

# **Series PM172 Powermeters**

## **GE EGD Communications Protocol**

### Reference Guide

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Every effort has been made to ensure that the material herein is complete and accurate. However, the manufacturer is not responsible for any mistakes in printing or faulty instructions contained in this book. Notification of any errors or misprints will be received with appreciation.

For further information regarding a particular installation, operation or maintenance of equipment, contact the manufacturer or your local representative or distributor.

# Table of Contents

|  |          |
|--|----------|
| <b>1 GENERAL .....</b>                                   | <b>5</b> |
| <b>2 EGD MESSAGING PROTOCOL .....</b>                    | <b>6</b> |
| 2.1 EGD PRODUCTION EXCHANGES.....                        | 6        |
| 2.2 DATA TYPES.....                                      | 6        |
| 2.3 POINT ADDRESS RANGES.....                            | 6        |
| 2.4 EGD PRODUCTION PERIODS.....                          | 7        |
| <b>3 DEVICE POINT MAP.....</b>                           | <b>8</b> |
| Special Inputs .....                                     | 8        |
| Event Flags (bitmap) <sup>EH</sup> .....                 | 8        |
| Digital Inputs DI1-DI2 (bitmap).....                     | 8        |
| Relay Outputs RO1-RO2 (bitmap) .....                     | 8        |
| Counters .....   | 8        |
| 1-Cycle Phase Values.....                                | 8        |
| 1-Cycle Total Values.....                                | 9        |
| 1-Cycle Auxiliary Values.....                            | 9        |
| Phasor.....  | 9        |
| 1-Second Phase Values.....                               | 10       |
| 1-Second Total Values.....                               | 10       |
| 1-Second Auxiliary Values .....                          | 11       |
| Present Harmonic Demands .....                           | 11       |
| Present Volt, Ampere and Power Demands.....              | 11       |
| Total Energies <sup>E</sup> .....                        | 12       |
| Summary Energy Registers <sup>E</sup> .....              | 12       |
| Phase Energies <sup>E</sup> .....                        | 12       |
| V1/V12 Harmonic Distortions <sup>EH</sup> .....          | 13       |
| V2/V23 Harmonic Distortions <sup>EH</sup> .....          | 13       |
| V3/V31 Harmonic Distortions <sup>EH</sup> .....          | 13       |
| I1 Harmonic Distortions <sup>EH</sup> .....              | 13       |
| I2 Harmonic Distortions <sup>EH</sup> .....              | 13       |
| I3 Harmonic Distortions <sup>EH</sup> .....              | 13       |
| Fundamental (H01) Phase Values .....                     | 13       |
| Harmonic Total Values.....                               | 14       |
| Minimum 1-Cycle Phase Values .....                       | 14       |
| Minimum 1-Cycle Total Values.....                        | 15       |
| Minimum 1-Cycle Auxiliary Values .....                   | 15       |
| Maximum 1-Cycle Phase Values .....                       | 15       |
| Maximum 1-Cycle Total Values.....                        | 15       |
| Maximum 1-Cycle Auxiliary Values .....                   | 15       |
| Maximum Demands .....                                    | 16       |
| Maximum Harmonic Demands .....                           | 16       |
| Scaled Analog Inputs .....                               | 16       |
| Raw Analog Inputs .....                                  | 16       |
| TOU Parameters <sup>E</sup> .....                        | 16       |
| Scaled Analog Outputs .....                              | 17       |
| TOU Energy Register #1 <sup>E</sup> .....                | 17       |
| TOU Energy Register #2 <sup>E</sup> .....                | 17       |
| TOU Energy Register #3 <sup>E</sup> .....                | 17       |
| TOU Energy Register #4 <sup>E</sup> .....                | 17       |
| TOU Energy Register #5 <sup>E</sup> .....                | 17       |
| TOU Energy Register #6 <sup>E</sup> .....                | 17       |
| TOU Energy Register #7 <sup>E</sup> .....                | 17       |
| TOU Energy Register #8 <sup>E</sup> .....                | 18       |
| Summary Energy Accumulated Demands <sup>E</sup> .....    | 18       |
| Summary Energy Block Demands <sup>E</sup> .....          | 18       |
| Summary Energy Sliding Window Demands <sup>E</sup> ..... | 18       |

|   |           |
|---|-----------|
| Summary Energy Maximum Demands <sup>E</sup> ..... | 18        |
| TOU Maximum Demand Register #1 <sup>E</sup> ..... | 18        |
| TOU Maximum Demand Register #2 <sup>E</sup> ..... | 18        |
| TOU Maximum Demand Register #3 <sup>E</sup> ..... | 18        |
| TOU Maximum Demand Register #4 <sup>E</sup> ..... | 19        |
| TOU Maximum Demand Register #5 <sup>E</sup> ..... | 19        |
| TOU Maximum Demand Register #6 <sup>E</sup> ..... | 19        |
| TOU Maximum Demand Register #7 <sup>E</sup> ..... | 19        |
| TOU Maximum Demand Register #8 <sup>E</sup> ..... | 19        |
| V1/V12 Harmonic Angles <sup>EH</sup> .....        | 19        |
| V2/V23 Harmonic Angles <sup>EH</sup> .....        | 19        |
| V1/V31 Harmonic Angles <sup>EH</sup> .....        | 19        |
| I1 Harmonic Angles <sup>EH</sup> .....            | 20        |
| I2 Harmonic Angles <sup>EH</sup> .....            | 20        |
| I3 Harmonic Angles <sup>EH</sup> .....            | 20        |
| Setpoint Status SP1-SP16 (bitmap) .....           | 20        |
| <b>4 DATA SCALES AND UNITS .....</b>              | <b>21</b> |
| Data Scales .....                                 | 21        |
| Data Units .....                                  | 21        |
| <b>5 EGD IMPLEMENTATION PROFILE .....</b>         | <b>22</b> |

# 1 General

This document specifies the GE EGD (Ethernet Global Data) messaging protocol used to transfer data between the PM172 EGD producer and EGD consumer nodes. The document provides the complete information necessary to develop third-party communications software capable of communication with the Series PM172 devices. Additional information concerning communications operation, configuring the communications parameters, and communications connections is found in "Series PM172 Powermeters, Installation and Operation Manual".

## **IMPORTANT**

In 3-wire connection schemes, the unbalanced current and phase readings for power factor, active power, and reactive power will be zeros, because they have no meaning. Only the total three-phase power values will be shown.

### **Designations used in the guide:**

- E - available in the meters with the E and EH suffixes
- EH - available in the meters with the EH suffix

## 2 EGD Messaging Protocol

The PM172 implements an EGD data producer that supports up to 4 data exchanges. Each data exchange is individually configurable through the supplemental PAS software and can produce and send data to the same or to different consuming nodes. The implementation is based on the Ethernet Global Data Protocol Specification V2.01. See the EGD implementation profile in Section 5 for EGD implementation and configuration details.

The PM172 does not provide a command port and cannot receive command PDU's.

### 2.1 EGD Production Exchanges

The PM172 production exchanges use exchange IDs in the range of 1 to 4. For the configuration signature, refer to the EGD implementation profile in Section 5. Each exchange sends data messages to the EGD UDP data port 18246 on the consuming node at a fixed periodic rate.

For each production exchange, the following parameters are configurable:

1. Destination IP address of the consuming node.
2. Production period.
3. Point address ranges of the production data to be sent via an exchange.
4. Data element type for each address range.

Up to 30 point ranges can be defined for each exchange that may specify a single point or a range of contiguous points. An exchange can send a total of 480 bytes of production data. This provides up to 120 data points per exchange using floating-point or double word data format, or 240 points per exchange using word format.

A configured exchange can be temporarily put into the pending state (disabled), and then resumed (enabled) whenever needed.

### 2.2 Data Types

Data transferred through the EGD exchanges is represented in little endian format: the bytes are ordered from least significant at the highest address to most significant at the lowest address. Data can be transferred in word (16-bit) or double word (32-bit) integer format, or in IEEE single precision floating-point format. Negative integer numbers are represented in 2-complement code.

Though data can be requested in floating-point format, it is actually stored in the device memory in integer format. The device point map in Section 3 shows an actual device storage type for each data point, a data range and available precision. If you use word or double word integer format and the data measurement units are indicated for the point with decimal places, multiply received data by the units to get readings in real engineering units.

If you use 16-bit word format for transferring 32-bit data, beware of the possible over-range. The value range allowed for 16-bit word data is 0 to 65535 for unsigned numbers and -32768 to 32767 for signed numbers. If the requested data exceeds a 16-bit word range, it is truncated to the maximum allowable negative or positive number. When over-range occurs, an unsigned value is reported as 65535, a positive signed value as 32767 and a negative signed value as -32768.

### 2.3 Point Address Ranges

Device data points are addressed using 16-bit point identifiers (ID). Available device data points are listed in Section 3. The point IDs are given in both decimal notation and in four-digit hexadecimal notation.

## 2.4 EGD Production Periods

The PM172 exchanges can provide production periods from 70 ms to 10 minutes in 10 ms increments. Though lower settings are allowed, the actual production period in most cases will not be less than 70 ms.

