CATERPILLAR®

Standards & Development

EMCP 3.S Data Table Interface Manual

(Customer Version)

DCN0006 Rev 1.4

DOCUMENTATION

This publication may have been revised or updated since this copy was produced. To verify that you have the latest revision, be sure to contact Intelligent Switchgear Organization, LLC.

The revision level is shown at the bottom of the front cover after the publication number. The latest version of most publications is available at Intelligent Switchgear Organization, LLC.

WARNING

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Practice all plant and safety instructions and precautions. Failure to follow instructions can cause personal injury and/or property damage.

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (i) constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and (ii) invalidate product certifications or listings.

Important Definitions

WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation that, if not avoided, could result in damage to equipment.

NOTE

Provides other helpful information that does not fall under the warning or caution categories.

ISO, LLC reserves the right to update any portion of this publication at any time.

Revision History

Rev.	Date	Editor	Changes
NEW	03/05/09	JNS	Initial Release
1.0	04/01/09	DL	Formatting Corrections
1.1	06/30/09	MLA	Updated and standardized with new formatting
1.2	08/11/09	MLA	Updated to be consistent with Rev 0001_0003_0002
1.3	10/14/09	DL	Removed N2-4 Gen 11-16
1.4	10/27/09	MLA	Reverted from changes in rev 1.3 (changes made in error)

Software Version Compatibility

This manual is compatible back to Template Rev 0001_0003_0002.

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Section 1.
General Information

The EMCP 3.S Data Table Interface is designed to provide a third-party automation system with an interface to gather values from ISO switchgear, and if specified and applied, control the system itself.

The EMCP 3.S Data Table Interface (DTI) provides data over either a RS-485 serial link via ModbusRTU, or an ethernet connection via ModbusTCP.

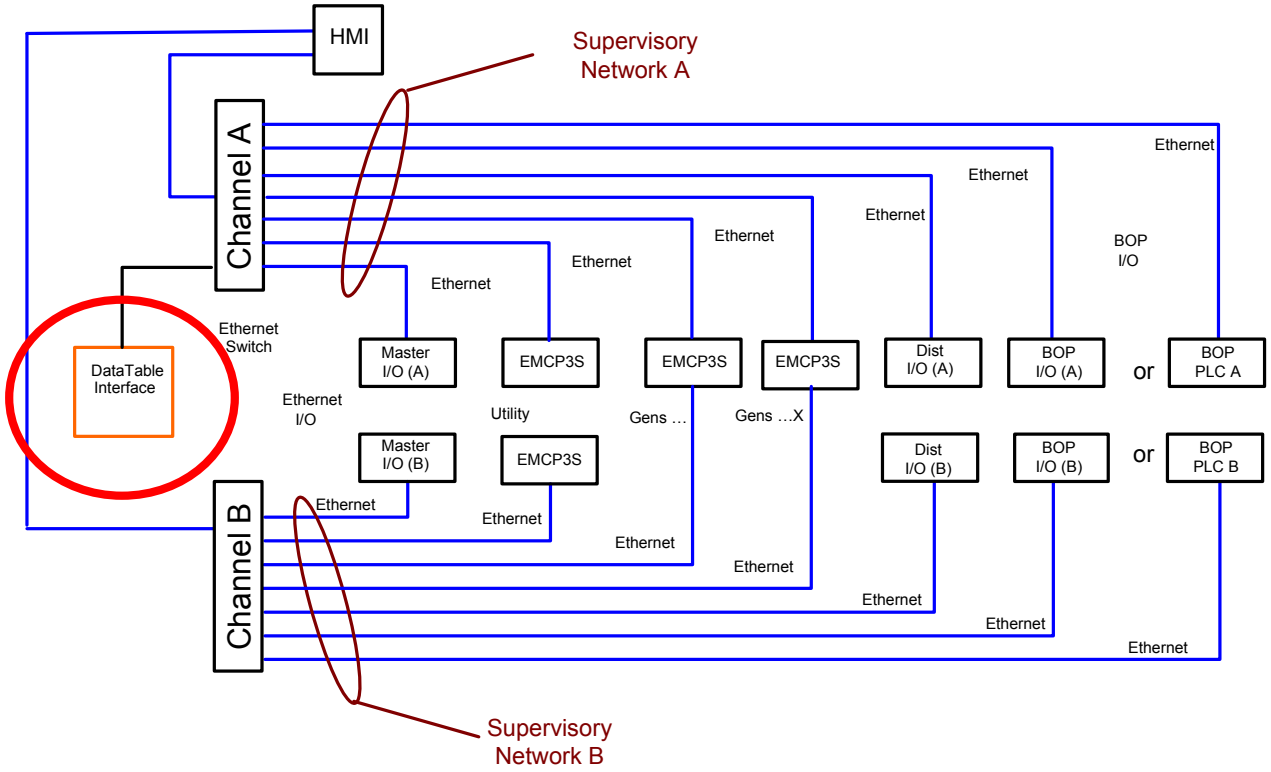


Figure 1-1 Data Table Interface Location In System

The DTI is connected as shown above. The EMCP 3.S controller has two separate independent ethernet ports (Ethernet A and Ethernet B). Ethernet A is dedicated to communicating with the rest of the switchgear system as a whole over the ethernet control network, and Ethernet B is dedicated for use as a third-party interface via ModbusTCP. Serial port RS-485B is dedicated for use as a third-party interface via ModbusRTU.

Section 2. Hardware

The EMCP 3.S Data Table Interface has two ethernet ports, one RS-232 port, and two RS-485 ports. Only Ethernet B and RS-485B ports are available for use as customer interfaces.

RS-485A

The RS-485A port can be used to communicate to other modbus slave devices. It is not available for use as an interface as a modbus slave, simply because the data it can access is limited due to its physical placement on the controller.

The RS-485A port supports the following settings as defined in the tables below:

Setting	Available Values
Baud Rate	0 = 2400 bps 1 = 4800 bps 2 = 9600 bps 3 = 14400 bps 4 = 19200 bps (default) 5 = 38400 bps 6 = 56000 bps 7 = 115000 bps
Parity	0 = None 1 = Even (default) 2 = Odd
Stop Bits	0 = 1 Bit (default) 1 = 2 Bits
Duplex Mode	0 = Half Duplex (default) 1 = Full Duplex

Table 2-1 RS-485A Communication Settings

The RS-485A port requires a standard 9-pin DB-9 female connector, with a minimum wire size of 22 AWG. Details are given in the figures and tables below:

Pin Number	Description
1	Not Used
2	Tx+ (B)
3	Not Used
4	Rx+ (B')
5	Not Used
6	Not Used
7	Tx- (A)
8	Not Used
9	Rx- (A)

Table 2-2 RS-485A Pin Assignment

A Modbus slave device can be wired to the EMCP 3.S DTI in either two-wire or four-wire mode, and with either a single modbus slave device, or multiple modbus slave devices. The figures below demonstrate wiring possibilities:

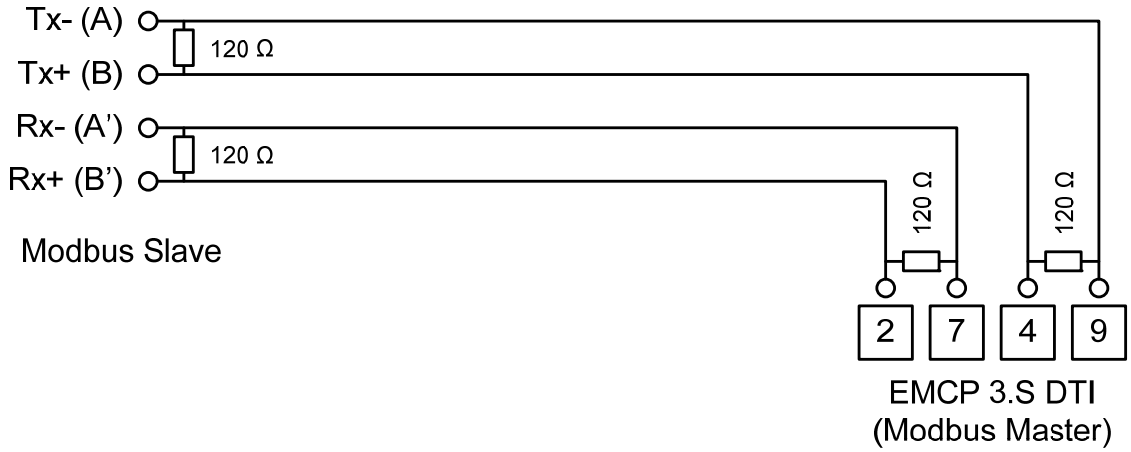


Figure 2-1 RS-485A Four-Wire To Single EMCP 3.S DTI

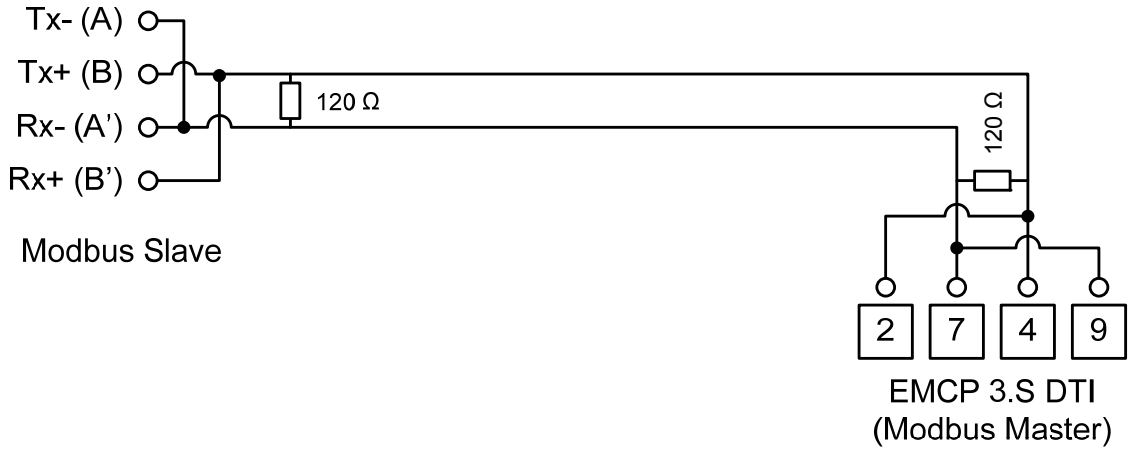


Figure 2-2 RS-485A Two-Wire To Single EMCP 3.S DTI

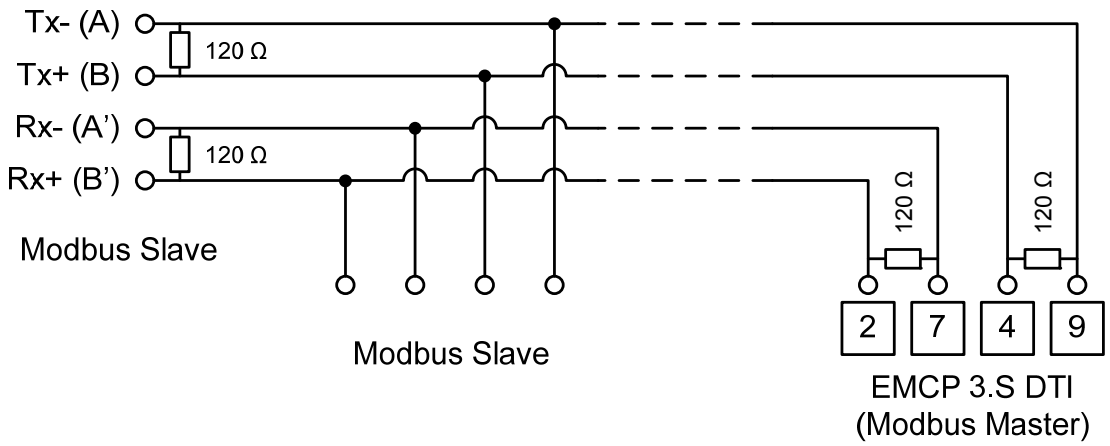


Figure 2-3 RS-485A Four-Wire to multiple EMCP 3.S DTIs

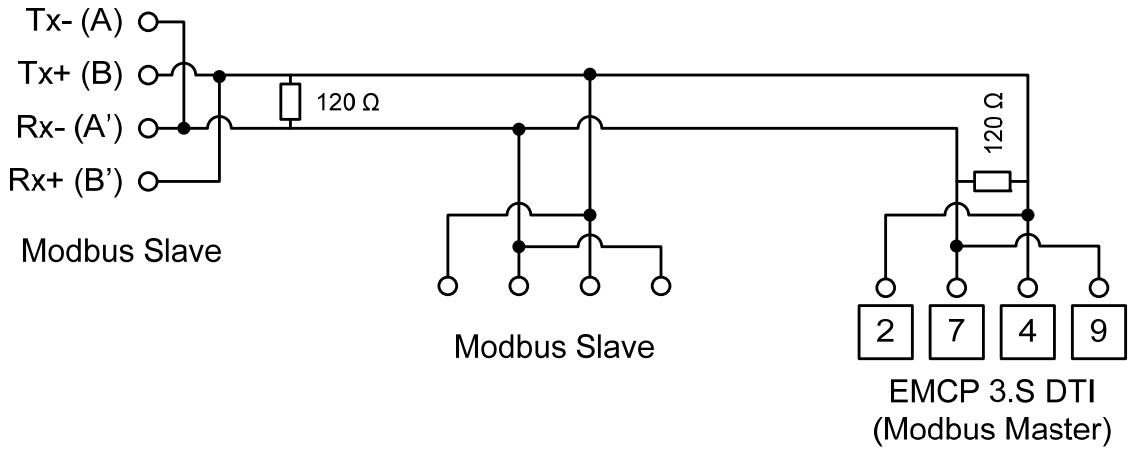


Figure 2-4 RS-485A Two-Wire to multiple EMCP 3.S DTIs

RS-485B

The RS-485B port acts as both the programming port (where the DTI application is loaded onto the controller) and the customer interface port.

