APPENDIX B • MODBUS™ COMMUNICATION

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APPENDIX B • MODBUS™ COMMUNICATION

Introduction

General Overview

An optional feature of the DGC-2020 performs Modbus™ communications by emulating a subset of the Modicon 984 Programmable Controller. This document describes the Modbus communications protocol employed by the DGC-2020 and how to exchange information with the DGC-2020 over a Modbus network.

The DGC-2020 maps all parameters into the Modicon 984 Holding Register address space (4XXXX). Refer to *MAPPING - DGC 2020 Parameters into MODICON ADDRESS SPACE* in this section.

Note

Legacy Registers: The 40XXX registers are identical to the data that was present in the DGC-500 and DGC-1000 products. This allows the DGC-2020 to work seamlessly in Modbus applications where it is replacing a DGC-500 or DGC-1000. The 42XXX registers contain all information included in the DGC-2020 and should be used for any new Modbus applications."

Intended Use of the Communications Protocol

This document provides the necessary information for 3rd party OEMs to develop in-house software to communicate with the DGC-2020 via Modbus protocol. This will allow the exchange of setup information and measured data between a Modbus Master Station and the DGC-2020.

The DGC-2020 data supported for remote access is listed in *MAPPING - DGC 2020 Parameters into MODICON ADDRESS SPACE* in this section.

Detailed Description of DGC-2020 Modbus™ Protocol

Modbus™ Protocol Overview

Modbus communications use a master-slave technique in which only the master can initiate a transaction, called a query. The slave addressed by the query will respond by either supplying the requested data to the master or by performing the requested action. A slave device never initiates communications on the Modbus, and will always generate a response to the query unless certain error conditions occur. The DGC-2020 is designed to communicate on the Modbus only as a slave device.

A master can query slaves individually or query all slaves collectively by initiating a broadcast message. A slave does not send a response message to a broadcast query.

If a query requests actions unable to be performed by the slave, the slave response message will contain an Exception Response Code defining the error detected.

Query and response messages share the same message structure. Each message is comprised of four message fields: the Device Address, the Function Code, the Data Block, and the Error Check field. Subsequent sections in this document detail each message field and the corresponding functionality supported by the DGC-2020.

Query / Response Message Structure:

- Device Address
- Function Code
- Eight-Bit Data Bytes
- Error Check

Device Address Field

The Device Address field contains the unique Modbus address of the slave being queried. The addressed slave will repeat its address in the Device Address field of the response message. This field is 1 byte.

Function Code Field

The Function Code field in the Query message defines the action to be taken by the addressed slave. This field is echoed in the Response message, and will be altered by setting the MSB of the field to "1" if the response is an error response. This field is 1 byte.

Data Block Field

The query Data block contains additional information needed by the slave to perform the requested function. The response Data block contains data collected by the slave for the queried function. An error response will substitute an Exception Response Code for the Data Block. The length of this field varies with each query.

Error Check Field

The Error Check field provides a method for the slave to validate the integrity of the query message contents and allows the master to confirm the validity of response message contents. This field is 2 bytes.

Serial Transmission Details

A standard Modbus network offers 2 transmission modes for communication: ASCII or RTU. The DGC-2020 supports only the RTU (Remote Terminal Unit) mode.

Each 8-bit byte in a message contains two 4-bit hexadecimal characters. The message is transmitted in a continuous stream with the LSB of each byte of data transmitted first. Transmission of each 8-bit data byte occurs with 1 start bit and 1 stop bit. A ninth data bit is added when parity is selected. Parity checking is user-configurable to even, odd or none. The transmission baud rate is also user-configurable, and both parity and baud rate can be altered during real-time operation. If altered, the new baud rate and / or parity will not be enforced until the response message to the current query has completed. The DGC-2020 supported baud rates are 9600, 4800, 2400, and 1200.

Message Framing / Timing Considerations

When receiving a message, the DGC-2020 will allow maximum inter-byte latency up to 3.5 - 4.0 character times before considering the message complete.

Once a valid query is received, the DGC-2020 waits 10 msec. before responding.

Error Handling and Exception Responses

Any query received that contains a non-existent device address, a framing error or CRC error will be ignored - no response will be transmitted. Queries addressed to a DGC-2020 with an unsupported function code, unsupported register references, or illegal values in the data block will result in an error response message with an Exception Response Code. The Exception Response codes supported by the DGC-2020 are listed in Table B-1.

Table B-1. Exception Response Codes

Code	Name	Meaning
01	Illegal Function	The query Function/Subfunction Code is unsupported; query read of more than 125 registers; query preset of more than 100 registers
02	Illegal Data Address	A register referenced in the data block does not support queried read/write; query preset of a subset of a numerical register group.
03	Illegal Data Value	A preset register data block contains an incorrect number of bytes or one or more data values out of range.

Detailed DGC-2020 Message Definition

Device Address

The DGC-2020 Device Address can be any value in the Modbus protocol Device Address range (1 - 247). A query with a Device Address of 0 signifies a Broadcast message to all slaves - the connected DGC-2020s will not respond to the broadcast query.

Function Code and Data Block

The DGC-2020 maps all parameters into the Modicon 984 Holding Register address space (4XXXX) and supports the following Function Codes:

- Function 03 - Read Holding Registers
- Function 6 - Preset Single Register, Non-Broadcast & Broadcast
- Function 08, Subfunction 00 - Diagnostics: Return Query Data
- Function 16 - Preset Multiple Registers, Non-Broadcast & Broadcast

The only Broadcast query supported by the DGC-2020 is the Preset Multiple Registers query.

Read Holding Registers

Read Holding Registers - General

QUERY:

This query message requests a register or block of registers to be read. The data block contains the starting register address and the quantity of registers to be read. A register address of N will read Holding Register N+1.

Device Address
Function Code 03 (hex)
Starting Address Hi
Starting Address Lo
No. of Registers Hi
No. of Registers Lo
CRC Error Check

The number of registers cannot exceed 125 without causing an error response with Exception Code "Illegal Function".

Queries to read Write Only or unsupported registers result in an error response with Exception Code of “Illegal Data Address”.

RESPONSE:

The response message contains the data queried, respectively. The data block contains the block length in bytes followed by the data for each requested register. Attempting to read an unused register or a register which does not support read results in an error response with Exception Code of "Illegal Data Address".

Device Address	
Function Code	03 (hex)
Byte Count	
Data Hi	
Data Lo	
.	
.	
.	
Data Hi	
Data Lo	
CRC Error Check	

Return Query Data

This query contains data to be returned (looped back) in the response. The response and query messages should be identical.

Device Address	
Function Code	08 (hex)
Subfunction Hi	00 (hex)
Subfunction Lo	00 (hex)
Data Hi	
Data Lo	
CRC Error Check	

Preset Multiple Registers, Non-Broadcast & Broadcast

Preset Multiple Registers - General

QUERY:

This query message requests a register or block of registers to be written. The data block contains the starting address and the quantity of registers to be written, followed by the Data Block byte count and data. A device address is 0 for a broadcast query.

A register address of N will write Holding Register N+1.

No query data will be written (non-broadcast or broadcast) if any of the following exceptions occur:

- Queries writing to Read Only or unsupported registers result in an error response with Exception Code of “Illegal Data Address”.
- Queries attempting to write more than 100 registers cause an error response with Exception Code “Illegal Function”.
- An incorrect Byte Count will result in an error response with Exception Code of “Illegal Data Value”.
- There are several instances of registers that are grouped together (signified as DP or TP) to collectively represent a single numerical (vs. ASCII string) DGC-2020 parameter value. A query to write a subset of such a register group will result in an error response with Exception Code “Illegal Data Address”.
- A query to write an unacceptable value (out of range) to a register results in an error response with Exception Code of “Illegal Data Value”.

Device Address
Function Code 10 (hex)
Starting Address Hi
Starting Address Lo
No. of Registers Hi
No. of Registers Lo
Byte Count
Data Hi
Data Lo
.
.
.
Data Hi
Data Lo
CRC Error Check

RESPONSE:

The response message echoes the starting address and the number of registers. There is no response message when the query is broadcast.

Device Address	
Function Code	10 (hex)
Starting Address Hi	
Starting Address Lo	
No. of Registers Hi	
No. of Registers Lo	
CRC Error Check	

Preset Single Register, Non-Broadcast & Broadcast

QUERY:

This query message requests a register to be written. A device address is 0 for a broadcast query.

No query data will be written (non-broadcast or broadcast) if any of the following exceptions occur:

- Queries writing to Read Only or unsupported registers result in an error response with Exception Code of “Illegal Data Address”.
- There are several instances of registers that are grouped together (signified as DP or TP) to collectively represent a single numerical (vs. ASCII string) DGC-2020 parameter value. A query to write a subset of such a register group will result in an error response with Exception Code “Illegal Data Address”.
- A query to write an unacceptable value (out of range) to a register results in an error response with Exception Code of “Illegal Data Value”.

Device Address	
Function Code	06 (hex)
Address Hi	
Address Lo	
Data Hi	
Data Lo	
CRC Error Check	

RESPONSE:

The response message echoes the address and the value written. There is no response message when the query is broadcast.

Device Address	
Function Code	06 (hex)
Address Hi	
Address Lo	
Data Hi	
Data Lo	
CRC Error Check	

Data Formats

Short Integer Data Format (INT8)

The Modbus short integer data format uses a single holding register to represent an 8 bit data value. The holding register high byte will always be zero.

Example: The value 132 represented in short integer format is hexadecimal 0x84. This number will read from a holding register as follows:

Holding Register	Value
K (Hi Byte)	hex 00
K (Lo Byte)	hex 84

The same byte alignments are required to write.

Integer Data Format (INT16)

The Modbus integer data format uses a single holding register to represent a 16-bit data value.

Example: The value 4660 represented in integer format is hexadecimal 0x1234. This number will read from a holding register as follows:

Holding Register	Value
K (Hi Byte)	hex 12
K (Lo Byte)	hex 34

The same byte alignments are required to write.

Long Integer Data Format (INT32)

The Modbus long integer data format uses two consecutive holding registers to represent a 32-bit data value. The first register contains the low-order 16 bits and the second register contains the high-order 16 bits.

Example: The value 95,800 represented in long integer format is hexadecimal 0x00017638. This number will read from two consecutive holding registers as follows:

Holding Register	Value
K (Hi Byte)	hex 76
K (Lo Byte)	hex 38
K+1 (Hi Byte)	hex 00
K+1 (Lo Byte)	hex 01

The same byte alignments are required to write.

32-bit Bit-Mapped Parameter Mapping

The register arrangement for 32-bit bit-mapped parameters is illustrated in Figure B-1. The Alarm Metering registers (44812/44813) are shown as an example. In this example, Bit 25 is set indicating an Overcrank condition and Bit 17 is set indicating a Global Alarm.

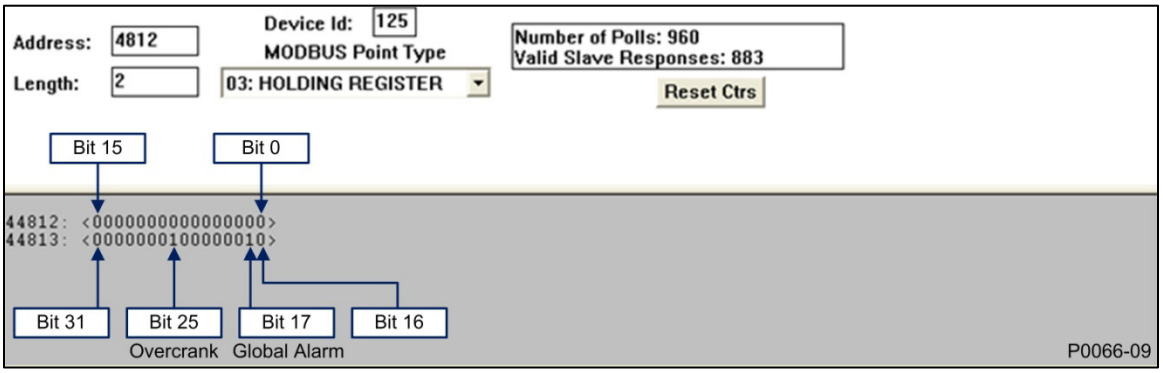

Figure B-1. 32-Bit Bit-Mapped Parameter Mapping

The Alarm Metering register bits are defined as follows:

- Bit 0 through Bit 16 = Not Used
- Bit 17 = Global Alarm
- Bit 18 = Auto Restart Failure
- Bit 19 = Fuel Leak Detect
- Bit 20 = Battery Charger Failure
- Bit 21 = Transfer Fail
- Bit 22 = Low Coolant Level
- Bit 23 = ECU Shutdown
- Bit 24 = Emergency Shutdown
- Bit 25 = Overcrank
- Bit 26 = Loss of ECU Comms
- Bit 27 = Global Sender Fail
- Bit 28 = Low Fuel Level
- Bit 29 = Low Oil Pressure
- Bit 30 = Hi Coolant Temp
- Bit 31 = Overspeed

Floating Point Data Format

The Modbus floating point data format uses two consecutive holding registers to represent a data value. The first register contains the low-order 16 bits of the following 32-bit format:

- MSB is the sign bit for the floating-point value (0 = positive).
- The next 8 bits are the exponent biased by 127 decimal.
- The 23 LSBs comprise the normalized mantissa. The most-significant bit of the mantissa is always assumed to be 1 and is not explicitly stored, yielding an effective precision of 24 bits.

The value of the floating-point number is obtained by multiplying the binary mantissa times two raised to the power of the unbiased exponent. The assumed bit of the binary mantissa has the value of 1.0, with the remaining 23 bits providing a fractional value. Table B-2 shows the floating-point format.

Table B-2. Floating Point Format

Sign	Exponent + 127	Mantissa
1 bit	8 bits	23 bits

The floating-point format allows for values ranging from approximately $8.43X10^{-37}$ to $3.38X10^{38}$. A floating-point value of all zeroes is the value zero. A floating-point value of all ones (not a number) signifies a value currently not applicable or disabled.

Example: The value 95,800 represented in floating point format is hexadecimal 47BB1C00. This number will read from two consecutive holding registers as follows:

Holding Register	Value
K (Hi Byte)	hex 1C
K (Lo Byte)	hex 00
K+1 (Hi Byte)	hex 47
K+1 (Lo Byte)	hex BB

The same byte alignments are required to write.

Double Precision Data Format (DP)

The Modbus Double Precision data format (DP) uses 2 consecutive registers to represent a data value. The first register contains the high-order 16 bits of double precision data, and is the actual data value / 10,000.

The second register contains the low-order 16 bits of double precision data, and is the actual data value modulus 10,000.

Triple Precision Data Format (TP)

The Modbus Triple Precision data format (TP) uses 3 consecutive registers to represent a data value. The first register contains the high-order 16 bits of triple precision data, and is the actual data value / 100,000,000. The modulus from this operation is divided by 10,000 to arrive at the value of the second register, and the modulus of this last operation is the value of the third register (the low-order 16 bits of triple precision).

Error Check

This field contains a 2-byte CRC value for transmission error detection. The master first calculates the CRC and appends it to the query message. The DGC-2020 recalculates the CRC value for the received query and performs a comparison to the query CRC value to determine if a transmission error has occurred. If so, no response message is generated. Otherwise, the slave calculates a new CRC value for the response message and appends it to the message for transmission.

Reference the "Modicon Modbus Protocol Reference Guide", PI-MBUS-300 Rev. E, pages 112 - 115 for an excellent explanation and implementation of the CRC-16 algorithm.

The CRC calculation is performed using all bytes of the Device Address, Function Code, and Data Block fields. A 16-bit CRC-register is initialized to all 1's. Then each 8-bit byte of the message is used in the following algorithm:

First, exclusive-OR the message byte with the low-order byte of the CRC-register. The result, stored in the CRC-register, will then be right-shifted 8 times. The CRC-register MSB is zero-filled with each shift. After each shift the CRC-register LSB is examined: if 1, the CRC-register is then exclusive-ORed with the fixed polynomial value A001 (hex) prior to the next shift. Once all bytes of the message have undergone the above algorithm, the CRC-register will contain the message CRC value to be placed in the Error Check field.

Interdependence of Preset Multiple Register Data

Preset Multiple Register data is collectively written only after the query has been determined to be legal, which includes a range-check of the entire data block. Therefore, data which must be written prior to other data must use a separate query. For example, a Preset Multiple Register Query of the entire Contiguous Write Block (40023-40055) to set the Battery Overvoltage Pre-alarm Threshold atop the 24V range and change the Battery Volts from 12V to 24V will fail. The change to 24V would occur simultaneously to setting the Pre-alarm Threshold, and the threshold value range-check will use the current 12V range.

Mapping - DGC-2020 Parameters into Modicon Address Space

Current Parameter Table

The DGC-2020 maps all non-legacy parameters into the Holding Register address space (42000 and above). Query address N will access the Holding Register N+1.

Breaker Management

Register	Description	Type	Units	Scaling Factor	R/W	Range
42000	Gen Breaker Configured	Int32	N/A	N/A	RW	0 = Not Configured 1 = Configured
42002	Gen Breaker Open Pulse Time	Int32	Centisecond	Centi	RW	1 - 80
42004	Gen Breaker Close Pulse Time	Int32	Centisecond	Centi	RW	1 - 80
42006	Gen Breaker Contact Type	Int32	N/A	N/A	RW	0 = Pulse 1 = Continuous
42008	Gen Breaker Close Time	Int32	Millisecond	N/A	RW	0 - 800
42010	RESERVED					
42012	Mains Breaker Configured	Int32	N/A	N/A	RW	0 = Not Configured 1 = Configured
42014	Mains Breaker Open Pulse Time	Int32	Centisecond	Centi	RW	1 - 80
42016	Mains Breaker Close Pulse Time	Int32	Centisecond	Centi	RW	1 - 80
42018	Mains Breaker Output Continuous	Int32	N/A	N/A	RW	0 = Pulse 1 = Continuous
42020	Mains Breaker Close Time	Int32	Millisecond	N/A	RW	0 - 800
42022	RESERVED					
42024	Synchronizer Type	Int32	N/A	N/A	RW	1 = Anticipatory 2 = Phase Lock Loop
42026	Synchronizer Mode	Int32	N/A	N/A	RW	0 = Off Mode 1 = Auto Mode
42028	Slip Frequency	Int32	CentiHertz	Centi	RW	1 - 50
42030	Breaker Closing Angle	Int32	DeciDegree	Deci	RW	30 - 200
42032	Regulation Offset	Int32	DeciPercent	Deci	RW	20 - 150
42034	Vgen > Vbus	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42036	Fgen > Fbus	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42038-40	RESERVED					
42042	Breaker Close Wait Time	Int32	Second	N/A	RW	0.1 - 600
42044	Sync Time Delay	Float	Second	N/A	RW	0.1 - 0.8
42046	Sync Fail Time Delay	Float	Second	N/A	RW	0.1 - 600
42048	Mains Fail Transfer Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42050	Gen Breaker Status	Int32	N/A	N/A	R	0 = Open 1 = Closed
42052	Mains Breaker Status	Int32	N/A	N/A	R	0 = Open 1 = Closed
42054	Mains Fail Transfer Delay	Int32	Second	N/A	RW	0 - 300
42056	Mains Fail Return Delay	Int32	Second	N/A	RW	0 - 1800
42058	Mains Fail Max Transfer Time	Int32	Second	N/A	RW	1 - 120
42060	RESERVED					
42062	Dead Bus Close Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42064	Sync Speed Gain	Float	N/A	N/A	RW	0.001 - 1000
42066	Sync Voltage Gain	Float	N/A	N/A	RW	0.001 - 1000

Register	Description	Type	Units	Scaling Factor	R/W	Range
42068	Max Parallel Time	Int32	Second	Deci	RW	1 - 100000
42070	Mains Fail Transfer Type	Int32	N/A	N/A	RW	0 = Open 1 = Close
42072	In Phase Monitor Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42074	Dead Gen Close Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42076	RESERVED					
42078	Min Slip Control Limit	Int32	N/A	Centi	RW	0 - 200
42080	Max Slip Control Limit	Int32	N/A	Centi	RW	0 - 200
42082	Rev. Rotation Mains Fail Inhibit	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42084-248	FUTURE USE					

Bias Control Settings

Register	Description	Type	Units	Scaling Factor	R/W	Range
42250	AVR Kp Proportional Gain	Float	N/A	N/A	RW	0 - 1000
42252	AVR Ki Integral Gain	Float	N/A	N/A	RW	0 - 1000
42254	AVR Kd Derivative Gain	Float	N/A	N/A	RW	0 - 1000
42256	AVR Td Filter Constant	Float	N/A	N/A	RW	0 - 1
42258	AVR Kg Loop Gain	Float	N/A	N/A	RW	0 - 1000
42260	AVR Windup Limit	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42262	AVR Integrator Limit Plus	Float	N/A	N/A	RW	0 - 1000
42264	AVR Integrator Limit Minus	Float	N/A	N/A	RW	(-1000) - 0
42266	AVR Output Upper Limit	Float	N/A	N/A	RW	0 - 1000
42268	AVR Output Lower Limit	Float	N/A	N/A	RW	(-1000) - 0
42270	RESERVED					
42272	Governor Kp Proportional Gain	Float	N/A	N/A	RW	0 - 1000
42274	Governor Ki Integral Gain	Float	N/A	N/A	RW	0 - 1000
42276	Governor Kd Derivative Gain	Float	N/A	N/A	RW	0 - 1000
42278	Governor Td Filter Constant	Float	N/A	N/A	RW	0 - 1
42280	Governor Loop Gain	Float	N/A	N/A	RW	0 - 1000
42282	Governor Windup Limit	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42284	Governor Integrator Limit Plus	Float	N/A	N/A	RW	0 - 1000
42286	Governor Integrator Limit Minus	Float	N/A	N/A	RW	(-1000) - 0
42288	Governor Output Upper Limit	Float	N/A	N/A	RW	0 - 1000
42290	Governor Output Lower Limit	Float	N/A	N/A	RW	(-1000) - 0
42292	RESERVED					
42294	kvar Kp	Float	N/A	N/A	RW	0 - 1000
42296	kvar Ki	Float	N/A	N/A	RW	0 - 1000
42298	kvar Kd	Float	N/A	N/A	RW	0 - 1000
42300	kvar Td	Float	N/A	N/A	RW	0 - 1
42302	kvar Loop Gain	Float	N/A	N/A	RW	0 - 1000
42304	kvar Windup Limit	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42306	kvar Integrator Limit Plus	Float	N/A	N/A	RW	0 - 1000
42308	kvar Integrator Limit Minus	Float	N//A	N/A	RW	(-1000) - 0
42310	kvar Output Upper Limit	Float	N/A	N/A	RW	0 - 1000
42312	kvar Output Lower Limit	Float	N/A	N/A	RW	(-1000) - 0
42314	RESERVED					
42316	kW Kp	Float	N/A	N/A	RW	0 - 1000
42318	kW Ki	Float	N/A	N/A	RW	0 - 1000
42320	kW Kd	Float	N/A	N/A	RW	0 - 1000
42322	kW Td	Float	N/A	N/A	RW	0 - 1
42324	kW Loop Gain	Float	N/A	N/A	RW	0 - 1000
42326	kW Windup Limit	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42328	kW Integrator Limit Plus	Float	N/A	N/A	RW	0 - 1000

Register	Description	Type	Units	Scaling Factor	R/W	Range
42330	kW Integrator Limit Minus	Float	N/A	N/A	RW	(-1000) - 0
42332	kW Output Upper Limit	Float	N/A	N/A	RW	0 - 1000
42334	kW Output Lower Limit	Float	N/A	N/A	RW	(-1000) - 0
42336	RESERVED					
42338	Droop Percent	Float	Percent	N/A	RW	0 - 10
42340	Load Control	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42342	kW Load Rate	Int32	N/A	Deci	RW	0 - 1000
42344	Breaker Open Setpoint	Int32	N/A	Deci	RW	0 - 1000
42346	AVR Bias Control Output Type	Int32	N/A	N/A	RW	0 = Contact 1 = Analog
42348	Governor Bias Control Output Type	Int32	N/A	N/A	RW	0 = Contact 1 = Analog
42350	Speed Droop Gain	Float	N/A	N/A	RW	0 - 1000
42352	Voltage Droop Gain	Float	N/A	N/A	RW	0 - 1000
42354	Speed Trim Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42356	Voltage Trim Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42358	Ramped Watt Demand Per Unit	Float	N/A	N/A	R	0 - 100
42360	Watt Demand Per Unit	Float	N/A	N/A	R	0 - 100
42362	Speed PID Output	Float	N/A	N/A	R	0 - 100
42364	kW PID Output	Float	N/A	N/A	R	0 - 100
42366	Volt PID Output	Float	N/A	N/A	R	0 - 100
42368	Speed Trim Setpoint	Uint32	DeciHertz	Centi	RW	4700 - 44000
42370	var Control Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
42372	kvar Load Rate	Uint32	N/A	Deci	RW	1 - 1000
42374	Base Load Level Source	Uint32	N/A	N/A	RW	0 = User Setting 1 = LSM Analog Input 1 2 = AEM Analog Input 1 3 = AEM Analog Input 2 4 = AEM Analog Input 3 5 = AEM Analog Input 4 6 = AEM Analog Input 5 7 = AEM Analog Input 6 8 = AEM Analog Input 7 9 = AEM Analog Input 8
42376	kVar Setpoint Source	Uint32	N/A	N/A	RW	0 = User Setting 1 = LSM Analog Input 1 2 = AEM Analog Input 1 3 = AEM Analog Input 2 4 = AEM Analog Input 3 5 = AEM Analog Input 4 6 = AEM Analog Input 5 7 = AEM Analog Input 6 8 = AEM Analog Input 7 9 = AEM Analog Input 8
42378	PF Setpoint Source	Uint32	N/A	N/A	RW	0 = User Setting 1 = LSM Analog Input 1 2 = AEM Analog Input 1 3 = AEM Analog Input 2 4 = AEM Analog Input 3 5 = AEM Analog Input 4 6 = AEM Analog Input 5 7 = AEM Analog Input 6 8 = AEM Analog Input 7 9 = AEM Analog Input 8
42380-84	RESERVED					
42386	Baseload Analog Max	Int32	Percent	Deci	RW	0 - 1000
42388	Baseload Analog Min	Int32	Percent	Deci	RW	0 - 1000
42390	kvar Analog Max	Int32	Percent	Deci	RW	(-1000) - 1000
42392	kvar Analog Min	Int32	Percent	Deci	RW	(-1000) - 1000

