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Delta Din-rail Power Meter
DPM-D520I User Manual

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Revision History

Version	Revision	Date
1st	The first version was published.	2020/8/13
2nd	Updated the specification of storage temperature in sections 2.1 and 3.1.	2024/12/5

Delta Din-rail Power Meter DPM-D520I

User Manual

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Chapter 1 Product Introduction

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1.1 Preface

Thank you for choosing this product. This manual provides installation instructions for the DPM-D520I power meter. The multifunction power meter DPM-D520I is an obvious choice for any application in terms of power monitoring and control. It also can be used for measurement category CAT III.

Before using the meter, read this manual carefully to ensure proper use of this meter. Please observe and follow the notes below prior to finish reading this manual.

- The installation environment must be free of water vapor, corrosive and flammable gas.
- Follow the instructions on the diagram in this manual for wiring the device.
- Grounding must be performed correctly and properly according to provisions for related electric work regulations currently effective in the country.
- Do not disassemble the meter or alter its wiring when the power is on.
- When the power is on, do not touch the terminal area to avoid electric shock.

If you still experience issues when using the device, please contact your distributor or our customer service center. As the product is updated and improved, changes to the specifications will be included in the newest version of the manual which you can get by contacting your distributor or downloading it from the Delta Electronics website (Download Center).

1.2 Overview

1.3 Safety Precautions

- **Installation Notes**

- Install the power meter according to instructions on the manual. Use appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- Only qualified electrical workers should install this equipment. Such work should be performed only after reading the entire set of installation instructions.
- Operate the power meter according to instructions on the manual. Neglecting fundamental installation requirements may lead to personal injury as well as damage to electrical equipment or other property.
- This equipment should be installed in a suitable insulated and fireproof enclosure.

- **Operation Notes**

- DO NOT work alone.
- Before performing visual inspections, tests, or maintenance on this equipment, disconnect all electric power sources.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace all devices, doors and covers before turning on power to this equipment.
- Carefully inspect the work area for tools and objects that may have been left inside the equipment.

- **Operation Notes**

- Never short the secondary of a Power Transformer (PT).
- Never open circuit a Current Transformer (CT)
- Ensure that the CT secondary winding is fixed securely on the equipment. It may damage the equipment if the secondary winding becomes loose during operation.
- When used with CTs, make sure the CTs are UL2808 listed in America and Canada as well as meeting the accuracy specifications for IEC61869-2 class or accepted by authority having jurisdiction (AHJ) in other areas.

- **Wiring Notes**

- When the measured current is higher than the rated specification for the device, consider using an external current transformer (CT).
- When the measured voltage is higher than the rated specification for the device, consider using an external potential transformer (PT) (line voltage: 35 to 690V AC L-L or phase voltage: 20 to 400V AC L-N).
- Connect only one cord to one plug on the quick connector.
- For the device is accidently unplugged, check the connecting cord and restart.

- **Maintenance and Inspection Notes**

- While cleaning the equipment, be sure to unplug all external power sources first. Use a dry cloth to clean the equipment's exterior. DO NOT open the equipment or touch the wiring inside to prevent personal injury as well as damage to electrical equipment or other property. DO NOT use aerosol sprays, solvents, or abrasives.

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Chapter 2 Product Specifications

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2.1 Electrical Characteristic

Measurement Accuracy					
Power factor		± 0.5 %	**Frequency**		± 0.5 %
Electrical Quantity	**Voltage/ Current**	± 0.5 %	**Electric Energy**	**Real power**	± 0.5 %
	Real power/ Reactive power/ Apparent power	± 0.5 %		**Reactive power**	± 0.5 %
				Apparent power	± 2.0 %

Input		
Voltage Connection	1PH2W, 1 CT	1PH3W, 2 CT
	1PH3W, No CT	1PH3W, No CT
	3PH3W, Δ connection, 3 CT, 2 PT	3PH4W, Y connection, 3 CT, No PT
	3PH3W, Δ connection, 3 CT, No PT	3PH4W, Y connection, 3 CT, 3 PT
	3PH3W, Δ connection, 2 CT, No PT	3PH4W, Y connection, 2 CT, 3 PT
	3PH3W, Δ connection, No CT	3PH4W, Y connection, No CT
Rated Voltage	Line voltage: 35 to 690 VAC (L-L) Phase voltage: 20 to 400 VAC (L-N)	
Rated Current	63 A	
Measure Current	20 mA to 63 A	
Start Current	20 mA	
Frequency	50/60 Hz	
Harmonic Distortion for Individual Current/Voltage	31	
Voltage Input	Measuring Category: CAT III	
Alarm	Set up multi-level alarms	29 multi-level alarms
Power	Operating range	80 to 265 VAC (maximum power: 4.6 W) 100 to 300 VDC
Frequency	Operating frequency	50/60 Hz
Communication	RS-485 port	Modbus-RTU, Modbus ASCII
		Baud rate 9600 / 19200 / 38400 bps
Mechanical Characteristics	Dimension (W x H x D)	96 x 96 x 95.4 mm
	IP Degree of Protection	IP20 (Power meter body)

Environment	Ambient operating temperature	0 to +70°C (32 to +158°F)
	Storage temperature	-10 to +80°C (14 to +176°F)
	Relative Humidity	5–95% RH
	Altitude	Below 2000 meters

*Meet the requirements of IEC62053-22 which the accuracy specification ranges from 50 mA.

Data Recording	
Maximum / Minimum Instantaneous Values	39 / 39
Alarm Type	29
Alarms History	500

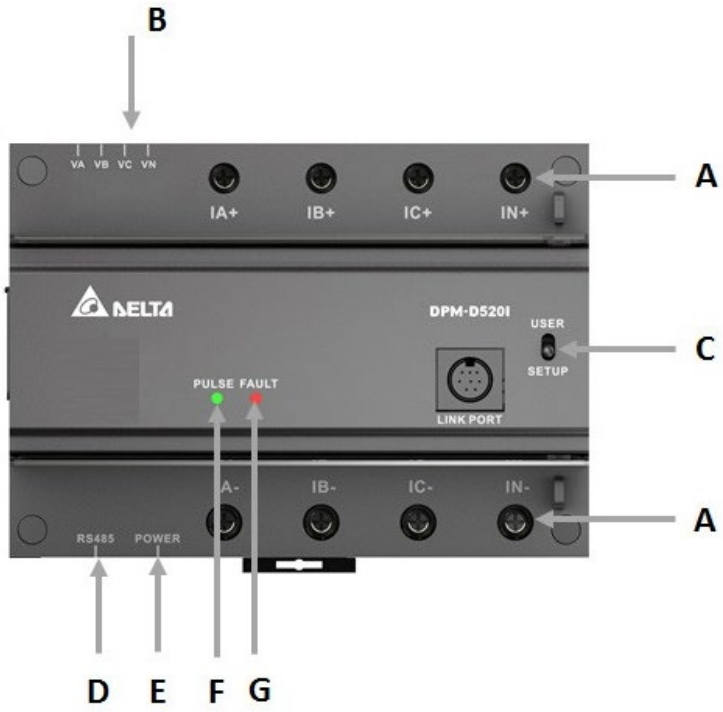
Display	
LED Indicator	Green: pulse light ; Red: fault light

Electromagnetic Compatibility	
Electrostatic Discharge	IEC 61000-4-2
Immunity to Radiated Fields	IEC 61000-4-3
Immunity to Fast Transients	IEC 61000-4-4
Immunity to Impulse Waves	IEC 61000-4-5
Conducted Immunity	IEC 61000-4-6
Immunity to Magnetic Fields	IEC 61000-4-8
Immunity to Voltage Dips	IEC 61000-4-11
Radiated Emissions	FCC Part 15 Class A, EN55011 Class A
Conducted Emissions	FCC Part 15 Class A, EN55011 Class A
Harmonics	IEC 61000-3-2

2.2 Communications Specifications

Communications	
RS-485	Modbus-RTU, Modbus ASCII
Baud rate	2400 / 4800 / 9600 / 19200 / 38400 bps

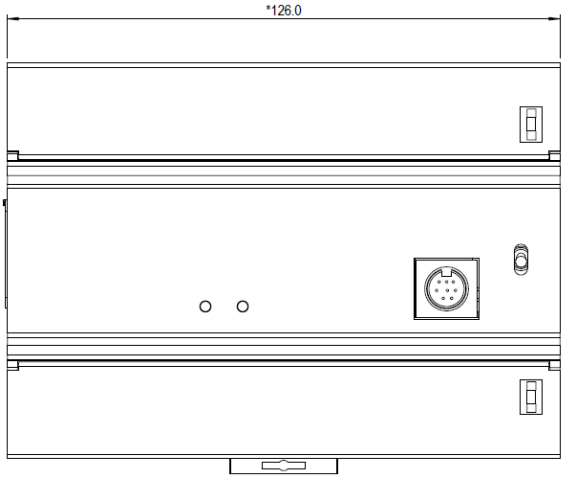
2.3 Operator Interface



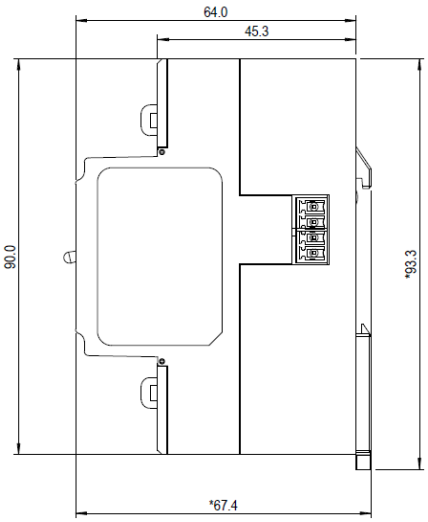
Part	Name
A	Measure current
B	Measure voltage
C	Setup Switch
D	RS-485
E	Power light
F	Pulse light
G	Fault light

2.4 Dimensions

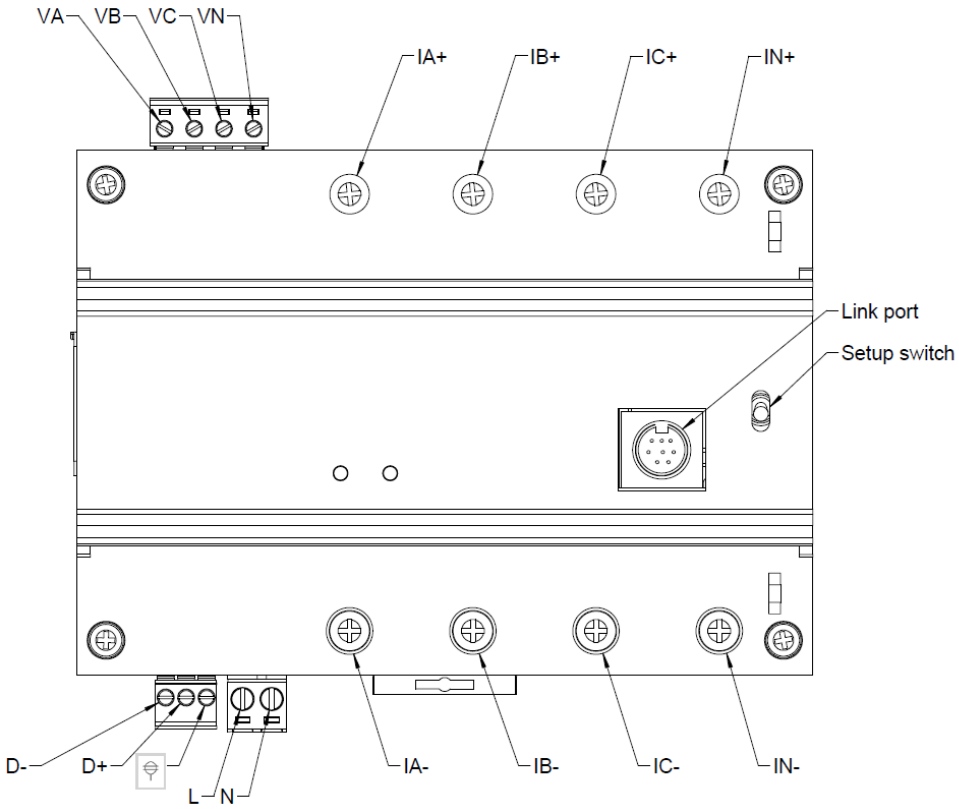
- **Front**



- **Side**



Unit: mm (inch)



FUNCTION	PIN	VOLTAGE	CURRENT
MEASURED VOLTAGE	VA	20 V L-N to 400 V L-N 35 V L-L to 690 V L-L	
	VB		
	VC		
	VN		
CONTROL POWER	L1/+	80 to 265 VAC 100 to 300 VDC	40 mA MAX.
	L2/-		
MEASURED CURRENT	IA+		3 A to 63 A
	IA-		
	IB+		
	IB-		
	IC+		
	IC-		
	IN+		
	IN-		
RS-485	D+	-7 to +12 VDC	
	D-		

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Chapter 3 Installation

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3.1 Installation

3.1.1 Installation Environment

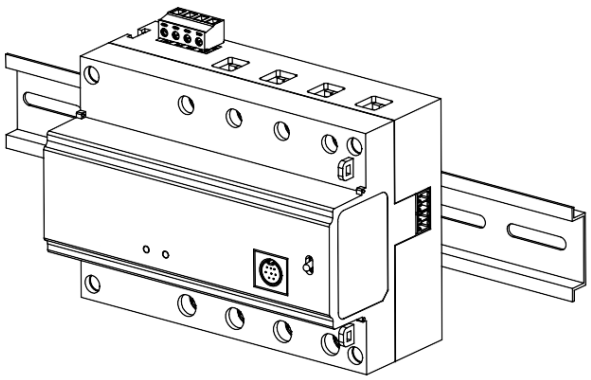
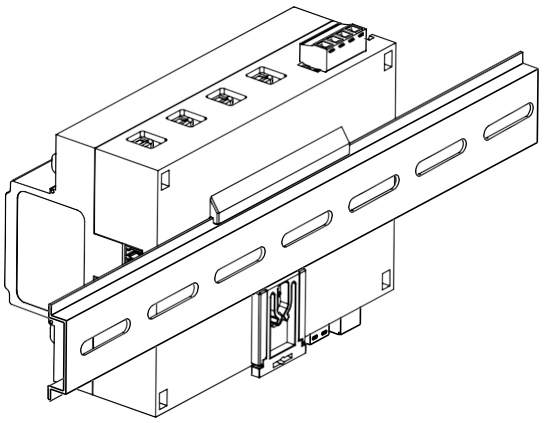
Keep the product in the shipping carton before installation. Store the product properly when it is not to be used for an extended period of time to retain the warranty coverage. Some storage suggestions are listed below.

- Store the power meter in a clean, dry, and controlled environment.
- Store in an ambient temperature range of -10 to +80°C (14 to +176°F).
- Store in a relative humidity range of 5–95%, non-condensing.
- Do not store the product in a place subjected to corrosive gases or liquids.
- Place the product on a solid and durable surface.
- Do not mount the product near heat-radiating elements; or in a location subjected to corrosive gases, liquids, airborne dust or metallic particles; or where it can be subjected to high levels of electromagnetic radiation.

3.1.2 Installation Notes

- Follow the instruction when installing the product to prevent equipment breakdown.
- To increase the cooling efficiency, install the product with sufficient space between adjacent objects and baffles and walls to prevent poor heat dissipation.
- The maximum panel thickness should be 4.0 mm.

Illustration for installation

Front:	Back:
	

3.2 Basic Checks

Items	Contents
General Check	■ Regularly check for mounting looseness where the power meter and device are connected. ■ Prevent foreign objects, such as oil, water, or metal powder entering the device through the ventilation holes. Prevent drill shavings or other debris entering the power meter. ■ If the power meter is installed at a location with harmful gas or dust, prevent those materials from entering the power meter.
Pre-operation Check (not supplied with power)	■ Insulate the connections at the wiring terminals. ■ Communications wiring should be done properly to prevent abnormal operations. ■ Check for the presence of conducive and flammable objects, such as screws or metal pieces in the power meter. ■ If electronic devices near to the power meter experience electromagnetic interference, take steps to reduce the electromagnetic interference. ■ Check for the correct voltage level for the power supplied to the power meter.
Pre-running Check (supplied with power)	■ Check if the power indicator light is lit. ■ Check if communication between every device is normal. ■ If there is any abnormal response from the power meter, contact your distributor or our customer service center.

3.3 Wiring

3.3.1 Wiring Diagrams

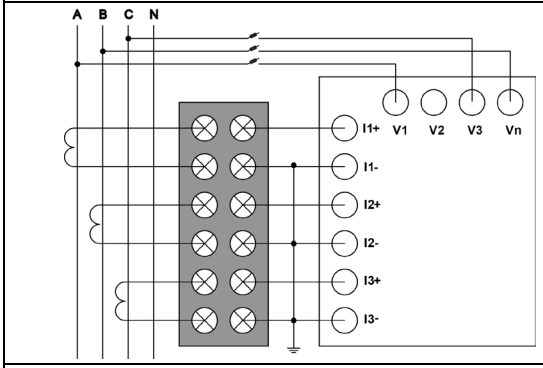
- To avoid electric shock, do not change the wiring when the power is on.
- It is necessary to install a breaker switch on the power cord of the meter due to no power switch on the power meter.
- When the measured voltage is higher than the rated specification for the device, it is necessary to use an external potential transformer (PT).
- When the measured current is higher than the rated specification for the device, it is necessary to use an external current transformer (CT).

The following table shows the recommended wiring materials.