The RS-485B port supports the following settings as defined in the tables below:

Setting	Available Values
Baud Rate	0 = 2400 bps 1 = 4800 bps 2 = 9600 bps 3 = 14400 bps 4 = 19200 bps (default) 5 = 38400 bps 6 = 56000 bps 7 = 115000 bps
Parity	0 = None (default) 1 = Even 2 = Odd
Stop Bits	0 = 1 Bit (default) 1 = 2 Bits
Duplex Mode	0 = Half Duplex 1 = Full Duplex (default)

Table 2-3 RS-485B Communication Settings

The RS-485B port requires a standard 9-pin DB-9 female connector, with a minimum wire size of 22 AWG. Details are given in the figures and tables below:

Pin Number	Description
1	Not Used
2	Tx+ (B)
3	Not Used
4	Rx+ (B')
5	Not Used
6	Not Used
7	Tx- (A)
8	Not Used
9	Rx- (A)

Table 2-4 RS-485B Pin Assignment

A Modbus master can be wired to the EMCP 3.S DTI in either two-wire or four-wire mode, and possible with other EMCP 3.S DTI controllers (especially on larger projects). The figures below demonstrate the proper wiring schemes for all possibilities:

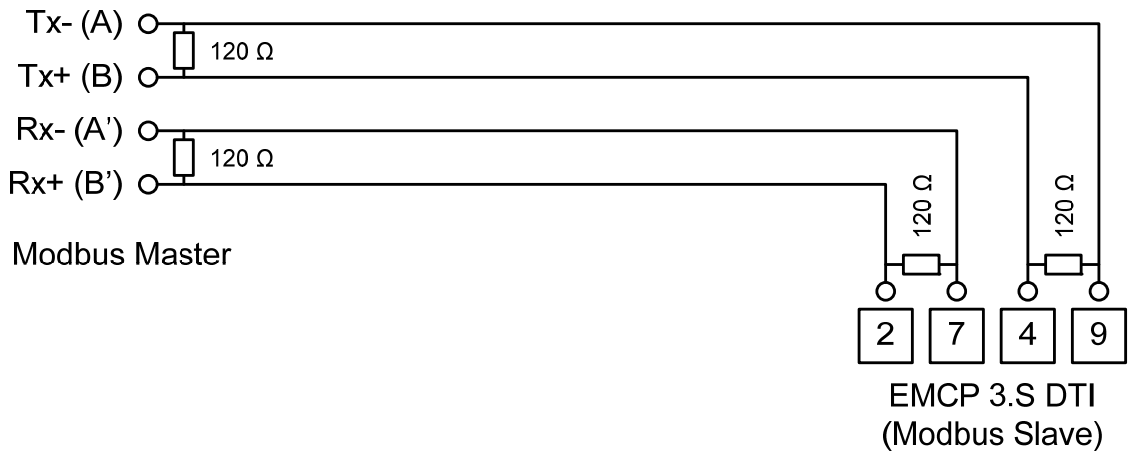


Figure 2-5 RS-485B Four-Wire To Single EMCP 3.S DTI

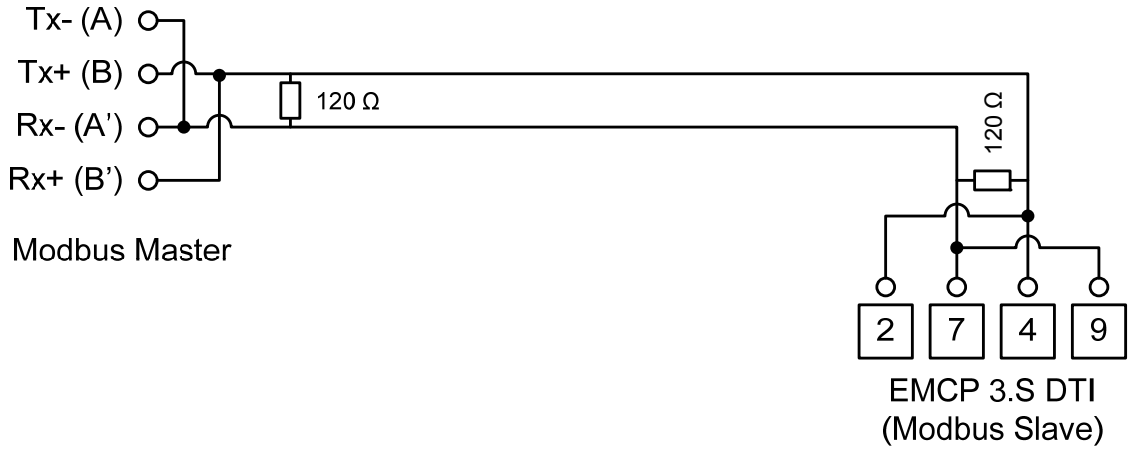


Figure 2-6 RS-485B Two-Wire To Single EMCP 3.S DTI

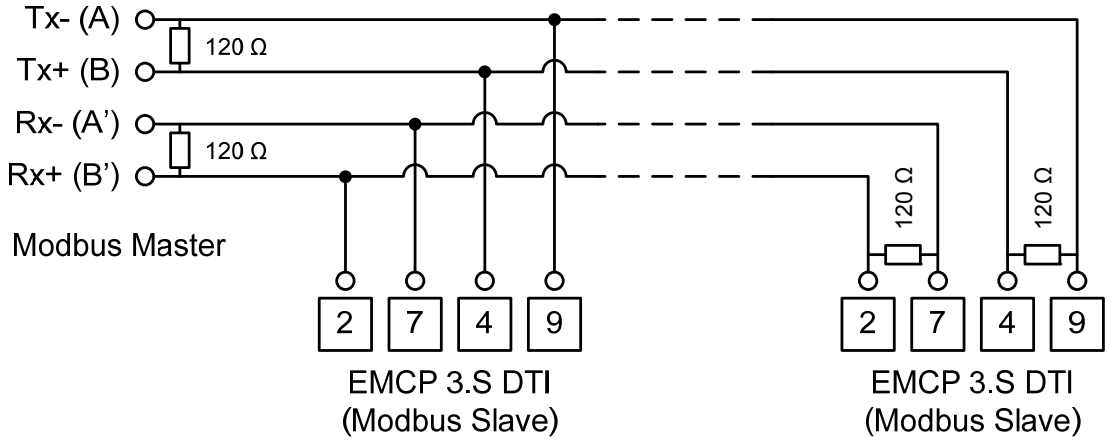


Figure 2-7 RS-485B Four-Wire to multiple EMCP 3.S DTIs

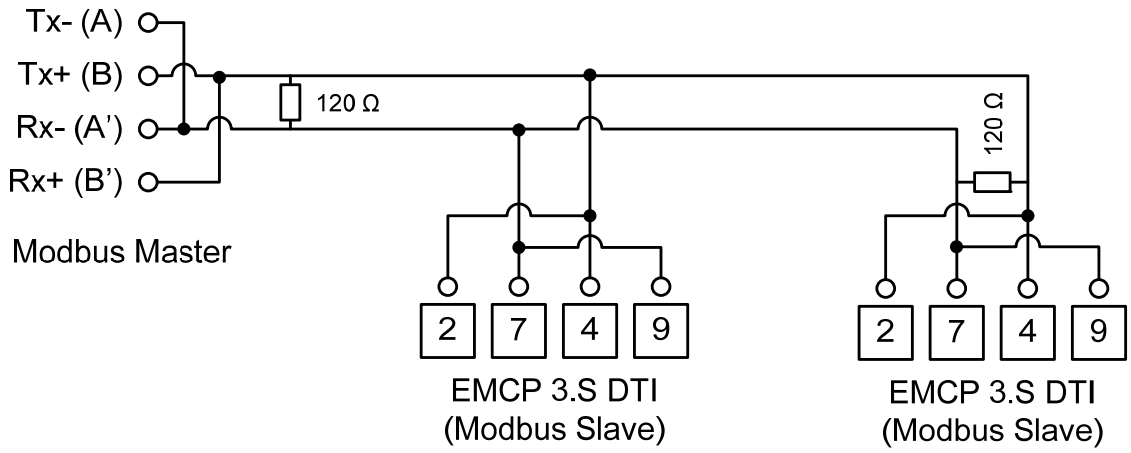


Figure 2-8 RS-485B Two-Wire To Multiple EMCP 3.S DTIs

NOTE
The EMCP 3.S Data Table Interface is configured by default for half-duplex operation. Full-duplex operation is available, but must be configured.

The RS-485B serial port communicates only at a baud rate of 19200bps with no parity, 1 stop bit, and a word length of 8 bits.

ETHERNET A/B

Both Ethernet ports A & B require a standard RJ-45 male plug. It is recommended that CAT-6 cable is used, as it features more stringent specifications for cross-talk and noise prevention than CAT-5/5e.

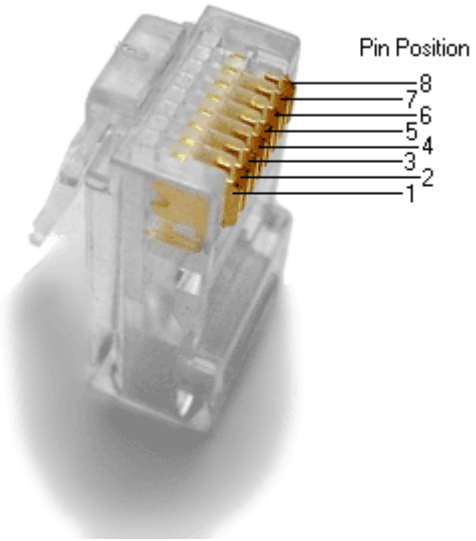


Figure 2-9 RJ-45 Plug ---Pin Configuration

NOTE
The EMCP 3.S Data Table Interface Ethernet A port must be connected to the switchgear control network in order for the DTI to function correctly. Only the Ethernet B port is available for customer use.

The TIE/EIA-568-A specifies two wiring standards for the RJ-45 connector. The two wiring standards (T568A and T568B) vary only in the arrangement of the colored pairs. Either standard can be used. Both standards are shown below for straight-through cabling:

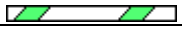
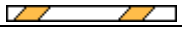
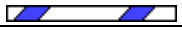
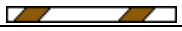
RJ-45 Pin #	Wire Color	Wire Diagram	Function
1	White/Green		Tx+
2	Green		Tx-
3	White/Orange		Rx+
4	Blue		Unused
5	White/Blue		Unused
6	Orange		Rx-
7	White/Brown		Unused
8	Brown		Unused

Table 2-5 T568A Ethernet Cabling Standard

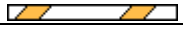
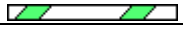
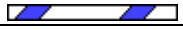
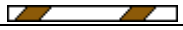
RJ-45 Pin #	Wire Color	Wire Diagram	Function
1	White/Orange		Tx+
2	Orange		Tx-
3	White/Green		Rx+
4	Blue		Unused
5	White/Blue		Unused
6	Green		Rx-
7	White/Brown		Unused
8	Brown		Unused

Table 2-6 T568B Ethernet Cable Standard

Section 3. Data Tables

The Data Tables specify all values, addresses, and data types for all available information on the EMCP 3.S DTI. These data tables apply to the customer interfaces only (Ethernet B and RS-485B), and are not applicable to any other interfaces.