Register	Description	Type	Units	Scaling Factor	R/W	Range
42394	PF Analog Max	Int32	N/A	Centi	RW	160 - 240
42396	PF Analog Min	Int32	N/A	Centi	RW	160 - 240
42398	var Droop Percentage	Float	Percent	N/A	RW	0 - 10
42400-06	RESERVED					
42408	Base Load Level	Float	Percent	N/A	RW	0 - 100
42410	kvar Setpoint	Float	Percent	N/A	RW	(-100) - 100
42412	PF Setpoint	Int32	N/A	Centi	RW	160 - 240
42414	var Control Mode	Int32	N/A	N/A	RW	0 = var Control 1 = PF Control
42416	Load Share Interface	Int32	N/A	N/A	RW	0 = Analog Load Share Line 1 = Ethernet Comms
42418	Remote Speed Bias Source	Int32	N/A	N/A	RW	0 = User Setting 1 = LSM Analog Input 1 2 = AEM Analog Input 1 3 = AEM Analog Input 2 4 = AEM Analog Input 3 5 = AEM Analog Input 4 6 = AEM Analog Input 5 7 = AEM Analog Input 6 8 = AEM Analog Input 7 9 = AEM Analog Input 8
42420	RESERVED					
42422	RESERVED					
42424	LSM Aux Input Source	Int32	N/A	N/A	RW	0 = LSM Local Aux Input 1 = LSM System Manager
42426	kW Ramp Status	Int32	N/A	N/A	RW	0 – 2
42428	kvar Ramp Status	Int32	N/A	N/A	RW	0 – 2
42430-498	FUTURE USE					

Pulse Outputs

Register	Description	Type	Units	Scaling Factor	R/W	Range
42500	AVR Correction Pulse Width	Int32	Decisecond	Deci	RW	0 - 999
42502	AVR Correction Pulse Interval	Int32	Decisecond	Deci	RW	0 - 999
42504	AVR Bias Contact Type	Int32	N/A	N/A	RW	0 = Continuous 1 = Proportional
42506	RESERVED					
42508	Governor Correction Pulse Width	Int32	Decisecond	Deci	RW	0 - 999
42510	Governor Correction Pulse Interval	Int32	Decisecond	Deci	RW	0 - 999
42512	Governor Bias Contact Type	Int32	Decisecond	Deci	RW	0 = Continuous 1 = Proportional
42514	RESERVED					
42516-748	FUTURE USE					

Bus Condition Detection

Register	Description	Type	Units	Scaling Factor	R/W	Range
42750	Gen Sensing Dead Bus Pickup	Int32	Volt	N/A	RW	0 - 4800
42752	Gen Sensing Dead Bus Time Delay	Int32	Decisecond	Deci	RW	1 - 6000
42754	RESERVED					
42756	Gen Sensing Stable Undervoltage Pickup	Int32	Volt	N/A	RW	10 - 99999
42758	Gen Sensing Stable Undervoltage Dropout	Int32	Volt	N/A	RW	10 - 99999
42760	Gen Sensing Stable Overvoltage	Int32	Volt	N/A	RW	10 - 99999
42762	Gen Sensing Stable Overvoltage Dropout	Int32	Volt	N/A	RW	10 - 99999
42764	Gen Sensing Stable Underfrequency Pickup	Int32	CentiHertz	Centi	RW	4600 - 6400
42766	Gen Sensing Stable Underfrequency Dropout	Int32	CentiHertz	Centi	RW	4600 - 6400
42768	Gen Sensing Stable Overfrequency Pickup	Int32	CentiHertz	Centi	RW	4600 - 6400
42770	Gen Sensing Stable Overfrequency Dropout	Int32	CentiHertz	Centi	RW	4600 - 6400
42772	Gen Sensing Fail Time Delay	Int32	Decisecond	Deci	RW	1 - 6000
42774	Gen Sensing Stable Time Delay	Int32	Decisecond	Deci	RW	1 - 6000
42776	RESERVED					
42778	Bus Sensing Dead Bus Pickup	Int32	Volt	N/A	RW	0 - 4800

Register	Description	Type	Units	Scaling Factor	R/W	Range
42780	Bus Sensing Dead Bus Time Delay	Int32	Decisecond	Deci	RW	1 - 6000
42782	RESERVED					
42784	Bus Sensing Stable Undervoltage Pickup	Int32	Volt	N/A	RW	10 - 9999
42786	Bus Sensing Stable Undervoltage Dropout	Int32	Volt	N/A	RW	10 - 9999
42788	Bus Sensing Stable Overvoltage Pickup	Int32	Volt	N/A	RW	10 - 9999
42790	Bus Sensing Stable Overvoltage Dropout	Int32	Volt	N/A	RW	10 - 9999
42792	Bus Sensing Stable Underfrequency Pickup	Int32	CentiHertz	Centi	RW	4600 - 6400
42794	Bus Sensing Stable Underfrequency Dropout	Int32	CentiHertz	Centi	RW	4600 - 6400
42796	Bus Sensing Stable Overfrequency Pickup	Int32	CentiHertz	Centi	RW	4600 - 6400
42798	Bus Sensing Stable Overfrequency Dropout	Int32	CentiHertz	Centi	RW	4600 - 6400
42800	Bus Sensing Fail Time Delay	Int32	Decisecond	Deci	RW	1 - 6000
42802	Bus Sensing Stable Time Delay	Int32	Decisecond	Deci	RW	1 - 6000
42804	RESERVED					
42806	Gen Dead Status	Int32	N/A	N/A	R	0 - 1
42808	Gen Stable Status	Int32	N/A	N/A	R	0 - 1
42810	Gen Fail Status	Int32	N/A	N/A	R	0 - 1
42812	Bus Dead Status	Int32	N/A	N/A	R	0 - 1
42814	Bus Stable Status	Int32	N/A	N/A	R	0 - 1
42816	Bus Fail Status	Int32	N/A	N/A	R	0 - 1
42818	Gen Stable Low Line Scale Factor	Float	N/A	N/A	RW	0.001 - 3
42820	Bus Stable Low Line Scale Factor	Float	N/A	N/A	RW	0.001 - 3
42822	Gen Stable Alternate Frequency Scale Factor	Float	N/A	N/A	RW	0.001 - 100
42824	Bus Stable Alternate Frequency Scale Factor	Float	N/A	N/A	RW	0.001 - 100
42826-3432	FUTURE USE					

Senders

Register	Description	Type	Units	Scaling Factor	R/W	Range
43434	Coolant Temperature Sender Fail Configuration Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
43436	Coolant Temperature Sender Fail Activation Delay	Int32	Minute	N/A	RW	5 - 30
43438	Oil Pressure Sender Fail Configuration Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
43440	Oil Pressure Sender Fail Activation Delay	Int32	Second	N/A	RW	0 - 300
43442	Fuel Level Sender Fail Configuration Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
43444	Fuel Level Sender Fail Activation Delay	Int32	Second	N/A	RW	0 - 300
43446	Voltage Sensing Fail Configuration Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
43448	Voltage Sensing Fail Activation Delay	Int32	Second	N/A	RW	0 - 300
43450	Low Coolant Level Contact Input	Int32	N/A	N/A	RW	-1 = None 0 = Input 1 1 = Input 2 2 = Input 3 3 = Input 4 4 = Input 5 5 = Input 6 6 = Input 7 7 = Input 8 8 = Input 9 9 = Input 10 10 = Input 11 11 = Input 12 12 = Input 13 13 = Input 14 14 = Input 15 15 = Input 16

Register	Description	Type	Units	Scaling Factor	R/W	Range
43452	Low Coolant Level Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
43454	Low Coolant Level Time Delay	Int32	Second	N/A	RW	0 - 300
43456	Battery Charge Failed Contact Input	Int32	N/A	N/A	RW	-1 = None 0 = Input 1 1 = Input 2 2 = Input 3 3 = Input 4 4 = Input 5 5 = Input 6 6 = Input 7 7 = Input 8 8 = Input 9 9 = Input 10 10 = Input 11 11 = Input 12 12 = Input 13 13 = Input 14 14 = Input 15 15 = Input 16
43458	Battery Charge Failed Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
43460	Battery Charge Failed Time Delay	Int32	Second	N/A	RW	0 - 300
43462	Fuel Leak Detect Contact Input	Int32	N/A	N/A	RW	-1 = None 0 = Input 1 1 = Input 2 2 = Input 3 3 = Input 4 4 = Input 5 5 = Input 6 6 = Input 7 7 = Input 8 8 = Input 9 9 = Input 10 10 = Input 11 11 = Input 12 12 = Input 13 13 = Input 14 14 = Input 15 15 = Input 16
43464	Fuel Leak Detect Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
43466	Fuel Leak Detect Time Delay	Int32	Second	N/A	RW	0 - 300
43468	User Configurable Input 1 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
43470	User Configurable Input 2 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
43472	User Configurable Input 3 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
43474	User Configurable Input 4 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
43476	User Configurable Input 5 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only

Register	Description	Type	Units	Scaling Factor	R/W	Range
43478	User Configurable Input 6 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
43480	User Configurable Input 7 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
43482	User Configurable Input 8 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
43484	User Configurable Input 9 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
43486	User Configurable Input 10 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
43488	User Configurable Input 11 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
43490	User Configurable Input 12 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
43492	User Configurable Input 13 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
43494	User Configurable Input 14 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
43496	User Configurable Input 15 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
43498	User Configurable Input 16 Eng Run Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only

System Configuration and Status

Register	Description	Type	Units	Scaling Factor	R/W	Range
43500	Rated Volts	Float	Volt	N/A	RW	1 - 99999
43502	Pre-Start Contact Config	Int32	N/A	N/A	RW	0 = Open After Disconnect 1 = Closed While Running
43504	System Units	Int32	N/A	N/A	RW	0 = English 1 = Metric
43506	Battery Volts	Int32	N/A	N/A	RW	0 = 12V 1 = 24V
43508	Off Mode Status	Int32	N/A	N/A	R	0 = Disable 1 = Enable
43510	Run Mode Status	Int32	N/A	N/A	R	0 = Disable 1 = Enable
43512	Auto Mode Status	Int32	N/A	N/A	R	0 = Disable 1 = Enable
43514	Virtual Input 1 Status	Int32	N/A	N/A	R	0 = Disable 1 = Enable
43516	Virtual Input 2 Status	Int32	N/A	N/A	R	0 = Disable 1 = Enable

Register	Description	Type	Units	Scaling Factor	R/W	Range
43518	Virtual Input 3 Status	Int32	N/A	N/A	R	0 = Disable 1 = Enable
43520	Virtual Input 4 Status	Int32	N/A	N/A	R	0 = Disable 1 = Enable
43522	RTC Clock Hour	Int32	Hour	N/A	RW	0 - 23
43524	RTC Minute	Int32	Minute	N/A	RW	0 - 59
43526	RTC Second	Int32	Second	N/A	RW	0 - 59
43528	RTC Month	Int32	N/A	N/A	RW	1 - 12
43530	RTC Day	Int32	N/A	N/A	RW	1 - 31
43532	RTC Year	Int32	N/A	N/A	RW	0 - 99
43534	RTC DST Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43536	Gen PT Primary	Int32	Volt	N/A	RW	1 - 99999
43538	Gen PT Secondary	Int32	Volt	N/A	RW	1 - 480
43540	Gen CT Primary	Int32	Amp	N/A	RW	1 - 9999
43542	Bus PT Primary	Int32	Volt	N/A	RW	1 - 99999
43544	Bus PT Secondary	Int32	Volt	N/A	RW	1 - 480
43546	Cranking Style	Uint32	N/A	N/A	RW	0 = Continuous 1 = Cycle
43548	Number of Crank Cycles	Uint32	N/A	N/A	RW	1 - 7
43550	Cycle Crank Time	Unit32	Second	N/A	RW	5 - 15
43552	Continuous Crank Time	Unit32	Second	N/A	RW	5 - 60
43554	Crank Disconnect Limit	Uint32	Percent	N/A	RW	10 - 100
43556	Pre Crank Delay	Uint32	Second	N/A	RW	0 - 30
43558	Configured Gen Connection	Uint32	N/A	N/A	RW	0 = Delta 1 = Wye 2 = 1-phase AB 3 = 1-phase AC 4 = Grounded Delta
43560	Gen Rated Frequency	Int32	Hertz	N/A	RW	0 = 50 Hz 1 = 60 Hz
43562	Rated kW	Uint32	kiloWatt	N/A	RW	5 - 9999
43564	Rated Engine RPM	Uint32	RPM	N/A	RW	750 - 3600
43566	No Load Cool Down Time	Uint32	Minute	N/A	RW	0 - 60
43568	EPS Current Threshold	Int32	PercentCTPri	N/A	RW	3 - 10
43570	Fuel Level Function	Uint32	N/A	N/A	RW	0 = Disable 1 = Fuel Lvl 2 = Natural Gas 3 = Propane
43572	Number Flywheel Teeth	Uint32	N/A	N/A	RW	1 - 500
43574	Speed Signal Source	Uint32	N/A	N/A	RW	1 = MPU 2 = Gen Freq 3 = MPU Freq
43576	NFPA Level	Uint32	N/A	N/A	RW	0 = Zero 1 = One 2 = Two
43578	Horn Enable	Int32	N/A	N/A	RW	0 = Disabled 1 = Enabled
43580	Single Phase Override Sensing	Uint32	N/A	N/A	RW	0 = AB 1 = AC
43582	RESERVED					
43584	LCD Contrast Value	Uint32	N/A	N/A	RW	0 - 100
43586	Front Panel Sleep Mode	Uint32	N/A	N/A	RW	0 = Disabled 1 = Enabled
43588	RESERVED					
43590	UTC Offset	Int32	Minute	N/A	RW	(-1440) - 1440
43592	DST Configuration	Int32	N/A	N/A	RW	0 = Disabled 1 = Floating 2 = Fixed
43594	Start/End Time Reference	Int32	N/A	N/A	RW	0 = Local Time 1 = UTC Time
43596	DST Bias Hours	Int32	N/A	N/A	RW	0 - 23

Register	Description	Type	Units	Scaling Factor	R/W	Range
43598	DSP Bias Minutes	Int32	N/A	N/A	RW	0 - 59
43600	DST Start Month	Int32	N/A	N/A	RW	1 = January 2 = February 3 = March 4 = April 5 = May 6 = June 7 = July 8 = August 9 = September 10 = October 11 = November 12 = December
43602	DST Start Day	Int32	N/A	N/A	RW	1 - 31
43604	DST Start Week of Month	In32	N/A	N/A	RW	0 = First 1 = Second 2 = Third 3 = Fourth 4 = Last
43606	DST Start Day of Week	Int32	N/A	N/A	RW	0 = Sunday 1 = Monday 2 = Tuesday 3 = Wednesday 4 = Thursday 5 = Friday 6 = Saturday
43608	DST Start Hour	Int32	N/A	N/A	RW	0 - 23
43610	DST Start Minute	Int32	N/A	N/A	RW	0 - 59
43612	DST End Month	Int32	N/A	N/A	RW	1 = January 2 = February 3 = March 4 = April 5 = May 6 = June 7 = July 8 = August 9 = September 10 = October 11 = November 12 = December
43614	DST End Day	Int32	N/A	N/A	RW	1 - 31
43616	DST End Week of Month	Int32	N/A	N/A	RW	0 = First 1 = Second 2 = Third 3 = Fourth 4 = Last
43618	DST End Day of Week	Int32	N/A	N/A	RW	0 = Sunday 1 = Monday 2 = Tuesday 3 = Wednesday 4 = Thursday 5 = Friday 6 = Saturday
43620	DST End Hour	Int32	N/A	N/A	RW	0 - 23
43622	DST End Minute	Int32	N/A	N/A	RW	0 - 59
43624	EPS Low Line Scale Factor	Float	N/A	N/A	RW	0.001 - 3
43626	Rated Power Factor	Float	Power Factor	N/A	RW	(-1) - 1
43628	Prestart Rest Configuration	Int32	N/A	N/A	RW	0 = Off During Rest 1 = On During Rest 2 = Preheat before Crank
43630	Oil Pressure Crank Disconnect	UInt32	N/A	N/A	RW	0 = Disable 1 = Enable
43632	Crank Disconnect Pressure	Uint32	PSI	Deci	RW	29 - 1500
43634	Crank Disconnect Pressure in kPa	Uin32	kPa	Deci	RW	200 - 10345
43636	Power Up Delay	Uint32	Second	N/A	RW	0 - 60
43638	Auto Config Detect Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable

Register	Description	Type	Units	Scaling Factor	R/W	Range
43640	Low Line Detect Threshold	Int32	Volt	N/A	RW	0 - 480
43642	Single Phase Detect Threshold	Int32	Volt	N/A	RW	0 - 480
43644	Start Relay Control	Uint32	N/A	N/A	RW	0 = Predefined 1 = Programmable
43646	Run Relay Control	Uint32	N/A	N/A	RW	0 = Predefined 1 = Programmable
43648	Prestart Relay Control	Uint32	N/A	N/A	RW	0 = Predefined 1 = Programmable
43650	Single Phase Connect Generator Detection	Int32	N/A	N/A	RW	0 = A-B 1 = A-C
43652	Off Mode Cool Down Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
43654	RESERVED					
43656	Not In Auto Horn Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
43658	Clock Not Set Warning Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
43660	Alternate Frequency	Int32	Hertz	Centi	RW	1000 - 45000
43662	Generator System Type	Int32	N/A	N/A	RW	0 = Single Generator 1 = Multiple Generator
43664	Gen CT Low Line Scale Factor	Float	N/A	N/A	RW	0.001 - 3
43666	Metric Pressure Units	Int32	N/A	N/A	RW	0 = Bar 1 = kPa
43668	System Units	Int32	N/A	N/A	RW	0 = English 1 = Metric
43674	RPM Bandwidth Data	Int32	N/A	N/A	RW	0 - 1000
43676	Number Flywheel Teeth	Uint32	N/A	Deci	RW	10 - 5000
43678	Phase Rotation	Int32	N/A	N/A	RW	0 = ACB 1 = ABC
43680	Restart Delay	Int32	Second	N/A	RW	0 - 120
43682	RESERVED					
43684	Fuel Level Source	Int32	N/A	N/A	RW	1 – 9
43686	Fuel Level Percent Max	Int32	N/A	N/A	RW	0 – 150
43688	Fuel Level Percent Min	Int32	N/A	N/A	RW	0 – 150
43690-748	FUTURE USE					

Control

Register	Description	Type	Units	Scaling Factor	R/W	Range
43750	Emergency Stop: Writing a 1 will toggle emergency stop from off to on. Writing a 1 again will toggle emergency stop from on to off	Int32	N/A	N/A	RW	1 = Toggle On/Off
43752	Remote Start	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43754	Remote Stop	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43756	Run Mode	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43758	Off Mode	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43760	Auto Mode	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43762	Alarm Reset	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43764	Gen Breaker Open	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43766	Gen Breaker Close	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43768	Mains Breaker Open	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43770	Mains Breaker Close	Int32	N/A	N/A	RW	0 = Disable 1 = Enable

Register	Description	Type	Units	Scaling Factor	R/W	Range
43772	FUTURE USE					
43774	Virtual Input 1 Close	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43776	Virtual Input 1 Open	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43778	Virtual Input 2 Close	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43780	Virtual Input 2 Open	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43782	Virtual Input 3 Close	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43784	Virtual Input 3 Open	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43786	Virtual Input 4 Close	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43788	Virtual Input 4 Open	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
43790	ESTOP Latch Status	Int32	N/A	N/A	R	0 = Disabled 1 = Enabled
43792	Gen Breaker Open	Int32	N/A	N/A	RW	1 = Operate (non-latching)
43794	Gen Breaker Close	Int32	N/A	N/A	RW	1 = Operate (non-latching)
43796	Mains Breaker Open	Int32	N/A	N/A	RW	1 = Operate (non-latching)
43798	Mains Breaker Close	Int32	N/A	N/A	RW	1 = Operate (non-latching)
43800-4006	FUTURE USE					

Communication

Register	Description	Type	Units	Scaling Factor	R/W	Range
44008	RESERVED					
44010-16	FUTURE USE					
44018	Modem Inter Dialout Activation Delay	Int32	Second	N/A	RW	0 = 15 1 = 30 2 = 60 3 = 120
44020	Modem Pager Buffer Limit	Int32	N/A	N/A	RW	0 = 80 Chars 1 = 120 Chars 2 = 160 Chars 3 = 200 Chars
44022	Modem Pager Coms Data Format	Int32	N/A	N/A	RW	0 = 8 bit, no parity 1 = 7 bit, even parity

Register	Description	Type	Units	Scaling Factor	R/W	Range
44024-25	Modem Dialout Conditions 1	Uint32	N/A	N/A	RW	Bit 0 = Aux Input 5 Closed Bit 1 = Aux Input 4 Closed Bit 2 = Aux Input 3 Closed Bit 3 = Aux Input 2 Closed Bit 4 = Aux Input 1 Closed Bit 5 = Cooldown Timer Active Bit 6 = Switch Not In Auto Bit 7 = Scheduled Maintenance Pre-Alarm Bit 8 = Weak Battery Voltage Pre-Alarm Bit 9 = Low Battery Voltage Pre-Alarm Bit 10 = Low Oil Pressure Pre-Alarm Bit 11 = High Coolant Temp Pre-Alarm Bit 12 = kW Overload 1 Pre-Alarm Bit 13 = Battery Overvoltage Pre-Alarm Bit 14 = Fuel Level Sender Fail Pre-Alarm Bit 15 = Oil Pressure Sender Fail Pre-Alarm Bit 16 = Coolant Temp Sender Fail Pre-Alarm Bit 17 = Low Coolant Temp Pre-Alarm Bit 18 = High Fuel Pre-Alarm Bit 19 = Low Fuel Pre-Alarm Bit 20 = Overspeed Alarm Bit 21 = Emergency Stop Alarm Bit 22 = Overcrank Alarm Bit 23 = Low Coolant Level Status Bit 24 = Low Fuel Alarm Bit 25 = Loss of Gen Volt Sensing Alarm Bit 26 = MPU Speed Sender Fail Alarm Bit 27 = Fuel Level Sender Fail Alarm Bit 28 = Oil Pressure Sender Fail Alarm Bit 29 = Coolant Temp Sender Fail Alarm Bit 30 = Low Oil Pressure Alarm Bit 31 = High Coolant Temp Alarm
44026-27	Modem Dialout Conditions 2	Uint32	N/A	N/A	RW	Bit 0 = 59-2 Trip Alarm Bit 1 = 27-2 Trip Alarm Bit 2 = 51-2 Trip Alarm Bit 3 = Engine Running Bit 4 = Battery Charger Fail Status Bit 5 = Fuel Leak Detect Status Bit 6 = Transfer Fail Alarm Bit 7 = 81U Trip Pre-Alarm Bit 8 = 81O Trip Pre-Alarm Bit 9 = 59-1 Trip Pre-Alarm Bit 10 = 27-1 Trip Pre-Alarm Bit 11 = 47 Trip Pre-Alarm Bit 12 = 51-1 Trip Pre-Alarm Bit 13 = 81U Trip Alarm Bit 14 = 81O Trip Alarm Bit 15 = 59-1 Trip Alarm Bit 16 = 27-1 Trip Alarm Bit 17 = 47 Trip Alarm Bit 18 = 51-1 Trip Alarm Bit 19 = Loss of ECU Coms Pre-Alarm Bit 20 = Loss of ECU Coms Alarm Bit 21 = Aux Input 16 Closed Bit 22 = Aux Input 15 Closed Bit 23 = Aux Input 14 Closed Bit 24 = Aux Input 13 Closed Bit 25 = Aux Input 12 Closed Bit 26 = Aux Input 11 Closed Bit 27 = Aux Input 10 Closed Bit 28 = Aux Input 9 Closed Bit 29 = Aux Input 8 Closed Bit 30 = Aux Input 7 Closed Bit 31 = Aux Input 6 Closed
44028-30	RESERVED					
44032	CANbus Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable

Register	Description	Type	Units	Scaling Factor	R/W	Range
44034	DTC Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44036	Rings for Modem Answer	Int32	N/A	N/A	RW	1 - 9
44038	Modem Offline Delay	Int32	Minute	N/A	RW	1 - 240
44040	Modbus Baud Rate	Int32	N/A	N/A	RW	0 = 9600 Baud 1 = 4800 Baud 2 = 2400 Baud 3 = 1200 Baud
44042	Modbus Parity	Int32	N/A	N/A	RW	0 = No Parity 1 = Odd Parity 2 = Even Parity
44044	Modbus Address	Int32	N/A	N/A	RW	1 - 247
44046-47	Modem Dialout Conditions 3	Uint32	N/A	N/A	RW	Bit 0 = 78 Vector Shift Trip Bit 1 = 51-3 Trip Pre-Alarm Bit 2 = 51-3 Trip Alarm Bit 3 = Duplicate AEM Bit 4 = AEM Comms Failure Bit 5 = Duplicate CEM Bit 6 = CEM Comms Failure Bit 7 = Duplicate LSM Bit 8 = Config Element 8 Status Bit 9 = Config Element 7 Status Bit 10 = Config Element 6 Status Bit 11 = Config Element 5 Status Bit 12 = Config Element 4 Status Bit 13 = Config Element 3 Status Bit 14 = Config Element 2 Status Bit 15 = Config Element 1 Status Bit 16 = ID Repeat Bit 17 = ID Missing Bit 18 = LSM Comms Failure Bit 19 = Intergenset Comms Failure Bit 20 = GOV Output Limit Bit 21 = AVR Output Limit Bit 22 = Auto Restart Fail Alarm Bit 23 = kW Overload 3 Pre-Alarm Bit 24 = kW Overload 2 Pre-Alarm Bit 25 = 40 Trip Pre-Alarm Bit 26 = 32 Trip Pre-Alarm Bit 27 = 59-2 Trip Pre-Alarm Bit 28 = 27-2 Trip Pre-Alarm Bit 29 = 51-2 Trip Pre-Alarm Bit 30 = 40 Trip Alarm Bit 31 = 32 Trip Alarm
44048	LSM-2020 Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44050	DHCP Enabled	Uint32	N/A	N/A	R	0 = Disabled 1 = Enabled
44052-56	RESERVED					
44058	CEM-2020 Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44060	RESERVED					
44062	AEM-2020 Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44064	CEM Outputs	Int32	N/A	N/A	RW	0 = 18 Outputs 1 = 24 Outputs

Register	Description	Type	Units	Scaling Factor	R/W	Range
44066-67	Modem Dialout Conditions 4	Uint32	N/A	N/A	RW	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Common Pre-Alarm Bit 16 = Common Alarm Bit 17 = Unexpected Shutdown Alarm Bit 18 = ECU Shutdown Bit 19 = DEF Inducement Override Pre-Alarm Bit 20 = DEF Severe Inducement Pre-Alarm Bit 21 = DEF Pre-Severe Inducement Pre-Alarm Bit 22 = DEF Engine Derate Pre-Alarm Bit 23 = DEF Fluid Empty Pre-Alarm Bit 24 = DEF Fluid Low Pre-Alarm Bit 25 = DPF Soot Level Severely High Pre-Alarm Bit 26 = DPF Soot Level Moderately High Pre-Alarm Bit 27 = DPF Soot Level High Pre-Alarm Bit 28 = High Exhaust Temp Pre-Alarm Bit 29 = DPF Regeneration Inhibited Pre-Alarm Bit 30 = DPF Regeneration Required Pre-Alarm Bit 31 = 81 ROCOF DF/DT Trip
44068	Active IP Address	Uint32	N/A	N/A	R	0 - 4294967295
44070	Gateway IP Address	Uint32	N/A	N/A	R	0 - 4294967295
44072	Subnet Mask	Uint32	N/A	N/A	R	0 - 4294967295
44074-248	FUTURE USE					