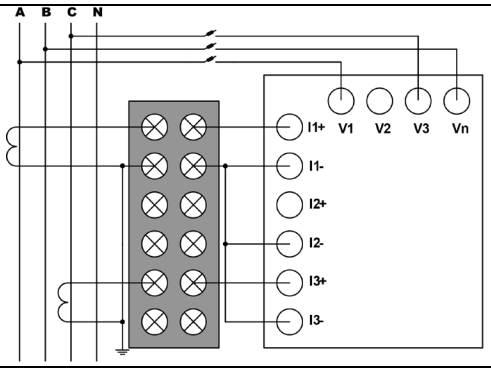
Connecting Terminals	Wire Diameters	Screw Turning Torque	Temperature rating
Operating Power	AWG 10–24	7.14 kgf-cm (0.7 N·m)	above 70°C
Voltage Measurement	AWG 10–24	7.14 kgf-cm (0.7 N·m)	above 70°C
Current Measurement	AWG 14–22	8.0 kgf-cm (0.79 N·m)	above 70°C
RS-485	AWG 14–28	2.04 kgf-cm (0.2 N·m)	above 70°C

- **Wiring Diagrams**

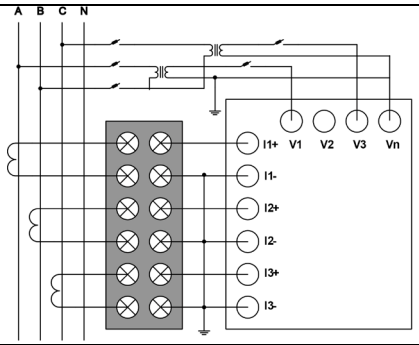
3PH3W, Δ connection, 3 CT, No PT



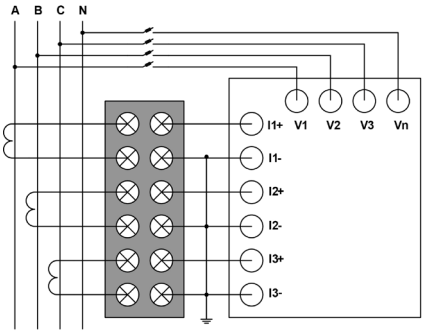
3PH3W, Δ connection, 2 CT, No PT



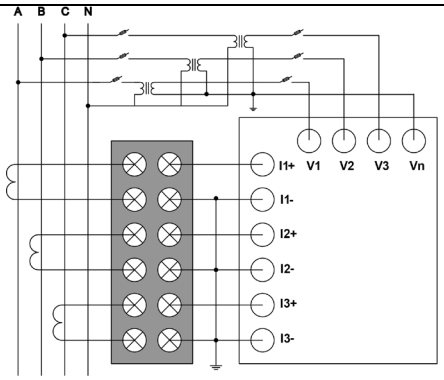
3PH3W, Δ connection, 3 CT, 2 PT



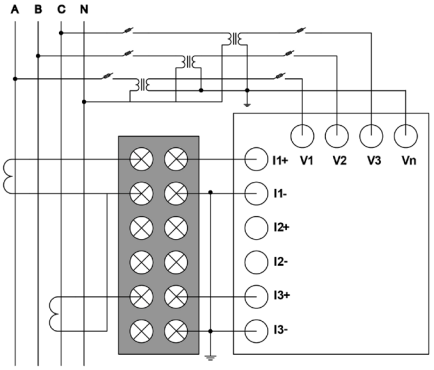
3PH4W, Y connection, 3 CT, No PT



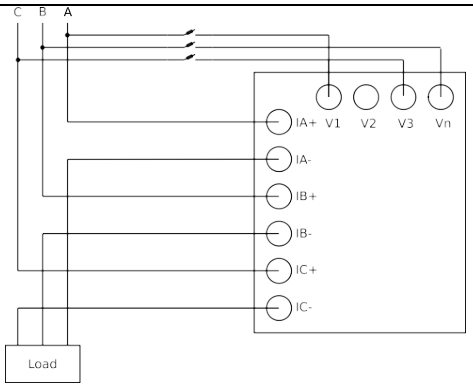
3PH4W, Y connection, 3 CT, 3 PT



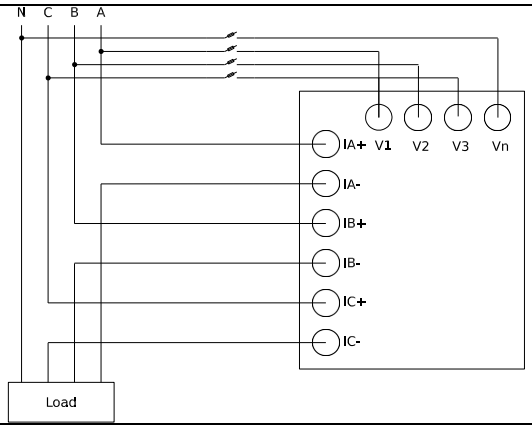
3PH4W, Y connection, 2 CT, 3 PT

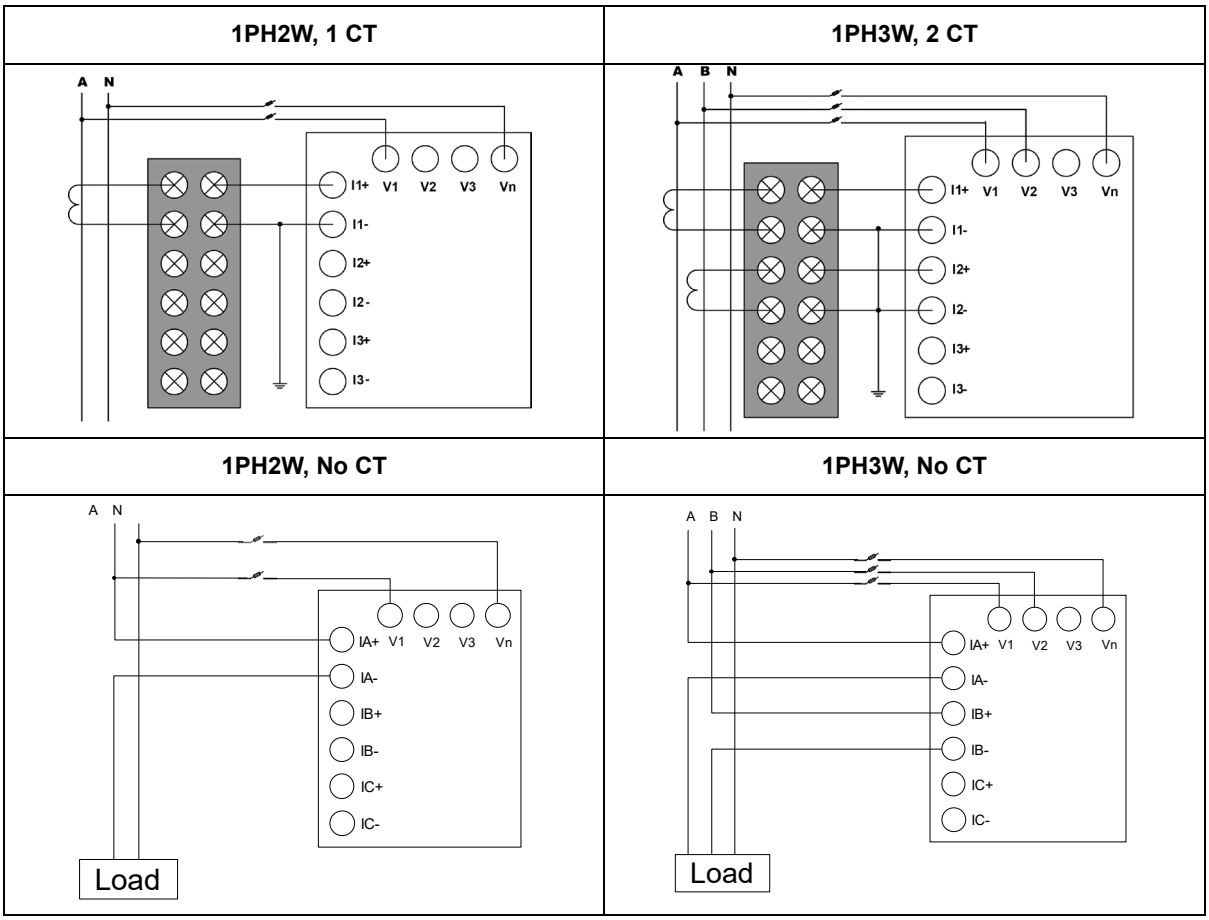


3PH3W, Δ connection, No CT



3PH4W, Y connection, No CT





The following table lists the symbols used in the diagram.

Symbol	⏚	⊂	▮	⫴⊂	⌇
Description	Grounding	Current transformer	Terminal block	Voltage transformer	Fuse

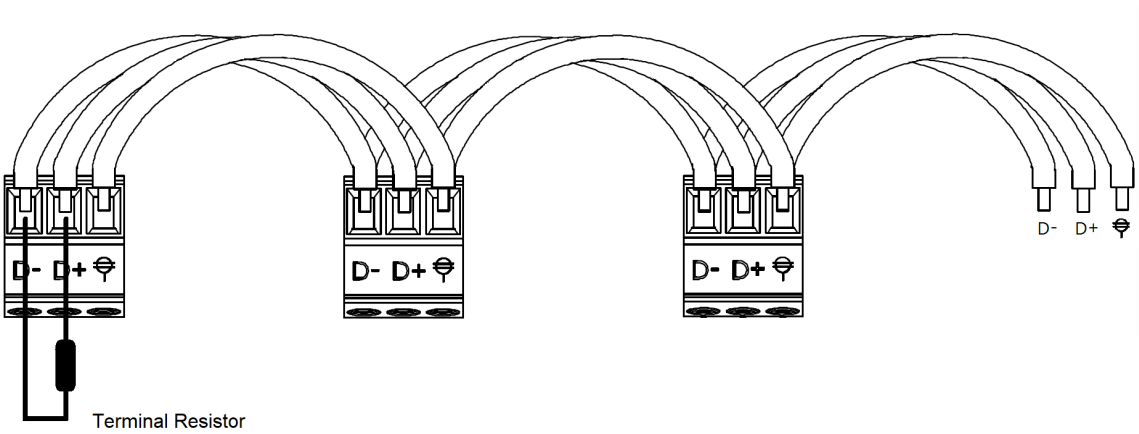
3.3.2 Communication Characteristics

- **Communications Specifications**

Max. Communication Distance	1200 m	**Baud Rate**	2400, 4800, 9600, 19200, 38400 bps
Max. Connection Number	32	**Data Length**	7-, 8-bits
Communication Protocols	Modbus RTU/ASCII	**Parity**	None, Odd, Even
Function Code	03, 06, 10, FE	**Stop Bits**	1, 2

Note: The 7-bit data length is not available for the Modbus RTU protocol.

- Use shielded twisted-pair cables for RS485 communication. When connecting multiple devices in series, use the wiring method in the following diagram.



- Connect the D+ communication terminal for all devices on the same twisted pair cable. Connect the D- terminals on another twisted pair cable. Ground the cable shield. Install a terminal resistor on the terminal device as shown.
- Use cables with a diameter of 14–28 AWG.

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Chapter 4 Operation

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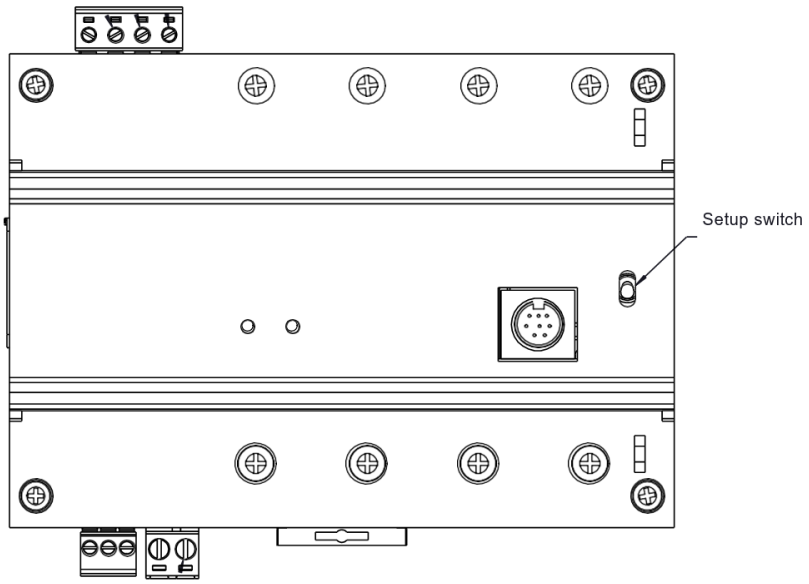
4.1 General Operation

4.1.1 Read Measurement Data

- Corresponding meter registers should be set via Modbus communication for meter setting
- When switching Setup Switch to “SETUP”, the meter communication parameters are set to factory defaults (Station 1, RTU, 9600, 8N1).
- When switching Setup Switch to “USER”, the meter communication parameters are set to user setting values.

  ***Note:** In case that users forget the meter communication parameters, Setup Switch can be switched to “SETUP” to set the parameters as factory defaults. Then switch to “USER”, so the meter communication parameters are set to user setting values and stay latched at the same time.



4.2 Basic Setups

4.2.1 Set up the Time and Date

- **Time:** Present power meter time; the time format includes the hour, minute, and second.
- **Date:** Present power meter date; the date format includes the last two digits of the year, month, date, and day.

4.2.2 Communication Settings

- **Address:**

  The range of address for the device is 1 to 254, with the broadcast address of 255 and factory default is 1. Corresponding Modbus address 0x1B.

- **Protocol:**

  Mode of communication transmission, with a selection from RTU (factory default), ASCII. Corresponding Modbus address 0x17.

- **Baud Rate:**

  Speed of communication transmission, with the factory default of 9600 kbps. Corresponding Modbus address 0x16.

- **Parity:**

  Odd and even checking bit for communication, with a selection from None (factory default), Even, and Odd. Corresponding Modbus address 0x19

- **Stop Bit:**

  Signal for completion of packet transmission, with a selection from 1 and 2 bit (s) (factory default: 1 bit). Corresponding Modbus address 0x1A.

  USER / SETUP Mode:

Mode	Uses and Timing
USER	Under normal status of meter communication.
SETUP	When the original communication parameters are lost and need to be reset.

Steps for SETUP mode:

1. Switch the Setup switch to **SETUP** mode.

2. Set the communication parameters: Station1, RTU communication mode, baud rate 9600 bps, 8-bit data length, NONE for Parity and 1 for stop bit.

3. Use parameters in step 2 to connect the power meter.

4. After the connection is successful, set new communication parameters for power meter.

5. When parameters setting is done, switch the Setup switch to **User** mode.

6. Use parameters in step 5 to connect the power meter.

4.2.3 Transformers Setting

- **Primary-side current transformer (CT1):**

  Ampere for the primary-side current transformer, with a selectable range of 1 to 9999 A (factory default: 5 A). Corresponding Modbus address 0xE

- **Secondary-side current transformer (CT2):**

  Ampere for the secondary-side current transformer, with a selection of 1 and 5 A (factory default: 5 A). Corresponding Modbus address 0xF

- **Primary-side potential transformer (PT1):**

  Voltage for the primary-side potential transformer, with a selectable range of 1 to 65535 V (factory default: 1 V). Corresponding Modbus address 0x10

- **Secondary-side potential transformer (PT2):**

  Voltage for the secondary-side potential transformer, with a selectable range of 1 to 9999 V (factory default: 1 V). Corresponding Modbus address 0x11

4.2.4 Set up the System Parameters

- **Wiring (Power System):** Options are one-phase two-wire (1PH2W), one-phase three-wire (1PH3W), three-phase three-wire (3PH3W), and three-phase four-wire (3PH4W; default). Corresponding Modbus address is 0XD.

- **Rotation (Phase):** Options are ABC mode (default) and CBA mode. When the phase A wiring is connected to the meters phase C and phase C wiring is connected to the meter's phase A, you can use CBA mode without having to reconnect the wiring. Corresponding Modbus address is 0XC.

- **Number CT:** The number of CTs on the system; options are 0, 1, 2 and 3 (default). Corresponding Modbus address 0X12.

- **Number PT:** The number of PTs on the system; options are 0, 2 and 3 (default). Corresponding Modbus address 0X12.

***Note:** When the wiring is one-phase two-wire (1PH2W), the fixed number of CT and PT is 1 and 3. When the wiring is one-phase three-wire (1PH3W), the fixed number of CT and PT is 2 and 3, which are not able to be modified.

4.2.5 Set up the Alarms

- **Alarm:** Whether this alarm is enabled or disabled (factory default).

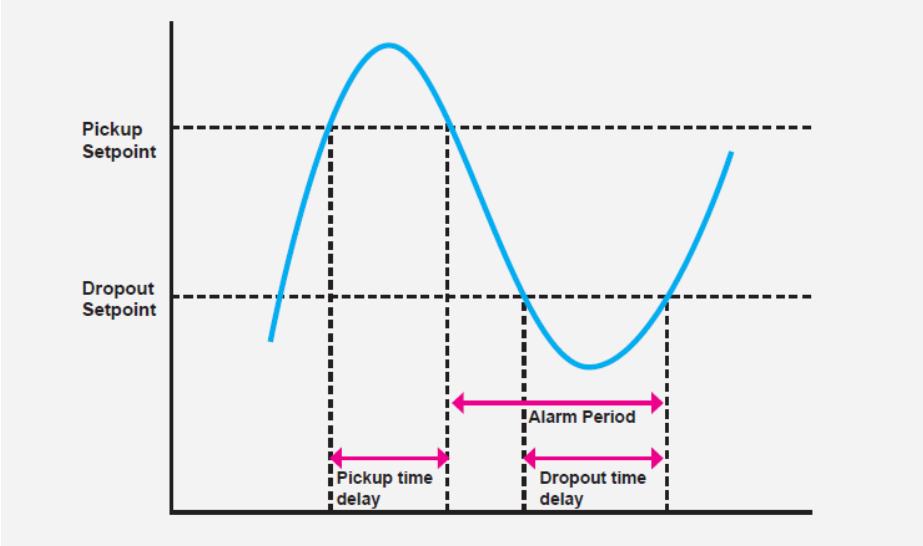
- **Pickup Setpoint:** When the threshold (default: 0) set on the meter is exceeded, an alarm is generated triggered.

