

Standard Centurion™ C5-1 Modbus Application Guide for firmware 50-33-3920

September 2018



The Centurion uses 16-Bit Integer Modbus Holding Registers, which are read using Modbus function code (FC) 03. Writes using FC06 and FC16 are supported. Decimal places may be implied by multiplying by factors of 10 to format a whole number. Refer to specific configuration for unit engineering unit scales. Controller will respond with exception code 0x8x for invalid requests from the Modbus master and for requests for data outside the ranges documented below.

For advanced data reference, refer to section 3.0.

1.0 Modbus Holding Register Ranges

400001	402000	COMMAND, VIP DATA, ALARMS, HISTORY (READ AND READ/WRITE WHERE INDICATED) – THIS IS THE MOST COMMON AREA THAT REMOTE MONITORING NEEDS TO REQUEST, STARTING AT 400101. COPIES OF SCALED DATA RESIDE IN THIS RANGE FOR HARDWIRED READINGS. ADDITIONAL DATA IS AVAILABLE IN TRANSLATED/SCALED INPUT AND OUTPUT RANGE.
402001	402275	RAW STATUS REGISTERS-FACTORY USE
403001	403364	TRANSLATED/SCALED INPUT AND OUTPUT STATUS REGISTERS
404001	410000	SETPOINT DATA-DYNAMIC CONFIGURATION ITEMS, READ-WRITE THROUGH CENTURION DISPLAY AND MODBUS RTU

2.0 Modbus Holding Register Table

Reg	Variable	Format	Units	RO RW	Description
COMMAND, VIP, ALARMS, HISTORY (READ AND READ/WRITE WHERE INDICATED)					
400001	Command1	u16bit	raw	RO	Keypad Commands Enumeration from Port 1 (local display)
400002	Command1_parm1	u16bit	raw	RO	Command Parameter 1
400003	Command1_parm2	u16bit	raw	RO	Command Parameter 2
400004	Command1_complete	u16bit	raw	RO	Last command completed feedback
400005	Command2	u16bit	raw	RW	Keypad Command Enumeration from Port 2 (remote) Command Explanation 1 Ack Alarm (Requires Parameter 1 of Fault #) Parameter 1 = -1, Acks All Alarms 2 Keypad Start (Disable remote mode) 3 Keypad Stop (Disable remote mode) 4 Keypad Reset (Disable remote mode) 5 Timer 0 6 Start Test Mode 7 Stop Test Mode 8 Clear event log 9 Clear alarm log 10 Put controller into Local mode 11 Put controller into Remote mode 12 Restore Factory Defaults 13 Keypad Start plus FN key (Enable remote) 14 Keypad Stop plus FN key (Enable remote) 15 Keypad Reset plus FN key (Enable remote) 16 Reset Maintenance timer (Requires Param 1) Parameter 1 == 1-10 for Maintenance timer # 17 Turn on output force mode (Requires Param 1 and 2) Parameter 1 == 0 turns on timer, 1 - 16 for digital output # 18 Disable force mode
400006	Command2_parm1	u16bit	raw	RW	Command Parameter 1
400007	Command2_parm2	u16bit	raw	RW	Command Parameter 2
400008	Command2_complete	u16bit	raw	RO	Last command completed feedback
400009	Cfg_date_year	u16bit	raw	RO	Timestamp of Configuration Creation/Save
400010	Cfg_date_month	u16bit	raw	RO	
400011	Cfg_date_day	u16bit	raw	RO	
400012	Cfg_date_hour	u16bit	raw	RO	
400013	Cfg_date_minute	u16bit	raw	RO	
400014	Cfg_date_second	u16bit	raw	RO	
400015	Cfg_string1	string	raw	RO	16 character of Configuration Description
400016	Cfg_string2	string	raw	RO	
400017	Cfg_string3	string	raw	RO	
400018	Cfg_string4	string	raw	RO	
400019	Cfg_string5	string	raw	RO	
400020	Cfg_string6	string	raw	RO	
400021	Cfg_string7	string	raw	RO	

400022	Cfg_string8	string	raw	RO	
400023	Fw_number	u16bit	raw	RO	Firmware Number
400024	Ctl_major_ver	u16bit	raw	RO	Firmware Major Version (Use with Major, Minor, Build to make XX.YY.ZZZZ.)
400025	Ctl_minor_ver	u16bit	raw	RO	Firmware Minor Version (Use with Major, Minor, Build to make XX.YY.ZZZZ.)
400026	Ctl_build_ver	u16bit	raw	RO	Firmware Build Version (Use with Major, Minor, Build to make XX.YY.ZZZZ.)
400027	Boot_major_ver	u16bit	raw	RO	Bootloader Major Version (Use with Major, Minor, Build to make XX.YY.ZZZZ.)
400028	Boot_minor_ver	u16bit	raw	RO	Bootloader Minor Version (Use with Major, Minor, Build to make XX.YY.ZZZZ.)
400029	Boot_build_ver	u16bit	raw	RO	Bootloader Build Version (Use with Major, Minor, Build to make XX.YY.ZZZZ.)
400030	MX_fw_number	u16bit	raw	RO	MX4/5 Module Firmware number
400031	MX_major_ver	u16bit	raw	RO	MX4/5 Firmware Major Version (Use with Major, Minor, Build to make XX.YY.ZZZZ.)
400032	MX_minor_ver	u16bit	raw	RO	MX4/5 Firmware Minor Version (Use with Major, Minor, Build to make XX.YY.ZZZZ.)
400033	MX_build_ver	u16bit	raw	RO	MX4/5 Firmware Build Version (Use with Major, Minor, Build to make XX.YY.ZZZZ.)
400034	MX_boot_major_ver	u16bit	raw	RO	MX4/5 Bootloader Major Version (Use with Major, Minor, Build to make XX.YY.ZZZZ.)
400035	MX_boot_minor_ver	u16bit	raw	RO	MX4/5 Bootloader Minor Version (Use with Major, Minor, Build to make XX.YY.ZZZZ.)
400036	MX_boot_build_ver	u16bit	raw	RO	MX4/5 Bootloader Build Version (Use with Major, Minor, Build to make XX.YY.ZZZZ.)
400037	Reserved				
400038	Reserved				
400039	Ctl_fw_checksum_msw	u32bit	raw	RO	Firmware Checksum
400040	Ctl_fw_checksum_lsw				
400041	Cfg_checksum	u16bit	raw	RO	Configuration Checksum
400042	Reserved				
400043	Reserved				
400044	Lifetimer seconds msw	u32bit	sec	RO	Factory use-total device lifetime seconds
400045	Lifetimer seconds lsw				
400046	Null task counter msw	u32bit	raw	RO	Factory use
400047	Null task counter lsw				
400048	Null task lowest qs msw	u32bit	raw	RO	Factory use
400049	Null task lowest qs lsw				
400050	System powered up time msw	u32bit	sec	RO	Total time powered up seconds
400051	System powered up time lsw				
400052	Reserved				
400053	Reserved				
400054	Rs485_1_dly	u16bit	mS	RW	RS485_1 Modbus Response Delay
400055	Rs485_2_dly	u16bit	mS	RW	RS485_2 Modbus Response Delay
400056	Rs232_1_dly	u16bit	mS	RW	RS232_1 Modbus Response Delay
400057	Rs232_2_dly	u16bit	mS	RW	RS232_2 Modbus Response Delay
400058	Ccp_comm_status	u16bit	raw	RO	Communication status to EICS (0=waiting,1=lost,2=bad key,3=ok)
400059	Ccp_key_used	u16bit	raw	RO	Factory Use
400060	Reserved				
400061	Reserved				
400062	Reserved				
400063	Hardware_type	u16bit	raw	RO	Factory Use
400064	DIP_address	u16bit	raw	RO	Setting of the DIP Switch Modbus RTU Slave Address for RS485-1
400065	Reserved				
400066	Reserved				
400067	Reserved				
400068	Reserved				
400069	Reserved				
VIP DATA					
400101	State enumeration	u16bit	raw	RO	Value 1 to 23 representing operating state of the controller. (Refer to configuration for text descriptions for each value.) 23 = Fault Shutdown 1 = Ready to Start
400102	Rpm_converted	u16bit	RPM	RO	RPM value set by RPM Source selection in the configuration
400103	Reserved				
400104	Reserved				
400105	Reserved				
400106	Reserved				

400107	Status bits	bitmap	bmp	RO	Bit 0 Fault Shutdown in progress Bit 1 Emergency Shutdown in progress Bit 2 Active alarms present Bit 3 Start/Stop indicator 1=Start Bit 4 Mode 1=Remote 0=Local Bit 5 TEST timer is running Bit 6 B1 timer is running Bit 7 B2 timer is running Bit 8 Reserved Bit 9 C2 timer is running Bit 10 S1 timer is running Bit 11 S2 timer is running Bit 12 S3 timer is running Bit 13 S4 timer is running Bit 14 NF timer is running Bit 15 Bad Configuration
400108	State_timer	u16bit	sec	RO	State timer Accumulator
400109	Test_timer	u16bit	sec	RO	Test timer Accumulator
400110	B1	u16bit	sec	RO	Class B1 Lockout timer Accumulator
400111	B2	u16bit	sec	RO	Class B2 Lockout timer Accumulator
400112	Reserved				
400113	C2	u16bit	sec	RO	Class C2 Lockout timer Accumulator
400114	S1	u16bit	sec	RO	Class S1 timer Accumulator
400115	S2	u16bit	sec	RO	Class S2 timer Accumulator
400116	S3	u16bit	sec	RO	Class S3 timer Accumulator
400117	S4	u16bit	sec	RO	Class S4 timer Accumulator
400118	Nf	u16bit	sec	RO	Global No-Flow timer Accumulator
400119	Hourmeter_msw	u32bit	sec	RO	Run hourmeter represented in seconds
400120	Hourmeter_lsw				
400121	Hourmeter thousands	u16bit	hrs	RO	Run hourmeter represented in thousand hours
400122	Hourmeter tenths	u16bit	hrs/10	RO	Run hourmeter tenths of hours
400123	DI_01_16	bitmap	bmp	RO	Digital input 1-16 Status (After NO/NC setting conversion a logical "1" means input is active/faulted to the controller, for raw status read 402001.)
400124	DI_17_32	bitmap	bmp	RO	Digital input 17-32 Status
400125	AI_01	s16bit	*cfg	RO	Scaled Analog Input 1 (Refer to configuration for engineering unit & data scale.)
400126	AI_02	s16bit	*cfg	RO	Scaled Analog Input 2
400127	AI_03	s16bit	*cfg	RO	Scaled Analog Input 3
400128	AI_04	s16bit	*cfg	RO	Scaled Analog Input 4
400129	AI_05	s16bit	*cfg	RO	Scaled Analog Input 5
400130	AI_06	s16bit	*cfg	RO	Scaled Analog Input 6
400131	AI_07	s16bit	*cfg	RO	Scaled Analog Input 7
400132	AI_08	s16bit	*cfg	RO	Scaled Analog Input 8
400133	AI_09	s16bit	*cfg	RO	Scaled Analog Input 9
400134	AI_10	s16bit	*cfg	RO	Scaled Analog Input 10
400135	AI_11	s16bit	*cfg	RO	Scaled Analog Input 11
400136	AI_12	s16bit	*cfg	RO	Scaled Analog Input 12
400137	AI_13	s16bit	*cfg	RO	Scaled MX5 Analog Input 1 or Calculated Differential 1
400138	AI_14	s16bit	*cfg	RO	Scaled MX5 Analog Input 2 or Calculated Differential 2
400139	AI_15	s16bit	*cfg	RO	Scaled MX5 Analog Input 3 or Calculated Differential 3
400140	AI_16	s16bit	*cfg	RO	Scaled MX5 Analog Input 4 or Calculated Differential 4
400141	AI_17	s16bit	*cfg	RO	Scaled MX5 Analog Input 5 or Calculated Differential 5
400142	AI_18	s16bit	*cfg	RO	Scaled MX5 Analog Input 6 or Calculated Differential 6
400143	AI_19	s16bit	*cfg	RO	Scaled MX5 Analog Input 7 or Calculated Differential 7
400144	AI_20	s16bit	*cfg	RO	Scaled MX5 Analog Input 8 or Calculated Differential 8
400145	Pid_output_1	u16bit	%x100	RO	Scaled Control Loop 1 Output as Analog Input Value (Refer to configuration for engineering unit & data scale.)
400146	Pid_output_2	u16bit	%x100	RO	Scaled Control Loop 2 Output as Analog Input Value
400147	Pid_output_3	u16bit	%x100	RO	Scaled Control Loop 3 Output as Analog Input Value
400148	Pid_output_4	u16bit	%x100	RO	Scaled Control Loop 4 Output as Analog Input Value
400149	Pid_output_5	u16bit	%x100	RO	Scaled Control Loop 5 Output as Analog Input Value
400150	Pid_output_6	u16bit	%x100	RO	Scaled Control Loop 6 Output as Analog Input Value
400151	Pid_output_7	u16bit	%x100	RO	Scaled Control Loop 7 Output as Analog Input Value
400152	Pid_output_8	u16bit	%x100	RO	Scaled Control Loop 8 Output as Analog Input Value
400153	TI_01	s16bit	°C/ F	RO	Scaled Temperature Input 1 (Refer to configuration for °C or °F scale.)
400154	TI_02	s16bit	°C/ F	RO	Scaled Temperature Input 2
400155	TI_03	s16bit	°C/ F	RO	Scaled Temperature Input 3
400156	TI_04	s16bit	°C/ F	RO	Scaled Temperature Input 4
400157	TI_05	s16bit	°C/ F	RO	Scaled Temperature Input 5
400158	TI_06	s16bit	°C/ F	RO	Scaled Temperature Input 6
400159	TI_07	s16bit	°C/ F	RO	Scaled Temperature Input 7

