GE Consumer & Industrial
Multilin

PQMII Power Quality Meter Communications Guide

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Part numbers contained in this manual are subject to change without notice, and should therefore be verified by GE Multilin before ordering.

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COMMUNICATIONS GUIDE

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PQMII Power Quality Meter

Communications Guide

1 Modbus Overview

1.1 Modbus Protocol

The GE Multilin PQMII implements a subset of the AEG Modicon Modbus RTU serial communication standard. Many popular programmable controllers support this protocol directly with a suitable interface card allowing direct connection of the PQMII. Although the Modbus protocol is hardware independent, the PQMII interface uses 2-wire RS485 and 9-pin RS232 interfaces. Modbus is a single-master multiple-slave protocol suitable for a multi-drop configuration provided by RS485 hardware. In this configuration, up to 32 slaves can be daisy-chained together on a single communication channel.

The PQMII is always a Modbus slave; it cannot be programmed as a Modbus master. Computers or PLCs are commonly programmed as masters. The Modbus protocol exists in two versions: Remote Terminal Unit (RTU, binary) and ASCII. Only the RTU version is supported by the PQMII. Monitoring, programming and control functions are possible using read and write register commands.

1.2 Electrical Interface

The electrical interface is 2-wire RS485 and 9-pin RS232. In a 2-wire RS485 link, data flow is bi-directional and half duplex. That is, data is never transmitted and received at the same time. RS485 lines should be connected in a daisy-chain configuration (avoid star connections) with a terminating network installed at each end of the link, i.e. at the master end and the slave farthest from the master. The terminating network should consist of a 120 Ω resistor in series with a 1 nF ceramic capacitor when used with Belden 9841 RS485 wire. The value of the terminating resistors should be equal to the characteristic impedance of the line. This is approximately 120 Ω for standard #22 AWG twisted-pair wire. Shielded wire should always be used to minimize noise. Polarity is important in RS485 communications: each '+' terminal of every device must be connected together for the system to operate. See *PQMII Intstruction Manual section 2.2.11: RS485 Serial Ports* for details on serial port wiring.

1.3 Data Frame Format and Data Rate

One data frame of an asynchronous transmission to or from a PQMII consists of 1 start bit, 8 data bits, and 1 stop bit, resulting in a 10-bit data frame. This is important for high-speed modem transmission, since 11-bit data frames are not supported by Hayes modems at bit rates greater than 300 bps. The Modbus protocol can be implemented at any standard communication speed. The PQMII supports operation at 1200, 2400, 4800, 9600, and 19200 baud.

1.4 Data Packet Format

A complete request/response sequence consists of the following bytes (transmitted as separate data frames):

Master Request Transmission:

SLAVE ADDRESS: 1 byte
FUNCTION CODE: 1 byte
DATA: variable number of bytes depending on the Function Code
CRC: 2 bytes

Slave Response Transmission:

SLAVE ADDRESS: 1 byte
FUNCTION CODE: 1 byte
DATA: variable number of bytes depending on FUNCTION CODE
CRC: 2 bytes

The **Slave Address** is the first byte of every transmission. It represents the user-assigned address of the slave device assigned to receive the message sent by the master. Each slave device must be assigned a unique address so only it responds to a transmission that starts with its address. In a master request transmission, the Slave Address represents the address to which the request is being sent. In a slave response transmission the Slave Address represents the address sending the response.

NOTE

A master transmission with a Slave Address of 0 indicates a broadcast command. Broadcast commands can be used only to store setpoints or perform commands.

The **Function Code** is the second byte of every transmission. Modbus defines function codes of 1 to 127. The PQMII implements some of these functions. See *2.1 Supported Modbus Functions* for details of the supported function codes. In a master request transmission the Function Code tells the slave what action to perform. In a slave response transmission if the Function Code sent from the slave is the same as the Function Code sent from the master then the slave performed the function as requested. If the high order bit of the Function Code sent from the slave is a 1 (i.e. if the Function Code is > 127) then the slave did not perform the function as requested and is sending an error or exception response.

The **Data** is a variable number of bytes depending on the Function Code. This may be Actual Values, Setpoints, or addresses sent by the master to the slave or by the slave to the master. See *2.1 Supported Modbus Functions* for a description of the supported functions and the data required for each.

The **CRC** is a a two byte error checking code. See the following section for details.

1.5 Error Checking

The RTU version of Modbus includes a 2-byte CRC-16 (16-bit cyclic redundancy check) with every transmission. The CRC-16 algorithm essentially treats the entire data stream (data bits only; start, stop and parity are ignored) as one continuous binary number. This number is first shifted left 16 bits and then divided by a characteristic polynomial (11000000000000101B). The 16-bit remainder is appended to the end of the transmission, MSByte first. The resulting message including CRC, when divided by the same polynomial at the receiver, results in a zero remainder if no transmission errors have occurred.

If a PQMII Modbus slave device receives a transmission in which an error is indicated by the CRC-16 calculation, the slave device will not respond to the transmission. A CRC-16 error indicates that one or more bytes of the transmission were received incorrectly and thus the entire transmission should be ignored in order to avoid the PQMII performing any incorrect operation.

The CRC-16 calculation is an industry standard method used for error detection. An algorithm is included here to assist programmers in situations where no standard CRC-16 calculation routines are available.

1.6 CRC-16 Algorithm

Once the following algorithm is complete, the working register "A" will contain the CRC value to be transmitted. Note that this algorithm requires the characteristic polynomial to be reverse bit ordered. The MSbit of the characteristic polynomial is dropped since it does not affect the value of the remainder. The following symbols are used in the algorithm:

-->: data transfer;
A: 16-bit working register;
AL: low order byte of A;
AH: high order byte of A;
CRC: 16-bit CRC-16 value;
i and j: loop counters;
(+): logical exclusive-OR operator;
Di: i-th data byte (i = 0 to N – 1);
G: 16-bit characteristic polynomial = 1010000000000001 with MSbit dropped and bit order reversed;
shr(x): shift right (the LSbit of the low order byte of x shifts into a carry flag, a '0' is shifted into the MSbit of the high order byte of x, all other bits shift right one location

The algorithm is shown below:

```
1. FFFF hex --> A
2. 0 --> i
3. 0 --> j
```

```
4. Di (+) AL --> AL
5. j + 1 --> j
6. shr(A)
7. is there a carry?  No: go to 8; Yes: G (+) A --> A
8. is j = 8?  No: go to 5; Yes: go to 9.
9. i + 1 --> i
10. is i = N?  No: go to 3; Yes: go to 11.
11. A --> CRC
```

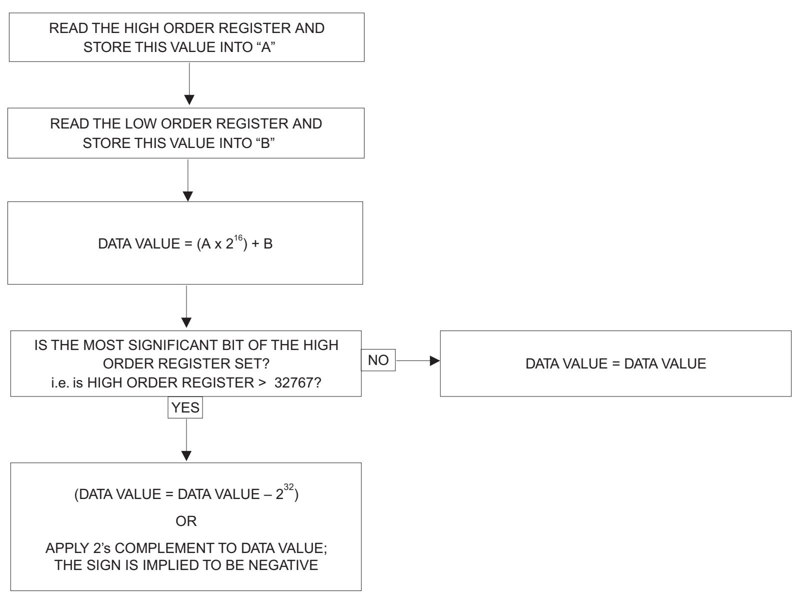
1.7 Timing

Data packet synchronization is maintained by timing constraints. The receiving device must measure the time between the reception of characters. If three and one half character times elapse without a new character or completion of the packet, then the communication link must be reset (i.e. all slaves start listening for a new transmission from the master). Thus at 9600 baud a delay of greater than 3.5 × 1/9600 × 10 = 3.65 ms will cause the communication link to be reset.

1.8 Reading Long Integers from the Memory Map

1.8.1 Description

The PQMII memory map contains data formatted as a long integer type, or 32 bits. Because the Modbus protocol maximum register size is 16 bits, the PQMII stores long integers in 2 consecutive register locations, 2 high order bytes, and 2 low order bytes. The data can be retrieved by the following logic:



1.8.2 Example

Reading a positive 3 Phase Real Power actual value from the PQMII:

Register	Actual Value	Description	Units & Scale	Format
02F0	004Fh	3 Phase Real Power (high)	0.01 × kW	F4

Register	Actual Value	Description	Units & Scale	Format
02F1	35D1h	3 Phase Real Power (low)	0.01 × kW	F4

Following the method described above, we have:

DATA VALUE	= $(004F \times 2^{16}) + 35D1$	hexadecimal
	= 5177344 + 13777	converted to decimal
	= 5191121	decimal

The most significant bit of the High Order register is not set, therefore the Data Value is as calculated. Applying the Units and Scale parameters to the Data Value, we multiply the Data Value by 0.01 kW. Therefore the resultant value of 3 Phase Real Power as read from the memory map is 51911.21 kW.

Reading a negative 3 Phase Real Power actual value from the PQMII:

Register	Actual Value	Description	Units & Scale	Format
02F0	FF3Ah	3 Phase Real Power (high)	0.01 × kW	F4
02F1	EA7Bh	3 Phase Real Power (low)	0.01 × kW	F4

Following the method described above:

DATA VALUE	= $(FF3A \times 2^{16}) + EA7B$	hexadecimal
	= $(65338 \times 2^{16}) + 60027$	converted to decimal
	= 4282051195	decimal

The most significant bit of the High Order register is set, therefore the Data Value is:

DATA VALUE = DATA VALUE – 2^{32} = 4282051195 – 4294967296 = –12916101

Multiply the Data Value by 0.01 kW according to the Units and Scale parameter. The resultant 3 Phase Real Power value read from the memory map is –129161.01 kW.

2 Modbus Functions

2.1 Supported Modbus Functions

The following functions are supported by the PQMII:

03h: Read Setpoints and Actual Values

04h: Read Setpoints and Actual Values

05h: Execute Operation

06h: Store Single Setpoint

07h: Read Device Status

08h: Loopback Test

10h: Store Multiple Setpoints

2.2 Read Setpoints/Actual Values (Function Codes 03/04h)

Modbus implementation: Read Input and Holding Registers
PQMII Implementation: Read Setpoints and Actual Values

For the PQMII Modbus implementation, these commands are used to read any setpoint ('holding registers') or actual value ('input registers'). Holding and input registers are 16-bit (two byte) values with the high-order byte transmitted first. Thus, all setpoints and actual values are sent as two bytes. A maximum of 125 registers can be read in one transmission. Function codes 03 and 04 are configured to read setpoints or actual values interchangeably since some PLCs do not support both of them.

The slave response to function codes 03/04 is the slave address, function code, number of data bytes to follow, the data, and the CRC. Each data item is sent as a 2 byte number with the high order byte first.

Message Format and Example for Modbus Function Code 03/04h:

Request slave 17 to respond with 3 registers starting at address 006B. For this example the register data in these addresses is:

Address:	006B	006C	006D
Data:	022B	0000	0064

The master/slave packet format is shown below:

Master Transmission	Bytes	Example	Description
Slave Address	1	11	message for slave 17
Function Code	1	03	read registers
Data Starting Address	2	00 6B	data starting at 006B
Number Of Setpoints	2	00 03	3 registers = 6 bytes total
CRC	2	9D 8D	CRC error code

Slave Response	Bytes	Example	Description
Slave Address	1	11	message from slave 17

Slave Response	Bytes	Example	Description
Function Code	1	03	read registers
Byte Count	1	06	3 registers = 6 bytes
Data 1 (see definition above)	2	02 2B	value in address 006B
Data 2 (see definition above)	2	00 00	value in address 006C
Data 3 (see definition above)	2	00 64	value in address 006D
CRC	2	C8 B8	CRC error code

2.3 Execute Operation (Function Code 05h)

Modbus Implementation: Force Single Coil
PQMII Implementation: Execute Operation

This function code allows the master to request a PQMII to perform specific command operations. The command numbers listed in the Commands area of the memory map correspond to operation codes for function code 05.

The operation commands can also be initiated by writing to the Commands area of the memory map using function code 16. *2.9 Performing Commands (Function Code 10h)* for complete details.

Message Format and Example for Modbus Function Code 05h:

Reset PQMII (operation code 1).

Master Transmission	Bytes	Example	Description
Slave Address	1	11	message for slave 17
Function Code	1	05	execute operation
Operation Code	2	00 01	Reset command (operation code 1)
Code Value	2	FF 00	perform function
CRC	2	DF 6A	CRC error code

Slave Response	Bytes	Example	Description
Slave Address	1	11	message from slave 17
Function Code	1	05	execute operation
Operation Code	2	00 01	operation code 1
Code Value	2	FF 00	perform function
CRC	2	DF 6A	CRC error code

2.4 Broadcast Command (Function Code 05h)

Modbus Implementation: Force Single Coil
PQMII Implementation: Execute Operation

This function code allows the master to request all PQMIIs on a particular communications link to Clear All Demand Data. The PQMII will recognize a packet as being a broadcast command if the Slave Address is transmitted as 0. Below is an example of the Broadcast Command to Clear All Demand Data.

Message Format and Example for Modbus Function Code 05h:

Clear All Demand Data on all PQMIIs (operation code 34).

Master Transmission	Bytes	Example	Description
Slave Address	1	00	broadcast command (address = 0)
Function Code	1	05	execute operation
Operation Code	2	00 22	clear all demand data (op. code 34)
Code Value	2	FF 00	perform function
CRC	2	2D E1	CRC error code

Slave Response	Bytes	Example	Description
Slave does not respond back to the master.			

2.5 Store Single Setpoint (Function Code 06h)

Modbus Implementation: Preset Single Register
PQMII Implementation: Store Single Setpoint

This command allows the master to store a single setpoint into the memory of a PQMII. The slave response to this function code is to echo the entire master transmission.

Message Format and Example for Modbus Function Code 06h:

Request slave 17 to store the value 01E4 in setpoint address 1020. After the transmission in this example is complete, setpoint address 1020 will contain the value 01E4.

Master Transmission	Bytes	Example	Description
Slave Address	1	11	message for slave 17
Function Code	1	06	store single setpoint
Data Starting Address	2	10 20	setpoint address 1020
Data	2	01 E4	data for setpoint address 1020
CRC	2	8E 47	CRC error code

Slave Response	Bytes	Example	Description
Slave Address	1	11	message from slave 17
Function Code	1	06	store single setpoint
Data Starting Address	2	10 20	setpoint address 1020
Data	2	01 E4	data stored in setpoint address 1020
CRC	2	8E 47	CRC error code

2.6 Read Device Status (Function Code 07h)

Modbus Implementation: Read Exception Status
PQMII Implementation: Read Device Status

This is a function used to quickly read the status of a selected device. A short message length allows for rapid reading of status. The status byte returned will have individual bits set to 1 or 0 depending on the status of the slave device.

PQMII General Device Status Byte:

Bit Position	Description
B0 (LSBit)	Alarm Condition = 1

Bit Position	Description
B1	Self test failure = 1
B2	Alarm relay energized = 1
B3	Aux 1 relay energized = 1
B4	Aux 2 relay energized = 1
B5	Aux 3 relay energized = 1
B6	Not used
B7 (MSBit)	Not used

Message Format and Example for Modbus Function Code 07h:

Request status from slave 17.

Master Transmission	Bytes	Example	Description
Slave Address	1	11	message for slave 17
Function Code	1	07	read device status
CRC	2	4C 22	CRC error code

Slave Response	Bytes	Example	Description
Slave Address	1	11	message from slave 17
Function Code	1	07	read device status
Device Status (see above)	2	2C	status = 00101100 (in binary)
CRC	2	22 28	CRC error code

2.7 Loopback Test (Function Code 08h)

Modbus Implementation: Loopback Test
PQMII Implementation: Loopback Test

This function is used to test the integrity of the communication link. The PQMII will echo the request.

Message Format and Example for Modbus Function 08h:

Loopback test from slave 17.

Master Transmission	Bytes	Example	Description
Slave Address	1	11	message for slave 17
Function Code	1	08	loopback test
Diagnostic code	2	00 00	must be 00 00
Data	2	00 00	must be 00 00
CRC	2	E0 0B	CRC error code

Slave Response	Bytes	Example	Description
Slave Address	1	11	message from slave 17
Function Code	1	08	loopback test
Diagnostic Code	2	00 00	must be 00 00
Data	2	00 00	must be 00 00
CRC	2	E0 0B	CRC error code

2.8 Store Multiple Setpoints (Function Code 10h)

Modbus Implementation: Preset Multiple Registers
PQMII Implementation: Store Multiple Setpoints

This function code allows multiple setpoints to be stored into the PQMII memory. Modbus 'registers' are 16-bit (2-byte) values transmitted high order byte first. Thus all PQMII setpoints are sent as two bytes. The maximum number of setpoints that can be stored in one transmission is dependent on the slave device. Modbus allows up to a maximum of 60 holding registers to be stored. The PQMII allows 60 registers to be stored in one transmission. The PQMII response to this function is to echo the slave address, function code, starting address, the number of setpoints stored, and the CRC.

Message Format and Example for function code 10h:

Request slave 17 to store the value 01F4 to setpoint address 1028 and the value 2710 to setpoint address 1029.

Master Transmission	Bytes	Example	Description
Slave Address	1	11	message for slave 17
Function Code	1	10	store multiple setpoints
Data Starting Address	2	10 28	setpoint address 1028
Number of Setpoints	2	00 02	2 setpoints = 4 bytes total
Byte Count	1	04	4 bytes of data
Data 1	2	01 F4	data for setpoint address 1028
Data 2	2	27 10	data for setpoint address 1029
CRC	2	33 23	CRC error code

Slave Response	Bytes	Example	Description
Slave Address	1	11	message from slave 17
Function Code	1	10	store multiple setpoints
Data Starting Address	2	10 28	setpoint address 1028
Number of Setpoints	2	00 02	2 setpoints
CRC	2	C7 90	CRC error code

2.9 Performing Commands (Function Code 10h)

Some PLCs may not support command execution using function code 05 but do support storing multiple setpoints with function code 10h. To perform this operation using function code 10h, a certain sequence of commands must be written to the PQMII. The sequence consists of: command function register, command operation register and command data (if required). The command function register must be written with the value of 05, indicating an execute operation. The command operation register must then be written with a valid command operation number from the list of commands shown in the memory map. The command data registers must be written with valid data if the command operation requires data. The selected command will be executed immediately upon receipt of a valid transmission.

Message Format and Example for Function Code 10h:

Perform a reset on PQMII (operation code 1).

Master Transmission	Bytes	Example	Description
Slave Address	1	11	message for slave 17
Function Code	1	10	store multiple setpoints
Data Starting Address	2	00 80	setpoint address 0080
Number of Setpoints	2	00 02	2 setpoints = 4 bytes total
Byte Count	1	04	4 bytes of data
Data 1	2	00 05	data for setpoint address 0080
Data 2	2	00 01	data for setpoint address 0081
CRC	2	B0 D6	CRC error code

Slave Response	Bytes	Example	Description
Slave Address	1	11	message from slave 17
Function Code	1	10	store multiple setpoints
Data Starting Address	2	00 80	setpoint address 0080
Number of Setpoints	2	00 02	2 setpoints
CRC	2	46 7A	CRC error code

2.10 Broadcast Command (Function Code 10h)

In applications where multiple devices are daisy-chained, it may be necessary to synchronize device clocks (date and/or time) through one command. The broadcast command allows such synchronization. The PQMII recognizes a packet as being a broadcast command if the Slave Address is transmitted as 0.

Message Format and Example for Function Code 10h:

Send broadcast command to store 1:27:10.015 pm, October 29, 1997.

Master Transmission	Bytes	Example	Description
Slave Address	1	00	broadcast command (address = 0)
Function Code	1	10	store multiple setpoints
Data Starting Address	2	00 F0	setpoint address 00F0
Number of Setpoints	2	00 04	4 setpoints = 8 bytes total
Byte Count	1	08	8 bytes of data
Data 1	2	0D 1B	hours (24-hour format), minutes
Data 2	2	27 1F	milliseconds
Data 3	2	0A 1D	month, day
Data 4	2	07 CD	year (four digits, i.e. 1997)
CRC	2	9D 8D	CRC error code

Slave Response	Bytes	Example	Description
Slave does not respond back to the master.			

The PQMII allows the date and time to be stored separately. In other word, a broadcast command can be sent to store just date or time.

2.11 Error Responses

When a PQMII detects an error other than a CRC error, a response will be sent to the master. The MSbit of the Function Code byte will be set to 1 (i.e. the function code sent from the slave will be equal to the function code sent from the master plus 128). The following byte will be an exception code indicating the type of error that occurred.

Transmissions received from the master with CRC errors are ignored by the PQMII.

The slave response to an error (other than CRC error) will be:

Slave Address: 1 byte
Function Code: 1 byte (with MSbit set to 1)
Exception Code: 1 byte
CRC: 2 bytes

The PQMII implements the following exception response codes.

- **01 - Illegal Function**: The function code transmitted is not one of the functions supported by the PQMII.
- **02 - Illegal Data Address**: The address referenced in the data field transmitted by the master is not an allowable address for the PQMII.
- **03 - Illegal Data Value**: The value referenced in the data field transmitted by the master is not within range for the selected data address.

3 Modbus Memory Map

3.1 Memory Map Information

The data stored in the PQMII are grouped by setpoints and actual values. Setpoints can be read and written by a master computer; actual values are read-only. All setpoints and actual values are stored as two-byte values; that is, each register address is the address of a two-byte value. In the Modbus memory map, addresses are shown in hexadecimal notation; data values (setpoint ranges, increments, factory values) are in decimal notation.

3.2 User-definable Memory Map

The PQMII contains a user-definable area in the memory map. This area allows remapping of the addresses of all actual values and setpoints registers. The user-definable area has two sections:

- A **Register Index** area (memory map addresses 0180h to 01F7h) that contains 120 actual values or setpoints register addresses.
- A **Register** area (memory map addresses 0100h to 017Fh) that contains the data at the addresses in the Register Index.

Register data that is separated in the rest of the memory map may be remapped to adjacent register addresses in the user-definable registers area. This is accomplished by writing to register addresses in the user-definable register index area. This allows for improved throughput of data and can eliminate the need for multiple read command sequences.

For example, if the values of Phase A Current (register address 0240h) and Phase A Power Factor (register address 02FDh) are required to be read from a PQMII, their addresses may be remapped as follows:

1. Write 0240h to address 0180h (User-Definable Register Index 0000) using Modbus function code 06h or 10h.
2. Write 02FDh to address 0181h (User-Definable Register Index 0001) using Modbus function code 06h or 10h.

A read (function code 03h or 04h) of registers 0100h (User-Definable Register 0000) and 0101h (User-Definable Register 0001) will return the Phase A Current and Phase A Power Factor.

3.3 PQMII Memory Map

The PQMII memory map is shown in the following table.

Table 1: PQMII Memory Map (Sheet 1 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
Product Information (Input Registers) Addresses: 0000 to 007F							
PRODUCT ID	0000	Product Device Code	---	---	---	F1	73
	0001	Hardware Version Code	---	---	---	F5	current version
	0002	Main Software Version Code	---	---	---	F1	current version
	0003	Modification File Number 1	---	---	---	F1	mod. file number 1
	0004	Boot Software Version Code	---	---	---	F1	current version
	0005	Reserved					
	0006	Product options	---	---	---	F100	from order code
	0007	Modification File Number 2	---	---	---	F1	mod. file number 2
	0008	Modification File Number 3	---	---	---	F1	mod. file number 3
	0009	Modification File Number 4	---	---	---	F1	mod. file number 4
	000A	Modification File Number 5	---	---	---	F1	mod. file number 5
	000B	CPU Speed	0 to 1	1	---	F45	16 MHz
	to	↓					
	001F	Reserved					
	0020	Serial Number Character 1 and 2	---	---	ASCII	F10	1^{st}, 2^{nd} char.
	0021	Serial Number Character 3 and 4	---	---	ASCII	F10	3^{rd}, 4^{th} char.
	0022	Serial Number Character 5 and 6	---	---	ASCII	F10	5^{th}, 6^{th} char
	0023	Serial Number Character 7 and 8	---	---	ASCII	F10	7^{th}, 8^{th} char.
	0024	Reserved					
	to	↓					
	002F	Reserved					
	0030	Manufacture Month/Day	---	---	---	F24	manf. month/day
	0031	Manufacture Year	---	---	---	F25	manufacture year
	0032	Calibration Month/Day	---	---	---	F24	cal. month/day
	0033	Calibration Year	---	---	---	F25	calibration year
	0034	Reserved					
	0035	Reserved					
	to	↓					
	007F	Reserved					
Commands (Holding Registers) Addresses: 0080 to 00EF							
COMMANDS	0080	Command Function Code	5	---	---	F1	5
	0081	Command Operation Code	1 to 35	1	---	F7	0
	0082	Command Data 1	0 to 65535	1	---	*	0
	0083	Command Data 2	0 to 65535	1	---	F31	0
	0084	Command Data 3	0 to 65535	1	---	F8	0
	0085	Command Data 4	0 to 65535	1	---	F8	0
	0086	Command Data 5	0 to 65535	1	---	F8	0
	0087	Command Data 6	0 to 65535	1	---	F8	0

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents “OFF”.
**** Minimum Setpoint value represents “OFF”.
***** Maximum Setpoint value represents “UNLIMITED”.

Table 1: PQMII Memory Map (Sheet 2 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	0088	Command Data 7	0 to 65535	1	---	F8	0
	0089	Command Data 8	0 to 65535	1	---	F8	0
	008A	Command Data 9	0 to 65535	1	---	F8	0
	008B	Command Data 10	0 to 65535	1	---	F8	0
COMMANDS continued	008C	Command Data 11	0 to 65535	1	---	F8	0
	008D	Reserved					
	to	↓					
	00EF	Reserved					
Broadcast Command (Holding Registers) Addresses: 00F0 to 00FF							
BROADCAST COMMAND	00F0	Time Hours/Minutes	0 to 65535	1	hr/min	F22	N/A
	00F1	Time Seconds	0 to 59999	1	ms	F23	N/A
	00F2	Date Month/Day	0 to 65535	1	---	F24	N/A
	00F3	Date Year	0 to 2037	1	---	F25	N/A
	00F4	Reserved					
	to	↓					
	00FF	Reserved					
User Definable Register (Input Registers) Addresses: 0100 to 017F							
USER DEFINABLE REGISTERS	0100	User Definable Data 0000	---	---	---	---	---
	0101	User Definable Data 0001	---	---	---	---	---
	0102	User Definable Data 0002	---	---	---	---	---
	0103	User Definable Data 0003	---	---	---	---	---
	0104	User Definable Data 0004	---	---	---	---	---
	0105	User Definable Data 0005	---	---	---	---	---
	0106	User Definable Data 0006	---	---	---	---	---
	0107	User Definable Data 0007	---	---	---	---	---
	0108	User Definable Data 0008	---	---	---	---	---
	0109	User Definable Data 0009	---	---	---	---	---
	010A	User Definable Data 000A	---	---	---	---	---
	010B	User Definable Data 000B	---	---	---	---	---
	to	↓	↓	↓	↓	↓	↓
	0177	User Definable Data 0077	---	---	---	---	---
	0178	Reserved					
	to	↓					
	017F	Reserved					
User Definable Register Index (Holding Registers) Addresses: 0180 to 01FF							
USER DEFINABLE REGISTER INDEX	0180	Register address for User Data 0000	**	1	---	F1	0
	0181	Register address for User Data 0001	**	1	---	F1	0
	0182	Register address for User Data 0002	**	1	---	F1	0
	0183	Register address for User Data 0003	**	1	---	F1	0
	0184	Register address for User Data 0004	**	1	---	F1	0
	0185	Register address for User Data 0005	**	1	---	F1	0
	0186	Register address for User Data 0006	**	1	---	F1	0
	0187	Register address for User Data 0007	**	1	---	F1	0
	0188	Register address for User Data 0008	**	1	---	F1	0
	0189	Register address for User Data 0009	**	1	---	F1	0
	018A	Register address for User Data 000A	**	1	---	F1	0
	018B	Register address for User Data 000B	**	1	---	F1	0

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents “OFF”.
**** Minimum Setpoint value represents “OFF”.
***** Maximum Setpoint value represents “UNLIMITED”.