- **Pickup Time Delay:** When the threshold set on the meter is exceed for a period longer than the pickup time delay (default: 0), the alarm is triggered.

- **Dropout Setpoint:** When the threshold (default: 0) set on the meter falls short, the alarm is cleared.

- **Dropout Time Delay:** When the measurement value falls below the threshold for a period longer than the dropout time delay (default: 0), the alarm is triggered.

- The corresponding MODBUS address for alarms would be 0x1F–0xDD.



4.2.6 Set up the Demands

- **Method:** Block interval demand method is supported for demand calculation. Corresponding Modbus address is 0x1D.
- **Interval:** Time interval to calculate for the demand, with a selectable range of 1 to 60 min (factory default is 1 min). Corresponding Modbus address is 0x1E.

4.2.7 Set up the Resets

There are seven types of supported resets, including Default, Energy, Demand, Alarm, MaxMin, Data Log, and ClearAll.

- **Default:** Restore all the settings back to the defaults.
- **Energy:** Clear all the accumulated and auto-read energy values.
- **Demand:** Clear the current demand, power factor demand, recorded time and date.
- **Alarm:** Clear all the detected alarm logs.
- **MaxMin:** Clear all maximum values and minimum value logs.
- **Data Log:** Clear the data log stored in the memory.
- **Clear All:** Restore all the settings back to the defaults and clear all logs.
- The corresponding MODBUS address is 0x1C.

4.3 Advanced Setups

4.3.1 Auto Metering

- **Energy 1:** Enable or disable auto metering Group 1. The Default setting is disabled. Corresponding Modbus address is 0x502.
- **Auto Day 1:** Set the date to conclude the monthly accumulated energy value; options are 1–31; 0 is default. Corresponding Modbus address is 0x504
- **Energy 2:** Enable or disable auto metering Group 2. The Default is disabled. Corresponding Modbus address is 0x507.
- **Auto Day 2:** Set the date to conclude the monthly accumulated energy value; options are 1–31; 0 is default. Corresponding Modbus address is 0x509.

4.3.2 Data Log

- **Interval:** Parameter intervals; the first two digits represent minute(s), the last two digits represent second(s). The minimum interval is 0 minute 5 seconds; the maximum is 60 minutes. If 0 minute 0 second is set for the Interval, it means the function is disabled (default). Corresponding Modbus address is 0x501.
- **Example:** To record the Voltage L-N and Current values, write 1 (the code for Voltage L-N) into the Modbus address 0x55B with function code 0x06 (single write) or 0x10 (multi-write) first, and then write 2 (the code for Current) into the Modbus address 0x55C with function code 0x06 (single write) or 0x10 (multi-write). Refer to section 5.1 for more information on the codes and Modbus addresses.
- **Note**

(1) Before setting up Interval, make sure to first set the recording parameter codes, or only date and time are recorded. You can set the Interval through a user interface (using the Set up Steps above), or through Modbus Communication (the address is 0x501).

(2) The following table lists the various parameters you can select according to different Intervals.

Interval / Item	5 to 59 seconds	1 minute to 4 minutes and 59 seconds	5 minutes to 60 minutes
Maximum Number of Parameters	6	17	17
Maximum Recording days	7	31	62

4.3.3 Maximum and Minimum Interval Setting

- **Interval:** Reset the maximum and minimum values at the end of interval; options are day, month, year and disable (default). Corresponding Modbus address is 0x55A.

4.3.4 Parameter Grouping

- **Block transmission:** Mirror the address of the to-be-read measured values to sequential Modbus addresses. The mirrored addresses would be 0x100 (Min) – 0x1E7 (Max). The default is 0xFFFF.
- Configure Modbus address to be 0x50c to 0x551 and read MODBUS address 0x600–0x645.
- **Set up Steps**

  1. Write the address of the to-be-read measured values into sequential Modbus addresses 0x50C–0x551 with function code 0x06 (single write) or 0x10 (multi-write).
  2. Once you complete Step 1, you can read the mirrored Modbus address 0x600–0x645 with function code 0x03 (multi-read) for the measured values.

- **Example**

  1. You can use function code 0x06 (single write) or 0x10 (multi-write) to read the average Voltage L-N value. Write the value 0x100 into Modbus 0x50C and the value 0x101 into Modbus 0x50D in a consecutive order to read the average Voltage L-N value (Modbus 0x100–0x101).
  2. You can use function code 0x06 (single write) or 0x10 (multi-write), to read the average current value. Write the value 0x126 into Modbus 0x50E and the value 0x127 into Modbus 0x50F in a consecutive order to read the average current value (Modbus 0x126–0x127). Refer to section 5.1 for more information on the codes and Modbus addresses.
  3. Once you complete Step 1, you can read mirrored Modbus address 0x600–0x601 with function code 0x03 (multi-read). After the value is converted to IEEE754 format, you can read the average Voltage L-N value. You can also read mirrored Modbus address 0x602–0x603 with function code 0x03 (multi-read). After the value is converted to IEEE754 format, you can read the average current value.

4.4 Power Analysis Values

4.4.1 Total Harmonic Distortion Measurement

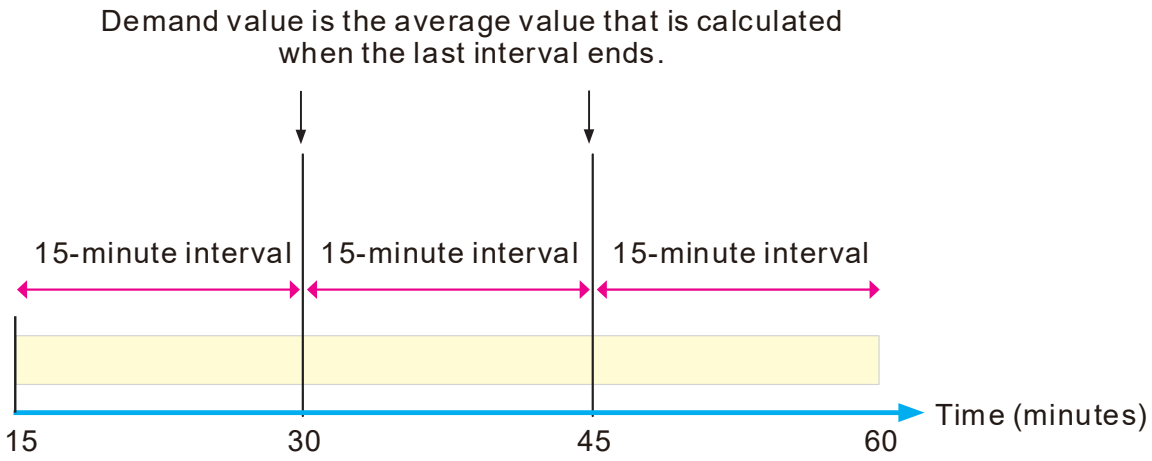
The total harmonic distortion (THD) is a measurement of the harmonic distortion and is defined as the ratio between the power of the harmonic frequencies above the base frequency and the power of the base frequency. The total harmonic distortions for current and voltage are calculated using the following formulas.

Total Harmonic Distortion for Current	$THD_I = \frac{1}{\lvert I_{fund} \rvert} \sqrt{\sum_{n=2}^{31} \lvert I_{n.Harm} \rvert^2}$
Total Harmonic Distortion for Voltage	$THD_U = \frac{1}{\lvert U_{fund} \rvert} \sqrt{\sum_{n=2}^{31} \lvert U_{n.Harm} \rvert^2}$

4.4.2 Demand Calculation Method

The power meter provides measured values for current demand, active power demand, reactive power demand and apparent power demand. You can also calculate the last, present, predicted, and peak demand values from above measured values. The power meter supports fixed block interval demand methods. The example shown below uses a 15-minute interval. You can select an interval from 1 to 60 minutes. The meter updates the present, predicted, and peak demand values every second, and updates the last demand value at the end of the interval. The power meter treats last demand value as the present demand after updating.

- Last demand: The power meter calculates the value when the last interval ends.
- Present demand: The power meter calculates the value during the current interval.
- Predicted demand: The power meter calculates the value before the current interval ends.
- Peak demand: The power meter calculates the maximum value during the current interval.



MEMO

5

Chapter 5 Parameters and Functions

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5.1 Overview of Parameters

Modbus Address		Item	Range	Data Type	Unit	Data Size (byte)	Read (R) / Write (W)
Hex	Modicom Format						
0. System Parameters: 0001 – 00FF							
1	40002	Present date	Year: 00–99 Month: 1–12	byte	Year, Month	2	R/W
2	40003		Date: 1–31 Week: Sun–Sat	byte	Date, Week	2	R/W
3	40004	Present time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
4	40005		Second: 00–59	word	Second	2	R/W
5	40006	Meter Constant	3200	uint	P/kWh	2	R
6	40007	Meter Model	0: None 3: DPM-D520I	word		2	R
7	40008	Total running time of the meter	Day: 0–65535	uint	Day	2	R
8	40009		Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
9	40010	Firmware version	0.0000 – 9.9999	uint		2	R
A	40011	Firmware release date	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
B	40012		Date: 1–31	word	Date	2	R
C	40013	Phase rotation	0: ABC 1: CBA	word		2	R/W

C	40013	Reserved					
D	40014	Power system configuration	0: 3φ4W 1: 3φ3W 2: 1φ2W 3: 1φ3W	word		2	R/W
E	40015	Primary CT (A)	1 – 9999	uint	A	2	R/W
F	40016	Secondary CT (A)	0: 1 A 1: 5 A	word	A	2	R/W
10	40017	Primary PT	1 – 65535	uint	V	2	R/W
11	40018	Secondary PT	1 – 9999	uint	V	2	R/W
12	40019	Transformer quantities	0: 3CT3PT 1: 3CT2PT 2: 3CT0PT 3: 2CT3PT 4: 2CT2PT 5: 2CT0PT 6: 1CT3PT 7: 1CT2PT 8: 1CT0PT	word		2	R/W
13	40020	Reserved					
14	40021	Reserved					
15	40022	Reserved					

16	40023	Baud Rate	0: 9600 1: 19200 2: 38400 The rates below are only supported by HW version 1.0408 and after. 4: 2400 5: 4800	word	bps	2	R/W
17	40024	Communication mode	0: ASCII 1: RTU	word		2	R/W
18	40025	Data bit	0: 8 1: 7	word	bit	2	R/W
19	40026	Stop bit	0: None 1: Even 2: Odd	word		2	R/W
1A	40027	Stop bit	0: 1 1: 2	word	bit	2	R/W
1B	40028	Modbus address / BACnet (MAC ID)	1 – 254	word		2	R/W
1C	40029	Reset	0: None 1: Reset to factory default 2: Reset energy value 3: Reset demand value 4: Clear alarm logs / Times 5: Reset max./min. values 6: Clear logs	word		2	W

			7: Clear all 8: Reset time of use value and accumulated energy value from auto recording 9: Reset accumulated energy value from energy saving mode of the measured equipment				
1D	40030	Demand	0: block	word		2	R
1E	40031	Demand time interval	0–60	word	Minute	2	R/W
Alarm – Over Current							
1F	40032	Alarm enable	0: Disable 1: Enable	word		2	R/W
20	40033	Pickup setpoint (current value exceeding this value triggers alarm)	0.000 – 99999.999	float	A	4	R/W
21	40034						
22	40035	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
23	40036	Dropout setpoint (current value below this value clears alarm)	0.000 – 99999.999	float	A	4	R/W
24	40037						
25	4038	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Under Current							
26	4039	Alarm enable	0: Disable 1: Enable	word		2	R/W
27	40040	Pickup setpoint (current value below	0.000 – 99999.999	float	A	4	R/W

28	40041	this value triggers alarm)					
29	40042	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
2A	40043	Dropout setpoint (current value exceeding this value clears alarm)	0.000 – 99999.999	float	A	4	R/W
2B	40044						
2C	40045	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Over Neutral Current							
2D	40046	Alarm enables	0: Disable 1: Enable	word		2	R/W
2E	40047	Pickup setpoint (neutral current value exceeding this value triggers alarm)	0.000 – 99999.999	float	A	4	R/W
2F	40048						
30	40049	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
31	40050	Dropout setpoint (neutral current value below this value clears alarm)	0.000 – 99999.999	float	A	4	R/W
32	40051						
33	40052	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Over Voltage L–L							
34	40053	Alarm enables	0: Disable 1: Enable	word		2	R/W
35	40054	Pickup setpoint (line voltage value	0.000 – 99999.999	float	V	4	R/W

36	40055	exceeding this value triggers alarm)					
37	40056	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
38	40057	Dropout setpoint (line voltage value below this value clears alarm)	0.000 – 99999.999	float	V	4	R/W
39	40058						
3A	40059	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Under Voltage L–L							
3B	40060	Alarm enable	0: Disable 1: Enable	word		2	R/W
3C	40061	Pickup setpoint (line voltage value below this value triggers alarm)	0.000 – 99999.999	float	V	4	R/W
3D	40062						
3E	40063	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
3F	40064	Dropout setpoint (line voltage value exceeding this value clears alarm)	0.000 – 99999.999	float	V	4	R/W
40	40065						
41	40066	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Over Voltage L–N							
42	40067	Alarm enable	0: Disable 1: Enable	word		2	R/W
43	40068	Pickup setpoint (phase voltage value	0.000 – 99999.999	float	V	4	R/W

44	40069	exceeding this value triggers alarm)					
45	40070	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
46	40071	Dropout setpoint (phase voltage value below this value clears alarm)	0.000 – 99999.999	float	V	4	R/W
47	40072						
48	40073	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Under Voltage L–N							
49	40074	Alarm enable	0: Disable 1: Enable	word		2	R/W
4A	40075	Pickup setpoint (phase value below this value triggers alarm)	0.000 – 99999.999	float	V	4	R/W
4B	40076						
4C	40077	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
4D	40078	Dropout setpoint (phase voltage value exceeding this value clears alarm)	0.000 – 99999.999	float	V	4	R/W
4E	40079						
4F	40080	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Over Voltage Unbalance							
50	40081	Alarm enable	0: Disable 1: Enable	word		2	R/W
51	40082	Pickup setpoint (over voltage unbalance	0.00 – 99.99	float	%	4	R/W

52	40083	value exceeding this value triggers alarm)					
53	40084	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
54	40085	Dropout setpoint (over voltage unbalance value below this value clears alarm)	0.00 – 99.99	float	%	4	R/W
55	40086						
56	40087	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Over Current Unbalance							
57	40088	Alarm enable	0: Disable 1: Enable	word		2	R/W
58	40089	Pickup setpoint (over current unbalance value below this value triggers alarm)	0.00 – 99.99	float	%	4	R/W
59	40090						
5A	40091	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
5B	40092	Dropout setpoint (over current unbalance value exceeding this value clears alarm)	0.00 – 99.99	float	%	4	R/W
5C	40093						
5D	40094	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Over Active Power							
5E	40095	Alarm enable	0: Disable 1: Enable	word		2	R/W

5F	40096	Pickup setpoint (total active power value exceeding this value triggers alarm)	0.000 – 99999.999	float	kW	4	R/W
60	40097						
61	40098	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
62	40099	Dropout setpoint (total active power value below this value clears alarm)	0.000 – 99999.999	float	kW	4	R/W
63	40100						
64	40101	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Over Reactive Power							
65	40102	Alarm enable	0: Disable 1: Enable	word		2	R/W
66	40103	Pickup setpoint (total reactive power value exceeding this value triggers alarm)	0.000 – 99999.999	float	kVAR	4	R/W
67	40104						
68	40105	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
69	40106	Dropout setpoint (total reactive power value below this value clears alarm)	0.000 – 99999.999	float	kVAR	4	R/W
6A	40107						
6B	40108	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Over Apparent Power							
6C	40109	Alarm enable	0: Disable 1: Enable	word		2	R/W

6D	40110	Pickup setpoint (total apparent power value exceeding this value triggers alarm)	0.000 – 99999.999	float	kVA	4	R/W
6E	40111						
6F	40112	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
70	40113	Dropout setpoint (total apparent power value below this value clears alarm)	0.000 – 99999.999	float	kVA	4	R/W
71	40114						
72	40115	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Lead PF							
73	40116	Alarm enable	0: Disable 1: Enable	word		2	R/W
74	40117	Pickup setpoint (total power factor value below this value triggers alarm)	0.00000 – 1.00000	float		4	R/W
75	40118						
76	40119	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
77	40120	Dropout setpoint (total power factor value exceeding this value clears alarm)	0.00000 – 1.00000	float		4	R/W
78	40121						
79	40122	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Lag PF							
7A	40123	Alarm enable	0: Disable 1: Enable	word		2	R/W

7B	40124	Pickup setpoint (total power factor value below this value triggers alarm)	0.00000 – 1.00000	float		4	R/W
7C	40125						
7D	40126	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
7E	40127	Dropout setpoint (total power factor value exceeding this value clears alarm)	0.00000 – 1.00000	float		4	R/W
7F	40128						
80	40129	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Lead Displacement PF							
81	40130	Alarm enable	0: Disable 1: Enable	word		2	R/W
82	40131	Pickup setpoint (total displacement power factor value below this value triggers alarm)	0.00000 – 1.00000	float		4	R/W
83	40132						
84	40133	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
85	40134	Dropout setpoint total displacement power factor value exceeding this value clears alarm)	0.00000 – 1.00000	float		4	R/W
86	40135						
87	40136	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Lag Displacement PF							