400160	TI_08	s16bit	°C/ F	RO	Scaled Temperature Input 8
400161	TI_09	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 1
400162	TI_10	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 2
400163	TI_11	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 3
400164	TI_12	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 4
400165	TI_13	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 5
400166	TI_14	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 6
400167	TI_15	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 7
400168	TI_16	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 8
400169	TI_17	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 9
400170	TI_18	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 10
400171	TI_19	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 11
400172	TI_20	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 12
400173	TI_21	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 13
400174	TI_22	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 14
400175	TI_23	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 15
400176	TI_24	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 16
400177	TI_25	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 17
400178	TI_26	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 18
400179	Core_rpm	u16bit	RPM	RO	Raw RPM Reading
400180	Core_rpm_filtered	u16bit	RPM	RO	Averaged RPM Reading
400181	Expansion_rpm	u16bit	RPM	RO	MX4/5 raw RPM Reading
400182	Expansion_rpm_filtered	u16bit	RPM	RO	MX4/5 Averaged RPM Reading
400183	System_voltage	u16bit	Vx10	RO	Scaled System Voltage Status
400184	Reserved				
400185	Full_cn_fw_num_msw	u32bit		RO	Full controller firmware number
400186	Full_cn_fw_num_lsw				
400187	Full_mv_fw_num_msw	u32bit		RO	Full display firmware number
400188	Full_mv_fw_num_lsw				
400189	Full_mx_fw_num_msw	u32bit		RO	Full MX4/5 firmware number
400190	Full_mx_fw_num_lsw				
400191	Shutdown_enumeration	u16bit	raw	RO	Enumeration (1-206) of cause of shutdown (Refer to configuration for description text.)
400192	Num_active_alarms	u16bit	raw	RO	Total number of current active alarm only events detected
400193	Reserved				
400194	Starts_remaining	u16bit	raw	RO	Number of Engine Crank Attempts Remaining/Number of Electric Motor Start Attempts Remaining
400195	Cold_junction_tmp	s16bit	°Fx10	RO	Cold junction Sensor Temperature
400196	Reserved				
400197	Reserved				
400198	Type_k_terminal_temp_mv	u16bit	mV	RO	Factory use-Calculated mV offset for Type K thermocouples
400199	Type_j_terminal_temp_mv	u16bit	mV	RO	Factory use-Calculated mV offset for Type J thermocouples
400200	Cold_junction_expansion	s16bit		RO	MX4 Cold junction Sensor Temperature
400201	Reserved				
400202	Reserved				
400203	Reserved				
400204	Reserved				
400205	Pid_auto	bitmap		RO	Control Loop Mode-(0=Manual,1=Auto) Bit 0 Control Loop 1 Mode Bit 1 Control Loop 2 Mode Bit 2 Control Loop 3 Mode Bit 3 Control Loop 4 Mode Bit 4 Control Loop 5 Mode Bit 5 Control Loop 6 Mode Bit 6 Control Loop 7 Mode Bit 7 Control Loop 8 Mode
400206	Pid_enabled	bitmap		RO	Control Loop Enabled-Each loop may be independently configured to be active at specific times (0=Not Active,1=Enabled/Controlling). Bit 0 Control Loop 1 Active Bit 1 Control Loop 2 Active Bit 2 Control Loop 3 Active Bit 3 Control Loop 4 Active Bit 4 Control Loop 5 Active Bit 5 Control Loop 6 Active Bit 6 Control Loop 7 Active Bit 7 Control Loop 8 Active

400207	Pid_override	bitmap		RO	Control Loop override Status-Each loop has up to 3 possible Overrides to change control loop action based on other signals. This bit indicates the override is active (0=Not Active, 1=Active). Bit 0 Control Loop 1 override Active Bit 1 Control Loop 2 override Active Bit 2 Control Loop 3 override Active Bit 3 Control Loop 4 override Active Bit 4 Control Loop 5 override Active Bit 5 Control Loop 6 override Active Bit 6 Control Loop 7 override Active Bit 7 Control Loop 8 override Active
400208	Armed_alarm_classes	bitmap		RO	Fault class arm status (0=disarmed, 1=armed) Bit 0 class b1 armed Bit 1 class b2 armed Bit 2 class c1 arming possible Bit 3 class c2 arming possible Bit 4 class s1 armed Bit 5 class s2 armed Bit 6 class s3 armed Bit 7 class s4 armed Bit 8 reserved Bit 9 global class nf armed
400209	Control_output_val_1	u16bit	%x100	RO	Control Loop 1 Final Value sent to Control Output
400210	Control_output_val_2	u16bit	%x100	RO	Control Loop 2 Final Value sent to Control Output
400211	Control_output_val_3	u16bit	%x100	RO	Control Loop 3 Final Value sent to Control Output
400212	Control_output_val_4	u16bit	%x100	RO	Control Loop 4 Final Value sent to Control Output
400213	Control_output_val_5	u16bit	%x100	RO	Control Loop 5 Final Value sent to Control Output
400214	Control_output_val_6	u16bit	%x100	RO	Control Loop 6 Final Value sent to Control Output
400215	Control_output_val_7	u16bit	%x100	RO	Control Loop 7 Final Value sent to Control Output
400216	Control_output_val_8	u16bit	%x100	RO	Control Loop 8 Final Value sent to Control Output
400217	Reserved				
400218	Reserved				
400219	Reserved				
400220	Reserved				
400221	Reserved				
400222	Reserved				
400223	Reserved				
400224	Reserved				
400225	Ctrl_manual_01	u16bit	%x100	RW	Control Loop 1 Manual Output Value (Write to this value while control loop is in manual mode to directly modify the output.)
400226	Ctrl_manual_02	u16bit	%x100	RW	Control Loop 2 Manual Output Value
400227	Ctrl_manual_03	u16bit	%x100	RW	Control Loop 3 Manual Output Value
400228	Ctrl_manual_04	u16bit	%x100	RW	Control Loop 4 Manual Output Value
400229	Ctrl_manual_05	u16bit	%x100	RW	Control Loop 5 Manual Output Value
400230	Ctrl_manual_06	u16bit	%x100	RW	Control Loop 6 Manual Output Value
400231	Ctrl_manual_07	u16bit	%x100	RW	Control Loop 7 Manual Output Value
400232	Ctrl_manual_08	u16bit	%x100	RW	Control Loop 8 Manual Output Value
400233	Reserved				
400234	Reserved				
400235	Reserved				
400236	Reserved				
400237	Reserved				
400238	Reserved				
400239	Reserved				
400240	Reserved				
400241	Reserved				
400242	Reserved				
400243	Dig_force_timer	u16bit	sec	RO	Output Force Mode time Remaining
400244	Pwr_save_timer	u16bit	sec	RO	Power Save Mode time Remaining-if a Digital Output is configured as a Power Save output function, this is the amount of time remaining before the output is de-energized.
400245	Reserved				
400246	Reserved				
400247	Pid_target_1	u16bit	%x100	RO	Factory Use-Calculated Control Loop 1 Target (may have changed based on Overrides)
400248	Pid_target_2	u16bit	%x100	RO	Factory Use-Calculated Control Loop 2 Target (may have changed based on Overrides)
400249	Pid_target_3	u16bit	%x100	RO	Factory Use-Calculated Control Loop 3 Target (may have changed based on Overrides)
400250	Pid_target_4	u16bit	%x100	RO	Factory Use-Calculated Control Loop 4 Target (may have changed based on Overrides)
400251	Pid_target_5	u16bit	%x100	RO	Factory Use-Calculated Control Loop 5 Target (may have changed based on Overrides)

400252	Pid_target_6	u16bit	%x100	RO	Factory Use-Calculated Control Loop 6 Target (may have changed based on Overrides)
400253	Pid_target_7	u16bit	%x100	RO	Factory Use-Calculated Control Loop 7 Target (may have changed based on Overrides)
400254	Pid_target_8	u16bit	%x100	RO	Factory Use-Calculated Control Loop 8 Target (may have changed based on Overrides)
400255	Reserved				
400256	Reserved				
400257	Reserved				
400258	Reserved				
400259	Reserved				
400260	Reserved				
400261	Reserved				
400262	Reserved				
400263	Pid_setpoint_1	s16bit	*cfg	RO	Control Loop 1 Setpoint (Refer to configuration for description and units.)
400264	Pid_setpoint_2	s16bit	*cfg	RO	Control Loop 2 Setpoint
400265	Pid_setpoint_3	s16bit	*cfg	RO	Control Loop 3 Setpoint
400266	Pid_setpoint_4	s16bit	*cfg	RO	Control Loop 4 Setpoint
400267	Pid_setpoint_5	s16bit	*cfg	RO	Control Loop 5 Setpoint
400268	Pid_setpoint_6	s16bit	*cfg	RO	Control Loop 6 Setpoint
400269	Pid_setpoint_7	s16bit	*cfg	RO	Control Loop 7 Setpoint
400270	Pid_setpoint_8	s16bit	*cfg	RO	Control Loop 8 Setpoint
400271	Reserved				
400272	Reserved				
400273	Reserved				
400274	Reserved				
400275	Reserved				
400276	Reserved				
400277	Reserved				
400278	Reserved				
400279	Reserved				
400280	Reserved				
400281	Alarm1	u16bit	raw	RO	Active Alarm Enumeration 1 (up to 32 active alarms possible simultaneously, refer to configuration for enumeration codes descriptions) 0 = no alarm active. MSB (bit 15) in these words indicate whether alarm has been acknowledged or not (1=not acked, 0=acked). SEE SECTION 3.0 FOR ADVANCED REFERENCE
400282	Alarm2	u16bit	raw	RO	Active Alarm Enumeration 2
400283	Alarm3	u16bit	raw	RO	Active Alarm Enumeration 3
400284	Alarm4	u16bit	raw	RO	Active Alarm Enumeration 4
400285	Alarm5	u16bit	raw	RO	Active Alarm Enumeration 5
400286	Alarm6	u16bit	raw	RO	Active Alarm Enumeration 6
400287	Alarm7	u16bit	raw	RO	Active Alarm Enumeration 7
400288	Alarm8	u16bit	raw	RO	Active Alarm Enumeration 8
400289	Alarm9	u16bit	raw	RO	Active Alarm Enumeration 9
400290	Alarm10	u16bit	raw	RO	Active Alarm Enumeration 10
400291	Alarm11	u16bit	raw	RO	Active Alarm Enumeration 11
400292	Alarm12	u16bit	raw	RO	Active Alarm Enumeration 12
400293	Alarm13	u16bit	raw	RO	Active Alarm Enumeration 13
400294	Alarm14	u16bit	raw	RO	Active Alarm Enumeration 14
400295	Alarm15	u16bit	raw	RO	Active Alarm Enumeration 15
400296	Alarm16	u16bit	raw	RO	Active Alarm Enumeration 16
400297	Alarm17	u16bit	raw	RO	Active Alarm Enumeration 17
400298	Alarm18	u16bit	raw	RO	Active Alarm Enumeration 18
400299	Alarm19	u16bit	raw	RO	Active Alarm Enumeration 19
400300	Alarm20	u16bit	raw	RO	Active Alarm Enumeration 20
400301	Alarm21	u16bit	raw	RO	Active Alarm Enumeration 21
400302	Alarm22	u16bit	raw	RO	Active Alarm Enumeration 22
400303	Alarm23	u16bit	raw	RO	Active Alarm Enumeration 23
400304	Alarm24	u16bit	raw	RO	Active Alarm Enumeration 24
400305	Alarm25	u16bit	raw	RO	Active Alarm Enumeration 25
400306	Alarm26	u16bit	raw	RO	Active Alarm Enumeration 26
400307	Alarm27	u16bit	raw	RO	Active Alarm Enumeration 27
400308	Alarm28	u16bit	raw	RO	Active Alarm Enumeration 28
400309	Alarm29	u16bit	raw	RO	Active Alarm Enumeration 29
400310	Alarm30	u16bit	raw	RO	Active Alarm Enumeration 30
400311	Alarm31	u16bit	raw	RO	Active Alarm Enumeration 31
400312	Alarm32	u16bit	raw	RO	Active Alarm Enumeration 32
400313	Reserved				
400314	Reserved				
400315	Reserved				