Table 1: PQMII Memory Map (Sheet 3 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	018C	Register address for User Data 000C	**	1	---	F1	0
	018D	Register address for User Data 000D	**	1	---	F1	0
	to	↓	↓	↓	↓	↓	↓
	01F7	Register address for User Data 0077	**	1	---	F1	0
USER DEFINABLE REGISTER INDEX continued	01F8	Reserved					
	to	↓					
	01FF	Reserved					
Actual Values (Input Registers) Addresses: 0200-0E1F							
STATUS	0200	Switch Input Status	---	---	---	F101	N/A
	0201	LED Status Flags	---	---	---	F102	N/A
	0202	LED Attribute Flags	---	---	---	F103	N/A
	0203	Output Relay Status Flags	---	---	---	F104	N/A
	0204	Alarm Active Status Flags 1	---	---	---	F105	N/A
	0205	Alarm Pickup Status Flags 1	---	---	---	F105	N/A
	0206	Alarm Active Status Flags 2	---	---	---	F106	N/A
	0207	Alarm Pickup Status Flags 2	---	---	---	F106	N/A
	0208	Alarm Active Status Flags 3	---	---	---	F107	N/A
	0209	Alarm Pickup Status Flags 3	---	---	---	F107	N/A
	020A	Aux. 1 Active Status Flags 1	---	---	---	F105	N/A
	020B	Aux. 1 Pickup Status Flags 1	---	---	---	F105	N/A
	020C	Aux. 1 Active Status Flags 2	---	---	---	F106	N/A
	020D	Aux. 1 Pickup Status Flags 2	---	---	---	F106	N/A
	020E	Aux. 1 Active Status Flags 3	---	---	---	F107	N/A
	020F	Aux. 1 Pickup Status Flags 3	---	---	---	F107	N/A
	0210	Aux. 2 Active Status Flags 1	---	---	---	F105	N/A
	0211	Aux. 2 Pickup Status Flags 1	---	---	---	F105	N/A
	0212	Aux. 2 Active Status Flags 2	---	---	---	F106	N/A
	0213	Aux. 2 Pickup Status Flags 2	---	---	---	F106	N/A
	0214	Aux. 2 Active Status Flags 3	---	---	---	F107	N/A
	0215	Aux. 2 Pickup Status Flags 3	---	---	---	F107	N/A
	0216	Aux. 3 Active Status Flags 1	---	---	---	F105	N/A
	0217	Aux. 3 Pickup Status Flags 1	---	---	---	F105	N/A
	0218	Aux. 3 Active Status Flags 2	---	---	---	F106	N/A
	0219	Aux. 3 Pickup Status Flags 2	---	---	---	F106	N/A
	021A	Aux. 3 Active Status Flags 3	---	---	---	F107	N/A
	021B	Aux. 3 Pickup Status Flags 3	---	---	---	F107	N/A
	021C	General Status	---	---	---	F109	N/A
	021D	Encrypted Passcode	---	---	---	F1	N/A
	021E	Reserved					
	to	↓	↓	↓	↓	↓	↓
	022F	Reserved					
CLOCK	0230	Time - Hours/Minutes	---	---	---	F22	N/A
	0231	Time - Seconds	---	---	---	F23	N/A
	0232	Time - Month/Day	---	---	---	F24	N/A
	0233	Time Year	---	---	---	F25	N/A
	0234	Reserved					

Notes: *Data type depends on the Command Operation Code.
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**** Minimum Setpoint value represents "OFF".
***** Maximum Setpoint value represents "UNLIMITED".

Table 1: PQMII Memory Map (Sheet 4 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	to	↓	↓	↓	↓	↓	↓
	023F	Reserved					
CURRENT	0240	Phase A Current	---	---	A	F1	N/A
	0241	Phase B Current	---	---	A	F1	N/A
CURRENT continued	0242	Phase C Current	---	---	A	F1	N/A
	0243	Average Current	---	---	A	F1	N/A
	0244	Neutral Current	---	---	A	F1	N/A
	0245	Current Unbalance	---	---	0.1 x%	F1	N/A
	0246	Phase A Current - Minimum			A	F1	N/A
	0247	Phase B Current - Minimum			A	F1	N/A
	0248	Phase C Current - Minimum			A	F1	N/A
	0249	Neutral Current - Minimum			A	F1	N/A
	024A	Current Unbalance - Minimum			0.1 x%	F1	N/A
	024B	Phase A Current - Maximum			A	F1	N/A
	024C	Phase B Current - Maximum			A	F1	N/A
	024D	Phase C Current - Maximum			A	F1	N/A
	024E	Neutral Current - Maximum			A	F1	N/A
	024F	Current Unbalance - Maximum			0.1 x%	F1	N/A
	0250	Time - Hour/Minutes of Phase A Curr. Min	---	---	---	F22	N/A
	0251	Time - Seconds of Phase A Current Min	---	---	---	F23	N/A
	0252	Date - Month/Day of Phase A Current Min	---	---	---	F24	N/A
	0253	Date - Year of Phase A Current Min	---	---	---	F25	N/A
	0254	Time - Hour/Minutes of Phase B Curr. Min	---	---	---	F22	N/A
	0255	Time - Seconds of Phase B Current Min	---	---	---	F23	N/A
	0256	Date - Month/Day of Phase B Current Min	---	---	---	F24	N/A
	0257	Date - Year of Phase B Current Min	---	---	---	F25	N/A
	0258	Time - Hour/Minutes of Phase C Curr. Min	---	---	---	F22	N/A
	0259	Time - Seconds of Phase C Current Min	---	---	---	F23	N/A
	025A	Date - Month/Day of Phase C Current Min	---	---	---	F24	N/A
	025B	Date - Year of Phase C Current Min	---	---	---	F25	N/A
	025C	Time - Hour/Minutes of Neutral Current Min	---	---	---	F22	N/A
	025D	Time - Seconds of Neutral Current Min	---	---	---	F23	N/A
	025E	Date - Month/Day of Neutral Current Min	---	---	---	F24	N/A
	025F	Date - Year of Neutral Current Min	---	---	---	F25	N/A
	0260	Time - Hour/Minutes of Current Unbal. Min	---	---	---	F22	N/A
	0261	Time - Seconds of Current Unbalance Min	---	---	---	F23	N/A
	0262	Date - Month/Day of Current Unbal. Min	---	---	---	F24	N/A
	0263	Date - Year of Current Unbalance Min	---	---	---	F25	N/A
	0264	Time - Hour/Minutes of Phase A Curr. Max	---	---	---	F22	N/A
	0265	Time - Seconds of Phase A Current Max	---	---	---	F23	N/A

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**** Minimum Setpoint value represents "OFF".
***** Maximum Setpoint value represents "UNLIMITED".

Table 1: PQMII Memory Map (Sheet 5 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	0266	Date - Month/Day of Phase A Current Max	---	---	---	F24	N/A
	0267	Date - Year of Phase A Current Max	---	---	---	F25	N/A
	0268	Time - Hour/Minutes of Phase B Curr. Max	---	---	---	F22	N/A
CURRENT continued	0269	Time - Seconds of Phase B Current Max	---	---	---	F23	N/A
	026A	Date - Month/Day of Phase B Current Max	---	---	---	F24	N/A
	026B	Date - Year of Phase B Current Max	---	---	---	F25	N/A
	026C	Time - Hour/Minutes of Phase C Curr. Max	---	---	---	F22	N/A
	026D	Time - Seconds of Phase C Current Max	---	---	---	F23	N/A
	026E	Date - Month/Day of Phase C Current Max	---	---	---	F24	N/A
	026F	Date - Year of Phase C Current Max	---	---	---	F25	N/A
	0270	Time - Hour/Minutes of Neutral Current Max	---	---	---	F22	N/A
	0271	Time - Seconds of Neutral Current Max	---	---	---	F23	N/A
	0272	Date - Month/Day of Neutral Current Max	---	---	---	F24	N/A
	0273	Date - Year of Neutral Current Max	---	---	---	F25	N/A
	0274	Time - Hour/Minutes of Current Unbal. Max	---	---	---	F22	N/A
	0275	Time - Seconds of Current Unbal. Max	---	---	---	F23	N/A
	0276	Date - Month/Day of Current Unbal. Max	---	---	---	F24	N/A
	0277	Date - Year of Current Unbalance Max	---	---	---	F25	N/A
	0278	Reserved					
	to	↓	↓	↓	↓	↓	↓
	027F	Reserved					
VOLTAGE	0280	Voltage Van (High)	---	---	V	F3	N/A
	0281	Voltage Van (Low)					
	0282	Voltage Vbn (High)	---	---	V	F3	N/A
	0283	Voltage Vbn (Low)					
	0284	Voltage Vcn (High)	---	---	V	F3	N/A
	0285	Voltage Vcn (Low)					
	0286	Average Phase Voltage (High)	---	---	V	F3	N/A
	0287	Average Phase Voltage (Low)					
	0288	Voltage Vab (High)	---	---	V	F3	N/A
	0289	Voltage Vab (Low)					
	028A	Voltage Vbc (High)	---	---	V	F3	N/A
	028B	Voltage Vbc (Low)					
	028C	Voltage Vca (High)	---	---	V	F3	N/A
	028D	Voltage Vca (Low)					
	028E	Average Line Voltage (High)	---	---	V	F3	N/A
	028F	Average Line Voltage (Low)					
	0290	Voltage Unbalance	---	---	0.1 x %	F1	N/A
	0291	Voltage Van - Minimum (high)	---	---	V	F3	N/A
	0292	Voltage Van - Minimum (Low)					

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents “OFF”.
**** Minimum Setpoint value represents “OFF”.
***** Maximum Setpoint value represents “UNLIMITED”.

Table 1: PQMII Memory Map (Sheet 6 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	0293	Voltage Vbn - Minimum (high)	---	---	V	F3	N/A
	0294	Voltage Vbn - Minimum (Low)					
	0295	Voltage Vcn - Minimum (high)	---	---	V	F3	N/A
	0296	Voltage Vcn - Minimum (Low)					
	0297	Voltage Vab - Minimum (high)	---	---	V	F3	N/A
	0298	Voltage Vab - Minimum (Low)					
	0299	Voltage Vbc - Minimum (high)	---	---	V	F3	N/A
	029A	Voltage Vbc - Minimum (Low)					
	029B	Voltage Vca - Minimum (high)	---	---	V	F3	N/A
	029C	Voltage Vca - Minimum (Low)					
	029D	Voltage Unbalance - Minimum	---	---	0.1 x%	F1	N/A
	029E	Voltage Van - Maximum (high)	---	---	V	F3	N/A
	029F	Voltage Van - Maximum (Low)					
	02A0	Voltage Vbn - Maximum (high)	---	---	V	F3	N/A
	02A1	Voltage Vbn - Maximum (Low)					
	02A2	Voltage Vcn - Maximum (high)	---	---	V	F3	N/A
	02A3	Voltage Vcn - Maximum (Low)					
	02A4	Voltage Vab - Maximum (high)	---	---	V	F3	N/A
	02A5	Voltage Vab - Maximum (Low)					
	02A6	Voltage Vbc - Maximum (high)	---	---	V	F3	N/A
	02A7	Voltage Vbc - Maximum (Low)					
	02A8	Voltage Vca - Maximum (high)	---	---	V	F3	N/A
	02A9	Voltage Vca - Maximum (Low)					
	02AA	Voltage Unbalance - Maximum	---	---	0.1 x%	F1	N/A
	02AB	Time - Hour/Minutes of Voltage Van Min	---	---	---	F22	N/A
	02AC	Time - Seconds of Voltage Van Min	---	---	---	F23	N/A
	02AD	Date - Month/Day of Voltage Van Min	---	---	---	F24	N/A
	02AE	Date - Year of Voltage Van Min	---	---	---	F25	N/A
	02AF	Time - Hour/Minutes of Voltage Vbn Min	---	---	---	F22	N/A
	02B0	Time - Seconds of Voltage Vbn Min	---	---	---	F23	N/A
	02B1	Date - Month/Day of Voltage Vbn Min	---	---	---	F24	N/A
	02B2	Date - Year of Voltage Vbn Min	---	---	---	F25	N/A
	02B3	Time - Hour/Minutes of Voltage Vcn Min	---	---	---	F22	N/A
	02B4	Time - Seconds of Voltage Vcn Min	---	---	---	F23	N/A
	02B5	Date - Month/Day of Voltage Vcn Min	---	---	---	F24	N/A
	02B6	Date - Year of Voltage Vcn Min	---	---	---	F25	N/A
	02B7	Time - Hour/Minutes of Voltage Vab Min	---	---	---	F22	N/A
	02B8	Time - Seconds of Voltage Vab Min	---	---	---	F23	N/A
	02B9	Date - Month/Day of Voltage Vab Min	---	---	---	F24	N/A
	02BA	Date - Year of Voltage Vab Min	---	---	---	F25	N/A
	02BB	Time - Hour/Minutes of Voltage Vbc Min	---	---	---	F22	N/A
	02BC	Time - Seconds of Voltage Vbc Min	---	---	---	F23	N/A
	02BD	Date - Month/Day of Voltage Vbc Min	---	---	---	F24	N/A
	02BE	Date - Year of Voltage Vbc Min	---	---	---	F25	N/A

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***** Maximum Setpoint value represents "UNLIMITED".

Table 1: PQMII Memory Map (Sheet 7 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	02BF	Time - Hour/Minutes of Voltage Vca Min	---	---	---	F22	N/A
VOLTAGE continued	02C0	Time - Seconds of Voltage Vca Min	---	---	---	F23	N/A
	02C1	Date - Month/Day of Voltage Vca Min	---	---	---	F24	N/A
	02C2	Date - Year of Voltage Vca Min	---	---	---	F25	N/A
	02C3	Time - Hour/Minutes of Voltage Unbal. Min	---	---	---	F22	N/A
	02C4	Time - Seconds of Voltage Unbalance Min	---	---	---	F23	N/A
	02C5	Date - Month/Day of Voltage Unbal. Min	---	---	---	F24	N/A
	02C6	Date - Year of Voltage Unbalance Min	---	---	---	F25	N/A
	02C7	Time - Hour/Minutes of Voltage Van Max	---	---	---	F22	N/A
	02C8	Time - Seconds of Voltage Van Max	---	---	---	F23	N/A
	02C9	Date - Month/Day of Voltage Van Max	---	---	---	F24	N/A
	02CA	Date - Year of Voltage Van Max	---	---	---	F25	N/A
	02CB	Time - Hour/Minutes of Voltage Vbn Max	---	---	---	F22	N/A
	02CC	Time - Seconds of Voltage Vbn Max	---	---	---	F23	N/A
	02CD	Date - Month/Day of Voltage Vbn Max	---	---	---	F24	N/A
	02CE	Date - Year of Voltage Vbn Max	---	---	---	F25	N/A
	02CF	Time - Hour/Minutes of Voltage Vcn Max	---	---	---	F22	N/A
	02D0	Time - Seconds of Voltage Vcn Max	---	---	---	F23	N/A
	02D1	Date - Month/Day of Voltage Vcn Max	---	---	---	F24	N/A
	02D2	Date - Year of Voltage Vcn Max	---	---	---	F25	N/A
	02D3	Time - Hour/Minutes of Voltage Vab Max	---	---	---	F22	N/A
	02D4	Time - Seconds of Voltage Vab Max	---	---	---	F23	N/A
	02D5	Date - Month/Day of Voltage Vab Max	---	---	---	F24	N/A
	02D6	Date - Year of Voltage Vab Max	---	---	---	F25	N/A
	02D7	Time - Hour/Minutes of Voltage Vbc Max	---	---	---	F22	N/A
	02D8	Time - Seconds of Voltage Vbc Max	---	---	---	F23	N/A
	02D9	Date - Month/Day of Voltage Vbc Max	---	---	---	F24	N/A
	02DA	Date - Year of Voltage Vbc Max	---	---	---	F25	N/A
	02DB	Time - Hour/Minutes of Voltage Vca Max	---	---	---	F22	N/A
	02DC	Time - Seconds of Voltage Vca Max	---	---	---	F23	N/A
	02DD	Date - Month/Day of Voltage Vca Max	---	---	---	F24	N/A
	02DE	Date - Year of Voltage Vca Max	---	---	---	F25	N/A
	02DF	Time - Hour/Minutes of Voltage Unbal. Max	---	---	---	F22	N/A
	02E0	Time - Seconds of Voltage Unbalance Max	---	---	---	F23	N/A
	02E1	Date - Month/Day of Voltage Unbalance Max	---	---	---	F24	N/A
	02E2	Date - Year of Voltage Unbalance Max	---	---	---	F25	N/A
	02E3	Reserved					
	02E4	Reserved					
	02E5	Reserved					
	02D6	Reserved					

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Table 1: PQMII Memory Map (Sheet 8 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	02E7	Va Phasor Angle	---	---	° lag	F1	
VOLTAGE continued	02E8	Vb Phasor Angle	---	---	° lag	F1	
	02E9	Vc Phasor Angle	---	---	° lag	F1	
	02EA	Ia Phasor Angle	---	---	° lag	F1	
	02EB	Ib Phasor Angle	---	---	° lag	F1	
	02EC	Ic Phasor Angle	---	---	° lag	F1	
	02ED	Reserved					
	02EE	Reserved					
	02EF	Reserved					
POWER	02F0	3 Phase Real Power (high)	---	---	0.01 x kW	F4	N/A
	02F1	3 Phase Real Power (low)					
	02F2	3 Phase Reactive Power (high)	---	---	0.01 x kvar	F4	N/A
	02F3	3 Phase Reactive Power (low)					
	02F4	3 Phase Apparent Power (high)	---	---	0.01 x kVA	F3	N/A
	02F5	3 Phase Apparent Power (low)					
	02F6	3 Phase Power Factor	---	---	0.01 x PF	F2	N/A
	02F7	Phase A Real Power (high)	---	---	0.01 x kW	F4	N/A
	02F8	Phase A Real Power (low)					
	02F9	Phase A Reactive Power (high)	---	---	0.01 x kvar	F4	N/A
	02FA	Phase A Reactive Power (low)					
	02FB	Phase A Apparent Power (high)	---	---	0.01 x kVA	F3	N/A
	02FC	Phase A Apparent Power (low)					
	02FD	Phase A Power Factor	---	---	0.01 x PF	F2	N/A
	02FE	Phase B Real Power (high)	---	---	0.01 x kW	F4	N/A
	02FF	Phase B Real Power (low)					
	0300	Phase B Reactive Power (high)	---	---	0.01 x kvar	F4	N/A
	0301	Phase B Reactive Power (low)					
	0302	Phase B Apparent Power (high)	---	---	0.01 x kVA	F3	N/A
	0303	Phase B Apparent Power (low)					
	0304	Phase B Power Factor	---	---	0.01 x PF	F2	N/A
	0305	Phase C Real Power (high)	---	---	0.01 x kW	F4	N/A
	0306	Phase C Real Power (low)					
	0307	Phase C Reactive Power (high)	---	---	0.01 x kvar	F4	N/A
	0308	Phase C Reactive Power (low)					
	0309	Phase C Apparent Power (high)	---	---	0.01 x kVA	F3	N/A
	030A	Phase C Apparent Power (low)					
	030B	Phase C Power Factor	---	---	0.01 x PF	F2	N/A
	030C	3 Phase Real Power - Minimum (high)	---	---	0.01 x kW	F4	N/A
	030D	3 Phase Real Power - Minimum (low)					
	030E	3 Phase Reactive Power - Minimum (high)	---	---	0.01 x kvar	F4	N/A
	030F	3 Phase Reactive Power - Minimum (low)					
	0310	3 Phase Apparent Power - Minimum (high)	---	---	0.01 x kVA	F3	N/A
	0311	3 Phase Apparent Power - Minimum (low)					

Notes: *Data type depends on the Command Operation Code.
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**** Minimum Setpoint value represents “OFF”.
***** Maximum Setpoint value represents “UNLIMITED”.

Table 1: PQMII Memory Map (Sheet 9 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	0312	3 Phase Power Factor - Minimum	---	---	0.01 x PF	F2	N/A
POWER continued	0313	3 Phase Real Power - Maximum (high)	---	---	0.01 x kW	F4	N/A
	0314	3 Phase Real Power - Maximum (low)					
	0315	3 Phase Reactive Power - Maximum (high)	---	---	0.01 x kvar	F4	N/A
	0316	3 Phase Reactive Power - Maximum (low)					
	0317	3 Phase Apparent Power - Maximum (high)	---	---	0.01 x kVA	F3	N/A
	0318	3 Phase Apparent Power - Maximum (low)					
	0319	3 Phase Power Factor - Maximum	---	---	0.01 x PF	F2	N/A
	031A	Phase A Real Power - Minimum (high)	---	---	0.01 x kW	F4	N/A
	031B	Phase A Real Power - Minimum (low)					
	031C	Phase A Reactive Power - Minimum (high)	---	---	0.01 x kvar	F4	N/A
	031D	Phase A Reactive Power - Minimum (low)					
	031E	Phase A Apparent Power - Minimum (high)	---	---	0.01 x kVA	F3	N/A
	031F	Phase A Apparent Power - Minimum (low)					
	0320	Phase A Power Factor - Minimum	---	---	0.01 xPF	F2	N/A
	0321	Phase A Real Power - Maximum (high)	---	---	0.01 x kW	F4	N/A
	0322	Phase A Real Power - Maximum (low)					
	0323	Phase A Reactive Power - Maximum (high)	---	---	0.01 x kvar	F4	N/A
	0324	Phase A Reactive Power - Maximum (low)					
	0325	Phase A Apparent Power - Maximum (high)	---	---	0.01 x kVA	F3	N/A
	0326	Phase A Apparent Power - Maximum (low)					
	0327	Phase A Power Factor - Maximum	---	---	0.01 x PF	F2	N/A
	0328	Phase B Real Power - Minimum (high)	---	---	0.01 x kW	F4	N/A
	0329	Phase B Real Power - Minimum (low)					
	032A	Phase B Reactive Power - Minimum (high)	---	---	0.01 x kvar	F4	N/A
	032B	Phase B Reactive Power - Minimum (low)					
	032C	Phase B Apparent Power - Minimum (high)	---	---	0.01 x kVA	F3	N/A
	032D	Phase B Apparent Power - Minimum (low)					
	032E	Phase B Power Factor - Minimum	---	---	0.01 x PF	F2	N/A
	032F	Phase B Real Power - Maximum (high)	---	---	0.01 x kW	F4	N/A
	0330	Phase B Real Power - Maximum (low)					
	0331	Phase B Reactive Power - Maximum (high)	---	---	0.01 x kvar	F4	N/A
	0332	Phase B Reactive Power - Maximum (low)					
	0333	Phase B Apparent Power - Maximum (high)	---	---	0.01 x kVA	F3	N/A
	0334	Phase B Apparent Power - Maximum (low)					
	0335	Phase B Power Factor - Maximum	---	---	0.01 x PF	F2	N/A

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents “OFF”.
**** Minimum Setpoint value represents “OFF”.
***** Maximum Setpoint value represents “UNLIMITED”.

Table 1: PQMII Memory Map (Sheet 10 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
POWER continued	0336	Phase C Real Power - Minimum (high)	---	---	0.01 x kW	F4	N/A
	0337	Phase C Real Power - Minimum (low)					
	0338	Phase C Reactive Power - Minimum (high)	---	---	0.01 x kvar	F4	N/A
	0339	Phase C Reactive Power - Minimum (low)					
	033A	Phase C Apparent Power - Minimum (high)	---	---	0.01 x kVA	F3	N/A
	033B	Phase C Apparent Power - Minimum (low)					
	033C	Phase C Power Factor - Minimum	---	---	0.01 x PF	F2	N/A
	033D	Phase C Real Power - Maximum (high)	---	---	0.01 x kW	F4	N/A
	033E	Phase C Real Power - Maximum (low)					
	033F	Phase C Reactive Power - Maximum (high)	---	---	0.01 x kvar	F4	N/A
	0340	Phase C Reactive Power - Maximum (low)					
	0341	Phase C Apparent Power - Maximum (high)	---	---	0.01 x kVA	F3	N/A
	0342	Phase C Apparent Power - Maximum (low)					
	0343	Phase C Power Factor - Maximum	---	---	0.01 x PF	F2	N/A
	0344	Time - Hour/Minutes of Real Power Min	---	---	---	F22	N/A
	0345	Time - Seconds of Real Power Min	---	---	---	F23	N/A
	0346	Date - Month/Day of Real Power Min	---	---	---	F24	N/A
	0347	Date - Year of Real Power Min	---	---	---	F25	N/A
	0348	Time - Hour/Minutes of Reactive Pwr Min	---	---	---	F22	N/A
	0349	Time - Seconds of Reactive Power Min	---	---	---	F23	N/A
	034A	Date - Month/Day of Reactive Power Min	---	---	---	F24	N/A
	034B	Date - Year of Reactive Power Min	---	---	---	F25	N/A
	034C	Time - Hour/Minutes of Apparent Pwr Min	---	---	---	F22	N/A
	034D	Time - Seconds of Apparent Power Min	---	---	---	F23	N/A
	034E	Date - Month/Day of Apparent Power Min	---	---	---	F24	N/A
	034F	Date - Year of Apparent Power Min	---	---	---	F25	N/A
	0350	Time - Hour/Minutes of Power Factor Min	---	---	---	F22	N/A
	0351	Time - Seconds of Power Factor Min	---	---	---	F23	N/A
	0352	Date - Month/Day of Power Factor Min	---	---	---	F24	N/A
	0353	Date - Year of Power Factor Min	---	---	---	F25	N/A
	0354	Time - Hour/Minutes of Real Power Max	---	---	---	F22	N/A
	0355	Time - Seconds of Real Power Max	---	---	---	F23	N/A
	0356	Date - Month/Day of Real Power Max	---	---	---	F24	N/A
	0357	Date - Year of Real Power Max	---	---	---	F25	N/A
	0358	Time - Hour/Minutes of Reactive Pwr Max	---	---	---	F22	N/A

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents "OFF".
**** Minimum Setpoint value represents "OFF".
***** Maximum Setpoint value represents "UNLIMITED".

Table 1: PQMII Memory Map (Sheet 11 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
POWER continued	0359	Time - Seconds of Reactive Power Max	---	---	---	F23	N/A
	035A	Date - Month/Day of Reactive Pwr Max	---	---	---	F24	N/A
	035B	Date - Year of Reactive Power Max	---	---	---	F25	N/A
	035C	Time - Hour/Minutes of Apparent Pwr Max	---	---	---	F22	N/A
	035D	Time - Seconds of Apparent Pwr Max	---	---	---	F23	N/A
	035E	Date - Month/Day of Apparent Pwr Max	---	---	---	F24	N/A
	035F	Date - Year of Apparent Power Max	---	---	---	F25	N/A
	0360	Time - Hour/Minutes of Power Factor Max	---	---	---	F22	N/A
	0361	Time - Seconds of Power Factor Max	---	---	---	F23	N/A
	0362	Date - Month/Day of Power Factor Max	---	---	---	F24	N/A
	0363	Date - Year of Power Factor Max	---	---	---	F25	N/A
	0364	Time - Hour/Min of Phase A Real Pwr Min	---	---	---	F22	N/A
	0365	Time - Seconds of Phase A Real Pwr Min	---	---	---	F23	N/A
	0366	Date - Month/Day of Phase A Real Pwr Min	---	---	---	F24	N/A
	0367	Date - Year of Phase A Real Pwr Min	---	---	---	F25	N/A
	0368	Time - Hour/Min of Phase A React Pwr Min	---	---	---	F22	N/A
	0369	Time - Seconds of Phase A React Pwr Min	---	---	---	F23	N/A
	036A	Date - Month/Day of Phase A React Pwr Min	---	---	---	F24	N/A
	036B	Date - Year of Phase A Reactive Pwr Min	---	---	---	F25	N/A
	036C	Time - Hour/Min of Phase A App Pwr Min	---	---	---	F22	N/A
	036D	Time - Seconds of Phase A App Pwr Min	---	---	---	F23	N/A
	036E	Date - Month/Day of Phase A App Pwr Min	---	---	---	F24	N/A
	036F	Date - Year of Phase A Apparent Pwr Min	---	---	---	F25	N/A
	0370	Time - Hour/Minutes of Phase A PF Min	---	---	---	F22	N/A
	0371	Time - Seconds of Phase A PF Min	---	---	---	F23	N/A
	0372	Date - Month/Day of Phase A PF Min	---	---	---	F24	N/A
	0373	Date - Year of Phase A Power Factor Min	---	---	---	F25	N/A
	0374	Time - Hour/Min of Phase A Real Pwr Max	---	---	---	F22	N/A
	0375	Time - Seconds of Phase A Real Pwr Max	---	---	---	F23	N/A
	0376	Date - Month/Day of Phase A Real Pwr Max	---	---	---	F24	N/A
	0377	Date - Year of Phase A Real Power Max	---	---	---	F25	N/A
	0378	Time - Hour/Min of Phase A React Pwr Max	---	---	---	F22	N/A
	0379	Time - Seconds of Phase A React Pwr Max	---	---	---	F23	N/A
	037A	Date - Mnth/Day of Phase A React Pwr Max	---	---	---	F24	N/A

Notes: *Data type depends on the Command Operation Code.
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*** Maximum Setpoint value represents “OFF”.
**** Minimum Setpoint value represents “OFF”.
***** Maximum Setpoint value represents “UNLIMITED”.