88	40137	Alarm enable	0: Disable 1: Enable	word		2	R/W
89	40138	Pickup setpoint (total displacement power factor value below this value triggers alarm)	0.00000 – 1.00000	float		4	R/W
8A	40139						
8B	40140	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
8C	40141	Dropout setpoint (total displacement power factor value exceeding this value clears alarm)	0.00000 – 1.00000	float		4	R/W
8D	40142						
8E	40143	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Over Current Demand							
8F	40144	Alarm enable	0: Disable 1: Enable	word		2	R/W
90	40145	Pickup setpoint (current demand value exceeding this value triggers alarm)	0.000 – 99999.999	float	A	4	R/W
91	40146						
92	40147	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
93	40148	Dropout setpoint (current demand value below this value clears alarm)	0.000 – 99999.999	float	A	4	R/W
94	40149						
95	40150	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W

Alarm – Over Active Power Demand							
96	40151	Alarm enable	0: Disable 1: Enable	word		2	R/W
97	40152	Pickup setpoint (active power demand value exceeding this value triggers alarm)	0.000 – 99999.999	float	kW	4	R/W
98	40153						
99	40154	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
9A	40155	Dropout setpoint (active power demand value below this value clears alarm)	0.000 – 99999.999	float	kW	4	R/W
9B	40156						
9C	40157	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Over Reactive Power Demand							
9D	40158	Alarm enable	0: Disable 1: Enable	word		2	R/W
9E	40159	Pickup setpoint (reactive power demand value exceeding this value triggers alarm)	0.000 – 99999.999	float	kW	4	R/W
9F	40160						
A0	40161	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
A1	40162	Dropout setpoint (reactive power	0.000 – 99999.999	float	kW	4	R/W

A2	40163	demand value below this value clears alarm)					
A3	40164	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Over Apparent Power Demand							
A4	40165	Alarm enable	0: Disable 1: Enable	word		2	R/W
A5	40166	Pickup setpoint (apparent power demand value exceeding this value triggers alarm)	0.000 – 99999.999	float	kW	4	R/W
A6	40167						
A7	40168	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
A8	40169	Dropout setpoint (apparent power demand value below this value clears alarm)	0.000 – 99999.999	float	kW	4	R/W
A9	40170						
AA	40171	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Over Frequency							
AB	40172	Alarm enable	0: Disable 1: Enable	word		2	R/W
AC	40173	Pickup setpoint (frequency value exceeding this value triggers alarm)	0.0000 – 99.9999	float	Hz	4	R/W
AD	40174						

AE	40175	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
AF	40176	Dropout setpoint (frequency value below this value clears alarm)	0.0000 – 99.9999	float	Hz	4	R/W
B0	40177						
B1	40178	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Under Frequency							
B2	40179	Alarm enable	0: Disable 1: Enable	word		2	R/W
B3	40180	Pickup setpoint (frequency value below this value triggers alarm)	0.0000 – 99.9999	float	Hz	4	R/W
B4	40181						
B5	40182	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
B6	40183	Dropout setpoint (frequency value exceeding this value, alarm cleared)	0.0000 – 99.9999	float	Hz	4	R/W
B7	40184						
B8	40185	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Over THD Voltage							
B9	40186	Alarm enable	0: Disable 1: Enable	word		2	R/W
BA	40187	Pickup setpoint (THD voltage value	0.000 – 999.999	float	%	4	R/W

BB	40188	exceeding this value triggers alarm)					
BC	40189	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
BD	40190	Dropout setpoint (THD voltage value below this value, alarm cleared)	0.000 – 999.999	float	%	4	R/W
BE	40191						
BF	40192	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Over THD Current							
C0	40193	Alarm enable	0: Disable 1: Enable	word		2	R/W
C1	40194	Pickup setpoint (THD current value exceeding this value triggers alarm)	0.000 – 999.999	float	%	4	R/W
C2	40195						
C3	40196	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
C4	40197	Dropout setpoint (THD current value below this value, alarm cleared)	0.000 – 999.999	float	%	4	R/W
C5	40198						
C6	40199	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Phase Loss							
C7	40200	Alarm enable	0: Disable 1: Enable	word		2	R/W
Alarm – Over DUI							

CE	40207	Alarm enable	0: Disable 1: Enable	word		2	R/W
CF	40208	Pickup setpoint (DUI value exceeding this value triggers alarm)	0.000 – 99999.999	float	kW / m^2	4	R/W
D0	40209						
D1	40210	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
D2	40211	Dropout setpoint (DUI value below this value, alarm cleared)	0.000 – 99999.999	float	kW / m^2	4	R/W
D3	40212						
D4	40213	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Over EUI							
D5	40214	Alarm enable	0: Disable 1: Enable	word		2	R/W
D6	40215	Pickup setpoint (EUI value exceeding this value triggers alarm)	0.000 – 99999.999	float	kWh/ m^2	4	R/W
D7	40216						
D8	40217	Pickup time delay (alarm–trigger delay)	0 – 99	word	s	2	R/W
D9	40218	Dropout setpoint (EUI value below this value, alarm cleared)	0.000 – 99999.999	float	kWh/ m^2	4	R/W
DA	40219						
DB	40220	Dropout time delay (alarm–clear delay)	0 – 99	word	s	2	R/W
Alarm – Meter Reset							
DC	40221	Alarm enable	0: Disable 1: Enable	word		2	R/W

Alarm – Phase Rotation							
DD	40222	Alarm enable	0: Disable 1: Enable	word		2	R/W
1. Meter Parameters: 0100 – 01FF							
100	40257	Phase A voltage	0.000 – 99999.999	float	V	4	R
101	40258						
102	40259	Phase B voltage	0.000 – 99999.999	float	V	4	R
103	40260						
104	40261	Phase C voltage	0.000 – 99999.999	float	V	4	R
105	40262						
106	40263	Average phase voltage	0.000 – 99999.999	float	V	4	R
107	40264						
108	40265	A–B line voltage	0.000 – 99999.999	float	V	4	R
109	40266						
10A	40267	B–C line voltage	0.000 – 99999.999	float	V	4	R
10B	40268						
10C	40269	C–A line voltage	0.000 – 99999.999	float	V	4	R
10D	40270						
10E	40271	Average line voltage	0.000 – 99999.999	float	V	4	R
10F	40272						
110	40273	Phase A voltage unbalance	0.00 – 99.99	float	%	4	R
111	40274						
112	40275	Phase B voltage unbalance	0.00 – 99.99	float	%	4	R
113	40276						

114	40277	Phase C voltage unbalance	0.00 – 99.99	float	%	4	R
115	40278						
116	40279	Phase voltage unbalance	0.00 – 99.99	float	%	4	R
117	40280						
118	40281	A–B line voltage unbalance	0.00 – 99.99	float	%	4	R
119	40282						
11A	40283	B–C line voltage unbalance	0.00 – 99.99	float	%	4	R
11B	40284						
11C	40285	C–A line voltage unbalance	0.00 – 99.99	float	%	4	R
11D	40286						
11E	40287	Line voltage unbalance	0.00 – 99.99	float	%	4	R
11F	40288						
120	40289	Phase A current	0.000 – 99999.999	float	A	4	R
121	40290						
122	40291	Phase B current	0.000 – 99999.999	float	A	4	R
123	40292						
124	40293	Phase C current	0.000 – 99999.999	float	A	4	R
125	40294						
126	40295	Three–phase average current	0.000 – 99999.999	float	A	4	R
127	40296						
128	40297	Neutral line current	0.000 – 99999.999	float	A	4	R
129	40298						
12A	40299	Phase A current unbalance	0.00 – 99.99	float	%	4	R
12B	40300						

12C	40301	Phase B current unbalance	0.00 – 99.99	float	%	4	R
12D	40302						
12E	40303	Phase C current unbalance	0.00 – 99.99	float	%	4	R
12F	40304						
130	40305	Current unbalance	0.00 – 99.99	float	%	4	R
131	40306						
132	40307	Total power factor	0.00000 – 1.00000 (positive: lag; negative: lead)	float		4	R
133	40308						
134	40309	Power factor of phase A	0.00000 – 1.00000 (positive: lag; negative: lead)	float		4	R
135	40310						
136	40311	Power factor of phase B	0.00000 – 1.00000 (positive: lag; negative: lead)	float		4	R
137	40312						
138	40313	Power factor of phase C	0.00000 – 1.00000 (positive: lag; negative: lead)	float		4	R
139	40314						
13A	40315	Total displacement power factor	0.00000 – 1.00000 (positive: lag; negative: lead)	float		4	R
13B	40316						
13C	40317	Total displacement power factor of phase A	0.00000 – 1.00000 (positive: lag; negative: lead)	float		4	R
13D	40318						
13E	40319	Total displacement power factor of phase B	0.00000 – 1.00000 (positive: lag; negative: lead)	float		4	R
13F	40320						
140	40321	Total displacement power factor of phase C	0.00000 – 1.00000 (positive: lag; negative: lead)	float		4	R
141	40322						
142	40323	Frequency	0.0000 – 99.9999	float	Hz	4	R
143	40324						

144	40325	Total instantaneous active power	0.000 – 99999.999 (positive: power consumption/ negative: power generation)	float	kW	4	R
145	40326						
146	40327	Instantaneous active power of phase A	0.000 – 99999.999 (positive: power consumption/ negative: power generation)	float	kW	4	R
147	40328						
148	40329	Instantaneous active power of phase B	0.000 – 99999.999 (positive: power consumption/ negative: power generation)	float	kW	4	R
149	40330						
14A	40331	Instantaneous active power of phase C	0.000 – 99999.999 (positive: power consumption/ negative: power generation)	float	kW	4	R
14B	40332						
14C	40333	Total instantaneous reactive power	0.000 – 99999.999 (positive: lag; negative: lead)	float	kVAR	4	R
14D	40334						
14E	40335	Instantaneous reactive power of phase A	0.000 – 99999.999 (positive: lag; negative: lead)	float	kVAR	4	R
14F	40336						
150	40337	Instantaneous reactive power of phase B	0.000 – 99999.999 (positive: lag; negative: lead)	float	kVAR	4	R
151	40338						
152	40339	Instantaneous reactive power of phase C	0.000 – 99999.999 (positive: lag; negative: lead)	float	kVAR	4	R
153	40340						
154	40341	Instantaneous apparent power	0.000 – 99999.999	float	kVA	4	R
155	40342						
156	40343	Instantaneous apparent power of phase A	0.000 – 99999.999	float	kVA	4	R
157	40344						
158	40345	Instantaneous apparent power of phase B	0.000 – 99999.999	float	kVA	4	R
159	40346						

15A	40347	Instantaneous apparent power of phase C	0.000 – 99999.999	float	kVA	4	R
15B	40348						
15C	40349	Active energy of three - phase delivered	0 to 4294967295	UINT	Wh	4	R
15D	40350						
15E	40351	Active energy of three - phase received	0 to 4294967295	UINT	Wh	4	R
15F	40352						
160	40353	Reactive energy of three - phase delivered	0 to 4294967295	UINT	VARh	4	R
161	40354						
162	40355	Reactive energy of three - phase received	0 to 4294967295	UINT	VARh	4	R
163	40356						
164	40357	Apparent energy of three - phase delivered	0 to 4294967295	UINT	VAh	4	R
165	40358						
166	40359	Apparent energy of three - phase received	0 to 4294967295	UINT	VAh	4	R
167	40360						
168	40361	Active energy of three - phase delivered + active energy of three - phase received	0 to 4294967295	UINT	Wh	4	R
169	40362						
16A	40363	Active energy of three - phase delivered – active energy of three - phase received	0x80000001 to 0x7FFFFFFF (Negative numbers are represented in 2's complement format.)	INT	Wh	4	R
16B	40364						
16C	40365	Reactive energy of three - phase	0 to 4294967295	UINT	VARh	4	R

16D	40366	delivered + reactive energy of three - phase received					
16E	40367	Reactive energy of three - phase delivered – reactive energy of three - phase received	0x80000001 to 0x7FFFFFFF (Negative numbers are represented in 2's complement format.)	INT	VARh	4	R
16F	40368						
170	40369	Apparent energy of three - phase delivered + apparent energy of three - phase received	0 to 4294967295	UINT	VAh	4	R
171	40370						
172	40371	Apparent energy of three - phase delivered – apparent energy of three - phase received	0x80000001 to 0x7FFFFFFF (Negative numbers are represented in 2's complement format.)	INT	VAh	4	R
173	40372						
174	40373	Total harmonic distortion for phase A current	0.000 – 999.999	float	%	4	R
175	40374						
176	40375	Total harmonic distortion for phase B current	0.000 – 999.999	float	%	4	R
177	40376						
178	40377	Total harmonic distortion for phase C current	0.000 – 999.999	float	%	4	R
179	40378						
17A	40379	Total harmonic distortion for neutral line current	0.000 – 999.999	float	%	4	R
17B	40380						
17C	40381	Total harmonic distortion for phase A voltage	0.000 – 999.999	float	%	4	R
17D	40382						

17E	40383	Total harmonic distortion for phase B voltage	0.000 – 999.999	float	%	4	R
17F	40384						
180	40385	Total harmonic distortion for phase C voltage	0.000 – 999.999	float	%	4	R
181	40386						
182	40387	Total harmonic distortion for phase A–B voltage	0.000 – 999.999	float	%	4	R
183	40388						
184	40389	Total harmonic distortion for phase B–C voltage	0.000 – 999.999	float	%	4	R
185	40390						
186	40391	Total harmonic distortion for phase C–A voltage	0.000 – 999.999	float	%	4	R
187	40392						
188	40393	Total harmonic distortion for current	0.000 – 999.999	float	%	4	R
189	40394						
18A	40395	Total harmonic distortion for voltage	0.000 – 999.999	float	%	4	R
18B	40396						
18C	40397	Present three - phase current demand	0.000 – 99999.999	float	A	4	R
18D	40398						
18E	40399	Last three - phase average current demand	0.000 – 99999.999	float	A	4	R
18F	40400						
190	40401	Predicted three - phase average current demand	0.000 – 99999.999	float	A	4	R
191	40402						
192	40403	Peak value of three - phase current demand	0.000 – 99999.999	float	A	4	R
193	40404						

194	40405	Date of the three - phase current peak demand value	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
195	40406		Date: 1–31	word	Date	2	R
196	40407	Time of the three - phase current peak demand value	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
197	40408		Second: 00–59	word	Second	2	R
198	40409	Present three - phase active power demand	0.000 – 99999.999	float	kW	4	R
199	40410						
19A	40411	Last three - phase active power demand	0.000 – 99999.999	float	kW	4	R
19B	40412						
19C	40413	Predicted three - phase active power demand	0.000 – 99999.999	float	kW	4	R
19D	40414						
19E	40415	Peak value of three - phase active power demand	0.000 – 99999.999	float	kW	4	R
19F	40416						
1A0	40417	Date of the three - phase active power demand	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
1A1	40418		Date: 1–31	word	Date	2	R
1A2	40419	Time of the three - phase active power demand	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
1A3	40420		Second: 00–59	word	Second	2	R
1A4	40421	Present three - phase reactive power demand	0.000 – 99999.999	float	kVAR	4	R
1A5	40422						

1A6	40423	Last three - phase reactive power demand	0.000 – 99999.999	float	kVAR	4	R
1A7	40424						
1A8	40425	Predicted three - phase reactive power demand	0.000 – 99999.999	float	kVAR	4	R
1A9	40426						
1AA	40427	Peak value of three - phase reactive power demand	0.000 – 99999.999	float	kVAR	4	R
1AB	40428						
1AC	40429	Date of the three - phase reactive power demand	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
1AD	40430		Date: 1–31	word	Date	2	R
1AE	40431	Time of the three - phase reactive power demand	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
1AF	40432		Second: 00–59	word	Second	2	R
1B0	40433	Present three - phase apparent power demand	0.000 – 99999.999	float	kVA	4	R
1B1	40434						
1B2	40435	Last three - phase apparent power demand	0.000 – 99999.999	float	kVA	4	R
1B3	40436						
1B4	40437	Predicted three - phase apparent power demand	0.000 – 99999.999	float	kVA	4	R
1B5	40438						
1B6	40439	Peak value of three - phase apparent power demand	0.000 – 99999.999	float	kVA	4	R
1B7	40440						
1B8	40441	Date of the three - phase apparent	Year: 00–99 Month: 1–12	byte	Year, Month	2	R

1B9	40442	power demand	Date: 1–31	word	Date	2	R
1BA	40443	Time of the three - phase apparent power demand	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
1BB	40444		Second: 00–59	word	Second	2	R
1BC	40445	DUI (kW / Floor Area)	0.000 – 99999.999	float	kW/m^2	4	R
1BD	40446						
1BE	40447	EUI (kWh / Floor Area)	0.000 – 99999,999,999.999	float	kWh/m^2	4	R
1BF	40448						
1C0	40449	Auto Date 1 – positive active energy	0.000 – 99999,999,999.999	float	kWh	4	R
1C1	40450						
1C2	40451	Auto Date 1 – reversed active energy	0.000 – 99999,999,999.999	float	kWh	4	R
1C3	40452						
1C4	40453	Auto Date 2 – positive active energy	0.000 – 99999,999,999.999	float	kWh	4	R
1C5	40454						
1C6	40455	Auto Date 2 – reversed active energy	0.000 – 99999,999,999.999	float	kWh	4	R
1C7	40456						
1C8	40457	Auto Date 1 – positive reactive energy	0.000 – 99999,999,999.999	float	kVARh	4	R
1C9	40458						
1CA	40459	Auto Date 1 – reversed reactive energy	0.000 – 99999,999,999.999	float	kVARh	4	R
1CB	40460						
1CC	40461	Auto Date 2 – positive reactive energy	0.000 – 99999,999,999.999	float	kVARh	4	R
1CD	40462						
1CE	40463	Auto Date 2 –	0.000 – 99999,999,999.999	float	kVARh	4	R

