



Powermeter and Power Quality Analyzer PM175

Modbus Communications Protocol
GOST 13109-97/GOST 32144-2013 extensions

Reference Guide

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

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

REVISION HISTORY

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1 General

This document specifies a subset of the Modbus communications protocol used to transfer data between a master computer station and the PM175. The document provides the complete information necessary to develop third-party communications software capable of communication with the PM175. Refer to the PM175 Installation and Operation Manual for more information on communication connections and configuring communication parameters in your device.

2 Modbus Protocol Implementation

For detailed information on the Modbus protocol, message framing and error checking, refer to the Modbus Protocol Reference Guide. It can be downloaded from the www.modbus.org Website. The following paragraphs outline some issues concerning the implementation of the Modbus protocol in the PM175.

2.1 Transmission Modes

The PM175 can be set up to communicate on a serial Modbus network using either RTU, or ASCII serial transmission mode, and via the Internet using Modbus/TCP mode. Refer to the PM175 Installation and Operation Manual for information on selecting the transmission mode in your meter.

2.2 Address Field

The address field contains a user assigned address of the instrument (1-247) on a Modbus network. Broadcast mode using address 0 is not supported.

When communicating via the Internet, the address field is not checked and is returned in the response message header.

2.3 Function Field

The Modbus functions implemented in the PM175 are shown in Table 2-1. Function 04 can be used in the same context as function 03.

Table 2-1 Modbus Function Codes

Code (decimal)	Meaning in Modbus	Action
03	Read holding registers	Read multiple registers
04	Read input registers	Read multiple registers
06	Preset single register	Write single register
16	Preset multiple registers	Write multiple registers
08 ¹	Loop-back test	Communications test

¹ The PM175 supports only diagnostic code 0 - return query data.

2.4 Exception Responses

The instrument sends an exception response when an error is detected in the received message. To indicate that the response is notification of an error, the high order bit of the function code is set to 1.

Implemented exception response codes:

- 01** - Illegal function
- 02** - Illegal data address
- 03** - Illegal data value
- 04** - Device failure

When the character framing, parity, or redundancy check detects a communication error, processing of the master's request stops. The instrument will not act on or respond to the message.

2.5 Modbus Register Addresses

The PM175 Modbus registers are numbered in the range of 0 to 65535. From the Modbus applications, the PM175 Modbus registers can be accessed by simulating holding registers of the Modicon 584, 884 or 984 Programmable Controller, using a 5-digit "4XXXX" or 6-digit "4XXXXX" addressing scheme.

To map the PM175 register address to the range of the Modbus holding registers, add a value of 40001 to the PM175 register address. When a register address exceeds 9999, use a 6-digit addressing scheme by adding 400001 to the PM175 register address.

2.6 Data Formats

The PM175 uses three data formats to pass data between a master application and the instrument: 16-bit short integer, 32-bit long integer and 32-bit modulo-10000 formats. Binary values and counters are always transmitted in 32-bit registers, while analog values can be read both in 32-bit and in 16-bit scaled registers.

Analog registers 256 through 308 and 6656 through 10935 contain scaled 16-bit values.

2.6.1 16-bit Scaled Integer Format

16-bit scaled analog data is transmitted in a single 16-bit Modbus register being scaled to the range of 0 to 9999. To get a true reading, a reverse conversion should be done using the following formula:

$$Y = \frac{X \times (HI - LO)}{9999} + LO$$

where:

- Y - true reading in engineering units
- X - raw input data in the range of 0 to 9999
- LO and HI - data low and high scales in engineering units

The engineering scales are indicated for every scaled 16-bit register. Refer to Section 4 "Data Scales and Units" for applicable data scales and measurement units.

The default voltage scale in the device is 144V (120V+20%). It can be changed through register 242 (see Section 3.1, Device Data Scales), or via the supplemental PAS software.

The recommended voltage scale is 120V+20% = 144V for using with external PT's, and 690V+20% = 828V for a direct connection to power line.

CONVERSION EXAMPLES

1. Voltage readings

a) Assume device settings (direct wiring): PT ratio = 1; Voltage scale = 828V (690V + 20%).