In the event that other active device TCP ports transfer data, like Modbus or DNP TCP/IP ports that can run along with the EGD producer, the production periods may increase. At least 60 ms timeout is highly recommended.

### 3 Device Point Map

| Point ID (Dec) | Point ID (Hex) | Description                               | Options/Range <sup>2</sup>                     | Units <sup>2</sup> | Type   | R/W | Notes                      |
|----------------|----------------|---|--|--------------------|--------|-----|----------------------------|
| 0              | 0x0000         | None                                      | 0  |                    | UINT16 | R   |                            |
|                |                | <b>Special Inputs</b>                     |  |                    |        |     |                            |
| 257            | 0x0101         | Phase rotation order                      | 0=error, 1=positive (ABC),<br>2=negative (CBA) |                    | UINT16 | R   |                            |
| 768            | 0x0300         | <b>Event Flags (bitmap)</b> <sup>EH</sup> | 0x0000-0x00FF                                  |                    | UINT16 | R   |                            |
| 1536           | 0x0600         | <b>Digital Inputs DI1-DI2 (bitmap)</b>    | 0x0000-0x0003                                  |                    | UINT16 | R   |                            |
| 2048           | 0x0800         | <b>Relay Outputs RO1-RO2 (bitmap)</b>     | 0x0000-0x0003                                  |                    | UINT16 | R   |                            |
|                |                | <b>Counters</b>                           |  |                    |        |     |                            |
| 2560           | 0x0A00         | Counter #1                                | 0-999,999                                      |                    | UINT32 | R   |                            |
| 2561           | 0x0A01         | Counter #2                                | 0-999,999                                      |                    | UINT32 | R   |                            |
| 2562           | 0x0A02         | Counter #3                                | 0-999,999                                      |                    | UINT32 | R   |                            |
| 2563           | 0x0A03         | Counter #4                                | 0-999,999                                      |                    | UINT32 | R   |                            |
|                |                | <b>1-Cycle Phase Values</b>               |  |                    |        |     |                            |
| 3072           | 0x0C00         | V1/V12 Voltage                            | 0-Vmax   | U1                 | UINT32 | R   | <sup>1</sup>               |
| 3073           | 0x0C01         | V2/V23 Voltage                            | 0-Vmax   | U1                 | UINT32 | R   | <sup>1</sup>               |
| 3074           | 0x0C02         | V3/V31 Voltage                            | 0-Vmax   | U1                 | UINT32 | R   | <sup>1</sup>               |
| 3075           | 0x0C03         | I1 Current                                | 0-Imax   | U2                 | UINT32 | R   |                            |
| 3076           | 0x0C04         | I2 Current                                | 0-Imax   | U2                 | UINT32 | R   |                            |
| 3077           | 0x0C05         | I3 Current                                | 0-Imax   | U2                 | UINT32 | R   |                            |
| 3078           | 0x0C06         | kW L1                                     | -Pmax-Pmax                                     | U3                 | INT32  | R   |                            |
| 3079           | 0x0C07         | kW L2                                     | -Pmax-Pmax                                     | U3                 | INT32  | R   |                            |
| 3080           | 0x0C08         | kW L3                                     | -Pmax-Pmax                                     | U3                 | INT32  | R   |                            |
| 3081           | 0x0C09         | kvar L1                                   | -Pmax-Pmax                                     | U3                 | INT32  | R   |                            |
| 3082           | 0x0C0A         | kvar L2                                   | -Pmax-Pmax                                     | U3                 | INT32  | R   |                            |
| 3083           | 0x0C0B         | kvar L3                                   | -Pmax-Pmax                                     | U3                 | INT32  | R   |                            |
| 3084           | 0x0C0C         | kVA L1                                    | 0-Pmax   | U3                 | UINT32 | R   |                            |
| 3085           | 0x0C0D         | kVA L2                                    | 0-Pmax   | U3                 | UINT32 | R   |                            |
| 3086           | 0x0C0E         | kVA L3                                    | 0-Pmax   | U3                 | UINT32 | R   |                            |
| 3087           | 0x0C0F         | Power factor L1                           | -1000-1000                                     | ×0.001             | INT16  | R   |                            |
| 3088           | 0x0C10         | Power factor L2                           | -1000-1000                                     | ×0.001             | INT16  | R   |                            |
| 3089           | 0x0C11         | Power factor L3                           | -1000-1000                                     | ×0.001             | INT16  | R   |                            |
| 3090           | 0x0C12         | V1/V12 Voltage THD                        | 0-9999   | ×0.1%              | UINT16 | R   | <sup>1</sup> 4-cycle value |
| 3091           | 0x0C13         | V2/V23 Voltage THD                        | 0-9999   | ×0.1%              | UINT16 | R   | <sup>1</sup> 4-cycle value |
| 3092           | 0x0C14         | V3/V31 Voltage THD                        | 0-9999   | ×0.1%              | UINT16 | R   | <sup>1</sup> 4-cycle value |
| 3093           | 0x0C15         | I1 Current THD                            | 0-9999   | ×0.1%              | UINT16 | R   | 4-cycle value              |
| 3094           | 0x0C16         | I2 Current THD                            | 0-9999   | ×0.1%              | UINT16 | R   | 4-cycle value              |
| 3095           | 0x0C17         | I3 Current THD                            | 0-9999   | ×0.1%              | UINT16 | R   | 4-cycle value              |
| 3096           | 0x0C18         | I1 K-Factor                               | 10-9999  | ×0.1               | UINT16 | R   | 4-cycle value              |
| 3097           | 0x0C19         | I2 K-Factor                               | 10-9999  | ×0.1               | UINT16 | R   | 4-cycle value              |

| Point ID (Dec) | Point ID (Hex) | Description                     | Options/Range <sup>2</sup> | Units <sup>2</sup> | Type   | R/W | Notes         |
|----------------|----------------|---------------------------------|----------------------------|--------------------|--------|-----|---------------|
| 3098           | 0x0C1A         | I3 K-Factor                     | 10-9999                    | ×0.1               | UINT16 | R   | 4-cycle value |
| 3099           | 0x0C1B         | I1 Current TDD                  | 0-1000                     | ×0.1%              | UINT16 | R   | 4-cycle value |
| 3100           | 0x0C1C         | I2 Current TDD                  | 0-1000                     | ×0.1%              | UINT16 | R   | 4-cycle value |
| 3101           | 0x0C1D         | I3 Current TDD                  | 0-1000                     | ×0.1%              | UINT16 | R   | 4-cycle value |
| 3102           | 0x0C1E         | V12 Voltage                     | 0-Vmax                     | U1                 | UINT16 | R   |               |
| 3103           | 0x0C1F         | V23 Voltage                     | 0-Vmax                     | U1                 | UINT16 | R   |               |
| 3104           | 0x0C20         | V31 Voltage                     | 0-Vmax                     | U1                 | UINT16 | R   |               |
|                |                | <b>1-Cycle Total Values</b>     |                            |                    |        |     |               |
| 3840           | 0x0F00         | Total kW                        | -Pmax-Pmax                 | U3                 | INT32  | R   |               |
| 3841           | 0x0F01         | Total kvar                      | -Pmax-Pmax                 | U3                 | INT32  | R   |               |
| 3842           | 0x0F02         | Total kVA                       | 0-Pmax                     | U3                 | UINT32 | R   |               |
| 3843           | 0x0F03         | Total PF                        | -1000-1000                 | ×0.001             | INT16  | R   |               |
| 3844           | 0x0F04         | Total PF lag                    | 0-1000                     | ×0.001             | UINT16 | R   |               |
| 3845           | 0x0F05         | Total PF lead                   | 0-1000                     | ×0.001             | UINT16 | R   |               |
| 3846           | 0x0F06         | Total kW import                 | 0-Pmax                     | U3                 | UINT32 | R   |               |
| 3847           | 0x0F07         | Total kW export                 | 0-Pmax                     | U3                 | UINT32 | R   |               |
| 3848           | 0x0F08         | Total kvar import               | 0-Pmax                     | U3                 | UINT32 | R   |               |
| 3849           | 0x0F09         | Total kvar export               | 0-Pmax                     | U3                 | UINT32 | R   |               |
| 3850           | 0x0F0A         | 3-phase average L-N/L-L voltage | 0-Vmax                     | U1                 | UINT32 | R   | 1             |
| 3851           | 0x0F0B         | 3-phase average L-L voltage     | 0-Vmax                     | U1                 | UINT32 | R   |               |
| 3852           | 0x0F0C         | 3-phase average current         | 0-Imax                     | U2                 | UINT32 | R   |               |
|                |                | <b>1-Cycle Auxiliary Values</b> |                            |                    |        |     |               |
| 4096           | 0x1000         | Not used                        |                            |                    | UINT32 | R   |               |
| 4097           | 0x1001         | In (neutral) Current            | 0-Imax                     | U2                 | UINT32 | R   |               |
| 4098           | 0x1002         | Frequency                       | 0-Fmax                     | ×0.01Hz            | UINT16 | R   |               |
| 4099           | 0x1003         | Voltage unbalance               | 0-3000                     | ×0.1%              | UINT16 | R   |               |
| 4100           | 0x1004         | Current unbalance               | 0-3000                     | ×0.1%              | UINT16 | R   |               |
|                |                | <b>Phasor</b>                   |                            |                    |        |     |               |
| 4224           | 0x1080         | V1/V12 Voltage magnitude        | 0-Vmax                     | U1                 | UINT32 | R   | 1             |
| 4225           | 0x1081         | V2/V23 Voltage magnitude        | 0-Vmax                     | U1                 | UINT32 | R   | 1             |
| 4226           | 0x1082         | V3/V31 Voltage magnitude        | 0-Vmax                     | U1                 | UINT32 | R   | 1             |
| 4227           | 0x1083         | Not used                        |                            |                    | UINT32 | R   |               |
| 4228           | 0x1084         | I1 Current magnitude            | 0-Imax                     | U2                 | UINT32 | R   |               |
| 4229           | 0x1085         | I2 Current magnitude            | 0-Imax                     | U2                 | UINT32 | R   |               |
| 4230           | 0x1086         | I3 Current magnitude            | 0-Imax                     | U2                 | UINT32 | R   |               |
| 4231           | 0x1087         | Not used                        |                            |                    | UINT32 | R   |               |
| 4232           | 0x1088         | V1/V12 Voltage angle            | -1800-1800                 | ×0.1°              | INT16  | R   | 1             |
| 4233           | 0x1089         | V2/V23 Voltage angle            | -1800-1800                 | ×0.1°              | INT16  | R   | 1             |
| 4234           | 0x108A         | V3/V31 Voltage angle            | -1800-1800                 | ×0.1°              | INT16  | R   | 1             |
| 4235           | 0x108B         | Not used                        |                            |                    | INT16  | R   |               |
| 4236           | 0x108C         | I1 Current angle                | -1800-1800                 | ×0.1°              | INT16  | R   |               |
| 4237           | 0x108D         | I2 Current angle                | -1800-1800                 | ×0.1°              | INT16  | R   |               |

