

# **MODBUS Communication Database**

Rev. 3.8 M-6283A



PROTOCOL

# **M-6283A MODBUS COMMUNICATION DATABASE**

DEVICE I.D. = 346 for M-6283A

Specifications Presented Herein Are Thought To Be Accurate At The Time Of Publication But Are Subject To Change Without Notice.

No Warranties Of Any Kind Are Implied On The Information Contained In This Document.

- REV 1.0 10/25/13 D-0346V02.01.04
- REV 2.3 01/26/15 D-0346V03.00.02
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- REV 3.1 08/2018 D-0346V04.05.00
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# **MODBUS COMMUNICATION PROTOCOL FOR M-6283A**

When the appropriate communication interface hardware is connected and the proper initialization of the communication options is complete, the data defined herein can be accessed and modified by remote communications.

This document describes the implementation of the MODBUS protocol as it relates to the M-6283A device.

The M-6283A may be programmed to support a subset of the MODBUS protocol. The following restrictions apply:

- 1. MODBUS protocol is supported on COM 1 (front RS232) and COM 2 (rear RS232/RS485).
- 2. Parity and Stop Bits are supported, valid selections are [8,N,2], [8,N,1], [8,O,1] or [8,E,1].
- 3. Only RTU mode is implemented, ASCII mode is not supported.
- 4. Standard baud rates from 300-115200 are supported.
- 5. Only the following 6 MODBUS commands are supported:

1) Read Holding register	(Function 03)
2) Read Input register	(Function 04)
3) Force Single Coil	(Function 05)
4) Preset Single Register	(Function 06)
5) Preset Multiple Registers	(Function 16)
6) Diagnostic	(Function 08 – Subfunction code 00, 01, 04)

No more than 128 contiguous registers should be read with one request.

No more than 16 contiguous registers should be written with one request.

Read Holding Register (03) is identical to Read Input Register (04) and reads the same data.

Force Single Coil (05) is identical to Preset Single Register (06) and writes the same data.

Force Single Coil (05), Preset Single Register (06) or Preset Multiple Registers (16) is used to write to register(s) defined as writeable.

Diagnostic (08), Subfunction code: (00) – return query data, (01) – restart communication, (04) – force listen only mode.

The following exception code are implemented:

ILLEGAL FUNCTION	01
ILLEGAL DATA ADDRESS	02
ILLEGAL DATA VALUE	03
SLAVE DEVICE BUSY	06

SLAVE DEVICE BUSY is returned if device is in the local mode.

Register addresses in this document are actual addresses in the device. For examples: Address 2000, in 3x reference (Read Input Registers) will be 30000 + 2000 + 1 = 32001. Address 3000, in 4x reference (Preset Single Register / Preset Multiple Registers) will be 40000 + 3000 + 1 = 43001.

Register content is a two-byte data word and is transmitted and must be received most significant (high-order) byte first.

Communications is effectively half duplex in that a request packet is transmitted and a response packet received. Further requests should not be sent until the previous packet response is received.

#### The following definitions apply to the data table in this specification:

**SCALE FACTOR:** the factor by which the register content read from the device is divided to get the value of the variable in the indicated "UNITS".

Unless otherwise noted all data registers return 16 Bit signed integer value.

Registers marked with a (U) appended to the scale factor field should be taken as unsigned values (0-65535) before scaling.

UNITS: unit of the register content

**ATT:** attribute of the register (R indicates reset, M indicates master reset, W indicates writeable, and F indicates factory writeable only. All registers are READ\_ONLY unless noted otherwise and unused registers return 0).

**RANGE/INCREMENT:** valid range and increments of the register content for WRITE commands. Consult the device specification sheet for unscaled setpoint ranges and increments.

**DESCRIPTION:** register content description.

#### ■ Notes:

If communication Security is enabled, the communication channel is locked on power up and remains locked until commanded to unlock or until the COMM PASSWORD is changed to 0000 (Disable communication Security) locally. When locked only registers below 700 to 725 may be read and only register 725 can be written. Attempts to read or write other registers while the communication channel is locked will return a system error code 6, "Communication locked". To open (unlocked) the communication channel, the correct communication password must be written to 725.

A write response packet will always return OK (no error) if data is between 0 and 9999 even if the incorrect password is given.

Writing an incorrect password or writing 0, with Security enabled will unconditionally lock the communication channel.

The communication channel is also locked if Security is enabled and no communication activity occurs for  $\sim$ 2.5 minutes.

CONTROL INFORMATION									
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION				
700	1	-	-	-	Control identification (Device type)				
701	1U	_	_	_	Control serial number				
702	1	_	_	_	Control communication address				
703	100	_	_	_	Software version number (Host)				
704	1	_	_	_	Build Number				
705 – 720	_	_	_	_	N/A				
721	_	-	-	-	Communication lock status 0 = Communication unlocked 1 = Communication locked				
722– 724	-	-	-	-	NA				
725	_	_	W	0-9999	Unlock Communication				
726 – 744	_	_	_	_	N/A				
800 – 805	_	_	_	_	N/A				
806 – 811	_	_	W	_	Access code 1 ( 6 numerical values )				
812 – 817	_	_	W	_	Access code 2 ( 6 numerical values)				
818	-	_	W	0-1	COM 1 serial protocol 0 = Modbus 1 = DNP				
819	-	_	W	0-65535	Comm Address				
820	_	_	W	0-9 / 1	COM 1 Baud rate           0 = 115200         5 = 4800           1 = 57600         6 = 2400           2 = 38400         7 = 1200           3 = 19200         8 = 600           4 = 9600         9 = 300				
821	_	_	W	0-2 / 1	COM 1 Parity 0 = NONE 1 = EVEN 2 = ODD				
822	-	_	W	0-1 / 1	COM 1 Stop Bits 0 = one stop Bit 1 = two stop Bits				
823	-	ms	W	1-5000	COM 2 Sync time				

 Table 1 – Control Information (1 of 3)
 (1 of 3)

CONTROL INFORMATION									
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION				
824	-	_	W	0-2	COM 2 serial protocol 0 = Modbus 1 = DNP 2 = Future Use				
826	-	_	W	0-9 / 1	COM 2 Baud rate $0 = 115200$ $5 = 4800$ $1 = 57600$ $6 = 2400$ $2 = 38400$ $7 = 1200$ $3 = 19200$ $8 = 600$ $4 = 9600$ $9 = 300$				
827	-	_	W	0-2 / 1	COM 2 Parity 0 = NONE 1 = EVEN 2 = ODD				
828	-	_	W	0-1 / 1	COM 2 Stop Bits 0 = one stop Bit 1 = two stop Bits				
829	_	ms	W	1-5000	Com 1 Sync time				
830		_	W	-	Ethernet protocol				
831			W	_	DHCP mode				
832			W	0-65535 / 1	IP address (LSB)				
833			W	0-65535 / 1	IP address (MSB)				
834			W	0-65535 / 1	Subnet mask (LSB)				
835			W	0-65535 / 1	Subnet mask (MSB)				
836		_	W	0-65535 / 1	Gateway address (LSB)				
837	_	_	W	0-65535 / 1	Gateway address (MSB)				
838	1	_	W	0-2/1	SCADA Heart Beat 0 = Disable 1 = Standard 2 = Direct				
839	_	Min	W	1-300/1	SCADA Heart beat Time Delay				
840	1		W	0-65535	Modem IP Address LSB				
841	1		W	0-65535	Modem IP Address MSB				
845	1	_	W	0-1/1	Modem Static IP Address Enable/Disable 0 = Disable 1 = Enable				
850 – 869	_	-	W	0-127/1	User Line 1 Text (20 Characters Excluding Null Character)				

Table 1 – Control Information (2 of 3)

REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION				
870 – 889	-	-	W	0-127/1	User Line 2 Text (20 Characters Excluding Null Character)				
890	_	_	W	0-2	Comm. Port type 0 = RS485 1 = Fiber 2 = RS232				
893 – 912	_	_	_	0-127/1	Bluetooth Friendly Name (20 characters excluding null character) All 20 characters need to be written to change the name, in case the name is less than 20 characters, the rest should be written with a null character.				
913 – 929	_	_	R	0-127/1	Bluetooth Passkey (17 Characters Including Null Character)				
933	1	-	W	1-5	DNP3 Session Limit				
934	_	-	W	0-65519	Substation address for DNP3.0				
935	_	-	W	0-65519	Feeder address for DNP3.0				
939	-	_	W	0-1	DNP Source Address Validation 0 = Disable 1 = Enable				
946	_	Min/Sec (Write/Read)	-	0-300	Direct SCADA Heart beat				
947	1	ms	-	0-50/1	Tx Delay				
2048	-	_	W	0-1	Communication Access Security 0 = Disable 1 = Enable				
2049	_	_	W	15-50000	Comm. Access Timeout				

 Table 1 – Control Information (3 of 3)
 (3 of 3)

CONTROL STATUS							
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION		
		Registers <sup>2</sup>	1500 – 155	56 Used During Sin	gle Pole Switching		
1500	1	%	_	_	Close Definite Timer Phase A		
1501	1	%	_	_	Close Definite Timer Phase B		
1502	1	%	-	_	Close Definite Timer Phase C		
1503	1	%	_	_	Open Definite Timer Phase A		
1504	1	%	_	-	Open Definite Timer Phase B		
1505	1	%	_	-	Open Definite Timer Phase C		
1506	1	%	-	-	Open Warning Timer Phase A		
1507	1	%	-	_	Open Warning Timer Phase B		
1508	1	%	-	-	Open Warning Timer Phase C		
1509	1	%	_	—	Close Warning Timer Phase A		
1510	1	%	_	_	Close Warning Timer Phase B		
1511	1	%	_	—	Close Warning Timer Phase C		
1512	1	%	_	—	Re-Close Delay Phase A		
1513	1	%	_	—	Re-Close Delay Phase B		
1514	1	%	_	—	Re-Close Delay Phase C		
1515	1U	_	_	_	Operation counter Phase A (Least significant word)		
1516	1U	_	_	-	Operation counter Phase A (Most significant word)		
1517	1U	_	_	_	Operation counter Phase B (Least significant word)		
1518	1U	_	_	_	Operation counter Phase B (Most significant word)		
1519	1U	-	_	-	Operation counter Phase C (Least significant word)		
1520	1U	_	_	-	Operation counter Phase C (Most significant word)		
1521	1	-	-	0-99/1	Daily Operation counter Phase A		

CONTROL STATUS							
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION		
1522	1	-	_	0-99/1	Daily Operation counter Phase B		
1523	1	_	_	0-99/1	Daily Operation counter Phase C		
1524	1	_	_	_	Capacitor Bank state Phase A 0 = None 1 = Open 2 = Close		
1525	1	_	_	-	Capacitor Bank state Phase B 0 = None 1 = Open 2 = Close		
1526	1	-	_	-	Capacitor Bank state Phase C 0 = None 1 = Open 2 = Close		
1527	1U				Status Bits Phase A Bit 0 = Block Status Bit 1 = Block Status 00 = OK 01 = Block Open 10 = Block Open 10 = Block Close 11 = Block DOPC Bit 2 = Run back Bit 3 = Run Forward Bit 4 = Operation mode (common) Bit 5 = Operation mode (common) 00 = Manual 01 = Auto 10 = Remote Bit 6 = Comm Block (common) Bit 7 = Self Test (common) Bit 8 = Bank status NC limit (common) Bit 9 = SCADA HB Lost (common) Bit 10 = Bank closed Bit 11 = Bank opened Bit 12 = HMI active (common) Bit 13 = Bit 14 = Neutral Limit L1 (common) Bit 15 = Neutral Limit L2 (common)		

Table 2 – Control Status (2 of 16)