400316	Shortcycle_timer_remain	u16bit	sec	RO	Electric Motor Starts Per Hour timer Remaining to gain new start attempt
400317	Reserved				
400318	Reserved				
400319	Service_count	u16bit	sec	RO	Factory Use
400320	Maint1_hours	u16bit	hrs	RO	Maintenance timer 1 time Remaining
400321					
400322	Maint2_hours	u16bit	hrs	RO	Maintenance timer 2 time Remaining
400323					
400324	Maint3_hours	u16bit	hrs	RO	Maintenance timer 3 time Remaining
400325					
400326	Maint4_hours	u16bit	hrs	RO	Maintenance timer 4 time Remaining
400327					
400328	Maint5_hours	u16bit	hrs	RO	Maintenance timer 5 time Remaining
400329					
400330	Maint6_hours	u16bit	hrs	RO	Maintenance timer 6 time Remaining
400331					
400332	Maint7_hours	u16bit	hrs	RO	Maintenance timer 7 time Remaining
400333					
400334	Maint8_hours	u16bit	hrs	RO	Maintenance timer 8 time Remaining
400335					
400336	Maint9_hours	u16bit	hrs	RO	Maintenance timer 9 time Remaining
400337					
400338	Maint10_hours	u16bit	hrs	RO	Maintenance timer 10 time Remaining
SHUTDOWN HISTORY					
400401	Shutdown1_msw	u32bit	sec	RO	Last 20 Shutdown Run hourmeter Snapshots represented in seconds. Sorted newest to oldest
400402	Shutdown1_lsw				
400403	Shutdown1_enum	u16bit	raw	RO	Last 20 Shutdown Enumerations (0= no fault) refer to configuration for enumeration codes descriptions) 0 = no alarm active. Sorted newest to oldest. SEE SECTION 3.0 FOR ADVANCED REFERENCE
400404	Shutdown2_msw	u32bit	sec	RO	
400405	Shutdown2_lsw				
400406	Shutdown2_enum	u16bit	raw	RO	
400407	Shutdown3_msw	u32bit	sec	RO	
400408	Shutdown3_lsw				
400409	Shutdown3_enum	u16bit	raw	RO	
400410	Shutdown4_msw	u32bit	sec	RO	
400411	Shutdown4_lsw				
400412	Shutdown4_enum	u16bit	raw	RO	
400413	Shutdown5_msw	u32bit	sec	RO	
400414	Shutdown5_lsw				
400415	Shutdown5_enum	u16bit	raw	RO	
400416	Shutdown6_msw	u32bit	sec	RO	
400417	Shutdown6_lsw				
400418	Shutdown6_enum	u16bit	raw	RO	
400419	Shutdown7_msw	u32bit	sec	RO	
400420	Shutdown7_lsw				
400421	Shutdown7_enum	u16bit	raw	RO	
400422	Shutdown8_msw	u32bit	sec	RO	
400423	Shutdown8_lsw				
400424	Shutdown8_enum	u16bit	raw	RO	
400425	Shutdown9_msw	u32bit	sec	RO	
400426	Shutdown9_lsw				
400427	Shutdown9_enum	u16bit	raw	RO	
400428	Shutdown10_msw	u32bit	sec	RO	
400429	Shutdown10_lsw				
400430	Shutdown10_enum	u16bit	raw	RO	
400431	Shutdown11_msw	u32bit	sec	RO	
400432	Shutdown11_lsw				
400433	Shutdown11_enum	u16bit	raw	RO	
400434	Shutdown12_msw	u32bit	sec	RO	
400435	Shutdown12_lsw				
400436	Shutdown12_enum	u16bit	raw	RO	
400437	Shutdown13_msw	u32bit	sec	RO	
400438	Shutdown13_lsw				
400439	Shutdown13_enum	u16bit	raw	RO	
400440	Shutdown14_msw	u32bit	sec	RO	
400441	Shutdown14_lsw				
400442	Shutdown14_enum	u16bit	raw	RO	
400443	Shutdown15_msw	u32bit	sec	RO	
400444	Shutdown15_lsw				

400445	Shutdown15_enum	u16bit	raw	RO	
400446	Shutdown16_msw	u32bit	sec	RO	
400447	Shutdown16_lsw				
400448	Shutdown16_enum	u16bit	raw	RO	
400449	Shutdown17_msw	u32bit	sec	RO	
400450	Shutdown17_lsw				
400451	Shutdown17_enum	u16bit	raw	RO	
400452	Shutdown18_msw	u32bit	sec	RO	
400453	Shutdown18_lsw				
400454	Shutdown18_enum	u16bit	raw	RO	
400455	Shutdown19_msw	u32bit	sec	RO	
400456	Shutdown19_lsw				
400457	Shutdown19_enum	u16bit	raw	RO	
400458	Shutdown20_msw	u32bit	sec	RO	
400459	Shutdown20_lsw				
400460	Shutdown20_enum	u16bit	raw	RO	
400461	Reserved				
400462	Reserved				
EVENT HISTORY					
400463	Event1_msw	u32bit	sec	RO	Last 32 Event Run hourmeter Snapshots represented in seconds. Sorted newest to oldest.
400464	Event1_lsw				
400465	Event1_enum	u16bit	raw	RO	Last 32 Event Enumerations (0= no fault) refer to configuration for enumeration codes descriptions) 0 = no alarm active. Sorted newest to oldest. SEE SECTION 3.0 FOR ADVANCED REFERENCE. Internal System Events 501 = START 502 = STOP 503 = POWERUP 504 = RESET 505 = START TEST MODE 506 = STOP TEST MODE 507 = FACTORY DEFAULTS RESTORED 508 = MOTOR SHORT CYCLE RESET
400466	Event2_msw	u32bit	sec	RO	
400467	Event2_lsw				
400468	Event2_enum	u16bit	raw	RO	
400469	Event3_msw	u32bit	sec	RO	
400470	Event3_lsw				
400471	Event3_enum	u16bit	raw	RO	
400472	Event4_msw	u32bit	sec	RO	
400473	Event4_lsw				
400474	Event4_enum	u16bit	raw	RO	
400475	Event5_msw	u32bit	sec	RO	
400476	Event5_lsw				
400477	Event5_enum	u16bit	raw	RO	
400478	Event6_msw	u32bit	sec	RO	
400479	Event6_lsw				
400480	Event6_enum	u16bit	raw	RO	
400481	Event7_msw	u32bit	sec	RO	
400482	Event7_lsw				
400483	Event7_enum	u16bit	raw	RO	
400484	Event8_msw	u32bit	sec	RO	
400485	Event8_lsw				
400486	Event8_enum	u16bit	raw	RO	
400487	Event9_msw	u32bit	sec	RO	
400488	Event9_lsw				
400489	Event9_enum	u16bit	raw	RO	
400490	Event10_msw	u32bit	sec	RO	
400491	Event10_lsw				
400492	Event10_enum	u16bit	raw	RO	
400493	Event11_msw	u32bit	sec	RO	
400494	Event11_lsw				
400495	Event11_enum	u16bit	raw	RO	
400496	Event12_msw	u32bit	sec	RO	
400497	Event12_lsw				
400498	Event12_enum	u16bit	raw	RO	
400499	Event13_msw	u32bit	sec	RO	
400500	Event13_lsw				
400501	Event13_enum	u16bit	raw	RO	
400502	Event14_msw	u32bit	sec	RO	
400503	Event14_lsw				

400504	Event14_enum	u16bit	raw	RO	
400505	Event15_msw	u32bit	sec	RO	
400506	Event15_lsw				
400507	Event15_enum	u16bit	raw	RO	
400508	Event16_msw	u32bit	sec	RO	
400509	Event16_lsw				
400510	Event16_enum	u16bit	raw	RO	
400511	Event17_msw	u32bit	sec	RO	
400512	Event17_lsw				
400513	Event17_enum	u16bit	raw	RO	
400514	Event18_msw	u32bit	sec	RO	
400515	Event18_lsw				
400516	Event18_enum	u16bit	raw	RO	
400517	Event19_msw	u32bit	sec	RO	
400518	Event19_lsw				
400519	Event19_enum	u16bit	raw	RO	
400520	Event20_msw	u32bit	sec	RO	
400521	Event20_lsw				
400522	Event20_enum	u16bit	raw	RO	
400523	Event21_msw	u32bit	sec	RO	
400524	Event21_lsw				
400525	Event21_enum	u16bit	raw	RO	
400526	Event22_msw	u32bit	sec	RO	
400527	Event22_lsw				
400528	Event22_enum	u16bit	raw	RO	
400529	Event23_msw	u32bit	sec	RO	
400530	Event23_lsw				
400531	Event23_enum	u16bit	raw	RO	
400532	Event24_msw	u32bit	sec	RO	
400533	Event24_lsw				
400534	Event24_enum	u16bit	raw	RO	
400535	Event25_msw	u32bit	sec	RO	
400536	Event25_lsw				
400537	Event25_enum	u16bit	raw	RO	
400538	Event26_msw	u32bit	sec	RO	
400539	Event26_lsw				
400540	Event26_enum	u16bit	raw	RO	
400541	Event27_msw	u32bit	sec	RO	
400542	Event27_lsw				
400543	Event27_enum	u16bit	raw	RO	
400544	Event28_msw	u32bit	sec	RO	
400545	Event28_lsw				
400546	Event28_enum	u16bit	raw	RO	
400547	Event29_msw	u32bit	sec	RO	
400548	Event29_lsw				
400549	Event29_enum	u16bit	raw	RO	
400550	Event30_msw	u32bit	sec	RO	
400551	Event30_lsw				
400552	Event30_enum	u16bit	raw	RO	
400553	Event31_msw	u32bit	sec	RO	
400554	Event31_lsw				
400555	Event31_enum	u16bit	raw	RO	
400556	Event32_msw	u32bit	sec	RO	
400557	Event32_lsw				
400558	Event32_enum	u16bit	raw	RO	
400559	Reserved				
400560	Reserved				
400561	Status_bits_pid_1	bitmap	bmp	RO	Control loop 1 status bits Bit 0 override 1 active, in deadband Bit 1 override 1 active, not in deadband Bit 2 override 2 active, in deadband Bit 3 override 2 active, not in deadband Bit 4 override 3 active, in deadband Bit 5 override 3 active, not in deadband Bit 6 fully unloaded input active Bit 7 fully loaded input active
400562	Status_bits_pid_2	bitmap	bmp	RO	Control loop 2 status bits
400563	Status_bits_pid_3	bitmap	bmp	RO	Control loop 3 status bits
400564	Status_bits_pid_4	bitmap	bmp	RO	Control loop 4 status bits
400565	Status_bits_pid_5	bitmap	bmp	RO	Control loop 5 status bits
400566	Status_bits_pid_6	bitmap	bmp	RO	Control loop 6 status bits
400567	Status_bits_pid_7	bitmap	bmp	RO	Control loop 7 status bits