Protection

Register	Description	Type	Units	Scaling Factor	R/W	Range
44250	3 Phase Overcurrent Pickup (51-1)	Uint32	CentiAmp	Centi	RW	18 - 775
44252	3 Phase Overcurrent Time Dial (51-1)	Uint32	DeciUnit	Deci	RW	0 - 72000
44254	3 Phase Overcurrent Curve (51-1)	Uint32	N/A	N/A	RW	0 = S1 Curve 1 = S2 Curve 2 = L1 Curve 3 = L2 Curve 4 = D Curve 5 = M Curve 6 = I1 Curve 7 = I2 Curve 8 = V1 Curve 9 = V2 Curve 10 = E1 Curve 11 = E2 Curve 12 = A Curve 13 = B Curve 14 = C Curve 15 = G Curve 16 = F Curve 17 = Programmable

Register	Description	Type	Units	Scaling Factor	R/W	Range
44256	3 Phase Overcurrent Alarm Configuration (51-1)	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44258	1 Phase Overcurrent Pickup (51-1)	Uint32	CentiAmp	Centi	RW	18 - 775
44260	1 Phase Overcurrent Time Dial (51-1)	Uint32	DeciUnit	Deci	RW	0 - 72000
44262	1 Phase Overcurrent Curve (51-1)	Uint32	N/A	N/A	RW	0 = S1 Curve 1 = S2 Curve 2 = L1 Curve 3 = L2 Curve 4 = D Curve 5 = M Curve 6 = I1 Curve 7 = I2 Curve 8 = V1 Curve 9 = V2 Curve 10 = E1 Curve 11 = E2 Curve 12 = A Curve 13 = B Curve 14 = C Curve 15 = G Curve 16 = F Curve 17 = Programmable
44264	1 Phase Overcurrent Alarm Configuration (51-1)	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44266	Phase Imbalance Pickup	Uint32	Volt	N/A	RW	5 - 100
44268	Phase Imbalance Activation Delay	Uint32	Decisecond	Deci	RW	0 - 300
44270	Phase Imbalance Alarm Configuration	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44272	3 Phase Undervoltage Pickup (27-1)	Uint32	Volt	N/A	RW	70 - 576
44274	3 Phase Undervoltage Activation Delay (27-1)	Uint32	Decisecond	Deci	RW	0 - 300
44276	3 Phase Undervoltage Inhibit Frequency (27-1)	Uint32	Hertz	N/A	RW	20 - 400
44278	3 Phase Undervoltage Alarm Configuration (27-1)	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44280	1 Phase Undervoltage Pickup (27-1)	Uint32	Volt	N/A	RW	70 - 576
44282	1 Phase Undervoltage Activation Delay (27-1)	Uint32	Decisecond	Deci	RW	0 - 300
44284	1 Phase Undervoltage Inhibit Frequency (27-1)	Uint32	Hertz	N/A	RW	20 - 400
44286	1 Phase Undervoltage Alarm Configuration (27-1)	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44288	3 Phase Overvoltage Pickup (59-1)	Uint32	Volt	N/A	RW	70 - 576
44290	3 Phase Overvoltage Activation Delay (59-1)	Uint32	Decisecond	Deci	RW	0 - 300
44292	3 Phase Overvoltage Alarm Configuration (59-1)	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44294	1 Phase Overvoltage Pickup (59-1)	Uint32	Volt	N/A	RW	70 - 576

Register	Description	Type	Units	Scaling Factor	R/W	Range
44296	1 Phase Overvoltage Activation Delay (59-1)	Uint32	Decisecond	Deci	RW	0 - 300
44298	1 Phase Overvoltage Alarm Configuration (59-1)	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44300	Underfrequency Pickup	Uint32	DeciHertz	Deci	RW	450 - 4400
44302	Underfrequency Activation Delay	Uint32	Decisecond	Deci	RW	0 - 300
44304	Underfrequency Inhibit Voltage	Uint32	Volt	N/A	RW	70 - 576
44306	Underfrequency Alarm Configuration	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44308	Overfrequency Pickup	Uint32	DeciHertz	Deci	RW	450 - 4400
44310	Overfrequency Activation Delay	Uint32	Decisecond	Deci	RW	0 - 300
44312	Overfrequency Alarm Configuration	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44314	Overcurrent Low Line Scale Factor (51-1)	Float	N/A	N/A	RW	0.001 - 3
44316	Overvoltage Low Line Scale Factor (59-1)	Float	N/A	N/A	RW	0.001 - 3
44318	Undervoltage Low Line Scale Factor (27-1)	Float	N/A	N/A	RW	0.001 - 3
44320	3 Phase Overcurrent Pickup (51-2)	Uint32	CentiAmp	Centi	RW	18 - 775
44322	3 Phase Overcurrent Time Dial (51-2)	Uint32	DeciUnit	Deci	RW	0 - 72000
44324	3 Phase Overcurrent Curve (51-2)	Uint32	N/A	N/A	RW	0 = S1 Curve 1 = S2 Curve 2 = L1 Curve 3 = L2 Curve 4 = D Curve 5 = M Curve 6 = I1 Curve 7 = I2 Curve 8 = V1 Curve 9 = V2 Curve 10 = E1 Curve 11 = E2 Curve 12 = A Curve 13 = B Curve 14 = C Curve 15 = G Curve 16 = F Curve 17 = Programmable
44326	3 Phase Overcurrent Alarm Configuration (51-2)	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44328	1 Phase Overcurrent Pickup (51-2)	Uint32	CentiAmp	Centi	RW	18 - 775
44330	1 Phase Overcurrent Time Dial (51-2)	Uint32	DeciUnit	Deci	RW	0 - 72000

Register	Description	Type	Units	Scaling Factor	R/W	Range
44332	1 Phase Overcurrent Curve (51-2)	Uint32	N/A	N/A	RW	0 = S1 Curve 1 = S2 Curve 2 = L1 Curve 3 = L2 Curve 4 = D Curve 5 = M Curve 6 = I1 Curve 7 = I2 Curve 8 = V1 Curve 9 = V2 Curve 10 = E1 Curve 11 = E2 Curve 12 = A Curve 13 = B Curve 14 = C Curve 15 = G Curve 16 = F Curve 17 = Programmable
44334	1 Phase Overcurrent Alarm Configuration (51-2)	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44336	3 Phase Undervoltage Pickup (27-2)	Uint32	Volt	N/A	RW	70 - 576
44338	3 Phase Undervoltage Activation Delay (27-2)	Uint32	Decisecond	Deci	RW	0 - 300
44340	3 Phase Undervoltage Inhibit Frequency (27-2)	Uint32	Hertz	N/A	RW	20 - 400
44342	3 Phase Undervoltage Alarm Configuration (27-2)	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44344	1 Phase Undervoltage Pickup (27-2)	Uint32	Volt	N/A	RW	70 - 576
44346	1 Phase Undervoltage Activation Delay (27-2)	Uint32	Decisecond	Deci	RW	0 - 300
44348	1 Phase Undervoltage Inhibit Frequency (27-2)	Uint32	Hertz	N/A	RW	20 - 400
44350	1 Phase Undervoltage Alarm Configuration (27-2)	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44352	3 Phase Overvoltage Pickup (59-2)	Uint32	Volt	N/A	RW	70 - 576
44354	3 Phase Overvoltage Activation Delay (59-2)	Uint32	Decisecond	Deci	RW	0 - 300
44356	3 Phase Overvoltage Alarm Configuration (59-2)	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44358	1 Phase Overvoltage Pickup (59-2)	Uint32	Volt	N/A	RW	70 - 576
44360	1 Phase Overvoltage Activation Delay (59-2)	Uint32	Decisecond	Deci	RW	0 - 300
44362	1 Phase Overvoltage Alarm Configuration (59-2)	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44364	Overcurrent Low Line Scale Factor (51-2)	Float	N/A	N/A	RW	0.001 - 3
44366	Overvoltage Low Line Scale Factor (59-2)	Float	N/A	N/A	RW	0.001 - 3
44368	Undervoltage Low Line Scale Factor (27-2)	Float	N/A	N/A	RW	0.001 - 3
44370	Phase Imbalance Hysteresis	Uint32	Volt	N/A	RW	1 - 5
44372	3 Phase Undervoltage Hysteresis (27-1)	Uint32	Volt	N/A	RW	1 - 60

Register	Description	Type	Units	Scaling Factor	R/W	Range
44374	1 Phase Undervoltage Hysteresis (27-1)	Uint32	Volt	N/A	RW	1 - 60
44376	3 Phase Overvoltage Hysteresis (59-1)	Uint32	Volt	N/A	RW	1 - 60
44378	1 Phase Overvoltage Hysteresis (59-1)	Uint32	Volt	N/A	RW	1 - 60
44380	Underfrequency Hysteresis	Uint32	DeciHertz	Deci	RW	1 - 400
44382	Overfrequency Hysteresis	Uint32	DeciHertz	Deci	RW	1 - 400
44384	3 Phase Undervoltage Hysteresis (27-2)	Uint32	Volt	N/A	RW	1 - 60
44386	1 Phase Undervoltage Hysteresis (27-2)	Uint32	Volt	N/A	RW	1 - 60
44388	3 Phase Overvoltage Hysteresis (59-2)	Uint32	Volt	N/A	RW	1 - 60
44390	1 Phase Overvoltage Hysteresis (59-2)	Uint32	Volt	N/A	RW	1 - 60
44392	3 Phase Reverse Power Pickup	Uint32	DeciPercent	Deci	RW	(-500) - 50
44394	3 Phase Reverse Power Activation Delay	Uint32	Decisecond	Deci	RW	0 - 300
44396	3 Phase Reverse Power Alarm Configuration	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44398	3 Phase Reverse Power Hysteresis	Int32	DeciPercent	Deci	RW	10 - 100
44400	1 Phase Reverse Power Pickup	Uint32	DeciPercent	Deci	RW	(-500) - 50
44402	1 Phase Reverse Power Activation Delay	Uint32	Decisecond	Deci	RW	0 - 300
44404	1 Phase Reverse Power Alarm Configuration	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44406	1 Phase Reverse Power Hysteresis	Int32	DeciPercent	Deci	RW	10 - 100
44408	3 Phase Loss of Excitation Pickup	Uint32	DeciPercent	Deci	RW	(-1500) - 0
44410	3 Phase Loss of Excitation Activation Delay	Uint32	Decisecond	Deci	RW	0 - 300
44412	3 Phase Loss of Excitation Alarm Configuration	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44414	3 Phase Loss of Excitation Hysteresis	Int32	DeciPercent	Deci	RW	10 - 100
44416	1 Phase Loss of Excitation Pickup	Uint32	DeciPercent	Deci	RW	(-1500) - 0
44418	1 Phase Loss of Excitation Activation Delay	Uint32	Decisecond	Deci	RW	0 - 300
44420	1 Phase Loss of Excitation Alarm Configuration	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44422	1 Phase Loss of Excitation Hysteresis	Int32	DeciPercent	Deci	RW	10 - 100
44424	3 Phase Overcurrent Reset Type (51-1)	Int32	N/A	N/A	RW	0 = Instantaneous 1 = Integrating
44426	1 Phase Overcurrent Reset Type (51-1)	Int32	N/A	N/A	RW	0 = Instantaneous 1 = Integrating
44428	3 Phase Overcurrent Reset Type (51-2)	Int32	N/A	N/A	RW	0 = Instantaneous 1 = Integrating
44430	1 Phase Overcurrent Reset Type (51-2)	Int32	N/A	N/A	RW	0 = Instantaneous 1 = Integrating
44432	51-1 Curve Constant A	Float	N/A	N/A	RW	0 - 600
44434	51-1 Curve Constant B	Float	N/A	N/A	RW	0 - 25
44436	51-1 Curve Constant C	Float	N/A	N/A	RW	0 - 1

Register	Description	Type	Units	Scaling Factor	R/W	Range
44438	51-1 Curve Constant N	Float	N/A	N/A	RW	0.5 - 2.5
44440	51-1 Curve Constant R	Float	N/A	N/A	RW	0 - 30
44442	51-2 Curve Constant A	Float	N/A	N/A	RW	0 - 600
44444	51-2 Curve Constant B	Float	N/A	N/A	RW	0 - 25
44446	51-2 Curve Constant C	Float	N/A	N/A	RW	0 - 1
44448	51-2 Curve Constant N	Float	N/A	N/A	RW	0.5 - 2.5
44450	51-2 Curve Constant R	Float	N/A	N/A	RW	0 - 30
44452	3 Phase Overcurrent Pickup (51-3)	Uint32	CentiAmp	Centi	RW	18 - 775
44454	3 Phase Overcurrent Time Dial (51-3)	Uint32	DeciUnit	Deci	RW	0 - 72000
44456	3 Phase Overcurrent Curve (51-3)	Uint32	N/A	N/A	RW	0 = S1 Curve 1 = S2 Curve 2 = L1 Curve 3 = L2 Curve 4 = D Curve 5 = M Curve 6 = I1 Curve 7 = I2 Curve 8 = V1 Curve 9 = V2 Curve 10 = E1 Curve 11 = E2 Curve 12 = A Curve 13 = B Curve 14 = C Curve 15 = G Curve 16 = F Curve 17 = Programmable
44458	3 Phase Overcurrent Alarm Configuration (51-3)	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44460	1 Phase Overcurrent Pickup (51-3)	Uint32	CentiAmp	Centi	RW	18 - 775
44462	1 Phase Overcurrent Time Dial (51-3)	Uint32	DeciUnit	Deci	RW	0 - 72000
44464	1 Phase Overcurrent Curve (51-3)	Uint32	N/A	N/A	RW	0 = S1 Curve 1 = S2 Curve 2 = L1 Curve 3 = L2 Curve 4 = D Curve 5 = M Curve 6 = I1 Curve 7 = I2 Curve 8 = V1 Curve 9 = V2 Curve 10 = E1 Curve 11 = E2 Curve 12 = A Curve 13 = B Curve 14 = C Curve 15 = G Curve 16 = F Curve 17 = Programmable
44466	1 Phase Overcurrent Alarm Configuration (51-3)	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44468	Overcurrent Low Line Scale Factor (51-3)	Float	N/A	N/A	RW	0.001 - 3
44470	3 Phase Overcurrent Reset Type (51-3)	Int32	N/A	N/A	RW	0 = Instantaneous 1 = Integrating
44472	1 Phase Overcurrent Reset Type (51-3)	Int32	N/A	N/A	RW	0 = Instantaneous 1 = Integrating
44474	51-3 Curve Constant A	Float	N/A	N/A	RW	0 - 600
44476	51-3 Curve Constant B	Float	N/A	N/A	RW	0 - 25
44478	51-3 Curve Constant C	Float	N/A	N/A	RW	0 - 1

Register	Description	Type	Units	Scaling Factor	R/W	Range
44480	51-3 Curve Constant N	Float	N/A	N/A	RW	0.5 - 2.5
44482	51-3 Curve Constant R	Float	N/A	N/A	RW	0 - 30
44484	78 Vector Shift Alarm Config	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44486	78 Vector Shift Pickup	Int32	Degree	N/A	RW	2 - 90
44488	78 Open Mains Breaker on Trip	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44490	81 ROCOF Alarm Config	Uint32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
44492	81 ROCOF Pickup	Uint32	Hz/Second	Deci	RW	2 - 100
44494	81 ROCOF Activation Delay	Uint32	Second	Milli	RW	0 - 10000
44496	81 ROCOF Open Mains Breaker on Trip	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44498	Alternate Frequency Scale Factor	Float	N/A	N/A	RW	0.001 - 100

Alarms

Register	Description	Type	Units	Scaling Factor	R/W	Range
44500	High Coolant Temp Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44502	High Coolant Temp Alarm Threshold	Uint32	Deg F	N/A	RW	100 - 280
44504	Metric High Coolant Temp Alarm Threshold	Int32	Deg C	N/A	RW	38 - 138
44506	High Coolant Temp Alarm Activation Delay	Uint32	Second	N/A	RW	0 - 150
44508	Low Oil Press. Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44510	Low Oil Press. Alarm Threshold	Uint32	PSI	Deci	RW	29 - 1500
44512	Metric Low Oil Press. Alarm Threshold	Uint32	kPa	Deci	RW	200 - 10345
44514	Low Oil Press. Alarm Arming Delay	Uint32	Second	N/A	RW	5 - 60
44516	Overspeed Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44518	Overspeed Alarm Threshold	Uint32	Percent	N/A	RW	105 - 140
44520	Overspeed Alarm Activation Delay	Uint32	Millisecond	Milli	RW	0 - 500
44522	Low Fuel Level Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44524	Low Fuel Level Alarm Threshold	Uint32	Percent	N/A	RW	0 - 100
44526	Low Fuel Level Alarm Activation Delay	Int32	Second	N/A	RW	0 - 30
44528	High Coolant Temp Pre-Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44530	High Coolant Temp Pre-Alarm Threshold	Uint32	Deg F	N/A	RW	100 - 280
44532	Metric High Coolant Temp Pre-Alarm Threshold	Int32	Deg C	N/A	RW	38 - 138
44534	Low Coolant Temp Pre-Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44536	Low Coolant Temp Pre-Alarm Threshold	Uint32	Deg F	N/A	RW	35 - 151
44538	Metric Low Coolant Temp Pre-Alarm Threshold	Int32	Deg C	N/A	RW	2 - 66
44540	High Fuel Level Pre-Alarm Threshold	Int32	Percent	N/A	RW	0 - 150
44542	High Fuel Level Pre-Alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable

Register	Description	Type	Units	Scaling Factor	R/W	Range
44544	High Fuel Level Pre-Alarm Activation Delay	Int32	Second	N/A	RW	0 - 30
44546	Low Fuel Level Pre-Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44548	Low Fuel Level Pre-Alarm Threshold	Uint32	Percent	N/A	RW	10 - 100
44550	Low Battery Pre-Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44552	Low Battery Pre-Alarm Threshold	Uint32	DeciVolt	Deci	RW	60 - 280
44554	Low Battery Pre-Alarm Activation Delay	Uint32	Second	N/A	RW	1 - 10
44556	Weak Battery Pre-Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44558	Weak Battery Pre-Alarm Threshold	Uint32	DeciVolt	Deci	RW	40 - 280
44560	Weak Battery Pre-Alarm Activation Delay	Uint32	Second	Deci	RW	0 - 100
44562	Battery Overvoltage Pre-Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44564	Low Oil Press. Pre-Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44566	Low Oil Press. Pre-Alarm Threshold	Uint32	PSI	Deci	RW	29 - 1500
44568	Metric Low Oil Press. Pre-Alarm Threshold	Int32	kPa	Deci	RW	20 - 10345
44570	Engine Overload 1 Pre-Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44572	Engine Overload 1 Pre-Alarm Threshold	Int32	Percent	N/A	RW	0 - 200
44574	ECU Comms Fail Pre-Alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44576	Active DTC Pre-Alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44578	Maintenance Interval Pre-Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44580	Maintenance Interval Pre-Alarm Threshold	Uint32	Hour	N/A	RW	0 - 5000
44582	Speed Sender Fail Activation Delay	Int32	Second	N/A	RW	0 - 300
44584	ECU Low Coolant Level Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44586	ECU Low Coolant Level Alarm Threshold	Uint32	Percent	N/A	RW	1 - 99
44588	ECU Low Coolant Level Pre-Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44590	ECU Low Coolant Level Pre-Alarm Threshold	Uint32	Percent	N/A	RW	1 - 99
44592	Battery Overvoltage Alarm Threshold	Int32	DeciVolt	Deci	RW	120 - 320
44594	Engine Overload 1 Pre-Alarm 3 Phase Hysteresis	Int32	DeciVolt	Deci	RW	1 - 10
44596	Engine Overload 1 Pre-Alarm 1 Phase Threshold	Int32	Percent	N/A	RW	0 - 200
44598	Engine Overload 1 Pre-Alarm 1 Phase Hysteresis	Int32	Percent	N/A	RW	1 - 10
44600	Engine Overload 1 Pre-Alarm 1 Phase Low Line Scale Factor	Float	N/A	N/A	RW	0.001 - 3
44602	Engine Overload 2 Pre-Alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44604	Engine Overload 2 Pre-Alarm 3 Phase Threshold	Int32	Percent	N/A	RW	0 - 200
44606	Engine Overload 2 Pre-Alarm 3 Phase Hysteresis	Int32	Percent	N/A	RW	1 - 10

Register	Description	Type	Units	Scaling Factor	R/W	Range
44608	Engine Overload 2 Pre-Alarm 1 Phase Threshold	Int32	Percent	N/A	RW	0 - 200
44610	Engine Overload 2 Pre-Alarm 1 Phase Hysteresis	Int32	Percent	N/A	RW	1 - 10
44612	Engine Overload 2 Pre-Alarm 1 Phase Low Line Scale Factor	Float	N/A	N/A	RW	0.001 - 3
44614	Engine Overload 3 Pre-Alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44616	Engine Overload 3 Pre-Alarm 3 Phase Threshold	Int32	Percent	N/A	RW	0 - 200
44618	Engine Overload 3 Pre-Alarm 3 Phase Hysteresis	Int32	Percent	N/A	RW	1 - 10
44620	Engine Overload 3 Pre-Alarm 1 Phase Threshold	Int32	Percent	N/A	RW	0 - 200
44622	Engine Overload 3 Pre-Alarm 1 Phase Hysteresis	Int32	Percent	N/A	RW	1 - 10
44624	Engine Overload 3 Pre-Alarm 1 Phase Low Line Scale Factor	Float	N/A	N/A	RW	0.001 - 3
44626	LSM Comm Failure Pre-alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44628	Intergenset Comm Failure Pre-alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44630	AVR Bias Output Limit Pre-alarm Activation Delay	Int32	Second	N/A	RW	1 - 15
44632	AVR Bias Output Limit Pre-alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44634	GOV Bias Output Limit Pre-alarm Activation Delay	Int32	Second	N/A	RW	1 - 15
44636	GOV Bias Output Limit Pre-alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44638	ID Missing Pre-alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44640	ID Repeat Pre-alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44642	CEM Comm Failure Pre-alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44644	AEM Comm Failure Pre-alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44646	Checksum Failure Pre-alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44648	Low Oil Pressure Alarm (metric pressure units is Bar)	Int32	Bar	Deci	RW	2 - 103
44650	Low Oil Pressure Pre-Alarm (metric pressure units is Bar)	Int32	Bar	Deci	RW	2 - 103
44652	Sync Fail Pre-alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44654	Breaker Close Fail Pre-Alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44656	Breaker Open Fail Pre-Alarm Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
44658	Breaker Close Fail Pre-Alarm Monitor	Int32	N/A	N/A	RW	0 = Transitions Only 1 = Always
44660	Breaker Open Fail Pre-Alarm Monitor	Int32	N/A	N/A	RW	0 = Transitions Only 1 = Always
44662	Reverse Rotation Pre-Alarm Enable	Uint32	N/A	N/A	RW	0 = Disable 1 = Enable
44664-748	FUTURE USE					

Metering

Register	Description	Type	Units	Scaling Factor	R/W	Range
44750	Gen VAB Metering	Int32	Volt	N/A	R	(-2147483648) - 2147483647
44752	Gen VBC Metering	Int32	Volt	N/A	R	(-2147483648) - 2147483647
44754	Gen VCA Metering	Int32	Volt	N/A	R	(-2147483648) - 2147483647

Register	Description	Type	Units	Scaling Factor	R/W	Range
44756	Gen VAN Metering	Int32	Volt	N/A	R	(-2147483648) - 2147483647
44758	Gen VBN Metering	Int32	Volt	N/A	R	(-2147483648) - 2147483647
44760	Gen VCN Metering	Int32	Volt	N/A	R	(-2147483648) - 2147483647
44762	Bus Voltage Metering	Int32	Volt	N/A	R	(-2147483648) - 2147483647
44764	Gen IA Metering	Int32	Amp	N/A	R	(-32768) - 32767
44766	Gen IB Metering	Int32	Amp	N/A	R	(-32768) - 32767
44768	Gen IC Metering	Int32	Amp	N/A	R	(-32768) - 32767
44770	Gen kVA A Metering	Int32	KiloVA	N/A	R	(-2147483648) - 2147483647
44772	Gen kVA B Metering	Int32	KiloVA	N/A	R	(-2147483648) - 2147483647
44774	Gen kVA C Metering	Int32	KiloVA	N/A	R	(-2147483648) - 2147483647
44776	Gen kVA Total Metering	Int32	KiloVA	N/A	R	(-2147483648) - 2147483647
44778	Gen kW A Metering	Int32	KiloWatt	N/A	R	(-2147483648) - 2147483647
44780	Gen kW B Metering	Int32	KiloWatt	N/A	R	(-2147483648) - 2147483647
44782	Gen kW C Metering	Int32	KiloWatt	N/A	R	(-2147483648) - 2147483647
44784	Gen kW Total Metering	Int32	KiloWatt	N/A	R	(-2147483648) - 2147483647
44786	Power Factor Metering	Float	N/A	N/A	R	(-1) - 1
44788	Gen PF Lagging	Int32	N/A	N/A	R	(-128) - 127
44790	Gen Frequency Metering	Float	Hertz	N/A	R	45 - 440
44792	Bus Frequency Metering	Float	Hertz	N/A	R	45 - 440
44794	Active Speed Source	Uint32	N/A	N/A	R	0 - 255
44796	Engine Speed Metering	Uint32	RPM	N/A	R	0 - 65535
44798	Engine Load Metering	Int32	Percent	N/A	R	(-32768) - 32767
44800	Coolant Temp. Metering	Int32	Deg F	N/A	R	(-32768) - 32767
44802	Oil Pressure Metering	Int32	PSI	N/A	R	(-32768) - 32767
44804	Battery Voltage Metering	Int32	DeciVolt	N/A	R	(-32768) - 32767
44806	Fuel Level Metering	Int32	N/A	N/A	R	(-32768) - 32767
44808	ECU Coolant Level Metering	Uint32	N/A	N/A	R	0 - 255
44810	Cool Down Time Remaining	Int32	Minute	N/A	R	(-128) - 127
44812-13	Alarm Metering	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Unexpected Shutdown Bit 17 = Global Alarm Bit 18 = Auto Restart Failure Bit 19 = Fuel Leak Detect Bit 20 = Battery Charger Failure Bit 21 = Transfer Fail Bit 22 = Low Coolant Level Bit 23 = ECU Shutdown Bit 24 = Emergency Shutdown Bit 25 = Overcrank Bit 26 = Loss of ECU Comms Bit 27 = Global Sender Fail Bit 28 = Low Fuel Level Bit 29 = Low Oil Pressure Bit 30 = Hi Coolant Temp Bit 31 = Overspeed