The data tables are separated by function for ease of use. Certain Data Tables will not apply to all projects. If a data table does not apply to a project, the values contained in the specified addresses will appear as 0.

All Modbus addresses are listed as zero-based (some devices may require an offset of one to be applied to the address.

The following Data Types are referenced in the Data Tables:

Data Type	Description
BIT	Unsigned 16 Bit Integer (all bits have independent functionality)
UINT	Unsigned 16 Bit Integer
INT	Signed 16 Bit Integer
FLOAT	32 Bit Float (IEEE 754)
FREQ	Unsigned 16 Bit Integer - In hundreds of Hz (5992 = 59.92 Hz)
PF	Signed 16 Bit Integer – Power Factor (-999 = 0.999 lagging, 999 = 0.999 leading, 1000 = unity)
DEG	Signed 16 Bit Integer - Degrees out of phase (ranges from -180 to 180)

Table 3-1 Data Table Data Types

Master Data Table

Description	Holding Reg.	Input Reg.	Data Type

Description	Holding Reg.	Input Reg.	Data Type
Alarms Bit 0 = EMODE Bit 1 = SYSTEM Not In Auto Bit 2 = Load Shed Override Bit 3 = Master Shutdown Bit 4 = Load Shed Bus Underfrequency Bit 5 = Spare Bit 6 = 24V Battery Charger Failure Bit 7 = 125V Battery Changer Failure Bit 8 = Main Fuel Tank Alarm Bit 9 = Load Management Setpoint Error Bit 10 = Dist CB Tripped Bit 11 = Spare Bit 12 = Cannot Transfer Bit 13 = Cannot Warm Up Bit 14 = Expected Node Is Missing Bit 15 = Unexpected Node On Network	450000	300000	BIT
Status Bits Bit 0 = Emergency Mode Bit 1 = Transfer To Gens Mode Bit 2 = Transfer To Normal Mode Bit 3 = Spare Bit 4 = Group Ramp Up Bit 5 = Group Ramp Down Bit 6 = Instant Auto Bit 7 = OK To Close Gens Bit 8 = Gen Plant Remove Bit 9 = Gen Plant Open Bit 10 = Sync To Utility 1 Bit 11 = Engine Run Request Bit 12 = Group Control Bit 13 = Group Ramp Bit 14 = Gens Warm Up Done Bit 15 = OK To Close Tie	450001	300001	BIT
Status Bits Bit 0 = Load Management Mode Bit 1 = Emergency Mode Bit 2 = Warm Up Timer Imminent Bit 3 = Start Mode Exit Timer Bit 4 = Quick Exit Bit 5 = Start Warmup Timer Bit 6 = Start Quick Exit Timer Bit 7 = Not Enough Gens To Transfer Bit 8 = Not Enough Gens To Warm Up Bit 9 = Return To Normal Bit 10 = Return TO Emergency Bit 11 = Horn Silence Bit 12 = System Alarm Unacknowledged Bit 13 = System Alarm Active Bit 14 = System Alarm Acknowledge Bit 15 = Dynamic No Ramp	450002	300002	BIT

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Trigger Load Sensitive Delay Bit 1 = Generator Demand Active Bit 2 = Gen Demand Add Enabled Bit 3 = Gen Demand Remove Enabled Bit 4 = Load Stabilization Timer Done Bit 5 = Load Sensitive Timer Running Bit 6 = Shed Active Bit 7 = Add Active Bit 8 = Spare Bit 9 = Spare Bit 10 = Spare Bit 11 = Spare Bit 12 = Master sees Node 33 Bit 13 = Master sees Node 34 Bit 14 = Master sees Node 35 Bit 15 = Master sees Node 36	450003	300003	BIT
Load Share kW Setpoint	450004	300004	INT
Dead Bus Permission Word	450005	300005	UINT
Slew Error	450006	300006	INT
Generator Remove Word	450007	300007	UINT
Inputs from 1st I/O Block	450008	300008	UINT
Inputs from 2ns I/O Block	450009	300009	UINT
Inputs from 3rd I/O Block	450010	300010	UINT
Inputs from 4th I/O Block	450011	300011	UINT
Inputs from 5th I/O Block	450012	300012	UINT
Inputs from 6th I/O Block	450013	300013	UINT
Inputs from 7th I/O Block	450014	300014	UINT
Inputs from 8th I/O Block	450015	300015	UINT
	450016	300016	UINT
	450017	300017	UINT
	450018	300018	UINT
	450019	300019	UINT
	450020	300020	UINT
	450021	300021	UINT
	450022	300022	UINT
	450023	300023	UINT
	450024	300024	UINT
	450025	300025	UINT
	450026	300026	UINT
	450027	300027	UINT
	450028	300028	UINT
	450029	300029	UINT
	450030	300030	UINT
	450031	300031	UINT
	450032	300032	UINT
	450033	300033	UINT
	450034	300034	UINT
	450035	300035	UINT
	450036	300036	UINT
	450037	300037	UINT
	450038	300038	UINT
	450039	300039	UINT
	450040	300040	UINT

Description	Holding Reg.	Input Reg.	Data Type
	450041	300041	UINT
	450042	300042	UINT
	450043	300043	UINT
	450044	300044	UINT
	450045	300045	UINT
	450046	300046	UINT
	450047	300047	UINT
	450048	300048	UINT
	450049	300049	UINT

Table 3-2 Master Data Table

Generator 1 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450050	300050	BIT
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450051	300051	BIT
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto	450052	300052	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =	450053	300053	BIT
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450054	300054	BIT
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower	450055	300055	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450056	300056	BIT
Generator KW	450057	300057	INT
Generator KVAR	450058	300058	INT
Generator Voltage Phase A - B	450059	300059	UINT
Generator Voltage Phase B - C	450060	300060	UINT
Generator Voltage Phase C - A	450061	300061	UINT
Generator Average Voltage (L-L)	450062	300062	UINT
Generator Amps Phase A	450063	300063	UINT
Generator Amps Phase B	450064	300064	UINT
Generator Amps Phase C	450065	300065	UINT
Generator Average Amps	450066	300066	UINT
Generator Frequency	450067	300067	FREQ
Generator PF	450068	300068	PF
Synch Angle	450069	300069	DEG
Bus Volts	450070	300070	UINT
Bus Frequency	450071	300071	UINT
Generator KWH (Float MSW)	450072	300072	FLOAT
Generator KWH (Float LSW)	450073	300073	
Generator KVARH (Float MSW)	450074	300074	FLOAT
Generator KVARH (Float LSW)	450075	300075	
Engine Starts (Long MSW)	450076	300076	FLOAT
Engine Starts (Long LSW)	450077	300077	
Engine Operating Hours (Long MSW)	450078	300078	FLOAT
Engine Operating Hours (Long LSW)	450079	300079	
RPM	450080	300080	UINT
Oil Temp	450081	300081	UINT
Oil Pressure	450082	300082	UINT

Description	Holding Reg.	Input Reg.	Data Type
Coolant Temp	450083	300083	UINT
Exhaust Manifold1Temp	450084	300084	UINT
Exhaust Manifold2Temp	450085	300085	UINT
Instant Fuel Consumption	450086	300086	UINT
Battery Voltage	450087	300087	UINT
Engine Status Word	450088	300088	UINT
Crank Case Pressure	450089	300089	UINT
Oil Filter Diff Pressure	450090	300090	UINT
Fuel Filter Diff Pressure	450091	300091	UINT
Fuel Pressure	450092	300092	UINT
Boost Pressure	450093	300093	UINT
Air Filter Diff Pressure	450094	300094	UINT
Atmospheric Pressure	450095	300095	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown	450096	300096	BIT
	450097	300097	UINT
	450098	300098	UINT
	450099	300099	UINT

Table 3-3 Generator 1 Data Table

Generator 2 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 =	450100	300100	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 14 = Bit 15 =			
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450101	300101	BIT
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450102	300102	BIT
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =	450103	300103	BIT

Description	Holding Reg.	Input Reg.	Data Type
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450104	300104	BIT
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450105	300105	BIT
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450106	300106	BIT
Generator KW	450107	300107	INT
Generator KVAR	450108	300108	INT

Description	Holding Reg.	Input Reg.	Data Type
Generator Voltage Phase A - B	450109	300109	UINT
Generator Voltage Phase B - C	450110	300110	UINT
Generator Voltage Phase C - A	450111	300111	UINT
Generator Average Voltage (L-L)	450112	300112	UINT
Generator Amps Phase A	450113	300113	UINT
Generator Amps Phase B	450114	300114	UINT
Generator Amps Phase C	450115	300115	UINT
Generator Average Amps	450116	300116	UINT
Generator Frequency	450117	300117	FREQ
Generator PF	450118	300118	PF
Synch Angle	450119	300119	DEG
Bus Volts	450120	300120	UINT
Bus Frequency	450121	300121	UINT
Generator KWH (Float MSW)	450122	300122	FLOAT
Generator KWH (Float LSW)	450123	300123	
Generator KVARH (Float MSW)	450124	300124	FLOAT
Generator KVARH (Float LSW)	450125	300125	
Engine Starts (Long MSW)	450126	300126	FLOAT
Engine Starts (Long LSW)	450127	300127	
Engine Operating Hours (Long MSW)	450128	300128	FLOAT
Engine Operating Hours (Long LSW)	450129	300129	
RPM	450130	300130	UINT
Oil Temp	450131	300131	UINT
Oil Pressure	450132	300132	UINT
Coolant Temp	450133	300133	UINT
Exhaust Manifold1Temp	450134	300134	UINT
Exhaust Manifold2Temp	450135	300135	UINT
Instant Fuel Consumption	450136	300136	UINT
Battery Voltage	450137	300137	UINT
Engine Status Word	450138	300138	UINT
Crank Case Pressure	450139	300139	UINT
Oil Filter Diff Pressure	450140	300140	UINT
Fuel Filter Diff Pressure	450141	300141	UINT
Fuel Pressure	450142	300142	UINT
Boost Pressure	450143	300143	UINT
Air Filter Diff Pressure	450144	300144	UINT
Atmospheric Pressure	450145	300145	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown	450146	300146	BIT

Description	Holding Reg.	Input Reg.	Data Type
	450147	300147	UINT
	450148	300148	UINT
	450149	300149	UINT

Table 3-4 Generator 2 Data Table

Generator 3 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450150	300150	BIT
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450151	300151	BIT
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check	450152	300152	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =	450153	300153	BIT
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450154	300154	BIT
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate	450155	300155	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450156	300156	BIT
Generator KW	450157	300157	INT
Generator KVAR	450158	300158	INT
Generator Voltage Phase A - B	450159	300159	UINT
Generator Voltage Phase B - C	450160	300160	UINT
Generator Voltage Phase C - A	450161	300161	UINT
Generator Average Voltage (L-L)	450162	300162	UINT
Generator Amps Phase A	450163	300163	UINT
Generator Amps Phase B	450164	300164	UINT
Generator Amps Phase C	450165	300165	UINT
Generator Average Amps	450166	300166	UINT
Generator Frequency	450167	300167	FREQ
Generator PF	450168	300168	PF
Synch Angle	450169	300169	DEG
Bus Volts	450170	300170	UINT
Bus Frequency	450171	300171	UINT
Generator KWH (Float MSW)	450172	300172	FLOAT
Generator KWH (Float LSW)	450173	300173	
Generator KVARH (Float MSW)	450174	300174	FLOAT
Generator KVARH (Float LSW)	450175	300175	
Engine Starts (Long MSW)	450176	300176	FLOAT
Engine Starts (Long LSW)	450177	300177	
Engine Operating Hours (Long MSW)	450178	300178	FLOAT
Engine Operating Hours (Long LSW)	450179	300179	
RPM	450180	300180	UINT
Oil Temp	450181	300181	UINT
Oil Pressure	450182	300182	UINT
Coolant Temp	450183	300183	UINT
Exhaust Manifold1Temp	450184	300184	UINT
Exhaust Manifold2Temp	450185	300185	UINT
Instant Fuel Consumption	450186	300186	UINT
Battery Voltage	450187	300187	UINT
Engine Status Word	450188	300188	UINT

