Series PM172 Powermeters

GE EGD
Communications Protocol

Reference Guide

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.

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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[2]	Units[2]	Type	R/W	Notes
0	0x0000	**None**	0		UINT16	R	
		Special Inputs					
257	0x0101	Phase rotation order	0=error, 1=positive (ABC), 2=negative (CBA)		UINT16	R	
768	0x0300	**Event Flags (bitmap)** [EH]	0x0000-0x00FF		UINT16	R	
1536	0x0600	**Digital Inputs DI1-DI2 (bitmap)**	0x0000-0x0003		UINT16	R	
2048	0x0800	**Relay Outputs RO1-RO2 (bitmap)**	0x0000-0x0003		UINT16	R	
		Counters					
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	
		1-Cycle Phase Values					
3072	0x0C00	V1/V12 Voltage	0-Vmax	U1	UINT32	R	[1]
3073	0x0C01	V2/V23 Voltage	0-Vmax	U1	UINT32	R	[1]
3074	0x0C02	V3/V31 Voltage	0-Vmax	U1	UINT32	R	[1]
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	[1] 4-cycle value
3091	0x0C13	V2/V23 Voltage THD	0-9999	×0.1%	UINT16	R	[1] 4-cycle value
3092	0x0C14	V3/V31 Voltage THD	0-9999	×0.1%	UINT16	R	[1] 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[2]	Units[2]	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	
		1-Cycle Total Values					
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	
		1-Cycle Auxiliary Values					
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	
		Phasor					
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[2]	Units[2]	Type	R/W	Notes
4238	0x108E	I3 Current angle	-1800-1800	×0.1°	INT16	R	
4239	0x108F	Not used			INT16	R	
		1-Second Phase Values					
4352	0x1100	V1/V12 Voltage	0-Vmax	U1	UINT32	R	[1]
4353	0x1101	V2/V23 Voltage	0-Vmax	U1	UINT32	R	[1]
4354	0x1102	V3/V31 Voltage	0-Vmax	U1	UINT32	R	[1]
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	[1] 3-sec value
4371	0x1113	V2/V23 Voltage THD	0-9999	×0.1%	UINT16	R	[1] 3-sec value
4372	0x1114	V3/V31 Voltage THD	0-9999	×0.1%	UINT16	R	[1] 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	
		1-Second Total Values					
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[2]	Units[2]	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	
		1-Second Auxiliary Values					
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	
		Present Harmonic Demands					
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	
		Present Volt, Ampere and Power Demands					
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[2]	Units[2]	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	
		Total Energies [E]					
5888	0x1700	kWh import	$0-10^9-1$	1 kWh	UINT32	R	
5889	0x1701	kWh export	$0-10^9-1$	1 kWh	UINT32	R	
5890	0x1702	Not used			INT32	R	
5891	0x1703	Not used			UINT32	R	
5892	0x1704	kvarh import	$0-10^9-1$	1 kvarh	UINT32	R	
5893	0x1705	kvarh export	$0-10^9-1$	1 kvarh	UINT32	R	
5894	0x1706	Not used			INT32	R	
5895	0x1707	Not used			UINT32	R	
5896	0x1708	kVAh total	$0-10^9-1$	1 kVAh	UINT32	R	
5897 -5900	0x1709 -0x170C	Not used			UINT32	R	
5901	0x170D	Harmonic kWh import [EH]	$0-10^9-1$	1 kWh	UINT32	R	
5902	0x170E	Harmonic kWh export [EH]	$0-10^9-1$	1 kWh	UINT32	R	
5903 -5904	0x170F -0x1710	Not used			UINT32	R	
5905	0x1711	Harmonic kVAh total [EH]	$0-10^9-1$	1 kVAh	UINT32	R	
		Summary Energy Registers [E]					
6016	0x1780	Summary energy register #1	$0-10^9-1$	1 kWh	UINT32	R	
6017	0x1781	Summary energy register #2	$0-10^9-1$	1 kWh	UINT32	R	
		...					
6023	0x1787	Summary energy register #8	$0-10^9-1$	1 kWh	UINT32	R	
		Phase Energies [E]					
6144	0x1800	kWh import L1	$0-10^9-1$	1 kWh	UINT32	R	
6145	0x1801	kWh import L2	$0-10^9-1$	1 kWh	UINT32	R	