CONTROL STATUS							
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION		
1528	1U				Status Bits Phase B Bit 0 = Block Status Bit 1 = Block Status 00 = OK 01 = Block Open 10 = Block Close 11 = Block DOPC Bit 2 = Run back Bit 3 = Run Forward Bit 4 = Operation mode (common) Bit 5 = Operation mode (common) 00 = Manual 01 = Auto 10 = Remote Bit 6 = Comm Block (common) Bit 7 = Self Test (common) Bit 8 = Bank status NC limit (common) Bit 9 = SCADA HB Lost (common) Bit 10 = Bank closed Bit 11 = Bank opened Bit 12 = HMI active (common) Bit 13 = Bit 14 = Neutral Limit L1 (common) Bit 15 = Neutral Limit L2 (common)		
1529	1U				Status Bits Phase C Bit 0 = Block Status Bit 1 = Block Status 00 = OK 01 = Block Open 10 = Block Close 11 = Block DOPC Bit 2 = Run back Bit 3 = Run Forward Bit 4 = Operation mode (common) Bit 5 = Operation mode (common) 00 = Manual 01 = Auto 10 = Remote Bit 6 = Comm Block (common) Bit 7 = Self Test (common) Bit 8 = Bank status NC limit (common) Bit 9 = SCADA HB Lost (common) Bit 10 = Bank closed Bit 11 = Bank opened Bit 12 = HMI active (common) Bit 13 = Bit 14 = Neutral Limit L1 (common) Bit 15 = Neutral Limit L2 (common)		

Table 2 – Control Status (3 of 16)

CONTROL STATUS							
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION		
1530	1			0-65535	Neutral current bank status Phase A (All are common) Bit 0 = Close Bit 1 = Retry close Bit 2 = Unused Bit 2 = Unused Bit 3 = Open Bit 4 = Retry open Bit 5 = Unused Bit 6 = Phase Switch Failure Bit 7 = Pack Failure or Harmonics Bit 8 = Cap Switch Failure Bit 9 = Unused Bit 10 = Reverse Operation Bit 11 = Retry done Bit 12 = Reverse open done Bit 13 = Reverse close done Bit 14 = NC Block Bit 15 = NC Lockout		
1531	1			0-65535	Neutral current bank status Phase B (All are common) Bit 0 = Close Bit 1 = Retry close Bit 2 = Unused Bit 2 = Unused Bit 3 = Open Bit 4 = Retry open Bit 5 = Unused Bit 6 = Phase Switch Failure Bit 7 = Pack Failure or Harmonics Bit 8 = Cap Switch Failure Bit 9 = Unused Bit 10 = Reverse Operation Bit 11 = Retry done Bit 12 = Reverse open done Bit 13 = Reverse close done Bit 14 = NC Block Bit 15 = NC Lockout		

Table 2 – Control Status (4 of 16)

CONTROL STATUS							
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION		
1532	1			0-65535	Neutral current bank status Phase B (All are common) Bit 0 = Close Bit 1 = Retry close Bit 2 = Unused Bit 2 = Unused Bit 3 = Open Bit 4 = Retry open Bit 5 = Unused Bit 6 = Phase Switch Failure Bit 7 = Pack Failure or Harmonics Bit 8 = Cap Switch Failure Bit 9 = Unused Bit 10 = Reverse Operation Bit 11 = Retry done Bit 12 = Reverse open done Bit 13 = Reverse close done Bit 14 = NC Block Bit 15 = NC Lockout		
1533	_	_	_	_	Cap Alarm Bit status Phase A Bit 0 = Maximum Voltage limit Bit 1 = Minimum Voltage limit Bit 2 = Remote Over Voltage limit Bit 3 = Remote Under Voltage limit Bit 4 = Bank/Switch failed L2 (common) Bit 5 = Bank/Switch failed L1 (common) Bit 6 = Resettable Counter limit Bit 7 = Daily Op Counter limit Bit 7 = Daily Op Counter limit Bit 8 = Comm Block (common) Bit 9 = Self Test (common) Bit 10 = Voltage Harmonics (common) Bit 11 = Current Harmonics (common) Bit 12 = Unused (internal) Bit 13 = Delta voltage Alarm		
1534	_	_	_		Cap Alarm Bit status Phase B Bit 0 = Maximum Voltage limit Bit 1 = Minimum Voltage limit Bit 2 = Remote Over Voltage limit Bit 3 = Remote Under Voltage limit Bit 4 = Bank/Switch failed L2 (common) Bit 5 = Bank/Switch failed L1 (common) Bit 6 = Resettable Counter limit Bit 7 = Daily Op Counter limit Bit 8 = Comm Block (common) Bit 9 = Self Test (common) Bit 10 = Voltage Harmonics (common) Bit 11 = Current Harmonics (common) Bit 12 = Unused (internal) Bit 13 = Delta voltage Alarm		

 Table 2 – Control Status (5 of 16)

	CONTROL STATUS							
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION			
1535	-	_	_	_	Cap Alarm Bit status Phase C Bit 0 = Maximum Voltage limit Bit 1 = Minimum Voltage limit Bit 2 = Remote Over Voltage limit Bit 3 = Remote Under Voltage limit Bit 4 = Bank/Switch failed L2 (common) Bit 5 = Bank/Switch failed L1 (common) Bit 6 = Resettable Counter limit Bit 7 = Daily Op Counter limit Bit 7 = Daily Op Counter limit Bit 8 = Comm Block (common) Bit 9 = Self Test (common) Bit 10 = Voltage Harmonics (common) Bit 11 = Current Harmonics (common) Bit 12 = Unused (internal) Bit 13 = Delta voltage Alarm			
1536	1000	-	-	-	Power factor Phase A (-) = Lead (+) = Lag			
1537	See 1728	See 1728	_	-	Real Power (Primary Watts) Phase A			
1538	_	-	-	_	Real Power Unit Phase A 0 = Watts (scale factor 10) 1 = KW (scale factor 10) 2 = MW (scale factor 100)			
1539	See 1730	See 1730	-	-	Reactive Power (Primary Vars) Phase A			
1540	-	-	-	-	Reactive Power Unit Phase A 0 = VArs (scale factor 10) 1 = KVAr (scale factor 10) 2 = MVAr (scale factor 100)			
1541	See 1732	See 1732	-	-	Apparent Power (Primary VA) Phase A			
1542	-	-	-	-	Apparent Power Unit Phase A 0 = VA (scale factor 10) 1 = KVA (scale factor 10) 2 = MVA (scale factor 100)			
1543	1000	_	-	-	Power factor Phase B (-) = Lead (+) = Lag			
1544	See 1728	See 1728	-	-	Real Power (Primary Watts) Phase B			
1545	-	-	-	-	Real Power Unit Phase B 0 = Watts (scale factor 10) 1 = KW (scale factor 10) 2 = MW (scale factor 100)			
1546	See 1730	See 1730	-	-	Reactive Power (Primary Vars) Phase B			

 Table 2 – Control Status (6 of 16)

	CONTROL STATUS							
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION			
1547	-	_	_	-	Reactive Power Unit Phase B 0 = VArs (scale factor 10) 1 = KVAr (scale factor 10) 2 = MVAr (scale factor 100)			
1548	See 1732	See 1732	_	-	Apparent Power (Primary VA) Phase B			
1549	-	_	-	-	Apparent Power Unit Phase B 0 = VA (scale factor 10) 1 = KVA (scale factor 10) 2 = MVA (scale factor 100)			
1550	1000	-	-	-	Power factor Phase C (-) = Lead (+) = Lag			
1551	See 1728	See 1728	-	-	Real Power (Primary Watts) Phase C			
1552	-	_	-	-	Real Power Unit Phase C 0 = Watts (scale factor 10) 1 = KW (scale factor 10) 2 = MW (scale factor 100)			
1553	See 1730	See 1730	-	-	Reactive Power (Primary Vars) Phase C			
1554	_	_	_	-	Reactive Power Unit Phase C 0 = VArs (scale factor 10) 1 = KVAr (scale factor 10) 2 = MVAr (scale factor 100)			
1555	See 1732	See 1732	-	-	Apparent Power (Primary VA) Phase C			
1556	_	_	_	_	Apparent Power Unit Phase C 0 = VA (scale factor 10) 1 = KVA (scale factor 10) 2 = MVA (scale factor 100)			
1560	1000	КV	_	_	Primary Phase A Voltage in 1/1000th KV			
1561	1000	KV		_	Primary Phase B Voltage in 1/1000th KV			
1562	1000	KV	-	_	Primary Phase C Voltage in 1/1000th KV			
1563	10	A	_	_	Phase A Current in 1/10th A			
1564	10	A			Phase B Current in 1/10th A			
1565	10	A	_	-	Phase C Current in 1/10th A			

Table 2 – Control Status (7 of 16)

CONTROL STATUS										
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION					
1566	1000	MW	_	_	Primary Watts 3ph					
1567	1000	MVAr	_	-	Primary VArs 3ph					
1568	1000	MVA	-	_	Primary VA 3ph					
1569	1000	MW	-	_	Primary Watts Phase A					
1570	1000	MVAr	-	_	Primary VArs Phase A					
1571	1000	MVA	-	_	Primary VA Phase A					
1572	1000	MW	-	-	Primary Watts Phase B					
1573	1000	MVAr	-	-	Primary VArs Phase B					
1574	1000	MVA	-	_	Primary VA Phase B					
1575	1000	MW	_	_	Primary Watts Phase C					
1576	1000	MVAr	_	_	Primary VArs Phase C					
1577	1000	MVA	-	_	Primary VA Phase C					
1578	1	_	_	0-65535	Neutral Current Phase and Magnitude Unbalance Bit Bit 0 = Neutral Phase Unbalance Bit 1 = Neutral Unbalance Phase A Bit 2 = Neutral Unbalance Phase B Bit 3 = Neutral Unbalance Phase C Bit 4 = Neutral magnitude Unbalance Bit 5 -15 = Unused					
1579	10	Degree	-	_	Neutral Current Phase Angle					
1604	1	_	Rd only	_	THD Lockout Status Bit 0 = Voltage THD Lockout Gang mode Bit 1 = Current THD Lockout Gang mode Bit 2 = Voltage THD Lockout Phase A Bit 3 = Voltage THD Lockout Phase B Bit 4 = Voltage THD Lockout Phase C Bit 5 = Current THD Lockout Phase A Bit 6 = Current THD Lockout Phase B Bit 7 = Current THD Lockout Phase C Bit 8 -15 = Unused					

Table 2 – Control Status (8 of 16)

CONTROL STATUS									
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION				
1606	1	_	Rd only	_	Emergency Mode Status Bits Bit 0 = Emergency Mode Voltage Loss Phase A Bit 1 = Emergency Mode Voltage Loss Phase B Bit 2 = Emergency Mode Voltage Loss Phase C Bit 3 = Emergency Mode Control/Switch Power Loss Bit 5 = Emergency Mode Auto Control Gang Operation Bit 9 = Emergency Mode Activated Bit 15 = Operation mode: (0 = Ganged; 1 = Independent)				
1610	10	K/W			Primany KWatts Phase 3nh				
1611	10	K\/Ar			Primary KVArs Phase 3nh				
1612	10	KVA	<u> </u>		Primary KVA Phase 3ph				
1613	10	KW	_		Primary KWatts Phase A				
1614	10	KVAr	_	_	Primary KVArs Phase A				
1615	10	KVA		_	Primary KVA Phase A				
1616	10	KW	_		Primary KWatts Phase B				
1617	10	KVAr		_	Primary KVArs Phase B				
1618	10	KVA	_	_	Primary KVA Phase B				
1619	10	KW	_	_	Primary KWatts Phase C				
1620	10	KVAr	_	_	Primary KVArs Phase C				
1621	10	KVA	_	_	Primary KVA Phase C				
1630	1	Sec	Rd only	_	Close Definite Timer (in seconds)				
1631	1	Sec	Rd only	_	Close Definite Timer Phase A (in seconds)				
1632	1	Sec	Rd only	_	Close Definite Timer Phase B (in seconds)				
1633	1	Sec	Rd only	_	Close Definite Timer Phase C (in seconds)				
1634	1	Sec	Rd only	_	Open Definite Timer (in seconds)				
1635	1	Sec	Rd only	_	Open Definite Timer Phase A (in seconds)				
1636	1	Sec	Rd only	_	Open Definite Timer Phase B (in seconds)				
1637	1	Sec	Rd only	-	Open Definite Timer Phase C (in seconds)				
1638	1	Sec	Rd only	_	Open Warning Timer (in seconds)				

Table 2 – Control Status (9 of 16)

