INSTRUCTION MANUAL

FOR

CURRENT DIFFERENTIAL SYSTEM BE1-CDS240

MODBUS® PROTOCOL

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INTRODUCTION

This instruction manual provides detailed information about the BE1-CDS240 Current Differential System with the Modbus® Protocol.

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It is not the intention of this manual to cover all details and variations in equipment, nor does this manual provide data for every possible contingency regarding installation or operation. The availability and design of all features and options are subject to modification without notice. Should further information be required, contact Basler Electric.

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REVISION HISTORY

The following information provides a historical summary of the changes made to this instruction manual (9365200992). Revisions are listed in reverse chronological order.

Manual Revision and Date	Change
F, 07/17	• Added caution box about nonvolatile memory in Section 1.
E, 07/12	• Added registers 40585 and 40586 for 87ND/187ND restraint type.
D, 03/12	• Added register 41053 for Power Flow Polarity in Section 2. • Changed the following registers in Section 3: o Fault Targets 1st register from 47975 to 47976. o Fault Targets 2nd register from 47976 to 47975. o Fault Targets 3rd register from 47977 to 47978. o Fault Targets 4th register from 47978 to 47977. o Fault Targets 5th register from 47979 to 47980. o Fault Targets 6th register from 47980 to 47979. • Added “<polarity>” field to SG-VTP and added 41053 to its list of registers in Section 4.
C, 11/11	• Changed register 47513 to 47965 and 47512 to 47964 under *Data Formats, Fault Summary Registers.* • Changed register 47973 as follows: o “Bit 1 for Pickup” to “Bit 1 for Trip” o “Bit 2 for Trip” to “Bit 2 for Logic” o “Bit 3 for Logic” to “Bit 3 for Pickup”
B, 03/08	• Added manual part number and revision to footers.
A, 10/06	• Added registers 41049, 41050, 41051, and 41052 for TX 180 Compensation CKT # 1-4. • Added registers 40581-82 59X Pickup. • Added registers 40583-84 59X Time Delay. • Added registers 45353 59X Logic Mode. • Added registers 45354-65 59X Block Logic Mask. • Added registers 45366-67 59X Block Logic Term. • Added 59X to system status bits and targets list.
—, 03/04	• Initial release.

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SECTION 1 • GENERAL INFORMATION

Introduction

This document describes the Modbus® communications protocol employed by BE1-CDS240 relays and how to exchange information with BE1-CDS240 relays over a Modbus network. The BE1-CDS240 communicates by emulating a subset of the Modicon 984 Programmable Controller.

CAUTION

This product contains one or more *nonvolatile memory* devices. Nonvolatile memory is used to store information (such as settings) that needs to be preserved when the product is power-cycled or otherwise restarted. Established nonvolatile memory technologies have a physical limit on the number of times they can be erased and written. In this product, the limit is 100,000 erase/write cycles. During product application, consideration should be given to communications, logic, and other factors that may cause frequent/repeated writes of settings or other information that is retained by the product. Applications that result in such frequent/repeated writes may reduce the useable product life and result in loss of information and/or product inoperability.

Functional Description

Modbus communications use a master-slave technique in which only the master can initiate a transaction. This transaction is called a query. When appropriate, a slave (BE1-CDS240) responds to the query. When a Modbus master communicates with a slave, information is provided or requested by the master. Information residing in the BE1-CDS240 is grouped categorically as follows:

- Session Parameters
- Global Parameters
- Control Parameters (Select Before Operate)
- Setting Parameters
- Report Parameters
- Metering Parameters

All supported data can be read as specified in the register table. Abbreviations are used in the *Register Table* to indicate the register type. Register types are:

- Read/Write = RW
- Read Only = R –

Select Before Operate (SBO) functions are used to change active settings groups and control outputs. There are two settings groups in the BE1-CDS240, one of which may be selected as active using SBO commands.

When a slave receives a query, the slave responds by either supplying the requested data to the master or performing the requested action. A slave device never initiates communications on the Modbus and will always generate a response to the query unless certain error conditions occur. The BE1-CDS240 is designed to communicate on the Modbus only as a slave device.

A master can query slaves individually or universally. A universal (“broadcast”) query, when allowed, evokes no response from any slave device. If a query to an individual slave device requests actions unable to be performed by the slave, the slave response message contains an exception response code defining the error detected. Exception response codes are quite often enhanced by the information found in the “Error Details” block of holding registers.

Message Structure

Master initiated queries and BE1-CDS240 responses share the same message structure. Each message is comprised of four message fields. They are:

- Device Address (1 byte)
- Function Code (1 byte)
- Data Block (n bytes)
- Error Check field (2 bytes)

Device Address Field

The device address field contains the unique Modbus address of the slave being queried. The addressed slave repeats the address in the device address field of the response message. This field is 1 byte.

Although Modbus protocol limits a device address from 1 - 247, a BE1-CDS240 can be assigned a device address in the range of 1 - 65534. The address is user-selectable at installation and can be altered during real-time operation.

Function Code Field

The function code field in the query message defines the action to be taken by the addressed slave. This field is echoed in the response message and is altered by setting the most significant bit (MSB) of the field to 1 if the response is an error response. This field is 1 byte.

The BE1-CDS240 maps all available data into the Modicon 984 holding register address space (4XXXX) and supports the following function codes:

- Function 03 (03 hex) - read holding registers
- Function 06 (06 hex) - preset single register (write single holding register)
- Function 08 (08 hex), subfunction 00 - diagnostics: return query data
- Function 08 (08 hex), subfunction 01 - diagnostics: restart communications option
- Function 08 (08 hex), subfunction 04 - diagnostics: force listen only mode
- Function 16 (10 hex) - preset multiple registers, non-broadcast and broadcast

Data Block Field

The query data block contains additional information needed by the slave to perform the requested function. The response data block contains data collected by the slave for the queried function. An error response will substitute an exception response code for the data block. The length of this field varies with each query. See the paragraphs on *Register Definitions* in this manual for interpretation of data.

Error Check Field

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

Serial Transmission Details

A standard Modbus network offers two transmission modes for communication: ASCII or remote terminal unit (RTU). The BE1-CDS240 supports only the RTU mode.

Each 8-bit byte in a message contains two 4-bit hexadecimal characters. The message is transmitted in a continuous stream with the LSB of each byte of data transmitted first. Transmission of each 8-bit data byte occurs with one start bit and either one or two stop bits. Parity checking is performed, when enabled, and can be either odd or even. The transmission baud rate is user-selectable and can be set at installation and altered during real-time operation. The BE1-CDS240 Modbus supported baud rates are 2400, 4800, 9600 and 19200. The factory default baud rate is 9600.

BE1-CDS240 supports both RS-232-C and RS-485 compatible serial interfaces. Both interfaces are accessible from the rear panel of the BE1-CDS240. The RS-232-C interfaces (front and rear) are configured for ASCII command mode while the RS-485 interface is configured for Modbus communication when this option is installed. The sixth character of the relay style number must be “1” for the relay to be configured for Modbus.

Message Framing and Timing Considerations

When receiving a message, the BE1-CDS240 requires an inter-byte latency of 3.5 character times before considering the message complete.

Once a valid query is received, the BE1-CDS240 waits a specified amount of time before responding. This time delay is set in the remote delay time parameter with the SG-COM ASCII command. This parameter contains a value from 10 - 200 milliseconds. The default value is 10 milliseconds.

Table 1-1 provides the response message transmission time (in seconds) and 3.5 character times (in milliseconds) for various message lengths and baud rates.

Table 1-1. Timing Considerations

Baud Rate	3.5 Character Time (ms)	Message Tx Time (seconds)	
		128 Bytes	256 Bytes
2400	16.04	0.59	1.17
4800	8.021	0.29	0.59
9600	4.0104	0.15	0.29
19200	2.0052	0.07	0.15

Error Handling and Exception Responses

Any query received that contains a non-existent device address, a framing error, or CRC error is ignored. No response is transmitted. Queries addressed to a BE1-CDS240 with an unsupported function or illegal values in the data block result in an error response message with an exception response code. The exception response codes supported by the BE1-CDS240 are provided in Table 1-2.

Table 1-2. Supported Exception Response Codes

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

Communications Hardware Requirements

The BE1-CDS240 RS-485 physical interface is three positions of a terminal strip with locations for Send/Receive A (A), Send/Receive B (B) and Signal Ground (C). Refer to the BE1-CDS240 Instruction Manual (9365200990) for further details.

Detailed Message Query and Response

A detailed description of BE1-CDS240 supported message queries and responses is provided in the following paragraphs.

Read Holding Registers

Query

This query message requests a register or block of registers to be read. The data block contains the starting register address and the quantity of registers to be read. A register address of N will read holding register N+1. If the query is a broadcast (device address = 0), no response message is returned.

Device Address
Function Code = 03 (hex)
Starting Address Hi
Starting Address Lo

No. of Registers Hi
No. of Registers Lo

CRC Hi error check
CRC Lo error check

The number of registers cannot exceed 125 without causing an error response with the exception code for an illegal function.

Response

The response message contains the data queried. The data block contains the block length in bytes followed by the data (one Data Hi byte and one Data Lo byte) for each requested register.

Reading an unassigned holding register returns a value of zero.

Device Address
Function Code = 03 (hex)
Byte Count
Data Hi (For each requested register, there is one Data Hi and one Data Lo.)
Data Lo
Data Hi
Data Lo
CRC Hi error check
CRC Lo error check

Return Query Data

This query contains data to be returned (looped back) in the response. The response and query messages should be identical. If the query is a broadcast (device address = 0), no response message is returned.

Device Address
Function Code = 08 (hex)
Subfunction Hi = 00 (hex)
Subfunction Lo = 00 (hex)
Data Hi = xx (don't care)
Data Lo = xx (don't care)
CRC Hi error check
CRC Lo error check

Restart Communications Option

This query causes the remote communications function of the BE1-CDS240 to restart, terminating an active listen only mode of operation. No effect is made upon primary relay operations. Only the remote communications function is affected. If the query is a broadcast (device address = 0), no response message is returned.

If the BE1-CDS240 receives this query while in the listen only mode, no response message is generated. Otherwise, a response message identical to the query message is transmitted prior to the communications restart.

Device Address
Function Code = 08 (hex)
Subfunction Hi = 00 (hex)
Subfunction Lo = 01 (hex)
Data Hi = xx (don't care)
Data Lo = xx (don't care)
CRC Hi error check
CRC Lo error check

Listen Only Mode

This query forces the addressed BE1-CDS240 to the listen only mode for Modbus communications, isolating it from other devices on the network. No responses are returned.

While in the Listen Only mode, the BE1-CDS240 continues to monitor all queries. The BE1-CDS240 does not respond to any other query until the listen only mode is removed. All write requests with a query to Preset Multiple Registers (Function Code = 16) are also ignored. When the BE1-CDS240 receives the restart communications query, the Listen Only mode is removed.

Device Address	
Function Code =	08 (hex)
Subfunction Hi =	00 (hex)
Subfunction Lo =	04 (hex)
Data Hi =	xx (don't care)
Data Lo =	xx (don't care)
CRC Hi error check	
CRC Lo error check	

Preset Multiple Registers

A preset multiple registers query could address multiple registers in one slave or multiple slaves. If the query is a broadcast (device address = 0), no response message is returned.

Query

A Preset Multiple Register query message requests a register or block of registers to be written. The data block contains the starting address and the quantity of registers to be written, followed by the Data Block byte count and data. The BE1-CDS240 will perform the write when the device address is the same as the BE1-CDS240 remote address or when the device address is 0. A device address is 0 for a broadcast query.

- A register address of N will write Holding Register N+1.
- Data will cease to be written if any of the following exceptions occur:
- Queries to write to Read Only registers result in an error response with Exception Code of “Illegal Data Address.”
- Queries attempting to write more than 100 registers cause an error response with Exception Code “Illegal Function.”
- An incorrect Byte Count will result in an error response with Exception Code of “Illegal Data Value.”
- There are several instances of registers that are grouped together to collectively represent a single numerical BE1-CDS240 data value (i.e., floating point data and 32-bit integer data). A query to write a subset of such a register group will result in an error response with Exception Code “Illegal Data Address.”
- A query to write a not allowed value (out of range) to a register results in an error response with Exception Code of “Illegal Data Value.”

Device Address	
Function Code =	10 (hex)
Starting Address Hi	
Starting Address Lo	
No. of Registers Hi	
No. of Registers Lo	
Byte Count	
Data Hi	
Data Lo	
.	
.	
.	
Data Hi	
Data Lo	
CRC Hi error check	
CRC Lo error check	

Response

The response message echoes the starting address and the number of registers. There is no response message when the query is a broadcast (device address = 0).

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

Preset Single Register (Write Single Holding Register)
A Preset Single Register query message requests a single register to be written. The BE1-CDS240 will perform the write when the device address is the same as the BE1-CDS240 remote address.

Query

Data will cease to be written if any of the following exceptions occur:

- Queries to write to Read Only registers result in an error response with Exception Code of "Illegal Data Address."
- A query to write an unallowed value (out of range) to a register results in an error response with Exception Code of "Illegal Data Value."

Device Address
Function Code = 06 (hex)
Address Hi
Address Lo
Data Hi
Data Lo
CRC Hi error check
CRC Lo error check

Response

The response message echoes the Query message after the register has been altered.

Data Formats

BE1-CDS240 data varies from one to four bytes in length. Single byte data resides in the holding register least-significant byte with the most-significant byte set to zero. Floating-point data and long integer data (each 32-bits in length) place the two most-significant bytes in the higher holding register address of the associated register pair.

Floating Point Data Format (FP)

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

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

The value of the floating-point number is obtained by multiplying the binary mantissa times two raised to the power of the unbiased exponent. The assumed bit of the binary mantissa has the value of 1.0, with the remaining 23 bits providing a fractional value. Table 1-3 shows the floating-point format.

Table 1-3. Floating Point Format

Sign	Exponent + 127	Mantissa
1 bit	8 bits	23 bits

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

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

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

The same byte alignments are required to write.

Long Integer Data Format (LI)

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

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

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

The same byte alignments are required to write.

Integer Data Format (INT)

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

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

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

The same byte alignments are required to write.

Short Integer Data Format (SI)

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

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

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

The same byte alignments are required to write.

ASCII Character Data Format (ASC (1))

The Modbus ASCII character data format uses a single holding register to represent a single character value. The holding register high byte will always be zero with the ASCII character code in the low byte.

Example: The character 'D' represented in ASCII character format is hexadecimal 44. This number will read from a holding register as follows:

Holding Register		Value
K	(Hi Byte)	hex 00
K	(Lo Byte)	hex 44

The same byte alignments are required to write.

ASCII String Data Format (ASC (x))

The Modbus ASCII string data format uses one or more holding registers to represent a sequence or string, of character values. If the string contains a single character, the holding register high byte will contain the ASCII character code and the low byte will be zero.

Example: The string "PASSWORD" represented in ASCII string format will read as follows:

Holding Register		Value
K	(Hi Byte)	'P'
K	(Lo Byte)	'A'
K+1	(Hi Byte)	'S'
K+1	(Lo Byte)	'S'
K+2	(Hi Byte)	'W'
K+2	(Lo Byte)	'O'
K+3	(Hi Byte)	'R'
K+3	(Lo Byte)	'D'

Example: If the above string is changed to "P," the new string will read as follows:

Holding Register		Value
K	(Hi Byte)	'P'
K	(Lo Byte)	hex 00
K+1	(Hi Byte)	hex 00
K+1	(Lo Byte)	hex 00
K+2	(Hi Byte)	hex 00
K+2	(Lo Byte)	hex 00
K+3	(Hi Byte)	hex 00
K+3	(Lo Byte)	hex 00

The same byte alignments are required to write.

Bit Mapped Data Format (BM (x))

The bit mapped data format uses two or more holding registers to represent a sequence of bit values. The Modbus Bit Map data format can represent an 8 bit, 16 bit, 32 bit, or 64 bit value.

Example: The Bit Map value of the hexadecimal number 0x123456789ABCDEF0 using a BM64 format will read as follows:

Holding Register		Value
K	(Hi Byte)	0x12
K	(Lo Byte)	0x34
K+1	(Hi Byte)	0x56
K+1	(Lo Byte)	0x78
K+2	(Hi Byte)	0x9A
K+2	(Lo Byte)	0xBC

K+3 (Hi Byte)	0xDE
K+3 (Lo Byte)	0xF0

CRC Error Check

This field contains a two-byte CRC value for transmission error detection. The master first calculates the CRC and appends it to the query message. The BE1-CDS240 recalculates the CRC value for the received query and performs a comparison to the query CRC value to determine if a transmission error has occurred. If so, no response message is generated. If no transmission error has occurred, the slave calculates a new CRC value for the response message and appends it to the message for transmission.

The CRC calculation is performed using all bytes of the device address, function code, and data block fields. A 16-bit CRC-register is initialized to all 1's. Then each eight-bit byte of the message is used in the following algorithm.

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

Session Access Registers

The ACCESS REQUEST and the EXIT registers are used to access and release write privileges while changing relay settings, resetting report registers or using control commands through the Modbus port. This feature is important because it prevents changes from being made concurrently from two areas. For example, a user cannot make changes from COM 0 at the same time a remote user is making changes via Modbus from COM 2.

Changing the settings through the Modbus port requires that the operator write to the ACCESS REQUEST register to obtain programming access. This must follow writing the ACCESS PASSWORD register(s) with a password to obtain access to change settings associated with the password. Different passwords give the ability or access to perform different operations. The relay will deny access if an invalid password is entered or if another user has already been granted programming access through another serial port or at the front panel. Only one user can have access at any one time.

If no password protection is used, it is still necessary to obtain access in order to protect against accidental changes. If password protection is disabled, then writing the ACCESS REQUEST register will be accepted in place of a password. The relay will transmit a valid response message if the access query was received and executed. The relay will respond with an error message if the access query could not be executed.

Changing settings through a Modbus communication port consists of the following sequence:

1. Preset Multiple Registers query to ACCESS PASSWORD register(s) to specify password.
2. Preset Multiple Registers query to ACCESS REQUEST register to access write privileges.
3. Preset Multiple Registers queries to change the current settings.
4. Preset Multiple Registers query to EXIT register to clear access and save.

Changes are not made to the working settings but to a scratch-pad copy of the settings. After the change(s) are made, the new data will be copied to the working settings and saved to non-volatile memory when the EXIT register is written with a ‘Y.’ It is important to make all changes to relay parameters before writing the EXIT register. This prevents a partial or incomplete protection scheme from being implemented.

Template Registers

The BE1-CDS240 uses three templates. A template is a block of holding registers to which the user assigns one of a number of similar groups of parameters. Templates are used for settings groups, fault summaries, and report generation. Modbus Template Registers 40036 (Settings Group Selection), 40038 (Fault Number Selection), 40039 (Report Selection) and 40040 (Report Focus) DO NOT REQUIRE any Write Password Access level before they can be written to.

The BE1-CDS240 has two settings groups. The GRP template is assigned the parameters of a settings group. Therefore, before reading or writing settings group values, a user must first specify which settings group is to be associated with the template. This is accomplished by writing the desired settings group number (0 - 1) into the SETTINGS GROUP SELECTION Template holding register.

The BE1-CDS240 stores up to 16 faults. Each fault is accessed by its fault number, which ranges from 1 to 255. The FLT template is assigned the parameters of a particular fault occurrence. Therefore, before reading fault summary values, a user must first specify which fault number is to be associated with the template. This is accomplished by writing the desired fault number (1 - 255) into the FAULT SELECTION Template holding register.

The BE1-CDS240 generates 14 ASCII reports. The RPT template is assigned the text of a report. Therefore, before reading report text, a user must first specify which report is to be associated with the template. This is accomplished by writing the desired report number into the REPORT SELECTION Template holding register along with the associated report identifier, if any, into the REPORT FOCUS Template holding register.

Fault Summary Registers

The user can enter any fault number (1 - 255) into the FAULT SELECTION Template holding register to associate summary parameters for that fault number with the FLT Template. The Fault Template Status register (47965) indicates whether or not that fault number specifies a recent fault (one of 16 stored faults). If so, the Fault Template Status register value is the fault number; otherwise, it is zero and all FLT template values will read zero.

The Fault Indicator register (47964) value is the fault number (1 - 255) of the most recent fault. The user may construct his front-end GUI to link this register value into the FAULT SELECTION Template holding register, thereby automatically associating the FLT template with the most recent fault occurrence.

Report Generation Registers

The BE1-CDS240 generates numerous ASCII reports available via serial commands. Several of these reports are available intact via the Modbus communication port. The desired report is first specified by writing the REPORT SELECTION holding register. If the report requires a number to be specified, such as a fault number or number of events, that number is written into the REPORT FOCUS holding register. The report is then available via the RPT template. The report can be read from 1 to 125 registers at a time, with each register containing 2 ASCII characters of information. The report read queries could be interspersed among other query types. The RPT template is continually re-read until the report has completed. Once the report is complete, reading from the RPT template will continually return the ASCII character code of 127 (“7F” hexadecimal). The report cannot be re-read or another report read until the REPORT SELECTION holding register is re-written.

Contiguous Poll Block Registers

The user may allocate up to 125 holding registers to the Contiguous Poll Block (49875-999). This allocation allows dispersed registers, which are frequently read to be polled via a single read query. A register is assigned to a position in the Poll Block by writing its address value into the corresponding position in the Contiguous Poll Block Assignments registers (40746-870). Writing a zero value leaves that Poll Block position unassigned. Once assignments are made, the values of the assigned registers may be read by polling the Contiguous Poll Block. Polling an unassigned position will return a value of zero.

For example, if you wanted to continuously monitor the Date (47364), Time (47365-66), Fault Indicator (47512) and Breaker Status (47388) Holding Registers, you would first configure the Contiguous Poll Block Registers by writing the desired register address values 7364, 7365, 7366, 7512 and 7388 into the Contiguous Poll Block Assignment registers 40746 through 40750, respectively. You may now begin monitoring the specified registers by reading the first 5 locations in the Contiguous Poll Block; i.e., reading register 49875 for the Date (as specified in it’s corresponding assignment register 40746), reading register 49876 and 77 for the Time (as specified in their corresponding assignment registers 40747 and 48), reading register 49878 for the Fault Indicator (as specified in it’s corresponding assignment register 40749) and reading register 49879 for the Breaker Status (as specified in it’s corresponding assignment register 40750).

Exception Code Enhancement Registers

When a BE1-CDS240 responds to a Preset Multiple Register query with an error response message, additional information detailing the cause of the error may be available in the ERROR DETAILS block of holding registers (49835-54). The information is in ASCII format and available by reading the message string from the ERROR DETAILS block. The message remains available until the next Preset Multiple Register query is executed unless that query is to the FAULT SELECTION Template holding register. Since this register can be written automatically and randomly in time, the ERROR DETAILS block will not be updated.

The ERROR DETAILS block will also contain the exit status following a Preset Multiple Register query to the EXIT (40001) register. You may clear the ERROR DETAILS message at any time without affecting system operation by sending a Preset Multiple Register query to any unassigned holding register.

SECTION 2 • REGISTER TABLE

Mapping BE1-CDS240 Parameters into Modicon Holding Register Address Space

General

Parameters are mapped into the holding register address space (40001 - 49999) in blocks according to access type.

Any Holding Register not listed in the Register Table is an unassigned Holding Register. A value of zero always results when reading an unassigned Holding Register. Writes to unassigned Holding Registers are legal, but no action will be taken (the write is ignored).

Conventions

The *Data Format* column uses the following abbreviations:

ASC(x) - ASCII string, where x = the maximum defined string length
BM(x) - Bit-map, where x = the number of related bits
FP - Floating point
INT - Integer (16-bit integer)
LI - Long Integer (32-bit integer)
SI - Short Integer (8-bit integer)

The Notes column uses the following abbreviations:

GRP - Group Template Member
FLT - Fault Template Member
RPT - Report Template Member
NS - Not Supported
TS - Time Stamp format: MSEC of the day (0 to 86,400,000 ms) and days since 01/01/1984.
PS - Effective only when the *Password Security* parameter is enabled. See *REGISTER DETAILS* for *Password Security* holding register 40989.
PW - Effective for any communication port active with ASCII protocol and for the Modbus™ port (COM 2) when Password Security is enabled.

Resister Table - Ordered by Register Number

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
Session Parameters				
40001	Exit	R W	ASC(1)	PS
40002-05	Access Password	R W	ASC(8)	PS
40006	Access Request	R W	BM(16)	PS
Template Parameters				
40036	Settings Group Selection	R W	SI	
40038	Fault Selection	R W	SI	
40039	Report Selection	R W	SI	
40040	Report Focus	R W	INT	
Global Parameters				
40080-83	Global Password	R W	ASC(8)	PW
40084	Global Path	R W	BM(8)	PW
40085-88	Setting Password	R W	ASC(8)	PW
40089	Setting Path	R W	BM(8)	PW
40090-93	Control Password	R W	ASC(8)	PW
40094	Control Path	R W	BM(8)	PW
40095-98	Report Password	R W	ASC(8)	PW
40099	Report Path	R W	BM(8)	PW
Control Parameters				
40117	Select Group	R W	ASC(1)	
40118	Operate Group	R W	ASC(1)	
40119	Select Virtual Selector Switch 43	R W	ASC(1)	
40120	Operate Virtual Selector Switch 43	R W	ASC(1)	
40121	Select Virtual Selector Switch 143	R W	ASC(1)	
40122	Operate Virtual Selector Switch 143	R W	ASC(1)	
40123	Select Virtual Selector Switch 243	R W	ASC(1)	
40124	Operate Virtual Selector Switch 243	R W	ASC(1)	
40125	Select Virtual Selector Switch 343	R W	ASC(1)	
40126	Operate Virtual Selector Switch 343	R W	ASC(1)	
40127	Select Virtual Selector Switch 443	R W	ASC(1)	
40128	Operate Virtual Selector Switch 443	R W	ASC(1)	
40129	Select Virtual Selector Switch 543	R W	ASC(1)	
40130	Operate Virtual Selector Switch 543	R W	ASC(1)	
40131	Select Virtual Selector Switch 643	R W	ASC(1)	
40132	Operate Virtual Selector Switch 643	R W	ASC(1)	
40133	Select Virtual Selector Switch 743	R W	ASC(1)	
40134	Operate Virtual Selector Switch 743	R W	ASC(1)	
40135	Select 101 Virtual Breaker Control Switch	R W	ASC(1)	
40136	Operate 101 Virtual Breaker Control Switch	R W	ASC(1)	
40137	Select 1101 Virtual Breaker Control Switch	R W	ASC(1)	
40138	Operate 1101 Virtual Breaker Control Switch	R W	ASC(1)	
40139	Select 2101 Virtual Breaker Control Switch	R W	ASC(1)	
40140	Operate 2101 Virtual Breaker Control Switch	R W	ASC(1)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
40141	Select 3101 Virtual Breaker Control Switch	R W	ASC(1)	
40142	Operate 3101 Virtual Breaker Control Switch	R W	ASC(1)	
40143	Select All Outputs	R W	ASC(1)	
40144	Operate All Outputs	R W	ASC(1)	
40145	Select Output A	R W	ASC(1)	
40146	Operate Output A	R W	ASC(1)	
40147	Select Output 1	R W	ASC(1)	
40148	Operate Output 1	R W	ASC(1)	
40149	Select Output 2	R W	ASC(1)	
40150	Operate Output 2	R W	ASC(1)	
40151	Select Output 3	R W	ASC(1)	
40152	Operate Output 3	R W	ASC(1)	
40153	Select Output 4	R W	ASC(1)	
40154	Operate Output 4	R W	ASC(1)	
40155	Select Output 5	R W	ASC(1)	
40156	Operate Output 5	R W	ASC(1)	
40157	Select Output 6	R W	ASC(1)	
40158	Operate Output 6	R W	ASC(1)	
40159	Select Output 7	R W	ASC(1)	
40160	Operate Output 7	R W	ASC(1)	
40161	Select Output 8	R W	ASC(1)	
40162	Operate Output 8	R W	ASC(1)	
40163	Select Output 9	R W	ASC(1)	
40164	Operate Output 9	R W	ASC(1)	
40165	Select Output 10	R W	ASC(1)	
40166	Operate Output 10	R W	ASC(1)	
40167	Select Output 11	R W	ASC(1)	
40168	Operate Output 11	R W	ASC(1)	
40169	Select Output 12	R W	ASC(1)	
40170	Operate Output 12	R W	ASC(1)	
40171	Select Output 13	R W	ASC(1)	
40172	Operate Output 13	R W	ASC(1)	
40173	Select Output 14	R W	ASC(1)	
40174	Operate Output 14	R W	ASC(1)	
Group Setting Parameters				
40269-70	50TP Pickup	R W	FP	GRP
40271-72	50TP Time Delay	R W	LI	GRP
40273-74	50TN Pickup	R W	FP	GRP
40275-76	50TN Time Delay	R W	LI	GRP
40277-78	50TQ Pickup	R W	FP	GRP
40279-80	50TQ Time Delay	R W	LI	GRP
40281-82	150TP Pickup	R W	FP	GRP
40283-84	150TP Time Delay	R W	LI	GRP
40285-86	150TN Pickup	R W	FP	GRP
40287-88	150TN Time Delay	R W	LI	GRP
40289-90	150TQ Pickup	R W	FP	GRP
40291-92	150TQ Time Delay	R W	LI	GRP
40293-94	250TP Pickup	R W	FP	GRP
40295-96	250TP Time Delay	R W	LI	GRP
40297-98	250TN Pickup	R W	FP	GRP
40299-300	250TN Time Delay	R W	LI	GRP
40301-02	250TQ Pickup	R W	FP	GRP
40303-04	250TQ Time Delay	R W	LI	GRP

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
40305-06	350TP Pickup	R W	FP	GRP
40307-08	350TP Time Delay	R W	LI	GRP
40309-10	350TN Pickup	R W	FP	GRP
40311-12	350TN Time Delay	R W	LI	GRP
40313-14	350TQ Pickup	R W	FP	GRP
40315-16	350TQ Time Delay	R W	LI	GRP
40317-18	450TP Pickup	R W	FP	GRP
40319-20	450TP Time Delay	R W	LI	GRP
40321-22	450TN Pickup	R W	FP	GRP
40323-24	450TN Time Delay	R W	LI	GRP
40325-26	550TP Pickup	R W	FP	GRP
40327-28	550TP Time Delay	R W	LI	GRP
40329-30	650TP Pickup	R W	FP	GRP
40331-32	650TP Time Delay	R W	LI	GRP
40333-34	750TP Pickup	R W	FP	GRP
40335-36	750TP Time Delay	R W	LI	GRP
40337-38	50BF Time Delay	R W	LI	GRP
40339-40	50BF Phase Pickup	R W	LI	GRP
40341-42	50BF Neutral Pickup	R W	LI	GRP
40343-44	50BF Control Time Delay	R W	LI	GRP
40345-46	150BF Time Delay	R W	LI	GRP
40347-48	150BF Phase Pickup	R W	LI	GRP
40349-50	150BF Neutral Pickup	R W	LI	GRP
40351-52	150BF Control Time Delay	R W	LI	GRP
40353-54	250BF Time Delay	R W	LI	GRP
40355-56	250BF Phase Pickup	R W	LI	GRP
40357-58	250BF Neutral Pickup	R W	LI	GRP
40359-60	250BF Control Time Delay	R W	LI	GRP
40361-62	350BF Time Delay	R W	LI	GRP
40363-64	350BF Phase Pickup	R W	LI	GRP
40365-66	350BF Neutral Pickup	R W	LI	GRP
40367-68	350BF Control Time Delay	R W	LI	GRP
40369-70	51P Pickup	R W	FP	GRP
40371-72	51P Time Dial	R W	FP	GRP
40373-74	51P Curve Type	R W	ASC(3)	GRP
40375-76	51N Pickup	R W	FP	GRP
40377-78	51N Time Dial	R W	FP	GRP
40379-80	51N Curve Type	R W	ASC(3)	GRP
40381-82	51Q Pickup	R W	FP	GRP
40383-84	51Q Time Dial	R W	FP	GRP
40385-86	51Q Curve Type	R W	ASC(3)	GRP

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
40387-88	151P Pickup	R W	FP	GRP
40389-90	151P Time Dial	R W	FP	GRP
40391-92	151P Curve Type	R W	ASC(3)	GRP
40393-94	151N Pickup	R W	FP	GRP
40395-96	151N Time Dial	R W	FP	GRP
40397-98	151N Curve Type	R W	ASC(3)	GRP
40399-400	151Q Pickup	R W	FP	GRP
40401-02	151Q Time Dial	R W	FP	GRP
40403-04	151Q Curve Type	R W	ASC(3)	GRP
40405-06	251P Pickup	R W	FP	GRP
40407-08	251P Time Dial	R W	FP	GRP
40409-10	251P Curve Type	R W	ASC(3)	GRP
40411-12	251N Pickup	R W	FP	GRP
40413-14	251N Time Dial	R W	FP	GRP
40415-16	251N Curve Type	R W	ASC(3)	GRP
40417-18	251Q Pickup	R W	FP	GRP
40419-20	251Q Time Dial	R W	FP	GRP
40421-22	251Q Curve Type	R W	ASC(3)	GRP
40423-24	351P Pickup	R W	FP	GRP
40425-26	351P Time Dial	R W	FP	GRP
40427-28	351P Curve Type	R W	ASC(3)	GRP
40429-30	351N Pickup	R W	FP	GRP
40431-32	351N Time Dial	R W	FP	GRP
40433-34	351N Curve Type	R W	ASC(3)	GRP
40435-36	351Q Pickup	R W	FP	GRP
40437-38	351Q Time Dial	R W	FP	GRP
40439-40	351Q Curve Type	R W	ASC(3)	GRP
40441-42	451N Pickup	R W	FP	GRP
40443-44	451N Time Dial	R W	FP	GRP
40445-46	451N Curve Type	R W	ASC(3)	GRP
40447-48	24 Pickup	R W	FP	GRP
40449-50	24 Time Dial	R W	FP	GRP
40451-52	24 Integrating Reset	R W	FP	GRP
40453-54	24 Curve Type	R W	ASC(3)	GRP
40455-56	24D Pickup1	R W	FP	GRP
40457-58	24D Time Delay1	R W	LI	GRP
40459-60	24D Pickup2	R W	FP	GRP
40461-62	24D Time Delay2	R W	LI	GRP
40463-64	27P Pickup	R W	FP	GRP
40465-66	27P Time Delay	R W	LI	GRP
40467-68	27P Inhibit Voltage	R W	FP	GRP
40469-70	127P Pickup	R W	FP	GRP
40471-72	127P Time Delay	R W	LI	GRP
40473-74	127P Inhibit Voltage	R W	FP	GRP
40475-76	27R Pickup	R W	FP	GRP
40477	27R Control Mode	R W	ASC(1)	GRP

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
40478-79	47 Pickup	R W	FP	GRP
40480-81	47 Time Delay	R W	LI	GRP
40482-83	59P Pickup	R W	FP	GRP
40484-85	59P Time Delay	R W	LI	GRP
40486-87	159P Pickup	R W	FP	GRP
40488-89	159P Time Delay	R W	LI	GRP
40490-91	62 Time Delay 1	R W	LI	GRP
40492-93	62 Time Delay 2	R W	LI	GRP
40494-95	162 Time Delay 1	R W	LI	GRP
40496-97	162 Time Delay 2	R W	LI	GRP
40498-99	262 Time Delay 1	R W	LI	GRP
40500-01	262 Time Delay 2	R W	LI	GRP
40502-03	362 Time Delay 1	R W	LI	GRP
40504-05	362 Time Delay 2	R W	LI	GRP
40506-07	81 Pickup	R W	FP	GRP
40508-09	81 Time Delay	R W	LI	GRP
40510	81 Mode	R W	ASC(1)	GRP
40511-12	181 Pickup	R W	FP	GRP
40513-14	181 Time Delay	R W	LI	GRP
40515	181 Mode	R W	ASC(1)	GRP
40516-17	281 Pickup	R W	FP	GRP
40518-19	281 Time Delay	R W	LI	GRP
40520	281 Mode	R W	ASC(1)	GRP
40521-22	381 Pickup	R W	FP	GRP
40523-24	381 Time Delay	R W	LI	GRP
40525	381 Mode	R W	ASC(1)	GRP
40526-27	481 Pickup	R W	FP	GRP
40528-29	481 Time Delay	R W	LI	GRP
40530	481 Mode	R W	ASC(1)	GRP
40531-32	581 Pickup	R W	FP	GRP
40533-34	581 Time Delay	R W	LI	GRP
40535	581 Mode	R W	ASC(1)	GRP
40536-37	81 Inhibit Setting	R W	FP	GRP
40538-39	87T Minimum Pickup	R W	FP	GRP
40540	87T Restraint Slope	R W	INT	GRP
40541-42	87T 2nd Harmonic Threshold	R W	FP	GRP
40543-44	87T 5th Harmonic Threshold	R W	FP	GRP
40545	87T Unrestrained Pickup	R W	INT	GRP
40546	87T 2nd Harmonic Sharing	R W	INT	GRP
40547-48	87ND Minimum Pickup	R W	FP	GRP
40549	87ND Restraint Slope	R W	INT	GRP
40550	87ND Restraint Time Delay	R W	INT	GRP