Voltage engineering scales (see Section 4):

$$\begin{aligned} HI_ENG &= V_{max} = 828.0 \times PT \text{ ratio} = 828.0 \times 1 = 828.0V \\ LO_ENG &= 0V \end{aligned}$$

If the raw data reading is 1449 then the voltage reading in engineering units will be as follows:

$$\text{Volts reading} = 1449 \times (828.0 - 0) / (9999 - 0) + 0 = 120.0V$$

b) Assume device settings (wiring via PT): PT ratio = 14,400V : 120V = 120; Voltage scale = 144V.

Voltage engineering scales (see Section 4):

$$\begin{aligned} HI_ENG &= V_{max} = 144.0 \times PT \text{ ratio} = 144 \times 120 = 17,280V \\ LO_ENG &= 0V \end{aligned}$$

If the raw data reading is 8314 then the voltage reading in engineering units will be as follows:

$$\text{Volts reading} = 8314 \times (17,280 - 0) / 9999 + 0 = 14,368V$$

2. Current readings

Assume device settings: CT primary current = 200A.

Current engineering scales (see Section 4):

$$HI_ENG = I_{max} = CT \text{ primary current} \times 2 = 200.00 \times 2 = 400.00A$$

$$LO_ENG = 0A$$

If the raw data reading is 250 then the current reading in engineering units will be as follows:

$$\text{Amps reading} = 250 \times (400.00 - 0)/(9999 - 0) + 0 = 10.00A$$

3. Power readings

a) Assume device settings (direct wiring): Wiring 4LL3; PT = 1; CT primary current = 200A; Voltage scale = 828V.

Active Power engineering scales (see Section 4):

$$HI_ENG = P_{max} = V_{max} \times I_{max} \times 2 = (828.0 \times 1) \times (200.00 \times 2) \times 2 = 662,400W = 662.400kW$$

$$LO_ENG = -P_{max} = -662.400kW$$

If the raw data reading is 5500 then the power reading in engineering units will be as follows:

$$\text{Watts reading} = 5500 \times (662.400 - (-662.400))/(9999 - 0) + (-662.400) = 66.313kW$$

If the raw data reading is 500 then the power reading in engineering units will be as follows:

$$\text{Watts reading} = 500 \times (662.400 - (-662.400))/(9999 - 0) + (-662.400) = -596.153kW$$

b) Assume device settings (wiring via PT): Wiring 4LN3; PT = 120; CT primary current = 200A.

Active Power engineering scales (see Section 4):

$$HI_ENG = P_{max} = V_{max} \times I_{max} \times 3 = (828 \times 120) \times (200.00 \times 2) \times 3/1000 = 119,232kW$$

$$LO_ENG = -P_{max} = -119,232kW$$

If the raw data reading is 5500 then the power reading in engineering units will be as follows:

$$\text{Watts reading} = 5500 \times (119,232 - (-119,232))/(9999 - 0) + (-119,232) = 11,936kW$$

If the raw data reading is 500 then the power reading in engineering units will be as follows:

$$\text{Watts reading} = 500 \times (119,232 - (-119,232))/(9999 - 0) + (-119,232) = -107,307kW$$

4. Power Factor readings

Power factor engineering scales (see Section 3.3):

$$HI_ENG = 1.000.$$

$$LO_ENG = -1.000.$$

If the raw data reading is 8900 then the power factor in engineering units will be as follows:

$$\text{Power factor reading} = 8900 \times (1.000 - (-1.000))/(9999 - 0) + (-1.000) = 0.78$$

2.6.2 32-bit Long Integer Format

32-bit long integer data is transmitted in two adjacent 16-bit Modbus registers as unsigned (UINT32) or signed (INT32) whole numbers. The first register contains the low-order word (lower 16 bits) and the second register contains the high order word (higher 16 bits). The low-order word always starts at an even Modbus address. The value range for unsigned data is 0 to 4,294,967,295; for signed data the range is -2,147,483,648 to 2,147,483,647.

If your Modbus driver does not support a 32-bit long integer format, you can read the two 16-bit registers separately, and then convert them into a 32-bit value as follows (using C notation):

$$\text{32-bit value} = (\text{signed short}) \text{ high_order_register} \times 65536L + (\text{unsigned short}) \text{ low_order_register}$$

Examples

1. Unsigned 32-bit Values

If you read unsigned Voltage V1 of 69,000V from registers 13952-13953, then the register readings will be as follows:

(13952) = 3464

(13953) = 1

The 32-bit value is $(1 \times 65536 + 3464) = 69000V$.