Table 1: PQMII Memory Map (Sheet 12 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
POWER continued	037B	Date - Year of Phase A Reactive Pwr Max	---	---	---	F25	N/A
	037C	Time - Hour/Min of Phase A App Pwr Max	---	---	---	F22	N/A
	037D	Time - Seconds of Phase A App Pwr Max	---	---	---	F23	N/A
	037E	Date - Month/Day of Phase A App Pwr Max	---	---	---	F24	N/A
	037F	Date - Year of Phase A Apparent Pwr Max	---	---	---	F25	N/A
	0380	Time - Hour/Minutes of Phase A PF Max	---	---	---	F22	N/A
	0381	Time - Seconds of Phase A PF Max	---	---	---	F23	N/A
	0382	Date - Month/Day of Phase A PF Max	---	---	---	F24	N/A
	0383	Date - Year of Phase A Power Factor Max	---	---	---	F25	N/A
	0384	Time - Hour/Min of Phase B Real Pwr Min	---	---	---	F22	N/A
	0385	Time - Seconds of Phase B Real Pwr Min	---	---	---	F23	N/A
	0386	Date - Month/Day of Phase B Real Pwr Min	---	---	---	F24	N/A
	0387	Date - Year of Phase B Real Power Min	---	---	---	F25	N/A
	0388	Time - Hour/Min of Phase B React Pwr Min	---	---	---	F22	N/A
	0389	Time - Seconds of Phase B React Pwr Min	---	---	---	F23	N/A
	038A	Date - Month/Day of Phase B React Pwr Min	---	---	---	F24	N/A
	038B	Date - Year of Phase B Reactive Pwr Min	---	---	---	F25	N/A
	038C	Time - Hour/Min of Phase B App Pwr Min	---	---	---	F22	N/A
	038D	Time - Seconds of Phase B App Pwr Min	---	---	---	F23	N/A
	038E	Date - Month/Day of Phase B App Pwr Min	---	---	---	F24	N/A
	038F	Date - Year of Phase B Apparent Pwr Min	---	---	---	F25	N/A
	0390	Time - Hour/Minutes of Phase B PF Min	---	---	---	F22	N/A
	0391	Time - Seconds of Phase B PF Min	---	---	---	F23	N/A
	0392	Date - Month/Day of Phase B PF Min	---	---	---	F24	N/A
	0393	Date - Year of Phase B PF Min	---	---	---	F25	N/A
	0394	Time - Hour/Min of Phase B Real Pwr Max	---	---	---	F22	N/A
	0395	Time - Seconds of Phase B Real Pwr Max	---	---	---	F23	N/A
	0396	Date - Month/Day of Phase B Real Pwr Max	---	---	---	F24	N/A
	0397	Date - Year of Phase B Real Power Max	---	---	---	F25	N/A
	0398	Time - Hour/Min of Phase B React Pwr Max	---	---	---	F22	N/A
	0399	Time - Seconds of Phase B React Pwr Max	---	---	---	F23	N/A
	039A	Date - Mnth/Day of Phase B React Pwr Max	---	---	---	F24	N/A
	039B	Date - Year of Phase B Reactive Pwr Max	---	---	---	F25	N/A

Notes: *Data type depends on the Command Operation Code.
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Table 1: PQMII Memory Map (Sheet 13 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
POWER continued	039C	Time - Hour/Min of Phase B App Pwr Max	---	---	---	F22	N/A
	039D	Time - Seconds of Phase B App Pwr Max	---	---	---	F23	N/A
	039E	Date - Month/Day of Phase B App Pwr Max	---	---	---	F24	N/A
	039F	Date - Year of Phase B Apparent Pwr Max	---	---	---	F25	N/A
	03A0	Time - Hour/Minutes of Phase B PF Max	---	---	---	F22	N/A
	03A1	Time - Seconds of Phase B PF Max	---	---	---	F23	N/A
	03A2	Date - Month/Day of Phase B PF Max	---	---	---	F24	N/A
	03A3	Date - Year of Phase B Power Factor Max	---	---	---	F25	N/A
	03A4	Time - Hour/Min of Phase C Real Pwr Min	---	---	---	F22	N/A
	03A5	Time - Seconds of Phase C Real Pwr Min	---	---	---	F23	N/A
	03A6	Date - Month/Day of Phase C Real Pwr Min	---	---	---	F24	N/A
	03A7	Date - Year of Phase C Real Power Min	---	---	---	F25	N/A
	03A8	Time - Hour/Min of Phase C React Pwr Min	---	---	---	F22	N/A
	03A9	Time - Seconds of Phase C React Pwr Min	---	---	---	F23	N/A
	03AA	Date - Mnth/Day of Phase C React Pwr Min	---	---	---	F24	N/A
	03AB	Date - Year of Phase C Reactive Pwr Min	---	---	---	F25	N/A
	03AC	Time - Hour/Min of Phase C App Pwr Min	---	---	---	F22	N/A
	03AD	Time - Seconds of Phase C App Pwr Min	---	---	---	F23	N/A
	03AE	Date - Month/Day of Phase C App Pwr Min	---	---	---	F24	N/A
	03AF	Date - Year of Phase C Apparent Pwr Min	---	---	---	F25	N/A
	03B0	Time - Hour/Minutes of Phase C PF Min	---	---	---	F22	N/A
	03B1	Time - Seconds of Phase C PF Min	---	---	---	F23	N/A
	03B2	Date - Month/Day of Phase C PF Min	---	---	---	F24	N/A
	03B3	Date - Year of Phase C Power Factor Min	---	---	---	F25	N/A
	03B4	Time - Hour/Min of Phase C Real Pwr Max	---	---	---	F22	N/A
	03B5	Time - Seconds of Phase C Real Pwr Max	---	---	---	F23	N/A
	03B6	Date - Month/Day of Phase C Real Pwr Max	---	---	---	F24	N/A
	03B7	Date - Year of Phase C Real Power Max	---	---	---	F25	N/A
	03B8	Time - Hour/Min of Phase C React Pwr Max	---	---	---	F22	N/A
	03B9	Time - Seconds of Phase C React Pwr Max	---	---	---	F23	N/A
	03BA	Date - Mnth/Day of Phase C React Pwr Max	---	---	---	F24	N/A
	03BB	Date - Year of Phase C Reactive Pwr Max	---	---	---	F25	N/A
	03BC	Time - Hour/Min of Phase C App Pwr Max	---	---	---	F22	N/A

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Table 1: PQMII Memory Map (Sheet 14 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
POWER continued	03BD	Time - Seconds of Phase C App Pwr Max	---	---	---	F23	N/A
	03BE	Date - Month/Day of Phase C App Pwr Max	---	---	---	F24	N/A
	03BF	Date - Year of Phase C Apparent Pwr Max	---	---	---	F25	N/A
	03C0	Time - Hour/Minutes of Phase C PF Max	---	---	---	F22	N/A
	03C1	Time - Seconds of Phase C PF Max	---	---	---	F23	N/A
	03C2	Date - Month/Day of Phase C PF Max	---	---	---	F24	N/A
	03C3	Date - Year of Phase C Power Factor Max	---	---	---	F25	N/A
	03C4	Reserved					
	to	↓	↓	↓	↓	↓	↓
	03CF	Reserved					
ENERGY	03D0	3 Phase Positive Real Energy Used (high)	---	---	kWh	F3	N/A
	03D1	3 Phase Positive Real Energy Used (low)					
	03D2	3 Phase Negative Real Energy Used (high)	---	---	kWh	F3	N/A
	03D3	3 Phase Negative Real Energy Used (low)					
	03D4	3 Phase Positive React. Energy Used (high)	---	---	kvarh	F3	N/A
	03D5	3 Phase Positive React. Energy Used (low)					
	03D6	3 Phase Neg Reactive Energy Used (high)	---	---	kvarh	F3	N/A
	03D7	3 Phase Neg Reactive Energy Used (low)					
	03D8	3 Phase Apparent Energy Used (high)	---	---	kVAh	F3	N/A
	03D9	3 Phase Apparent Energy Used (low)					
	03DA	3 Phase Energy Used in Last 24 h (high)	---	---	kWh	F3	N/A
	03DB	3 Phase Energy Used in Last 24 h (low)					
	03DC	3 Phase Energy Cost Since Reset (high)	---	---	$ × 0.01	F3	N/A
	03DD	3 Phase Energy Cost Since Reset (low)					
	03DE	3 Phase Energy Cost Per Day (high)	---	---	$ × 0.01	F3	N/A
	03DF	3 Phase Energy Cost Per Day (low)					
	03E0	Time - Hours/Minutes of Last Reset	---	---	---	F22	N/A
	03E1	Time - Seconds of Last Reset	---	---	---	F23	N/A
	03E2	Date - Month/Day of Last Reset	---	---	---	F24	N/A
	03E3	Date - Year of Last Reset	---	---	---	F25	N/A
	03E4	Tariff Period 1 Positive Real Energy (high)	---	---	kWh	F3	N/A
	03E5	Tariff Period 1 Positive Real Energy (low)					
	03E6	Tariff Period 1 Negative Real Energy (high)	---	---	kWh	F3	N/A
	03E7	Tariff Period 1 Negative Real Energy (low)					
	03E8	Tariff Period 2 Positive Real Energy (high)	---	---	kWh	F3	N/A
	03E9	Tariff Period 2 Positive Real Energy (low)					

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**** Minimum Setpoint value represents "OFF".
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Table 1: PQMII Memory Map (Sheet 15 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
ENERGY continued	03EA	Tariff Period 2 Negative Real Energy (high)	---	---	kWh	F3	N/A
	03EB	Tariff Period 2 Negative Real Energy (low)					
	03EC	Tariff Period 3 Positive Real Energy (high)	---	---	kWh	F3	N/A
	03ED	Tariff Period 3 Positive Real Energy (low)					
	03EE	Tariff Period 3 Negative Real Energy (high)	---	---	kWh	F3	N/A
	03EF	Tariff Period 3 Negative Real Energy (low)					
	03F0	Tariff Period 1 Cost (high)	---	---	$ x 0.01	F3	N/A
	03F1	Tariff Period 1 Cost (low)					
	03F2	Tariff Period 2 Cost (high)	---	---	$ x 0.01	F3	N/A
	03F3	Tariff Period 2 Cost (low)					
	03F4	Tariff Period 3 Cost (high)	---	---	$ x 0.01	F3	N/A
	03F5	Tariff Period 3 Cost (low)					
	03F6	Tariff Period 1 Net Energy Used (high)	---	---	kWh	F3	N/A
	03F7	Tariff Period 1 Net Energy Used (low)					
	03F8	Tariff Period 2 Net Energy Used (high)	---	---	kWh	F3	N/A
	03F9	Tariff Period 2 Net Energy Used (low)					
	03FA	Tariff Period 3 Net Energy Used (high)	---	---	kWh	F3	N/A
	03FB	Tariff Period 3 Net Energy Used (low)					
	03FC	Reserved					
	to	↓	↓	↓	↓	↓	↓
	03FF	Reserved					
DEMAND	0400	Phase A Current Demand	---	---	A	F1	N/A
	0401	Phase B Current Demand	---	---	A	F1	N/A
	0402	Phase C Current Demand	---	---	A	F1	N/A
	0403	Neutral Current Demand	---	---	A	F1	N/A
	0404	3 Phase Real Power Demand (high)	---	---	0.01 x kW	F4	N/A
	0405	3 Phase Real Power Demand (low)					
	0406	3 Phase React Power Demand (high)	---	---	0.01 x kvar	F4	N/A
	0407	3 Phase React Power Demand (low)					
	0408	3 Phase Apparent Power Demand (high)	---	---	0.01 x kVA	F3	N/A
	0409	3 Phase Apparent Power Demand (low)					
	040A	Phase A Current Demand - Maximum	---	---	A	F1	N/A
	040B	Phase B Current Demand - Maximum	---	---	A	F1	N/A
	040C	Phase C Current Demand - Maximum	---	---	A	F1	N/A
	040D	Neutral Current Demand - Maximum	---	---	A	F1	N/A
	040E	3 Phase Real Power Dmd (high) - Max	---	---	0.01 x kW	F4	N/A
	040F	3 Phase Real Power Dmd (low) - Max					
	0410	3 Phase React Power Dmd (high) - Max	---	---	0.01 x kvar	F4	N/A
	0411	3 Phase React Power Dmd (low) - Max					
	0412	3 Phase Apparent Power Dmd (high) - Max	---	---	0.01 x kVA	F3	N/A
	0413	3 Phase Apparent Power Dmd (low) - Max					
	0414	Time - Hours/Min of Phase A Cur. Dmd Max	---	---	---	F22	N/A

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**** Minimum Setpoint value represents “OFF”.
***** Maximum Setpoint value represents “UNLIMITED”.

Table 1: PQMII Memory Map (Sheet 16 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
DEMAND continued	0415	Time - Seconds of Phase A Cur. Dmd Max	---	---	---	F23	N/A
	0416	Date - Mnth/Day of Phase A Cur. Dmd Max	---	---	---	F24	N/A
	0417	Date - Year of Phase A Cur. Dmd Max	---	---	---	F25	N/A
	0418	Time - Hours/Min of Phase B Cur. Dmd Max	---	---	---	F22	N/A
	0419	Time - Seconds of Phase B Cur. Dmd Max	---	---	---	F23	N/A
	041A	Date - Mnth/Day of Phase B Cur. Dmd Max	---	---	---	F24	N/A
	041B	Date - Year of Phase B Cur. Dmd Max	---	---	---	F25	N/A
	041C	Time - Hours/Min of Phase C Cur. Dmd Max	---	---	---	F22	N/A
	041D	Time - Seconds of Phase C Cur. Dmd Max	---	---	---	F23	N/A
	041E	Date - Mnth/Day of Phase C Cur. Dmd Max	---	---	---	F24	N/A
	041F	Date - Year of Phase C Cur. Dmd Max	---	---	---	F25	N/A
	0420	Time - Hours/Min of Neutral Cur. Dmd Max	---	---	---	F22	N/A
	0421	Time - Seconds of Neutral Cur. Dmd Max	---	---	---	F23	N/A
	0422	Date - Month/Day of Neutral Cur. Dmd Max	---	---	---	F24	N/A
	0423	Date - Year of Neutral Cur. Dmd Max	---	---	---	F25	N/A
	0424	Time - Hours/Min of Real Pwr Dmd Max	---	---	---	F22	N/A
	0425	Time - Seconds of Real Pwr Dmd Max	---	---	---	F23	N/A
	0426	Date - Month/Day of Real Pwr Dmd Max	---	---	---	F24	N/A
	0427	Date - Year of Real Pwr Dmd Max	---	---	---	F25	N/A
	0428	Time - Hours/Min of React Pwr Dmd Max	---	---	---	F22	N/A
	0429	Time - Seconds of React Pwr Dmd Max	---	---	---	F23	N/A
	042A	Date - Month/Day of React Pwr Dmd Max	---	---	---	F24	N/A
	042B	Date - Year of React Pwr Dmd Max	---	---	---	F25	N/A
	042C	Time - Hour/Min of App. Pwr Dmd Max	---	---	---	F22	N/A
	042D	Time - Seconds of Apparent Pwr Dmd Max	---	---	---	F23	N/A
	042E	Date - Month/Day of App. Pwr Dmd Max	---	---	---	F24	N/A
	042F	Date - Year of Apparent Pwr Dmd Max	---	---	---	F25	N/A
	0430	Reserved					
	to	↓	↓	↓	↓	↓	↓
	043F	Reserved					
FREQUENCY	0440	Frequency	---	---	0.01 x Hz	F1	N/A
	0441	Frequency Minimum	---	---	0.01 x Hz	F1	N/A
	0442	Frequency Maximum	---	---	0.01 x Hz	F1	N/A
	0443	Time - Hours/Min of Frequency Max	---	---	---	F22	N/A
	0444	Time - Seconds of Frequency Max	---	---	---	F23	N/A
	0445	Date - Month/Day of Frequency Max	---	---	---	F24	N/A
	0446	Date - Year of Frequency Max	---	---	---	F25	N/A
	0447	Time - Hours/Min of Frequency Min	---	---	---	F22	N/A

Notes: *Data type depends on the Command Operation Code.
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***** Maximum Setpoint value represents “UNLIMITED”.

Table 1: PQMII Memory Map (Sheet 17 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
FREQUENCY continued	0448	Time - Seconds of Frequency Min	---	---	---	F23	N/A
	0449	Date - Month/Day of Frequency Min	---	---	---	F24	N/A
	044A	Date - Year of Frequency Min	---	---	---	F25	N/A
	044B	Reserved					
	to	↓	↓	↓	↓	↓	↓
	044F	Reserved					
PULSE INPUT COUNTERS	0450	Pulse Input 1 (high)	---	---	---	F3	N/A
	0451	Pulse Input 1 (low)					
	0452	Pulse Input 2 (high)	---	---	---	F3	N/A
	0453	Pulse Input 2 (low)					
	0454	Pulse Input 3 (high)	---	---	---	F3	N/A
	0455	Pulse Input 3 (low)					
	0456	Pulse Input 4 (high)	---	---	---	F3	N/A
	0457	Pulse Input 4 (low)					
ANALOG INPUT	0458	Main/Alternate Analog Input (High)	---	---	---	F3	N/A
	0459	Main/Alternate Analog Input (low)					
	045A	Reserved					
	to	↓	↓	↓	↓	↓	↓
	045F	Reserved					
PULSE INPUT COUNTERS	0460	Totalized Pulse Input (high)	---	---	---	F3	N/A
	0461	Totalized Pulse Input (low)					
	0462	Pulse Count Cleared Time – Hours/Min	---	---	---	F22	N/A
	0463	Pulse Count Cleared Time – Seconds	---	---	---	F23	N/A
	0464	Pulse Count Cleared Date – Month/Day	---	---	---	F24	N/A
	0465	Pulse Count Cleared Date – Year	---	---	---	F25	N/A
	0466	Reserved					
	to	↓	↓	↓	↓	↓	↓
	046F	Reserved					
POWER QUALITY	0470	Ia Crest Factor	---	---	0.001 xCF	F1	N/A
	0471	Ib Crest Factor	---	---	0.001 xCF	F1	N/A
	0472	Ic Crest Factor	---	---	0.001 xCF	F1	N/A
	0473	Ia Transformer Harmonic Derating Factor	---	---	0.01xTHDF	F1	N/A
	0474	Ib Transformer Harmonic Derating Factor	---	---	0.01xTHDF	F1	N/A
	0475	Ic Transformer Harmonic Derating Factor	---	---	0.01xTHDF	F1	N/A
	0476	Reserved					
	0477	Reserved					
TOTAL HARMONIC DISTORTION	0478	Phase A Current THD	---	---	0.1 x %	F1	N/A
	0479	Phase B Current THD	---	---	0.1 x %	F1	N/A
	047A	Phase C Current THD	---	---	0.1 x %	F1	N/A
	047B	Neutral Current THD	---	---	0.1 x %	F1	N/A
	047C	Voltage Van THD	---	---	0.1 x %	F1	N/A
	047D	Voltage Vbn THD	---	---	0.1 x %	F1	N/A
	047E	Voltage Vcn THD	---	---	0.1 x %	F1	N/A
	047F	Voltage Vab THD	---	---	0.1 x %	F1	N/A
	0480	Voltage Vbc THD	---	---	0.1 x %	F1	N/A

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Table 1: PQMII Memory Map (Sheet 18 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
TOTAL HARMONIC DISTORTION continued	0481	Reserved					
	0482	Phase A Current THD - Maximum	---	---	0.1 x %	F1	N/A
	0483	Phase B Current THD - Maximum	---	---	0.1 x %	F1	N/A
	0484	Phase C Current THD - Maximum	---	---	0.1 x %	F1	N/A
	0485	Neutral Current THD - Maximum	---	---	0.1 x %	F1	N/A
	0486	Voltage Van THD - Maximum	---	---	0.1 x %	F1	N/A
	0487	Voltage Vbn THD - Maximum	---	---	0.1 x %	F1	N/A
	0488	Voltage Vcn THD - Maximum	---	---	0.1 x %	F1	N/A
	0489	Voltage Vab THD - Maximum	---	---	0.1 x %	F1	N/A
	048A	Voltage Vbc THD - Maximum	---	---	0.1 x %	F1	N/A
	048B	Reserved					
	048C	Time - Hour/Min of Phase A Cur. THD Max	---	---	---	F22	N/A
	048D	Time - Seconds of Phase A Cur. THD Max	---	---	---	F23	N/A
	048E	Date - Mnth/Day of Phase A Cur. THD Max	---	---	---	F24	N/A
	048F	Date - Year of Phase A Cur. THD Max	---	---	---	F25	N/A
	0490	Time - Hour/Min of Phase B Cur. THD Max	---	---	---	F22	N/A
	0491	Time - Seconds of Phase B Cur. THD Max	---	---	---	F23	N/A
	0492	Date - Mnth/Day of Phase B Cur. THD Max	---	---	---	F24	N/A
	0493	Date - Year of Phase B Cur. THD Max	---	---	---	F25	N/A
	0494	Time - Hour/Min of Phase C Cur. THD Max	---	---	---	F22	N/A
	0495	Time - Seconds of Phase C Cur. THD Max	---	---	---	F23	N/A
	0496	Date - Mnth/Day of Phase C Cur. THD Max	---	---	---	F24	N/A
POWER QUALITY continued	0497	Date - Year of Phase C Cur. THD Max	---	---	---	F25	N/A
	0498	Time - Hour/Min of Neutral Cur. THD Max	---	---	---	F22	N/A
	0499	Time - Seconds of Neutral Cur. THD Max	---	---	---	F23	N/A
	049A	Date - Mnth/Day of Neutral Cur. THD Max	---	---	---	F24	N/A
	049B	Date - Year of Neutral Cur. THD Max	---	---	---	F25	N/A
	049C	Time - Hours/Min of Van THD Max	---	---	---	F22	N/A
	049D	Time - Seconds of Van THD Max	---	---	---	F23	N/A
	049E	Date - Month/Day of Van THD Max	---	---	---	F24	N/A
	049F	Date - Year of Van THD Max	---	---	---	F25	N/A
	04A0	Time - Hours/Min of Vbn THD Max	---	---	---	F22	N/A
	04A1	Time - Seconds of Vbn THD Max	---	---	---	F23	N/A
	04A2	Date - Month/Day of Vbn THD Max	---	---	---	F24	N/A
	04A3	Date - Year of Vbn THD Max	---	---	---	F25	N/A
	04A4	Time - Hours/Min of Vcn THD Max	---	---	---	F22	N/A
	04A5	Time - Seconds of Vcn THD Max	---	---	---	F23	N/A
	04A6	Date - Month/Day of Vcn THD Max	---	---	---	F24	N/A
	04A7	Date - Year of Vcn THD Max	---	---	---	F25	N/A

Notes: *Data type depends on the Command Operation Code.
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Table 1: PQMII Memory Map (Sheet 19 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
TOTAL HARMONIC DISTORTION continued	04A8	Time - Hours/Min of Vab THD Max	---	---	---	F22	N/A
	04A9	Time - Seconds of Vab THD Max	---	---	---	F23	N/A
	04AA	Date - Month/Day of Vab THD Max	---	---	---	F24	N/A
	04AB	Date - Year of Vab THD Max	---	---	---	F25	N/A
	04AC	Time - Hours/Min of Vbc THD Max	---	---	---	F22	N/A
	04AD	Time - Seconds of Vbc THD Max	---	---	---	F23	N/A
	04AE	Date - Month/Day of Vbc THD Max	---	---	---	F24	N/A
	04AF	Date - Year of Vbc THD Max	---	---	---	F25	N/A
	04B0	Reserved					
	04B1	Reserved					
	04B2	Reserved					
	04B3	Reserved					
	04B4	Average Current THD	---	---	0.1 x%	F1	N/A
	04B5	Average Voltage THD	---	---	0.1 x%	F1	N/A
	04B6	Reserved					
	to	↓	↓	↓	↓	↓	↓
	04C7	Reserved					
DEBUG DATA	04C8	ADC Reference	---	---	---	F1	N/A
	04C9	Power Loss Fine Time	---	---	10 ms	F1	N/A
	04CA	Power Loss Coarse Time	---	---	0.1 min	F1	N/A
	04CB	Current Key Press	---	---	---	F6	N/A
	04CC	Internal Fault Error Code	---	---	---	F108	N/A
	04CD	Reserved					
	to	↓	↓	↓	↓	↓	↓
	04D7	Reserved					
MESSAGE BUFFER	04D8	Message Buffer characters 1 and 2	---	---	ASCII	F10	N/A
	04D9	Message Buffer characters 3 and 4	---	---	ASCII	F10	N/A
	04DA	Message Buffer characters 5 and 6	---	---	ASCII	F10	N/A
	04DB	Message Buffer characters 7 and 8	---	---	ASCII	F10	N/A
	04DC	Message Buffer characters 9 and 10	---	---	ASCII	F10	N/A
	04DD	Message Buffer characters 11 and 12	---	---	ASCII	F10	N/A
	04DE	Message Buffer characters 13 and 14	---	---	ASCII	F10	N/A
	04DF	Message Buffer characters 15 and 16	---	---	ASCII	F10	N/A
	04E0	Message Buffer characters 17 and 18	---	---	ASCII	F10	N/A
	04E1	Message Buffer characters 19 and 20	---	---	ASCII	F10	N/A
	04E2	Message Buffer characters 21 and 22	---	---	ASCII	F10	N/A
	04E3	Message Buffer characters 23 and 24	---	---	ASCII	F10	N/A
	04E4	Message Buffer characters 25 and 26	---	---	ASCII	F10	N/A
	04E5	Message Buffer characters 27 and 28	---	---	ASCII	F10	N/A
	04E6	Message Buffer characters 29 and 30	---	---	ASCII	F10	N/A
	04E7	Message Buffer characters 31 and 32	---	---	ASCII	F10	N/A
	04E8	Message Buffer characters 33 and 34	---	---	ASCII	F10	N/A
	04E9	Message Buffer characters 35 and 36	---	---	ASCII	F10	N/A

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Table 1: PQMII Memory Map (Sheet 20 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
MESSAGE BUFFER continued	04EA	Message Buffer characters 37 and 38	---	---	ASCII	F10	N/A
	04EB	Message Buffer characters 39 and 40	---	---	ASCII	F10	N/A
	04EC	Reserved					
	to	↓	↓	↓	↓	↓	↓
	04F7	Reserved					
HIGH SPEED SAMPLES FOR HARMONIC SPECTRUM	04F8	High Speed Sampling Parameter	---	---	---	F26	N/A
	04F9	High Speed Sampling Scale Factor (high)	---	---	A or V x 10000	F3	N/A
	04FA	High Speed Sampling Scale Factor (low)					
	04FB	Freq. of High Speed Sampling Waveform	---	---	0.01 xHz	F1	N/A
	04FC	Time - Hours/Minutes of Last Sampling	---	---	---	F22	N/A
	04FD	Time - Seconds of Last Sampling	---	---	---	F23	N/A
	04FE	Date - Month/Day of Last Sampling	---	---	---	F24	N/A
	04FF	Date - Year of Last Sampling	---	---	---	F25	N/A
	0500	High Speed Sample Buffer 1	---	---	ADC counts	F2	N/A
	0501	High Speed Sample Buffer 2	---	---	ADC counts	F2	N/A
	0502	High Speed Sample Buffer 3	---	---	ADC counts	F2	N/A
	0503	High Speed Sample Buffer 4	---	---	ADC counts	F2	N/A
	to	↓	↓	↓	↓	↓	↓
	05FD	High Speed Sample Buffer 254	---	---	ADC counts	F2	N/A
	05FE	High Speed Sample Buffer 255	---	---	ADC counts	F2	N/A
	05FF	High Speed Sample Buffer 256	---	---	ADC counts	F2	N/A
	0600	Reserved					
	to	↓	↓	↓	↓	↓	↓
	061F	Reserved					
WAVEFORM CAPTURE HEADER	0620	Time - Hours/Minutes of Last Capture	---	---	---	F22	N/A
	0621	Time - Seconds of Last Capture	---	---	---	F23	N/A
	0622	Date - Month/Day of Last Capture	---	---	---	F24	N/A
	0623	Date - Year of Last Capture	---	---	---	F25	N/A
	0624	Frequency of Last Capture	---	---	0.01 x Hz	F1	N/A
	0625	Reserved					
	0626	Reserved					
	0627	Reserved					
WAVEFORM CAPTURE Ia	0628	Ia Waveform Capture Scale Factor (high)	---	---	A x 10000	F3	N/A
	0629	Ia Waveform Capture Scale Factor (low)					
	062A	Ia Sample Buffer 1	---	---	ADC counts	F2	N/A
	062B	Ia Sample Buffer 2	---	---	ADC counts	F2	N/A
	062C	Ia Sample Buffer 3	---	---	ADC counts	F2	N/A
	062D	Ia Sample Buffer 4	---	---	ADC counts	F2	N/A
	to	↓	↓	↓	↓	↓	↓
	06A6	Ia Sample Buffer 125	---	---	ADC counts	F2	N/A
	06A7	Ia Sample Buffer 126	---	---	ADC counts	F2	N/A
	06A8	Ia Sample Buffer 127	---	---	ADC counts	F2	N/A
	06A9	Ia Sample Buffer 128	---	---	ADC counts	F2	N/A