Point ID (Dec)	Point ID (Hex)	Description	Options/Range[2]	Units[2]	Type	R/W	Notes
6146	0x1802	kWh import L3	0-10⁹-1	1 kWh	UINT32	R	
6147	0x1803	kvarh import L1	0-10⁹-1	1 kvarh	UINT32	R	
6148	0x1804	kvarh import L2	0-10⁹-1	1 kvarh	UINT32	R	
6149	0x1805	kvarh import L3	0-10⁹-1	1 kvarh	UINT32	R	
6150	0x1806	kVAh total L1	0-10⁹-1	1 kVAh	UINT32	R	
6151	0x1807	kVAh total L2	0-10⁹-1	1 kVAh	UINT32	R	
6152	0x1808	kVAh total L3	0-10⁹-1	1 kVAh	UINT32	R	
		V1/V12 Harmonic Distortions [EH]					[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	
		V2/V23 Harmonic Distortions [EH]					[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	
		V3/V31 Harmonic Distortions [EH]					[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	
		I1 Harmonic Distortions [EH]					
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	
		I2 Harmonic Distortions [EH]					
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	
		I3 Harmonic Distortions [EH]					
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	
		Fundamental (H01) Phase Values					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[2]	Units[2]	Type	R/W	Notes
10498	0x2902	V3/V31 Voltage	0-Vmax	U1	UINT32	R	[1]
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	
		Harmonic Total Values					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 EH	-Pmax-Pmax	U3	INT32	R	
10756	0x2A05	Not used			INT32	R	
10757	0x2A06	Total harmonic kVA EH	0-Pmax	U3	UINT32	R	
10758	0x2A07	Not used			INT16	R	
		Minimum 1-Cycle Phase Values					
11264	0x2C00	V1/V12 Voltage	0-Vmax	U1	UINT32	R	[1]
11265	0x2C01	V2/V23 Voltage	0-Vmax	U1	UINT32	R	[1]
11266	0x2C02	V3/V31 Voltage	0-Vmax	U1	UINT32	R	[1]
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 -0x2C11	Not used	0		INT32	R	
11276	0x2C12	V1/V12 Voltage THD	0-9999	×0.1%	UINT32	R	[1] 4-cycle value
11277	0x2C13	V2/V23 Voltage THD	0-9999	×0.1%	UINT32	R	[1] 4-cycle value
11278	0x2C14	V3/V31 Voltage THD	0-9999	×0.1%	UINT32	R	[1] 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[2]	Units[2]	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
		Minimum 1-Cycle Total Values					
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
		Minimum 1-Cycle Auxiliary Values					
11776	0x2E00	Not used			UINT32	R	
11777	0x2E01	In Current	0-Imax	U2	UINT32	R	
11778	0x2E02	Frequency	0-Fmax	×0.01Hz	UINT32	R	
		Maximum 1-Cycle Phase Values					
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 -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
		Maximum 1-Cycle Total Values					
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
		Maximum 1-Cycle Auxiliary Values					
13824	0x3600	Not used			UINT32	R	
13825	0x3601	In Current	0-Imax	U2	UINT32	R	