2. Signed 32-bit Values

If you read signed kW of -789kW from registers 14336-14337, then the register readings will be:

(14336) = 64747 (unsigned)

(14337) = 65535 (unsigned) or -1(signed value).

To take the high order register as a signed value, compare it with 32767. If the value is less or equal to 32767, use it as is. If it is greater than 32767, then this is a negative number in a two's complement code (like in our example) - just subtract it from 65536 to get the original negative value.

The 32-bit reading is $(-1 \times 65536 + 64747) = -789kW$.

Fractional 32-bit data is transmitted using a decimal pre-multiplier to pass fractional numbers in an integer format. Fractional numbers are pre-multiplied by 10 to the power N, where N is the number of digits in the fractional part. For example, the frequency reading of 50.01 Hz is transmitted as 5001, having been pre-multiplied by 100. Whenever a data register contains a fractional number, the register measurement unit is given with a multiplier $\times 0.1$, $\times 0.01$ or $\times 0.001$, showing the weight of the least significant decimal digit. To get an actual fractional number with specified precision, multiply the register value by the given multiplier. To write a fractional number into the register, divide the number by the given multiplier.

2.6.3 32-bit Modulo-10000 Format

Energy counters 287-294 and 301-302 are read in two contiguous 16-bit registers in a modulo-10000 format. The first (low order) register contains the value mod 10000, and the second (high order) register contains the value/10000. To get the true energy reading, the high order register value should be multiplied by 10,000 and added to the low order register.

2.7 User Assignable Registers

The PM175 contains 120 user assignable registers in the address range of 0 to 119, any of which you can map to any register address accessible in the instrument. Registers that reside in different locations may be accessed by a single request by re-mapping them to adjacent addresses in the user assignable registers area.

The actual addresses of the assignable registers, which are accessed via addresses 0 through 119, are specified in the register map (registers 120 through 239), where register 120 contains the actual address of the register accessed via register 0, register 121 contains the actual address of the register accessed via register 1, and so on. The assignable registers and the map registers themselves may not be re-mapped.

To build your own register map, write to map registers 120 to 239 the actual addresses you want to read from or write to via the assignable area (registers 0 to 119). 32-bit long registers should always be aligned at even addresses. For example, if you want to read registers 7136 (1-second V1 voltage, scaled short integer) and 14720-14721 (kWh Import, long integer) via registers 0-2, do the following:

- write 14720 to register 120
- write 14721 to register 121
- write 7136 to register 122

Reading from registers 0-2 will return the kWh reading in registers 0 (low 16 bits) and 1 (high 16 bits), and the voltage reading in register 2.

2.8 Password Protection

The PM175 has a password protection option allowing you to protect your setups, cumulative registers and logs from being changed or cleared through communications. You can disable or

enable password protection through communications or via the front display. For details, refer to your instrument Installation and Operation Manual.

When password protection is enabled, the user password you set in your instrument should be written into the device authorization register (2575) before another write request is issued. If the correct password is not supplied while password protection is enabled, the instrument will respond to all write requests with the exception code 01 (illegal operation). It is recommended to clear the password register after you have completed your changes in order to activate password protection.

2.9 Data Recording and File Transfers

2.9.1 Log File Organization

Historical files are stored to the non-volatile memory with a battery backup. Memory is allocated for each file statically when you set up your files and will not change unless you re-organize the files. The PM175 automatically performs de-fragmentation of the memory each time you re-organize your files. This helps keep all free memory in one continuous chunk and thus prevents possible leakage of memory caused by fragmentation.

Data records in a file are arranged in the order of their recording. Each record has a unique 16-bit sequence number that is incremented modulo 65536 with each new record. The sequence number can be used to point to a particular record in the file, or to check the sequence of records when uploading files from the device.

Each file has a write position pointer that indicates the place where the next record will be recorded, and a read position pointer that indicates the place from where the current record will be read. Both pointers show sequence numbers of the records they point to rather than record offsets in the file.

After acknowledging a record you have read, the read pointer automatically advances to the next record in the file. When the read pointer gets to the record to which the file write pointer points, the end-of-file (EOF) flag is set. It is automatically cleared when a new record is added to the file, or when you explicitly move the read pointer to any record within a file.