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Table 1: PQMII Memory Map (Sheet 21 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
WAVEFORM CAPTURE Ia continued	06AA	Reserved					
	to	↓	↓	↓	↓	↓	↓
	06AF	Reserved					
WAVEFORM CAPTURE Ib	06B0	Ib Waveform Capture Scale Factor (high)	---	---	A x 10000	F3	N/A
	06B1	Ib Waveform Capture Scale Factor (low)					
	06B2	Ib Sample Buffer 1	---	---	ADC counts	F2	N/A
	06B3	Ib Sample Buffer 2	---	---	ADC counts	F2	N/A
	06B4	Ib Sample Buffer 3	---	---	ADC counts	F2	N/A
	06B5	Ib Sample Buffer 4	---	---	ADC counts	F2	N/A
	to	↓	↓	↓	↓	↓	↓
	072E	Ib Sample Buffer 125	---	---	ADC counts	F2	N/A
	072F	Ib Sample Buffer 126	---	---	ADC counts	F2	N/A
	0730	Ib Sample Buffer 127	---	---	ADC counts	F2	N/A
	0731	Ib Sample Buffer 128	---	---	ADC counts	F2	N/A
	0732	Reserved					
	to	↓	↓	↓	↓	↓	↓
	0737	Reserved					
WAVEFORM CAPTURE Ic	0738	Ic Waveform Capture Scale Factor (high)	---	---	A x 10000	F3	N/A
	0739	Ic Waveform Capture Scale Factor (low)					
	073A	Ic Sample Buffer 1	---	---	ADC counts	F2	N/A
	073B	Ic Sample Buffer 2	---	---	ADC counts	F2	N/A
	073C	Ic Sample Buffer 3	---	---	ADC counts	F2	N/A
	073D	Ic Sample Buffer 4	---	---	ADC counts	F2	N/A
	to	↓	↓	↓	↓	↓	↓
	07B6	Ic Sample Buffer 125	---	---	ADC counts	F2	N/A
	07B7	Ic Sample Buffer 126	---	---	ADC counts	F2	N/A
	07B8	Ic Sample Buffer 127	---	---	ADC counts	F2	N/A
	07B9	Ic Sample Buffer 128	---	---	ADC counts	F2	N/A
	07BA	Reserved					
	to	↓	↓	↓	↓	↓	↓
	07BF	Reserved					
WAVEFORM CAPTURE In	07C0	In Waveform Capture Scale Factor (high)	---	---	A x 10000	F3	N/A
	07C1	In Waveform Capture Scale Factor (low)					
	07C2	In Sample Buffer 1	---	---	ADC counts	F2	N/A
	07C3	In Sample Buffer 2	---	---	ADC counts	F2	N/A
	07C4	In Sample Buffer 3	---	---	ADC counts	F2	N/A
	07C5	In Sample Buffer 4	---	---	ADC counts	F2	N/A
	to	↓	↓	↓	↓	↓	↓
	083E	In Sample Buffer 125	---	---	ADC counts	F2	N/A
	083F	In Sample Buffer 126	---	---	ADC counts	F2	N/A
	0840	In Sample Buffer 127	---	---	ADC counts	F2	N/A
	0841	In Sample Buffer 128	---	---	ADC counts	F2	N/A
	0842	Reserved					

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Table 1: PQMII Memory Map (Sheet 22 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	to	↓	↓	↓	↓	↓	↓
	0847	Reserved					
WAVEFORM CAPTURE Van	0848	Van Waveform Capture Scale Factor (high)	---	---	V x 10000	F3	N/A
	0849	Van Waveform Capture Scale Factor (low)					
	084A	Van Sample Buffer 1	---	---	ADC counts	F2	N/A
	084B	Van Sample Buffer 2	---	---	ADC counts	F2	N/A
	084C	Van Sample Buffer 3	---	---	ADC counts	F2	N/A
	084D	Van Sample Buffer 4	---	---	ADC counts	F2	N/A
	to	↓	↓	↓	↓	↓	↓
	08C6	Van Sample Buffer 125	---	---	ADC counts	F2	N/A
	08C7	Van Sample Buffer 126	---	---	ADC counts	F2	N/A
	08C8	Van Sample Buffer 127	---	---	ADC counts	F2	N/A
	08C9	Van Sample Buffer 128	---	---	ADC counts	F2	N/A
	08CA	Reserved					
	to	↓	↓	↓	↓	↓	↓
	08CF	Reserved					
WAVEFORM CAPTURE Vbn	08D0	Vbn Waveform Capture Scale Factor (high)	---	---	V x 10000	F3	N/A
	08D1	Vbn Waveform Capture Scale Factor (low)					
	08D2	Vbn Sample Buffer 1	---	---	ADC counts	F2	N/A
	08D3	Vbn Sample Buffer 2	---	---	ADC counts	F2	N/A
	08D4	Vbn Sample Buffer 3	---	---	ADC counts	F2	N/A
	08D5	Vbn Sample Buffer 4	---	---	ADC counts	F2	N/A
	to	↓	↓	↓	↓	↓	↓
	094E	Vbn Sample Buffer 125	---	---	ADC counts	F2	N/A
	094F	Vbn Sample Buffer 126	---	---	ADC counts	F2	N/A
	0950	Vbn Sample Buffer 127	---	---	ADC counts	F2	N/A
	0951	Vbn Sample Buffer 128	---	---	ADC counts	F2	N/A
	0952	Reserved					
	to	↓	↓	↓	↓	↓	↓
	0957	Reserved					
WAVEFORM CAPTURE Vcn	0958	Vcn Waveform Capture Scale Factor (high)	---	---	V x 10000	F3	N/A
	0959	Vcn Waveform Capture Scale Factor (low)					
	095A	Vcn Sample Buffer 1	---	---	ADC counts	F2	N/A
	095B	Vcn Sample Buffer 2	---	---	ADC counts	F2	N/A
	095C	Vcn Sample Buffer 3	---	---	ADC counts	F2	N/A
	095D	Vcn Sample Buffer 4	---	---	ADC counts	F2	N/A
	to	↓	↓	↓	↓	↓	↓
	09D6	Vcn Sample Buffer 125	---	---	ADC counts	F2	N/A
	09D7	Vcn Sample Buffer 126	---	---	ADC counts	F2	N/A
	09D8	Vcn Sample Buffer 127	---	---	ADC counts	F2	N/A
	09D9	Vcn Sample Buffer 128	---	---	ADC counts	F2	N/A

Notes: *Data type depends on the Command Operation Code.
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Table 1: PQMII Memory Map (Sheet 23 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
WAVEFORM CAPTURE Vcn continued	09DA	Reserved					
	to	↓	↓	↓	↓	↓	↓
	09FF	Reserved					
DATA LOGGER DATA	0A00	Data Log Memory Access Block Number	---	---	---	F1	0
	0A01	Data Log Register 0	---	---	---	F1	---
	0A02	Data Log Register 1	---	---	---	F1	---
	0A03	Data Log Register 2	---	---	---	F1	---
	0A04	Data Log Register 3	---	---	---	F1	---
	to	↓	↓	↓	↓	↓	↓
	0A3D	Data Log Register 60	---	---	---	F1	---
	0A3E	Data Log Register 61	---	---	---	F1	---
	0A3F	Data Log Register 62	---	---	---	F1	---
	0A40	Data Log Register 63	---	---	---	F1	---
	0A41	Reserved					
	to	↓	↓	↓	↓	↓	↓
	0A4F	Reserved					
DATA LOGGER LOG NUMBERS	0A50	Ia Log Number	---	---	---	F110	0 = not selected
	0A51	Ib Log Number	---	---	---	F110	0 = not selected
	0A52	Ic Log Number	---	---	---	F110	0 = not selected
	0A53	Iavg Log Number	---	---	---	F110	0 = not selected
	0A54	In Log Number	---	---	---	F110	0 = not selected
	0A55	I Unbalance Log Number	---	---	---	F110	0 = not selected
	0A56	Van Log Number	---	---	---	F110	0 = not selected
	0A57	Vbn Log Number	---	---	---	F110	0 = not selected
	0A58	Vcn Log Number	---	---	---	F110	0 = not selected
	0A59	Vpavg Log Number	---	---	---	F110	0 = not selected
	0A5A	Vab Log Number	---	---	---	F110	0 = not selected
	0A5B	Vbc Log Number	---	---	---	F110	0 = not selected
	0A5C	Vca Log Number	---	---	---	F110	0 = not selected
	0A5D	Vlavg Log Number	---	---	---	F110	0 = not selected
	0A5E	V Unbalance Log Number	---	---	---	F110	0 = not selected
	0A5F	Pa Log Number	---	---	---	F110	0 = not selected
	0A60	Qa Log Number	---	---	---	F110	0 = not selected
	0A61	Sa Log Number	---	---	---	F110	0 = not selected
	0A62	PFa Log Number	---	---	---	F110	0 = not selected
	0A63	Pb Log Number	---	---	---	F110	0 = not selected
	0A64	Qb Log Number	---	---	---	F110	0 = not selected
	0A65	Sb Log Number	---	---	---	F110	0 = not selected
	0A66	PFb Log Number	---	---	---	F110	0 = not selected
	0A67	Pc Log Number	---	---	---	F110	0 = not selected
	0A68	Qc Log Number	---	---	---	F110	0 = not selected
	0A69	Sc Log Number	---	---	---	F110	0 = not selected
	0A6A	PFc Log Number	---	---	---	F110	0 = not selected
	0A6B	P3 Log Number	---	---	---	F110	0 = not selected
	0A6C	Q3 Log Number	---	---	---	F110	0 = not selected
	0A6D	S3 Log Number	---	---	---	F110	0 = not selected

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents “OFF”.
**** Minimum Setpoint value represents “OFF”.
***** Maximum Setpoint value represents “UNLIMITED”.

Table 1: PQMII Memory Map (Sheet 24 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
DATA LOGGER LOG NUMBERS continued	0A6E	PF3 Log Number	---	---	---	F110	0 = not selected
	0A6F	Frequency Log Number	---	---	---	F110	0 = not selected
	0A70	Positive kWh Log Number	---	---	---	F110	0 = not selected
	0A71	Negative kWh Log Number	---	---	---	F110	0 = not selected
	0A72	Positive kvarh Log Number	---	---	---	F110	0 = not selected
	0A73	Negative kvarh Log Number	---	---	---	F110	0 = not selected
	0A74	kVAh Log Number	---	---	---	F110	0 = not selected
	0A75	Ia Demand Log Number	---	---	---	F110	0 = not selected
	0A76	Ib Demand Log Number	---	---	---	F110	0 = not selected
	0A77	Ic Demand Log Number	---	---	---	F110	0 = not selected
	0A78	In Demand Log Number	---	---	---	F110	0 = not selected
	0A79	P3 Demand Log Number	---	---	---	F110	0 = not selected
	0A7A	Q3 Demand Log Number	---	---	---	F110	0 = not selected
	0A7B	S3 Demand Log Number	---	---	---	F110	0 = not selected
	0A7C	Ia THD Log Number	---	---	---	F110	0 = not selected
	0A7D	Ib THD Log Number	---	---	---	F110	0 = not selected
	0A7E	Ic THD Log Number	---	---	---	F110	0 = not selected
	0A7F	In THD Log Number	---	---	---	F110	0 = not selected
	0A80	Van THD Log Number	---	---	---	F110	0 = not selected
	0A81	Vbn THD Log Number	---	---	---	F110	0 = not selected
	0A82	Vcn THD Log Number	---	---	---	F110	0 = not selected
	0A83	Vab THD Log Number	---	---	---	F110	0 = not selected
	0A84	Vbc THD Log Number	---	---	---	F110	0 = not selected
	0A85	Analog Input Log Number	---	---	---	F110	0 = not selected
	0A86	Reserved					
	to	↓	↓	↓	↓	↓	↓
	0A8F	Reserved					
DATA LOGGER LOG 1 HEADER	0A90	Log 1 Time Interval (high)	---	---	s	F3	N/A
	0A91	Log 1 Time Interval (low)					
	0A92	Log 1 Time - Hours/Minutes	---	---	---	F22	N/A
	0A93	Log 1 Time - Seconds	---	---	---	F23	N/A
	0A94	Log 1 Date - Month/Day	---	---	---	F24	N/A
	0A95	Log 1 Date - Year	---	---	---	F25	N/A
	0A96	Log 1 Start Block Number	---	---	---	F1	0
	0A97	Log 1 Start Register Number	---	---	---	F1	0
	0A98	Log 1 Record Size	---	---	bytes	F1	0
	0A99	Log 1 Total Records (high)				F3	
	0A9A	Log 1 Total Records (low)					
	0A9B	Log 1 Block Number of First Record				F1	
	0A9C	Log 1 Register Number of First Record				F1	
	0A9D	Log 1 Pointer to 1st Item of 1st Rec. (high)	---	---	---	F1	0
	0A9E	Log 1 Pointer to 1st Item of 1st Record (low)	---	---	---	F1	0
	0A9F	Log 1 Block Number of Next Record to Write				F1	
	0AA0	Log 1 Register No. of Next Record to Write				F1	

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents "OFF".
**** Minimum Setpoint value represents "OFF".
***** Maximum Setpoint value represents "UNLIMITED".

Table 1: PQMII Memory Map (Sheet 25 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
DATA LOGGER LOG 1 HEADER continued	0AA1	Log 1 Pointer of 1st Item of Record after Last (high)				F3	
	0AA2	Log 1 Pointer of 1st Item of Record after Last (low)					
	0AA3	Log 1 Status	---	---	---	F35	0 = STOPPED
	0AA4	Log 1 Records Used (high)				F3	
	0AA5	Log 1 Records Used (low)					
	0AA6	Log 1 Time Until next Reading (high)	---	---	s	F3	N/A
	0AA7	Log 1 Time Until next Reading (low)					
	0AA8	Reserved					
	to	↓	↓	↓	↓	↓	↓
	0AAB	Reserved					
DATA LOGGER LOG 2 HEADER	0AAC	Log 2 Time Interval (high)	---	---	s	F3	N/A
	0AAD	Log 2 Time Interval (low)					
	0AAE	Log 2 Time - Hours/Minutes	---	---	---	F22	N/A
	0AAF	Log 2 Time - Seconds	---	---	---	F23	N/A
	0AB0	Log 2 Date - Month/Day	---	---	---	F24	N/A
	0AB1	Log 2 Date - Year	---	---	---	F25	N/A
	0AB2	Log 2 Start Block Number	---	---	---	F1	0
	0AB3	Log 2 Start Register Number	---	---	---	F1	0
	0AB4	Log 2 Record Size	---	---	bytes	F1	0
	0AB5	Log 2 Total Records (high)				F3	
	0AB6	Log 2 Total Records (low)					
	0AB7	Log 2 Block Number of First Record				F1	
	0AB8	Log 2 Register Number of First Record				F1	
	0AB9	Log 2 Pointer to 1st Item of 1st Rec. (high)	---	---	---	F1	0
	0ABA	Log 2 Pointer to 1st Item of 1st Record (low)	---	---	---	F1	0
	0ABB	Log 2 Block Number of Next Record to Write				F1	
	0ABC	Log 2 Register No. of Next Record to Write				F1	
	0ABD	Log 2 Pointer of 1st Item of Record after Last (high)				F3	
	0ABE	Log 2 Pointer of 1st Item of Record after Last (low)					
	0ABF	Log 2 Status	---	---	---	F35	0 = STOPPED
	0AC0	Log 2 Records Used (high)				F3	
	0AC1	Log 2 Records Used (low)					
	0AC2	Log 2 Time Until next Reading (high)	---	---	s	F3	N/A
	0AC3	Log 2 Time Until next Reading (low)					
	0AC4	Reserved					
	to	↓	↓	↓	↓	↓	↓
	0ACF	Reserved					
EVENT RECORD	0AD0	Total Number of Events Since Last Clear	---	---	---	F1	0
	0AD1	Event Record Last Cleared Time - Hrs./ Min.	---	---	---	F22	N/A
	0AD2	Event Record Last Cleared Time - Seconds	---	---	---	F23	N/A
	0AD3	Event Record Last Cleared Date - Month/Day	---	---	---	F24	N/A

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents “OFF”.
**** Minimum Setpoint value represents “OFF”.
***** Maximum Setpoint value represents “UNLIMITED”.

Table 1: PQMII Memory Map (Sheet 26 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
EVENT RECORD continued	0AD4	Event Record Last Cleared Date - Year	---	---	---	F25	N/A
	0AD5	Reserved					
	to	↓	↓	↓	↓	↓	↓
	0ADF	Reserved					
	0AE0	Record #N Event Number	---	---	---	F1	N/A
	0AE1	Record #N Event Cause	---	---	---	F36	0 = NO EVENT
	0AE2	Record #N Time - Hours/Minutes	---	---	---	F22	N/A
	0AE3	Record #N Time - Seconds	---	---	---	F23	N/A
	0AE4	Record #N Date - Month/Day	---	---	---	F24	N/A
	0AE5	Record #N Date - Year	---	---	---	F25	N/A
	0AE6	Record #N Switches and Relays States	---	---	---	F111	N/A
	0AE7	Record #N Ia	---	---	A	F1	N/A
	0AE8	Record #N Ib	---	---	A	F1	N/A
	0AE9	Record #N Ic	---	---	A	F1	N/A
	0AEA	Record #N In	---	---	A	F1	N/A
	0AEB	Record #N I Unbalance	---	---	0.1 x%	F1	N/A
	0AEC	Record #N Van (high)	---	---	V	F3	N/A
	0AED	Record #N Van (low)					
	0AEE	Record #N Vbn (high)	---	---	V	F3	N/A
	0AEF	Record #N Vbn (low)					
	0AF0	Record #N Vcn (high)	---	---	V	F3	N/A
	0AF1	Record #N Vcn (low)					
	0AF2	Record #N Vab (high)	---	---	V	F3	N/A
	0AF3	Record #N Vab (low)					
	0AF4	Record #N Vbc (high)	---	---	V	F3	N/A
	0AF5	Record #N Vbc (low)					
	0AF6	Record #N Vca (high)	---	---	V	F3	N/A
	0AF7	Record #N Vca (low)					
	0AF8	Record #N V Unbalance	---	---	0.1 x%	F1	N/A
	0AF9	Record #N Pa (high)	---	---	0.01 x kW	F4	N/A
	0AFA	Record #N Pa (low)					
	0AFB	Record #N Qa (high)	---	---	0.01 x kvar	F4	N/A
	0AFC	Record #N Qa (low)					
	0AFD	Record #N Sa (high)	---	---	0.01 x kVA	F3	N/A
	0AFE	Record #N Sa (low)					
	0AFF	Record #N PFa	---	---	0.01 x PF	F2	N/A
	0B00	Record #N Pb (high)	---	---	0.01 x kW	F4	N/A
	0B01	Record #N Pb (low)					
	0B02	Record #N Qb (high)	---	---	0.01 x kvar	F4	N/A
	0B03	Record #N Qb (low)					
	0B04	Record #N Sb (high)	---	---	0.01 x kVA	F3	N/A
	0B05	Record #N Sb (low)					
	0B06	Record #N PFb	---	---	0.01 x PF	F2	N/A
	0B07	Record #N Pc (high)	---	---	0.01 x kW	F4	N/A
	0B08	Record #N Pc (low)					

Notes: *Data type depends on the Command Operation Code.
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Table 1: PQMII Memory Map (Sheet 27 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
EVENT RECORD continued	0B09	Record #N Qc (high)	---	---	0.01 x kvar	F4	N/A
	0B0A	Record #N Qc (low)					
	0B0B	Record #N Sc (high)	---	---	0.01 x kVA	F3	N/A
	0B0C	Record #N Sc (low)					
	0B0D	Record #N PFc	---	---	0.01 x PF	F2	N/A
	0B0E	Record #N P3 (high)	---	---	0.01 x kW	F4	N/A
	0B0F	Record #N P3 (low)					
	0B10	Record #N Q3 (high)	---	---	0.01 x kvar	F4	N/A
	0B11	Record #N Q3 (low)					
	0B12	Record #N S3 (high)	---	---	0.01 x kVA	F3	N/A
	0B13	Record #N S3 (low)					
	0B14	Record #N PF3	---	---	0.01 x PF	F2	N/A
	0B15	Record #N Frequency	---	---	0.01 x Hz	F1	N/A
	0B16	Record #N Positive kWh (high)	---	---	kWh	F3	N/A
	0B17	Record #N Positive kWh (low)					
	0B18	Record #N Negative kWh (high)	---	---	kWh	F3	N/A
	0B19	Record #N Negative kWh (low)					
	0B1A	Record #N Positive kvarh (high)	---	---	kvarh	F3	N/A
	0B1B	Record #N Positive kvarh (low)					
	0B1C	Record #N Negative kvarh (high)	---	---	kvarh	F3	N/A
	0B1D	Record #N Negative kvarh (low)					
	0B1E	Record #N kVAh (high)	---	---	kVAh	F3	N/A
	0B1F	Record #N kVAh (low)					
	0B20	Record #N Ia Demand	---	---	A	F1	N/A
	0B21	Record #N Ib Demand	---	---	A	F1	N/A
	0B22	Record #N Ic Demand	---	---	A	F1	N/A
	0B23	Record #N In Demand	---	---	A	F1	N/A
	0B24	Record #N P3 Demand (high)	---	---	0.01 x kW	F4	N/A
	0B25	Record #N P3 Demand (low)					
	0B26	Record #N Q3 Demand (high)	---	---	0.01 x kvar	F4	N/A
	0B27	Record #N Q3 Demand (low)					
	0B28	Record #N S3 Demand (high)	---	---	0.01 x kVA	F3	N/A
	0B29	Record #N S3 Demand (low)					
	0B2A	Record #N Ia THD	---	---	0.1 x %	F1	N/A
	0B2B	Record #N Ib THD	---	---	0.1 x %	F1	N/A
	0B2C	Record #N Ic THD	---	---	0.1 x %	F1	N/A
	0B2D	Record #N In THD	---	---	0.1 x %	F1	N/A
	0B2E	Record #N Van THD	---	---	0.1 x %	F1	N/A
	0B2F	Record #N Vbn THD	---	---	0.1 x %	F1	N/A
	0B30	Record #N Vcn THD	---	---	0.1 x %	F1	N/A
	0B31	Record #N Vab THD	---	---	0.1 x %	F1	N/A
	0B32	Record #N Vbc THD	---	---	0.1 x %	F1	N/A
	0B33	Record #N Analog Input (high)	---	---	---	F3	N/A
	0B34	Record #N Analog Input (low)					
	0B35	Record #N Trace Memory Trigger Cause	---	---	---	F41	N/A

Notes: *Data type depends on the Command Operation Code.
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*** Maximum Setpoint value represents "OFF".
**** Minimum Setpoint value represents "OFF".
***** Maximum Setpoint value represents "UNLIMITED".

Table 1: PQMII Memory Map (Sheet 28 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	0B36	Record #N Internal Fault Error Code	---	---	---	F108	N/A
EVENT RECORD continued	0B37	Reserved					
	to	↓	↓	↓	↓	↓	↓
	0B7F	Reserved					
TRACE MEMORY	0B80	Trace Memory Usage	---	---	---	F37	N/A
	0B81	Trace Memory Trigger Flag	---	---	---	F113	N/A
	0B82	Trace Memory Trigger Counter	---	---	---	F1	N/A
	0B83	Total Trace Memory Triggers	---	---	---	F1	N/A
	0B88	Trigger Cause - Trace 1	---	---	---	F41	N/A
	0B89	Time - Hours/Minutes - Trace 1	---	---	---	F22	N/A
	0B8A	Time - Seconds - Trace 1	---	---	---	F23	N/A
	0B8B	Date - Month/Day - Trace 1	---	---	---	F24	N/A
	0B8C	Date - Year - Trace 1	---	---	---	F25	N/A
	0B8D	Trigger Sample Number 1	---	---	---	F1	N/A
	0B8E	Frequency 1	---	---	0.01 x Hz	F1	N/A
	0B98	Trigger Cause - Trace 2	---	---	---	F41	N/A
	0B99	Time - Hours/Minutes - Trace 2	---	---	---	F22	N/A
	0B9A	Time - Seconds - Trace 2	---	---	---	F23	N/A
	0B9B	Date - Month/Day - Trace 2	---	---	---	F24	N/A
	0B9C	Date - Year - Trace 2	---	---	---	F25	N/A
	0B9D	Trigger Sample Number 2	---	---	---	F1	N/A
	0B9E	Frequency 2	---	---	0.01 x Hz	F1	N/A
	0BA8	Trigger Cause - Trace 3	---	---	---	F41	N/A
	0BA9	Time - Hours/Minutes - Trace 3	---	---	---	F22	N/A
	0BAA	Time - Seconds - Trace 3	---	---	---	F23	N/A
	0BAB	Date - Month/Day - Trace 3	---	---	---	F24	N/A
	0BAC	Date - Year - Trace 3	---	---	---	F25	N/A
	0BAD	Trigger Sample Number 3	---	---	---	F1	N/A
	0BAE	Frequency 3	---	---	0.01xHz	F1	N/A
	0BB8	Trace Memory Waveform Selection	---	---	---	F40	N/A
	0BB9	Waveform Scale Factor (high)	---	---	A/Vx10000	F3	N/A
	0BBA	Waveform Scale Factor (low)					
	0BBB	Data Buffer 1	---	---	ADCcounts/2	F2	N/A
	0BBC	Data Buffer 2	---	---	ADCcounts/2	F2	N/A
	to	↓	↓	↓	↓	↓	↓
	0DF9	Data Buffer 575	---	---	ADCcounts/2	F2	N/A
	0DFA	Data Buffer 576	---	---	ADCcounts/2	F2	N/A
	0DFB	Reserved					
	to	↓	↓	↓	↓	↓	↓
	0DFF	Reserved					
	0E00	Invalid Serial Number Flag	---	---	---	F117	N/A
	0E01	Reserved					
	to	↓	↓	↓	↓	↓	↓
	0E1F	Reserved					

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents "OFF".
**** Minimum Setpoint value represents "OFF".
***** Maximum Setpoint value represents "UNLIMITED".

