133 Expansion module 0 digital input E input reading			16S
5	2133 Expansion module 0 digital input F input reading			16S
6	2133 Expansion module 0 digital input G input reading			16S
7	2133 Expansion module 0 digital input H input reading			16S
8-15	2133 Expansion module 1 digital inputs A-H input reading			
16-23	2133 Expansion module 2 digital inputs A-H input reading			
24-31	2133 Expansion module 3 digital inputs A-H input reading			
32	2131 Expansion module 0 analogue input A sensor category	0	3	16
33	2131 Expansion module 0 analogue input A input reading			16S
34	2131 Expansion module 0 analogue input Bsensor category	0	3	16
35	2131 Expansion module 0 analogue input Binput reading			16S
36	2131 Expansion module 0 analogue input Csensor category	0	3	16
37	2131 Expansion module 0 analogue input Cinput reading			16S
38	2131 Expansion module 0 analogue input Dsensor category	0	3	16
39	2131 Expansion module 0 analogue input Dinput reading			16S
40	2131 Expansion module 0 analogue input Esensor category	0	3	16
41	2131 Expansion module 0 analogue input Einput reading			16S
42	2131 Expansion module 0 analogue input Fsensor category	0	3	16
43	2131 Expansion module 0 analogue input Finput reading			16S
44	2131 Expansion module 0 analogue input Gsensor category	0	3	16
45	2131 Expansion module 0 analogue input Ginput reading			16S
46	2131 Expansion module 0 analogue input Hsensor category	0	3	16
47	2131 Expansion module 0 analogue input Hinput reading			16S
48	2131 Expansion module 0 analogue input Isensor category	0	3	16
49	2131 Expansion module 0 analogue input Iinput reading			16S
50	2131 Expansion module 0 analogue input Jsensor category	0	3	16
51	2131 Expansion module 0 analogue input Jinput reading			16S
52-71	2131 Expansion module 1 digital inputs A-J category&input reading			
72-91	2131 Expansion module 2 digital inputs A-J category&input reading			
92-111	2131 Expansion module 3 digital inputs A-J category&input reading			
112	2131 Expansion module 0 digital input A raw status	0	1	16
113	2131 Expansion module 0 digital input A processed status	0	1	16
114	2131 Expansion module 0 digital input B raw status	0	1	16
115	2131 Expansion module 0 digital input B processed status	0	1	16
116	2131 Expansion module 0 digital input C raw status	0	1	16
117	2131 Expansion module 0 digital input C processed status	0	1	16
118	2131 Expansion module 0 digital input D raw status	0	1	16
119	2131 Expansion module 0 digital input D processed status	0	1	16
120	2131 Expansion module 0 digital input E raw status	0	1	16
121	2131 Expansion module 0 digital input E processed status	0	1	16
122	2131 Expansion module 0 digital input F raw status	0	1	16
123	2131 Expansion module 0 digital input F processed status	0	1	16
124	2131 Expansion module 0 digital input G raw status	0	1	16
125	2131 Expansion module 0 digital input G processed status	0	1	16
126	2131 Expansion module 0 digital input H raw status	0	1	16
127	2131 Expansion module 0 digital input H processed status	0	1	16
128	2131 Expansion module 0 digital input I raw status	0	1	16
129	2131 Expansion module 0 digital input I processed status	0	1	16
130	2131 Expansion module 0 digital input J raw status	0	1	16
131	2131 Expansion module 0 digital input J processed status	0	1	16
132-151	2131 Expansion module 1 digital inputs A-H raw & processed status	0	1	16
152-171	2131 Expansion module 2 digital inputs A-H raw & processed status	0	1	16
172-191	2131 Expansion module 3 digital inputs A-H raw & processed status	0	1	16
192-255	Reserved			

Sender category codes and value ranges

Type code	Type	Minimum value	Maximum value	Scaling factor	Units
0	Unused	0	0		
1	Pressure	0	10000	1	KPa
2	Temperature	-200	10000	1	Degrees C
3	Level	0	200	1	%
4	Digital				
4-65535	Reserved				

10.63 Page 173 – Unnamed input status continued

1. This page is a continuation of page 170/171/172; refer to that page for notes.
2. Each family has different register allocations.
3. These registers are Read-Only

73xx MKII

Register offset	Name	Min value	Max value	Bits/ sign
0-55	Unimplemented			
56	Configurable CAN instrument 1 raw status	0	1	16
57	Configurable CAN instrument 1 processed status	0	1	16
58	Configurable CAN instrument 2 raw status	0	1	16
59	Configurable CAN instrument 2 processed status	0	1	16
60	Configurable CAN instrument 3 raw status	0	1	16
61	Configurable CAN instrument 3 processed status	0	1	16
62	Configurable CAN instrument 4 raw status	0	1	16
63	Configurable CAN instrument 4 processed status	0	1	16
64	Configurable CAN instrument 5 raw status	0	1	16
65	Configurable CAN instrument 5 processed status	0	1	16
66	Configurable CAN instrument 6 raw status	0	1	16
67	Configurable CAN instrument 6 processed status	0	1	16
68	Configurable CAN instrument 7 raw status	0	1	16
69	Configurable CAN instrument 7 processed status	0	1	16
70	Configurable CAN instrument 8 raw status	0	1	16
71	Configurable CAN instrument 8 processed status	0	1	16
72	Configurable CAN instrument 9 raw status	0	1	16
73	Configurable CAN instrument 9 processed status	0	1	16
74	Configurable CAN instrument 10 raw status	0	1	16
75	Configurable CAN instrument 10 processed status	0	1	16
76-255	Reserved			

10.64 Page 175 – Configurable CAN Receive Instruments Description

Notes:

1. These are read only registers.
2. Each string consists of 32 Unicode characters with the first character at the lowest register address, NULL terminators are not used.

61xx MKII (v2.0 & later), 73xx MKII (v4.0 & later), 74xx MKII, 86xxMKII, E800 (v3.0 & later), E400 (v7.0 & later)

Registers

Register offset	Name	Minimum value	Maximum value	Bits	Read/write
0	CAN Instrument 1 Title String	UNICODE	UNICODE	512	Read only
32	CAN Instrument 2 Title String	UNICODE	UNICODE	512	Read only
64	CAN Instrument 3 Title String	UNICODE	UNICODE	512	Read only
96	CAN Instrument 4 Title String	UNICODE	UNICODE	512	Read only
128	CAN Instrument 5 Title String	UNICODE	UNICODE	512	Read only
160	CAN Instrument 6 Title String	UNICODE	UNICODE	512	Read only
192	CAN Instrument 7 Title String	UNICODE	UNICODE	512	Read only
224	CAN Instrument 8 Title String	UNICODE	UNICODE	512	Read only

86xxMKII V4.2 only

Notes:

1. The reading of strings from this page is different from other most pages in this document.
2. All reads must be function number 03, if more than 1 character is to be read this must be a multi register read.
3. The first register read will select the instrument that is read.
4. After the first register the following registers of a single read will be the contents of that string
5. A new transaction (Modbus) read will return the characters of a different string, indexed by the first register read.
6. Any number of registers can be read, but only the first 32 registers (characters) are implemented, further or unused charactes will be returned as space ' '
7. To read a character part way through the string, the string must be read starting at the register that indexs that string.

Eg. A multi register read from register 12, of length 32 will return the contents of the string,
A read of single register read from register 13 will return the first character of instrument 14.

Read Register offset	Name	String length	Minimum value	Maximum value	Bits	Read/write
0	CAN Instrument 1 Title String	32	UNICODE	UNICODE	512	Read only
1	CAN Instrument 2 Title String	32	UNICODE	UNICODE	512	Read only
2	CAN Instrument 3 Title String	32	UNICODE	UNICODE	512	Read only
3	CAN Instrument 4 Title String	32	UNICODE	UNICODE	512	Read only
4	CAN Instrument 5 Title String	32	UNICODE	UNICODE	512	Read only
5	CAN Instrument 6 Title String	32	UNICODE	UNICODE	512	Read only
6	CAN Instrument 7 Title String	32	UNICODE	UNICODE	512	Read only
7	CAN Instrument 8 Title String	32	UNICODE	UNICODE	512	Read only
8	CAN Instrument 9 Title String	32	UNICODE	UNICODE	512	Read only
9	CAN Instrument 10 Title String	32	UNICODE	UNICODE	512	Read only
10	CAN Instrument 11 Title String	32	UNICODE	UNICODE	512	Read only
11	CAN Instrument 12 Title String	32	UNICODE	UNICODE	512	Read only
12	CAN Instrument 13 Title String	32	UNICODE	UNICODE	512	Read only
13	CAN Instrument 14 Title String	32	UNICODE	UNICODE	512	Read only
14	CAN Instrument 15 Title String	32	UNICODE	UNICODE	512	Read only
15	CAN Instrument 16 Title String	32	UNICODE	UNICODE	512	Read only
16	CAN Instrument 17 Title String	32	UNICODE	UNICODE	512	Read only
17	CAN Instrument 18 Title String	32	UNICODE	UNICODE	512	Read only
18	CAN Instrument 19 Title String	32	UNICODE	UNICODE	512	Read only
19	CAN Instrument 20 Title String	32	UNICODE	UNICODE	512	Read only
20	CAN Instrument 21 Title String	32	UNICODE	UNICODE	512	Read only
21	CAN Instrument 22 Title String	32	UNICODE	UNICODE	512	Read only
22	CAN Instrument 23 Title String	32	UNICODE	UNICODE	512	Read only
23	CAN Instrument 24 Title String	32	UNICODE	UNICODE	512	Read only
24	CAN Instrument 25 Title String	32	UNICODE	UNICODE	512	Read only
25	CAN Instrument 26 Title String	32	UNICODE	UNICODE	512	Read only
26	CAN Instrument 27 Title String	32	UNICODE	UNICODE	512	Read only
27	CAN Instrument 28 Title String	32	UNICODE	UNICODE	512	Read only
28	CAN Instrument 29 Title String	32	UNICODE	UNICODE	512	Read only
29	CAN Instrument 30 Title String	32	UNICODE	UNICODE	512	Read only

10.65 Page 176 – Configurable CAN Receive Instruments Description (cont)

61xx MKII (v2.0 & later), 73xx MKII (v4.0 & later), 74xx MKII, 86MKII, E800 (v3.0 & later), E400 (v7.0 & later)
Registers

Register offset	Name	Minimum value	Maximum value	Bits	Read/write
0	CAN Instrument 9 Title String	UNICODE	UNICODE	512	Read only
32	CAN Instrument 10 Title String	UNICODE	UNICODE	512	Read only
64	CAN Instrument 11 Title String	UNICODE	UNICODE	512	Read only
96	CAN Instrument 12 Title String	UNICODE	UNICODE	512	Read only
128	CAN Instrument 13 Title String	UNICODE	UNICODE	512	Read only
160	CAN Instrument 14 Title String	UNICODE	UNICODE	512	Read only
192	CAN Instrument 15 Title String	UNICODE	UNICODE	512	Read only
224	CAN Instrument 16 Title String	UNICODE	UNICODE	512	Read only

61xx, 74xx and Exxx use only descriptions 1..10

Descriptions are continued further on page 194

10.66 Page 177 – Configurable CAN Receive Instrument Values

Notes:

1. These are read only registers.
2. When a can instrumentation item is not configured, the register should return the S32 'unimplemented' sentinel value.
3. The value is the processed scaled value, not the raw CAN value.

61xx MKII (v2.0 & later), 73xx MKII (v4.0 & later), 86xx MKII
E800 (v3.0 & later), E400 (v7.0 & later)
Registers

Register offset	Name	Minimum value	Maximum value	Scaling Factor	Bits / sign	Read/ write
0-1	Value for CAN Instrument 1	Any	Any	1	32S	Read only
2-3	Value for CAN Instrument 2	Any	Any	1	32S	Read only
4-5	Value for CAN Instrument 3	Any	Any	1	32S	Read only
6-7	Value for CAN Instrument 4	Any	Any	1	32S	Read only
8-9	Value for CAN Instrument 5	Any	Any	1	32S	Read only
…						
58-59	Value for CAN Instrument 30	Any	Any	1	32S	Read only
60-255	Reserved					

74xx MKII

Register offset	Name	Min Value	Max Value	Bits/ sign	Read/write
0-1	Value for CAN Instrument 1	Any	Any	32S	Read only
2-3	Value for CAN Instrument 2	Any	Any	32S	Read only
4-5	Value for CAN Instrument 3	Any	Any	32S	Read only
6-7	Value for CAN Instrument 4	Any	Any	32S	Read only
8-9	Value for CAN Instrument 5	Any	Any	32S	Read only
10-11	Value for CAN Instrument 6	Any	Any	32S	Read only
12-13	Value for CAN Instrument 7	Any	Any	32S	Read only
14-15	Value for CAN Instrument 8	Any	Any	32S	Read only
16-17	Value for CAN Instrument 9	Any	Any	32S	Read only
18-19	Value for CAN Instrument 10	Any	Any	32S	Read only
20-31	Reserved	-	-	-	-
32	CAN Instrument 1–Category	0xffff ('User defined')			Read only
33	CAN Instrument 1– Multiplier	-128	127	16S	Read only
34	CAN Instrument 1– Precision	1	1		Read only
35-36	CAN Instrument 1– Range Min	Any	Any	32S	Read only
37-38	CAN Instrument 1– Range Max	Any	Any	32S	Read only
39-48	CAN Instrument 1– Unit suffix string	UNICODE	UNICODE		Read only
49	CAN Instrument 2–Category	0xffff ('User defined')			Read only
50	CAN Instrument 2– Multiplier	-128	127	16S	Read only
51	CAN Instrument 2– Precision	1	1		Read only
52-53	CAN Instrument 2– Range Min	Any	Any	32S	Read only
54-55	CAN Instrument 2– Range Max	Any	Any	32S	Read only
56-65	CAN Instrument 2– Unit suffix string	UNICODE	UNICODE		Read only
66	CAN Instrument 3–Category	0xffff ('User defined')			Read only
67	CAN Instrument 3– Multiplier	-128	127	16S	Read only
68	CAN Instrument 3– Precision	1	1		Read only
69-70	CAN Instrument 3– Range Min	Any	Any	32S	Read only
71-72	CAN Instrument 3– Range Max	Any	Any	32S	Read only
73-82	CAN Instrument 3– Unit suffix string	UNICODE	UNICODE		Read only
83	CAN Instrument 4–Category	0xffff ('User defined')			Read only

Register offset	Name	Min Value	Max Value	Bits/ sign	Read/write
84	CAN Instrument 4– Multiplier	-128	127	16S	Read only
85	CAN Instrument 4– Precision	1	1		Read only
86-87	CAN Instrument 4– Range Min	Any	Any	32S	Read only
88-89	CAN Instrument 4– Range Max	Any	Any	32S	Read only
90-99	CAN Instrument 4– Unit suffix string	UNICODE	UNICODE		Read only
100	CAN Instrument 5–Category	0xffff (‘User defined’)			Read only
101	CAN Instrument 5– Multiplier	-128	127	16S	Read only
102	CAN Instrument 5– Precision	1	1		Read only
103-104	CAN Instrument 5– Range Min	Any	Any	32S	Read only
105-106	CAN Instrument 5– Range Max	Any	Any	32S	Read only
107-116	CAN Instrument 5– Unit suffix string	UNICODE	UNICODE		Read only
117	CAN Instrument 6–Category	0xffff (‘User defined’)			Read only
118	CAN Instrument 6– Multiplier	-128	127	16S	Read only
119	CAN Instrument 6– Precision	1	1		Read only
120-121	CAN Instrument 6– Range Min	Any	Any	32S	Read only
122-123	CAN Instrument 6– Range Max	Any	Any	32S	Read only
124-133	CAN Instrument 6– Unit suffix string	UNICODE	UNICODE		Read only
134	CAN Instrument 7–Category	0xffff (‘User defined’)			Read only
135	CAN Instrument 7– Multiplier	-128	127	16S	Read only
136	CAN Instrument 7– Precision	1	1		Read only
137-138	CAN Instrument 7– Range Min	Any	Any	32S	Read only
139-140	CAN Instrument 7– Range Max	Any	Any	32S	Read only
141-150	CAN Instrument 7– Unit suffix string	UNICODE	UNICODE		Read only
151	CAN Instrument 8–Category	0xffff (‘User defined’)			Read only
152	CAN Instrument 8– Multiplier	-128	127	16S	Read only
153	CAN Instrument 8– Precision	1	1		Read only
154-155	CAN Instrument 8– Range Min	Any	Any	32S	Read only
156-157	CAN Instrument 8– Range Max	Any	Any	32S	Read only
158-167	CAN Instrument 8– Unit suffix string	UNICODE	UNICODE		Read only
168	CAN Instrument 9–Category	0xffff (‘User defined’)			Read only
169	CAN Instrument 9– Multiplier	-128	127	16S	Read only
170	CAN Instrument 9– Precision	1	1		Read only
171-172	CAN Instrument 9– Range Min	Any	Any	32S	Read only
173-174	CAN Instrument 9– Range Max	Any	Any	32S	Read only
175-184	CAN Instrument 9– Unit suffix string	UNICODE	UNICODE		Read only
185	CAN Instrument 10–Category	0xffff (‘User defined’)			Read only
186	CAN Instrument 10– Multiplier	-128	127	16S	Read only
187	CAN Instrument 10– Precision	1	1		Read only
188-189	CAN Instrument 10– Range Min	Any	Any	32S	Read only
190-191	CAN Instrument 10– Range Max	Any	Any	32S	Read only
192-201	CAN Instrument 10– Unit suffix string	UNICODE	UNICODE		Read only
202- 255	Reserved	-	-	-	-

10.67 Page 178 – Internal Analogue Sensor Readings and Unit Info

1. These registers are Read-Only
2. This page provides the values and the unit details for each of the user defined analogue inputs.
3. The unit information is extracted from the analogue input configuration data.
4. Note that the Unit ID enumeration is **NOT**the same as the Category enumeration used in Page 170/171/172