If a file has a wrap-around attribute (circular file), the most recent records can overwrite the oldest records. When this happens at the current read position, the read pointer automatically advances forward in order to point to the oldest record in the file.

The PM175 keeps a separate read pointer for each communication port so that access to the same file through a different port will not affect current active sessions for other ports.

Multi-section Files

Log files can have one or more (up to 16) sections for multi-channel recording. An ordinal file consists of a single section. Some files, such as daily profile log files and waveform log files, are arranged as multi-section files.

A multi-section file is subdivided into multiple sections of the same structure, one section per recording channel. The number of sections in each file is defined at the time you set up your files and may not change unless you re-organize the file. Each section within a multi-section file can be addressed by a section number, or by a section channel ID.

A multi-section file has a single write position pointer for all sections and stores data in all sections simultaneously. This means that records with the same sequence number in all sections are associated with the same event. A multi-section file has also a single read position pointer for all sections.

Data Log Files

Data log files can store up to 16 measured parameters per a record. Any data measured by the device can be stored in the log file. The number of parameters that each record will hold and the list of parameters you want to be recorded in the file can be selected through the Data log setup registers for a particular file.

Recording data to the data log files can be triggered through the setpoints, either on a time basis using the meter clock or periodic timers, or upon any event detected by the setpoints.

Profile Data Log Files

Data log file #16 can be configured for a daily profile log of the energy usage and maximum demand registers. A profile log file is organized as a multi-section file that has a separate section for each energy and maximum demand register. A file record stores the summary data (total of all tariffs) and all tariff data for each configured Billing/TOU register. See Section 3.14 for information on the file record structure.

The number of sections is taken automatically from the Billing/TOU Registers setup. Since each Billing/TOU energy register has a shadow maximum demand register, the number of sections in the file can be twice the number of the allocated Billing/TOU registers. Always configure the Billing/TOU registers before you allocate memory for your profile log file.

New records are added to the file automatically every day at midnight. You can review the list of parameters recorded to the file through the file info request/response blocks using info requests with variation 2 (see Section 3.9), or through the Data log #16 setup - it shows the list of parameters for the first file section, which represents the first configured energy usage register.

Power Quality Statistics Log Files

Data log files #9 and #10 are configured to store the power quality statistics data on a daily or weekly basis. They are organized as multi-section files. See Sections 3.10-3.13 for more information on the file record structure. You can review the list of parameters recorded to the files through the file info request/response blocks using info requests with variation 2 (see Section 3.9).

Waveform Log Files

Waveform log files are organized as multi-section files that store data for each recording channel in a separate section. A waveform log file can record up to six AC channels simultaneously: three voltage and three current waveforms. The number of sections in a file, or channels that a file can store, is defined when you set up the file. The channels that a file will record are selected in the waveform log setup. All selected channels are recorded in successive file sections.

A waveform file has a single read pointer for all sections, so that data from all channels of a single record can be read together without repositioning the file pointer. When you point to a particular file record, data from all sections related to the same event are all available for a read. Moreover, the PM175 takes all channel data for the currently accessed record to a separate buffer, so that even when the record is overwritten at the time of reading, you are still prevented from receiving partially updated data.

A single waveform record for a channel can contain up to 512 points of the sampled input signal. Refer to the line frequency field in the channel header record to correctly set up the time scale for the waveforms.

If a waveform log is configured to record more samples per event than a single record can hold, the waveform recorder will store as many records per event as required to record the entire event. All waveform records related to the event are merged in a series and have the same series number, so that they can be plotted together. Each record within a series has a unique serial number that allows tracking the sequence of records in a series. A single waveform series can hold up to 81,920 points (2,560 cycles at a rate of 32 samples per cycle) of a sampled AC signal.

2.9.2 File Transfers

File transfer protocol provides both data transfer and information services. File transfer is performed through two blocks of registers: a 32-word master request block and a 648-word read-only file response block. After a master application has written the request into the file request block, the requested data is available for a read through the file response block registers. File transfer functions allow changing the file or section position in order to point to the desired record.

The information services use separate 8-word file info request and 200-word file info response blocks. The extended file information is available including current file pointers' positions, file contents, the number of records in the file, allocated file size, time of the last file update, and more.

See Section 3.9 File Transfer Registers for information on register locations.