Table 1: PQMII Memory Map (Sheet 29 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
VOLTAGE DISTUR-BANCE RECORDER	0E20	Disturbances since Last Clear	---	---	---	F1	0
	0E21	Swell/Sag Last Cleared Time (Hrs./Min.)	---	---	---	F22	N/A
	0E22	Swell/Sag Last Cleared Time (Sec.)	---	---	---	F23	N/A
	0E23	Swell/Sag Last Cleared Date (Month/ Day.)	---	---	---	F24	N/A
	0E24	Swell/Sag Last Cleared Date (Year.)	---	---	---	F25	N/A
	0E25	Reserved					
	to	↓	↓	↓	↓	↓	↓
	0E2F	Reserved					
	0E30	Record *N* Disturbance Number				F1	N/A
	0E31	Record *N* Disturbance Type				F118	N/A
	0E32	Record *N* Disturbance Source				F119	N/A
	0E33	Record *N* Time (hours/minutes)				F22	N/A
	0E34	Record *N* Time (seconds)				F23	N/A
	0E35	Record *N* Date (month/day)				F24	N/A
	0E36	Record *N* Date (seconds)				F25	N/A
	0E37	Record *N* Over/Undervoltage Duration (high)			cycles	F3	N/A
	0E38	Record *N* Over/Undervoltage Duration (low)					
	0E39	Record *N* Average Voltage (high)			0.1 × V	F3	N/A
	0E3A	Record *N* Average Voltage (low)					
	0E3B	Reserved					
	to	↓	↓	↓	↓	↓	↓
	0FFF	Reserved					
Setpoint Values (Holding Registers) Addresses: 1000 to 131F							
METER ID	1000	Meter ID characters 1 and 2	---	---	ASCII	F10	N/A
	1001	Meter ID characters 3 and 4	---	---	ASCII	F10	N/A
	1002	Meter ID characters 5 and 6	---	---	ASCII	F10	N/A
	1003	Meter ID characters 7 and 8	---	---	ASCII	F10	N/A
	1004	Meter ID characters 9 and 10	---	---	ASCII	F10	N/A
	1005	Meter ID characters 11 and 12	---	---	ASCII	F10	N/A
	1006	Meter ID characters 13 and 14	---	---	ASCII	F10	N/A
	1007	Meter ID characters 15 and 16	---	---	ASCII	F10	N/A
	1008	Meter ID characters 17 and 18	---	---	ASCII	F10	N/A
	1009	Meter ID characters 19 and 20	---	---	ASCII	F10	N/A
	100A	Reserved					
	to	↓	↓	↓	↓	↓	↓
	100F	Reserved					
PREFERENCES	1010	Default Message Time	1 to 1201***	1	min x0.1	F1	10 = 1.0 min
	1011	Reserved					
	1012	Display Filter Constant	1 to 10	1	---	F1	4
	1013	Reserved					
	to	↓	↓	↓	↓	↓	↓
	1017	Reserved					

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents “OFF”.
**** Minimum Setpoint value represents “OFF”.
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Table 1: PQMII Memory Map (Sheet 30 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
RS485 COM1 SERIAL PORT	1018	Serial Communication Address	1 to 255	1	---	F1	1
	1019	Modbus Baud Rate for RS485 COM1	0 to 4	1	---	F12	3 = 9600
	101A	Parity for RS485 COM1	0 to 2	1	---	F13	0 = NONE
	101B	Reserved					
	to	↓	↓	↓	↓	↓	↓
	101F	Reserved					
RS485 COM2 SERIAL PORT	1020	Modbus Baud Rate for RS485 COM2	0 to 4	1	---	F12	3 = 9600
	1021	Parity for RS485 COM2	0 to 2	1	---	F13	0 = NONE
	1022	Reserved					
	to	↓	↓	↓	↓	↓	↓
	1027	Reserved					
RS232 SERIAL PORT	1028	Modbus Baud Rate for RS232	0 to 4	1	---	F12	3 = 9600
	1029	Parity for RS232	0 to 2	1	---	F13	0 = NONE
	102A	Reserved					
	to	↓	↓	↓	↓	↓	↓
	102F	Reserved					
CALCU-LATION PARAMETERS	1030	Current Demand Calculation Type	0 to 2	1	---	F28	0 = Thermal Exponential
	1031	Current Demand Time Interval	5 to 180	1	minutes	F1	30 min
	1032	Power Demand Calculation Type	0 to 2	1	---	F28	0 = Thermal Exponential
	1033	Power Demand Time Interval	5 to 180	1	minutes	F1	30 min
	1034	Energy Cost Per kWh	1 to 50000	1	¢ × 0.01	F1	10.00 ¢
	1035	Extract Fundamental	0 to 1	1	---	F11	0=DISABLE
	1036	Reserved					
	1037	Reserved					
CLEAR DATA	1038	Clear Energy Values	0 to 1	1	---	F31	0 = NO
	1039	Clear Max Demand Values	0 to 1	1	---	F31	0 = NO
	103A	Clear Min/Max Current Values	0 to 1	1	---	F31	0 = NO
	103B	Clear Min/Max Voltage Values	0 to 1	1	---	F31	0 = NO
	103C	Clear Min/Max Power Values	0 to 1	1	---	F31	0 = NO
	103D	Clear Max THD Values	0 to 1	1	---	F31	0 = NO
	103E	Clear Pulse Input Values	0 to 1	1	---	F31	0 = NO
	103F	Clear Event Record	0 to 1	1	---	F31	0 = NO
	1040	Clear All Demand Values	0 to 1	1	---	F31	0 = NO
	1041	Clear Frequency Values	0 to 1	1	---	F31	0 = NO
	1042	Reserved					
	1043	Reserved					
DNP	1044	DNP Port	0 to 3	1	---	F47	0 = NONE
	1045	DNP Slave Address	0 to 255	1	---	F1	0
	1046	DNP Turnaround Time	0 to 100	10	ms	F1	10 ms
TARIFF	1047	Tariff Period 1 Start Time	0 to 1439	1	minutes	F1	0 min.
	1048	Tariff Period 1 Cost per kWh	1 to 50000	1	¢ × 0.01	F1	10.00 ¢
	1049	Tariff Period 2 Start Time	0 to 1439	1	minutes	F1	0 min.
	104A	Tariff Period 2 Cost per kWh	1 to 50000	1	¢ × 0.01	F1	10.00 ¢
	104B	Tariff Period 3 Start Time	0 to 1439	1	minutes	F1	0 min.
	104C	Tariff Period 3 Cost per kWh	1 to 50000	1	¢ × 0.01	F1	10.00 ¢

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents “OFF”.
**** Minimum Setpoint value represents “OFF”.
***** Maximum Setpoint value represents “UNLIMITED”.

Table 1: PQMII Memory Map (Sheet 31 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
TARIFF continued	104D	Reserved					
	104E	Reserved					
	104F	Reserved					
CURRENT /VOLTAGE CONFIG.	1050	Phase CT Primary	0 to 12000****	5	A	F1	0 = OFF
	1051	Neutral Current Sensing	0 to 2	1	---	F16	0 = OFF
	1052	Neutral CT Primary	5 to 6000	5	A	F1	100 A
	1053	VT Wiring	0 to 6	1	---	F15	0 = OFF
	1054	VT Ratio	10 to 35000	1	0.1 × ratio	F1	1.0:1
	1055	VT Nominal Secondary Voltage	40 to 600	1	V	F1	120 V
	1056	Nominal Direct Input Voltage	40 to 600	1	V	F1	600 V
	1057	Nominal Frequency	50 to 60	10	Hz	F1	60 Hz
	1058	CT Wiring	0 to 3	1	---	F44	0=A,B AND C
	1059	Reserved					
	to	↓	↓	↓	↓	↓	↓
	105F	Reserved					
ANALOG OUTPUT 1	1060	Analog Output 1 Main Type	0 to 59	1	---	F14	5=Avg Ph Current
	1061	Analog Output 1 Main Min Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				0
	1062	Analog Output 1 Main Max Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				0
	1063	Analog Output 1 Alternate Type	0 to 59	1	---	F14	0=NOT USED
	1064	Analog Output 1 Alternate Min Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				0
	1065	Analog Output 1 Alternate Max Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				0
	1066	Reserved					
	1067	Analog Output 1 Serial Value		1	---	F2	0
ANALOG OUTPUT 2	1068	Analog Output 2 Main Type	0 to 59	1	---	F14	18=3Ph Real Pwr
	1069	Analog Output 2 Main Min Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				0
	106A	Analog Output 2 Main Max Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				0
	106B	Analog Output 2 Alternate Type	0 to 59	1	---	F14	0=NOT USED
	106C	Analog Output 2 Alternate Min Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				0
	106D	Analog Output 2 Alternate Max Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				0
	106E	Reserved					
	106F	Analog Output 2 Serial Value		1	---	F2	0
ANALOG OUTPUT 3	1070	Analog Output 3 Main Type	0 to 59	1	---	F14	19=3Ph React Pwr
	1071	Analog Output 3 Main Min Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				
	1072	Analog Output 3 Main Max Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				
	1073	Analog Output 3 Alternate Type	0 to 59	1	---	F14	0=NOT USED
	1074	Analog Output 3 Alternate Min Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				
	1075	Analog Output 3 Alternate Max Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				
	1076	Reserved					
	1077	Analog Output 3 Serial Value		1	---	F2	0

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents "OFF".
**** Minimum Setpoint value represents "OFF".
***** Maximum Setpoint value represents "UNLIMITED".

Table 1: PQMII Memory Map (Sheet 32 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
ANALOG OUTPUT 4	1078	Analog Output 4 Main Type	0 to 59	1	---	F14	17=3Ph Pwr Factor
	1079	Analog Output 4 Main Min Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				
	107A	Analog Output 4 Main Max Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				
	107B	Analog Output 4 Alternate Type	0 to 59	1	---	F14	0=NOT USED
	107C	Analog Output 4 Alternate Min Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				
	107D	Analog Output 4 Alternate Max Value	See *"Analog Output Parameter Range for Serial Ports" on page COMM-74*				
	107E	Reserved					
	107F	Analog Output 4 Serial Value		1	---	F2	0
ANALOG INPUT	1080	Analog Input Main/Alt Select Relay	0 to 3	1	---	F19	0=OFF
	1081	Analog In Main Name 1st and 2nd char.	---	---	ASCII	F10	""
	1082	Analog In Main Name 3rd and 4th char.	---	---	ASCII	F10	"MA"
	1083	Analog In Main Name 5th and 6th char.	---	---	ASCII	F10	"IN"
	1084	Analog In Main Name 7th and 8th char.	---	---	ASCII	F10	" A"
	1085	Analog In Main Name 9th and 10th char.	--	--	ASCII	F10	"NA"
	1086	Analog In Main Name 11th and 12th char.	--	--	ASCII	F10	"LO"
	1087	Analog In Main Name 13th and 14th char.	---	---	ASCII	F10	"G "
	1088	Analog In Main Name 15h and 16th char.	----	----	ASCII	F10	"IN"
	1089	Analog In Main Name 17th and 18th char.	---	---	ASCII	F10	"PU"
	108A	Analog In Main Name 19th and 20th char.	---	---	ASCII	F10	"T "
	108B	Analog In Main Units 1st and 2nd char.	---	---	ASCII	F10	" U"
	108C	Analog In Main Units 3rd and 4th char.	---	---	ASCII	F10	"ni"
	108D	Analog In Main Units 5th and 6th char.	---	---	ASCII	F10	"ts"
	108E	Analog In Main Units 7th and 8th char.	---	---	ASCII	F10	""
	108F	Analog In Main Units 9th and 10th char.	---	---	ASCII	F10	""
	1090	Analog Input Main 4 mA Value	0 to 65000	1	---	F1	0
	1091	Analog Input Main 20 mA Value	0 to 65000	1	---	F1	0
	1092	Analog Input Main Relay	0 to 4	1	---	F29	0=OFF
	1093	Analog Input Main Level	0 to 65000	1	---	F1	0
	1094	Analog Input Main Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	1095	Reserved					
	1096	Reserved					
	1097	Reserved					
	1098	Analog In Alt Name 1st and 2nd char.	---	---	ASCII	F10	""
	1099	Analog In Alt Name 3rd and 4th char.	---	---	ASCII	F10	"AL"
	109A	Analog In Alt Name 5th and 6th char.	---	---	ASCII	F10	"T "
	109B	Analog In Alt Name 7th and 8th char.	---	---	ASCII	F10	" A"
	109C	Analog In Alt Name 9th and 10th char.	--	--	ASCII	F10	"NA"
	109D	Analog In Alt Name 11th and 12th char.	--	--	ASCII	F10	"LO"

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents "OFF".
**** Minimum Setpoint value represents "OFF".
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Table 1: PQMII Memory Map (Sheet 33 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	109E	Analog In Alt Name 13th and 14th char.	---	---	ASCII	F10	"G "
	109F	Analog In Alt Name 15h and 16th char.	----	----	ASCII	F10	"IN"
	10A0	Analog In Alt Name 17th and 18th char.	---	---	ASCII	F10	"PU"
ANALOG INPUT continued	10A1	Analog In Alt Name 19th and 20th char.	---	---	ASCII	F10	"T "
	10A2	Analog In Alt Units 1st and 2nd char.	---	---	ASCII	F10	" U"
	10A3	Analog In Alt Units 3rd and 4th char.	---	---	ASCII	F10	"ni"
	10A4	Analog In Alt Units 5th and 6th char.	---	---	ASCII	F10	"ts"
	10A5	Analog In Alt Units 7th and 8th char.	---	---	ASCII	F10	" "
	10A6	Analog In Alt Units 9th and 10th char.	---	---	ASCII	F10	" "
	10A7	Analog Input Alt 4 mA Value	0 to 65000	1	---	F1	0
	10A8	Analog Input Alt 20 mA Value	0 to 65000	1	---	F1	0
	10A9	Analog Input Alt Relay	0-4	1	---	F29	0=OFF
	10AA	Analog Input Alt Level	0 to 65000	1	---	F1	0
	10AB	Analog Input Alt Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	10AC	Reserved					
	to	↓	↓	↓	↓	↓	↓
	10AF	Reserved					
SWITCH A	10B0	Switch A Name characters 1 and 2	---	---	ASCII	F10	" "
	10B1	Switch A Name characters 3 and 4	---	---	ASCII	F10	" S"
	10B2	Switch A Name characters 5 and 6	---	---	ASCII	F10	"WI"
	10B3	Switch A Name characters 7 and 8	---	---	ASCII	F10	"TC"
	10B4	Switch A Name characters 9 and 10	---	---	ASCII	F10	"H "
	10B5	Switch A Name characters 11 and 12	---	---	ASCII	F10	"IN"
	10B6	Switch A Name characters 13 and 14	---	---	ASCII	F10	"PU"
	10B7	Switch A Name characters 15 and 16	---	---	ASCII	F10	"T "
	10B8	Switch A Name characters 17 and 18	---	---	ASCII	F10	"A "
	10B9	Switch A Name characters 19 and 20	---	---	ASCII	F10	" "
	10BA	Switch A Function	0 to 14	1	---	F20	0 = Not Used
	10BB	Switch A Activation	0 to 1	1	---	F27	1 = Closed
	10BC	Switch A Time Delay	0 to 6000	1	0.1 x s	F1	0.0 s
	10BD	Reserved					
	10BE	Reserved					
	10BF	Reserved					
SWITCH B	10C0	Switch B Name characters 1 and 2	---	---	ASCII	F10	" "
	10C1	Switch B Name characters 3 and 4	---	---	ASCII	F10	" S"
	10C2	Switch B Name characters 5 and 6	---	---	ASCII	F10	"WI"
	10C3	Switch B Name characters 7 and 8	---	---	ASCII	F10	"TC"
	10C4	Switch B Name characters 9 and 10	---	---	ASCII	F10	"H "
	10C5	Switch B Name characters 11 and 12	---	---	ASCII	F10	"IN"
	10C6	Switch B Name characters 13 and 14	---	---	ASCII	F10	"PU"
	10C7	Switch B Name characters 15 and 16	---	---	ASCII	F10	"T "
	10C8	Switch B Name characters 17 and 18	---	---	ASCII	F10	"B "
	10C9	Switch B Name characters 19 and 20	---	---	ASCII	F10	" "
	10CA	Switch B Function	0 to 14	1	---	F20	0=NOT USED
	10CB	Switch B Activation	0 to 1	1	---	F27	1=CLOSED
	10CC	Switch B Time Delay	0 to 6000	1	0.1 x s	F1	0.0 s

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents "OFF".
**** Minimum Setpoint value represents "OFF".
***** Maximum Setpoint value represents "UNLIMITED".

Table 1: PQMII Memory Map (Sheet 34 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	10CD	Reserved					
	10CE	Reserved					
	10CF	Reserved					
SWITCH C	10D0	Switch C Name characters 1 and 2	---	---	ASCII	F10	“ ”
	10D1	Switch C Name characters 3 and 4	---	---	ASCII	F10	“ S”
	10D2	Switch C Name characters 5 and 6	---	---	ASCII	F10	“WI”
	10D3	Switch C Name characters 7 and 8	---	---	ASCII	F10	“TC”
	10D4	Switch C Name characters 9 and 10	---	---	ASCII	F10	“H ”
	10D5	Switch C Name characters 11 and 12	---	---	ASCII	F10	“IN”
	10D6	Switch C Name characters 13 and 14	---	---	ASCII	F10	“PU”
	10D7	Switch C Name characters 15 and 16	---	---	ASCII	F10	“T ”
	10D8	Switch C Name characters 17 and 18	---	---	ASCII	F10	“C ”
	10D9	Switch C Name characters 19 and 20	---	---	ASCII	F10	“ ”
	10DA	Switch C Function	0 to 14	1	---	F20	0=NOT USED
	10DB	Switch C Activation	0 to 1	1	---	F27	1=CLOSED
	10DC	Switch C Time Delay	0 to 6000	1	0.1 x s	F1	0.0 s
	10DD	Reserved					
	10DE	Reserved					
	10DF	Reserved					
SWITCH D	10E0	Switch D Name characters 1 and 2	---	---	ASCII	F10	“ ”
	10E1	Switch D Name characters 3 and 4	---	---	ASCII	F10	“ S”
	10E2	Switch D Name characters 5 and 6	---	---	ASCII	F10	“WI”
	10E3	Switch D Name characters 7 and 8	---	---	ASCII	F10	“TC”
	10E4	Switch D Name characters 9 and 10	---	---	ASCII	F10	“H ”
	10E5	Switch D Name characters 11 and 12	---	---	ASCII	F10	“IN”
	10E6	Switch D Name characters 13 and 14	---	---	ASCII	F10	“PU”
	10E7	Switch D Name characters 15 and 16	---	---	ASCII	F10	“T ”
	10E8	Switch D Name characters 17 and 18	---	---	ASCII	F10	“D ”
	10E9	Switch D Name characters 19 and 20	---	---	ASCII	F10	“ ”
	10EA	Switch D Function	0 to 14	1	---	F20	0=NOT USED
	10EB	Switch D Activation	0 to 1	1	---	F27	1=CLOSED
	10EC	Switch D Time Delay	0 to 6000	1	0.1 x s	F1	0.0 s
	10ED	Reserved					
	10EE	Reserved					
	10EF	Reserved					
PULSE OUTPUT	10F0	Positive kWh Pulse Output Relay	0 to 4	1	---	F29	0=OFF
	10F1	Positive kWh Pulse Output Interval	1 to 65000	1	kWh	F1	100 kWh
	10F2	Negative kWh Pulse Output Relay	0 to 4	1	---	F29	0=OFF
	10F3	Negative kWh Pulse Output Interval	1 to 65000	1	kWh	F1	100 kWh
	10F4	Positive kvarh Pulse Output Relay	0 to 4	1	---	F29	0=OFF
	10F5	Positive kvarh Pulse Output Interval	1 to 65000	1	kvarh	F1	100 kvarh
	10F6	Negative kvarh Pulse Output Relay	0 to 4	1	---	F29	0=OFF
	10F7	Negative kvarh Pulse Output Interval	1 to 65000	1	kvarh	F1	100 kvarh
	10F8	kVAh Pulse Output Relay	0 to 4	1	---	F29	0=OFF
	10F9	kVAh Pulse Output Interval	1 to 65000	1	kVAh	F1	100 kVAh
	10FA	Pulse Output Width	100 to 2000	10	ms	F1	100 ms

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents “OFF”.
**** Minimum Setpoint value represents “OFF”.
***** Maximum Setpoint value represents “UNLIMITED”.

Table 1: PQMII Memory Map (Sheet 35 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	10FB	Serial Pulse Relay Interval	100 to 10000	100	ms	F1	100 ms
	10FC	Reserved					
PULSE INPUT	10FD	Pulse Input Units 1st and 2nd char.	---	---	ASCII	F10	“ U”
	10FE	Pulse Input Units 3rd and 4th char.	---	---	ASCII	F10	“ni”
	10FF	Pulse Input Units 5th and 6th char.	---	---	ASCII	F10	“ts”
	1100	Pulse Input Units 7th and 8th char.	---	---	ASCII	F10	“ ”
	1101	Pulse Input Units 9th and 10th char.	---	---	ASCII	F10	“ ”
	1102	Pulse Input 1 Value	0 to 65000	1	Units	F1	1
	1103	Pulse Input 2 Value	0 to 65000	1	Units	F1	1
	1104	Pulse Input 3 Value	0 to 65000	1	Units	F1	1
	1105	Pulse Input 4 Value	0 to 65000	1	Units	F1	1
	1106	Pulse Input Total	0 to 10	1	---	F43	9 = 1+2+3+4
	1107	Reserved					
ALARM RELAY	1108	Alarm Relay Operation	0 to 1	1	---	F17	0 = NON-FAILSAFE
	1109	Alarm Relay Activation	0 to 1	1	---	F18	0 = UNLATCHED
	110A	Reserved					
	to	↓	↓	↓	↓	↓	↓
	110F	Reserved					
AUXILIARY RELAY 1	1110	Auxiliary Relay 1 Operation	0 to 1	1	---	F17	0 = NON-FAILSAFE
	1111	Auxiliary Relay 1 Activation	0 to 1	1	---	F18	0 = UNLATCHED
	1112	Reserved					
	to	↓	↓	↓	↓	↓	↓
	1117	Reserved					
AUXILIARY RELAY 2	1118	Auxiliary Relay 2 Operation	0 to 1	1	---	F17	0 = NON-FAILSAFE
	1119	Auxiliary Relay 2 Activation	0 to 1	1	---	F18	0 = UNLATCHED
	111A	Reserved					
	to	↓	↓	↓	↓	↓	↓
	111F	Reserved					
AUXILIARY RELAY 3	1120	Auxiliary Relay 3 Operation	0 to 1	1	---	F17	0 = NON-FAILSAFE
	1121	Auxiliary Relay 3 Activation	0 to 1	1	---	F18	0 = UNLATCHED
	1122	Reserved					
	1123	Reserved					
	1124	Reserved					
	1125	Reserved					
CURRENT/ VOLTAGE ALARMS	1126	Phase Overcurrent Activation	0 to 1	1	---	F115	0=AVERAGE
	1127	Detect I/V Alarms Using Percentage	0 to 1	1	---	F31	0=NO
	1128	Phase Undercurrent Relay	0 to 4	1	---	F29	0=OFF
	1129	Phase Undercurrent Level in Amps	1 to 12000	1	A	F1	100 A
	112A	Phase Undercurrent Delay	5 to 6000	5	0.1 × s	F1	100=10.0 s
	112B	Phase Overcurrent Relay	0 to 4	1	---	F29	0=OFF
	112C	Phase Overcurrent Level in Amps	1 to 12000	1	A	F1	100 A
	112D	Phase Overcurrent Delay	5 to 6000	5	0.1 × s	F1	100=10.0 s
	112E	Neutral Overcurrent Relay	0 to 4	1	---	F29	0=OFF
	112F	Neutral Overcurrent Level in Amps	1 to 12000	1	A	F1	100 A
	1130	Neutral Overcurrent Delay	5 to 6000	5	0.1 × s	F1	100=10.0 s
	1131	Undervoltage Relay	0 to 4	1	---	F29	0=OFF

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents “OFF”.
**** Minimum Setpoint value represents “OFF”.
***** Maximum Setpoint value represents “UNLIMITED”.

Table 1: PQMII Memory Map (Sheet 36 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	1132	Undervoltage Level in Volts	20 to 65000	1	V	F1	100 V
	1133	Undervoltage Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
CURRENT/ VOLTAGE ALARMS continued	1134	Phases Req'd for Operation of Undervoltage	0 to 2	1	---	F30	0=ANY ONE
	1135	Detect Undervoltage Below 20 V	0 to 1	1	---	F11	0=DISABLE
	1136	Overvoltage Relay	0 to 4	1	---	F29	0=OFF
	1137	Overvoltage Level in Volts	1 to 65000	1	V	F1	100 V
	1138	Overvoltage Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	1139	Phases Req'd for Operation of Overvoltage	0 to 2	1	---	F30	0=ANY ONE
	113A	Phase Current Unbalance Relay	0 to 4	1	---	F29	0=OFF
	113B	Phase Current Unbalance Level	1 to 100	1	%	F1	10%
	113C	Phase Current Unbalance Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	113D	Voltage Unbalance Relay	0 to 4	1	---	F29	0=OFF
	113E	Voltage Unbalance Level	1 to 100	1	%	F1	10%
	113F	Voltage Unbalance Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	1140	Voltage Phase Reversal Relay	0 to 4	1	---	F29	0=OFF
	1141	Voltage Phase Reversal Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	1142	Detect Undercurrent When 0A	0 to 1	1	---	F31	0=NO
	1143	Phase Undercurrent Level in % of CT	1 to 100	1	%	F1	100%
	1144	Phase Overcurrent Level in % of CT	1 to 150	1	%	F1	100%
	1145	Neutral Overcurrent Level in % of CT	1 to 150	1	%	F1	100%
	1146	Undervoltage Level in % of VT	20 to 100	1	%	F1	100%
	1147	Overvoltage Level in % of VT	20 to 150	1	%	F1	100%
TOTAL HARMONIC DISTORTION ALARMS	1148	Average Current THD Relay	0 to 4	1	---	F29	0=OFF
	1149	Average Current THD Level	5 to 1000	5	0.1 x %	F1	100=10.0%
	114A	Average Current THD Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	114B	Average Voltage THD Relay	0 to 4	1	---	F29	0=OFF
	114C	Average Voltage THD Level	5 to 1000	5	0.1 x %	F1	100=10.0%
	114D	Average Voltage THD Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	114E	Reserved					
	to	↓	↓	↓	↓	↓	↓
	1157	Reserved					
FREQUENCY ALARMS	1158	Underfrequency Relay	0 to 4	1	---	F29	0=OFF
	1159	Underfrequency Level	2000 to 7000	1	0.01 x Hz	F1	40.00 Hz
	115A	Underfrequency Delay	1 to 100	1	0.1 x s	F1	100=10.0 s
	115B	Zero Frequency Detect	0 to 1	1	---	F11	0=DISABLE
	115C	Overfrequency Relay	0 to 4	1	---	F29	0=OFF
	115D	Overfrequency Level	2000 to 12500	1	0.01 x Hz	F1	70.00 Hz
	115E	Overfrequency Delay	1 to 100	1	0.1 x s	F1	100=10.0 s
	115F	Reserved					
	to	↓	↓	↓	↓	↓	↓
	1166	Reserved					
POWER ALARMS	1167	Power Alarms Level Base Units	0 to 1	1	---	F114	0=kW/kVAR
	1168	Positive Real Power Relay	0 to 4	1	---	F29	0=OFF
	1169	Positive Real Power Level in kW	1 to 65000	1	kW	F1	1000 kW
	116A	Positive Real Power Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents "OFF".
**** Minimum Setpoint value represents "OFF".
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Table 1: PQMII Memory Map (Sheet 37 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	116B	Negative Real Power Relay	0 to 4	1	---	F29	0=OFF
	116C	Negative Real Power Level in kW	1 to 65000	1	kW	F1	1000 kW
POWER ALARMS continued	116D	Negative Real Power Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	116E	Positive Reactive Power Relay	0 to 4	1	---	F29	0=OFF
	116F	Positive Reactive Power Level in kVAR	1 to 65000	1	kVAR	F1	1000 kVAR
	1170	Positive Reactive Power Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	1171	Negative Reactive Power Relay	0 to 4	1	---	F29	0=OFF
	1172	Negative Reactive Power Level in kVAR	1 to 65000	1	kVAR	F1	1000 kVAR
	1173	Negative Reactive Power Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	1174	Positive Real Power Level in MW	1 to 65000	1	0.01 MW	F1	10.00MW
	1175	Negative Real Power Level in MW	1 to 65000	1	0.01 MW	F1	10.00MW
	1176	Positive Reactive Power Level in MVAR	1 to 65000	1	0.01 MVAR	F1	10.00MVAR
	1177	Negative Reactive Power Level in MVAR	1 to 65000	1	0.01 MVAR	F1	10.00MVAR
POWER FACTOR ALARMS	1178	Power Factor Lead 1 Relay	0 to 4	1	---	F29	0=OFF
	1179	Power Factor Lead 1 Pickup Level	0 to 100	1	0.01 x PF	F1	0.99
	117A	Power Factor Lead 1 Dropout Level	0 to 100	1	0.01 x PF	F1	1.00
	117B	Power Factor Lead 1 Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	117C	Power Factor Lag 1 Relay	0 to 4	1	---	F29	0=OFF
	117D	Power Factor Lag 1 Pickup Level	0 to 100	1	0.01 x PF	F1	0.99
	117E	Power Factor Lag 1 Dropout Level	0 to 100	1	0.01 x PF	F1	1.00
	117F	Power Factor Lag 1 Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	1180	Power Factor Lead 2 Relay	0 to 4	1	---	F29	0=OFF
	1181	Power Factor Lead 2 Pickup Level	0 to 100	1	0.01 x PF	F1	0.99
	1182	Power Factor Lead 2 Dropout Level	0 to 100	1	0.01 x PF	F1	1.00
	1183	Power Factor Lead 2 Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	1184	Power Factor Lag 2 Relay	0 to 4	1	---	F29	0=OFF
	1185	Power Factor Lag 2 Pickup Level	0 to 100	1	0.01 x PF	F1	0.99
	1186	Power Factor Lag 2 Dropout Level	0 to 100	1	0.01 x PF	F1	1.00
	1187	Power Factor Lag 2 Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	1188	Reserved					
	to	↓	↓	↓	↓	↓	↓
	118F	Reserved					
DEMAND ALARMS	1190	Phase A Current Demand Relay	0 to 4	1	---	F29	0=OFF
	1191	Phase A Current Demand Level	10 to 7500	1	A	F1	100 A
	1192	Phase B Current Demand Relay	0 to 4	1	---	F29	0=OFF
	1193	Phase B Current Demand Level	10 to 7500	1	A	F1	100 A
	1194	Phase C Current Demand Relay	0 to 4	1	---	F29	0=OFF
	1195	Phase C Current Demand Level	10 to 7500	1	A	F1	100 A
	1196	Neutral Current Demand Relay	0 to 4	1	---	F29	0=OFF
	1197	Neutral Current Demand Level	10 to 7500	1	A	F1	100 A
	1198	Positive Real Power Demand Relay	0 to 4	1	---	F29	0=OFF
	1199	Positive Real Power Demand Level	1 to 65000	1	kW	F1	1000 kW
	119A	Positive Reactive Power Demand Relay	0 to 4	1	---	F29	0=OFF
	119B	Positive Reactive Power Demand Level	1 to 65000	1	kvar	F1	1000 kvar
	119C	Apparent Power Demand Relay	0 to 4	1	---	F29	0=OFF
	119D	Apparent Power Demand Level	1 to 65000	1	kVA	F1	1000 kVA