CONTROL STATUS									
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION				
1639	1	Sec	Rd only	_	Open Warning Timer Phase A (in seconds)				
1640	1	Sec	Rd only	_	Open Warning Timer Phase B (in seconds)				
1641	1	Sec	Rd only	_	Open Warning Timer Phase C (in seconds)				
1642	1	Sec	Rd only	_	Close Warning Timer (in seconds)				
1643	1	Sec	Rd only	_	Close Warning Timer Phase A (in seconds)				
1644	1	Sec	Rd only	_	Close Warning Timer Phase B (in seconds)				
1645	1	Sec	Rd only	_	Close Warning Timer Phase C (in seconds)				
1646	1	Sec	Rd only	_	Re-Close Timer (in seconds)				
1647	1	Sec	Rd only	_	Re-Close Timer Phase A (in seconds)				
1648	1	Sec	Rd only	_	Re-Close Timer Phase B (in seconds)				
1649	1	Sec	Rd only	_	Re-Close Timer Phase C (in seconds)				
		1	1						
1701	10			_	Phase A Voltage				
1702	10	KV	_	_	Primary phase A voltage				
1703	10	V	-	_	Phase B Voltage				
1704	10	KV	_	_	Primary Phase B Voltage				
1705	10	V	_	_	Phase C Voltage				
1706	10	KV	_	_	Primary Phase C Voltage				
1707	100	Volts	-	_	Delta voltage				
1708	1	A	_	_	Phase Current A				
1709	1	A	_	_	Phase Current B				
1710	1	A	_	_	Phase Current C				
1711	100	A	_	_	Neutral Current				
1712	10	Hz	_	if 50 Hz: 45 to 55 Hz if 60 Hz: 55 to 65 Hz	Frequency				
1713	1	%	_	-	Close Definite Timer				
1714	1	%	-	-	Open Definite Timer				
1715	1	%	-	-	Open Warning Delay				
1716	1	%	_	0-100/1	Close Warning delay				
1717	1	%	_	_	Re-Close Delay				

Table 2 – Control Status (10 of 16)

	CONTROL STATUS								
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION				
1718	1U	_	-	-	Operation counter (Least significant word)				
1719	1U	_	-	-	Operation counter (Most significant word)				
1720	1	_	_	0-99/1	Daily Operation counter				
1721	1	_	_	-	Capacitor Bank state 0 = None 1 = Open 2 = Close				
1722	1U	_		_	Status Bits Bit 0 = Block Status Bit 1 = Block Status 00 = OK 01 = Block Open 10 = Block Close 11 = Block DOPC Bit 2 = Run back Bit 3 = Run Forward Bit 4 = Operation mode Bit 5 = Operation mode 00 = Manual 01 = Auto 10 = Remote Bit 6 = Comm Block Bit 7 = Self Test Bit 8 = Bank status NC limit Bit 9 = SCADA HB Lost Bit 10 = Bank closed Bit 11 = Bank opened Bit 12 = HMI active Bit 13 = Bit 14 = Neutral Limit L1 Bit 15 = Neutral Limit L2				
1723	1	_	_	0-65535	Neutral current bank status Bit 0 = Close Bit 1 = Retry close Bit 2 = Unused Bit 3 = Open Bit 4 = Retry open Bit 5 = Unused Bit 6 = Phase Switch Failure Bit 7 = Pack Failure or Harmonics Bit 8 = Cap Switch Failure Bit 9 = Unused Bit 10 = Reverse Operation Bit 11 = Retry done Bit 12 = Reverse open done Bit 13 = Reverse close done Bit 14 = NC Block Bit 15 = NC Lockout				

Table 2 – Control Status (11 of 16)

	CONTROL STATUS									
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION					
1724					Cap Alarm Bit status Bit 0 = Maximum Voltage limit Bit 1 = Minimum Voltage limit Bit 2 = Remote Over Voltage limit Bit 2 = Remote Under Voltage limit Bit 3 = Remote Under Voltage limit Bit 4 = Bank/Switch failed L2 Bit 5 = Bank/Switch failed L1 Bit 6 = Resettable Counter limit Bit 7 = Daily Op Counter limit Bit 7 = Daily Op Counter limit Bit 8 = Comm Block Bit 9 = Self Test Bit 10 = Voltage Harmonics Bit 11 = Current Harmonics Bit 12 = Unused (internal) Bit 13 = Delta voltage Alarm					
1725	1	_		0-7/1	Bank Switch Status: ON/OFF Bit 0 = Phase A Bit 1 = Phase B Bit 2 = Phase C Bit 3 = Intrusion detection switch Bit 4-15 = Unused					
1726	1000	_	_	_	Power factor (-) = Lead (+) = Lag					
1727	See 1728	See 1728	_	_	Real Power (Primary Watts)					
1728	_	_	_	-	Real Power Unit 0 = Watts (scale factor 10) 1 = KW (scale factor 10) 2 = MW (scale factor 100)					
1729	See 1730	See 1730	_	-	Reactive Power (Primary Vars)					
1730	_	_	_	-	Reactive Power Unit 0 = VArs (scale factor 10) 1 = KVAr (scale factor 10) 2 = MVAr (scale factor 100)					
1731	See 1732	See 1732	_	_	Apparent Power (Primary VA)					
1732	_	_	_	_	Apparent Power Unit 0 = VA (scale factor 10) 1 = KVA (scale factor 10) 2 = MVA (scale factor 100)					

Table 2 – Control Status (12 of 16)

CONTROL STATUS									
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION				
1733	_	_	Rd only	0-15	CBEMA Event Pickup Status Phase A Bit 0 = Event 1 Bit 1 = Event 2 Bit 2 = Event 3 Bit 3 = Event 4				
1734	-	-	Rd only	0-10000	CBEMA Event 1 Counter Phase A				
1735	—	_	Rd only	0-10000	CBEMA Event 2 Counter Phase A				
1736	_	_	Rd only	0-10000	CBEMA Event 3 Counter Phase A				
1737	_	_	Rd only	0-10000	CBEMA Event 4 Counter Phase A				
1738	_	_	Rd only	0-15	CBEMA Event Pickup Status Phase B Bit 0 = Event 1 Bit 1 = Event 2 Bit 2 = Event 3 Bit 3 = Event 4				
1739	_	_	Rd only	0-10000	CBEMA Event 1 Counter Phase B				
1740	_	_	Rd only	0-10000	CBEMA Event 2 Counter Phase B				
1741	_	_	Rd only	0-10000	CBEMA Event 3 Counter Phase B				
1742	_	_	Rd only	0-10000	CBEMA Event 4 Counter Phase B				
1743	_	_	Rd only	0-15	CBEMA Event Pickup Status Phase C Bit 0 = Event 1 Bit 1 = Event 2 Bit 2 = Event 3 Bit 3 = Event 4				
1744	_	_	Rd only	0-10000	CBEMA Event 1 Counter Phase C				
1745	_	_	Rd only	0-10000	CBEMA Event 2 Counter Phase C				
1746	_	_	Rd only	0-10000	CBEMA Event 3 Counter Phase C				
1747	_	_	Rd only	0-10000	CBEMA Event 4 Counter Phase C				
1748	1	А	Rd only	0-65535	Phase A Over Current Average				
1749	1	А	Rd only	0-65535	Phase A Over Current Max				
1750	1	А	Rd only	0-65535	Phase B Over Current Average				
1751	1	А	Rd only	0-65535	Phase B Over Current Max				
1752	1	А	Rd only	0-65535	Phase C Over Current Average				
1753	1	A	Rd only	0-65535	Phase C Over Current Max				

Table 2 – Control Status (13 of 16)

CONTROL STATUS									
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION				
1754	1	-	Rd only	0-0x07	Phase Over Current Events 0 = inactive 1 = active Bit 0 = Phase A OC Event Bit 1 = Phase B OC Event				
1755	1	-	Rd only	0-0x0fff	Bit 2 = Phase C OC Event         Harmonics Alarm         0 = inactive         1 = active         Bit 0 = Voltage Harmonics Alarm A         Bit 1 = Voltage Harmonics Alarm B         Bit 2 = Voltage Harmonics Alarm C         Bit 3 = Current Harmonics Alarm A         Bit 4 = Current Harmonics Alarm B         Bit 5 = Current Harmonics Alarm C         Bit 6-11 = internal use         Bit 12-15 = future use         Image: Note: Harmonics alarms should be enabled in order to use individual alarms				
1756			Rd only	0-65535	Phase Overcurrent Event Counter A				
1757			Rd only	0-65535	Phase Overcurrent Event Counter B				
1758	_	-	Rd only	0-65535	Phase Overcurrent Event Counter C				
		Register	s 1759 – 17	61 Used During Sinc	gle Pole Switching				
1759	100	Volts	-	-	Fwd Delta voltage Phase A				
1760	100	Volts	-	-	Fwd Delta voltage Phase B				
1761	100	Volts		_	Fwd Delta voltage Phase C				
1791	100	Volts			Reverse Delta Voltage Gang Mode				
1792	100	Volts		_	Reverse Delta Voltage Phase A				
1793	100	Volts		_	Reverse Delta Voltage Phase B				
1794	100	Volts		_	Reverse Delta Voltage Phase C				
1795	1	-	-	_	Cap Alarm Bit Status MSB Bit 0 = Leading VAr alarm Bit 1 = Lagging VAr alarm Bit 2 = Leading PF alarm Bit 3 = Lagging PF alarm				

Table 2 – Control Status (14 of 16)

CONTROL STATUS										
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION					
1822	1	_	_	0-65535	Bit Status Phase A Bit 0 = Maximum Voltage Limit Bit 1 = Minimum Voltage Limit Bit 2 = Remote Overvoltage Limit Bit 3 = Remote Under voltage Limit Bit 4 = Resettable Counter Limit Bit 5 = Daily Operation Counter Limit Bit 9 = Predictive Block Close Bit 10 = Predictive Block open Bit 11 = Block Close with Hysteresis Bit 12 = Block Open with Hysteresis Bit 13 = Delta Voltage Alarm					
1823	1	_	_	0-65535	Bit Status Phase B Bit 0 = Maximum Voltage Limit Bit 1 = Minimum Voltage Limit Bit 2 = Remote Overvoltage Limit Bit 3 = Remote Under voltage Limit Bit 4 = Resettable Counter Limit Bit 5 = Daily Operation Counter Limit Bit 9 = Predictive Block Close Bit 10 = Predictive Block open Bit 11 = Block Close with Hysteresis Bit 12 = Block Open with Hysteresis Bit 13 = Delta Voltage Alarm					
1824	1	_	_	0-65535	Bit Status Phase C Bit 0 = Maximum Voltage Limit Bit 1 = Minimum Voltage Limit Bit 2 = Remote Overvoltage Limit Bit 3 = Remote Under voltage Limit Bit 4 = Resettable Counter Limit Bit 5 = Daily Operation Counter Limit Bit 9 = Predictive Block Close Bit 10 = Predictive Block open Bit 11 = Block Close with Hysteresis Bit 12 = Block Open with Hysteresis Bit 13 = Delta Voltage Alarm					
1829	1	_	_	_	Number Output contacts 0 = Two output contact control 1 = Six output contact control					
4000										
1860	10	Degrees	Rd Only	0.0-360.0	Phase Angle A Current					
1861	10	Degrees	Rd Only	0.0-360.0	Phase Angle B Current					
1862	10	Degrees	Rd Only	0.0-360.0	Phase Angle C Current					
1863	10	Degrees	Rd Only	0.0-360.0	Phase Angle A Voltage					

Table 2 – Control Status (15 of 16)

CONTROL STATUS										
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION					
1864	10	Degrees	Rd Only	0.0-360.0	Phase Angle B Voltage					
1865	10	Degrees	Rd Only	0.0-360.0	Phase Angle C Voltage					
1866	10	Degrees	Rd Only	0.0-360.0	Neutral Current Angle					
1867	1000 or 10	KV	Rd Only	0-65535	Primary Line Voltage AB Sensor 10 V / 20 V (Scale factor 1000) Sensor 120 V (Scale factor 10)					
1868	1000 or 10	KV	Rd Only	0-65535	Primary Line Voltage BC Sensor 10 V / 20 V (Scale factor 1000) Sensor 120 V (Scale factor 10)					
1869	1000 or 10	KV	Rd Only	0-65535	Primary Line Voltage AC Sensor 10 V / 20 V (Scale factor 1000) Sensor 120 V (Scale factor 10)					
9000	10	-	Rd only	_	Temperature					

Table 2 – Control Status (16 of 16)