Register offset	Name	Min Value	Max Value	Bits/ sign	Read/write
0	Internal Analogue Input A – Input Reading	-32750	32750	16 S	Read only
1	Internal Analogue Input B – Input Reading	-32750	32750	16 S	Read only
2	Internal Analogue Input C – Input Reading	-32750	32750	16 S	Read only
3	Internal Analogue Input D – Input Reading	-32750	32750	16 S	Read only
4	Internal Analogue Input E – Input Reading	-32750	32750	16 S	Read only
5	Internal Analogue Input F – Input Reading	-32750	32750	16 S	Read only
6	Internal Analogue Input G – Input Reading	-32750	32750	16 S	Read only
7	Internal Analogue Input H – Input Reading	-32750	32750	16 S	Read only
8	Internal Analogue Input I – Input Reading	-32750	32750	16 S	Read only
9	Internal Analogue Input J – Input Reading	-32750	32750	16 S	Read only
10	Internal Analogue Input K – Input Reading	-32750	32750	16 S	Read only
11	Internal Analogue Input L – Input Reading	-32750	32750	16 S	Read only
12 - 15	Reserved	-	-	-	-
16	Internal Analogue Input A –Unit ID	See Unit ID table below		16	Read only
17	Internal Analogue Input A - Multiplier	-128	127	16 S	Read only
18	Internal Analogue Input A - Precision	0	65535	16	Read only
19	Internal Analogue Input A –Range Min	-32750	32750	16 S	Read only
20	Internal Analogue Input A –Range Max	-32750	32750	16 S	Read only
21 - 30	Internal Analogue Input A – Suffix	UNICODE	UNICODE	160	Read only
31	Internal Analogue Input B - Unit ID	See Unit ID table below		16	Read only
32	Internal Analogue Input B- Multiplier	-128	127	16 S	Read only
33	Internal Analogue Input B - Precision	0	65535	16	Read only
34	Internal Analogue Input B –Range Min	-32750	32750	16 S	Read only
35	Internal Analogue Input B –Range Max	-32750	32750	16 S	Read only
36 - 45	Internal Analogue Input B – Suffix	UNICODE	UNICODE	160	Read only
46	Internal Analogue Input C - Unit ID	See Unit ID table below		16	Read only
47	Internal Analogue Input C- Multiplier	-128	127	16 S	Read only
48	Internal Analogue Input C - Precision	0	65535	16	Read only
49	Internal Analogue Input C –Range Min	-32750	32750	16 S	Read only
50	Internal Analogue Input C –Range Max	-32750	32750	16 S	Read only
51 - 60	Internal Analogue Input C – Suffix	UNICODE	UNICODE	160	Read only
61	Internal Analogue Input D - Unit ID	See Unit ID table below		16	Read only
62	Internal Analogue Input D- Multiplier	-128	127	16 S	Read only
63	Internal Analogue Input D - Precision	0	65535	16	Read only
64	Internal Analogue Input D –Range Min	-32750	32750	16 S	Read only
65	Internal Analogue Input D –Range Max	-32750	32750	16 S	Read only
66 - 75	Internal Analogue Input D – Suffix	UNICODE	UNICODE	160	Read only
76	Internal Analogue Input E – Unit ID	See Unit ID table below		16	Read only
77	Internal Analogue Input E- Multiplier	-128	127	16 S	Read only
78	Internal Analogue Input E - Precision	0	65535	16	Read only
79	Internal Analogue Input E –Range Min	-32750	32750	16 S	Read only
80	Internal Analogue Input E –Range Max	-32750	32750	16 S	Read only
81 - 90	Internal Analogue Input E – Suffix	UNICODE	UNICODE	160	Read only
91	Internal Analogue Input F – Unit ID	See Unit ID table below		16	Read only
92	Internal Analogue Input F- Multiplier	-128	127	16 S	Read only
93	Internal Analogue Input F - Precision	0	65535	16	Read only
94	Internal Analogue Input F –Range Min	-32750	32750	16 S	Read only
95	Internal Analogue Input F –Range Max	-32750	32750	16 S	Read only
96 - 105	Internal Analogue Input F – Suffix	UNICODE	UNICODE	160	Read only
106	Internal Analogue Input G –Unit ID	See Unit ID table below		16	Read only

Register offset	Name	Min Value	Max Value	Bits/ sign	Read/write
107	Internal Analogue Input G- Multiplier	-128	127	16 S	Read only
108	Internal Analogue Input G - Precision	0	65535	16	Read only
109	Internal Analogue Input G –Range Min	-32750	32750	16 S	Read only
110	Internal Analogue Input G –Range Max	-32750	32750	16 S	Read only
111 - 120	Internal Analogue Input G – Suffix	UNICODE	UNICODE	160	Read only
121	Internal Analogue Input H –Unit ID	See Unit ID table below		16	Read only
122	Internal Analogue Input H- Multiplier	-128	127	16 S	Read only
123	Internal Analogue Input H - Precision	0	65535	16	Read only
124	Internal Analogue Input H –Range Min	-32750	32750	16 S	Read only
125	Internal Analogue Input H –Range Max	-32750	32750	16 S	Read only
126 - 135	Internal Analogue Input H – Suffix	UNICODE	UNICODE	160	Read only
136	Internal Analogue Input I –Unit ID	See Unit ID table below		16	Read only
137	Internal Analogue Input I- Multiplier	-128	127	16 S	Read only
138	Internal Analogue Input I - Precision	0	65535	16	Read only
139	Internal Analogue Input I –Range Min	-32750	32750	16 S	Read only
140	Internal Analogue Input I –Range Max	-32750	32750	16 S	Read only
141 - 150	Internal Analogue Input I – Suffix	UNICODE	UNICODE	160	Read only
151	Internal Analogue Input J – Unit ID	See Unit ID table below		16	Read only
152	Internal Analogue Input J- Multiplier	-128	127	16 S	Read only
153	Internal Analogue Input J - Precision	0	65535	16	Read only
154	Internal Analogue Input J –Range Min	-32750	32750	16 S	Read only
155	Internal Analogue Input J –Range Max	-32750	32750	16 S	Read only
156 - 165	Internal Analogue Input J – Suffix	UNICODE	UNICODE	160	Read only
166	Internal Analogue Input K –Unit ID	See Unit ID table below		16	Read only
167	Internal Analogue Input K- Multiplier	-128	127	16 S	Read only
168	Internal Analogue Input K - Precision	0	65535	16	Read only
169	Internal Analogue Input K –Range Min	-32750	32750	16 S	Read only
170	Internal Analogue Input K –Range Max	-32750	32750	16 S	Read only
171 - 180	Internal Analogue Input K – Suffix	UNICODE	UNICODE	160	Read only
181	Internal Analogue Input L – Unit ID	See Unit ID table below		16	Read only
182	Internal Analogue Input L - Multiplier	-128	127	16 S	Read only
183	Internal Analogue Input L - Precision	0	65535	16	Read only
184	Internal Analogue Input L – Range Min	-32750	32750	16 S	Read only
185	Internal Analogue Input L – Range Max	-32750	32750	16 S	Read only
186 - 195	Internal Analogue Input L – Suffix	UNICODE	UNICODE	160	Read only
196- 255	Reserved	-	-	-	-

Unit ID	
Value	**Meaning**
0	Not used
1	Temperature
2	Pressure
3	Percentage
0xFFFE	Digital Input
0xFFFF	User Defined

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Register offset	Name	Min value	Max value	Bits/ sign
0	Flex Sensor A reading	0	65535	16
1	Flex Sensor B reading	0	65535	16
2	Flex Sensor C reading	0	65535	16
3	Flex Sensor D reading	0	65535	16
4	Flex Sensor E reading	0	65535	16
5	Flex Sensor F reading	0	65535	16
6-11	Unimplemented			
12-15	Reserved			
16	Flex Sensor A Category	0	3	16
17	Flex Sensor A Multiplier – Currently not implemented	-128	127	S8
18	Flex Sensor A Precision – Currently not implemented	0	65535	16
19	Flex Sensor A Minimum Range	0	65535	16
20	Flex Sensor A Maximum Range	0	65535	16
21-31	Flex Sensor A Suffix – Currently not implemented	Unicode	Unicode	16
32-47	Flex Sensor B (category/multiplier/precision/min/max/suffix)			
48-63	Flex Sensor C (category/multiplier/precision/min/max/suffix)			
64-79	Flex Sensor D (category/multiplier/precision/min/max/suffix)			
80-95	Flex Sensor E (category/multiplier/precision/min/max/suffix)			
96-111	Flex Sensor F (category/multiplier/precision/min/max/suffix)			
196-255	Reserved			

10.68 Page 179 – Expansion Module Analogue Sensor Limits

1. These registers are Read-Only
2. This page provides the min and max ranges for the expansion modules values
3. The expansion modules will not use user defined units.
4. Range Min + Max will need to be available for the SCADA suite to set the range for Gauge/Dials

Register offset	Name	Min Value	Max Value	Bits/ sign	Read/write
0	2130 Expansion Module 0 – E Range Min			16 S	Read only
1	2130 Expansion Module 0 – E Range Max			16 S	Read only
2	2130 Expansion Module 0 – F Range Min			16 S	Read only
3	2130 Expansion Module 0 – F Range Max			16 S	Read only
4	2130 Expansion Module 0 – G Range Min			16 S	Read only
5	2130 Expansion Module 0 – G Range Max			16 S	Read only
6	2130 Expansion Module 0 – H Range Min			16 S	Read only
7	2130 Expansion Module 0 – H Range Max			16 S	Read only
8-15	2130 Expansion Module 1 – E- H (Range Min + Max)			16 S	Read only
16-23	2130 Expansion Module 2 – E- H (Range Min + Max)			16 S	Read only
24-31	2130 Expansion Module 3 – E- H (Range Min + Max)			16 S	Read only
32-51	2131 Expansion Module 0 – A- J (Range Min + Max)			16 S	Read only
52-71	2131 Expansion Module 1 – A- J (Range Min + Max)			16 S	Read only
72-91	2131 Expansion Module 2 – A- J (Range Min + Max)			16 S	Read only
92-111	2131 Expansion Module 3 – A- J (Range Min + Max)			16 S	Read only
112-127	2133 Expansion Module 0 – A- H (Range Min + Max)			16 S	Read only
128-143	2133 Expansion Module 1 – A- H (Range Min + Max)			16 S	Read only
144-159	2133 Expansion Module 2 – A- H (Range Min + Max)			16 S	Read only
160-175	2133 Expansion Module 3 – A- H (Range Min + Max)			16 S	Read only
176-255	Reserved				

Where:-

Name	***Additional Info***
Range Min	This is used by SCADA Suite for Gauge/Dial range. The value used will be the Y Axis Min Range set in the configuration.
Range Max	This is used by SCADA Suite for Gauge/Dial range. The value used will be the Y Axis Max Range set in the configuration.

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Register offset	Name	Min value	Max value	Bits/ sign
0	2130 Expansion module 0 analogue input E sensorMin value	0	65535	16
1	2130 Expansion module 0 analogue input E sensorMax value	0	65535	16
2	2130 Expansion module 0 analogue input FsensorMin value	0	65535	16
3	2130 Expansion module 0 analogue input FsensorMax value	0	65535	16
4	2130 Expansion module 0 analogue input GsensorMin value	0	65535	16
5	2130 Expansion module 0 analogue input GsensorMax value	0	65535	16
6	2130 Expansion module 0 analogue input HsensorMin value	0	65535	16
7	2130 Expansion module 0 analogue input HsensorMax value	0	65535	16
8-15	2130 Expansion module 1 analogue inputs A-H sensorMin & Max			
16-23	2130 Expansion module 2 analogue inputs A-H sensorMin & Max			
24-31	2130 Expansion module 3 analogue inputs A-H sensorMin & Max			
32	2131 Expansion module 0 analogue input A sensorMin value	0	65535	16
33	2131 Expansion module 0 analogue input AsensorMax value	0	65535	16
34	2131 Expansion module 0 analogue input B sensorMin value	0	65535	16
35	2131 Expansion module 0 analogue input BsensorMax value	0	65535	16
36	2131 Expansion module 0 analogue input C sensorMin value	0	65535	16
37	2131 Expansion module 0 analogue input CsensorMax value	0	65535	16
38	2131 Expansion module 0 analogue input D sensorMin value	0	65535	16
39	2131 Expansion module 0 analogue input DsensorMax value	0	65535	16
40	2131 Expansion module 0 analogue input E sensorMin value	0	65535	16
41	2131 Expansion module 0 analogue input EsensorMax value	0	65535	16
42	2131 Expansion module 0 analogue input F sensorMin value	0	65535	16
43	2131 Expansion module 0 analogue input FsensorMax value	0	65535	16
44	2131 Expansion module 0 analogue input G sensorMin value	0	65535	16
45	2131 Expansion module 0 analogue input GsensorMax value	0	65535	16
46	2131 Expansion module 0 analogue input H sensorMin value	0	65535	16
47	2131 Expansion module 0 analogue input HsensorMax value	0	65535	16
48	2131 Expansion module 0 analogue input I sensorMin value	0	65535	16
49	2131 Expansion module 0 analogue input IsensorMax value	0	65535	16
50	2131 Expansion module 0 analogue input J sensorMin value	0	65535	16
51	2131 Expansion module 0 analogue input JsensorMax value	0	65535	16
52-71	2131 Expansion module 1 analogue inputs A-J sensor Min & Max			
72-71	2131 Expansion module 2 analogue inputs A-J sensor Min & Max			
92-111	2131 Expansion module 3 analogue inputs A-J sensor Min & Max			
112	2133 Expansion module 0 analogue input A sensorMin value	0	65535	16
113	2133 Expansion module 0 analogue input AsensorMax value	0	65535	16
114	2133 Expansion module 0 analogue input B sensorMin value	0	65535	16
115	2133 Expansion module 0 analogue input BsensorMax value	0	65535	16
116	2133 Expansion module 0 analogue input C sensorMin value	0	65535	16
117	2133 Expansion module 0 analogue input CsensorMax value	0	65535	16
118	2133 Expansion module 0 analogue input D sensorMin value	0	65535	16
119	2133 Expansion module 0 analogue input DsensorMax value	0	65535	16
120	2133 Expansion module 0 analogue input E sensorMin value	0	65535	16
121	2133 Expansion module 0 analogue input EsensorMax value	0	65535	16
122	2133 Expansion module 0 analogue input F sensorMin value	0	65535	16
123	2133 Expansion module 0 analogue input FsensorMax value	0	65535	16
124	2133 Expansion module 0 analogue input G sensorMin value	0	65535	16
125	2133 Expansion module 0 analogue input GsensorMax value	0	65535	16
126	2133 Expansion module 0 analogue input H sensorMin value	0	65535	16
127	2133 Expansion module 0 analogue input HsensorMax value	0	65535	16
128-143	2133 Expansion module 1 analogue inputs A-HsensorMin & Max			
144-159	2133 Expansion module 2 analogue inputs A-HsensorMin & Max			
160-175	2133 Expansion module 3 analogue inputs A-HsensorMin & Max			
176-255	Reserved			

10.69 Page 180 – Unnamed output sources & polarities

1. This page indicates the control source and polarity settings for every digital output and LED, taken directly from the configuration.
2. Each family has different register allocations for registers 0-63 but common ones for the remainder of the page.
3. This is continued on page 181.
4. These registers are Read-Only

P100 family register allocations 0-63

Register offset	Name	Minimum value	Maximum value	Bits/ sign	Read/write
0	Digital output A source	0	65535	16	Read only
1	Digital output A polarity	0	1	16	Read only
2	Digital output B source	0	65535	16	Read only
3	Digital output B polarity	0	1	16	Read only
4	Digital output C source	0	65535	16	Read only
5	Digital output C polarity	0	1	16	Read only
6	Digital output D source	0	65535	16	Read only
7	Digital output D polarity	0	1	16	Read only
8	Digital output E source	0	65535	16	Read only
9	Digital output E polarity	0	1	16	Read only
10	Common Trip LED	0	65535	16	Read only
11	Common Trip LED	0	1	16	Read only
12	Voltage alarms green LED	0	65535	16	Read only
13	Voltage alarms green LED	0	1	16	Read only
14	Voltage alarms red LED	0	65535	16	Read only
15	Voltage alarms red LED	0	1	16	Read only
16	Frequency alarms green LED	0	65535	16	Read only
17	Frequency alarms green LED	0	1	16	Read only
18	Frequency alarms red LED	0	65535	16	Read only
19	Frequency alarms red LED	0	1	16	Read only
20	ROCOF alarm LED	0	1	16	Read only
21	ROCOF alarm LED	0	65535	16	Read only
22	Vector Shift LED	0	1	16	Read only
23	Vector Shift LED	0	65535	16	Read only
24	Alternate configuration LED	0	1	16	Read only
25	Alternate configuration LED	0	65535	16	Read only
26	Supervision enabled LED	0	1	16	Read only
27	Supervision enabled LED	0	65535	16	Read only
28-63	Reserved				