Register	Description	Type	Units	Scaling Factor	R/W	Range
44814-15	Pre-Alarm Metering 1	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Serial Flash Read Failure Bit 3 = Checksum Fail Bit 4 = Global Pre-Alarm Bit 5 = Fuel Filter 2 Leak Bit 6 = Fuel Filter 1 Leak Bit 7 = Engine kW Overload 3 Bit 8 = Engine kW Overload 2 Bit 9 = MPU Fail Bit 10 = Fuel Leak Detect Bit 11 = Battery Charger Failure Bit 12 = Low Coolant Level Bit 13 = Mains Brkr Fail to Open Bit 14 = Mains Brkr Fail to Close Bit 15 = Sync Fail at Mains Brkr Bit 16 = Gen Brkr Fail to Open Bit 17 = Gen Brkr Fail to Close Bit 18 = Sync Fail at Gen Brkr Bit 19 = High Fuel Level Bit 20 = Loss of Rem. Mod. Com Bit 21 = Engine kW Overload Bit 22 = Diagnostic Trouble Code Bit 23 = Loss of ECU Comms Bit 24 = Maintenance Due Bit 25 = Battery Overvoltage Bit 26 = Weak Battery Bit 27 = Low Battery Voltage Bit 28 = Low Coolant Temp Bit 29 = Low Fuel Level Bit 30 = Low Oil Pressure Bit 31 = Hi Coolant Temp
44816-17	MTU Alarm Metering	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Not Used Bit 23 = High ECU Supply Bit 24 = Combined Red Bit 25 = Overspeed Bit 26 = Low Oil Pressure Bit 27 = Low Fuel Delivery Press. Bit 28 = Low Aftercooler Coolant Level Bit 29 = High Coolant Temp Bit 30 = High Oil Temp Bit 31 = High Charge Air Temp

Register	Description	Type	Units	Scaling Factor	R/W	Range
44818-19	MTU Pre-Alarm Metering	Int32	N/A	N/A	R	Bit 0 = Low Storage Tank Bit 1 = High Storage Tank Bit 2 = Low Day Tank Bit 3 = High Day Tank Bit 4 = Alternator Winding Temp Bit 5 = Idle Speed Low Bit 6 = Run Up Speed Low Bit 7 = Start Speed Low Bit 8 = Priming Fault Bit 9 = Low Charge Air Coolant Level Bit 10 = High Fuel Temp. Bit 11 = High Exhaust Temp. B Bit 12 = High Exhaust Temp. A Bit 13 = Low ECU Supply Voltage Bit 14 = Engine Speed Too Low Bit 15 = High Voltage Supply Bit 16 = Low Voltage Supply Bit 17 = Speed Demand Fail Bit 18 = ECU Faulty Bit 19 = Combined Yellow Bit 20 = Low Oil Press. Bit 21 = Low Fuel Delivery Press. Bit 22 = Low Charge Air Press. Bit 23 = Low Coolant Level Bit 24 = Low Fuel Rail Press. Bit 25 = High Fuel Rail Press. Bit 26 = Shutdown Override Bit 27 = High Coolant Temp. Bit 28 = High Charge Air Temp. Bit 29 = High Intercooler Temp. Bit 30 = High Oil Temp. Bit 31 = High ECU Temp.
44820-21	Sender Fail Alarm Metering	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Not Used Bit 23 = Not Used Bit 24 = Not Used Bit 25 = Not Used Bit 26 = Not Used Bit 27 = Generator Voltage Bit 28 = Fuel Level Bit 29 = Coolant Temp Bit 30 = Oil Pressure Bit 31 = Speed
44822-26	RESERVED					

Register	Description	Type	Units	Scaling Factor	R/W	Range
44828-29	Local Input Metering	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Input 16 Bit 17 = Input 15 Bit 18 = Input 14 Bit 19 = Input 13 Bit 20 = Input 12 Bit 21 = Input 11 Bit 22 = Input 10 Bit 23 = Input 9 Bit 24 = Input 8 Bit 25 = Input 7 Bit 26 = Input 6 Bit 27 = Input 5 Bit 28 = Input 4 Bit 29 = Input 3 Bit 30 = Input 2 Bit 31 = Input 1
44830-31	Local Output Metering	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Pre Start Output Bit 18 = Run Output Bit 19 = Start Output Bit 20 = Output 12 Bit 21 = Output 11 Bit 22 = Output 10 Bit 23 = Output 9 Bit 24 = Output 8 Bit 25 = Output 7 Bit 26 = Output 6 Bit 27 = Output 5 Bit 28 = Output 4 Bit 29 = Output 3 Bit 30 = Output 2 Bit 31 = Output 1

Register	Description	Type	Units	Scaling Factor	R/W	Range
44832-33	Status Metering 1	Int32	N/A	N/A	R	Bit 0 = Idle Request Bit 1 = Lamp Test Bit 2 = Alarm Silence Bit 3 = Reset Bit 4 = Alternate Frequency Override Bit 5 = Start Delay Bypass Bit 6 = Cooldown and Stop Request from Logic Bit 7 = Cooldown Request from Logic Bit 8 = External Start Delay Bit 9 = Off Mode Cooldown Bit 10 = PF Mode Active Bit 11 = Var Mode Active Bit 12 = Cooldown Timer Active Bit 13 = Engine Running Bit 14 = Fuel Leak Detect Bit 15 = Battery Charger Failure Bit 16 = Low Coolant Level Bit 17 = Gen Failed Bit 18 = Gen Stable Bit 19 = Gen Dead Bit 20 = Bus Failed Bit 21 = Bus Stable Bit 22 = Bus Dead Bit 23 = Gen Breaker Closed Bit 24 = Mains Breaker Closed Bit 25 = Grounded Delta Override Bit 26 = Battle Override Bit 27 = Auto Transfer Switch Bit 28 = Low Line Override Bit 29 = Single Phase AC Override Bit 30 = Single Phase Override Bit 31 = EPS Supplying Load
44834	Hours Until Maintenance	Int32	N/A	N/A	RW	0 - 5000
44836	Cum. Total Engine Run Hrs.	Int32	Hour	N/A	R	0 - 99999
44838	Cum. Total Engine Run Min.	Int32	N/A	N/A	R	0 - 59
44840	Cum. Loaded Engine Run Hrs.	Int32	N/A	N/A	R	0 - 99999
44842	Cum. Loaded Engine Run Min.	Int32	N/A	N/A	R	0 - 59
44844	Cum. Unloaded Engine Run Hrs.	Int32	Hour	N/A	R	0 - 99999
44846	Cum. Unloaded Engine Run Min.	Int32	N/A	N/A	R	0 - 59
44848	Cum. Total kW-Hrs	Uint32	KiloWattHour	N/A	R	0 - 999999999
44850	Cum. Total kW-Mins	Uint32	KiloWattMinute	N/A	R	0 - 4294967295
44852	Commission Date Month	Uint32	N/A	N/A	RW	1 - 12
44854	Commission Date Day	Uint32	N/A	N/A	RW	1 - 31
44856	Commission Date Year	Uint32	N/A	N/A	RW	0 - 99
44858	Session Total Engine Run Hrs.	Int32	Hour	N/A	R	0 - 99999
44860	Session Total Engine Run Min.	Int32	N/A	N/A	R	0 - 59
44862	Session Loaded Engine Run Hrs.	Int32	Hour	N/A	R	0 - 99999
44864	Session Loaded Engine Run Min.	Int32	N/A	N/A	R	0 - 59
44866	Session Unloaded Engine Run Hrs.	Int32	Hour	N/A	R	0 - 99999
44868	Session Unloaded Engine Run Min.	Int32	N/A	N/A	R	0 - 59
44870	Session kW-Hrs	Int32	KiloWattHour	N/A	R	0 - 999999999

Register	Description	Type	Units	Scaling Factor	R/W	Range
44872	Cumulative Number of Engine Starts	Uint32	N/A	N/A	RW	0 - 65535
44874	Session Start Date Month	Uint32	N/A	N/A	RW	1 - 12
44876	Session Start Date Day	Uint32	N/A	N/A	RW	1 - 31
44878	Session Start Date Year	Uint32	N/A	N/A	RW	0 - 99
44880	Generator Status	Uint32	N/A	N/A	R	0 = RESET State 1 = READY State 2 = CRANKING State 3 = RESTING State 4 = RUNNING State 5 = ALARM State 6 = PRESTART State 7 = COOLING State 8 = CONNECTING State 9 = DISCONNECT State 10 = PULSING State 11 = UNLOADING State
44882-918	RESERVED					
44920-32	FUTURE USE					
44934-35	Protection Alarm Metering	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = 81 ROC DF/DT Trip Bit 19 = 78 Vector Shift Trip Bit 20 = 51-3 Overcurrent Bit 21 = 40Q Loss of Excitation Bit 22 = 32 Reverse Power Bit 23 = 59-2 Overvoltage Bit 24 = 27-2 Undervoltage Bit 25 = 51-2 Overcurrent Bit 26 = 81 Underfrequency Bit 27 = 81 Overfrequency Bit 28 = 59-1 Overvoltage Bit 29 = 27-1 Undervoltage Bit 30 = 47 Phase Imbalance Bit 31 = 51-1 Overcurrent
44936	Cumulative Stats - Total Run Hours	Uint32	Hour	N/A	RW	0 - 5999940
44938	Cumulative Stats - Loaded Run Hours	Uint32	Hour	N/A	RW	0 - 5999940
44940	Cumulative Stats - Unloaded Run Hours	Uint32	Hour	N/A	RW	0 - 5999940
44942	Run Stats - Total Run Hours	Uint32	Hour	N/A	RW	0 - 5999940
44944	Run Stats - Loaded Run Hours	Uint32	Hour	N/A	RW	0 - 5999940
44946	Run Stats - Unloaded Run Hours	Uint32	Hour	N/A	RW	0 - 5999940

Register	Description	Type	Units	Scaling Factor	R/W	Range
44948-49	LSM Alarm Bits	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Not Used Bit 23 = Not Used Bit 24 = Not Used Bit 25 = Duplicate LSM Bit 26 = ID Repeat Bit 27 = ID Missing Bit 28 = LSM Comms Failure Bit 29 = Intergenset Comms Failure Bit 30 = GOV Output Limit Bit 31 = AVR Output Limit
44950	Global Alarm	Uint32	N/A	N/A	R	Bit 0 = No system alarms in effect Bit 1 = System alarm(s) in effect
44952	Global Pre-Alarm	Uint32	N/A	N/A	R	Bit 0 = No system pre-alarms in effect Bit 1 = System pre-alarm(s) in effect

Register	Description	Type	Units	Scaling Factor	R/W	Range
44954-55	Local Configurable Inputs Pre-Alarm Bits	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Input 16 Bit 17 = Input 15 Bit 18 = Input 14 Bit 19 = Input 13 Bit 20 = Input 12 Bit 21 = Input 11 Bit 22 = Input 10 Bit 23 = Input 9 Bit 24 = Input 8 Bit 25 = Input 7 Bit 26 = Input 6 Bit 27 = Input 5 Bit 28 = Input 4 Bit 29 = Input 3 Bit 30 = Input 2 Bit 31 = Input 1
44956-57	Local Configurable Inputs Alarm Bits	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Input 16 Bit 17 = Input 15 Bit 18 = Input 14 Bit 19 = Input 13 Bit 20 = Input 12 Bit 21 = Input 11 Bit 22 = Input 10 Bit 23 = Input 9 Bit 24 = Input 8 Bit 25 = Input 7 Bit 26 = Input 6 Bit 27 = Input 5 Bit 28 = Input 4 Bit 29 = Input 3 Bit 30 = Input 2 Bit 31 = Input 1

Register	Description	Type	Units	Scaling Factor	R/W	Range
44958-59	Configurable Elements Status Bits	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Not Used Bit 23 = Not Used Bit 24 = Config Element 8 Bit 25 = Config Element 7 Bit 26 = Config Element 6 Bit 27 = Config Element 5 Bit 28 = Config Element 4 Bit 29 = Config Element 3 Bit 30 = Config Element 2 Bit 31 = Config Element 1
44960-61	Configurable Elements Pre-Alarm Bits	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Not Used Bit 23 = Not Used Bit 24 = Config Element 8 Bit 25 = Config Element 7 Bit 26 = Config Element 6 Bit 27 = Config Element 5 Bit 28 = Config Element 4 Bit 29 = Config Element 3 Bit 30 = Config Element 2 Bit 31 = Config Element 1

Register	Description	Type	Units	Scaling Factor	R/W	Range
44962-63	Configurable Elements Alarm Bits	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Not Used Bit 23 = Not Used Bit 24 = Config Element 8 Bit 25 = Config Element 7 Bit 26 = Config Element 6 Bit 27 = Config Element 5 Bit 28 = Config Element 4 Bit 29 = Config Element 3 Bit 30 = Config Element 2 Bit 31 = Config Element 1
44964-65	Remote Inputs Status Bits	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Remote Input 26 Bit 23 = Remote Input 25 Bit 24 = Remote Input 24 Bit 25 = Remote Input 23 Bit 26 = Remote Input 22 Bit 27 = Remote Input 21 Bit 28 = Remote Input 20 Bit 29 = Remote Input 19 Bit 30 = Remote Input 18 Bit 31 = Remote Input 17

Register	Description	Type	Units	Scaling Factor	R/W	Range
44966-67	Remote Outputs Status Bits	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Remote Output 36 Bit 9 = Remote Output 35 Bit 10 = Remote Output 34 Bit 11 = Remote Output 33 Bit 12 = Remote Output 32 Bit 13 = Remote Output 31 Bit 14 = Remote Output 30 Bit 15 = Remote Output 29 Bit 16 = Remote Output 28 Bit 17 = Remote Output 27 Bit 18 = Remote Output 26 Bit 19 = Remote Output 25 Bit 20 = Remote Output 24 Bit 21 = Remote Output 23 Bit 22 = Remote Output 22 Bit 23 = Remote Output 21 Bit 24 = Remote Output 20 Bit 25 = Remote Output 19 Bit 26 = Remote Output 18 Bit 27 = Remote Output 17 Bit 28 = Remote Output 16 Bit 29 = Remote Output 15 Bit 30 = Remote Output 14 Bit 31 = Remote Output 13
44968-69	CEM Alarm Bits	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Not Used Bit 23 = Not Used Bit 24 = Not Used Bit 25 = Not Used Bit 26 = Not Used Bit 27 = Not Used Bit 28 = Not Used Bit 29 = CEM Hardware Mismatch Bit 30 = Duplicate CEM Bit 31 = CEM Comm Fail

Register	Description	Type	Units	Scaling Factor	R/W	Range
44970-71	Remote Configurable Inputs Pre-Alarm Bits	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Remote Input 26 Bit 23 = Remote Input 25 Bit 24 = Remote Input 24 Bit 25 = Remote Input 23 Bit 26 = Remote Input 22 Bit 27 = Remote Input 21 Bit 28 = Remote Input 20 Bit 29 = Remote Input 19 Bit 30 = Remote Input 18 Bit 31 = Remote Input 17
44972-73	Remote Configurable Inputs Alarm Bits	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Remote Input 26 Bit 23 = Remote Input 25 Bit 24 = Remote Input 24 Bit 25 = Remote Input 23 Bit 26 = Remote Input 22 Bit 27 = Remote Input 21 Bit 28 = Remote Input 20 Bit 29 = Remote Input 19 Bit 30 = Remote Input 18 Bit 31 = Remote Input 17

Register	Description	Type	Units	Scaling Factor	R/W	Range
44974-75	AEM Alarm Bits	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Not Used Bit 23 = Not Used Bit 24 = Not Used Bit 25 = Not Used Bit 26 = Not Used Bit 27 = Not Used Bit 28 = Not Used Bit 29 = Not Used Bit 30 = Duplicate AEM Bit 31 = AEM Comm Fail
44976	Slip Frequency	Int32	Hertz	Centi	R	(-32768) - 32767
44978	Slip Angle	Int32	DeciUnit	Deci	R	(-32768) - 32767
44980	Voltage Difference	Int32	Volt	N/A	R	(-2147483648) - 2147483647

Register	Description	Type	Units	Scaling Factor	R/W	Range
44982-83	MDEC Pre-Alarms	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Not Used Bit 23 = Not Used Bit 24 = High Fuel Filter Diff Pressure Bit 25 = Overspeed Test On Bit 26 = Ambient Temp Bit 27 = High Temp Coil 3 Bit 28 = High Temp Coil 2 Bit 29 = High Temp Coil 1 Bit 30 = High Pressure Input 2 Bit 31 = High Pressure Input 1
44984-85	MTU Status	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = ECU Shutdown Bit 21 = Priming Pump ON Bit 22 = CAN Mode Feedback Bit 23 = Preheat Temp Not Reached Bit 24 = Load Gen On Bit 25 = Cylinder Cutout Bit 26 = Engine Running Bit 27 = Speed Decrease Bit 28 = Speed Increase Bit 29 = Speed Demand Fail Mode Bit 30 = External Stop Active Bit 31 = ECU Override
44986	Generator Frequency	Int32	Hertz	Deci	R	0 - 4400
44988	Bus Frequency	Int32	Hertz	Deci	R	0 - 4400

Register	Description	Type	Units	Scaling Factor	R/W	Range
44990	Power Factor	Int32	N/A	Centi	R	(-100) - 100
44992	Slip Frequency	Int32	N/A	Milli	R	(-450000) -450000
44994-98	RESERVED					
45000-01	ECU Lamp Status	Int32	N/A	N/A	R	Bit 0 = Protect Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Warning Bit 4 = Stop Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Malfunction Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Not Used Bit 23 = Not Used Bit 24 = Not Used Bit 25 = Not Used Bit 26 = Not Used Bit 27 = Not Used Bit 28 = Not Used Bit 29 = Not Used Bit 30 = Not Used Bit 31 = Not Used
45002	DTC Lamp Status Note: Odd bits are always a zero value	Int32	N/A	N/A	R	Active stored in upper byte, previous stored in lower byte. Bit 0 = Protect Lamp Bit 1 = 0 Bit 2 = Amber Warning Lamp Bit 3 = 0 Bit 4 = Red Stop Lamp Bit 5 = 0 Bit 6 = Malfunction Indicator Lamp Bit 7 = 0 Bit 8 = Protect Lamp Bit 9 = 0 Bit 10 = Amber Warning Lamp Bit 11 = 0 Bit 12 = Red Stop Lamp Bit 13 = 0 Bit 14 = Malfunction Indicator Lamp Bit 15 = 0
45004	Number of DTC's	Int32	N/A	N/A	R	(-32768) – 32767
45006-326	RESERVED					
45328	Engine Parameter Transmit Enable	Int32	N/A	N/A	RW	0 = Disable 1 = Enable
45330	Requested MTU SMC ENG Operating Mode	Int32	N/A	N/A	RW	1 - 2
45332	SPN Conversion Method	Int32	N/A	N/A	RW	1 - 4
45334-498	RESERVED					
45500	Analog Input 1 Metering Value	Int32	CentiUnit	Centi	R	(-100000000) – 99999900
45502	Analog Input 2 Metering Value	Int32	CentiUnit	Centi	R	(-100000000) – 99999900

Register	Description	Type	Units	Scaling Factor	R/W	Range
45504	Analog Input 3 Metering Value	Int32	CentiUnit	Centi	R	(-100000000) – 99999900
45506	Analog Input 4 Metering Value	Int32	CentiUnit	Centi	R	(-100000000) – 99999900
45508	Analog Input 5 Metering Value	Int32	CentiUnit	Centi	R	(-100000000) – 99999900
45510	Analog Input 6 Metering Value	Int32	CentiUnit	Centi	R	(-100000000) – 99999900
45512	Analog Input 7 Metering Value	Int32	CentiUnit	Centi	R	(-100000000) – 99999900
45514	Analog Input 8 Metering Value	Int32	CentiUnit	Centi	R	(-100000000) – 99999900
45516	RTD Input 1 Metering Value	Int32	CentiDeg F	Centi	R	(-100000000) – 99999900
45518	RTD Input 2 Metering Value	Int32	CentiDeg F	Centi	R	(-100000000) – 99999900
45520	RTD Input 3 Metering Value	Int32	CentiDeg F	Centi	R	(-100000000) – 99999900
45522	RTD Input 4 Metering Value	Int32	CentiDeg F	Centi	R	(-100000000) – 99999900
45524	RTD Input 5 Metering Value	Int32	CentiDeg F	Centi	R	(-100000000) – 99999900
45526	RTD Input 6 Metering Value	Int32	CentiDeg F	Centi	R	(-100000000) – 99999900
45528	RTD Input 7 Metering Value	Int32	CentiDeg F	Centi	R	(-100000000) – 99999900
45530	RTD Input 8 Metering Value	Int32	CentiDeg F	Centi	R	(-100000000) – 99999900
45532	Thermocouple Input 1 Metering Value	Int32	CentiDeg F	Centi	R	(-100000000) – 99999900
45534	Thermocouple Input 2 Metering Value	Int32	CentiDeg F	Centi	R	(-100000000) – 99999900
45536-37	AEM Input Threshold Status Bits Reg 1	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Analog Input 6 Under 2 Bit 3 = Analog Input 6 Under 1 Bit 4 = Analog Input 6 Over 2 Bit 5 = Analog Input 6 Over 1 Bit 6 = Analog Input 6 Out of Range Bit 7 = Analog Input 5 Under 2 Bit 8 = Analog Input 5 Under 1 Bit 9 = Analog Input 5 Over 2 Bit 10 = Analog Input 5 Over 1 Bit 11 = Analog Input 5 Out of Range Bit 12 = Analog Input 4 Under 2 Bit 13 = Analog Input 4 Under 1 Bit 14 = Analog Input 4 Over 2 Bit 15 = Analog Input 4 Over 1 Bit 16 = Analog Input 4 Out of Range Bit 17 = Analog Input 3 Under 2 Bit 18 = Analog Input 3 Under 1 Bit 19 = Analog Input 3 Over 2 Bit 20 = Analog Input 3 Over 1 Bit 21 = Analog Input 3 Out of Range Bit 22 = Analog Input 2 Under 2 Bit 23 = Analog Input 2 Under 1 Bit 24 = Analog Input 2 Over 2 Bit 25 = Analog Input 2 Over 1 Bit 26 = Analog Input 2 Out of Range Bit 27 = Analog Input 1 Under 2 Bit 28 = Analog Input 1 Under 1 Bit 29 = Analog Input 1 Over 2 Bit 30 = Analog Input 1 Over 1 Bit 31 = Analog Input 1 Out of Range

Register	Description	Type	Units	Scaling Factor	R/W	Range
45538-39	AEM Input Threshold Status Bits Reg 2	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = RTD Input 4 Under 2 Bit 3 = RTD Input 4 Under 1 Bit 4 = RTD Input 4 Over 2 Bit 5 = RTD Input 4 Over 1 Bit 6 = RTD Input 4 Out of Range Bit 7 = RTD Input 3 Under 2 Bit 8 = RTD Input 3 Under 1 Bit 9 = RTD Input 3 Over 2 Bit 10 = RTD Input 3 Over 1 Bit 11 = RTD Input 3 Out of Range Bit 12 = RTD Input 2 Under 2 Bit 13 = RTD Input 2 Under 1 Bit 14 = RTD Input 2 Over 2 Bit 15 = RTD Input 2 Over 1 Bit 16 = RTD Input 2 Out of Range Bit 17 = RTD Input 1 Under 2 Bit 18 = RTD Input 1 Under 1 Bit 19 = RTD Input 1 Over 2 Bit 20 = RTD Input 1 Over 1 Bit 21 = RTD Input 1 Out of Range Bit 22 = Analog Input 8 Under 2 Bit 23 = Analog Input 8 Under 1 Bit 24 = Analog Input 8 Over 2 Bit 25 = Analog Input 8 Over 1 Bit 26 = Analog Input 8 Out of Range Bit 27 = Analog Input 7 Under 2 Bit 28 = Analog Input 7 Under 1 Bit 29 = Analog Input 7 Over 2 Bit 30 = Analog Input 7 Over 1 Bit 31 = Analog Input 7 Out of Range
45540-41	AEM Input Threshold Status Bits Reg 3	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Thermocouple 2 Under 2 Bit 3 = Thermocouple 2 Under 1 Bit 4 = Thermocouple 2 Over 2 Bit 5 = Thermocouple 2 Over 1 Bit 6 = Thermocouple 2 Out of Range Bit 7 = Thermocouple 1 Under 2 Bit 8 = Thermocouple 1 Under 1 Bit 9 = Thermocouple 1 Over 2 Bit 10 = Thermocouple 1 Over 1 Bit 11 = Thermocouple 1 Out of Range Bit 12 = RTD Input 8 Under 2 Bit 13 = RTD Input 8 Under 1 Bit 14 = RTD Input 8 Over 2 Bit 15 = RTD Input 8 Over 1 Bit 16 = RTD Input 8 Out of Range Bit 17 = RTD Input 7 Under 2 Bit 18 = RTD Input 7 Under 1 Bit 19 = RTD Input 7 Over 2 Bit 20 = RTD Input 7 Over 1 Bit 21 = RTD Input 7 Out of Range Bit 22 = RTD Input 6 Under 2 Bit 23 = RTD Input 6 Under 1 Bit 24 = RTD Input 6 Over 2 Bit 25 = RTD Input 6 Over 1 Bit 26 = RTD Input 6 Out of Range Bit 27 = RTD Input 5 Under 2 Bit 28 = RTD Input 5 Under 1 Bit 29= RTD Input 5 Over 2 Bit 30 = RTD Input 5 Over 1 Bit 31 = RTD Input 5 Out of Range

Register	Description	Type	Units	Scaling Factor	R/W	Range
45542-43	AEM Input Threshold Status Bits Reg 4	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Not Used Bit 23 = Not Used Bit 24 = Not Used Bit 25 = Not Used Bit 26 = Not Used Bit 27 = Not Used Bit 28 = Analog Output 4 Out of Range Bit 29 = Analog Output 3 Out of Range Bit 30 = Analog Output 2 Out of Range Bit 31 = Analog Output 1 Out of Range
45544-45	AEM Input Threshold Alarm Bits Reg 1	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Analog Input 6 Under 2 Bit 3 = Analog Input 6 Under 1 Bit 4 = Analog Input 6 Over 2 Bit 5 = Analog Input 6 Over 1 Bit 6 = Analog Input 6 Out of Range Bit 7 = Analog Input 5 Under 2 Bit 8 = Analog Input 5 Under 1 Bit 9 = Analog Input 5 Over 2 Bit 10 = Analog Input 5 Over 1 Bit 11 = Analog Input 5 Out of Range Bit 12 = Analog Input 4 Under 2 Bit 13 = Analog Input 4 Under 1 Bit 14 = Analog Input 4 Over 2 Bit 15 = Analog Input 4 Over 1 Bit 16 = Analog Input 4 Out of Range Bit 17 = Analog Input 3 Under 2 Bit 18 = Analog Input 3 Under 1 Bit 19 = Analog Input 3 Over 2 Bit 20 = Analog Input 3 Over 1 Bit 21 = Analog Input 3 Out of Range Bit 22 = Analog Input 2 Under 2 Bit 23 = Analog Input 2 Under 1 Bit 24 = Analog Input 2 Over 2 Bit 25 = Analog Input 2 Over 1 Bit 26 = Analog Input 2 Out of Range Bit 27 = Analog Input 1 Under 2 Bit 28 = Analog Input 1 Under 1 Bit 29 = Analog Input 1 Over 2 Bit 30 = Analog Input 1 Over 1 Bit 31 = Analog Input 1 Out of Range