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
40551-52	187ND Minimum Pickup	R W	FP	GRP
40553	187ND Restraint Slope	R W	INT	GRP
40554	187ND Restraint Time Delay	R W	INT	GRP
40555-56	Transformer MVA Rating	R W	FP	GRP
40557-58	87T CT CKT #1 Tap	R W	FP	GRP
40559-60	Transformer Tap 1 KV Rating	R W	FP	GRP
40561-62	87T CT CKT #2 Tap	R W	FP	GRP
40563-64	Transformer Tap 2 KV Rating	R W	FP	GRP
40565-66	87T CT CKT #3 Tap	R W	FP	GRP
40567-68	Transformer Tap 3 KV Rating	R W	FP	GRP
40569-70	87T CT CKT #4 Tap	R W	FP	GRP
40571-72	Transformer Tap 4 KV Rating	R W	FP	GRP
40573-74	87ND Tap G	R -	FP	GRP
40575-76	87ND Tap N	R -	FP	GRP
40577-78	187ND Tap G	R -	FP	GRP
40579-80	187ND Tap N	R -	FP	GRP
40581-82	59X Pickup	R W	FP	GRP
40583-84	59X Time Delay	R W	LI	GRP
40585	87ND Restraint Type	R W	ASC(1)	GRP
40586	187ND Restraint Type	R W	ASC(1)	GRP
Global Setting Parameters				
40602-03	Power System Nominal Voltage	R W	FP	
40604-05	Power System Nominal Current	R W	FP	
40608-09	Programmable 51 Curve Constant A	R W	FP	
40610-11	Programmable 51 Curve Constant B	R W	FP	
40612-13	Programmable 51 Curve Constant C	R W	FP	
40614-15	Programmable 51 Curve Constant N	R W	FP	
40616-17	Programmable 51 Curve Constant R	R W	FP	
40618	Input 1 Contact Recognition Time Delay	R W	SI	
40619	Input 1 Contact Debounce Time Delay	R W	SI	
40620	Input 2 Contact Recognition Time Delay	R W	SI	
40621	Input 2 Contact Debounce Time Delay	R W	SI	
40622	Input 3 Contact Recognition Time Delay	R W	SI	
40623	Input 3 Contact Debounce Time Delay	R W	SI	
40624	Input 4 Contact Recognition Time Delay	R W	SI	
40625	Input 4 Contact Debounce Time Delay	R W	SI	
40626	Input 5 Contact Recognition Time Delay	R W	SI	
40627	Input 5 Contact Debounce Time Delay	R W	SI	
40628	Input 6 Contact Recognition Time Delay	R W	SI	
40629	Input 6 Contact Debounce Time Delay	R W	SI	
40630	Input 7 Contact Recognition Time Delay	R W	SI	
40631	Input 7 Contact Debounce Time Delay	R W	SI	
40632	Input 8 Contact Recognition Time Delay	R W	SI	
40633	Input 8 Contact Debounce Time Delay	R W	SI	
40634	Input 9 Contact Recognition Time Delay	R W	SI	
40635	Input 9 Contact Debounce Time Delay	R W	SI	
40636	Input 10 Contact Recognition Time Delay	R W	SI	
40637	Input 10 Contact Debounce Time Delay	R W	SI	
40638	Input 11 Contact Recognition Time Delay	R W	SI	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
40639	Input 11 Contact Debounce Time Delay	R W	SI	
40640	Input 12 Contact Recognition Time Delay	R W	SI	
40641	Input 12 Contact Debounce Time Delay	R W	SI	
Contiguous Poll Block				
40746-870	Contiguous Poll Block Assignments	R W	INT	
Setting Group Control				
40871	Setting Group Control On Time	R W	INT	
40872	Setting Group 1 Automatic Control Switch Time	R W	SI	
40873	Setting Group 1 Automatic Control Switch Level	R W	SI	
40874	Setting Group 1 Automatic Control Return Time	R W	SI	
40875	Setting Group 1 Automatic Control Return Level	R W	SI	
40876	Setting Group 1 Tracking Element	R W	INT	
40877	Setting Group 2 Automatic Control Switch Time	R W	SI	
40878	Setting Group 2 Automatic Control Switch Level	R W	SI	
40879	Setting Group 2 Automatic Control Return Time	R W	SI	
40880	Setting Group 2 Automatic Control Return Level	R W	SI	
40881	Setting Group 2 Tracking Element	R W	INT	
40882	Setting Group 3 Automatic Control Switch Time	R W	SI	
40883	Setting Group 3 Automatic Control Switch Level	R W	SI	
40884	Setting Group 3 Automatic Control Return Time	R W	SI	
40885	Setting Group 3 Automatic Control Return Level	R W	SI	
40886	Setting Group 3 Tracking Element	R W	INT	
40887-88	60FL Loss of Potential Amps Auto Block Setting	R W	ASC(3)	
40889-90	60FL Loss of Potential Volts Auto Block Setting	R W	ASC(3)	
Serial Port Setting Parameters				
40962	Serial Port 0 Baud Rate	R W	INT	
40964	Serial Port 0 Software Flow Control	R W	SI	
40965	Serial Port 0 Page Length	R W	SI	
40966	Serial Port 0 Acknowledgement Format	R W	SI	
40971	Serial Port 1 Baud Rate	R W	INT	
40972	Serial Port 1 Relay Address	R W	INT	
40973	Serial Port 1 Software Flow Control	R W	SI	
40974	Serial Port 1 Page Length	R W	SI	
40975	Serial Port 1 Acknowledgement Format	R W	SI	
40980	Serial Port 2 Baud Rate	R W	INT	
40981	Serial Port 2 Relay Address	R W	INT	
40986	Serial Port 2 Modbus™ Parity	R W	SI	
40987	Serial Port 2 Modbus™ Remote Delay	R W	SI	
40988	Serial Port 2 Modbus™ Stop Bits	R W	SI	
40989	Modbus Password Security	R W	SI	
System Data Setting Parameters				
41009	System Frequency	R W	SI	
41010	Phase Rotation	R W	SI	
41011	Phase CT Ratio CKT #1	R W	INT	
41012	CT Connection CKT #1	R W	INT	
41013	Phase CT Ratio CKT #2	R W	INT	
41014	CT Connection CKT #2	R W	INT	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
41015	Phase CT Ratio CKT #3	R W	INT	
41016	CT Connection CKT #3	R W	INT	
41017	Phase CT Ratio CKT #4	R W	INT	
41018	CT Connection CKT #4	R W	INT	
41019	Ground CT Ratio	R W	INT	
41020	TX Connection CKT #1	R W	INT	
41021	Ground Source CKT #1	R W	INT	
41022	TX Compensation CKT #1	R W	INT	
41023	Differential Source CKT #1	R W	INT	
41024	TX Connection CKT #2	R W	INT	
41025	Ground Source CKT #2	R W	INT	
41026	TX Compensation CKT #2	R W	INT	
41027	Differential Source CKT #2	R W	INT	
41028	TX Connection CKT #3	R W	INT	
41029	Ground Source CKT #3	R W	INT	
41030	TX Compensation CKT #3	R W	INT	
41031	Differential Source CKT #3	R W	INT	
41032	TX Connection CKT #4	R W	INT	
41033	Ground Source CKT #4	R W	INT	
41034	TX Compensation CKT #4	R W	INT	
41035	Differential Source CKT #4	R W	INT	
41036-37	Phase VT Ratio	R W	FP	
41038-39	VT Connection	R W	ASC(3)	
41040-41	27/59 Voltage Sensing Mode	R W	ASC(3)	
41042-43	51/27R Voltage Sensing Mode	R W	ASC(3)	
41044	VT Winding Circuit Number	R W	INT	
41045	Load Profile Interval	R W	INT	
41046	No of Oscillography Records	R W	INT	
41047	Virtual Circuit Configuration	R W	INT	
41048	Virtual Differential Restraint Circuit Config.	R W	INT	
41049	TX 180 Compensation CKT #1	R W	INT	
41050	TX 180 Compensation CKT #2	R W	INT	
41051	TX 180 Compensation CKT #3	R W	INT	
41052	TX 180 Compensation CKT #4	R W	INT	
41053	Power Flow Polarity	R W	INT	
Breaker Duty Setting Parameters				
41060-61	Breaker 1 Duty Exponent	R W	FP	
41062-63	Maximum Breaker 1 Duty	R W	FP	
41064-75	Block Breaker 1 Duty Logic Mask	R W	BM(192)	
41076-87	Block Breaker 1 Duty Logic Term	R W	BM(192)	
41088-89	Breaker 2 Duty Exponent	R W	FP	
41090-91	Maximum Breaker 2 Duty	R W	FP	
41093-104	Block Breaker 2 Duty Logic Mask	R W	BM(192)	
41105-116	Block Breaker 2 Duty Logic Term	R W	BM(192)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
41117-18	Breaker 3 Duty Exponent	R W	FP	
41119-20	Maximum Breaker 3 Duty	R W	FP	
41121-32	Block Breaker 3 Duty Logic Mask	R W	BM(192)	
41133-44	Block Breaker 3 Duty Logic Term	R W	BM(192)	
41145-46	Breaker 4 Duty Exponent	R W	FP	
41147-48	Maximum Breaker 4 Duty	R W	FP	
41149-60	Block Breaker 4 Duty Logic Mask	R W	BM(192)	
41161-72	Block Breaker 4 Duty Logic Term	R W	BM(192)	
41173	Programmable Breaker Alarm #1 Mode	R W	INT	
41174-75	Programmable Breaker Alarm #1 Limit	R W	FP	
41176	Programmable Breaker Alarm #1 Circuit	R W	INT	
41177	Programmable Breaker Alarm #2 Mode	R W	INT	
41178-79	Programmable Breaker Alarm #2 Limit	R W	FP	
41180	Programmable Breaker Alarm #2 Circuit	R W	INT	
41181	Programmable Breaker Alarm #3 Mode	R W	INT	
41182-83	Programmable Breaker Alarm #3 Limit	R W	FP	
41184	Programmable Breaker Alarm #3 Circuit	R W	INT	
41185	Programmable Breaker Alarm #4 Mode	R W	INT	
41186-87	Programmable Breaker Alarm #4 Limit	R W	FP	
41188	Programmable Breaker Alarm #4 Circuit	R W	INT	
41189	Programmable Breaker Alarm #5 Mode	R W	INT	
41190-91	Programmable Breaker Alarm #5 Limit	R W	FP	
41192	Programmable Breaker Alarm #5 Circuit	R W	INT	
41193	Programmable Breaker Alarm #6 Mode	R W	INT	
41194-95	Programmable Breaker Alarm #6 Limit	R W	FP	
41196	Programmable Breaker Alarm #6 Circuit	R W	INT	
41197	Programmable Breaker Alarm #7 Mode	R W	INT	
41198-99	Programmable Breaker Alarm #7 Limit	R W	FP	
41200	Programmable Breaker Alarm #7 Circuit	R W	INT	
41201	Programmable Breaker Alarm #8 Mode	R W	INT	
41202-03	Programmable Breaker Alarm #8 Limit	R W	FP	
41204	Programmable Breaker Alarm #8 Circuit	R W	INT	
41205	Programmable Breaker Alarm #9 Mode	R W	INT	
41206-07	Programmable Breaker Alarm #9 Limit	R W	FP	
41208	Programmable Breaker Alarm #9 Circuit	R W	INT	
41209	Programmable Breaker Alarm #10 Mode	R W	INT	
41210-11	Programmable Breaker Alarm #10 Limit	R W	FP	
41112	Programmable Breaker Alarm #10 Circuit	R W	INT	
41213	Programmable Breaker Alarm #11 Mode	R W	INT	
41214-15	Programmable Breaker Alarm #11 Limit	R W	FP	
41216	Programmable Breaker Alarm #11 Circuit	R W	INT	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
41217	Programmable Breaker Alarm #12 Mode	R W	INT	
41218-19	Programmable Breaker Alarm #12 Limit	R W	FP	
41220	Programmable Breaker Alarm #12 Circuit	R W	INT	
41221-32	Breaker1 Close Logic Mask	R W	BM(192)	
41233-44	Breaker1 Close Logic Term	R W	BM(192)	
41245-53	Breaker1 Label	R W	ASC(18)	
41254	Breaker1 Trip Coil Enable	R W	SI	
41255-66	Breaker2 Close Logic Mask	R W	BM(192)	
41267-78	Breaker2 Close Logic Term	R W	BM(192)	
41279-87	Breaker2 Label	R W	ASC(18)	
41288	Breaker2 Trip Coil Enable	R W	SI	
41289-00	Breaker3 Close Logic Mask	R W	BM(192)	
41301-12	Breaker3 Close Logic Term	R W	BM(192)	
41313-21	Breaker3 Label	R W	ASC(18)	
41322	Breaker3 Trip Coil Enable	R W	SI	
41323-34	Breaker4 Close Logic Mask	R W	BM(192)	
41335-46	Breaker4 Close Logic Term	R W	BM(192)	
41347-55	Breaker4 Label	R W	ASC(18)	
41356	Breaker4 Trip Coil Enable	R W	SI	
Transformer Duty Setting Parameters				
41360	Transformer Duty #1 Mode	R W	SI	
41361-62	Maximum Transformer Duty #1	R W	FP	
41363	Transformer Duty #1 CT CKT Number	R W	SI	
41364-75	Transformer Duty #1 Block Logic Mask	R W	BM(192)	
41376-87	Transformer Duty #1 Block Logic Term	R W	BM(192)	
41388	Transformer Duty #2 Mode	R W	SI	
41389-90	Maximum Transformer Duty #2	R W	FP	
41391	Transformer Duty #2 CT CKT Number	R W	SI	
41392-403	Transformer #2 Block Logic Mask	R W	BM(192)	
41404-15	Transformer #2 Block Logic Term	R W	BM(192)	
41416	Transformer Duty #3 Mode	R W	SI	
41417-18	Maximum Transformer Duty #3	R W	FP	
41419	Transformer Duty #3 CT CKT Number	R W	SI	
41420-31	Transformer Duty #3 Block Logic Mask	R W	BM(192)	
41432-43	Transformer Duty #3 Block Logic Term	R W	BM(192)	
41444	Transformer Duty #4 Mode	R W	SI	
41445-46	Maximum Transformer Duty #4	R W	FP	
41447	Transformer Duty #4 CT CKT Number	R W	SI	
41448-59	Transformer Duty #4 Block Logic Mask	R W	BM(192)	
41460-71	Transformer Duty #4 Block Logic Term	R W	BM(192)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
41472	Transformer Alarm #1 Mode	R W	INT	
41473-74	Transformer Alarm #1 Limit	R W	FP	
41475	Transformer Alarm #1 Duty CKT Number	R W	SI	
41476	Transformer Alarm #2 Mode	R W	INT	
41477-78	Transformer Alarm #2 Limit	R W	FP	
41479	Transformer Alarm #2 Duty CKT Number	R W	SI	
41480	Transformer Alarm #3 Mode	R W	INT	
41481-82	Transformer Alarm #3 Limit	R W	FP	
41483	Transformer Alarm #3 Duty CKT Number	R W	SI	
41484	Transformer Alarm #4 Mode	R W	INT	
41485-86	Transformer Alarm #4 Limit	R W	FP	
41487	Transformer Alarm #4 Duty CKT Number	R W	SI	
41488	Transformer Alarm #5 Mode	R W	INT	
41489-90	Transformer Alarm #5 Limit	R W	FP	
41491	Transformer Alarm #5 Duty CKT Number	R W	SI	
41492	Transformer Alarm #6 Mode	R W	INT	
41493-94	Transformer Alarm #6 Limit	R W	FP	
41495	Transformer Alarm #6 Duty CKT Number	R W	SI	
41496	Transformer Alarm #7 Mode	R W	INT	
41497-98	Transformer Alarm #7 Limit	R W	FP	
41499	Transformer Alarm #7 Duty CKT Number	R W	SI	
41500	Transformer Alarm #8 Mode	R W	INT	
41501-502	Transformer Alarm #8 Limit	R W	FP	
41503	Transformer Alarm #8 Duty CKT Number	R W	SI	
Relay Data Setting Parameters				
41508-09	Volts / Hertz Alarm Setting	R W	FP	
41510-11	Volts / Hertz Alarm Time Delay	R W	LI	
41512-13	Under Voltage Alarm Setting	R W	FP	
41514-15	Over Voltage Alarm Setting	R W	FP	
41516-17	Forward Var Demand Alarm Level	R W	FP	
41518-19	Reverse Var Demand Alarm Level	R W	FP	
41520-21	Forward Watt Demand Alarm Level	R W	FP	
41522-23	Reverse Watt Demand Alarm Level	R W	FP	
41524-25	Phase Voltage Max Demand Alarm Level	R W	FP	
41526-27	Phase Voltage Min Demand Alarm Level	R W	FP	
41528-29	Neutral Voltage Max Demand Alarm Level	R W	FP	
41530-31	Neutral Voltage Min Demand Alarm Level	R W	FP	
41532-33	Phase Demand1 Alarm Level	R W	FP	
41534-35	Phase Demand2 Alarm Level	R W	FP	
41536-37	Phase Demand3 Alarm Level	R W	FP	
41538-39	Phase Demand4 Alarm Level	R W	FP	
41540-41	Neutral Demand1 Alarm Level	R W	FP	
41542-43	Neutral Demand2 Alarm Level	R W	FP	
41544-45	Neutral Demand3 Alarm Level	R W	FP	
41546-47	Neutral Demand4 Alarm Level	R W	FP	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
41548-49	Negative-Sequence Demand1 Alarm Level	R W	FP	
41550-51	Negative-Sequence Demand2 Alarm Level	R W	FP	
41552-53	Negative-Sequence Demand3 Alarm Level	R W	FP	
41554-55	Negative-Sequence Demand4 Alarm Level	R W	FP	
41556-57	Ground Demand Alarm Level	R W	FP	
41558-63	Major Alarm Mask	R W	BM(96)	
41564-69	Minor Alarm Mask	R W	BM(96)	
41570-75	Logic Alarm Mask	R W	BM(96)	
41576	87T Differential Alarm	R W	INT	
41577	Clock Format - Date	R W	ASC(1)	
41578	Clock Format - Time	R W	SI	
41579	Clock Format - Daylight Savings	R W	SI	
41580	Phase Demand Interval	R W	SI	
41581	Phase Demand Calculation Method	R W	ASC(1)	
41582	Neutral Demand Interval	R W	SI	
41583	Neutral Demand Calculation Method	R W	ASC(1)	
41584	Negative-Seq. Demand Interval	R W	SI	
41585	Negative-Seq. Demand Calculation Method	R W	ASC(1)	
41586	Demand1 CT CKT Number	R W	SI	
41587	Demand2 CT CKT Number	R W	SI	
41588	Demand3 CT CKT Number	R W	SI	
41589	Demand4 CT CKT Number	R W	SI	
41590	Output Hold Mask	R W	BM(16)	
41591-96	Target Mask	R W	BM(96)	
41597-608	Reset Target Logic Mask	R W	BM(192)	
41609-20	Reset Target Logic Term	R W	BM(192)	
41621-24	Programmable Screen #1	R W	ASC(7)	
41625-28	Programmable Screen #2	R W	ASC(7)	
41629-32	Programmable Screen #3	R W	ASC(7)	
41633-36	Programmable Screen #4	R W	ASC(7)	
41637-40	Programmable Screen #5	R W	ASC(7)	
41641-44	Programmable Screen #6	R W	ASC(7)	
41645-48	Programmable Screen #7	R W	ASC(7)	
41649-52	Programmable Screen #8	R W	ASC(7)	
41653-56	Programmable Screen #9	R W	ASC(7)	
41657-60	Programmable Screen #10	R W	ASC(7)	
41661-64	Programmable Screen #11	R W	ASC(7)	
41665-68	Programmable Screen #12	R W	ASC(7)	
41669-72	Programmable Screen #13	R W	ASC(7)	
41673-76	Programmable Screen #14	R W	ASC(7)	
41677-80	Programmable Screen #15	R W	ASC(7)	
41681-84	Programmable Screen #16	R W	ASC(7)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
41685-96	Fault Record Trigger (Trip) Logic Mask	R W	BM(192)	
41697-708	Fault Record Trigger (Trip) Logic Term	R W	BM(192)	
41709-20	Fault Record Trigger (Pickup) Logic Mask	R W	BM(192)	
41721-32	Fault Record Trigger (Pickup) Logic Term	R W	BM(192)	
41733-44	Fault Record Trigger (Logic) Logic Mask	R W	BM(192)	
41745-56	Fault Record Trigger (Logic) Logic Term	R W	BM(192)	
41757-68	Reset Alarm Logic Mask	R W	BM(192)	
41769-80	Reset Alarm Logic Term	R W	BM(192)	
Custom Logic Setting Parameters				
41800-08	User Custom Logic Name	R W	ASC(18)	
41809-17	Current Active Logic Scheme	R -	ASC(18)	
41818-26	Standard Logic #1 Name	R -	ASC(18)	
41827-35	Standard Logic #2 Name	R -	ASC(18)	
41840	Programmable 50TP Logic Mode	R W	INT	
41841-52	Programmable 50TP Block Logic Mask	R W	BM(192)	
41853-64	Programmable 50TP Block Logic Term	R W	BM(192)	
41865	Programmable 50TN Logic Mode	R W	INT	
41866-77	Programmable 50TN Block Logic Mask	R W	BM(192)	
41878-89	Programmable 50TN Block Logic Term	R W	BM(192)	
41890	Programmable 50TQ Logic Mode	R W	INT	
41891-02	Programmable 50TQ Block Logic Mask	R W	BM(192)	
41903-14	Programmable 50TQ Block Logic Term	R W	BM(192)	
41915	Programmable 150TP Logic Mode	R W	INT	
41916-27	Programmable 150TP Block Logic Mask	R W	BM(192)	
41928-39	Programmable 150TP Block Logic Term	R W	BM(192)	
41940	Programmable 150TN Logic Mode	R W	INT	
41941-52	Programmable 150TN Block Logic Mask	R W	BM(192)	
41953-64	Programmable 150TN Block Logic Term	R W	BM(192)	
41965	Programmable 150TQ Logic Mode	R W	INT	
41966-77	Programmable 150TQ Block Logic Mask	R W	BM(192)	
41978-89	Programmable 150TQ Block Logic Term	R W	BM(192)	
41990	Programmable 250TP Logic Mode	R W	INT	
41991-02	Programmable 250TP Block Logic Mask	R W	BM(192)	
42003-14	Programmable 250TP Block Logic Term	R W	BM(192)	
42015	Programmable 250TN Logic Mode	R W	INT	
42016-27	Programmable 250TN Block Logic Mask	R W	BM(192)	
42028-39	Programmable 250TN Block Logic Term	R W	BM(192)	
42040	Programmable 250TQ Logic Mode	R W	INT	
42041-52	Programmable 250TQ Block Logic Mask	R W	BM(192)	
42053-64	Programmable 250TQ Block Logic Term	R W	BM(192)	
42065	Programmable 350TP Logic Mode	R W	INT	
42066-77	Programmable 350TP Block Logic Mask	R W	BM(192)	
42078-89	Programmable 350TP Block Logic Term	R W	BM(192)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
42090	Programmable 350TN Logic Mode	R W	INT	
42091-02	Programmable 350TN Block Logic Mask	R W	BM(192)	
42103-14	Programmable 350TN Block Logic Term	R W	BM(192)	
42115	Programmable 350TQ Logic Mode	R W	INT	
42116-27	Programmable 350TQ Block Logic Mask	R W	BM(192)	
42128-39	Programmable 350TQ Block Logic Term	R W	BM(192)	
42140	Programmable 450TP Logic Mode	R W	INT	
42141-52	Programmable 450TP Block Logic Mask	R W	BM(192)	
42153-64	Programmable 450TP Block Logic Term	R W	BM(192)	
42165	Programmable 450TN Logic Mode	R W	INT	
42166-77	Programmable 450TN Block Logic Mask	R W	BM(192)	
42178-89	Programmable 450TN Block Logic Term	R W	BM(192)	
42190	Programmable 550TP Logic Mode	R W	INT	
42191-02	Programmable 550TP Block Logic Mask	R W	BM(192)	
42203-14	Programmable 550TP Block Logic Term	R W	BM(192)	
42215	Programmable 650TP Logic Mode	R W	INT	
42216-27	Programmable 650TP Block Logic Mask	R W	BM(192)	
42228-39	Programmable 650TP Block Logic Term	R W	BM(192)	
42240	Programmable 750TP Logic Mode	R W	INT	
42241-52	Programmable 750TP Block Logic Mask	R W	BM(192)	
42253-64	Programmable 750TP Block Logic Term	R W	BM(192)	
42265	Programmable 50BF Logic Mode	R W	INT	
42266-77	Programmable 50BF Initiate Logic Mask	R W	BM(192)	
42278-89	Programmable 50BF Initiate Logic Term	R W	BM(192)	
42290-01	Programmable 50BF 52 Initiate Logic Mask	R W	BM(192)	
42302-13	Programmable 50BF 52 Initiate Logic Term	R W	BM(192)	
42314-25	Programmable 50BF 52 Status Logic Mask	R W	BM(192)	
42326-37	Programmable 50BF 52 Status Logic Term	R W	BM(192)	
42338-49	Programmable 50BF Block Logic Mask	R W	BM(192)	
42350-61	Programmable 50BF Block Logic Term	R W	BM(192)	
42362	Programmable 150BF Logic Mode	R W	INT	
42363-74	Programmable 150BF Initiate Logic Mask	R W	BM(192)	
42375-86	Programmable 150BF Initiate Logic Term	R W	BM(192)	
42387-98	Programmable 150BF 52 Initiate Logic Mask	R W	BM(192)	
42399-10	Programmable 150BF 52 Initiate Logic Term	R W	BM(192)	
42411-22	Programmable 150BF 52 Status Logic Mask	R W	BM(192)	
42423-34	Programmable 150BF 52 Status Logic Term	R W	BM(192)	
42435-46	Programmable 150BF Block Logic Mask	R W	BM(192)	
42447-58	Programmable 150BF Block Logic Term	R W	BM(192)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
42459	Programmable 250BF Logic Mode	R W	INT	
42460-71	Programmable 250BF Initiate Logic Mask	R W	BM(192)	
42472-83	Programmable 250BF Initiate Logic Term	R W	BM(192)	
42484-95	Programmable 250BF 52 Initiate Logic Mask	R W	BM(192)	
42496-07	Programmable 250BF 52 Initiate Logic Term	R W	BM(192)	
42508-19	Programmable 250BF 52 Status Logic Mask	R W	BM(192)	
42520-31	Programmable 250BF 52 Status Logic Term	R W	BM(192)	
42532-43	Programmable 250BF Block Logic Mask	R W	BM(192)	
42544-55	Programmable 250BF Block Logic Term	R W	BM(192)	
42556	Programmable 350BF Logic Mode	R W	INT	
42557-68	Programmable 350BF Initiate Logic Mask	R W	BM(192)	
42569-80	Programmable 350BF Initiate Logic Term	R W	BM(192)	
42581-92	Programmable 350BF 52 Initiate Logic Mask	R W	BM(192)	
42593-04	Programmable 350BF 52 Initiate Logic Term	R W	BM(192)	
42605-16	Programmable 350BF 52 Status Logic Mask	R W	BM(192)	
42617-28	Programmable 350BF 52 Status Logic Term	R W	BM(192)	
42629-40	Programmable 350BF Block Logic Mask	R W	BM(192)	
42641-52	Programmable 350BF Block Logic Term	R W	BM(192)	
42653	Programmable 51P Logic Mode	R W	INT	
42654-65	Programmable 51P Block Logic Mask	R W	BM(192)	
42666-77	Programmable 51P Block Logic Term	R W	BM(192)	
42678	Programmable 51N Logic Mode	R W	INT	
42679-90	Programmable 51N Block Logic Mask	R W	BM(192)	
42691-02	Programmable 51N Block Logic Term	R W	BM(192)	
42703	Programmable 51Q Logic Mode	R W	INT	
42704-15	Programmable 51Q Block Logic Mask	R W	BM(192)	
42716-27	Programmable 51Q Block Logic Term	R W	BM(192)	
42728	Programmable 151P Logic Mode	R W	INT	
42729-40	Programmable 151P Block Logic Mask	R W	BM(192)	
42741-52	Programmable 151P Block Logic Term	R W	BM(192)	
42753	Programmable 151N Logic Mode	R W	INT	
42754-65	Programmable 151N Block Logic Mask	R W	BM(192)	
42766-77	Programmable 151N Block Logic Term	R W	BM(192)	
42778	Programmable 151Q Logic Mode	R W	INT	
42779-90	Programmable 151Q Block Logic Mask	R W	BM(192)	
42791-02	Programmable 151Q Block Logic Term	R W	BM(192)	
42803	Programmable 251P Logic Mode	R W	INT	
42804-15	Programmable 251P Block Logic Mask	R W	BM(192)	
42816-27	Programmable 251P Block Logic Term	R W	BM(192)	
42828	Programmable 251N Logic Mode	R W	INT	
42829-40	Programmable 251N Block Logic Mask	R W	BM(192)	
42841-52	Programmable 251N Block Logic Term	R W	BM(192)	
42853	Programmable 251Q Logic Mode	R W	INT	
42854-65	Programmable 251Q Block Logic Mask	R W	BM(192)	
42866-77	Programmable 251Q Block Logic Term	R W	BM(192)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
42878	Programmable 351P Logic Mode	R W	INT	
42879-90	Programmable 351P Block Logic Mask	R W	BM(192)	
42891-02	Programmable 351P Block Logic Term	R W	BM(192)	
42903	Programmable 351N Logic Mode	R W	INT	
42904-15	Programmable 351N Block Logic Mask	R W	BM(192)	
42916-27	Programmable 351N Block Logic Term	R W	BM(192)	
42928	Programmable 351Q Logic Mode	R W	INT	
42929-40	Programmable 351Q Block Logic Mask	R W	BM(192)	
42941-52	Programmable 351Q Block Logic Term	R W	BM(192)	
42953	Programmable 451N Logic Mode	R W	INT	
42954-65	Programmable 451N Block Logic Mask	R W	BM(192)	
42966-77	Programmable 451N Block Logic Term	R W	BM(192)	
42978	Programmable 24 Logic Mode	R W	INT	
42979-90	Programmable 24 Block Logic Mask	R W	BM(192)	
42991-03	Programmable 24 Block Logic Term	R W	BM(192)	
43003	Programmable 27P Logic Mode	R W	INT	
43004-15	Programmable 27P Block Logic Mask	R W	BM(192)	
43016-27	Programmable 27P Block Logic Term	R W	BM(192)	
43028	Programmable 127P Logic Mode	R W	INT	
43029-40	Programmable 127P Block Logic Mask	R W	BM(192)	
43041-52	Programmable 127P Block Logic Term	R W	BM(192)	
43053	Programmable 47 Logic Mode	R W	INT	
43054-65	Programmable 47 Block Logic Mask	R W	BM(192)	
43066-77	Programmable 47 Block Logic Term	R W	BM(192)	
43078	Programmable 59P Logic Mode	R W	INT	
43079-90	Programmable 59P Block Logic Mask	R W	BM(192)	
43091-02	Programmable 59P Block Logic Term	R W	BM(192)	
43103	Programmable 159P Logic Mode	R W	INT	
43104-15	Programmable 159P Block Logic Mask	R W	BM(192)	
43116-27	Programmable 159P Block Logic Term	R W	BM(192)	
43128	Programmable 62 Timer Logic Mode	R W	INT	
43129-40	Programmable 62 Timer Start Logic Mask	R W	BM(192)	
43141-52	Programmable 62 Timer Start Logic Term	R W	BM(192)	
43153-64	Programmable 62 Timer Block Logic Mask	R W	BM(192)	
43165-76	Programmable 62 Timer Block Logic Term	R W	BM(192)	
43177	Programmable 162 Timer Logic Mode	R W	INT	
43178-89	Programmable 162 Timer Start Logic Mask	R W	BM(192)	
43190-01	Programmable 162 Timer Start Logic Term	R W	BM(192)	
43202-13	Programmable 162 Timer Block Logic Mask	R W	BM(192)	
43214-25	Programmable 162 Timer Block Logic Term	R W	BM(192)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
43226	Programmable 262 Timer Logic Mode	R W	INT	
43227-238	Programmable 262 Timer Start Logic Mask	R W	BM(192)	
43239-50	Programmable 262 Timer Start Logic Term	R W	BM(192)	
43251-62	Programmable 262 Timer Block Logic Mask	R W	BM(192)	
43263-74	Programmable 262 Timer Block Logic Term	R W	BM(192)	
43275	Programmable 362 Timer Logic Mode	R W	INT	
43276-87	Programmable 362 Timer Start Logic Mask	R W	BM(192)	
43288-99	Programmable 362 Timer Start Logic Term	R W	BM(192)	
43300-11	Programmable 362 Timer Block Logic Mask	R W	BM(192)	
43312-23	Programmable 362 Timer Block Logic Term	R W	BM(192)	
43324	Programmable 81 Logic Mode	R W	INT	
43325-36	Programmable 81 Block Logic Mask	R W	BM(192)	
43337-48	Programmable 81 Block Logic Term	R W	BM(192)	
43349	Programmable 181 Logic Mode	R W	INT	
43350-61	Programmable 181 Block Logic Mask	R W	BM(192)	
43362-73	Programmable 181 Block Logic Term	R W	BM(192)	
43374	Programmable 281 Logic Mode	R W	INT	
43375-86	Programmable 281 Block Logic Mask	R W	BM(192)	
43387-98	Programmable 281 Block Logic Term	R W	BM(192)	
43399	Programmable 381 Logic Mode	R W	INT	
43400-11	Programmable 381 Block Logic Mask	R W	BM(192)	
43412-23	Programmable 381 Block Logic Term	R W	BM(192)	
43424	Programmable 481 Logic Mode	R W	INT	
43425-36	Programmable 481 Block Logic Mask	R W	BM(192)	
43437-48	Programmable 481 Block Logic Term	R W	BM(192)	
43449	Programmable 581 Logic Mode	R W	INT	
43450-61	Programmable 581 Block Logic Mask	R W	BM(192)	
43462-73	Programmable 581 Block Logic Term	R W	BM(192)	
43474	Programmable 87 Differential Logic Mode	R W	INT	
43475-86	Programmable 87 Differential Block Logic Mask	R W	BM(192)	
43487-98	Programmable 87 Differential Block Logic Term	R W	BM(192)	
43499	Programmable 87ND Differential Logic Mode	R W	INT	
43500-11	Programmable 87ND Diff. Block Logic Mask	R W	BM(192)	
43512-23	Programmable 87ND Diff. Block Logic Term	R W	BM(192)	
43524	Programmable 187ND Differential Logic Mode	R W	INT	
43525-36	Programmable 187ND Diff. Block Logic Mask	R W	BM(192)	
43537-48	Programmable 187ND Diff. Block Logic Term	R W	BM(192)	
43549	Programmable Settings Group Logic Mode	R W	INT	
43550-61	Programmable Settings Grp0 Select Logic Mask	R W	BM(192)	
43562-73	Programmable Settings Grp0 Select Logic Term	R W	BM(192)	
43574-85	Programmable Settings Grp1 Select Logic Mask	R W	BM(192)	
43586-97	Programmable Settings Grp1 Select Logic Term	R W	BM(192)	
43598-609	Programmable Settings Grp2 Select Logic Mask	R W	BM(192)	
43610-21	Programmable Settings Grp2 Select Logic Term	R W	BM(192)	
43622-33	Programmable Settings Grp3 Select Logic Mask	R W	BM(192)	
43634-45	Programmable Settings Grp3 Select Logic Term	R W	BM(192)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
43646-57	Programmable Settings Group Auto Logic Mask	R W	BM(192)	
43658-69	Programmable Settings Group Auto Logic Term	R W	BM(192)	
43670	Programmable 43 Virtual Switch Logic Mode	R W	INT	
43671	Programmable 143 Virtual Switch Logic Mode	R W	INT	
43672	Programmable 243 Virtual Switch Logic Mode	R W	INT	
43673	Programmable 343 Virtual Switch Logic Mode	R W	INT	
43674	Programmable 443 Virtual Switch Logic Mode	R W	INT	
43675	Programmable 543 Virtual Switch Logic Mode	R W	INT	
43676	Programmable 643 Virtual Switch Logic Mode	R W	INT	
43677	Programmable 743 Virtual Switch Logic Mode	R W	INT	
43782	Programmable Virtual Output A Term Count	R W	SI	
43783-94	Programmable Virtual Output A Logic Mask 1	R W	BM(192)	
43795-06	Programmable Virtual Output A Logic Term 1	R W	BM(192)	
43807-18	Programmable Virtual Output A Logic Mask 2	R W	BM(192)	
43819-30	Programmable Virtual Output A Logic Term 2	R W	BM(192)	
43831-42	Programmable Virtual Output A Logic Mask 3	R W	BM(192)	
43843-54	Programmable Virtual Output A Logic Term 3	R W	BM(192)	
43855-66	Programmable Virtual Output A Logic Mask 4	R W	BM(192)	
43867-78	Programmable Virtual Output A Logic Term 4	R W	BM(192)	
43879	Programmable Virtual Output 1 Term Count	R W	SI	
43880-91	Programmable Virtual Output 1 Logic Mask 1	R W	BM(192)	
43892-03	Programmable Virtual Output 1 Logic Term 1	R W	BM(192)	
43904-15	Programmable Virtual Output 1 Logic Mask 2	R W	BM(192)	
43916-27	Programmable Virtual Output 1 Logic Term 2	R W	BM(192)	
43928-39	Programmable Virtual Output 1 Logic Mask 3	R W	BM(192)	
43940-51	Programmable Virtual Output 1 Logic Term 3	R W	BM(192)	
43952-63	Programmable Virtual Output 1 Logic Mask 4	R W	BM(192)	
43964-75	Programmable Virtual Output 1 Logic Term 4	R W	BM(192)	
43976	Programmable Virtual Output 2 Term Count	R W	SI	
43977-88	Programmable Virtual Output 2 Logic Mask 1	R W	BM(192)	
43989-00	Programmable Virtual Output 2 Logic Term 1	R W	BM(192)	
44001-12	Programmable Virtual Output 2 Logic Mask 2	R W	BM(192)	
44013-24	Programmable Virtual Output 2 Logic Term 2	R W	BM(192)	
44025-36	Programmable Virtual Output 2 Logic Mask 3	R W	BM(192)	
44037-48	Programmable Virtual Output 2 Logic Term 3	R W	BM(192)	
44049-60	Programmable Virtual Output 2 Logic Mask 4	R W	BM(192)	
44061-72	Programmable Virtual Output 2 Logic Term 4	R W	BM(192)	
44073	Programmable Virtual Output 3 Term Count	R W	SI	
44074-85	Programmable Virtual Output 3 Logic Mask 1	R W	BM(192)	
44086-97	Programmable Virtual Output 3 Logic Term 1	R W	BM(192)	
44098-09	Programmable Virtual Output 3 Logic Mask 2	R W	BM(192)	
44110-21	Programmable Virtual Output 3 Logic Term 2	R W	BM(192)	
44122-33	Programmable Virtual Output 3 Logic Mask 3	R W	BM(192)	
44134-45	Programmable Virtual Output 3 Logic Term 3	R W	BM(192)	
44146-57	Programmable Virtual Output 3 Logic Mask 4	R W	BM(192)	
44158-69	Programmable Virtual Output 3 Logic Term 4	R W	BM(192)	
44170	Programmable Virtual Output 4 Term Count	RW	SI	
44171-82	Programmable Virtual Output 4 Logic Mask 1	R W	BM(192)	
44183-94	Programmable Virtual Output 4 Logic Term 1	R W	BM(192)	
44195-06	Programmable Virtual Output 4 Logic Mask 2	R W	BM(192)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
44207-18	Programmable Virtual Output 4 Logic Term 2	R W	BM(192)	
44219-30	Programmable Virtual Output 4 Logic Mask 3	R W	BM(192)	
44231-42	Programmable Virtual Output 4 Logic Term 3	R W	BM(192)	
44243-54	Programmable Virtual Output 4 Logic Mask 4	R W	BM(192)	
44255-66	Programmable Virtual Output 4 Logic Term 4	R W	BM(192)	
44267	Programmable Virtual Output 5 Term Count	R W	SI	
44268-79	Programmable Virtual Output 5 Logic Mask 1	R W	BM(192)	
44280-91	Programmable Virtual Output 5 Logic Term 1	R W	BM(192)	
44292-03	Programmable Virtual Output 5 Logic Mask 2	R W	BM(192)	
44304-15	Programmable Virtual Output 5 Logic Term 2	R W	BM(192)	
44316-27	Programmable Virtual Output 5 Logic Mask 3	R W	BM(192)	
44328-39	Programmable Virtual Output 5 Logic Term 3	R W	BM(192)	
44340-51	Programmable Virtual Output 5 Logic Mask 4	R W	BM(192)	
44352-63	Programmable Virtual Output 5 Logic Term 4	R W	BM(192)	
44364	Programmable Virtual Output 6 Term Count	R W	SI	
44365-76	Programmable Virtual Output 6 Logic Mask 1	R W	BM(192)	
44377-88	Programmable Virtual Output 6 Logic Term 1	R W	BM(192)	
44389-00	Programmable Virtual Output 6 Logic Mask 2	R W	BM(192)	
44401-12	Programmable Virtual Output 6 Logic Term 2	R W	BM(192)	
44413-24	Programmable Virtual Output 6 Logic Mask 3	R W	BM(192)	
44425-36	Programmable Virtual Output 6 Logic Term 3	R W	BM(192)	
44437-48	Programmable Virtual Output 6 Logic Mask 4	R W	BM(192)	
44449-60	Programmable Virtual Output 6 Logic Term 4	R W	BM(192)	
44461	Programmable Virtual Output 7 Term Count	R W	SI	
44462-73	Programmable Virtual Output 7 Logic Mask 1	R W	BM(192)	
44474-85	Programmable Virtual Output 7 Logic Term 1	R W	BM(192)	
44486-97	Programmable Virtual Output 7 Logic Mask 2	R W	BM(192)	
44498-09	Programmable Virtual Output 7 Logic Term 2	R W	BM(192)	
44510-21	Programmable Virtual Output 7 Logic Mask 3	R W	BM(192)	
44522-33	Programmable Virtual Output 7 Logic Term 3	R W	BM(192)	
44534-45	Programmable Virtual Output 7 Logic Mask 4	R W	BM(192)	
44546-57	Programmable Virtual Output 7 Logic Term 4	R W	BM(192)	
44558	Programmable Virtual Output 8 Term Count	R W	SI	
44559-70	Programmable Virtual Output 8 Logic Mask 1	R W	BM(192)	
44571-82	Programmable Virtual Output 8 Logic Term 1	R W	BM(192)	
44583-94	Programmable Virtual Output 8 Logic Mask 2	R W	BM(192)	
44595-06	Programmable Virtual Output 8 Logic Term 2	R W	BM(192)	
44607-18	Programmable Virtual Output 8 Logic Mask 3	R W	BM(192)	
44619-30	Programmable Virtual Output 8 Logic Term 3	R W	BM(192)	
44631-42	Programmable Virtual Output 8 Logic Mask 4	R W	BM(192)	
44643-54	Programmable Virtual Output 8 Logic Term 4	R W	BM(192)	
44655	Programmable Virtual Output 9 Term Count	R W	SI	
44656-67	Programmable Virtual Output 9 Logic Mask 1	R W	BM(192)	
44668-79	Programmable Virtual Output 9 Logic Term 1	R W	BM(192)	
44680-91	Programmable Virtual Output 9 Logic Mask 2	R W	BM(192)	
44692-03	Programmable Virtual Output 9 Logic Term 2	R W	BM(192)	
44704-15	Programmable Virtual Output 9 Logic Mask 3	R W	BM(192)	
44716-27	Programmable Virtual Output 9 Logic Term 3	R W	BM(192)	
44728-39	Programmable Virtual Output 9 Logic Mask 4	R W	BM(192)	
44740-51	Programmable Virtual Output 9 Logic Term 4	R W	BM(192)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
44752	Programmable Virtual Output 10 Term Count	R W	SI	
44753-64	Programmable Virtual Output 10 Logic Mask 1	R W	BM(192)	
44765-76	Programmable Virtual Output 10 Logic Term 1	R W	BM(192)	
44777-88	Programmable Virtual Output 10 Logic Mask 2	R W	BM(192)	
44789-00	Programmable Virtual Output 10 Logic Term 2	R W	BM(192)	
44801-12	Programmable Virtual Output 10 Logic Mask 3	R W	BM(192)	
44813-24	Programmable Virtual Output 10 Logic Term 3	R W	BM(192)	
44825-36	Programmable Virtual Output 10 Logic Mask 4	R W	BM(192)	
44837-48	Programmable Virtual Output 10 Logic Term 4	R W	BM(192)	
44849	Programmable Virtual Output 11 Term Count	R W	SI	
44850-61	Programmable Virtual Output 11 Logic Mask 1	R W	BM(192)	
44862-73	Programmable Virtual Output 11 Logic Term 1	R W	BM(192)	
44874-85	Programmable Virtual Output 11 Logic Mask 2	R W	BM(192)	
44886-97	Programmable Virtual Output 11 Logic Term 2	R W	BM(192)	
44898-09	Programmable Virtual Output 11 Logic Mask 3	R W	BM(192)	
44910-21	Programmable Virtual Output 11 Logic Term 3	R W	BM(192)	
44922-33	Programmable Virtual Output 11 Logic Mask 4	R W	BM(192)	
44934-45	Programmable Virtual Output 11 Logic Term 4	R W	BM(192)	
44946	Programmable Virtual Output 12 Term Count	R W	SI	
44947-58	Programmable Virtual Output 12 Logic Mask 1	R W	BM(192)	
44959-70	Programmable Virtual Output 12 Logic Term 1	R W	BM(192)	
44971-82	Programmable Virtual Output 12 Logic Mask 2	R W	BM(192)	
44983-94	Programmable Virtual Output 12 Logic Term 2	R W	BM(192)	
44995-06	Programmable Virtual Output 12 Logic Mask 3	R W	BM(192)	
45007-18	Programmable Virtual Output 12 Logic Term 3	R W	BM(192)	
45019-30	Programmable Virtual Output 12 Logic Mask 4	R W	BM(192)	
45031-42	Programmable Virtual Output 12 Logic Term 4	R W	BM(192)	
45043	Programmable Virtual Output 13 Term Count	R W	SI	
45044-55	Programmable Virtual Output 13 Logic Mask 1	R W	BM(192)	
45056-67	Programmable Virtual Output 13 Logic Term 1	R W	BM(192)	
45068-79	Programmable Virtual Output 13 Logic Mask 2	R W	BM(192)	
45080-91	Programmable Virtual Output 13 Logic Term 2	R W	BM(192)	
45092-03	Programmable Virtual Output 13 Logic Mask 3	R W	BM(192)	
45104-15	Programmable Virtual Output 13 Logic Term 3	R W	BM(192)	
45116-27	Programmable Virtual Output 13 Logic Mask 4	R W	BM(192)	
45128-39	Programmable Virtual Output 13 Logic Term 4	R W	BM(192)	
45140	Programmable Virtual Output 14 Term Count	R W	SI	
45141-52	Programmable Virtual Output 14 Logic Mask 1	R W	BM(192)	
45153-64	Programmable Virtual Output 14 Logic Term 1	R W	BM(192)	
45165-76	Programmable Virtual Output 14 Logic Mask 2	R W	BM(192)	
45177-88	Programmable Virtual Output 14 Logic Term 2	R W	BM(192)	
45189-00	Programmable Virtual Output 14 Logic Mask 3	R W	BM(192)	
45201-12	Programmable Virtual Output 14 Logic Term 3	R W	BM(192)	
45213-24	Programmable Virtual Output 14 Logic Mask 4	R W	BM(192)	
45225-36	Programmable Virtual Output 14 Logic Term 4	R W	BM(192)	
45237	Programmable Virtual Output 15 Term Count	R W	SI	
45238-49	Programmable Virtual Output 15 Logic Mask 1	R W	BM(192)	
45250-61	Programmable Virtual Output 15 Logic Term 1	R W	BM(192)	
45262-73	Programmable Virtual Output 15 Logic Mask 2	R W	BM(192)	
45274-85	Programmable Virtual Output 15 Logic Term 2	R W	BM(192)	
45286-97	Programmable Virtual Output 15 Logic Mask 3	R W	BM(192)	
45298-09	Programmable Virtual Output 15 Logic Term 3	R W	BM(192)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
45310-21	Programmable Virtual Output 15 Logic Mask 4	R W	BM(192)	
45322-33	Programmable Virtual Output 15 Logic Term 4	R W	BM(192)	
45334	Programmable Hardware Output A Logic	R W	BM(16)	
45335	Programmable Hardware Output 1 Logic	R W	BM(16)	
45336	Programmable Hardware Output 2 Logic	R W	BM(16)	
45337	Programmable Hardware Output 3 Logic	R W	BM(16)	
45338	Programmable Hardware Output 4 Logic	R W	BM(16)	
45339	Programmable Hardware Output 5 Logic	R W	BM(16)	
45340	Programmable Hardware Output 6 Logic	R W	BM(16)	
45341	Programmable Hardware Output 7 Logic	R W	BM(16)	
45342	Programmable Hardware Output 8 Logic	R W	BM(16)	
45343	Programmable Hardware Output 9 Logic	R W	BM(16)	
45344	Programmable Hardware Output 10 Logic	R W	BM(16)	
45345	Programmable Hardware Output 11 Logic	R W	BM(16)	
45346	Programmable Hardware Output 12 Logic	R W	BM(16)	
45347	Programmable Hardware Output 13 Logic	R W	BM(16)	
45348	Programmable Hardware Output 14 Logic	R W	BM(16)	
45349	Prog. 101 Virtual Breaker Control Logic Mode	R W	INT	
45350	Prog. 1101 Virtual Breaker Control Logic Mode	R W	INT	
45351	Prog. 2101 Virtual Breaker Control Logic Mode	R W	INT	
45352	Prog. 3101 Virtual Breaker Control Logic Mode	R W	INT	
45353	Programmable 59X Logic Mode	R W	INT	
45354-65	Programmable 59X Block Logic Mask	R W	BM(192)	
45366-77	Programmable 59X Block Logic Term	R W	BM(192)	
System Labels and ID Setting Parameters				
45400-14	Relay ID	R W	ASC(30)	
45415-29	Station ID	R W	ASC(30)	
45430-44	User ID #1	R W	ASC(30)	
45445-59	User ID #2	R W	ASC(30)	
45460-67	Input 1 - Name Label	R W	ASC(16)	
45468-71	Input 1 - True Label	R W	ASC(7)	
45472-75	Input 1 - False Label	R W	ASC(7)	
45476-83	Input 2 - Name Label	R W	ASC(16)	
45484-87	Input 2 - True Label	R W	ASC(7)	
45488-91	Input 2 - False Label	R W	ASC(7)	
45492-99	Input 3 - Name Label	R W	ASC(16)	
45500-03	Input 3 - True Label	R W	ASC(7)	
45504-07	Input 3 - False Label	R W	ASC(7)	
45508-15	Input 4 - Name Label	R W	ASC(16)	
45516-19	Input 4 - True Label	R W	ASC(7)	
45520-23	Input 4 - False Label	R W	ASC(7)	
45524-31	Input 5 - Name Label	R W	ASC(16)	
45532-35	Input 5 - True Label	R W	ASC(7)	
45536-39	Input 5 - False Label	R W	ASC(7)	
45540-47	Input 6 - Name Label	R W	ASC(16)	
45548-51	Input 6 - True Label	R W	ASC(7)	
45552-55	Input 6 - False Label	R W	ASC(7)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
45556-63	Input 7 - Name Label	R W	ASC(16)	
45564-67	Input 7 - True Label	R W	ASC(7)	
45568-71	Input 7 - False Label	R W	ASC(7)	
45572-79	Input 8 - Name Label	R W	ASC(16)	
45580-83	Input 8 - True Label	R W	ASC(7)	
45584-87	Input 8 - False Label	R W	ASC(7)	
45588-95	Input 9 - Name Label	R W	ASC(16)	
45596-99	Input 9 - True Label	R W	ASC(7)	
45600-03	Input 9 - False Label	R W	ASC(7)	
45604-11	Input 10 - Name Label	R W	ASC(16)	
45612-15	Input 10 - True Label	R W	ASC(7)	
45616-19	Input 10 - False Label	R W	ASC(7)	
45620-27	Input 11 - Name Label	R W	ASC(16)	
45628-31	Input 11 - True Label	R W	ASC(7)	
45632-35	Input 11 - False Label	R W	ASC(7)	
45636-43	Input 12 - Name Label	R W	ASC(16)	
45644-47	Input 12 - True Label	R W	ASC(7)	
45648-51	Input 12 - False Label	R W	ASC(7)	
45652-59	Virtual Selector Switch 43 - Name Label	R W	ASC(16)	
45660-63	Virtual Selector Switch 43 - True Label	R W	ASC(7)	
45664-67	Virtual Selector Switch 43 - False Label	R W	ASC(7)	
45668-75	Virtual Selector Switch 143 - Name Label	R W	ASC(16)	
45676-79	Virtual Selector Switch 143 - True Label	R W	ASC(7)	
45680-83	Virtual Selector Switch 143 - False Label	R W	ASC(7)	
45684-91	Virtual Selector Switch 243 - Name Label	R W	ASC(16)	
45692-95	Virtual Selector Switch 243 - True Label	R W	ASC(7)	
45696-99	Virtual Selector Switch 243 - False Label	R W	ASC(7)	
45700-07	Virtual Selector Switch 343 - Name Label	R W	ASC(16)	
45708-11	Virtual Selector Switch 343 - True Label	R W	ASC(7)	
45712-15	Virtual Selector Switch 343 - False Label	R W	ASC(7)	
45716-23	Virtual Selector Switch 443 - Name Label	R W	ASC(16)	
45724-27	Virtual Selector Switch 443 - True Label	R W	ASC(7)	
45728-31	Virtual Selector Switch 443 - False Label	R W	ASC(7)	
45732-39	Virtual Selector Switch 543 - Name Label	R W	ASC(16)	
45740-43	Virtual Selector Switch 543 - True Label	R W	ASC(7)	
45744-47	Virtual Selector Switch 543 - False Label	R W	ASC(7)	
45748-55	Virtual Selector Switch 643 - Name Label	R W	ASC(16)	
45756-59	Virtual Selector Switch 643 - True Label	R W	ASC(7)	
45760-63	Virtual Selector Switch 643 - False Label	R W	ASC(7)	
45764-71	Virtual Selector Switch 743 - Name Label	R W	ASC(16)	
45772-75	Virtual Selector Switch 743 - True Label	R W	ASC(7)	
45776-79	Virtual Selector Switch 743 - False Label	R W	ASC(7)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
45780-87	Virtual Output A - Name Label	R W	ASC(16)	
45788-91	Virtual Output A - True Label	R W	ASC(7)	
45792-95	Virtual Output A - False Label	R W	ASC(7)	
45796-03	Virtual Output 1 - Name Label	R W	ASC(16)	
45804-07	Virtual Output 1 - True Label	R W	ASC(7)	
45808-11	Virtual Output 1 - False Label	R W	ASC(7)	
45812-19	Virtual Output 2 - Name Label	R W	ASC(16)	
45820-23	Virtual Output 2 - True Label	R W	ASC(7)	
45824-27	Virtual Output 2 - False Label	R W	ASC(7)	
45828-35	Virtual Output 3 - Name Label	R W	ASC(16)	
45836-39	Virtual Output 3 - True Label	R W	ASC(7)	
45840-43	Virtual Output 3 - False Label	R W	ASC(7)	
45844-51	Virtual Output 4 - Name Label	R W	ASC(16)	
45852-55	Virtual Output 4 - True Label	R W	ASC(7)	
45856-59	Virtual Output 4 - False Label	R W	ASC(7)	
45860-67	Virtual Output 5 - Name Label	R W	ASC(16)	
45868-71	Virtual Output 5 - True Label	R W	ASC(7)	
45872-75	Virtual Output 5 - False Label	R W	ASC(7)	
45876-83	Virtual Output 6 - Name Label	R W	ASC(16)	
45884-87	Virtual Output 6 - True Label	R W	ASC(7)	
45888-91	Virtual Output 6 - False Label	R W	ASC(7)	
45892-99	Virtual Output 7 - Name Label	R W	ASC(16)	
45900-03	Virtual Output 7 - True Label	R W	ASC(7)	
45904-07	Virtual Output 7 - False Label	R W	ASC(7)	
45908-15	Virtual Output 8 - Name Label	R W	ASC(16)	
45916-19	Virtual Output 8 - True Label	R W	ASC(7)	
45920-23	Virtual Output 8 - False Label	R W	ASC(7)	
45924-31	Virtual Output 9 - Name Label	R W	ASC(16)	
45932-35	Virtual Output 9 - True Label	R W	ASC(7)	
45936-39	Virtual Output 9 - False Label	R W	ASC(7)	
45940-47	Virtual Output 10 - Name Label	R W	ASC(16)	
45948-51	Virtual Output 10 - True Label	R W	ASC(7)	
45952-55	Virtual Output 10 - False Label	R W	ASC(7)	
45956-63	Virtual Output 11 - Name Label	R W	ASC(16)	
45964-67	Virtual Output 11 - True Label	R W	ASC(7)	
45968-71	Virtual Output 11 - False Label	R W	ASC(7)	
45972-79	Virtual Output 12 - Name Label	R W	ASC(16)	
45980-83	Virtual Output 12 - True Label	R W	ASC(7)	
45984-87	Virtual Output 12 - False Label	R W	ASC(7)	
45988-95	Virtual Output 13 - Name Label	R W	ASC(16)	
45996-99	Virtual Output 13 - True Label	R W	ASC(7)	
46000-03	Virtual Output 13 - False Label	R W	ASC(7)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
46004-11	Virtual Output 14 - Name Label	R W	ASC(16)	
46012-15	Virtual Output 14 - True Label	R W	ASC(7)	
46016-19	Virtual Output 14 - False Label	R W	ASC(7)	
46020-27	Virtual Output 15 - Name Label	R W	ASC(16)	
46028-31	Virtual Output 15 - True Label	R W	ASC(7)	
46032-35	Virtual Output 15 - False Label	R W	ASC(7)	
Report Parameters				
47290-94	Model Number	R -	ASC(10)	
47295-03	Application SW Version # / Date	R -	ASC(16)	
47304-12	Boot SW Version # / Date	R -	ASC(14)	
47313-19	Serial Number	R -	ASC(13)	
47320-30	Style Number	R -	ASC(21)	
47331-39	DSP SW Version # / Date	R -	ASC(16)	
47340	COM1 Serial Port Relay Address	R W	INT	
47341	COM2 Serial Port Relay Address	R W	INT	
47342	Date and Time - Day	R W	INT	TS
47343-44	Date and Time - Milliseconds	R W	LI	TS
47345-56	System Status	R -	BM(192)	
47357	Input Status	R -	BM(16)	
47358	43 Status	R -	BM(16)	
47359	101 Status	R -	BM(16)	
47360	Current Active Group Setting	R -	SI	
47361	Current Group Control Setting	R -	ASC(1)	
47362-63	Current Output Control Settings (Output Pulse)	R -	BM(32)	
47364-65	Current Output Control Settings (Output Latch)	R -	BM(32)	
47366	Current Output Contact Status	R -	BM(16)	
47367-68	Active Alarm Flags (Sum Flags)	R -	BM(32)	
47369-74	Active Alarm Flags (Prog Alarms)	R -	BM(96)	
47375-80	Target Status	R W	BM(96)	
47381	Breaker Ckt1 Status	R -	ASC(1)	
47382	Breaker Ckt2 Status	R -	ASC(1)	
47383	Breaker Ckt3 Status	R -	ASC(1)	
47384	Breaker Ckt4 Status	R -	ASC(1)	
47385-93	Current Active Logic Scheme	R -	ASC(18)	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
47394-95	Breaker Ckt 1 Contact Duty Log - Phase A	R W	FP	
47396-97	Breaker Ckt 1 Contact Duty Log - Phase B	R W	FP	
47398-99	Breaker Ckt 1 Contact Duty Log - Phase C	R W	FP	
47400-01	Breaker Ckt 2 Contact Duty Log - Phase A	R W	FP	
47402-03	Breaker Ckt 2 Contact Duty Log - Phase B	R W	FP	
47404-05	Breaker Ckt 2 Contact Duty Log - Phase C	R W	FP	
47406-07	Breaker Ckt 3 Contact Duty Log - Phase A	R W	FP	
47408-09	Breaker Ckt 3 Contact Duty Log - Phase B	R W	FP	
47410-11	Breaker Ckt 3 Contact Duty Log - Phase C	R W	FP	
47412-13	Breaker Ckt 4 Contact Duty Log - Phase A	R W	FP	
47414-15	Breaker Ckt 4 Contact Duty Log - Phase B	R W	FP	
47416-17	Breaker Ckt 4 Contact Duty Log - Phase C	R W	FP	
47418-19	Breaker Ckt 1 Operation Counter	R W	LI	
47420-21	Breaker Ckt 2 Operation Counter	R W	LI	
47422-23	Breaker Ckt 3 Operation Counter	R W	LI	
47424-25	Breaker Ckt 4 Operation Counter	R W	LI	
47426-27	Transformer Duty Log Ckt 1 - Phase A	R W	FP	
47428-29	Transformer Duty Log Ckt 1 - Phase B	R W	FP	
47430-31	Transformer Duty Log Ckt 1 - Phase C	R W	FP	
47432-33	Transformer Duty Log Ckt 2 - Phase A	R W	FP	
47434-35	Transformer Duty Log Ckt 2 - Phase B	R W	FP	
47436-37	Transformer Duty Log Ckt 2 - Phase C	R W	FP	
47438-39	Transformer Duty Log Ckt 3 - Phase A	R W	FP	
47440-41	Transformer Duty Log Ckt 3 - Phase B	R W	FP	
47442-43	Transformer Duty Log Ckt 3 - Phase C	R W	FP	
47444-45	Transformer Duty Log Ckt 4 - Phase A	R W	FP	
47446-47	Transformer Duty Log Ckt 4 - Phase B	R W	FP	
47448-49	Transformer Duty Log Ckt 4 - Phase C	R W	FP	
47450-51	Transformer Through Faults Counter	R W	LI	
47452-53	Yesterday's Peak Demand Current Ckt 1 - Phase A	R -	FP	
47454	Yesterday's Peak Demand Ckt 1 Timestamp - Day	R -	INT	TS
47455-56	Yesterday's Peak Demand Ckt 1 Timestamp - Msec	R -	LI	TS
47457-58	Yesterday's Peak Demand Current Ckt 1 - Phase B	R -	FP	
47459	Yesterday's Peak Demand Ckt 1 Timestamp - Day	R -	INT	TS
47460-61	Yesterday's Peak Demand Ckt 1 Timestamp - Msec	R -	LI	TS
47462-63	Yesterday's Peak Demand Current Ckt 1 - Phase C	R -	FP	
47464	Yesterday's Peak Demand Ckt 1 Timestamp - Day	R -	INT	TS
47465-66	Yesterday's Peak Demand Ckt 1 Timestamp - Msec	R -	LI	TS
47467-68	Yesterday's Peak Demand Current Ckt 1 - Neutral	R -	FP	
47469	Yesterday's Peak Demand Ckt 1 Timestamp - Day	R -	INT	TS
47470-71	Yesterday's Peak Demand Ckt 1 Timestamp - Msec	R -	LI	TS