400568	Status_bits_pid_8	bitmap	bmp	RO	Control loop 8 status bits
400569	Reserved				
400570	Reserved				
400571	Reserved				
400572	Reserved				
400573	Reserved				
400574	Reserved				
400575	Reserved				
400576	Reserved				
400577	Reserved				
400578	Reserved				
TEMPERATURE INPUT CHANNEL STATUS					
400579	TI1_wire_fault	u16bit	raw	RO	Status of temperature input channel (1=TC OK, 2=RTD OK, 3=OPEN,4=SHORT DC-,5=LEAK DC-,6=SHORT DC+, 7=LEAK DC+)
400580	TI2_wire_fault	u16bit	raw	RO	
400581	TI3_wire_fault	u16bit	raw	RO	
400582	TI4_wire_fault	u16bit	raw	RO	
400583	TI5_wire_fault	u16bit	raw	RO	
400584	TI6_wire_fault	u16bit	raw	RO	
400585	TI7_wire_fault	u16bit	raw	RO	
400586	TI8_wire_fault	u16bit	raw	RO	
400587	MX4_TI1_wire_fault	u16bit	raw	RO	
400588	MX4_TI2_wire_fault	u16bit	raw	RO	
400589	MX4_TI3_wire_fault	u16bit	raw	RO	
400590	MX4_TI4_wire_fault	u16bit	raw	RO	
400591	MX4_TI5_wire_fault	u16bit	raw	RO	
400592	MX4_TI6_wire_fault	u16bit	raw	RO	
400593	MX4_TI7_wire_fault	u16bit	raw	RO	
400594	MX4_TI8_wire_fault	u16bit	raw	RO	
400595	MX4_TI9_wire_fault	u16bit	raw	RO	
400596	MX4_TI10_wire_fault	u16bit	raw	RO	
400597	MX4_TI11_wire_fault	u16bit	raw	RO	
400598	MX4_TI12_wire_fault	u16bit	raw	RO	
400599	MX4_TI13_wire_fault	u16bit	raw	RO	
400600	MX4_TI14_wire_fault	u16bit	raw	RO	
400601	MX4_TI15_wire_fault	u16bit	raw	RO	
400602	MX4_TI16_wire_fault	u16bit	raw	RO	
400603	MX4_TI17_wire_fault	u16bit	raw	RO	
400604	MX4_TI18_wire_fault	u16bit	raw	RO	
400605	Reserved				
400606	Reserved				
400607	Reserved				
400608	Reserved				
400609	Reserved				
400610	Reserved				
400611	Reserved				
400612	Reserved				
400613	Reserved				
400614	Reserved				
400615	Reserved				
400616	Reserved				
400617	Reserved				
400618	Reserved				
400619	Reserved				
400620	Reserved				
400621	Reserved				
400622	Reserved				
400623	Reserved				
400624	Reserved				
400625	Reserved				
400626	Reserved				
400627	Reserved				
400628	Reserved				
400629	Reserved				
400630	Reserved				
400631	Reserved				
400632	Reserved				
400633	Reserved				
400634	Reserved				
400635	Reserved				
400636	Reserved				

400637	Reserved				
400638	Reserved				
400639	Reserved				
400640	Reserved				
400641	Reserved				
400642	Reserved				
400643	Reserved				
400644	Reserved				
400645	Reserved				
400646	Reserved				
400647	Reserved				
400648	Reserved				
400649	Reserved				
400650	Reserved				
400651	Reserved				
400652	Reserved				
400653	Reserved				
400654	Reserved				
400655	Reserved				
400656	Reserved				
400657	Reserved				
400658	Reserved				
400659	Reserved				
400660	Reserved				
400661	Reserved				
400662	Reserved				
400663	Reserved				
400664	Reserved				
400665	Reserved				
400666	Reserved				
400667	Reserved				
400668	Reserved				
400669	Reserved				
400670	Reserved				
400671	Reserved				
400672	Reserved				
400673	Reserved				
400674	Reserved				
400675	Reserved				
400676	Reserved				
400677	Reserved				
400678	Reserved				
400679	Reserved				
400680	Reserved				
REAL-TIME CLOCK READING					
400681	Modbus_clock_set	u16bit	raw	RW	Write 1 to preset internal Real-time Clock
400682	Second	u16bit	raw	RW	Real-time Clock Seconds
400683	Minute	u16bit	raw	RW	Real-time Clock Minutes
400684	Hour	u16bit	raw	RW	Real-time Clock Hours
400685	Day_of_week	u16bit	raw	RW	Real-time Clock Day Of Week (0=Sun, 1=Mon, etc.)
400686	Day	u16bit	raw	RW	Real-time Clock Day
400687	Month	u16bit	raw	RW	Real-time Clock Month
400688	Year	u16bit	raw	RW	Real-time Clock Year
DIGITAL INPUT FILTER TIMER STATUS (PULSE/DEBOUNCE)					
400701	No_flow_tmr_01	u16bit	sec	RO	Digital Input 1 Filter Debounce/Pulse timer Remaining
400702	No_flow_tmr_02	u16bit	sec	RO	Digital Input 2 Filter Debounce/Pulse timer Remaining
400703	No_flow_tmr_03	u16bit	sec	RO	Digital Input 3 Filter Debounce/Pulse timer Remaining
400704	No_flow_tmr_04	u16bit	sec	RO	Digital Input 4 Filter Debounce/Pulse timer Remaining
400705	No_flow_tmr_05	u16bit	sec	RO	Digital Input 5 Filter Debounce/Pulse timer Remaining
400706	No_flow_tmr_06	u16bit	sec	RO	Digital Input 6 Filter Debounce/Pulse timer Remaining
400707	No_flow_tmr_07	u16bit	sec	RO	Digital Input 7 Filter Debounce/Pulse timer Remaining
400708	No_flow_tmr_08	u16bit	sec	RO	Digital Input 8 Filter Debounce/Pulse timer Remaining
400709	No_flow_tmr_09	u16bit	sec	RO	Digital Input 9 Filter Debounce/Pulse timer Remaining
400710	No_flow_tmr_10	u16bit	sec	RO	Digital Input 10 Filter Debounce/Pulse timer Remaining
400711	No_flow_tmr_11	u16bit	sec	RO	Digital Input 11 Filter Debounce/Pulse timer Remaining
400712	No_flow_tmr_12	u16bit	sec	RO	Digital Input 12 Filter Debounce/Pulse timer Remaining
400713	No_flow_tmr_13	u16bit	sec	RO	Digital Input 13 Filter Debounce/Pulse timer Remaining
400714	No_flow_tmr_14	u16bit	sec	RO	Digital Input 14 Filter Debounce/Pulse timer Remaining
400715	No_flow_tmr_15	u16bit	sec	RO	Digital Input 15 Filter Debounce/Pulse timer Remaining
400716	No_flow_tmr_16	u16bit	sec	RO	Digital Input 16 Filter Debounce/Pulse timer Remaining
400717	No_flow_tmr_17	u16bit	sec	RO	Digital Input 17 Filter Debounce/Pulse timer Remaining

400923	Nf_last_23	u16bit	sec	RO	Digital Input 23 Last time between state transition
400924	Nf_last_24	u16bit	sec	RO	Digital Input 24 Last time between state transition
400925	Nf_last_25	u16bit	sec	RO	Digital Input 25 Last time between state transition
400926	Nf_last_26	u16bit	sec	RO	Digital Input 26 Last time between state transition
400927	Nf_last_27	u16bit	sec	RO	Digital Input 27 Last time between state transition
400928	Nf_last_28	u16bit	sec	RO	Digital Input 28 Last time between state transition
400929	Nf_last_29	u16bit	sec	RO	Digital Input 29 Last time between state transition
400930	Nf_last_30	u16bit	sec	RO	Digital Input 30 Last time between state transition
400931	Nf_last_31	u16bit	sec	RO	Digital Input 31 Last time between state transition
400932	Nf_last_32	u16bit	sec	RO	Digital Input 32 Last time between state transition
DIGITAL INPUT PULSE TOTALS (HUNDREDS)					
401001	Nf_total_01	u16bit	pls/100	RO	Digital Input 1 Total Pulses
401002	Nf_total_02	u16bit	pls/100	RO	Digital Input 2 Total Pulses
401003	Nf_total_03	u16bit	pls/100	RO	Digital Input 3 Total Pulses
401004	Nf_total_04	u16bit	pls/100	RO	Digital Input 4 Total Pulses
401005	Nf_total_05	u16bit	pls/100	RO	Digital Input 5 Total Pulses
401006	Nf_total_06	u16bit	pls/100	RO	Digital Input 6 Total Pulses
401007	Nf_total_07	u16bit	pls/100	RO	Digital Input 7 Total Pulses
401008	Nf_total_08	u16bit	pls/100	RO	Digital Input 8 Total Pulses
401009	Nf_total_09	u16bit	pls/100	RO	Digital Input 9 Total Pulses
401010	Nf_total_10	u16bit	pls/100	RO	Digital Input 10 Total Pulses
401011	Nf_total_11	u16bit	pls/100	RO	Digital Input 11 Total Pulses
401012	Nf_total_12	u16bit	pls/100	RO	Digital Input 12 Total Pulses
401013	Nf_total_13	u16bit	pls/100	RO	Digital Input 13 Total Pulses
401014	Nf_total_14	u16bit	pls/100	RO	Digital Input 14 Total Pulses
401015	Nf_total_15	u16bit	pls/100	RO	Digital Input 15 Total Pulses
401016	Nf_total_16	u16bit	pls/100	RO	Digital Input 16 Total Pulses
401017	Nf_total_17	u16bit	pls/100	RO	Digital Input 17 Total Pulses
401018	Nf_total_18	u16bit	pls/100	RO	Digital Input 18 Total Pulses
401019	Nf_total_19	u16bit	pls/100	RO	Digital Input 19 Total Pulses
401020	Nf_total_20	u16bit	pls/100	RO	Digital Input 20 Total Pulses
401021	Nf_total_21	u16bit	pls/100	RO	Digital Input 21 Total Pulses
401022	Nf_total_22	u16bit	pls/100	RO	Digital Input 22 Total Pulses
401023	Nf_total_23	u16bit	pls/100	RO	Digital Input 23 Total Pulses
401024	Nf_total_24	u16bit	pls/100	RO	Digital Input 24 Total Pulses
401025	Nf_total_25	u16bit	pls/100	RO	Digital Input 25 Total Pulses
401026	Nf_total_26	u16bit	pls/100	RO	Digital Input 26 Total Pulses
401027	Nf_total_27	u16bit	pls/100	RO	Digital Input 27 Total Pulses
401028	Nf_total_28	u16bit	pls/100	RO	Digital Input 28 Total Pulses
401029	Nf_total_29	u16bit	pls/100	RO	Digital Input 29 Total Pulses
401030	Nf_total_30	u16bit	pls/100	RO	Digital Input 30 Total Pulses
401031	Nf_total_31	u16bit	pls/100	RO	Digital Input 31 Total Pulses
401032	Nf_total_32	u16bit	pls/100	RO	Digital Input 32 Total Pulses
RAW INPUT STATUS					
402001	DI_01_16	bitmap	bmp	RO	Raw Digital input 1-16 Status (Bit 0 = Digital input 1)
402002	DI_17_32	bitmap	bmp	RO	Raw Digital input 17-32 Status (Bit 0 = Digital input 17)
402003	Reserved				
402004	Reserved				
402005	Reserved				
402006	Reserved				
402007	Reserved				
402008	Analog_input_01	s16bit	count	RO	Raw Analog Input 1 Status (0=0v or 0mA, 32767 = 5v or 24mA)
402009	Analog_input_02	s16bit	count	RO	Raw Analog Input 2 Status
402010	Analog_input_03	s16bit	count	RO	Raw Analog Input 3 Status
402011	Analog_input_04	s16bit	count	RO	Raw Analog Input 4 Status
402012	Analog_input_05	s16bit	count	RO	Raw Analog Input 5 Status
402013	Analog_input_06	s16bit	count	RO	Raw Analog Input 6 Status
402014	Analog_input_07	s16bit	count	RO	Raw Analog Input 7 Status
402015	Analog_input_08	s16bit	count	RO	Raw Analog Input 8 Status
402016	Analog_input_09	s16bit	count	RO	Raw Analog Input 9 Status
402017	Analog_input_10	s16bit	count	RO	Raw Analog Input 10 Status
402018	Analog_input_11	s16bit	count	RO	Raw Analog Input 11 Status
402019	Analog_input_12	s16bit	count	RO	Raw Analog Input 12 Status
402020	Analog_input_13	s16bit	count	RO	Raw MX5 Analog Input 1 Status
402021	Analog_input_14	s16bit	count	RO	Raw MX5 Analog Input 2 Status
402022	Analog_input_15	s16bit	count	RO	Raw MX5 Analog Input 3 Status
402023	Analog_input_16	s16bit	count	RO	Raw MX5 Analog Input 4 Status
402024	Analog_input_17	s16bit	count	RO	Raw MX5 Analog Input 5 Status
402025	Analog_input_18	s16bit	count	RO	Raw MX5 Analog Input 6 Status
402026	Analog_input_19	s16bit	count	RO	Raw MX5 Analog Input 7 Status
402027	Analog_input_20	s16bit	count	RO	Raw MX5 Analog Input 8 Status