-										
TIME CLOCK										
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION					
2700	1	Sec	W	0-59/1	Present time Seconds					
2701	1	Min	W	0-59/1	Present time minutes					
2702	1	Hours	W	0-23/1	Present time hours					
2703	1	_	_	_	Not used					
2704	1	Day of Month	W	1-31/1	Present time day of month					
2705	1	Month	W	1-12/1	Present time month 1 = Jan.					
2706	1	Year	W	0-38/1	Present time year					

Table 3 – Time Clock - M-2001C Format

TIME CLOCK 32 Bit Timestamp Format										
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION					
2800	1	Sec	W	0-65535	Present time LSB					
2801	1	Sec	W	0-65535	Present time MSB					

Table 4 – Time Clock 32 Bit Timestamp Format

			CONF	GURATION	
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION
1000	1	_	W	0-2/1	Override Mode 0 = No Override 1 = Temperature Override 2 = Time Override
1001	1	_	W	0-65535/1	Start Time (LSB) (Time Override)
1002	1	_	W	0-65535/1	Start Time (MSB) (Time Override)
1003	10	_	W	0-240/1	Duration In Hours (Time Override)
1004	1	_	W	0-1/1	Operation (Time Override) 0 = Daily 1 = Weekly
1006	1	_	W	0-0x7f/1	Weekdays Selection (Time Override) Bit 0 = Sunday Bit 1 = Monday Bit 2 = Tuesday Bit 3 = Wednesday Bit 4 = Thursday Bit 5 = Friday Bit 6 = Saturday
1007	1	_	W	1-10000/1	Overcurrence Count (Time Override)
1009	10	_	W	-400-1850	Temperature Limit in FAHRENHEIT (above op) -> If Writing (Temperature Override) <b>NOTE:</b> Reading this register will return the temperature limit with no indication of the unit. Register 1014 indicates the temperature unit.
1010	1	-	W	0-2/1	Above Operation (Temperature Override) 0 = No Operation 1 = Close Operation 2 = Open Operation
1011	1	_	W	0-2/1	Below Operation (Temperature Override) 0 = No Operation 1 = Close Operation 2 = Open Operation

			CONF	IGURATION	
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION
1012	1	_	W	0-2/1	Mode of Occurrence (Time Override) 0 = No End Date 1 = End After
1013	10	_	W	-400-850	Temperature Limit in CELSIUS (above op) -> If Writing (Temperature Override) <b>NOTE:</b> Reading this register will return the temperature limit with no indication of the unit. Register 1014 indicates the temperature unit.
1014	1	_	W	0-1/1	Temperature Unit (Temperature Override) 0 = CELSIUS 1 = FAHRENHEIT
1015	10	_	W	-400-850	Override Temperature Mode Limit Celsius (below op) -> If Writing (Temperature Override) <b>NOTE:</b> Reading this register will return the temperature limit with no indication of the unit. Register 1014 indicates the temperature unit.
1016	10	_	W	-400-1850	Override Temperature Mode Limit Fahrenheit (below op) -> If Writing (Temperature Override) <b>NOTE:</b> Reading this register will return the temperature limit with no indication of the unit. Register 1014 indicates the temperature unit.
1017	1	_	W	0-65535/1	Season 2 Start time (LSB) (Time Override)
1018	1	_	W	0-65535/1	Season 2 Start time (MSB) (Time Override)
1019	1	_	W	0-1/1	Season 2 Operation (Time Override) 0 = Do Open 1 = Do Close
1020	1	_	W	1-10000/1	Season 2 Occurrence Count (Time Override)

Table 5 – Configuration (2 of 19)

			CONF	IGURATION							
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION						
	PROFILE OVERRIDE FUNCTIONS										
1021	1	-	W	0-2/1	Override mode (Profile 1) 0 = No Override 1 = Temperature Override 2 = Time Override						
1022	1	_	W	0-65535/1	Start time (LSB) (Profile 1) (Time Override)						
1023	1	_	W	0-65535/1	Start time (MSB) (Profile 1) (Time Override)						
1024	10	_	W	0-240/1	Duration in Hours (Profile 1) (Time Override)						
1025	1	_	W	0-1/1	Operation (Profile 1) (Time Override) 0 = Do Open 1 = Do Close						
1026	1	_	W	0-1/1	Recurrence (Profile 1) (Time Override) 0 = Daily 1 = Weekly						
1027	1	_	W	0-0x7f/1	Week days selection (Profile 1) (Time Override) Bit 0 = Sunday Bit 1 = Monday Bit 2 = Tuesday Bit 3 = Wednesday Bit 4 = Thursday Bit 5 = Friday Bit 6 = Saturday						
1028	1	_	W	1-10000/1	Occurrence Count (Profile 1) (Time Override)						
1029	10	_	W	-400-1850	Temperature Limit in FAHRENHEIT(above op) (Profile 1) -> if writing (Temperature Override) <b>NOTE:</b> Reading this register will return the temperature limit with no indication of the unit. Register 1014 indicates the temperature unit.						
1030	1	_	W	0-2/1	Above Operation (Profile 1) (Temperature Override) 0 = No Operation 1 = Close Operation 2 = Open Operation						

Table 5 – Configuration (3 of 19)

CONFIGURATION								
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION			
1031	1	_	W	0-2/1	Below Operation (Profile 1) (Temperature Override) 0 = No Operation 1 = Close Operation 2 = Open Operation			
1032	1	_	W	0-1/1	Mode of Occurrence (Profile 1) (Time Override) 0 = No End date 1 = End after			
1033	10	_	W	-400-850	Temperature Limit in CELSIUS (above op) (Profile 1) -> if writing (Temperature Override) <b>NOTE:</b> Reading this register will return the temperature limit with no indication of the unit. Register 1014 indicates the temperature unit.			
1034	10	_	W	-400-850	Override Temperature Mode Limit Celsius (Below Op) (Profile 1) -> if writing (Temperature Override) <b>NOTE:</b> Reading this register will return the temperature limit with no indication of the unit. Register 1014 indicates the temperature unit.			
1035	10	_	W	-400-1850	Override Temperature Mode Limit Fahrenheit (Below Op) (Profile 1) -> if writing (Temperature Override) <b>NOTE:</b> Reading this register will return the temperature limit with no indication of the unit. Register 1014 indicates the temperature unit.			
1036-1050	-	_	_	_	Profile 2 Override Functions <b>NOTE:</b> Profile 2 through Profile 8 Overrides have same order of points as Profile 1 Overrides listed above			
1051-1065	-	-	_	_	Profile 3 Override Functions			
1066-1080	_	-	-	-	Profile 4 Override Functions			
1081-1095	_	-	-	_	Profile 5 Override Functions			
1096-1110	_	—	-	_	Profile 6 Override Functions			
1111-1125	_	-	_	-	Profile 7 Override Functions			
1126-1140	_	-	-	-	Profile 8 Override Functions			

Table 5 – Configuration (4 of 19)

			CONF	IGURATION							
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION						
	ENHANCED TIME OVERRIDE ADDITIONS										
1171	1	-	W	0-65535/1	Start time 2 (LSB) (Profile 1) (Time Override)						
1172	1	-	W	0-65535/1	Start time 2 (MSB) (Profile 1) (Time Override)						
1173	10	-	W	0-240/1	Duration 2 in Hours (Profile 1) (Time Override)						
1174	1	-	W	0-1/1	Operation 2 (Profile 1) (Time Override) 0 = Do Open 1 = Do Close						
1175	1	-	W	0-65535/1	Override End time (LSB) (Profile 1) (Time Override)						
1176	1	-	W	0-65535/1	Override End time (MSB) (Profile 1) (Time Override)						
1177-1182	_	_	-	_	Profile 2 Enhanced Time Override Additions <b>NOTE:</b> Profile 2 through Profile 8 Enhanced Time Override Additions follow the same order of points as Profile 1 Enhanced Time Override Additions listed above.						
1183-1188	_	_			Profile 3 Enhanced Time Override Additions						
1189-1194		_			Profile 4 Enhanced Time Override Additions						
1195-1200		_			Profile 5 Enhanced Time Override Additions						
1201-1206		_			Profile 6 Enhanced Time Override Additions						
1207-1212		_			Profile 7 Enhanced Time Override Additions						
1213-1218		_			Profile 8 Enhanced Time Override Additions						
			F	PROFILES							
3038	10	Volts	W	950-1400/1	Control Open voltage (Profile 1)						
3039	10	Volts	W	950-1400/1	Control Close voltage (Profile 1)						
3040	1	Sec	W	0-600/1	Close Def/Inv time (Profile 1) (Auto control mode)						
3041	1	Sec	W	0-600/1	Open Def/Inv time (Profile 1) (Auto control mode)						
3042	1	-	W	0-7/1	Control mode limits (Profile 1) Enable/Disable 000 = Disable All bit 0 = Enable in Auto bit 1 = Enable in Manual bit 2 = Enable in Remote						
3043	10	Volts	W	950-1400/1	Maximum voltage limit (Profile 1)						

 Table 5 – Configuration (5 of 19)

			CONF	GURATION	
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION
3044	10	Volts	W	950-1400/1	Minimum voltage limit (Profile 1)
3045	1	Sec	W	0-60/1	Definite Time (Profile 1) (Control Mode limits)
3046	1	_	W	0-1/1	Remote control mode (Profile 1) Enable/Disable 0 = Disable 1 = Enable
3047	10	V	W	950-1400/1	Over voltage limit (Profile 1) (Remote control mode)
3048	10	V	W	950-1400/1	Under voltage limit (Profile 1) (Remote control mode)
3049	1	Sec	W	0-600/1	Def/Inv voltage limits timer (Profile 1) (Remote control mode)
3050	1	_	W	0 - 1/1	Time Delay Selection (Profile 1) (Auto control mode) 0 = Definite Time 1 = Inverse time
3051	1	_	W	0-1/1	Basic Timer Type (Profile 1) (Auto control mode) 0 = Integrating 1 = Instant Reset
3052	1	_	W	0-1/1	Time Delay Selection (Profile 1) (Remote control mode) 0 = Definite Time 1 = Inverse time
3053	1	_	W	0-1/1	Basic Timer Type (Profile 1) (Remote control mode) 0 = Integrating 1 = Instant Reset
3054	1	_	W	0-2/1	Control mode select (Auto mode of operation) (Profile 1) 0 = Voltage control If (var option is selected in factory) 1 = VAr control 2 = Current Control
3055	1	%	W	-100-100/1	Open Var limit (Profile 1)
3056	1	%	W	0-100/1	Close Var limit (Profile 1)
3057	1	А	W	10-600/1	Open Current Limit (Profile 1)
3058	1	A	W	10-600/1	Close Current Limit (Profile 1)
3059	1	-	W	0-2/1	Voltage control selection (Profile 1) 0 = Classic 1 = AutoDaptive 2 = MOD668 (if enabled in factory)

Table 5 – Configuration (6 of 19)

- ``			CONF	GURATION	
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION
3060	1	_	W	0-1/1	Band Center selection (Profile 1) 0 = Fixed 1 = Average
3061	10	Volts	W	1000-1350/1	Fixed Voltage Band center (Profile 1)
3062	10	—	W	10-20/1	Bandwidth multiplier (Profile 1)
3063	1	sec	W	60-3600/1	Close Inverse time (Profile 1)
3064	1	sec	W	60-3600/1	Open Inverse time (Profile 1)
3065	10	Volts	W	1000-1350/1	Preferred Band Center (Profile 1)
3066	10	Volts	W	0-50/1	Voltage Deadband (Profile 1)
3067	10	_	W	2-100/1	Delta V Divisor (M) (Profile 1)
3068	1	sec	W	10-1200/1	Maximum Time Delay (Profile 1)
3069	1	_	W	0-1/1	Basic Timer Type (Auto-Adaptive MOD668) (Profile 1) 0 = Integrating 1 = Instant
3070	1	sec	W	1-600/1	Minimum Time Delay (Profile 1)
3071	1	_	W	2-30/1	Delta V Operations to Average (Profile 1)
3072	1	Days	W	1-365/1	Number of Consecutive Days without bank Operation (Profile 1)
3073	1	KVAR	W	75-4800/1	Three Phase Base KVAR (Profile 1)
3074	10	Volts	W	10-150/1	Maximum Delta Voltage (Profile 1)
3075	10	Volts	W	4-50/1	Minimum Delta Voltage (Profile 1)
3076-3113	_	_	W	_	Profile 2 Setpoints <b>NOTE:</b> Profile 2 through Profile 8 have same order of points as Profile 1 listed above
3114-3151	_	_	W	_	Profile 3 Setpoints
3152-3189	—	_	W	_	Profile 4 Setpoints
3190-3227	_	_	W	_	Profile 5 Setpoints
3228-3265	_	_	W	_	Profile 6 Setpoints
3266-3303	_	_	W	_	Profile 7 Setpoints
3304-3341	_	-	W	_	Profile 8 Setpoints
			PRC	FILE NAMES	
3342-3357	_	—	W	0-255	Profile 1 Name (16 chars)
3358-3373	_	-	W	0-255	Profile 2 Name (16 chars)