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
47472-73	Yesterday's Peak Demand Current Ckt 1 - Neg-Seq	R -	FP	
47474	Yesterday's Peak Demand Ckt 1 Timestamp - Day	R -	INT	TS
47475-76	Yesterday's Peak Demand Ckt 1 Timestamp - Msec	R -	LI	TS
47477-78	Yesterday's Peak Demand Current Ckt 2 - Phase A	R -	FP	
47479	Yesterday's Peak Demand Ckt 2 Timestamp - Day	R -	INT	TS
47480-81	Yesterday's Peak Demand Ckt 2 Timestamp - Msec	R -	LI	TS
47482-83	Yesterday's Peak Demand Current Ckt 2 - Phase B	R -	FP	
47484	Yesterday's Peak Demand Ckt 2 Timestamp - Day	R -	INT	TS
47485-86	Yesterday's Peak Demand Ckt 2 Timestamp - Msec	R -	LI	TS
47487-88	Yesterday's Peak Demand Current Ckt 2 - Phase C	R -	FP	
47489	Yesterday's Peak Demand Ckt 2 Timestamp - Day	R -	INT	TS
47490-91	Yesterday's Peak Demand Ckt 2 Timestamp - Msec	R -	LI	TS
47492-93	Yesterday's Peak Demand Current Ckt 2 - Neutral	R -	FP	
47494	Yesterday's Peak Demand Ckt 2 Timestamp - Day	R -	INT	TS
47495-96	Yesterday's Peak Demand Ckt 2 Timestamp - Msec	R -	LI	TS
47497-98	Yesterday's Peak Demand Current Ckt 2 - Neg-Seq	R -	FP	
47499	Yesterday's Peak Demand Ckt 2 Timestamp - Day	R -	INT	TS
47500-01	Yesterday's Peak Demand Ckt 2 Timestamp - Msec	R -	LI	TS
47502-03	Yesterday's Peak Demand Current Ckt 3 - Phase A	R -	FP	
47504	Yesterday's Peak Demand Ckt 3 Timestamp - Day	R -	INT	TS
47505-06	Yesterday's Peak Demand Ckt 3 Timestamp - Msec	R -	LI	TS
47507-08	Yesterday's Peak Demand Current Ckt 3 - Phase B	R -	FP	
47509	Yesterday's Peak Demand Ckt 3 Timestamp - Day	R -	INT	TS
47510-11	Yesterday's Peak Demand Ckt 3 Timestamp - Msec	R -	LI	TS
47512-13	Yesterday's Peak Demand Current Ckt 3 - Phase C	R -	FP	
47514	Yesterday's Peak Demand Ckt 3 Timestamp - Day	R -	INT	TS
47515-16	Yesterday's Peak Demand Ckt 3 Timestamp - Msec	R -	LI	TS
47517-18	Yesterday's Peak Demand Current Ckt 3 - Neutral	R -	FP	
47519	Yesterday's Peak Demand Ckt 3 Timestamp - Day	R -	INT	TS
47520-21	Yesterday's Peak Demand Ckt 3 Timestamp - Msec	R -	LI	TS
47522-23	Yesterday's Peak Demand Current Ckt 3 - Neg-Seq	R -	FP	
47524	Yesterday's Peak Demand Ckt 3 Timestamp - Day	R -	INT	TS
47525-26	Yesterday's Peak Demand Ckt 3 Timestamp - Msec	R -	LI	TS
47527-28	Yesterday's Peak Demand Current Ckt 4 - Phase A	R -	FP	
47529	Yesterday's Peak Demand Ckt 4 Timestamp - Day	R -	INT	TS
47530-31	Yesterday's Peak Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47532-33	Yesterday's Peak Demand Current Ckt 4 - Phase B	R -	FP	
47534	Yesterday's Peak Demand Ckt 4 Timestamp - Day	R -	INT	TS
47535-36	Yesterday's Peak Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47537-38	Yesterday's Peak Demand Current Ckt 4 - Phase C	R -	FP	
47539	Yesterday's Peak Demand Ckt 4 Timestamp - Day	R -	INT	TS
47540-41	Yesterday's Peak Demand Ckt 4 Timestamp - Msec	R -	LI	TS

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
47542-43	Yesterday's Peak Demand Current Ckt 4 - Neutral	R -	FP	
47544	Yesterday's Peak Demand Ckt 4 Timestamp - Day	R -	INT	TS
47545-46	Yesterday's Peak Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47547-48	Yesterday's Peak Demand Current Ckt 4 - Neg-Seq	R -	FP	
47549	Yesterday's Peak Demand Ckt 4 Timestamp - Day	R -	INT	TS
47550-51	Yesterday's Peak Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47552-53	Yesterday's Peak Demand Current - Ground		R -	FP
47554	Yesterday's Peak Demand Ckt 4 Timestamp - Day	R -	INT	TS
47555-56	Yesterday's Peak Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47557-58	Yesterday's Peak Demand Voltage - Phase A HI	R -	FP	
47559	Yesterday's Peak Demand Timestamp - Day	R -	INT	TS
47560-61	Yesterday's Peak Demand Timestamp - Millisecond	R -	LI	TS
47562-63	Yesterday's Peak Demand Voltage - Phase A LO	R -	FP	
47564	Yesterday's Peak Demand Timestamp - Day	R -	INT	TS
47565-66	Yesterday's Peak Demand Timestamp - Millisecond	R -	LI	TS
47567-68	Yesterday's Peak Demand Voltage - Phase B HI	R -	FP	
47569	Yesterday's Peak Demand Timestamp - Day	R -	INT	TS
47570-71	Yesterday's Peak Demand Timestamp - Millisecond	R -	LI	TS
47572-73	Yesterday's Peak Demand Voltage - Phase B LO	R -	FP	
47574	Yesterday's Peak Demand Timestamp - Day	R -	INT	TS
47575-76	Yesterday's Peak Demand Timestamp - Millisecond	R -	LI	TS
47577-78	Yesterday's Peak Demand Voltage - Phase C HI	R -	FP	
47579	Yesterday's Peak Demand Timestamp - Day	R -	INT	TS
47580-81	Yesterday's Peak Demand Timestamp - Millisecond	R -	LI	TS
47582-83	Yesterday's Peak Demand Voltage - Phase C LO	R -	FP	
47584	Yesterday's Peak Demand Timestamp - Day	R -	INT	TS
47585-86	Yesterday's Peak Demand Timestamp - Millisecond	R -	LI	TS
47587-88	Yesterday's Peak Demand Voltage - Neutral HI	R -	FP	
47589	Yesterday's Peak Demand Timestamp - Day	R -	INT	TS
47590-91	Yesterday's Peak Demand Timestamp - Millisecond	R -	LI	TS
47592-93	Yesterday's Peak Demand Voltage - Neutral LO	R -	FP	
47594	Yesterday's Peak Demand Timestamp - Day	R -	INT	TS
47595-96	Yesterday's Peak Demand Timestamp - Millisecond	R -	LI	TS
47597-98	Yesterday's Demand Vars	R -	FP	
47599	Yesterday's Demand Vars Timestamp - Day	R -	INT	TS
47600-01	Yesterday's Demand Vars Timestamp - Millisecond	R -	LI	TS
47602-03	Yesterday's Demand Reverse Vars	R -	FP	
47604	Yesterday's Demand Rev Vars Timestamp – Day	R -	INT	TS
47605-06	Yesterday's Demand Rev Vars Timestamp - Msec	R -	LI	TS
47607-08	Yesterday's Demand Watts	R -	FP	
47609	Yesterday's Demand Watts Timestamp - Day	R -	INT	TS
47610-11	Yesterday's Demand Watts Timestamp - Millisecond	R -	LI	TS

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
47612-13	Yesterday's Demand Reverse Watts	R -	FP	
47614	Yesterday's Demand Rev Watts Timestamp - Day	R -	INT	TS
47615-16	Yesterday's Demand Rev Watts Timestamp - Msec	R -	LI	TS
47617-18	Today's Peak Demand Current Ckt 1 - Phase A	R -	FP	
47619	Today's Peak Demand Ckt 1 Timestamp - Day	R -	INT	TS
47620-21	Today's Peak Demand Ckt 1 Timestamp - Msec	R -	LI	TS
47622-23	Today's Peak Demand Current Ckt 1 - Phase B	R -	FP	
47624	Today's Peak Demand Ckt 1 Timestamp - Day	R -	INT	TS
47625-26	Today's Peak Demand Ckt 1 Timestamp - Msec	R -	LI	TS
47627-28	Today's Peak Demand Current Ckt 1 - Phase C	R -	FP	
47629	Today's Peak Demand Ckt 1 Timestamp - Day	R -	INT	TS
47630-31	Today's Peak Demand Ckt 1 Timestamp - Msec	R -	LI	TS
47632-33	Today's Peak Demand Current Ckt 1 - Neutral	R -	FP	
47634	Today's Peak Demand Ckt 1 Timestamp - Day	R -	INT	TS
47635-36	Today's Peak Demand Ckt 1 Timestamp - Msec	R -	LI	TS
47637-38	Today's Peak Demand Current Ckt 1 - Neg-Seq	R -	FP	
47639	Today's Peak Demand Ckt 1 Timestamp - Day	R -	INT	TS
47640-41	Today's Peak Demand Ckt 1 Timestamp - Msec	R -	LI	TS
47642-43	Today's Peak Demand Current Ckt 2 - Phase A	R -	FP	
47644	Today's Peak Demand Ckt 2 Timestamp - Day	R -	INT	TS
47645-46	Today's Peak Demand Ckt 2 Timestamp - Msec	R -	LI	TS
47647-48	Today's Peak Demand Current Ckt 2 - Phase B	R -	FP	
47649	Today's Peak Demand Ckt 2 Timestamp - Day	R -	INT	TS
47650-51	Today's Peak Demand Ckt 2 Timestamp - Msec	R -	LI	TS
47652-53	Today's Peak Demand Current Ckt 2 - Phase C	R -	FP	
47654	Today's Peak Demand Ckt 2 Timestamp - Day	R -	INT	TS
47655-56	Today's Peak Demand Ckt 2 Timestamp - Msec	R -	LI	TS
47657-58	Today's Peak Demand Current Ckt 2 - Neutral	R -	FP	
47659	Today's Peak Demand Ckt 2 Timestamp - Day	R -	INT	TS
47660-61	Today's Peak Demand Ckt 2Timestamp - Msec	R -	LI	TS
47662-63	Today's Peak Demand Current Ckt 2 - Neg-Seq	R -	FP	
47664	Today's Peak Demand Ckt 2 Timestamp - Day	R -	INT	TS
47665-66	Today's Peak Demand Ckt 2 Timestamp - Msec	R -	LI	TS
47667-68	Today's Peak Demand Current Ckt 3 - Phase A	R -	FP	
47669	Today's Peak Demand Ckt 3 Timestamp - Day	R -	INT	TS
47670-71	Today's Peak Demand Ckt 3 Timestamp - Msec	R -	LI	TS
47672-73	Today's Peak Demand Current Ckt 3 - Phase B	R -	FP	
47674	Today's Peak Demand Ckt 3 Timestamp - Day	R -	INT	TS
47675-76	Today's Peak Demand Ckt 3 Timestamp - Msec	R -	LI	TS

| Holding Register | Parameter | Read/Write Supported | Data Format | Notes |

47677-78	Today's Peak Demand Current Ckt 3 - Phase C	R -	FP	
47679	Today's Peak Demand Ckt 3 Timestamp - Day	R -	INT	TS
47680-81	Today's Peak Demand Ckt 3 Timestamp - Msec	R -	LI	TS
47682-83	Today's Peak Demand Current Ckt 3 - Neutral	R -	FP	
47684	Today's Peak Demand Ckt 3 Timestamp - Day	R -	INT	TS
47685-86	Today's Peak Demand Ckt 3 Timestamp - Msec	R -	LI	TS
47687-88	Today's Peak Demand Current Ckt 3 - Neg-Seq	R -	FP	
47689	Today's Peak Demand Ckt 3 Timestamp - Day	R -	INT	TS
47690-91	Today's Peak Demand Ckt 3 Timestamp - Msec	R -	LI	TS
47692-93	Today's Peak Demand Current Ckt 4 - Phase A	R -	FP	
47694	Today's Peak Demand Ckt 4 Timestamp - Day	R -	INT	TS
47695-96	Today's Peak Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47697-98	Today's Peak Demand Current Ckt 4 - Phase B	R -	FP	
47699	Today's Peak Demand Ckt 4 Timestamp - Day	R -	INT	TS
47700-01	Today's Peak Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47702-03	Today's Peak Demand Current Ckt 4 - Phase C	R -	FP	
47704	Today's Peak Demand Ckt 4 Timestamp - Day	R -	INT	TS
47705-06	Today's Peak Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47707-08	Today's Peak Demand Current Ckt 4 - Neutral	R -	FP	
47709	Today's Peak Demand Ckt 4 Timestamp - Day	R -	INT	TS
47710-11	Today's Peak Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47712-13	Today's Peak Demand Current Ckt 4 - Neg-Seq	R -	FP	
47714	Today's Peak Demand Ckt 4 Timestamp - Day	R -	INT	TS
47715-16	Today's Peak Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47717-18	Today's Peak Demand Current - Ground		R -	FP
47719	Today's Peak Demand Timestamp - Day	R -	INT	TS
47720-21	Today's Peak Demand Timestamp - Msec	R -	LI	TS
47722-23	Today's Peak Demand Voltage - Phase A HI	R -	FP	
47724	Today's Peak Demand Timestamp - Day	R -	INT	TS
47725-26	Today's Peak Demand Timestamp - Millisecond	R -	LI	TS
47727-28	Today's Peak Demand Voltage - Phase A LO	R -	FP	
47729	Today's Peak Demand Timestamp - Day	R -	INT	TS
47730-31	Today's Peak Demand Timestamp - Millisecond	R -	LI	TS
47732-33	Today's Peak Demand Voltage - Phase B HI	R -	FP	
47734	Today's Peak Demand Timestamp - Day	R -	INT	TS
47735-36	Today's Peak Demand Timestamp - Millisecond	R -	LI	TS
47737-38	Today's Peak Demand Voltage - Phase B LO	R -	FP	
47739	Today's Peak Demand Timestamp - Day	R -	INT	TS
47740-41	Today's Peak Demand Timestamp - Millisecond	R -	LI	TS
47742-43	Today's Peak Demand Voltage - Phase C HI	R -	FP	
47744	Today's Peak Demand Timestamp - Day	R -	INT	TS
47745-46	Today's Peak Demand Timestamp - Millisecond	R -	LI	TS

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
47747-48	Today's Peak Demand Voltage - Phase C LO	R -	FP	
47749	Today's Peak Demand Timestamp - Day	R -	INT	TS
47750-51	Today's Peak Demand Timestamp - Millisecond	R -	LI	TS
47752-53	Today's Peak Demand Voltage - Neutral HI	R -	FP	
47754	Today's Peak Demand Timestamp - Day	R -	INT	TS
47755-56	Today's Peak Demand Timestamp - Millisecond	R -	LI	TS
47757-58	Today's Peak Demand Voltage - Neutral LO	R -	FP	
47759	Today's Peak Demand Timestamp - Day	R -	INT	TS
47760-61	Today's Peak Demand Timestamp - Millisecond	R -	LI	TS
47762-63	Today's Peak Demand Vars	R -	FP	
47764	Today's Peak Demand Vars Timestamp - Day	R -	INT	TS
47765-66	Today's Peak Demand Vars Timestamp - Msec	R -	LI	TS
47767-68	Today's Peak Demand Reverse Vars	R -	FP	
47769	Today's Peak Demand Rev Vars Timestamp - Day	R -	INT	TS
47770-71	Today's Peak Demand Rev Vars Timestamp - Msec	R -	LI	TS
47772-73	Today's Peak Demand Watts	R -	FP	
47774	Today's Peak Demand Watts Timestamp - Day	R -	INT	TS
47775-76	Today's Peak Demand Watts Timestamp - Msec	R -	LI	TS
47777-78	Today's Peak Demand Reverse Watts	R -	FP	
47779	Today's Peak Demand Rev Watts Timestamp - Day	R -	INT	TS
47780-81	Today's Pk Demand Rev Watts Timestamp - Msec	R -	LI	TS
47782-83	Peak Since Reset Demand Current Ckt 1 - Phase A	R W	FP	
47784	Peak Since Reset Demand Ckt 1 Timestamp - Day	R -	INT	TS
47785-86	Peak Since Reset Demand Ckt 1 Timestamp - Msec	R -	LI	TS
47787-88	Peak Since Reset Demand Current Ckt 1 - Phase B	R W	FP	
47789	Peak Since Reset Demand Ckt 1 Timestamp - Day	R -	INT	TS
47790-91	Peak Since Reset Demand Ckt 1 Timestamp - Msec	R -	LI	TS
47792-93	Peak Since Reset Demand Current Ckt 1 - Phase C	R W	FP	
47794	Peak Since Reset Demand Ckt 1 Timestamp - Day	R -	INT	TS
47795-96	Peak Since Reset Demand Ckt 1 Timestamp - Msec	R -	LI	TS
47797-98	Peak Since Reset Demand Current Ckt 1 - Neutral	R W	FP	
47799	Peak Since Reset Demand Ckt 1 Timestamp - Day	R -	INT	TS
47800-01	Peak Since Reset Demand Ckt 1 Timestamp - Msec	R -	LI	TS
47802-03	Peak Since Reset Demand Current Ckt 1 - Neg-Seq	R W	FP	
47804	Peak Since Reset Demand Ckt 1 Timestamp - Day	R -	INT	TS
47805-06	Peak Since Reset Demand Ckt 1 Timestamp - Msec	R -	LI	TS
47807-08	Peak Since Reset Demand Current Ckt 2 - Phase A	R W	FP	
47809	Peak Since Reset Demand Ckt 2 Timestamp - Day	R -	INT	TS
47810-11	Peak Since Reset Demand Ckt 2 Timestamp - Msec	R -	LI	TS
47812-13	Peak Since Reset Demand Current Ckt 2 - Phase B	R W	FP	
47814	Peak Since Reset Demand Ckt 2 Timestamp - Day	R -	INT	TS
47815-16	Peak Since Reset Demand Ckt 2 Timestamp - Msec	R -	LI	TS