61xx MkII family register allocations 0-63

Register offset	Name	Minimum value	Maximum value	Bits/ sign	Read/write
0	Digital output A source (Fuel)	0	65535	16	Read only
1	Digital output A polarity (Fuel)	0	1	16	Read only
2	Digital output B source (Crank)	0	65535	16	Read only
3	Digital output B polarity (Crank)	0	1	16	Read only
4	Digital output E source	0	65535	16	Read only
5	Digital output E polarity	0	1	16	Read only
6	Digital output F source	0	65535	16	Read only
7	Digital output F polarity	0	1	16	Read only
8	Digital output G source	0	65535	16	Read only
9	Digital output G polarity	0	1	16	Read only
10	Digital output H source	0	65535	16	Read only
11	Digital output H polarity	0	1	16	Read only
12	Reserved	0	65535	16	Read only
13	Reserved	0	1	16	Read only
14	Reserved	0	65535	16	Read only
15	Reserved	0	1	16	Read only
16	STOP LED source (STOP)	0	65535	16	Read only
17	STOP LED polarity (STOP)	0	1	16	Read only
18	MANUAL LED source (MANUAL)	0	65535	16	Read only
19	MANUAL LED polarity (MANUAL)	0	1	16	Read only
20	TEST LED source (TEST)	0	65535	16	Read only
21	TEST LED polarity (TEST)	0	1	16	Read only
22	AUTO LED source (AUTO)	0	65535	16	Read only
23	AUTO LED polarity (AUTO)	0	1	16	Read only
24	MAINS LED source (MAINS)	0	65535	16	Read only
25	MAINS LED polarity (MAINS)	0	1	16	Read only
26	MAINS BREAKER LED source (MAINS BREAKER)	0	65535	16	Read only
27	MAINS BREAKER LED polarity (MAINS BREAKER)	0	1	16	Read only
28	GEN BREAKER LED source (GEN BREAKER)	0	65535	16	Read only
29	GEN BREAKER LED polarity (GEN BREAKER)	0	1	16	Read only
30	GEN LED source (GEN)	0	65535	16	Read only
31	GEN LED polarity (GEN)	0	1	16	Read only
32	Warning LED Source	0	65535	16	Read only
33	Warning LED polarity	0	1	16	Read only
34	USER LCD 1 source (USER LCD 1)	0	65535	16	Read only
35	USER LCD 1 polarity (USER LCD 1)	0	1	16	Read only
36	USER LCD 2 source (USER LCD 2)	0	65535	16	Read only
37	USER LCD 2 polarity (USER LCD 2)	0	1	16	Read only
38	USER LCD 3 source (USER LCD 3)	0	65535	16	Read only
39	USER LCD 3 polarity (USER LCD 3)	0	1	16	Read only
40-63	Reserved				

71xx/72xx/73xx/6xxx/L40x/4xxx family register allocations 0-63

Register offset	Name	Minimum value	Maximum value	Bits/ sign	Read/write
0	Digital output A source (Fuel)	0	65535	16	Read only
1	Digital output A polarity (Fuel)	0	1	16	Read only
2	Digital output B source (Crank)	0	65535	16	Read only
3	Digital output B polarity (Crank)	0	1	16	Read only
4	Digital output E source	0	65535	16	Read only
5	Digital output E polarity	0	1	16	Read only
6	Digital output F source	0	65535	16	Read only
7	Digital output F polarity	0	1	16	Read only
8	Digital output G source	0	65535	16	Read only
9	Digital output G polarity	0	1	16	Read only
10	Digital output H source	0	65535	16	Read only
11	Digital output H polarity	0	1	16	Read only
12	Digital output D source (Generator)	0	65535	16	Read only
13	Digital output D polarity (Generator)	0	1	16	Read only
14	Digital output C source (Mains)	0	65535	16	Read only
15	Digital output C polarity (Mains)	0	1	16	Read only
16	STOP LED source (STOP)	0	65535	16	Read only
17	STOP LED polarity (STOP)	0	1	16	Read only
18	MANUAL LED source (MANUAL)	0	65535	16	Read only
19	MANUAL LED polarity (MANUAL)	0	1	16	Read only
20	TEST LED source (TEST)	0	65535	16	Read only
21	TEST LED polarity (TEST)	0	1	16	Read only
22	AUTO LED source (AUTO)	0	65535	16	Read only
23	AUTO LED polarity (AUTO)	0	1	16	Read only
24	MAINS LED source (MAINS)	0	65535	16	Read only
25	MAINS LED polarity (MAINS)	0	1	16	Read only
26	MAINS BREAKER LED source (MAINS BREAKER)	0	65535	16	Read only
27	MAINS BREAKER LED polarity (MAINS BREAKER)	0	1	16	Read only
28	GEN BREAKER LED source (GEN BREAKER)	0	65535	16	Read only
29	GEN BREAKER LED polarity (GEN BREAKER)	0	1	16	Read only
30	GEN LED source (GEN)	0	65535	16	Read only
31	GEN LED polarity (GEN)	0	1	16	Read only
32	USER LED 1 source (USER LED 1)	0	65535	16	Read only
33	USER LED 1 polarity (USER LED 1)	0	1	16	Read only
34	USER LED 2 source (USER LED 2)	0	65535	16	Read only
35	USER LED 2 polarity (USER LED 2)	0	1	16	Read only
36	USER LED 3 source (USER LED 3)	0	65535	16	Read only
37	USER LED 3 polarity (USER LED 3)	0	1	16	Read only
38	USER LED 4 source (USER LED 4)	0	65535	16	Read only
39	USER LED 4 polarity (USER LED 4)	0	1	16	Read only
40	Digital output I source	0	65535	16	Read only
41	Digital output I polarity	0	1	16	Read only
42	Digital output J source	0	65535	16	Read only
43	Digital output J polarity	0	1	16	Read only
44-63	Reserved				

8xxx/74xx/L401 MKIIfamily register allocations 0-63

Register offset	Name	Minimum value	Maximum value	Bits/ sign	Read/write
0	Digital output A source (Fuel)	0	65535	16	Read only
1	Digital output A polarity (Fuel)	0	1	16	Read only
2	Digital output B source (Crank)	0	65535	16	Read only
3	Digital output B polarity (Crank)	0	1	16	Read only
4	Digital output E source	0	65535	16	Read only
5	Digital output E polarity	0	1	16	Read only
6	Digital output F source	0	65535	16	Read only
7	Digital output F polarity	0	1	16	Read only
8	Digital output G source	0	65535	16	Read only
9	Digital output G polarity	0	1	16	Read only
10	Digital output H source	0	65535	16	Read only
11	Digital output H polarity	0	1	16	Read only
12	Digital output I source	0	65535	16	Read only
13	Digital output I polarity	0	1	16	Read only
14	Digital output J source	0	65535	16	Read only
15	Digital output J polarity	0	1	16	Read only
16	Digital output K source	0	65535	16	Read only
17	Digital output K polarity	0	1	16	Read only
18	Digital output L source	0	65535	16	Read only
19	Digital output L polarity	0	1	16	Read only
20	Digital output M source	0	65535	16	Read only
21	Digital output M polarity	0	1	16	Read only
22	Digital output N source	0	65535	16	Read only
23	Digital output N polarity	0	1	16	Read only
24	Digital output D source (Generator)	0	65535	16	Read only
25	Digital output D polarity (Generator)	0	1	16	Read only
26	Digital output C source (Mains)	0	65535	16	Read only
27	Digital output C polarity (Mains)	0	1	16	Read only
28	STOP LED source (STOP)	0	65535	16	Read only
29	STOP LED polarity (STOP)	0	1	16	Read only
30	MANUAL LED source (MANUAL)	0	65535	16	Read only
31	MANUAL LED polarity (MANUAL)	0	1	16	Read only
32	TEST LED source (TEST)	0	65535	16	Read only
33	TEST LED polarity (TEST)	0	1	16	Read only
34	AUTO LED source (AUTO)	0	65535	16	Read only
35	AUTO LED polarity (AUTO)	0	1	16	Read only
36	MAINS LED source (MAINS)	0	65535	16	Read only
37	MAINS LED polarity (MAINS)	0	1	16	Read only
38	MAINS BREAKER LED source (MAINS BREAKER)	0	65535	16	Read only
39	MAINS BREAKER LED polarity (MAINS BREAKER)	0	1	16	Read only
40	GEN BREAKER LED source (GEN BREAKER)	0	65535	16	Read only
41	GEN BREAKER LED polarity (GEN BREAKER)	0	1	16	Read only
42	GEN LED source (GEN)	0	65535	16	Read only
43	GEN LED polarity (GEN)	0	1	16	Read only
44	USER LED 1 source (USER LED 1)	0	65535	16	Read only
45	USER LED 1 polarity (USER LED 1)	0	1	16	Read only
46	USER LED 2 source (USER LED 2)	0	65535	16	Read only
47	USER LED 2 polarity (USER LED 2)	0	1	16	Read only
48	USER LED 3 source (USER LED 3)	0	65535	16	Read only
49	USER LED 3 polarity (USER LED 3)	0	1	16	Read only
50	USER LED 4 source (USER LED 4)	0	65535	16	Read only
51	USER LED 4 polarity (USER LED 4)	0	1	16	Read only
52-63	Reserved				

332/333 register allocation

Register offset	Name	Minimum value	Maximum value	Bits/ sign	Read/write
0	Mains breaker output source	0	65535	16	Read only
1	Mains breaker output polarity	0	1	16	Read only
2	Generator breaker output source	0	65535	16	Read only
3	Generator breaker output polarity	0	1	16	Read only
4	Digital output C source	0	65535	16	Read only
5	Digital output C polarity	0	1	16	Read only
6	Digital output D source	0	65535	16	Read only
7	Digital output D polarity	0	1	16	Read only
8	Digital output E source	0	65535	16	Read only
9	Digital output E polarity	0	1	16	Read only
10-15	Reserved for future outputs				
16	Exercise LED source	0	65535	16	Read only
17	Exercise LED polarity	0	1	16	Read only
18	Manual LED source	0	65535	16	Read only
19	Manual LED source	0	1	16	Read only
20	Prohibit Return LED source	0	65535	16	Read only
21	Prohibit Return LED source	0	1	16	Read only
22	Auto LED source	0	65535	16	Read only
23	Auto LED source	0	1	16	Read only
24	Generator breaker LED source	0	65535	16	Read only
25	Generator breaker LED source	0	1	16	Read only
26	Mains breaker LED source	0	65535	16	Read only
27	Mains breaker LED source	0	1	16	Read only
28	Generator available LED source	0	65535	16	Read only
29	Generator available LED source	0	1	16	Read only
28	Mains available LED source	0	65535	16	Read only
29	Mains available LED source	0	1	16	Read only
28	Warning LED source	0	65535	16	Read only
29	Warning LED polarity	0	1	16	Read only
30	LCD Indicator 1 source (USER LED 1)	0	65535	16	Read only
31	LCD Indicator 1 polarity (USER LED 1)	0	1	16	Read only
32	LCD Indicator 2 source (USER LED 2)	0	65535	16	Read only
33	LCD Indicator 2 polarity (USER LED 2)	0	1	16	Read only
34	LCD Indicator 3 source (USER LED 3)	0	65535	16	Read only
35	LCD Indicator 3 polarity (USER LED 3)	0	1	16	Read only
36-63	Reserved				

330/331/334 Register allocations 0-63

Register offset	Name	Minimum value	Maximum value	Bits/ sign	330	331	334
0	Digital output A source	0	65535	16	✓	✓	✓
1	Digital output A polarity	0	1	16	✓	✓	✓
2	Digital output B source	0	65535	16	✓	✓	✓
3	Digital output B polarity	0	1	16	✓	✓	✓
4	Digital output C source	0	65535	16	✓	✓	✓
5	Digital output C polarity	0	1	16	✓	✓	✓
6	Digital output D source	0	65535	16	✓	✓	✓
7	Digital output D polarity	0	1	16	✓	✓	✓
8	Digital output E source	0	65535	16	✓	✓	✓
9	Digital output E polarity	0	1	16	✓	✓	✓
10	Digital output F source	0	65535	16	✓	✓	
11	Digital output F polarity	0	1	16	✓	✓	
12	Digital output G source	0	65535	16		✓	
13	Digital output G polarity	0	1	16		✓	
14	Digital output H source	0	65535	16		✓	
15	Digital output H polarity	0	1	16		✓	
16	Stop LED source	0	65535	16			✓
17	Stop LED polarity	0	1	16			✓
18	Manual LED source	0	65535	16			✓
19	Manual LED polarity	0	1	16			✓
20	Auto LED source	0	65535	16			✓
21	Auto LED polarity	0	1	16			✓
22	Mode LED source	0	65535	16			✓
23	Mode LED polarity	0	1	16			✓
24	S2 breaker LED source	0	65535	16			✓
25	S2 breaker LED polarity	0	1	16			✓
26	S1breaker LED source	0	65535	16			✓
27	S1 breaker LED polarity	0	1	16			✓
28	S2 available LED source	0	65535	16			✓
29	S2 available LED polarity	0	1	16			✓
30	S1 available LED source	0	65535	16			✓
31	S1 available LED polarity	0	1	16			✓
32	Warning LED source	0	65535	16	✓	✓	✓
33	Warning LED polarity	0	1	16	✓	✓	✓
34	USER LED / LCD Indicator 1 source (USER LED 1)	0	65535	16			✓
35	USER LED / LCD Indicator 1 polarity (USER LED 1)	0	1	16			✓
36	USER LED / LCD Indicator 2 source (USER LED 2)	0	65535	16			✓
37	USER LED / LCD Indicator 2 polarity (USER LED 2)	0	1	16			✓
38	USER LED / LCD Indicator 3 source (USER LED 3)	0	65535	16			✓
39	USER LED / LCD Indicator 3 polarity (USER LED 3)	0	1	16			✓
40-63	Reserved						

335 Register allocations 0-63

Register offset	Name	Minimum value	Maximum value	Bits/ sign	Read/write
0	Digital output A source	0	65535	16	Read only
1	Digital output A polarity	0	1	16	Read only
2	Digital output B source	0	65535	16	Read only
3	Digital output B polarity	0	1	16	Read only
4	Digital output C source	0	65535	16	Read only
5	Digital output C polarity	0	1	16	Read only
6	Digital output D source	0	65535	16	Read only
7	Digital output D polarity	0	1	16	Read only
8	Digital output E source	0	65535	16	Read only
9	Digital output E polarity	0	1	16	Read only
10	Digital output F source	0	65535	16	Read only
11	Digital output F polarity	0	1	16	Read only
12	Digital output G source	0	65535	16	Read only
13	Digital output G polarity	0	1	16	Read only
14	Digital output H source	0	65535	16	Read only
15	Digital output H polarity	0	1	16	Read only
16	Digital output I source	0	65535	16	Read only
17	Digital output I polarity	0	1	16	Read only
18	Digital output J source	0	65535	16	Read only
19	Digital output J polarity	0	1	16	Read only
20	Digital output K source	0	65535	16	Read only
21	Digital output K polarity	0	1	16	Read only
22	Digital output L source	0	65535	16	Read only
23	Digital output L polarity	0	1	16	Read only
24	Stop LED source	0	65535	16	Read only
25	Stop LED polarity	0	1	16	Read only
26	Manual LED source	0	65535	16	Read only
27	Manual LED polarity	0	1	16	Read only
28	Mode LED source	0	65535	16	Read only
29	Mode LED polarity	0	1	16	Read only
30	Auto LED source	0	65535	16	Read only
31	Auto LED polarity	0	1	16	Read only
32	S2 breaker LED source	0	65535	16	Read only
33	S2 breaker LED polarity	0	1	16	Read only
34	S1breaker LED source	0	65535	16	Read only
35	S1 breaker LED polarity	0	1	16	Read only
36	S2 available LED source	0	65535	16	Read only
37	S2 available LED polarity	0	1	16	Read only
38	S1 available LED source	0	65535	16	Read only
39	S1 available LED polarity	0	1	16	Read only
40	USER LED 1 source	0	65535	16	Read only
41	USER LED 1 polarity	0	1	16	Read only
42	USER LED 2 source	0	65535	16	Read only
43	USER LED 2 polarity	0	1	16	Read only
44	USER LED 3 source	0	65535	16	Read only
45	USER LED 3 polarity	0	1	16	Read only
46	USER LED 4 source	0	65535	16	Read only
47	USER LED 4 polarity	0	1	16	Read only
48	USER LED 1 colour	0	1	16	Read only
49	USER LED 2 colour	0	1	16	Read only
50	USER LED 3 colour	0	1	16	Read only
51	USER LED 4 colour	0	1	16	Read only
52-63	Reserved				

Exxx Register allocations 0-63

Register offset	Name	Min value	Max value	Bits/ sign	Read/write	E 8 0 0	E 4 0 0
0	Digital output A source (Fuel)	0	65535	16	Read only	✓	✓
1	Digital output A polarity(Fuel)	0	1	16	Read only	✓	✓
2	Digital output B source (Crank)	0	65535	16	Read only	✓	✓
3	Digital output B polarity (Crank)	0	1	16	Read only	✓	✓
4	Digital output C source	0	65535	16	Read only	✓	✓
5	Digital output C polarity	0	1	16	Read only	✓	✓
6	Digital output D source	0	65535	16	Read only	✓	✓
7	Digital output D polarity	0	1	16	Read only	✓	✓
8	Digital output E source	0	65535	16	Read only	✓	
9	Digital output E polarity	0	1	16	Read only	✓	
10	Digital output F source	0	65535	16	Read only	✓	
11	Digital output F polarity	0	1	16	Read only	✓	
12	Digital output G source	0	65535	16	Read only	✓	
13	Digital output G polarity	0	1	16	Read only	✓	
14	Digital output H source	0	65535	16	Read only	✓	
15	Digital output H polarity	0	1	16	Read only	✓	
16	Digital output I source	0	65535	16	Read only		
17	Digital output I polarity	0	1	16	Read only		
18	Digital output J source	0	65535	16	Read only		
19	Digital output J polarity	0	1	16	Read only		
20	Digital output K source	0	65535	16	Read only		
21	Digital output K polarity	0	1	16	Read only		
22	Digital output L source	0	65535	16	Read only		
23	Digital output L polarity	0	1	16	Read only		
24	OFF LED source (OFF)	0	1	16	Read only	✓	
25	OFF LED polarity (OFF)	0	65535	16	Read only	✓	
26	MANUAL LED source (MANUAL)	0	1	16	Read only	✓	✓
27	MANUAL LED polarity (MANUAL)	0	65535	16	Read only	✓	✓
28	AUTO LED source (AUTO)	0	1	16	Read only	✓	✓
29	AUTO LED polarity (AUTO)	0	65535	16	Read only	✓	✓
30	STOP LED source (STOP)	0	1	16	Read only	✓	✓
31	STOP LED polarity (STOP)	0	65535	16	Read only	✓	✓
32	USER LED 1 source (USER LED 1)	0	1	16	Read only	✓	
33	USER LED 1 polarity (USER LED 1)	0	65535	16	Read only	✓	
34	USER LED 2 source (USER LED 2)	0	1	16	Read only	✓	
35	USER LED 2 polarity (USER LED 2)	0	65535	16	Read only	✓	
36	USER LED 3 source (USER LED 3)	0	1	16	Read only	✓	
37	USER LED 3 polarity (USER LED 3)	0	65535	16	Read only	✓	
38	USER LED 4 source (USER LED 4)	0	1	16	Read only	✓	
39	USER LED 4 polarity (USER LED 4)	0	65535	16	Read only	✓	
40	PWM 1 Digital output source	0	65535	16	Read only	✓	✓
41	PWM 1 Digital output polarity	0	1	16	Read only	✓	✓
42	PWM 2 Digital output source	0	65535	16	Read only	✓	✓
43	PWM 2 Digital output polarity	0	1	16	Read only	✓	✓
44	PWM 3 Digital output source	0	65535	16	Read only	✓	
45	PWM 3 Digital output polarity	0	1	16	Read only	✓	
46	PWM 4 Digital output source	0	65535	16	Read only	✓	
47	PWM 4 Digital output polarity	0	1	16	Read only	✓	
48-63	Reserved						