Common File Transfer

Log files can be read either in a sequence record-by-record, or in a random order. Each Read-File request fills the file response block with the data of the record pointed to by the file (or section) read pointer. If you want to begin reading a file from a particular record, which sequence number is known, you can change the pointer position by issuing the Set-File-Position request with the desired sequence number. If you want to read a file from the beginning, send the Reset-File-Position request that moves the pointer to the oldest file record. If you do not change the file position, then you will continue reading the file from the record following the one you have read the last time you accessed the file.

You need not explicitly move the file position to the following record if you want to continue reading a file in sequence after you have uploaded the current record. Instead, issue an acknowledgment request that automatically advances the file pointer to the next record, and then read the record data through the file response block.

The file response block can contain more than one record. The number of records available in the block and the file record size in words are always reported in the block heading. There are no special rules on how to read records from the file transfer block. You can read a single record or all records together, or begin reading from the last record and end with the first record. However, you should remember: 1) after an acknowledgment, the file position moves to the record following the last one you have accessed in the file transfer block; and 2) data in the file transfer block does not change until you either issue an acknowledgment, or explicitly change the file position by the Set-File-Position or Reset-File-Position requests.

The file transfer is completed after you have read the last record of the file. Before storing a file record to your database, always check bit 9 in the record status word, which contains the end-of-file (EOF) flag. This bit set to 1 indicates that the file read pointer does not point to any record within the file, and you should not store any record that has this bit set. The EOF flag is set only after you have acknowledged the last record of the file, so that testing for end-of-file requires one extra read. If you wish to stop the transfer just after storing the last file record, acknowledge the record and check bit 0 in the record status word. Bit 0 is set to 1 only once when you read the last record of the file.

The following gives a summary of steps you should do to read an ordinal log file:

- 1) If you wish to begin reading a file from a particular record or from the first record, use either the Set-File-Position request with the desired record sequence number, or the Reset-File-Position request. Preset a section number and channel ID to zero.
- 2) Write the Read-File request with a section number and channel ID set to zero.
- 3) Read the record data from the file response block.
- 4) Write an acknowledgment for the file. You need not fill all the request fields: only the file function is required. The file pointer will be moved to the next file record.
- 5) Repeat steps 3-4 until all the file records are read.

Reading Multi-section Data Log Files

In a multi-section data log file, all user requests including an acknowledgment, the Read-File, Set-File-Position and Reset-File-Position requests, relate to a particular file section rather than to the file itself. The only request that affects the entire file is the Erase-File that clears all the file sections together.

A file section can be requested either by a section number, or by a section channel ID. If you use a channel ID, preset the section number field to 0xFFFF. If a section number is specified, the channel ID field will not be checked. The device returns both fields in the response block heading, so you can always identify what channel data is being read from the present file section. If you want to know which channels are recorded to the file sections, check the file channel mask in the file info block. This is a bitmap that contains one in a bit position if a channel with an ID equal to the bit number is recorded to the file, and contains zero if it is not.

The following gives a summary of steps for reading a multi-section data log file:

- 1) If you wish to begin reading a file section from a particular record or from the first record, use either the Set-File-Position request with the desired record sequence number, or the

Reset-File-Position request. Specify either a section number, or the channel ID for the section from where you want to read data. If you use a channel ID, preset the section number field to 0xFFFF.

- 2) Write the Read-File request with the section number and channel ID as shown in the previous step.
- 3) Read the record data from the file response block.
- 4) Write an acknowledgment for the file. The file section pointer will be moved to the next record.
- 5) Repeat steps 3-4 until all the section records are read.

Reading Multi-section Waveform Files

Waveform files can be read as conventional multi-section files in the order described above. Another way is to take advantage of the fact that waveform files have a single read pointer for all file sections, so you can read records of all the channels related to the same event at once without repositioning the file pointer. The following gives a summary of steps for reading waveform files:

- 1) If you want to begin reading a file from a particular record or from the first record, use either the Set-File-Position request with the desired record sequence number, or the Reset-File-Position request. Preset the section field to zero.
- 2) Write the Read-File request. Address your request to the first file section (its number is always zero), or to the first file channel (if you know channel's ID). If you use a channel ID, preset the section number field to 0xFFFF.
- 3) Read the channel's data from the file response block. Store the received record's sequence number.
- 4) Write the Read-File request for the next file section or channel using the stored record sequence number. The file response block will be refilled with the data for the requested channel that is related to the record with the same sequence number.
- 5) Repeat steps 3, 4 until all the channel records with the current sequence number are read.
- 6) Write an acknowledgment. The file pointer will be moved to the next record.