| Point ID (Dec) | Point ID (Hex) | Description                  | Options/Range <sup>2</sup> | Units <sup>2</sup> | Type   | R/W | Notes                    |
|----------------|----------------|------------------------------|----------------------------|--------------------|--------|-----|--------------------------|
| 4238           | 0x108E         | I3 Current angle             | -1800-1800                 | ×0.1°              | INT16  | R   |                          |
| 4239           | 0x108F         | Not used                     |                            |                    | INT16  | R   |                          |
|                |                | <b>1-Second Phase Values</b> |                            |                    |        |     |                          |
| 4352           | 0x1100         | V1/V12 Voltage               | 0-Vmax                     | U1                 | UINT32 | R   | <sup>1</sup>             |
| 4353           | 0x1101         | V2/V23 Voltage               | 0-Vmax                     | U1                 | UINT32 | R   | <sup>1</sup>             |
| 4354           | 0x1102         | V3/V31 Voltage               | 0-Vmax                     | U1                 | UINT32 | R   | <sup>1</sup>             |
| 4355           | 0x1103         | I1 Current                   | 0-Imax                     | U2                 | UINT32 | R   |                          |
| 4356           | 0x1104         | I2 Current                   | 0-Imax                     | U2                 | UINT32 | R   |                          |
| 4357           | 0x1105         | I3 Current                   | 0-Imax                     | U2                 | UINT32 | R   |                          |
| 4358           | 0x1106         | kW L1                        | -Pmax-Pmax                 | U3                 | INT32  | R   |                          |
| 4359           | 0x1107         | kW L2                        | -Pmax-Pmax                 | U3                 | INT32  | R   |                          |
| 4360           | 0x1108         | kW L3                        | -Pmax-Pmax                 | U3                 | INT32  | R   |                          |
| 4361           | 0x1109         | kvar L1                      | -Pmax-Pmax                 | U3                 | INT32  | R   |                          |
| 4362           | 0x110A         | kvar L2                      | -Pmax-Pmax                 | U3                 | INT32  | R   |                          |
| 4363           | 0x110B         | kvar L3                      | -Pmax-Pmax                 | U3                 | INT32  | R   |                          |
| 4364           | 0x110C         | kVA L1                       | 0-Pmax                     | U3                 | UINT32 | R   |                          |
| 4365           | 0x110D         | kVA L2                       | 0-Pmax                     | U3                 | UINT32 | R   |                          |
| 4366           | 0x110E         | kVA L3                       | 0-Pmax                     | U3                 | UINT32 | R   |                          |
| 4367           | 0x110F         | Power factor L1              | -1000-1000                 | ×0.001             | INT16  | R   |                          |
| 4368           | 0x1110         | Power factor L2              | -1000-1000                 | ×0.001             | INT16  | R   |                          |
| 4369           | 0x1111         | Power factor L3              | -1000-1000                 | ×0.001             | INT16  | R   |                          |
| 4370           | 0x1112         | V1/V12 Voltage THD           | 0-9999                     | ×0.1%              | UINT16 | R   | <sup>1</sup> 3-sec value |
| 4371           | 0x1113         | V2/V23 Voltage THD           | 0-9999                     | ×0.1%              | UINT16 | R   | <sup>1</sup> 3-sec value |
| 4372           | 0x1114         | V3/V31 Voltage THD           | 0-9999                     | ×0.1%              | UINT16 | R   | <sup>1</sup> 3-sec value |
| 4373           | 0x1115         | I1 Current THD               | 0-9999                     | ×0.1%              | UINT16 | R   | 3-sec value              |
| 4374           | 0x1116         | I2 Current THD               | 0-9999                     | ×0.1%              | UINT16 | R   | 3-sec value              |
| 4375           | 0x1117         | I3 Current THD               | 0-9999                     | ×0.1%              | UINT16 | R   | 3-sec value              |
| 4376           | 0x1118         | I1 K-Factor                  | 10-9999                    | ×0.1               | UINT16 | R   | 3-sec value              |
| 4377           | 0x1119         | I2 K-Factor                  | 10-9999                    | ×0.1               | UINT16 | R   | 3-sec value              |
| 4378           | 0x111A         | I3 K-Factor                  | 10-9999                    | ×0.1               | UINT16 | R   | 3-sec value              |
| 4379           | 0x111B         | I1 Current TDD               | 0-1000                     | ×0.1%              | UINT16 | R   | 3-sec value              |
| 4380           | 0x111C         | I2 Current TDD               | 0-1000                     | ×0.1%              | UINT16 | R   | 3-sec value              |
| 4381           | 0x111D         | I3 Current TDD               | 0-1000                     | ×0.1%              | UINT16 | R   | 3-sec value              |
| 4382           | 0x111E         | V12 Voltage                  | 0-Vmax                     | U1                 | UINT16 | R   |                          |
| 4383           | 0x111F         | V23 Voltage                  | 0-Vmax                     | U1                 | UINT16 | R   |                          |
| 4384           | 0x1120         | V31 Voltage                  | 0-Vmax                     | U1                 | UINT16 | R   |                          |
|                |                | <b>1-Second Total Values</b> |                            |                    |        |     |                          |
| 5120           | 0x1400         | Total kW                     | -Pmax-Pmax                 | U3                 | INT32  | R   |                          |
| 5121           | 0x1401         | Total kvar                   | -Pmax-Pmax                 | U3                 | INT32  | R   |                          |
| 5122           | 0x1402         | Total kVA                    | 0-Pmax                     | U3                 | UINT32 | R   |                          |
| 5123           | 0x1403         | Total PF                     | -1000-1000                 | ×0.001             | INT16  | R   |                          |
| 5124           | 0x1404         | Total PF lag                 | 0-1000                     | ×0.001             | UINT16 | R   |                          |