8xxx/74xx/72xx/73xx/3xx/ExxxCommon family register allocations 64-255

Register offset	Name	Min value	Max value	Bits/ sign	8xxx/ 74xx	72xx/ 73xx	335	E 8 0 0
64	2157 expansion module 0 output A source	0	65535	16	✓	✓	✓	✓
65	2157 expansion module 0 output A polarity	0	1	16	✓	✓	✓	✓
66	2157 expansion module 0 output B source	0	65535	16	✓	✓	✓	✓
67	2157 expansion module 0 output B polarity	0	1	16	✓	✓	✓	✓
68	2157 expansion module 0 output C source	0	65535	16	✓	✓	✓	✓
69	2157 expansion module 0 output C polarity	0	1	16	✓	✓	✓	✓
70	2157 expansion module 0 output D source	0	65535	16	✓	✓	✓	✓
71	2157 expansion module 0 output D polarity	0	1	16	✓	✓	✓	✓
72	2157 expansion module 0 output E source	0	65535	16	✓	✓	✓	✓
73	2157 expansion module 0 output E polarity	0	1	16	✓	✓	✓	✓
74	2157 expansion module 0 output F source	0	65535	16	✓	✓	✓	✓
75	2157 expansion module 0 output F polarity	0	1	16	✓	✓	✓	✓
76	2157 expansion module 0 output G source	0	65535	16	✓	✓	✓	✓
77	2157 expansion module 0 output G polarity	0	1	16	✓	✓	✓	✓
78	2157 expansion module 0 output H source	0	65535	16	✓	✓	✓	✓
79	2157 expansion module 0 output H polarity	0	1	16	✓	✓	✓	✓
80-95	2157 expansion module 1 outputs A-H	0	65535	16	✓	✓	✓	✓
96-111	2157 expansion module 2 outputs A-H	0	1	16	✓	✓		✓
112-127	2157 expansion module 3 outputs A-H	0	65535	16	✓	✓		✓
128-223	2157 expansion module 4-9 outputs A-H	0	1	16	✓	✓		✓
224	2548 expansion module 0 output A source	0	65535	16	✓	✓	✓	✓
225	2548 expansion module 0 output A polarity	0	1	16	✓	✓	✓	✓
226	2548 expansion module 0 output B source	0	65535	16	✓	✓	✓	✓
227	2548 expansion module 0 output B polarity	0	1	16	✓	✓	✓	✓
228	2548 expansion module 0 output C source	0	65535	16	✓	✓	✓	✓
229	2548 expansion module 0 output C polarity	0	1	16	✓	✓	✓	✓
230	2548 expansion module 0 output D source	0	65535	16	✓	✓	✓	✓
231	2548 expansion module 0 output D polarity	0	1	16	✓	✓	✓	✓
232	2548 expansion module 0 output E source	0	65535	16	✓	✓	✓	✓
233	2548 expansion module 0 output E polarity	0	1	16	✓	✓	✓	✓
234	2548 expansion module 0 output F source	0	65535	16	✓	✓	✓	✓
235	2548 expansion module 0 output F polarity	0	1	16	✓	✓	✓	✓
236	2548 expansion module 0 output G source	0	65535	16	✓	✓	✓	✓
237	2548 expansion module 0 output G polarity	0	1	16	✓	✓	✓	✓
238	2548 expansion module 0 output H source	0	65535	16	✓	✓	✓	✓
239	2548 expansion module 0 output H polarity	0	1	16	✓	✓	✓	✓
240	2548 expansion module 0 sounder output Source	0	65535	16	✓	✓	✓	✓
241	2548 expansion module 0 sounder output polarity	0	1	16	✓	✓	✓	✓
242-255	2548 expansion module 1 outputs A-G				✓	✓	✓	✓

LED colours

Type code	Type
0	Red
1	Green

10.70 Page 181 – Unnamed output sources & polarities continued

1. This page is a continuation of page 180; refer to that page for notes.

8xxx/74xx/72xx/73xx/3xx/E800Common family register allocations 0-255 continued

Register offset	Name	Minimum value	Maximum value	Bits/ sign	8xxx/ 74xx/ E800	72xx/ 73xx	335
0	2548 expansion module 1 output H source	0	65535	16	✓	✓	✓
1	2548 expansion module 1 output H polarity	0	1	16	✓	✓	✓
2	2548 expansion module 1 sounder output Source	0	65535	16	✓	✓	✓
3	2548 expansion module 1 sounder output polarity	0	1	16	✓	✓	✓
4-21	2548 expansion module 2 outputs A-H & sounder				✓	✓	
22-39	2548 expansion module 3 outputs A-H & sounder				✓	✓	
40-57	2548 expansion module 4 outputs A-H & sounder				✓	✓	
58-75	2548 expansion module 5 outputs A-H & sounder				✓	✓	
76-93	2548 expansion module 6 outputs A-H & sounder				✓	✓	
94-111	2548 expansion module 7 outputs A-H & sounder				✓	✓	
112-129	2548 expansion module 8 outputs A-H & sounder				✓	✓	
130-147	2548 expansion module 9 outputs A-H & sounder				✓	✓	
148-255	Reserved						

10.71 Page 182 – Virtual output sources & polarities

1. This page indicates the control source and polarity settings for every virtual output, taken directly from the configuration.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
0	Virtual output 1 source	0	65535			16	Read only
1	Virtual output 1 polarity	0	1			16	Read only
2	Virtual output 2 source	0	65535			16	Read only
3	Virtual output 2 polarity	0	1			16	Read only
4	Virtual output 3 source	0	65535			16	Read only
5	Virtual output 3 polarity	0	1			16	Read only
6	Virtual output 4 source	0	65535			16	Read only
7	Virtual output 4 polarity	0	1			16	Read only
8	Virtual output 5 source	0	65535			16	Read only
9	Virtual output 5 polarity	0	1			16	Read only
10	Virtual output 6 source	0	65535			16	Read only
11	Virtual output 6 polarity	0	1			16	Read only
12	Virtual output 7 source	0	65535			16	Read only
13	Virtual output 7 polarity	0	1			16	Read only
14	Virtual output 8 source	0	65535			16	Read only
15	Virtual output 8 polarity	0	1			16	Read only
16	Virtual output 9 source	0	65535			16	Read only
17	Virtual output 9 polarity	0	1			16	Read only
18	Virtual output 10 source	0	65535			16	Read only
19	Virtual output 10 polarity	0	1			16	Read only
20	Virtual output 11 source	0	65535			16	Read only
21	Virtual output 11 polarity	0	1			16	Read only
22	Virtual output 12 source	0	65535			16	Read only
23	Virtual output 12 polarity	0	1			16	Read only
24	Virtual output 13 source	0	65535			16	Read only
25	Virtual output 13 polarity	0	1			16	Read only
26	Virtual output 14 source	0	65535			16	Read only
27	Virtual output 14 polarity	0	1			16	Read only
28	Virtual output 15 source	0	65535			16	Read only
29	Virtual output 15 polarity	0	1			16	Read only
30	Virtual output 16 source	0	65535			16	Read only
31	Virtual output 16 polarity	0	1			16	Read only
32	Virtual output 17 source	0	65535			16	Read only
33	Virtual output 17 polarity	0	1			16	Read only
34	Virtual output 18 source	0	65535			16	Read only
35	Virtual output 18 polarity	0	1			16	Read only
36	Virtual output 19 source	0	65535			16	Read only
37	Virtual output 19 polarity	0	1			16	Read only
38	Virtual output 20 source	0	65535			16	Read only
39	Virtual output 20 polarity	0	1			16	Read only
40-255	Reserved						

10.72 Page 183 – Configurable output sources & polarities

1. This page indicates the control source and polarity settings for every configurable output, taken directly from the configuration.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
0	configurable output 1 item A source	0	65535			16	Read only
1	configurable output 1 item A polarity	0	1			16	Read only
2	configurable output 1 item B source	0	65535			16	Read only
3	configurable output 1 item B polarity	0	1			16	Read only
4	configurable output 1 item C source	0	65535			16	Read only
5	configurable output 1 item C polarity	0	1			16	Read only
6	configurable output 2 item A source	0	65535			16	Read only
7	configurable output 2 item A polarity	0	1			16	Read only
8	configurable output 2 item B source	0	65535			16	Read only
9	configurable output 2 item B polarity	0	1			16	Read only
10	configurable output 2 item C source	0	65535			16	Read only
11	configurable output 2 item C polarity	0	1			16	Read only
12	configurable output 3 item A source	0	65535			16	Read only
13	configurable output 3 item A polarity	0	1			16	Read only
14	configurable output 3 item B source	0	65535			16	Read only
15	configurable output 3 item B polarity	0	1			16	Read only
16	configurable output 3 item C source	0	65535			16	Read only
17	configurable output 3 item C polarity	0	1			16	Read only
18-255	Reserved						

10.73 Page 184 – Expansion Analogue output sources, types and values

1. The analogue output source list is the same as the list in the expansion configuration and is not duplicated here.
2. The analogue output type is described in the table below.
3. The analogue output value for an output configured for voltage is in millivolts.
4. The analogue output value for an output configured for current is in microamps but should be displayed in milliamps.

Registers

Register offset	Name	Minimum value	Maximum value	Bits/ sign	Read/write
0	2152 expansion module 0 analogue output A source	0	65535	16	Read only
1	2152 expansion module 0 analogue output A type	0	1	16	Read only
2	2152 expansion module 0 analogue output B source	0	65535	16	Read only
3	2152 expansion module 0 analogue output B type	0	1	16	Read only
4	2152 expansion module 0 analogue output C source	0	65535	16	Read only
5	2152 expansion module 0 analogue output C type	0	1	16	Read only
6	2152 expansion module 0 analogue output D source	0	65535	16	Read only
7	2152 expansion module 0 analogue output D type	0	1	16	Read only
8	2152 expansion module 0 analogue output E source	0	65535	16	Read only
9	2152 expansion module 0 analogue output E type	0	1	16	Read only
10	2152 expansion module 0 analogue output F source	0	65535	16	Read only
11	2152 expansion module 0 analogue output F type	0	1	16	Read only
12-23	2152 expansion module 1 analogue outputs A-F				Read only
24-35	2152 expansion module 2 analogue outputs A-F				Read only
36-47	2152 expansion module 3 analogue outputs A-F				Read only
48	2152 expansion module 0 analogue output A value	See table below		16S	Read only
49	2152 expansion module 0 analogue output B value	See table below		16S	Read only
50	2152 expansion module 0 analogue output C value	See table below		16S	Read only
51	2152 expansion module 0 analogue output D value	See table below		16S	Read only
52	2152 expansion module 0 analogue output E value	See table below		16S	Read only
53	2152 expansion module 0 analogue output F value	See table below		16S	Read only
54-59	2152 expansion module 1 analogue outputs A-F value				Read only
60-65	2152 expansion module 2 analogue outputs A-F value				Read only
66-71	2152 expansion module 3 analogue outputs A-F value				Read only
72-255	Reserved				

Output types and value ranges

Type code	Type	Minimum value	Maximum value	Scaling factor	Units
0	Voltage	0	10000	0.001	V
1	Current	0	20000	0.001	mA
2-65535	Reserved				

10.74 Page 185 – Internal Analogue output sources, types and values

1. The PWM output control type indicates whether the PWM is used as a digital output (see pages 180 and 190) or as an analogue output.
2. The analogue output source list is the same as the list in the E800 configuration and is not duplicated here.

Page 185 Exxx Registers									
Register offset	Name	Minimum value	Maximum value	Scaling Factor	Units	Bits/ sign	Read/write	E800	E400
0	PWM 1 output control type	0,2,3,4 (See **Analogue Output Control Type Table** below)		1	-	16	Read only	✓	✓
1	PWM 1 analogue output frequency	0	2500	0.1	Hz	16	Read only	✓	✓
2	PWM 1 analogue output source	0	65535	1	-	16	Read only	✓	✓
3	PWM 1 analogue output range type	0,1 (See **Analogue Output Range Table** below)		1	-	16	Read only	✓	✓
4	PWM 2 output control type	0,2,3,4 (See **Analogue Output Control Type Table** below)		1	-	16	Read only	✓	✓
5	PWM 2 analogue output frequency	0	20000	0.1	Hz	16	Read only	✓	✓
6	PWM 2 analogue output source	0	65535	1	-	16	Read only	✓	✓
7	PWM 2 analogue output range type	0,1 (See **Analogue Output Range Table** below)		1	-	16	Read only	✓	✓
8	PWM 3 output control type	0,2,3,4 (See **Analogue Output Control Type Table** below)		1	-	16	Read only	✓	
9	PWM 3 analogue output frequency	0	20000	0.1	Hz	16	Read only	✓	
10	PWM 3 analogue output source	0	65535	1	-	16	Read only	✓	
11	PWM 3 analogue output range type	0,1 (See **Analogue Output Range Table** below)		1	-	16	Read only	✓	
12	PWM 4 output control type	0,2,3,4 (See **Analogue Output Control Type Table** below)		1	-	16	Read only	✓	
12	PWM 4 analogue output frequency	0	20000	0.1	Hz	16	Read only	✓	
13	PWM 4 analogue output source	0	65535	1	-	16	Read only	✓	
15	PWM 4 analogue output range type	0,1 (See **Analogue Output Range Table** below)		1	-	16	Read only	✓	
16-31	Reserved						Read only		
32	PWM 1 analogue output value	See **Analogue Output Table** below				16	Read only	✓	✓
33	PWM 2 analogue output value	See **Analogue Output Table** below				16	Read only	✓	✓
34	PWM 3 analogue output value	See **Analogue Output Table** below				16	Read only	✓	
35	PWM 4 analogue output value	See **Analogue Output Table** below				16	Read only	✓	
36-40	Reserved								
41	Analogue Output 1 control type	0,1,5 (See **Analogue Output Control Table** below)		1	-	16	Read only	✓	✓
42	Analogue Output 1Output Type/Range	2,3,4 (See **Analogue Output Table** below)		1	-	16	Read only	✓	✓
43	Analogue Output 1 Source	0	65535	1	-	16	Read only	✓	✓
44	Analogue Output 1Value	See **Analogue Output Table** below		1	-	16S	Read only	✓	✓
45-255	Reserved								

Analogue Output Control types	
Type code	**Type**
0	Not Used
1	Flexible Analogue
2	Digital output
3	PWM Analogue output
4	PWMi Analogue output
5	Governor
6-65535	Reserved

Analogue Output Ranges	
Range code	**Range**
0	0-2A Current
1	0-4A Current
2	-10-0 Volts
3	0-10 Volts
4	0-20mA
5-65535	Reserved

Analogue Output Table							
Type code	**Range Code**	**Type**	**Value**		**Scaling factor**	**Units**	**Notes**
			Min	**Max**			
2		Digital Output					PWM / PWMi
3	-	Duty Cycle Percentage	0	1000	0.1	%	PWM
4	0	0-2A Current	0	200	1	mA * 10	PWMi actual/feed back current
4	1	0-4A Current	0	400	1	mA * 10	PWMi actual/feed back current
5	2	-10 -0 Volts	-10000	0	0.001	V	Analogue Output - Gov
5	3	0-10 Volts	0	10000	0.001	V	Analogue Output - Gov
1	3	0-10V	0	10000	0.001	V	Analogue Output - Flex Output
1	4	0-20mA	0	2000	0.01	mA	Analogue Output - Flex Output
0		Not used	--				PWM / PWMi / Gov
6-65535		Reserved					

10.75 Page 190 – Unnamed output status

1. This page indicates the current status of each output from the module, both digital outputs and LEDs.
2. LED outputs are affected by lamp test.
3. LED and button allocations vary by model and are shown in the table below.
4. Each family has different allocations for registers 0-31 but common ones for the remainder of the page.
5. These registers are Read-Only
6. Unimplemented registers within a family/module are shaded.