Repeat steps 2-6 until all the file records are read.

Reading Real-time Waveforms

Real-time waveforms are accessed through the same transfer blocks just like the waveform log files by addressing file 128. Writing the Read-File request for file 128 provides a simultaneous capture of 6 real-time waveform records – three voltage and three current waveforms – into a communication buffer that can be read through the common file response block. The following gives a summary of steps for reading real-time waveforms:

- 1) Write the Read-File request for file 128. Address your request to the first file section (its number is always zero), or to the first file channel (if you know channel's ID). If you use a channel ID, preset the section number field to 0xFFFF.
- 2) Read the channel's data from the file response block.
- 3) Write the Read-File request for the next file section or channel. The file response block will be refilled with the data for the requested channel.
- 4) Repeat steps 3, 4 until all the channel records are read.
- 5) Write an acknowledgment to release the buffer.

2.10TCP Notification Client

The TCP notification client can establish connections with a remote Modbus/TCP server and send notification messages either on events, or periodically on a time basis.

Notification messages are sent via a block of 16 Modbus registers using write function 16. The following table shows the message exchange structure.

Modbus Register	Description	Type	Comment
+0-1	Device serial number	UINT32	
+2-4	Device MAC address	CHAR6	
+5	Device address	UINT16	Device port address
+6-7	Device IP address	UINT32	Network byte order
+8	Event type	UINT16	See F22 in Section 5
+9	Event sequence number	UINT16	
+10-11	Event timestamp, seconds	UINT32	Local time since Jan 1, 1970
+12-13	Event timestamp, seconds fraction, in microseconds	UINT32	
+14-15	Reserved	UINT32	Written as 0

After receiving a write acknowledgement from a server, a TCP connection is still open for 10 seconds (20 seconds via GPRS) to give the server an opportunity to access meter registers through an open socket. It may help you access the meter from outside your local network when the server is located on another network, or when using wireless GPRS communications. The notification client will respond to all server requests as if it were a regular incoming connection.

If the server does not close a connection, it will be closed in 20 seconds if there is no activity on the socket. In the event a connection attempt was unsuccessful, the notification client retries two more times before announcing a connection failure.

The server's IP address, port number and starting Modbus register address are programmable in the meter. See "TCP Notification Client Setup" for more information on the client setup. To configure and enable the notification client in your meter via PAS, select Communication Setup in the Meter Setup menu, and click on the TCP Notification Client Setup tab.

Client connections are triggered via programmable setpoints. To send event notifications to a server, configure a setpoint to respond to desired triggers or to periodic time events and add the "Send notification" action to the end of the setpoint actions list.

3 Modbus Register Map

3.1 Modbus Setup Registers

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
Modbus Assignable Registers							
0-119							
+0		Register 0 contents	0-65535		UINT16	R/W	
+1		Register 1 contents	0-65535		UINT16	R/W	
		...					
+119		Register 119 contents	0-65535		UINT16	R/W	
Assignable Registers Map							
120-239							
+0		Mapped register 0 address	0-65535		UINT16	R/W	
+1		Mapped register 1 address	0-65535		UINT16	R/W	
+119		Mapped register 119 address	0-65535		UINT16	R/W	
Modbus Conversion Scales							
240		Low raw scale	0		UINT16	R	
241		High raw scale	9999		UINT16	R	
Device Data Scales							
242		Voltage scale, in secondary volts	60-828 (default 144V)	1V	UINT16	R/W	
243		Current scale, in secondary amps = CT secondary current (1A, 5A) × Current overload	20, 100 (2.0A, 10.0A)	×0.1A	UINT16	R	