Description	Holding Reg.	Input Reg.	Data Type
Crank Case Pressure	450189	300189	UINT
Oil Filter Diff Pressure	450190	300190	UINT
Fuel Filter Diff Pressure	450191	300191	UINT
Fuel Pressure	450192	300192	UINT
Boost Pressure	450193	300193	UINT
Air Filter Diff Pressure	450194	300194	UINT
Atmospheric Pressure	450195	300195	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown	450196	300196	BIT
	450197	300197	UINT
	450198	300198	UINT
	450199	300199	UINT

Table 3-5 Generator 3 Data Table

Generator 4 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450200	300200	BIT
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm	450201	300201	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450202	300202	BIT
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =	450203	300203	BIT
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 =	450204	300204	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450205	300205	BIT
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450206	300206	BIT
Generator KW	450207	300207	INT
Generator KVAR	450208	300208	INT
Generator Voltage Phase A - B	450209	300209	UINT
Generator Voltage Phase B - C	450210	300210	UINT
Generator Voltage Phase C - A	450211	300211	UINT
Generator Average Voltage (L-L)	450212	300212	UINT
Generator Amps Phase A	450213	300213	UINT
Generator Amps Phase B	450214	300214	UINT

Description	Holding Reg.	Input Reg.	Data Type
Generator Amps Phase C	450215	300215	UINT
Generator Average Amps	450216	300216	UINT
Generator Frequency	450217	300217	FREQ
Generator PF	450218	300218	PF
Synch Angle	450219	300219	DEG
Bus Volts	450220	300220	UINT
Bus Frequency	450221	300221	UINT
Generator KWH (Float MSW)	450222	300222	FLOAT
Generator KWH (Float LSW)	450223	300223	
Generator KVARH (Float MSW)	450224	300224	FLOAT
Generator KVARH (Float LSW)	450225	300225	
Engine Starts (Long MSW)	450226	300226	FLOAT
Engine Starts (Long LSW)	450227	300227	
Engine Operating Hours (Long MSW)	450228	300228	FLOAT
Engine Operating Hours (Long LSW)	450229	300229	
RPM	450230	300230	UINT
Oil Temp	450231	300231	UINT
Oil Pressure	450232	300232	UINT
Coolant Temp	450233	300233	UINT
Exhaust Manifold1Temp	450234	300234	UINT
Exhaust Manifold2Temp	450235	300235	UINT
Instant Fuel Consumption	450236	300236	UINT
Battery Voltage	450237	300237	UINT
Engine Status Word	450238	300238	UINT
Crank Case Pressure	450239	300239	UINT
Oil Filter Diff Pressure	450240	300240	UINT
Fuel Filter Diff Pressure	450241	300241	UINT
Fuel Pressure	450242	300242	UINT
Boost Pressure	450243	300243	UINT
Air Filter Diff Pressure	450244	300244	UINT
Atmospheric Pressure	450245	300245	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown	450246	300246	BIT
	450247	300247	UINT
	450248	300248	UINT
	450249	300249	UINT

Table 3-6 Generator 4 Data Table

Generator 5 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450250	300250	BIT
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450251	300251	BIT
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 =	450252	300252	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 14 = Bit 15 =			
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =	450253	300253	BIT
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450254	300254	BIT
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450255	300255	BIT

Description	Holding Reg.	Input Reg.	Data Type
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450256	300256	BIT
Generator KW	450257	300257	INT
Generator KVAR	450258	300258	INT
Generator Voltage Phase A - B	450259	300259	UINT
Generator Voltage Phase B - C	450260	300260	UINT
Generator Voltage Phase C - A	450261	300261	UINT
Generator Average Voltage (L-L)	450262	300262	UINT
Generator Amps Phase A	450263	300263	UINT
Generator Amps Phase B	450264	300264	UINT
Generator Amps Phase C	450265	300265	UINT
Generator Average Amps	450266	300266	UINT
Generator Frequency	450267	300267	FREQ
Generator PF	450268	300268	PF
Synch Angle	450269	300269	DEG
Bus Volts	450270	300270	UINT
Bus Frequency	450271	300271	UINT
Generator KWH (Float MSW)	450272	300272	FLOAT
Generator KWH (Float LSW)	450273	300273	
Generator KVARH (Float MSW)	450274	300274	FLOAT
Generator KVARH (Float LSW)	450275	300275	
Engine Starts (Long MSW)	450276	300276	FLOAT
Engine Starts (Long LSW)	450277	300277	
Engine Operating Hours (Long MSW)	450278	300278	FLOAT
Engine Operating Hours (Long LSW)	450279	300279	
RPM	450280	300280	UINT
Oil Temp	450281	300281	UINT
Oil Pressure	450282	300282	UINT
Coolant Temp	450283	300283	UINT
Exhaust Manifold1Temp	450284	300284	UINT
Exhaust Manifold2Temp	450285	300285	UINT
Instant Fuel Consumption	450286	300286	UINT
Battery Voltage	450287	300287	UINT
Engine Status Word	450288	300288	UINT
Crank Case Pressure	450289	300289	UINT
Oil Filter Diff Pressure	450290	300290	UINT
Fuel Filter Diff Pressure	450291	300291	UINT
Fuel Pressure	450292	300292	UINT
Boost Pressure	450293	300293	UINT

Description	Holding Reg.	Input Reg.	Data Type
Air Filter Diff Pressure	450294	300294	UINT
Atmospheric Pressure	450295	300295	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown	450296	300296	BIT
	450297	300297	UINT
	450298	300298	UINT
	450299	300299	UINT

Table 3-7 Generator 5 Data Table

Generator 6 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450300	300300	BIT
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO	450301	300301	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450302	300302	BIT
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =	450303	300303	BIT
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open	450304	300304	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450305	300305	BIT
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450306	300306	BIT
Generator KW	450307	300307	INT
Generator KVAR	450308	300308	INT
Generator Voltage Phase A - B	450309	300309	UINT
Generator Voltage Phase B - C	450310	300310	UINT
Generator Voltage Phase C - A	450311	300311	UINT
Generator Average Voltage (L-L)	450312	300312	UINT
Generator Amps Phase A	450313	300313	UINT
Generator Amps Phase B	450314	300314	UINT
Generator Amps Phase C	450315	300315	UINT
Generator Average Amps	450316	300316	UINT
Generator Frequency	450317	300317	FREQ
Generator PF	450318	300318	PF
Synch Angle	450319	300319	DEG

Description	Holding Reg.	Input Reg.	Data Type
Bus Volts	450320	300320	UINT
Bus Frequency	450321	300321	UINT
Generator KWH (Float MSW)	450322	300322	FLOAT
Generator KWH (Float LSW)	450323	300323	
Generator KVARH (Float MSW)	450324	300324	FLOAT
Generator KVARH (Float LSW)	450325	300325	
Engine Starts (Long MSW)	450326	300326	FLOAT
Engine Starts (Long LSW)	450327	300327	
Engine Operating Hours (Long MSW)	450328	300328	FLOAT
Engine Operating Hours (Long LSW)	450329	300329	
RPM	450330	300330	UINT
Oil Temp	450331	300331	UINT
Oil Pressure	450332	300332	UINT
Coolant Temp	450333	300333	UINT
Exhaust Manifold1Temp	450334	300334	UINT
Exhaust Manifold2Temp	450335	300335	UINT
Instant Fuel Consumption	450336	300336	UINT
Battery Voltage	450337	300337	UINT
Engine Status Word	450338	300338	UINT
Crank Case Pressure	450339	300339	UINT
Oil Filter Diff Pressure	450340	300340	UINT
Fuel Filter Diff Pressure	450341	300341	UINT
Fuel Pressure	450342	300342	UINT
Boost Pressure	450343	300343	UINT
Air Filter Diff Pressure	450344	300344	UINT
Atmospheric Pressure	450345	300345	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown	450346	300346	BIT
	450347	300347	UINT
	450348	300348	UINT
	450349	300349	UINT

Table 3-8 Generator 6 Data Table

Generator 7 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits	450350	300350	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450351	300351	BIT
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450352	300352	BIT
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp	450353	300353	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =			
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450354	300354	BIT
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450355	300355	BIT
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure	450356	300356	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Generator KW	450357	300357	INT
Generator KVAR	450358	300358	INT
Generator Voltage Phase A - B	450359	300359	UINT
Generator Voltage Phase B - C	450360	300360	UINT
Generator Voltage Phase C - A	450361	300361	UINT
Generator Average Voltage (L-L)	450362	300362	UINT
Generator Amps Phase A	450363	300363	UINT
Generator Amps Phase B	450364	300364	UINT
Generator Amps Phase C	450365	300365	UINT
Generator Average Amps	450366	300366	UINT
Generator Frequency	450367	300367	FREQ
Generator PF	450368	300368	PF
Synch Angle	450369	300369	DEG
Bus Volts	450370	300370	UINT
Bus Frequency	450371	300371	UINT
Generator KWH (Float MSW)	450372	300372	FLOAT
Generator KWH (Float LSW)	450373	300373	
Generator KVARH (Float MSW)	450374	300374	FLOAT
Generator KVARH (Float LSW)	450375	300375	
Engine Starts (Long MSW)	450376	300376	FLOAT
Engine Starts (Long LSW)	450377	300377	
Engine Operating Hours (Long MSW)	450378	300378	FLOAT
Engine Operating Hours (Long LSW)	450379	300379	
RPM	450380	300380	UINT
Oil Temp	450381	300381	UINT
Oil Pressure	450382	300382	UINT
Coolant Temp	450383	300383	UINT
Exhaust Manifold1Temp	450384	300384	UINT
Exhaust Manifold2Temp	450385	300385	UINT
Instant Fuel Consumption	450386	300386	UINT
Battery Voltage	450387	300387	UINT
Engine Status Word	450388	300388	UINT
Crank Case Pressure	450389	300389	UINT
Oil Filter Diff Pressure	450390	300390	UINT
Fuel Filter Diff Pressure	450391	300391	UINT
Fuel Pressure	450392	300392	UINT
Boost Pressure	450393	300393	UINT
Air Filter Diff Pressure	450394	300394	UINT
Atmospheric Pressure	450395	300395	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused	450396	300396	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown			
	450397	300397	UINT
	450398	300398	UINT
	450399	300399	UINT

Table 3-9 Generator 7 Data Table

Generator 8 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450400	300400	BIT
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 =	450401	300401	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 13 = Bit 14 = Bit 15 =			
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450402	300402	BIT
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =	450403	300403	BIT
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 =	450404	300404	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 15 =			
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450405	300405	BIT
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450406	300406	BIT
Generator KW	450407	300407	INT
Generator KVAR	450408	300408	INT
Generator Voltage Phase A - B	450409	300409	UINT
Generator Voltage Phase B - C	450410	300410	UINT
Generator Voltage Phase C - A	450411	300411	UINT
Generator Average Voltage (L-L)	450412	300412	UINT
Generator Amps Phase A	450413	300413	UINT
Generator Amps Phase B	450414	300414	UINT
Generator Amps Phase C	450415	300415	UINT
Generator Average Amps	450416	300416	UINT
Generator Frequency	450417	300417	FREQ
Generator PF	450418	300418	PF
Synch Angle	450419	300419	DEG
Bus Volts	450420	300420	UINT
Bus Frequency	450421	300421	UINT
Generator KWH (Float MSW)	450422	300422	FLOAT
Generator KWH (Float LSW)	450423	300423	
Generator KVARH (Float MSW)	450424	300424	FLOAT
Generator KVARH (Float LSW)	450425	300425	

Description	Holding Reg.	Input Reg.	Data Type
Engine Starts (Long MSW)	450426	300426	FLOAT
Engine Starts (Long LSW)	450427	300427	
Engine Operating Hours (Long MSW)	450428	300428	FLOAT
Engine Operating Hours (Long LSW)	450429	300429	
RPM	450430	300430	UINT
Oil Temp	450431	300431	UINT
Oil Pressure	450432	300432	UINT
Coolant Temp	450433	300433	UINT
Exhaust Manifold1Temp	450434	300434	UINT
Exhaust Manifold2Temp	450435	300435	UINT
Instant Fuel Consumption	450436	300436	UINT
Battery Voltage	450437	300437	UINT
Engine Status Word	450438	300438	UINT
Crank Case Pressure	450439	300439	UINT
Oil Filter Diff Pressure	450440	300440	UINT
Fuel Filter Diff Pressure	450441	300441	UINT
Fuel Pressure	450442	300442	UINT
Boost Pressure	450443	300443	UINT
Air Filter Diff Pressure	450444	300444	UINT
Atmospheric Pressure	450445	300445	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown	450446	300446	BIT
	450447	300447	UINT
	450448	300448	UINT
	450449	300449	UINT