Notes: *Data type depends on the Command Operation Code.
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Table 1: PQMII Memory Map (Sheet 38 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	119E	Negative Real Power Demand Relay	0 to 4	1	---	F29	0=OFF
	119F	Negative Real Power Demand Level	1 to 65000	1	kW	F1	1000 kW
DEMAND ALARMS continued	11A0	Negative Reactive Power Demand Relay	0 to 4	1	---	F29	0=OFF
	11A1	Negative Reactive Power Demand Level	1 to 65000	1	kvar	F1	1000 kvar
	11A2	Reserved					
	to	↓	↓	↓	↓	↓	↓
	11A7	Reserved					
PULSE INPUT ALARMS	11A8	Pulse Input 1 Relay	0 to 4	1	---	F29	0=OFF
	11A9	Pulse Input 1 Level	1 to 65000	1	---	F1	100
	11AA	Pulse Input 1 Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	11AB	Reserved					
	to	↓	↓	↓	↓	↓	↓
	11AF	Reserved					
MISC. ALARMS	11B0	Serial COM1 Failure Alarm Delay	5 to 61***	1	s	F1	61=OFF
	11B1	Serial COM2 Failure Alarm Delay	5 to 61***	1	s	F1	61=OFF
	11B2	Clock Not Set Alarm	0 to 1	1	---	F11	0 = DISABLED
	11B3	Data Log 1 Percentage Full Alarm Level	50 to 101***	1	%	F1	101=OFF
	11B4	Data Log 2 Percentage Full Alarm Level	50 to 101***	1	%	F1	101=OFF
	11B5	Reserved					
	11B6	Reserved					
	11B7	Reserved					
PULSE INPUT ALARMS	11B8	Pulse Input 2 Relay	0 to 4	1	---	F29	0=OFF
	11B9	Pulse Input 2 Level	1 to 65000	1	---	F1	100
	11BA	Pulse Input 2 Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	11BB	Pulse Input 3 Relay	0 to 4	1	---	F29	0=OFF
	11BC	Pulse Input 3 Level	1 to 65000	1	---	F1	100
	11BD	Pulse Input 3 Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	11BE	Pulse Input 4 Relay	0 to 4	1	---	F29	0=OFF
	11BF	Pulse Input 4 Level	1 to 65000	1	---	F1	100
	11C0	Pulse Input 4 Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	11C1	Totalized Pulse Input Relay	0 to 4	1	---	F29	0=OFF
	11C2	Totalized Pulse Input Level	1 to 65000	1	---	F1	100
	11C3	Totalized Pulse Input Delay	5 to 6000	5	0.1 x s	F1	100=10.0 s
	11C4	Reserved					
	to	↓	↓	↓	↓	↓	↓
	11C7	Reserved					
SIMULATION	11C8	Current/Voltage Simulation	0 to 1	1	---	F11	0=OFF
	11C9	Current/Voltage Simulation Time	5 to 305	5	min	F1*****	15 min
	11CA	Phase A Current	0 to 10000	1	A	F1	0 A
	11CB	Phase B Current	0 to 10000	1	A	F1	0 A
	11CC	Phase C Current	0 to 10000	1	A	F1	0 A
	11CD	Neutral Current	0 to 10000	1	A	F1	0 A
	11CE	Vax Voltage	0 to 65000	1	V	F1	0 V
	11CF	Vbx Voltage	0 to 65000	1	V	F1	0 V

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Table 1: PQMII Memory Map (Sheet 39 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	11D0	Vcx Voltage	0 to 65000	1	V	F1	0 V
	11D1	Phase Angle	0 to 359	1	degrees	F1	0 degrees
SIMULATION continued	11D2	Analog Output Simulation	0 to 1	1	---	F11	0=OFF
	11D3	Analog Output Simulation Time	5 to 305	5	min	F1*****	15 min
	11D4	Analog Output 1	0 to 1201***	1	0.1 x %	F1	1201=OFF
	11D5	Analog Output 2	0 to 1201***	1	0.1 x %	F1	1201=OFF
	11D6	Analog Output 3	0 to 1201***	1	0.1 x %	F1	1201=OFF
	11D7	Analog Output 4	0 to 1201***	1	0.1 x %	F1	1201=OFF
	11D8	Analog Input Simulation	0 to 1	1	---	F11	0=OFF
	11D9	Analog Input Simulation Time	5 to 305	5	min	F1*****	15 min
	11DA	Analog Input	40 to 201	1	0.1 x mA	F1	201=OFF
	11DB	Switch Input Simulation	0 to 1	1	---	F11	0=OFF
	11DC	Switch Input Simulation Time	5 to 305	5	min	F1*****	15 min
	11DD	Switch Input A	0 to 1	1	---	F27	0=OPEN
	11DE	Switch Input B	0 to 1	1	---	F27	0=OPEN
	11DF	Switch Input C	0 to 1	1	---	F27	0=OPEN
	11E0	Switch Input D	0 to 1	1	---	F27	0=OPEN
	11E1	Reserved					
	11E2	Reserved					
	11E3	Reserved					
TIME ALARM	11E4	Time Relay	0 to 4	1	---	F29	0=OFF
	11E5	Pickup Time Hours/Minutes	0 to 65535	1	hr./min	F22	12:00
	11E6	Pickup Time Seconds	0 to 59000	1000	ms	F1	0
	11E7	Dropout Time Hours/Minutes	0 to 65535	1	hr./min	F22	12:00
	11E8	Dropout Time Seconds	0 to 59000	1000	ms	F1	0
	11E9	Reserved					
	to	↓	↓	↓	↓	↓	↓
	11EF	Reserved					
PROGRAM-MABLE MESSAGE	11F0	Programmable message chars 1 & 2	32 to 127	1	ASCII	F10	"Ph"
	11F1	Programmable message chars 3 & 4	32 to 127	1	ASCII	F10	"on"
	11F2	Programmable message chars 5 & 6	32 to 127	1	ASCII	F10	"e:"
	11F3	Programmable message chars 7 & 8	32 to 127	1	ASCII	F10	" 9"
	11F4	Programmable message chars 9 & 10	32 to 127	1	ASCII	F10	"05"
	11F5	Programmable message chars 11 & 12	32 to 127	1	ASCII	F10	"-2"
	11F6	Programmable message chars 13 & 14	32 to 127	1	ASCII	F10	"94"
	11F7	Programmable message chars 15 & 16	32 to 127	1	ASCII	F10	"-6"
	11F8	Programmable message chars 17 & 18	32 to 127	1	ASCII	F10	"22"
	11F9	Programmable message chars 19 & 20	32 to 127	1	ASCII	F10	"2 "
	11FA	Programmable message chars 21 & 22	32 to 127	1	ASCII	F10	"GE"
	11FB	Programmable message chars 23 & 24	32 to 127	1	ASCII	F10	"in"
	11FC	Programmable message chars 25 & 26	32 to 127	1	ASCII	F10	"du"
	11FD	Programmable message chars 27 & 28	32 to 127	1	ASCII	F10	"st"
	11FE	Programmable message chars 29 & 30	32 to 127	1	ASCII	F10	"ri"
	11FF	Programmable message chars 31 & 32	32 to 127	1	ASCII	F10	"al"
	1200	Programmable message chars 33 & 34	32 to 127	1	ASCII	F10	".c"
	1201	Programmable message chars 35 & 36	32 to 127	1	ASCII	F10	"om"

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Table 1: PQMII Memory Map (Sheet 40 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	1202	Programmable message chars 37 & 38	32 to 127	1	ASCII	F10	"/p"
	1203	Programmable message chars 39 & 40	32 to 127	1	ASCII	F10	"m "
PROGRAM-MABLE MESSAGE continued	1204	Reserved					
	to	↓	↓	↓	↓	↓	↓
	120F	Reserved					
FLASH MESSAGE	1210	Flash message characters 1 and 2	32 to 127	1	ASCII	F10	""
	1211	Flash message characters 3 and 4	32 to 127	1	ASCII	F10	""
	1212	Flash message characters 5 and 6	32 to 127	1	ASCII	F10	""
	1213	Flash message characters 7 and 8	32 to 127	1	ASCII	F10	""
	1214	Flash message characters 9 and 10	32 to 127	1	ASCII	F10	""
	1215	Flash message characters 11 and 12	32 to 127	1	ASCII	F10	""
	1216	Flash message characters 13 and 14	32 to 127	1	ASCII	F10	""
	1217	Flash message characters 15 and 16	32 to 127	1	ASCII	F10	""
	1218	Flash message characters 17 and 18	32 to 127	1	ASCII	F10	""
	1219	Flash message characters 19 and 20	32 to 127	1	ASCII	F10	""
	121A	Flash message characters 21 and 22	32 to 127	1	ASCII	F10	""
	121B	Flash message characters 23 and 24	32 to 127	1	ASCII	F10	""
	121C	Flash message characters 25 and 26	32 to 127	1	ASCII	F10	""
	121D	Flash message characters 27 and 28	32 to 127	1	ASCII	F10	""
	121E	Flash message characters 29 and 30	32 to 127	1	ASCII	F10	""
	121F	Flash message characters 31 and 32	32 to 127	1	ASCII	F10	""
	1220	Flash message characters 33 and 34	32 to 127	1	ASCII	F10	""
	1221	Flash message characters 35 and 36	32 to 127	1	ASCII	F10	""
	1222	Flash message characters 37 and 38	32 to 127	1	ASCII	F10	""
	1223	Flash message characters 39 and 40	32 to 127	1	ASCII	F10	""
	1224	Reserved					
	to	↓	↓	↓	↓	↓	↓
	125F	Reserved					
DATA LOGGER	1260	Log 1 Interval (high)	1 to 86400	1	s	F3	3600
	1261	Log 1 Interval (low)					
	1262	Log 2 Interval (high)	1 to 86400	1	s	F3	3600
	1263	Log 2 Interval (low)					
	1264	Log 1 Mode	0 to 1	1	---	F32	0 = RUN TO FILL
	1265	Log 2 Mode	0 to 1	1	---	F32	0 = RUN TO FILL
	1266	Log Size Determination	0 to 1	1	---	F33	0 = AUTOMATIC
	1267	Log 1 Size	0 to 100	1	%	F1	50%
	1268	Data Log Memory Access Block Number	0 to 511	1	---	F1	0
	1269	Stop Data Log 1	0 to 1	1	---	F31	0=NO
	126A	Stop Data Log 2	0 to 1	1	---	F31	0=NO
	126B	Reserved					
	to	↓	↓	↓	↓	↓	↓
	126F	Reserved					
	1270	Ia Log Assignment	0 to 3	1	---	F34	0 = NONE
	1271	Ib Log Assignment	0 to 3	1	---	F34	0 = NONE
	1272	Ic Log Assignment	0 to 3	1	---	F34	0 = NONE
	1273	Iavg Log Assignment	0 to 3	1	---	F34	0 = NONE

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Table 1: PQMII Memory Map (Sheet 41 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	1274	In Log Assignment	0 to 3	1	---	F34	0 = NONE
	1275	I Unbalance Log Assignment	0 to 3	1	---	F34	0 = NONE
DATA LOGGER continued	1276	Van Log Assignment	0 to 3	1	---	F34	0 = NONE
	1277	Vbn Log Assignment	0 to 3	1	---	F34	0 = NONE
	1278	Vcn Log Assignment	0 to 3	1	---	F34	0 = NONE
	1279	Vp avg Log Assignment	0 to 3	1	---	F34	0 = NONE
	127A	Vab Log Assignment	0 to 3	1	---	F34	0 = NONE
	127B	Vbc Log Assignment	0 to 3	1	---	F34	0 = NONE
	127C	Vca Log Assignment	0 to 3	1	---	F34	0 = NONE
	127D	Vl avg Log Assignment	0 to 3	1	---	F34	0 = NONE
	127E	V Unbalance Log Assignment	0 to 3	1	---	F34	0 = NONE
	127F	Pa Log Assignment	0 to 3	1	---	F34	0 = NONE
	1280	Qa Log Assignment	0 to 3	1	---	F34	0 = NONE
	1281	Sa Log Assignment	0 to 3	1	---	F34	0 = NONE
	1282	PFa Log Assignment	0 to 3	1	---	F34	0 = NONE
	1283	Pb Log Assignment	0 to 3	1	---	F34	0 = NONE
	1284	Qb Log Assignment	0 to 3	1	---	F34	0 = NONE
	1285	Sb Log Assignment	0 to 3	1	---	F34	0 = NONE
	1286	PFb Log Assignment	0 to 3	1	---	F34	0 = NONE
	1287	Pc Log Assignment	0 to 3	1	---	F34	0 = NONE
	1288	Qc Log Assignment	0 to 3	1	---	F34	0 = NONE
	1289	Sc Log Assignment	0 to 3	1	---	F34	0 = NONE
	128A	PFc Log Assignment	0 to 3	1	---	F34	0 = NONE
	128B	P3 Log Assignment	0 to 3	1	---	F34	0 = NONE
	128C	Q3 Log Assignment	0 to 3	1	---	F34	0 = NONE
	128D	S3 Log Assignment	0 to 3	1	---	F34	0 = NONE
	128E	PF3 Log Assignment	0 to 3	1	---	F34	0 = NONE
	128F	Frequency Log Assignment	0 to 3	1	---	F34	0 = NONE
	1290	Positive kWh Log Assignment	0 to 3	1	---	F34	0 = NONE
	1291	Negative kWh Log Assignment	0 to 3	1	---	F34	0 = NONE
	1292	Positive kvarh Log Assignment	0 to 3	1	---	F34	0 = NONE
	1293	Negative kvarh Log Assignment	0 to 3	1	---	F34	0 = NONE
	1294	kVAh Log Assignment	0 to 3	1	---	F34	0 = NONE
	1295	Ia Demand Log Assignment	0 to 3	1	---	F34	0 = NONE
	1296	Ib Demand Log Assignment	0 to 3	1	---	F34	0 = NONE
	1297	Ic Demand Log Assignment	0 to 3	1	---	F34	0 = NONE
	1298	In Demand Log Assignment	0 to 3	1	---	F34	0 = NONE
	1299	P3 Demand Log Assignment	0 to 3	1	---	F34	0 = NONE
	129A	Q3 Demand Log Assignment	0 to 3	1	---	F34	0 = NONE
	129B	S3 Demand Log Assignment	0 to 3	1	---	F34	0 = NONE
	129C	Ia THD Log Assignment	0 to 3	1	---	F34	0 = NONE
	129D	Ib THD Log Assignment	0 to 3	1	---	F34	0 = NONE
	129E	Ic THD Log Assignment	0 to 3	1	---	F34	0 = NONE
	129F	In THD Log Assignment	0 to 3	1	---	F34	0 = NONE

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Table 1: PQMII Memory Map (Sheet 42 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	12A0	Van THD Log Assignment	0 to 3	1	---	F34	0 = NONE
	12A1	Vbn THD Log Assignment	0 to 3	1	---	F34	0 = NONE
	12A2	Vcn THD Log Assignment	0 to 3	1	---	F34	0 = NONE
	12A3	Vab THD Log Assignment	0 to 3	1	---	F34	0 = NONE
DATA LOGGER continued	12A4	Vbc THD Log Assignment	0 to 3	1	---	F34	0 = NONE
	12A5	Analog Input Log Assignment	0 to 3	1	---	F34	0 = NONE
	12A6	Reserved					
	to	↓	↓	↓	↓	↓	↓
	12BF	Reserved					
EVENT RECORDER	12C0	Event Recorder Memory Access Event Num	0 to 65535	1	---	F1	0
	12C1	Event Recorder Operation	0 to 1	1	---	F11	0 = DISABLE
	12C2	Event Recorder Event Enable Flags 1	0 to 65535	1	---	F105	65535
	12C3	Event Recorder Event Enable Flags 2	0 to 65535	1	---	F106	65535
	12C4	Event Recorder Event Enable Flags 3	0 to 65535	1	---	F107	65535
	12C5	Event Recorder Event Enable Flags 4	0 to 65535	1	---	F112	65535
	12C6	Reserved					
	to	↓	↓	↓	↓	↓	↓
	12CF	Reserved					
TRACE MEMORY	12D0	Trace Memory Usage	0 to 2	1	---	F37	0=1x36 cycles
	12D1	Trace Memory Trigger Mode	0 to 1	1	---	F38	0=ONE SHOT
	12D2	Ia Overcurrent Trigger Level	1 to 151***	1	% CT	F1	151=OFF
	12D3	Ib Overcurrent Trigger Level	1 to 151***	1	% CT	F1	151=OFF
	12D4	Ic Overcurrent Trigger Level	1 to 151***	1	% CT	F1	151=OFF
	12D5	In Overcurrent Trigger Level	1 to 151***		% CT	F1	151=OFF
	12D6	Va Overvoltage Trigger Level	20 to 151***	1	% VT	F1	151=OFF
	12D7	Vb Overvoltage Trigger Level	20 to 151***	1	% VT	F1	151=OFF
	12D8	Vc Overvoltage Trigger Level	20 to 151***	1	% VT	F1	151=OFF
	12D9	Va Undervoltage Trigger Level	20 to 151***	1	% VT	F1	151=OFF
	12DA	Vb Undervoltage Trigger Level	20 to 151***	1	% VT	F1	151=OFF
	12DB	Vc Undervoltage Trigger Level	20 to 151***	1	% VT	F1	151=OFF
	12DC	Switch Input A Trigger	0 to 2	1	---	F39	0=OFF
	12DD	Switch Input B Trigger	0 to 2	1	---	F39	0=OFF
	12DE	Switch Input C Trigger	0 to 2	1	---	F39	0=OFF
	12DF	Switch Input D Trigger	0 to 2	1	---	F39	0=OFF
	12E0	Trace Memory Trigger Delay	0 to 30	1	cycles	F1	0 cycles
	12E1	Trace Memory Waveform Selection	0 to 6	1	---	F40	0=Ia
	12E2	Trace Memory Trigger Relay	0 to 4	1	---	F29	0=OFF
	12E3	Reserved					
	to	↓	↓	↓	↓	↓	↓
	12EF	Reserved					
PRODUCT OPTIONS	12F0	Product Options Upgrade	1 to 23	1	---	F116	1=PQMII
	12F1	Product Modifications Upgrade MOD1	0 to 999	1	---	F1	0
	12F2	Product Modifications Upgrade MOD2	0 to 999	1	---	F1	0
	12F3	Product Modifications Upgrade MOD3	0 to 999	1	---	F1	0
	12F4	Product Modifications Upgrade MOD4	0 to 999	1	---	F1	0
	12F5	Product Modifications Upgrade MOD5	0 to 999	1	---	F1	0

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Table 1: PQMII Memory Map (Sheet 43 of 43)

GROUP	ADDR (HEX)	DESCRIPTION	RANGE	STEP VALUE	UNITS and SCALE	FORMAT	FACTORY DEFAULT
	12F6	Passcode Input 1	32 to 127	1	---	F10	32
	12F7	Passcode Input 2	32 to 127	1	---	F10	32
	12F8	Passcode Input 3	32 to 127	1	---	F10	32
	12F9	Passcode Input 4	32 to 127	1	---	F10	32
PRODUCT OPTIONS continued	12FA	Passcode Input 5	32 to 127	1	---	F10	32
	12FB	Passcode Input 6	32 to 127	1	---	F10	32
	12FC	Passcode Input 7	32 to 127	1	---	F10	32
	12FD	Passcode Input 8	32 to 127	1	---	F10	32
	12FE	Passcode Input 9	32 to 127	1	---	F10	32
	12FF	Passcode Input 10	32 to 127	1	---	F10	32
	1300	Reserved					
	to	↓	↓	↓	↓	↓	↓
	131F	Reserved					
VOLTAGE DISTUR-BANCE RECORDER	1320	Record Selector	0 to 65535	1	---	F1	0
	1321	Sag Level % Nominal	20 to 100	1	%	F1***	OFF
	1322	Swell Level % Nominal	101 to 151	1	%	F1***	OFF
	1323	Reserved					
	to	↓	↓	↓	↓	↓	↓
	132F	Reserved					

Notes: *Data type depends on the Command Operation Code.
** Any valid Actual Values or Setpoints address.
*** Maximum Setpoint value represents “OFF”.
**** Minimum Setpoint value represents “OFF”.
***** Maximum Setpoint value represents “UNLIMITED”.

3.4 Memory Map Data Formats

Table 2: Data Formats (Sheet 1 of 18)

Code	Description	Bitmask
F1	**Unsigned Integer - Numerical Data**	FFFF
F2	**Signed Integer - Numerical Data**	FFFF
F3	**Unsigned Long Integer - Numerical Data**	FFFFFFFF
F4	**Signed Long Integer - Numerical Data**	FFFFFFFF
F5	**Hardware Version Code**	FFFF
	1 = A	---
	2 = B	---
	↓	↓
	26 = Z	---
F6	**Unsigned Integer - Current Key Press**	FFFF
	0000 = no key	---
	FE01 = Enter	---
	FE02 = Menu	---
	FE04 = Message Right	---
	FE08 = Value Up	---
	FD01 = Reset	---
	FD02 = Message Left	---
	FD04 = Message Up	---
	FD08 = Value Down	---
	FB01 = Escape	---
	FB02 = Message Down	---
F7	**Unsigned Integer - Command**	FFFF
	1 = Reset	---
	2 = Alarm Relay On	---
	3 = Alarm Relay Off	---
	4 = Auxiliary Relay 1 On	---
	5 = Auxiliary Relay 1 Off	---
	6 = Auxiliary Relay 2 On	---
	7 = Auxiliary Relay 2 Off	---
	8 = Auxiliary Relay 3 On	---
	9 = Auxiliary Relay 3 Off	---
	10 = Set Clock Time	---

Table 2: Data Formats (Sheet 2 of 18)

Code	Description	Bitmask
	11 = Set Clock Date	---
	12 = Display 40 char. Flash Msg for 5 s	---
	13 = Simulate Keypress	---
	14 = Clear Energy Values	---
	15 = Clear Max. Demand Values	---
	16 = Clear Min./Max. Current Values	---
	17 = Clear Min./Max. Voltage Values	---
	18 = Clear Min./Max. Power Values	---
	19 = Clear Max. THD Values	---
	20 = Clear Switch Input Pulse Count	---
	21 = High Speed Sampling Trigger	---
	22 = Upload Mode Entry 2	---
	23 = Upload Mode Entry 1	---
	24 = Factory Setpoints Reload 2	---
	25 = Factory Setpoints Reload 1	---
	26 = Test Relays and LEDs	---
	27 = Waveform Capture Trigger	---
	28 = Start Data Log(s)	---
	29 = Stop Data Log(s)	---
	30 = Resize Data Logs (valid only if both logs are stopped)	---
	31 = Clear Event Record	---
	32= Trigger Trace Memory	---
	33= Re-arm Trace Mem.	---
	34= Clear All Demand	---
	35= Clear Min./Max. Freq	---
	40 = Clear Voltage Disturbance Recorder	----
F8	**Unsigned Integer - Keypress Simulation**	FFFF
	49 = '1' = Menu	---
	50 = '2' = Escape	---
	51 = '3' = Reset	---
	52 = '4' = Enter	---
	53 = '5' = Message Up	---
	54 = '6' = Message Down	---
	55 = '7' = Message Left	---

Table 2: Data Formats (Sheet 3 of 18)

Code	Description	Bitmask
	56 = '8' = Message Right	---
	57 = '9' = Value Up	---
	97 = 'a' = Value Down	---
F9	**Unsigned Integer - Relay/LED Test Data**	FFFF
	Alarm Relay	0001
	Auxiliary Relay 1	0002
	Auxiliary Relay 2	0004
	Auxiliary Relay 3	0008
	'Alarm' LED	0010
	'Program' LED	0020
	'Simulation' LED	0040
	'Self Test' LED	0080
	'Alarm' Relay LED	0100
	'Aux 1' Relay LED	0200
	'Aux 2' Relay LED	0400
	'Aux 3' Relay LED	0800
F10	**Two ASCII Characters**	FFFF
	32-127 = ASCII Character	7F00
	32-127 = ASCII Character	007F
F11	**Unsigned Integer - Enable/Disable**	FFFF
	0 = Disable/OFF	---
	1 = Enable/ON	---
F12	**Unsigned Integer - Modbus Baud Rate**	FFFF
	0 = 1200	---
	1 = 2400	---
	2 = 4800	---
	3 = 9600	---
	4 = 19200	---
F13	**Unsigned Integer - Parity Type**	FFFF
	0 = None	---
	1 = Even	---
	2 = Odd	---
F14	UNSIGNED INTEGER - ANALOG OUTPUT TYPE	FFFF
	0 = Not Used	---

Table 2: Data Formats (Sheet 4 of 18)

Code	Description	Bitmask
	1 = Phase A Current	---
	2 = Phase B Current	---
	3 = Phase C Current	---
	4 = Neutral Current	---
	5 = Avg Phase Current	---
	6 = Current Unbalance	---
	7 = Voltage Van	---
	8 = Voltage Vbn	---
	9 = Voltage Vcn	---
	10 = Voltage Vab	---
	11 = Voltage Vbc	---
	12 = Voltage Vca	---
	13 = Avg Phase Voltage	---
	14 = Average Line Voltage	---
	15 = Voltage Unbalance	---
	16 = Frequency	---
	17 = 3Φ Power Factor	---
	18 = 3Φ Real Power (kW)	---
	19 = 3Φ Reactive Pwr (kvar)	---
	20 = 3Φ Apparent Pwr (kVA)	---
	21 = 3Φ Real Power (MW)	---
	22 = 3Φ Reactive Power (Mvar)	---
	23 = 3Φ Apparent Pwr (MVA)	---
	24 = Ph A Power Factor	---
	25 = Phase A Real Power	---
	26 = Ph A Reactive Power	---
	27 = Ph A Apparent Power	---
	28 = Ph B Power Factor	---
	29 = Phase B Real Power	---
	30 = Ph B Reactive Power	---
	31 = Ph B Apparent Power	---
	32 = Ph C Power Factor	---
	33 = Phase C Real Power	---
	34 = Ph C Reactive Power	---

Table 2: Data Formats (Sheet 5 of 18)

Code	Description	Bitmask
	35 = Ph C Apparent Power	---
	36 = 3Φ Positive Real Energy Used	---
	37 = 3ΦPositive Reactive Energy Used	---
	38 = 3Φ Negative Real Energy Used	---
	39 = 3Φ Negative Reactive Energy Used	---
	40 = 3Φ Apparent Energy Used	---
	41 = Ph A Current Dmd	---
	42 = Ph B Current Dmd	---
	43 = Ph C Current Dmd	---
	44 = Neutral Current Dmd	---
	45 = 3Φ Real Power Dmd	---
	46 = 3Φ Reactive Power Demand	---
	47 = 3Φ Apparent Power Demand	---
	48 = 3Φ Current THD	---
	49 = 3Φ Voltage THD	---
	50 = Phase A Current THD	---
	51 = Phase B Current THD	---
	52 = Phase C Current THD	---
	53 = Voltage Van THD	---
	54 = Voltage Vbn THD	---
	55 = Voltage Vcn THD	---
	56 = Voltage Vab THD	---
	57 = Voltage Vbc THD	---
	58 = Neutral Current THD	---
	59 = Serial Control	---
F15	**Unsigned Integer - VT Wiring**	FFFF
	0 = Off	---
	1 = 4 Wire Wye / 3 VTs	---
	2 = 4 Wire Wye Direct	---
	3 = 4 Wire Wye / 2 VTs	---
	4 = 3 Wire Delta / 2 VTs	---
	5 = 3 Wire Direct	---
	6 = Single Phase Direct	---