Register	Description	Type	Units	Scaling Factor	R/W	Range
45546-47	AEM Input Threshold Alarm Bits Reg 2	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = RTD Input 4 Under 2 Bit 3 = RTD Input 4 Under 1 Bit 4 = RTD Input 4 Over 2 Bit 5 = RTD Input 4 Over 1 Bit 6 = RTD Input 4 Out of Range Bit 7 = RTD Input 3 Under 2 Bit 8 = RTD Input 3 Under 1 Bit 9 = RTD Input 3 Over 2 Bit 10 = RTD Input 3 Over 1 Bit 11 = RTD Input 3 Out of Range Bit 12 = RTD Input 2 Under 2 Bit 13 = RTD Input 2 Under 1 Bit 14 = RTD Input 2 Over 2 Bit 15 = RTD Input 2 Over 1 Bit 16 = RTD Input 2 Out of Range Bit 17 = RTD Input 1 Under 2 Bit 18 = RTD Input 1 Under 1 Bit 19 = RTD Input 1 Over 2 Bit 20 = RTD Input 1 Over 1 Bit 21 = RTD Input 1 Out of Range Bit 22 = Analog Input 8 Under 2 Bit 23 = Analog Input 8 Under 1 Bit 24 = Analog Input 8 Over 2 Bit 25 = Analog Input 8 Over 1 Bit 26 = Analog Input 8 Out of Range Bit 27 = Analog Input 7 Under 2 Bit 28 = Analog Input 7 Under 1 Bit 29 = Analog Input 7 Over 2 Bit 30 = Analog Input 7 Over 1 Bit 31 = Analog Input 7 Out of Range
45548-49	AEM Input Threshold Alarm Bits Reg 3	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Thermocouple 2 Under 2 Bit 3 = Thermocouple 2 Under 1 Bit 4 = Thermocouple 2 Over 2 Bit 5 = Thermocouple 2 Over 1 Bit 6 = Thermocouple 2 Out of Range Bit 7 = Thermocouple 1 Under 2 Bit 8 = Thermocouple 1 Under 1 Bit 9 = Thermocouple 1 Over 2 Bit 10 = Thermocouple 1 Over 1 Bit 11 = Thermocouple 1 Out of Range Bit 12 = RTD Input 8 Under 2 Bit 13 = RTD Input 8 Under 1 Bit 14 = RTD Input 8 Over 2 Bit 15 = RTD Input 8 Over 1 Bit 16 = RTD Input 8 Out of Range Bit 17 = RTD Input 7 Under 2 Bit 18 = RTD Input 7 Under 1 Bit 19 = RTD Input 7 Over 2 Bit 20 = RTD Input 7 Over 1 Bit 21 = RTD Input 7 Out of Range Bit 22 = RTD Input 6 Under 2 Bit 23 = RTD Input 6 Under 1 Bit 24 = RTD Input 6 Over 2 Bit 25 = RTD Input 6 Over 1 Bit 26 = RTD Input 6 Out of Range Bit 27 = RTD Input 5 Under 2 Bit 28 = RTD Input 5 Under 1 Bit 29= RTD Input 5 Over 2 Bit 30 = RTD Input 5 Over 1 Bit 31 = RTD Input 5 Out of Range

Register	Description	Type	Units	Scaling Factor	R/W	Range
45550-51	AEM Input Threshold Alarm Bits Reg 4	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Not Used Bit 23 = Not Used Bit 24 = Not Used Bit 25 = Not Used Bit 26 = Not Used Bit 27 = Not Used Bit 28 = Analog Output 4 Out of Range Bit 29 = Analog Output 3 Out of Range Bit 30 = Analog Output 2 Out of Range Bit 31 = Analog Output 1 Out of Range
45552-53	AEM Input Threshold Pre-Alarm Bits Reg 1	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Analog Input 6 Under 2 Bit 3 = Analog Input 6 Under 1 Bit 4 = Analog Input 6 Over 2 Bit 5 = Analog Input 6 Over 1 Bit 6 = Analog Input 6 Out of Range Bit 7 = Analog Input 5 Under 2 Bit 8 = Analog Input 5 Under 1 Bit 9 = Analog Input 5 Over 2 Bit 10 = Analog Input 5 Over 1 Bit 11 = Analog Input 5 Out of Range Bit 12 = Analog Input 4 Under 2 Bit 13 = Analog Input 4 Under 1 Bit 14 = Analog Input 4 Over 2 Bit 15 = Analog Input 4 Over 1 Bit 16 = Analog Input 4 Out of Range Bit 17 = Analog Input 3 Under 2 Bit 18 = Analog Input 3 Under 1 Bit 19 = Analog Input 3 Over 2 Bit 20 = Analog Input 3 Over 1 Bit 21 = Analog Input 3 Out of Range Bit 22 = Analog Input 2 Under 2 Bit 23 = Analog Input 2 Under 1 Bit 24 = Analog Input 2 Over 2 Bit 25 = Analog Input 2 Over 1 Bit 26 = Analog Input 2 Out of Range Bit 27 = Analog Input 1 Under 2 Bit 28 = Analog Input 1 Under 1 Bit 29 = Analog Input 1 Over 2 Bit 30 = Analog Input 1 Over 1 Bit 31 = Analog Input 1 Out of Range

Register	Description	Type	Units	Scaling Factor	R/W	Range
45554-55	AEM Input Threshold Pre-Alarm Bits Reg 2	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = RTD Input 4 Under 2 Bit 3 = RTD Input 4 Under 1 Bit 4 = RTD Input 4 Over 2 Bit 5 = RTD Input 4 Over 1 Bit 6 = RTD Input 4 Out of Range Bit 7 = RTD Input 3 Under 2 Bit 8 = RTD Input 3 Under 1 Bit 9 = RTD Input 3 Over 2 Bit 10 = RTD Input 3 Over 1 Bit 11 = RTD Input 3 Out of Range Bit 12 = RTD Input 2 Under 2 Bit 13 = RTD Input 2 Under 1 Bit 14 = RTD Input 2 Over 2 Bit 15 = RTD Input 2 Over 1 Bit 16 = RTD Input 2 Out of Range Bit 17 = RTD Input 1 Under 2 Bit 18 = RTD Input 1 Under 1 Bit 19 = RTD Input 1 Over 2 Bit 20 = RTD Input 1 Over 1 Bit 21 = RTD Input 1 Out of Range Bit 22 = Analog Input 8 Under 2 Bit 23 = Analog Input 8 Under 1 Bit 24 = Analog Input 8 Over 2 Bit 25 = Analog Input 8 Over 1 Bit 26 = Analog Input 8 Out of Range Bit 27 = Analog Input 7 Under 2 Bit 28 = Analog Input 7 Under 1 Bit 29 = Analog Input 7 Over 2 Bit 30 = Analog Input 7 Over 1 Bit 31 = Analog Input 7 Out of Range
45556-57	AEM Input Threshold Pre-Alarm Bits Reg 3	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Thermocouple 2 Under 2 Bit 3 = Thermocouple 2 Under 1 Bit 4 = Thermocouple 2 Over 2 Bit 5 = Thermocouple 2 Over 1 Bit 6 = Thermocouple 2 Out of Range Bit 7 = Thermocouple 1 Under 2 Bit 8 = Thermocouple 1 Under 1 Bit 9 = Thermocouple 1 Over 2 Bit 10 = Thermocouple 1 Over 1 Bit 11 = Thermocouple 1 Out of Range Bit 12 = RTD Input 8 Under 2 Bit 13 = RTD Input 8 Under 1 Bit 14 = RTD Input 8 Over 2 Bit 15 = RTD Input 8 Over 1 Bit 16 = RTD Input 8 Out of Range Bit 17 = RTD Input 7 Under 2 Bit 18 = RTD Input 7 Under 1 Bit 19 = RTD Input 7 Over 2 Bit 20 = RTD Input 7 Over 1 Bit 21 = RTD Input 7 Out of Range Bit 22 = RTD Input 6 Under 2 Bit 23 = RTD Input 6 Under 1 Bit 24 = RTD Input 6 Over 2 Bit 25 = RTD Input 6 Over 1 Bit 26 = RTD Input 6 Out of Range Bit 27 = RTD Input 5 Under 2 Bit 28 = RTD Input 5 Under 1 Bit 29= RTD Input 5 Over 2 Bit 30 = RTD Input 5 Over 1 Bit 31 = RTD Input 5 Out of Range

Register	Description	Type	Units	Scaling Factor	R/W	Range
45558-59	AEM Input Threshold Pre-Alarm Bits Reg 4	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Not Used Bit 23 = Not Used Bit 24 = Not Used Bit 25 = Not Used Bit 26 = Not Used Bit 27 = Not Used Bit 28 = Analog Output 4 Out of Range Bit 29 = Analog Output 3 Out of Range Bit 30 = Analog Output 2 Out of Range Bit 31 = Analog Output 1 Out of Range
45560	Analog Output 1 Metering Value	Int32	CentiUnit	Centi	R	(-100000000) – 99999900
45562	Analog Output 2 Metering Value	Int32	CentiUnit	Centi	R	(-100000000) – 99999900
45564	Analog Output 3 Metering Value	Int32	CentiUnit	Centi	R	(-100000000) – 99999900
45566	Analog Output 4 Metering Value	Int32	CentiUnit	Centi	R	(-100000000) – 99999900

Register	Description	Type	Units	Scaling Factor	R/W	Range
45568-69	Configurable Protection Threshold Status Bits	Uint32	N/A	N/A	R	Bit 0 = Conf Protection 8 Under 2 Bit 1 = Conf Protection 8 Under 1 Bit 2 = Conf Protection 8 Over 2 Bit 3 = Conf Protection 8 Over 1 Bit 4 = Conf Protection 7 Under 2 Bit 5 = Conf Protection 7 Under 1 Bit 6 = Conf Protection 7 Over 2 Bit 7 = Conf Protection 7 Over 1 Bit 8 = Conf Protection 6 Under 2 Bit 9 = Conf Protection 6 Under 1 Bit 10 = Conf Protection 6 Over 2 Bit 11 = Conf Protection 6 Over 1 Bit 12 = Conf Protection 5 Under 2 Bit 13 = Conf Protection 5 Under 1 Bit 14 = Conf Protection 5 Over 2 Bit 15 = Conf Protection 5 Over 1 Bit 16 = Conf Protection 4 Under 2 Bit 17 = Conf Protection 4 Under 1 Bit 18 = Conf Protection 4 Over 2 Bit 19 = Conf Protection 4 Over 1 Bit 20 = Conf Protection 3 Under 2 Bit 21 = Conf Protection 3 Under 1 Bit 22 = Conf Protection 3 Over 2 Bit 23 = Conf Protection 3 Over 1 Bit 24 = Conf Protection 2 Under 2 Bit 25 = Conf Protection 2 Under 1 Bit 26 = Conf Protection 2 Over 2 Bit 27 = Conf Protection 2 Over 1 Bit 28 = Conf Protection 1 Under 2 Bit 29 = Conf Protection 1 Under 1 Bit 30 = Conf Protection 1 Over 2 Bit 31 = Conf Protection 1 Over 1
45570-71	Configurable Protection Alarm Bits	Uint32	N/A	N/A	R	Bit 0 = Conf Protection 8 Under 2 Bit 1 = Conf Protection 8 Under 1 Bit 2 = Conf Protection 8 Over 2 Bit 3 = Conf Protection 8 Over 1 Bit 4 = Conf Protection 7 Under 2 Bit 5 = Conf Protection 7 Under 1 Bit 6 = Conf Protection 7 Over 2 Bit 7 = Conf Protection 7 Over 1 Bit 8 = Conf Protection 6 Under 2 Bit 9 = Conf Protection 6 Under 1 Bit 10 = Conf Protection 6 Over 2 Bit 11 = Conf Protection 6 Over 1 Bit 12 = Conf Protection 5 Under 2 Bit 13 = Conf Protection 5 Under 1 Bit 14 = Conf Protection 5 Over 2 Bit 15 = Conf Protection 5 Over 1 Bit 16 = Conf Protection 4 Under 2 Bit 17 = Conf Protection 4 Under 1 Bit 18 = Conf Protection 4 Over 2 Bit 19 = Conf Protection 4 Over 1 Bit 20 = Conf Protection 3 Under 2 Bit 21 = Conf Protection 3 Under 1 Bit 22 = Conf Protection 3 Over 2 Bit 23 = Conf Protection 3 Over 1 Bit 24 = Conf Protection 2 Under 2 Bit 25 = Conf Protection 2 Under 1 Bit 26 = Conf Protection 2 Over 2 Bit 27 = Conf Protection 2 Over 1 Bit 28 = Conf Protection 1 Under 2 Bit 29 = Conf Protection 1 Under 1 Bit 30 = Conf Protection 1 Over 2 Bit 31 = Conf Protection 1 Over 1

Register	Description	Type	Units	Scaling Factor	R/W	Range
45572-73	Configurable Protection Pre-Alarm Bits	Uint32	N/A	N/A	R	Bit 0 = Conf Protection 8 Under 2 Bit 1 = Conf Protection 8 Under 1 Bit 2 = Conf Protection 8 Over 2 Bit 3 = Conf Protection 8 Over 1 Bit 4 = Conf Protection 7 Under 2 Bit 5 = Conf Protection 7 Under 1 Bit 6 = Conf Protection 7 Over 2 Bit 7 = Conf Protection 7 Over 1 Bit 8 = Conf Protection 6 Under 2 Bit 9 = Conf Protection 6 Under 1 Bit 10 = Conf Protection 6 Over 2 Bit 11 = Conf Protection 6 Over 1 Bit 12 = Conf Protection 5 Under 2 Bit 13 = Conf Protection 5 Under 1 Bit 14 = Conf Protection 5 Over 2 Bit 15 = Conf Protection 5 Over 1 Bit 16 = Conf Protection 4 Under 2 Bit 17 = Conf Protection 4 Under 1 Bit 18 = Conf Protection 4 Over 2 Bit 19 = Conf Protection 4 Over 1 Bit 20 = Conf Protection 3 Under 2 Bit 21 = Conf Protection 3 Under 1 Bit 22 = Conf Protection 3 Over 2 Bit 23 = Conf Protection 3 Over 1 Bit 24 = Conf Protection 2 Under 2 Bit 25 = Conf Protection 2 Under 1 Bit 26 = Conf Protection 2 Over 2 Bit 27 = Conf Protection 2 Over 1 Bit 28 = Conf Protection 1 Under 2 Bit 29 = Conf Protection 1 Under 1 Bit 30 = Conf Protection 1 Over 2 Bit 31 = Conf Protection 1 Over 1
45574	Gen Kvar A	Int32	kvar	N/A	R	(-2147483648) - 2147483647
45576	Gen Kvar B	Int32	kvar	N/A	R	(-2147483648) - 2147483647
45578	Gen Kvar C	Int32	kvar	N/A	R	(-2147483648) - 2147483647
45580	Gen Kvar Total	Int32	kvar	N/A	R	(-2147483648) - 2147483647
45582	FUTURE USE					

Register	Description	Type	Units	Scaling Factor	R/W	Range
45584-85	Logic Control Relay Status	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Logic Control Relay 16 Bit 17 = Logic Control Relay 15 Bit 18 = Logic Control Relay 14 Bit 19 = Logic Control Relay 13 Bit 20 = Logic Control Relay 12 Bit 21 = Logic Control Relay 11 Bit 22 = Logic Control Relay 10 Bit 23 = Logic Control Relay 9 Bit 24 = Logic Control Relay 8 Bit 25 = Logic Control Relay 7 Bit 26 = Logic Control Relay 6 Bit 27 = Logic Control Relay 5 Bit 28 = Logic Control Relay 4 Bit 29 = Logic Control Relay 3 Bit 30 = Logic Control Relay 2 Bit 31 = Logic Control Relay 1
45586-87	I/O Modules Connected	Uint32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Not Used Bit 19 = Not Used Bit 20 = Not Used Bit 21 = Not Used Bit 22 = Not Used Bit 23 = Not Used Bit 24 = Not Used Bit 25 = Not Used Bit 26 = Not Used Bit 27 = Not Used Bit 28 = Not Used Bit 29 = AEM Connected Bit 30 = CEM Connected Bit 31 = LSM Connected
45588	Max Vector Shift	Int32	N/A	Centi	R	0 - 100000
45590	Max DF/DT	Int32	N/A	Centi	R	0 - 100000

Register	Description	Type	Units	Scaling Factor	R/W	Range
45592	Current DF/DT	Int32	N/A	Centi	R	0 - 100000
45594-95	Status Metering 2	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Bus Reverse Rotation Bit 17 = Bus Forward Rotation Bit 18 = Gen Reverse Rotation Bit 19 = Gen Forward Rotation Bit 20 = Closed Transition Override Bit 21 = Auto Breaker Operation Inhibit Bit 22 = Mains Fail Transfer Inhibit Bit 23 = Restart Delay Active Bit 24 = Synchronizer Break Close OK Bit 25 = Synchronizer Angle OK Bit 26 = Synchronizer Slip Freq OK Bit 27 = Synchronizer Volt Match OK Bit 28 = Synchronizer Active Bit 29 = Parallel To Mains Bit 30 = Mains Fail Test Bit 31 = Take Over Load
45596-97	Gen Protect Pre-Alarm Status	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = 81 ROC DF/DT Trip Bit 19 = 78 Vector Shift Trip Bit 20 = 51-3 Overcurrent Trip Bit 21 = 40 Loss of Excitation Trip Bit 22 = 32 Reverse Overpower Trip Bit 23 = 59-2 Overvoltage Trip Bit 24 = 27-2 Undervoltage Trip Bit 25 = 51-2 Overcurrent Trip Bit 26 = 81 Underfrequency Trip Bit 27 = 81 Overfrequency Trip Bit 28 = 59-1 Overvoltage Trip Bit 29 = 27-1 Undervoltage Trip Bit 30 = 47 Phase Imbalance Trip Bit 31 = 51-1 Overcurrent Trip

Register	Description	Type	Units	Scaling Factor	R/W	Range
45598-99	Gen Protect Alarm Status	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = 81 ROC DF/DT Trip Bit 19 = 78 Vector Shift Trip Bit 20 = 51-3 Overcurrent Trip Bit 21 = 40 Loss of Excitation Trip Bit 22 = 32 Reverse Overpower Trip Bit 23 = 59-2 Overvoltage Trip Bit 24 = 27-2 Undervoltage Trip Bit 25 = 51-2 Overcurrent Trip Bit 26 = 81 Underfrequency Trip Bit 27 = 81 Overfrequency Trip Bit 28 = 59-1 Overvoltage Trip Bit 29 = 27-1 Undervoltage Trip Bit 30 = 47 Phase Imbalance Trip Bit 31 = 51-1 Overcurrent Trip
45600-01	Pre-Alarm Metering 2	Int32	N/A	N/A	R	Bit 0 = Not Used Bit 1 = Not Used Bit 2 = Not Used Bit 3 = Not Used Bit 4 = Not Used Bit 5 = Not Used Bit 6 = Not Used Bit 7 = Not Used Bit 8 = Not Used Bit 9 = Not Used Bit 10 = Not Used Bit 11 = Not Used Bit 12 = Not Used Bit 13 = Not Used Bit 14 = Not Used Bit 15 = Not Used Bit 16 = Not Used Bit 17 = Not Used Bit 18 = Bus Reverse Rotation Bit 19 = Gen Reverse Rotation Bit 20 = DEF Inducement Override Bit 21 = DEF Severe Inducement Bit 22 = DEF Presevere Inducement Bit 23 = DEF Engine Derate Bit 24 = DEF Fluid Level Empty Bit 25 = DEF Fluid Level Low Bit 26 = DPF Soot Level Severely High Bit 27 = DPF Soot Level Moderately High Bit 28 = DPF Soot Level High Bit 29 = High Exhaust Temperature Bit 30 = DPF Regenerate Disabled Bit 31 = DPF Regenerate Required

Register	Description	Type	Units	Scaling Factor	R/W	Range
45602	Operating Units Config Data	Int32	N/A	N/A	R	0 – 3
45604	kW Rate of Change Data	Int32	N/A	Centi	R	0 – 10000
45606	Generator Network System Manager Data	Int32	N/A	N/A	R	-1 – 255
45608	Generator Network Unit ID 1	Int32	N/A	N/A	R	-1 – 255
45610	Generator Network Unit ID 2	Int32	N/A	N/A	R	-1 – 255
45612	Generator Network Unit ID 3	Int32	N/A	N/A	R	-1 – 255
45614	Generator Network Unit ID 4	Int32	N/A	N/A	R	-1 – 255
45616	Generator Network Unit ID 5	Int32	N/A	N/A	R	-1 – 255
45618	Generator Network Unit ID 6	Int32	N/A	N/A	R	-1 – 255
45620	Generator Network Unit ID 7	Int32	N/A	N/A	R	-1 – 255
45622	Generator Network Unit ID 8	Int32	N/A	N/A	R	-1 – 255
45624	Generator Network Unit ID 9	Int32	N/A	N/A	R	-1 – 255
45626	Generator Network Unit ID 10	Int32	N/A	N/A	R	-1 – 255
45628	Generator Network Unit ID 11	Int32	N/A	N/A	R	-1 – 255
45630	Generator Network Unit ID 12	Int32	N/A	N/A	R	-1 – 255
45632	Generator Network Unit ID 13	Int32	N/A	N/A	R	-1 – 255
45634	Generator Network Unit ID 14	Int32	N/A	N/A	R	-1 – 255
45636	Generator Network Unit ID 15	Int32	N/A	N/A	R	-1 – 255
45638	Generator Network Unit ID 16	Int32	N/A	N/A	R	-1 – 255
45640	Generator Network Number of Units	Int32	N/A	N/A	R	0 – 16
45642	LSM Input Data	Int32	CentiUnit	Centi	R	(-100000000) - 99999900
45644	Generator Network Number of Units Online	Int32	N/A	N/A	R	0 – 16
45646	Generator Network Total System kW Capacity	Int32	N/A	N/A	R	0 – 16777216
45648	Generator Network Total Generated kW	Int32	N/A	N/A	R	0 – 16777216
45650	Generator Network Total Generated kvar	Int32	N/A	N/A	R	0 – 16777216
45652	Sequencing Mode Feedback from LSM	Int32	N/A	N/A	R	-2147483648 – 2147483647
45654	Next Unit to Start from LSM	Int32	N/A	N/A	R	-1 – 255
45656	Next Unit to Stop from LSM	Int32	N/A	N/A	R	-1 – 255
45658	Start Timer 1 Sec from LSM	Int32	N/A	N/A	R	0 – 32767
45660	Start Timer 2 Sec from LSM	Int32	N/A	N/A	R	0 – 32767
45662	Stop Timer Sec from LSM	Int32	N/A	N/A	R	0 – 32767
45664-748	FUTURE USE					
45750	Device Address	Int32	N/A	N/A	RW	(-128) - 127
45752	pc Emergency Stop	Uint32	N/A	N/A	RW	0 = Stop 1 = Start

Register	Description	Type	Units	Scaling Factor	R/W	Range
45754	pc Relay Closed: Runs when in Auto mode	Uint32	N/A	N/A	RW	0 = Stop 1 = Start
45756	Test Buttons Image	Uint32	N/A	N/A	RW	0 - 255
45758-60	RESERVED					
45762	Embedded Code Version Number	Uint32	N/A	N/A	R	
45764	Boot Code Version Number	Int32	N/A	N/A	R	
45766	Model Number	Uint32	N/A	N/A	R	
45768	Embedded Code Part Number	Uint32	N/A	N/A	R	

Register	Description	Type	Units	Scaling Factor	R/W	Range
45770	Conf Prot 1 Param Select	Unit32	N/A	N/A	RW	0 = Oil Pressure 1 = Coolant Temp 2 = Battery Volts 3 = RPM 4 = Fuel Level 5 = Gen VAB 6 = Gen VBC 7 = Gen VCA 8 = Gen VAN 9 = Gen VBN 10 = Gen VCN 11 = Bus Freq 12 = Bus Volts 13 = Gen Freq 14 = Gen PF 15 = Gen IA 16 = Gen IB 17 = Gen IC 18 = kW A 19 = kW B 20 = kW C 21 = kW Total 22 = kVA A 23 = kVA B 24 = kVA C 25 = kVA Total 26 = Analog Input 1 27 = Analog Input 2 28 = Analog Input 3 29 = Analog Input 4 30 = Analog Input 5 31 = Analog Input 6 32 = Analog Input 7 33 = Analog Input 8 34 = RTD Input 1 35 = RTD Input 2 36 = RTD Input 3 37 = RTD Input 4 38 = RTD Input 5 39 = RTD Input 6 40 = RTD Input 7 41 = RTD Input 8 42 = Thermocouple 1 43 = Thermocouple 2 44 = Fuel Delivery Pressure 45 = kvar A 46 = kvar B 47 = kvar C 48 = kvar Total 49 = Injector Metering Rail Pressure 50 = Total Fuel Used 51 = Fuel Temperature 52 = Engine Oil Temperature 53 = Engine Intercooler Temperature 54 = Coolant Pressure 55 = Fuel Rate 56 = Boost Pressure 57 = Intake Manifold Temperature 58 = Charge Air Temperature 59 = Engine Percent Load 60 = Bus VAB 61 = Bus VBC 62 = Bus VCA 63 = kW Load Percent 64 = Number of Units Online 65 = System kW Capacity 66 = System Total Generated kW 67 = System Total Generated kvar
45772	Conf Prot 1 Hysteresis	Int32	Percent	Deci	RW	0 - 1000
45774	Conf Prot 1 Arming Delay	Int32	Second	N/A	RW	0 - 300
45776	Conf Prot 1 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 - 300
45778	Conf Prot 1 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 - 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
45780	Conf Prot 1 Over 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45782	Conf Prot 1 Over 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45784	Conf Prot 1 Under 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45786	Conf Prot 1 Under 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45788	Conf Prot 1 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45790	Conf Prot 1 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45792	Conf Prot 1 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45794	Conf Prot 1 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only

Register	Description	Type	Units	Scaling Factor	R/W	Range
45796	Conf Prot 2 Param Select	Unit32	N/A	N/A	RW	0 = Oil Pressure 1 = Coolant Temp 2 = Battery Volts 3 = RPM 4 = Fuel Level 5 = Gen VAB 6 = Gen VBC 7 = Gen VCA 8 = Gen VAN 9 = Gen VBN 10 = Gen VCN 11 = Bus Freq 12 = Bus Volts 13 = Gen Freq 14 = Gen PF 15 = Gen IA 16 = Gen IB 17 = Gen IC 18 = kW A 19 = kW B 20 = kW C 21 = kW Total 22 = kVA A 23 = kVA B 24 = kVA C 25 = kVA Total 26 = Analog Input 1 27 = Analog Input 2 28 = Analog Input 3 29 = Analog Input 4 30 = Analog Input 5 31 = Analog Input 6 32 = Analog Input 7 33 = Analog Input 8 34 = RTD Input 1 35 = RTD Input 2 36 = RTD Input 3 37 = RTD Input 4 38 = RTD Input 5 39 = RTD Input 6 40 = RTD Input 7 41 = RTD Input 8 42 = Thermocouple 1 43 = Thermocouple 2 44 = Fuel Delivery Pressure 45 = kvar A 46 = kvar B 47 = kvar C 48 = kvar Total 49 = Injector Metering Rail Pressure 50 = Total Fuel Used 51 = Fuel Temperature 52 = Engine Oil Temperature 53 = Engine Intercooler Temperature 54 = Coolant Pressure 55 = Fuel Rate 56 = Boost Pressure 57 = Intake Manifold Temperature 58 = Charge Air Temperature 59 = Engine Percent Load 60 = Bus VAB 61 = Bus VBC 62 = Bus VCA 63 = kW Load Percent 64 = Number of Units Online 65 = System kW Capacity 66 = System Total Generated kW 67 = System Total Generated kvar
45798	Conf Prot 2 Hysteresis	Int32	Percent	Deci	RW	0 - 1000
45800	Conf Prot 2 Arming Delay	Int32	Second	N/A	RW	0 - 300
45802	Conf Prot 2 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 - 300
45804	Conf Prot 2 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 - 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
45806	Conf Prot 2 Over 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45808	Conf Prot 2 Over 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45810	Conf Prot 2 Under 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45812	Conf Prot 2 Under 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45814	Conf Prot 2 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45816	Conf Prot 2 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45818	Conf Prot 2 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45820	Conf Prot 2 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only