402028	Reserved				
402029	Reserved				
402030	Reserved				
402031	Reserved				
402032	Reserved				
402033	Reserved				
402034	Reserved				
402035	Reserved				
402158	Temp_input_01	s16bit	mVx100	RO	Raw Temperature Input 1 Status
402159	Temp_input_02	s16bit	mVx100	RO	Raw Temperature Input 2 Status
402160	Temp_input_03	s16bit	mVx100	RO	Raw Temperature Input 3 Status
402161	Temp_input_04	s16bit	mVx100	RO	Raw Temperature Input 4 Status
402162	Temp_input_05	s16bit	mVx100	RO	Raw Temperature Input 5 Status
402163	Temp_input_06	s16bit	mVx100	RO	Raw Temperature Input 6 Status
402164	Temp_input_07	s16bit	mVx100	RO	Raw Temperature Input 7 Status
402165	Temp_input_08	s16bit	mVx100	RO	Raw Temperature Input 8 Status
402166	Temp_input_09	s16bit	mVx100	RO	Raw MX4 Temperature Input 1 Status
402167	Temp_input_10	s16bit	mVx100	RO	Raw MX4 Temperature Input 2 Status
402168	Temp_input_11	s16bit	mVx100	RO	Raw MX4 Temperature Input 3 Status
402169	Temp_input_12	s16bit	mVx100	RO	Raw MX4 Temperature Input 4 Status
402170	Temp_input_13	s16bit	mVx100	RO	Raw MX4 Temperature Input 5 Status
402171	Temp_input_14	s16bit	mVx100	RO	Raw MX4 Temperature Input 6 Status
402172	Temp_input_15	s16bit	mVx100	RO	Raw MX4 Temperature Input 7 Status
402173	Temp_input_16	s16bit	mVx100	RO	Raw MX4 Temperature Input 8 Status
402174	Temp_input_17	s16bit	mVx100	RO	Raw MX4 Temperature Input 9 Status
402175	Temp_input_18	s16bit	mVx100	RO	Raw MX4 Temperature Input 10 Status
402176	Temp_input_19	s16bit	mVx100	RO	Raw MX4 Temperature Input 11 Status
402177	Temp_input_20	s16bit	mVx100	RO	Raw MX4 Temperature Input 12 Status
402178	Temp_input_21	s16bit	mVx100	RO	Raw MX4 Temperature Input 13 Status
402179	Temp_input_22	s16bit	mVx100	RO	Raw MX4 Temperature Input 14 Status
402180	Temp_input_23	s16bit	mVx100	RO	Raw MX4 Temperature Input 15 Status
402181	Temp_input_24	s16bit	mVx100	RO	Raw MX4 Temperature Input 16 Status
402182	Temp_input_25	s16bit	mVx100	RO	Raw MX4 Temperature Input 17 Status
402183	Temp_input_26	s16bit	mVx100	RO	Raw MX4 Temperature Input 18 Status
402253	Analog_input_00	s16bit	count	RO	Raw internal system voltage status
402254	Reserved				
402255	Expansion_frequency	u16bit	Hz	RO	Raw MX4/5 MPU Input Status
402256	Reserved				
402257	Core_frequency	U16BBIT	Hz	RO	Raw MPU Input Status
402258	DO_1_10	bitmap	bmp	RO	Raw Digital Output 1-10 Status (Bit 0 = Digital Output 1)
402259	Expansion_DO_1_16	bitmap	bmp	RO	Raw MX5 Digital Output 1-6 Status (Bit 0 = Digital Output 1)
402260	Reserved				
402261	Analog_output_01	u16bit	count	RO	Raw Analog Output 1 Status (0-65535)
402262	Analog_output_02	u16bit	count	RO	Raw Analog Output 2 Status (0-65535)
402263	Analog_output_03	u16bit	count	RO	Raw Analog Output 3 Status (0-65535)
402264	Analog_output_04	u16bit	count	RO	Raw Analog Output 4 Status (0-65535)
402265	Analog_output_05	u16bit	count	RO	Raw MX5 Analog Output 1 Status (0-65535)
402266	Analog_output_06	u16bit	count	RO	Raw MX5 Analog Output 2 Status (0-65535)
402267	Analog_output_07	u16bit	count	RO	Raw MX5 Analog Output 3 Status (0-65535)
402268	Analog_output_08	u16bit	count	RO	Raw MX5 Analog Output 4 Status (0-65535)
402269	Reserved				
402270	Reserved				
402271	Reserved				
402272	Reserved				
402273	Reserved				
402274	Reserved				
402275	Reserved				
402276	Reserved				
402277	DI_01_16_wire_fault	bitmap	bmp	RO	Wire fault status bits for digital inputs (0=no fault, 1=fault)
402278	DI_17_32_wire_fault	bitmap	bmp	RO	
402321	Shutdowns_0_Msw_Rtc	u16bit	sec	RO	Last 20 Shutdown Snapshot time represented in real-time clock seconds (32 bit). Sorted newest to oldest.
402322	Shutdowns_0_Lsw_Rtc	u16bit	sec	RO	
402323	Shutdowns_1_Msw_Rtc	u16bit	sec	RO	
402324	Shutdowns_1_Lsw_Rtc	u16bit	sec	RO	
402325	Shutdowns_2_Msw_Rtc	u16bit	sec	RO	
402326	Shutdowns_2_Lsw_Rtc	u16bit	sec	RO	
402327	Shutdowns_3_Msw_Rtc	u16bit	sec	RO	
402328	Shutdowns_3_Lsw_Rtc	u16bit	sec	RO	
402329	Shutdowns_4_Msw_Rtc	u16bit	sec	RO	
402330	Shutdowns_4_Lsw_Rtc	u16bit	sec	RO	

402331	Shutdowns_5_Msw_Rtc	u16bit	sec	RO	
402332	Shutdowns_5_Lsw_Rtc	u16bit	sec	RO	
402333	Shutdowns_6_Msw_Rtc	u16bit	sec	RO	
402334	Shutdowns_6_Lsw_Rtc	u16bit	sec	RO	
402335	Shutdowns_7_Msw_Rtc	u16bit	sec	RO	
402336	Shutdowns_7_Lsw_Rtc	u16bit	sec	RO	
402337	Shutdowns_8_Msw_Rtc	u16bit	sec	RO	
402338	Shutdowns_8_Lsw_Rtc	u16bit	sec	RO	
402339	Shutdowns_9_Msw_Rtc	u16bit	sec	RO	
402340	Shutdowns_9_Lsw_Rtc	u16bit	sec	RO	
402341	Shutdowns_10_Msw_Rtc	u16bit	sec	RO	
402342	Shutdowns_10_Lsw_Rtc	u16bit	sec	RO	
402343	Shutdowns_11_Msw_Rtc	u16bit	sec	RO	
402344	Shutdowns_11_Lsw_Rtc	u16bit	sec	RO	
402345	Shutdowns_12_Msw_Rtc	u16bit	sec	RO	
402346	Shutdowns_12_Lsw_Rtc	u16bit	sec	RO	
402347	Shutdowns_13_Msw_Rtc	u16bit	sec	RO	
402348	Shutdowns_13_Lsw_Rtc	u16bit	sec	RO	
402349	Shutdowns_14_Msw_Rtc	u16bit	sec	RO	
402350	Shutdowns_14_Lsw_Rtc	u16bit	sec	RO	
402351	Shutdowns_15_Msw_Rtc	u16bit	sec	RO	
402352	Shutdowns_15_Lsw_Rtc	u16bit	sec	RO	
402353	Shutdowns_16_Msw_Rtc	u16bit	sec	RO	
402354	Shutdowns_16_Lsw_Rtc	u16bit	sec	RO	
402355	Shutdowns_17_Msw_Rtc	u16bit	sec	RO	
402356	Shutdowns_17_Lsw_Rtc	u16bit	sec	RO	
402357	Shutdowns_18_msw_rtc	u16bit	sec	RO	
402358	Shutdowns_18_Lsw_Rtc	u16bit	sec	RO	
402359	Shutdowns_19_Msw_Rtc	u16bit	sec	RO	
402360	Shutdowns_19_Lsw_Rtc	u16bit	sec	RO	
402361	Event_0_Msw_Rtc	u16bit	sec	RO	Last 20 Event Snapshot time represented in real-time clock seconds (32 bit). Sorted newest to oldest.
402362	Event_0_Lsw_Rtc	u16bit	sec	RO	
402363	Event_1_Msw_Rtc	u16bit	sec	RO	
402364	Event_1_Lsw_Rtc	u16bit	sec	RO	
402365	Event_2_Msw_Rtc	u16bit	sec	RO	
402366	Event_2_Lsw_Rtc	u16bit	sec	RO	
402367	Event_3_Msw_Rtc	u16bit	sec	RO	
402368	Event_3_Lsw_Rtc	u16bit	sec	RO	
402369	Event_4_Msw_Rtc	u16bit	sec	RO	
402370	Event_4_Lsw_Rtc	u16bit	sec	RO	
402371	Event_5_Msw_Rtc	u16bit	sec	RO	
402372	Event_5_Lsw_Rtc	u16bit	sec	RO	
402373	Event_6_Msw_Rtc	u16bit	sec	RO	
402374	Event_6_Lsw_Rtc	u16bit	sec	RO	
402375	Event_7_Msw_Rtc	u16bit	sec	RO	
402376	Event_7_Lsw_Rtc	u16bit	sec	RO	
402377	Event_8_Msw_Rtc	u16bit	sec	RO	
402378	Event_8_Lsw_Rtc	u16bit	sec	RO	
402379	Event_9_Msw_Rtc	u16bit	sec	RO	
402380	Event_9_Lsw_Rtc	u16bit	sec	RO	
402381	Event_10_Msw_Rtc	u16bit	sec	RO	
402382	Event_10_Lsw_Rtc	u16bit	sec	RO	
402383	Event_11_Msw_Rtc	u16bit	sec	RO	
402384	Event_11_Lsw_Rtc	u16bit	sec	RO	
402385	Event_12_Msw_Rtc	u16bit	sec	RO	
402386	Event_12_Lsw_Rtc	u16bit	sec	RO	
402387	Event_13_Msw_Rtc	u16bit	sec	RO	
402388	Event_13_Lsw_Rtc	u16bit	sec	RO	
402389	Event_14_Msw_Rtc	u16bit	sec	RO	
402390	Event_14_Lsw_Rtc	u16bit	sec	RO	
402391	Event_15_Msw_Rtc	u16bit	sec	RO	
402392	Event_15_Lsw_Rtc	u16bit	sec	RO	
402393	Event_16_Msw_Rtc	u16bit	sec	RO	
402394	Event_16_Lsw_Rtc	u16bit	sec	RO	
402395	Event_17_Msw_Rtc	u16bit	sec	RO	
402396	Event_17_Lsw_Rtc	u16bit	sec	RO	
402397	Event_18_Msw_Rtc	u16bit	sec	RO	
402398	Event_18_Lsw_Rtc	u16bit	sec	RO	
402399	Event_19_Msw_Rtc	u16bit	sec	RO	
402400	Event_19_Lsw_Rtc	u16bit	sec	RO	