3.2 16-bit Scaled Analog Registers and Energy Counters - Basic Register Set

Address	Point ID	Description	Low and High Scales ²	Units ²	Type	R/W	Notes
256-308							
+0	0x1100	V1/V12 Voltage	0-Vmax	U1	UINT16	R	1
+1	0x1101	V2/V23 Voltage	0-Vmax	U1	UINT16	R	1
+2	0x1102	V3/V31 Voltage	0-Vmax	U1	UINT16	R	1
+3	0x1103	I1 Current	0-Imax	U2	UINT16	R	
+4	0x1104	I2 Current	0-Imax	U2	UINT16	R	
+5	0x1105	I3 Current	0-Imax	U2	UINT16	R	
+6	0x1106	kW L1	-Pmax-Pmax	U3	INT16	R	
+7	0x1107	kW L2	-Pmax-Pmax	U3	INT16	R	
+8	0x1108	kW L3	-Pmax-Pmax	U3	INT16	R	
+9	0x1109	kvar L1	-Pmax-Pmax	U3	INT16	R	
+10	0x110A	kvar L2	-Pmax-Pmax	U3	INT16	R	
+11	0x110B	kvar L3	-Pmax-Pmax	U3	INT16	R	
+12	0x110C	kVA L1	-Pmax-Pmax	U3	UINT16	R	
+13	0x110D	kVA L2	-Pmax-Pmax	U3	UINT16	R	
+14	0x110E	kVA L3	-Pmax-Pmax	U3	UINT16	R	
+15	0x110F	Power factor L1	-1.000-1.000	0.001	INT16	R	
+16	0x1110	Power factor L2	-1.000-1.000	0.001	INT16	R	
+17	0x1111	Power factor L3	-1.000-1.000	0.001	INT16	R	
+18	0x1403	Total PF	-1.000-1.000	0.001	INT16	R	
+19	0x1400	Total kW	-Pmax-Pmax	U3	INT16	R	
+20	0x1401	Total kvar	-Pmax-Pmax	U3	INT16	R	
+21	0x1402	Total kVA	-Pmax-Pmax	U3	UINT16	R	
+22	0x1501	In (neutral) Current	0-Imax	U2	UINT16	R	
+23	0x1502	Frequency	45.00-65.00	0.01Hz	UINT16	R	
+24	0x3709	Maximum kW import sliding window demand	-Pmax-Pmax	U3	UINT16	R	
+25	0x160F	kW import accumulated demand	-Pmax-Pmax	U3	UINT16	R	
+26	0x370B	Maximum kVA sliding window demand	-Pmax-Pmax	U3	UINT16	R	
+27	0x1611	kVA accumulated demand	-Pmax-Pmax	U3	UINT16	R	
+28	0x3703	I1 Maximum ampere demand	0-Imax	U2	UINT16	R	
+29	0x3704	I2 Maximum ampere demand	0-Imax	U2	UINT16	R	
+30	0x3705	I3 Maximum ampere demand	0-Imax	U2	UINT16	R	
+31		kWh import (low)	0-9999	1kWh	UINT16	R	6
+32		kWh import (high)	0-9999	×10MWh	UINT16	R	6
+33		kWh export (low)	0-9999	1kWh	UINT16	R	6
+34		kWh export (high)	0-9999	×10MWh	UINT16	R	6
+35		+kvarh net (low)	0-9999	1kvarh	UINT16	R	4, 6
+36		+kvarh net (high)	0-9999	×10Mvarh	UINT16	R	4, 6
+37		-kvarh net (low)	0-9999	1kvarh	UINT16	R	5, 6
+38		-kvarh net (high)	0-9999	×10Mvarh	UINT16	R	5, 6

Address	Point ID	Description	Low and High Scales ²	Units ²	Type	R/W	Notes
+39	0x1112	V1/V12 Voltage THD	0-999.9	0.1%	UINT16	R	3
+40	0x1113	V2/V23 Voltage THD	0-999.9	0.1%	UINT16	R	3
+41	0x1114	V3/V31 Voltage THD	0-999.9	0.1%	UINT16	R	3
+42	0x1115	I1 Current THD	0-999.9	0.1%	UINT16	R	3
+43	0x1116	I2 Current THD	0-999.9	0.1%	UINT16	R	3
+44	0x1117	I3 Current THD	0-999.9	0.1%	UINT16	R	3
+45		kVAh (low)	0-9999	1kVAh	UINT16	R	6
+46		kVAh (high)	0-9999	10MVAh	UINT16	R	6
+47	0x1609	Present kW import sliding window demand	-Pmax-Pmax	U3	UINT16	R	
+48	0x160B	Present kVA sliding window demand	-Pmax-Pmax	U3	UINT16	R	
+49	0x1615	PF (import) at Max. kVA sliding window demand	0-1.000	0.001	UINT16	R	
+50	0x111B	I1 Current TDD	0-100.0	0.1%	UINT16	R	3
+51	0x111C	I2 Current TDD	0-100.0	0.1%	UINT16	R	3
+52	0x111D	I3 Current TDD	0-100.0	0.1%	UINT16	R	3

NOTES:

¹ When the 4LN3, 3LN3 or 3BLN3 wiring mode is selected, the voltages will be line-to-neutral; for any other wiring mode, they will be line-to-line voltages.