Table 5 – Configuration (7 of 19)

			CONF	GURATION	
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION
3374-3389	-	-	W	0-255	Profile 3 Name (16 chars)
3390-3405	_	_	W	0-255	Profile 4 Name (16 chars)
3406-3421	_	_	W	0-255	Profile 5 Name (16 chars)
3422-3437	_	_	W	0-255	Profile 6 Name (16 chars)
3438-3453	_	_	W	0-255	Profile 7 Name (16 chars)
3454-3469	_	_	W	0-255	Profile 8 Name (16 chars)
			PROF	FILE TRIGGER	
3470	_	_	W	1-8/1	SCADA Trigger Priority
3471	_	_	W	0-255	SCADA Switch Profile
3472	1	_	W	1-8/1	Season 1 Priority
3473	1	_	W	0-255	Season 1 Switch Profile Bit 0 = Profile 1 Bit 1 = Profile 2 Bit 2 = Profile 3 Bit 3 = Profile 4 Bit 4 = Profile 5 Bit 5 = Profile 6 Bit 6 = Profile 7 Bit 7 = Profile 8
3474	1	_	W	0-65535/1	Season 1 Start Time (LSB)
3475	1	_	W	0-65535/1	Season 1 Start Time (MSB)
3476	10	Hrs	W	0-240/1	Season 1 Duration
3477	1	_	W	0-1/1	Season 1 Recurrence
3478	1	_	W	0-0x7F/1	Season 1 Week days selection Bit 0 = Sunday Bit 1 = Monday Bit 2 = Tuesday Bit 3 = Wednesday Bit 4 = Thursday Bit 5 = Friday Bit 6 = Saturday
3479	1	_	W	0-65535/1	Season 1 End Time (LSB)

Table 5 – Configuration (8 of 19)

0-65535/1

1-8/1

Season 1 End Time (MSB)

Season 2 Priority

W

W

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3480

3481

1

1

			CONF	GURATION	
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION
3482	1	_	w	0-255/1	Season 2 Switch Profile Bit 0 = Profile 1 Bit 1 = Profile 2 Bit 2 = Profile 3 Bit 3 = Profile 4 Bit 4 = Profile 5 Bit 5 = Profile 6 Bit 6 = Profile 7 Bit 7 = Profile 8
3483	1	_	W	0-65535/1	Season 2 Start Time (LSB)
3484	1	_	W	0-65535/1	Season 2 Start Time (MSB)
3485	10	Hrs	W	0-240/1	Season 2 Duration
3486	1	-	W	0-1/1	Season 2 Recurrence
3487	1	_	w	0-0x7F/1	Season 2 Week days selection Bit 0 = Sunday Bit 1 = Monday Bit 2 = Tuesday Bit 3 = Wednesday Bit 4 = Thursday Bit 5 = Friday Bit 6 = Saturday
3488	1	—	W	0-65535/1	Season 2 End Time (LSB)
3489	1	-	W	0-65535/1	Season 2 End Time (MSB)
3490	1	—	W	1-8/1	Season 3 Priority
3491	1	_	W	0-255/1	Season 3 Switch Profile Bit 0 = Profile 1 Bit 1 = Profile 2 Bit 2 = Profile 3 Bit 3 = Profile 4 Bit 4 = Profile 5 Bit 5 = Profile 6 Bit 6 = Profile 7 Bit 7 = Profile 8
3492	1	_	W	0-65535/1	Season 3 Start Time (LSB)
3493	1	_	W	0-65535/1	Season 3 Start Time (MSB)
3494	10	Hrs	W	0-240/1	Season 3 Duration
3495	1	_	W	0-1/1	Season 3 Recurrence

Table 5 – Configuration (9 of 19)

CONFIGURATION									
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION				
3496	1	_	W	0-0x7F/1	Season 3 Week days selection Bit 0 = Sunday Bit 1 = Monday Bit 2 = Tuesday Bit 3 = Wednesday Bit 4 = Thursday Bit 5 = Friday Bit 6 = Saturday				
3497	1	_	W	0-65535/1	Season 3 End Time (LSB)				
3498	1	-	W	0-65535/1	Season 3 End Time (MSB)				
3499	1	-	W	1-8/1	Season 4 Priority				
3500	1	_	W	0-255/1	Season 4 Switch Profile Bit 0 = Profile 1 Bit 1 = Profile 2 Bit 2 = Profile 3 Bit 3 = Profile 4 Bit 4 = Profile 5 Bit 5 = Profile 6 Bit 6 = Profile 7 Bit 7 = Profile 8				
3501	1	_	W	0-65535/1	Season 4 Start Time (LSB)				
3502	1	_	W	0-65535/1	Season 4 Start Time (MSB)				
3503	10	Hrs	W	0-240/1	Season 4 Duration				
3504	1	-	W	0-1/1	Season 4 Recurrence				
3505	1	_	W	0-0x7F/1	Season 4 Week days selection Bit 0 = Sunday Bit 1 = Monday Bit 2 = Tuesday Bit 3 = Wednesday Bit 4 = Thursday Bit 5 = Friday Bit 6 = Saturday				
3506	1	-	W	0-65535/1	Season 4 End Time (LSB)				
3507	1	_	W	0-65535/1	Season 4 End Time (MSB)				
3507	1	_	W	0-65535/1	Season 4 End Time (MSB)				
3508	1	_	W	1-8/1	Below Temperature Priority				
3509	1	_	W	0-255/1	Below Temperature Switch Profile				
3510	10	-	W	-400-1850/1	Below Temperature Limit in Fahrenheit				
3511	10	-	W	-400-850/1	Below Temperature Limit in Celsius				
3512	1	_	W	1-8/1	Above Temperature Priority				

Table 5 – Configuration (10 of 19)

CONFIGURATION								
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION			
3513	1	_	W	0-255/1	Above Temperature Switch Profile			
3514	10	_	W	-400-1850/1	Above Temperature Limit in Fahrenheit			
3515	10	_	W	-400-850/1	Above Temperature Limit in Celsius			
3516	1	-	W	1-8/1	Reverse Power Priority			
3517	1	-	W	0-255/1	Reverse Power Switch Profile			
3518	1	-	W	0-2/1	Reverse Power Selection 0 = No Bias 1 = Forward Bias 2 = Reverse Bias			
			DEFA	AULT PROFILE				
3519	1	-	W	0-7/1	Default Profile Selection			
	SWITCH PROFILE THROUGH SCADA							
3520	1	_	W	0-8/1	Profile Selection through SCADA (0 is for deselect current profile)			
_		OTHER P	ROFILE/C	ONFIGURATION	SETTINGS			
3701	10	Volts	W	950-1400/1	Control Open voltage			
3702	10	Volts	W	950-1400/1	Control Close voltage			
3703	1	Sec	W	0-600/1	Close Def/Inv time (Auto control mode)			
3704	1	Sec	W	0-600/1	Open Def/Inv time (Auto control mode)			
3705	1	_	W	0-7/1	Control mode limits Enable/Disable 000 = Disable All Bit 0 = Enable in Auto Bit 1 = Enable in Manual Bit 2 = Enable in Remote			
3706	10	Volts	W	950-1400/1	Maximum voltage limit			
3707	10	Volts	W	950-1400/1	Minimum voltage limit			
3708	1	Sec	W	0-60/1	Definite Time (Control Mode limits)			
3709	1	-	W	0-1/1	Remote control mode Enable/Disable 0 = Disable 1 = Enable			
3710	10	Volts	W	950-1400/1	Over voltage limit (Remote control mode)			
3711	10	Volts	W	950-1400/1	Under voltage limit (Remote control mode)			

Table 5 – Configuration (11 of 19)

CONFIGURATION										
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION					
3712	1	Sec	W	0-600/1	Def/Inv voltage limits timer (Remote control mode)					
3713	1	Sec	W	0-90/1	Close warning Delay					
3715	1	Sec	W	0-90/1	Open warning Delay					
3716	1	Sec	W	300-600/1	Re-Close Delay					
3717	1	Sec (Motor Driven) Ms (Solenoid Driven)	W	5-15/1 (Motor Driven) 5-30/1 (Motor Driven -Six output board) 50-100/1 (Solenoid Driven) 50-300/1 (Solenoid Driven -Six output board)	Close/Open pulse Duration					
3718	1	_	W	0 – 1/1	Time Delay Selection (Auto control mode) 0 = Definite Time 1 = Inverse time					
3719	1	Sec	W	0 – 1/1	Basic Timer Type (Auto control mode) 0 = Integrating 1 = Instant Reset					
3720	1	-	W	0 – 1/1	Time Delay Selection (Remote control mode) 0 = Definite Time 1 = Inverse time					
3721	1	-	W	0 – 1/1	Basic Timer Type (Remote control mode) 0 = Integrating 1 = Instant Reset					
3722	10	Volts	W	-150 – 150 /1	VT Correction Phase A					
3723	10	Х	W	1-32600/1	Future Use					
3724	10	Х	W	10-32600/1	Neutral Current multiplier					
3725	1	_	W	0-1/1	Bank/Switch Failed level2					

10-2000/1

Enable/Disable 0 = Disable 1 = Enable

Bank/Switch Failed level2

3726

10

А

W

			CONF	GURATION	
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION
3727	1	-	W	0-1/1	Bank/Switch Failed level1 Enable/Disable 0 = Disable 1 = Enable
3728	10	А	W	10-2000/1	Bank/Switch Failed level1
3729	1	Sec	W	1-300/1	Time Delay (Bank/Switch Failed levels)
3730	1	_	W	0-7/1	Action Taken (Bank/Switch Failed levels) Bit 0 = Retry Operation Bit 1 = Reverse Operation and Block Bit 2 = Reset Block
3731	1	_	W	0-1/1	Bank/Switch Status Enable/Disable 0 = Disable 1 = Enable
3732	100	А	W	10-10000/1	Bank Status Closed
3733	100	А	W	10-10000/1	Bank Status Open
3734	1	Sec	W	10-300/1	Time Delay (Bank/Switch Status)
3735	1	_	W	0-1/1	Action Taken (Bank/Switch Status) 0 = None 1 = Retry Operation
3736	1	-	W	0-1/1	Bank/Switch Status Detect Enable/Disable 0 = Disable 1 = Enable
3737	1	_	W	0-2/1	Control mode select (Auto mode of operation) 0 – Voltage control if (var option is selected in factory) 1 = VAR control 2 = Current Control
3738	1	%	W	-100-100/1	Open Var limit
3739	1	%	W	0-100/1	Close Var limit
3740	100	Х	W	100-50000/1	Phase A current multiplier
3743	1	A	W	10-600/1	Open Current Limit
3744	1	A	W	10-600/1	Close Current Limit
3745	10	Degrees	W	0-3590/1	Current Phase shift compensator A
3746	1	KVar	W	75-4800/1	Max Cap Bank Size (three phase)

Table 5 – Configuration (13 of 19)