Table 3-10 Generator 8 Data Table

Generator 9 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown	450450	300450	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450451	300451	BIT
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450452	300452	BIT
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure	450453	300453	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =			
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450454	300454	BIT
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450455	300455	BIT
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 =	450456	300456	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Generator KW	450457	300457	INT
Generator KVAR	450458	300458	INT
Generator Voltage Phase A - B	450459	300459	UINT
Generator Voltage Phase B - C	450460	300460	UINT
Generator Voltage Phase C - A	450461	300461	UINT
Generator Average Voltage (L-L)	450462	300462	UINT
Generator Amps Phase A	450463	300463	UINT
Generator Amps Phase B	450464	300464	UINT
Generator Amps Phase C	450465	300465	UINT
Generator Average Amps	450466	300466	UINT
Generator Frequency	450467	300467	FREQ
Generator PF	450468	300468	PF
Synch Angle	450469	300469	DEG
Bus Volts	450470	300470	UINT
Bus Frequency	450471	300471	UINT
Generator KWH (Float MSW)	450472	300472	FLOAT
Generator KWH (Float LSW)	450473	300473	
Generator KVARH (Float MSW)	450474	300474	FLOAT
Generator KVARH (Float LSW)	450475	300475	
Engine Starts (Long MSW)	450476	300476	FLOAT
Engine Starts (Long LSW)	450477	300477	
Engine Operating Hours (Long MSW)	450478	300478	FLOAT
Engine Operating Hours (Long LSW)	450479	300479	
RPM	450480	300480	UINT
Oil Temp	450481	300481	UINT
Oil Pressure	450482	300482	UINT
Coolant Temp	450483	300483	UINT
Exhaust Manifold1Temp	450484	300484	UINT
Exhaust Manifold2Temp	450485	300485	UINT
Instant Fuel Consumption	450486	300486	UINT
Battery Voltage	450487	300487	UINT
Engine Status Word	450488	300488	UINT
Crank Case Pressure	450489	300489	UINT
Oil Filter Diff Pressure	450490	300490	UINT
Fuel Filter Diff Pressure	450491	300491	UINT
Fuel Pressure	450492	300492	UINT
Boost Pressure	450493	300493	UINT
Air Filter Diff Pressure	450494	300494	UINT
Atmospheric Pressure	450495	300495	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused	450496	300496	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown			
	450497	300497	UINT
	450498	300498	UINT
	450499	300499	UINT

Table 3-11 Generator 9 Data Table

Generator 10 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450500	300500	BIT
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450501	300501	BIT
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off	450502	300502	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =	450503	300503	BIT
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450504	300504	BIT
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt	450505	300505	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450506	300506	BIT
Generator KW	450507	300507	INT
Generator KVAR	450508	300508	INT
Generator Voltage Phase A - B	450509	300509	UINT
Generator Voltage Phase B - C	450510	300510	UINT
Generator Voltage Phase C - A	450511	300511	UINT
Generator Average Voltage (L-L)	450512	300512	UINT
Generator Amps Phase A	450513	300513	UINT
Generator Amps Phase B	450514	300514	UINT
Generator Amps Phase C	450515	300515	UINT
Generator Average Amps	450516	300516	UINT
Generator Frequency	450517	300517	FREQ
Generator PF	450518	300518	PF
Synch Angle	450519	300519	DEG
Bus Volts	450520	300520	UINT
Bus Frequency	450521	300521	UINT
Generator KWH (Float MSW)	450522	300522	FLOAT
Generator KWH (Float LSW)	450523	300523	
Generator KVARH (Float MSW)	450524	300524	FLOAT
Generator KVARH (Float LSW)	450525	300525	
Engine Starts (Long MSW)	450526	300526	FLOAT
Engine Starts (Long LSW)	450527	300527	
Engine Operating Hours (Long MSW)	450528	300528	FLOAT
Engine Operating Hours (Long LSW)	450529	300529	
RPM	450530	300530	UINT
Oil Temp	450531	300531	UINT

Description	Holding Reg.	Input Reg.	Data Type
Oil Pressure	450532	300532	UINT
Coolant Temp	450533	300533	UINT
Exhaust Manifold1Temp	450534	300534	UINT
Exhaust Manifold2Temp	450535	300535	UINT
Instant Fuel Consumption	450536	300536	UINT
Battery Voltage	450537	300537	UINT
Engine Status Word	450538	300538	UINT
Crank Case Pressure	450539	300539	UINT
Oil Filter Diff Pressure	450540	300540	UINT
Fuel Filter Diff Pressure	450541	300541	UINT
Fuel Pressure	450542	300542	UINT
Boost Pressure	450543	300543	UINT
Air Filter Diff Pressure	450544	300544	UINT
Atmospheric Pressure	450545	300545	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown	450546	300546	BIT
	450547	300547	UINT
	450548	300548	UINT
	450549	300549	UINT

Table 3-12 Generator 10 Data Table

Generator 11 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 =	450550	300550	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 13 = Bit 14 = Bit 15 =			
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450551	300551	BIT
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450552	300552	BIT
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 =	450553	300553	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 15 =			
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450554	300554	BIT
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450555	300555	BIT
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450556	300556	BIT
Generator KW	450557	300557	INT

Description	Holding Reg.	Input Reg.	Data Type
Generator KVAR	450558	300558	INT
Generator Voltage Phase A - B	450559	300559	UINT
Generator Voltage Phase B - C	450560	300560	UINT
Generator Voltage Phase C - A	450561	300561	UINT
Generator Average Voltage (L-L)	450562	300562	UINT
Generator Amps Phase A	450563	300563	UINT
Generator Amps Phase B	450564	300564	UINT
Generator Amps Phase C	450565	300565	UINT
Generator Average Amps	450566	300566	UINT
Generator Frequency	450567	300567	FREQ
Generator PF	450568	300568	PF
Synch Angle	450569	300569	DEG
Bus Volts	450570	300570	UINT
Bus Frequency	450571	300571	UINT
Generator KWH (Float MSW)	450572	300572	FLOAT
Generator KWH (Float LSW)	450573	300573	
Generator KVARH (Float MSW)	450574	300574	FLOAT
Generator KVARH (Float LSW)	450575	300575	
Engine Starts (Long MSW)	450576	300576	FLOAT
Engine Starts (Long LSW)	450577	300577	
Engine Operating Hours (Long MSW)	450578	300578	FLOAT
Engine Operating Hours (Long LSW)	450579	300579	
RPM	450580	300580	UINT
Oil Temp	450581	300581	UINT
Oil Pressure	450582	300582	UINT
Coolant Temp	450583	300583	UINT
Exhaust Manifold1Temp	450584	300584	UINT
Exhaust Manifold2Temp	450585	300585	UINT
Instant Fuel Consumption	450586	300586	UINT
Battery Voltage	450587	300587	UINT
Engine Status Word	450588	300588	UINT
Crank Case Pressure	450589	300589	UINT
Oil Filter Diff Pressure	450590	300590	UINT
Fuel Filter Diff Pressure	450591	300591	UINT
Fuel Pressure	450592	300592	UINT
Boost Pressure	450593	300593	UINT
Air Filter Diff Pressure	450594	300594	UINT
Atmospheric Pressure	450595	300595	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused	450596	300596	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 15 = Engine Coolant Level Low Shutdown			
	450597	300597	UINT
	450598	300598	UINT
	450599	300599	UINT

Table 3-13 Generator 12 Data Table

Generator 12 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450600	300600	BIT
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450601	300601	BIT
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual	450602	300602	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =	450603	300603	BIT
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450604	300604	BIT
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 =	450605	300605	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450606	300606	BIT
Generator KW	450607	300607	INT
Generator KVAR	450608	300608	INT
Generator Voltage Phase A - B	450609	300609	UINT
Generator Voltage Phase B - C	450610	300610	UINT
Generator Voltage Phase C - A	450611	300611	UINT
Generator Average Voltage (L-L)	450612	300612	UINT
Generator Amps Phase A	450613	300613	UINT
Generator Amps Phase B	450614	300614	UINT
Generator Amps Phase C	450615	300615	UINT
Generator Average Amps	450616	300616	UINT
Generator Frequency	450617	300617	FREQ
Generator PF	450618	300618	PF
Synch Angle	450619	300619	DEG
Bus Volts	450620	300620	UINT
Bus Frequency	450621	300621	UINT
Generator KWH (Float MSW)	450622	300622	FLOAT
Generator KWH (Float LSW)	450623	300623	
Generator KVARH (Float MSW)	450624	300624	FLOAT
Generator KVARH (Float LSW)	450625	300625	
Engine Starts (Long MSW)	450626	300626	FLOAT
Engine Starts (Long LSW)	450627	300627	
Engine Operating Hours (Long MSW)	450628	300628	FLOAT
Engine Operating Hours (Long LSW)	450629	300629	
RPM	450630	300630	UINT
Oil Temp	450631	300631	UINT
Oil Pressure	450632	300632	UINT
Coolant Temp	450633	300633	UINT
Exhaust Manifold1Temp	450634	300634	UINT
Exhaust Manifold2Temp	450635	300635	UINT
Instant Fuel Consumption	450636	300636	UINT
Battery Voltage	450637	300637	UINT

Description	Holding Reg.	Input Reg.	Data Type
Engine Status Word	450638	300638	UINT
Crank Case Pressure	450639	300639	UINT
Oil Filter Diff Pressure	450640	300640	UINT
Fuel Filter Diff Pressure	450641	300641	UINT
Fuel Pressure	450642	300642	UINT
Boost Pressure	450643	300643	UINT
Air Filter Diff Pressure	450644	300644	UINT
Atmospheric Pressure	450645	300645	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown	450646	300646	BIT
	450647	300647	UINT
	450648	300648	UINT
	450649	300649	UINT

Table 3-14 Generator 14 Data Table

Generator 13 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450650	300650	BIT
Status Bits Bit 0 = Unacknowledged Alarm	450651	300651	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450652	300652	BIT
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =	450653	300653	BIT
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level	450654	300654	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450655	300655	BIT
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450656	300656	BIT
Generator KW	450657	300657	INT
Generator KVAR	450658	300658	INT
Generator Voltage Phase A - B	450659	300659	UINT
Generator Voltage Phase B - C	450660	300660	UINT
Generator Voltage Phase C - A	450661	300661	UINT
Generator Average Voltage (L-L)	450662	300662	UINT
Generator Amps Phase A	450663	300663	UINT

Description	Holding Reg.	Input Reg.	Data Type
Generator Amps Phase B	450664	300664	UINT
Generator Amps Phase C	450665	300665	UINT
Generator Average Amps	450666	300666	UINT
Generator Frequency	450667	300667	FREQ
Generator PF	450668	300668	PF
Synch Angle	450669	300669	DEG
Bus Volts	450670	300670	UINT
Bus Frequency	450671	300671	UINT
Generator KWH (Float MSW)	450672	300672	FLOAT
Generator KWH (Float LSW)	450673	300673	
Generator KVARH (Float MSW)	450674	300674	FLOAT
Generator KVARH (Float LSW)	450675	300675	
Engine Starts (Long MSW)	450676	300676	FLOAT
Engine Starts (Long LSW)	450677	300677	
Engine Operating Hours (Long MSW)	450678	300678	FLOAT
Engine Operating Hours (Long LSW)	450679	300679	
RPM	450680	300680	UINT
Oil Temp	450681	300681	UINT
Oil Pressure	450682	300682	UINT
Coolant Temp	450683	300683	UINT
Exhaust Manifold1Temp	450684	300684	UINT
Exhaust Manifold2Temp	450685	300685	UINT
Instant Fuel Consumption	450686	300686	UINT
Battery Voltage	450687	300687	UINT
Engine Status Word	450688	300688	UINT
Crank Case Pressure	450689	300689	UINT
Oil Filter Diff Pressure	450690	300690	UINT
Fuel Filter Diff Pressure	450691	300691	UINT
Fuel Pressure	450692	300692	UINT
Boost Pressure	450693	300693	UINT
Air Filter Diff Pressure	450694	300694	UINT
Atmospheric Pressure	450695	300695	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown	450696	300696	BIT
	450697	300697	UINT
	450698	300698	UINT
	450699	300699	UINT

Table 3-15 Generator 13 Data Table

Generator 14 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450700	300700	BIT
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450701	300701	BIT
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 =	450702	300702	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 14 = Bit 15 =			
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =	450703	300703	BIT
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450704	300704	BIT
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450705	300705	BIT