Point ID (Dec)	Point ID (Hex)	Description	Options/Range[2]	Units[2]	Type	R/W	Notes
13826	0x3602	Frequency	0-Fmax	×0.01Hz	UINT32	R	
		Maximum Demands					
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	
		Maximum Harmonic Demands					
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	
		Scaled Analog Inputs					
15104	0x3B00	Analog input AI1	AImin - AImax (programmable scale)		UINT32	R	
15105	0x3B01	Analog input AI2	AImin - AImax (programmable scale)		UINT32	R	
		Raw Analog Inputs					
15232	0x3B80	Analog input AI1	0-4095		UINT32	R	
15233	0x3B81	Analog input AI2	0-4095		UINT32	R	
		TOU Parameters [E]					
15360	0x3C00	Active tariff	0-7		UINT32	R	
15361	0x3C01	Active profile	0-15: 0-3 = Season 1 Profile #1-4,		UINT32	R	

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

Point ID (Dec)	Point ID (Hex)	Description	Options/Range[2]	Units[2]	Type	R/W	Notes
17159	0x4307	Tariff #8 register	0-10^9-1	1 kWh	UINT32	R	
		TOU Energy Register #8 ^{E}					
17408	0x4400	Tariff #1 register	0-10^9-1	1 kWh	UINT32	R	
17409	0x4401	Tariff #2 register	0-10^9-1	1 kWh	UINT32	R	
...		...				R	
17415	0x4407	Tariff #8 register	0-10^9-1	1 kWh	UINT32	R	
		Summary Energy Accumulated Demands ^{E}					
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	
		Summary Energy Block Demands ^{E}					
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	
		Summary Energy Sliding Window Demands^E					
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	
		Summary Energy Maximum Demands ^{E}					
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	
		TOU Maximum Demand Register #1 ^{E}					
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	
		TOU Maximum Demand Register #2 ^{E}					
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	
		TOU Maximum Demand Register #3 ^{E}					
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[2]	Units[2]	Type	R/W	Notes
18951	0x4A07	Tariff #8 maximum demand	0-Pmax	U3	UINT32	R	
		TOU Maximum Demand Register #4 [E]					
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	
		TOU Maximum Demand Register #5 [E]					
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	
		TOU Maximum Demand Register #6 [E]					
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	
		TOU Maximum Demand Register #7 [E]					
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	
		TOU Maximum Demand Register #8 [E]					
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	
		V1/V12 Harmonic Angles [EH]					[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	
		V2/V23 Harmonic Angles [EH]					[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	
		V1/V31 Harmonic Angles [EH]					[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[2]	Units[2]	Type	R/W	Notes
26151	0x6627	H40 Harmonic angle	-1800-1800	×0.1°	INT16	R	
		I1 Harmonic Angles EH					[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	
		I2 Harmonic Angles EH					[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	
		I3 Harmonic Angles EH					[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	**Setpoint Status SP1-SP16 (bitmap)**	0x0000-0xFFFF		UINT16	R	

NOTES:

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

[1] 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.

[2] For volts, amps, power and frequency scales and units, refer to Section 4 "Data Scales and Units".

[3] Harmonic angles are referenced to the fundamental voltage harmonic H01 on phase L1.

4 Data Scales and Units

Code	Condition	Value/Range	Notes
Data Scales			
Vmax		Voltage scale × PT Ratio, V	2
Imax		Current scale (2A/10A) × CT Ratio = CT Primary current × 2, A	1, 3
Pmax	Wiring 4LN3, 3LN3, 3BLN3	Vmax × Imax × 3, W	
	Wiring 4LL3, 3LL3, 3BLL3, 3OP2, 3OP3, 3DIR2	Vmax × Imax × 2, W	
Fmax	Nominal frequency 25, 50 or 60 Hz	100 Hz	
	Nominal frequency 400Hz	500 Hz	
AImin AImax	+/-1mA	AImin = -AI full scale × 2 AImax = AI full scale × 2	
	0-20mA	AImin = AI zero scale AImax = AI full scale	
	4-20mA	AImin = AI zero scale AImax = AI full scale	
	0-1mA	AImin = AI zero scale AImax = AI full scale	
Data Units			
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	

[1] CT Ratio = CT primary current/CT secondary current

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

[3] The default Current scale is 2 × CT secondary current (2 × 1A or 2 × 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