P100 family register allocation 0-31

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0	Digital output A status	0	1	16
1	Digital output B status	0	1	16
2	Digital output C status	0	1	16
3	Digital output D status	0	1	16
4	Digital output E status	0	1	16
5	Common trip LED status	0	1	16
6	Common voltage alarm green LED status	0	1	16
7	Common voltage alarm red LED status	0	1	16
8	Common frequency alarm green LED status	0	1	16
9	Common frequency alarm red LED status	0	1	16
10	ROCOF alarm LED status	0	1	16
11	Vector shift alarm LED status	0	1	16
12	Alternate config selected LED status	0	1	16
13	Supervision enabled LED status	0	1	16
14-31	Reserved			

71xx/72xx/73xx/6xxx/L40x/4xxx family register allocation 0-31

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0	Digital output A status (Fuel)	0	1	16
1	Digital output B status (Crank)	0	1	16
2	Digital output E status	0	1	16
3	Digital output F status	0	1	16
4	Digital output G status	0	1	16
5	Digital output H status	0	1	16
6	Digital output D status (Gen)	0	1	16
7	Digital output C status (Mains)	0	1	16
8	STOP LED status(STOP)	0	1	16
9	MANUAL LED status (MANUAL)	0	1	16
10	TEST LED status (TEST)	0	1	16
11	AUTO LED status (AUTO)	0	1	16
12	MAINS LED status (MAINS)	0	1	16
13	MAINS BREAKER LED status (MAINS BREAKER)	0	1	16
14	GEN BREAKER LED status (GEN BREAKER)	0	1	16
15	GEN LED status (GEN)	0	1	16
16	USER LED 1 status (USER LED 1)	0	1	16
17	USER LED 2 status (USER LED 2)	0	1	16
18	USER LED 3 status (USER LED 3)	0	1	16
19	USER LED 4 status (USER LED 4)	0	1	16
20	Digital output I status	0	1	16
21	Digital output J status	0	1	16
20-31	Reserved			

332/333 register allocation 0-31

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0	Digital output A	0	1	16
1	Digital output B	0	1	16
2	Digital output C	0	1	16
3	Digital output D	0	1	16
4	Digital output E	0	1	16
5-15	Reserved for future outputs	0	1	16
16	Exercise LED	0	1	16
17	Manual LED	0	1	16
18	Prohibit Return LED	0	1	16
19	Auto LED	0	1	16
20	Generator breaker LED	0	1	16
21	Mains breaker LED	0	1	16
22	Generator available LED	0	1	16
23	Mains available LED	0	1	16
24	Warning LED	0	1	16
25	LCD Indicator 1 (USER LED 1)	0	1	16
26	LCD Indicator 2 (USER LED 2)	0	1	16
27	LCD Indicator 3 (USER LED 3)	0	1	16
28-31	Reserved			

330/331/334 register allocation 0-31

Register offset	Name	Minimum value	Maximum value	Bits/ sign	330	331	334
0	Digital output A	0	1	16	✓	✓	✓
1	Digital output B	0	1	16	✓	✓	✓
2	Digital output C	0	1	16	✓	✓	✓
3	Digital output D	0	1	16	✓	✓	✓
4	Digital output E	0	1	16	✓	✓	✓
5	Digital output F	0	1	16	✓	✓	
6	Digital output G	0	1	16		✓	
7	Digital output H	0	1	16		✓	
8-15	Unimplemented - Reserved for future outputs	0	1	16			
16	Stop LED	0	1	16			✓
17	Manual LED	0	1	16			✓
18	Mode LED	0	1	16			✓
19	Auto LED	0	1	16			✓
20	S2 breaker LED	0	1	16			✓
21	S1 breaker LED	0	1	16			✓
22	S2 available LED	0	1	16			✓
23	S1 available LED	0	1	16			✓
24	Warning LED	0	1	16	✓	✓	✓
25	USER / LCD Indicator 1 (USER LED 1)	0	1	16			✓
26	USER / LCD Indicator 2 (USER LED 2)	0	1	16			✓
27	USER / LCD Indicator 3 (USER LED 3)	0	1	16			✓
28-31	Reserved						

335 register allocation 0-31

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0	Digital output A status	0	1	16
1	Digital output B status	0	1	16
2	Digital output C status	0	1	16
3	Digital output D status	0	1	16
4	Digital output E status	0	1	16
5	Digital output F status	0	1	16
6	Digital output G status	0	1	16
7	Digital output H status	0	1	16
8	Digital output I status	0	1	16
9	Digital output J status	0	1	16
10	Digital output K status	0	1	16
11	Digital output L status	0	1	16
12-15	Unimplemented - Reserved for future outputs	0	1	16
16	Stop LED	0	1	16
17	Manual LED	0	1	16
18	Mode LED	0	1	16
19	Auto LED	0	1	16
20	S2 breaker LED	0	1	16
21	S1 breaker LED	0	1	16
22	S2 available LED	0	1	16
23	S1 available LED	0	1	16
24	USER LED 1	0	1	16
25	USER LED 2	0	1	16
26	USER LED 3	0	1	16
27	USER LED 4	0	1	16
28-31	Reserved			

6xxxfamily register allocation 0-31

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0	Digital output A status (Fuel)	0	1	16
1	Digital output B status (Crank)	0	1	16
2	Digital output C status	0	1	16
3	Digital output D status	0	1	16
4	Digital output E status	0	1	16
5	Digital output F status	0	1	16
6-7	Reserved			
8	STOP LED status(STOP)	0	1	16
9	MANUAL LED status (MANUAL)	0	1	16
10	TEST LED status (TEST)	0	1	16
11	AUTO LED status (AUTO)	0	1	16
12	MAINS LED status (MAINS)	0	1	16
13	MAINS BREAKER LED status (MAINS BREAKER)	0	1	16
14	GEN BREAKER LED status (GEN BREAKER)	0	1	16
15	GEN LED status (GEN)	0	1	16
16	USER LED 1 status (USER LED 1)	0	1	16
17	USER LED 2 status (USER LED 2)	0	1	16
18	USER LED 3 status (USER LED 3)	0	1	16
19	USER LED 4 status (USER LED 4)	0	1	16
20	Digital output I status	0	1	16
21	Digital output J status	0	1	16
20-31	Reserved			

8xxx / 74xx family register allocation 0-255

Register offset	Name	Minimum value	Maximum value	Bits/ sign
0	Digital output A status (Fuel)	0	1	16
1	Digital output B status (Crank)	0	1	16
2	Digital output E status	0	1	16
3	Digital output F status	0	1	16
4	Digital output G status	0	1	16
5	Digital output H status	0	1	16
6	Digital output I status	0	1	16
7	Digital output J status	0	1	16
8	Digital output K status	0	1	16
9	Digital output L status	0	1	16
10	Digital output M status	0	1	16
11	Digital output N status	0	1	16
12	Digital output D status (Gen)	0	1	16
13	Digital output C status (Mains)	0	1	16
14	STOP LED status(STOP)	0	1	16
15	MANUAL LED status (MANUAL)	0	1	16
16	TEST LED status (TEST)	0	1	16
17	AUTO LED status (AUTO)	0	1	16
18	MAINS LED status (MAINS)	0	1	16
19	MAINS BREAKER LED status (MAINS BREAKER)	0	1	16
20	GEN BREAKER LED status (GEN BREAKER)	0	1	16
21	GEN LED status (GEN)	0	1	16
22	USER LED 1 status (USER LED 1)	0	1	16
23	USER LED 2 status (USER LED 2)	0	1	16
24	USER LED 3 status (USER LED 3)	0	1	16
25	USER LED 4 status (USER LED 4)	0	1	16
26-31	Reserved			

Exxx register allocation 0-255						
Register offset	Name	Min value	Max value	Bits/ sign	E800	E400
0	Digital output A status	0	1	16	✓	✓
1	Digital output B status	0	1	16	✓	✓
2	Digital output C status	0	1	16	✓	✓
3	Digital output D status	0	1	16	✓	✓
4	Digital output E status	0	1	16	✓	
5	Digital output F status	0	1	16	✓	
6	Digital output G status	0	1	16	✓	
7	Digital output H status	0	1	16		
8	Digital output I status	0	1	16		
9	Digital output J status	0	1	16		
10	Digital output K status	0	1	16		
11	Digital output L status	0	1	16		
12	OFF LED status (OFF)	0	1	16	✓	
13	MANUAL LED status (MANUAL)	0	1	16	✓	✓
14	AUTO LED status (AUTO)	0	1	16	✓	✓
15	STOP LED status(STOP)	0	1	16	✓	✓
16	USER LED 1 status (USER LED 1)	0	1	16	✓	
17	USER LED 2 status (USER LED 2)	0	1	16	✓	
18	USER LED 3 status (USER LED 3)	0	1	16	✓	
19	USER LED 4 status (USER LED 4)	0	1	16	✓	
20	PWM 1 digital output status	0	1	16	✓	✓
21	PWM 2 digital output status	0	1	16	✓	✓
22	PWM 3 digital output status	0	1	16	✓	
23	PWM 4 digital output status	0	1	16	✓	
24-31	Reserved	0	1	16		

Common register allocation 32-255

Register offset	Name	Minimum value	Maximum value	Bits/ sign	8xxx/ 74xx	73xx	335	P100
32	2157 expansion module 0 output A	0	1	16	✓	✓	✓	
33	2157 expansion module 0 output B	0	1	16	✓	✓	✓	
34	2157 expansion module 0 output C	0	1	16	✓	✓	✓	
35	2157 expansion module 0 output D	0	1	16	✓	✓	✓	
36	2157 expansion module 0 output E	0	1	16	✓	✓	✓	
37	2157 expansion module 0 output F	0	1	16	✓	✓	✓	
38	2157 expansion module 0 output G	0	1	16	✓	✓	✓	
39	2157 expansion module 0 output H	0	1	16	✓	✓	✓	
40-47	2157 expansion module 1 outputs A-H				✓	✓	✓	
48-55	2157 expansion module 2 outputs A-H				✓	✓		
56-63	2157 expansion module 3 outputs A-H				✓	✓		
64-71	2157 expansion module 4 outputs A-H				✓	✓		
72-79	2157 expansion module 5 outputs A-H				✓	✓		
80-87	2157 expansion module 6 outputs A-H				✓	✓		
88-95	2157 expansion module 7 outputs A-H				✓	✓		
96-103	2157 expansion module 8 outputs A-H				✓	✓		
104-111	2157 expansion module 9 outputs A-H				✓	✓		
112	2548 expansion module 0 output A	0	1	16	✓	✓	✓	
113	2548 expansion module 0 output B	0	1	16	✓	✓	✓	
114	2548 expansion module 0 output C	0	1	16	✓	✓	✓	
115	2548 expansion module 0 output D	0	1	16	✓	✓	✓	
116	2548 expansion module 0 output E	0	1	16	✓	✓	✓	
117	2548 expansion module 0 output F	0	1	16	✓	✓	✓	
118	2548 expansion module 0 output G	0	1	16	✓	✓	✓	
119	2548 expansion module 0 output H	0	1	16	✓	✓	✓	
120	2548 expansion module 0 sounder output	0	1	16	✓	✓	✓	
121-129	2548 expansion module 1 outputs A-H & sounder				✓	✓	✓	
130-138	2548 expansion module 2 outputs A-H & sounder				✓	✓		
139-147	2548 expansion module 3 outputs A-H & sounder				✓	✓		
148-156	2548 expansion module 4 outputs A-H & sounder				✓	✓		
157-165	2548 expansion module 5 outputs A-H & sounder				✓	✓		
166-174	2548 expansion module 6 outputs A-H & sounder				✓	✓		
175-183	2548 expansion module 7 outputs A-H & sounder				✓	✓		
184-192	2548 expansion module 8 outputs A-H & sounder				✓	✓		
193-201	2548 expansion module 9 outputs A-H & sounder				✓	✓		
202-255	Reserved							

8xxx / 74xx LED allocation by model

Register	Model 8x10/7410	Model 8x60	Model 8680
14	Stop mode LED	Stop mode LED	0xFFFF
15	Manual mode LED	Manual mode LED	0xFFFF
16	0x0000	Test mode LED	Manual mode LED
17	Auto mode LED	Auto mode LED	Auto mode LED
18	0x0000	Mains available LED	Bus 1 live LED
19	Bus breaker LED	Mains breaker LED	Bus breaker LED
20	0x0000	Bus breaker LED	0xFFFF
21	Gen available LED	Bus available LED	Bus 2 live LED

10.76 Page 191 – Virtual output status

1. This page indicates the status of each virtual output.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
0	Virtual output 1 status	0	1			16	Read only
1	Virtual output 2 status	0	1			16	Read only
2	Virtual output 3 status	0	1			16	Read only
3	Virtual output 4 status	0	1			16	Read only
4	Virtual output 5 status	0	1			16	Read only
5	Virtual output 6 status	0	1			16	Read only
6	Virtual output 7 status	0	1			16	Read only
7	Virtual output 8 status	0	1			16	Read only
8	Virtual output 9 status	0	1			16	Read only
9	Virtual output 10 status	0	1			16	Read only
10	Virtual output 11 status	0	1			16	Read only
11	Virtual output 12 status	0	1			16	Read only
12	Virtual output 13 status	0	1			16	Read only
13	Virtual output 14 status	0	1			16	Read only
14	Virtual output 15 status	0	1			16	Read only
15	Virtual output 16 status	0	1			16	Read only
16	Virtual output 17 status	0	1			16	Read only
17	Virtual output 18 status	0	1			16	Read only
18	Virtual output 19 status	0	1			16	Read only
19	Virtual output 20 status	0	1			16	Read only
20-255	Reserved						

10.77 Page 192 – PLC Maths Registers

1. This page return the value of plc elements.
2. This page is not used on the 73xx MKII, 74xx MKII and 86xx MKII. It has been replaced by the following…
    a. PLC Data Stores – now page 70.
    b. PLC Data Registers – now page 72.
    c. PLC Timers – now page 74.
    d. PLC Counters – now page 76.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
0	configurable output 1 item A status	0	1			16	Read only
1	configurable output 1 item B status	0	1			16	Read only
2	configurable output 1 item C status	0	1			16	Read only
3	configurable output 2 item A status	0	1			16	Read only
4	configurable output 2 item B status	0	1			16	Read only
5	configurable output 2 item C status	0	1			16	Read only
6	configurable output 3 item A status	0	1			16	Read only
7	configurable output 3 item B status	0	1			16	Read only
8	configurable output 3 item C status	0	1			16	Read only
9-15	Reserved						
16-17	PLC Data store 1	-2147483648	2147483647			32 S	Read/write
18-19	PLC Data store 2	-2147483648	2147483647			32 S	Read/write
20-21	PLC Data store 3	-2147483648	2147483647			32 S	Read/write
22-23	PLC Data store 4	-2147483648	2147483647			32 S	Read/write
24-25	PLC Data store 5	-2147483648	2147483647			32 S	Read/write
26-27	PLC Data store 6	-2147483648	2147483647			32 S	Read/write
28-29	PLC Data store 7	-2147483648	2147483647			32 S	Read/write
30-31	PLC Data store 8	-2147483648	2147483647			32 S	Read/write
32-63	Unimplemented					32 S	Read Only
64-65	PLC Data Register 1	-2147483648	2147483647			32 S	Read Only
66-67	PLC Data Register 2	-2147483648	2147483647			32 S	Read Only
68-69	PLC Data Register 3	-2147483648	2147483647			32 S	Read Only
70-71	PLC Data Register 4	-2147483648	2147483647			32 S	Read Only
72-73	PLC Data Register 5	-2147483648	2147483647			32 S	Read Only
74-75	PLC Data Register 6	-2147483648	2147483647			32 S	Read Only
76-77	PLC Data Register 7	-2147483648	2147483647			32 S	Read Only
78-79	PLC Data Register 8	-2147483648	2147483647			32 S	Read Only
80-81	PLC Data Register 9	-2147483648	2147483647			32 S	Read Only
82-83	PLC Data Register 10	-2147483648	2147483647			32 S	Read Only
84-85	PLC Data Register 11	-2147483648	2147483647			32 S	Read Only
86-87	PLC Data Register 12	-2147483648	2147483647			32 S	Read Only
88-89	PLC Data Register 13	-2147483648	2147483647			32 S	Read Only
90-91	PLC Data Register 14	-2147483648	2147483647			32 S	Read Only
92-93	PLC Data Register 15	-2147483648	2147483647			32 S	Read Only
94-95	PLC Data Register 16	-2147483648	2147483647			32 S	Read Only
96-97	PLC Data Register 17	-2147483648	2147483647			32 S	Read Only
98-99	PLC Data Register 18	-2147483648	2147483647			32 S	Read Only
100-101	PLC Data Register 19	-2147483648	2147483647			32 S	Read Only
102-103	PLC Data Register 20	-2147483648	2147483647			32 S	Read Only
104-128	Unimplemented					32 S	Read Only
128-129	PLC Timer value 1	0	864000	0.1	s	32 S	Read Only
130-131	PLC Timer value 2	0	864000	0.1	s	32 S	Read Only
132-133	PLC Timer value 3	0	864000	0.1	s	32 S	Read Only
134-135	PLC Timer value 4	0	864000	0.1	s	32 S	Read Only
136-137	PLC Timer value 5	0	864000	0.1	s	32 S	Read Only
138-139	PLC Timer value 6	0	864000	0.1	s	32 S	Read Only
140-141	PLC Timer value 7	0	864000	0.1	s	32 S	Read Only
142-143	PLC Timer value 8	0	864000	0.1	s	32 S	Read Only
144-145	PLC Timer value 9	0	864000	0.1	s	32 S	Read Only
146-147	PLC Timer value 10	0	864000	0.1	s	32 S	Read Only

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
148-149	PLC Timer value 11	0	864000	0.1	s	32 S	Read Only
150-151	PLC Timer value 12	0	864000	0.1	s	32 S	Read Only
152-153	PLC Timer value 13	0	864000	0.1	s	32 S	Read Only
154-155	PLC Timer value 14	0	864000	0.1	s	32 S	Read Only
156-157	PLC Timer value 15	0	864000	0.1	s	32 S	Read Only
158-159	PLC Timer value 16	0	864000	0.1	s	32 S	Read Only
160-161	PLC Timer value 17	0	864000	0.1	s	32 S	Read Only
162-163	PLC Timer value 18	0	864000	0.1	s	32 S	Read Only
164-165	PLC Timer value 19	0	864000	0.1	s	32 S	Read Only
166-167	PLC Timer value 20	0	864000	0.1	s	32 S	Read Only
169-191	Unimplemented					32 S	Read Only
192-193	PLC Counter value 1	0	999 999			32 S	Read Only
194-195	PLC Counter value 2	0	999 999			32 S	Read Only
196-197	PLC Counter value 3	0	999 999			32 S	Read Only
198-199	PLC Counter value 4	0	999 999			32 S	Read Only
200-201	PLC Counter value 5	0	999 999			32 S	Read Only
202-203	PLC Counter value 6	0	999 999			32 S	Read Only
204-205	PLC Counter value 7	0	999 999			32 S	Read Only
206-207	PLC Counter value 8	0	999 999			32 S	Read Only
208-209	PLC Counter value 9	0	999 999			32 S	Read Only
210-211	PLC Counter value 10	0	999 999			32 S	Read Only
212-213	PLC Counter value 11	0	999 999			32 S	Read Only
214-215	PLC Counter value 12	0	999 999			32 S	Read Only
216-217	PLC Counter value 13	0	999 999			32 S	Read Only
218-219	PLC Counter value 14	0	999 999			32 S	Read Only
220-221	PLC Counter value 15	0	999 999			32 S	Read Only
222-223	PLC Counter value 16	0	999 999			32 S	Read Only
224-225	PLC Counter value 17	0	999 999			32 S	Read Only
226-227	PLC Counter value 18	0	999 999			32 S	Read Only
228-229	PLC Counter value 19	0	999 999			32 S	Read Only
230-231	PLC Counter value 20	0	999 999			32 S	Read Only
232-255	Unimplemented					32 S	Read Only

10.78 Page 193 – Remote control sources

1. This page allows remote control flags to read or written, these can be used to drive outputs, LED's or the elements of the control logic.
2. The P100 only supports remote control sources 1-5. Sources 1-4 are read write but 5 is read only and can only be controlled by writing control keys.