Register	Description	Type	Units	Scaling Factor	R/W	Range
45822	Conf Prot 3 Param Select	Uint32	N/A	N/A	RW	0 = Oil Pressure 1 = Coolant Temp 2 = Battery Volts 3 = RPM 4 = Fuel Level 5 = Gen VAB 6 = Gen VBC 7 = Gen VCA 8 = Gen VAN 9 = Gen VBN 10 = Gen VCN 11 = Bus Freq 12 = Bus Volts 13 = Gen Freq 14 = Gen PF 15 = Gen IA 16 = Gen IB 17 = Gen IC 18 = kW A 19 = kW B 20 = kW C 21 = kW Total 22 = kVA A 23 = kVA B 24 = kVA C 25 = kVA Total 26 = Analog Input 1 27 = Analog Input 2 28 = Analog Input 3 29 = Analog Input 4 30 = Analog Input 5 31 = Analog Input 6 32 = Analog Input 7 33 = Analog Input 8 34 = RTD Input 1 35 = RTD Input 2 36 = RTD Input 3 37 = RTD Input 4 38 = RTD Input 5 39 = RTD Input 6 40 = RTD Input 7 41 = RTD Input 8 42 = Thermocouple 1 43 = Thermocouple 2 44 = Fuel Delivery Pressure 45 = kvar A 46 = kvar B 47 = kvar C 48 = kvar Total 49 = Injector Metering Rail Pressure 50 = Total Fuel Used 51 = Fuel Temperature 52 = Engine Oil Temperature 53 = Engine Intercooler Temperature 54 = Coolant Pressure 55 = Fuel Rate 56 = Boost Pressure 57 = Intake Manifold Temperature 58 = Charge Air Temperature 59 = Engine Percent Load 60 = Bus VAB 61 = Bus VBC 62 = Bus VCA 63 = kW Load Percent 64 = Number of Units Online 65 = System kW Capacity 66 = System Total Generated kW 67 = System Total Generated kvar
45824	Conf Prot 3 Hysteresis	Int32	Percent	Deci	RW	1 - 1000
45826	Conf Prot 3 Arming Delay	Int32	Second	N/A	RW	0 - 300
45828	Conf Prot 3 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 - 300
45830	Conf Prot 3 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 - 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
45832	Conf Prot 3 Over 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45834	Conf Prot 3 Over 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45836	Conf Prot 3 Under 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45838	Conf Prot 3 Under 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45840	Conf Prot 3 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45842	Conf Prot 3 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45844	Conf Prot 3 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45846	Conf Prot 3 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only

Register	Description	Type	Units	Scaling Factor	R/W	Range
45848	Conf Prot 4 Param Select	Uint32	N/A	N/A	RW	0 = Oil Pressure 1 = Coolant Temp 2 = Battery Volts 3 = RPM 4 = Fuel Level 5 = Gen VAB 6 = Gen VBC 7 = Gen VCA 8 = Gen VAN 9 = Gen VBN 10 = Gen VCN 11 = Bus Freq 12 = Bus Volts 13 = Gen Freq 14 = Gen PF 15 = Gen IA 16 = Gen IB 17 = Gen IC 18 = kW A 19 = kW B 20 = kW C 21 = kW Total 22 = kVA A 23 = kVA B 24 = kVA C 25 = kVA Total 26 = Analog Input 1 27 = Analog Input 2 28 = Analog Input 3 29 = Analog Input 4 30 = Analog Input 5 31 = Analog Input 6 32 = Analog Input 7 33 = Analog Input 8 34 = RTD Input 1 35 = RTD Input 2 36 = RTD Input 3 37 = RTD Input 4 38 = RTD Input 5 39 = RTD Input 6 40 = RTD Input 7 41 = RTD Input 8 42 = Thermocouple 1 43 = Thermocouple 2 44 = Fuel Delivery Pressure 45 = kvar A 46 = kvar B 47 = kvar C 48 = kvar Total 49 = Injector Metering Rail Pressure 50 = Total Fuel Used 51 = Fuel Temperature 52 = Engine Oil Temperature 53 = Engine Intercooler Temperature 54 = Coolant Pressure 55 = Fuel Rate 56 = Boost Pressure 57 = Intake Manifold Temperature 58 = Charge Air Temperature 59 = Engine Percent Load 60 = Bus VAB 61 = Bus VBC 62 = Bus VCA 63 = kW Load Percent 64 = Number of Units Online 65 = System kW Capacity 66 = System Total Generated kW 67 = System Total Generated kvar
45850	Conf Prot 4 Hysteresis	Int32	Percent	Deci	RW	1 - 1000
45852	Conf Prot 4 Arming Delay	Int32	Second	N/A	RW	0 - 300
45854	Conf Prot 4 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 - 300
45856	Conf Prot 4 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 - 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
45858	Conf Prot 4 Over 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45860	Conf Prot 4 Over 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45862	Conf Prot 4 Under 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45864	Conf Prot 4 Under 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45866	Conf Prot 4 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45868	Conf Prot 4 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45870	Conf Prot 4 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45872	Conf Prot 4 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only

Register	Description	Type	Units	Scaling Factor	R/W	Range
45874	Conf Prot 5 Param Select	Uint32	N/A	N/A	RW	0 = Oil Pressure 1 = Coolant Temp 2 = Battery Volts 3 = RPM 4 = Fuel Level 5 = Gen VAB 6 = Gen VBC 7 = Gen VCA 8 = Gen VAN 9 = Gen VBN 10 = Gen VCN 11 = Bus Freq 12 = Bus Volts 13 = Gen Freq 14 = Gen PF 15 = Gen IA 16 = Gen IB 17 = Gen IC 18 = kW A 19 = kW B 20 = kW C 21 = kW Total 22 = kVA A 23 = kVA B 24 = kVA C 25 = kVA Total 26 = Analog Input 1 27 = Analog Input 2 28 = Analog Input 3 29 = Analog Input 4 30 = Analog Input 5 31 = Analog Input 6 32 = Analog Input 7 33 = Analog Input 8 34 = RTD Input 1 35 = RTD Input 2 36 = RTD Input 3 37 = RTD Input 4 38 = RTD Input 5 39 = RTD Input 6 40 = RTD Input 7 41 = RTD Input 8 42 = Thermocouple 1 43 = Thermocouple 2 44 = Fuel Delivery Pressure 45 = kvar A 46 = kvar B 47 = kvar C 48 = kvar Total 49 = Injector Metering Rail Pressure 50 = Total Fuel Used 51 = Fuel Temperature 52 = Engine Oil Temperature 53 = Engine Intercooler Temperature 54 = Coolant Pressure 55 = Fuel Rate 56 = Boost Pressure 57 = Intake Manifold Temperature 58 = Charge Air Temperature 59 = Engine Percent Load 60 = Bus VAB 61 = Bus VBC 62 = Bus VCA 63 = kW Load Percent 64 = Number of Units Online 65 = System kW Capacity 66 = System Total Generated kW 67 = System Total Generated kvar
45876	Conf Prot 5 Hysteresis	Int32	Percent	Deci	RW	1 - 1000
45878	Conf Prot 5 Arming Delay	Int32	Second	N/A	RW	0 - 300
45880	Conf Prot 5 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 - 300
45882	Conf Prot 5 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 - 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
45884	Conf Prot 5 Over 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45886	Conf Prot 5 Over 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45888	Conf Prot 5 Under 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45890	Conf Prot 5 Under 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45892	Conf Prot 5 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45894	Conf Prot 5 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45896	Conf Prot 5 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45898	Conf Prot 5 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only

Register	Description	Type	Units	Scaling Factor	R/W	Range
45900	Conf Prot 6 Param Select	Uint32	N/A	N/A	RW	0 = Oil Pressure 1 = Coolant Temp 2 = Battery Volts 3 = RPM 4 = Fuel Level 5 = Gen VAB 6 = Gen VBC 7 = Gen VCA 8 = Gen VAN 9 = Gen VBN 10 = Gen VCN 11 = Bus Freq 12 = Bus Volts 13 = Gen Freq 14 = Gen PF 15 = Gen IA 16 = Gen IB 17 = Gen IC 18 = kW A 19 = kW B 20 = kW C 21 = kW Total 22 = kVA A 23 = kVA B 24 = kVA C 25 = kVA Total 26 = Analog Input 1 27 = Analog Input 2 28 = Analog Input 3 29 = Analog Input 4 30 = Analog Input 5 31 = Analog Input 6 32 = Analog Input 7 33 = Analog Input 8 34 = RTD Input 1 35 = RTD Input 2 36 = RTD Input 3 37 = RTD Input 4 38 = RTD Input 5 39 = RTD Input 6 40 = RTD Input 7 41 = RTD Input 8 42 = Thermocouple 1 43 = Thermocouple 2 44 = Fuel Delivery Pressure 45 = kvar A 46 = kvar B 47 = kvar C 48 = kvar Total 49 = Injector Metering Rail Pressure 50 = Total Fuel Used 51 = Fuel Temperature 52 = Engine Oil Temperature 53 = Engine Intercooler Temperature 54 = Coolant Pressure 55 = Fuel Rate 56 = Boost Pressure 57 = Intake Manifold Temperature 58 = Charge Air Temperature 59 = Engine Percent Load 60 = Bus VAB 61 = Bus VBC 62 = Bus VCA 63 = kW Load Percent 64 = Number of Units Online 65 = System kW Capacity 66 = System Total Generated kW 67 = System Total Generated kvar
45902	Conf Prot 6 Hysteresis	Int32	Percent	Deci	RW	1 - 1000
45904	Conf Prot 6 Arming Delay	Int32	Second	N/A	RW	0 - 300
45906	Conf Prot 6 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 - 300
45908	Conf Prot 6 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 - 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
45910	Conf Prot 6 Over 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45912	Conf Prot 6 Over 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45914	Conf Prot 6 Under 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45916	Conf Prot 6 Under 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45918	Conf Prot 6 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45920	Conf Prot 6 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45922	Conf Prot 6 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45924	Conf Prot 6 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only

Register	Description	Type	Units	Scaling Factor	R/W	Range
45926	Conf Prot 7 Param Select	Uint32	N/A	N/A	RW	0 = Oil Pressure 1 = Coolant Temp 2 = Battery Volts 3 = RPM 4 = Fuel Level 5 = Gen VAB 6 = Gen VBC 7 = Gen VCA 8 = Gen VAN 9 = Gen VBN 10 = Gen VCN 11 = Bus Freq 12 = Bus Volts 13 = Gen Freq 14 = Gen PF 15 = Gen IA 16 = Gen IB 17 = Gen IC 18 = kW A 19 = kW B 20 = kW C 21 = kW Total 22 = kVA A 23 = kVA B 24 = kVA C 25 = kVA Total 26 = Analog Input 1 27 = Analog Input 2 28 = Analog Input 3 29 = Analog Input 4 30 = Analog Input 5 31 = Analog Input 6 32 = Analog Input 7 33 = Analog Input 8 34 = RTD Input 1 35 = RTD Input 2 36 = RTD Input 3 37 = RTD Input 4 38 = RTD Input 5 39 = RTD Input 6 40 = RTD Input 7 41 = RTD Input 8 42 = Thermocouple 1 43 = Thermocouple 2 44 = Fuel Delivery Pressure 45 = kvar A 46 = kvar B 47 = kvar C 48 = kvar Total 49 = Injector Metering Rail Pressure 50 = Total Fuel Used 51 = Fuel Temperature 52 = Engine Oil Temperature 53 = Engine Intercooler Temperature 54 = Coolant Pressure 55 = Fuel Rate 56 = Boost Pressure 57 = Intake Manifold Temperature 58 = Charge Air Temperature 59 = Engine Percent Load 60 = Bus VAB 61 = Bus VBC 62 = Bus VCA 63 = kW Load Percent 64 = Number of Units Online 65 = System kW Capacity 66 = System Total Generated kW 67 = System Total Generated kvar
45928	Conf Prot 7 Hysteresis	Int32	Percent	Deci	RW	1 - 1000
45930	Conf Prot 7 Arming Delay	Int32	Second	N/A	RW	0 - 300
45932	Conf Prot 7 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 - 300
45934	Conf Prot 7 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 - 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
45936	Conf Prot 7 Over 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45938	Conf Prot 7 Over 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45940	Conf Prot 7 Under 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45942	Conf Prot 7 Under 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45944	Conf Prot 7 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45946	Conf Prot 7 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45948	Conf Prot 7 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45950	Conf Prot 7 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only

Register	Description	Type	Units	Scaling Factor	R/W	Range
45952	Conf Prot 8 Param Select	Uint32	N/A	N/A	RW	0 = Oil Pressure 1 = Coolant Temp 2 = Battery Volts 3 = RPM 4 = Fuel Level 5 = Gen VAB 6 = Gen VBC 7 = Gen VCA 8 = Gen VAN 9 = Gen VBN 10 = Gen VCN 11 = Bus Freq 12 = Bus Volts 13 = Gen Freq 14 = Gen PF 15 = Gen IA 16 = Gen IB 17 = Gen IC 18 = kW A 19 = kW B 20 = kW C 21 = kW Total 22 = kVA A 23 = kVA B 24 = kVA C 25 = kVA Total 26 = Analog Input 1 27 = Analog Input 2 28 = Analog Input 3 29 = Analog Input 4 30 = Analog Input 5 31 = Analog Input 6 32 = Analog Input 7 33 = Analog Input 8 34 = RTD Input 1 35 = RTD Input 2 36 = RTD Input 3 37 = RTD Input 4 38 = RTD Input 5 39 = RTD Input 6 40 = RTD Input 7 41 = RTD Input 8 42 = Thermocouple 1 43 = Thermocouple 2 44 = Fuel Delivery Pressure 45 = kvar A 46 = kvar B 47 = kvar C 48 = kvar Total 49 = Injector Metering Rail Pressure 50 = Total Fuel Used 51 = Fuel Temperature 52 = Engine Oil Temperature 53 = Engine Intercooler Temperature 54 = Coolant Pressure 55 = Fuel Rate 56 = Boost Pressure 57 = Intake Manifold Temperature 58 = Charge Air Temperature 59 = Engine Percent Load 60 = Bus VAB 61 = Bus VBC 62 = Bus VCA 63 = kW Load Percent 64 = Number of Units Online 65 = System kW Capacity 66 = System Total Generated kW 67 = System Total Generated kvar
45954	Conf Prot 8 Hysteresis	Int32	Percent	Deci	RW	1 - 1000
45956	Conf Prot 8 Arming Delay	Int32	Second	N/A	RW	0 - 300
45958	Conf Prot 8 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 - 300
45960	Conf Prot 8 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 - 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
45962	Conf Prot 8 Over 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45964	Conf Prot 8 Over 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45966	Conf Prot 8 Under 1 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45968	Conf Prot 8 Under 2 Threshold	Int32	N/A	Centi	RW	(-99999900) - 99999900
45970	Conf Prot 8 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45972	Conf Prot 8 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45974	Conf Prot 8 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45976	Conf Prot 8 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
45978-6248	FUTURE USE					
46250	PLC Timer 1 Seconds	Int32	Second	Deci	RW	0 - 18000
46252	PLC Timer 2 Seconds	Int32	Second	Deci	RW	0 - 18000
46254	PLC Timer 3 Seconds	Int32	Second	Deci	RW	0 - 18000
46256	PLC Timer 4 Seconds	Int32	Second	Deci	RW	0 - 18000
46258	PLC Timer 5 Seconds	Int32	Second	Deci	RW	0 - 18000
46260	PLC Timer 6 Seconds	Int32	Second	Deci	RW	0 - 18000
46262	PLC Timer 7 Seconds	Int32	Second	Deci	RW	0 - 18000
46264	PLC Timer 8 Seconds	Int32	Second	Deci	RW	0 - 18000
46266	PLC Timer 9 Seconds	Int32	Second	Deci	RW	0 - 18000
46268	PLC Timer 10 Seconds	Int32	Second	Deci	RW	0 - 18000
46270	PLC Timer 1 Minutes	Uint32	Minute	N/A	RW	0 - 250
46272	PLC Timer 2 Minutes	Uint32	Minute	N/A	RW	0 - 250
46274	PLC Timer 3 Minutes	Uint32	Minute	N/A	RW	0 - 250
46276	PLC Timer 4 Minutes	Uint32	Minute	N/A	RW	0 - 250
46278	PLC Timer 5 Minutes	Uint32	Minute	N/A	RW	0 - 250
46280	PLC Timer 6 Minutes	Uint32	Minute	N/A	RW	0 - 250
46282	PLC Timer 7 Minutes	Uint32	Minute	N/A	RW	0 - 250
46284	PLC Timer 8 Minutes	Uint32	Minute	N/A	RW	0 - 250
46286	PLC Timer 9 Minutes	Uint32	Minute	N/A	RW	0 - 250
46288	PLC Timer 10 Minutes	Uint32	Minute	N/A	RW	0 - 250
46290	PLC Timer 1 Hours	Uint32	Hour	N/A	RW	0 - 250
46292	PLC Timer 2 Hours	Uint32	Hour	N/A	RW	0 - 250
46294	PLC Timer 3 Hours	Uint32	Hour	N/A	RW	0 - 250
46296	PLC Timer 4 Hours	Uint32	Hour	N/A	RW	0 - 250
46298	PLC Timer 5 Hours	Uint32	Hour	N/A	RW	0 - 250
46300	PLC Timer 6 Hours	Uint32	Hour	N/A	RW	0 - 250
46302	PLC Timer 7 Hours	Uint32	Hour	N/A	RW	0 - 250
46304	PLC Timer 8 Hours	Uint32	Hour	N/A	RW	0 - 250
46306	PLC Timer 9 Hours	Uint32	Hour	N/A	RW	0 - 250
46308	PLC Timer 10 Hours	Uint32	Hour	N/A	RW	0 - 250
46310	AEM Input 1 Max Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46312	AEM Input 1 Max Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46314	AEM Input 1 Min Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46316	AEM Input 1 Min Current	Int32	Milliamp x 10	Deci	RW	40 - 200

Register	Description	Type	Units	Scaling Factor	R/W	Range
46318	AEM Input 1 Param Max	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46320	AEM Input 1 Param Min	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46322	AEM Input 1 Hysteresis	Int32	Deci Percent	Deci	RW	0 – 1000
46324	AEM Input 1 Arming Delay	Int32	Second	N/A	RW	0 – 300
46326	AEM Input 1 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 – 300
46328	AEM Input 1 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 – 300
46330	AEM Input 1 Over 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46332	AEM Input 1Over 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46334	AEM Input 1 Under 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46336	AEM Input 1Under 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46338	AEM Input 1 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46340	AEM Input 1 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46342	AEM Input 1 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46344	AEM Input 1 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46346	AEM Input 1 Out of Range Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46348	AEM Input 2 Max Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46350	AEM Input 2 Max Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46352	AEM Input 2 Min Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46354	AEM Input 2 Min Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46356	AEM Input 2 Param Max	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46358	AEM Input 2 Param Min	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46360	AEM Input 2 Hysteresis	Int32	Deci Percent	Deci	RW	0 – 1000
46362	AEM Input 2 Arming Delay	Int32	Second	N/A	RW	0 – 300
46364	AEM Input 2 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 – 300
46366	AEM Input 2 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 – 300
46368	AEM Input 2 Over 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46370	AEM Input 2Over 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46372	AEM Input 2 Under 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46374	AEM Input 2Under 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46376	AEM Input 2 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only

Register	Description	Type	Units	Scaling Factor	R/W	Range
46378	AEM Input 2 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46380	AEM Input 2 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46382	AEM Input 2 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46384	AEM Input 2 Out of Range Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46386	AEM Input 3 Max Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46388	AEM Input 3 Max Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46390	AEM Input 3 Min Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46392	AEM Input 3 Min Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46394	AEM Input 3 Param Max	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46396	AEM Input 3 Param Min	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46398	AEM Input 3 Hysteresis	Int32	Deci Percent	Deci	RW	0 – 1000
46400	AEM Input 3 Arming Delay	Int32	Second	N/A	RW	0 – 300
46402	AEM Input 3 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 – 300
46404	AEM Input 3 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 – 300
46406	AEM Input 3 Over 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46408	AEM Input 3Over 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46410	AEM Input 3 Under 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46412	AEM Input 3Under 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46414	AEM Input 3 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46416	AEM Input 3 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46418	AEM Input 3 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46420	AEM Input 3 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46422	AEM Input 3 Out of Range Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46424	AEM Input 4 Max Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46426	AEM Input 4 Max Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46428	AEM Input 4 Min Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46430	AEM Input 4 Min Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46432	AEM Input 4 Param Max	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46434	AEM Input 4 Param Min	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900

Register	Description	Type	Units	Scaling Factor	R/W	Range
46436	AEM Input 4 Hysteresis	Int32	Deci Percent	Deci	RW	0 – 1000
46438	AEM Input 4 Arming Delay	Int32	Second	N/A	RW	0 – 300
46440	AEM Input 4 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 – 300
46442	AEM Input 4 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 – 300
46444	AEM Input 4 Over 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46446	AEM Input 4Over 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46448	AEM Input 4 Under 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46450	AEM Input 4Under 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46452	AEM Input 4 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46454	AEM Input 4 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46456	AEM Input 4 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46458	AEM Input 4 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46460	AEM Input 4 Out of Range Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46462 - 46498	FUTURE USE					
46500	AEM Input 5 Max Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46502	AEM Input 5 Max Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46504	AEM Input 5 Min Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46506	AEM Input 5 Min Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46508	AEM Input 5 Param Max	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46510	AEM Input 5 Param Min	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46512	AEM Input 5 Hysteresis	Int32	Deci Percent	Deci	RW	0 – 1000
46514	AEM Input 5 Arming Delay	Int32	Second	N/A	RW	0 – 300
46516	AEM Input 5 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 – 300
46518	AEM Input 5 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 – 300
46520	AEM Input 5 Over 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46522	AEM Input 5Over 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46524	AEM Input 5 Under 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46526	AEM Input 5Under 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46528	AEM Input 5 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only

Register	Description	Type	Units	Scaling Factor	R/W	Range
46530	AEM Input 5 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46532	AEM Input 5 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46534	AEM Input 5 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46536	AEM Input 5 Out of Range Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46538	AEM Input 6 Max Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46540	AEM Input 6 Max Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46542	AEM Input 6 Min Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46544	AEM Input 6 Min Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46546	AEM Input 6 Param Max	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46548	AEM Input 6 Param Min	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46550	AEM Input 6 Hysteresis	Int32	Deci Percent	Deci	RW	0 – 1000
46552	AEM Input 6 Arming Delay	Int32	Second	N/A	RW	0 – 300
46554	AEM Input 6 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 – 300
46556	AEM Input 6 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 – 300
46558	AEM Input 6 Over 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46560	AEM Input 6Over 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46562	AEM Input 6 Under 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46564	AEM Input 6Under 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46566	AEM Input 6 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46568	AEM Input 6 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46570	AEM Input 6 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46572	AEM Input 6 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46574	AEM Input 6 Out of Range Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46576	AEM Input 7 Max Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46578	AEM Input 7 Max Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46580	AEM Input 7 Min Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46582	AEM Input 7 Min Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46584	AEM Input 7 Param Max	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46586	AEM Input 7 Param Min	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900

Register	Description	Type	Units	Scaling Factor	R/W	Range
46588	AEM Input 7 Hysteresis	Int32	Deci Percent	Deci	RW	0 – 1000
46590	AEM Input 7 Arming Delay	Int32	Second	N/A	RW	0 – 300
46592	AEM Input 7 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 – 300
46594	AEM Input 7 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 – 300
46596	AEM Input 7 Over 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46598	AEM Input 7Over 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46600	AEM Input 7 Under 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46602	AEM Input 7Under 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46604	AEM Input 7 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46606	AEM Input 7 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46608	AEM Input 7 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46610	AEM Input 7 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46612	AEM Input 7 Out of Range Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46614	AEM Input 8 Max Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46616	AEM Input 8 Max Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46618	AEM Input 8 Min Voltage	Int32	DeciVolt	Deci	RW	0 - 100
46620	AEM Input 8 Min Current	Int32	Milliamp x 10	Deci	RW	40 - 200
46622	AEM Input 8 Param Max	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46624	AEM Input 8 Param Min	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46626	AEM Input 8 Hysteresis	Int32	Deci Percent	Deci	RW	0 – 1000
46628	AEM Input 8 Arming Delay	Int32	Second	N/A	RW	0 – 300
46630	AEM Input 8 Threshold 1 Activation Delay	Int32	Second	N/A	RW	0 – 300
46632	AEM Input 8 Threshold 2 Activation Delay	Int32	Second	N/A	RW	0 – 300
46634	AEM Input 8 Over 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46636	AEM Input 8Over 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46638	AEM Input 8 Under 1 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46640	AEM Input 8Under 2 Threshold	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46642	AEM Input 8 Over 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46644	AEM Input 8 Over 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only

Register	Description	Type	Units	Scaling Factor	R/W	Range
46646	AEM Input 8 Under 1 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46648	AEM Input 8 Under 2 Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46650	AEM Input 8 Out of Range Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46652	AEM Output 1 Max Voltage	Int32	DeciVolt	Deci	RW	0 – 100
46654	AEM Output 1 Max Current	Int32	Milliamp x 10	Deci	RW	40 – 200
46656	AEM Output 1 Min Voltage	Int32	DeciVolt	Deci	RW	0 – 100
46658	AEM Output 1 Min Current	Int32	Milliamp x 10	Deci	RW	40 – 200
46660	AEM Output 1 Param Max	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46662	AEM Output 1 Param Min	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900