| Point ID (Dec) | Point ID (Hex) | Description                                   | Options/Range <sup>2</sup> | Units <sup>2</sup> | Type   | R/W | Notes |
|----------------|----------------|---|----------------------------|--------------------|--------|-----|-------|
| 5125           | 0x1405         | Total PF lead                                 | 0-1000                     | ×0.001             | UINT16 | R   |       |
| 5126           | 0x1406         | Total kW import                               | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5127           | 0x1407         | Total kW export                               | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5128           | 0x1408         | Total kvar import                             | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5129           | 0x1409         | Total kvar export                             | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5130           | 0x140A         | 3-phase average L-N/L-L voltage               | 0-Vmax                     | U1                 | UINT32 | R   | 1     |
| 5131           | 0x140B         | 3-phase average L-L voltage                   | 0-Vmax                     | U1                 | UINT32 | R   |       |
| 5132           | 0x140C         | 3-phase average current                       | 0-Imax                     | U2                 | UINT32 | R   |       |
|                |                | <b>1-Second Auxiliary Values</b>              |                            |                    |        |     |       |
| 5376           | 0x1500         | Not used                                      |                            |                    | UINT32 | R   |       |
| 5377           | 0x1501         | In (neutral) Current                          | 0-Imax                     | U2                 | UINT32 | R   |       |
| 5378           | 0x1502         | Frequency                                     | 0-Fmax                     | ×0.01Hz            | UINT16 | R   |       |
| 5379           | 0x1503         | Voltage unbalance                             | 0-3000                     | ×0.1%              | UINT16 | R   |       |
| 5380           | 0x1504         | Current unbalance                             | 0-3000                     | ×0.1%              | UINT16 | R   |       |
|                |                | <b>Present Harmonic Demands</b>               |                            |                    |        |     |       |
| 5504           | 0x1580         | V1/V12 THD demand                             | 0-9999                     | ×0.1%              | UINT16 | R   | 1     |
| 5505           | 0x1581         | V2/V23 THD demand                             | 0-9999                     | ×0.1%              | UINT16 | R   | 1     |
| 5506           | 0x1582         | V3/V31 THD demand                             | 0-9999                     | ×0.1%              | UINT16 | R   | 1     |
| 5507           | 0x1583         | Not used                                      |                            |                    | UINT16 | R   |       |
| 5508           | 0x1584         | I1 THD demand                                 | 0-9999                     | ×0.1%              | UINT16 | R   |       |
| 5509           | 0x1585         | I2 THD demand                                 | 0-9999                     | ×0.1%              | UINT16 | R   |       |
| 5510           | 0x1586         | I3 THD demand                                 | 0-9999                     | ×0.1%              | UINT16 | R   |       |
| 5511           | 0x1587         | Not used                                      | 0-9999                     | ×0.1%              | UINT16 | R   |       |
| 5512           | 0x1588         | I1 TDD demand                                 | 0-1000                     | ×0.1%              | UINT16 | R   |       |
| 5513           | 0x1589         | I2 TDD demand                                 | 0-1000                     | ×0.1%              | UINT16 | R   |       |
| 5514           | 0x158A         | I3 TDD demand                                 | 0-1000                     | ×0.1%              | UINT16 | R   |       |
| 5515           | 0x158B         | Not used                                      | 0-1000                     | ×0.1%              | UINT16 | R   |       |
|                |                | <b>Present Volt, Ampere and Power Demands</b> |                            |                    |        |     |       |
| 5632           | 0x1600         | V1/V12 Volt demand                            | 0-Vmax                     | U1                 | UINT32 | R   | 1     |
| 5633           | 0x1601         | V2/V23 Volt demand                            | 0-Vmax                     | U1                 | UINT32 | R   | 1     |
| 5634           | 0x1602         | V3/V31 Volt demand                            | 0-Vmax                     | U1                 | UINT32 | R   | 1     |
| 5635           | 0x1603         | I1 Ampere demand                              | 0-Imax                     | U2                 | UINT32 | R   |       |
| 5636           | 0x1604         | I2 Ampere demand                              | 0-Imax                     | U2                 | UINT32 | R   |       |
| 5637           | 0x1605         | I3 Ampere demand                              | 0-Imax                     | U2                 | UINT32 | R   |       |
| 5638           | 0x1606         | kW import block demand                        | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5639           | 0x1607         | kvar import block demand                      | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5640           | 0x1608         | kVA block demand                              | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5641           | 0x1609         | kW import sliding window demand               | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5642           | 0x160A         | kvar import sliding window demand             | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5643           | 0x160B         | kVA sliding window demand                     | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5644           | 0x160C         | Not used                                      | 0                          |                    | UINT32 | R   |       |
| 5645           | 0x160D         | Not used                                      | 0                          |                    | UINT32 | R   |       |

| Point ID (Dec) | Point ID (Hex) | Description                                   | Options/Range <sup>2</sup> | Units <sup>2</sup> | Type   | R/W | Notes |
|----------------|----------------|---|----------------------------|--------------------|--------|-----|-------|
| 5646           | 0x160E         | Not used                                      | 0                          |                    | UINT32 | R   |       |
| 5647           | 0x160F         | kW import accumulated demand                  | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5648           | 0x1610         | kvar import accumulated demand                | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5649           | 0x1611         | kVA accumulated demand                        | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5650           | 0x1612         | kW import predicted sliding window demand     | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5651           | 0x1613         | kvar import predicted sliding window demand   | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5652           | 0x1614         | kVA predicted sliding window demand           | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5653           | 0x1615         | PF (import) at Max. kVA sliding window demand | 0-1000                     | ×0.001             | UINT16 | R   |       |
| 5654           | 0x1616         | kW export block demand                        | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5655           | 0x1617         | kvar export block demand                      | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5656           | 0x1618         | kW export sliding window demand               | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5657           | 0x1619         | kvar export sliding window demand             | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5658           | 0x161A         | kW export accumulated demand                  | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5659           | 0x161B         | kvar export accumulated demand                | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5660           | 0x161C         | kW export predicted sliding window demand     | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 5661           | 0x161D         | kvar export predicted sliding window demand   | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | <b>Total Energies<sup>E</sup></b>             |                            |                    |        |     |       |
| 5888           | 0x1700         | kWh import                                    | 0-10 <sup>9</sup> -1       | 1 kWh              | UINT32 | R   |       |
| 5889           | 0x1701         | kWh export                                    | 0-10 <sup>9</sup> -1       | 1 kWh              | UINT32 | R   |       |
| 5890           | 0x1702         | Not used                                      |                            |                    | INT32  | R   |       |
| 5891           | 0x1703         | Not used                                      |                            |                    | UINT32 | R   |       |
| 5892           | 0x1704         | kvarh import                                  | 0-10 <sup>9</sup> -1       | 1 kvarh            | UINT32 | R   |       |
| 5893           | 0x1705         | kvarh export                                  | 0-10 <sup>9</sup> -1       | 1 kvarh            | UINT32 | R   |       |
| 5894           | 0x1706         | Not used                                      |                            |                    | INT32  | R   |       |
| 5895           | 0x1707         | Not used                                      |                            |                    | UINT32 | R   |       |
| 5896           | 0x1708         | kVAh total                                    | 0-10 <sup>9</sup> -1       | 1 kVAh             | UINT32 | R   |       |
| 5897           | 0x1709         | Not used                                      |                            |                    | UINT32 | R   |       |
| -5900          | -0x170C        |   |                            |                    |        |     |       |
| 5901           | 0x170D         | Harmonic kWh import <sup>EH</sup>             | 0-10 <sup>9</sup> -1       | 1 kWh              | UINT32 | R   |       |
| 5902           | 0x170E         | Harmonic kWh export <sup>EH</sup>             | 0-10 <sup>9</sup> -1       | 1 kWh              | UINT32 | R   |       |
| 5903           | 0x170F         | Not used                                      |                            |                    | UINT32 | R   |       |
| -5904          | -0x1710        |   |                            |                    |        |     |       |
| 5905           | 0x1711         | Harmonic kVAh total <sup>EH</sup>             | 0-10 <sup>9</sup> -1       | 1 kVAh             | UINT32 | R   |       |
|                |                | <b>Summary Energy Registers<sup>E</sup></b>   |                            |                    |        |     |       |
| 6016           | 0x1780         | Summary energy register #1                    | 0-10 <sup>9</sup> -1       | 1 kWh              | UINT32 | R   |       |
| 6017           | 0x1781         | Summary energy register #2                    | 0-10 <sup>9</sup> -1       | 1 kWh              | UINT32 | R   |       |
|                |                | ...   |                            |                    |        |     |       |
| 6023           | 0x1787         | Summary energy register #8                    | 0-10 <sup>9</sup> -1       | 1 kWh              | UINT32 | R   |       |
|                |                | <b>Phase Energies<sup>E</sup></b>             |                            |                    |        |     |       |
| 6144           | 0x1800         | kWh import L1                                 | 0-10 <sup>9</sup> -1       | 1 kWh              | UINT32 | R   |       |
| 6145           | 0x1801         | kWh import L2                                 | 0-10 <sup>9</sup> -1       | 1 kWh              | UINT32 | R   |       |