Description	Holding Reg.	Input Reg.	Data Type
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450706	300706	BIT
Generator KW	450707	300707	INT
Generator KVAR	450708	300708	INT
Generator Voltage Phase A - B	450709	300709	UINT
Generator Voltage Phase B - C	450710	300710	UINT
Generator Voltage Phase C - A	450711	300711	UINT
Generator Average Voltage (L-L)	450712	300712	UINT
Generator Amps Phase A	450713	300713	UINT
Generator Amps Phase B	450714	300714	UINT
Generator Amps Phase C	450715	300715	UINT
Generator Average Amps	450716	300716	UINT
Generator Frequency	450717	300717	FREQ
Generator PF	450718	300718	PF
Synch Angle	450719	300719	DEG
Bus Volts	450720	300720	UINT
Bus Frequency	450721	300721	UINT
Generator KWH (Float MSW)	450722	300722	FLOAT
Generator KWH (Float LSW)	450723	300723	
Generator KVARH (Float MSW)	450724	300724	FLOAT
Generator KVARH (Float LSW)	450725	300725	
Engine Starts (Long MSW)	450726	300726	FLOAT
Engine Starts (Long LSW)	450727	300727	
Engine Operating Hours (Long MSW)	450728	300728	FLOAT
Engine Operating Hours (Long LSW)	450729	300729	
RPM	450730	300730	UINT
Oil Temp	450731	300731	UINT
Oil Pressure	450732	300732	UINT
Coolant Temp	450733	300733	UINT
Exhaust Manifold1Temp	450734	300734	UINT
Exhaust Manifold2Temp	450735	300735	UINT
Instant Fuel Consumption	450736	300736	UINT
Battery Voltage	450737	300737	UINT
Engine Status Word	450738	300738	UINT
Crank Case Pressure	450739	300739	UINT
Oil Filter Diff Pressure	450740	300740	UINT
Fuel Filter Diff Pressure	450741	300741	UINT
Fuel Pressure	450742	300742	UINT
Boost Pressure	450743	300743	UINT

Description	Holding Reg.	Input Reg.	Data Type
Air Filter Diff Pressure	450744	300744	UINT
Atmospheric Pressure	450745	300745	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown	450746	300746	BIT
	450747	300747	UINT
	450748	300748	UINT
	450749	300749	UINT

Table 3-16 Generator 14 Data Table

Generator 15 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450750	300750	BIT
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO	450751	300751	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450752	300752	BIT
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =	450753	300753	BIT
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open	450754	300754	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450755	300755	BIT
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450756	300756	BIT
Generator KW	450757	300757	INT
Generator KVAR	450758	300758	INT
Generator Voltage Phase A - B	450759	300759	UINT
Generator Voltage Phase B - C	450760	300760	UINT
Generator Voltage Phase C - A	450761	300761	UINT
Generator Average Voltage (L-L)	450762	300762	UINT
Generator Amps Phase A	450763	300763	UINT
Generator Amps Phase B	450764	300764	UINT
Generator Amps Phase C	450765	300765	UINT
Generator Average Amps	450766	300766	UINT
Generator Frequency	450767	300767	FREQ
Generator PF	450768	300768	PF
Synch Angle	450769	300769	DEG

Description	Holding Reg.	Input Reg.	Data Type
Bus Volts	450770	300770	UINT
Bus Frequency	450771	300771	UINT
Generator KWH (Float MSW)	450772	300772	FLOAT
Generator KWH (Float LSW)	450773	300773	
Generator KVARH (Float MSW)	450774	300774	FLOAT
Generator KVARH (Float LSW)	450775	300775	
Engine Starts (Long MSW)	450776	300776	FLOAT
Engine Starts (Long LSW)	450777	300777	
Engine Operating Hours (Long MSW)	450778	300778	FLOAT
Engine Operating Hours (Long LSW)	450779	300779	
RPM	450780	300780	UINT
Oil Temp	450781	300781	UINT
Oil Pressure	450782	300782	UINT
Coolant Temp	450783	300783	UINT
Exhaust Manifold1Temp	450784	300784	UINT
Exhaust Manifold2Temp	450785	300785	UINT
Instant Fuel Consumption	450786	300786	UINT
Battery Voltage	450787	300787	UINT
Engine Status Word	450788	300788	UINT
Crank Case Pressure	450789	300789	UINT
Oil Filter Diff Pressure	450790	300790	UINT
Fuel Filter Diff Pressure	450791	300791	UINT
Fuel Pressure	450792	300792	UINT
Boost Pressure	450793	300793	UINT
Air Filter Diff Pressure	450794	300794	UINT
Atmospheric Pressure	450795	300795	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown	450796	300796	BIT
	450797	300797	UINT
	450798	300798	UINT
	450799	300799	UINT

Table 3-17 Generator 15 Data Table

Generator 16 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits	450800	300800	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 0 = Gen CB Closed Bit 1 = Gen CB Open Bit 2 = Gen CB Fail To Close Bit 3 = Gen CB Fail To Open Bit 4 = Generator Available Bit 5 = Generator Running Bit 6 = Generator Cooldown Bit 7 = Generator In Remove Bit 8 = Bit 9 = Generator Fault Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Status Bits Bit 0 = Unacknowledged Alarm Bit 1 = Active Alarm Bit 2 = Horn Bit 3 = Start JCAHO Test Bit 4 = Stop JCAHO Test Bit 5 = Generate JCAHO Report Bit 6 = Start Log JCAHO Bit 7 = Test Active JCAHO Bit 8 = Test Passes JCAHO Bit 9 = State Trigger JCAHO Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450801	300801	BIT
Status Bits Bit 0 = Gen CB Fail Reset Bit 1 = ECS Off Bit 2 = ECS Auto Bit 3 = ECS Man Bit 4 = ECS Cool Bit 5 = Sync SW Off Bit 6 = Sync SW Auto Bit 7 = Sync SW Manual Bit 8 = Sync SW Check Bit 9 = Alarm Reset Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450802	300802	BIT
Alarms Bit 0 = High Coolant Temp Bit 1 = Low Coolant Temp	450803	300803	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 2 = Low Oil Pressure Bit 3 = Low Battery Voltage Bit 4 = High Battery Voltage Bit 5 = Battery Charger Fail Bit 6 = Bit 7 = Bit 8 = Engine Comms Failure Bit 9 = Fail to Synch Bit 10 = Low Fuel Level Bit 11 = Synch Not in Auto Bit 12 = ECS Not In A Bit 13 = Bit 14 = Bit 15 =			
Alarms Bit 0 = Ground Fault Alarm Bit 1 = Rupture Basin Alarm Bit 2 = High Fuel Level Bit 3 = Bit 4 = Bit 5 = Bit 6 = Bit 7 = GEN CB Fail to Close Bit 8 = GEN CB Fail to Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450804	300804	BIT
Shutdown Alarms Bit 0 = GEN UnderFreq Bit 1 = GEN OverFreq Bit 2 = GEN UnderVolt Bit 3 = GEN OverVolt Bit 4 = GEN ReversePower Bit 5 = GEN LossOfField Bit 6 = GEN Over Excitation Bit 7 = Bit 8 = Bit 9 = Bit 10 = GEN Crank Terminate Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =	450805	300805	BIT
Shutdown Alarms Bit 0 = ESTOP Bit 1 = Low Coolant Level Bit 2 = Hi Coolant Temp Bit 3 = Low Oil Pressure	450806	300806	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 4 = Overcrank Bit 5 = Overspeed Bit 6 = Bit 7 = Bit 8 = Engine Mounted CB Open Bit 9 = Bit 10 = Bit 11 = Bit 12 = Bit 13 = Bit 14 = Bit 15 =			
Generator KW	450807	300807	INT
Generator KVAR	450808	300808	INT
Generator Voltage Phase A - B	450809	300809	UINT
Generator Voltage Phase B - C	450810	300810	UINT
Generator Voltage Phase C - A	450811	300811	UINT
Generator Average Voltage (L-L)	450812	300812	UINT
Generator Amps Phase A	450813	300813	UINT
Generator Amps Phase B	450814	300814	UINT
Generator Amps Phase C	450815	300815	UINT
Generator Average Amps	450816	300816	UINT
Generator Frequency	450817	300817	FREQ
Generator PF	450818	300818	PF
Synch Angle	450819	300819	DEG
Bus Volts	450820	300820	UINT
Bus Frequency	450821	300821	UINT
Generator KWH (Float MSW)	450822	300822	FLOAT
Generator KWH (Float LSW)	450823	300823	
Generator KVARH (Float MSW)	450824	300824	FLOAT
Generator KVARH (Float LSW)	450825	300825	
Engine Starts (Long MSW)	450826	300826	FLOAT
Engine Starts (Long LSW)	450827	300827	
Engine Operating Hours (Long MSW)	450828	300828	FLOAT
Engine Operating Hours (Long LSW)	450829	300829	
RPM	450830	300830	UINT
Oil Temp	450831	300831	UINT
Oil Pressure	450832	300832	UINT
Coolant Temp	450833	300833	UINT
Exhaust Manifold1Temp	450834	300834	UINT
Exhaust Manifold2Temp	450835	300835	UINT
Instant Fuel Consumption	450836	300836	UINT
Battery Voltage	450837	300837	UINT
Engine Status Word	450838	300838	UINT
Crank Case Pressure	450839	300839	UINT
Oil Filter Diff Pressure	450840	300840	UINT
Fuel Filter Diff Pressure	450841	300841	UINT
Fuel Pressure	450842	300842	UINT
Boost Pressure	450843	300843	UINT
Air Filter Diff Pressure	450844	300844	UINT
Atmospheric Pressure	450845	300845	UINT
Engine Alarms Bit 0 = Engine Over Speed Bit 1 = Unused	450846	300846	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 2 = Unused Bit 3 =Emergency Stop Accuated Bit 4 = Engine Oil Press Low Shutdown Bit 5 = Engine Oil Press Low Alarm Bit 6 = Unused Bit 7 = Unused Bit 8 = Unused Bit 9 = Unused Bit 10 = Engine Coolant Temp High Shutdown Bit 11 = Engine Coolant Temp High Alarm Bit 12 = Engine Coolant Temp Low Alarm Bit 13 = Unused Bit 14 = Unused Bit 15 = Engine Coolant Level Low Shutdown			
	450847	300847	UINT
	450848	300848	UINT
	450849	300849	UINT

Table 3-18 Generator 16 Data Table

Utility 1 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits 0 = Utility CB Closed 1 = Utility CB Open 2 = Utility Fail To Close CB 3 = Utility Fail To Open CB 4 = Utility Alarm Unacked 5 = Utility Alarm Active 6 = Utility Horn Active 7 = Spare 8 = Utility OK To Close 9 = Utility Relay 27/81U 10 = Spare 11 = Utility Tripped 12 = Utility Sync Sw Off 13 = Utility Sync Sw Auto 14 = Utility Sync Sw Manual 15 = Utility Fail To Sync	450850	300850	BIT
Alarms Bit 0 = Utility CB Tripped Bit 1 = Utility Fail To Close Bit 2 = Utility Fail To Open Bit 3 = Utility Fail To Sync Bit 4 = Utility Relay Fault Bit 5 = Utility CB Not Connected Bit 6 = Utility Relay 27/81U Bit 7 = Utility Relay 32 Bit 8 = Utility CB SW Lockedout Bit 9 = Utility Sync Switch NIA Bit 10 = Utility Close Lockedout Bit 11 = Utility Ground Fault Alarm Bit 12 = Utility Ground Fault Trip	450851	300851	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 13 = Utility 86 Lockedout Bit 14 = Spare Bit 15 = Spare			
Alarms Bit 0 = Spare Bit 1 = Spare Bit 2 = Spare Bit 3 = Spare Bit 4 = Spare Bit 5 = Spare Bit 6 = Spare Bit 7 = Spare Bit 8 = Spare Bit 9 = Spare Bit 10 = Spare Bit 11 = Spare Bit 12 = Spare Bit 13 = Spare Bit 14 = Spare Bit 15 = Spare	450852	300852	BIT
Utility KW	450853	300853	INT
Utility KVAR	450854	300854	INT
Utility Voltage Phase A-B	450855	300855	UINT
Utility Voltage Phase B-C	450856	300856	UINT
Utility Voltage Phase C-A	450857	300857	UINT
Utility Average Voltage (L-L)	450858	300858	UINT
Utility Voltage Phase A-N	450859	300859	UINT
Utility Voltage Phase B-N	450860	300860	UINT
Utility Voltage Phase C-N	450861	300861	UINT
Utility Average Voltage (L-N)	450862	300862	UINT
Utility Amps Phase A	450863	300863	UINT
Utility Amps Phase B	450864	300864	UINT
Utility Amps Phase C	450865	300865	UINT
Utility Average Amps	450866	300866	UINT
Utility Frequency	450867	300867	FREQ
Utility PF	450868	300868	PF
Synch Angle	450869	300869	DEG
Bus Frequency	450870	300870	UINT
Bus Volts	450871	300871	UINT
Utility KWH (Float MSW)	450872	300872	FLOAT
Utility KWH (Float LSW)	450873	300873	
Utility KVARH (Float MSW)	450874	300874	FLOAT
Utility KVARH (Float LSW)	450875	300875	
	450876	300876	UINT
	450877	300877	UINT
	450878	300878	UINT
	450879	300879	UINT
	450880	300880	UINT
	450881	300881	UINT
	450882	300882	UINT
	450883	300883	UINT
	450884	300884	UINT
	450885	300885	UINT
	450886	300886	UINT