Registers

Register offset	Name	Minimum value	Maximum value	Scaling factor	Units	Bits/ sign	Read/write
0	Remote control source 1	0	1			16	Read/write
1	Remote control source 2	0	1			16	Read/write
2	Remote control source 3	0	1			16	Read/write
3	Remote control source 4	0	1			16	Read/write
4	Remote control source 5	0	1			16	Read/write
5	Remote control source 6	0	1			16	Read/write
6	Remote control source 7	0	1			16	Read/write
7	Remote control source 8	0	1			16	Read/write
8	Remote control source 9	0	1			16	Read/write
9	Remote control source 10	0	1			16	Read/write
10-255	Reserved						

10.79 Page 194 – Configurable CAN Receive Instruments Description (cont from p176)

(86MKII)

Registers

Register offset	Name	Minimum value	Maximum value	Bits	Read/write
0	CAN Instrument 17 Title String	UNICODE	UNICODE	512	Read only
32	CAN Instrument 18 Title String	UNICODE	UNICODE	512	Read only
64	CAN Instrument 19 Title String	UNICODE	UNICODE	512	Read only
96	CAN Instrument 20 Title String	UNICODE	UNICODE	512	Read only
128	CAN Instrument 21 Title String	UNICODE	UNICODE	512	Read only
160	CAN Instrument 22 Title String	UNICODE	UNICODE	512	Read only
192	CAN Instrument 23 Title String	UNICODE	UNICODE	512	Read only
224	CAN Instrument 24 Title String	UNICODE	UNICODE	512	Read only

10.80 Page 195 – Configurable CAN Receive Instruments Description (cont from p176)

(86MKII)

Registers

Register offset	Name	Minimum value	Maximum value	Bits	Read/write
0	CAN Instrument 25 Title String	UNICODE	UNICODE	512	Read only
32	CAN Instrument 26 Title String	UNICODE	UNICODE	512	Read only
64	CAN Instrument 27 Title String	UNICODE	UNICODE	512	Read only
96	CAN Instrument 28 Title String	UNICODE	UNICODE	512	Read only
128	CAN Instrument 29 Title String	UNICODE	UNICODE	512	Read only
160	CAN Instrument 30 Title String	UNICODE	UNICODE	512	Read only
192	CAN Instrument 31 Title String	UNICODE	UNICODE	512	Read only
224	CAN Instrument 32 Title String	UNICODE	UNICODE	512	Read only

10.81 Pages 200-239 – Unnamed alarm strings

1. This is implemented for 86xx/87xx modules to provide the various unnamed alarm strings (including internal and external digital and analogue inputs).
2. They are used in place of pages 64-95 in the old alarm system, the inactive strings are not implemented to reduce the register count required to support the large number of expansion inputs.
3. The order of the strings is the same as for the input functions and input status pages to simplify the look-up process for the PC software.
4. Reading from the reserved pages will return spaces.
5. The register allocation is different for each family.
6. In the 86xx/74xx there are 17 pages of strings reserved for the expansion alarms.

61xx MkII family register allocation

Page	Register offset	Name	Minimum value	Maximum value	Bits
200	0	Digital input A active string	UNICODE	UNICODE	512
	32	Digital input B active string	UNICODE	UNICODE	512
	64	Digital input C active string	UNICODE	UNICODE	512
	96	Digital input D active string	UNICODE	UNICODE	512
	128	Digital input E active string	UNICODE	UNICODE	512
	160	Digital input F active string	UNICODE	UNICODE	512
	192	Flexible Sensor A Digital input active string	UNICODE	UNICODE	512
	224	Flexible Sensor B Digital input active string	UNICODE	UNICODE	512
201	0	Flexible Sensor C Digital input active string	UNICODE	UNICODE	512
	32	Flexible Sensor D Digital input active string	UNICODE	UNICODE	512
	64	Reserved (for digital input K-P strings)			
202	0	2130 expansion module 0 digital input A string	UNICODE	UNICODE	512
	32	2130 expansion module 0 digital input B string	UNICODE	UNICODE	512
	64	2130 expansion module 0 digital input C string	UNICODE	UNICODE	512
	96	2130 expansion module 0 digital input D string	UNICODE	UNICODE	512
	128	2130 expansion module 0 digital input E string	UNICODE	UNICODE	512
	160	2130 expansion module 0 digital input F string	UNICODE	UNICODE	512
	192	2130 expansion module 0 digital input G string	UNICODE	UNICODE	512
	224	2130 expansion module 0 digital input H string	UNICODE	UNICODE	512
203	0-255	2130 expansion module 1 digital input A-H string	UNICODE	UNICODE	512
204-211	0-255	Reserved for 2130 expansion module 4-9 digital input A-H string	UNICODE	UNICODE	512
212	0	2130 Expansion module 0 input E (low) string	UNICODE	UNICODE	512
	32	2130 Expansion module 0 input E (high) string	UNICODE	UNICODE	512
	64	2130 Expansion module 0 input F (low) string	UNICODE	UNICODE	512
	96	2130 Expansion module 0 input F (high) string	UNICODE	UNICODE	512
	128	2130 Expansion module 0 input G (low) string	UNICODE	UNICODE	512
	160	2130 Expansion module 0 input G (high) string	UNICODE	UNICODE	512
	192	2130 Expansion module 0 input H (low) string	UNICODE	UNICODE	512
	224	2130 Expansion module 0 input H (high) string	UNICODE	UNICODE	512
213		2130 Expansion module 1 inputs E-H strings	UNICODE	UNICODE	512
214-221		Reserved for 2130 Expansion modules 4-9 inputs E-H strings	UNICODE	UNICODE	512
222	0	Flexible sender input A (low) string	UNICODE	UNICODE	512
	32	Flexible sender input A (high) string	UNICODE	UNICODE	512
	64	Flexible sender input B (low) string	UNICODE	UNICODE	512
	96	Flexible sender input B (high) string	UNICODE	UNICODE	512
	128	Flexible sender input C (low) string	UNICODE	UNICODE	512
	160	Flexible sender input C (high) string	UNICODE	UNICODE	512
	192	Flexible sender input D (low) string	UNICODE	UNICODE	512
	224	Flexible sender input D (high) string	UNICODE	UNICODE	512
223	0	Maintenance alarm 1 string	UNICODE	UNICODE	512
	32	Maintenance alarm 2 string	UNICODE	UNICODE	512
	64	Maintenance alarm 3 string	UNICODE	UNICODE	512
	96	Low Load	UNICODE	UNICODE	512
	128	Reserved	UNICODE	UNICODE	512

Page	Register offset	Name	Minimum value	Maximum value	Bits
	160	Reserved	UNICODE	UNICODE	512
	192	Reserved	UNICODE	UNICODE	512
	224	Reserved	UNICODE	UNICODE	512
224	0	Reserved	UNICODE	UNICODE	512
	32	Reserved	UNICODE	UNICODE	512
	64	Reserved	UNICODE	UNICODE	512
	96	Reserved	UNICODE	UNICODE	512
	128	Reserved	UNICODE	UNICODE	512
	160	Reserved	UNICODE	UNICODE	512
	192	Reserved	UNICODE	UNICODE	512
	224	Reserved	UNICODE	UNICODE	512
225	0	Reserved	UNICODE	UNICODE	512
	32	Reserved	UNICODE	UNICODE	512
	64	Reserved	UNICODE	UNICODE	512
	96	Reserved	UNICODE	UNICODE	512
	128	Reserved	UNICODE	UNICODE	512
	160	Reserved	UNICODE	UNICODE	512
	192	Reserved	UNICODE	UNICODE	512
	224	Reserved	UNICODE	UNICODE	512
226-239		Reserved			

72xx/73xx/74xx MKII/61xx MKIII/63xx/6420 family register allocation

Page	Register offset	Name	Minimum value	Maximum value	Bits
200	0	Digital input A active string	UNICODE	UNICODE	512
	32	Digital input B active string	UNICODE	UNICODE	512
	64	Digital input C active string	UNICODE	UNICODE	512
	96	Digital input D active string	UNICODE	UNICODE	512
	128	Digital input E active string	UNICODE	UNICODE	512
	160	Digital input F active string	UNICODE	UNICODE	512
	192	Digital input G active string	UNICODE	UNICODE	512
	224	Digital input H active string	UNICODE	UNICODE	512
201	0	Digital input (Flex Sensor A) active string	UNICODE	UNICODE	512
	32	Digital input (Flex Sensor B) active string	UNICODE	UNICODE	512
	64	Digital input (Flex Sensor C) active string	UNICODE	UNICODE	512
	96	Digital input (Flex Sensor D) active string	UNICODE	UNICODE	512
	128	Digital input (Flex Sensor E) active string	UNICODE	UNICODE	512
	160	Digital input (Flex Sensor F) active string	UNICODE	UNICODE	512
	192	Digital input (Flex Sensor G) active string	UNICODE	UNICODE	512
	224	Digital input (Flex Sensor H) active string	UNICODE	UNICODE	512
202	0	2130 expansion module 0 digital input A string	UNICODE	UNICODE	512
	32	2130 expansion module 0 digital input B string	UNICODE	UNICODE	512
	64	2130 expansion module 0 digital input C string	UNICODE	UNICODE	512
	96	2130 expansion module 0 digital input D string	UNICODE	UNICODE	512
	128	2130 expansion module 0 digital input E string	UNICODE	UNICODE	512
	160	2130 expansion module 0 digital input F string	UNICODE	UNICODE	512
	192	2130 expansion module 0 digital input G string	UNICODE	UNICODE	512
	224	2130 expansion module 0 digital input H string	UNICODE	UNICODE	512
203	0-255	2130 expansion module 1 digital input A-H string	UNICODE	UNICODE	512
204	0-255	2130 expansion module 2 digital input A-H string	UNICODE	UNICODE	512
205	0-255	2130 expansion module 3 digital input A-H string	UNICODE	UNICODE	512
206-211	0-255	Reserved for 2130 expansion module 4-9 digital input A-H string	UNICODE	UNICODE	512
212	0	2130 Expansion module 0 input E (low) string	UNICODE	UNICODE	512
	32	2130 Expansion module 0 input E (high) string	UNICODE	UNICODE	512
	64	2130 Expansion module 0 input F (low) string	UNICODE	UNICODE	512
	96	2130 Expansion module 0 input F (high) string	UNICODE	UNICODE	512
	128	2130 Expansion module 0 input G (low) string	UNICODE	UNICODE	512
	160	2130 Expansion module 0 input G (high) string	UNICODE	UNICODE	512
	192	2130 Expansion module 0 input H (low) string	UNICODE	UNICODE	512
	224	2130 Expansion module 0 input H (high) string	UNICODE	UNICODE	512
213		2130 Expansion module 1 inputs E-H strings	UNICODE	UNICODE	512
214		2130 Expansion module 2 inputs E-H strings	UNICODE	UNICODE	512
215		2130 Expansion module 3 inputs E-H strings	UNICODE	UNICODE	512
216-221		Reserved for 2130 Expansion modules 4-9 inputs E-H strings	UNICODE	UNICODE	512
222	0	Internal flexible sender A input (low) string	UNICODE	UNICODE	512
	32	Internal flexible sender A input (high) string	UNICODE	UNICODE	512
	64	Maintenance alarm 1 string	UNICODE	UNICODE	512
	96	Maintenance alarm 2 string	UNICODE	UNICODE	512
	128	Maintenance alarm 3 string	UNICODE	UNICODE	512
	160	PLC function 1 string	UNICODE	UNICODE	512
	192	PLC function 2 string	UNICODE	UNICODE	512
	224	PLC function 3 string	UNICODE	UNICODE	512
223	0	PLC function 4 string	UNICODE	UNICODE	512
	32	PLC function 5 string	UNICODE	UNICODE	512
	64	PLC function 6 string	UNICODE	UNICODE	512
	96	PLC function 7 string	UNICODE	UNICODE	512
	128	PLC function 8 string	UNICODE	UNICODE	512
	160	PLC function 9 string	UNICODE	UNICODE	512
	192	PLC function 10 string	UNICODE	UNICODE	512
	224	PLC function 11 string	UNICODE	UNICODE	512

Page	Register offset	Name	Minimum value	Maximum value	Bits
224	0	PLC function 12 string	UNICODE	UNICODE	512
	32	PLC function 13 string	UNICODE	UNICODE	512
	64	PLC function 14 string	UNICODE	UNICODE	512
	96	PLC function 15 string	UNICODE	UNICODE	512
	128	PLC function 16 string	UNICODE	UNICODE	512
	160	PLC function 17 string	UNICODE	UNICODE	512
	192	PLC function 18 string	UNICODE	UNICODE	512
	224	PLC function 19 string	UNICODE	UNICODE	512
225	0	PLC function 20 string	UNICODE	UNICODE	512
	32	Internal flexible sender A open circuit string	UNICODE	UNICODE	512
	64	Internal flexible sender B input (low) string	UNICODE	UNICODE	512
	96	Internal flexible sender B input (high) string	UNICODE	UNICODE	512
	128	Internal flexible sender B open circuit string	UNICODE	UNICODE	512
	160	Internal flexible sender C input (low) string	UNICODE	UNICODE	512
	192	Internal flexible sender C input (high) string	UNICODE	UNICODE	512
	224	Internal flexible sender C open circuit string	UNICODE	UNICODE	512
226	0	Internal flexible sender D input (low) string	UNICODE	UNICODE	512
	32	Internal flexible sender D input (high) string	UNICODE	UNICODE	512
	64	Internal flexible sender D open circuit string	UNICODE	UNICODE	512
	96	Internal flexible sender E input (low) string	UNICODE	UNICODE	512
	128	Internal flexible sender E input (high) string	UNICODE	UNICODE	512
	160	Internal flexible sender E open circuit string	UNICODE	UNICODE	512
	192	Internal flexible sender F input (low) string	UNICODE	UNICODE	512
	224	Internal flexible sender F input (high) string	UNICODE	UNICODE	512
227	0	Internal flexible sender F open circuit string	UNICODE	UNICODE	512
	32	Low kW load string	UNICODE	UNICODE	512
	64	ECU Software ID Error (6310-A2 only)	UNICODE	UNICODE	512
	96	Reserved	UNICODE	UNICODE	512
	128	Reserved	UNICODE	UNICODE	512
	160	Reserved	UNICODE	UNICODE	512
	192	Reserved	UNICODE	UNICODE	512
	224	Reserved	UNICODE	UNICODE	512
228	0	DSENet charger 0 common shutdown	UNICODE	UNICODE	512
	32	DSENet charger 0 common warning	UNICODE	UNICODE	512
	64	DSENet charger 1 common shutdown	UNICODE	UNICODE	512
	96	DSENet charger 1 common warning	UNICODE	UNICODE	512
	128	DSENet charger 2 common shutdown	UNICODE	UNICODE	512
	160	DSENet charger 2 common warning	UNICODE	UNICODE	512
	192	DSENet charger 3 common shutdown	UNICODE	UNICODE	512
	224	DSENet charger 3 common warning	UNICODE	UNICODE	512
229-239		Reserved			