Table 2: Data Formats (Sheet 6 of 18)

Code	Description	Bitmask
F16	**Unsigned Integer - Neutral Current Sensing**	FFFF
	0 = Off	---
	1 = Separate CT	---
	2 = Calculated	---
F17	**Unsigned Integer -Failsafe/Non-failsafe**	FFFF
	0 =Non-failsafe	---
	1 = Failsafe	---
F18	**Unsigned Integer - Unlatched / Latched**	FFFF
	0 = Unlatched	---
	1 = Latched	---
F19	**Unsigned Integer - Aux Relay Function**	FFFF
	0 = Off	---
	1 = Aux1 Relay	---
	2 = Aux2 Relay	---
	3 = Aux3 Relay	---
F20	**Unsigned Integer - Switch Function**	FFFF
	0 = Not Used	---
	1 = Alarm Relay	---
	2 = Auxiliary Relay 1	---
	3 = Auxiliary Relay 2	---
	4 = Auxiliary Relay 3	---
	5 = Pulse Input 1	---
	6 = New Demand Period	---
	7 = Setpoint Access	---
	8 = Select Main/Alt Analog Output	---
	9 = Select Main/Alt Analog Input	---
	10 = Pulse Input 2	---
	11 = Pulse Input 3	---
	12 = Pulse Input 4	---
	13 = Clear Energy	---
	14 = Clear Demand	---
F22	**Time Hours/minutes**	FFFF
	Hours: 0 = 12 am, 1 = 1 am,..., 23 = 11 pm	FF00

Table 2: Data Formats (Sheet 7 of 18)

Code	Description	Bitmask
	Minutes: 0 to 59 in steps of 1	00FF
F23	**Unsigned Integer - Time Seconds**	FFFF
	Seconds: 0 = 0.000s,..., 59999 = 59.999s	---
F24	**Date Month/day**	FFFF
	Month: 1=January,..., 12=December	FF00
	Day: 1 to 31 in steps of 1	00FF
F25	**Unsigned Integer - Date Year**	FFFF
	Year: 1995, 1996,...	---
F26	**Unsigned Integer: Harmonic Spectrum Parameter**	FFFF
	0 = None	---
	1 = Phase A Current	---
	2 = Phase B Current	---
	3 = Phase C Current	---
	4 = Neutral Current	---
	5 = Voltage Vax	---
	6 = Voltage Vbx	---
	7 = Voltage Vcx	---
F27	**Unsigned Integer - Switch Activation**	FFFF
	0 = Open	---
	1 = Closed	---
F28	**Unsigned Integer: Demand Calculation**	FFFF
	0 = Thermal Exponential	---
	1 = Block Interval	---
	2 = Rolling Interval	---
F29	**Unsigned Integer: Alarm/Control Relay**	FFFF
	0 = Off	---
	1 = Alarm Relay	---
	2 = Auxiliary Relay 1	---
	3 = Auxiliary Relay 2	---
	4 = Auxiliary Relay 3	---
F30	**Unsigned Integer: Phases Required**	FFFF
	0 = Any One	---
	1 = Any Two	---
	2 = All Three	---

Table 2: Data Formats (Sheet 8 of 18)

Code	Description	Bitmask
F31	**Unsigned Integer: Yes/No**	FFFF
	0 = No	---
	1 = Yes	---
F32	**Unsigned Integer: Data Log Mode**	FFFF
	0 = Run to Fill	---
	1 = Circulate	---
F33	**Unsigned Integer: Data Log Size Determination**	FFFF
	0 = Automatic	---
	1 = From Setpoint	---
F34	**Unsigned Integer: Data Log Selection**	FFFF
	0 = None	---
	1 = Log 1	---
	2 = Log 2	---
	3 = Log 1 and Log 2	---
F35	**Unsigned Integer: Data Log Status**	FFFF
	0 = Stopped	---
	1 = Running	---
F36	**Unsigned Integer: Cause Of Event**	FFFF
	0 = No Event	---
	1 = Clear Event Record	---
	2 = Power On	---
	3 = Power Off	---
	4 = Reset	---
	5 = Setpt Access Enabled	---
	6 = Switch A Alarm	---
	7 = Switch B Alarm	---
	8 = Switch C Alarm	---
	9 = Switch D Alarm	---
	10 = COM1 Fail Alarm	---
	11 = COM2 Fail Alarm	---
	12 = Self Test Alarm	---
	13 = Clock Not Set Alarm	---
	14 = Params Not Set Alrm	---

Table 2: Data Formats (Sheet 9 of 18)

Code	Description	Bitmask
	15 = Underfreq Alarm	---
	16 = Overfreq Alarm	---
	17 = Undercurrent Alarm	---
	18 = Overcurrent Alarm	---
	19 = Neutral O/C Alarm	---
	20 = Undervoltage Alarm	---
	21 = Overvoltage Alarm	---
	22 = I Unbalance Alarm	---
	23 = V Unbalance Alarm	---
	24 = Phase Rev Alarm	---
	25 = PF Lead 1 Alarm	---
	26 = PF Lead 2 Alarm	---
	27 = PF Lag 1 Alarm	---
	28 = PF Lag 2 Alarm	---
	29 = Positive kW Alarm	---
	30 = Negative kW Alarm	---
	31 = Positive kvar Alarm	---
	32 = Negative kvar Alarm	---
	33 = +kW Demand Alarm	---
	34 = +kvar Dmd Alarm	---
	35 = –kW Demand Alarm	---
	36 = –kvar Dmd Alarm	---
	37 = kVA Demand Alarm	---
	38 = Phase A Current Demand Alarm	---
	39 = Phase B Current Demand Alarm	---
	40 = Phase C Current Demand Alarm	---
	41 = Neutral Current Demand Alarm	---
	42 = Pulse Input 1 Alarm	---
	43 = Current THD Alarm	---
	44 = Voltage THD Alarm	---
	45 = Analog In Main Alm	---
	46 = Analog In Alt Alarm	---
	47 = Data Log 1 Alarm	---
	48 = Data Log 2 Alarm	---

Table 2: Data Formats (Sheet 10 of 18)

Code	Description	Bitmask
	49 = Switch A Alarm Clear	---
	50 = Switch B Alarm Clear	---
	51 = Switch C Alarm Clear	---
	52 = Switch D Alarm Clear	---
	53 = COM1 Fail Alarm Clr	---
	54 = COM2 Fail Alarm Clr	---
	55 = Self Test Alarm Clear	---
	56 = Clock Not Set Alarm Clear	---
	57 = Parameters Not Set Alarm Clear	---
	58 = Underfreq Alarm Clr	---
	59 = Overfreq Alarm Clear	---
	60 = U/C Alarm Clear	---
	61 = O/C Alarm Clear	---
	62 = Neutral Overcurrent Alarm Clear	---
	63 = U/V Alarm Clear	---
	64 = O/V Alarm Clear	---
	65 = Current Unbalance Alarm Clear	---
	66 = Voltage Unbalance Alarm Clear	---
	67 = Phase Reversal Alarm Clear	---
	68 = PF Lead 1 Alarm Clr	---
	69 = PF Lead 2 Alarm Clr	---
	70 = PF Lag 1 Alarm Clear	---
	71 = PF Lag 2 Alarm Clear	---
	72 = +kW Alarm Clear	---
	73 = –kW Alarm Clear	---
	74 = +kvar Alarm Clear	---
	75 = –kvar Alarm Clear	---
	76 = +kW Demand Alarm Clear	---
	77 = +kvar Demand Alarm Clear	---
	78 = –kW Demand Alarm Clear	---
	79 = –kvar Demand Alarm Clear	---
	80 = kVA Demand Alarm Clear	---
	81 = Phase A Current Demand Alarm Clear	---
	82 = Phase B Current Demand Alarm Clear	---

Table 2: Data Formats (Sheet 11 of 18)

Code	Description	Bitmask
	83 = Phase C Current Demand Alarm Clear	---
	84 = Neutral Current Demand Alarm Clear	---
	85 = Pulse In 1 Alarm Clr	---
	86 = I THD Alarm Clear	---
	87 = V THD Alarm Clear	---
	88 = Analog Input Main Alarm Clear	---
	89 = Analog Input Alternate Alarm Clear	---
	90 = Data Log 1 Alarm Clr	---
	91 = Data Log 2 Alarm Clr	---
	92 = Pulse Input 2 Alarm	---
	93 = Pulse Input 3 Alarm	---
	94 = Pulse Input 4 Alarm	---
	95 = Pulse Count Total Alarm	---
	96 = Pulse In 2 Alarm Clr	---
	97 = Pulse In 3 Alarm Clr	---
	98 = Pulse In 4 Alarm Clr	---
	99 = Pulse Input Total Alarm Clear	---
	100 = Time Alarm	---
	101 = Time Alarm Clear	---
	102 = Trace Memory Trig	---
F37	**Trace Memory Usage**	FFFF
	0 = 1 x 36 cycles	---
	1 = 2 x 18 cycles	---
	2 = 3 x 12 cycles	---
F38	**Trace Memory Trigger Mode**	FFFF
	0 = One Shot	---
	1 = Retrigger	---
F39	**Trace Memory Switch Input Trigger**	FFFF
	0 = Off	---
	1 = Open-to-closed	---
	2 = Closed-to-open	---
F40	**Trace Memory Waveform Selection**	FFFF
	0 = Ia	---
	1 = Ib	---

Table 2: Data Formats (Sheet 12 of 18)

Code	Description	Bitmask
	2 = Ic	---
	3 = In	---
	4 = Va	---
	5 = Vb	---
	6 = Vc	---
F41	**Trace Memory Triggers**	FFFF
	0 = Trace Memory Not Triggered	---
	1 = Ia Overcurrent	---
	2 = Ib Overcurrent	---
	3 = Ic Overcurrent	---
	4 = In Overcurrent	---
	5 = Va Overvoltage	---
	6 = Vb Overvoltage	---
	7 = Vc Overvoltage	---
	8 = Va Undervoltage	---
	9 = Vb Undervoltage	---
	10 = Vc Undervoltage	---
	11 = Switch Input A	---
	12 = Switch Input B	---
	13 = Switch Input C	---
	14 = Switch Input D	---
	15 = Serial Comms.	---
F43	**Pulse Input Totalization**	FFFF
	0 = 1+2	---
	1 = 1+3	---
	2 = 1+4	---
	3 = 2+3	---
	4 = 2+4	---
	5 = 3+4	---
	6 = 1+2+3	---
	7 = 1+3+4	---
	8 = 2+3+4	---
	9 = 1+2+3+4	---
	10 = 1+2+4	---

Table 2: Data Formats (Sheet 13 of 18)

Code	Description	Bitmask
F44	**Phase CT Wiring**	FFFF
	0 = Phase A, B and C	---
	1 = Phase A and B only	---
	2 = Phase A and C only	---
	3 = Phase A only	---
F45	**CPU Speed**	FFFF
	0 = 16 MHz	---
	1 = 25 MHz	---
F47	**DNP Port**	FFFF
	0 = None	---
	1 = RS232	---
	2 = COM1	---
	3 = COM2	---
F100	**PQMII Options**	FFFF
	PQMII (Display Version)	0001
	T20 (4-20mA Transducer)	0002
	T1 (0-1mA Transducer)	0004
	C (Control) Option	0008
	A (Power Analysis) Option	0010
F101	**Switch Input Status (0 = Open, 1 = Closed)**	FFFF
	Switch A	0100
	Switch B	0200
	Switch C	0400
	Switch D	0800
F102	**LED Status Flags: (0=Inactive, 1=Active)**	FFFF
	Aux 1 Relay	0001
	Aux 2 Relay	0002
	Aux 3 Relay	0004
	Alarm	0008
	Program	0010
	Simulation	0020
	Alarm Relay	0040
	Self Test	0080

Table 2: Data Formats (Sheet 14 of 18)

Code	Description	Bitmask
F103	**LED Attribute Flags (0 = Flashing, 1 = Solid; Active)**	**FFFF**
	Aux 1 Relay	0001
	Aux 2 Relay	0002
	Aux 3 Relay	0004
	Alarm	0008
	Program	0010
	Simulation	0020
	Alarm Relay	0040
	Self Test	0080
F104	**Output Relay Flag (0=de-energized, 1=energized)**	FFFF
	Alarm Relay	0001
	Auxiliary Relay 1	0002
	Auxiliary Relay 2	0004
	Auxiliary Relay 3	0008
F105	**Alarm Status Flags 1**	FFFF
	Phase Undercurrent Alarm	0001
	Phase Overcurrent Alarm	0002
	Neutral Overcurrent Alarm	0004
	Undervoltage Alarm	0008
	Overvoltage Alarm	0010
	Current Unbalance Alarm	0020
	Voltage Unbalance Alarm	0040
	Voltage Phase Reversal	0080
	PF Lead Alarm 1	0100
	PF Lead Alarm 2	0200
	Power Factor Lag Alarm 1	0400
	Power Factor Lag Alarm 2	0800
	Positive Real Power Alarm	1000
	Neg Real Power Alarm	2000
	Pos Reactive Power Alarm	4000
	Neg Reactive Power Alarm	8000
F106	**Alarm Status Flags 2**	FFFF
	Underfrequency Alarm	0001

Table 2: Data Formats (Sheet 15 of 18)

Code	Description	Bitmask
	Overfrequency Alarm	0002
	Positive Real Power Demand Alarm	0004
	Positive Reactive Power Demand Alarm	0008
	Apparent Power Demand Alarm	0010
	Ph A Current Dmd Alarm	0020
	Ph B Current Dmd Alarm	0040
	Ph C Current Dmd Alarm	0080
	Neutral Current Demand Alarm	0100
	Switch A Alarm	0200
	Switch B Alarm	0400
	Switch C Alarm	0800
	Switch D Alarm	1000
	Internal Fault Alarm	2000
	Serial COM1 Failure Alarm	4000
	Serial COM2 Failure Alarm	8000
F107	**Alarm Status Flags 3**	FFFF
	Clock Not Set Alarm	0001
	Parameters Not Set Alarm	0002
	Pulse Input 1 Alarm	0004
	Current THD Alarm	0008
	Voltage THD Alarm	0010
	Analog Input Main Alarm	0020
	Analog Input Alt Alarm	0040
	Data Log 1	0080
	Data Log 2	0100
	Negative Real Power Demand Alarm	0200
	Negative Reactive Power Demand Alarm	0400
	Pulse Input 2 Alarm	0800
	Pulse Input 3 Alarm	1000
	Pulse Input 4 Alarm	2000
	Totalized Pulse In Alarm	4000
	Time Alarm	8000
F108	**Internal Fault Error Code**	FFFF
	ADC Ref Out of Range	0001

Table 2: Data Formats (Sheet 16 of 18)

Code	Description	Bitmask
	Reserved	0002
	Switch Input Circuit Fault	0004
	Reserved	0008
F109	**General Status**	FFFF
	Alarm Present	0001
	Clock Not Set	0002
	Clock Drifting	0004
	Data Log 1 Running	0008
	Data Log 2 Running	0010

Table 2: Data Formats (Sheet 17 of 18)

Code	Description	Bitmask
F110	**Data Logger Numbers**	FFFF
	Log 1	0001
	Log 2	0002
F111	**Event Record Switches And Relay Status**	FFFF
	Alarm Relay	0001
	Auxiliary Relay 1	0002
	Auxiliary Relay 2	0004
	Auxiliary Relay 3	0008
F112	**Event Recorder Event Enable Flags 4**	**FFFF**
	Power On	0001
	Power Off	0002
	Alarm / Control Reset	0004
	Setpoint Access Enable	0008
F113	**Trace Memory Triggered Flag Status**	FFFF
	0 = Trace Memory Not Triggered	---
	1 = Trace Memory Triggered	---
	2 to 16 = Not Used	
F114	**Power Alarms Level Base Units**	FFFF
	0 = kW/kVAR	---
	1 = MW/MVAR	---
	2 to 16 = Not Used	---
F115	**Phase Overcurrent Activation**	FFFF
	0 = Average	---
	1 = Maximum	---
	2 to 16 = Not Used	---
F116	**Product Options Upgrade**	FFFF
	1=PQMII	---
	3=PQMII-T20	---
	5=PQMII-T1	---
	7=PQMII-C	---
	9=PQMII-T20-C	---
	11=PQMII-T1-C	---
	13=PQMII-A	---
	15=PQMII-T20-A	---

Table 2: Data Formats (Sheet 18 of 18)

Code	Description	Bitmask
F116 ctd.	17=PQMII-T1-A	---
	19=PQMII-C-A	---
	21=PQMII-T20-C-A	---
	23=PQMII-T1-C-A	---
F117	**Invalid Serial Number Flag**	FFFF
	0=Serial Number Valid	---
	1= Serial Number Invalid	---
F118	**Voltage Disturbance Type**	FFFF
	Sag	0001
	Swell	0002
	Undervoltage	0004
	Overvoltage	0008
F119	**Voltage Disturbance Source**	FFFF
	Voltage Van	0001
	Voltage Vbn	0002
	Voltage Vcn	0004
	Voltage Vab	0008
	Reserved	0010
	Voltage Vca	0020

3.5 Analog Output Parameter Range

Table 3: Analog Output Parameter Range for Serial Ports (Sheet 1 of 3)

No.	Analog Out Parameter	Range	Step	Units/scale	Default
0	Not Used	0	0	---	0
1	Phase A Current	0 to 150	1	%	0
2	Phase B Current	0 to 150	1	%	0
3	Phase C Current	0 to 150	1	%	0
4	Neutral Current	0 to 150	1	%	0
5	Average Phase Current	0 to 150	1	%	0

* Since values of –0 and +0 both exist for power factor, the value stored in the PQMII serial register is the opposite of the value shown on the display. For example: if a range of 0.23 lead (–0.23) to 0.35 lag (+0.35) is required, –77 (–100 + 23)and +65 (100 – 35) must be sent.

Table 3: Analog Output Parameter Range for Serial Ports (Sheet 2 of 3)

No.	Analog Out Parameter	Range	Step	Units/scale	Default
6	Current Unbalance	0 to 1000	1	0.1 x%	0
7	Voltage Van	0 to 200	1	%	0
8	Voltage Vbn	0 to 200	1	%	0
9	Voltage Vcn	0 to 200	1	%	0
10	Voltage Vab	0 to 200	1	%	0
11	Voltage Vbc	0 to 200	1	%	0
12	Voltage Vca	0 to 200	1	%	0
13	Average Phase Voltage	0 to 200	1	%	0
14	Average Line Voltage	0 to 200	1	%	0
15	Voltage Unbalance	0 to 1000	1	0.1 x%	0
16	Frequency	0 to 7500	1	0.01 x Hz	0
17	*3 Phase PF	–99 to +99	1	0.01 x PF	0
18	3 Phase kW	–32500 to +32500	1	kW	0
19	3 Phase kvar	–32500 to +32500	1	kvar	0
20	3 Phase kVA	0 to 65400	1	kVA	0
21	3 Phase MW	–32500 to +32500	1	0.1 x MW	0
22	3 Phase Mvar	–32500 to +32500	1	0.1 x Mvar	0
23	3 Phase MVA	0 to 65400	1	0.1 x MVA	0
24	*Phase A PF	–99 to +99	1	0.01 x PF	0
25	Phase A kW	–32500 to +32500	1	kW	0
26	Phase A kvar	–32500 to +32500	1	kvar	0
27	Phase A kVA	0 to 65400	1	kVA	0
28	*Phase B PF	–99 to +99	1	0.01 x PF	0
29	Phase B kW	–32500 to +32500	1	kW	0
30	Phase B kvar	–32500 to +32500	1	kvar	0
31	Phase B kVA	0 to 65400	1	kVA	0
32	*Phase C PF	–99 to +99	1	0.01 x PF	0
33	Phase C kW	–32500 to +32500	1	kW	0
34	Phase C kvar	–32500 to +32500	1	kvar	0

* Since values of –0 and +0 both exist for power factor, the value stored in the PQMII serial register is the opposite of the value shown on the display. For example: if a range of 0.23 lead (–0.23) to 0.35 lag (+0.35) is required, –77 (–100 + 23)and +65 (100 – 35) must be sent.

Table 3: Analog Output Parameter Range for Serial Ports (Sheet 3 of 3)

No.	Analog Out Parameter	Range	Step	Units/scale	Default
35	Phase C kVA	0 to 65400	1	kVA	0
36	3 Phase +kWh Used	0 to 65400	1	kWh	0
37	3 Phase +kvarh Used	0 to 65400	1	kvarh	0
38	3 Phase -kWh Used	0 to 65400	1	kWh	0
39	3 Phase -kvarh Used	0 to 65400	1	kvarh	0
40	3 Phase kVAh Used	0 to 65400	1	kVAh	0
41	Phase A Current Demand	0 to 7500	1	A	0
42	Phase B Current Demand	0 to 7500	1	A	0
43	Phase C Current Demand	0 to 7500	1	A	0
44	Neutral Current Demand	0 to 7500	1	A	0
45	3 Phase kW Demand	–32500 to +32500	1	kW	0
46	3 Phase kvar Demand	–32500 to +32500	1	kvar	0
47	3 Phase kVA Demand	0 to 65400	1	kVA	0
48	3 Phase Current THD	0 to 1000	1	0.1 × %	0
49	Three Phase Voltage THD	0 to 1000	1	0.1 × %	0
50	Phase A Current THD	0 to 1000	1	0.1 × %	0
51	Phase B Current THD	0 to 1000	1	0.1 × %	0
52	Phase C Current THD	0 to 1000	1	0.1 × %	0
53	Voltage Van THD	0 to 1000	1	0.1 × %	0
54	Voltage Vbn THD	0 to 1000	1	0.1 × %	0
55	Voltage Vcn THD	0 to 1000	1	0.1 × %	0
56	Voltage Vab THD	0 to 1000	1	0.1 × %	0
57	Voltage Vbc THD	0 to 1000	1	0.1 × %	0
58	Neutral Current THD	0 to 1000	1	0.1 × %	0
59	Serial Control	–32500 to +32500	1	---	0

* Since values of –0 and +0 both exist for power factor, the value stored in the PQMII serial register is the opposite of the value shown on the display. For example: if a range of 0.23 lead (–0.23) to 0.35 lag (+0.35) is required, –77 (–100 + 23)and +65 (100 – 35) must be sent.

4 DNP 3.0 Communications

4.1 DNP 3.0 Device Profile Document

The communications port configured as a DNP slave port must support the full set of features listed in the Level 2 DNP V3.00 Implementation (DNP-L2) described in Chapter 2 of the subset definitions. See the DNP protocol website at http://www.dnp.org for details

DNP 3.0: DEVICE PROFILE DOCUMENT	
Vendor Name: General Electric Multilin Inc.	
Device Name: PQMII Power Quality Meter	
Highest DNP Level Supported: For Requests: Level 2 For Responses: Level 2	Device Function: ❒ Master ☒ Slave
Notable objects, functions, and/or qualifiers supported in addition to the Highest DNP Levels Supported (the complete list is described in the attached table): none	
Maximum Data Link Frame Size (octets): Transmitted: 249 Received: 292	Maximum Application Fragment Size (octets): Transmitted: 2048 Received: 2048
Maximum Data Link Re-tries: ☒ None ❒ Fixed ❒ Configurable	Maximum Application Layer Re-tries: ☒ None ❒ Configurable
Requires Data Link Layer Confirmation: ☒ Never ❒ Always ❒ Sometimes ❒ Configurable	
Requires Application Layer Confirmation: ❒ Never ❒ Always ☒ When reporting Event Data ❒ When sending multi-fragment responses ❒ Sometimes ❒ Configurable	
Timeouts while waiting for: Data Link Confirm ☒ None ❒ Fixed ❒ Variable ❒ Configurable Complete Appl. Fragment ☒ None ❒ Fixed ❒ Variable ❒ Configurable Application Confirm ❒ None ☒ Fixed ❒ Variable ❒ Configurable (fixed value is 5000 milliseconds) Complete Appl. Response ☒ None ❒ Fixed ❒ Variable ❒ Configurable Others: (None)	

DNP 3.0: DEVICE PROFILE DOCUMENT (Continued)				
Executes Control Operations:				
Write Binary Outputs	☒ Never	☐ Always	☐ Sometimes	☐ Configurable
Select/Operate	☒ Never	☐ Always	☐ Sometimes	☐ Configurable
Direct Operate	☐ Never	☒ Always	☐ Sometimes	☐ Configurable
Direct Operate: No Ack	☐ Never	☒ Always	☐ Sometimes	☐ Configurable
Count > 1	☒ Never	☐ Always	☐ Sometimes	☐ Configurable
Pulse On	☐ Never	☐ Always	☒ Sometimes	☐ Configurable
Pulse Off	☒ Never	☐ Always	☐ Sometimes	☐ Configurable
Latch On	☒ Never	☐ Always	☐ Sometimes	☐ Configurable
Latch Off	☒ Never	☐ Always	☐ Sometimes	☐ Configurable
	No action is taken if Count is zero; Queue, Clear, Trip, Close, On-Time, and Off-Time fields are ignored			
Queue	☒ Never	☐ Always	☐ Sometimes	☐ Configurable
Clear Queue	☒ Never	☐ Always	☐ Sometimes	☐ Configurable

Reports Binary Input Change Events when no specific variations requested: ☐ Never ☒ Only time-tagged ☐ Only non-time-tagged ☐ Configurable to send both, one or the other	Reports time-tagged Binary Input Change Events when no specific variation requested: ☐ Never ☒ Binary Input Change With Time ☐ Binary Input Change With Relative Time ☐ Configurable
Sends Unsolicited Responses: ☒ Never ☐ Configurable ☐ Only certain objects ☐ Sometimes ☐ ENABLE/DISABLE UNSOLICITED Function codes supported	Sends Static Data in Unsolicited Responses: ☒ Never ☐ When Device Restarts ☐ When Status Flags Change
Default Counter Object/Variation: ☐ No Counters Reported ☐ Configurable ☒ Default Object / Default Variation ☐ Point-by-point list attached	Counters Roll Over at: ☐ No Counters Reported ☐ Configurable ☒ 16 Bits ☒ 32 Bits ☐ Other Value ☐ Point-by-point list attached
Sends Multi-Fragment Responses: ☐ Yes	☒ No

4.2 Implementation Table

The following table lists all objects recognized and returned by the PQMII. Additional information provided on the following pages includes lists of the default variations and defined point numbers returned for each object.

Implementation Table Notes:

1. For this object, the quantity specified in the request must be exactly 1 as there is only one instance of this object defined in the relay.
2. All static input data known to the relay is returned in response to a request for Class 0. This includes all objects of type 1 (Binary Input) and type 30 (Analog Input).

3. The point tables for Binary Input and Analog Input objects contain a field which defines which event class the corresponding static data has been assigned to.
4. For this object, the qualifier code must specify an index of 7 only.
5. Warm Restart (function code 14) is supported although it is not required by the DNP level 2 specification.
6. Object 1 Variation 1 always indicates On Line for all points.

Table 4: DNP Implementation Table

Object			Request		Response	
Obj	Var	Description	Func Codes	Qual Codes (Hex)	Func Codes	Qual Codes (Hex)
1	0	Binary Input - All Variations	1	06		
1	1	Binary Input	1	00, 01, 06	129	00, 01
1	2	Binary Input With Status (Note 6)	1	00, 01, 06	129	00, 01
2	0	Binary Input Change - All Variations	1	06, 07, 08		
2	1	Binary Input Change Without Time	1	06, 07, 08	129	17, 28
2	2	Binary Input Change With Time	1	06, 07, 08	129	17, 28
10	0	Binary Output - All Variations	1	06		
10	2	Binary Output Status	1	00, 01, 06	129	00, 01
12	1	Control Relay Output Block	3, 4, 5, 6	17, 28	129	17, 28
20	0	Binary Counter - All Variations	1, 7, 8, 9,10	06, 07, 08	129	00. 01
20	5	32-Bit Binary Counter Without Flag	1, 7, 8, 9, 10	06, 07, 08	129	00. 01
20	6	16-Bit Binary Counter Without Flag	1, 7, 8, 9, 10	06, 07, 08	129	00. 01
30	0	Analog Input - All Variations	1	06		
30	1	32-Bit Analog Input With Flag	1	00, 01, 06	129	00, 01
30	2	16-Bit Analog Input With Flag	1	00, 01, 06	129	00, 01
30	3	32-Bit Analog Input Without Flag	1	00, 01, 06	129	00, 01
30	4	16-Bit Analog Input Without Flag	1	00, 01, 06	129	00, 01
32	0	Analog Input Change - All Variations	1	06, 07, 08		
32	1	32-Bit Analog Input Change without Time	1	06, 07, 08	129	17, 28
32	2	16-Bit Analog Input Change without Time	1	06, 07, 08	129	17, 28
32	3	32-Bit Analog Input Change with Time	1	06, 07, 08	129	17, 28
32	4	16-Bit Analog Input Change with Time	1	06, 07, 08	129	17, 28
50	1	Time and Date	1, 2	07 (Note 1)	129	07
60	1	Class 0 Data (Note 2)	1	06	129	
60	2	Class 1 Data (Note 3)	1	06, 07, 08	129	
60	3	Class 2 Data (Note 3)	1	06, 07, 08	129	
60	4	Class 3 Data (Note 3)	1	06, 07, 08	129	
80	1	Internal Indications	2	00 (Note 4)	129	
		No object - Cold Start	13			
		No object - Warm Start (Note 5)	14			
		No object - enable unsolicited (parsed only)	20			
		No object - disable unsolicited (parsed only)	21			
		No object - Delay Measurement	23			

1, 2, 3, 4, 5, 6: see the IMPLEMENATION TABLE NOTES above.