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CONFIGURATION										
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION					
3747	1	Х	W	0-1/1	Power on open command					
3748	1	_	W	0	Reset Delta Current Gang					
3752	1	_	W	0	Voltage control selection 0 = Classic					
3753	1	_	W	0-1/1	Future Use					
3754	10	Volts	W	100-1350/1	Future Use					
3755	10	_	W	10-20/1	Future Use					
3756	1	Sec	W	60-3600/1	Future Use					
3757	1	Sec	W	60-3600/1	Future Use					
3758	1	_	W	0-1/1	Future Use					
3760	10	Volts	W	950-1400/1	Future Use					
3762	10	Volts	R	_	Future Use					
3763	10	Volts	R	_	Future Use					
3765	1	Degrees	W	0-3590/1	NC Phase Shift Compensation					
3766	1	_	W	0-1/1	Switch Type Selection 0 = Solenoid 1 = Motor					
3769	1	_	W	5-60/1	Average voltage period					
3770	10	_	W	1-32600/1	Future Use					
3771	10	_	W	1-32600/1	Future Use					
3772	1	_	W	1000-65535/1	Primary Nominal voltage					
3773	100	Х	W	100-50000/1	Phase B current multiplier					
3774	100	Х	W	100-50000/1	Phase C current multiplier					
3775	1	_	W	0-4/1	Control Phase Selection 0 = Phase A 1 = Phase B 2 = Phase C 3 = Average 4 = Single Pole switching					
3776	10	Degrees	W	0-3590/1	Current Phase shift compensator B					
3777	10	Degrees	W	0-3590/1	Current Phase shift compensator C					
3778	1	-	W	0-1/1	Voltage Loss Trip Enable/Disable 0 = Disable 1 = Enable					

Table 5 – Configuration (14 of 19)

CONFIGURATION									
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION				
3780	10	Volts	W	1000-1350/1	Future Use				
3781	10	Volts	W	0-50/1	Future Use				
3782	10	_	W	2-100/1	Future Use				
3783	1	Sec	W	10-1200/1	Future Use				
3784	1	_	W	0-1/1	Future Use				
3785	1	Sec	W	1-600/1	Future Use				
3786	1	_	W	2-30/1	Future Use				
3787	1	_	W	0-1/1	Alarm Contact Enable/Disable 0 = Disable 1 = Enable				
3788	1	Days	W	1-30/1	Future Use				
3789	1	KVAR	W	300-4800/1	Future Use				
3790	1	Sec	R	-	Future Use				
3791	1	Sec	R	-	Future Use				
3792	10	Volts	W	10-150/1	Future Use				
3793	10	Volts	W	4-50/1	Future Use				
3795	1	_	_	1-3/1	Future Use				
3797	1	_	_	0-7/1	Close Warning Delay Enable 0 = Disable 1 = Enable Bit 0 = Enable in Auto Bit 1 = Enable in Remote Bit 2 = Enable in Manual <b>NOTE:</b> The warning delay should always be enabled in manual mode. The				
3798	1	_	_	0-7/1	Open Warning Delay Enable 0 = Disable 1 = Enable Bit 0 = Enable in Auto Bit 1 = Enable in Remote Bit 2 = Enable in Manual <b>NOTE:</b> The warning delay should always be enabled in manual mode. The control automatically enables it otherwise.				
3799	1	_	W	1	Delta Voltage Alarm Reset 1 = Reset				

Table 5 – Configuration (15 of 19)

			CONF	GURATION	
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION
3800	1	_	W	1-9/1	Number of Retry Attempts
3802	1	Hrs	W	1-72/1	Block Reset Time Delay
3803	1	_	W	0-1/1	Level 2 No prior operation Enable/Disable 0 = Disable 1 = Enable
3804	1	Min	W	1-4320/1	Open and Lockout Time Delay
3805	1	_	W	0-1/1	Reset Lockout Enable/Disable 0 = Disable 1 = Enable
3806	1	Hrs	W	1-72/1	Reset Lockout Time Delay
3808	1	A	W	1-20000/1	Phase Over Current Pickup Limit
3809	1	Cycle	W	1-8160/1	Phase Over Current Time delay
3810	1	_	W	0-5/1	Input Terminal Assignment Terminal: 1 2 3 0 = A B C 1 = A C B 2 = B A C 3 = B C A 4 = C A B 5 = C B A
3811	1	_	W	0	Neutral Options (Line post sensor only) 0 = Neutral Current 1 = Neutral Voltage
3812	100	_	W	0-30000/1	Neutral Voltage Limit Level 2
3813	100	_	W	0-30000/1	Neutral Voltage Limit Level 1
3814	100	-	W	0-3000/1	Close status Neutral Voltage Limit
3815	100	_	W	0-3000/1	Open status Neutral Voltage Limit
3819	1	_	_	0-1/1	Enable/Disable External Temperature Sensor
3820	1	-	W	0-1/1	High Energy Switch 0 = Disable 1 = Enable
3824	1	_	W	0-1/1	Switch Contact Type 0 = 52a 1 = 52b
3825	1	_	W	0-7/1	Daily Operation Counter Configuration Bit 0 = Enable in Auto Bit 1 = Enable in Manual Bit 2 = Enable in Remote

Table 5 – Configuration (16 of 19)

			CONF	GURATION	
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION
3830	1	_	W	(MSB   LSB)	Phase A Voltage multiplier MSB
3831	10	_	W	0-100000/1	Phase A Voltage multiplier LSB
3832	1	_	W	(MSB   LSB)	Phase B Voltage multiplier MSB
3833	10	_	W	0-100000/1	Phase B Voltage multiplier LSB
3834	1	_	W	(MSB   LSB)	Phase C Voltage multiplier MSB
3835	10	_	W	0-100000/1	Phase C Voltage multiplier LSB
3837	1	_	W	0-1/1	Operation Counter Configuration 0 = Open or Close 1 = Close Only
3839	10	%	W	800-2000/1	Neutral Overcurrent Pickup
3840	10	%	W	200-1000/1	Neutral Undercurrent Pickup
3841	1	Seconds	W	0-3600/1	Minimum Time Between Operations
3842	1	_	W	0-1/1	Voltage THD Trip and Lockout Enable 0 = Disable 1 = Enable
3843	1	%	_	1-100/1	Voltage THD Trip Pickup
3844	1	%	_	1-100/1	Voltage THD Lockout Reset
3845	1	Seconds	_	1-3600/1	Voltage THD Trip Time Delay
3846	1	Seconds	_	1-3600/1	Voltage THD Lockout Reset Delay
3847	1	_	_	0-1/1	Current THD Trip and Lockout Enable 0 = Disable 1 = Enable
3848	1	%	_	1-100/1	Current THD Trip Pickup
3849	1	%	_	1-100/1	Current THD Lockout Reset
3850	1	Seconds	_	1-3600/1	Current THD Trip Time Delay
3851	1	Seconds	_	1-3600/1	Current THD Lockout Reset Delay
3852	1	_	_	1-5	Maximum THD Lockout/Reset Operations
3853	1	Minutes	_	5-3600	Maximum Time for THD Lockout/Reset Operations
3854	10	Volts	W	-150 – 150 /1	VT correction Phase B
3855	10	Volts	W	-150 – 150 /1	VT correction Phase C
3856	1	KVAr	_	-4800150/1	Leading VAr Alarm Limit
3857	1	KVAr	_	150-4800/1	Lagging VAr Alarm Limit

Table 5 – Configuration (17 of 19)

CONFIGURATION										
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION					
3858	1000	-	_	-990—850/1	Leading PF Alarm Limit					
3859	1000	-	_	800-980/1	Lagging PF Alarm Limit					
3860	1	sec	-	0-3600/1	VAr and PF Alarm Time Delay					
3861	1	A	_	5-150/1	Min. Current Threshold for Power Factor Alarms					
3862	1	%	-	0-100/1	Delta Voltage Offset Buffer					
3863	1	_	-	0-2/1	Emergency Control/Switch Power 0 = Phase A 1 = Phase B 2 = Phase C					
3864	1	Minutes	-	3-60/1	Emergency Voltage Loss Time Delay					
3865	1	_	_	0-1/1	Emergency mode Enable/Disable 0 = Disable 1 = Enable					
3866	1	_	_	0-1/1	Primary Power Metering Unit 0 = KILO W/VA/VAr 1 = MEGA W/VA/VAr					
3867	1	Volts	_	85-115/1	Emergency Voltage Loss Activate Level					
3868	1	Volts	-	85-120/1	Emergency Voltage Restore De-Activate Level					
3869	1	Minutes	-	1-60/1	Emergency Voltage Restore Time Delay					
3870	1	_	-	0-1	Time Override Method 0 = Classic time override 1 = Enhanced time override					
3875	1	_	W	0-5	Phase Angle Reference 0 = Phase A voltage 1 = Phase B voltage 2 = Phase C voltage 3 = Phase A Current 4 = Phase B Current 5 = Phase C Current					
9800	1	_	W	0	Reset Delta Current A					
9805	1	_	W	0	Reset Delta Current B					
9806	1	-	W	0	Reset Delta Current C					

Table 5 – Configuration (18 of 19)

			CONF	IGURATION	
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/ INCREMENT	DESCRIPTION
4718	1U	_	W	4096-65535/1	Programmable alarm relay Bit 0 = Maximum Voltage limit Bit 1 = Minimum Voltage limit Bit 2 = Remote Over Voltage limit Bit 3 = Remote Under Voltage limit Bit 4 = Magnitude Unbalance Bit 5 = Phase Unbalance Bit 6 = Resettable Counter limit Bit 7 = Daily Op Counter limit Bit 8 = Comm Block Bit 9 = Self Test Bit 10 = Voltage Harmonics Bit 11 = Current Harmonics Bit 12 = Delta Voltage Bit 13 = Voltage THD Lockout Bit 14 = Current THD Lockout Bit 15 = Leading Var alarm
4719	1U	-	W	0-7/1	Programmable alarm relay MSB Bit 0 = Lagging Var alarm Bit 1 = Leading PF alarm Bit 2 = Lagging PF alarm
4826	1	—	W	0-999/1	Operational counter preset 1000's Phase A
4827	1	_	W	0-999/1	Operational counter preset 1's Phase A
4828	1	_	W	2-99/1	Daily Operation Counter
4833	1	_	W	0-15/1	Alarm limit counter MSB
4834	1	_	W	0-65535/1	Alarm limit counter LSB
4986	1	_	_	1-2/1	Preset bank status Phase A
4987	1	_	_	1-2/1	Preset bank status Phase B
4988	1	_	_	1-2/1	Preset bank status Phase C
4993	1	_	W	0-999/1	Operational counter preset 1000's Phase B
4994	1	_	W	0-999/1	Operational counter preset 1's Phase B
4995	1	_	W	0-999/1	Operational counter preset 1000's Phase C
4996	1	_	W	0-999/1	Operational counter preset 1's Phase C

Table 5 – Configuration (19 of 19)

	HARMONICS ANALYSIS										
REGISTER	SCALE FACTOR	UNITS	W/R/M	RANGE/ INCREMENT	DESCRIPTION						
4200	10	%	Rd only	0-65535	Voltage Total Harmonic Distortion Phase A						
4201-4230	10	_	Rd only	0-65535	2nd - 31st Voltage Harmonics Phase A						
4231	10	%	Rd only	0-65535	Current Total Harmonic Distortion Phase A						
4232-4261	10	-	Rd only	0-65535	2nd - 31st Current harmonics Phase A						
4262	10	%	Rd only	0-65535	Voltage Total Harmonic Distortion Phase B						
4263-4292	10	-	Rd only	0-65535	2nd - 31st Voltage Harmonics Phase B						
4293	10	%	Rd only	0-65535	Current Total Harmonic Distortion Phase B						
4294-4323	10	-	Rd only	0-65535	2nd - 31st Current harmonics Phase B						
4324	10	%	Rd only	0-65535	Voltage Total Harmonic Distortion Phase C						
4325-4354	10	_	Rd only	0-65535	2nd - 31st Voltage Harmonics Phase C						
4355	10	%	Rd only	0-65535	Current Total Harmonic Distortion Phase C						
4356-4385	10	-	Rd only	0-65535	2nd - 31st Current harmonics Phase C						
4390	10	_	Rd only	0-65535	Fundamental Voltage Phase A						
4391	10	_	Rd only	0-65535	Fundamental Voltage Phase B						
4392	10	_	Rd only	0-65535	Fundamental Voltage Phase C						
4393	1	_	Rd only	0-65535	Fundamental Current Phase A						
4394	1	_	Rd only	0-65535	Fundamental Current Phase B						
4395	1	_	Rd only	0-65535	Fundamental Current Phase C						