Description	Holding Reg.	Input Reg.	Data Type
	450887	300887	UINT
	450888	300888	UINT
	450889	300889	UINT
	450890	300890	UINT
	450891	300891	UINT
	450892	300892	UINT
	450893	300893	UINT
	450894	300894	UINT
	450895	300895	UINT
	450896	300896	UINT
	450897	300897	UINT
	450898	300898	UINT
	450899	300899	UINT

Table 3-19 Utility 1 Data Table

Emergency Tie 1 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits 0 = Tie CB Closed 1 = Tie CB Open 2 = Tie Fail To Close CB 3 = Tie Fail To Open CB 4 = Tie Alarm Unacked 5 = Tie Alarm Active 6 = Tie Horn Active 7 = Spare 8 = Tie OK To Close 9 = Spare 10 = Spare 11 = Tie Tripped 12 = Tie Sync Sw Off 13 = Tie Sync Sw Auto 14 = Tie Sync Sw Manual 15 = Tie Fail To Sync	450900	300900	BIT
Alarms Bit 0 = Tie CB Tripped Bit 1 = Tie Fail To Close Bit 2 = Tie Fail To Open Bit 3 = Tie Fail To Sync Bit 4 = Tie Relay Fault Bit 5 = Tie CB Not Connected Bit 6 = Tie Relay 27/81U Bit 7 = Tie Relay 32 Bit 8 = Tie CB SW Lockedout Bit 9 = Tie Sync Switch NIA Bit 10 = Tie Close Lockedout Bit 11 = Tie Ground Fault Alarm Bit 12 = Tie Ground Fault Trip Bit 13 = Tie 86 Lockedout Bit 14 = Spare Bit 15 = Spare	450901	300901	BIT
	450902	300902	UINT

Description	Holding Reg.	Input Reg.	Data Type
Tie KW	450903	300903	INT
Tie KVAR	450904	300904	INT
Tie Voltage Phase A-B	450905	300905	UINT
Tie Voltage Phase B-C	450906	300906	UINT
Tie Voltage Phase C-A	450907	300907	UINT
Tie Average Voltage (L-L)	450908	300908	UINT
Tie Voltage Phase A-N	450909	300909	UINT
Tie Voltage Phase B-N	450910	300910	UINT
Tie Voltage Phase C-N	450911	300911	UINT
Tie Average Voltage (L-N)	450912	300912	UINT
Tie Amps Phase A	450913	300913	UINT
Tie Amps Phase B	450914	300914	UINT
Tie Amps Phase C	450915	300915	UINT
Tie Average Amps	450916	300916	UINT
Tie Frequency	450917	300917	FREQ
Tie PF	450918	300918	PF
Synch Angle	450919	300919	DEG
Bus Frequency	450920	300920	UINT
Bus Volts	450921	300921	UINT
Tie KWH (Float MSW)	450922	300922	FLOAT
Tie KWH (Float LSW)	450923	300923	
Tie KVARH (Float MSW)	450924	300924	FLOAT
Tie KVARH (Float LSW)	450925	300925	
	450926	300926	UINT
	450927	300927	UINT
	450928	300928	UINT
	450929	300929	UINT
	450930	300930	UINT
	450931	300931	UINT
	450932	300932	UINT
	450933	300933	UINT
	450934	300934	UINT
	450935	300935	UINT
	450936	300936	UINT
	450937	300937	UINT
	450938	300938	UINT
	450939	300939	UINT
	450940	300940	UINT
	450941	300941	UINT
	450942	300942	UINT
	450943	300943	UINT
	450944	300944	UINT
	450945	300945	UINT
	450946	300946	UINT
	450947	300947	UINT
	450948	300948	UINT
	450949	300949	UINT

Table 3-20 Emergency Tie 1 Data Table

Utility 2 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits	450950	300950	BIT

Description	Holding Reg.	Input Reg.	Data Type
0 = Utility CB Closed 1 = Utility CB Open 2 = Utility Fail To Close CB 3 = Utility Fail To Open CB 4 = Utility Alarm Unacked 5 = Utility Alarm Active 6 = Utility Horn Active 7 = Spare 8 = Utility OK To Close 9 = Utility Relay 27/81U 10 = Spare 11 = Utility Tripped 12 = Utility Sync Sw Off 13 = Utility Sync Sw Auto 14 = Utility Sync Sw Manual 15 = Utility Fail To Sync			
Alarms Bit 0 = Utility CB Tripped Bit 1 = Utility Fail To Close Bit 2 = Utility Fail To Open Bit 3 = Utility Fail To Sync Bit 4 = Utility Relay Fault Bit 5 = Utility CB Not Connected Bit 6 = Utility Relay 27/81U Bit 7 = Utility Relay 32 Bit 8 = Utility CB SW Lockedout Bit 9 = Utility Sync Switch NIA Bit 10 = Utility Close Lockedout Bit 11 = Utility Ground Fault Alarm Bit 12 = Utility Ground Fault Trip Bit 13 = Utility 86 Lockedout Bit 14 = Spare Bit 15 = Spare	450951	300951	BIT
Alarms Bit 0 = Spare Bit 1 = Spare Bit 2 = Spare Bit 3 = Spare Bit 4 = Spare Bit 5 = Spare Bit 6 = Spare Bit 7 = Spare Bit 8 = Spare Bit 9 = Spare Bit 10 = Spare Bit 11 = Spare Bit 12 = Spare Bit 13 = Spare Bit 14 = Spare Bit 15 = Spare	450952	300952	BIT
Utility KW	450953	300953	INT
Utility KVAR	450954	300954	INT
Utility Voltage Phase A-B	450955	300955	UINT

Description	Holding Reg.	Input Reg.	Data Type
Utility Voltage Phase B-C	450956	300956	UINT
Utility Voltage Phase C-A	450957	300957	UINT
Utility Average Voltage (L-L)	450958	300958	UINT
Utility Voltage Phase A-N	450959	300959	UINT
Utility Voltage Phase B-N	450960	300960	UINT
Utility Voltage Phase C-N	450961	300961	UINT
Utility Average Voltage (L-N)	450962	300962	UINT
Utility Amps Phase A	450963	300963	UINT
Utility Amps Phase B	450964	300964	UINT
Utility Amps Phase C	450965	300965	UINT
Utility Average Amps	450966	300966	UINT
Utility Frequency	450967	300967	FREQ
Utility PF	450968	300968	PF
Synch Angle	450969	300969	DEG
Bus Frequency	450970	300970	UINT
Bus Volts	450971	300971	UINT
Utility KWH (Float MSW)	450972	300972	FLOAT
Utility KWH (Float LSW)	450973	300973	
Utility KVARH (Float MSW)	450974	300974	FLOAT
Utility KVARH (Float LSW)	450975	300975	
	450976	300976	UINT
	450977	300977	UINT
	450978	300978	UINT
	450979	300979	UINT
	450980	300980	UINT
	450981	300981	UINT
	450982	300982	UINT
	450983	300983	UINT
	450984	300984	UINT
	450985	300985	UINT
	450986	300986	UINT
	450987	300987	UINT
	450988	300988	UINT
	450989	300989	UINT
	450990	300990	UINT
	450991	300991	UINT
	450992	300992	UINT
	450993	300993	UINT
	450994	300994	UINT
	450995	300995	UINT
	450996	300996	UINT
	450997	300997	UINT
	450998	300998	UINT
	450999	300999	UINT

Table 3-21 Utility 2 Data Table

Emergency Tie 2 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits 0 = Tie CB Closed 1 = Tie CB Open	451000	301000	BIT

Description	Holding Reg.	Input Reg.	Data Type
2 = Tie Fail To Close CB 3 = Tie Fail To Open CB 4 = Tie Alarm Unacked 5 = Tie Alarm Active 6 = Tie Horn Active 7 = Spare 8 = Tie OK To Close 9 = Spare 10 = Spare 11 = Tie Tripped 12 = Tie Sync Sw Off 13 = Tie Sync Sw Auto 14 = Tie Sync Sw Manual 15 = Tie Fail To Sync			
Alarms Bit 0 = Tie CB Tripped Bit 1 = Tie Fail To Close Bit 2 = Tie Fail To Open Bit 3 = Tie Fail To Sync Bit 4 = Tie Relay Fault Bit 5 = Tie CB Not Connected Bit 6 = Tie Relay 27/81U Bit 7 = Tie Relay 32 Bit 8 = Tie CB SW Lockedout Bit 9 = Tie Sync Switch NIA Bit 10 = Tie Close Lockedout Bit 11 = Tie Ground Fault Alarm Bit 12 = Tie Ground Fault Trip Bit 13 = Tie 86 Lockedout Bit 14 = Spare Bit 15 = Spare	451001	301001	BIT
	451002	301002	UINT
Tie KW	451003	301003	INT
Tie KVAR	451004	301004	INT
Tie Voltage Phase A-B	451005	301005	UINT
Tie Voltage Phase B-C	451006	301006	UINT
Tie Voltage Phase C-A	451007	301007	UINT
Tie Average Voltage (L-L)	451008	301008	UINT
Tie Voltage Phase A-N	451009	301009	UINT
Tie Voltage Phase B-N	451010	301010	UINT
Tie Voltage Phase C-N	451011	301011	UINT
Tie Average Voltage (L-N)	451012	301012	UINT
Tie Amps Phase A	451013	301013	UINT
Tie Amps Phase B	451014	301014	UINT
Tie Amps Phase C	451015	301015	UINT
Tie Average Amps	451016	301016	UINT
Tie Frequency	451017	301017	FREQ
Tie PF	451018	301018	PF
Synch Angle	451019	301019	DEG
Bus Frequency	451020	301020	UINT
Bus Volts	451021	301021	UINT
Tie KWH (Float MSW)	451022	301022	FLOAT
Tie KWH (Float LSW)	451023	301023	
Tie KVARH (Float MSW)	451024	301024	FLOAT

Description	Holding Reg.	Input Reg.	Data Type
Tie KVARH (Float LSW)	451025	301025	
	451026	301026	UINT
	451027	301027	UINT
	451028	301028	UINT
	451029	301029	UINT
	451030	301030	UINT
	451031	301031	UINT
	451032	301032	UINT
	451033	301033	UINT
	451034	301034	UINT
	451035	301035	UINT
	451036	301036	UINT
	451037	301037	UINT
	451038	301038	UINT
	451039	301039	UINT
	451040	301040	UINT
	451041	301041	UINT
	451042	301042	UINT
	451043	301043	UINT
	451044	301044	UINT
	451045	301045	UINT
	451046	301046	UINT
	451047	301047	UINT
	451048	301048	UINT
	451049	301049	UINT