402401	Event_20_Msw_Rtc	u16bit	sec	RO	
402402	Event_20_Lsw_Rtc	u16bit	sec	RO	
402403	Event_21_Msw_Rtc	u16bit	sec	RO	
402404	Event_21_Lsw_Rtc	u16bit	sec	RO	
402405	Event_22_Msw_Rtc	u16bit	sec	RO	
402406	Event_22_Lsw_Rtc	u16bit	sec	RO	
402407	Event_23_Msw_Rtc	u16bit	sec	RO	
402408	Event_23_Lsw_Rtc	u16bit	sec	RO	
402409	Event_24_Msw_Rtc	u16bit	sec	RO	
402410	Event_24_Lsw_Rtc	u16bit	sec	RO	
402411	Event_25_Msw_Rtc	u16bit	sec	RO	
402412	Event_25_Lsw_Rtc	u16bit	sec	RO	
402413	Event_26_Msw_Rtc	u16bit	sec	RO	
402414	Event_26_Lsw_Rtc	u16bit	sec	RO	
402415	Event_27_Msw_Rtc	u16bit	sec	RO	
402416	Event_27_Lsw_Rtc	u16bit	sec	RO	
402417	Event_28_Msw_Rtc	u16bit	sec	RO	
402418	Event_28_Lsw_Rtc	u16bit	sec	RO	
402419	Event_29_Msw_Rtc	u16bit	sec	RO	
402420	Event_29_Lsw_Rtc	u16bit	sec	RO	
402421	Event_30_Msw_Rtc	u16bit	sec	RO	
402422	Event_30_Lsw_Rtc	u16bit	sec	RO	
402423	Event_31_Msw_Rtc	u16bit	sec	RO	
402424	Event_31_Lsw_Rtc	u16bit	sec	RO	
FAULT SNAPSHOT DATA AT TIME OF LAST SHUTDOWN FAULT					
402425	SS_AI_01	s16bit	*cfg	RO	Snapshot Scaled Analog Input 1 (Refer to configuration for engineering unit & data scale.)
402426	SS_AI_02	s16bit	*cfg	RO	Snapshot Scaled Analog Input 2
402427	SS_AI_03	s16bit	*cfg	RO	Snapshot Scaled Analog Input 3
402428	SS_AI_04	s16bit	*cfg	RO	Snapshot Scaled Analog Input 4
402429	SS_AI_05	s16bit	*cfg	RO	Snapshot Scaled Analog Input 5
402430	SS_AI_06	s16bit	*cfg	RO	Snapshot Scaled Analog Input 6
402431	SS_AI_07	s16bit	*cfg	RO	Snapshot Scaled Analog Input 7
402432	SS_AI_08	s16bit	*cfg	RO	Snapshot Scaled Analog Input 8
402433	SS_AI_09	s16bit	*cfg	RO	Snapshot Scaled Analog Input 9
402434	SS_AI_10	s16bit	*cfg	RO	Snapshot Scaled Analog Input 10
402435	SS_AI_11	s16bit	*cfg	RO	Snapshot Scaled Analog Input 11
402436	SS_AI_12	s16bit	*cfg	RO	Snapshot Scaled Analog Input 12
402437	SS_AI_13	s16bit	*cfg	RO	Snapshot Scaled MX5 Analog Input 1 or Calculated Differential 1
402438	SS_AI_14	s16bit	*cfg	RO	Snapshot Scaled MX5 Analog Input 2 or Calculated Differential 2
402439	SS_AI_15	s16bit	*cfg	RO	Snapshot Scaled MX5 Analog Input 3 or Calculated Differential 3
402440	SS_AI_16	s16bit	*cfg	RO	Snapshot Scaled MX5 Analog Input 4 or Calculated Differential 4
402441	SS_AI_17	s16bit	*cfg	RO	Snapshot Scaled MX5 Analog Input 5 or Calculated Differential 5
402442	SS_AI_18	s16bit	*cfg	RO	Snapshot Scaled MX5 Analog Input 6 or Calculated Differential 6
402443	SS_AI_19	s16bit	*cfg	RO	Snapshot Scaled MX5 Analog Input 7 or Calculated Differential 7
402444	SS_AI_20	s16bit	*cfg	RO	Snapshot Scaled MX5 Analog Input 8 or Calculated Differential 8
402567	SS_Pid_output_1	u16bit	%x100	RO	Snapshot Scaled Control Loop 1 Output as Analog Input Value (Refer to configuration for engineering unit & data scale.)
402568	SS_Pid_output_2	u16bit	%x100	RO	Snapshot Scaled Control Loop 2 Output as Analog Input Value
402569	SS_Pid_output_3	u16bit	%x100	RO	Snapshot Scaled Control Loop 3 Output as Analog Input Value
402570	SS_Pid_output_4	u16bit	%x100	RO	Snapshot Scaled Control Loop 4 Output as Analog Input Value
402571	SS_Pid_output_5	u16bit	%x100	RO	Snapshot Scaled Control Loop 5 Output as Analog Input Value
402572	SS_Pid_output_6	u16bit	%x100	RO	Snapshot Scaled Control Loop 6 Output as Analog Input Value
402573	SS_Pid_output_7	u16bit	%x100	RO	Snapshot Scaled Control Loop 7 Output as Analog Input Value
402574	SS_Pid_output_8	u16bit	%x100	RO	Snapshot Scaled Control Loop 8 Output as Analog Input Value
402575	SS_TI_01	s16bit	°C/ F	RO	Snapshot Scaled Temperature Input 1 (Refer to configuration for °C or °F scale.)
402576	SS_TI_02	s16bit	°C/ F	RO	Snapshot Scaled Temperature Input 2
402577	SS_TI_03	s16bit	°C/ F	RO	Snapshot Scaled Temperature Input 3
402578	SS_TI_04	s16bit	°C/ F	RO	Snapshot Scaled Temperature Input 4
402579	SS_TI_05	s16bit	°C/ F	RO	Snapshot Scaled Temperature Input 5
402580	SS_TI_06	s16bit	°C/ F	RO	Snapshot Scaled Temperature Input 6
402581	SS_TI_07	s16bit	°C/ F	RO	Snapshot Scaled Temperature Input 7
402582	SS_TI_08	s16bit	°C/ F	RO	Snapshot Scaled Temperature Input 8
402583	SS_TI_09	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 1
402584	SS_TI_10	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 2
402585	SS_TI_11	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 3
402586	SS_TI_12	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 4
402587	SS_TI_13	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 5
402588	SS_TI_14	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 6
402589	SS_TI_15	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 7

402590	SS_TI_16	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 8
402591	SS_TI_17	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 9
402592	SS_TI_18	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 10
402593	SS_TI_19	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 11
402594	SS_TI_20	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 12
402595	SS_TI_21	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 13
402596	SS_TI_22	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 14
402597	SS_TI_23	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 15
402598	SS_TI_24	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 16
402599	SS_TI_25	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 17
402600	SS_TI_26	s16bit	°C/ F	RO	Snapshot Scaled MX4 Temperature Input 18
402669	SS_Core_cold_junction	s16bit	°Fx10	RO	Snapshot core cold junction temperature
402670	SS_System_voltage	u16bit	Vx10	RO	Snapshot Scaled System Voltage Status
402671	SS_Expansion_rpm_filtered	u16bit	RPM	RO	Snapshot MX4/5 Averaged RPM Reading
402672	SS_Expansion_rpm	u16bit	RPM	RO	Snapshot MX4/5 raw RPM Reading
402673	SS_Core_rpm_filtered	u16bit	RPM	RO	Snapshot Averaged RPM Reading
402674	SS_Core_rpm	u16bit	RPM	RO	Snapshot raw RPM Reading
TRANSLATED/SCALED STATUS POLLING RANGE					
403001	DI_01_16	bitmap	bmp	RO	Digital input 1-16 Status (After NO/NC setting conversion a logical "1" means input is active/faulted to the controller, for raw status read 402001.)
403002	DI_17_32	bitmap	bmp	RO	Digital input 17-32 Status
403003	Reserved				
403004	Reserved				
403005	Reserved				
403006	Reserved				
403007	Reserved				
403008	AI_01	s16bit	*cfg	RO	Scaled Analog Input 1 (Refer to configuration for engineering unit & data scale.)
403009	AI_02	s16bit	*cfg	RO	Scaled Analog Input 2
403010	AI_03	s16bit	*cfg	RO	Scaled Analog Input 3
403011	AI_04	s16bit	*cfg	RO	Scaled Analog Input 4
403012	AI_05	s16bit	*cfg	RO	Scaled Analog Input 5
403013	AI_06	s16bit	*cfg	RO	Scaled Analog Input 6
403014	AI_07	s16bit	*cfg	RO	Scaled Analog Input 7
403015	AI_08	s16bit	*cfg	RO	Scaled Analog Input 8
403016	AI_09	s16bit	*cfg	RO	Scaled Analog Input 9
403017	AI_10	s16bit	*cfg	RO	Scaled Analog Input 10
403018	AI_11	s16bit	*cfg	RO	Scaled Analog Input 11
403019	AI_12	s16bit	*cfg	RO	Scaled Analog Input 12
403020	AI_13	s16bit	*cfg	RO	Scaled MX5 Analog Input 1 or Calculated Differential 1
403021	AI_14	s16bit	*cfg	RO	Scaled MX5 Analog Input 2 or Calculated Differential 2
403022	AI_15	s16bit	*cfg	RO	Scaled MX5 Analog Input 3 or Calculated Differential 3
403023	AI_16	s16bit	*cfg	RO	Scaled MX5 Analog Input 4 or Calculated Differential 4
403024	AI_17	s16bit	*cfg	RO	Scaled MX5 Analog Input 5 or Calculated Differential 5
403025	AI_18	s16bit	*cfg	RO	Scaled MX5 Analog Input 6 or Calculated Differential 6
403026	AI_19	s16bit	*cfg	RO	Scaled MX5 Analog Input 7 or Calculated Differential 7
403027	AI_20	s16bit	*cfg	RO	Scaled MX5 Analog Input 8 or Calculated Differential 8
403142	Pid_output_1	u16bit	%x100	RO	Scaled Control Loop 1 Output as Analog Input Value (Refer to configuration for engineering unit & data scale.)
403143	Pid_output_2	u16bit	%x100	RO	Scaled Control Loop 2 Output as Analog Input Value
403144	Pid_output_3	u16bit	%x100	RO	Scaled Control Loop 3 Output as Analog Input Value
403145	Pid_output_4	u16bit	%x100	RO	Scaled Control Loop 4 Output as Analog Input Value
403146	Pid_output_5	u16bit	%x100	RO	Scaled Control Loop 5 Output as Analog Input Value
403147	Pid_output_6	u16bit	%x100	RO	Scaled Control Loop 6 Output as Analog Input Value
403148	Pid_output_7	u16bit	%x100	RO	Scaled Control Loop 7 Output as Analog Input Value
403149	Pid_output_8	u16bit	%x100	RO	Scaled Control Loop 8 Output as Analog Input Value
403150	Reserved				
403151	Reserved				
403152	Reserved				
403153	Reserved				
403154	Reserved				
403155	Reserved				
403156	Reserved				
403157	Reserved				
403158	TI_01	s16bit	°C/ F	RO	Scaled Temperature Input 1 (Refer to configuration for °C or °F scale.)
403159	TI_02	s16bit	°C/ F	RO	Scaled Temperature Input 2
403160	TI_03	s16bit	°C/ F	RO	Scaled Temperature Input 3
403161	TI_04	s16bit	°C/ F	RO	Scaled Temperature Input 4
403162	TI_05	s16bit	°C/ F	RO	Scaled Temperature Input 5
403163	TI_06	s16bit	°C/ F	RO	Scaled Temperature Input 6

403164	TI_07	s16bit	°C/ F	RO	Scaled Temperature Input 7
403165	TI_08	s16bit	°C/ F	RO	Scaled Temperature Input 8
403166	TI_09	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 1
403167	TI_10	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 2
403168	TI_11	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 3
403169	TI_12	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 4
403170	TI_13	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 5
403171	TI_14	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 6
403172	TI_15	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 7
403173	TI_16	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 8
403174	TI_17	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 9
403175	TI_18	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 10
403176	TI_19	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 11
403177	TI_20	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 12
403178	TI_21	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 13
403179	TI_22	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 14
403180	TI_23	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 15
403181	TI_24	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 16
403182	TI_25	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 17
403183	TI_26	s16bit	°C/ F	RO	Scaled MX4 Temperature Input 18
403252	Core_cj_temp	s16bit	°Fx10	RO	Cold junction temperature on the core board
403253	System_voltage	u16bit	Vx10	RO	Scaled System Voltage Status
403254	Expansion_rpm_filtered	u16bit	RPM	RO	MX4/5 Averaged RPM Reading
403255	Expansion_rpm	u16bit	RPM	RO	MX4/5 raw RPM Reading
403256	Core_rpm_filtered	u16bit	RPM	RO	Averaged RPM Reading
403257	Core_rpm	u16bit	RPM	RO	Raw RPM Reading
403258	DO_1_10	bitmap	bmp	RO	Digital Output 1-10 Status (After NO/NC setting conversion *a logical "1" means output true to the controller, for raw status read 402258.)
403259	Expansion_DO_1_16	bitmap	bmp	RO	MX5 Digital Output 1-6 Status (After NO/NC setting conversion *a logical "1" means output true to the controller, for raw status read 402259.)
403260	Reserved				
403261	Analog_output_01	u16bit	%x100	RO	Analog Output 1 Status
403262	Analog_output_02	u16bit	%x100	RO	Analog Output 2 Status
403263	Analog_output_03	u16bit	%x100	RO	Analog Output 3 Status
403264	Analog_output_04	u16bit	%x100	RO	Analog Output 4 Status
403265	Analog_output_05	u16bit	%x100	RO	MX5 Analog Output 1 Status
403266	Analog_output_06	u16bit	%x100	RO	MX5 Analog Output 2 Status
403267	Analog_output_07	u16bit	%x100	RO	MX5 Analog Output 3 Status
403268	Analog_output_08	u16bit	%x100	RO	MX5 Analog Output 4 Status
DIGITAL INPUT POLARITY STATUS					
403286	DI01_02_state	2-byte	byte	RO	Digital Input raw state 1 byte per input 0= DC-, 1=DC+, 2=OPEN
403287	DI03_04_state	2-byte	byte	RO	
403288	DI05_06_state	2-byte	byte	RO	
403289	DI07_08_state	2-byte	byte	RO	
403290	DI09_10_state	2-byte	byte	RO	
403291	DI11_12_state	2-byte	byte	RO	
403292	DI13_14_state	2-byte	byte	RO	
403293	DI15_16_state	2-byte	byte	RO	
403294	DI17_18_state	2-byte	byte	RO	
403295	DI19_20_state	2-byte	byte	RO	
403296	DI21_22_state	2-byte	byte	RO	
403297	DI23_24_state	2-byte	byte	RO	
403298	DI25_26_state	2-byte	byte	RO	
403299	DI27_28_state	2-byte	byte	RO	
403300	DI29_30_state	2-byte	byte	RO	
403301	DI31_32_state	2-byte	byte	RO	