| Point ID (Dec) | Point ID (Hex) | Description                                      | Options/Range <sup>2</sup> | Units <sup>2</sup> | Type   | R/W | Notes          |
|----------------|----------------|--|----------------------------|--------------------|--------|-----|----------------|
| 6146           | 0x1802         | kWh import L3                                    | 0-10 <sup>9</sup> -1       | 1 kWh              | UINT32 | R   |                |
| 6147           | 0x1803         | kvarh import L1                                  | 0-10 <sup>9</sup> -1       | 1 kvarh            | UINT32 | R   |                |
| 6148           | 0x1804         | kvarh import L2                                  | 0-10 <sup>9</sup> -1       | 1 kvarh            | UINT32 | R   |                |
| 6149           | 0x1805         | kvarh import L3                                  | 0-10 <sup>9</sup> -1       | 1 kvarh            | UINT32 | R   |                |
| 6150           | 0x1806         | kVAh total L1                                    | 0-10 <sup>9</sup> -1       | 1 kVAh             | UINT32 | R   |                |
| 6151           | 0x1807         | kVAh total L2                                    | 0-10 <sup>9</sup> -1       | 1 kVAh             | UINT32 | R   |                |
| 6152           | 0x1808         | kVAh total L3                                    | 0-10 <sup>9</sup> -1       | 1 kVAh             | UINT32 | R   |                |
|                |                | <b>V1/V12 Harmonic Distortions</b> <sup>EH</sup> |                            |                    |        |     | 1              |
| 6400           | 0x1900         | H01 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
| 6401           | 0x1901         | H02 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
|                |                | ...  |                            |                    |        |     |                |
| 6439           | 0x1927         | H40 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
|                |                | <b>V2/V23 Harmonic Distortions</b> <sup>EH</sup> |                            |                    |        |     | 1              |
| 6656           | 0x1A00         | H01 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
| 6657           | 0x1A01         | H02 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
|                |                | ...  |                            |                    |        |     |                |
| 6695           | 0x1A27         | H40 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
|                |                | <b>V3/V31 Harmonic Distortions</b> <sup>EH</sup> |                            |                    |        |     | 1              |
| 6912           | 0x1B00         | H01 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
| 6913           | 0x1B01         | H02 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
|                |                | ...  |                            |                    |        |     |                |
| 6951           | 0x1B27         | H40 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
|                |                | <b>I1 Harmonic Distortions</b> <sup>EH</sup>     |                            |                    |        |     |                |
| 7168           | 0x1C00         | H01 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
| 7169           | 0x1C01         | H02 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
|                |                | ...  |                            |                    |        |     |                |
| 7207           | 0x1C27         | H40 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
|                |                | <b>I2 Harmonic Distortions</b> <sup>EH</sup>     |                            |                    |        |     |                |
| 7424           | 0x1D00         | H01 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
| 7425           | 0x1D01         | H02 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
|                |                | ...  |                            |                    |        |     |                |
| 7464           | 0x1D27         | H40 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
|                |                | <b>I3 Harmonic Distortions</b> <sup>EH</sup>     |                            |                    |        |     |                |
| 7680           | 0x1E00         | H01 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
| 7681           | 0x1E01         | H02 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
|                |                | ...  |                            |                    |        |     |                |
| 7719           | 0x1E27         | H40 Harmonic distortion                          | 0-10000                    | 0.01%              | UINT16 | R   |                |
|                |                | <b>Fundamental (H01) Phase Values</b>            |                            |                    |        |     | 4-cycle values |
| 10496          | 0x2900         | V1/V12 Voltage                                   | 0-Vmax                     | U1                 | UINT32 | R   | 1              |
| 10497          | 0x2901         | V2/V23 Voltage                                   | 0-Vmax                     | U1                 | UINT32 | R   | 1              |

| Point ID (Dec) | Point ID (Hex)    | Description                         | Options/Range <sup>2</sup> | Units <sup>2</sup> | Type   | R/W | Notes                      |
|----------------|-------------------|-------------------------------------|----------------------------|--------------------|--------|-----|----------------------------|
| 10498          | 0x2902            | V3/V31 Voltage                      | 0-Vmax                     | U1                 | UINT32 | R   | <sup>1</sup>               |
| 10499          | 0x2903            | I1 Current                          | 0-Imax                     | U2                 | UINT32 | R   |                            |
| 10500          | 0x2904            | I2 Current                          | 0-Imax                     | U2                 | UINT32 | R   |                            |
| 10501          | 0x2905            | I3 Current                          | 0-Imax                     | U2                 | UINT32 | R   |                            |
| 10502          | 0x2906            | kW L1                               | -Pmax-Pmax                 | U3                 | INT32  | R   |                            |
| 10503          | 0x2907            | kW L2                               | -Pmax-Pmax                 | U3                 | INT32  | R   |                            |
| 10504          | 0x2908            | kW L3                               | -Pmax-Pmax                 | U3                 | INT32  | R   |                            |
| 10505          | 0x2909            | kvar L1                             | -Pmax-Pmax                 | U3                 | INT32  | R   |                            |
| 10506          | 0x290A            | kvar L2                             | -Pmax-Pmax                 | U3                 | INT32  | R   |                            |
| 10507          | 0x290B            | kvar L3                             | -Pmax-Pmax                 | U3                 | INT32  | R   |                            |
| 10508          | 0x290C            | kVA L1                              | 0-Pmax                     | U3                 | UINT32 | R   |                            |
| 10509          | 0x290D            | kVA L2                              | 0-Pmax                     | U3                 | UINT32 | R   |                            |
| 10510          | 0x290E            | kVA L3                              | 0-Pmax                     | U3                 | UINT32 | R   |                            |
| 10511          | 0x290F            | Power factor L1                     | -1000-1000                 | ×0.001             | INT16  | R   |                            |
| 10512          | 0x2910            | Power factor L2                     | -1000-1000                 | ×0.001             | INT16  | R   |                            |
| 10513          | 0x2911            | Power factor L3                     | -1000-1000                 | ×0.001             | INT16  | R   |                            |
|                |                   | <b>Harmonic Total Values</b>        |                            |                    |        |     | 4-cycle values             |
| 10752          | 0x2A00            | Total fundamental kW                | -Pmax-Pmax                 | U3                 | INT32  | R   |                            |
| 10753          | 0x2A01            | Total fundamental kvar              | -Pmax-Pmax                 | U3                 | INT32  | R   |                            |
| 10754          | 0x2A02            | Total fundamental kVA               | 0-Pmax                     | U3                 | UINT32 | R   |                            |
| 10755          | 0x2A03            | Total fundamental PF                | -1000-1000                 | ×0.001             | INT16  | R   |                            |
| 10755          | 0x2A04            | Total harmonic kW <sup>EH</sup>     | -Pmax-Pmax                 | U3                 | INT32  | R   |                            |
| 10756          | 0x2A05            | Not used                            |                            |                    | INT32  | R   |                            |
| 10757          | 0x2A06            | Total harmonic kVA <sup>EH</sup>    | 0-Pmax                     | U3                 | UINT32 | R   |                            |
| 10758          | 0x2A07            | Not used                            |                            |                    | INT16  | R   |                            |
|                |                   | <b>Minimum 1-Cycle Phase Values</b> |                            |                    |        |     |                            |
| 11264          | 0x2C00            | V1/V12 Voltage                      | 0-Vmax                     | U1                 | UINT32 | R   | <sup>1</sup>               |
| 11265          | 0x2C01            | V2/V23 Voltage                      | 0-Vmax                     | U1                 | UINT32 | R   | <sup>1</sup>               |
| 11266          | 0x2C02            | V3/V31 Voltage                      | 0-Vmax                     | U1                 | UINT32 | R   | <sup>1</sup>               |
| 11267          | 0x2C03            | I1 Current                          | 0-Imax                     | U2                 | UINT32 | R   |                            |
| 11268          | 0x2C04            | I2 Current                          | 0-Imax                     | U2                 | UINT32 | R   |                            |
| 11269          | 0x2C05            | I3 Current                          | 0-Imax                     | U2                 | UINT32 | R   |                            |
|                | 0x2C06<br>-0x2C11 | Not used                            | 0                          |                    | INT32  | R   |                            |
| 11276          | 0x2C12            | V1/V12 Voltage THD                  | 0-9999                     | ×0.1%              | UINT32 | R   | <sup>1</sup> 4-cycle value |
| 11277          | 0x2C13            | V2/V23 Voltage THD                  | 0-9999                     | ×0.1%              | UINT32 | R   | <sup>1</sup> 4-cycle value |
| 11278          | 0x2C14            | V3/V31 Voltage THD                  | 0-9999                     | ×0.1%              | UINT32 | R   | <sup>1</sup> 4-cycle value |
| 11279          | 0x2C15            | I1 Current THD                      | 0-9999                     | ×0.1%              | UINT32 | R   | 4-cycle value              |
| 11280          | 0x2C16            | I2 Current THD                      | 0-9999                     | ×0.1%              | UINT32 | R   | 4-cycle value              |
| 11281          | 0x2C17            | I3 Current THD                      | 0-9999                     | ×0.1%              | UINT32 | R   | 4-cycle value              |
| 11282          | 0x2C18            | I1 K-Factor                         | 10-9999                    | ×0.1               | UINT32 | R   | 4-cycle value              |
| 11283          | 0x2C19            | I2 K-Factor                         | 10-9999                    | ×0.1               | UINT32 | R   | 4-cycle value              |