### Table 6 – Harmonics Analysis

-	HARMONICS SETUP										
REGISTER	SCALE FACTOR	UNITS	W/R/M	RANGE/ INCREMENT	DESCRIPTION						
5100	1	_	W	0-65535/1	Voltage harmonics selection (MSB)Bit 0 = 18thBit 8 = 26thBit 1 = 19thBit 9 = 27thBit 2 = 20thBit 10 = 28thBit 3 = 21stBit 11 = 29thBit 4 = 22ndBit 12 = 30thBit 5 = 23rdBit 13 = 31stBit 6 = 24thBit 14 -15Bit 7 = 25th						
5101	1	_	W	0-65535/1	Voltage harmonics selection (LSB)Bit 0 = 2ndBit 8 = 10thBit 1 = 3rdBit 9 = 11thBit 2 = 4thBit 10 = 12thBit 3 = 5thBit 11 = 13thBit 4 = 6thBit 12 = 14thBit 5 = 7thBit 13 = 15thBit 6 = 8thBit 14 = 16thBit 7 = 9thBit 15 = 17th						
5102	10	%	W	0-300/1	Voltage Threshold						
5103	1	Sec	_	1-300/1	Voltage Delay						
5104	1	_	W	0-16383/1	Current harmonics selection (MSB)Bit 0 = 18thBit 8 = 26thBit 1 = 19thBit 9 = 27thBit 2 = 20thBit 10 = 28thBit 3 = 21stBit 11 = 29thBit 4 = 22ndBit 12 = 30thBit 5 = 23rdBit 13 = 31stBit 6 = 24thBit 14-15Bit 7 = 25th						
5105	1	_	W	0-65535	Current harmonics selection (LSB)Bit 0 = 2ndBit 8 = 10thBit 1 = 3rdBit 9 = 11thBit 2 = 4thBit 10 = 12thBit 3 = 5thBit 11 = 13thBit 4 = 6thBit 12 = 14thBit 5 = 7thBit 13 = 15thBit 6 = 8thBit 14 = 16thBit 7 = 9thBit 15 = 17th						
5106	1	%	W	0-100/1	Current Threshold						
5107	1	_	W	0-1	Harmonics Minimum Current Enable/Disable						
5108	10	A	W	0-1500/1	Harmonics Minimum Current Threshold						

	WAKEUP SCREEN										
REGISTER	SCALE FACTOR	UNITS	W/R/M	RANGE/ INCREMENT	DESCRIPTION						
5110	1	_	W	0-32	Wakeup screen config slot 0						
5111	1	_	W	0-32	Wakeup screen config slot 1						
5112	1	_	W	0-32	Wakeup screen config slot 2						
5113	1	_	W	0-32	Wakeup screen config slot 3						
5114	1	_	W	0-32	Wakeup screen config slot 4						
5115	1	—	W	0-32	Wakeup screen config slot 5						
5116	1	_	W	0-32	Wakeup screen config slot 6						
5117	1	—	W	0-32	Wakeup screen config slot 7						
5118	1	_	W	0-32	Wakeup screen config slot 8						
5119	1	—	W	0-32	Wakeup screen config slot 9						
5120	1	—	W	0-32	Wakeup screen config slot 10						
5121	1	—	W	0-32	Wakeup screen config slot 11						
5122	1	_	W	0-32	Wakeup screen config slot 12						
5123	1	—	W	0-32	Wakeup screen config slot 13						
5124	1	—	W	0-32	Wakeup screen config slot 14						
5125	1	—	W	0-32	Wakeup screen config slot 15						
5126	1	—	W	0-32	Wakeup screen config slot 16						
5127	1	—	W	0-32	Wakeup screen config slot 17						
5128	1	_	W	0-32	Wakeup screen config slot 18						
5129	1	_	W	0-32	Wakeup screen config slot 19						
5130	1	_	W	0-32	Wakeup screen config slot 20						
5131	1	_	W	0-32	Wakeup screen config slot 21						
5132	1	_	W	0-32	Wakeup screen config slot 22						

 ■ NOTE: The value in each slot represents the menu item that will be shown. If value is set to 0, it means this menu slot is disabled. All unused slots should be set to 0. The menu items values are shown below: For example, MODBUS registers are configured as follows: 5110 = 10, 5111 = 7, 5112 = 1, 5113 = 23, 5114 - 5141 = 0 The following menu will be shown: Power Factor Primary Watts

Local Voltage Watt Hrs Forward

all his forward

Table 8 – Wakeup Screen (1 of 2)

WAKEUP SCREEN											
REGISTER	SCALE FACTOR	UNITS	W/R/M	RANGE/ INCREMENT	DESCRIPTION						
5133	1	-	W	0-32	Wakeup screen config slot 23						
5134	1	_	W	0-32	Wakeup screen config slot 24						
5135	1	_	W	0-32	Wakeup screen config slot 25						
5136	1	_	W	0-32	Wakeup screen config slot 26						
5137	1	_	W	0-32	Wakeup screen config slot 27						
5138	1	_	W	0-32	Wakeup screen config slot 28						
5139	1	_	W	0-32	Wakeup screen config slot 29						
5140	1	_	W	0-32	Wakeup screen config slot 30						
5141	1	_	W	0-32	Wakeup screen config slot 31						

 NOTE: The value in each slot represents the menu item that will be shown. If value is set to 0, it means this menu slot is disabled. All unused slots should be set to 0. The menu items values are shown below: For example, MODBUS registers are configured as follows: 5110 = 10, 5111 = 7, 5112 = 1, 5113 = 23, 5114 - 5141 = 0 The following menu will be shown: Power Factor Primary Watts Local Voltage

Watt Hrs Forward

Table 8 – Wakeup Screen(2 of 2)

				CBEMA	
REGISTER	SCALE FACTOR	UNITS	W/R/M	RANGE/ INCREMENT	DESCRIPTION
5200	10	Volts	W	1000-1300	CBEMA Normal Voltage*
5201	1	—	W	0-1	CBEMA Event1 Enable*
5202	1	Volts	W	50-130	CBEMA Event1 Pickup*
5203	1	Volts	W	50-130	CBEMA Event1 Dropout*
5204	1	Cycles	W	1-60	CBEMA Event1 Minimum Duration*
5205	1	_	W	0-1	CBEMA Event2 Enable*
5206	1	Volts	W	50-130	CBEMA Event2 Pickup*
5207	1	Volts	W	50-130	CBEMA Event2 Dropout*
5208	1	Cycles	W	1-120	CBEMA Event2 Minimum Duration*
5209	1	_	W	0-1	CBEMA Event3 Enable*
5210	1	Volts	W	50-130	CBEMA Event3 Pickup*
5211	1	Volts	W	50-130	CBEMA Event3 Dropout*
5212	1	Cycles	W	60-60000	CBEMA Event3 Minimum Duration*
5213	1	—	W	0-1	CBEMA Event4 Enable*
5214	1	Volts	W	50-130	CBEMA Event4 Pickup*
5215	1	Volts	W	50-130	CBEMA Event4 Dropout*
5216	1	Cycles	W	1-60	CBEMA Event4 Minimum Duration*
5217	1	_	W	1	Reset CBEMA Counters
5233	1	_	W	1	Reset Phase Overcurrent Counter
5234	1	—	W	1	Clear Peak Phase Overcurrent Parameters

\* - CBEMA Settings have the following rules: Dropout should always be greater than pickup in the sag condition Dropout is fixed to 100 in the swell condition

	RESETTABLE COUNTERS											
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCRE- MENT	DESCRIPTION							
5703	1U	_	R	_	Resettable operation counter (least significant word) Write 1 => Reset							
5704	1U	_	R	_	Resettable operation counter (most significant word) Note: reset of either 5703 or 5704 will clear entire operation counter) Write 1 => Reset							

Table 10 – Resettable Counters

DIRECT CONTROL							
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION		
7700	1	_	W	0-1/1	Close 0 = No operation 1 = Close		
7701	1	_	W	0-1/1	Trip 0 = No operation 1 = Open		
7702	1	_	W	0-1/1	Remote control via comm 0 = Disable 1 = Enable		
7704	1	_	W	1	Reset NC Block 1 = Reset		
7705	1	-	W	1	Reset NC Lockout 1 = Reset		
7706	1	_	W	1	Reset THD Lockout 1 = Reset		
7710	1	_	W	0-1/1	Close All Phases 0 = No operation 1 = Close		
7711	1	_	W	0-1/1	Trip All Phases 0 = No operation 1 = Open		
7712	1	_	W	0-1/1	Close Phase A 0 = No operation 1 = Close		
7713	1	_	W	0-1/1	Trip Phase A 0 = No operation 1 = Open		
7714	1	_	W	0-1/1	Close Phase B 0 = No operation 1 = Close		
7715	1	_	W	0-1/1	Trip Phase B 0 = No operation 1 = Open		

Table 11 – Direct Control (1 of 2)

DIRECT CONTROL							
REGISTER	SCALE FACTOR	UNITS	ATT	RANGE/INCREMENT	DESCRIPTION		
7716	1	_	W	0-1/1	Close Phase C 0 = No operation 1 = Close		
7717	1	-	W	0-1/1	Trip Phase C 0 = No operation 1 = Open		
7718	1	_	W	1	Clear SCADA Test Mode 1 = Clear		
7719	1	_	W	1	Reset Emergency Voltage Loss Mode 1 = Reset		

Table 11 – Direct Control (2 of 2)

			DA	TA LOGGING	
REGISTER	SCALE FACTOR	UNITS	W/R/M	RANGE/ INCREMENT	DESCRIPTION
8698	1	_	Rd only	0-65535	Total Comtrade block number (MSB)
8699	1	_	Rd only	0-65535	Total Comtrade block number (LSB)
8700	1	Minutes	W	0-120/1	Log sample period 0 = No logging
8701	1	_	W	0-1023(32767)	Datalog mask Bit 0 = Voltage Bit 1 = Delta voltage Bit 2 = Frequency Bit 3 = Primary Neutral Current Bit 4 = Operation Counter Bit 5 = Resettable Counter Bit 6 = Capacitor Bank Status Bit 7 = Temperature If var option is selected in factory Bit 8 = Phase Current Bit 9 = Primary Real Power Bit 10 = Primary Reactive Power
8702	1	_	Rd only	0-1	Records status 0 = No records 1 = Records available
8703	1	_	W	1-2	Comtrade current file type: 1 = CFG 2 = DAT
8704	1	_	Rd only	0-65535	Comtrade number of registers to read
8705	1	_	Rd only	-	Total bytes for cfg or dat file (LSB word)
8706	1	_	Rd only	0-260000	Total bytes for cfg or dat file (MSB word)
8707	1	_	RW	0-65535	Current block count for cfg or dat file
8708	1	_	W	_	Clear records Write 1 clears records Read returns 0, if records are cleared Else returns 1

Data log downloading through Comtrade format:

- 1. Write 1 to modbus register 8703 to download config file (1->config, 2->dat).
- 2. Read 8704 max number for each block.
- 3. Read register 8705 & 8706 for total no of bytes (cfg or dat file) to download.
- 4. Write register 8707 for blockcount to 0 to download block 0. After successfully downloading block 0, it will automatically increment.

Table 12 – Data Logging (1 of 2)

DATA LOGGING								
REGISTER	SCALE FACTOR	UNITS	W/R/M	RANGE/ INCREMENT	DESCRIPTION			
8709	1	-	W	0-1	Data log Recorder inhiBit 0 = recorder active (running) 1 = recorder inhiBit			
8710	_	_	_	0-255	Issue a read for comtrade file downloading			

#### Data log downloading through Comtrade format:

- 1. Write 1 to modbus register 8703 to download config file (1->config, 2->dat).
- 2. Read 8704 max number for each block.
- 3. Read register 8705 & 8706 for total no of bytes (cfg or dat file) to download.
- 4. Write register 8707 for blockcount to 0 to download block 0. After successfully downloading block 0, it will automatically increment.