ROD LOAD READINGS					
403336	Throw1_compression_msw	s32bit	lbs/N	RO	Rod load calculated readings in lbs-force or Newtons based on configuration setting
403337	Throw1_compression_lsw				
403338	Throw1_tension_msw	s32bit	lbs/N	RO	
403339	Throw1_tension_lsw				
403340	Throw2_compression_msw	s32bit	lbs/N	RO	
403341	Throw2_compression_lsw				
403342	Throw2_tension_msw	s32bit	lbs/N	RO	
403343	Throw2_tension_lsw				
403344	Throw3_compression_msw	s32bit	lbs/N	RO	
403345	Throw3_compression_lsw				
403346	Throw3_tension_msw	s32bit	lbs/N	RO	
403347	Throw3_tension_lsw				
403348	Throw4_compression_msw	s32bit	lbs/N	RO	
403349	Throw4_compression_lsw				
403350	Throw4_tension_msw	s32bit	lbs/N	RO	
403351	Throw4_tension_lsw				
403352	Throw5_compression_msw	s32bit	lbs/N	RO	
403353	Throw5_compression_lsw				
403354	Throw5_tension_msw	s32bit	lbs/N	RO	
403355	Throw5_tension_lsw				
403356	Throw6_compression_msw	s32bit	lbs/N	RO	
403357	Throw6_compression_lsw				
403358	Throw6_tension_msw	s32bit	lbs/N	RO	
403359	Throw6_tension_lsw				
SETPOINT DATA-CONFIGURATION FILE DATA					
406269	Pid_1_setpoint	s16bit	*cfg	RW	Control Loop 1 Setpoint
406270	Pid_1_deadband	u16bit	*cfg	RW	Control Loop 1 Deadband
406284	Pid_2_setpoint	s16bit	*cfg	RW	Control Loop 2 Setpoint
406285	Pid_2_deadband	u16bit	*cfg	RW	Control Loop 2 Deadband
406299	Pid_3_setpoint	s16bit	*cfg	RW	Control Loop 3 Setpoint
406300	Pid_3_deadband	u16bit	*cfg	RW	Control Loop 3 Deadband
406314	Pid_4_setpoint	s16bit	*cfg	RW	Control Loop 4 Setpoint
406315	Pid_4_deadband	u16bit	*cfg	RW	Control Loop 4 Deadband
406329	Pid_5_setpoint	s16bit	*cfg	RW	Control Loop 5 Setpoint
406330	Pid_5_deadband	u16bit	*cfg	RW	Control Loop 5 Deadband
406344	Pid_6_setpoint	s16bit	*cfg	RW	Control Loop 6 Setpoint
406345	Pid_6_deadband	u16bit	*cfg	RW	Control Loop 6 Deadband
406359	Pid_7_setpoint	s16bit	*cfg	RW	Control Loop 7 Setpoint
406360	Pid_7_deadband	u16bit	*cfg	RW	Control Loop 7 Deadband
406374	Pid_8_setpoint	s16bit	*cfg	RW	Control Loop 8 Setpoint
406375	Pid_8_deadband	u16bit	*cfg	RW	Control Loop 8 Deadband
406616	Cooldown_rpm	u16bit	RPM	RW	Throttle Control Cooldown RPM Setpoint
406617	Warmup_rpm	u16bit	RPM	RW	Throttle Control Warmup RPM Setpoint
406618	Wait_for_load_rpm	u16bit	RPM	RW	Throttle Control Wait For Load RPM Setpoint
406619	Run_loaded_rpm	u16bit	RPM	RW	Throttle Control Run Loaded RPM Setpoint
407624	Setpoint_001	s16bit	*cfg	RW	Setpoint 1-192 Data (Refer to Centurion configuration report for description, units and decimals.)
407625	Setpoint_002	s16bit	*cfg	RW	
407626	Setpoint_003	s16bit	*cfg	RW	
407627	Setpoint_004	s16bit	*cfg	RW	
407628	Setpoint_005	s16bit	*cfg	RW	
407629	Setpoint_006	s16bit	*cfg	RW	
407630	Setpoint_007	s16bit	*cfg	RW	
407631	Setpoint_008	s16bit	*cfg	RW	
407632	Setpoint_009	s16bit	*cfg	RW	
407633	Setpoint_010	s16bit	*cfg	RW	
407634	Setpoint_011	s16bit	*cfg	RW	
407635	Setpoint_012	s16bit	*cfg	RW	
407636	Setpoint_013	s16bit	*cfg	RW	
407637	Setpoint_014	s16bit	*cfg	RW	
407638	Setpoint_015	s16bit	*cfg	RW	
407639	Setpoint_016	s16bit	*cfg	RW	
407640	Setpoint_017	s16bit	*cfg	RW	
407641	Setpoint_018	s16bit	*cfg	RW	
407642	Setpoint_019	s16bit	*cfg	RW	
407643	Setpoint_020	s16bit	*cfg	RW	
407644	Setpoint_021	s16bit	*cfg	RW	

407645	Setpoint_022	s16bit	*cfg	RW	
407646	Setpoint_023	s16bit	*cfg	RW	
407647	Setpoint_024	s16bit	*cfg	RW	
407648	Setpoint_025	s16bit	*cfg	RW	
407649	Setpoint_026	s16bit	*cfg	RW	
407650	Setpoint_027	s16bit	*cfg	RW	
407651	Setpoint_028	s16bit	*cfg	RW	
407652	Setpoint_029	s16bit	*cfg	RW	
407653	Setpoint_030	s16bit	*cfg	RW	
407654	Setpoint_031	s16bit	*cfg	RW	
407655	Setpoint_032	s16bit	*cfg	RW	
407656	Setpoint_033	s16bit	*cfg	RW	
407657	Setpoint_034	s16bit	*cfg	RW	
407658	Setpoint_035	s16bit	*cfg	RW	
407659	Setpoint_036	s16bit	*cfg	RW	
407660	Setpoint_037	s16bit	*cfg	RW	
407661	Setpoint_038	s16bit	*cfg	RW	
407662	Setpoint_039	s16bit	*cfg	RW	
407663	Setpoint_040	s16bit	*cfg	RW	
407664	Setpoint_041	s16bit	*cfg	RW	
407665	Setpoint_042	s16bit	*cfg	RW	
407666	Setpoint_043	s16bit	*cfg	RW	
407667	Setpoint_044	s16bit	*cfg	RW	
407668	Setpoint_045	s16bit	*cfg	RW	
407669	Setpoint_046	s16bit	*cfg	RW	
407670	Setpoint_047	s16bit	*cfg	RW	
407671	Setpoint_048	s16bit	*cfg	RW	
407672	Setpoint_049	s16bit	*cfg	RW	
407673	Setpoint_050	s16bit	*cfg	RW	
407674	Setpoint_051	s16bit	*cfg	RW	
407675	Setpoint_052	s16bit	*cfg	RW	
407676	Setpoint_053	s16bit	*cfg	RW	
407677	Setpoint_054	s16bit	*cfg	RW	
407678	Setpoint_055	s16bit	*cfg	RW	
407679	Setpoint_056	s16bit	*cfg	RW	
407680	Setpoint_057	s16bit	*cfg	RW	
407681	Setpoint_058	s16bit	*cfg	RW	
407682	Setpoint_059	s16bit	*cfg	RW	
407683	Setpoint_060	s16bit	*cfg	RW	
407684	Setpoint_061	s16bit	*cfg	RW	
407685	Setpoint_062	s16bit	*cfg	RW	
407686	Setpoint_063	s16bit	*cfg	RW	
407687	Setpoint_064	s16bit	*cfg	RW	
407688	Setpoint_065	s16bit	*cfg	RW	
407689	Setpoint_066	s16bit	*cfg	RW	
407690	Setpoint_067	s16bit	*cfg	RW	
407691	Setpoint_068	s16bit	*cfg	RW	
407692	Setpoint_069	s16bit	*cfg	RW	
407693	Setpoint_070	s16bit	*cfg	RW	
407694	Setpoint_071	s16bit	*cfg	RW	
407695	Setpoint_072	s16bit	*cfg	RW	
407696	Setpoint_073	s16bit	*cfg	RW	
407697	Setpoint_074	s16bit	*cfg	RW	
407698	Setpoint_075	s16bit	*cfg	RW	
407699	Setpoint_076	s16bit	*cfg	RW	
407700	Setpoint_077	s16bit	*cfg	RW	
407701	Setpoint_078	s16bit	*cfg	RW	
407702	Setpoint_079	s16bit	*cfg	RW	
407703	Setpoint_080	s16bit	*cfg	RW	
407704	Setpoint_081	s16bit	*cfg	RW	
407705	Setpoint_082	s16bit	*cfg	RW	
407706	Setpoint_083	s16bit	*cfg	RW	
407707	Setpoint_084	s16bit	*cfg	RW	
407708	Setpoint_085	s16bit	*cfg	RW	
407709	Setpoint_086	s16bit	*cfg	RW	
407710	Setpoint_087	s16bit	*cfg	RW	
407711	Setpoint_088	s16bit	*cfg	RW	
407712	Setpoint_089	s16bit	*cfg	RW	
407713	Setpoint_090	s16bit	*cfg	RW	
407714	Setpoint_091	s16bit	*cfg	RW	
407715	Setpoint_092	s16bit	*cfg	RW	

407716	Setpoint_093	s16bit	*cfg	RW	
407717	Setpoint_094	s16bit	*cfg	RW	
407718	Setpoint_095	s16bit	*cfg	RW	
407719	Setpoint_096	s16bit	*cfg	RW	
407720	Setpoint_097	s16bit	*cfg	RW	
407721	Setpoint_098	s16bit	*cfg	RW	
407722	Setpoint_099	s16bit	*cfg	RW	
407723	Setpoint_100	s16bit	*cfg	RW	
407724	Setpoint_101	s16bit	*cfg	RW	
407725	Setpoint_102	s16bit	*cfg	RW	
407726	Setpoint_103	s16bit	*cfg	RW	
407727	Setpoint_104	s16bit	*cfg	RW	
407728	Setpoint_105	s16bit	*cfg	RW	
407729	Setpoint_106	s16bit	*cfg	RW	
407730	Setpoint_107	s16bit	*cfg	RW	
407731	Setpoint_108	s16bit	*cfg	RW	
407732	Setpoint_109	s16bit	*cfg	RW	
407733	Setpoint_110	s16bit	*cfg	RW	
407734	Setpoint_111	s16bit	*cfg	RW	
407735	Setpoint_112	s16bit	*cfg	RW	
407736	Setpoint_113	s16bit	*cfg	RW	
407737	Setpoint_114	s16bit	*cfg	RW	
407738	Setpoint_115	s16bit	*cfg	RW	
407739	Setpoint_116	s16bit	*cfg	RW	
407740	Setpoint_117	s16bit	*cfg	RW	
407741	Setpoint_118	s16bit	*cfg	RW	
407742	Setpoint_119	s16bit	*cfg	RW	
407743	Setpoint_120	s16bit	*cfg	RW	
407744	Setpoint_121	s16bit	*cfg	RW	
407745	Setpoint_122	s16bit	*cfg	RW	
407746	Setpoint_123	s16bit	*cfg	RW	
407747	Setpoint_124	s16bit	*cfg	RW	
407748	Setpoint_125	s16bit	*cfg	RW	
407749	Setpoint_126	s16bit	*cfg	RW	
407750	Setpoint_127	s16bit	*cfg	RW	
407751	Setpoint_128	s16bit	*cfg	RW	
407752	Setpoint_129	s16bit	*cfg	RW	
407753	Setpoint_130	s16bit	*cfg	RW	
407754	Setpoint_131	s16bit	*cfg	RW	
407755	Setpoint_132	s16bit	*cfg	RW	
407756	Setpoint_133	s16bit	*cfg	RW	
407757	Setpoint_134	s16bit	*cfg	RW	
407758	Setpoint_135	s16bit	*cfg	RW	
407759	Setpoint_136	s16bit	*cfg	RW	
407760	Setpoint_137	s16bit	*cfg	RW	
407761	Setpoint_138	s16bit	*cfg	RW	
407762	Setpoint_139	s16bit	*cfg	RW	
407763	Setpoint_140	s16bit	*cfg	RW	
407764	Setpoint_141	s16bit	*cfg	RW	
407765	Setpoint_142	s16bit	*cfg	RW	
407766	Setpoint_143	s16bit	*cfg	RW	
407767	Setpoint_144	s16bit	*cfg	RW	
407768	Setpoint_145	s16bit	*cfg	RW	
407769	Setpoint_146	s16bit	*cfg	RW	
407770	Setpoint_147	s16bit	*cfg	RW	
407771	Setpoint_148	s16bit	*cfg	RW	
407772	Setpoint_149	s16bit	*cfg	RW	
407773	Setpoint_150	s16bit	*cfg	RW	
407774	Setpoint_151	s16bit	*cfg	RW	
407775	Setpoint_152	s16bit	*cfg	RW	
407776	Setpoint_153	s16bit	*cfg	RW	
407777	Setpoint_154	s16bit	*cfg	RW	
407778	Setpoint_155	s16bit	*cfg	RW	
407779	Setpoint_156	s16bit	*cfg	RW	
407780	Setpoint_157	s16bit	*cfg	RW	
407781	Setpoint_158	s16bit	*cfg	RW	
407782	Setpoint_159	s16bit	*cfg	RW	
407783	Setpoint_160	s16bit	*cfg	RW	
407784	Setpoint_161	s16bit	*cfg	RW	
407785	Setpoint_162	s16bit	*cfg	RW	
407786	Setpoint_163	s16bit	*cfg	RW	