Register	Description	Type	Units	Scaling Factor	R/W	Range
46664	AEM Output 1 Param Selection	Uint32	N/A	N/A	RW	0 = Oil Pressure 1 = Coolant Temp 2 = Battery Volts 3 = RPM 4 = Fuel Level 5 = Gen VAB 6 = Gen VBC 7 = Gen VCA 8 = Gen VAN 9 = Gen VBN 10 = Gen VCN 11 = Bus Freq 12 = Bus Volts 13 = Gen Freq 14 = Gen PF 15 = Gen IA 16 = Gen IB 17 = Gen IC 18 = kW A 19 = kW B 20 = kW C 21 = kW Total 22 = kVA A 23 = kVA B 24 = kVA C 25 = kVA Total 26 = Analog Input 1 27 = Analog Input 2 28 = Analog Input 3 29 = Analog Input 4 30 = Analog Input 5 31 = Analog Input 6 32 = Analog Input 7 33 = Analog Input 8 34 = RTD Input 1 35 = RTD Input 2 36 = RTD Input 3 37 = RTD Input 4 38 = RTD Input 5 39 = RTD Input 6 40 = RTD Input 7 41 = RTD Input 8 42 = Thermocouple 1 43 = Thermocouple 2 44 = Fuel Delivery Pressure 45 = kvar A 46 = kvar B 47 = kvar C 48 = kvar Total 49 = Injector Metering Rail Pressure 50 = Total Fuel Used 51 = Fuel Temperature 52 = Engine Oil Temperature 53 = Engine Intercooler Temperature 54 = Coolant Pressure 55 = Fuel Rate 56 = Boost Pressure 57 = Intake Manifold Temperature 58 = Charge Air Temperature 59 = Engine Percent Load 60 = Bus VAB 61 = Bus VBC 62 = Bus VCA 63 = kW Load Percent 64 = Number of Units Online 65 = System kW Capacity 66 = System Total Generated kW 67 = System Total Generated kvar
46666	AEM Output 1 Out of Range Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46668	AEM Output 1 Out of Range Time Delay	Int32	Second	N/A	RW	0 – 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
46670	AEM Output 2 Max Voltage	Int32	DeciVolt	Deci	RW	0 – 100
46672	AEM Output 2 Max Current	Int32	Milliamp x 10	Deci	RW	40 – 200
46674	AEM Output 2 Min Voltage	Int32	DeciVolt	Deci	RW	0 – 100
46676	AEM Output 2 Min Current	Int32	Milliamp x 10	Deci	RW	40 – 200
46678	AEM Output 2 Param Max	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46680	AEM Output 2 Param Min	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900

Register	Description	Type	Units	Scaling Factor	R/W	Range
46682	AEM Output 2 Param Selection	Uint32	N/A	N/A	RW	0 = Oil Pressure 1 = Coolant Temp 2 = Battery Volts 3 = RPM 4 = Fuel Level 5 = Gen VAB 6 = Gen VBC 7 = Gen VCA 8 = Gen VAN 9 = Gen VBN 10 = Gen VCN 11 = Bus Freq 12 = Bus Volts 13 = Gen Freq 14 = Gen PF 15 = Gen IA 16 = Gen IB 17 = Gen IC 18 = kW A 19 = kW B 20 = kW C 21 = kW Total 22 = kVA A 23 = kVA B 24 = kVA C 25 = kVA Total 26 = Analog Input 1 27 = Analog Input 2 28 = Analog Input 3 29 = Analog Input 4 30 = Analog Input 5 31 = Analog Input 6 32 = Analog Input 7 33 = Analog Input 8 34 = RTD Input 1 35 = RTD Input 2 36 = RTD Input 3 37 = RTD Input 4 38 = RTD Input 5 39 = RTD Input 6 40 = RTD Input 7 41 = RTD Input 8 42 = Thermocouple 1 43 = Thermocouple 2 44 = Fuel Delivery Pressure 45 = kvar A 46 = kvar B 47 = kvar C 48 = kvar Total 49 = Injector Metering Rail Pressure 50 = Total Fuel Used 51 = Fuel Temperature 52 = Engine Oil Temperature 53 = Engine Intercooler Temperature 54 = Coolant Pressure 55 = Fuel Rate 56 = Boost Pressure 57 = Intake Manifold Temperature 58 = Charge Air Temperature 59 = Engine Percent Load 60 = Bus VAB 61 = Bus VBC 62 = Bus VCA 63 = kW Load Percent 64 = Number of Units Online 65 = System kW Capacity 66 = System Total Generated kW 67 = System Total Generated kvar
46684	AEM Output 2 Out of Range Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46686	AEM Output 2 Out of Range Time Delay	Int32	Second	N/A	RW	0 – 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
46688	AEM Output 3 Max Voltage	Int32	DeciVolt	Deci	RW	0 – 100
46690	AEM Output 3 Max Current	Int32	Milliamp x 10	Deci	RW	40 – 200
46692	AEM Output 3 Min Voltage	Int32	DeciVolt	Deci	RW	0 – 100
46694	AEM Output 3 Min Current	Int32	Milliamp x 10	Deci	RW	40 – 200
46696	AEM Output 3 Param Max	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46698	AEM Output 3 Param Min	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900

Register	Description	Type	Units	Scaling Factor	R/W	Range
46700	AEM Output 3 Param Selection	Uint32	N/A	N/A	RW	0 = Oil Pressure 1 = Coolant Temp 2 = Battery Volts 3 = RPM 4 = Fuel Level 5 = Gen VAB 6 = Gen VBC 7 = Gen VCA 8 = Gen VAN 9 = Gen VBN 10 = Gen VCN 11 = Bus Freq 12 = Bus Volts 13 = Gen Freq 14 = Gen PF 15 = Gen IA 16 = Gen IB 17 = Gen IC 18 = kW A 19 = kW B 20 = kW C 21 = kW Total 22 = kVA A 23 = kVA B 24 = kVA C 25 = kVA Total 26 = Analog Input 1 27 = Analog Input 2 28 = Analog Input 3 29 = Analog Input 4 30 = Analog Input 5 31 = Analog Input 6 32 = Analog Input 7 33 = Analog Input 8 34 = RTD Input 1 35 = RTD Input 2 36 = RTD Input 3 37 = RTD Input 4 38 = RTD Input 5 39 = RTD Input 6 40 = RTD Input 7 41 = RTD Input 8 42 = Thermocouple 1 43 = Thermocouple 2 44 = Fuel Delivery Pressure 45 = kvar A 46 = kvar B 47 = kvar C 48 = kvar Total 49 = Injector Metering Rail Pressure 50 = Total Fuel Used 51 = Fuel Temperature 52 = Engine Oil Temperature 53 = Engine Intercooler Temperature 54 = Coolant Pressure 55 = Fuel Rate 56 = Boost Pressure 57 = Intake Manifold Temperature 58 = Charge Air Temperature 59 = Engine Percent Load 60 = Bus VAB 61 = Bus VBC 62 = Bus VCA 63 = kW Load Percent 64 = Number of Units Online 65 = System kW Capacity 66 = System Total Generated kW 67 = System Total Generated kvar
46702	AEM Output 3 Out of Range Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46704	AEM Output 3 Out of Range Time Delay	Int32	Second	N/A	RW	0 – 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
46706	AEM Output 4 Max Voltage	Int32	DeciVolt	Deci	RW	0 – 100
46708	AEM Output 4 Max Current	Int32	Milliamp x 10	Deci	RW	40 – 200
46710	AEM Output 4 Min Voltage	Int32	DeciVolt	Deci	RW	0 – 100
46712	AEM Output 4 Min Current	Int32	Milliamp x 10	Deci	RW	40 – 200
46714	AEM Output 4 Param Max	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900
46716	AEM Output 4 Param Min	Int32	Centi Unit	Centi	RW	(-100000000) – 99999900

Register	Description	Type	Units	Scaling Factor	R/W	Range
46718	AEM Output 4 Param Selection	Uint32	N/A	N/A	RW	0 = Oil Pressure 1 = Coolant Temp 2 = Battery Volts 3 = RPM 4 = Fuel Level 5 = Gen VAB 6 = Gen VBC 7 = Gen VCA 8 = Gen VAN 9 = Gen VBN 10 = Gen VCN 11 = Bus Freq 12 = Bus Volts 13 = Gen Freq 14 = Gen PF 15 = Gen IA 16 = Gen IB 17 = Gen IC 18 = kW A 19 = kW B 20 = kW C 21 = kW Total 22 = kVA A 23 = kVA B 24 = kVA C 25 = kVA Total 26 = Analog Input 1 27 = Analog Input 2 28 = Analog Input 3 29 = Analog Input 4 30 = Analog Input 5 31 = Analog Input 6 32 = Analog Input 7 33 = Analog Input 8 34 = RTD Input 1 35 = RTD Input 2 36 = RTD Input 3 37 = RTD Input 4 38 = RTD Input 5 39 = RTD Input 6 40 = RTD Input 7 41 = RTD Input 8 42 = Thermocouple 1 43 = Thermocouple 2 44 = Fuel Delivery Pressure 45 = kvar A 46 = kvar B 47 = kvar C 48 = kvar Total 49 = Injector Metering Rail Pressure 50 = Total Fuel Used 51 = Fuel Temperature 52 = Engine Oil Temperature 53 = Engine Intercooler Temperature 54 = Coolant Pressure 55 = Fuel Rate 56 = Boost Pressure 57 = Intake Manifold Temperature 58 = Charge Air Temperature 59 = Engine Percent Load 60 = Bus VAB 61 = Bus VBC 62 = Bus VCA 63 = kW Load Percent 64 = Number of Units Online 65 = System kW Capacity 66 = System Total Generated kW 67 = System Total Generated kvar
46720	AEM Output 4 Out of Range Alarm Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm 3 = Status Only
46722	AEM Output 4 Out of Range Time Delay	Int32	Second	N/A	RW	0 – 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
46724 - 46748	FUTURE USE					
46750	User Config Input 1 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46752	User Config Input 1 Time Delay	Int32	Second	N/A	RW	0 – 300
46754	User Config Input 1 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46756	User Config Input 2 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46758	User Config Input 2 Time Delay	Int32	Second	N/A	RW	0 – 300
46760	User Config Input 2 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46762	User Config Input 3 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46764	User Config Input 3 Time Delay	Int32	Second	N/A	RW	0 – 300
46766	User Config Input 3 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46768	User Config Input 4 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46770	User Config Input 4 Time Delay	Int32	Second	N/A	RW	0 – 300
46772	User Config Input 4 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46774	User Config Input 5 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46776	User Config Input 5 Time Delay	Int32	Second	N/A	RW	0 – 300
46778	User Config Input 5 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46780	User Config Input 6 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46782	User Config Input 6 Time Delay	Int32	Second	N/A	RW	0 – 300
46784	User Config Input 6 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46786	User Config Input 7 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46788	User Config Input 7 Time Delay	Int32	Second	N/A	RW	0 – 300
46790	User Config Input 7 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46792	User Config Input 8 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46794	User Config Input 8 Time Delay	Int32	Second	N/A	RW	0 – 300
46796	User Config Input 8 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46798	User Config Input 9 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46800	User Config Input 9 Time Delay	Int32	Second	N/A	RW	0 – 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
46802	User Config Input 9 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46804	User Config Input 10 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46806	User Config Input 10 Time Delay	Int32	Second	N/A	RW	0 – 300
46808	User Config Input 10 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46810	User Config Input 11 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46812	User Config Input 11 Time Delay	Int32	Second	N/A	RW	0 – 300
46814	User Config Input 11 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46816	User Config Input 12 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46818	User Config Input 12 Time Delay	Int32	Second	N/A	RW	0 – 300
46820	User Config Input 12 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46822	User Config Input 13 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46824	User Config Input 13 Time Delay	Int32	Second	N/A	RW	0 – 300
46826	User Config Input 13 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46828	User Config Input 14 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46830	User Config Input 14 Time Delay	Int32	Second	N/A	RW	0 – 300
46832	User Config Input 14 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46834	User Config Input 15 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46836	User Config Input 15 Time Delay	Int32	Second	N/A	RW	0 – 300
46838	User Config Input 15 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46840	User Config Input 16 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46842	User Config Input 16 Time Delay	Int32	Second	N/A	RW	0 – 300
46844	User Config Input 16 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46846	User Config Input 17 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46848	User Config Input 17 Time Delay	Int32	Second	N/A	RW	0 – 300
46850	User Config Input 17 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46852	User Config Input 18 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46854	User Config Input 18 Time Delay	Int32	Second	N/A	RW	0 – 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
46856	User Config Input 18 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46858	User Config Input 19 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46860	User Config Input 19 Time Delay	Int32	Second	N/A	RW	0 – 300
46862	User Config Input 19 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46864	User Config Input 20 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46866	User Config Input 20 Time Delay	Int32	Second	N/A	RW	0 – 300
46868	User Config Input 20 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46870	User Config Input 21 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46872	User Config Input 21 Time Delay	Int32	Second	N/A	RW	0 – 300
46874	User Config Input 21 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46876	User Config Input 22 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46878	User Config Input 22 Time Delay	Int32	Second	N/A	RW	0 – 300
46880	User Config Input 22 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46882	User Config Input 23 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46884	User Config Input 23 Time Delay	Int32	Second	N/A	RW	0 – 300
46886	User Config Input 23 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46888	User Config Input 24 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46890	User Config Input 24 Time Delay	Int32	Second	N/A	RW	0 – 300
46892	User Config Input 24 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46894	User Config Input 25 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46896	User Config Input 25 Time Delay	Int32	Second	N/A	RW	0 – 300
46898	User Config Input 25 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46900	User Config Input 26 Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46902	User Config Input 26 Time Delay	Int32	Second	N/A	RW	0 – 300
46904	User Config Input 26 Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only

Register	Description	Type	Units	Scaling Factor	R/W	Range
46906	ATS Contact Input	Int32	N/A	N/A	RW	-1 = None 0 = Input 1 1 = Input 2 2 = Input 3 3 = Input 4 4 = Input 5 5 = Input 6 6 = Input 7 7 = Input 8 8 = Input 9 9 = Input 10 10 = Input 11 11 = Input 12 12 = Input 13 13 = Input 14 14 = Input 15 15 = Input 16
46908	ATS Time Delay	Int32	Second	N/A	RW	0 – 300
46910	ATS Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46912	Battle Override Contact Input	Int32	N/A	N/A	RW	-1 = None 0 = Input 1 1 = Input 2 2 = Input 3 3 = Input 4 4 = Input 5 5 = Input 6 6 = Input 7 7 = Input 8 8 = Input 9 9 = Input 10 10 = Input 11 11 = Input 12 12 = Input 13 13 = Input 14 14 = Input 15 15 = Input 16
46914	Battle Override Time Delay	Int32	Second	N/A	RW	0 – 300
46916	Battle Override Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46918	Low Coolant Level Contact Input	Int32	N/A	N/A	RW	-1 = None 0 = Input 1 1 = Input 2 2 = Input 3 3 = Input 4 4 = Input 5 5 = Input 6 6 = Input 7 7 = Input 8 8 = Input 9 9 = Input 10 10 = Input 11 11 = Input 12 12 = Input 13 13 = Input 14 14 = Input 15 15 = Input 16
46920	Low Coolant Level Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46922	Low Coolant Level Time Delay	Int32	Second	N/A	RW	0 – 300
46924	Low Coolant Level Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only

Register	Description	Type	Units	Scaling Factor	R/W	Range
46926	Battery Charge Failed Contact Input	Int32	N/A	N/A	RW	-1 = None 0 = Input 1 1 = Input 2 2 = Input 3 3 = Input 4 4 = Input 5 5 = Input 6 6 = Input 7 7 = Input 8 8 = Input 9 9 = Input 10 10 = Input 11 11 = Input 12 12 = Input 13 13 = Input 14 14 = Input 15 15 = Input 16
46928	Battery Charge Failed Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46930	Battery Charge Failed Time Delay	Int32	Second	N/A	RW	0 – 300
46932	Battery Charge Failed Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46934	Fuel Leak Detect Contact Input	Int32	N/A	N/A	RW	-1 = None 0 = Input 1 1 = Input 2 2 = Input 3 3 = Input 4 4 = Input 5 5 = Input 6 6 = Input 7 7 = Input 8 8 = Input 9 9 = Input 10 10 = Input 11 11 = Input 12 12 = Input 13 13 = Input 14 14 = Input 15 15 = Input 16
46936	Fuel Leak Detect Config Type	Int32	N/A	N/A	RW	0 = None 1 = Alarm 2 = Pre-Alarm
46938	Fuel Leak Detect Time Delay	Int32	Second	N/A	RW	0 – 300
46940	Fuel Leak Detect Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46942	Single Phase Connection Override Contact Input	Int32	N/A	N/A	RW	-1 = None 0 = Input 1 1 = Input 2 2 = Input 3 3 = Input 4 4 = Input 5 5 = Input 6 6 = Input 7 7 = Input 8 8 = Input 9 9 = Input 10 10 = Input 11 11 = Input 12 12 = Input 13 13 = Input 14 14 = Input 15 15 = Input 16

Register	Description	Type	Units	Scaling Factor	R/W	Range
46944	Single Phase Connection Override Time Delay	Int32	Second	N/A	RW	0 – 300
46946	Single Phase Connection Override Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46948	Single Phase AC Sense Override Contact Input	Int32	N/A	N/A	RW	-1 = None 0 = Input 1 1 = Input 2 2 = Input 3 3 = Input 4 4 = Input 5 5 = Input 6 6 = Input 7 7 = Input 8 8 = Input 9 9 = Input 10 10 = Input 11 11 = Input 12 12 = Input 13 13 = Input 14 14 = Input 15 15 = Input 16
46950	Single Phase AC Sense Override Time Delay	Int32	Second	N/A	RW	0 – 300
46952	Single Phase AC Sense Override Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46954	Hi/Lo Line Contact Input	Int32	N/A	N/A	RW	-1 = None 0 = Input 1 1 = Input 2 2 = Input 3 3 = Input 4 4 = Input 5 5 = Input 6 6 = Input 7 7 = Input 8 8 = Input 9 9 = Input 10 10 = Input 11 11 = Input 12 12 = Input 13 13 = Input 14 14 = Input 15 15 = Input 16
46956	Hi/Lo Line Time Delay	Int32	Second	N/A	RW	0 – 300
46958	Hi/Lo Line Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only
46960	Grounded Delta Override Contact Input	Int32	N/A	N/A	RW	-1 = None 0 = Input 1 1 = Input 2 2 = Input 3 3 = Input 4 4 = Input 5 5 = Input 6 6 = Input 7 7 = Input 8 8 = Input 9 9 = Input 10 10 = Input 11 11 = Input 12 12 = Input 13 13 = Input 14 14 = Input 15 15 = Input 16
46962	Grounded Delta Override Time Delay	Int32	Second	N/A	RW	0 – 300

Register	Description	Type	Units	Scaling Factor	R/W	Range
46964	Grounded Delta Override Engine Running Only	Int32	N/A	N/A	RW	0 = Always 1 = While Engine Running Only

Legacy Parameter Table

The DGC-2020 maps all legacy parameters previously associated with the DGC-500 and DGC-1000 into the Holding Register address space (40000 to 41999). Query address N will access the Holding Register N+1. The Data Format is Integer type data unless identified otherwise in the Data Format column.

Holding Register	Parameter	Range	Read/Write Supported	Data Format	Units
40001-18	RESERVED				
PARAMETER SETTINGS					
40019	Emergency Stop	0-1	R W	0 =Off 1 =Stop	
40020	Remote Start / Stop: Runs when in Auto mode	0-1	R W	0 =Stop 1 =Start	
40021-22	RESERVED				
SYSTEM PARAMETERS					
40023	Default Generator Connection	0-2	R W	0=3ph L-L 1=3ph L-N 2=1ph A-B	
40024	NFPA Level	0-2	R W	0=Off 1=Level 1 2=Level 2	
40025	RESERVED				
40026	Rated Engine RPM	750-3600	R W		RPM
40027	Number Flywheel Teeth	50-500	R W		
40028	Genset kW Rating	25-9999	R W		KWatt
40029	No Load Cool Down Time	0-60	R W		Minutes
GENERATOR PT PRIMARY					
40030	Voltage(a)	1-15000	R W	DP	VoltsAC x10000
40031	Voltage(b)		R W	DP	VoltsAC
GENERATOR PT SECONDARY					
40032	Voltage	1-480	R W		VoltsAC
GENERATOR CT PRIMARY					
40033	Current	1-5000	R W		AmpsAC
LOW FUEL ALARM					
40034	Enable	0-1	R W	0 =Off 1 =On	
40035	Threshold	2-50	R W		% Full Tank
LOW FUEL PRE-ALARM					
40036	Enable	0-1	R W	0 =Off 1 =On	
40037	Threshold	10-100	R W		% Full Tank
LOW COOLANT TEMP PRE-ALARM					
40038	Enable	0-1	R W	0 =Off 1 =On	
40039	Threshold	32-150	R W		Degrees F
BATTERY OVERVOLTAGE PRE-ALARM					
40040	Enable	0-1	R W	0 =Off 1 =On	
40041	RESERVED				
MAINTENANCE INTERVAL PRE-ALARM					
40042	Enable	0-1	R W	0 =Off 1 =On	
40043	Threshold	0-5000	R W		Hours
ENGINE KW OVERLOAD PRE-ALARM					

Holding Register	Parameter	Range	Read/Write Supported	Data Format	Units
40044	Enable	0-1	R W	0 =Off 1 =On	
40045	Threshold	95-140	R W		% of Rated
HIGH COOLANT TEMP PRE-ALARM					
40046	Enable	0-1	R W	0 =Off 1 =On	
40047	Threshold	100-280	R W		Degrees F
LOW OIL PRESSURE PRE-ALARM					
40048	Enable	0-1	R W	0 =Off 1 =On	
40049	Threshold	3-100	R W		PSI
LOW BATTERY VOLTAGE PRE-ALARM					
40050	Enable	0-1	R W	0 =Off 1 =On	
40051	Threshold	60-120 (12V) 120-240 (24V)	R W		0.1 Volts DC
40052	Pre-alarm Activation Time Delay	1-10	R W		Seconds
WEAK BATTERY VOLTAGE PRE-ALARM					
40053	Enable	0-1	R W	0 =Off 1 =On	
40054	Threshold	40-80 (12V) 80-160 (24V)	R W		0.1 VoltDC
40055	Pre-alarm Activation Time Delay	1-10	R W		Seconds
40056-59	RESERVED				
HIGH COOLANT TEMP ALARM					
40060	Enable	0-1	R W	0 =Off 1 =On	
40061	Threshold	100-280	R W		Degrees F
40062	Arming Delay after Crank Disconnect	60	R W		Seconds
LOW OIL PRESSURE ALARM					
40063	Enable	0-1	R W	0 =Off 1 =On	
40064	Threshold	3-100	R W		PSI
40065	Arming Delay after Crank Disconnect	5-15	R W		Seconds
OVERSPEED ALARM					
40066	Enable	0-1	R W	0 =Off 1 =On	
40067	Threshold	105-140	R W		% of Rated
40068	Alarm Activation Time Delay	0-500	R W		MilliSec
40069-71	RESERVED				
CRANKING PARAMETERES					
40072	Cranking Style	0-1	R W	0=Contin. 1=Cycle	
40073	Number of Crank Cycles	1-7	R W		
40074	Cycle Crank Time	5-15	R W		Seconds
40075	Continuous Crank Time	1-60	R W		Seconds
40076	Crank Disconnect Limit	10-100	R W		% of Rated
40077	Pre-crank Delay	0-30	R W		Seconds
SYSTEM MONITOR					
40078	Remaining Cooldown Time	0-60	R		Minutes
40079	RESERVED				
40080	Active Speed Signal Sources	1-4	R	1 = MPU 2 = ALT 3 = GEN 4 = NONE	

Holding Register	Parameter	Range	Read/Write Supported	Data Format	Units
40081	Sender Failure Alarm Code	individual bits are 0 or 1	R	b0 = High Coolant Temperature b1 = Oil Pressure b2 = Fuel Level b3 = Magnetic Pick-up b4 = Generator Voltage Sensing b5 = Battery Charger Fail b6 = Coolant Level Sender Fail b7 not used	
40082	Alarm Codes	individual bits are 0 or 1	R	b0=High Coolant Temperature b1=Low Coolant Level b2=Low Fuel Level b3=Emergency Stop b4=Sender Failure b5=Over Crank b6=Over Speed b7=Low Oil Pressure Rev. 3.04 Added: b8 = CAN Fail	
40083	Pre-Alarm Codes	individual bits are 0 or 1	R	b0=High Coolant Temperature b1=Low Coolant Temperature b2=Weak Battery b3=Low Battery b4=Battery Overvoltage b5=Battery Charger Fail b6=Maintenance Interval b7=Engine Overload Rev. 3.04 Added: b8 = DTC b9 = CAN Fail	
40084	Pre-Alarm Codes, Group 2	individual bits are 0 or 1	R	b0=Low Oil Pressure b1=Low Fuel Level b2=Magnetic Pick-up Fail b3=Fuel Level Sender Fail b4=Aux Input 1 b5=Aux Input 2 b6=Aux Input 3 b7=Aux Input 4	
40085	Engine Coolant Temperature		R		DegF
40086	Engine Oil Pressure		R		PSI
40087	Battery Voltage		R		0.1 VoltsDC
40088	Fuel Level		R		% Full Tank
40089	Time Remaining until Maintenance		R		Hours
40090	Accumulated Engine Runtime(a)		R W	DP	Minutes x 10000
40091	Accumulated Engine Runtime(b)		R W	DP	Minutes
40092	Not Currently Used		R W	DP	
40093	Not Currently Used		R W	DP	
40094	Engine Speed(a)		R	DP	RPM x10000
40095	Engine Speed(b)		R	DP	RPM
40096	Engine Load(a)		R	DP	
40097	Engine Load(b)		R	DP	% of Rated Load
GENERATOR MONITOR					
40098	Phase a-b RMS Voltage(a)		R	DP	RMS Volt x 10000
40099	Phase a-b RMS Voltage(b)		R	DP	RMS Volt
40100	Phase b-c RMS Voltage(a)		R	DP	RMS Volt x 10000
40101	Phase b-c RMS Voltage(b)		R	DP	RMS Volt
40102	Phase c-a RMS Voltage(a)		R	DP	RMS Volt x 10000
40103	Phase c-a RMS Voltage(b)		R	DP	RMS Volt
40104	Phase a-n RMS Voltage(a)		R	DP	RMS Volt x 10000
40105	Phase a-n RMS Voltage(b)		R	DP	RMS Volt