8xxx / 74xx family register allocation

Page	Register offset	Name	Minimum value	Maximum value	Bits
200	0	Digital input A active string	UNICODE	UNICODE	512
	32	Digital input B active string	UNICODE	UNICODE	512
	64	Digital input C active string	UNICODE	UNICODE	512
	96	Digital input D active string	UNICODE	UNICODE	512
	128	Digital input E active string	UNICODE	UNICODE	512
	160	Digital input F active string	UNICODE	UNICODE	512
	192	Digital input G active string	UNICODE	UNICODE	512
	224	Digital input H active string	UNICODE	UNICODE	512
201	0	Digital input I active string	UNICODE	UNICODE	512
	32	Digital input J active string	UNICODE	UNICODE	512
	64	Digital input K active string	UNICODE	UNICODE	512
	96	Digital input L active string	UNICODE	UNICODE	512
	128	Digital input M active string	UNICODE	UNICODE	512
	160	Digital input N active string	UNICODE	UNICODE	512
	192	Digital input O active string	UNICODE	UNICODE	512
	224	Digital input P active string	UNICODE	UNICODE	512
202	0	Digital input Q active string	UNICODE	UNICODE	512
	32	Digital input R active string	UNICODE	UNICODE	512
	64	Digital input S active string	UNICODE	UNICODE	512
	96	Digital input T active string	UNICODE	UNICODE	512
	128	Digital input U active string	UNICODE	UNICODE	512
	160	Digital input V active string	UNICODE	UNICODE	512
	192	Digital input W active string	UNICODE	UNICODE	512
	224	Digital input X active string	UNICODE	UNICODE	512
203	0	Digital input Y active string	UNICODE	UNICODE	512
	32	Digital input Z active string	UNICODE	UNICODE	512
	64	Digital input AA active string	UNICODE	UNICODE	512
	96	Digital input AB active string	UNICODE	UNICODE	512
	128	Digital input AC active string	UNICODE	UNICODE	512
	160	Digital input AD active string	UNICODE	UNICODE	512
	192	Digital input AE active string	UNICODE	UNICODE	512
	224	Digital input AF active string	UNICODE	UNICODE	512
204	0	2130 expansion module 0 digital input A string	UNICODE	UNICODE	512
	32	2130 expansion module 0 digital input B string	UNICODE	UNICODE	512
	64	2130 expansion module 0 digital input C string	UNICODE	UNICODE	512
	96	2130 expansion module 0 digital input D string	UNICODE	UNICODE	512
	128	2130 expansion module 0 digital input E string	UNICODE	UNICODE	512
	160	2130 expansion module 0 digital input F string	UNICODE	UNICODE	512
	192	2130 expansion module 0 digital input G string	UNICODE	UNICODE	512
	224	2130 expansion module 0 digital input H string	UNICODE	UNICODE	512
205	0-255	2130 expansion module 1 digital input A-H string	UNICODE	UNICODE	512
206	0-255	2130 expansion module 2 digital input A-H string	UNICODE	UNICODE	512
207	0-255	2130 expansion module 3 digital input A-H string	UNICODE	UNICODE	512
208-213	0-255	Reserved for 2130 expansion module 4-9 digital input A-H string	UNICODE	UNICODE	512
214	0	2130 Expansion module 0 input E (low) string	UNICODE	UNICODE	512
	32	2130 Expansion module 0 input E (high) string	UNICODE	UNICODE	512
	64	2130 Expansion module 0 input F (low) string	UNICODE	UNICODE	512
	96	2130 Expansion module 0 input F (high) string	UNICODE	UNICODE	512
	128	2130 Expansion module 0 input G (low) string	UNICODE	UNICODE	512
	160	2130 Expansion module 0 input G (high) string	UNICODE	UNICODE	512
	192	2130 Expansion module 0 input H (low) string	UNICODE	UNICODE	512
	224	2130 Expansion module 0 input H (high) string	UNICODE	UNICODE	512
215		2130 Expansion module 1 inputs E-H strings	UNICODE	UNICODE	512
216		2130 Expansion module 2 inputs E-H strings	UNICODE	UNICODE	512
217		2130 Expansion module 3 inputs E-H strings	UNICODE	UNICODE	512
218-223		Reserved for 2130 Expansion modules 4-9 inputs E-H strings			

Page	Register offset	Name	Minimum value	Maximum value	Bits
224	0	Internal flexible sender 1 input (low) string	UNICODE	UNICODE	512
	32	Internal flexible sender 1 input (high) string	UNICODE	UNICODE	512
	64	Internal flexible sender 2 input (low) string	UNICODE	UNICODE	512
	96	Internal flexible sender 2 input (high) string	UNICODE	UNICODE	512
	128	Internal flexible sender 3 input (low) string	UNICODE	UNICODE	512
	160	Internal flexible sender 3 input (high) string	UNICODE	UNICODE	512
	192	Internal flexible sender 4 input (low) string	UNICODE	UNICODE	512
	224	Internal flexible sender 4 input (high) string	UNICODE	UNICODE	512
225	0	Internal flexible sender 5 input (low) string	UNICODE	UNICODE	512
	32	Internal flexible sender 5 input (high) string	UNICODE	UNICODE	512
	64	Engine Maintenance alarm 1 string	UNICODE	UNICODE	512
	96	Engine Maintenance alarm 2 string	UNICODE	UNICODE	512
	128	Engine Maintenance alarm 3 string	UNICODE	UNICODE	512
	160	PLC function1 string	UNICODE	UNICODE	512
	192	PLC function 2 string	UNICODE	UNICODE	512
	224	PLC function 3 string	UNICODE	UNICODE	512
226	0	PLC function 4 string	UNICODE	UNICODE	512
	32	PLC function 5 string	UNICODE	UNICODE	512
	64	PLC function 6 string	UNICODE	UNICODE	512
	96	PLC function 7 string	UNICODE	UNICODE	512
	128	PLC function 8 string	UNICODE	UNICODE	512
	160	PLC function 9 string	UNICODE	UNICODE	512
	192	PLC function 10 string	UNICODE	UNICODE	512
	224	PLC function 11 string	UNICODE	UNICODE	512
227	0	PLC function 12 string	UNICODE	UNICODE	512
	32	PLC function 13 string	UNICODE	UNICODE	512
	64	PLC function 14 string	UNICODE	UNICODE	512
	96	PLC function 15 string	UNICODE	UNICODE	512
	128	PLC function 16 string	UNICODE	UNICODE	512
	160	PLC function 17 string	UNICODE	UNICODE	512
	192	PLC function 18 string	UNICODE	UNICODE	512
	224	PLC function 19 string	UNICODE	UNICODE	512
228	0	PLC function 20 string	UNICODE	UNICODE	512
	32	Low load string	UNICODE	UNICODE	512
	64	Generator Under loaded string	UNICODE	UNICODE	512
	96	Reserved	UNICODE	UNICODE	512
	128	Reserved	UNICODE	UNICODE	512
	160	Reserved	UNICODE	UNICODE	512
	192	Reserved	UNICODE	UNICODE	512
	224	Reserved	UNICODE	UNICODE	512
229-231		Reserved for future PLC function strings	UNICODE	UNICODE	512
232	0	Plant Battery Maintenance alarm 1 string (7450)	UNICODE	UNICODE	512
	32	Plant Battery Maintenance alarm 2 string (7450)	UNICODE	UNICODE	512
	64	Plant Battery Maintenance alarm 3 string (7450)	UNICODE	UNICODE	512
	96	Reserved	UNICODE	UNICODE	512
	128	Reserved	UNICODE	UNICODE	512
	160	Reserved	UNICODE	UNICODE	512
	192	Reserved	UNICODE	UNICODE	512
	224	Reserved	UNICODE	UNICODE	512
233-239		Reserved			

332/333 register allocation

Page	Register offset	Name	Minimum value	Maximum value	Bits
200	0	Digital input A active string	UNICODE	UNICODE	512
	32	Digital input B active string	UNICODE	UNICODE	512
	64	Digital input C active string	UNICODE	UNICODE	512
	96	Digital input D active string	UNICODE	UNICODE	512
	128	Digital input E active string	UNICODE	UNICODE	512
	160	Digital input F active string	UNICODE	UNICODE	512
	192	Digital input G active string	UNICODE	UNICODE	512
	224	Digital input H active string	UNICODE	UNICODE	512
201	0	Digital input I active string	UNICODE	UNICODE	512
	32	Digital input J active string	UNICODE	UNICODE	512
	64	Digital input K active string			
	96-255	Reserved for future outputs			
202	0	Module description 1	UNICODE	UNICODE	512
	32	Module description 2	UNICODE	UNICODE	512
	64	Site ID	UNICODE	UNICODE	512
	96	Generator ID	UNICODE	UNICODE	512
	128-255	Reserved for future use			
203	0	LCD indicator 1	UNICODE	UNICODE	512
	32	LCD indicator 2	UNICODE	UNICODE	512
	64	LCD indicator 3	UNICODE	UNICODE	512
	96-255	Reserved			
204-231	0	Reserved			

330/331 register allocation

Page	Register offset	Name	Minimum value	Maximum value	Bits
200		Reserved			
201		Reserved			
202	0	Module description 1	UNICODE	UNICODE	512
	32	Module description 2	UNICODE	UNICODE	512
	64-255	Reserved for future use			
203		Reserved			
204-231		Reserved			

334 register allocation

Page	Register offset	Name	Minimum value	Maximum value	Bits
200	0	Digital input A active string	UNICODE	UNICODE	512
	32	Digital input B active string	UNICODE	UNICODE	512
	64	Digital input C active string	UNICODE	UNICODE	512
	96	Digital input D active string	UNICODE	UNICODE	512
	128	Digital input E active string	UNICODE	UNICODE	512
	160	Digital input F active string	UNICODE	UNICODE	512
	192	Digital input G active string	UNICODE	UNICODE	512
	224	Digital input H active string	UNICODE	UNICODE	512
201	0	Digital input I active string	UNICODE	UNICODE	512
	32	Digital input J active string	UNICODE	UNICODE	512
	64	Digital input K active string	UNICODE	UNICODE	512
	96-255	Reserved for future outputs			
202	0	Module description 1	UNICODE	UNICODE	512
	32	Module description 2	UNICODE	UNICODE	512
	64	Site ID (note 1)	UNICODE	UNICODE	512
	96	S2 ID (note 1)	UNICODE	UNICODE	512
	128-255	Reserved for future use			
203	0	LCD indicator / Insert 1	UNICODE	UNICODE	512
	32	LCD indicator / Insert 2	UNICODE	UNICODE	512
	64	LCD indicator / Insert 3	UNICODE	UNICODE	512
	96-255	Reserved			
204-231		Reserved			

335 register allocation

Page	Register offset	Name	Minimum value	Maximum value	Bits
200	0	Digital input A active string	UNICODE	UNICODE	512
	32	Digital input B active string	UNICODE	UNICODE	512
	64	Digital input C active string	UNICODE	UNICODE	512
	96	Digital input D active string	UNICODE	UNICODE	512
	128	Digital input E active string	UNICODE	UNICODE	512
	160	Digital input F active string	UNICODE	UNICODE	512
	192	Digital input G active string	UNICODE	UNICODE	512
	224	Digital input H active string	UNICODE	UNICODE	512
201	0	Digital input I active string	UNICODE	UNICODE	512
	32	Digital input J active string	UNICODE	UNICODE	512
	64	Digital input K active string	UNICODE	UNICODE	512
	96	Digital input L active string	UNICODE	UNICODE	512
	128-255	Reserved for future outputs			
202	0	2130 expansion module 0 digital input A string	UNICODE	UNICODE	512
	32	2130 expansion module 0 digital input B string	UNICODE	UNICODE	512
	64	2130 expansion module 0 digital input C string	UNICODE	UNICODE	512
	96	2130 expansion module 0 digital input D string	UNICODE	UNICODE	512
	128	2130 expansion module 0 digital input E string	UNICODE	UNICODE	512
	160	2130 expansion module 0 digital input F string	UNICODE	UNICODE	512
	192	2130 expansion module 0 digital input G string	UNICODE	UNICODE	512
	224	2130 expansion module 0 digital input H string	UNICODE	UNICODE	512
203	0-255	2130 expansion module 1 digital input A-H string	UNICODE	UNICODE	512
204-211	0-255	Reserved for 2130 expansion module 2-9 digital input A-H string	UNICODE	UNICODE	512
212	0	2130 Expansion module 0 input E (low) string	UNICODE	UNICODE	512
	32	2130 Expansion module 0 input E (high) string	UNICODE	UNICODE	512
	64	2130 Expansion module 0 input F (low) string	UNICODE	UNICODE	512
	96	2130 Expansion module 0 input F (high) string	UNICODE	UNICODE	512
	128	2130 Expansion module 0 input G (low) string	UNICODE	UNICODE	512
	160	2130 Expansion module 0 input G (high) string	UNICODE	UNICODE	512
	192	2130 Expansion module 0 input H (low) string	UNICODE	UNICODE	512
	224	2130 Expansion module 0 input H (high) string	UNICODE	UNICODE	512
213		2130 Expansion module 1 inputs E-H strings	UNICODE	UNICODE	512
214-221		Reserved for 2130 Expansion modules 2-9 inputs E-H strings			
222	0	PLC function 1 string	UNICODE	UNICODE	512
	32	PLC function 2 string	UNICODE	UNICODE	512
	64	PLC function 3 string	UNICODE	UNICODE	512
	96	PLC function 4 string	UNICODE	UNICODE	512
	128	PLC function 5 string	UNICODE	UNICODE	512
	160	PLC function 6 string	UNICODE	UNICODE	512
	192	PLC function 7 string	UNICODE	UNICODE	512
	224	PLC function 8 string	UNICODE	UNICODE	512
223	0	PLC function 9 string	UNICODE	UNICODE	512
	32	PLC function 10 string	UNICODE	UNICODE	512
	64	PLC function 11 string	UNICODE	UNICODE	512
	96	PLC function 12 string	UNICODE	UNICODE	512
	128	PLC function 13 string	UNICODE	UNICODE	512
	160	PLC function 14 string	UNICODE	UNICODE	512
	192	PLC function 15 string	UNICODE	UNICODE	512
	224	PLC function 16 string	UNICODE	UNICODE	512
224	0	PLC function 17 string	UNICODE	UNICODE	512
	32	PLC function 18 string	UNICODE	UNICODE	512
	64	PLC function 19 string	UNICODE	UNICODE	512
	96	PLC function 20 string	UNICODE	UNICODE	512
	128-255	Reserved			
225	0	Module description 1	UNICODE	UNICODE	512

Page	Register offset	Name	Minimum value	Maximum value	Bits
	32	Module description 2	UNICODE	UNICODE	512
	64	Site ID (note 1)	UNICODE	UNICODE	512
	96	S2 ID (note 1)	UNICODE	UNICODE	512
	128-255	Reserved for future use			
226-239	0	Reserved			

Exxx family register allocation

Page	Register offset	Name	Minimum value	Maximum value	Bits	E800	E400
200	0	Digital input A active string	UNICODE	UNICODE	512	✓	✓
	32	Digital input B active string	UNICODE	UNICODE	512	✓	✓
	64	Digital input C active string	UNICODE	UNICODE	512	✓	✓
	96	Digital input D active string	UNICODE	UNICODE	512	✓	✓
	128	Digital input E active string	UNICODE	UNICODE	512	✓	
	160	Digital input F active string	UNICODE	UNICODE	512	✓	
	192	Digital input G active string	UNICODE	UNICODE	512	✓	
	224	Digital input H active string	UNICODE	UNICODE	512	✓	
201	0	Digital input I active string	UNICODE	UNICODE	512	✓	
	32	Digital input J active string	UNICODE	UNICODE	512	✓	
	64	Digital input K active string	UNICODE	UNICODE	512	✓	
	96	Reserved	UNICODE	UNICODE	512		
	128	Reserved	UNICODE	UNICODE	512		
	160	Reserved	UNICODE	UNICODE	512		
	192	Reserved	UNICODE	UNICODE	512		
	224	Reserved	UNICODE	UNICODE	512		
202	0	Flex Digital input A active string	UNICODE	UNICODE	512	✓	✓
	32	Flex Digital input B active string	UNICODE	UNICODE	512	✓	✓
	64	Flex Digital input C active string	UNICODE	UNICODE	512	✓	✓
	96	Flex Digital input D active string	UNICODE	UNICODE	512	✓	✓
	128	Flex Digital input E active string	UNICODE	UNICODE	512	✓	✓
	160	Flex Digital input F active string	UNICODE	UNICODE	512	✓	✓
	192	Flex Digital input G active string	UNICODE	UNICODE	512	✓	✓
	224	Flex Digital input H active string	UNICODE	UNICODE	512	✓	
203	0	Flex Digital input I active string	UNICODE	UNICODE	512	✓	
	32	Flex Digital input J active string	UNICODE	UNICODE	512	✓	
	64	Flex Digital input K active string	UNICODE	UNICODE	512	✓	
	96	Flex Digital input L active string	UNICODE	UNICODE	512	✓	
	128	Reserved	UNICODE	UNICODE	512		
	160	Reserved	UNICODE	UNICODE	512		
	192	Reserved	UNICODE	UNICODE	512		
	224	Reserved	UNICODE	UNICODE	512		
204	0	2130 expansion module 0 digital input A string	UNICODE	UNICODE	512	✓	
	32	2130 expansion module 0 digital input B string	UNICODE	UNICODE	512	✓	
	64	2130 expansion module 0 digital input C string	UNICODE	UNICODE	512	✓	
	96	2130 expansion module 0 digital input D string	UNICODE	UNICODE	512	✓	
	128	2130 expansion module 0 digital input E string	UNICODE	UNICODE	512	✓	
	160	2130 expansion module 0 digital input F string	UNICODE	UNICODE	512	✓	
	192	2130 expansion module 0 digital input G string	UNICODE	UNICODE	512	✓	
	224	2130 expansion module 0 digital input H string	UNICODE	UNICODE	512	✓	
205	0-255	2130 expansion module 1 digital input A-H string	UNICODE	UNICODE	512	✓	
206	0-255	2130 expansion module 2 digital input A-H string	UNICODE	UNICODE	512	✓	
207	0-255	2130 expansion module 3 digital input A-H string	UNICODE	UNICODE	512	✓	
208-213	0-255	Reserved for 2130 expansion module 4-9 digital input A-H string	UNICODE	UNICODE	512		
214	0	2130 Expansion module 0 input E (low) string	UNICODE	UNICODE	512	✓	
	32	2130 Expansion module 0 input E (high) string	UNICODE	UNICODE	512	✓	
	64	2130 Expansion module 0 input F (low) string	UNICODE	UNICODE	512	✓	
	96	2130 Expansion module 0 input F (high) string	UNICODE	UNICODE	512	✓	
	128	2130 Expansion module 0 input G (low) string	UNICODE	UNICODE	512	✓	
	160	2130 Expansion module 0 input G (high) string	UNICODE	UNICODE	512	✓	
	192	2130 Expansion module 0 input H (low) string	UNICODE	UNICODE	512	✓	
	224	2130 Expansion module 0 input H (high) string	UNICODE	UNICODE	512	✓	
215		2130 Expansion module 1 inputs E-H strings	UNICODE	UNICODE	512	✓	
216		2130 Expansion module 2 inputs E-H strings	UNICODE	UNICODE	512	✓	
217		2130 Expansion module 3 inputs E-H strings	UNICODE	UNICODE	512	✓	