1CF	40464	reversed reactive energy					
1D0	40465	Instantaneous total fundamental active power	0.000 – 99999.999	float	kW	4	R
1D1	40466						
1D2	40467	Instantaneous fundamental active power of phase A	0.000 – 99999.999	float	kW	4	R
1D3	40468						
1D4	40469	Instantaneous fundamental active power of phase B	0.000 – 99999.999	float	kW	4	R
1D5	40470						
1D6	40471	Instantaneous fundamental active power of phase C	0.000 – 99999.999	float	kW	4	R
1D7	40472						
1D8	40473	Instantaneous total fundamental reactive power	0.000 – 99999.999	float	kVAR	4	R
1D9	40474						
1DA	40475	Instantaneous fundamental reactive power of phase A	0.000 – 99999.999	float	kVAR	4	R
1DB	40476						
1DC	40477	Instantaneous fundamental reactive power of phase B	0.000 – 99999.999	float	kVAR	4	R
1DD	40478						
1DE	40479	Instantaneous fundamental reactive power of phase C	0.000 – 99999.999	float	kVAR	4	R
1DF	40480						
1E0	40481	Instantaneous fundamental apparent power	0.000 – 99999.999	float	kVA	4	R
1E1	40482						
1E2	40483	Instantaneous fundamental apparent power of phase A	0.000 – 99999.999	float	kVA	4	R
1E3	40484						

1E4	40485	Instantaneous fundamental apparent power of phase B	0.000 – 99999.999	float	kVA	4	R
1E5	40486						
1E6	40487	Instantaneous fundamental apparent power of phase C	0.000 – 99999.999	float	kVA	4	R
1E7	40488						
2. Maximum: 0200 – 02FF							
200	40513	Maximum A–B line voltage	0.000 – 99999.999	float	V	4	R
201	40514						
202	40515	Date of maximum A–B line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
203	40516		Date: 1–31	word	Date	2	R
204	40517	Time of maximum A–B line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
205	40518		Second: 00–59	word	Second	2	R
206	40519	Maximum B–C line voltage	0.000 – 99999.999	float	V	4	R
207	40520						
208	40521	Date of maximum B–C line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
209	40522		Date: 1–31	word	Date	2	R
20A	40523	Time of maximum B–C line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
20B	40524		Second: 00–59	word	Second	2	R
20C	40525	Maximum C–A line voltage	0.000 – 99999.999	float	V	4	R
20D	40526						

20E	40527	Date of maximum C–A line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
20F	40528		Date: 1–31	word	Date	2	R
210	40529	Time of maximum C–A line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
211	40530		Second: 00–59	word	Second	2	R
212	40531	Maximum phase A voltage	0.000 – 99999.999	float	V	4	R
213	40532						
214	40533	Date of maximum phase A voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
215	40534		Date: 1–31	word	Date	2	R
216	40535	Time of maximum phase A voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
217	40536		Second: 00–59	word	Second	2	R
218	40537	Maximum phase B voltage	0.000 – 99999.999	float	V	4	R
219	40538						
21A	40539	Date of maximum phase B voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
21B	40540		Date: 1–31	word	Date	2	R
21C	40541	Time of maximum phase B voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
21D	40542		Second: 00–59	word	Second	2	R
21E	40543	Maximum phase C voltage	0.000 – 99999.999	float	V	4	R
21F	40544						

220	40545	Date of maximum phase C voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
221	40546		Date: 1–31	word	Date	2	R
222	40547	Time of maximum phase C voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
223	40548		Second: 00–59	word	Second	2	R
224	40549	Maximum phase A current	0.000 – 99999.999	float	A	4	R
225	40550						
226	40551	Date of maximum phase A current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
227	40552		Date: 1–31	word	Date	2	R
228	40553	Time of maximum phase A current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
229	40554		Second: 00–59	word	Second	2	R
22A	40555	Maximum phase B current	0.000 – 99999.999	float	A	4	R
22B	40556						
22C	40557	Date of maximum phase B current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
22D	40558		Date: 1–31	word	Date	2	R
22E	40559	Time of maximum phase B current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
22F	40560		Second: 00–59	word	Second	2	R
230	40561	Maximum phase C current	0.000 – 99999.999	float	A	4	R
231	40562						

232	40563	Date of maximum phase C current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
233	40564		Date: 1–31	word	Date	2	R
234	40565	Time of maximum phase C current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
235	40566		Second: 00–59	word	Second	2	R
236	40567	Maximum neutral line current	0.000 – 99999.999	float	A	4	R
237	40568						
238	40569	Date of maximum neutral line current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
239	40570		Date: 1–31	word	Date	2	R
23A	40571	Time of maximum neutral line current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
23B	40572		Second: 00–59	word	Second	2	R
23C	40573	Maximum frequency value	0.0000 – 99.9999	float	Hz	4	R
23D	40574						
23E	40575	Date of maximum frequency value	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
23F	40576		Date: 1–31	word	Date	2	R
240	40577	Time of maximum frequency value	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
241	40578		Second: 00–59	word	Second	2	R
242	40579	Maximum total power factor	0.00000 – 1.00000	float		4	R
243	40580						

244	40581	Date of maximum total power factor	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
245	40582		Date: 1–31	word	Date	2	R
246	40583	Time of maximum total power factor	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
247	40584		Second: 00–59	word	Second	2	R
248	40585	Maximum total active power	0.000 – 99999.999	float	kW	4	R
249	40586						
24A	40587	Date of maximum total active power	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
24B	40588		Date: 1–31	word	Date	2	R
24C	40589	Time of maximum total active power	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
24D	40590		Second: 00–59	word	Second	2	R
24E	40591	Maximum total reactive power	0.000 – 99999.999	float	kVAR	4	R
24F	40592						
250	40593	Date of maximum total reactive power	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
251	40594		Date: 1–31	word	Date	2	R
252	40595	Time of maximum total reactive power	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
253	40596		Second: 00–59	word	Second	2	R
254	40597	Maximum total apparent power	0.000 – 99999.999	float	kVA	4	R
255	40598						

256	40599	Date of maximum total apparent power	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
257	40600		Date: 1–31	word	Date	2	R
258	40601	Time of maximum total apparent power	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
259	40602		Second: 00–59	word	Second	2	R
25A	40603	Maximum Total harmonic distortion for A–B line voltage	0.000 – 999.999	float	%	4	R
25B	40604						
25C	40605	Date of maximum total harmonic distortion for A–B line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
25D	40606		Date: 1–31	word	Date	2	R
25E	40607	Time of maximum total harmonic distortion for A–B line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
25F	40608		Second: 00–59	word	Second	2	R
260	40609	Maximum total harmonic distortion for B–C line voltage	0.000 – 999.999	float	%	4	R
261	40610						
262	40611	Date of maximum total harmonic distortion for B–C line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
263	40612		Date: 1–31	word	Date		
264	40613	Time of maximum total harmonic distortion for B–C line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
265	40614		Second: 00–59	word	Second		
266	40615	Maximum total harmonic distortion for C–A line voltage	0.000 – 999.999	float	%	4	R
267	40616						

268	40617	Date of maximum total harmonic distortion for C–A line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
269	40618		Date: 1–31	word	Date	2	R
26A	40619	Time of maximum total harmonic distortion for C–A line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
26B	40620		Second: 00–59	word	Second	2	R
26C	40621	Maximum total harmonic distortion for phase A voltage	0.000 – 999.999	float	%	4	R
26D	40622						
26E	40623	Date of maximum total harmonic distortion for phase A voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
26F	40624		Date: 1–31	word	Date		
270	40625	Time of maximum total harmonic distortion for phase A voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
271	40626		Second: 00–59	word	Second		
272	40627	Maximum total harmonic distortion for phase B voltage	0.000 – 999.999	float	%	4	R
273	40628						
274	40629	Date of maximum total harmonic distortion for phase B voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
275	40630		Date: 1–31	word	Date		
276	40631	Time of maximum total harmonic distortion for phase B voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
277	40632		Second: 00–59	word	Second		
278	40633	Maximum total harmonic distortion for phase C voltage	0.000 – 999.999	float	%	4	R
279	40634						

27A	40635	Date of maximum total harmonic distortion for phase C voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
27B	40636		Date: 1–31	word	Date		
27C	40637	Time of maximum total harmonic distortion for phase C voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
27D	40638		Second: 00–59	word	Second	2	R
27E	40639	Maximum total harmonic distortion for line voltage	0.000 – 999.999	float	%	4	R
27F	40640						
280	40641	Date of maximum total harmonic distortion for line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
281	40642		Date: 1–31	word	Date		
282	40643	Time of maximum total harmonic distortion for line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
283	40644		Second: 00–59	word	Second		
284	40645	Maximum total harmonic distortion for phase voltage	0.000 – 999.999	float	%	4	R
285	40646						
286	40647	Date of maximum total harmonic distortion for phase voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
287	40648		Date: 1–31	word	Date		
288	40649	Time of maximum total harmonic distortion for phase voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
289	40650		Second: 00–59	word	Second	2	R
28A	40651	Maximum total harmonic distortion for phase A current	0.000 – 999.999	float	%	4	R
28B	40652						

28C	40653	Date of maximum total harmonic distortion for phase A current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
28D	40654		Date: 1–31	word	Date		
28E	40655	Time of maximum total harmonic distortion for phase A current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
28F	40656		Second: 00–59	word	Second	2	R
290	40657	Maximum total harmonic distortion for phase B current	0.000 – 999.999	float	%	4	R
291	40658						
292	40659	Date of maximum total harmonic distortion for phase B current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
293	40660		Date: 1–31	word	Date		
294	40661	Time of maximum total harmonic distortion for phase B current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
295	40662		Second: 00–59	word	Second		
296	40663	Maximum total harmonic distortion for phase C current	0.000 – 999.999	float	%	4	R
297	40664						
298	40665	Date of maximum total harmonic distortion for phase C current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
299	40666		Date: 1–31	word	Date		
29A	40667	Time of maximum total harmonic distortion for phase C current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
29B	40668		Second: 00–59	word	Second		
29C	40669	Maximum total harmonic distortion for current	0.000 – 999.999	float	%	4	R
29D	40670						

29E	40671	Date of maximum total harmonic distortion for current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
29F	40672		Date: 1–31	word	Date		
2A0	40673	Time of maximum total harmonic distortion for current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
2A1	40674		Second: 00–59	word	Second		
2A2	40675	Maximum total harmonic distortion for A–B line voltage unbalance	0.00 – 99.99	float	%	4	R
2A3	40676						
2A4	40677	Date of maximum total harmonic distortion for A–B line voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
2A5	40678		Date: 1–31	word	Date		
2A6	40679	Time of maximum total harmonic distortion for A–B line voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
2A7	40680		Second: 00–59	word	Second		
2A8	40681	Maximum total harmonic distortion for B–C line voltage unbalance	0.00 – 99.99	float	%	4	R
2A9	40682						
2AA	40683	Date of maximum total harmonic distortion for B–C line voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
2AB	40684		Date: 1–31	word	Date		
2AC	40685	Time of maximum total harmonic distortion for B–C	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R

2AD	40686	line voltage unbalance	Second: 00–59	word	Second		
2AE	40687	Maximum total harmonic distortion for C–A line voltage unbalance	0.00 – 99.99	float	%	4	R
2AF	40688						
2B0	40689	Date of maximum total harmonic distortion for C–A line voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
2B1	40690		Date: 1–31	word	Date		
2B2	40691	Time of maximum total harmonic distortion for C–A line voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
2B3	40692		Second: 00–59	word	Second		
2B4	40693	Maximum total harmonic distortion for phase A voltage unbalance	0.00 – 99.99	float	%	4	R
2B5	40694						
2B6	40695	Date of maximum total harmonic distortion for phase A voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
2B7	40696		Date: 1–31	word	Date		
2B8	40697	Time of maximum total harmonic distortion for phase A voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
2B9	40698		Second: 00–59	word	Second		
2BA	40699	Maximum total harmonic distortion for phase B voltage unbalance	0.00 – 99.99	float	%	4	R
2BB	40700						

2BC	40701	Date of maximum total harmonic distortion for phase B voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
2BD	40702		Date: 1–31	word	Date		
2BE	40703	Time of maximum total harmonic distortion for phase B voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
2BF	40704		Second: 00–59	word	Second		
2C0	40705	Maximum total harmonic distortion for phase C voltage unbalance	0.00 – 99.99	float	%	4	R
2C1	40706						
2C2	40707	Date of maximum total harmonic distortion for phase C voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
2C3	40708		Date: 1–31	word	Date		
2C4	40709	Time of maximum total harmonic distortion for phase C voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
2C5	40710		Second: 00–59	word	Second		
2C6	40711	Maximum total harmonic distortion for line voltage unbalance	0.00 – 99.99	float	%	4	R
2C7	40712						
2C8	40713	Date of maximum total harmonic distortion for line voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
2C9	40714		Date: 1–31	word	Date	2	R
2CA	40715	Time of maximum total harmonic distortion for line voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
2CB	40716		Second: 00–59	word	Second	2	R

2CC	40717	Maximum total harmonic distortion for phase voltage unbalance	0.00 – 99.99	float	%	4	R
2CD	40718						
2CE	40719	Date of maximum total harmonic distortion for phase voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
2CF	40720		Date: 1–31	word	Date		
2D0	40721	Time of maximum total harmonic distortion for phase voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
2D1	40722		Second: 00–59	word	Second		
2D2	40723	Maximum total harmonic distortion for phase A current unbalance	0.00 – 99.99	float	%	4	R
2D3	40724						
2D4	40725	Date of maximum total harmonic distortion for phase A current unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
2D5	40726		Date: 1–31	word	Date		
2D6	40727	Time of maximum total harmonic distortion for phase A current unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
2D7	40728		Second: 00–59	word	Second		
2D8	40729	Maximum total harmonic distortion for phase B current unbalance	0.00 – 99.99	float	%	4	R
2D9	40730						
2DA	40731	Date of maximum total harmonic distortion for phase B current unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
2DB	40732		Date: 1–31	word	Date		

2DC	40733	Time of maximum total harmonic distortion for phase B current unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
2DD	40734		Second: 00–59	word	Second		
2DE	40735	Maximum total harmonic distortion for phase C current unbalance	0.00 – 99.99	float	%	4	R
2DF	40736						
2E0	40737	Date of maximum total harmonic distortion for phase C current unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
2E1	40738		Date: 1–31	word	Date		
2E2	40739	Time of maximum total harmonic distortion for phase C current unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
2E3	40740		Second: 00–59	word	Second		
2E4	40741	Maximum total harmonic distortion for phase current unbalance	0.00 – 99.99	float	%	2	R
2E5	40742						
2E6	40743	Date of maximum total harmonic distortion for phase current unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
2E7	40744		Date: 1–31	word	Date		
2E8	40745	Time of maximum total harmonic distortion for phase current unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
2E9	40746		Second: 00–59	word	Second		
3. Minimum: 0300 – 03FF							
300	40769	Minimum A–B line voltage	0.000 – 99999.999	float	V	4	R
301	40770						

302	40771	Date of minimum A–B line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
303	40772		Date: 1–31	word	Date	2	R
304	40773	Time of minimum A–B line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
305	40774		Second: 00–59	word	Second	2	R
306	40775	Minimum B–C line voltage	0.000 – 99999.999	float	V	4	R
307	40776						
308	40777	Date of minimum B–C line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
309	40778		Date: 1–31	word	Date	2	R
30A	40779	Time of minimum B–C line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
30B	40780		Second: 00–59	word	Second	2	R
30C	40781	Minimum C–A line voltage	0.000 – 99999.999	float	V	4	R
30D	40782						
30E	40783	Date of minimum C–A line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
30F	40784		Date: 1–31	word	Date	2	R
310	40785	Time of minimum C–A line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
311	40786		Second: 00–59	word	Second	2	R
312	40787	Minimum phase A voltage	0.000 – 99999.999	float	V	4	R
313	40788						

314	40789	Date of minimum phase A voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
315	40790		Date: 1–31	word	Date	2	R
316	40791	Time of minimum phase A voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
317	40792		Second: 00–59	word	Second	2	R
318	40793	Minimum phase B voltage	0.000 – 99999.999	float	V	4	R
319	40794						
31A	40795	Date of minimum phase B voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
31B	40796		Date: 1–31	word	Date	2	R
31C	40797	Time of minimum phase B voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
31D	40798		Second: 00–59	word	Second	2	R
31E	40799	Minimum phase C voltage	0.000 – 99999.999	float	V	4	R
31F	40800						
320	40801	Date of minimum phase C voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
321	40802		Date: 1–31	word	Date	2	R
322	40803	Time of minimum phase C voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
323	40804		Second: 00–59	word	Second	2	R
324	40805	Minimum phase A current	0.000 – 99999.999	float	A	4	R
325	40806						

326	40807	Date of minimum phase A current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
327	40808		Date: 1–31	word	Date	2	R
328	40809	Time of minimum phase A current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
329	40810		Second: 00–59	word	Second	2	R
32A	40811	Minimum phase B current	0.000 – 99999.999	float	A	4	R
32B	40812						
32C	40813	Date of minimum phase B current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
32D	40814		Date: 1–31	word	Date	2	R
32E	40815	Time of minimum phase B current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
32F	40816		Second: 00–59	word	Second	2	R
330	40817	Minimum phase C current	0.000 – 99999.999	float	A	4	R
331	40818						
332	40819	Date of minimum phase C current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
333	40820		Date: 1–31	word	Date	2	R
334	40821	Time of minimum phase C current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
335	40822		Second: 00–59	word	Second	2	R
336	40823	Minimum neutral line current	0.000 – 99999.999	float	A	4	R
337	40824						