Table 3-22 Emergency Tie 2 Data Table

Utility 3 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits 0 = Utility CB Closed 1 = Utility CB Open 2 = Utility Fail To Close CB 3 = Utility Fail To Open CB 4 = Utility Alarm Unacked 5 = Utility Alarm Active 6 = Utility Horn Active 7 = Spare 8 = Utility OK To Close 9 = Utility Relay 27/81U 10 = Spare 11 = Utility Tripped 12 = Utility Sync Sw Off 13 = Utility Sync Sw Auto 14 = Utility Sync Sw Manual 15 = Utility Fail To Sync	451050	301050	BIT
Alarms Bit 0 = Utility CB Tripped Bit 1 = Utility Fail To Close Bit 2 = Utility Fail To Open Bit 3 = Utility Fail To Sync	451051	301051	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 4 = Utility Relay Fault Bit 5 = Utility CB Not Connected Bit 6 = Utility Relay 27/81U Bit 7 = Utility Relay 32 Bit 8 = Utility CB SW Lockedout Bit 9 = Utility Sync Switch NIA Bit 10 = Utility Close Lockedout Bit 11 = Utility Ground Fault Alarm Bit 12 = Utility Ground Fault Trip Bit 13 = Utility 86 Lockedout Bit 14 = Spare Bit 15 = Spare			
Alarms Bit 0 = Spare Bit 1 = Spare Bit 2 = Spare Bit 3 = Spare Bit 4 = Spare Bit 5 = Spare Bit 6 = Spare Bit 7 = Spare Bit 8 = Spare Bit 9 = Spare Bit 10 = Spare Bit 11 = Spare Bit 12 = Spare Bit 13 = Spare Bit 14 = Spare Bit 15 = Spare	451052	301052	BIT
Utility KW	451053	301053	INT
Utility KVAR	451054	301054	INT
Utility Voltage Phase A-B	451055	301055	UINT
Utility Voltage Phase B-C	451056	301056	UINT
Utility Voltage Phase C-A	451057	301057	UINT
Utility Average Voltage (L-L)	451058	301058	UINT
Utility Voltage Phase A-N	451059	301059	UINT
Utility Voltage Phase B-N	451060	301060	UINT
Utility Voltage Phase C-N	451061	301061	UINT
Utility Average Voltage (L-N)	451062	301062	UINT
Utility Amps Phase A	451063	301063	UINT
Utility Amps Phase B	451064	301064	UINT
Utility Amps Phase C	451065	301065	UINT
Utility Average Amps	451066	301066	UINT
Utility Frequency	451067	301067	FREQ
Utility PF	451068	301068	PF
Synch Angle	451069	301069	DEG
Bus Frequency	451070	301070	UINT
Bus Volts	451071	301071	UINT
Utility KWH (Float MSW)	451072	301072	FLOAT
Utility KWH (Float LSW)	451073	301073	
Utility KVARH (Float MSW)	451074	301074	FLOAT
Utility KVARH (Float LSW)	451075	301075	
	451076	301076	UINT
	451077	301077	UINT

Description	Holding Reg.	Input Reg.	Data Type
	451078	301078	UINT
	451079	301079	UINT
	451080	301080	UINT
	451081	301081	UINT
	451082	301082	UINT
	451083	301083	UINT
	451084	301084	UINT
	451085	301085	UINT
	451086	301086	UINT
	451087	301087	UINT
	451088	301088	UINT
	451089	301089	UINT
	451090	301090	UINT
	451091	301091	UINT
	451092	301092	UINT
	451093	301093	UINT
	451094	301094	UINT
	451095	301095	UINT
	451096	301096	UINT
	451097	301097	UINT
	451098	301098	UINT
	451099	301099	UINT

Table 3-23 Utility 3 Data Table

Emergency Tie 3 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits 0 = Tie CB Closed 1 = Tie CB Open 2 = Tie Fail To Close CB 3 = Tie Fail To Open CB 4 = Tie Alarm Unacked 5 = Tie Alarm Active 6 = Tie Horn Active 7 = Spare 8 = Tie OK To Close 9 = Spare 10 = Spare 11 = Tie Tripped 12 = Tie Sync Sw Off 13 = Tie Sync Sw Auto 14 = Tie Sync Sw Manual 15 = Tie Fail To Sync	451100	301100	BIT
Alarms Bit 0 = Tie CB Tripped Bit 1 = Tie Fail To Close Bit 2 = Tie Fail To Open Bit 3 = Tie Fail To Sync Bit 4 = Tie Relay Fault Bit 5 = Tie CB Not Connected Bit 6 = Tie Relay 27/81U Bit 7 = Tie Relay 32	451101	301101	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 8 = Tie CB SW Lockedout Bit 9 = Tie Sync Switch NIA Bit 10 = Tie Close Lockedout Bit 11 = Tie Ground Fault Alarm Bit 12 = Tie Ground Fault Trip Bit 13 = Tie 86 Lockedout Bit 14 = Spare Bit 15 = Spare			
	451102	301102	UINT
Tie KW	451103	301103	INT
Tie KVAR	451104	301104	INT
Tie Voltage Phase A-B	451105	301105	UINT
Tie Voltage Phase B-C	451106	301106	UINT
Tie Voltage Phase C-A	451107	301107	UINT
Tie Average Voltage (L-L)	451108	301108	UINT
Tie Voltage Phase A-N	451109	301109	UINT
Tie Voltage Phase B-N	451110	301110	UINT
Tie Voltage Phase C-N	451111	301111	UINT
Tie Average Voltage (L-N)	451112	301112	UINT
Tie Amps Phase A	451113	301113	UINT
Tie Amps Phase B	451114	301114	UINT
Tie Amps Phase C	451115	301115	UINT
Tie Average Amps	451116	301116	UINT
Tie Frequency	451117	301117	FREQ
Tie PF	451118	301118	PF
Synch Angle	451119	301119	DEG
Bus Frequency	451120	301120	UINT
Bus Volts	451121	301121	UINT
Tie KWH (Float MSW)	451122	301122	FLOAT
Tie KWH (Float LSW)	451123	301123	
Tie KVARH (Float MSW)	451124	301124	FLOAT
Tie KVARH (Float LSW)	451125	301125	
	451126	301126	UINT
	451127	301127	UINT
	451128	301128	UINT
	451129	301129	UINT
	451130	301130	UINT
	451131	301131	UINT
	451132	301132	UINT
	451133	301133	UINT
	451134	301134	UINT
	451135	301135	UINT
	451136	301136	UINT
	451137	301137	UINT
	451138	301138	UINT
	451139	301139	UINT
	451140	301140	UINT
	451141	301141	UINT
	451142	301142	UINT
	451143	301143	UINT
	451144	301144	UINT
	451145	301145	UINT
	451146	301146	UINT
	451147	301147	UINT

Description	Holding Reg.	Input Reg.	Data Type
	451148	301148	UINT
	451149	301149	UINT

Table 3-24 Emergency Tie 3 Data Table

Utility 4 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits 0 = Utility CB Closed 1 = Utility CB Open 2 = Utility Fail To Close CB 3 = Utility Fail To Open CB 4 = Utility Alarm Unacked 5 = Utility Alarm Active 6 = Utility Horn Active 7 = Spare 8 = Utility OK To Close 9 = Utility Relay 27/81U 10 = Spare 11 = Utility Tripped 12 = Utility Sync Sw Off 13 = Utility Sync Sw Auto 14 = Utility Sync Sw Manual 15 = Utility Fail To Sync	451150	301150	BIT
Alarms Bit 0 = Utility CB Tripped Bit 1 = Utility Fail To Close Bit 2 = Utility Fail To Open Bit 3 = Utility Fail To Sync Bit 4 = Utility Relay Fault Bit 5 = Utility CB Not Connected Bit 6 = Utility Relay 27/81U Bit 7 = Utility Relay 32 Bit 8 = Utility CB SW Lockedout Bit 9 = Utility Sync Switch NIA Bit 10 = Utility Close Lockedout Bit 11 = Utility Ground Fault Alarm Bit 12 = Utility Ground Fault Trip Bit 13 = Utility 86 Lockedout Bit 14 = Spare Bit 15 = Spare	451151	301151	BIT
Alarms Bit 0 = Spare Bit 1 = Spare Bit 2 = Spare Bit 3 = Spare Bit 4 = Spare Bit 5 = Spare Bit 6 = Spare Bit 7 = Spare Bit 8 = Spare Bit 9 = Spare	451152	301152	BIT

Description	Holding Reg.	Input Reg.	Data Type
Bit 10 = Spare Bit 11 = Spare Bit 12 = Spare Bit 13 = Spare Bit 14 = Spare Bit 15 = Spare			
Utility KW	451153	301153	INT
Utility KVAR	451154	301154	INT
Utility Voltage Phase A-B	451155	301155	UINT
Utility Voltage Phase B-C	451156	301156	UINT
Utility Voltage Phase C-A	451157	301157	UINT
Utility Average Voltage (L-L)	451158	301158	UINT
Utility Voltage Phase A-N	451159	301159	UINT
Utility Voltage Phase B-N	451160	301160	UINT
Utility Voltage Phase C-N	451161	301161	UINT
Utility Average Voltage (L-N)	451162	301162	UINT
Utility Amps Phase A	451163	301163	UINT
Utility Amps Phase B	451164	301164	UINT
Utility Amps Phase C	451165	301165	UINT
Utility Average Amps	451166	301166	UINT
Utility Frequency	451167	301167	FREQ
Utility PF	451168	301168	PF
Synch Angle	451169	301169	DEG
Bus Frequency	451170	301170	UINT
Bus Volts	451171	301171	UINT
Utility KWH (Float MSW)	451172	301172	FLOAT
Utility KWH (Float LSW)	451173	301173	
Utility KVARH (Float MSW)	451174	301174	FLOAT
Utility KVARH (Float LSW)	451175	301175	
	451176	301176	UINT
	451177	301177	UINT
	451178	301178	UINT
	451179	301179	UINT
	451180	301180	UINT
	451181	301181	UINT
	451182	301182	UINT
	451183	301183	UINT
	451184	301184	UINT
	451185	301185	UINT
	451186	301186	UINT
	451187	301187	UINT
	451188	301188	UINT
	451189	301189	UINT
	451190	301190	UINT
	451191	301191	UINT
	451192	301192	UINT
	451193	301193	UINT
	451194	301194	UINT
	451195	301195	UINT
	451196	301196	UINT
	451197	301197	UINT
	451198	301198	UINT
	451199	301199	UINT

Table 3-25 Utility 4 Data Table

Emergency Tie 4 Data Table

Description	Holding Reg.	Input Reg.	Data Type
Status Bits 0 = Tie CB Closed 1 = Tie CB Open 2 = Tie Fail To Close CB 3 = Tie Fail To Open CB 4 = Tie Alarm Unacked 5 = Tie Alarm Active 6 = Tie Horn Active 7 = Spare 8 = Tie OK To Close 9 = Spare 10 = Spare 11 = Tie Tripped 12 = Tie Sync Sw Off 13 = Tie Sync Sw Auto 14 = Tie Sync Sw Manual 15 = Tie Fail To Sync	451200	301200	BIT
Alarms Bit 0 = Tie CB Tripped Bit 1 = Tie Fail To Close Bit 2 = Tie Fail To Open Bit 3 = Tie Fail To Sync Bit 4 = Tie Relay Fault Bit 5 = Tie CB Not Connected Bit 6 = Tie Relay 27/81U Bit 7 = Tie Relay 32 Bit 8 = Tie CB SW Lockedout Bit 9 = Tie Sync Switch NIA Bit 10 = Tie Close Lockedout Bit 11 = Tie Ground Fault Alarm Bit 12 = Tie Ground Fault Trip Bit 13 = Tie 86 Lockedout Bit 14 = Spare Bit 15 = Spare	451201	301201	BIT
	451202	301202	UINT
Tie KW	451203	301203	INT
Tie KVAR	451204	301204	INT
Tie Voltage Phase A-B	451205	301205	UINT
Tie Voltage Phase B-C	451206	301206	UINT
Tie Voltage Phase C-A	451207	301207	UINT
Tie Average Voltage (L-L)	451208	301208	UINT
Tie Voltage Phase A-N	451209	301209	UINT
Tie Voltage Phase B-N	451210	301210	UINT
Tie Voltage Phase C-N	451211	301211	UINT
Tie Average Voltage (L-N)	451212	301212	UINT
Tie Amps Phase A	451213	301213	UINT
Tie Amps Phase B	451214	301214	UINT
Tie Amps Phase C	451215	301215	UINT
Tie Average Amps	451216	301216	UINT

Description	Holding Reg.	Input Reg.	Data Type
Tie Frequency	451217	301217	FREQ
Tie PF	451218	301218	PF
Synch Angle	451219	301219	DEG
Bus Frequency	451220	301220	UINT
Bus Volts	451221	301221	UINT
Tie KWH (Float MSW)	451222	301222	FLOAT
Tie KWH (Float LSW)	451223	301223	
Tie KVARH (Float MSW)	451224	301224	FLOAT
Tie KVARH (Float LSW)	451225	301225	
	451226	301226	UINT
	451227	301227	UINT
	451228	301228	UINT
	451229	301229	UINT
	451230	301230	UINT
	451231	301231	UINT
	451232	301232	UINT
	451233	301233	UINT
	451234	301234	UINT
	451235	301235	UINT
	451236	301236	UINT
	451237	301237	UINT
	451238	301238	UINT
	451239	301239	UINT
	451240	301240	UINT
	451241	301241	UINT
	451242	301242	UINT
	451243	301243	UINT
	451244	301244	UINT
	451245	301245	UINT
	451246	301246	UINT
	451247	301247	UINT
	451248	301248	UINT
	451249	301249	UINT

Table 3-26 Emergency Tie 4 Data Table

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