| Point ID (Dec) | Point ID (Hex)    | Description                             | Options/Range <sup>2</sup> | Units <sup>2</sup> | Type   | R/W | Notes           |
|----------------|-------------------|---|----------------------------|--------------------|--------|-----|-----------------|
| 11284          | 0x2C1A            | I3 K-Factor                             | 10-9999                    | ×0.1               | UINT32 | R   | 4-cycle value   |
| 11285          | 0x2C1B            | I1 Current TDD                          | 0-1000                     | ×0.1%              | UINT32 | R   | 4-cycle value   |
| 11286          | 0x2C1C            | I2 Current TDD                          | 0-1000                     | ×0.1%              | UINT32 | R   | 4-cycle value   |
| 11287          | 0x2C1D            | I3 Current TDD                          | 0-1000                     | ×0.1%              | UINT32 | R   | 4-cycle value   |
|                |                   | <b>Minimum 1-Cycle Total Values</b>     |                            |                    |        |     |                 |
| 11520          | 0x2D00            | Total kW                                | -Pmax-Pmax                 | U3                 | INT32  | R   |                 |
| 11521          | 0x2D01            | Total kvar                              | -Pmax-Pmax                 | U3                 | INT32  | R   |                 |
| 11522          | 0x2D02            | Total kVA                               | 0-Pmax                     | U3                 | UINT32 | R   |                 |
| 11523          | 0x2D03            | Total PF                                | 0-1000                     | ×0.001             | UINT32 | R   | Absolute value  |
|                |                   | <b>Minimum 1-Cycle Auxiliary Values</b> |                            |                    |        |     |                 |
| 11776          | 0x2E00            | Not used                                |                            |                    | UINT32 | R   |                 |
| 11777          | 0x2E01            | In Current                              | 0-Imax                     | U2                 | UINT32 | R   |                 |
| 11778          | 0x2E02            | Frequency                               | 0-Fmax                     | ×0.01Hz            | UINT32 | R   |                 |
|                |                   | <b>Maximum 1-Cycle Phase Values</b>     |                            |                    |        |     |                 |
| 13312          | 0x3400            | V1/V12 Voltage                          | 0-Vmax                     | U1                 | UINT32 | R   | 1               |
| 13313          | 0x3401            | V2/V23 Voltage                          | 0-Vmax                     | U1                 | UINT32 | R   | 1               |
| 13314          | 0x3402            | V3/V31 Voltage                          | 0-Vmax                     | U1                 | UINT32 | R   | 1               |
| 13315          | 0x3403            | I1 Current                              | 0-Imax                     | U2                 | UINT32 | R   |                 |
| 13316          | 0x3404            | I2 Current                              | 0-Imax                     | U2                 | UINT32 | R   |                 |
| 13317          | 0x3405            | I3 Current                              | 0-Imax                     | U2                 | UINT32 | R   |                 |
|                | 0x3406<br>-0x3411 | Not used                                | 0                          |                    | INT32  | R   |                 |
| 13324          | 0x3412            | V1/V12 Voltage THD                      | 0-9999                     | ×0.1%              | UINT32 | R   | 1 4-cycle value |
| 13325          | 0x3413            | V2/V23 Voltage THD                      | 0-9999                     | ×0.1%              | UINT32 | R   | 1 4-cycle value |
| 13326          | 0x3414            | V3/V31 Voltage THD                      | 0-9999                     | ×0.1%              | UINT32 | R   | 1 4-cycle value |
| 13327          | 0x3415            | I1 Current THD                          | 0-9999                     | ×0.1%              | UINT32 | R   | 4-cycle value   |
| 13328          | 0x3416            | I2 Current THD                          | 0-9999                     | ×0.1%              | UINT32 | R   | 4-cycle value   |
| 13329          | 0x3417            | I3 Current THD                          | 0-9999                     | ×0.1%              | UINT32 | R   | 4-cycle value   |
| 13330          | 0x3418            | I1 K-Factor                             | 10-9999                    | ×0.1               | UINT32 | R   | 4-cycle value   |
| 13331          | 0x3419            | I2 K-Factor                             | 10-9999                    | ×0.1               | UINT32 | R   | 4-cycle value   |
| 13332          | 0x341A            | I3 K-Factor                             | 10-9999                    | ×0.1               | UINT32 | R   | 4-cycle value   |
| 13333          | 0x341B            | I1 Current TDD                          | 0-1000                     | ×0.1%              | UINT32 | R   | 4-cycle value   |
| 13334          | 0x341C            | I2 Current TDD                          | 0-1000                     | ×0.1%              | UINT32 | R   | 4-cycle value   |
| 13335          | 0x341D            | I3 Current TDD                          | 0-1000                     | ×0.1%              | UINT32 | R   | 4-cycle value   |
|                |                   | <b>Maximum 1-Cycle Total Values</b>     |                            |                    |        |     |                 |
| 13568          | 0x3500            | Total kW                                | -Pmax-Pmax                 | U3                 | INT32  | R   |                 |
| 13569          | 0x3501            | Total kvar                              | -Pmax-Pmax                 | U3                 | INT32  | R   |                 |
| 13570          | 0x3502            | Total kVA                               | 0-Pmax                     | U3                 | UINT32 | R   |                 |
| 13571          | 0x3503            | Total PF                                | 0-1000                     | ×0.001             | UINT32 | R   | Absolute value  |
|                |                   | <b>Maximum 1-Cycle Auxiliary Values</b> |                            |                    |        |     |                 |
| 13824          | 0x3600            | Not used                                |                            |                    | UINT32 | R   |                 |
| 13825          | 0x3601            | In Current                              | 0-Imax                     | U2                 | UINT32 | R   |                 |

| Point ID (Dec) | Point ID (Hex) | Description                               | Options/Range <sup>2</sup>            | Units <sup>2</sup> | Type   | R/W | Notes |
|----------------|----------------|---|---------------------------------------|--------------------|--------|-----|-------|
| 13826          | 0x3602         | Frequency                                 | 0-Fmax                                | ×0.01Hz            | UINT32 | R   |       |
|                |                | <b>Maximum Demands</b>                    |                                       |                    |        |     |       |
| 14080          | 0x3700         | V1/V12 Maximum volt demand                | 0-Vmax                                | U1                 | UINT32 | R   | 1     |
| 14081          | 0x3701         | V2/V23 Maximum volt demand                | 0-Vmax                                | U1                 | UINT32 | R   | 1     |
| 14082          | 0x3702         | V3/V31 Maximum volt demand                | 0-Vmax                                | U1                 | UINT32 | R   | 1     |
| 14083          | 0x3703         | I1 Maximum ampere demand                  | 0-Imax                                | U2                 | UINT32 | R   |       |
| 14084          | 0x3704         | I2 Maximum ampere demand                  | 0-Imax                                | U2                 | UINT32 | R   |       |
| 14085          | 0x3705         | I3 Maximum ampere demand                  | 0-Imax                                | U2                 | UINT32 | R   |       |
| 14086          | 0x3706         | Not used                                  |                                       |                    | UINT32 | R   |       |
| 14087          | 0x3707         | Not used                                  |                                       |                    | UINT32 | R   |       |
| 14088          | 0x3708         | Not used                                  |                                       |                    | UINT32 | R   |       |
| 14089          | 0x3709         | Maximum kW import sliding window demand   | 0-Pmax                                | U3                 | UINT32 | R   |       |
| 14090          | 0x370A         | Maximum kvar import sliding window demand | 0-Pmax                                | U3                 | UINT32 | R   |       |
| 14091          | 0x370B         | Maximum kVA sliding window demand         | 0-Pmax                                | U3                 | UINT32 | R   |       |
| 14092          | 0x3737         | Not used                                  |                                       |                    | UINT32 | R   |       |
| 14093          | 0x370D         | Not used                                  |                                       |                    | UINT32 | R   |       |
| 14094          | 0x370E         | Not used                                  |                                       |                    | UINT32 | R   |       |
| 14095          | 0x370F         | Maximum kW export sliding window demand   | 0-Pmax                                | U3                 | UINT32 | R   |       |
| 14096          | 0x3710         | Maximum kvar export sliding window demand | 0-Pmax                                | U3                 | UINT32 | R   |       |
|                |                | <b>Maximum Harmonic Demands</b>           |                                       |                    |        |     |       |
| 14336          | 0x3880         | V1/V12 THD demand                         | 0-9999                                | ×0.1%              | UINT32 | R   | 1     |
| 14337          | 0x3881         | V2/V23 THD demand                         | 0-9999                                | ×0.1%              | UINT32 | R   | 1     |
| 14338          | 0x3882         | V3/V31 THD demand                         | 0-9999                                | ×0.1%              | UINT32 | R   | 1     |
| 14339          | 0x3883         | Not used                                  |                                       |                    | UINT32 | R   |       |
| 14340          | 0x3884         | I1 THD demand                             | 0-9999                                | ×0.1%              | UINT32 | R   |       |
| 14341          | 0x3885         | I2 THD demand                             | 0-9999                                | ×0.1%              | UINT32 | R   |       |
| 14342          | 0x3886         | I3 THD demand                             | 0-9999                                | ×0.1%              | UINT32 | R   |       |
| 14343          | 0x3887         | Not used                                  |                                       |                    | UINT32 | R   |       |
| 14344          | 0x3888         | I1 TDD demand                             | 0-1000                                | ×0.1%              | UINT32 | R   |       |
| 14345          | 0x3889         | I2 TDD demand                             | 0-1000                                | ×0.1%              | UINT32 | R   |       |
| 14346          | 0x388A         | I3 TDD demand                             | 0-1000                                | ×0.1%              | UINT32 | R   |       |
| 14347          | 0x388B         | Not used                                  |                                       |                    | UINT32 | R   |       |
|                |                | <b>Scaled Analog Inputs</b>               |                                       |                    |        |     |       |
| 15104          | 0x3B00         | Analog input AI1                          | AImin - AImax (programmable scale)    |                    | UINT32 | R   |       |
| 15105          | 0x3B01         | Analog input AI2                          | AImin - AImax (programmable scale)    |                    | UINT32 | R   |       |
|                |                | <b>Raw Analog Inputs</b>                  |                                       |                    |        |     |       |
| 15232          | 0x3B80         | Analog input AI1                          | 0-4095                                |                    | UINT32 | R   |       |
| 15233          | 0x3B81         | Analog input AI2                          | 0-4095                                |                    | UINT32 | R   |       |
|                |                | <b>TOU Parameters<sup>E</sup></b>         |                                       |                    |        |     |       |
| 15360          | 0x3C00         | Active tariff                             | 0-7                                   |                    | UINT32 | R   |       |
| 15361          | 0x3C01         | Active profile                            | 0-15:<br>0-3 = Season 1 Profile #1-4, |                    | UINT32 | R   |       |