338	40825	Date of minimum neutral line current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
339	40826		Date: 1–31	word	Date	2	R
33A	40827	Time of minimum neutral line current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
33B	40828		Second: 00–59	word	Second	2	R
33C	40829	Minimum frequency value	0.0000 – 99.9999	float	Hz	4	R
33D	40830						
33E	40831	Date of minimum frequency value	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
33F	40832		Date: 1–31	word	Date	2	R
340	40833	Time of minimum frequency value	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
341	40834		Second: 00–59	word	Second	2	R
342	40835	Minimum total power factor	0.00000 – 1.00000	float		4	R
343	40836						
344	40837	Date of minimum total power factor	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
345	40838		Date: 1–31	word	Date	2	R
346	40839	Time of minimum total power factor	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
347	40840		Second: 00–59	word	Second	2	R
348	40841	Minimum total active power	0.000 – 99999.999	float	kW	4	R
349	40842						

34A	40843	Date of minimum total active power	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
34B	40844		Date: 1–31	word	Date	2	R
34C	40845	Time of minimum total active power	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
34D	40846		Second: 00–59	word	Second	2	R
34E	40847	Minimum total reactive power	0.000 – 99999.999	float	kVAR	4	R
34F	40848						
350	40849	Date of minimum total reactive power	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
351	40850		Date: 1–31	word	Date	2	R
352	40851	Time of minimum total reactive power	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
353	40852		Second: 00–59	word	Second	2	R
354	40853	Minimum total apparent power	0.000 – 99999.999	float	kVA	4	R
355	40854						
356	40855	Date of minimum total apparent power	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
357	40856		Date: 1–31	word	Date	2	R
358	40857	Time of minimum total apparent power	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
359	40858		Second: 00–59	word	Second	2	R
35A	40859	Minimum total harmonic distortion for A–B line voltage	0.000 – 999.999	float	%	4	R
35B	40860						

35C	40861	Date of minimum total harmonic distortion for A–B line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
35D	40862		Date: 1–31	word	Date		
35E	40863	Time of minimum total harmonic distortion for A–B line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
35F	40864		Second: 00–59	word	Second		
360	40865	Minimum total harmonic distortion for B–C line voltage	0.000 – 999.999	float	%	4	R
361	40866						
362	40867	Date of minimum total harmonic distortion for B–C line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
363	40868		Date: 1–31	word	Date		
364	40869	Time of minimum total harmonic distortion for B–C line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
365	40870		Second: 00–59	word	Second		
366	40871	Minimum total harmonic distortion for C–A line voltage	0.000 – 999.999	float	%	4	R
367	40872						
368	40873	Date of minimum total harmonic distortion for C–A line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
369	40874		Date: 1–31	word	Date	2	R
36A	40875	Time of minimum total harmonic distortion for C–A line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
36B	40876		Second: 00–59	word	Second		
36C	40877	Minimum total harmonic distortion for phase A voltage	0.000 – 999.999	float	%	4	R
36D	40878						

36E	40879	Date of minimum total harmonic distortion for phase A voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
36F	40880		Date: 1–31	word	Date		
370	40881	Time of minimum total harmonic distortion for phase A voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
371	40882		Second: 00–59	word	Second		
372	40883	Minimum total harmonic distortion for phase B voltage	0.000 – 999.999	float	%	4	R
373	40884						
374	40885	Date of minimum total harmonic distortion for phase B voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
375	40886		Date: 1–31	word	Date		
376	40887	Time of minimum total harmonic distortion for phase B voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
377	40888		Second: 00–59	word	Second		
378	40889	Minimum total harmonic distortion for phase C voltage	0.000 – 999.999	float	%	4	R
379	40890						
37A	40891	Date of minimum total harmonic distortion for phase C voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
37B	40892		Date: 1–31	word	Date		
37C	40893	Time of minimum total harmonic distortion for phase C voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
37D	40894		Second: 00–59	word	Second		
37E	40895	Minimum total harmonic distortion for line voltage	0.000 – 999.999	float	%	4	R
37F	40896						

380	40897	Date of minimum total harmonic distortion for line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
381	40898		Date: 1–31	word	Date		
382	40899	Time of minimum total harmonic distortion for line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
383	40900		Second: 00–59	word	Second		
384	40901	Minimum total harmonic distortion for phase voltage	0.000 – 999.999	float	%	4	R
385	40902						
386	40903	Date of minimum total harmonic distortion for phase voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
387	40904		Date: 1–31	word	Date		
388	40905	Time of minimum total harmonic distortion for phase voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
389	40906		Second: 00–59	word	Second		
38A	40907	Minimum total harmonic distortion for phase A current	0.000 – 999.999	float	%	4	R
38B	40908						
38C	40909	Date of minimum total harmonic distortion for phase A current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
38D	40910		Date: 1–31	word	Date		
38E	40911	Time of minimum total harmonic distortion for phase A current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
38F	40912		Second: 00–59	word	Second		
390	40913	Minimum total harmonic distortion for phase B current	0.000 – 999.999	float	%	4	R
391	40914						

392	40915	Date of minimum total harmonic distortion for phase B current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
393	40916		Date: 1–31	word	Date		
394	40917	Time of minimum total harmonic distortion for phase B current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
395	40918		Second: 00–59	word	Second		
396	40919	Minimum total harmonic distortion for phase C current	0.000 – 999.999	float	%	4	R
397	40920						
398	40921	Date of minimum total harmonic distortion for phase C current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
399	40922		Date: 1–31	word	Date		
39A	40923	Time of minimum total harmonic distortion for phase C current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
39B	40924		Second: 00–59	word	Second		
39C	40925	Minimum total harmonic distortion for current	0.000 – 999.999	float	%	4	R
39D	40926						
39E	40927	Date of minimum total harmonic distortion for current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
39F	40928		Date: 1–31	word	Date		
3A0	40929	Time of minimum total harmonic distortion for current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
3A1	40930		Second: 00–59	word	Second		
3A2	40931	Minimum total harmonic distortion for	0.00 – 99.99	float	%	4	R

3A3	40932	A–B line voltage unbalance					
3A4	40933	Date of minimum total harmonic distortion for A–B line voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
3A5	40934		Date: 1–31	word	Date		
3A6	40935	Time of minimum total harmonic distortion for A–B line voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
3A7	40936		Second: 00–59	word	Second		
3A8	40937	Minimum total harmonic distortion for B–C line voltage unbalance	0.00 – 99.99	float	%	4	R
3A9	40938						
3AA	40939	Date of minimum total harmonic distortion for B–C line voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
3AB	40940		Date: 1–31	word	Date		
3AC	40941	Time of minimum total harmonic distortion for B–C line voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
3AD	40942		Second: 00–59	word	Second		
3AE	40943	Minimum total harmonic distortion for C–A line voltage unbalance	0.00 – 99.99	float	%	4	R
3AF	40944						
3B0	40945	Date of minimum total harmonic distortion for C–A line voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
3B1	40946		Date: 1–31	word	Date		
3B2	40947	Time of minimum total harmonic distortion for C–A line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R

3B3	40948	unbalance	Second: 00–59	word	Second		
3B4	40949	Minimum total harmonic distortion for phase A voltage unbalance	0.00 – 99.99	float	%	4	R
3B5	40950						
3B6	40951	Date of minimum total harmonic distortion for phase A voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
3B7	40952		Date: 1–31	word	Date		
3B8	40953	Time of minimum total harmonic distortion for phase A voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
3B9	40954		Second: 00–59	word	Second		
3BA	40955	Minimum total harmonic distortion for phase B voltage unbalance	0.00 – 99.99	float	%	4	R
3BB	40956						
3BC	40957	Date of minimum total harmonic distortion for phase B voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
3BD	40958		Date: 1–31	word	Date		
3BE	40959	Time of minimum total harmonic distortion for phase B voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
3BF	40960		Second: 00–59	word	Second		
3C0	40961	Minimum total harmonic distortion for phase C voltage unbalance	0.00 – 99.99	float	%	4	R
3C1	40962						
3C2	40963	Date of minimum total harmonic distortion for phase C voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
3C3	40964		Date: 1–31	word	Date		

3C4	40965	Time of minimum total harmonic distortion for phase C voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
3C5	40966		Second: 00–59	word	Second		
3C6	40967	Minimum total harmonic distortion for line voltage unbalance	0.00 – 99.99	float	%	4	R
3C7	40968						
3C8	40969	Date of minimum total harmonic distortion for line voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
3C9	40970		Date: 1–31	word	Date		
3CA	40971	Time of minimum total harmonic distortion for line voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
3CB	40972		Second: 00–59	word	Second		
3CC	40973	Minimum total harmonic distortion for phase voltage unbalance	0.00 – 99.99	float	%	4	R
3CD	40974						
3CE	40975	Date of minimum total harmonic distortion for phase voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
3CF	40976		Date: 1–31	word	Date		
3D0	40977	Time of minimum total harmonic distortion for phase voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
3D1	40978		Second: 00–59	word	Second		
3D2	40979	Minimum total harmonic distortion for phase A current unbalance	0.00 – 99.99	float	%	4	R
3D3	40980						

3D4	40981	Date of minimum total harmonic distortion for phase A current unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
3D5	40982		Date: 1–31	word	Date		
3D6	40983	Time of minimum total harmonic distortion for phase A current unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
3D7	40984		Second: 00–59	word	Second		
3D8	40985	Minimum total harmonic distortion for phase B current unbalance	0.00 – 99.99	float	%	4	R
3D9	40986						
3DA	40987	Date of minimum total harmonic distortion for phase B current unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
3DB	40988		Date: 1–31	word	Date		
3DC	40989	Time of minimum total harmonic distortion for phase B current unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
3DD	40990		Second: 00–59	word	Second		
3DE	40991	Minimum total harmonic distortion for phase C current unbalance	0.00 – 99.99	float	%	4	R
3DF	40992						
3E0	40993	Date of minimum total harmonic distortion for phase C current unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
3E1	40994		Date: 1–31	word	Date		
3E2	40995	Time of minimum total harmonic distortion for phase C current unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
3E3	40996		Second: 00–59	word	Second		

3E4	40997	Minimum total harmonic distortion for phase current unbalance	0.00 – 99.99	float	%	2	R
3E5	40998						
3E6	40999	Date of minimum total harmonic distortion for phase current unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
3E7	41000		Date: 1–31	word	Date		
3E8	41001	Time of minimum total harmonic distortion for phase current unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
3E9	41002		Second: 00–59	word	Second		
4. Alarm：0400 – 04FF							
400	41025	Alarm status of over current	0: Cleared 1: Triggered	word		2	R
401	41026	Alarm times of over current	1–255	word	Times	2	R
402	41027	Alarm date of over current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
403	41028		Date: 1–31	word	Date		
404	41029	Alarm time of over current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
405	41030		Second: 00–59	word	Second		
406	41031	Alarm status of under current	0: Cleared 1: Triggered	word		2	R
407	41032	Alarm times of under current	1–255	word	Times	2	R

408	41033	Alarm date of under current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
409	41034		Date: 1–31	word	Date		
40A	41035	Alarm time of under current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
40B	41036		Second: 00–59	word	Second		
40C	41037	Alarm status of over neutral current	0: Cleared 1: Triggered	word		2	R
40D	41038	Alarm times of over neutral current	1–255	word	Times	2	R
40E	41039	Alarm date of over neutral current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
40F	41040		Date: 1–31	word	Date		
410	41041	Alarm time of over neutral current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
411	41042		Second: 00–59	word	Second		
412	41043	Alarm status of over line voltage	0: Cleared 1: Triggered	word		2	R
413	41044	Alarm times of over line voltage	1–255	word	Times	2	R
414	41045	Alarm date of over line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
415	41046		Date: 1–31	word	Date		
416	41047	Alarm time of over line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R

417	41048		Second: 00–59	word	Second		
418	41049	Alarm status of under line voltage	0: Cleared 1: Triggered	word		2	R
419	41050	Alarm times of under line voltage	1–255	word	Times	2	R
41A	41051	Alarm date of under line voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
41B	41052		Date: 1–31	word	Date		
41C	41053	Alarm time of under line voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
41D	41054		Second: 00–59	word	Second		
41E	41055	Alarm status of over phase voltage	0: Cleared 1: Triggered	word		2	R
41F	41056	Alarm times of over phase voltage	1–255	word	Times	2	R
420	41057	Alarm date of over phase voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
421	41058		Date: 1–31	word	Date		
422	41059	Alarm time of over phase voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
423	41060		Second: 00–59	word	Second		
424	41061	Alarm status of under voltage	0: Cleared 1: Triggered	word		2	R
425	41062	Alarm times of under phase voltage	1–255	word	Times	2	R

426	41063	Alarm date of under phase voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
427	41064		Date: 1–31	word	Date		
428	41065	Alarm time of under phase voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
429	41066		Second: 00–59	word	Second		
42A	41067	Alarm status of over voltage unbalance	0: Cleared 1: Triggered	word		2	R
42B	41068	Alarm times of over voltage unbalance	1–255	word	Times	2	R
42C	41069	Alarm date of over voltage unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
42D	41070		Date: 1–31	word	Date		
42E	41071	Alarm time of over voltage unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
42F	41072		Second: 00–59	word	Second		
430	41073	Alarm status of over current unbalance	0: Cleared 1: Triggered	word		2	R
431	41074	Alarm times of over current unbalance	1–255	word	Times	2	R
432	41075	Alarm date of over current unbalance	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
433	41076		Date: 1–31	word	Date		
434	41077	Alarm time of over current unbalance	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R

435	41078		Second: 00–59	word	Second		
436	41079	Alarm status of over active energy	0: Cleared 1: Triggered	word		2	R
437	41080	Alarm times of over active energy	1–255	word	Times	2	R
438	41081	Alarm date of over active energy	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
439	41082		Date: 1–31	word	Date		
43A	41083	Alarm time of over active energy	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
43B	41084		Second: 00–59	word	Second		
43C	41085	Alarm status of over reactive energy	0: Cleared 1: Triggered	word		2	R
43D	41086	Alarm times of over reactive energy	1–255	word	Times	2	R
43E	41087	Alarm date of over reactive energy	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
43F	41088		Date: 1–31	word	Date		
440	41089	Alarm time of over reactive energy	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
441	41090		Second: 00–59	word	Second		
442	41091	Alarm status of over apparent power	0: Cleared 1: Triggered	word		2	R
443	41092	Alarm times of over apparent power	1, 255	word	Times	2	R

444	41093	Alarm date of over apparent power	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
445	41094		Date: 1–31	word	Date		
446	41095	Alarm time of over apparent power	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
447	41096		Second: 00–59	word	Second		
448	41097	Alarm status of power factor (lead)	0: Cleared 1: Triggered	word		2	R
449	41098	Alarm times of power factor (lead)	1–255	word	Times	2	R
44A	41099	Alarm date of power factor (lead)	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
44B	41100		Date: 1–31	word	Date		
44C	41101	Alarm time of power factor (lead)	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
44D	41102		Second: 00–59	word	Second		
44E	41103	Alarm status of power factor (lag)	0: Cleared 1: Triggered	word		2	R
44F	41104	Alarm times of power factor (lag)	1–255	word	Times	2	R
450	41105	Alarm date of power factor (lag)	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
451	41106		Date: 1–31	word	Date		
452	41107	Alarm time of power factor (lag)	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R

453	41108		Second: 00–59	word	Second		
454	41109	Alarm status of displacement power factor (lead)	0: Cleared 1: Triggered	word		2	R
455	41110	Alarm times of displacement power factor (lead)	1–255	word	Times	2	R
456	41111	Alarm date of displacement power factor (lead)	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
457	41112		Date: 1–31	word	Date		
458	41113	Alarm time of displacement power factor (lead)	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
459	41114		Second: 00–59	word	Second		
45A	41115	Alarm status of displacement power factor (lag)	0: Cleared 1: Triggered	word		2	R
45B	41116	Alarm times of displacement power factor (lag)	1–255	word	Times	2	R
45C	41117	Alarm date of displacement power factor (lag)	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
45D	41118		Date: 1–31	word	Date		
45E	41119	Alarm time of displacement power factor (lag)	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
45F	41120		Second: 00–59	word	Second		
460	41121	Alarm status of over current demand	0: Cleared 1: Triggered	word		2	R

461	41122	Alarm times of over current demand	1–255	word	Times	2	R
462	41123	Alarm date of over current demand	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
463	41124		Date: 1–31	word	Date		
464	41125	Alarm time of over current demand	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
465	41126		Second: 00–59	word	Second		
466	41127	Alarm status of over active power demand	0: Cleared 1: Triggered	word		2	R
467	41128	Alarm times of over active power demand	1–255	word	Times	2	R
468	41129	Alarm date of over active power demand	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
469	41130		Date: 1–31	word	Date		
46A	41131	Alarm time of over active power demand	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
46B	41132		Second: 00–59	word	Second		
46C	41133	Alarm status of over reactive power demand	0: Cleared 1: Triggered	word		2	R
46D	41134	Alarm times of over reactive power demand	1–255	word	Times	2	R
46E	41135	Alarm date of over reactive power demand alarm	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
46F	41136		Date: 1–31	word	Date		

470	41137	Alarm time of over reactive power demand	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
471	41138		Second: 00–59	word	Second		
472	41139	Alarm status of over apparent power demand	0: Cleared 1: Triggered	word		2	R
473	41140	Alarm times of over apparent power demand	1–255	word	Times	2	R
474	41141	Alarm date of over apparent power demand	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
475	41142		Date: 1–31	word	Date		
476	41143	Alarm time of over apparent power demand	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
477	41144		Second: 00–59	word	Second		
478	41145	Alarm status of over frequency	0: Cleared 1: Triggered	word		2	R
479	41146	Alarm times of over frequency	1, 255	word	Times	2	R
47A	41147	Alarm date of over frequency	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
47B	41148		Date: 1–31	word	Date		
47C	41149	Alarm time of over frequency	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
47D	41150		Second: 00–59	word	Second		