Page	Register offset	Name	Minimum value	Maximum value	Bits	E800	E400
218-223		Reserved for 2130 Expansion modules 4-9 inputs E-H strings					
224	0	Internal flexible sender A input (low) string	UNICODE	UNICODE	512	✓	✓
	32	Internal flexible sender A input (high) string	UNICODE	UNICODE	512	✓	✓
	64	Internal flexible sender B input (low) string	UNICODE	UNICODE	512	✓	✓
	96	Internal flexible sender B input (high) string	UNICODE	UNICODE	512	✓	✓
	128	Internal flexible sender C input (low) string	UNICODE	UNICODE	512	✓	✓
	160	Internal flexible sender C input (high) string	UNICODE	UNICODE	512	✓	✓
	192	Internal flexible sender D input (low) string	UNICODE	UNICODE	512	✓	✓
	224	Internal flexible sender D input (high) string	UNICODE	UNICODE	512	✓	✓
225	0	Internal flexible sender E input (low) string	UNICODE	UNICODE	512	✓	✓
	32	Internal flexible sender E input (high) string	UNICODE	UNICODE	512	✓	✓
	64	Internal flexible sender F input (low) string	UNICODE	UNICODE	512	✓	✓
	96	Internal flexible sender F input (high) string	UNICODE	UNICODE	512	✓	✓
	128	Internal flexible sender G input (low) string	UNICODE	UNICODE	512	✓	✓
	160	Internal flexible sender G input (high) string	UNICODE	UNICODE	512	✓	✓
	192	Internal flexible sender H input (low) string	UNICODE	UNICODE	512	✓	
	224	Internal flexible sender H input (high) string	UNICODE	UNICODE	512	✓	
226	0	Internal flexible sender I input (low) string	UNICODE	UNICODE	512	✓	
	32	Internal flexible sender I input (high) string	UNICODE	UNICODE	512	✓	
	64	Internal flexible sender J input (low) string	UNICODE	UNICODE	512	✓	
	96	Internal flexible sender J input (high) string	UNICODE	UNICODE	512	✓	
	128	Internal flexible sender K input (low) string	UNICODE	UNICODE	512	✓	
	160	Internal flexible sender K input (high) string	UNICODE	UNICODE	512	✓	
	192	Internal flexible sender L input (low) string	UNICODE	UNICODE	512	✓	
	224	Internal flexible sender L input (high) string	UNICODE	UNICODE	512	✓	
227	0	Engine Maintenance alarm 1 string	UNICODE	UNICODE	512	✓	
	32	Engine Maintenance alarm 2 string	UNICODE	UNICODE	512	✓	
	64	Engine Maintenance alarm 3 string	UNICODE	UNICODE	512	✓	
	96	Engine Maintenance alarm 4 string	UNICODE	UNICODE	512		✓
	128	PLC function1 string	UNICODE	UNICODE	512	✓	✓
	160	PLC function 2 string	UNICODE	UNICODE	512	✓	✓
	192	PLC function 3 string	UNICODE	UNICODE	512	✓	✓
	224	PLC function 4 string	UNICODE	UNICODE	512	✓	✓
228	0	PLC function 5 string	UNICODE	UNICODE	512	✓	✓
	32	PLC function 6 string	UNICODE	UNICODE	512	✓	✓
	64	PLC function 7 string	UNICODE	UNICODE	512	✓	✓
	96	PLC function 8 string	UNICODE	UNICODE	512	✓	✓
	128	PLC function 9 string	UNICODE	UNICODE	512	✓	✓
	160	PLC function 10 string	UNICODE	UNICODE	512	✓	✓
	192	PLC function 11 string	UNICODE	UNICODE	512	✓	✓
	224	PLC function 12 string	UNICODE	UNICODE	512	✓	✓
229	0	PLC function 13 string	UNICODE	UNICODE	512	✓	✓
	32	PLC function 14 string	UNICODE	UNICODE	512	✓	✓
	64	PLC function 15 string	UNICODE	UNICODE	512	✓	✓
	96	PLC function 16 string	UNICODE	UNICODE	512	✓	✓
	128	PLC function 17 string	UNICODE	UNICODE	512	✓	✓
	160	PLC function 18 string	UNICODE	UNICODE	512	✓	✓
	192	PLC function 19 string	UNICODE	UNICODE	512	✓	✓
	224	PLC function 20 string	UNICODE	UNICODE	512	✓	✓
230	0	Internal Flexible Sensor A Sensor Fault string	UNICODE	UNICODE	512	✓	
	32	Internal Flexible Sensor B Sensor Fault string	UNICODE	UNICODE	512	✓	
	64	Internal Flexible Sensor C Sensor Fault string	UNICODE	UNICODE	512	✓	
	96	Internal Flexible Sensor D Sensor Fault string	UNICODE	UNICODE	512	✓	
	128	Internal Flexible Sensor E Sensor Fault string	UNICODE	UNICODE	512	✓	
	160	Internal Flexible Sensor F Sensor Fault string	UNICODE	UNICODE	512	✓	
	192	Internal Flexible Sensor G Sensor Fault string	UNICODE	UNICODE	512	✓	

Page	Register offset	Name	Minimum value	Maximum value	Bits	E800	E400
	224	Internal Flexible Sensor H Sensor Fault string	UNICODE	UNICODE	512	✓	
231	0	Internal Flexible Sensor I Sensor Fault string	UNICODE	UNICODE	512	✓	
	32	Internal Flexible Sensor J Sensor Fault string	UNICODE	UNICODE	512	✓	
	64	Internal Flexible Sensor K Sensor Fault string	UNICODE	UNICODE	512	✓	
	96	Internal Flexible Sensor L Sensor Fault string	UNICODE	UNICODE	512	✓	✓
	128	Engine Maintenance alarm 5 string	UNICODE	UNICODE	512		✓
	160	Engine Maintenance alarm 6 string	UNICODE	UNICODE	512		✓
	192	Engine Maintenance alarm 7 string	UNICODE	UNICODE	512		✓
	224	Engine Maintenance alarm 8 string	UNICODE	UNICODE	512		✓
232	0	Engine Maintenance alarm 9 string	UNICODE	UNICODE	512		✓
	32	Engine Maintenance alarm 10 string	UNICODE	UNICODE	512		✓
	64	Reserved					
	96	Reserved					
	128	Reserved					
	160	Reserved					
	192	Reserved					
	224	Reserved					
233-239		Reserved					

P100 family register allocation

Page	Register offset	Name	Minimum value	Maximum value	Bits
200	0	Digital input A active string	UNICODE	UNICODE	512
	32	Digital input B active string	UNICODE	UNICODE	512
	64	Digital input C active string	UNICODE	UNICODE	512
	96	Digital input D active string	UNICODE	UNICODE	512
	128	Digital input E active string	UNICODE	UNICODE	512

10.82 Pages 240-246 – Analogue Input Name Strings

1. This page provides the name strings for user configurable analogue inputs.
2. The order of the strings is the same as for the input functions and input status pages to simplify the look-up process for the PC software.
3. The register allocation is different for each family.

61xx MkII register allocation

Page	Register offset	Name	Minimum value	Maximum value	Bits
240	0	2130 Expansion module 0 input E name string	UNICODE	UNICODE	512
	32	2130 Expansion module 0 input F name string	UNICODE	UNICODE	512
	64	2130 Expansion module 0 input G name string	UNICODE	UNICODE	512
	96	2130 Expansion module 0 input H name string	UNICODE	UNICODE	512
	128	2130 Expansion module 1 input E name string	UNICODE	UNICODE	512
	160	2130 Expansion module 1 input F name string	UNICODE	UNICODE	512
	192	2130 Expansion module 1 input G name string	UNICODE	UNICODE	512
	224	2130 Expansion module 1 input H name string	UNICODE	UNICODE	512
241-244		Reserved for 2130 expansion module 4-9 input E-H name strings			
245	0	Flexible sender A name string	UNICODE	UNICODE	512
	32	Flexible sender B name string	UNICODE	UNICODE	512
	64	Flexible sender C name string	UNICODE	UNICODE	512
	96	Flexible sender D name string	UNICODE	UNICODE	512
	128	Reserved			
	160	Reserved			
	192	Reserved			
	224	Reserved			
246	0	Reserved			
	32	Reserved			
	64	Reserved			
	96	Reserved			
	128	Reserved			
	160	Reserved			
	192	Reserved			
	224	Reserved			

72xx/73xx family register allocation

Page	Register offset	Name	Minimum value	Maximum value	Bits
240	0	2130 Expansion module 0 input E name string	UNICODE	UNICODE	512
	32	2130 Expansion module 0 input F name string	UNICODE	UNICODE	512
	64	2130 Expansion module 0 input G name string	UNICODE	UNICODE	512
	96	2130 Expansion module 0 input H name string	UNICODE	UNICODE	512
	128	2130 Expansion module 1 input E name string	UNICODE	UNICODE	512
	160	2130 Expansion module 1 input F name string	UNICODE	UNICODE	512
	192	2130 Expansion module 1 input G name string	UNICODE	UNICODE	512
	224	2130 Expansion module 1 input H name string	UNICODE	UNICODE	512
241	0	2130 Expansion module 2 input E name string	UNICODE	UNICODE	512
	32	2130 Expansion module 2 input F name string	UNICODE	UNICODE	512
	64	2130 Expansion module 2 input G name string	UNICODE	UNICODE	512
	96	2130 Expansion module 2 input H name string	UNICODE	UNICODE	512
	128	2130 Expansion module 3 input E name string	UNICODE	UNICODE	512
	160	2130 Expansion module 3 input F name string	UNICODE	UNICODE	512
	192	2130 Expansion module 3 input G name string	UNICODE	UNICODE	512
	224	2130 Expansion module 3 input H name string	UNICODE	UNICODE	512
242-244		Reserved for 2130 expansion module 4-9 input E-H name strings			
245	0	Flexible sender A name string	UNICODE	UNICODE	512
	32	Flexible sender B name string	UNICODE	UNICODE	512
	64	Flexible sender C name string	UNICODE	UNICODE	512
	96	Flexible sender D name string	UNICODE	UNICODE	512
	128	Flexible sender E name string	UNICODE	UNICODE	512
	160	Flexible sender F name string	UNICODE	UNICODE	512
	192	Reserved			
	224	Reserved			
246	0	Reserved			
	32	Reserved			
	64	Reserved			
	96	Reserved			
	128	Reserved			
	160	Reserved			
	192	Reserved			
	224	Reserved			

8xxx/74xx family register allocation

Page	Register offset	Name	Minimum value	Maximum value	Bits
240	0	2130 Expansion module 0 input E name string	UNICODE	UNICODE	512
	32	2130 Expansion module 0 input F name string	UNICODE	UNICODE	512
	64	2130 Expansion module 0 input G name string	UNICODE	UNICODE	512
	96	2130 Expansion module 0 input H name string	UNICODE	UNICODE	512
	128	2130 Expansion module 1 input E name string	UNICODE	UNICODE	512
	160	2130 Expansion module 1 input F name string	UNICODE	UNICODE	512
	192	2130 Expansion module 1 input G name string	UNICODE	UNICODE	512
	224	2130 Expansion module 1 input H name string	UNICODE	UNICODE	512
241	0	2130 Expansion module 2 input E name string	UNICODE	UNICODE	512
	32	2130 Expansion module 2 input F name string	UNICODE	UNICODE	512
	64	2130 Expansion module 2 input G name string	UNICODE	UNICODE	512
	96	2130 Expansion module 2 input H name string	UNICODE	UNICODE	512
	128	2130 Expansion module 3 input E name string	UNICODE	UNICODE	512
	160	2130 Expansion module 3 input F name string	UNICODE	UNICODE	512
	192	2130 Expansion module 3 input G name string	UNICODE	UNICODE	512
	224	2130 Expansion module 3 input H name string	UNICODE	UNICODE	512
242-244		Reserved			
245	0	Internal Flexible sender 1 name string	UNICODE	UNICODE	512
	32	Internal Flexible sender 2 name string	UNICODE	UNICODE	512
	64	Internal Flexible sender 3 name string	UNICODE	UNICODE	512
	96	Internal Flexible sender 4 name string	UNICODE	UNICODE	512
	128	Internal Flexible sender 5 name string	UNICODE	UNICODE	512
	160	Reserved			
	192	Reserved			
	224	Reserved			
246	0	Reserved			
	32	Reserved			
	64	Reserved			
	96	Reserved			
	128	Reserved			
	160	Reserved			
	192	Reserved			
	224	Reserved			

335 register allocation

Page	Register offset	Name	Minimum value	Maximum value	Bits
240	0	2130 Expansion module 0 input E name string	UNICODE	UNICODE	512
	32	2130 Expansion module 0 input F name string	UNICODE	UNICODE	512
	64	2130 Expansion module 0 input G name string	UNICODE	UNICODE	512
	96	2130 Expansion module 0 input H name string	UNICODE	UNICODE	512
	128	2130 Expansion module 1 input E name string	UNICODE	UNICODE	512
	160	2130 Expansion module 1 input F name string	UNICODE	UNICODE	512
	192	2130 Expansion module 1 input G name string	UNICODE	UNICODE	512
	224	2130 Expansion module 1 input H name string	UNICODE	UNICODE	512
241-244		Reserved for 2130 Expansion modules 2-9 inputs E-H strings			
245-246		Reserved			

Exxx register allocation

Page	Register offset	Name	Minimum value	Maximum value	Bits
240	0	2130 Expansion module 0 input E name string	UNICODE	UNICODE	512
	32	2130 Expansion module 0 input F name string	UNICODE	UNICODE	512
	64	2130 Expansion module 0 input G name string	UNICODE	UNICODE	512
	96	2130 Expansion module 0 input H name string	UNICODE	UNICODE	512
	128	2130 Expansion module 1 input E name string	UNICODE	UNICODE	512
	160	2130 Expansion module 1 input F name string	UNICODE	UNICODE	512
	192	2130 Expansion module 1 input G name string	UNICODE	UNICODE	512
	224	2130 Expansion module 1 input H name string	UNICODE	UNICODE	512
241	0	2130 Expansion module 2 input E name string	UNICODE	UNICODE	512
	32	2130 Expansion module 2 input F name string	UNICODE	UNICODE	512
	64	2130 Expansion module 2 input G name string	UNICODE	UNICODE	512
	96	2130 Expansion module 2 input H name string	UNICODE	UNICODE	512
	128	2130 Expansion module 3 input E name string	UNICODE	UNICODE	512
	160	2130 Expansion module 3 input F name string	UNICODE	UNICODE	512
	192	2130 Expansion module 3 input G name string	UNICODE	UNICODE	512
	224	2130 Expansion module 3 input H name string	UNICODE	UNICODE	512
242-244		Reserved			
245	0	Internal Flexible sender 1 name string	UNICODE	UNICODE	512
	32	Internal Flexible sender 2 name string	UNICODE	UNICODE	512
	64	Internal Flexible sender 3 name string	UNICODE	UNICODE	512
	96	Internal Flexible sender 4 name string	UNICODE	UNICODE	512
	128	Internal Flexible sender 5 name string	UNICODE	UNICODE	512
	160	Internal Flexible sender 6 name string	UNICODE	UNICODE	512
	192	Internal Flexible sender 7 name string	UNICODE	UNICODE	512
	224	Internal Flexible sender 8 name string	UNICODE	UNICODE	512
246	0	Internal Flexible sender 9 name string	UNICODE	UNICODE	512
	32	Internal Flexible sender 10 name string	UNICODE	UNICODE	512
	64	Internal Flexible sender 11 name string	UNICODE	UNICODE	512
	96	Internal Flexible sender 12 name string	UNICODE	UNICODE	512
	128	Configurable output 1 string	UNICODE	UNICODE	512
	160	Configurable output 2 string	UNICODE	UNICODE	512
	192	Configurable output 3 string	UNICODE	UNICODE	512
	224	Reserved			

10.83 Page 250 – Misc strings

1. This page provides the strings for the insert card.

Registers

Page	Register offset	Name	Minimum value	Maximum value	Bits
250	0	LED Insert card string 1	UNICODE	UNICODE	512
	32	LED Insert card string 2	UNICODE	UNICODE	512
	64	LED Insert card string 3	UNICODE	UNICODE	512
	96	LED Insert card string 4	UNICODE	UNICODE	512
	128	Onboard Analogue Output string	UNICODE	UNICODE	512
	160	Reserved	UNICODE	UNICODE	512
	192	Reserved	UNICODE	UNICODE	512
	224	Reserved	UNICODE	UNICODE	512

94xx Battery Charger

Page	Register offset	Name	Minimum value	Maximum value	Bits
250	0	Site ID	UNICODE	UNICODE	512
	32	Charger ID	UNICODE	UNICODE	512
	64	Reserved	UNICODE	UNICODE	512
	96	Reserved	UNICODE	UNICODE	512
	128	Reserved	UNICODE	UNICODE	512
	160	Reserved	UNICODE	UNICODE	512
	192	Reserved	UNICODE	UNICODE	512
	224	Reserved	UNICODE	UNICODE	512

Automatic Voltage Regulator A106 Registers

Page	Register offset	Name	Minimum value	Maximum value	Bits
250	0	Configuration 1 name string	UNICODE	UNICODE	512
	32	Configuration 2 name string	UNICODE	UNICODE	512
	64	Configuration 3 name string	UNICODE	UNICODE	512
	96	Configuration 4 name string	UNICODE	UNICODE	512
	128	Reserved	UNICODE	UNICODE	512
	160	Reserved	UNICODE	UNICODE	512
	192	Reserved	UNICODE	UNICODE	512
	224	Reserved	UNICODE	UNICODE	512

Automatic Voltage Regulator A108 Registers

Page	Register offset	Name	Minimum value	Maximum value	Bits
250	0	Voltage and Frequency configuration name string	UNICODE	UNICODE	512
	32	Stability configuration name string	UNICODE	UNICODE	512
	64	Reserved	UNICODE	UNICODE	512
	96	Reserved	UNICODE	UNICODE	512
	128	Reserved	UNICODE	UNICODE	512
	160	Reserved	UNICODE	UNICODE	512
	192	Reserved	UNICODE	UNICODE	512
	224	Reserved	UNICODE	UNICODE	512