| Point ID (Dec) | Point ID (Hex) | Description                               | Options/Range <sup>2</sup>   | Units <sup>2</sup> | Type   | R/W | Notes |
|----------------|----------------|---|--|--------------------|--------|-----|-------|
|                |                |   | 4-7 = Season 2 Profile #1-4,<br>8-11 = Season 3 Profile #1-4,<br>12-15 = Season 4 Profile #1-4 |                    |        |     |       |
|                |                | <b>Scaled Analog Outputs</b>              |  |                    |        |     |       |
| 15488          | 0x3C80         | Analog output AO1                         | 0-4095   |                    | UINT32 | R   |       |
| 15489          | 0x3C81         | Analog output AO2                         | 0-4095   |                    | UINT32 | R   |       |
|                |                | <b>TOU Energy Register #1<sup>E</sup></b> |  |                    |        |     |       |
| 15616          | 0x3D00         | Tariff #1 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
| 15617          | 0x3D01         | Tariff #2 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
| ...            |                | ...                                       |  |                    |        | R   |       |
| 15623          | 0x3D07         | Tariff #8 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
|                |                | <b>TOU Energy Register #2<sup>E</sup></b> |  |                    |        |     |       |
| 15872          | 0x3E00         | Tariff #1 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
| 15873          | 0x3E01         | Tariff #2 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
| ...            |                | ...                                       |  |                    |        | R   |       |
| 15879          | 0x3E07         | Tariff #8 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
|                |                | <b>TOU Energy Register #3<sup>E</sup></b> |  |                    |        |     |       |
| 16128          | 0x3F00         | Tariff #1 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
| 16129          | 0x3F01         | Tariff #2 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
| ...            |                | ...                                       |  |                    |        | R   |       |
| 16135          | 0x3F07         | Tariff #8 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
|                |                | <b>TOU Energy Register #4<sup>E</sup></b> |  |                    |        |     |       |
| 16384          | 0x4000         | Tariff #1 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
| 16385          | 0x4001         | Tariff #2 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
| ...            |                | ...                                       |  |                    |        | R   |       |
| 16391          | 0x4007         | Tariff #8 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
|                |                | <b>TOU Energy Register #5<sup>E</sup></b> |  |                    |        |     |       |
| 16640          | 0x4100         | Tariff #1 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
| 16641          | 0x4101         | Tariff #2 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
| ...            |                | ...                                       |  |                    |        | R   |       |
| 16647          | 0x4107         | Tariff #8 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
|                |                | <b>TOU Energy Register #6<sup>E</sup></b> |  |                    |        |     |       |
| 16896          | 0x4200         | Tariff #1 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
| 16897          | 0x4201         | Tariff #2 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
| ...            |                | ...                                       |  |                    |        | R   |       |
| 16903          | 0x4207         | Tariff #8 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
|                |                | <b>TOU Energy Register #7<sup>E</sup></b> |  |                    |        |     |       |
| 17152          | 0x4300         | Tariff #1 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
| 17153          | 0x4301         | Tariff #2 register                        | 0-10 <sup>9</sup> -1   | 1 kWh              | UINT32 | R   |       |
| ...            |                | ...                                       |  |                    |        | R   |       |

| Point ID (Dec) | Point ID (Hex) | Description  | Options/Range <sup>2</sup> | Units <sup>2</sup> | Type   | R/W | Notes |
|----------------|----------------|--|----------------------------|--------------------|--------|-----|-------|
| 17159          | 0x4307         | Tariff #8 register                                       | 0-10 <sup>9</sup> -1       | 1 kWh              | UINT32 | R   |       |
|                |                | <b>TOU Energy Register #8<sup>E</sup></b>                |                            |                    |        |     |       |
| 17408          | 0x4400         | Tariff #1 register                                       | 0-10 <sup>9</sup> -1       | 1 kWh              | UINT32 | R   |       |
| 17409          | 0x4401         | Tariff #2 register                                       | 0-10 <sup>9</sup> -1       | 1 kWh              | UINT32 | R   |       |
| ...            | ...            | ...  |                            |                    |        | R   |       |
| 17415          | 0x4407         | Tariff #8 register                                       | 0-10 <sup>9</sup> -1       | 1 kWh              | UINT32 | R   |       |
|                |                | <b>Summary Energy Accumulated Demands<sup>E</sup></b>    |                            |                    |        |     |       |
| 17664          | 0x4500         | Summary register #1 demand                               | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 17665          | 0x4501         | Summary register #2 demand                               | 0-Pmax                     | U3                 | UINT32 | R   |       |
| ...            | ...            | ...  |                            |                    |        |     |       |
| 17671          | 0x4507         | Summary register #8 demand                               | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | <b>Summary Energy Block Demands<sup>E</sup></b>          |                            |                    |        |     |       |
| 17792          | 0x4580         | Summary register #1 demand                               | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 17793          | 0x4581         | Summary register #2 demand                               | 0-Pmax                     | U3                 | UINT32 | R   |       |
| ...            | ...            | ...  |                            |                    |        |     |       |
| 17799          | 0x4587         | Summary register #8 demand                               | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | <b>Summary Energy Sliding Window Demands<sup>E</sup></b> |                            |                    |        |     |       |
| 17920          | 0x4600         | Summary register #1 demand                               | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 17921          | 0x4601         | Summary register #2 demand                               | 0-Pmax                     | U3                 | UINT32 | R   |       |
| ...            | ...            | ...  |                            |                    |        |     |       |
| 17927          | 0x4607         | Summary register #8 demand                               | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | <b>Summary Energy Maximum Demands<sup>E</sup></b>        |                            |                    |        |     |       |
| 18304          | 0x4780         | Summary register #1 maximum demand                       | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 18305          | 0x4781         | Summary register #2 maximum demand                       | 0-Pmax                     | U3                 | UINT32 | R   |       |
| ...            | ...            | ...  |                            |                    |        |     |       |
| 18311          | 0x4787         | Summary register #8 maximum demand                       | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | <b>TOU Maximum Demand Register #1<sup>E</sup></b>        |                            |                    |        |     |       |
| 18432          | 0x4800         | Tariff #1 maximum demand                                 | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 18433          | 0x4801         | Tariff #2 maximum demand                                 | 0-Pmax                     | U3                 | UINT32 | R   |       |
| ...            | ...            | ...  |                            |                    |        | R   |       |
| 18439          | 0x4807         | Tariff #8 maximum demand                                 | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | <b>TOU Maximum Demand Register #2<sup>E</sup></b>        |                            |                    |        |     |       |
| 18688          | 0x4900         | Tariff #1 maximum demand                                 | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 18689          | 0x4901         | Tariff #2 maximum demand                                 | 0-Pmax                     | U3                 | UINT32 | R   |       |
| ...            | ...            | ...  |                            |                    |        | R   |       |
| 18795          | 0x4907         | Tariff #8 maximum demand                                 | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | <b>TOU Maximum Demand Register #3<sup>E</sup></b>        |                            |                    |        |     |       |
| 18944          | 0x4A00         | Tariff #1 maximum demand                                 | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 18945          | 0x4A01         | Tariff #2 maximum demand                                 | 0-Pmax                     | U3                 | UINT32 | R   |       |
| ...            | ...            | ...  |                            |                    |        | R   |       |