4.3 Default Variations

The following table specifies the default variation for all objects returned by the relay. These are the variations that will be returned for the object in a response when no specific variation is specified in a request.

Table 5: Default Variations

Object	Description	Default Variation
1	Binary Input - Single Bit	1
2	Binary Input Change With Time	2
10	Binary Output Status	2
12	Control Relay Output Block	1
20	32-Bit Binary Counter Without Flag	5
30	16-Bit Analog Input Without Flag	2
32	16-Bit Analog Input Change Without Time	2

4.4 Internal Indication Bits

The following internal indication bits are supported:

Table 6: Internal Indication Bits

Character Position	Bit Position	Description
0	7	Device Restart: set when PQMII powers up, cleared by writing zero to object 80
0	4	Need Time -- set whenever the PQMII has a “CLOCK NOT SET” alarm, cleared by setting the clock
0	1	Class 1: indicates that class 1 events are available
0	2	Class 2: indicates that class 2 events are available
0	3	Class 3: indicates that class 2 events are available
1	3	Buffer Overflow: generally indicates that the host has not picked up the event data often enough

5 DNP Point Lists

5.1 Binary Input / Binary Input Change

The DNP point list for Binary Input / Binary Input Change Point List (objects 01 and 02, respectively), is shown below.

NOTE

This point is also reflected in the corresponding internal indication (IIN) bit in each response header.

Table 7: Binary Input / Binary Input Change Points (Sheet 1 of 4)

Index	Description	Event Class Assigned To
0	Alarm condition(s) active	Class 1
1	Clock not set *	Class 1
2	Clock drifting	Class 1
3	Internal error: ADC reference out of range	Class 1
4	Reserved	---
5	Internal error: switch input circuit fault	Class 1
6	PQMII (display) option installed **	Class 1
7	T20 (4-20 mA transducer) option installed **	Class 1
8	T1 (0-1 mA transducer) option installed **	Class 1
9	C (control) option installed **	Class 1
10	A (power analysis) option installed **	Class 1
11	Switch A closed	Class 1
12	Switch B closed	Class 1
13	Switch C closed	Class 1
14	Switch D closed	Class 1
15	Alarm relay energized	Class 1
16	Auxiliary relay 1 energized	Class 1
17	Auxiliary relay 2 energized	Class 1
18	Auxiliary relay 3 energized	Class 1
19	Aux 1 relay LED active	Class 1
20	Aux 2 relay LED active	Class 1

* This point is also reflected in the corresponding internal indication (IIN) bit in each response header.
** This point is not reflected in a Binary Input Change.

Table 7: Binary Input / Binary Input Change Points (Sheet 2 of 4)

Index	Description	Event Class Assigned To
21	Aux 3 relay LED active	Class 1
22	Alarm LED active	Class 1
23	Program LED active	Class 1
24	Simulation LED active	Class 1
25	Alarm relay LED active	Class 1
26	Self test LED active	Class 1
27	Reserved	---
28	Reserved	---
29	Reserved	---
30	Reserved	---
31	Reserved	---
32	Reserved	---
33	Reserved	---
34	Reserved	---
35	Alarm active: phase undercurrent	Class 1
36	Alarm active: phase overcurrent	Class 1
37	Alarm active: neutral overcurrent	Class 1
38	Alarm active: undervoltage	Class 1
39	Alarm active: overvoltage	Class 1
40	Alarm active: current unbalance	Class 1
41	Alarm active: voltage unbalance	Class 1
42	Alarm active: voltage phase reversal	Class 1
43	Alarm active: power factor lead alarm 1	Class 1
44	Alarm active: power factor lead alarm 2	Class 1
45	Alarm active: power factor lag alarm 1	Class 1
46	Alarm active: power factor lag alarm 2	Class 1
47	Alarm active: positive real power	Class 1
48	Alarm active: negative real power	Class 1
49	Alarm active: positive reactive power	Class 1

* This point is also reflected in the corresponding internal indication (IIN) bit in each response header.
** This point is not reflected in a Binary Input Change.

Table 7: Binary Input / Binary Input Change Points (Sheet 3 of 4)

Index	Description	Event Class Assigned To
50	Alarm active: negative reactive power	Class 1
51	Alarm active: underfrequency	Class 1
52	Alarm active: overfrequency	Class 1
53	Alarm active: real power demand	Class 1
54	Alarm active: reactive power demand	Class 1
55	Alarm active: apparent power demand	Class 1
56	Alarm active: phase A current demand	Class 1
57	Alarm active: phase B current demand	Class 1
58	Alarm active: phase C current demand	Class 1
59	Alarm active: Neutral demand	Class 1
60	Alarm active: switch A	Class 1
61	Alarm active: switch B	Class 1
62	Alarm active: switch C	Class 1
63	Alarm active: switch D	Class 1
64	Alarm active: internal fault	Class 1
65	Alarm active: serial COM1 failure	Class 1
66	Alarm active: serial COM2 failure	Class 1
67	Alarm active: clock not set	Class 1
68	Alarm active: parameters not set	Class 1
69	Alarm active: Pulse input 1	Class 1
70	Alarm active: current THD	Class 1
71	Alarm active: voltage THD	Class 1
72	Alarm active: analog input main	Class 1
73	Alarm active: analog input alt	Class 1
74	Alarm active: data log 1	Class 1
75	Alarm active: data log 2	Class 1
76	Alarm active: Negative real demand	Class 1
77	Alarm active: Negative reactive demand	Class 1
78	Alarm active: Pulse input 2	Class 1

* This point is also reflected in the corresponding internal indication (IIN) bit in each response header.
** This point is not reflected in a Binary Input Change.

Table 7: Binary Input / Binary Input Change Points (Sheet 4 of 4)

Index	Description	Event Class Assigned To
79	Alarm active: Pulse input 3	Class 1
80	Alarm active: Pulse input 4	Class 1
81	Alarm active: Pulse input total	Class 1
82	Alarm active: Time	Class 1

* This point is also reflected in the corresponding internal indication (IIN) bit in each response header.
** This point is not reflected in a Binary Input Change.

5.2 Binary Output / Control Relay Output

The DNP point list for Binary Outputs / Control Relay Outputs (objects 10 and 12, respectively) is shown below:

Table 8: Binary Output / Control Relay Output Points

Index	Description
0	Reset
1	Alarm relay on
2	Alarm relay off
3	Auxiliary relay 1 on
4	Auxiliary relay 1 off
5	Auxiliary relay 2 on
6	Auxiliary relay 2 off
7	Auxiliary relay 3 on
8	Auxiliary relay 3 off
9	Display 40 character flash message for 5 seconds (the display message must be set up using Modbus)
10	Clear energy values
11	Clear max. demand values
12	Clear min./max current values
13	Clear min./max voltage values
14	Clear min./max power values
15	Clear max. THD values
16	Clear switch input pulse count
17	Clear event record

Table 8: Binary Output / Control Relay Output Points

Index	Description
18	Simulate “MENU” keypress
19	Simulate “ESCAPE” keypress
20	Simulate “RESET” keypress
21	Simulate “ENTER” keypress
22	Simulate “MESSAGE UP” keypress
23	Simulate “MESSAGE DOWN” keypress
24	Simulate “MESSAGE LEFT” keypress
25	Simulate “MESSAGE RIGHT” keypress
26	Simulate “VALUE UP” keypress
27	Simulate “VALUE DOWN” keypress

NOTE

Index points 0 and 9 through 27 are not reflected in the Binary Output.

The following restrictions should be observed when using object 12 to control the points listed in the following table.

1. The **Count** field is checked first. If it is zero, the command will be accepted but no action will be taken. If this field is non-zero, the command will be executed exactly once regardless of its value.
2. The **Control Code** field of object 12 is then inspected:
   - A NUL Code will cause the command to be accepted without any action being taken.
   - A Code of “Pulse On” (1) is valid for all points. This is used to activate the function (e.g., Reset) associated with the point.
   - All other Codes are invalid and will be rejected.
   - The Queue, Clear, and Trip/Close sub-fields are ignored.
3. The **On Time** and **Off Time** fields are ignored. A “Pulse On” Code takes effect immediately when received. Thus, the timing is irrelevant.
4. The **Status** field in the response will reflect the success or failure of the control attempt thus:
   - A Status of “Request Accepted” (0) will be returned if the command was accepted.
   - A Status of “Request not Accepted due to Formatting Errors” (3) will be returned if the Control Code field was incorrectly formatted or an invalid Code was present in the command.
   - A Status of “Control Operation not Supported for this Point” (4) will be returned in response to a “Latch On” or “Latch Off” command

5. An operate of the Reset, alarm relay on/off or Aux Relay 1-3 on/off points may fail (even if the command is accepted) due to other inputs or conditions (e.g., alarm conditions) existing at the time. To verify the success or failure of an operate of these points it is necessary that the associated Binary Input(s) be examined after the control attempt is performed.
6. When using object 10 to read the status of a Binary Output, a read will always return zero.

5.3 Analog Input/Output Change

In the following point list for Analog Input/Output Change, the entry in the “Format” column indicates that the format of the associated data point can be determined by looking up the entry in *Table 2: Data Formats*. For example, an “F1” format is described in that table as a (16-bit) unsigned value without any decimal places. Therefore, the value read should be interpreted in this manner.

Table 9: Point List for Analog Input/Output Change (Sheet 1 of 6)

Point	Modbus Reg	Description	Unit / Value	Deadband	Format Code	Event Class Assigned To
0	1050	Phase CT Primary setpoint [1]	amps	1 unit	F1	3
1	1052	Neutral CT Primary setpoint [1]	amps	1 unit	F1	3
2	1054	VT Ratio setpoint [2]	0.1 x ratio	1 unit	F1	3
3	1055	VT Nominal Secondary Volts setpoint	volts	1 unit	F1	3
4	-	VT Nominal Ph-to-Ph Voltage [7] (VT Ratio x Nominal Sec. adjusted for wye or delta) [3]	32-bit volts	1 unit	F3	3
5	-	VT Nominal Phase-to-Neutral Voltage (VT Ratio x Nominal Sec. adjusted for wye or delta) [3]	32-bit volts	1 unit	F3	3
6	-	Nominal Single-Phase VA [4, 5] (VT Nominal Pri. × Phase CT Pri.)	32-bit VA	1 unit	F3	3
7	-	Nominal Three-Phase VA [5] (VT Nominal Pri. × Phase CT Pri. × 3)	32-bit VA	1 unit	F3	3
8	0240	Phase A Current	1000ths of nominal A	20 units	F1	1
9	0241	Phase B Current	1000ths of nominal	20 units	F1	1
10	0242	Phase C Current	1000ths of nominal	20 units	F1	1
11	0243	Average Current	1000ths of nominal	20 units	F1	1
12	0244	Neutral Current	1000ths of nominal	20 units	F1	1
13	0245	Current Unbalance	tenths of 1 percent	10 units	F1	2
14	0280	Voltage Van	1000ths of nominal V	20 units	F3	1
15	0282	Voltage Vbn	1000ths of nominal V	20 units	F3	1

footnote reference are located at the end of the table

Table 9: Point List for Analog Input/Output Change (Sheet 2 of 6)

Point	Modbus Reg	Description	Unit / Value	Deadband	Format Code	Event Class Assigned To
16	0284	Voltage Vcn	1000ths of nominal V	20 units	F3	1
17	0286	Average Phase Voltage	1000ths of nominal V	20 units	F3	1
18	0288	Voltage Vab	1000ths of nominal V	20 units	F3	1
19	028A	Voltage Vbc	1000ths of nominal V	20 units	F3	1
20	028C	Voltage Vca	1000ths of nominal V	20 units	F3	1
21	028E	Average Line Voltage	1000ths of nominal	20 units	F3	1
22	0290	Voltage Unbalance	0.1 x %	10 units	F1	2
23	02F0	3 Phase Real Power	1000ths of nominal VA	20 units	F4	2
24	02F2	3 Phase Reactive Power	1000ths of nominal VA	20 units	F4	2
25	02F4	3 Phase Apparent Power	1000ths of nominal VA	20 units	F3	2
26	02F6	3 Phase Power Factor	%	5 units	F2	2
27	02F7	Phase A Real Power	1000ths of nominal	20 units	F4	3
28	02F9	Phase A Reactive Power	1000ths of nominal	20 units	F4	3
29	02FB	Phase A Apparent Power	1000ths of nominal	20 units	F3	3
30	02FD	Phase A Power Factor	%	5 units	F2	3
31	02FE	Phase B Real Power	1000ths of nominal	20 units	F4	3
32	0300	Phase B Reactive Power	1000ths of nominal	20 units	F4	3
33	0302	Phase B Apparent Power	1000ths of nominal	20 units	F3	3
34	0304	Phase B Power Factor	%	5 units	F2	3
35	0305	Phase C Real Power	1000ths of nominal	20 units	F4	3
36	0307	Phase C Reactive Power	1000ths of nominal	20 units	F4	3
37	0309	Phase C Apparent Power	1000ths of nominal	20 units	F3	3
38	030B	Phase C Power Factor	%	5 units	F2	3
39	0400	Phase A Current Demand	1000ths of nominal	20 units	F1	3
40	0401	Phase B Current Demand	1000ths of nominal	20 units	F1	3
41	0402	Phase C Current Demand	1000ths of nominal	20 units	F1	3
42	0403	Neutral Current Demand	1000ths of nominal	20 units	F1	3
43	0404	3 Phase Real Power Demand	1000ths of nominal	20 units	F4	3
44	0406	3 Phase React Power Demand	1000ths of nominal	20 units	F4	3
45	0408	3 Phase Apparent Power Demand	1000ths of nominal	20 units	F3	3
46	0440	Frequency	0.01x Hz	.05 Hz	F1	1
47	0458	Main/Alternate Analog Input	Unit varies -- 32 bits	10	F3	2

footnote reference are located at the end of the table

Table 9: Point List for Analog Input/Output Change (Sheet 3 of 6)

Point	Modbus Reg	Description	Unit / Value	Deadband	Format Code	Event Class Assigned To
48	0470	Ia Crest Factor	0.001 x CF	-	F1	-
49	0471	Ib Crest Factor	0.001 x CF	-	F1	-
50	0472	Ic Crest Factor	0.001 x CF	-	F1	-
51	0473	Ia Trans Harmonic Derating Factor	0.001 x THDF	-	F1	-
52	0474	Ib Trans Harmonic Derating Factor	0.001 x THDF	-	F1	-
53	0475	Ic Trans Harmonic Derating Factor	0.001 x THDF	-	F1	-
54	0478	Phase A Current THD	0.1 x %	5.0%	F1	3
55	0479	Phase B Current THD	0.1 x %	5.0%	F1	3
56	047A	Phase C Current THD	0.1 x %	5.0%	F1	3
57	047B	Neutral Current THD	0.1 x %	5.0%	F1	3
58	047C	Voltage Van THD	0.1 x %	5.0%	F1	3
59	047D	Voltage Vbn THD	0.1 x %	5.0%	F1	3
60	047E	Voltage Vcn THD	0.1 x %	5.0%	F1	3
61	047F	Voltage Vab THD	0.1 x %	5.0%	F1	3
62	0480	Voltage Vbc THD	0.1 x %	5.0%	F1	3
63		Reserved				
64	04B4	Average Current THD	0.1 x %	5.0%	F1	3
65	04B5	Average Voltage THD	0.1 x %	5.0%	F1	3
66	0246	Phase A Current - Minimum	1000^{ths} of nominal A	1 unit	F1	3
67	0247	Phase B Current - Minimum	1000^{ths} of nominal A	1 unit	F1	3
68	0248	Phase C Current - Minimum	1000^{ths} of nominal A	1 unit	F1	3
69	0249	Neutral Current - Minimum	1000^{ths} of nominal A	1 unit	F1	3
70	024A	Current Unbalance - Minimum	tenths of 1 percent	1 unit	F1	3
71	024B	Phase A Current - Maximum	1000^{ths} of nominal A	1 unit	F1	3
72	024C	Phase B Current - Maximum	1000^{ths} of nominal A	1 unit	F1	3
73	024D	Phase C Current - Maximum	1000^{ths} of nominal A	1 unit	F1	3
74	024E	Neutral Current - Maximum	1000^{ths} of nominal A	1 unit	F1	3
75	024F	Current Unbalance - Maximum	tenths of 1 percent	1 unit	F1	3
76	0291	Voltage Van - Minimum	1000^{ths} of nominal V	1 unit	F3	3
77	0293	Voltage Vbn - Minimum	1000^{ths} of nominal V	1 unit	F3	3
78	0295	Voltage Vcn - Minimum	1000^{ths} of nominal V	1 unit	F3	3
79	0297	Voltage Vab - Minimum	1000^{ths} of nominal V	1 unit	F3	3

footnote reference are located at the end of the table

Table 9: Point List for Analog Input/Output Change (Sheet 4 of 6)

Point	Modbus Reg	Description	Unit / Value	Deadband	Format Code	Event Class Assigned To
80	0299	Voltage Vbc - Minimum	1000^{ths} of nominal V	1 unit	F3	3
81	029B	Voltage Vca - Minimum	1000^{ths} of nominal V	1 unit	F3	3
82	029D	Voltage Unbalance - Minimum	0.1 x %	1 unit	F1	3
83	029E	Voltage Van - Maximum	1000^{ths} of nominal V	1 unit	F3	3
84	02A0	Voltage Vbn - Maximum	1000^{ths} of nominal V	1 unit	F3	3
85	02A2	Voltage Vcn - Maximum	1000^{ths} of nominal V	1 unit	F3	3
86	02A4	Voltage Vab - Maximum	1000^{ths} of nominal V	1 unit	F3	3
87	02A6	Voltage Vbc - Maximum	1000^{ths} of nominal V	1 unit	F3	3
88	02A8	Voltage Vca - Maximum	1000^{ths} of nominal V	1 unit	F3	3
89	02AA	Voltage Unbalance - Maximum	0.1 x %	1 unit	F1	3
90	030C	3 Phase Real Power - Minimum	1000^{ths} of nominal W	1 unit	F4	3
91	030E	3 Phase Reactive Power Minimum	1000^{ths} of nom. kvar	1 unit	F4	3
92	0310	3 Phase Apparent Power Minimum	1000^{ths} of nominal VA	1 unit	F3	3
93	0312	3 Phase Power Factor - Minimum	%	1 unit	F2	3
94	0313	3 Phase Real Power - Maximum	1000^{ths} of nominal	1 unit	F4	3
95	0315	3 Phase Reactive Power Maximum	1000^{ths} of nominal	1 unit	F4	3
96	0317	3 Phase Apparent Power Maximum	1000^{ths} of nominal	1 unit	F3	3
97	0319	3 Phase Power Factor - Maximum	%	1 unit	F2	3
98	031A	Phase A Real Power - Minimum	1000^{ths} of nominal	1 unit	F4	3
99	031C	Phase A Reactive Power Minimum	1000^{ths} of nominal	1 unit	F4	3
100	031E	Phase A Apparent Power Minimum	1000^{ths} of nominal	1 unit	F3	3
101	0220	Phase A Power Factor - Minimum	%	1 unit	F2	3
102	0321	Phase A Real Power - Maximum	1000^{ths} of nominal	1 unit	F4	3
103	0323	Phase A Reactive Power Maximum	1000^{ths} of nominal	1 unit	F4	3
104	0325	Phase A Apparent Power Maximum	1000^{ths} of nominal	1 unit	F3	3
105	0327	Phase A Power Factor Maximum	%	1 unit	F2	3
106	0328	Phase B Real Power Minimum	1000^{ths} of nominal	1 unit	F4	3
107	032A	Phase B Reactive Power Minimum	1000^{ths} of nominal	1 unit	F4	3
108	032C	Phase B Apparent Power Minimum	1000^{ths} of nominal	1 unit	F3	3

footnote reference are located at the end of the table

Table 9: Point List for Analog Input/Output Change (Sheet 5 of 6)

Point	Modbus Reg	Description	Unit / Value	Deadband	Format Code	Event Class Assigned To
109	032E	Phase B Power Factor Minimum	%	1 unit	F2	3
110	032F	Phase B Real Power Maximum	1000ths of nominal	1 unit	F4	3
111	0331	Phase B Reactive Power Maximum	1000ths of nominal	1 unit	F4	3
112	0333	Phase B Apparent Power Maximum	1000ths of nominal	1 unit	F3	3
113	0335	Phase B Power Factor Maximum	%	1 unit	F2	3
114	0336	Phase C Real Power Minimum	1000ths of nominal	1 unit	F4	3
115	0338	Phase C Reactive Power Minimum	1000ths of nominal	1 unit	F4	3
116	033A	Phase C Apparent Power - Minimum	1000ths of nominal	1 unit	F3	3
117	033C	Phase C Power Factor Minimum	%	1 unit	F2	3
118	033D	Phase C Real Power Maximum	1000ths of nominal	1 unit	F4	3
119	033F	Phase C Reactive Power Maximum	1000ths of nominal	1 unit	F4	3
120	0341	Phase C Apparent Power Maximum	1000ths of nominal	1 unit	F3	3
121	0343	Phase C Power Factor Maximum	%	1 unit	F2	3
122	040A	Phase A Current Demand Maximum	1000ths of nominal	1 unit	F1	3
123	040B	Phase B Current Demand Maximum	1000ths of nominal	1 unit	F1	3
124	040C	Phase C Current Demand Maximum	1000ths of nominal	1 unit	F1	3
125	040D	Neutral Current Demand Maximum	1000ths of nominal	1 unit	F1	3
126	040E	3 Phase Real Power Dmd Max	1000ths of nominal	1 unit	F4	3
127	0410	3 Phase React Power Dmd Max	1000ths of nominal	1 unit	F4	3
128	0412	3 Phase Apparent Power Dmd Max	1000ths of nominal	1 unit	F3	3
129	0441	Frequency Minimum	0.01 x Hz	.01 Hz	F1	3
130	0442	Frequency Maximum	0.01 x Hz	.01 Hz	F1	3
131	0482	Phase A Current THD - Maximum	0.1 x %	1 unit	F1	3
132	0483	Phase B Current THD - Maximum	0.1 x %	1 unit	F1	3
133	0484	Phase C Current THD - Maximum	0.1 x %	1 unit	F1	3
134	0485	Neutral Current THD - Maximum	0.1 x %	1 unit	F1	3
135	0486	Voltage Van THD - Maximum	0.1 x %	1 unit	F1	3
136	0487	Voltage Vbn THD - Maximum	0.1 x %	1 unit	F1	3
137	0488	Voltage Vcn THD - Maximum	0.1 x %	1 unit	F1	3

footnote reference are located at the end of the table

Table 9: Point List for Analog Input/Output Change (Sheet 6 of 6)

Point	Modbus Reg	Description	Unit / Value	Deadband	Format Code	Event Class Assigned To
138	0489	Voltage Vab THD - Maximum	0.1 x %	1 unit	F1	3
139	048A	Voltage Vbc THD - Maximum	0.1 x %	1 unit	F1	3
140		Reserved				
141	04C8	ADC Reference	-	20 units	F1	2
142	04CB	Current Key Press	-	1 unit	F8[1]	2
143	04CC	Internal Fault Error Code	-	1 unit	F108	2
144	0000	GE Multilin Product Device Code	always 73	-	F1	-
145	0001	Hardware Version Code	-	-	F5	-
146	0002	Main Software Version Code	-	-	F1	-
147	0003	Modification File Number 1	-	-	F1	-
148	0004	Boot Software Version Code	-	-	F1	-
149	0007	Modification File Number 2	-	-	F1	-
150	0008	Modification File Number 3	-	-	F1	-
151	0009	Modification File Number 4	-	-	F1	-
152	000A	Modification File Number 5	-	-	F1	-
153	0020	Serial Number Character 1 and 2	-	-	F10	-
154	0021	Serial Number Character 3 and 4	-	-	F10	-
155	0022	Serial Number Character 5 and 6	-	-	F10	-
156	0023	Serial Number Character 7 and 8	-	-	F10	-
157	0030	Manufacture Month/Day	-	-	F24	-
158	0031	Manufacture Year	-	-	F25	-
159	0032	Calibration Month/Day	-	-	F24	-
159	0033	Calibration Year	-	-	F25	-
footnote reference are located at the end of the table						

1. This point is used to reconstruct current values from the 1,000ths per-unit quantities given in the other points. Multiply the particular point by this one, and divide by 1000 to get amps.

   For example, given a CT primary setpoint value of 3000 and an actual phase A current reading from the DUT of 1077 A, the reconstructed phase A current is:

$$\text{Ia(reconstructed)} = \frac{\text{Point 0} \times \text{Point 8}}{1000} = \frac{3000 \times 359}{1000} = 1077\ \text{A}$$

2. The VT Ratio setpoint is always reported, but is not used if a direct (i.e., without VTs) voltage wiring scheme is configured. In this case the VT Ratio setpoint is ignored, and a ratio of 1.0:1 is used in the PQMII.
3. This point is used to reconstruct voltage values from the 1,000ths per-unit quantities given in the other points. Multiply the particular point by this one, and divide by 1000 to get volts. Since some SCADA systems do not read 32 bit values, you can also multiply the VT ratio and nominal secondary (both of which are 16 bit) in the master in cases where the nominal primary may exceed 32767 volts.

   For example, given a VT ratio of 300:1, a VT nominal secondary volts setting of 115 V, and an actual phase-neutral voltage reading from the DUT of 19919 V, we have:

$$\text{Van(reconstructed)} = \frac{\text{Point 5} \times \text{Point 14}}{1000} = \frac{577 \times 34500}{1000} = 19.91\ \text{kV}$$

$$\text{Vbn(reconstructed)} = \frac{\text{Point 5} \times \text{Point 18}}{1000} = \frac{577 \times 59756}{1000} = 34.50\ \text{kV}$$

4. This point is used to reconstruct power values from the 1,000ths per-unit quantities given in the other points. Multiply the particular point by this one, and divide by 1000 to get VA, kW or kvar.
5. The maximum value for Nominal Single-Phase VA and Nominal Three-Phase VA is 983010000 VA. When this value is over-range, it will indicate “1”; in this case, the DNP power values become the actual value and no formula is used.
6. In Modbus, the current keypress is reported with format code F6. In order to fit the value into a sixteen-bit signed value, F8 is used in DNP, with ASCII zero (48 decimal) returned when no key is pressed.
7. This point is not used for reconstructing any voltage values. The $\sqrt{3}$ difference between phase-to-phase and phase-to-neutral values is accounted for in the actual voltage points themselves. The VT nominal phase-to-neutral voltage (point 5) is used to reconstruct all voltage values.

5.4 Counters

The DNP point list for Binary Counters (object 20) is shown below:

Table 10: Counters Point List

Point Num	Modbus Register	Description	Unit	Format code
0	0450	Pulse Input 1	-	F3
1	0452	Pulse Input 2	-	F3
2	0454	Pulse Input 3	-	F3
3	0456	Pulse Input 4	-	F3
4	0460	Totalized Pulse Input	-	F3
5	03D0	3 Phase Positive Real Energy Used	kWh	F3
6	03D2	3 Phase Negative Real Energy Used	kWh	F3
7	03D4	3 Phase Positive React. Energy Used	kvarh	F3
8	03D6	3 Phase Negative React. Energy Used	kvarh	F3
9	03D8	3 Phase Apparent Energy Used	kVAh	F3
10	03DA	3 Phase Energy Used in Last 24 h	kWh	F3
11	03DC	3 Phase Energy Cost Since Reset	cents	F3
12	03DE	3 Phase Energy Cost Per Day	cents	F3

NOTE

Only counter points 0 to 4 can be cleared using function codes 9 and 10, and doing so disturbs the totals presented on the display and via Modbus communications. In general, the binary output points which clear data should be used if it is necessary to clear any of these counters.