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
47817-18	Peak Since Reset Demand Current Ckt 2 - Phase C	R W	FP	
47819	Peak Since Reset Demand Ckt 2 Timestamp - Day	R -	INT	TS
47820-21	Peak Since Reset Demand Ckt 2 Timestamp - Msec	R -	LI	TS
47822-23	Peak Since Reset Demand Current Ckt 2 - Neutral	R W	FP	
47824	Peak Since Reset Demand Ckt 2 Timestamp - Day	R -	INT	TS
47825-26	Peak Since Reset Demand Ckt 2 Timestamp - Msec	R -	LI	TS
47827-28	Peak Since Reset Demand Current Ckt 2 - Neg-Seq	R W	FP	
47829	Peak Since Reset Demand Ckt 2 Timestamp - Day	R -	INT	TS
47830-31	Peak Since Reset Demand Ckt 2 Timestamp - Msec	R -	LI	TS
47832-33	Peak Since Reset Demand Current Ckt 3 - Phase A	R W	FP	
47834	Peak Since Reset Demand Ckt 3 Timestamp - Day	R -	INT	TS
47835-36	Peak Since Reset Demand Ckt 3 Timestamp - Msec	R -	LI	TS
47837-38	Peak Since Reset Demand Current Ckt 3 - Phase B	R W	FP	
47839	Peak Since Reset Demand Ckt 3 Timestamp - Day	R -	INT	TS
47840-41	Peak Since Reset Demand Ckt 3 Timestamp - Msec	R -	LI	TS
47842-43	Peak Since Reset Demand Current Ckt 3 - Phase C	R W	FP	
47844	Peak Since Reset Demand Ckt 3 Timestamp - Day	R -	INT	TS
47845-46	Peak Since Reset Demand Ckt 3 Timestamp - Msec	R -	LI	TS
47847-48	Peak Since Reset Demand Current Ckt 3 - Neutral	R W	FP	
47849	Peak Since Reset Demand Ckt 3 Timestamp - Day	R -	INT	TS
47850-51	Peak Since Reset Demand Ckt 3 Timestamp - Msec	R -	LI	TS
47852-53	Peak Since Reset Demand Current Ckt 3 - Neg-Seq	R W	FP	
47854	Peak Since Reset Demand Ckt 3 Timestamp - Day	R -	INT	TS
47855-56	Peak Since Reset Demand Ckt 3 Timestamp - Msec	R -	LI	TS
47857-58	Peak Since Reset Demand Current Ckt 4 - Phase A	R W	FP	
47859	Peak Since Reset Demand Ckt 4 Timestamp - Day	R -	INT	TS
47860-61	Peak Since Reset Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47862-63	Peak Since Reset Demand Current Ckt 4 - Phase B	R W	FP	
47864	Peak Since Reset Demand Ckt 4 Timestamp - Day	R -	INT	TS
47865-66	Peak Since Reset Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47867-68	Peak Since Reset Demand Current Ckt 4 - Phase C	R W	FP	
47869	Peak Since Reset Demand Ckt 4 Timestamp - Day	R -	INT	TS
47870-71	Peak Since Reset Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47872-73	Peak Since Reset Demand Current Ckt 4 - Neutral	R W	FP	
47874	Peak Since Reset Demand Ckt 4 Timestamp - Day	R -	INT	TS
47875-76	Peak Since Reset Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47877-78	Peak Since Reset Demand Current Ckt 4 - Neg-Seq	R W	FP	
47879	Peak Since Reset Demand Ckt 4 Timestamp - Day	R -	INT	TS
47880-81	Peak Since Reset Demand Ckt 4 Timestamp - Msec	R -	LI	TS
47882-83	Peak Since Reset Demand Current - Ground	R W	FP	
47884	Peak Since Reset Demand Timestamp - Day	R -	INT	TS
47885-86	Peak Since Reset Demand Timestamp - Msec	R -	LI	TS

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
47887-88	Peak Since Reset Demand Voltage - Phase A HI	R W	FP	
47889	Peak Since Reset Demand Timestamp - Day	R -	INT	TS
47890-91	Peak Since Reset Demand Timestamp - Millisecond	R -	LI	TS
47892-93	Peak Since Reset Demand Voltage - Phase A LO	R W	FP	
47894	Peak Since Reset Demand Timestamp - Day	R -	INT	TS
47895-96	Peak Since Reset Demand Timestamp - Millisecond	R -	LI	TS
47897-98	Peak Since Reset Demand Voltage - Phase B HI	R W	FP	
47899	Peak Since Reset Demand Timestamp - Day	R -	INT	TS
47900-01	Peak Since Reset Demand Timestamp - Millisecond	R -	LI	TS
47902-03	Peak Since Reset Demand Voltage - Phase B LO	R W	FP	
47904	Peak Since Reset Demand Timestamp - Day	R -	INT	TS
47905-06	Peak Since Reset Demand Timestamp - Millisecond	R -	LI	TS
47907-08	Peak Since Reset Demand Voltage - Phase C HI	R W	FP	
47909	Peak Since Reset Demand Timestamp - Day	R -	INT	TS
47910-11	Peak Since Reset Demand Timestamp - Millisecond	R -	LI	TS
47912-13	Peak Since Reset Demand Voltage - Phase C LO	R W	FP	
47914	Peak Since Reset Demand Timestamp - Day	R -	INT	TS
47915-16	Peak Since Reset Demand Timestamp - Millisecond	R -	LI	TS
47917-18	Peak Since Reset Demand Voltage - Neutral HI	R W	FP	
47919	Peak Since Reset Demand Timestamp - Day	R -	INT	TS
47920-21	Peak Since Reset Demand Timestamp - Millisecond	R -	LI	TS
47922-23	Peak Since Reset Demand Voltage - Neutral LO	R W	FP	
47924	Peak Since Reset Demand Timestamp - Day	R -	INT	TS
47925-26	Peak Since Reset Demand Timestamp - Millisecond	R -	LI	TS
47927-28	Peak Since Reset Demand Vars	R W	FP	
47929	Peak Since Reset Demand Vars Timestamp - Day	R -	INT	TS
47930-31	Peak Since Reset Demand Vars Timestamp - Msec	R -	LI	TS
47932-33	Peak Since Reset Demand Reverse Vars	R W	FP	
47934	Pk Since Reset Demand Rev Vars Timestamp - Day	R -	INT	TS
47935-36	Pk Since Reset D'md Rev Vars Timestamp - Msec	R -	LI	TS
47937-38	Peak Since Reset Demand Watts	R W	FP	
47939	Peak Since Reset Demand Watts Timestamp-Day	R -	INT	TS
47940-41	Pk Since Reset Demand Watts Timestamp - Msec	R -	LI	TS
47942-43	Peak Since Reset Demand Reverse Watts	R W	FP	
47944	Pk Since Reset Demand Rev Watts Timestamp-Day	R -	INT	TS
47945-46	Pk Since Reset D'md Rev Watts Timestamp-Msec	R -	LI	TS
47947-48	3 Phase Var Hours	R W	FP	
47949-50	3 Phase Reverse Var Hours	R W	FP	
47951-52	3 Phase Watt Hours	R W	FP	
47953-54	3 Phase Reverse Watt Hours	R W	FP	
47955	Trigger Differential Alarm Report	R W	SI	
47956	Reset Logic Alarm Information	R W	SI	
47957	Reset Major Alarm Information	R W	SI	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
47958	Reset Minor Alarm Information	R W	SI	
47959	Reset Relay Alarm Information	R W	SI	
47960	Reset Load Profile	R W	SI	
47961	Clear Fault Log	R W	SI	
47962	Trigger Fault Record	R W	SI	
47963	Clear Events Report	R W	SI	
47964	Fault Indicator	R -	SI	
47965	Fault Template Status	R -	SI	
Fault Template (FLT)				
47970	Fault Date and Time - Day	R -	INT	FLT,TS
47971-72	Fault Date and Time - Milliseconds	R -	LI	FLT,TS
47973	Fault Event Type	R -	BM(16)	FLT
47974	Fault Active Group	R -	SI	FLT
47975-80	Fault Targets	R -	BM(96)	FLT
47981	Fault Clearing Time Status	R -	SI	FLT
47982-83	Fault Clearing Time	R -	FP	FLT
47984	Fault Breaker Operate Time Status	R -	SI	FLT
47985-86	Fault Breaker Operate Time Ckt 1	R -	FP	FLT
47987-88	Fault Breaker Operate Time Ckt 2	R -	FP	FLT
47989-90	Fault Breaker Operate Time Ckt 3	R -	FP	FLT
47991-92	Fault Breaker Operate Time Ckt 4	R -	FP	FLT
47993-94	Fault Phase A or AB Voltage Magnitude	R -	FP	FLT
47995	Fault Phase A or AB Voltage Angle	R -	INT	FLT
47996-97	Fault Phase B or BC Voltage Magnitude	R -	FP	FLT
47998	Fault Phase B or BC Voltage Angle	R -	INT	FLT
47999-00	Fault Phase C or CA Voltage Magnitude	R -	FP	FLT
48001	Fault Phase C or CA Voltage Angle	R -	INT	FLT
Phase to phase quantities are reported in 3P3W sensing mode; all other sensing modes report phase to neutral quantities.				
48002-03	Fault V1 Voltage Magnitude	R -	FP	FLT
48004	Fault V1 Voltage Angle	R -	INT	FLT
48005-06	Fault V2 Voltage Magnitude	R -	FP	FLT
48007	Fault V2 Voltage Angle	R -	INT	FLT
48008-09	Fault 3V0 Voltage Magnitude	R -	FP	FLT
48010	Fault 3V0 Voltage Angle	R -	INT	FLT
48011-12	Fault CT CKT #1 Phase A Current Magnitude	R -	FP	FLT
48013	Fault CT CKT #1 Phase A Angle	R -	INT	FLT
48014-15	Fault CT CKT #1 Phase B Current Magnitude	R -	FP	FLT
48016	Fault CT CKT #1 Phase B Angle	R -	INT	FLT
48017-18	Fault CT CKT #1 Phase C Current Magnitude	R -	FP	FLT
48019	Fault CT CKT #1 Phase C Angle	R -	INT	FLT
48020-21	Fault CT CKT #1 Residual Current Magnitude	R -	FP	FLT
48022	Fault CT CKT #1 Residual Angle	R -	INT	FLT
48023-24	Fault CT CKT #1 Negative-Seq Current Magnitude	R -	FP	FLT
48025	Fault CT CKT #1 Negative-Seq Angle	R -	INT	FLT
48026-27	Fault CT CKT #2 Phase A Current Magnitude	R -	FP	FLT
48028	Fault CT CKT #2 Phase A Angle	R -	INT	FLT
48029-30	Fault CT CKT #2 Phase B Current Magnitude	R -	FP	FLT
48031	Fault CT CKT #2 Phase B Angle	R -	INT	FLT
48032-33	Fault CT CKT #2 Phase C Current Magnitude	R -	FP	FLT

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
48034	Fault CT CKT #2 Phase C Angle	R -	INT	FLT
48035-36	Fault CT CKT #2 Residual Current Magnitude	R -	FP	FLT
48037	Fault CT CKT #2 Residual Angle	R -	INT	LT
48038-39	Fault CT CKT #2 Negative-Seq. Current Magnitude	R -	FP	FLT
48040	Fault CT CKT #2 Negative-Sequence Angle	R -	INT	FLT
48041-42	Fault CT CKT #3 Phase A Current Magnitude	R -	FP	FLT
48043	Fault CT CKT #3 Phase A Angle	R -	INT	FLT
48044-45	Fault CT CKT #3 Phase B Current Magnitude	R -	FP	FLT
48046	Fault CT CKT #3 Phase B Angle	R -	INT	FLT
48047-48	Fault CT CKT #3 Phase C Current Magnitude	R -	FP	FLT
48049	Fault CT CKT #3 Phase C Angle	R -	INT	FLT
48050-51	Fault CT CKT #3 Residual Current Magnitude	R -	FP	FLT
48052	Fault CT CKT #3 Residual Angle	R -	INT	FLT
48053-54	Fault CT CKT #3 Negative-Seq Current Magnitude	R -	FP	FLT
48055	Fault CT CKT #3 Negative-Sequence Angle	R -	INT	FLT
48056-57	Fault CT CKT #4 Phase A Current Magnitude	R -	FP	FLT
48058	Fault CT CKT #4 Phase A Angle	R -	INT	FLT
48059-60	Fault CT CKT #4 Phase B Current Magnitude	R -	FP	FLT
48061	Fault CT CKT #4 Phase B Angle	R -	INT	FLT
48062-63	Fault CT CKT #4 Phase C Current Magnitude	R -	FP	FLT
48064	Fault CT CKT #4 Phase C Angle	R -	INT	FLT
48065-66	Fault CT CKT #4 Residual Current Magnitude	R -	FP	FLT
48067	Fault CT CKT #4 Residual Angle	R -	INT	FLT
48068-69	Fault CT CKT #4 Negative-Seq Current Magnitude	R -	FP	FLT
48070	Fault CT CKT #4 Negative-Sequence Angle	R -	INT	FLT
48071-72	Fault Ground Current Magnitude	R -	FP	FLT
48073	Fault Ground Angle	R -	INT	FLT
48074-75	Fault CT CKT #5 Phase A Current Magnitude	R -	FP	FLT
48076	Fault CT CKT #5 Phase A Angle	R -	INT	FLT
48077-78	Fault CT CKT #5 Phase B Current Magnitude	R -	FP	FLT
48079	Fault CT CKT #5 Phase B Angle	R -	INT	FLT
48080-81	Fault CT CKT #5 Phase C Current Magnitude	R -	FP	FLT
48082	Fault CT CKT #5 Phase C Angle	R -	INT	FLT
48083-84	Fault CT CKT #5 Residual Current Magnitude	R -	FP	FLT
48085	Fault CT CKT #5 Residual Angle	R -	INT	FLT
48086-87	Fault CT CKT #5 Negative-Seq Current Magnitude	R -	FP	FLT
48088	Fault CT CKT #5 Negative-Sequence Angle	R -	INT	FLT
48089-90	Fault CT CKT #6 Phase A Current Magnitude	R -	FP	FLT
48091	Fault CT CKT #6 Phase A Angle	R -	INT	FLT
48092-93	Fault CT CKT #6 Phase B Current Magnitude	R -	FP	FLT
48094	Fault CT CKT #6 Phase B Angle	R -	INT	FLT
48095-96	Fault CT CKT #6 Phase C Current Magnitude	R -	FP	FLT
48097	Fault CT CKT #6 Phase C Angle	R -	INT	FLT
48098-99	Fault CT CKT #6 Residual Current Magnitude	R -	FP	FLT
48100	Fault CT CKT #6 Residual Angle	R -	INT	FLT
48101-102	Fault CT CKT #6 Negative-Seq Current Magnitude	R -	FP	FLT
48103	Fault CT CKT #6 Negative-Sequence Angle	R -	INT	FLT
48104-105	Fault Frequency Phase circuit	R -	FP	FLT
48106-107	Fault Frequency Aux circuit	R -	FP	FLT
Report Template (RPT)				
48500-625	Report Text	R -	ASC(250)	RPT

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
Metering Parameters				
49000	Part Number	R -	INT	
49001-02	Ground Current Magnitude	R -	FP	
49003	Ground Angle	R -	INT	
49004-05	CT CKT #1 Phase A Current Magnitude	R -	FP	
49006	CT CKT #1 Phase A Angle	R -	INT	
49007-08	CT CKT #1 Phase B Current Magnitude	R -	FP	
49009	CT CKT #1 Phase B Angle	R -	INT	
49010-11	CT CKT #1 Phase C Current Magnitude	R -	FP	
49012	CT CKT #1 Phase C Angle	R -	INT	
49013-14	CT CKT #1 Residual Current Magnitude	R -	FP	
49015	CT CKT #1 Residual Angle	R -	INT	
49016-17	CT CKT #1 Negative-Sequence Current Magnitude	R -	FP	
49018	CT CKT #1 Negative-Sequence Angle	R -	INT	
49019-20	CT CKT #2 Phase A Current Magnitude	R -	FP	
49021	CT CKT #2 Phase A Angle	R -	INT	
49022-23	CT CKT #2 Phase B Current Magnitude	R -	FP	
49024	CT CKT #2 Phase B Angle	R -	INT	
49025-26	CT CKT #2 Phase C Current Magnitude	R -	FP	
49027	CT CKT #2 Phase C Angle	R -	INT	
49028-29	CT CKT #2 Residual Current Magnitude	R -	FP	
49030	CT CKT #2 Residual Angle	R -	INT	
49031-32	CT CKT #2 Negative-Sequence Current Magnitude	R -	FP	
49033	CT CKT #2 Negative-Sequence Angle	R -	INT	
49034-35	CT CKT #3 Phase A Current Magnitude	R -	FP	
49036	CT CKT #3 Phase A Angle	R -	INT	
49037-38	CT CKT #3 Phase B Current Magnitude	R -	FP	
49039	CT CKT #3 Phase B Angle	R -	INT	
49040-41	CT CKT #3 Phase C Current Magnitude	R -	FP	
49042	CT CKT #3 Phase C Angle	R -	INT	
49043-44	CT CKT #3 Residual Current Magnitude	R -	FP	
49045	CT CKT #3 Residual Angle	R -	INT	
49046-47	CT CKT #3 Negative-Sequence Current Magnitude	R -	FP	
49048	CT CKT #3 Negative-Sequence Angle	R -	INT	
49049-50	CT CKT #4 Phase A Current Magnitude	R -	FP	
49051	CT CKT #4 Phase A Angle	R -	INT	
49052-53	CT CKT #4 Phase B Current Magnitude	R -	FP	
49054	CT CKT #4 Phase B Angle	R -	INT	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
49055-56	CT CKT #4 Phase C Current Magnitude	R -	FP	
49057	CT CKT #4 Phase C Angle	R -	INT	
49058-59	CT CKT #4 Residual Current Magnitude	R -	FP	
49060	CT CKT #4 Residual Angle	R -	INT	
49061-62	CT CKT #4 Negative-Sequence Current Magnitude	R -	FP	
49063	CT CKT #4 Negative-Sequence Angle	R -	INT	
49064-65	CT CKT #5 Phase A Current Magnitude	R -	FP	
49066	CT CKT #5 Phase A Angle	R -	INT	
49067-68	CT CKT #5 Phase B Current Magnitude	R -	FP	
49069	CT CKT #5 Phase B Angle	R -	INT	
49070-71	CT CKT #5 Phase C Current Magnitude	R -	FP	
49072	CT CKT #5 Phase C Angle	R -	INT	
49073-74	CT CKT #5 Residual Current Magnitude	R -	FP	
49075	CT CKT #5 Residual Angle	R -	INT	
49076-77	CT CKT #5 Negative-Sequence Current Magnitude	R -	FP	
49078	CT CKT #5 Negative-Sequence Angle	R -	INT	
49079-80	CT CKT #6 Phase A Current Magnitude	R -	FP	
49081	CT CKT #6 Phase A Angle	R -	INT	
49082-83	CT CKT #6 Phase B Current Magnitude	R -	FP	
49084	CT CKT #6 Phase B Angle	R -	INT	
49085-86	CT CKT #6 Phase C Current Magnitude	R -	FP	
49087	CT CKT #6 Phase C Angle	R -	INT	
49088-89	CT CKT #6 Residual Current Magnitude	R -	FP	
49090	CT CKT #6 Residual Angle	R -	INT	
49091-92	CT CKT #6 Negative-Sequence Current Magnitude	R -	FP	
49093	CT CKT #6 Negative-Sequence Angle	R -	INT	
49094-95	3V0 Zero-Sequence Voltage	R -	FP	
49096	3V0 Zero-Sequence Voltage Angle	R -	INT	
49097-98	V2 Negative-Sequence Voltage	R -	FP	
49099	V2 Negative-Sequence Voltage Angle	R -	INT	
49100-01	V1 Positive-Sequence Voltage	R -	FP	
49102	V1 Negative-Sequence Voltage Angle	R -	INT	
49103-04	Phase A Voltage	R -	FP	
49105	Phase A Voltage Angle	R -	INT	
49106-07	Phase B Voltage	R -	FP	
49108	Phase B Voltage Angle	R -	INT	
49109-10	Phase C Voltage	R -	FP	
49111	Phase C Voltage Angle	R -	INT	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
49112-13	Phase A-B Voltage	R -	FP	
49114	Phase A-B Voltage Angle	R -	INT	
49115-16	Phase B-C Voltage	R -	FP	
49117	Phase B-C Voltage Angle	R -	INT	
49118-19	Phase C-A Voltage	R -	FP	
49120	Phase C-A Voltage Angle	R -	INT	
49121-22	3 Phase Watts	R -	FP	
49123-24	3 Phase Power Factor	R -	FP	
49125-26	3 Phase Vars	R -	FP	
49127-28	3 Phase VA	R -	FP	
49129-30	Phase A Watts	R -	FP	
49131-32	Phase B Watts	R -	FP	
49133-34	Phase C Watts	R -	FP	
49135-36	Phase A Vars	R -	FP	
49137-38	Phase B Vars	R -	FP	
49139-40	Phase C Vars	R -	FP	
49141-42	Measured Frequency P	R -	FP	
49143-44	Measured Frequency X	R -	FP	
49145-46	CT CKT #1 Differential per Unit Phase A Current	R -	FP	
49147	CT CKT #1 Phase A Diff. Compensation Angle	R -	INT	
49148-49	CT CKT #2 Differential per Unit Phase A Current	R -	FP	
49150	CT CKT #2 Phase A Diff. Compensation Angle	R -	INT	
49151-52	CT CKT #3 Differential per Unit Phase A Current	R -	FP	
49153	CT CKT #3 Phase A Diff. Compensation Angle	R -	INT	
49154-55	CT CKT #4 Differential per Unit Phase A Current	R -	FP	
49156	CT CKT #4 Phase A Diff. Compensation Angle	R -	INT	
49157-58	Phase A Differential Operating Current	R -	FP	
49159-60	CT CKT #1 Differential per Unit Phase B Current	R -	FP	
49161	CT CKT #1 Phase B Diff. Compensation Angle	R -	INT	
49162-63	CT CKT #2 Differential per Unit Phase B Current	R -	FP	
49164	CT CKT #2 Phase B Diff. Compensation Angle	R -	INT	
49165-66	CT CKT #3 Differential per Unit Phase B Current	R -	FP	
49167	CT CKT #3 Phase B Diff. Compensation Angle	R -	INT	
49168-69	CT CKT #4 Differential per Unit Phase B Current	R -	FP	
49170	CT CKT #4 Phase B Diff. Compensation Angle	R -	INT	
49171-72	Phase B Differential Operating Current	R -	FP	
49173-74	CT CKT #1 Differential per Unit Phase C Current	R -	FP	
49175	CT CKT #1 Phase C Diff. Compensation Angle	R -	INT	

Holding Register	Parameter	Read/Write Supported	Data Format	Notes
49176-77	CT CKT #2 Differential per Unit Phase C Current	R -	FP	
49178	CT CKT #2 Phase C Diff. Compensation Angle	R -	INT	
49179-80	CT CKT #3 Differential per Unit Phase C Current	R -	FP	
49181	CT CKT #3 Phase C Diff. Compensation Angle	R -	INT	
49182-83	CT CKT #4 Differential per Unit Phase C Current	R -	FP	
49184	CT CKT #4 Phase C Diff. Compensation Angle	R -	INT	
49185-86	Phase C Differential Operating Current	R -	FP	
49187-88	CT CKT #1 Differential per Unit Residual Current	R -	FP	
49189	CT CKT #1 Residual Diff. Compensation Angle	R -	INT	
49190-91	CT CKT #2 Differential per Unit Residual Current	R -	FP	
49192	CT CKT #2 Residual Diff. Compensation Angle	R -	INT	
49193-94	CT CKT #1 Differential per Unit Ground Current	R -	FP	
49195	CT CKT #1 Ground Diff. Compensation Angle	R -	INT	
49196-97	CT CKT #2 Differential per Unit Ground Current	R -	FP	
49198	CT CKT #2 Ground Diff. Compensation Angle	R -	INT	
49199-200	Ground Differential Operating Current #1	R -	FP	
49201-202	Ground Differential Operating Current #2	R -	FP	
49203	Phase A Differential Second Harmonic Percentage	R -	INT	
49204	Phase B Differential Second Harmonic Percentage	R -	INT	
49205	Phase C Differential Second Harmonic Percentage	R -	INT	
49206	Phase A Differential Fifth Harmonic Percentage	R -	INT	
49207	Phase B Differential Fifth Harmonic Percentage	R -	INT	
49208	Phase C Differential Fifth Harmonic Percentage	R -	INT	
49835-54	Error Details	R -	ASC(40)	
49875-999	Contiguous Poll Block	R -	Mixed	

SECTION 3 • REGISTER DETAILS

TABLE OF CONTENTS

SECTION 3 • REGISTER DETAILS

Introduction

This section details the register formats and data ranges of the previous section. The two sections combined provide all information necessary to communicate with the BE1-CDS240 Modbus™ Holding Registers.

Any Holding Register not listed in *Table 4, Register Table,* is an unassigned Holding Register. A value of zero always results when reading an unassigned Holding Register. Writes to unassigned Holding Registers are legal, but no action will be taken (the write is ignored).

Logic Settings

Logic settings consist of a combination of modes, masks, terms, and term counts. Logic modes are specific to each logic set, while the masks, terms, and term counts have value definitions consistent throughout all logic sets. A single logic equation consists of a “mask” and “term” pair. The logic “term count” is used only in VOA, VO1 - VO15 virtual output logic blocks.

The logic “mode” enables or disables the logic equation for that logic block.

The logic “mask” corresponds to the System Status bits to be evaluated. These bits are referenced in the desired logic equation and are set to 1 (non-used bits masked out as 0‘s).

The logic “term” corresponds to the System Status bit’s TRUE or FALSE state referenced in the desired logic equation where only the TRUE bits in the equation are set to 1.

The logic “term count” may be of one of four logic types which are NONE (logic disabled), OR only (a + b + c), AND only (a * b * c) or MIXED (a * b + b * c).

The following defines all logic set parameters:

Logic Modes

41840	Programmable 50TP Logic Mode	INT
41890	Programmable 50TQ Logic Mode	INT
41915	Programmable 150TP Logic Mode	INT
41965	Programmable 150TQ Logic Mode	INT
41990	Programmable 250TP Logic Mode	INT
42040	Programmable 250TQ Logic Mode	INT
42065	Programmable 350TP Logic Mode	INT
42115	Programmable 350TQ Logic Mode	INT
42140	Programmable 450TP Logic Mode	INT
42190	Programmable 550TP Logic Mode	INT
42215	Programmable 650TP Logic Mode	INT
42240	Programmable 750TP Logic Mode	INT
42653	Programmable 51P Logic Mode	INT
42703	Programmable 51Q Logic Mode	INT
42728	Programmable 151P Logic Mode	INT
42803	Programmable 251P Logic Mode	INT
42853	Programmable 251Q Logic Mode	INT
42878	Programmable 351P Logic Mode	INT
42928	Programmable 351Q Logic Mode	INT
43499	Programmable 87ND Differential Logic Mode	INT
43524	Programmable 187ND Differential Logic Mode	INT
	Read and Write: 0 for disabled 1 for circuit 1 2 for circuit 2 3 for circuit 3 4 for circuit 4 5 for circuit 5 6 for circuit 6	
41865	Programmable 50TN Logic Mode	INT
41940	Programmable 150TN Logic Mode	INT

42015	Programmable 250TN Logic Mode	INT
42090	Programmable 350TN Logic Mode	INT
42165	Programmable 450TN Logic Mode	INT
42678	Programmable 51N Logic Mode	INT
42753	Programmable 151N Logic Mode	INT
42828	Programmable 251N Logic Mode	INT
42903	Programmable 351N Logic Mode	INT
42953	Programmable 451N Logic Mode	INT

Read and Write:

0 for disabled
1 for circuit 1, 3 Phase Input Neutral
2 for circuit 2, 3 Phase Input Neutral
3 for circuit 3, 3 Phase Input Neutral
4 for circuit 4, 3 Phase Input Neutral
5 for circuit 5, 3 Phase Input Neutral
6 for circuit 6, 3 Phase Input Neutral
7 for enabled - Ground Input

42265	Programmable 50BF Logic Mode	INT
42362	Programmable 150BF Logic Mode	INT
42556	Programmable 350BF Logic Mode	INT
42978	Programmable 24 Logic Mode	INT
43053	Programmable 47 Logic Mode	INT
43474	Programmable 87 Differential Logic Mode	INT
45149	Programmable 101 Virtual Breaker Control Logic Mode	INT
45150	Programmable 1101 Virtual Breaker Control Logic Mode	INT
45151	Programmable 2101 Virtual Breaker Control Logic Mode	INT
45152	Programmable 3101 Virtual Breaker Control Logic Mode	INT

Read and Write:

0 for disabled
1 for enabled

43128	Programmable 62 Timer Logic Mode	INT
43177	Programmable 162 Timer Logic Mode	INT
43226	Programmable 262 Timer Logic Mode	INT
43275	Programmable 362 Timer Logic Mode	INT

Read and Write:

0 for disabled
1 for Pickup / Dropout
2 for One-Shot Non-Retriggerable
3 for One-Shot Retriggerable
4 for Oscillator
5 for Integrating
6 for Edge Triggered Latch

43003	Programmable 27P Logic Mode	INT
43028	Programmable 127P Logic Mode	INT
43078	Programmable 59P Logic Mode	INT
43103	Programmable 159P Logic Mode	INT

Read and Write:

0 for disabled
1 for enabled - Undervoltage or overvoltage on one or more phases causes pickup.
2 for enabled - Undervoltage or overvoltage on two or more phases causes pickup.
3 for enabled - Undervoltage or overvoltage on all three phases causes pickup.

45353	Programmable 59X Logic Mode	INT

Read and Write:

0 for disabled
2 for enabled -Overvoltage on 3V0 voltage causes pickup

43549	Programmable Settings Group Logic Mode Read and Write: 0 for all setting groups disabled except Group 0 1 for selecting setting group via pulsed input logic 2 for selecting setting group via sustained input logic	INT
43670	Programmable 43 Virtual Switch Logic Mode	INT
43671	Programmable 143 Virtual Switch Logic Mode	INT
43672	Programmable 243 Virtual Switch Logic Mode	INT
43673	Programmable 343 Virtual Switch Logic Mode	INT
43674	Programmable 443 Virtual Switch Logic Mode	INT
43675	Programmable 543 Virtual Switch Logic Mode	INT
43676	Programmable 643 Virtual Switch Logic Mode	INT
43677	Programmable 743 Virtual Switch Logic Mode Read and Write: 0 for disabled 1 for on / off / pulse (all) 2 for on / off 3 for pulse	INT
43324	Programmable 81 Logic Mode	INT
43349	Programmable 181 Logic Mode	INT
43374	Programmable 281 Logic Mode	INT
43399	Programmable 381 Logic Mode	INT
43424	Programmable 481 Logic Mode	INT
43449	Programmable 581 Logic Mode Read and Write: 0 for disabled 1 for phase VT input enabled	INT

Logic Mask and Terms

Each set bit in the "mask" parameter indicates a significant variable in the equation. A corresponding bit in the "term" parameter indicates that the variable must be TRUE / 1 if set or FALSE / 0 if not set.

Mask and Term - 1st Register (Logic Var 0 to 15) BM(16)
Read only:
- Bit 15 - 750TP tripped
- Bit 14 - 650TP tripped
- Bit 13 - 550TP tripped
- Bit 12 - 450TP tripped
- Bit 11 - 350TP tripped
- Bit 10 - 250TP tripped
- Bit 9 - 150TP tripped
- Bit 8 - 50TP tripped
- Bit 7 - 750TP picked-up
- Bit 6 - 650TP picked-up
- Bit 5 - 550TP picked-up
- Bit 4 - 450TP picked-up
- Bit 3 - 350TP picked-up
- Bit 2 - 250TP picked-up
- Bit 1 - 150TP picked-up
- Bit 0 - 50TP picked-up

Mask and Term - 2nd register (Logic Var 16 to 31) BM(16)
Read only:
- Bit 15 - 187ND tripped
- Bit 14 - 87ND tripped
- Bit 13 - 87R tripped
- Bit 12 - 187ND picked-up
- Bit 11 - 87ND picked-up
- Bit 10 - 87R picked-up

Bit 9 - 450TN tripped
Bit 8 - 350TN tripped
Bit 7 - 250TN tripped
Bit 6 - 150TN tripped
Bit 5 - 50TN tripped
Bit 4 - 450TN picked-up
Bit 3 - 350TN picked-up
Bit 2 - 250TN picked-up
Bit 1 - 150TN picked-up
Bit 0 - 50TN picked-up

Mask and Term - 3rd Register (Logic Var 32 to 47) BM(16)
Read only:
Bit 15 - Output Trip Coil Circuit Monitor 4
Bit 14 - Output Trip Coil Circuit Monitor 3
Bit 13 - Output Trip Coil Circuit Monitor 2
Bit 12 - Output Trip Coil Circuit Monitor 1
Bit 11 - Input 12 status
Bit 10 - Input 11 status
Bit 9 - Input 10 status
Bit 8 - Input 9 status
Bit 7 - Input 8 status
Bit 6 - Input 7 status
Bit 5 - Input 6 status
Bit 4 - Input 5 status
Bit 3 - Input 4 status
Bit 2 - Input 3 status
Bit 1 - Input 2 status
Bit 0 - Input 1 status

Mask and Term - 4th Register (Logic Var 48 to 63) BM(16)
Read only:
Bit 15 - Logic is FALSE
Bit 14 - Circuit 4 Breaker Failure tripped
Bit 13 - Circuit 3 Breaker Failure tripped
Bit 12 - Circuit 2 Breaker Failure tripped
Bit 11 - Circuit 1 Breaker Failure tripped
Bit 10 - Circuit 4 Breaker Failure picked-up
Bit 9 - Circuit 3 Breaker Failure picked-up
Bit 8 - Circuit 2 Breaker Failure picked-up
Bit 7 - Circuit 1 Breaker Failure picked-up
Bit 6 - 87 5th Harmonic Inhibit phase C
Bit 5 - 87 5th Harmonic Inhibit phase B
Bit 4 - 87 5th Harmonic Inhibit phase A
Bit 3 - 87 2nd Harmonic Inhibit phase C
Bit 2 - 87 2nd Harmonic Inhibit phase B
Bit 1 - 87 2nd Harmonic Inhibit phase A
Bit 0 - 87U tripped

Mask and Term - 5th Register (Logic Var 64 to 79) BM(16)
Read only:
Bit 15 - Virtual Output 15 status
Bit 14 - Virtual Output 14 status
Bit 13 - Virtual Output 13 status
Bit 12 - Virtual Output 12 status
Bit 11 - Virtual Output 11 status
Bit 10 - Virtual Output 10 status
Bit 9 - Virtual Output 9 status
Bit 8 - Virtual Output 8 status
Bit 7 - Virtual Output 7 status
Bit 6 - Virtual Output 6 status

Bit 5 - Virtual Output 5 status
Bit 4 - Virtual Output 4 status
Bit 3 - Virtual Output 3 status
Bit 2 - Virtual Output 2 status
Bit 1 - Virtual Output 1 status
Bit 0 - Virtual Output A status

Mask and Term - 6th Register (Logic Var 80 to 95) BM(16)
Read only:
Bit 15 - VIN16
Bit 14 - VIN15
Bit 13 - VIN14
Bit 12 - VIN13
Bit 11 - VIN12
Bit 10 - VIN11
Bit 9 - VIN10
Bit 8 - VIN9
Bit 7 - VIN8
Bit 6 - VIN7
Bit 5 - VIN6
Bit 4 - VIN5
Bit 3 - VIN4
Bit 2 - VIN3
Bit 1 - VIN2
Bit 0 - VIN1

Mask and Term - 7th Register (Logic Var 96 to 111) BM(16)
Read only:
Bit 15 - 350TQ picked-up
Bit 14 - 250TQ picked-up
Bit 13 - 150TQ picked-up
Bit 12 - 50TQ picked-up
Bit 11 - 581 tripped
Bit 10 - 481 tripped
Bit 9 - 381 tripped
Bit 8 - 281 tripped
Bit 7 - 181 tripped
Bit 6 - 81 tripped
Bit 5 - 581 picked-up
Bit 4 - 481 picked-up
Bit 3 - 381 picked-up
Bit 2 - 281 picked-up
Bit 1 - 181 picked-up
Bit 0 - 81 picked-up

Mask and Term - 8th Register (Logic Var 112 to 127) BM(16)
Read only:
Bit 15 - 3101SC
Bit 14 - 2101SC
Bit 13 - 1101SC
Bit 12 - 101SC
Bit 11 - 3101C
Bit 10 - 2101C
Bit 9 - 1101C
Bit 8 - 101C
Bit 7 - 3101T
Bit 6 - 2101T
Bit 5 - 1101T
Bit 4 - 101T
Bit 3 - 350TQ tripped
Bit 2 - 250TQ tripped

Bit 1 - 150TQ tripped
Bit 0 - 50TQ tripped

Mask and Term - 9th Register (Logic Var 128 to 143) BM(16)
Read only:

Bit 15 - 127P tripped
Bit 14 - 27P tripped
Bit 13 - 351Q tripped
Bit 12 - 251Q tripped
Bit 11 - 151Q tripped
Bit 10 - 51Q tripped
Bit 9 - spare
Bit 8 - 451N tripped
Bit 7 - 351N tripped
Bit 6 - 251N tripped
Bit 5 - 151N tripped
Bit 4 - 51N tripped
Bit 3 - 351P tripped
Bit 2 - 251P tripped
Bit 1 - 151P tripped
Bit 0 - 51P tripped

Mask and Term - 10th Register (Logic Var 144 to 159) BM(16)
Read only:

Bit 15 - 127P picked-up
Bit 14 - 27P picked-up
Bit 13 - 351Q picked-up
Bit 12 - 251Q picked-up
Bit 11 - 151Q picked-up
Bit 10 - 51Q picked-up
Bit 9 - spare
Bit 8 - 451N picked-up
Bit 7 - 351N picked-up
Bit 6 - 251N picked-up
Bit 5 - 151N picked-up
Bit 4 - 51N picked-up
Bit 3 - 351P picked-up
Bit 2 - 251P picked-up
Bit 1 - 151P picked-up
Bit 0 - 51P picked-up

Mask and Term - 11th Register (Logic Var 160 to 175) BM(16)
Read only:

Bit 15 - Settings Group 3
Bit 14 - Settings Group 2
Bit 13 - Settings Group 1
Bit 12 - Settings Group 0
Bit 11 - 362 timer
Bit 10 - 262 timer
Bit 9 - 162 timer
Bit 8 - 62 timer
Bit 7 - 24 tripped
Bit 6 - 24 picked-up
Bit 5 - 159P tripped
Bit 4 - 59P tripped
Bit 3 - 159P picked-up
Bit 2 - 59P picked-up
Bit 1 - 47 tripped
Bit 0 - 47 picked-up

Mask and Term - 12th Register (Logic Var 176 to 191) BM(16)
Read only:

Bit 15 - 60FL
Bit 14 - 59X tripped
Bit 13 - 59X picked-up
Bit 12 - ARSTKEY
Bit 11 - TRSTKEY
Bit 10 - Alarm Logic
Bit 9 - Alarm Minor
Bit 8 - Alarm Major
Bit 7 - SWITCH 743
Bit 6 - SWITCH 643
Bit 5 - SWITCH 543
Bit 4 - SWITCH 443
Bit 3 - SWITCH 343
Bit 2 - SWITCH 243
Bit 1 - SWITCH 143
Bit 0 - SWITCH 43

Logic Term Count

43782	Programmable Virtual Output A Term Count	SI
43879	Programmable Virtual Output 1 Term Count	SI
43976	Programmable Virtual Output 2 Term Count	SI
44073	Programmable Virtual Output 3 Term Count	SI
44170	Programmable Virtual Output 4 Term Count	SI
44267	Programmable Virtual Output 5 Term Count	SI
44364	Programmable Virtual Output 6 Term Count	SI
44461	Programmable Virtual Output 7 Term Count	SI
44558	Programmable Virtual Output 8 Term Count	SI
44655	Programmable Virtual Output 9 Term Count	SI
44752	Programmable Virtual Output 10 Term Count	SI
44849	Programmable Virtual Output 11 Term Count	SI
44946	Programmable Virtual Output 12 Term Count	SI
45043	Programmable Virtual Output 13 Term Count	SI
45140	Programmable Virtual Output 14 Term Count	SI
45237	Programmable Virtual Output 15 Term Count	SI

Term Count Register

Read and Write:

0 means the logic equation is disabled (NONE)
-1 means the logic equation consists of a single term of OR-ed variables
1 means the logic equation consists of a single term of AND-ed variables
2 means the logic equation consists of the OR-ing of 2 terms of AND-ed variables
3 means the logic equation consists of the OR-ing of 3 terms of AND-ed variables
4 means the logic equation consists of the OR-ing of 4 terms of AND-ed variables

45334	Programmable Hardware Output A Logic	BM(16)
45335	Programmable Hardware Output 1 Logic	BM(16)
45336	Programmable Hardware Output 2 Logic	BM(16)
45337	Programmable Hardware Output 3 Logic	BM(16)
45338	Programmable Hardware Output 4 Logic	BM(16)
45339	Programmable Hardware Output 5 Logic	BM(16)
45340	Programmable Hardware Output 6 Logic	BM(16)
45341	Programmable Hardware Output 7 Logic	BM(16)
45342	Programmable Hardware Output 8 Logic	BM(16)
45343	Programmable Hardware Output 9 Logic	BM(16)
45344	Programmable Hardware Output 10 Logic	BM(16)
45345	Programmable Hardware Output 11 Logic	BM(16)
45346	Programmable Hardware Output 12 Logic	BM(16)
45347	Programmable Hardware Output 13 Logic	BM(16)

45348 Programmable Hardware Output 14 Logic BM(16)
Read and Write:
Bit 15 - Virtual Output 15
Bit 14 - Virtual Output 14
Bit 13 - Virtual Output 13
Bit 12 - Virtual Output 12
Bit 11 - Virtual Output 11
Bit 10 - Virtual Output 10
Bit 9 - Virtual Output 9
Bit 8 - Virtual Output 8
Bit 7 - Virtual Output 7
Bit 6 - Virtual Output 6
Bit 5 - Virtual Output 5
Bit 4 - Virtual Output 4
Bit 3 - Virtual Output 3
Bit 2 - Virtual Output 2
Bit 1 - Virtual Output 1
Bit 0 - Virtual Output A

Session Parameters

40001 Exit ASC(1)
Read: always the ASCII character '0' (zero)
Write: ASCII characters 'Y' or 'N' ('Y' to save changes, 'N' to ignore changes)
Note: ERROR DETAIL block (49835-54) contains Exit status message following a write.