47E	41151	Alarm status of under frequency	0: Cleared 1: Triggered	word		2	R
47F	41152	Alarm times of under frequency	1–255	word	Times	2	R
480	41153	Alarm date of under frequency	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
481	41154		Date: 1–31	word	Date		
482	41155	Alarm time of under frequency	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
483	41156		Second: 00–59	word	Second		
484	41157	Alarm status of total harmonic distortion for over voltage	0: Cleared 1: Triggered	word		2	R
485	41158	Alarm times of total harmonic distortion for over voltage	1–255	word	Times	2	R
486	41159	Alarm date of total harmonic distortion for over voltage	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
487	41160		Date: 1–31	word	Date		
488	41161	Alarm time of total harmonic distortion for over voltage	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
489	41162		Second: 00–59	word	Second		
48A	41163	Alarm status of total harmonic distortion for over current	0: Cleared 1: Triggered	word		2	R
48B	41164	Alarm times of total harmonic distortion for over current	1–255	word	Times	2	R

48C	41165	Alarm date of total harmonic distortion for over current	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
48D	41166		Date: 1–31	word	Date		
48E	41167	Alarm time of total harmonic distortion for over current	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
48F	41168		Second: 00–59	word	Second		
490	41169	Alarm status of phase loss	0: Cleared 1: Triggered	word		2	R
491	41170	Alarm times of phase loss	1–255	word	Times	2	R
492	41171	Alarm date of phase loss	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
493	41172		Date: 1–31	word	Date	2	R
494	41173	Alarm time of phase loss	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
495	41174		Second: 00–59	word	Second	2	R
496	41175	Alarm status of meter reset	0: Cleared 1: Triggered	word		2	R
497	41176	Alarm times of meter reset	1–255	word	Times	2	R
498	41177	Alarm date of meter reset	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
499	41178		Date: 1–31	word	Date	2	R
49A	41179	Alarm time of meter reset	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R

49B	41180		Second: 00–59	word	Second	2	R
49C	41181	Alarm status of phase rotation	0: Cleared 1: Triggered	word		2	R
49D	41182	Alarm times of phase rotation	1–255	word	Times	2	R
49E	41183	Alarm date of phase rotation	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
49F	41184		Date: 1–31	word	Date	2	R
4A0	41185	Alarm time of phase rotation	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
4A1	41186		Second: 00–59	word	Second	2	R
4A2	41187	Alarm status of over DUI	0: Cleared 1: Triggered	word		2	R
4A3	41188	Alarm times of over DUI	1–255	word	Times	2	R
4A4	41189	Alarm date of over DUI	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
4A5	41190		Date: 1–31	word	Date	2	R
4A6	41191	Alarm time of over DUI	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
4A7	41192		Second: 00–59	word	Second	2	R
4A8	41193	Alarm status of over EUI	0: Cleared 1: Triggered	word		2	R
4A9	41194	Alarm times of over EUI	1–255	word	Times	2	R

4AA	41195	Alarm date of over EUI	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
4AB	41196		Date: 1–31	word	Date	2	R
4AC	41197	Alarm time of over EUI	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
4AD	41198		Second: 00–59	word	Second	2	R
5. Advanced Settings: 0500 – 05FF							
500	41281	Floor Area	1–65536	word	m^2	2	R/W
501	41282	Data Log	Minute: 00–60 Second: 00–59 0: Disable	byte	Minute, Second	2	R/W
502	41283	Auto Recording – Energy 1	0: Disable 1: Enable	word		2	R/W
503	Reserved						
504	41285	Auto Recording – Auto Day 1	Date: 1–31	word	Date	2	R/W
505	Reserved						
506	Reserved						
507	41288	Auto Recording – Energy 2	0: Disable 1: Enable	word		2	R/W
508	Reserved						
509	41290	Auto Recording – Auto Day 2	Date: 1–31	word	Date	2	R/W
50A	Reserved						
50B	Reserved						

50C	41293	Setting group 1	0x100 – 0x1E7	word		2	R/W
50D	41294	Setting group 2	0x100 – 0x1E7	word		2	R/W
⋮	⋮	⋮	0x100 – 0x1E7	word		2	R/W
551	41362	Setting group 70	0x100 – 0x1E7	word		2	R/W
552	41363	Reset energy date	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
553	41364	Reset energy date	Date: 1–31	word	Date	2	R
554	41365	Reset energy time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
555	41366	Reset energy time	Second: 00–59	word	Second	2	R
556	41367	Data log start date	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
557	41368		Date: 1–31	word	Date	2	R
558	41369	Data log start time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
559	41370		Second: 00–59	word	Second	2	R
55A	41371	Auto Max/Min reset interval	0: Disable 1: Day 2: Month 3: Year	word		2	R/W
55B	41372	Parameter #1 for data log	1: Phase voltage 2: Line voltage 3: Average current 4: Neutral current 5: Power factor	word		2	R/W
55C	41373	Parameter #2 for data log					
55D	41374	Parameter #3 for data log					

55E	41375	Parameter #4 for data log	6: Displacement power factor 7: Total active power 8: Total reactive power 9: Total apparent power 10: Positive active energy 11: Reversed active energy 12: Positive reactive energy 13: Reversed reactive energy 14: Positive apparent energy 15: Reversed apparent energy 16: Total harmonic distortion for voltage 17: Total harmonic distortion for current				
55F	41376	Parameter #5 for data log					
560	41377	Parameter #6 for data log					
561	41378	Parameter #7 for data log					
562	41379	Parameter #8 for data log					
563	41380	Parameter #9 for data log					
564	41381	Parameter #10 for data log					
565	41382	Parameter #11 for data log					
566	41383	Parameter #12 for data log					
567	41384	Parameter #13 for data log					
568	41385	Parameter #14 for data log					
569	41386	Parameter #15 for data log					
56A	41387	Parameter #16 for data log					
56B	41388	Parameter #17 for data log					

56E	41392	Time of Use #1 start time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
57F	41393	Time of Use #1 stop time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
570	41395	Time of Use #2 start time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
571	41396	Time of Use #2 stop time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
572	41398	Time of Use #3 start time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
573	41399	Time of Use #3 stop time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
574	41401	Time of Use #4 start time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
575	41402	Time of Use #4 stop time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
576	41404	Time of Use #5 start time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
577	41405	Time of Use #5 stop time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
578	41407	Time of Use #6 start time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
579	41408	Time of Use #6 stop time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W

57A	41410	Time of Use #7 start time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
57B	41411	Time of Use #7 stop time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
57C	41413	Time of Use #8 start time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
57D	41414	Time of Use #8 stop time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R/W
6. Parameter Group: 0600 – 06FF							
600	41537	Read data from group 1				2	R
601	41538	Read data from group 2					
⋮	⋮	⋮					
645	41606	Read data from group 70					
646	41607	Rate of use #1 start time	0.000 –4294967295	UINT	Wh	4	R
647	41608						
648	41609	Rate of use #2 start time					
649	41610						
64A	41611	Rate of use #3 start time					
64B	41612						
64C	41613	Rate of use #4 start time					
64D	41614						
64E	41615	Rate of use #5 start time	0.000 –4294967295	UINT	Wh	4	R
64F	41616						
650	41617	Rate of use #6 start					

651	41618	time					
652	41619	Rate of use #7 start time					
653	41620						
654	41621	Rate of use #8 start time					
655	41622						

8. Data Log: 0800 – B6FF **(use only function code 0xFE to read the following parameters)**				
The following data types can be stored in Data Log.				
Date, Month, Year	byte		3	
Second, Minute, Hour	byte		3	
1. Phase voltage	float		4	
2. Line voltage	float		4	
3. Average current	float		4	
4. Neutral line current	float		4	
5. Power factor (Positive: lag; Negative: lead)	float		4	
6. Displacement power factor (Positive: lag; Negative: lead)	float		4	
7. Total active power (Positive: lag; Negative: lead)	float		4	
8. Total reactive power (Positive: lag; Negative: lead)	float		4	
9. Total apparent power	float		4	
10. Positive active energy	float		4	
11. Reversed active energy	float		4	
12. Positive reactive energy	float		4	

13. Reversed reactive energy				float		4	
14. Positive apparent energy				float		4	
15. Reversed apparent energy				float		4	
16. Total harmonic distortion for voltage				float		4	
17. Total harmonic distortion for current				float		4	
0800		data log of 3 intervals					R
0801		data log of 3 intervals					R
0802		data log of 3 intervals					R
⋮		⋮					R
⋮		⋮					R
B6FF		data log of 3 intervals					R
Alarm History **(use only function code 0xFE to read the following parameters)**							
Alarm types							
1. Over Current				byte		1	
2. Under Current				byte		1	
3. Over Neutral Current				byte		1	
4. Over Voltage LL				byte		1	
5. Under Voltage LL				byte		1	
6. Over Voltage LN				byte		1	
7. Under Voltage LN				byte		1	
8. Over Volt Unbalance				byte		1	
9. Over AMP Unbalance				byte		1	
10. Over Active power				byte		1	

11. Over Reactive Power				byte		1	
12. Over Apparent Power				byte		1	
13. LEAD PF				byte		1	
14. Lag PF				byte		1	
15. Lead DPF				byte		1	
16. Lag DPF				byte		1	
17. Over Current Demand				byte		1	
18. Over kW Demand				byte		1	
19. Over kVAR Demand				byte		1	
20. Over kVA Demand				byte		1	
21. Over Frequency				byte		1	
22. Under Frequency				byte		1	
23. Over Voltage THD				byte		1	
24. Over Current THD				byte		1	
25. Phase Loss				byte		1	
26. Meter Reset				byte		1	
27. Phase Rotation				byte		1	
28. Over DUI				byte		1	
29. Over EUI				byte		1	
B700		Alarm History 1	1 – 29 (high byte, types) (low byte, times)	byte		2	R

B701		Alarm History 2	1 – 29 (high byte, types) (low byte, times)	byte		2	R
B702		Alarm History 3	1 – 29 (high byte, types) (low byte, times)	byte		2	R
⋮		⋮	⋮	byte		2	R
B8F3		Alarm History 500	1 – 29 (high byte, types) (low byte, times)	byte		2	R
B8F4		Alarm 01 Date	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
B8F5			Date: 1–31	word	Date	2	R
B8F6		Alarm 01 Time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
B8F7			Second: 00–59	word	Second	2	R
B8F8		Alarm 02 Date	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
B8F9			Date: 1–31	word	Date	2	R
B8FA		Alarm 02 Time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
B8FB			Second: 00–59	word	Second	2	R
B8FC		Alarm 03 Date	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
B8FD			Date: 1–31	word	Date	2	R
B8FE		Alarm 03 Time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
B8FF			Second: 00–59	word	Second	2	R

⋮		⋮	⋮	byte	Year, Month	2	R
C0C0		Alarm 500 Date	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
C0C1			Date: 1–31	word	Date	2	R
C0C2		Alarm 500 Time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
C0C3			Second: 00–59	word	Second	2	R
⋮		⋮	⋮	byte	Year, Month	2	R
C0C0		Alarm 500 Date	Year: 00–99 Month: 1–12	byte	Year, Month	2	R
C0C1			Date: 1–31	word	Date	2	R
C0C2		Alarm 500 Time	Hour: 00–23 Minute: 00–59	byte	Hour, Minute	2	R
C0C3			Second: 00–59	word	Second	2	R

5.2 Modbus Protocol

5.2.1 Supported Modbus Function Code

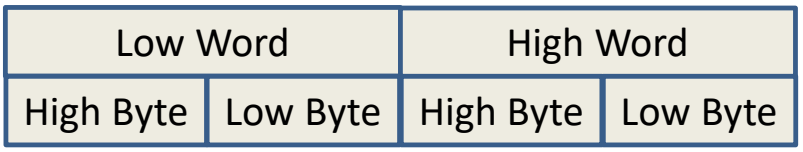
Function Code	Modbus Name	Content
0x03	Read Holding Registers	Read the contents of read location
0x06	Preset Single Registers	Preset the contents of written location
0x10	Preset Multiple Registers	Preset the contents of written locations
0xFE	Read Data Log/THD/alarm Log	Read the contents of data log/THD/alarm log

When the protocol is Modbus RTU, the maximum address to be gathered with a single Modbus block read is 125 for function code 0x03, and the maximum address is 123 for function code 0x10. When the protocol is Modbus ASCII, the maximum address to be gathered with a single Modbus block read is 60 for function code 0x03, and the maximum address is 59 for function code 0x10.

Function code **0xFE** is only supported when the protocol is Modbus RTU.

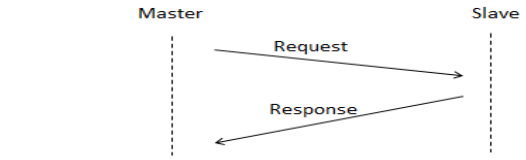
5.2.2 Modbus Communication Protocol

With Modbus RTU, Modbus master sends the Request message which contains Function code 0x03- request Slave to answer values corresponding to the Modbus address. Modbus Slave in response sends the requested data. Modbus register (Modbus address) values in floating-point data format corresponding to the table in section 5.1 are based on IEEE754 standard. The response order of data packets is shown as follows.



The signed values in the table in section 5.1 are packed in two's complement format. The example is shown as follows.

Read:



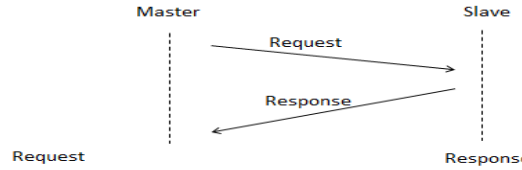
Request

Slave Address	1 ~ 255
Function Code	03h
Start Address (High)	00h ~ FFh
Start Address (Low)	00h ~ FFh
Number of Points (High)	00h
Number of Points (Low)	00h ~ FFh
Error Check (Low)	CRC
Error Check (High)	CRC

Response

Slave Address	1 ~ 255
Function Code	03h,
Byte Count	00h ~ FFh
Data (High)	00h
Data (Low)	00h ~ FFh
Error Check (Low)	CRC
Error Check (High)	CRC

Write:



Request

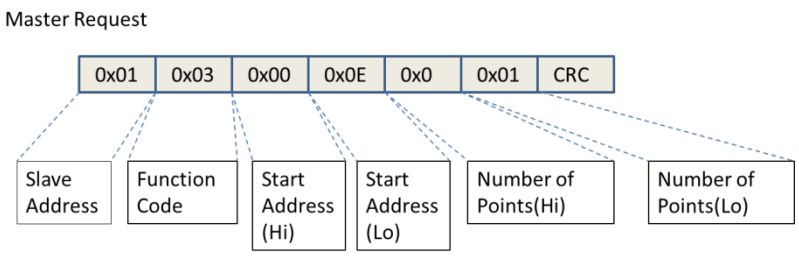
Slave Address	1 ~ 255
Function Code	06h
Start Address (High)	00h ~ FFh
Start Address (Low)	00h ~ FFh
Number of Points (High)	00h
Number of Points (Low)	00h ~ FFh
Error Check (Low)	CRC
Error Check (High)	CRC

Response

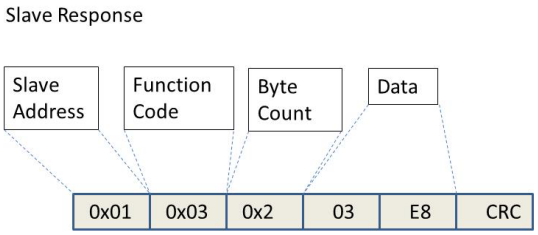
Slave Address	1 ~ 255
Function Code	06h
Start Address (High)	00h ~ FFh
Start Address (Low)	00h ~ FFh
Number of Points (High)	00h
Number of Points (Low)	00h ~ FFh
Error Check (Low)	CRC
Error Check (High)	CRC

Example: If Modbus Master such as PLCs or data collectors reads values of CT"s primary current (Register address 0x000E) of the power meter (Modbus Slave)(Slave address is 0x1) by using Modbus protocol, which the register value would be 1000.

The following is packet format of Request sent by Modbus Master (PLCs or data collectors).

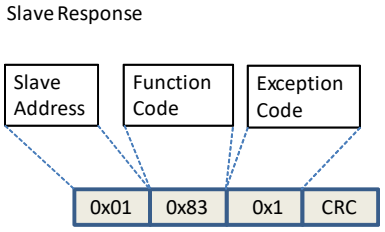


The following is packet format of Response sent by Modbus Slave.



After receiving response from the power meter, Modbus Master acquires the value of currents from the primary-side current transformer (register address 0x000E), which is 1000.

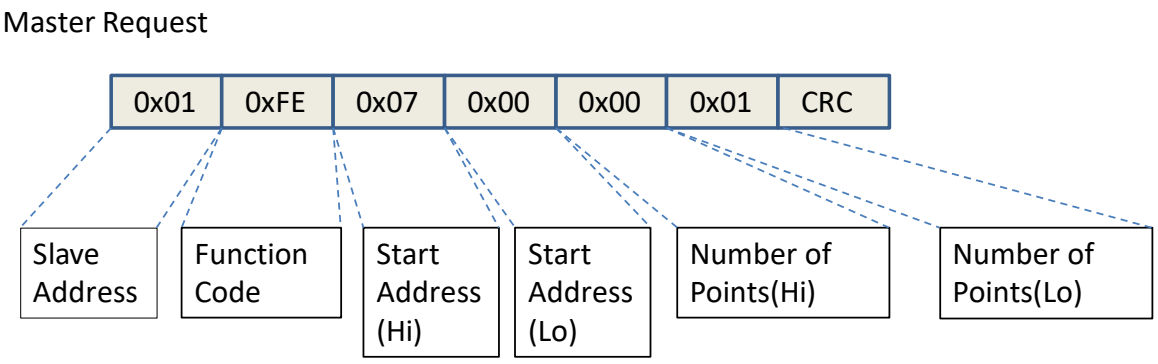
If Modbus Slave (power meter) receives an unusual Request, the packet format for response would be as follows.