| Point ID (Dec) | Point ID (Hex) | Description                                       | Options/Range <sup>2</sup> | Units <sup>2</sup> | Type   | R/W | Notes |
|----------------|----------------|---|----------------------------|--------------------|--------|-----|-------|
| 18951          | 0x4A07         | Tariff #8 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | <b>TOU Maximum Demand Register #4<sup>E</sup></b> |                            |                    |        |     |       |
| 18560          | 0x4880         | Tariff #1 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 18561          | 0x4881         | Tariff #2 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | ...   |                            |                    |        | R   |       |
| 18567          | 0x4887         | Tariff #8 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | <b>TOU Maximum Demand Register #5<sup>E</sup></b> |                            |                    |        |     |       |
| 18816          | 0x4980         | Tariff #1 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 18817          | 0x4981         | Tariff #2 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | ...   |                            |                    |        | R   |       |
| 18823          | 0x4987         | Tariff #8 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | <b>TOU Maximum Demand Register #6<sup>E</sup></b> |                            |                    |        |     |       |
| 19072          | 0x4A80         | Tariff #1 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 19073          | 0x4A81         | Tariff #2 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | ...   |                            |                    |        | R   |       |
| 19079          | 0x4A87         | Tariff #8 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | <b>TOU Maximum Demand Register #7<sup>E</sup></b> |                            |                    |        |     |       |
| 21248          | 0x5300         | Tariff #1 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 21249          | 0x5301         | Tariff #2 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | ...   |                            |                    |        | R   |       |
| 21255          | 0x5307         | Tariff #8 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | <b>TOU Maximum Demand Register #8<sup>E</sup></b> |                            |                    |        |     |       |
| 21376          | 0x5380         | Tariff #1 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
| 21377          | 0x5381         | Tariff #2 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | ...   |                            |                    |        | R   |       |
| 21383          | 0x5387         | Tariff #8 maximum demand                          | 0-Pmax                     | U3                 | UINT32 | R   |       |
|                |                | <b>V1/V12 Harmonic Angles<sup>EH</sup></b>        |                            |                    |        |     | 1, 3  |
| 25600          | 0x6400         | H01 Harmonic angle                                | -1800-1800                 | ×0.1°              | INT16  | R   |       |
| 25601          | 0x6400         | H02 Harmonic angle                                | -1800-1800                 | ×0.1°              | INT16  | R   |       |
|                |                | ...   |                            |                    |        |     |       |
| 25639          | 0x6427         | H40 Harmonic angle                                | -1800-1800                 | ×0.1°              | INT16  | R   |       |
|                |                | <b>V2/V23 Harmonic Angles<sup>EH</sup></b>        |                            |                    |        |     | 1, 3  |
| 25856          | 0x6500         | H01 Harmonic angle                                | -1800-1800                 | ×0.1°              | INT16  | R   |       |
| 25857          | 0x6500         | H02 Harmonic angle                                | -1800-1800                 | ×0.1°              | INT16  | R   |       |
|                |                | ...   |                            |                    |        |     |       |
| 25895          | 0x6527         | H40 Harmonic angle                                | -1800-1800                 | ×0.1°              | INT16  | R   |       |
|                |                | <b>V1/V31 Harmonic Angles<sup>EH</sup></b>        |                            |                    |        |     | 1, 3  |
| 26112          | 0x6600         | H01 Harmonic angle                                | -1800-1800                 | ×0.1°              | INT16  | R   |       |
| 26113          | 0x6600         | H02 Harmonic angle                                | -1800-1800                 | ×0.1°              | INT16  | R   |       |
|                |                | ...   |                            |                    |        |     |       |

| Point ID (Dec) | Point ID (Hex) | Description                              | Options/Range <sup>2</sup> | Units <sup>2</sup> | Type   | R/W | Notes |
|----------------|----------------|--|----------------------------|--------------------|--------|-----|-------|
| 26151          | 0x6627         | H40 Harmonic angle                       | -1800-1800                 | ×0.1°              | INT16  | R   |       |
|                |                | <b>I1 Harmonic Angles</b> <sup>EH</sup>  |                            |                    |        |     | 3     |
| 26368          | 0x6700         | H01 Harmonic angle                       | -1800-1800                 | ×0.1°              | INT16  | R   |       |
| 26369          | 0x6700         | H02 Harmonic angle                       | -1800-1800                 | ×0.1°              | INT16  | R   |       |
|                |                | ...                                      |                            |                    |        |     |       |
| 26407          | 0x6727         | H40 Harmonic angle                       | -1800-1800                 | ×0.1°              | INT16  | R   |       |
|                |                | <b>I2 Harmonic Angles</b> <sup>EH</sup>  |                            |                    |        |     | 3     |
| 26624          | 0x6800         | H01 Harmonic angle                       | -1800-1800                 | ×0.1°              | INT16  | R   |       |
| 26625          | 0x6800         | H02 Harmonic angle                       | -1800-1800                 | ×0.1°              | INT16  | R   |       |
|                |                | ...                                      |                            |                    |        |     |       |
| 26663          | 0x6827         | H40 Harmonic angle                       | -1800-1800                 | ×0.1°              | INT16  | R   |       |
|                |                | <b>I3 Harmonic Angles</b> <sup>EH</sup>  |                            |                    |        |     | 3     |
| 26880          | 0x6900         | H01 Harmonic angle                       | -1800-1800                 | ×0.1°              | INT16  | R   |       |
| 26881          | 0x6900         | H02 Harmonic angle                       | -1800-1800                 | ×0.1°              | INT16  | R   |       |
|                |                | ...                                      |                            |                    |        |     |       |
| 26919          | 0x6927         | H40 Harmonic angle                       | -1800-1800                 | ×0.1°              | INT16  | R   |       |
| 31744          | 0x7C00         | <b>Setpoint Status SP1-SP16 (bitmap)</b> | 0x0000-0xFFFF              |                    | UINT16 | R   |       |

**NOTES:**

Energy and power demand readings are only available in the meters with suffixes E and EH.

<sup>1</sup> Voltage and voltage harmonics readings:

When the 4LN3, 3LN3 or 3BLN3 wiring mode is selected, the voltages will be line-to-neutral; for any other wiring mode, they will be line-to-line voltages.

When the 4LN3, 4LL3, 3LN3, 3LL3, 3BLN3 or 3BLL3 wiring mode is selected, the voltage harmonics will be line-to-neutral; for any other wiring mode, they will be line-to-line.

<sup>2</sup> For volts, amps, power and frequency scales and units, refer to Section 4 "Data Scales and Units".

<sup>3</sup> Harmonic angles are referenced to the fundamental voltage harmonic H01 on phase L1.

## 4 Data Scales and Units

| Code                                   | Condition                                   | Value/Range   | Notes |
|--|---|---|-------|
| <b>Data Scales</b>                     |   |   |       |
| Vmax                                   |   | Voltage scale $\times$ PT Ratio, V  | 2     |
| I <sub>max</sub>                       |   | Current scale $(2A/10A) \times$ CT Ratio = CT Primary current $\times$ 2, A                   | 1, 3  |
| P <sub>max</sub>                       | Wiring 4LN3, 3LN3, 3BLN3                    | V <sub>max</sub> $\times$ I <sub>max</sub> $\times$ 3, W                                      |       |
|  | Wiring 4LL3, 3LL3, 3BLL3, 3OP2, 3OP3, 3DIR2 | V <sub>max</sub> $\times$ I <sub>max</sub> $\times$ 2, W                                      |       |
| F <sub>max</sub>                       | Nominal frequency 25, 50 or 60 Hz           | 100 Hz  |       |
|  | Nominal frequency 400Hz                     | 500 Hz  |       |
| AI <sub>min</sub><br>AI <sub>max</sub> | +/-1mA                                      | AI <sub>min</sub> = -AI full scale $\times$ 2<br>AI <sub>max</sub> = AI full scale $\times$ 2 |       |
|  | 0-20mA                                      | AI <sub>min</sub> = AI zero scale<br>AI <sub>max</sub> = AI full scale                        |       |
|  | 4-20mA                                      | AI <sub>min</sub> = AI zero scale<br>AI <sub>max</sub> = AI full scale                        |       |
|  | 0-1mA                                       | AI <sub>min</sub> = AI zero scale<br>AI <sub>max</sub> = AI full scale                        |       |
| <b>Data Units</b>                      |   |   |       |
| U1                                     | PT Ratio = 1, Integer                       | 0.1 V   |       |
|  | PT Ratio > 1, Integer                       | 1 V   |       |
|  | PT Ratio = 1, Float                         | 0.1 V   |       |
|  | PT Ratio > 1, Float                         | 0.001 kV  |       |
| U2                                     | Integer and Float                           | 0.01 A  |       |
| U3                                     | PT Ratio = 1, Integer                       | 1 W/Var/VA  |       |
|  | PT Ratio > 1, Integer                       | 1 kW/kvar/kVA   |       |
|  | PT Ratio = 1, Float                         | 0.001 kW/kvar/kVA   |       |
|  | PT Ratio > 1, Float                         | 0.001 MW/Mvar/MVA   |       |

<sup>1</sup> CT Ratio = CT primary current/CT secondary current

<sup>2</sup> The default Voltage scale is 144V (120V + 20%). You can change it via the Device Options setup in PAS.

<sup>3</sup> The default Current scale is 2  $\times$  CT secondary current (2  $\times$  1A or 2  $\times$  5A depending on the order).

# 5 EGD Implementation Profile

**EGD Device:** SATEC Model PM172

**Maximum Exchanges:** 4

**Support Command Port:** No

**Support Masked Write:** No

**Data Coherency and Alignment:**

| Data Element Type | Size in Bytes | Alignment Requirements | Coherent Transfer |
|-------------------|---------------|------------------------|-------------------|
| Word              | 2             | Even                   | Yes               |
| Double word       | 4             | Divisible by 4         | Yes               |
| Float             | 4             | Divisible by 4         | Yes               |
| Array             | up to 480     | Same as elements       | Yes               |

**Protocol Version Number (PVN):** 1

**Configuration Signature:** 1.1

**Production Data Size:** up to 480 bytes

**Production Rate:** 70-600000 ms