40002-5 Access Password ASC(8)
Read: Always the ASCII string of '*' characters.
Write: access password in ASCII string.
Note: If password written is less than 8 characters long, a binary zero value must be included following the final password character.

40006 Access Request BM(16)
Read: Returns the current write access available to the Modbus user
Bit 3 is set for Global Access
Bit 2 is set for Setting Access
Bit 1 is set for Control Access
Bit 0 is set for Report Access
Zero value for Read Only Access
Write: To request write privileges using the password written into Access Password registers. Value written into Access Request register is arbitrary (any value will initiate the request).
Note: If write access is denied, the response message will be an error response message with Illegal Function exception code.

Template Parameters

40036 Settings Group Selection SI
Read: returns the current value of Settings Group Selection.
Write: the desired value to assign a Settings Group to the Group (GRP) Template.
O for Settings Group 0
1 for Settings Group 1
2 for Settings Group 2
3 for Settings Group 3

40038 Fault Selection SI
Read: Returns the current value of Fault Selection.
Write: The desired value to assign a Fault Record to the Fault (FLT) Template.
Allowed values are 0 - 255. 0 for most recent fault.
Note: Refer to Fault Indicator (47512) and Fault Template Status (47513) Registers.

40039 Report Selection SI
Read: Returns the current value of Report Selection.

Writing to Report Selection terminates previous report and initializes new report. See table for values.

40040 Report Focus INT

Read: Returns the current value of Report Focus.
Write: See table for values.
Note: If an illegal Report Focus value is written, the user is not notified until a read of the Report Text is attempted.
Note: Write to Report Selection and Report Focus to specify the report, which will be made available via the Report (RPT) Template. The template is the Report Text Block at 47695-819.

Table 3-1. Report

Report Text 48500-48625	Report Selection 40039	Report Focus 40040
RA-LGC Report	0	Not used
RA-MAJ Report	1	Not used
RA-MIN Report	2	Not used
RA-REL Report	3	Not used
RF Report	4	Not used
RF-# Report	5	Value of # (1 - 255)
RF-NEW Report	6	Not used
RS Report	7	Not used
RS-# Report	8	Value of # (1 - 255)
RS-NEW Report	9	Not used
RS-F# Report	10	Value of # (1 - 255)
RS-ALM	11	Not used
RS-IO	12	Not used
RS-LGC	13	Not used

Global Parameters

40080-83 Global Password ASC(8)
40085-88 Setting Password ASC(8)
40090-93 Control Password ASC(8)
40095-98 Report Password ASC(8)

Read: If global access granted, password ASCII strings are read. Otherwise, the ASCII string of '*' characters is read.
Write: Password in ASCII string.
Note: If password written is less than 8 characters long, a binary zero value must be included following the final password character.

40084 Global Path BM(8)
40089 Setting Path BM(8)
40094 Control Path BM(8)
40099 Report Path BM(8)

Read: Path associated with password.
Write: Path associated with password.
Bit 2 is set for COM 2 access.
Bit 1 is set for COM1 access.
Bit 0 is set for COM0 / FP access.

40100 PW Timeout INT

Read and Write:
1 to 1440 min.

Control Parameters

All values read from and written to Select and Operate registers are ASCII characters. Select registers must be written first, followed by a write to the Operate register. A 30 second window starts after the first write to

the Select register. If the second write to the Operate register is not received within the 30-second window, an error response will be returned.

Writes to Operate registers 40138, 40140 - 40150 with ASCII data ‘E‘ (Enable Output override control) or ‘D’ (Disable Output override control) requires an additional write of ‘Y’ to Exit register 40001 to allow these control settings to be saved to the relay’s internal EEPROM.

NOTE: All values read from and written to Select and Operate registers are ASCII characters.

40117 Select Group ASC(1)

Read: To read a value other than ASCII character ‘X’, the Select Group register must be the most recent control register written AND must have been written within the previous 30 seconds.

- 0 if Group 0 selection has been made.
- 1 if Group 1 selection has been made.
- 2 if Group 2 selection has been made.
- 3 if Group 3 selection has been made.
- L if Logic selection has been made.
- X if Group control not selected or control timer has expired

Write: the desired ASCII character.

- 0 to select Group 0.
- 1 to select Group 1.
- 2 to select Group 2.
- 3 to select Group 3.
- L to select Logic.

40118 Operate Group ASC(1)

Read: Current control.

- 0 if Group 0.
- 1 if Group 1.
- 2 if Group 2.
- 3 if Group 3.
- L if Logic.

Write: the desired ASCII character to alter control (corresponding Select register must contain same value, written within previous 30 seconds).

- 0 to select Group 0.
- 1 to select Group 1.
- 2 to select Group 2.
- 3 to select Group 3.
- L to select Logic.

40119	Select Virtual Selector Switch 43	ASC(1)
40121	Select Virtual Selector Switch 143	ASC(1)
40123	Select Virtual Selector Switch 243	ASC(1)
40125	Select Virtual Selector Switch 343	ASC(1)
40127	Select Virtual Selector Switch 443	ASC(1)
40129	Select Virtual Selector Switch 543	ASC(1)
40131	Select Virtual Selector Switch 643	ASC(1)
40133	Select Virtual Selector Switch 743	ASC(1)

Read: To read a value other than ASCII character ‘X’, the Select Virtual Selector Switch register must be the most recent control register written AND must have been written within the previous 30 seconds.

- P if Pulse Switch selection has been made.
- 0 if Latch Switch at 0 selection has been made.
- 1 if Latch Switch at 1 selection has been made.
- X if Virtual Selector Switch control not selected or control timer has expired.

Write: The desired ASCII character.

- P to select Pulsing the Switch.
- 0 to select Latching the Switch at 0.
- 1 to select Latching the Switch at 1.

40120	Operate Virtual Selector Switch 43	ASC(1)
40122	Operate Virtual Selector Switch 143	ASC(1)
40124	Operate Virtual Selector Switch 243	ASC(1)
40126	Operate Virtual Selector Switch 343	ASC(1)
40128	Operate Virtual Selector Switch 443	ASC(1)
40130	Operate Virtual Selector Switch 443	ASC(1)
40132	Operate Virtual Selector Switch 443	ASC(1)
40134	Operate Virtual Selector Switch 443	ASC(1)

Read: Current control.

P if Pulse Switch.
0 if Latch Switch at 0.
1 if Latch Switch at 1.

Write: The desired ASCII character to alter control (corresponding Select register must contain same value, written within previous 30 seconds).

P to Pulse Switch.
0 to Latch Switch at 0.
1 to Latch Switch at 1.

40135	Select 101 Virtual Breaker Control Switch	ASC(1)
40137	Select 1101 Virtual Breaker Control Switch	ASC(1)
40139	Select 2101 Virtual Breaker Control Switch	ASC(1)
40141	Select 3101 Virtual Breaker Control Switch	ASC(1)

Read: To read a value other than ASCII character ‘X’, the Select 101 Virtual Breaker Control Switch register must be the most recent control register written AND must have been written within the previous 30 seconds.

C if Close selection has been made.
T if Trip selection has been made.
X if 101 Virtual Breaker Control Switch control not selected or control timer has expired

Write: The desired ASCII character.

C to select Closing the Switch.
T to select Tripping the Switch.

40136	Operate 101 Virtual Breaker Control Switch	ASC(1)
40138	Operate 1101 Virtual Breaker Control Switch	ASC(1)
40140	Operate 2101 Virtual Breaker Control Switch	ASC(1)
40142	Operate 3101 Virtual Breaker Control Switch	ASC(1)

Read: Current control.

C if Close Switch.
T if Trip Switch.

Write: The desired ASCII character to alter control (corresponding Select register must contain same value, written within previous 30 seconds).

C to Close Switch.
T to Trip Switch.

40143	Select All Outputs	ASC(1)

Read: To read a value other than ASCII character ‘X’, the Select All Output register must be the most recent control register written AND must have been written within the previous 30 seconds.

P if Pulse All Outputs selection has been made.
0 if Latch All Outputs at 0 selection has been made.
1 if Latch All Outputs at 1 selection has been made.
L if programmable Logic selection has been made.
E if Enable All Outputs override control has been set.
D if Disable All Outputs override control has been set.
X if All Outputs control not selected or control timer has expired.

Write: The desired ASCII character.

P to select Pulsing All Outputs.
0 to select Latching All Outputs at 0.
1 to select Latching All Outputs at 1.

L to select programmable Logic.
E to select Enabling All Outputs override control.
D to select Disabling All Outputs override control.

40144	Operate All Outputs	ASC(1)

Read: Current control.
E if All Outputs override control Enabled.
D if All Outputs override control Disabled.
Write: The desired ASCII character to alter control (corresponding Select register must contain same value, written within previous 30 seconds).
P to Pulse All Outputs.
0 to Latch All Outputs at 0.
1 to Latch All Outputs at 1.
L to select programmable Logic.
E to Enable All Outputs override control. *
D to Disable All Outputs override control. *

40145	Select Output A	ASC(1)
40147	Select Output 1	ASC(1)
40149	Select Output 2	ASC(1)
40151	Select Output 3	ASC(1)
40153	Select Output 4	ASC(1)
40155	Select Output 5	ASC(1)
40157	Select Output 6	ASC(1)
40159	Select Output 7	ASC(1)
40161	Select Output 8	ASC(1)
40163	Select Output 9	ASC(1)
40165	Select Output 10	ASC(1)
40167	Select Output 11	ASC(1)
40169	Select Output 12	ASC(1)
40171	Select Output 13	ASC(1)
40173	Select Output 14	ASC(1)

Read: To read a value other than ASCII character ‘X’, the Select Output register must be the most recent control register written AND must have been written within the previous 30 seconds.
P if Pulse Output selection has been made.
0 if Latch Output at 0 selection has been made.
1 if Latch Output at 1 selection has been made.
L if programmable Logic selection has been made.
E if Enable All Outputs serial control has been made.
D if Disable All Outputs serial control has been made.
X if Output control not selected or control timer has expired
Write: The desired ASCII character.
P to select Pulsing Output.
0 to select Latching Output at 0.
1 to select Latching Output at 1.
L to select programmable Logic.
E to select Enabling All Outputs override control.
D to select Disabling All Outputs override control.

40146	Operate Output A	ASC(1)
40148	Operate Output 1	ASC(1)
40150	Operate Output 2	ASC(1)
40152	Operate Output 3	ASC(1)
40154	Operate Output 4	ASC(1)
40156	Operate Output 5	ASC(1)
40158	Operate Output 6	ASC(1)
40160	Operate Output 7	ASC(1)
40162	Operate Output 8	ASC(1)
40164	Operate Output 9	ASC(1)
40166	Operate Output 10	ASC(1)
40168	Operate Output 11	ASC(1)

40170	Operate Output 12	ASC(1)
40172	Operate Output 13	ASC(1)
40174	Operate Output 14	ASC(1)

Read: Current control.
P to Pulse Output.
0 to Latch Output at 0.
1 to Latch Output at 1.
L to select programmable Logic.
D if All Outputs override control Disabled
Write: The desired ASCII character to alter control (corresponding Select register must contain same value, written within previous 30 seconds).
P to Pulse Output.
0 to Latch Output at 0.
1 to Latch Output at 1.
L to select programmable Logic.
E to Enable All Outputs override control. ∗
D to Disable All Outputs override control. ∗

∗ Requires an additional write of 'Y' to Exit register 40001 to allow these control settings to be saved to the relay's internal EEPROM (if Modbus password security is enabled).

Group Setting Parameters

40269-70	50TP Pickup	FP
40273-74	50TN Pickup	FP
40277-78	50TQ Pickup	FP
40281-82	150TP Pickup	FP
40285-86	150TN Pickup	FP
40289-90	150TQ Pickup	FP
40293-94	250TP Pickup	FP
40297-98	250TN Pickup	FP
40301-02	250TQ Pickup	FP
40305-06	350TP Pickup	FP
40309-10	350TN Pickup	FP
40313-14	350TQ Pickup	FP
40317-18	450TP Pickup	FP
40321-22	450TN Pickup	FP
40325-26	550TP Pickup	FP
40329-30	650TP Pickup	FP
40333-34	750TP Pickup	FP

Read and Write:
0.50 to 150.00 amps

40271-72	50TP Time Delay	LI
40275-76	50TN Time Delay	LI
40279-80	50TQ Time Delay	LI
40283-84	150TP Time Delay	LI
40287-88	150TN Time Delay	LI
40291-92	150TQ Time Delay	LI
40295-96	250TP Time Delay	LI
40299-300	250TN Time Delay	LI
40303-04	250TQ Time Delay	LI
40307-08	350TP Time Delay	LI
40311-12	350TN Time Delay	LI
40315-16	350TQ Time Delay	LI
40319-20	450TP Time Delay	LI
40323-24	450TN Time Delay	LI
40327-28	550TP Time Delay	LI
40331-32	650TP Time Delay	LI
40335-36	750TP Time Delay	LI

	Read and Write: 0 to 60,000 milliseconds	
40337-38	50BF Time Delay	LI
40343-44	50BF Ctrl Time Delay	LI
40345-46	150BF Time Delay	LI
40351-52	150BF Ctrl Time Delay	LI
40353-54	250BF Time Delay	LI
40359-60	250BF Ctrl Time Delay	LI
40361-62	350BF Time Delay	LI
40367-68	350BF Ctrl Time Delay	LI
	Read and Write: 50 to 999 ms	
40339-40	50BF Phase PU	FP
40341-42	50BF Neutral PU	FP
40347-48	150BF Phase PU	FP
40349-50	150BF Neutral PU	FP
40355-56	250BF Phase PU	FP
40357-58	250BF Neutral PU	FP
40363-64	350BF Phase PU	FP
40365-66	350BF Neutral PU	FP
	Read and Write: 0.5 to 10.00 amps	
40369-70	51P Pickup	FP
40375-76	51N Pickup	FP
40381-82	51Q Pickup	FP
40387-88	151P Pickup	FP
40393-94	151N Pickup	FP
40399-400	151Q Pickup	FP
40405-06	251P Pickup	FP
40411-12	251N Pickup	FP
40417-18	251Q Pickup	FP
40423-24	351P Pickup	FP
40429-30	351N Pickup	FP
40435-36	351Q Pickup	FP
40441-42	451N Pickup	FP
	Read and Write: 0.50 to 16.00 amps	
40371-72	51P Time Dial	LI
40377-78	51N Time Dial	LI
40383-84	51Q Time Dial	LI
40389-90	151P Time Dial	LI
40395-96	151N Time Dial	LI
40401-02	151Q Time Dial	LI
40407-08	251P Time Dial	LI
40413-14	251N Time Dial	LI
40419-20	251Q Time Dial	LI
40425-26	351P Time Dial	LI
40431-32	351N Time Dial	LI
40437-38	351Q Time Dial	LI
40443-44	451N Time Dial	LI
	Read and Write: 0.0 to 9.9	
40373-74	51P Curve Type	ASC(3)
40379-80	51N Curve Type	ASC(3)
40385-86	51Q Curve Type	ASC(3)
40391-92	151P Curve Type	ASC(3)

40397-98	151N Curve Type	ASC(3)
40403-04	151Q Curve Type	ASC(3)
40409-10	251P Curve Type	ASC(3)
40415-16	251N Curve Type	ASC(3)
40421-22	251Q Curve Type	ASC(3)
40427-28	351P Curve Type	ASC(3)
40433-34	351N Curve Type	ASC(3)
40439-40	351Q Curve Type	ASC(3)
40445-46	451N Curve Type	ASC(3)
	Read and Write: one of the following ASCII strings S1, S2, L1, L2, D, M, I1, I2, V1, V2, E1, E2, S1R, S2R, L1R, L2R, DR, MR, I1R, I2R, V1R, V2R, E1R, E2R, A, B, C, G, F, P, AR, BR, CR, GR, FR, PR, 46	
40447-48	24 Pickup	FP
40455-56	24D Pickup 1	
40459-60	24D Pickup 2	
	Read and Write: 0 to disable 0.5 to 6.0	
40449-50	24 Time Dial	FP
40451-52	24 Integrating Reset	FP
	Read and Write: 0 to 9.9	
40453-54	24 Curve Type	ASC(3)
	Read and Write: 0 for inverse square root 1 for inverse 2 for inverse square	
40457-58	24D Time Delay 1	LI
40461-62	24D Time Delay 2	LI
	Read and Write: 50 to 600,000 milliseconds	
40463-64	27P Pickup	FP
40467-68	27P Inhibit Voltage	FP
40469-70	127P Pickup	FP
40473-74	127P Inhibit Voltage	FP
	Read and Write: 0 to disable 10.0 to 300	
40465-66	27P Time Delay	LI
40471-72	127P Time Delay	LI
	Read and Write: 50 to 600,000 milliseconds	
40475-76	27R Pickup	FP
	Read and Write: 0 to disable 30.0 to 250	
40477	27R Control Mode	ASC(1)
	Read and Write: R or C	

40478-79	47 Pickup Read and Write: 0 to disable 1 to 300	FP
40480-81	47 Time Delay Read and Write: 50 to 600,000 milliseconds	LI
40482-83	59 Pickup	FP
40486-87	159P Pickup	FP
40484-85	59 Time Delay	LI
40488-89	159P Time Delay	LI
40490-91	62 Time Delay 1	LI
40492-93	62 Time Delay 2	LI
40494-95	162 Time Delay 1	LI
40496-97	162 Time Delay 2	LI
40498-99	262 Time Delay 1	LI
40500-01	262 Time Delay 2	LI
40502-03	362 Time Delay 1	LI
40504-05	362 Time Delay 2 Read and Write: 0 to 9,999,000 milliseconds	LI
40506-07	81 Pickup	FP
40511-12	181 Pickup	FP
40516-17	281 Pickup	FP
40521-22	381 Pickup	FP
40526-27	481 Pickup	FP
40531-32	581 Pickup Read and Write: 0 to disable 40.00 to 70.00 Hz	FP
40508-09	81 Time Delay	LI
40513-14	181 Time Delay	LI
40518-19	281 Time Delay	LI
40523-24	381 Time Delay	LI
40528-29	481 Time Delay	LI
40533-34	581 Time Delay Read and Write: 0 to 600,000 milliseconds	LI
40510	81 Mode	ASC(1)
40515	181 Mode	ASC(1)
40520	281 Mode	ASC(1)
40525	381 Mode	ASC(1)
40530	481 Mode	ASC(1)
40535	581 Mode Read and Write: O = overfrequency U = underfrequency	ASC(1)
40536-37	81 Inhibit Setting Read and Write: 0 to disable 15.0 to 150	FP
40538-39	87T Minimum Pickup	FP
40547-48	87ND Minimum Pickup	FP
40551-52	187ND Minimum Pickup	FP

	Read and Write: 0.00 to 1.00 amps	
40540	87T Restraint Slope	INT
40549	87ND Restraint Slope	INT
40553	187ND Restraint Slope	INT
	Read and Write: 15 to 60	
40541-42	87T 2nd Harmonic Threshold	FP
40543-44	87T 5th Harmonic Threshold	FP
	Read and Write: 5.0 to 75.0	
40545	87T Unrestrained Pickup	INT
	Read and Write: 0 to 21	
40546	87T 2nd Harmonic Sharing	INT
	Read and Write: 0 to 1	
40550	87ND Restraint Time Delay	INT
40554	187ND Restraint Time Delay	INT
	Read and Write: 50 to 60,000 milliseconds	
40555-56	Transformer MVA Rating	FP
	Read and Write: 0, 0.5 to 1000.0	
40557-58	87T CT CKT #1 Tap	FP
40561-62	87T CT CKT #2 Tap	FP
40565-66	87T CT CKT #3 Tap	FP
40569-70	87T CT CKT #4 Tap	FP
	For CT Type 1A: Read and Write: 0.40 to 4.00 For CT Type 5A: Read and Write: 2.00 to 20.00	
40559-60	Transformer Tap 1 KV Rating	FP
40563-64	Transformer Tap 2 KV Rating	FP
40567-68	Transformer Tap 3 KV Rating	FP
40569-70	Transformer Tap 4 KV Rating	FP
	Read and Write: 0, 0.01 to 1000.00	
40573-74	87ND TapG	FP
40575-76	87ND TapN	FP
40577-78	87ND TapG	FP
40579-80	187ND TapN	FP
	Read Only: 2.00 to 20.00 amps	
40581-82	59X Pickup	FP
	Read and Write: 0 to disable 10.0 to 300	

40583-84	59X Time Delay Read and Write: 50 to 600,000 milliseconds	LI
40585	87ND Restraint Type Read and Write: 0 = IN, IG 1 = IA, IB, IC, IG	ASC(1)
40586	187ND Restraint Type Read and Write: 0 = IN, IG 1 = IA, IB, IC, IG	ASC(1)

Global Settings Parameters

40602-03	Power System Nominal Voltage Read and Write: 50 to 250	FP
40604-05	Power System Nominal Current Read and Write: 0.5 to 10.0	FP
40608-09	Programmable 51 Curve Constant A Delay Read and Write: 0.0 to 600.0000	FP
40610-11	Programmable 51 Curve Constant B Delay Read and Write: 0.0 to 25.0000	FP
40612-13	Programmable 51 Curve Constant C Delay Read and Write: 0.0 to 1.0000 1.0	FP
40614-15	Programmable 51 Curve Constant N Delay Read and Write: 0.5000 to 2.5000	FP
40616-17	Programmable 51 Curve Constant R Delay Read and Write: 0.0000 to 30.0000	FP
40618	Input 1 Contact Recognition Time Delay	SI
40619	Input 1 Contact Debounce Time Delay	SI
40620	Input 2 Contact Recognition Time Delay	SI
40621	Input 2 Contact Debounce Time Delay	SI
40622	Input 3 Contact Recognition Time Delay	SI
40623	Input 3 Contact Debounce Time Delay	SI
40624	Input 4 Contact Recognition Time Delay	SI
40625	Input 4 Contact Debounce Time Delay	SI
40626	Input 5 Contact Recognition Time Delay	SI
40627	Input 5 Contact Debounce Time Delay	SI
40628	Input 6 Contact Recognition Time Delay	SI
40629	Input 6 Contact Debounce Time Delay	SI
40630	Input 7 Contact Recognition Time Delay	SI
40631	Input 7 Contact Debounce Time Delay	SI
40632	Input 8 Contact Recognition Time Delay	SI
40633	Input 8 Contact Debounce Time Delay	SI
40634	Input 9 Contact Recognition Time Delay	SI

40635	Input 9 Contact Debounce Time Delay	SI
40636	Input 10 Contact Recognition Time Delay	SI
40637	Input 10 Contact Debounce Time Delay	SI
40638	Input 11 Contact Recognition Time Delay	SI
40639	Input 11 Contact Debounce Time Delay	SI
40640	Input 12 Contact Recognition Time Delay	SI
40641	Input 12 Contact Debounce Time Delay	SI
	Read and Write: 4 to 255 milliseconds	
40746-870	Contiguous Poll Block Assignments	INT
	Read and Write: 0 if unassigned 1 to 9874: Holding Register 40001 to 49874 **Note:** To read the data from the registers programmed in this block, Contiguous Poll Block registers, 49875 -49999 must be read.	
40871	Setting Group Control On Time	INT
	Read and Write: 0 to 10 seconds	
40872	Setting Group 1 Automatic Control Switch Time	SI
40874	Setting Group 1 Automatic Control Return Time	SI
40877	Setting Group 2 Automatic Control Switch Time	SI
40879	Setting Group 2 Automatic Control Return Time	SI
40882	Setting Group 3 Automatic Control Switch Time	SI
40884	Setting Group 3 Automatic Control Return Time	SI
	Read and Write: 0 to 60 minutes	
40873	Setting Group 1 Automatic Control Switch Level	SI
40875	Setting Group 1 Automatic Control Return Level	SI
40878	Setting Group 2 Automatic Control Switch Level	SI
40880	Setting Group 2 Automatic Control Return Level	SI
40883	Setting Group 3 Automatic Control Switch Level	SI
40885	Setting Group 3 Automatic Control Return Level	SI
	Read and Write: 0 to 150%	
40876	Setting Group 1 Tracking Element	INT
40881	Setting Group 2 Tracking Element	INT
40886	Setting Group 3 Tracking Element	INT
	Read and Write: 0 to 13 (0 =51P, 1=51N, 2=51Q, 3=151P, 4=151N, 5=151Q, 6=251P, 7=251N, 8=251Q, 9 = 351P, 10=351N, 11=351Q, 13=451N); Number 12 is reserved and not allowed.	
40887-88	60FL Loss of Current Auto Block Setting	ASC(3)
	Read and Write: Ena/Dia	
40889-90	60FL Loss of Voltage Auto Block Setting	ASC(3)
	Read and Write: DIS/PNQ/PN/PQ/NQ/P/N/Q	

Serial Port Setting Parameters

40962	Serial Port 0 Baud Rate	INT
40971	Serial Port 1 Baud Rate	INT
40980	Serial Port 2 Baud Rate	INT

Read and Write:
0 - 300 baud (Do not select for Port 2 Modbus communications.)
1 - 600 baud (Do not select for Port 2 Modbus communications.)
2 - 1200 baud (Do not select for Port 2 Modbus communications.)
3 - 2400 baud
4 - 4800 baud
5 - 9600 baud
6 - 19K baud
7 - 38K baud

40972	Serial Port 1 Relay Address	INT
40981	Serial Port 2 Relay Address	INT

Read and Write:
0 to 65,534

40964	Serial Port 0 Software Flow Control	SI
40973	Serial Port 1 Software Flow Control	SI

Read:
0 if XON / XOFF Control is disabled
1 if XON / XOFF Control is enabled
Write:
0 to disable XON / XOFF Control
1 to 255 to enable XON / XOFF Control

40965	Serial Port 0 Page Length	SI
40974	Serial Port 1 Page Length	SI

Read and Write:
0 for disabled
1 to 40 for number of lines / page

40966	Serial Port 0 Acknowledgement Format	SI
40975	Serial Port 1 Acknowledgement Format	SI

Read:
0 if No acknowledge
1 if Acknowledge enabled
Write:
0 for No acknowledge
1 to 255 to enable acknowledge

40986	Serial Port 2 Modbus Parity	SI

Read and Write:
0 for No parity
1 for Even parity
2 for Odd parity

40987	Serial Port 2 Modbus Remote Delay	SI

Read and Write:
1 to 20: 10 to 200 milliseconds

40988	Serial Port 2 Modbus Stop Bits	SI

Read and Write:
1 for One stop bit
2 for Two stop bits

40989	Serial Port 2 Modbus Password Security	SI

Read and Write:
0 for Disable Password
1 for Enable Password

System Data Setting Parameters

41009	System Frequency Read and Write: 50 for 50 hertz 60 for 60 hertz	SI
41010-11	Phase Rotation Read and Write: 1 for ABC rotation 2 for ACB rotation	SI
41011	Phase CT Ratio CKT #1	INT
41013	Phase CT Ratio CKT #2	INT
41015	Phase CT Ratio CKT #3	INT
41017	Phase CT Ratio CKT #4	INT
41019	Ground CT Ratio Read and Write: 1 to 50,000	INT
41012	CT Connection, CT CKT #1	INT
41014	CT Connection, CT CKT #2	INT
41016	CT Connection, CT CKT #3	INT
41018	CT Connection, CT CKT #4 Read and Write: 0 to 3, 0=WYE, 1=DAB, 2=DAC, 3=GND (ckt #4 only)	INT
41020	TX Connection CKT #1	INT
41024	TX Connection CKT #2	INT
41028	TX Connection CKT #3	INT
41032	TX Connection CKT #4 Read and Write: 0 to 6, 0=WYE, 1=DAB, 2=DAC, 3=ZAB, 4=ZAC, 5=NA, 6=GND	INT
41021	Ground Source CKT #1	INT
41025	Ground Source CKT #2	INT
41029	Ground Source CKT #3	INT
41033	Ground Source CKT #4 Read and Write: 0 to 1	INT
41022	TX Compensation CKT #1	INT
41026	TX Compensation CKT #2	INT
41030	TX Compensation CKT #3	INT
41034	TX Compensation CKT #4 Read and Write: 0 to 2, 0 = A, 1 = B, 2 = C	INT
41023	Differential Source CKT #1	INT
41027	Differential Source CKT #2	INT
41031	Differential Source CKT #3	INT
41035	Differential Source CKT #4 Read and Write: 0 to 2, 0 = N, 1 = P, 2 = S	INT
41036-37	Phase VT Ratio Read and Write: 1.00 to 10,000	FP

41038-39	VT Connection Read and Write: 3W for 3W 4W for 4W AB for AB BC for BC CA for CA AN for AN BN for BN CN for CN	ASC(3)
41040-41	27/59 Voltage Sensing Mode	ASC(3)
41042-43	51/27R Voltage Sensing Mode PP for Line PN for Phase	ASC(3)
41044	VT Winding Circuit Number Read and Write: 0 to 6, Circuits 0 - 6	INT
41045	Load Profile Interval Read and Write: 1 to 60 minutes	INT
41047	Virtual Circuit Configuration Read and Write: 0 to 13	INT
41048	Virtual Differential Restraint Circuit Configuration Read and Write: 0 to 3	INT
41049	TX 180 Degree Compensation CKT #1	INT
41050	TX 180 Degree Compensation CKT #2	INT
41051	TX 180 Degree Compensation CKT #3	INT
41052	TX 180 Degree Compensation CKT #4 Read and Write: 1 = Yes, 0 = No	INT
41053	Power Flow Polarity Read and Write: 1 = Reversed, 0 = Normal	INT

Breaker Duty Setting Parameters

41060-61	Breaker 1 Duty Exponent	FP
41088-89	Breaker 2 Duty Exponent	FP
41117-18	Breaker 3 Duty Exponent	FP
41145-46	Breaker 4 Duty Exponent Read and Write: 1.00 to 3.00	FP
41062-63	Maximum Breaker 1 Duty	FP
41090-91	Maximum Breaker 2 Duty	FP
41119-20	Maximum Breaker 3 Duty	FP
41147-48	Maximum Breaker 4 Duty Read and Write: 0 to 4,290,000,000 amps	FP
41173	Programmable Breaker Alarm #1 Mode	INT
41177	Programmable Breaker Alarm #2 Mode	INT
41181	Programmable Breaker Alarm #3 Mode	INT
41185	Programmable Breaker Alarm #4 Mode	INT

41189	Programmable Breaker Alarm #5 Mode	INT
41193	Programmable Breaker Alarm #6 Mode	INT
41197	Programmable Breaker Alarm #7 Mode	INT
41201	Programmable Breaker Alarm #8 Mode	INT
41205	Programmable Breaker Alarm #9 Mode	INT
41209	Programmable Breaker Alarm #10 Mode	INT
41213	Programmable Breaker Alarm #11 Mode	INT
41217	Programmable Breaker Alarm #12 Mode	INT
	Read and Write: 0 for Disabled 1 for Percent duty 2 for Breaker operations 3 for Clearing time	

41174-75	Programmable Breaker Alarm #1 Limit	FP
41178-79	Programmable Breaker Alarm #2 Limit	FP
41182-83	Programmable Breaker Alarm #3 Limit	FP
41186-87	Programmable Breaker Alarm #4 Limit	FP
41190-91	Programmable Breaker Alarm #5 Limit	FP
41194-95	Programmable Breaker Alarm #6 Limit	FP
41198-99	Programmable Breaker Alarm #7 Limit	FP
41202-03	Programmable Breaker Alarm #8 Limit	FP
41206-07	Programmable Breaker Alarm #9 Limit	FP
41210-11	Programmable Breaker Alarm #10 Limit	FP
41214-15	Programmable Breaker Alarm #11 Limit	FP
41218-19	Programmable Breaker Alarm #12 Limit	FP
	Read and Write: If mode is 0: Reads 0, any value writes 0 If mode is 1: 0.00 to 100.00% If mode is 2: 0 to 99,999 If mode is 3: 0, 20 to 1000 milliseconds	

41176	Programmable Breaker Alarm #1 Circuit	INT
41180	Programmable Breaker Alarm #2 Circuit	INT
41184	Programmable Breaker Alarm #3 Circuit	INT
41188	Programmable Breaker Alarm #4 Circuit	INT
41192	Programmable Breaker Alarm #5 Circuit	INT
41196	Programmable Breaker Alarm #6 Circuit	INT
41200	Programmable Breaker Alarm #7 Circuit	INT
41204	Programmable Breaker Alarm #8 Circuit	INT
41208	Programmable Breaker Alarm #9 Circuit	INT
41212	Programmable Breaker Alarm #10 Circuit	INT
41216	Programmable Breaker Alarm #11 Circuit	INT
41220	Programmable Breaker Alarm #12 Circuit	INT
	Read and Write: For Ckt #1, 2 for Ckt #2, 3 for Ckt #3, 4 for Ctk #4	

41245-53	Breaker 1 Label	ASC(18)
41279-87	Breaker 2 Label	ASC(18)
41313-21	Breaker 3 Label	ASC(18)
41347-55	Breaker 4 Label	ASC(18)
	Read and Write of ASCII strings.	