5.2.3 Packet Structure for Funtion Code 0XFE

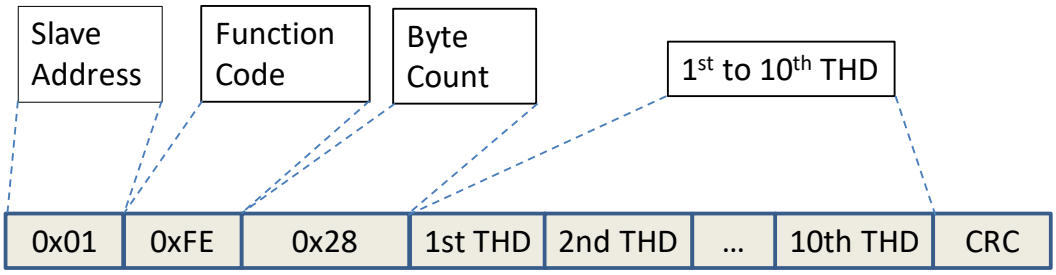
Function code 0xFE is used to read datas, such as data log, 2 to 31th harmonics and alarm log, supported only when using Modbus RTU communication. Similar to Modbus RTU mode, Modbus master sends the Request message which contains Function code 0xFE- asking the Slave to response with corresponding values in a Modbus address. Modbus Slave in response sends the requested data.

Eample A (Individual harmonics): If Modbus Master such as PLCs or data collectors reads data log from a power meter with function code 0xFE in Modbus address 0x0700, the packet format of Request sent by Modbus Master would be as follows. (Same as Modbus RTU, but Number of Points must be 1)



The following is packet format of Response sent by Modbus Slave (The part before Byte Count is same as Modbus RTU. The sequenced data of 1st to 10th THD is shown below, address is 0x700, with a total of 40bytes for data lenth.)

Slave Response

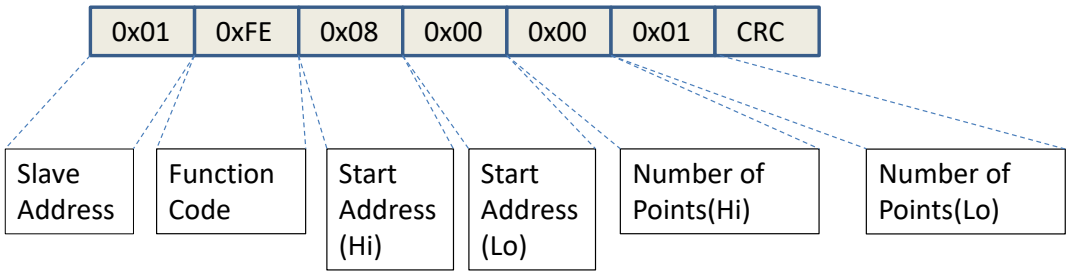


Note: The total data length of address 0x702, 0x705, 0x708, 0x70B, 0x70E and 0x711 is 44 bytes.

Example B (Data Log): If Modbus Master such as PLCs or data collectors reads recorded data from the meter with function code 0xFE in Modbus address 0x800, the Request packet format sent by Modbus Master would be as follows. (Same as Modbus RTU, but Number of Points must be 1)

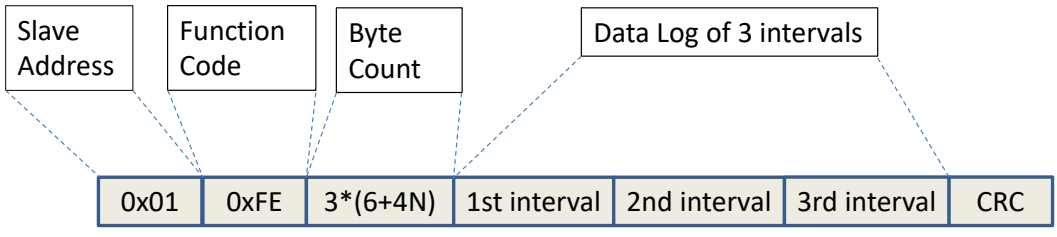
5

Master Request



The following is packet format of Response sent by Modbus Slave (The part before Byte Count is same as Modbus RTU. The sequenced log data of 3 continuous intervals is shown below. If N parameters are selected, the total data length will be 3*(6+4N) bytes):

Slave Response

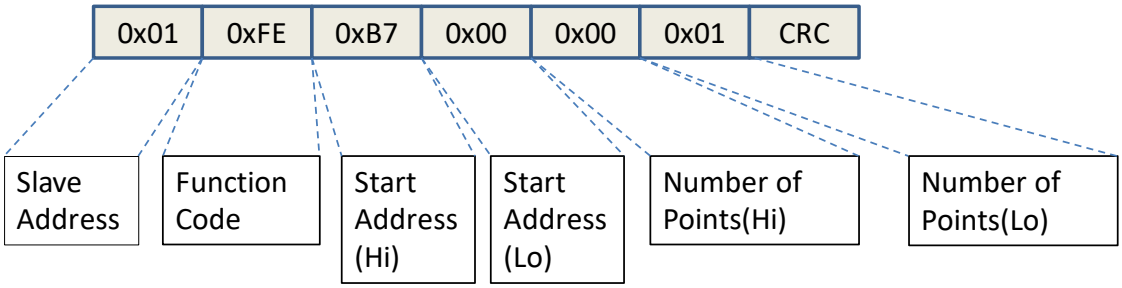


Data Log of 3 intervals - the order of one of the intervals:

Sequence	Item	Data size (byte)	Order	
1	Year	1		
2	Month	1		
3	Day	1		
4	Hour	1		
5	Minute	1		
6	Second	1		
7	Selected parameter 1	4	Low word	High byte
				Low byte
			High word	High byte
				Low byte
8	Selected parameter 2	4	Low word	High byte
				Low byte
			High word	High byte
				Low byte
…	…	…	…	…
N	Selected parameter N	4	Low word	High byte
				Low byte
			High word	High byte
				Low byte

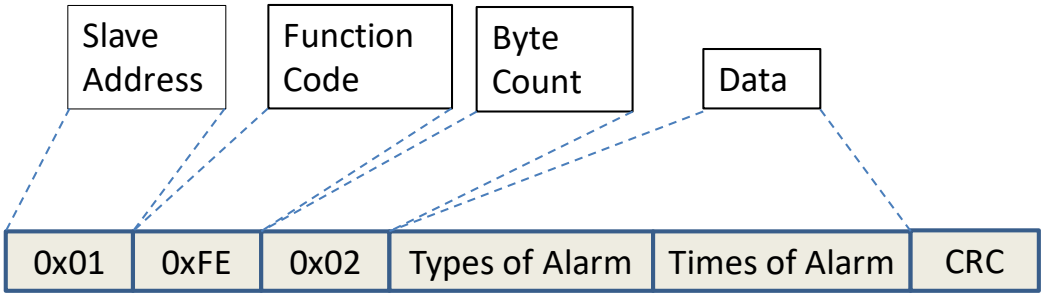
Example c (Alarm history): If Modbus Master such as PLCs or data collectors reads recorded data from the meter with function code 0xFE in Modbus address 0xB700, the Request packet format sent by Modbus Master would be as follows. (Same as Modbus RTU, but the function changed to 0xFE)

Master Request



The following is packet format of Response sent by Modbus Slave (The part before Byte Count is same as Modbus RTU.)

Slave Response



6

Chapter 6 Error Codes

Table of Contents

6.1 Error Codes

When an error occurs during operation, the power monitor sends an error code through Modbus. The following table lists the error codes and causes.

Error Code	Name	Description
0x01	Illegal function	Incorrect function code
0x02	Illegal data address	Incorrect data address to read or write
0x03	Illegal data value	Incorrect data format (for example, data length)
0x04	Slave device failure	Slave cannot execute the command.

6.2 Alarm Types

The power meter supports 29 types of alarms. You can activate the alarm in the registers 0x1F–0xDD. When an alarm is triggered, the data (such as alarm type and alarm triggered time) are stored in registers 0xB700–0xC0C3. The following table lists the details and descriptions for the alarm types.

Number	Alarm Type	Description
1	Over Current	The measured current exceeds the setting value.
2	Under Current	The measured current is below the setting value.
3	Over Neutral Current	The measured neutral current exceeds the setting value.
4	Over Voltage LL	The measured line voltage exceeds the setting value.
5	Under Voltage LL	The measured line voltage is below the setting value.
6	Over Voltage LN	The measured phase voltage exceeds the setting value.
7	Under Voltage LN	The measured phase voltage is below the setting value.
8	Over Volt Unbalance	The measured voltage unbalance exceeds the setting value.
9	Over AMP Unbalance	The measured current unbalance is below the setting value.
10	Over Active power	The measured total active power exceeds the setting value.
11	Over Reactive Power	The measured total reactive power exceeds the setting value.
12	Over Apparent Power	The measured total apparent power exceeds the setting value.
13	LEAD PF	The leading power factor is below the setting value.
14	Lag PF	The lagging power factor is below the setting value.
15	Lead DPF	The leading power factor demand is below the setting value.

Number	Alarm Type	Description
16	Lag DPF	The lagging power factor demand is below the setting value.
17	Over Current Demand	The current demand exceeds the setting value.
18	Over kW Demand	The total active power factor demand exceeds the setting value.
19	Over kVAR Demand	The total reactive power factor demand exceeds the setting value
20	Over kVA Demand	The total apparent power factor demand exceeds the setting value
21	Over Frequency	The measured frequency exceeds the setting value.
22	Under Frequency	The measured frequency is below the setting value.
23	Over Voltage THD	The total harmonic distortion for voltage exceeds the setting value.
24	Over Current THD	The total harmonic distortion for current exceeds the setting value.
25	Phase Loss	When the power is unbalanced, the voltage is below the setting value.
26	Meter Reset	The power meter is resetting.
27	Phase Rotation	The phase A and phase C are incorrectly swapped.
28	Over DUI	The Demand Use Intensity (DUI) value exceeds the setting value.
29	Over EUI	The Energy Use Intensity (EUI) value exceeds the setting value.

Memo

A

Appendix A Accessories

Table of Contents

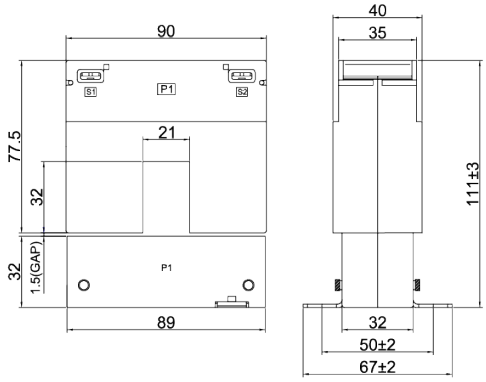
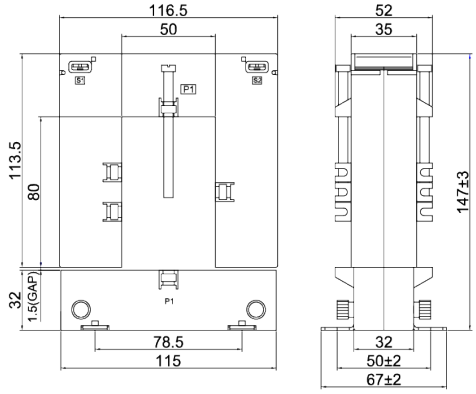
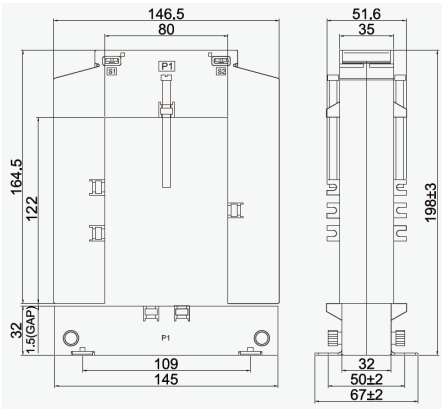
When measured current is higher than the rated specification for the device, use of an external current transformer (CT) is necessary. Users can select a suitable CT with reference to the table below.

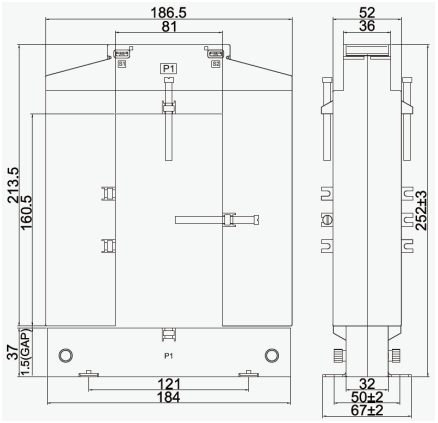
A.1 DCT1000 Series

Electromagnetic Compatibility: CE-marking, IEC61869-2.

Model Number	Measurement Accuracy	Primary Current	Secondary Current	Rated Burden (VA)	External Dimension*1 (mm)	Size of Opening*1 (mm)
DCT-S301C	1.0%	100 A	5 A	1.5	90 x 40 x 111	21 x 32
DCT-S211C	0.5%	200 A	5 A	1		
DCT-S221C	0.5%	300 A	5 A	1.5		
DCT-S231C	0.5%	400 A	5 A	2.5		
DCT-S241C	0.5%	500 A	5 A	2.5	116.5 x 52 x 147	50 x 80
DCT-S251C	0.5%	600 A	5 A	2.5		
DCT-S261C	0.5%	750 A	5 A	2.5		
DCT-S271C	0.5%	1000 A	5 A	5		
DCT-S281C	0.5%	1500 A	5 A	7.5	146.5 x 51.6 x 198	80 x 122
DCT-S291C	0.5%	2000 A	5 A	10	186.5 x 52 x 252	81 x 160.5
DCT-S2A1C	0.5%	2500 A	5 A	15		
DCT-S2B1C	0.5%	3000 A	5 A	20		

*1: See the following table for detailed information on the external dimensions and sizes of opening.

Model Number	Dimension (mm)	
DCT-S301C DCT-S211C DCT-S221C DCT-S231C	External Dimension: 90 x 40 x 111 Size of Opening: 21 x 32 	
DCT-S241C DCT-S251C DCT-S261C DCT-S271C	External Dimension: 116.5 x 52 x 147 Size of Opening: 50 x 80 	
DCT-S281C	External Dimension: 146.5 x 51.6 x 198 Size of Opening: 80 x 122 	

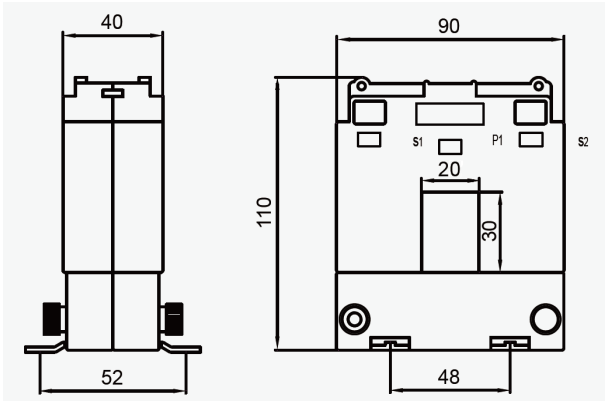
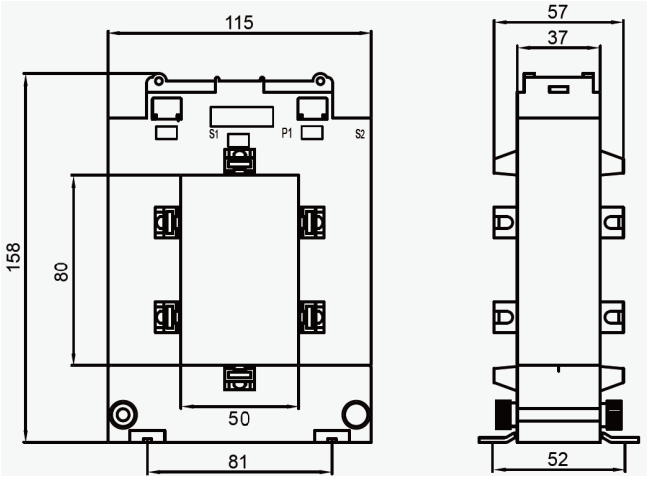
DCT-S291C DCT-S2A1C DCT-S2B1C	External Dimension: 186.5 x 52 x 252 Size of Opening: 81 x 160.5 	

A.2 DCT2000 Series

Electromagnetic Compatibility: UL, UL2808.

Model Number	Measurement Accuracy	Primary Current	Secondary Current	Rated Burden (VA)	External Dimension*1 (mm)	Size of Opening*1 (mm)
DCT-S201B	1.0%	100 A	5 A	1	90 x 40 x 110	20 x 30
DCT-S211B	0.5%	200 A	5 A	1		
DCT-S221B	0.5%	300 A	5 A	1.5		
DCT-S231B	0.5%	400 A	5 A	1.5	115 x 57 x 158	50 x 80
DCT-S241B	0.5%	500 A	5 A	2.5		
DCT-S251B	0.5%	600 A	5 A	2.5		
DCT-S261B	0.5%	750 A	5 A	2.5		
DCT-S2C1B	0.5%	800 A	5 A	3.75		
DCT-S271B	0.5%	1000 A	5 A	5		

*1: See the following table for detailed information on the external dimensions and sizes of opening.

<table>
<tr><th>Model Number</th><th colspan="2">Dimension (mm)</th></tr>
<tr><td>DCT-S201B
DCT-S211B
DCT-S221B</td><td>External Dimension:
90 x 40 x 110
Size of Opening:
20 x 30
  </td><td> 
</td></tr>
<tr><td>DCT-S231B
DCT-S241B
DCT-S251B
DCT-S261B
DCT-S2C1B
DCT-S271B</td><td>External Dimension:
115 x 57 x 158
Size of Opening:
50 x 80
  </td><td> 
</td></tr>
</table>

MEMO

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