Table 12 – Data Logging (2 of 2)

OSCILLOGRAPH							
REGISTER	SCALE FACTOR	UNITS	W/R/M	RANGE/INCREMENT	DESCRIPTION		
8800	1	-	W	0-1	Oscillograph trigger 1 = Trigger		
8801	1	_	W	0-2/1	Index to download oscillograph 0 = Data log 1 = Oscillograph 2 = Sequence of Events		
8802	1	-	W	0-15/1	Oscillograph record index		
8803	_	_	_	0-65535	Oscillograph pickup (MSB) If var option is selected in factory Bit 0 = Current Harmonics Bit 1 = Phase Overcurrent Bit 2 = Leading VAr Bit 3 = Lagging VAr Bit 4 = Leading PF Bit 5 = Lagging PF Bit 6-15 Not used		
8804	1		W	0-65535	Oscillograph pickup (LSB) Bit 0 = Close Command Bit 1 = Open Command Bit 2 = Maximum Voltage limit Bit 3 = Minimum Voltage limit Bit 4 = Remote Overvoltage limit Bit 5 = Remote Undervoltage limit Bit 5 = Remote Undervoltage limit Bit 6 = Magnitude Unbalance Bit 7 = Phase Unbalance Bit 7 = Phase Unbalance Bit 8 = SCADA Heart Beat Bit 9 = Voltage Harmonics Bit 10 = CBEMA Event 1 Bit 11 = CBEMA Event 1 Bit 11 = CBEMA Event 2 Bit 12 = CBEMA Event 3 Bit 13 = CBEMA Event 4 Bit 14 = Delta Voltage Alarm Bit 15 = Bank Failed Level 2		

Oscillograph downloading through Comtrade format:

- Write 1 to modbus register 8801 to download datalog. Write 1 to modbus register 8703 to download config file (1->config, 2->dat).
- 2. Read 8704 max number for each block.
- 3. Read register 8705 & 8706 for total no of bytes (cfg or dat file) to download.
- 4. Write register 8707 for blockcount to 0 to download block 0. After successfully downloading block 0, it will automatically increment.
- 5. Issue a read command for register 8710 by knowing how many bytes to read.
- 6. Repeat step 5 to retrieve consecutive blocks.

Table 13 – Oscillograph (1 of 3)

OSCILLOGRAPH								
REGISTER	SCALE FACTOR	UNITS	W/R/M	RANGE/INCREMENT	DESCRIPTION			
8805	_	_	_	0-65535	Oscillograph dropout (MSB) If var option is selected in factory Bit 0 = Current Harmonics Bit 1 = Phase Overcurrent Bit 2 = Leading VAr Bit 3 = Lagging VAr Bit 4 = Leading PF Bit 5 = Lagging PF Bit 6-15 Not Used			
8806	1		W	0-65535	Oscillograph dropout (LSB) Bit 0 = Close Command Bit 1 = Open Command Bit 2 = Maximum Voltage limit Bit 3 = Minimum Voltage limit Bit 4 = Remote Overvoltage limit Bit 5 = Remote Undervoltage limit Bit 5 = Remote Undervoltage limit Bit 6 = Magnitude Unbalance Bit 7 = Phase Unbalance Bit 7 = Phase Unbalance Bit 8 = SCADA Heart Beat Bit 9 = Voltage Harmonics Bit 10 = CBEMA Event 1 Bit 11 = CBEMA Event 2 Bit 12 = CBEMA Event 2 Bit 13 = CBEMA Event 4 Bit 14 = Delta Voltage Alarm Bit 15 = Bank Failed Level 2			
8807	1	Sec	w	5-95	Delay			
8808	1	_	W	1-16	Oscillograph partition			
8809	1	-	Rd Only	0-2	Trigger status			
8810	1	-	Rd Only	0-65535	Trigger time (MSB)			
8811	1	_	Rd Only	0-65535	Trigger time (LSB)			
8812	1	_	W	0	Clear oscillograph records			

#### Oscillograph downloading through Comtrade format:

- Write 1 to modbus register 8801 to download datalog. Write 1 to modbus register 8703 to download config file (1->config, 2->dat).
- 2. Read 8704 max number for each block.
- 3. Read register 8705 & 8706 for total no of bytes (cfg or dat file) to download.
- 4. Write register 8707 for blockcount to 0 to download block 0. After successfully downloading block 0, it will automatically increment.
- 5. Issue a read command for register 8710 by knowing how many bytes to read.
- 6. Repeat step 5 to retrieve consecutive blocks.

Table 13 – Oscillograph (2 of 3)

OSCILLOGRAPH							
REGISTER	SCALE FACTOR	UNITS	W/R/M	RANGE/INCREMENT	DESCRIPTION		
8813	1	_	W	0-2	Oscillograph samples 0 = 16 samples/cycle 1 = 32 samples/cycle 2 = 64 samples/cycle		

Oscillograph downloading through Comtrade format:

- Write 1 to modbus register 8801 to download datalog. Write 1 to modbus register 8703 to download config file (1->config, 2->dat).
- 2. Read 8704 max number for each block.
- 3. Read register 8705 & 8706 for total no of bytes (cfg or dat file) to download.
- 4. Write register 8707 for blockcount to 0 to download block 0. After successfully downloading block 0, it will automatically increment.
- 5. Issue a read command for register 8710 by knowing how many bytes to read.
- 6. Repeat step 5 to retrieve consecutive blocks.

Table 13 – Oscillograph (3 of 3)

-	SEQUENCE OF EVENTS							
REGISTER	SCALE FACTOR	UNITS	W/R/M	RANGE/ INCREMENT	DESCRIPTION			
8900	1	_	W	0-65535	OR Gate pickup (MSB) If var option is selected in factory Bit 0 = Current Harmonics Bit 1 = Phase Overcurrent Bit 2 = HMI Active Bit 3 = Leading VAr Bit 4 = Lagging VAr Bit 5 = Leading PF Bit 6 = Lagging PF Bit 7-15 Not used			
8901	1	_	W	0-65535	OR Gate Pickup (LSB) Bit 0 = Close Command Bit 1 = Open Command Bit 2 = Maximum Voltage limit Bit 3 = Minimum Voltage limit Bit 4 = Remote Overvoltage limit Bit 5 = Remote Undervoltage limit Bit 5 = Remote Undervoltage limit Bit 6 = Magnitude Unbalance Bit 7 = Phase Unbalance Bit 7 = Phase Unbalance Bit 8 = SCADA Heart Beat Bit 9 = Voltage Harmonics Bit 10 = CBEMA Event 1 Bit 11 = CBEMA Event 2 Bit 12 = CBEMA Event 3 Bit 13 = CBEMA Event 4 Bit 14 = Delta Voltage Alarm Bit 15 = Bank Failed Level 2			

- Write 2 to modbus register 8801 to download datalog. Write 1 to modbus register 8703 to download config file (1->config, 2->dat).
- 2. Read 8704 max number for each block.
- 3. Read register 8705 & 8706 for total no of bytes (cfg or dat file) to download.
- 4. Write register 8707 for blockcount to 0 to download block 0. After successfully downloading block 0, it will automatically increment.
- 5. Issue a read command for register 8710 by knowing how many bytes to read.
- 6. Repeat step 5 to retrieve consecutive blocks.

 Table 14 – Sequence of Events (1 of 4)

SEQUENCE OF EVENTS							
REGISTER	SCALE FACTOR	UNITS	W/R/M	RANGE/ INCREMENT	DESCRIPTION		
8902	1		W	0-65535	OR Gate Dropout (MSB) If var option is selected in factory Bit 0 = Current Harmonics Bit 1 = Phase Overcurrent Bit 2 = HMI Active Bit 3 = Leading VAr Bit 4 = Lagging VAr Bit 5 = Leading PF Bit 6 = Lagging PF Bit 7-15 Not used		
8903	1		W	0-65535	OR Gate Dropout (LSB) Bit 0 = Close Command Bit 1 = Open Command Bit 2 = Maximum Voltage limit Bit 3 = Minimum Voltage limit Bit 4 = Remote Overvoltage limit Bit 5 = Remote Undervoltage limit Bit 5 = Remote Undervoltage limit Bit 6 = Magnitude Unbalance Bit 7 = Phase Unbalance Bit 7 = Phase Unbalance Bit 8 = SCADA Heart Beat Bit 9 = Voltage Harmonics Bit 10 = CBEMA Event 1 Bit 11 = CBEMA Event 2 Bit 12 = CBEMA Event 3 Bit 13 = CBEMA Event 4 Bit 14 = Delta Voltage Alarm Bit 15 = Bank Failed Level 2		
8904	1	_	W	0-65535	AND Gate Pickup (MSB) If var option is selected in factory Bit 0 = Current Harmonics Bit 1 = Phase Overcurrent Bit 2 = HMI Active Bit 3 = Leading VAr Bit 4 = Lagging VAr Bit 5 = Leading PF Bit 6 = Lagging PF Bit 7-15 Not used		

- Write 2 to modbus register 8801 to download datalog. Write 1 to modbus register 8703 to download config file (1->config, 2->dat).
- 2. Read 8704 max number for each block.
- 3. Read register 8705 & 8706 for total no of bytes (cfg or dat file) to download.
- 4. Write register 8707 for blockcount to 0 to download block 0. After successfully downloading block 0, it will automatically increment.
- 5. Issue a read command for register 8710 by knowing how many bytes to read.
- 6. Repeat step 5 to retrieve consecutive blocks.

Table 14 – Sequence of Events (2 of 4)

REGISTER	SCALE FACTOR	UNITS	W/R/M	RANGE/ INCREMENT	DESCRIPTION				
8905	1	_	W	0-65535	AND Gate Pickup (LSB) Bit 0 = Close Command Bit 1 = Open Command Bit 2 = Maximum Voltage limit Bit 3 = Minimum Voltage limit Bit 4 = Remote Overvoltage limit Bit 5 = Remote Undervoltage limit Bit 6 = Magnitude Unbalance Bit 7 = Phase Unbalance Bit 8 = SCADA Heart Beat Bit 9 = Voltage Harmonics Bit 10 = CBEMA Event 1 Bit 11 = CBEMA Event 2 Bit 12 = CBEMA Event 3 Bit 13 = CBEMA Event 4 Bit 14 = Delta Voltage Alarm Bit 15 = Bank Failed Level 2				
8906	1	_	W	0-65535	AND Gate dropout (MSB) If var option is selected in factory Bit 0 = Current Harmonics Bit 1 = Phase Overcurrent Bit 2 = HMI Active Bit 3 = Leading VAr Bit 4 = Lagging VAr Bit 5 = Leading PF Bit 6 = Lagging PF Bit 7-15 Not used				

- Write 2 to modbus register 8801 to download datalog. Write 1 to modbus register 8703 to download config file (1->config, 2->dat).
- 2. Read 8704 max number for each block.
- 3. Read register 8705 & 8706 for total no of bytes (cfg or dat file) to download.
- 4. Write register 8707 for blockcount to 0 to download block 0. After successfully downloading block 0, it will automatically increment.
- 5. Issue a read command for register 8710 by knowing how many bytes to read.
- 6. Repeat step 5 to retrieve consecutive blocks.

 Table 14 – Sequence of Events (3 of 4)

-	SEQUENCE OF EVENTS								
REGISTER	SCALE FACTOR	UNITS	W/R/M	RANGE/ INCREMENT	DESCRIPTION				
8907	1	_	W	0-65535	AND Gate Dropout (LSB) Bit 0 = Close Command Bit 1 = Open Command Bit 2 = Maximum Voltage limit Bit 3 = Minimum Voltage limit Bit 4 = Remote Overvoltage limit Bit 5 = Remote Undervoltage limit Bit 5 = Remote Undervoltage limit Bit 6 = Magnitude Unbalance Bit 7 = Phase Unbalance Bit 7 = Phase Unbalance Bit 8 = SCADA Heart Beat Bit 9 = Voltage Harmonics Bit 10 = CBEMA Event 1 Bit 11 = CBEMA Event 2 Bit 12 = CBEMA Event 3 Bit 13 = CBEMA Event 4 Bit 14 = Delta Voltage Alarm Bit 15 = Bank Failed Level 2				
8908	1	_	W	0-1	Gate config 0 = OR Gate 1 = AND Gate				
8909	1	_	W	0	Clear sequence of events				
8910	1	_	W	0-1	Trigger sequence of events				

- Write 2 to modbus register 8801 to download datalog. Write 1 to modbus register 8703 to download config file (1->config, 2->dat).
- 2. Read 8704 max number for each block.
- 3. Read register 8705 & 8706 for total no of bytes (cfg or dat file) to download.
- 4. Write register 8707 for blockcount to 0 to download block 0. After successfully downloading block 0, it will automatically increment.
- 5. Issue a read command for register 8710 by knowing how many bytes to read.
- 6. Repeat step 5 to retrieve consecutive blocks.

Table 14 – Sequence of Events (4 of 4)

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