41254	Breaker 1 Trip Coil Enable	SI
41288	Breaker 2 Trip Coil Enable	SI
41322	Breaker 3 Trip Coil Enable	SI
41356	Breaker 4 Trip Coil Enable	SI
	Read and Write: 0 to 1	

Transformer Duty Setting Parameters

41360	Transformer Duty #1 Mode	SI
41388	Transformer Duty #2 Mode	SI
41416	Transformer Duty #3 Mode	SI
41444	Transformer Duty #4 Mode	SI
	Read and Write: 0 for Off 1 for Sum % I * t, primary amps 2 for Sum % I^2 * t, primary amps	
41361-62	Maximum Transformer Duty #1	FP
41389-90	Maximum Transformer Duty #2	FP
41417-18	Maximum Transformer Duty #3	FP
41445-46	Maximum Transformer Duty #4	FP
	Read and Write: 0 to 4.29E 09 primary amps	
41363	Transformer Duty #1 CT CKT Number	SI
41391	Transformer Duty #2 CT CKT Number	SI
41419	Transformer Duty #3 CT CKT Number	SI
41447	Transformer Duty #4 CT CKT Number	SI
	Read and Write: 1 for Ckt #1, 2 for Ckt #2, 3 for Ckt #3, 4 for Ctk #4	
41472	Programmable Transformer Alarm #1 Mode	INT
41476	Programmable Transformer Alarm #2 Mode	INT
41480	Programmable Transformer Alarm #3 Mode	INT
41484	Programmable Transformer Alarm #4 Mode	INT
41488	Programmable Transformer Alarm #5 Mode	INT
41492	Programmable Transformer Alarm #6 Mode	INT
41496	Programmable Transformer Alarm #7 Mode	INT
41500	Programmable Transformer Alarm #8 Mode	INT
	Read and Write: 0 for Disabled 1 for Percent duty 2 for Through faults	
41473-74	Programmable Transformer Alarm #1 Limit	FP
41477-78	Programmable Transformer Alarm #2 Limit	FP
41481-82	Programmable Transformer Alarm #3 Limit	FP
41485-86	Programmable Transformer Alarm #4 Limit	FP
41489-90	Programmable Transformer Alarm #5 Limit	FP
41493-94	Programmable Transformer Alarm #6 Limit	FP
41497-98	Programmable Transformer Alarm #7 Limit	FP
41501-02	Programmable Transformer Alarm #8 Limit	FP
	Read and Write: If mode is 0: Reads 0; Any value writes 0 If mode is 1: 0.00 to 100.00% If mode is 2: 0 to 99,999	
41475	Transformer Alarm #1 Duty Circuit Number	SI
41479	Transformer Alarm #2 Duty Circuit Number	SI
41483	Transformer Alarm #3 Duty Circuit Number	SI
41487	Transformer Alarm #4 Duty Circuit Number	SI
41491	Transformer Alarm #5 Duty Circuit Number	SI
41495	Transformer Alarm #6 Duty Circuit Number	SI
41499	Transformer Alarm #7 Duty Circuit Number	SI
41503	Transformer Alarm #8 Duty Circuit Number	SI

Read and Write:
0 to 4

Relay Data Setting Parameters

41508-09	Volts / Hertz alarm settings Read and Write: 0.5 to 6.0 V/Hz	FP
41510-11	Volts / Hertz Alarm Time Delay Read and Write: 50 to 600,000 milliseconds	FP
41512-13	Undervoltage alarm settings	FP
41514-15	Overvoltage alarm settings Read and Write: 0 to 300 volts	FP
41516-17	Forward Var Demand Alarm	FP
41518-19	Reverse Var Demand Alarm Read and Write: 0.0 to 8500 Vars	FP
41520-21	Forward Watt Demand Alarm	FP
41522-23	Reverse Watt Demand Alarm Read and Write: 0.0 to 8500 Vars	FP
41524-25	Phase Voltage Max Demand Alarm Level	FP
41526-27	Phase Voltage Min Demand Alarm Level	FP
41528-29	Neutral Voltage Max Demand Alarm Level	FP
41530-31	Neutral Voltage Min Demand Alarm Level Read and Write: 0 to 300 volts	FP
41532-34	Phase Demand 1 Alarm Level	FP
41534-35	Phase Demand 2 Alarm Level	FP
41536-37	Phase Demand 3 Alarm Level	FP
41538-39	Phase Demand 4 Alarm Level	FP
41540-41	Neutral Demand 1 Alarm Level	FP
41542-43	Neutral Demand 2 Alarm Level	FP
41544-45	Neutral Demand 3 Alarm Level	FP
41546-47	Neutral Demand 4 Alarm Level	PF
41548-49	Negative-Sequence Demand 1 Alarm Level	FP
41550-51	Negative-Sequence Demand 2 Alarm Level	FP
41552-53	Negative-Sequence Demand 3 Alarm Level	FP
41554-55	Negative-Sequence Demand 4 Alarm Level	FP
41556-57	Ground Current Demand Alarm Level Read and Write: 0 to 16.0 amps	FP
41558	Major Alarm Mask 1st register	BM(16)
41564	Minor Alarm Mask 1st register	BM(16)
41570	Logic Alarm Mask 1st register Read and Write: Bit 15 - Setting Group Change Active alarm Bit 14 - Loss of IRIG-B sync or IRIG-B decode problem Bit 13 - An override is active in one or more outputs Bit 12 - EEPROM non-fatal error Bit 11 - User settings changed, ('EXIT' with 'Y') Bit 10 - Power reset alarm, hard reset of MPU Bit 9 - Clock problem, real time clock has not been set	BM(16)

Bit 8 - Communicating failure alarm, read error on serial port
Bit 7 - Operating System Overload detected alarm
Bit 6 - Setting group override in effect
Bit 5 - Breaker alarm #12
Bit 4 - Breaker alarm #11
Bit 3 - Breaker alarm #10
Bit 2 - Breaker alarm #9
Bit 1 - Breaker alarm #8
Bit 0 - Breaker alarm #7

41559	Major Alarm Mask 2nd register	BM(16)
41565	Minor Alarm Mask 2nd register	BM(16)
41571	Logic Alarm Mask 2nd register	BM(16)

Read and Write:

Bit 15 - Breaker alarm #6
Bit 14 - Breaker alarm #5
Bit 13 - Breaker alarm #4
Bit 12 - Breaker alarm #3
Bit 11 - Breaker alarm #2
Bit 10 - Breaker alarm #1
Bit 9 - Changes Lost alarm
Bit 8 - Differential alarm
Bit 7 - Breaker 4 Fail alarm
Bit 6 - Breaker 3 Fail alarm
Bit 5 - Breaker 2 Fail alarm
Bit 4 - Breaker 1 Fail alarm
Bit 3 - CKT 4 Monitor alarm
Bit 2 - CKT 3 Monitor alarm
Bit 1 - CKT 2 Monitor alarm
Bit 0 - CKT 1 Monitor alarm

41560	Major Alarm Mask 3rd register	BM(16)
41566	Minor Alarm Mask 3rd register	BM(16)
41572	Logic Alarm Mask 3rd register	BM(16)

Read and Write:

Bit 15 - VP Min Demand Alarm
Bit 14 - VP Max Demand Alarm
Bit 13 - Rev Watt Demand alarm
Bit 12 - Fwd Watt Demand alarm
Bit 11 - Neg Var Demand alarm
Bit 10 - Pos Var Demand alarm
Bit 9 - IG Demand Alarm
Bit 8 - Q demand 4 alarm, excessive negative-sequence unbalance
Bit 7 - Q demand 3 alarm, excessive negative-sequence unbalance
Bit 6 - Q demand 2 alarm, excessive negative-sequence unbalance
Bit 5 - Q demand 1 alarm, excessive negative-sequence unbalance
Bit 4 - Neutral demand 4 alarm
Bit 3 - Neutral demand 3 alarm
Bit 2 - Neutral demand 2 alarm
Bit 1 - Neutral demand 1 alarm
Bit 0 - Phase demand 4 alarm

41561	Major Alarm Mask 4th register	BM(16)
41567	Minor Alarm Mask 4th register	BM(16)
41573	Logic Alarm Mask 4th register	BM(16)

Read and Write:

Bit 15 - Phase demand 3 alarm
Bit 14 - Phase demand 2 alarm
Bit 13 - Phase demand 1 alarm
Bit 12 - Logic = None alarm
Bit 11 - Transformer alarm 8

	Bit 10 - Transformer alarm 7 Bit 9 - Transformer alarm 6 Bit 8 - Transformer alarm 5 Bit 7 - Transformer alarm 4 Bit 6 - Transformer alarm 3 Bit 5 - Transformer alarm 2 Bit 4 - Transformer alarm 1 Bit 3 - Fault Report Timeout alarm Bit 2 - Virtual Output 15 alarm Bit 1 - Virtual Output 14 alarm Bit 0 - Virtual Output 13 alarm	
41562	Major Alarm Mask 5th register	BM(16)
41568	Minor Alarm Mask 5th register	BM(16)
41574	Logic Alarm Mask 5th register Read and Write: Bit 0 - Bit 15 not used	BM(16)
41563	Major Alarm Mask 6th register	BM(16)
41569	Minor Alarm Mask 6th register	BM(16)
41575	Logic Alarm Mask 6th register Read and Write: Bit 7 - Bit 15 not used Bit 6 - Freq Range alarm Bit 5 - 60 Fuse Loss alarm Bit 4 - 59 Overvoltage alarm Bit 3 - 27 Undervoltage alarm Bit 2 - Volts per Hertz alarm Bit 1 - VN Min Demand alarm Bit 0 - VN Max Demand alarm	BM(16)
41576	87T Differential Alarm Read and Write: 50 - 100 %	INT
41577	Clock Format - Date Read and Write: M for mm/dd/yy format D for dd/mm/yy format	ASC(1)
41578	Clock Format - Time Read and Write: 12 for 12 hour clock 24 for 24 hour clock	SI
41579	Clock Format - Daylight Savings Read and Write: 0 for disabling Daylight Savings 1 for enabling Daylight Savings	SI
41580	Phase Demand Interval	SI
41582	Neutral Demand Interval	SI
41584	Negative-Sequence Demand Interval Read and Write: 1 to 60 minutes 0 to disable	SI
41581	Phase Demand Calculation Method	ASC(1)
41583	Neutral Demand Calculation Method	ASC(1)
41585	Negative-Sequence Demand Calculation Method Read and Write:	ASC(1)

T - Thermal
B - Block
S - Sliding Block

41586	Demand 1 CT circuit number	INT
41587	Demand 2 CT circuit number	INT
41588	Demand 3 CT circuit number	INT
41589	Demand 4 CT circuit number	INT

Read and Write:
0 to 6, 0 = none, 1 - 6 = circuits 1 - 6

41590	Output Hold Mask	BM(16)

Read and Write:
Bit 15 - Spare
Bit 14 - Output 14 Status
Bit 13 - Output 13 Status
Bit 12 - Output 12 Status
Bit 11 - Output 11 Status
Bit 10 - Output 10 Status
Bit 9 - Output 9 Status
Bit 8 - Output 8 Status
Bit 7 - Output 7 Status
Bit 6 - Output 6 Status
Bit 5 - Output 5 Status
Bit 4 - Output 4 Status
Bit 3 - Output 3 Status
Bit 2 - Output 2 Status
Bit 1 - Output 1 Status
Bit 0 - Output A Status

41591	Target Mask 1st register	BM(16)

Read and Write:
Bit 15 - 59X
Bit 14 – 362
Bit 13 – 262
Bit 12 – 162
Bit 11 – 62
Bit 10 - 159C
Bit 9 - 159B
Bit 8 - 159A
Bit 7 - 59C
Bit 6 - 59B
Bit 5 - 59A
Bit 4 - 60FL
Bit 3 - 350BF
Bit 2 - 250BF
Bit 1 - 150BF
Bit 0 - 50BF

41592	Target Mask 2nd register	BM(16)

Read and Write:
Bit 15 – 47
Bit 14 - 127C
Bit 13 - 127B
Bit 12 - 127A
Bit 11 - 27C
Bit 10 - 27B
Bit 9 - 27A
Bit 8 – 24
Bit 7 - 187ND
Bit 6 - 87ND

Bit 5 - 87RC
Bit 4 - 87RB
Bit 3 - 87RA
Bit 2 - 87UC
Bit 1 - 87UB
Bit 0 - 87UA

41593 Target Mask 3rd register BM(16)
Read and Write:
Bit 15 – spare
Bit 14 – spare
Bit 13 – 581
Bit 12 – 481
Bit 11 – 381
Bit 10 – 281
Bit 9 – 181
Bit 8 – 81
Bit 7 - 750TC
Bit 6 - 750TB
Bit 5 - 750TA
Bit 4 - 650TC
Bit 3 - 650TB
Bit 2 - 650TA
Bit 1 - 550TC
Bit 0 - 550TB

41594 Target Mask 4th register BM(16)
Read and Write:
Bit 15 - 550TA
Bit 14 - 450TC
Bit 13 - 450TB
Bit 12 - 450TA
Bit 11 - 350TC
Bit 10 - 350TB
Bit 9 - 350TA
Bit 8 - 250TC
Bit 7 - 250TB
Bit 6 - 250TA
Bit 5 - 150TC
Bit 4 - 150TB
Bit 3 - 150TA
Bit 2 - 50TC
Bit 1 - 50TB
Bit 0 - 50TA

41595 Target Mask 5th register BM(16)
Read and Write:
Bit 15 – spare
Bit 14 - 351Q
Bit 13 - 251Q
Bit 12 - 151Q
Bit 11 - 51Q
Bit 10 - 451N
Bit 9 - 351N
Bit 8 - 251N
Bit 7 - 151N
Bit 6 - 51N
Bit 5 - 351C
Bit 4 - 351B
Bit 3 - 351A
Bit 2 - 251C

Bit 1 - 251B
Bit 0 - 251A

41596 Target Mask 6th register BM(16)
Read and Write:
Bit 15 - 151C
Bit 14 - 151B
Bit 13 - 151A
Bit 12 - 51C
Bit 11 - 51B
Bit 10 - 51A
Bit 9 – spare
Bit 8 - 350TQ
Bit 7 - 250TQ
Bit 6 - 150TQ
Bit 5 - 50TQ
Bit 4 - 450TN
Bit 3 - 350TN
Bit 2 - 250TN
Bit 1 - 150TN
Bit 0 - 50TN

41621-24	Programmable Screen #1	ASC(7)
41625-28	Programmable Screen #2	ASC(7)
41629-32	Programmable Screen #3	ASC(7)
41633-36	Programmable Screen #4	ASC(7)
41637-40	Programmable Screen #5	ASC(7)
41641-44	Programmable Screen #6	ASC(7)
41645-48	Programmable Screen #7	ASC(7)
41649-52	Programmable Screen #8	ASC(7)
41653-56	Programmable Screen #9	ASC(7)
41657-60	Programmable Screen #10	ASC(7)
41661-64	Programmable Screen #11	ASC(7)
41665-68	Programmable Screen #12	ASC(7)
41669-72	Programmable Screen #13	ASC(7)
41673-76	Programmable Screen #14	ASC(7)
41677-80	Programmable Screen #15	ASC(7)
41681-84	Programmable Screen #16	ASC(7)

Read and Write:
Screen identifier. For example, the Output Status Screen would be 1.5.2

Custom Logic Setting Parameters

41800-08 User Custom Logic Name ASC(18)
Read:
If programming, reads custom logic name
Write:
New custom logic name or standard logic name of logic scheme to be copied to custom scheme.

41809-17 Current Active Logic Scheme ASC(18)
Read:
Current active logic name.

41818-26 Standard Logic #1 Name ASC(18)
Read:
Standard logic name #1

41827-35 Standard Logic #2 Name ASC(18)
Read:
Standard logic name #2

System Labels and ID Setting Parameters

All are Read and Write of ASCII strings.

Report Parameters

47290-94	Model Number	ASC(10)
47295-03	Application SW Version # / Date	ASC(18)
47304-12	Boot SW Version # / Date	ASC(18)
47315-21	Serial Number	ASC(13)
47320-30	Style Number	ASC(21)
47331-39	DSP SW Version #/Date Read Only: ASCII strings	ASC(16)
47340	COM 1 Serial Port Relay Address Read and Write: 0 to 65,534	INT
47341	COM 2 Serial Port Relay Address Read and Write: 0 to 65,534	INT
47342	Date and Time - Day Read and Write: Any value (days since 01/01/1984)	INT
47343-44	Date and Time - milliseconds Read and Write: 0 to 86,399,999 milliseconds	LI
47345	System Status - 1st Register (Logic Var 0 to 15) Read only: Bit 15 - 750TP tripped Bit 14 - 650TP tripped Bit 13 - 550TP tripped Bit 12 - 450TP tripped Bit 11 - 350TP tripped Bit 10 - 250TP tripped Bit 9 - 150TP tripped Bit 8 - 50TP tripped Bit 7 - 750TP picked-up Bit 6 - 650TP picked-up Bit 5 - 550TP picked-up Bit 4 - 450TP picked-up Bit 3 - 350TP picked-up Bit 2 - 250TP picked-up Bit 1 - 150TP picked-up Bit 0 - 50TP picked-up	BM(16)
47346	System Status - 2nd register (Logic Var 16 to 31) Read only: Bit 15 - 187ND tripped Bit 14 - 87ND tripped Bit 13 - 87R tripped Bit 12 - 187ND picked-up Bit 11 - 87ND picked-up Bit 10 - 87R picked-up Bit 9 - 450TN tripped Bit 8 - 350TN tripped Bit 7 - 250TN tripped Bit 6 - 150TN tripped	BM(16)

Bit 5 - 50TN tripped
Bit 4 - 450TN picked-up
Bit 3 - 350TN picked-up
Bit 2 - 250TN picked-up
Bit 1 - 150TN picked-up
Bit 0 - 50TN picked-up

47347 System Status - 3rd Register (Logic Var 32 to 47) BM(16)
Read only:
Bit 15 - Output Trip Coil Circuit Monitor 4
Bit 14 - Output Trip Coil Circuit Monitor 3
Bit 13 - Output Trip Coil Circuit Monitor 2
Bit 12 - Output Trip Coil Circuit Monitor 1
Bit 11 - Input 12 status
Bit 10 - Input 11 status
Bit 9 - Input 10 status
Bit 8 - Input 9 status
Bit 7 - Input 8 status
Bit 6 - Input 7 status
Bit 5 - Input 6 status
Bit 4 - Input 5 status
Bit 3 - Input 4 status
Bit 2 - Input 3 status
Bit 1 - Input 2 status
Bit 0 - Input 1 status

47348 System Status - 4th Register (Logic Var 48 to 63) BM(16)
Read only:
Bit 15 - Logic is FALSE
Bit 14 - Circuit 4 Breaker Failure tripped
Bit 13 - Circuit 3 Breaker Failure tripped
Bit 12 - Circuit 2 Breaker Failure tripped
Bit 11 - Circuit 1 Breaker Failure tripped
Bit 10 - Circuit 4 Breaker Failure picked-up
Bit 9 - Circuit 3 Breaker Failure picked-up
Bit 8 - Circuit 2 Breaker Failure picked-up
Bit 7 - Circuit 1 Breaker Failure picked-up
Bit 6 - 87 5th Harmonic Inhibit phase C
Bit 5 - 87 5th Harmonic Inhibit phase B
Bit 4 - 87 5th Harmonic Inhibit phase A
Bit 3 - 87 2nd Harmonic Inhibit phase C
Bit 2 - 87 2nd Harmonic Inhibit phase B
Bit 1 - 87 2nd Harmonic Inhibit phase A
Bit 0 - 87U tripped

47349 System Status - 5th Register (Logic Var 64 to 79) BM(16)
Read only:
Bit 15 - Virtual Output 15 status
Bit 14 - Virtual Output 14 status
Bit 13 - Virtual Output 13 status
Bit 12 - Virtual Output 12 status
Bit 11 - Virtual Output 11 status
Bit 10 - Virtual Output 10 status
Bit 9 - Virtual Output 9 status
Bit 8 - Virtual Output 8 status
Bit 7 - Virtual Output 7 status
Bit 6 - Virtual Output 6 status
Bit 5 - Virtual Output 5 status
Bit 4 - Virtual Output 4 status
Bit 3 - Virtual Output 3 status
Bit 2 - Virtual Output 2 status

Bit 1 - Virtual Output 1 status
Bit 0 - Virtual Output A status

47350 System Status - 6th Register (Logic Var 80 to 95) BM(16)
Read only:
Bit 15 - VIN16
Bit 14 - VIN15
Bit 13 - VIN14
Bit 12 - VIN13
Bit 11 - VIN12
Bit 10 - VIN11
Bit 9 - VIN10
Bit 8 - VIN9
Bit 7 - VIN8
Bit 6 - VIN7
Bit 5 - VIN6
Bit 4 - VIN5
Bit 3 - VIN4
Bit 2 - VIN3
Bit 1 - VIN2
Bit 0 - VIN1

47351 System Status - 7th Register (Logic Var 96 to 111) BM(16)
Read only:
Bit 15 - 350TQ picked-up
Bit 14 - 250TQ picked-up
Bit 13 - 150TQ picked-up
Bit 12 - 50TQ picked-up
Bit 11 - 581 tripped
Bit 10 - 481 tripped
Bit 9 - 381 tripped
Bit 8 - 281 tripped
Bit 7 - 181 tripped
Bit 6 - 81 tripped
Bit 5 - 581 picked-up
Bit 4 - 481 picked-up
Bit 3 - 381 picked-up
Bit 2 - 281 picked-up
Bit 1 - 181 picked-up
Bit 0 - 81 picked-up

47352 System Status - 8th Register (Logic Var 112 to 127) BM(16)
Read only:
Bit 15 - 3101SC
Bit 14 - 2101SC
Bit 13 - 1101SC
Bit 12 - 101SC
Bit 11 - 3101C
Bit 10 - 2101C
Bit 9 - 1101C
Bit 8 - 101C
Bit 7 - 3101T
Bit 6 - 2101T
Bit 5 - 1101T
Bit 4 - 101T
Bit 3 - 350TQ tripped
Bit 2 - 250TQ tripped
Bit 1 - 150TQ tripped
Bit 0 - 50TQ tripped

47353 System Status - 9th Register (Logic Var 128 to 143) BM(16)
Read only:
Bit 15 - 127P tripped
Bit 14 - 27 tripped
Bit 13 - 351Q tripped
Bit 12 - 251Q tripped
Bit 11 - 151Q tripped
Bit 10 - 51Q tripped
Bit 9 - spare
Bit 8 - 451N tripped
Bit 7 - 351N tripped
Bit 6 - 251N tripped
Bit 5 - 151N tripped
Bit 4 - 51N tripped
Bit 3 - 351P tripped
Bit 2 - 251P tripped
Bit 1 - 151P tripped
Bit 0 - 51P tripped

47354 System Status - 10th Register (Logic Var 144 to 159) BM(16)
Read only:
Bit 15 - 127P picked-up
Bit 14 - 27 picked-up
Bit 13 - 351Q picked-up
Bit 12 - 251Q picked-up
Bit 11 - 151Q picked-up
Bit 10 - 51Q picked-up
Bit 9 - spare
Bit 8 - 451N picked-up
Bit 7 - 351N picked-up
Bit 6 - 251N picked-up
Bit 5 - 151N picked-up
Bit 4 - 51N picked-up
Bit 3 - 351P picked-up
Bit 2 - 251P picked-up
Bit 1 - 151P picked-up
Bit 0 - 51P picked-up

47355 System Status - 11th Register (Logic Var 160 to 175) BM(16)
Read only:
Bit 15 - Settings Group 3
Bit 14 - Settings Group 2
Bit 13 - Settings Group 1
Bit 12 - Settings Group 0
Bit 11 - 362 timer
Bit 10 - 262 timer
Bit 9 - 162 timer
Bit 8 - 62 timer
Bit 7 - 24 tripped
Bit 6 - 24 picked-up
Bit 5 - 159P tripped
Bit 4 - 59P tripped
Bit 3 - 159P picked-up
Bit 2 - 59P picked-up
Bit 1 - 47 tripped
Bit 0 - 47 picked-up

47356 System Status - 12th Register (Logic Var 176 to 191) BM(16)
Read only:
Bit 15 - 60FL
Bit 14 - 59X tripped

Bit 13 - 59X picked-up
Bit 12 - ARSTKEY
Bit 11 - TRSTKEY
Bit 10 - Alarm Logic
Bit 9 - Alarm Minor
Bit 8 - Alarm Major
Bit 7 - SWITCH 743
Bit 6 - SWITCH 643
Bit 5 - SWITCH 543
Bit 4 - SWITCH 443
Bit 3 - SWITCH 343
Bit 2 - SWITCH 243
Bit 1 - SWITCH 143
Bit 0 - SWITCH 43

47357 Input Status BM(16)
Read only:
Bit 12 - 15 Not used
Bit 11 - Input 12 status
Bit 10 - Input 11 status
Bit 9 - Input 10 status
Bit 8 - Input 9 status
Bit 7 - Input 8 status
Bit 6 - Input 7 status
Bit 5 - Input 6 status
Bit 4 - Input 5 status
Bit 3 - Input 4 status
Bit 2 - Input 3 status
Bit 1 - Input 2 status
Bit 0 - Input 1 status

47358 43 Status BM(16)
Read only:
Bit8 - Bit15 Not used
Bit 7 - SWITCH 743
Bit 6 - SWITCH 643
Bit 5 - SWITCH 543
Bit 4 - SWITCH 443
Bit 3 - SWITCH 343
Bit 2 - SWITCH 243
Bit 1 - SWITCH 143
Bit 0 - SWITCH 43

47359 101 Status BM(16)
Read only:
Bit4 - Bit15 Not used
Bit 3 - 3101 Status
Bit 2 - 2101 Status
Bit 1 - 1101 Status
Bit 0 - 101 Status

47360 Current Active Group Setting SI
Read only:
0 to 3

47361 Current Group Control Setting ASC(1)
Read only:
ASCII character 0, 1, 2, 3, L

47362 Current Output Control Settings (Output Pulse 0) 1st register. BM(16)
Read only:
Bit 15 – Not used

Bit 14 - Output 14 pulse low
Bit 13 - Output 13 pulse low
Bit 12 - Output 12 pulse low
Bit 11 - Output 11 pulse low
Bit 10 - Output 10 pulse low
Bit 9 - Output 9 pulse low
Bit 8 - Output 8 pulse low
Bit 7 - Output 7 pulse low
Bit 6 - Output 6 pulse low
Bit 5 - Output 5 pulse low
Bit 4 - Output 4 pulse low
Bit 3 - Output 3 pulse low
Bit 2 - Output 2 pulse low
Bit 1 - Output 1 pulse low
Bit 0 - Output A pulse low

47363 Current Output Control Settings (OutputPulse1) 2nd register BM(16)
Read only:

Bit 15 – Not used
Bit 14 - Output 14 pulse high
Bit 13 - Output 13 pulse high
Bit 12 - Output 12 pulse high
Bit 11 - Output 11 pulse high
Bit 10 - Output 10 pulse high
Bit 9 - Output 9 pulse high
Bit 8 - Output 8 pulse high
Bit 7 - Output 7 pulse high
Bit 6 - Output 6 pulse high
Bit 5 - Output 5 pulse high
Bit 4 - Output 4 pulse high
Bit 3 - Output 3 pulse high
Bit 2 - Output 2 pulse high
Bit 1 - Output 1 pulse high
Bit 0 - Output A pulse high

47364 Current Output Control Settings (OutputLatch 0) 1st register BM(16)
Read only:

Bit 15 – Not used
Bit 14 - Output 14 latch low
Bit 13 - Output 13 latch low
Bit 12 - Output 12 latch low
Bit 11 - Output 11 latch low
Bit 10 - Output 10 latch low
Bit 9 - Output 9 latch low
Bit 8 - Output 8 latch low
Bit 7 - Output 7 latch low
Bit 6 - Output 6 latch low
Bit 5 - Output 5 latch low
Bit 4 - Output 4 latch low
Bit 3 - Output 3 latch low
Bit 2 - Output 2 latch low
Bit 1 - Output 1 latch low
Bit 0 - Output A latch low

47365 Current Output Control Settings (OutputLatch1) 2nd register BM(16)
Read only:

Bit 15 – Not used
Bit 14 - Output 14 latch high
Bit 13 - Output 13 latch high
Bit 12 - Output 12 latch high
Bit 11 - Output 11 latch high
Bit 10 - Output 10 latch high

Bit 9 - Output 9 latch high
Bit 8 - Output 8 latch high
Bit 7 - Output 7 latch high
Bit 6 - Output 6 latch high
Bit 5 - Output 5 latch high
Bit 4 - Output 4 latch high
Bit 3 - Output 3 latch high
Bit 2 - Output 2 latch high
Bit 1 - Output 1 latch high
Bit 0 - Output A latch high

47366 Current Output Contact Status BM(16)
Read only:
Bit 15 – Not used
Bit 14 - Output 14
Bit 13 - Output 13
Bit 12 - Output 12
Bit 11 - Output 11
Bit 10 - Output 10
Bit 9 - Output 9
Bit 8 - Output 8
Bit 7 - Output 7
Bit 6 - Output 6
Bit 5 - Output 5
Bit 4 - Output 4
Bit 3 - Output 3
Bit 2 - Output 2
Bit 1 - Output 1
Bit 0 - Output A

47367 Active Alarm Flags (Sum Flags) 1st register BM(16)
Read only:
Bits 15 to 0 - Spare

47368 Active Alarm Flags (Sum Flags) 2nd register BM(16)
Read only:
Bit 15 - Flash block Erase Failure
Bit 14 - Lost Oscillography Data
Bit 13 - Lost Fault Record Data
Bit 12 - Lost Sequence of Events Data
Bit 11 - Lost Load Profile Data
Bit 10 - DSP Failure
Bit 9 - Calibration defaults loaded
Bit 8 - Setting defaults loaded
Bit 7 - Watchdog failure
Bit 6 - Power Supply error
Bit 5 - Calibration error
Bit 4 - Analog failure
Bit 3 - EEPROM Read / Write Fatal error
Bit 2 - MPU Self-test error
Bit 1 - ROM (flash) Failure detected
Bit 0 - RAM Failure detected

47369 Active Alarm Flags (ProgAlarms) 1ST register BM(16)
Read Only:
Bit 15 - Breaker alarm #6
Bit 14 - Breaker alarm #5
Bit 13 - Breaker alarm #4
Bit 12 - Breaker alarm #3
Bit 11 - Breaker alarm #2
Bit 10 - Breaker alarm #1

Bit 9 - Changes Lost alarm
Bit 8 - Differential alarm
Bit 7 - Breaker 4 Fail alarm
Bit 6 - Breaker 3 Fail alarm
Bit 5 - Breaker 2 Fail alarm
Bit 4 - Breaker 1 Fail alarm
Bit 3 - CKT 4 Monitor alarm
Bit 2 - CKT 3 Monitor alarm
Bit 1 - CKT 2 Monitor alarm
Bit 0 - CKT 1 Monitor alarm

47370 Active Alarm Flags (ProgAlarms) 2nd register BM(16)
Read Only:
Bit 15 - Setting Group Change Active alarm
Bit 14 - Loss of IRIG-B sync or IRIG-B decode problem
Bit 13 - An override is active in one or more outputs
Bit 12 - EEPROM Non fatal error
Bit 11 - User settings changed ('EXIT' with 'Y')
Bit 10 - Power reset alarm, hard reset of MPU
Bit 9 - Clock problem, real time clock has not been set
Bit 8 - Communicating failure alarm, read error on serial port
Bit 7 - Operating System Overload detected alarm
Bit 6 - Setting group override in effect
Bit 5 - Breaker alarm #12
Bit 4 - Breaker alarm #11
Bit 3 - Breaker alarm #10
Bit 2 - Breaker alarm #9
Bit 1 - Breaker alarm #8
Bit 0 - Breaker alarm #7

47371 Active Alarm Flags (Prog Alarms) 3rd register BM(16)
Read Only:
Bit 15 - Phase demand 3 alarm
Bit 14 - Phase demand 2 alarm
Bit 13 - Phase demand 1 alarm
Bit 12 - Logic = None alarm
Bit 11 - Transformer Alarm 8
Bit 10 - Transformer Alarm 7
Bit 9 - Transformer Alarm 6
Bit 8 - Transformer Alarm 5
Bit 7 - Transformer Alarm 4
Bit 6 - Transformer Alarm 3
Bit 5 - Transformer Alarm 2
Bit 4 - Transformer Alarm 1
Bit 3 - Fault Report Timeout alarm
Bit 2 - Virtual Output 15 alarm
Bit 1 - Virtual Output 14 alarm
Bit 0 - Virtual Output 13 alarm

47372 Active Alarm Flags (Prog Alarms) 4th register BM(16)
Read Only:
Bit 15 - VP Min Demand Alarm
Bit 14 - VP Max Demand Alarm
Bit 13 - Rev Watt Demand alarm
Bit 12 - Fwd Watt Demand alarm
Bit 11 - Neg Var Demand alarm
Bit 10 - Pos Var Demand alarm
Bit 9 - IG Demand Alarm
Bit 8 - Q demand 4 alarm, excessive negative-sequence unbalance
Bit 7 - Q demand 3 alarm, excessive negative-sequence unbalance
Bit 6 - Q demand 2 alarm, excessive negative-sequence unbalance

Bit 5 - Q demand 1 alarm, excessive negative-sequence unbalance
Bit 4 - Neutral demand 4 alarm
Bit 3 - Neutral demand 3 alarm
Bit 2 - Neutral demand 2 alarm
Bit 1 - Neutral demand 1 alarm
Bit 0 - Phase demand 4 alarm

47373 Active Alarm Flags (ProgAlarms) 5th register BM(16)
Read Only:
Bit 7 - Bit 15 Not used
Bit 6 - Freq Range alarm
Bit 5 - 60 Fuse Loss alarm
Bit 4 - 59 Overvoltage Alarm
Bit 3 - 27 Undervoltage Alarm
Bit 2 - Volts per Hertz alarm
Bit 1 - VN Min Demand Alarm
Bit 0 - VN Max Demand Alarm

47374 Active Alarm Flags (Prog Alarms) 6th register BM(16)
Read Only:
Bit 0 - Bit 15 Not used

47375 Target Status 1st register BM(16)
Read Only:
Bit 15 - 59X
Bit 14 – 362
Bit 13 – 262
Bit 12 – 162
Bit 11 – 62
Bit 10 - 159C
Bit 9 - 159B
Bit 8 - 159A
Bit 7 - 59C
Bit 6 - 59B
Bit 5 - 59A
Bit 4 - 60FL
Bit 3 - 350BF
Bit 2 - 250BF
Bit 1 - 150BF
Bit 0 - 50BF

47376 Target Status 2nd register BM(16)
Read Only:
Bit 15 – 47
Bit 14 - 127C
Bit 13 - 127B
Bit 12 - 127A
Bit 11 - 27C
Bit 10 - 27B
Bit 9 - 27A
Bit 8 – 24
Bit 7 - 187ND
Bit 6 - 87ND
Bit 5 - 87RC
Bit 4 - 87RB
Bit 3 - 87RA
Bit 2 - 87UC
Bit 1 - 87UB
Bit 0 - 87UA

47377	Target Status 3rd register Read Only: Bit 15 – spare Bit 14 – spare Bit 13 – 581 Bit 12 – 481 Bit 11 – 381 Bit 10 – 281 Bit 9 – 181 Bit 8 – 81 Bit 7 - 750TC Bit 6 - 750TB Bit 5 - 750TA Bit 4 - 650TC Bit 3 - 650TB Bit 2 - 650TA Bit 1 - 550TC Bit 0 - 550TB	BM(16)
47378	Target Status 4th register Read Only: Bit 15 - 550TA Bit 14 - 450TC Bit 13 - 450TB Bit 12 - 450TA Bit 11 - 350TC Bit 10 - 350TB Bit 9 - 350TA Bit 8 - 250TC Bit 7 - 250TB Bit 6 - 250TA Bit 5 - 150TC Bit 4 - 150TB Bit 3 - 150TA Bit 2 - 50TC Bit 1 - 50TB Bit 0 - 50TA	BM(16)
47379	Target Status 5th register Read Only: Bit 15 – spare Bit 14 - 351Q Bit 13 - 251Q Bit 12 - 151Q Bit 11 - 51Q Bit 10 - 451N Bit 9 - 351N Bit 8 - 251N Bit 7 - 151N Bit 6 - 51N Bit 5 - 351C Bit 4 - 351B Bit 3 - 351A Bit 2 - 251C Bit 1 - 251B Bit 0 - 251A	BM(16)

47380	Target Status 6th register Read Only: Bit 15 - 151C Bit 14 - 151B Bit 13 - 151A Bit 12 - 51C Bit 11 - 51B Bit 10 - 51A Bit 9 – spare Bit 8 - 350TQ Bit 7 - 250TQ Bit 6 - 150TQ Bit 5 - 50TQ Bit 4 - 450TN Bit 3 - 350TN Bit 2 - 250TN Bit 1 - 150TN Bit 0 - 50TN	BM(16)
47381	Breaker Circuit 1 Status	ASC(1)
47382	Breaker Circuit 2 Status	ASC(1)
47383	Breaker Circuit 3 Status	ASC(1)
47384	Breaker Circuit 4 Status Read only: O for Open C for Closed D for Disabled (off)	ASC(1)
47385-93	Current Active Logic Scheme Read Only: ASCII strings	ASC(18)
47394-95	Breaker Ckt 1 Contact Duty Log - Phase A	FP
47396-97	Breaker Ckt 1 Contact Duty Log - Phase B	FP
47398-99	Breaker Ckt 1 Contact Duty Log - Phase C	FP
47400-01	Breaker Ckt 2 Contact Duty Log - Phase A	FP
47402-03	Breaker Ckt 2 Contact Duty Log - Phase B	FP
47404-05	Breaker Ckt 2 Contact Duty Log - Phase C	FP
47406-07	Breaker Ckt 3 Contact Duty Log - Phase A	FP
47408-09	Breaker Ckt 3 Contact Duty Log - Phase B	FP
47410-11	Breaker Ckt 3 Contact Duty Log - Phase C	FP
47412-13	Breaker Ckt 4 Contact Duty Log - Phase A	FP
47414-15	Breaker Ckt 4 Contact Duty Log - Phase B	FP
47416-17	Breaker Ckt 4 Contact Duty Log - Phase C Read: If Breaker Duty Type = Off or Maximum Breaker Duty = 0, reads undefined floating point value of 0xFFFFFFFF. Otherwise, reads 0.00 to 200.00%. Write: 0.00 to 200.00%.	FP
47418-19	Breaker Ckt 1 Operations Count	LI
47420-21	Breaker Ckt 2 Operations Count	LI
47422-23	Breaker Ckt 3 Operations Count	LI
47424-25	Breaker Ckt 4 Operations Count Read and Write: 0 to 99,999	LI
47426-27	Transformer Duty Log Ckt 1 - Phase A	FP
47428-29	Transformer Duty Log Ckt 1 - Phase B	FP
47430-31	Transformer Duty Log Ckt 1 - Phase C	FP

47432-33	Transformer Duty Log Ckt 2 - Phase A	FP
47434-35	Transformer Duty Log Ckt 2 - Phase B	FP
47436-37	Transformer Duty Log Ckt 2 - Phase C	FP
47438-39	Transformer Duty Log Ckt 3 - Phase A	FP
47440-41	Transformer Duty Log Ckt 3 - Phase B	FP
47442-43	Transformer Duty Log Ckt 3 - Phase C	FP
47444-45	Transformer Duty Log Ckt 4 - Phase A	FP
47446-47	Transformer Duty Log Ckt 4 - Phase B	FP
47448-49	Transformer Duty Log Ckt 4 - Phase C	FP

Read:

If Transformer Duty Mode = Off or Maximum Transformer Duty = 0, reads undefined floating point value of 0xFFFFFFFF. Otherwise, reads 0.00 to 200.00%.

Write:

0.00 to 200.00%.