407787	Setpoint_164	s16bit	*cfg	RW	
407788	Setpoint_165	s16bit	*cfg	RW	
407789	Setpoint_166	s16bit	*cfg	RW	
407790	Setpoint_167	s16bit	*cfg	RW	
407791	Setpoint_168	s16bit	*cfg	RW	
407792	Setpoint_169	s16bit	*cfg	RW	
407793	Setpoint_170	s16bit	*cfg	RW	
407794	Setpoint_171	s16bit	*cfg	RW	
407795	Setpoint_172	s16bit	*cfg	RW	
407796	Setpoint_173	s16bit	*cfg	RW	
407797	Setpoint_174	s16bit	*cfg	RW	
407798	Setpoint_175	s16bit	*cfg	RW	
407799	Setpoint_176	s16bit	*cfg	RW	
407800	Setpoint_177	s16bit	*cfg	RW	
407801	Setpoint_178	s16bit	*cfg	RW	
407802	Setpoint_179	s16bit	*cfg	RW	
407803	Setpoint_180	s16bit	*cfg	RW	
407804	Setpoint_181	s16bit	*cfg	RW	
407805	Setpoint_182	s16bit	*cfg	RW	
407806	Setpoint_183	s16bit	*cfg	RW	
407807	Setpoint_184	s16bit	*cfg	RW	
407808	Setpoint_185	s16bit	*cfg	RW	
407809	Setpoint_186	s16bit	*cfg	RW	
407810	Setpoint_187	s16bit	*cfg	RW	
407811	Setpoint_188	s16bit	*cfg	RW	
407812	Setpoint_189	s16bit	*cfg	RW	
407813	Setpoint_190	s16bit	*cfg	RW	
407814	Setpoint_191	s16bit	*cfg	RW	
407815	Setpoint_192	s16bit	*cfg	RW	

3.0 Modbus RTU Application Addendum:

- 3.1 Note that the Centurion Modbus Map does not change from application to application; however, the configuration file does change, therefore additional information about the configuration is required to decode the Modbus Holding Register information.
- 3.2 Sequence of Operation = A document that describes the operation of the Centurion as it was configured for your application. Each Centurion system is custom configured and has custom events, setpoints and process data points. The information contained in the Modbus registers requires a Sequence of Operation to describe the data points and event enumerations correctly.
 - 3.2.1 Bit = a single binary digit, can be 0 or 1
 - 3.2.2 Word = group of 16 bits
 - 3.2.3 Signed Integer = a whole number value made of 15 bits with the sign bit at the MSB position. Range = -32767 to 32767
 - 3.2.4 Unsigned Integer = a whole number value made of 16 bits. Range = 0 to 65535
 - 3.2.5 Signed Long = a whole number value made of 31 bits with the sign bit at the MSB position. Range = -2,147,483,648 to 2,147,483,647
 - 3.2.6 Unsigned Long = a whole number value made of 32 bits. Range = 0 to 4,294,967,295
 - 3.2.7 LSB = Least significant bit in a word, bit 1, this holds a bit value of 1.
 - 3.2.8 MSB = Most significant bit in a word, bit 16, this holds a bit value of 32768.
 - 3.2.9 MSW = Most significant word, used to describe upper half of a long.
 - 3.2.10 LSW = Least significant word, used to describe lower half of a long.
- 3.3 Examination of Bits within a 16 bit unsigned word:
 - 3.3.1 Some Modbus Holding Registers in the Centurion contain bitmapped information showing the status of individual bits within a 16 bit Modbus Holding register.
 - 3.3.2 To pick out the individual bits, some PLC, HMI and SCADA packages allow bit-level addressing to see the individual bits (refer to the user guides for the product).
 - 3.3.3 In addition, most PLC, HMI and SCADA packages have a function called "bitwise AND". Using this function, the bits or group of bits within a word can be picked out easily using a mask that allows the bit position you wish to see to pass through and ignore the other bits.

- 3.3.4 To do this, turn off all the unwanted bits using the bitwise AND function. Then compare the value with 0. If it is equal to 0, then the bit was off, but if the value is any other value, then the bit was on. What makes this convenient is that it is not necessary to figure out what the value actually is, just that it is not 0 (like example 1 below). If groups of bits are wanted, then it is possible to mask out bits (like the MSB in example 2 below).

Example 1: Querying the status of the 16th bit (ignore bits 1-15), 2 cases shown

```
(Case 1, B16 on) (Case 2, B16 off)
1001110110101101 1001110110101101 (data read in Centurion)
AND 1000000000000000 1000000000000000 (mask that passes bit 16)
= 1000000000000000 0000000000000000 (result of the operation)
```

Example 2: Querying the status of the bits 1-15 (ignore bit 16), 2 cases shown

```
(Case 1, B16 on) (Case 2, B16 off)
1001110110101101 0001110110101101 (data read in Centurion)
AND 0111111111111111 0111111111111111 (mask that passes bits 1-15)
= 0001110110101101 0001110110101101 (result of the operation)
```

- 3.3.5 Alternate methods of masking are possible but require additional testing of the value. For example, it may be possible to get a result similar to example 2 above by simply reading the value as an unsigned integer and subtracting 32768. This removes the MSB from the result, if it was a 1. However, if it originally was 0, then this would result in a negative answer (not possible, since the alarm code is a number between 0 and 206). So the subtraction must be conditional on the register value being greater than 206 or else no subtraction is required.

3.4 Examination of Longs:

- 3.4.1 Modbus RTU Holding registers each contain only 16 bits.
- 3.4.2 In order to represent a 32 bit number, 2 consecutive registers are used with the first register address representing the MSW and the subsequent address representing the LSW.
- 3.4.3 The most common example of this use is when representing the Centurion's Run Hourmeter counter which is stored as an unsigned long in the controller.
- 400119 contains the MSW of the Run Hourmeter counter (in seconds).
400120 contains the LSW of the Run Hourmeter counter (in seconds).
To calculate the actual time in seconds, the 2 words must be joined to create a 32 bit number. There are several methods that can be used, depending on the options in the PLC, HMI or SCADA package; one may be preferred over the other.
- 3.4.4 Read as 32-bit option Method: Some packages allow the data to be read as a 32 bit number (long), so simply address the first register, 400119 in this example, and the polling software will automatically request the next register 400120. (Refer to the user guides for the product to see if this is an option.)
(Brackets indicate the data read as unsigned integer.)

Mathematical Method: (_400119 x 65536) + _400120 = run hourmeter seconds.
Bit shift Left Method: (_400119 << 16) + _400120 = run hourmeter seconds.

- 3.4.5 If wanted, dividing the seconds by 3600 will give the run hourmeter in hours.

3.5 Shutdowns/Alarms/Message Events:

- 3.5.1 The Centurion controller keeps track of shutdowns, alarms and message-only type event messages as a numeric value between 1 and 206. This value can be read as an integer number in various areas of the Modbus Holding Register map depending on the type of event configured in the controller.
- 3.5.2 Shutdown Event = a condition that triggers the controller to advance to the shut-down state and stop the driven equipment. This also triggers the fault shut-down output in the configuration to be active and will show a pop-up message on the Centurion display. This type of event latched true and requires a reset to clear. Only one shut-down event can be latched at any time (in a firstout fashion).
- 3.5.3 Alarm Event-Self Resetting = a condition that triggers the alarm annunciation output in the configuration to be active. This also triggers a pop-up message on the Centurion display. No state change is triggered in the controller. When the alarm event is no longer true, the pop-up message will be cleared from the display, and the alarm annunciation output in the configuration will be de-activated. Multiple alarms are possible, up to 32.
- 3.5.4 Alarm Event-Requires Acknowledgement = a condition that triggers the alarm annunciation output in the configuration to be active. This also triggers a pop-up message on the Centurion display. No state change is triggered in the controller. While the alarm event is true, a musical note appears next to the alarm message. If the alarm event is false, the message will remain on the display; however, the music note will be absent, and the alarm annunciation output in the configuration will remain active. This type of event is latched true and requires an ACK key press to clear. Multiple alarms are possible, up to 32.
- 3.5.5 Message Event = a condition that triggers a pop-up message on the Centurion display. No state change is triggered in the controller. This type of event is always self-resetting and will clear when the condition is no longer true. Multiple events are possible, up to 32.

3.6 Shutdowns/Alarms/Message Events over Modbus:

- 3.6.1 SHUTDOWNS: There are several places in the map to get information about fault shutdown status. Note that you do not have to use all of the options below, but all are offered as options depending on how much information you wish to receive. Below is a description of each.
- 3.6.2 400107 (BIT 1) = bit that shows any shutdown (non-ESD type) is active or not active.
- 3.6.3 400107 (BIT 2) = bit that shows any ESD type shutdown is active or not active.
- 3.6.4 400191 = 16-bit unsigned integer showing the cause of fault (**firstout**) shut-down event. Only events configured as fault shutdowns can appear in this register. A "0" means that no shut-down fault is active.
- 3.6.5 400401 – 400460 = Log of last 20 shutdowns with hourmeter timestamp of each. Only events configured as fault shutdowns can be recorded in this log.

400401 = MSW of hourmeter seconds at time of most recent shutdown.
400402 = LSW of hourmeter seconds at time of most recent shutdown.
400403 = 16-bit unsigned integer showing the most recent shut-down event. Only events configured as shutdowns (non ESD or ESD) can appear in this register. This will be a number between 1 and 128. A "0" means that no shut-down fault has been recorded.
This pattern of 3 registers repeats until the 20th is recorded.

3.7 ALARMS: Since there can be up to 32 simultaneous alarms, reading the alarms requires a combination of register information. Below is a description of each.

- 3.7.1 400192 = Number of active alarms. This is an integer value stating how many alarms are active at any moment. A zero represents that no alarms are active.
- 3.7.2 400255 through 400286 = up to 32 active alarm integers and acknowledge status. The most recent alarm to go active will be at 400255, and the older alarms will follow. A zero represents that no alarm has been recorded active in this register.
 - 3.7.2.1 Bits 1-15 of each register contain the actual integer code of the alarm event (this will be a number between 1 and 128 matching the alarm event number in the Sequence of Operation). **See section 3.3 for information about bit masking.**
 - 3.7.2.2 Bit 16 of each register represents the Acknowledge status for the alarm. A 1 in this position indicates no acknowledgement has occurred. A 0 in this position indicates that the alarm has been acknowledged. **See section 3.3 for information about bit masking.**

3.8 EVENTS: All events (Shutdowns, Alarms and Message only) are recorded in a historical log as a 16-bit unsigned integer with a run hourmeter timestamp. Note that it is impossible to distinguish here whether an event is of one type or another. This is simply a log of events.

(Note: When the controller is placed in TEST mode to test shut-down faults without causing a shutdown, this is where the tested fault messages will appear. The tested faults will not populate the Shut-down log.)

- 3.8.1 400501 through 400596 = Log of last 32 events and run hourmeter timestamp. The most recent event information will be at 400501, 400502 and 400503, and the older alarms will follow. A zero represents that no event has been recorded active in this register.

400501 = MSW of hourmeter seconds at time of most recent event.
400502 = LSW of hourmeter seconds at time of most recent event.
400503 = 16-bit unsigned integer showing the most recent event. This will be a number between 1 and 128. A "0" means that no event has been recorded.
This pattern of 3 registers repeats until the 32nd is recorded.

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