Holding Register	Parameter	Range	Read/Write Supported	Data Format	Units
40106	Phase b-n RMS Voltage(a)		R	DP	RMS Volt x 10000
40107	Phase b-n RMS Voltage(b)		R	DP	RMS Volt
40108	Phase c-n RMS Voltage(a)		R	DP	RMS Volt x 10000
40109	Phase c-n RMS Voltage(b)		R	DP	RMS Volt
40110	Phase a RMS Current		R		RMS Amps
40111	Phase b RMS Current		R		RMS Amps
40112	Phase c RMS Current		R		RMS Amps
40113	Phase a Apparent Power(a)		R	DP	KVA x 10000
40114	Phase a Apparent Power(b)		R	DP	KVA
40115	Phase b Apparent Power(a)		R	DP	KVA x 10000
40116	Phase b Apparent Power(b)		R	DP	KVA
40117	Phase c Apparent Power(a)		R	DP	KVA x 10000
40118	Phase c Apparent Power(b)		R	DP	KVA
40119	3 Phase Apparent Power(a)		R	DP	KVA x 10000
40120	3 Phase Apparent Power(b)		R	DP	KVA
40121	Phase a Power(a)		R	DP	KWatt x 10000
40122	Phase a Power(b)		R	DP	KWatt
40123	Phase b Power(a)		R	DP	KWatt x 10000
40124	Phase b Power(b)		R	DP	KWatt
40125	Phase c Power(a)		R	DP	KWatt x 10000
40126	Phase c Power(b)		R	DP	KWatt
40127	3 Phase power(a)		R	DP	KWatt x 10000
40128	3 Phase power(b)		R	DP	KWatt
40129	3 Phase Total kW-Hours(a)		R W	TP	KWH x 10000 x 10000
40130	3 Phase Total kW-Hours(b)		R W	TP	KWH x 10000
40131	3 Phase Total kW-Hours(x)		R W	TP	KWH
40132	Power Factor	0-100	R		0.01
40133	Frequency		R		0.1 Hertz
40134	Present Total kW-minutes (a)		R W	TP	kWm x 10000 x 10000
40135	Present Total kW-minutes (b)		R W	TP	kWm x 10000
40136	Present Total kW-minutes (c)		R W	TP	kWm
40137	Generator Speed Mode	individual bits are 0 or 1	R W	<u>active spd signals:</u> b0 =mag. pick-up or CAN's ECU engine's speed. b1 =generator	
40138-39	RESERVED				
40140	Power Factor State	0-3	R	0= +LAG 1= -LEAD 2= -LAG 3= +LEAD	
40141-272	RESERVED				
40273	Input Contacts States	individual bits are 0 or 1	R	b0 = coolant level, b1 = ATS, b2 = E-stop, b3 = charger failed, b4 = aux. input 1, b5 = aux. input 2, b6 = aux. input 3, b7 = aux. input 4. /* b7 = aux. input 4. */	
40274	BESTCOMS*Plus*® Test Buttons States	individual bits are 0 or 1	R W	b0 = button #1, b1 = button #2, b2 = button #3, b3 = button #4, b4-b7 are not used.	
40275-80	RESERVED				

Holding Register	Parameter	Range	Read/Write Supported	Data Format	Units
40281	Embedded Code Version Number (a)	0-99	R		
40282	Embedded Code Version Number (b)	0-9999	R		
40283	Embedded Code Version Number (c)	0-9999	R		
40287-97	RESERVED				
40298	Read Relay Image of both Main and Aux Output	individual bits are 0 or 1	R	Main is in lower byte and Aux is in upper byte. b0 = Aux Output 1, b1 = Aux Output 2, b2 = Aux Output 3, b3 = Aux Output 4, b4 = Aux Output 5, b5 = Aux Output 6, b6 = Aux Output 7, b7 = Aux Output 8. b8 = Master Start Relay, b9 = Fuel Solenoid Relay, b10 = PreHeat PreLube Relay, b11 = Alarm Relay, b12 = UNASSIGNED, b13 = Buzzer On, b14 = EPS Loaded Relay, b15 = PreAlarm Relay,	
40299	RESERVED				
J1939 DIAGNOSTIC TROUBLE CODES					
40300	Active DTC Number 16 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40301	Active DTC Number 16 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40302	Active DTC Number 15 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40303	Active DTC Number 15 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40304	Active DTC Number 14 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40305	Active DTC Number 14 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40306	Active DTC Number 13 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40307	Active DTC Number 13 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40308	Active DTC Number 12 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40309	Active DTC Number 12 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40310	Active DTC Number 11 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40311	Active DTC Number 11 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40312	Active DTC Number 10 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40313	Active DTC Number 10 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40314	Active DTC Number 9 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40315	Active DTC Number 9 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40316	Active DTC Number 8 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40317	Active DTC Number 8 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40318	Active DTC Number 7 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	

Holding Register	Parameter	Range	Read/Write Supported	Data Format	Units
40319	Active DTC Number 7 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40320	Active DTC Number 6 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40321	Active DTC Number 6 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40322	Active DTC Number 5 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40323	Active DTC Number 5 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40324	Active DTC Number 4 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40325	Active DTC Number 4 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40326	Active DTC Number 3 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40327	Active DTC Number 3 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40328	Active DTC Number 2 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40329	Active DTC Number 2 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40330	Active DTC Number 1 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40331	Active DTC Number 1 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40332	Previous DTC Number 1 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40333	Previous DTC Number 1 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40334	Previous DTC Number 2 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40335	Previous DTC Number 2 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40336	Previous DTC Number 3 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40337	Previous DTC Number 3 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40338	Previous DTC Number 4 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40339	Previous DTC Number 4 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40340	Previous DTC Number 5 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40341	Previous DTC Number 5 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40342	Previous DTC Number 6 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40343	Previous DTC Number 6 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40344	Previous DTC Number 7 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40345	Previous DTC Number 7 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40346	Previous DTC Number 8 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40347	Previous DTC Number 8 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40348	Previous DTC Number 9 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40349	Previous DTC Number 9 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40350	Previous DTC Number 10 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	

Holding Register	Parameter	Range	Read/Write Supported	Data Format	Units
40351	Previous DTC Number 10 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40352	Previous DTC Number 11 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40353	Previous DTC Number 11 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40354	Previous DTC Number 12 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40355	Previous DTC Number 12 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40356	Previous DTC Number 13 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40357	Previous DTC Number 13 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40358	Previous DTC Number 14 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40359	Previous DTC Number 14 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40360	Previous DTC Number 15 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40361	Previous DTC Number 15 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40362	Previous DTC Number 16 – Lower Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40363	Previous DTC Number 16 – Upper Two Bytes	0-65535	R	Half of a set of DTC data as defined in SAE J1939-73	
40364	RESERVED				
40365	RESERVED				
40366	RESERVED				
40367	RESERVED				
40368	DTC Lamp Status Note: Odd bits are always a zero value.	individual bits are 0 or 1	R	Active stored in upper byte – Previous stored in lower byte. Bit 0 = Protect Lamp Bit 1 = 0 Bit 2 = Amber Warning Lamp Bit 3 = 0 Bit 4 = Red Stop Lamp Bit 5 = 0 Bit 6 = Malfunction Indicator Lamp Bit 7 = 0 Bit 8 = Protect Lamp Bit 9 = 0 Bit 10 = Amber Warning Lamp Bit 11 = 0 Bit 12 = Red Stop Lamp Bit 13 = 0 Bit 14 = Malfunction Indicator Lamp Bit 15 = 0	
40369	Number of DTC's	0-65535	R	Active stored in upper byte – Previous stored in lower byte.	
40370	CAN Bus Results Register	individual bits are 0 or 1	R	b0 = CAN Comms. Fail, b1 = Active DTC Clear Fail, b2 = Previous DTC Clear Fail, b3 = DTC Values Changed, b4 = CAN Hardware Test Pass, b5 = UNASSIGNED, b6 = UNASSIGNED, b7 = UNASSIGNED,	
40371	CAN Related Parameter: Percent Coolant Level	0-100	R	Percent	

Holding Register	Parameter	Range	Read/Write Supported	Data Format	Units
40372	CAN Communications Diagnostics for use when CAN is enabled.	individual bits are 0 or 1	R	Bit 12 - .Engine Run Time Bit 11 – Data Failure Status Previous Active DTCs Cleared Bit 10 – Active DTCs Cleared Bit 9 - Previous Active DTCs Bit 8 - Current Active DTCs Bit 7 – Coolant Level Bit 6 - Oil Pressure Bit 5 - Coolant Temp Bit 4 - Engine Speed Bit 3 – Can Error Status tx err passive Bit 2 – Can Error Status rx err passive Bit 1 – Can Error Status driver sleep status Bit 0 – Can Error Status bus off	
40373	System Config	individual bits are 0 or 1	R W	Bit 0 – RUN Bit 1 – OFF Bit 2 – AUTO_RUN Bit 3 – AUTO_OFF Bit 4 – AUTO_ANY	
40374	System Status	0 - 10	R	0 = RESET 1 = READY 2 = CRANKING 3 = RESTING 4 = RUNNING 5 = ALARM 6 = PRESTART 7 = COOLING 8 = CONNECTING 9 = DISCONNECT 10 = PULSING 11 = UNLOADING	
40375	Used to display Value, NC, NS, NA, and SF		R	Bits 0-2: coolant level Bits 3-5: coolant temperature Bits 6-8: oil pressure Bits 9-11: engine speed Bits 12-14: engine run time Bit 15: NOT USED <u>3-Bit Status Flag Values</u>: 000 for Valid Data 001 for No Comms 010 for Not Sent 011 for Not Supp 100 for Sender Error	
40380-81	FUTURE USE				
40382	MTU module type	1-4	R W	1 = module type 201 2 = module type 302 3 = module type 303 4 = module type 304	
40383	MTU speed demand switch	0-7	R W	0 = ANALOG_CAN 1 = UP_DN_ECU 2 = UP_DN_CAN 3 = ANALOG_ECU 5 = FREQUENCY 7 = NO_CAN_DEMAND	
40384	MTU RPM request for engine	1400-2000	R W		
40385	Volvo Accelerator Pedal Position (Trim)	0-100	R W	0 = Rated speed – 120rpm; 50 = Rated speed; 100 = Rated speed + 120rpm.	
40386	Volvo Engine RPM Select	0-1	R W	0 = Primary, 1 = Secondary.	
40387	J1939 source address for this unit	0-253	R W		
40388	CANbus ECU Configuration	0-65535	R W	0 = Not configured; 1 = Volvo Penta EDC3; 2 = MTU MDEC 3 = MTU ADEC	

Holding Register	Parameter	Range	Read/Write Supported	Data Format	Units
40395	ECU Settling Time	0-65535	R W	milliseconds	
40396	ECU Pulse Cycle Time - The amount of time unit is to wait in OFF between Pulse Cycles.	0-65535	R W	minutes	
40397	ECU Disconnect Time - The amount of time ECU is kept powered off.	0-65535	R W	seconds	
40398	ECU Connect Time - The amount of time ECU is powered when connecting (unit tries to run). Also used for the Pulse duration time.	0-65535	R W	seconds	
40399-420	FUTURE USE				
J1939 DATA					
40421	Accelerator Pedal Position	0 to 100%	R	0.4%/bit gain, 0% offset	
40422	Percent Load At Current Speed	0 to 125%	R	1%/bit gain, 0% offset	
40423	Actual Engine Percent Torque	0 to 125%	R	1%/bit gain, -125% offset	
40424	Engine Speed	0 to 8031.875	R	RPM (0.125rpm/bit gain)	
40425	Injection Control Pressure2		R		
40426	Injector Metering Rail Pressure2	0 to +251 MPa (0 to 36 404 psi)	R	1/256 MPa/bit gain, 0 MPa offset	
40427	Engine Run Time	0 to +210,554, 060.75 h	R	0.05 h/bit gain, 0 h offset	
40428	Engine Run Time		R		
40429	Engine Run Time		R		
40430	Trip Fuel	Data Range: 0 to +2,105,540, 608 L	R	0.5 L per bit gain, 0 L offset	
40431	Trip Fuel		R		
40432	Trip Fuel		R		
40433	Total Fuel Used	Data Range: 0 to +2,105,540, 608 L	R	0.5 L per bit gain, 0 L offset	
40434	Total Fuel Used		R		
40435	Total Fuel Used		R		
40436	Coolant Temperature	-40 to +210 °C (-40 to 410 °F)	R	Raw ECU Parameter Data 1 °C/bit gain	
40437	Fuel Temperature	-40 to +210 °C (-40 to 410 °F)	R	Raw ECU Parameter Data 1 °C/bit gain, -40 °C offset	
40438	Engine Oil Temperature	-273 to +1735.0 °C (-459.4 to 3155.0 °F)	R	Raw ECU Parameter Data 0.03125 °C/bit gain, -273 °C offset	
40439	Engine Intercooler Temperature	-40 to +210 °C (-40 to 410 °F)	R	Raw ECU Parameter Data 1 °C/bit gain, -40 °C offset	
40440	Fuel Delivery Pressure	0 to +1000 kPa (0 to 145 psi)	R	Raw ECU Parameter Data 4 kPa/bit gain, 0 kPa offset	
40441	Engine Oil Level	0 to +100 %	R	Raw ECU Parameter Data 0.4 %/bit gain, 0 % offset	
40442	Oil Pressure	0 to +1000 kPa (0 to 145 psi)	R	Raw ECU Parameter Data 4 kPa/bit gain, 0 kPa offset	
40443	Coolant Pressure	0 to +500 kPa (0 to 72.5 psi)	R	Raw ECU Parameter Data 4 kPa/bit gain, 0 kPa offset	
40444	Coolant Level	0 to +100 %	R	Raw ECU Parameter Data 0.4 %/bit gain, 0 % offset	
40445	Fuel Rate	0 to +3212.75 L/h	R	Raw ECU Parameter Data 0.05 L/h per bit gain, 0 L/h offset (13.9 x 10-6 L/s per bit)	

Holding Register	Parameter	Range	Read/Write Supported	Data Format	Units
40446	Barometric Pressure	0 to +125 kPa (0 to +18.1 psi)	R	Raw ECU Parameter Data 0.5 kPa/bit gain, 0 kPa offset	
40447	Ambient Air Temperature	-273 to +1735.0 °C (-459.4 to 3155.0 °F)	R	Raw ECU Parameter Data 0.03125 °C/bit gain, -273 °C offset	
40448	Air Inlet Temperature	-40 to +210 °C (-40 to 410 °F)	R	Raw ECU Parameter Data 1 °C/bit gain, -40 °C offset	
40449	Boost Pressure	0 to +500 kPa (0 to 72.5 psi)	R	Raw ECU Parameter Data 2 kPa/bit gain, 0 kPa offset	
40450	Intake Manifold Temperature	-40 to +210 °C (-40 to 410 °F)	R	Raw ECU Parameter Data 1 °C/bit gain, -40 °C offset	
40451	Air Filter Differential Pressure	0 to +12.5 kPa (0 to +1.8 psi)	R	Raw ECU Parameter Data 0.05 kPa/bit gain, 0 kPa offset	
40452	Exhaust Gas Temperature	-273 to +1735.0 °C (-459.4 to 3155.0 °F)	R	Raw ECU Parameter Data 0.03125 °C/bit gain, -273 °C offset	
40453	Electrical Potential Voltage	0 to +3212.75 V	R	Raw ECU Parameter Data 0.05 V/bit gain, 0 V offset	
40454	Battery Potential Voltage Switched	Data Range: 0 to +3212.75 V	R	Raw ECU Parameter Data 0.05 V/bit gain, 0 V offset	
40455	Speed At Idle Point1	0 to 8031.875 rpm	R	Raw ECU Parameter Data 0.125 rpm/bit, 0 rpm offset	
40456	Torque At Idle Point1	0 to 125%	R	Raw ECU Parameter Data 1%/bit gain, -125% offset	
40457	Speed At Idle Point2	0 to 8031.875 rpm	R	Raw ECU Parameter Data 0.125 rpm/bit, 0 rpm offset	
40458	Torque At Idle Point2	0 to 125%	R	Raw ECU Parameter Data 1%/bit gain, -125% offset	
40459	Speed At Idle Point3	0 to 8031.875 rpm	R	Raw ECU Parameter Data 0.125 rpm/bit, 0 rpm offset	
40460	Torque At Idle Point3	0 to 125%	R	Raw ECU Parameter Data 1%/bit gain, -125% offset	
40461	Speed At Idle Point4	0 to 8031.875 rpm	R	Raw ECU Parameter Data 0.125 rpm/bit, 0 rpm offset	
40462	Torque At Idle Point4	0 to 125%	R	Raw ECU Parameter Data 1%/bit gain, -125% offset	
40463	Speed At Idle Point5	0 to 8031.875 rpm	R	Raw ECU Parameter Data 0.125 rpm/bit, 0 rpm offset	
40464	Torque At Idle Point5	0 to 125%	R	Raw ECU Parameter Data 1%/bit gain, -125% offset	
40465	Speed At High Idle Point6	0 to 8031.875 rpm	R	Raw ECU Parameter Data 0.125 rpm/bit, 0 rpm offset	
40466	Gain Of End speed governor	0 to 50.2 %/rpm	R	Raw ECU Parameter Data 0.0007813 % engine reference torque/rpm per bit gain (normalized), 0 %/rpm per bit offset	
40467	Reference Engine Torque	0 to 64 255 Nm	R	Raw ECU Parameter Data 1 Nm/bit gain, 0 Nm offset	
40468	Override Speed Point7	0 to 8031.875 rpm	R	Raw ECU Parameter Data 0.125 rpm/bit, 0 rpm offset	
40469	Override Time Limit	0 s to 25 s	R	Raw ECU Parameter Data 0.1 s/bit gain, 0 s offset	
40470	Speed Lower Limit	0 to 2500 rpm	R	Raw ECU Parameter Data 10 rpm/bit gain, 0 rpm offset	

Holding Register	Parameter	Range	Read/Write Supported	Data Format	Units
40471	Speed Upper Limit	0 to 2500 rpm	R	Raw ECU Parameter Data 10 rpm/bit gain, 0 rpm offset	
40472	Torque Lower Limit	0 to 125%	R	Raw ECU Parameter Data 1%/bit gain, -125% offset	
40473	Torque Upper Limit	0 to 125%	R	Raw ECU Parameter Data 1%/bit gain, -125% offset	
40474	Crankcase Pressure	-250 to +251.99 kPa	R	Raw ECU Parameter Data 0.0078125 kPa/bit gain, -250 kPa offset	
40475	Oil Filter Diff. Pressure	0 to 125 kPa	R	Raw ECU Parameter Data 0.5 kPa/bit gain, 0 offset	
40476	Fuel Filter Diff. Pressure	0 to 500 kPa	R	Raw ECU Parameter Data 2 kPa/bit gain, 0 offset	
40477-82	FUTURE USE				
40493-99	FUTURE USE				
40500	DGC-2020 product series identifier	2020	R		
40501	Firmware Part Number - 2nd most significant digit. NOTE: The most significant digit is always 9, but is not mapped.	0 - 9	R		
40502	Firmware Part Number - 3rd-6th most significant digits	0000 - 9999	R		
40503	Firmware Part Number - four least significant digits	0000 - 9999	R		
40504	LED Status	individual bits are 0 or 1	R	Bits indicate status of LED's: b0 = RUN b1 = OFF b2 = AUTO b3 = ALARM b4 = LOAD b5 = NOT IN AUTO	
40507	Read Relay Image of both Main and Aux Output (Duplicate of 40298)	individual bits are 0 or 1	R	Main is in lower byte and Aux is in upper byte. b0 = Aux Output 1, b1 = Aux Output 2, b2 = Aux Output 3, b3 = Aux Output 4, b4 = Aux Output 5, b5 = Aux Output 6, b6 = Aux Output 7, b7 = Aux Output 8. b8 = Master Start Relay, b9 = Fuel Solenoid Relay, b10 = PreHeat PreLube Relay, b11 = Alarm Relay, b12 = UNASSIGNED, b13 = Buzzer On, b14 = EPS Loaded Relay, b15 = PreAlarm Relay,	
40508	Input Contacts States (Duplicate of 40273)	individual bits are 0 or 1	R	b0 = coolant level, b1 = ATS, b2 = E-stop, b3 = charger failed, b4 = aux. input 1, b5 = aux. input 2, b6 = aux. input 3, b7 = aux. input 4. /* b7 = aux. input 4. */	
40509-604	RESERVED				
OVERCURRENT					
40605	51 Pick-up – 3-phase	18-118, 90-775	R W	0.18-1.18 Aac for 1A CTs, 0.90-7.75 Aac for 5A CTs	

Holding Register	Parameter	Range	Read/Write Supported	Data Format	Units
40606	51 Time Dial – 3-phase	0-99, 0-300	R W	0.0-9.9 for 40607=0-15 (inverse), 0.0-30.0s for 40607=16 (fixed)	
40607	51 Curve – 3-phase	0-16	R W	0-15 for inverse, 16 for fixed	
40608	51 Alarm Config. – 3-phase	0-2	R W	0=None, 1=Pre-Alarm, 2=Alarm	
40609	51 Pick-up – 1-phase	18-118, 90-775	R W	0.18-1.18 Aac for 1A CTs, 0.90-7.75 Aac for 5A CTs	
40610	51 Time Dial – 1-phase	0-99, 0-300	R W	0.0-9.9 for 40607=0-15 (inverse), 0.0-30.0s for 40607=16 (fixed)	
40611	51 Curve – 1-phase	0-16	R W	0-15 for inverse, 16 for fixed	
40612	51 Alarm Config. – 1-phase	0-2	R W	0=None, 1=Pre-Alarm, 2=Alarm	
PHASE IMBALANCE					
40613	47 Pick-up	5-100	R W	Volts AC	
40614	47 Time Delay	0-300	R W	0.0-30.0 seconds	
40615	47 Alarm Configuration	0-2	R W	0=None, 1=Pre-Alarm, 2=Alarm	
UNDERVOLTAGE					
40616	27 Pick-up – 3-phase	70-576	R W	Volts AC	
40617	27 Time Delay – 3-phase	0-300	R W	0.0-30.0 seconds	
40618	27 Inhibit Frequency- 3-ph.	20-400	R W	Hertz	
40619	27 Alarm Config. – 3-phase	0-2	R W	0=None, 1=Pre-Alarm, 2=Alarm	
40620	27 Pick-up – 1-phase	70-576	R W	Volts AC	
40621	27 Time Delay – 1-phase	0-300	R W	0.0-30.0 seconds	
40622	27 Inhibit Frequency – 1-ph.	20-400	R W	Hertz	
40623	27 Alarm Config. – 1-phase	0-2	R W	0=None, 1=Pre-Alarm, 2=Alarm	
OVERVOLTAGE					
40624	59 Pick-up – 3-phase	70-576	R W	Volts AC	
40625	59 Time Delay – 3-phase	0-300	R W	0.0-30.0 seconds	
40626	59 Alarm Config. – 3-phase	0-2	R W	0=None, 1=Pre-Alarm, 2=Alarm	
40627	59 Pick-up – 1-phase	70-576	R W	Volts AC	
40628	59 Time Delay – 1-phase	0-300	R W	0.0-30.0 seconds	
40629	59 Alarm Config. – 1-phase	0-2	R W	0=None, 1=Pre-Alarm, 2=Alarm	
UNDERFREQUENCY					
40630	81U Pick-up	450-550, 550-650, 3600-4400	R W	45.0-55.0 Hz for 50-Hz config., 55.0-65.0 Hz for 60-Hz config., 360.0-440.0 Hz for 400-Hz unit	
40631	81U Time Delay	0-300	R W	0.0-30.0 seconds	
40632	81U Inhibit Voltage	70-576	R W	Volts AC	
40633	81U Alarm Configuration	0-2	R W	0=None, 1=Pre-Alarm, 2=Alarm	
OVERFREQUENCY					
40634	81O Pick-up	450-550, 550-650, 3600-4400	R W	45.0-55.0 Hz for 50-Hz config., 55.0-65.0 Hz for 60-Hz config., 360.0-440.0 Hz for 400-Hz unit	
40635	81O Time Delay	0-300	R W	0.0-30.0 seconds	
40636	81O Alarm Configuration	0-2	R W	0=None, 1=Pre-Alarm, 2=Alarm	
GENERATOR PROTECTION STATUS					
40637	Gen Protection Status (upper 16 bits)	0-65535	R	b16-b31 UNASSIGNED	
40638	Gen Protection Status (lower 16 bits)	0-65535	R	b0 = overvoltage trip, b1 = undervoltage trip, b2 = overfrequency trip, b3 = underfrequency trip, b4 = overcurrent trip, b5 = phase imbalance trip, b6-b15 UNASSIGNED	
40639	Gen Protection Pre-Alarms (upper 16 bits)	0-65535	R	b16-b31 UNASSIGNED	

Holding Register	Parameter	Range	Read/Write Supported	Data Format	Units
40640	Gen Protection Pre-Alarms (lower 16 bits)	0-65535	R	b0 = overvoltage pre-alarm, b1 = undervoltage pre-alarm, b2 = overfrequency pre-alarm, b3 = underfrequency pre-alarm, b4 = overcurrent pre-alarm, b5 = phase imbalance pre-alarm, b6-b15 UNASSIGNED	
40641	Gen Protection Alarms (upper 16 bits)	0-65535	R	b16-b31 UNASSIGNED	
40642	Gen Protection Alarms (lower 16 bits)	0-65535	R	b0 = overvoltage alarm, b1 = undervoltage alarm, b2 = overfrequency alarm, b3 = underfrequency alarm, b4 = overcurrent alarm, b5 = phase imbalance alarm, b6-b15 UNASSIGNED	
REAL TIME CLOCK					
40700	Hours	0-23	R W		
40701	Minutes	0-59	R W		
40702	Seconds	0-59	R W		
40703	Month	1-12	R W		
40704	Day	1-31	R W		
40705	Year		R W		
40706	Daylight Savings Time Enable	0-1	R W	0 = Off 1 = On	
40707-33	RESERVED				
RUN STATISTICS					
40734	Maintenance Interval Hours	0-5000	R W		hours
40735	Hours Until Maintenance	0-5000	R W		hours
40737	Commission Start Month	1-12	R W		month
40738	Commission Start Day	1-31	R W		day
40739	Commission Start Year	0-99	R W		year
40740-41	Cumulative Run Hours x 60	0-4294967295	R W	DP	hours
40742-43	Cumulative Loaded Run Hours x 60	0-4294967295	R W	DP	hours
40744-45	Cumulative Unloaded Run Hours x 60	0-4294967295	R W	DP	hours
40746	Start Count	0-65535	R W		
40747	Session Start Month	1-12	R W		month
40748	Session Start Day	1-31	R W		day
40749	Session Start Year	0-99	R W		year
40750-51	Session Run Hours x 60	0-4294967295	R W	DP	hours
40752-53	Session Loaded Run Hours x 60	0-4294967295	R W	DP	hours
40754-55	Session Unloaded Run Hours x 60	0-4294967295	R W	DP	hours
CANbus ECU					
40758	ECU Control Output Select	0-1	R W	0 = fuel solenoid relay, 1 = pre-start relay	
40759	ECU Pulsing Enable	0-1	R W	0 = pulsing is enabled, 1 = pulsing is disabled	
40760	MDEC Alarms	0-65535	R	b0 = High Charge Air Temp, b1 = High Oil Temp, b2 = High Coolant Temp, b3 = Low Aftercooler Level, b4 = Low Fuel Delivery Press, b5 = Low Oil Press, b6 = Overspeed, b7 = Combined Red, b8-b15 UNASSIGNED	

Holding Register	Parameter	Range	Read/Write Supported	Data Format	Units
40761	MTU Pre-alarms	0-65535	R	b0 = High ECU Temp, b1 = High Oil Temp, b2 = High Intercooler Temp, b3 = High Charge Air Temp, b4 = High Coolant Temp, b5 = Shutdown Override, b6 = High Fuel Rail Press, b7 = Low Fuel Rail Press, b8 = Low Coolant Level, b9 = Low Charge Air Pressure, b10 = Low Fuel Deliv Pressure, b11 = Low Oil Pressure, b12 = Combined Yellow, b13-b15 UNASSIGNED	

APPENDIX C • TUNING PID SETTINGS

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Tables