47450-51	Transformer Through Faults Counter	LI

Read and Write:

0 to 99,999

47452-53	Yesterday's Peak Demand Current Ckt 1 - Phase A	FP
47457-58	Yesterday's Peak Demand Current Ckt 1 - Phase B	FP
47462-63	Yesterday's Peak Demand Current Ckt 1 - Phase C	FP
47467-68	Yesterday's Peak Demand Current Ckt 1 - Neutral	FP
47472-73	Yesterday's Peak Demand Current Ckt 1 - Neg-Seq	FP
47477-78	Yesterday's Peak Demand Current Ckt 2 - Phase A	FP
47482-83	Yesterday's Peak Demand Current Ckt 2 - Phase B	FP
47487-88	Yesterday's Peak Demand Current Ckt 2 - Phase C	FP
47492-93	Yesterday's Peak Demand Current Ckt 2 - Neutral	FP
47497-98	Yesterday's Peak Demand Current Ckt 2 - Neg-Seq	FP
47502-03	Yesterday's Peak Demand Current Ckt 3 - Phase A	FP
47507-08	Yesterday's Peak Demand Current Ckt 3 - Phase B	FP
47512-13	Yesterday's Peak Demand Current Ckt 3 - Phase C	FP
47517-18	Yesterday's Peak Demand Current Ckt 3 - Neutral	FP
47522-23	Yesterday's Peak Demand Current Ckt 3 - Neg-Seq	FP
47527-28	Yesterday's Peak Demand Current Ckt 4 - Phase A	FP
47532-33	Yesterday's Peak Demand Current Ckt 4 - Phase B	FP
47537-38	Yesterday's Peak Demand Current Ckt 4 - Phase C	FP
47542-43	Yesterday's Peak Demand Current Ckt 4 - Neutral	FP
47547-48	Yesterday's Peak Demand Current Ckt 4 - Neg-Seq	FP
47552-53	Yesterday's Peak Demand Current - Ground	FP

47617-18	Today's Peak Demand Current Ckt 1 - Phase A	FP
47622-23	Today's Peak Demand Current Ckt 1 - Phase B	FP
47627-28	Today's Peak Demand Current Ckt 1 - Phase C	FP
47632-33	Today's Peak Demand Current Ckt 1 - Neutral	FP
47637-38	Today's Peak Demand Current Ckt 1 - Neg-Seq	FP
47642-43	Today's Peak Demand Current Ckt 2 - Phase A	FP
47647-48	Today's Peak Demand Current Ckt 2 - Phase B	FP
47652-53	Today's Peak Demand Current Ckt 2 - Phase C	FP
47657-58	Today's Peak Demand Current Ckt 2 - Neutral	FP
47662-63	Today's Peak Demand Current Ckt 2 - Neg-Seq	FP
47667-68	Today's Peak Demand Current Ckt 3 - Phase A	FP
47672-73	Today's Peak Demand Current Ckt 3 - Phase B	FP
47677-78	Today's Peak Demand Current Ckt 3 - Phase C	FP
47682-83	Today's Peak Demand Current Ckt 3 - Neutral	FP
47687-88	Today's Peak Demand Current Ckt 3 - Neg-Seq	FP
47692-93	Today's Peak Demand Current Ckt 4 - Phase A	FP
47697-98	Today's Peak Demand Current Ckt 4 - Phase B	FP
47702-03	Today's Peak Demand Current Ckt 4 - Phase C	FP
47707-08	Today's Peak Demand Current Ckt 4 - Neutral	FP

47712-13	Today's Peak Demand Current Ckt 4 - Neg-Seq	FP
47717-18	Today's Peak Demand Current - Ground	FP
47782-83	Peak Since Reset Demand Current Ckt 1 - Phase A	FP
47787-88	Peak Since Reset Demand Current Ckt 1 - Phase B	FP
47792-93	Peak Since Reset Demand Current Ckt 1 - Phase C	FP
47797-98	Peak Since Reset Demand Current Ckt 1 - Neutral	FP
47802-03	Peak Since Reset Demand Current Ckt 1 - Neg-Seq	FP
47807-08	Peak Since Reset Demand Current Ckt 2 - Phase A	FP
47812-13	Peak Since Reset Demand Current Ckt 2 - Phase B	FP
47817-18	Peak Since Reset Demand Current Ckt 2 - Phase C	FP
47822-23	Peak Since Reset Demand Current Ckt 2 - Neutral	FP
47827-28	Peak Since Reset Demand Current Ckt 2 - Neg-Seq	FP
47832-33	Peak Since Reset Demand Current Ckt 3 - Phase A	FP
47837-38	Peak Since Reset Demand Current Ckt 3 - Phase B	FP
47842-43	Peak Since Reset Demand Current Ckt 3 - Phase C	FP
47847-48	Peak Since Reset Demand Current Ckt 3 - Neutral	FP
47852-53	Peak Since Reset Demand Current Ckt 3 - Neg-Seq	FP
47857-58	Peak Since Reset Demand Current Ckt 4 - Phase A	FP
47862-63	Peak Since Reset Demand Current Ckt 4 - Phase B	FP
47872-73	Peak Since Reset Demand Current Ckt 4 - Neutral	FP
47877-78	Peak Since Reset Demand Current Ckt 4 - Neg-Seq	FP
47882-83	Peak Since Reset Demand Current - Ground	FP
	Read only: Any value (amps)	
47557-58	Yesterday's Peak Demand Voltage - Phase A HI	FP
47562-63	Yesterday's Peak Demand Voltage - Phase A LO	FP
47567-68	Yesterday's Peak Demand Voltage - Phase B HI	FP
47572-73	Yesterday's Peak Demand Voltage - Phase B LO	FP
47577-78	Yesterday's Peak Demand Voltage - Phase C HI	FP
47582-83	Yesterday's Peak Demand Voltage - Phase C LO	FP
47587-88	Yesterday's Peak Demand Voltage - Neutral HI	FP
47592-93	Yesterday's Peak Demand Voltage - Neutral LO	FP
47722-23	Today's Peak Demand Voltage - Phase A HI	FP
47727-28	Today's Peak Demand Voltage - Phase A LO	FP
47732-33	Today's Peak Demand Voltage - Phase B HI	FP
47737-38	Today's Peak Demand Voltage - Phase B LO	FP
47742-43	Today's Peak Demand Voltage - Phase C HI	FP
47747-48	Today's Peak Demand Voltage - Phase C LO	FP
47752-53	Today's Peak Demand Voltage - Neutral HI	FP
47757-58	Today's Peak Demand Voltage - Neutral LO	FP
7887-88	Peak Since Reset Demand Voltage - Phase A HI	FP
47892-93	Peak Since Reset Demand Voltage - Phase A LO	FP
47897-98	Peak Since Reset Demand Voltage - Phase B HI	FP
47902-03	Peak Since Reset Demand Voltage - Phase B LO	FP
47907-08	Peak Since Reset Demand Voltage - Phase C HI	FP
47912-13	Peak Since Reset Demand Voltage - Phase C LO	FP
47917-18	Peak Since Reset Demand Voltage - Neutral HI	FP
47922-23	Peak Since Reset Demand Voltage - Neutral LO	FP
	Read only: Any value (volts)	
47597-98	Yesterday's Demand Vars	FP
47602-03	Yesterday's Demand Reverse Vars	FP
47762-63	Today's Peak Demand Vars	FP
47767-68	Today's Peak Demand Reverse Vars	FP

47927-28	Peak Since Reset Demand Vars	FP
47932-33	Peak Since Reset Demand Reverse Vars	FP
	Read only: Any value (Vars)	
47607-08	Yesterday's Demand Watts	FP
47612-13	Yesterday's Demand Reverse Watts	FP
47772-73	Today's Peak Demand Watts	FP
47777-78	Today's Peak Demand Reverse Watts	FP
47937-38	Peak Since Reset Demand Watts	FP
47942-43	Peak Since Reset Demand Reverse Watts	FP
	Read only: Any value (watts)	
47454	Yesterday's Peak Demand Ckt 1 Timestamp - Day	INT
47459	Yesterday's Peak Demand Ckt 1 Timestamp - Day	INT
47464	Yesterday's Peak Demand Ckt 1 Timestamp - Day	INT
47469	Yesterday's Peak Demand Ckt 1 Timestamp - Day	INT
47474	Yesterday's Peak Demand Ckt 1 Timestamp - Day	INT
47479	Yesterday's Peak Demand Ckt 2 Timestamp - Day	INT
47484	Yesterday's Peak Demand Ckt 2 Timestamp - Day	INT
47489	Yesterday's Peak Demand Ckt 2 Timestamp - Day	INT
47494	Yesterday's Peak Demand Ckt 2 Timestamp - Day	INT
47499	Yesterday's Peak Demand Ckt 2 Timestamp - Day	INT
47504	Yesterday's Peak Demand Ckt 3 Timestamp - Day	INT
47509	Yesterday's Peak Demand Ckt 3 Timestamp - Day	INT
47514	Yesterday's Peak Demand Ckt 3 Timestamp - Day	INT
47519	Yesterday's Peak Demand Ckt 3 Timestamp - Day	INT
47524	Yesterday's Peak Demand Ckt 3 Timestamp - Day	INT
47529	Yesterday's Peak Demand Ckt 4 Timestamp - Day	INT
47534	Yesterday's Peak Demand Ckt 4 Timestamp - Day	INT
47539	Yesterday's Peak Demand Ckt 4 Timestamp - Day	INT
47544	Yesterday's Peak Demand Ckt 4 Timestamp - Day	INT
47549	Yesterday's Peak Demand Ckt 4 Timestamp - Day	INT
47554	Yesterday's Peak Demand Ckt 4 Timestamp - Day	INT
47559	Yesterday's Peak Demand Va HI Timestamp - Day	INT
47564	Yesterday's Peak Demand Va LO Timestamp - Day	INT
47569	Yesterday's Peak Demand Vb HI Timestamp - Day	INT
47574	Yesterday's Peak Demand Vb LO Timestamp - Day	INT
47579	Yesterday's Peak Demand Vc HI Timestamp - Day	INT
47584	Yesterday's Peak Demand Vc LO Timestamp - Day	INT
47589	Yesterday's Peak Demand Vn HI Timestamp - Day	INT
47594	Yesterday's Peak Demand Vn LO Timestamp - Day	INT
47599	Yesterday's Demand Vars Timestamp - Day	INT
47604	Yesterday's Demand Rev Vars Timestamp - Day	INT
47609	Yesterday's Demand Watts Timestamp - Day	INT
47614	Yesterday's Demand Rev Watts Timestamp - Day	INT
47619	Today's Peak Demand Ckt 1Timestamp - Day	INT
47624	Today's Peak Demand Ckt 1Timestamp - Day	INT
47629	Today's Peak Demand Ckt 1Timestamp - Day	INT
47634	Today's Peak Demand Ckt 1Timestamp - Day	INT
47639	Today's Peak Demand Ckt 1Timestamp - Day	INT
47644	Today's Peak Demand Ckt 2Timestamp - Day	INT
47649	Today's Peak Demand Ckt 2Timestamp - Day	INT
47654	Today's Peak Demand Ckt 2Timestamp - Day	INT
47659	Today's Peak Demand Ckt 2Timestamp - Day	INT
47664	Today's Peak Demand Ckt 2Timestamp - Day	INT
47669	Today's Peak Demand Ckt 3Timestamp - Day	INT
47674	Today's Peak Demand Ckt 3Timestamp - Day	INT
47679	Today's Peak Demand Ckt 3Timestamp - Day	INT

47684	Today's Peak Demand Ckt 3Timestamp - Day	INT
47689	Today's Peak Demand Ckt 3Timestamp - Day	INT
47694	Today's Peak Demand Ckt 4Timestamp - Day	INT
47699	Today's Peak Demand Ckt 4Timestamp - Day	INT
47704	Today's Peak Demand Ckt 4Timestamp - Day	INT
47709	Today's Peak Demand Ckt 4Timestamp - Day	INT
47714	Today's Peak Demand Ckt 4Timestamp - Day	INT
47719	Today's Peak Demand Timestamp - Day	INT
47724	Today's Peak Demand Va HI Timestamp - Day	INT
47729	Today's Peak Demand Va LO Timestamp - Day	INT
47734	Today's Peak Demand Vb HI Timestamp - Day	INT
47739	Today's Peak Demand Vb LO Timestamp - Day	INT
47744	Today's Peak Demand Vc HI Timestamp - Day	INT
47749	Today's Peak Demand Vc LO Timestamp - Day	INT
47754	Today's Peak Demand Vn HI Timestamp - Day	INT
47759	Today's Peak Demand Vn LO Timestamp - Day	INT
47764	Today's Peak Demand Vars Timestamp - Day	INT
47769	Today's Peak Demand Rev Vars Timestamp - Day	INT
47774	Today's Peak Demand Watts Timestamp - Day	INT
47779	Today's Peak Demand Rev Watts Timestamp - Day	INT
47784	Peak Since Reset Demand Ckt 1Timestamp - Day	INT
47789	Peak Since Reset Demand Ckt 1Timestamp - Day	INT
47794	Peak Since Reset Demand Ckt 1Timestamp - Day	INT
47799	Peak Since Reset Demand Ckt 1Timestamp - Day	INT
47804	Peak Since Reset Demand Ckt 1Timestamp - Day	INT
47809	Peak Since Reset Demand Ckt 2Timestamp - Day	INT
47814	Peak Since Reset Demand Ckt 2Timestamp - Day	INT
47819	Peak Since Reset Demand Ckt 2Timestamp - Day	INT
47824	Peak Since Reset Demand Ckt 2Timestamp - Day	INT
47829	Peak Since Reset Demand Ckt 2Timestamp - Day	INT
47834	Peak Since Reset Demand Ckt 3Timestamp - Day	INT
47839	Peak Since Reset Demand Ckt 3Timestamp - Day	INT
47844	Peak Since Reset Demand Ckt 3Timestamp - Day	INT
47849	Peak Since Reset Demand Ckt 3Timestamp - Day	INT
47854	Peak Since Reset Demand Ckt 3Timestamp - Day	INT
47859	Peak Since Reset Demand Ckt 4Timestamp - Day	INT
47864	Peak Since Reset Demand Ckt 4Timestamp - Day	INT
47869	Peak Since Reset Demand Ckt 4Timestamp - Day	INT
47874	Peak Since Reset Demand Ckt 4Timestamp - Day	INT
47879	Peak Since Reset Demand Ckt 4Timestamp - Day	INT
47884	Peak Since Reset Demand Ckt 4Timestamp - Day	INT
47889	Peak Since Reset Demand Va HI Timestamp - Day	INT
47894	Peak Since Reset Demand Va LO Timestamp - Day	INT
47899	Peak Since Reset Demand Vb HI Timestamp - Day	INT
47904	Peak Since Reset Demand Vb LO Timestamp - Day	INT
47909	Peak Since Reset Demand Vc HI Timestamp - Day	INT
47914	Peak Since Reset Demand Vc LO Timestamp - Day	INT
47919	Peak Since Reset Demand Vn HI Timestamp - Day	INT
47924	Peak Since Reset Demand Vn LO Timestamp - Day	INT
47929	Peak Since Reset Demand Vars Timestamp - Day	INT
47934	Pk Since Reset Demand Rev Vars Timestamp-Day	INT
47939	Peak Since Reset Demand Watts Timestamp - Day	INT
47944	Peak Since Reset Demand Rev Watts Timestamp-Day	INT
	Read only: Any value (days since 01/01/1984)	
47455-56	Yesterday's Peak Demand Ckt 1 Timestamp - Msec	LI
47460-61	Yesterday's Peak Demand Ckt 1 Timestamp - Msec	LI
47465-66	Yesterday's Peak Demand Ckt 1 Timestamp - Msec	LI
47470-71	Yesterday's Peak Demand Ckt 1 Timestamp - Msec	LI

47475-76	Yesterday's Peak Demand Ckt 1 Timestamp - Msec	LI
47480-81	Yesterday's Peak Demand Ckt 2 Timestamp - Msec	LI
47485-86	Yesterday's Peak Demand Ckt 2 Timestamp - Msec	LI
47490-91	Yesterday's Peak Demand Ckt 2 Timestamp - Msec	LI
47495-96	Yesterday's Peak Demand Ckt 2 Timestamp - Msec	LI
47500-01	Yesterday's Peak Demand Ckt 2 Timestamp - Msec	LI
47505-06	Yesterday's Peak Demand Ckt 3 Timestamp - Msec	LI
47510-11	Yesterday's Peak Demand Ckt 3 Timestamp - Msec	LI
47515-16	Yesterday's Peak Demand Ckt 3 Timestamp - Msec	LI
47520-21	Yesterday's Peak Demand Ckt 3 Timestamp - Msec	LI
47525-26	Yesterday's Peak Demand Ckt 3 Timestamp - Msec	LI
47530-31	Yesterday's Peak Demand Ckt 4 Timestamp - Msec	LI
47535-36	Yesterday's Peak Demand Ckt 4 Timestamp - Msec	LI
47540-41	Yesterday's Peak Demand Ckt 4 Timestamp - Msec	LI
47545-46	Yesterday's Peak Demand Ckt 4 Timestamp - Msec	LI
47550-51	Yesterday's Peak Demand Ckt 4 Timestamp - Msec	LI
47555-56	Yesterday's Peak Demand Ckt 4 Timestamp - Msec	LI
47560-61	Yesterday's Peak Demand Va HI Timestamp - Msec	LI
47565-66	Yesterday's Pk Demand Va LO Timestamp - Msec	LI
47570-71	Yesterday's Peak Demand Vb HI Timestamp - Msec	LI
47575-76	Yesterday's Pk Demand Vb LO Timestamp - Msec	LI
47580-81	Yesterday's Peak Demand Vc HI Timestamp - Msec	LI
47585-86	Yesterday's Pk Demand Vc LO Timestamp - Msec	LI
47590-91	Yesterday's Peak Demand Vn HI Timestamp - Msec	LI
47595-96	Yesterday's Pk Demand Vn LO Timestamp - Msec	LI
47600-01	Yesterday's Demand Vars Timestamp - Msec	LI
47605-06	Yesterday's Demand Rev Vars Timestamp - Msec	LI
47610-11	Yesterday's Demand Watts Timestamp - Msec	LI
47615-16	Yesterday's Demand Rev Watts Timestamp - Msec	LI
47620-21	Today's Peak Demand Ckt 1Timestamp - Msec	LI
47625-26	Today's Peak Demand Ckt 1Timestamp - Msec	LI
47630-31	Today's Peak Demand Ckt 1Timestamp - Msec	LI
47635-36	Today's Peak Demand Ckt 1Timestamp - Msec	LI
47640-41	Today's Peak Demand Ckt 1Timestamp - Msec	LI
47645-46	Today's Peak Demand Ckt 2Timestamp - Msec	LI
47650-51	Today's Peak Demand Ckt 2Timestamp - Msec	LI
47655-56	Today's Peak Demand Ckt 2Timestamp - Msec	LI
47660-61	Today's Peak Demand Ckt 2Timestamp - Msec	LI
47665-66	Today's Peak Demand Ckt 2Timestamp - Msec	LI
47670-71	Today's Peak Demand Ckt 3Timestamp - Msec	LI
47675-76	Today's Peak Demand Ckt 3Timestamp - Msec	LI
47680-81	Today's Peak Demand Ckt 3Timestamp - Msec	LI
47685-86	Today's Peak Demand Ckt 3Timestamp - Msec	LI
47690-91	Today's Peak Demand Ckt 3Timestamp - Msec	LI
47695-96	Today's Peak Demand Ckt 4Timestamp - Msec	LI
47700-01	Today's Peak Demand Ckt 4Timestamp - Msec	LI
47705-06	Today's Peak Demand Ckt 4Timestamp - Msec	LI
47710-11	Today's Peak Demand Ckt 4Timestamp - Msec	LI
47715-16	Today's Peak Demand Ckt 4Timestamp - Msec	LI
47720-21	Today's Peak Demand Timestamp - Msec	LI
47725-26	Today's Peak Demand Va HI Timestamp - Msec	LI
47730-31	Today's Peak Demand Va LO Timestamp - Msec	LI
47735-36	Today's Peak Demand Vb HI Timestamp - Msec	LI
47740-41	Today's Peak Demand Vb LO Timestamp - Msec	LI
47745-46	Today's Peak Demand Vc HI Timestamp - Msec	LI
47750-51	Today's Peak Demand Vc LO Timestamp - Msec	LI
47755-56	Today's Peak Demand Vn HI Timestamp - Msec	LI
47760-61	Today's Peak Demand Vn LO Timestamp - Msec	LI
47765-66	Today's Peak Demand Vars Timestamp - Msec	LI
47770-71	Today's Peak Demand Rev Vars Timestamp - Msec	LI

47775-76	Today's Peak Demand Watts Timestamp - Msec	LI
47780-81	Today's Pk Demand Rev Watts Timestamp - Msec	LI
47785-86	Peak Since Reset Demand Ckt 1Timestamp - Msec	LI
47790-91	Peak Since Reset Demand Ckt 1Timestamp - Msec	LI
47795-96	Peak Since Reset Demand Ckt 1Timestamp - Msec	LI
47800-01	Peak Since Reset Demand Ckt 1Timestamp - Msec	LI
47805-06	Peak Since Reset Demand Ckt 1Timestamp - Msec	LI
47810-11	Peak Since Reset Demand Ckt 2Timestamp - Msec	LI
47815-16	Peak Since Reset Demand Ckt 2Timestamp - Msec	LI
47820-21	Peak Since Reset Demand Ckt 2Timestamp - Msec	LI
47825-26	Peak Since Reset Demand Ckt 2Timestamp - Msec	LI
47830-31	Peak Since Reset Demand Ckt 2Timestamp - Msec	LI
47835-36	Peak Since Reset Demand Ckt 3Timestamp - Msec	LI
47840-41	Peak Since Reset Demand Ckt 3Timestamp - Msec	LI
47845-46	Peak Since Reset Demand Ckt 3Timestamp - Msec	LI
47850-51	Peak Since Reset Demand Ckt 3Timestamp - Msec	LI
47855-56	Peak Since Reset Demand Ckt 3Timestamp - Msec	LI
47860-61	Peak Since Reset Demand Ckt 4Timestamp - Msec	LI
47865-66	Peak Since Reset Demand Ckt 4Timestamp - Msec	LI
47870-71	Peak Since Reset Demand Ckt 4Timestamp - Msec	LI
47875-76	Peak Since Reset Demand Ckt 4Timestamp - Msec	LI
47880-81	Peak Since Reset Demand Ckt 4Timestamp - Msec	LI
47885-86	Peak Since Reset Demand Ckt 4Timestamp - Msec	LI
47890-91	Peak Since Reset Demand Va HI Timestamp - Msec	LI
47895-96	Pk Since Reset Demand Va LO Timestamp - Msec	LI
47900-01	Peak Since Reset Demand Vb HI Timestamp - Msec	LI
47905-06	Pk Since Reset Demand Vb LO Timestamp - Msec	LI
47910-11	Peak Since Reset Demand Vc HI Timestamp - Msec	LI
47915-16	Pk Since Reset Demand Vc LO Timestamp - Msec	LI
47920-21	Peak Since Reset Demand Vn HI Timestamp - Msec	LI
47925-26	Pk Since Reset Demand Vn LO Timestamp - Msec	LI
47930-31	Peak Since Reset Demand Vars Timestamp - Msec	LI
47935-36	Pk Since Reset Demand Rev Vars Timestamp-Msec	LI
47940-41	Pk Since Reset Demand Watts Timestamp - Msec	LI
47945-46	Pk Since Reset D'md Rev Watts Timestamp-Msec Read only: 0 to 86,399,999 milliseconds	LI
47947-48	3 Phase Var Hours	FP
47949-50	3 Phase Reverse Var-hours Read and Write: 0 to 1000.0 G Var-hours	FP
47951-52	3 Phase Watt-hours	FP
47953-54	3 Phase Reverse Watt-hours Read and Write: 0 to 1000.0 G Watt-hours	FP
47955	Trigger Differential Alarm Report	SI
47956	Reset Logic Alarm Information	SI
47957	Reset Major Alarm Information	SI
47958	Reset Minor Alarm Information	SI
47959	Reset Relay Alarm Information	SI
47960	Reset Load Profile	SI
47961	Clear Fault Log	SI
47962	Trigger Fault Record	SI

47963	Clear Events Report Read: 0 Write: Any value will perform reset / trigger / clear.	SI
47964	Fault Indicator Read only: Most recent fault number (1 - 255)	SI
47965	Fault Template Status Read only: 0: Template not valid for current Fault Selection (Refer to Register 40038). All FLT template values will read 0. 1 to 255: Valid user selected fault number.	SI

Fault Template (FLT)

47970	Fault Date and Time - Day Read only: Any value (days since 01/01/1984)	INT
47971-72	Fault Date and Time - milliseconds Read only: 0 to 86,399,999 milliseconds	LI
47973	Fault Event Type Read only: Bit 0 for Breaker Fail Bit 1 for Trip Bit 2 for Logic Bit 3 for Pickup Bit 4 for Fault Record Trigger Bit 5 - 15 not used	BM(16)
47974	Fault Active Group Read only: 0 to 3	SI
47975	Fault Targets 2nd register Read Only: Bit 15 - 59X Bit 14 – 362 Bit 13 – 262 Bit 12 – 162 Bit 11 – 62 Bit 10 - 159C Bit 9 - 159B Bit 8 - 159A Bit 7 - 59C Bit 6 - 59B Bit 5 - 59A Bit 4 - 60FL Bit 3 - 350BF Bit 2 - 250BF Bit 1 - 150BF Bit 0 - 50BF	BM(16)
47976	Fault Targets 1st register Read Only: Bit 15 – 47 Bit 14 - 127C Bit 13 - 127B	BM(16)

Bit 12 - 127A
Bit 11 - 27C
Bit 10 - 27B
Bit 9 - 27A
Bit 8 – 24
Bit 7 - 187ND
Bit 6 - 87ND
Bit 5 - 87RC
Bit 4 - 87RB
Bit 3 - 87RA
Bit 2 - 87UC
Bit 1 - 87UB
Bit 0 - 87UA

47977 Fault Targets 4th register BM(16)
Read Only:
Bit 15 – spare
Bit 14 – spare
Bit 13 – 581
Bit 12 – 481
Bit 11 – 381
Bit 10 – 281
Bit 9 – 181
Bit 8 – 81
Bit 7 - 750TC
Bit 6 - 750TB
Bit 5 - 750TA
Bit 4 - 650TC
Bit 3 - 650TB
Bit 2 - 650TA
Bit 1 - 550TC
Bit 0 - 550TB

47978 Fault Targets 3rd register BM(16)
Read only:
Bit 15 - 550TA
Bit 14 - 450TC
Bit 13 - 450TB
Bit 12 - 450TA
Bit 11 - 350TC
Bit 10 - 350TB
Bit 9 - 350TA
Bit 8 - 250TC
Bit 7 - 250TB
Bit 6 - 250TA
Bit 5 - 150TC
Bit 4 - 150TB
Bit 3 - 150TA
Bit 2 - 50TC
Bit 1 - 50TB
Bit 0 - 50TA

47979 Fault Targets 6th register BM(16)
Read and Write:
Bit 15 – spare
Bit 14 - 351Q
Bit 13 - 251Q
Bit 12 - 151Q
Bit 11 - 51Q
Bit 10 - 451N
Bit 9 - 351N

Bit 8 - 251N
Bit 7 - 151N
Bit 6 - 51N
Bit 5 - 351C
Bit 4 - 351B
Bit 3 - 351A
Bit 2 - 251C
Bit 1 - 251B
Bit 0 - 251A

47980 Fault Targets 5th register BM(16)
Read Only:
Bit 15 - 151C
Bit 14 - 151B
Bit 13 - 151A
Bit 12 - 51C
Bit 11 - 51B
Bit 10 - 51A
Bit 9 – spare
Bit 8 - 350TQ
Bit 7 - 250TQ
Bit 6 - 150TQ
Bit 5 - 50TQ
Bit 4 - 450TN
Bit 3 - 350TN
Bit 2 - 250TN
Bit 1 - 150TN
Bit 0 - 50TN

47981 Fault Clearing Time Status SI
Read only:
0 if Valid Fault Clearing Time (Registers 47525-26) value
1 if No pickup
2 if N/A; Out of range

47982-83 Fault Clearing Time FP
Read only:
0 if Fault Clearing Time Status is not 0 (not valid).
Time (xxx.xxx) in seconds if Fault Clearing Time Status is 0 (valid).

47984 Fault Breaker Operate Time Status SI
Read only:
0 if Valid Fault Breaker Operate Time (Registers 47985-92) value
1 if Unknown
2 if N/A; out of range
3 if No operation
4 if Disabled

47985-86 Fault Breaker Operate Time Ckt 1 FP
47987-88 Fault Breaker Operate Time Ckt 2 FP
47989-90 Fault Breaker Operate Time Ckt 3 FP
47991-92 Fault Breaker Operate Time Ckt 4 FP
Read only:
0 if Fault Breaker Operate Time Status is not 0 (not valid).
Time (xxx.xxx) in seconds if Fault Breaker Operate Time Status is 0 (valid).

47993-94 Fault Phase A or AB Voltage Magnitude FP
47996-97 Fault Phase B or BC Voltage Magnitude FP
47999-00 Fault Phase C or CA Voltage Magnitude FP
Phase to phase quantities are reported in 3P3W sensing mode, all other sensing modes report phase to neutral quantities

48002-03	Fault V1 Voltage Magnitude	FP
48005-06	Fault V2 Voltage Magnitude	FP
48008-09	Fault 3V0 Voltage Magnitude	FP
	Read only: Value in volts	
48011-12	Fault CT CKT #1 Phase A Current Magnitude	FP
48014-15	Fault CT CKT #1 Phase B Current Magnitude	FP
48017-18	Fault CT CKT #1 Phase C Current Magnitude	FP
48020-21	Fault CT CKT #1 Residual Current Magnitude	FP
48023-24	Fault CT CKT #1 Neg-Seq. Current Magnitude	FP
48026-27	Fault CT CKT #2 Phase A Current Magnitude	FP
48029-30	Fault CT CKT #2 Phase B Current Magnitude	FP
48032-33	Fault CT CKT #2 Phase C Current Magnitude	FP
48035-36	Fault CT CKT #2 Residual Current Magnitude	FP
48038-39	Fault CT CKT #2 Neg-Seq. Current Magnitude	FP
48041-42	Fault CT CKT #3 Phase A Current Magnitude	FP
48044-45	Fault CT CKT #3 Phase B Current Magnitude	FP
48047-48	Fault CT CKT #3 Phase C Current Magnitude	FP
48050-51	Fault CT CKT #3 Residual Current Magnitude	FP
48053-54	Fault CT CKT #3 Neg-Seq. Current Magnitude	FP
48056-57	Fault CT CKT #4 Phase A Current Magnitude	FP
48059-60	Fault CT CKT #4 Phase B Current Magnitude	FP
48062-63	Fault CT CKT #4 Phase C Current Magnitude	FP
48065-66	Fault CT CKT #4 Residual Current Magnitude	FP
48068-69	Fault CT CKT #4 Neg-Seq. Current Magnitude	FP
48071-72	Fault Ground Current Magnitude	FP
48074-75	Fault CT CKT #5 Phase A Current Magnitude	FP
48077-78	Fault CT CKT #5 Phase B Current Magnitude	FP
48080-81	Fault CT CKT #5 Phase C Current Magnitude	FP
48083-84	Fault CT CKT #5 Residual Current Magnitude	FP
48086-87	Fault CT CKT #5 Neg-Seq. Current Magnitude	FP
48089-90	Fault CT CKT #6 Phase A Current Magnitude	FP
48092-93	Fault CT CKT #6 Phase B Current Magnitude	FP
48095-96	Fault CT CKT #6 Phase C Current Magnitude	FP
48098-99	Fault CT CKT #6 Residual Current Magnitude	FP
48101-102	Fault CT CKT #6 Neg-Seq. Current Magnitude	FP
	Read only: Value in amps	
47995	Fault Phase A Voltage Angle	INT
47998	Fault Phase B Voltage Angle	INT
48001	Fault Phase C Voltage Angle	INT
48004	Fault V1 Voltage Angle	INT
48007	Fault V2 Voltage Angle	INT
48010	Fault 3V0 Voltage Angle	INT
48013	Fault CT CKT #1 Phase A Angle	INT
48016	Fault CT CKT #1 Phase B Angle	INT
48019	Fault CT CKT #1 Phase C Angle	INT
48022	Fault CT CKT #1 Residual Angle	INT
48025	Fault CT CKT #1 Negative-Sequence Angle	INT
48028	Fault CT CKT #2 Phase A Angle	INT
48031	Fault CT CKT #2 Phase B Angle	INT
48034	Fault CT CKT #2 Phase C Angle	INT
48037	Fault CT CKT #2 Residual Angle	INT
48040	Fault CT CKT #2 Negative-Sequence Angle	INT
48043	Fault CT CKT #3 Phase A Angle	INT
48046	Fault CT CKT #3 Phase B Angle	INT
48049	Fault CT CKT #3 Phase C Angle	INT
48052	Fault CT CKT #3 Residual Angle	INT

48055	Fault CT CKT #3 Negative-Sequence Angle	INT
48058	Fault CT CKT #4 Phase A Angle	INT
48061	Fault CT CKT #4 Phase B Angle	INT
48064	Fault CT CKT #4 Phase C Angle	INT
48067	Fault CT CKT #4 Residual Angle	INT
48070	Fault CT CKT #4 Negative-Sequence Angle	INT
48073	Fault Ground Angle	INT
48076	Fault CT CKT #5 Phase A Angle	INT
48079	Fault CT CKT #5 Phase B Angle	INT
48082	Fault CT CKT #5 Phase C Angle	INT
48085	Fault CT CKT #5 Residual Angle	INT
48088	Fault CT CKT #5 Negative-Sequence Angle	INT
48091	Fault CT CKT #6 Phase A Angle	INT
48094	Fault CT CKT #6 Phase B Angle	INT
48097	Fault CT CKT #6 Phase C Angle	INT
48100	Fault CT CKT #6 Residual Angle	INT
48103	Fault CT CKT #6 Negative-Sequence Angle Read only: Value in degrees	INT
48104-105	Fault Frequency Phase circuit	FP
48106-107	Fault Frequency Aux circuit Read only: Value in Hertz	FP

Report Template (RPT)

48500-625	Report Text Read only: ASCII string (illegal message response generated for invalid Report Focus value).	

Metering Parameters

49000	Part Number Read only: 0 to 999	INT
49001-02	Ground Current Magnitude	FP
49004-05	CT CKT #1 Phase A Current Magnitude	FP
49007-08	CT CKT #1 Phase B Current Magnitude	FP
49010-11	CT CKT #1 Phase C Current Magnitude	FP
49013-14	CT CKT #1 Residual Current Magnitude	FP
49016-17	CT CKT #1 Neg-Seq Current Magnitude	FP
49019-20	CT CKT #2 Phase A Current Magnitude	FP
49022-23	CT CKT #2 Phase B Current Magnitude	FP
49025-26	CT CKT #2 Phase C Current Magnitude	FP
49028-29	CT CKT #2 Residual Current Magnitude	FP
49031-32	CT CKT #2 Neg-Seq Current Magnitude	FP
49034-35	CT CKT #3 Phase A Current Magnitude	FP
49037-38	CT CKT #3 Phase B Current Magnitude	FP
49040-41	CT CKT #3 Phase C Current Magnitude	FP
49043-44	CT CKT #3 Residual Current Magnitude	FP
49046-47	CT CKT #3 Neg-Seq Current Magnitude	FP
49049-50	CT CKT #4 Phase A Current Magnitude	FP
49052-53	CT CKT #4 Phase B Current Magnitude	FP
49055-56	CT CKT #4 Phase C Current Magnitude	FP
49058-59	CT CKT #4 Residual Current Magnitude	FP
49061-62	CT CKT #4 Neg-Seq Current Magnitude	FP
49064-65	CT CKT #5 Phase A Current Magnitude	FP
49067-68	CT CKT #5 Phase B Current Magnitude	FP
49070-71	CT CKT #5 Phase C Current Magnitude	FP
49073-74	CT CKT #5 Residual Current Magnitude	FP

49076-77	CT CKT #5 Neg-Seq Current Magnitude	FP
49079-80	CT CKT #6 Phase A Current Magnitude	FP
49082-83	CT CKT #6 Phase B Current Magnitude	FP
49085-86	CT CKT #6 Phase C Current Magnitude	FP
49088-89	CT CKT #6 Residual Current Magnitude	FP
49091-92	CT CKT #6 Neg-Seq Current Magnitude	FP

Read only:

Value in amps. If not applicable, reads undefined floating-point value of 0xFFFFFFFF.

49094-95	3V0 Zero-Sequence Voltage Magnitude	FP
49097-98	V2 Negative-Sequence Voltage Magnitude	FP
49100-01	V1 Positive-Sequence Voltage Magnitude	FP
49103-04	Phase A Voltage Magnitude	FP
49106-07	Phase B Voltage Magnitude	FP
49109-10	Phase C Voltage Magnitude	FP
49112-13	Phase A-B Voltage Magnitude	FP
49115-16	Phase B-C Voltage Magnitude	FP
49118-19	Phase C-A Voltage Magnitude	FP

Read only:

Value in volts. If not applicable, reads undefined floating-point value of 0xFFFFFFFF.

49003	Ground Angle	INT
49006	CT CKT #1 Phase A Angle	INT
49009	CT CKT #1 Phase B Angle	INT
49012	CT CKT #1 Phase C Angle	INT
49015	CT CKT #1 Residual Angle	INT
49018	CT CKT #1 Negative-Sequence Angle	INT
49021	CT CKT #2 Phase A Angle	INT
49024	CT CKT #2 Phase B Angle	INT
49027	CT CKT #2 Phase C Angle	INT
49030	CT CKT #2 Residual Angle	INT
49033	CT CKT #2 Negative-Sequence Angle	INT
49036	CT CKT #3 Phase A Angle	INT
49039	CT CKT #3 Phase B Angle	INT
49042	CT CKT #3 Phase C Angle	INT
49045	CT CKT #3 Residual Angle	INT
49048	CT CKT #3 Negative-Sequence Angle	INT
49051	CT CKT #4 Phase A Angle	INT
49054	CT CKT #4 Phase B Angle	INT
49057	CT CKT #4 Phase C Angle	INT
49060	CT CKT #4 Residual Angle	INT
49063	CT CKT #4 Negative-Sequence Angle	INT
49066	CT CKT #5 Phase A Angle	INT
49069	CT CKT #5 Phase B Angle	INT
49072	CT CKT #5 Phase C Angle	INT
49075	CT CKT #5 Residual Angle	INT
49078	CT CKT #5 Negative-Sequence Angle	INT
49081	CT CKT #6 Phase A Angle	INT
49084	CT CKT #6 Phase B Angle	INT
49087	CT CKT #6 Phase C Angle	INT
49090	CT CKT #6 Residual Angle	INT
49093	CT CKT #6 Negative-Sequence Angle	INT
49096	3V0 Zero-Sequence Voltage Angle	INT
49099	V2 Negative-Sequence Voltage Angle	INT
49102	V1 Negative-Sequence Voltage Angle	INT
49105	Phase A Voltage Angle	INT
49108	Phase B Voltage Angle	INT
49111	Phase C Voltage Angle	INT
49114	Phase A-B Voltage Angle	INT

49117	Phase B-C Voltage Angle	INT
49120	Phase C-A Voltage Angle	INT
	Read only: 0 to 359 degrees	
49123-24	3 Phase Power Factor	FP
	Read only: 1.00 to 1.00	
49127-28	3 Phase VA	FP
	Read only: Value in volt amps. If not applicable, reads undefined floating-point value of 0xFFFFFFFF.	
49121-22	3 Phase Watts	FP
49129-30	Phase A Watts	FP
49131-32	Phase B Watts	FP
49133-34	Phase C Watts	FP
	Read only: Value in watts. If not applicable, reads undefined floating-point value of 0xFFFFFFFF	
49125-26	3 Phase Vars	FP
49135-36	Phase A Vars	FP
49137-38	Phase B Vars	FP
49139-40	Phase C Vars	FP
	Read only: Value in Vars. If not applicable, reads undefined floating-point value of 0xFFFFFFFF	
49145-46	CT CKT #1 Differential per Unit Phase A Current	FP
49148-49	CT CKT #2 Differential per Unit Phase A Current	FP
49151-52	CT CKT #3 Differential per Unit Phase A Current	FP
49154-55	CT CKT #4 Differential per Unit Phase A Current	FP
49159-60	CT CKT #1 Differential per Unit Phase B Current	FP
49162-63	CT CKT #2 Differential per Unit Phase B Current	FP
49165-66	CT CKT #3 Differential per Unit Phase B Current	FP
49168-69	CT CKT #4 Differential per Unit Phase B Current	FP
49173-74	CT CKT #1 Differential per Unit Phase C Current	FP
49176-77	CT CKT #2 Differential per Unit Phase C Current	FP
49179-80	CT CKT #3 Differential per Unit Phase C Current	FP
49182-83	CT CKT #4 Differential per Unit Phase C Current	FP
49187-88	Differential per Unit Residual Current #1	FP
49190-91	Differential per Unit Residual Current #2	FP
49193-94	Differential per Unit Ground Current #1	FP
49196-97	Differential per Unit Ground Current #2	FP
49157-58	Phase A Differential Operating Current	FP
49171-72	Phase B Differential Operating Current	FP
49185-86	Phase C Differential Operating Current	FP
49199-00	Ground Differential Operating Current #1	FP
	Read only: Value in Amps XTAP. If not applicable, reads undefined floating-point value of 0xFFFFFFFF.	
49200-01	Ground Differential Operating Current #2	FP
	Read only: Value in amps XTAP. If not applicable, reads undefined floating-point value of 0xFFFFFFFF.	

49147	CT CKT #1 Phase A Differential Compensation Angle	INT
49150	CT CKT #2 Phase A Differential Compensation Angle	INT
49153	CT CKT #3 Phase A Differential Compensation Angle	INT
49156	CT CKT #4 Phase A Differential Compensation Angle	INT
49161	CT CKT #1 Phase B Differential Compensation Angle	INT
49164	CT CKT #2 Phase B Differential Compensation Angle	INT
49167	CT CKT #3 Phase B Differential Compensation Angle	INT
49170	CT CKT #4 Phase B Differential Compensation Angle	INT
49175	CT CKT #1 Phase C Differential Compensation Angle	INT
49178	CT CKT #2 Phase C Differential Compensation Angle	INT
49181	CT CKT #3 Phase C Differential Compensation Angle	INT
49184	CT CKT #4 Phase C Differential Compensation Angle	INT
49189	CT CKT #1 Residual Differential Compensation Angle	INT
49192	CT CKT #2 Residual Differential Compensation Angle	INT
49195	CT CKT #1 Ground Differential Compensation Angle	INT
49198	CT CKT #2 Ground Differential Compensation Angle Read only: 0 to 359 degrees	INT
49203	Phase A Differential Second Harmonic Percentage	INT
49204	Phase B Differential Second Harmonic Percentage	INT
49205	Phase C Differential Second Harmonic Percentage	INT
49206	Phase A Differential Fifth Harmonic Percentage	INT
49207	Phase B Differential Fifth Harmonic Percentage	INT
49208	Phase C Differential Fifth Harmonic Percentage Read only: Values in % IOP	INT
49835-54	Error Details Read only: ASCII string	ASC(40)
49875-999	Contiguous Poll Block Read Only: Mixed values	Mixed

SECTION 4 • ASCII CROSS REFERENCE

ASCII Command versus Modbus® Register Cross Reference

ASCII Command	Modbus® Registers
A=<password>	40002-40005
CS-GROUP=<settings group>	40117
CO-GROUP=<settings group>	40118
CS-43	40119
CO-43	40120
CS-143	40121
CO-143	40122
CS-243	40123
CO-243	40124
CS-343	40125
CO-343	40126
CS-443	40127
CO-443	40128
CS-543	40129
CO-543	40130
CS-643	40131
CO-643	40132
CS-743	40133
CO-743	40134
CS-101	40135
CO-101	40136
CS-1101	40137
CO-1101	40138
CS-2101	40139
CO-2101	40140
CS-3101	40141
CO-3101	40142
CS-OUTALL	40143
CO-OUTALL	40144
CS-OUTA	40145
CO-OUTA	40146
CS-OUT1	40147
CO-OUT1	40148
CS-OUT2	40149
CO-OUT2	40150
CS-OUT3	40151
CO-OUT3	40152
CS-OUT4	40153
CO-OUT4	40154
CS-OUT5	40155

ASCII Command	Modbus® Registers
CO-OUT5	40156
CS-OUT6	40157
CO-OUT6	40158
CS-OUT7	40159
CO-OUT7	40160
CS-OUT8	40161
CO-OUT8	40162
CS-OUT9	40163
CO-OUT9	40164
CS-OUT10	40165
CO-OUT10	40166
CS-OUT11	40167
CO-OUT11	40168
CS-OUT12	40169
CO-OUT12	40170
CS-OUT13	40171
CO-OUT13	40172
CS-OUT14	40173
CO-OUT14	40174
EXIT	40001
GS-PWC=<Control password>,<Control path>	40090-40093,40094
GS-PWG=<Global password>,<Global path>	40080-40083,40084
GS-PWR=<Report password>,<Report path>	40095-40098,40099
GS-PWS=<Settings password>,<Settings path>	40085-40088,40089
M-FREQ	49141-49142,49143-49144
M1-IA	49004-49005,49006
M1-IB	49007-49008,49009
M1-IC	49010-49011,49012
M1-IN	49013-49014,49015
M1-IQ	49016-49017,49018
M2-IA	49019-49020,49021
M2-IB	49022-49023,49024
M2-IC	49025-49026,49027
M2-IN	49028-49029,49030
M2-IQ	49031-49032,49033
M3-IA	49034-49035,49036
M3-IB	49037-49038,49039
M3-IC	49040-49041,49042
M3-IN	49043-49044,49045
M3-IQ	49046-49047,49048
M4-IA	49049-49050,49051
M4-IB	49052-49053,49054
M4-IC	49055-49056,49057
M4-IN	49058-49059,49060
M4-IQ	49061-49062,49063

ASCII Command	Modbus® Registers
M5-IA	49064-49065,49066
M5-IB	49067-49068,49069
M5-IC	49070-49071,49072
M5-IN	49073-49074,49075
M5-IQ	49076-49077,49078
M6-IA	49079-49080,49081
M6-IB	49082-49083,49084
M6-IC	49085-49086,49087
M6-IN	49088-49089,49090
M6-IQ	49091-49092,49093
M-IG	49001-49002,49003
MD-IA1COMP	49145-49146,49147
MD-IA2COMP	49148-49149,49150
MD-IA3COMP	49151-49152,49153
MD-IA4COMP	49154-49155,49156
MD-IAOP	49157-49158
MD-IB1COMP	49159-49160,49161
MD-IB2COMP	49162-49163,49164
MD-IB3COMP	49165-49166,49167
MD-IB4COMP	49168-49169,49170
MD-IBOP	49171-49172
MD-IC1COMP	49173-49174,49175
MD-IC2COMP	49176-49177,49178
MD-IC3COMP	49179-49180,49181
MD-IC4COMP	49182-49183,49184
MD-ICOP	49185-49186
MD-IN1COMP	49187-49188,49189
MD-IN2COMP	49190-49191,49192
MD-IG1COMP	49193-49194,49195
MD-IG2COMP	49196-49197,49198
MD-INOP1	49199-49200
MD-INOP2	49201-49202
MD-IA2ND	49203
MD-IB2ND	49204
MD-IC2ND	49205
MD-IA5TH	49206
MD-IB5TH	49207
MD-IC5TH	49208
M-PF	49123-49124
M-S	49127-49128
M-V1	49100-49101,49102
M-V2	49097-49098,49099
M-V3V0	49094-49095,49096
M-VA	49103-49104,49105
M-VB	49106-49107,49108

ASCII Command	Modbus® Registers
M-VC	49109-49110,49111
M-VAB	49112-49113,49114
M-VBC	49115-49116,49117
M-VCA	49118-49119,49120
M-VAR	49125-49126,49135-49140
M-WATT	49121-49122,49129-49134
RA-MAJ	47595-47719,40039
RA-MAJ=0	47957
RA-LGC	47956,40039
RA-LGC=0	47956
RA-MIN	47595-47719,40039
RA-MIN=0	47958
RA-REL	47959,40039
RA-REL=0	47959
RA-DIFF=0	47955
RB-DUTY1A=<% of duty>	47394-47395
RB-DUTY1B=<% of duty>	47396-47397
RB-DUTY1C=<% of duty>	47398-47399
RB-DUTY2A=<% of duty>	47400-47401
RB-DUTY2B=<% of duty>	47402-47403
RB-DUTY2C=<% of duty>	47404-47405
RB-DUTY3A=<% of duty>	47406-47407
RB-DUTY3B=<% of duty>	47408-47409
RB-DUTY3C=<% of duty>	47410-47411
RB-DUTY4A=<% of duty>	47412-47413
RB-DUTY4B=<% of duty>	47414-47415
RB-DUTY4C=<% of duty>	47416-47417
RB-OPCNTR1=<number of operations>	47418-47419
RB-OPCNTR2=<number of operations>	47420-47421
RB-OPCNTR3=<number of operations>	47422-47423
RB-OPCNTR4=<number of operations>	47424-47425
RD-LOG = 0	47960
RD1-PIA	47782-47783, 47784, 47785-47786
RD1-PIB	47787-47788, 47789, 47790-47791
RD1-PIC	47792-47793, 47794, 47795-47796
RD1-PIN	47797-47798, 47799, 47800-47801
RD1-PIQ	47802-47803, 47804, 47805-47806
RD2-PIA	47807-47808, 47809, 47810-47811
RD2-PIB	47812-47813, 47814, 47815-47816
RD2-PIC	47817-47818, 47819, 47820-47821
RD2-PIN	47822-47823, 47824, 47825-47816
RD2-PIQ	47827-47828, 47829, 47830-47831
RD3-PIA	47832-47833, 47834, 47835-47836
RD3-PIB	47837-47838, 47839, 47840-47841
RD3-PIC	47842-47843, 47844, 47845-47846

ASCII Command	Modbus® Registers
RD3-PIN	47847-47848, 47849, 47850-47851
RD3-IQ	47852-47853, 47854, 47855-47856
RD4-PIA	47857-47858, 47859, 47860-47861
RD4-PIB	47862-47863, 47864, 47865-47866
RD4-PIC	47867-47868, 47869, 47870-47871
RD4-PIN	47872-47873, 47874, 47875-47876
RD4-PIQ	47877-47878, 47879, 47880-47881
RD-PIG	47882-47883, 47884, 47885-47886
RD-PVA	47887-47888, 47889, 47890-47891,47892-47893, 47894, 47895-47896
RD-PVB	47897-47898, 47899, 47900-49001,47902-47903, 47904, 47905-47906
RD-PVC	47907-47908, 47909, 47910-47911,47912-47913, 47914, 47915-47916
RD-PVN	47917-47918, 47919, 47920-47921,47922-47923, 47924, 47925-47926
RD-PVAR	47927-47928, 47929, 47930-47931,47932-47933, 47934, 47935-47936
RD-PWATT	47937-47938, 47939, 47940-47941,47942-47943, 47944, 47945-47946
RD1-TIA	47617-47618, 47619, 47620-47621
RD1-TIB	47622-47623, 47624, 47625-47626
RD1-TIC	47627-47628, 47629, 47630-47631
RD1-TIN	47632-47633, 47634, 47635-47636
RD1-TIQ	47637-47638, 47639, 47640-47641
RD2-TIA	47642-47643, 47644, 47645-47646
RD2-TIB	47647-47648, 47649, 47650-47651
RD2-TIC	47652-47653, 47654, 47655-47656
RD2-TIN	47657-47658, 47659, 47660-47661
RD2-TIQ	47662-47663, 47664, 47665-47666
RD3-TIA	47667-47668, 47669, 47670-47671
RD3-TIB	47672-47673, 47674, 47675-47676
RD3-TIC	47677-47678, 47679, 47680-47681
RD3-TIN	47682-47683, 47684, 47685-47686
RD3-TIQ	47687-47688, 47689, 47690-47691
RD4-TIA	47692-47693, 47694, 47695-47696
RD4-TIB	47697-47698, 47699, 47700-47701
RD4-TIC	47702-47703, 47704, 47705-47706
RD4-TIN	47707-47708, 47709, 47710-47711
RD4-TIQ	47712-47713, 47714, 47715-47716
RD-TIG	47717-47718, 47719, 47720-47721
RD-TVA	47722-47723, 47724, 47725-47726,47727-47728, 47729, 47730-47731
RD-TVB	47732-47733, 47734, 47735-47736,47737-47738, 47739, 47740-47741
RD-TVC	47742-47743, 47744, 47745-47746,47747-47748, 47749, 47750-47751

ASCII Command	Modbus® Registers
RD-TVN	47752-47753, 47754, 47755-47756,47757-47758,,47759, 47760-47761
RD-TVAR	47762-47763, 47764, 47765-47766,47767-47768, 47769, 47770-47771
RD-TWATT	47772-47773, 47774, 47775-47776,47777-47778, 47779, 47780-47781
RD1-YIA	47452-47453, 47454, 47455-47456
RD1-YIB	47457-47458, 47459, 47460-47461
RD1-YIC	47462-47463, 47464, 47465-47466
RD1-YIN	47467-47468, 47469, 47470-47471
RD1-YIQ	47472-47473, 47474, 47475-47476
RD2-YIA	47477-47478, 47479, 47480-47481
RD2-YIB	47482-47483, 47484, 47485-47486
RD2-YIC	47487-47488, 47489, 47490-47491
RD2-YIN	47492-47493, 47494, 47495-47496
RD2-YIQ	47497-47498, 47499, 47500-47501
RD3-YIA	47502-47503, 47504, 47505-47506
RD3-YIB	47507-47508, 47509, 47510-47511
RD3-YIC	47512-47513, 47514, 47515-47516
RD3-YIN	47517-47518, 47519, 47520-47521
RD3-YIQ	47522-47523, 47524, 47525-47526
RD4-YIA	47527-47528, 47529, 47530-47531
RD4-YIB	47532-47533, 47534, 47535-47536
RD4-YIC	47537-47538, 47539, 47540-47541
RD4-YIN	47542-47543, 47544, 47545-47546
RD4-YIQ	47547-47548, 47549, 47550-47551
RD-YIG	47552-47553, 47554, 47555-47556
RD-YVA	47557-47558, 47559, 47560-47561,47562-47563, 47564, 47565-47566
RD-YVB	47567-47568, 47569, 47570-47571,47572-47573, 47574, 47575-47576
RD-YVC	47577-47578, 47579, 47580-47581,47582-47583, 47584, 47585-47586
RD-YVN	47587-47588, 47589, 47590-47591,47592-47593, 47594, 47595-47596
RD-YVAR	47597-47598, 47599, 47600-47601,47602-47603, 47604, 47605-47606
RD-YWATT	47607-47608, 47609, 47610-47611,47612-47613, 47614, 47615-47616
RE-KVARH	47947-47948, 47949-47950
RE-KWH	47951-47952, 47953-47954
RF	47970-48073,40039
RF-NEW, RF-#	47950-48053,40039,40040
RF=0	47961
RF=TRIG	47962
RG-101STAT	47359
RG-43STAT	47358
RG-ADDR1	47340

ASCII Command	Modbus® Registers
RG-ADDR2	47341
RG-BREAKER	47381, 47382, 47383, 47384
RG-DATE=<date>	47342
RG-GRPACTIVE	47360
RG-GRPCNTRL	47361
RG-INPUT	47357
RG-LOGIC	47345-47356
RG-OUTCNTRL	47362
RG-OUTSTAT	47366
RG-STAT	47342-47393
RG-TARG	47375-47380
RG-TIME=<time>	47343-47344
RG-VER	47290-47341
RS, RS-#, RS-F#, RS-NEW	47595-47719,40039,40040
RS=0	47963
RT-DUTY1A	47426-47427
RT-DUTY1B	47428-47429
RT-DUTY1C	47430-47431
RT-DUTY2A	47432-47433
RT-DUTY2B	47434-47435
RT-DUTY2C	47436-47437
RT-DUTY3A	47438-47439
RT-DUTY3B	47440-47441
RT-DUTY3C	47442-47443
RT-DUTY4A	47444-47445
RT-DUTY4B	47446-47447
RT-DUTY4C	47448-47449
RT-TFCNTR	47450-47451
S#-50TP=<pu>,<td>	40269-40270,40271-40272
S#-50TN=<pu>,<td>	40273-40274,40275-40276
S#-50TQ=<pu>,<td>	40277-40278,40279-40280
S#-150TP=<pu>,<td>	40281-40282,40283-40284
S#-150TN=<pu>,<td>	40285-40286,40287-40288
S#-150TQ=<pu>,<td>	40289-40290,40291-40292
S#-250TP=<pu>,<td>	40293-40294,40295-40296
S#-250TN=<pu>,<td>	40297-40298,40299-40300
S#-250TQ=<pu>,<td>	40301-40302,40303-40304
S#-350TP=<pu>,<td>	40305-40306,40307-40308
S#-350TN=<pu>,<td>	40309-40310,40311-40312
S#-350TQ=<pu>,<td>	40313-40314,40315-40316
S#-450TP=<pu>,<td>	40317-40318,40319-40320
S#-450TN=<pu>,<td>	40321-40322,40323-40324
S#-550TP=<pu>,<td>	40325-40326,40327-40328
S#-650TP=<pu>,<td>	40329-40330,40331-40332
S#-750TP=<pu>,<td>	40333,40334,40335-40336

ASCII Command	Modbus® Registers
S#-50BF=<td>,<ppu>,<npu>,<ctd>	40337-40338,40339-40340,40341-40342,40343-40344
S#-150BF=<td>,<ppu>,<npu>,<ctd>	40345-40346,43047-40348,40349-40350,40351-40352
S#-250BF=<td>,<ppu>,<npu>,<ctd>	40353-40354,40355-40356,40357-40358,40359-40360
S#-350BF=<td>,<ppu>,<npu>,<ctd>	40361-40362,40363-40364,40365-40366,40367-40368
S#-51P=<pu>,<td>,<curve>	40369-40370,40371-40372,40373-40374
S#-51N=<pu>,<td>,<curve>	40375-40376,40377-40378,40379-40380
S#-51Q=<pu>,<td>.<curve>	40381-40382,40383-40384,40385-40386
S#-151P=<pu>,<td>.<curve>	40387-40388,40389-40390,40391-40392
S#-151N=<pu>,<td>.<curve>	40393-40394,40395-40396,40397-40398
S#-151Q=<pu>,<td>.<curve>	40399-40400,40401-40402,40403-40404
S#-251P=<pu>,<td>.<curve>	40405-40406,40407-40408,40409-40410
S#-251N=<pu>,<td>.<curve>	40411-40412,40413-40414,40415-40416
S#-251Q=<pu>,<td>.<curve>	40417-40418,40419-40420,40421-40422
S#-351P=<pu>,<td>.<curve>	40423-40424,40425-40426,40427-40428
S#-351N=<pu>,<td>.<curve>	40429-40430,40431-40432,40433-40434
S#-351Q=<pu>,<td>.<curve>	40435-40436,40437-40438,40439-40440
S#-451N=<pu>,<td>.<curve>	40441-40442,40443-40444,40445-40446
S#-24=<pu>,<td>,<rst>, <curve>	40447-40448,40449-40450,40451-40452, 40453-40454
S#-24D=<pu1>,<td1>,<pu2>,<td2>	40455-40456, 40457-40458, 40459-40460, 40461-40462
S#-27P=<pu>,<td>,<inh>	40463-40464,40465-40466,40467-40468
S#-127P=<pu>,<td>,<inh>	40469-40470,40471-40472,40473-40474
S#-27R=<pu>,<mode>	40475-40476,40477
S#-47=<pu>,<td>	40478-40479,40480-40481
S#-59P=<pu>,<td>	40482-40483,40484-40485
S#-59X=<pu>,<td>	40581-40582,40583-40584
S#-159P=<pu>,<td>	40486-40487,40488-40489
S#-62=<td 1>,<td 2>	40490-40491,40492-40493
S#-162=<td 1>,<td 2>	40494-40495,40496-40497
S#-262=<td 1>,<td 2>	40498-40498,40500-40501
S#-362=<td 1>,<td 2>	40502-40503,40504-40505
S#-81=<pu>,<td>,<mode>	40506-40507,40508-40509,40510
S#-181=<pu>,<td>,<mode>	40511-40512,40513-40514,40515
S#-281=<pu>,<td>,<mode>	40516-40517,40518-40519,40520
S#-381=<pu>,<td>,<mode>	40521-40522,40523-40524,40525
S#-481=<pu>,<td>,<mode>	40526-40527,40528-40529,40530
S#-581=<pu>,<td>,<mode>	40531-40532,40533-40534,40535
S#-81INH=<pu>	40536-40537
S#-87=<pu>,<slope>,<2nd>,<5th>,<URO>,<2nd har shar>	40538-40539,40540,40541-40542,40543-40544, 40545,40546
S#-87ND=<pu>,<slope>,<td>,<restraint type>	40547-40548,40549,40550,40585
S#-187ND=<pu>,<slope>,<td>,<restraint type>	40551-40552,40553,40554,40586
S#-TAP87=<mva>,<kv1/tap1>,<kv2/tap2>, <kv3/tap3>,<kv4/tap4>	40555-40556,40557-40558,40559-40560,40561-40562,40563-40564,40565-40566,40567-40568,40569-40570,40571-40572
S#-TAP87ND=<tapG>,<tapN>	40573-40574,40575-40576
S#-TAP187ND=<tapG>,<tapN>	40577-40578,40579-40580

ASCII Command	Modbus® Registers
SA-24=<alarm level>, <time delay>	41508, 41510-41511
SA-27=<alarm level>	41512-41513
SA-59=<alarm level>	41514-41515
SA-BKR1=<mode>,<alarm limit>,<ckt #>	41173, 41174-41175, 41176
SA-BKR2=<mode>,<alarm limit>,<ckt #>	41177, 41178-41179, 41180
SA-BKR3=<mode>,<alarm limit>,<ckt #>	41181, 41182-41183, 41184
SA-BKR4=<mode>,<alarm limit>,<ckt #>	41185, 41186-41187, 41188
SA-BKR5=<mode>,<alarm limit>,<ckt #>	41189, 41190-41191, 41192
SA-BKR6=<mode>,<alarm limit>,<ckt #>	41193, 41194-41195, 41196
SA-BKR7=<mode>,<alarm limit>,<ckt #>	41197, 41198-41199, 41200
SA-BKR8=<mode>,<alarm limit>,<ckt #>	41201, 41202-41203, 41204
SA-BKR9=<mode>,<alarm limit>,<ckt #>	41205, 41206-41207, 41208
SA-BKR10=<mode>,<alarm limit>,<ckt #>	41209, 41210-41211, 41212
SA-BKR11=<mode>,<alarm limit>,<ckt #>	41213, 41214-41215, 41216
SA-BKR12=<mode>,<alarm limit>,<ckt #>	41217, 41218-41219, 41220
SA-DIP=<dmd1>,<dmd2>,<dmd3>,<dmd4>	41532-33,41534-35,41536-37,41538-39
SA-DIN=<dmd1>,<dmd2>,<dmd3>,<dmd4>	41540-41,41542-43,41544-45,41546-47
SA-DIQ=<dmd1>,<dmd2>,<dmd3>,<dmd4>	41548-49,41550-51,41552-53,41554-55
SA-DIG=<alm level>	41557-58
SA-DVP=<max alm level>,<min alm level>	41524-25,41526-27
SA-DVN=<max alm level>,<min alm level>	41528-29,41530-31
SA-DVAR=<fwd alm level>,<rev alm level>	41516-41517,41518-41519
SA-DWATT=<fwd alm level>,<rev alm level>	41520-41521,41522-41523
SA-LGC=<alarm number>	41570-41575
SA-MAJ=<alarm number>	41558-41563
SA-MIN=<alarm number>	41564-41569
SA-RESET=<reset Alarm Logic>	41757-41768, 41769-41780
SA-DIFF	41576
SA-TX1	41472, 41473-41474, 41475
SA-TX2	41476, 41477-41478, 41479
SA-TX3	41480, 41481-41482, 41483
SA-TX4	41484, 41485-41486, 41487
SA-TX5	41488, 41489-41490, 41491
SA-TX6	41492, 41493-41494, 41495
SA-TX7	41496, 41497-41498, 41499
SA-TX8	41500, 41501-41502, 41503
SB-DUTY1=<exp>,<dmax.>,<blk bkr logic>	41060-41061, 41062-41063, 41064-41075, 41076-41087
SB-DUTY2=<exp>,<dmax.>,<blk bkr logic>	41088-41089, 41090-41091, 41093-41104, 41105-41116
SB-DUTY3=<exp>,<dmax.>,<blk bkr logic>	41117-41118, 41119-41120, 41121-41132, 41133-41144
SB-DUTY4=<exp>,<dmax.>,<blk bkr logic>	41145-41146, 41147-41148, 41149-41160, 41161-41172
SB-LOGIC1=<close logic>,<label>,<trip coil en>	41221-41232,41233-41244,41245-41253,41254
SB-LOGIC2=<close logic>,<label>,<trip coil en>	41255-41266,41267-41278,41279-41287,41288
SB-LOGIC3=<close logic>,<label>,<trip coil en>	41289-41300,41301-41312,41313-41321,41322
SB-LOGIC4=<close logic>,<label>,<trip coil en>	41323-41334,41335-41346,41347-41355,41356
SG-CLK=<date format>,<time format><dst enable>	41272,41273,41274

ASCII Command	Modbus® Registers
SG-COM0=<baud rate>,<page length>,<ack> ,<XON>	40962,40964,40965,40966
SG-COM1=<baud>,<addr>,<page length>,<ack>,><XON>	40971,40972,40973,40974,40975
SG-COM2=<baud>,<addr>,,,,, <parity>,<remote delay>,<stop bits>,<password security>	40980,40981,40986,40987,40988,40989
SG-CLK=<date format>,<clock format><daylight savings>	41519,41520,41521
SG-CKT1=<tx con>,<gnd src>,<tx cmp>,<ckt>, <180 deg comp>	41020,41021,41022,41023,41049
SG-CKT2=<tx con>,<gnd src>,<tx cmp>,<ckt>, <180 deg comp>	41024,41025,41026,41027,41050
SG-CKT3=<tx con>,<gnd src>,<tx cmp>,<ckt>, <180 deg comp>	41028,41029,41030,41031,41051
SG-CKT4=<tx con>,<gnd src>,<tx cmp>,<ckt>, <180 deg cmp>	41032,41033,41034,41035,41052
SG-CTP1=<ratio>,<connection>	41011,41012
SG-CTP2=<ratio>,<connection>	41013,41014
SG-CTP3=<ratio>,<connection>	41015,41016
SG-CTP4=<ratio>,<connection>	41017,41018
SG-CTG=<ratio>	41019
SG-DC=<Dmd1>,<Dmd2>,<Dnd3>,<Dmd4>	41586, 41587, 41588, 41589
SG-DIP=<demand interval>,<calculation method>	41580, 41581
SG-DIN=<demand interval>,<calculation method>	41582, 41583
SG-DIQ=<demand interval>,<calculation method>	41584, 41585
SG-FREQ=<frequency>	41009
SG-HOLD1=<output hold enable>	41590
SG-HOLD2=<output hold enable>	41590
SG-HOLD3=<output hold enable>	41590
SG-HOLD4=<output hold enable>	41590
SG-HOLD5=<output hold enable>	41590
SG-HOLD6=<output hold enable>	41590
SG-HOLD7=<output hold enable>	41590
SG-HOLD8=<output hold enable>	41590
SG-HOLD9=<output hold enable>	41590
SG-HOLD10=<output hold enable>	41590
SG-HOLD11=<output hold enable>	41590
SG-HOLD12=<output hold enable>	41590
SG-HOLD13=<output hold enable>	41590
SG-HOLD14=<output hold enable>	41590
SG-ID1=<relay ID>	45400-45414
SG-ID2=<station ID>	45415-45429
SG-ID3=<user1>	45430-45444
SG-ID4=<user2>	45445-45459
SG-IN1=<input recognition>,<input debounce >	40618,40619
SG-IN2=<input recognition>,<input debounce >	40620,40621
SG-IN3=<input recognition>,<input debounce >	40622,40623
SG-IN4=<input recognition>,<input debounce >	40624,40625

ASCII Command	Modbus® Registers
SG-IN5=<input recognition>,<input debounce >	40626,40627
SG-IN6=<input recognition>,<input debounce >	40628,40629
SG-IN7=<input recognition>,<input debounce >	40630,40631
SG-IN8=<input recognition>,<input debounce >	40632,40633
SG-IN9=<input recognition>,<input debounce >	40634,40635
SG-IN10=<input recognition>,<input debounce >	40636,40637
SG-IN11=<input recognition>,<input debounce >	40638,40639
SG-IN12=<input recognition>,<input debounce >	40640,40641
SG-LOG=<interval>	41049
SG-NOM=<nom volts>,<nom amps>	40602-40603,40604-40605
SG-OSC=<6/8/10/12/15/16>	41050
SG-PHROT=<rotation sequence>	41010
SG-SCREEN1=<menu screen>	41621-41624
SG-SCREEN2=<menu screen>	41625-41628
SG-SCREEN3=<menu screen>	41629-41632
SG-SCREEN4=<menu screen>	41633-41636
SG-SCREEN5=<menu screen>	41637-41640
SG-SCREEN6=<menu screen>	41641-41644
SG-SCREEN7=<menu screen>	41645-41648
SG-SCREEN8=<menu screen>	41649-41652
SG-SCREEN9=<menu screen>	41653-41656
SG-SCREEN10=<menu screen>	41657-41660
SG-SCREEN11=<menu screen>	41661-41664
SG-SCREEN12=<menu screen>	41665-41668
SG-SCREEN13=<menu screen>	41669-41672
SG-SCREEN14=<menu screen>	41673-41676
SG-SCREEN15=<menu screen>	41677-41680
SG-SCREEN16=<menu screen>	41681-41684
SG-SGCON=<time>	40871
SG-TARG=<target list>,<reset Targ Logic>	41591-41596,41597-41608,41609-41620
SG-TRIG=<trip logic>,<pu logic>,<logic logic>	41685-41696, 41697-41708, 41709-41720, 41721-41732, 41733-41744, 41745-41756
SG-VCKT=<circuit configuration>,<restraint configuration>	41047, 41048
SG-VTP =<VT_ratio>,<connection>,<27/59mode>,<51/27Rmode>,<ckt#>,<polarity>	41036-41037,41038-41039,41040-41041,41042-41043,41044,41053
SL-N=<name>	41800-41808
SL: <custom logic>,<logic1>,<logic2	41809-41817,41818-41826,41827-41835,
SL-50TP=<mode>,<block logic equation>	41840,41841-41852,41853-41864
SL-50TN=<mode>,<block logic equation>	41865,41866-41877,41878-41889
SL-50TQ=<mode>,<block logic equation>	41890,41891-41902,41903-41914
SL-150TP=<mode>,<block logic equation>	41915,41916-41927,41928-41939
SL-150TN=<mode>,<block logic equation>	41940,41941-41952,41953-41964
SL-150TQ=<mode>,<block logic equation>	41965,41966-41977,41978-41989
SL-250TP=<mode>,<block logic equation>	41990,41991-41902,42003-41914
SL-250TN=<mode>,<block logic equation>	42015,42016-41927,42028-41939

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SL-250TQ=<mode>,<block logic equation>	42040,42041-41952,42053-41964
SL-350TP=<mode>,<block logic equation>	42065,42066-41977,42078-41989
SL-350TN=<mode>,<block logic equation>	42090,42091-41902,42103-41914
SL-350TQ=<mode>,<block logic equation>	42115,42116-41927,42128-41939
SL-450TP=<mode>,<block logic equation>	42140,42141-41952,42153-41964
SL-450TN=<mode>,<block logic equation>	42165,42166-41977,42178-41989
SL-550TP=<mode>,<block logic equation>	42190,42191-41902,42203-41914
SL-650TP=<mode>,<block logic equation>	42215,42216-41927,42228-41939
SL-750TP=<mode>,<block logic equation>	42240,42241-41952,42253-41964
SL-50BF=<mode>,<50IN>,<52INI>,<52Stat>,<BLK>	42265, 42266-42277, 42278-42289, 42290-42301,42302-42313, 42314-42325, 42326-42337,42338-42349, 42350-42361
SL-150BF=<mode>,<50IN>,<52INI>,<52Stat>,<BLK>	42362, 42363-42374, 42375-42386,42387-42398,42399-42410, 42411-42422, 42423-42434, 42435-42446, 42447-42458
SL-250BF=<mode>,<50IN>,<52INI>,<52Stat>,<BLK>	42459, 42460-42471, 42472-42483, 42484-42495, 42496-42507, 42508-42519, 42520-42531,42532-42543, 42544-42555
SL-350BF=<mode>,<50IN>,<52INI>,<52Stat>,<BLK>	42556, 42557-42568, 42569-42580, 42581-42592, 42593-42604, 42605-42616, 42617-42628, 42629-42640, 42641-42652
SL-51P=<mode>,<block logic equation>	42653, 42654-42665, 42666-42677
SL-51N=<mode>,<block logic equation>	42678, 42679-42690, 42691-42602
SL-51Q=<mode>,<block logic equation>	42703, 42704-42715, 42716-42727
SL-151P=<mode>,<block logic equation>	42728, 42729-42740, 42741-42752
SL-151N=<mode>,<block logic equation>	42753, 42754-42765, 42766-42777
SL-151Q=<mode>,<block logic equation>	42778, 42779-42790, 42791-42802
SL-251P=<mode>,<block logic equation>	42803, 42804-42815, 42816-42827
SL-251N=<mode>,<block logic equation>	42828, 42829-42840, 42841-42852
SL-251Q=<mode>,<block logic equation>	42853, 42854-42865, 42866-42877
SL-351P=<mode>,<block logic equation>	42878, 42879-42890, 42891-42802
SL-351N=<mode>,<block logic equation>	42903, 42904-42915, 42916-42927
SL-351Q=<mode>,<block logic equation>	42928, 42929-42940, 42941-42952
SL-451N=<mode>,<block logic equation>	42953, 42954-42965, 42966-42977
SL-24=<mode>,<BLK logic>	42978, 42979-42990, 42991-43002
SL-27P=<mode>,<BLK logic>	43003, 43004-43015, 43016-43027
SL-127P=<mode>,<BLK logic>	43028, 43029-43040, 43041-43052
SL-47=<mode>,<BLK>	43053, 43054-43065, 43066-43077
SL-59P=<mode>,<block logic equation>	43078, 43079-43090, 43091-43002
SL-159P=<mode>,<block logic equation>	43103, 43104-43115, 43116-43127
SL-59X=<mode>,<block logic equation>	45353, 45354-45365, 45366-45377
SL-62=<mode>,< ini logic equation>, <block logic equation>	43128, 43129-43140, 43141-43152 , 43153-43164, 43165-43176
SL-162=<mode>,<ini logic equation>,<block logic equation>	43177, 43178-43189, 43190-43101, 43202-43213,43214-43225
SL-262=<mode>,<ini logic equation>,<block logic equation>	43226, 43227-43238, 43239-43250, 43251-43262,43263-43274
SL-362=<mode>,<ini logic equation>,<block logic equation>	43275, 43276-43287, 43288-43299, 43300-43311,43312-43323

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SL-81=<mode>,<block logic>	43324, 43325-43336, 43337-43348
SL-181=<mode>,<block logic>	43349, 43350-43361, 43362-43373
SL-281=<mode>,<block logic>	43374, 43375-43386, 43387-43398
SL-381=<mode>,<block logic>	43399, 43400-43411, 43412-43423
SL-481=<mode>,<block logic>	43424, 43425-43436, 43437-43448
SL-581=<mode>,<block logic>	43449, 43450-43461, 43462-43473
SL-87=<mode>,<block logic equation>	43474, 43475-43486, 43487-43498
SL-87ND=<mode>,<block logic equation>	43499, 43500-43511, 43512-43523
SL-187ND=<mode>,<block logic equation>	43524, 43525-43536, 43537-43548
SL-GROUP=<mode>,<D0 logic equation>, <D1 logic equation>,<D2 logic equation>, <D3 logic equation>,<auto logic equation>	43549, 43550-43561, 43562-43573, 43574-43585, 43586-43597, 43598-43609,43610-43621, 43622-43633, 43634-43645, 43646-43657, 43658-43669
SL-43=<mode>	43670
SL-143=<mode>	43671
SL-243=<mode>	43672
SL-343=<mode>	43673
SL-443=<mode>	43674
SL-543=<mode>	43675
SL-643=<mode>	43676
SL-743=<mode>	43677
SL-VOA=<boolean logic equation>	43782, 43783-43794, 43795-43806,43807-43818, 43819-43830, 43831-43842, 43843-43854,43855-43866, 43867-43878
SL-VO1=<boolean logic equation>	43879, 43880-43891,43892-43903, 43904-43915, 43916-43927, 43928-43939, 43940-43951,43952-43963, 43964-43975
SL-VO2=<boolean logic equation>	43976, 43977-43988, 43989-44000, 44001-44012, 44013-44024, 44025-44036, 44037-44048,44049-44060, 44061-44072
SL-VO3=<boolean logic equation>	44073, 44074-44085, 44086-44097, 44098-44109, 44110-44121, 44122-44133, 44134-44145, 44146-44157, 44158-44169
SL-VO4=<boolean logic equation>	44170, 44171-44182, 44183-44194, 44195-44206, 44207-44218, 44219-44230, 44231-44242, 44243-44254, 44255-44266
SL-VO5=<boolean logic equation>	44267, 44268-44279, 44280-44291, 44292-44303, 44304-44315, 44316-44327, 44328-44339, 44340-44351, 44352-44363
SL-VO6=<boolean logic equation>	44364, 44365-44376, 44377-44388, 44389-44400, 44401-44412, 44413-44424, 44425-44436, 44437-44448, 44449-44460
SL-VO7=<boolean logic equation>	44461, 44462-44473, 44474-44485, 44486-44497, 44498-44509, 44510-44521, 44522-44533,44534-44545, 44546-44557
SL-VO8=<boolean logic equation>	44558, 44559-44570, 44571-44582, 44583-44594, 44595-44606, 44607-44618, 44619-44630, 44631-44642, 44643-44654
SL-VO9=<boolean logic equation>	44655, 44656-44667, 44668-44679, 44680-44691, 44692-44703, 44704-44715, 44716-44727,44728-44739, 44740-44751

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SL-VO10=<boolean logic equation>	44752, 44753-44764, 44765-44776, 44777-44788, 44789-44800, 44801-44812, 44813-44824,44825-44836, 44837-44848
SL-VO11=<boolean logic equation>	44849, 44850-44861, 44862-44873, 44874-44885, 44886-44897, 44898-44909, 44910-44921,44922-44933, 44934-44945
SL-VO12=<boolean logic equation>	44946, 44947-44958, 44959-44970, 44971-44982, 44983-44994, 44995-45006, 45007-45018,45019-45030, 45031-45042
SL-VO13=<boolean logic equation>	45043, 45044-45055, 45056-45067, 45068-45079, 45080-45091, 45092-45103, 45104-45115, 45116-45127, 45128-45139
SN-VO14=<name>,<true label>,<false label>	46004-46011, 46012-46015, 46016-46019
SN-VO15=<name>,<true label>,<false label>	46020-46027, 46028-46031, 46032-46035
SP-60FL=<I_Blk>,<V_Blk>	40887-40888, 40889-40890
SP-CURVE=<a>,<b>,<c>,<n>,<r>	40608-40609,40610-40611,40612-40613,40614-40615,40616-40617
SP-GROUP1=<switch time>,<switch level>, <return time>, <return level>,<prot element>	40872,40873,40874,40875,40876
SP-GROUP2=<switch time>,<switch evel>,<return time>, <return level>,<prot element>	40877,40878,40879,40880,40881
SP-GROUP3=<switch time>,<switch evel>, <return time>, <return level>,<prot element>	40882,40883,40884,40885,40886
ST-DUTY1=<mode>,<dmax>,<CT cKt #>, <blk txfrmr logic>	41360, 41361-41362, 41363, 41364-41375, 41376-41387
ST-DUTY2=<mode>,<dmax>,<CT cKt #>, <blk txfrmr logic>	41388, 41389-41390, 41391, 41392-41403 41404-41415
ST-DUTY3=<mode>,<dmax>,<CT cKt #>, <blk txfrmr logic>	41416, 41417-41418, 41419, 41420-41431, 41432-41443
ST-DUTY4=<mode>,<dmax>,<CT cKt #>, <blk txfrmr logic>	41444, 41445-41446, 41447, 41448-41459, 41460-41471

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