² All analog registers except of harmonics are 1-second average values. For volts, amps and power scales and units, refer to Section 4 "Data Scales and Units". For analog data scaling formulas and examples, see Section 2.6.1, "16-bit Scaled Integer Format".

³ On a 3-s interval.

⁴ Positive readings of kvarh net.

⁵ Negative readings of kvarh net.

⁶ If you use these energy registers instead of 32-bit registers, limit the energy roll value to 8 digits (see Device Options Setup) to avoid overflow.

3.3 16-bit Scaled Analog Registers, Binary Registers and Counters

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
3584	0x0000	None	0		UINT16	R	
3616	0x0080	Setpoint Status (bitmap)	0x0000-0xFFFF		UINT16	R	
3648-3649		Special Inputs					
+0	0x0100	Not used	0		UINT16	R	
+1	0x0101	Phase rotation order	0=error, 1=positive (ABC), 2=negative (CBA)		UINT16	R	
3776	0x0300	Event Flags (bitmap)	0x0000-0x00FF		UINT16	R	
3968	0x0600	Digital Inputs (bitmap)	0x0000-0x000F		UINT16	R	
4096	0x0800	Relay Outputs (bitmap)	0x0000-0x000F		UINT16	R	
4224-4231		Counters					
+0,1	0x0A00	Counter #1	0-999,999		UINT32	R/W	
+2,3	0x0A01	Counter #2	0-999,999		UINT32	R/W	
+4,5	0x0A02	Counter #3	0-999,999		UINT32	R/W	
+6,7	0x0A03	Counter #4	0-999,999		UINT32	R/W	
4320-4331		1/2-Cycle Values					
+0	0x0B80	V1 Voltage	0-Vmax	U1	UINT16	R	1
+1	0x0B81	V2 Voltage	0-Vmax	U1	UINT16	R	1
+2	0x0B82	V3 Voltage	0-Vmax	U1	UINT16	R	1
+3	0x0B83	Not used	0		UINT16	R	
+4	0x0B84	V12 Voltage	0-Vmax	U1	UINT16	R	
+5	0x0B85	V23 Voltage	0-Vmax	U1	UINT16	R	
+5	0x0B86	V31 Voltage	0-Vmax	U1	UINT16	R	
+7	0x0B87	I1 Current	0-Imax	U2	UINT16	R	
+8	0x0B88	I2 Current	0-Imax	U2	UINT16	R	
+9	0x0B89	I3 Current	0-Imax	U2	UINT16	R	
+10	0x0B8A	Not used	0		UINT16	R	
+11	0x0B8B	In Current	0-Imax	U2	UINT16	R	
4352-4384		1-Cycle Phase Values					
+0	0x0C00	V1/V12 Voltage	0-Vmax	U1	UINT16	R	1
+1	0x0C01	V2/V23 Voltage	0-Vmax	U1	UINT16	R	1
+2	0x0C02	V3/V31 Voltage	0-Vmax	U1	UINT16	R	1
+3	0x0C03	I1 Current	0-Imax	U2	UINT16	R	
+4	0x0C04	I2 Current	0-Imax	U2	UINT16	R	
+5	0x0C05	I3 Current	0-Imax	U2	UINT16	R	
+6	0x0C06	kW L1	-Pmax-Pmax	U3	INT16	R	
+7	0x0C07	kW L2	-Pmax-Pmax	U3	INT16	R	
+8	0x0C08	kW L3	-Pmax-Pmax	U3	INT16	R	
+9	0x0C09	kvar L1	-Pmax-Pmax	U3	INT16	R	
+10	0x0C0A	kvar L2	-Pmax-Pmax	U3	INT16	R	
+11	0x0C0B	kvar L3	-Pmax-Pmax	U3	INT16	R	

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
+12	0x0C0C	kVA L1	0-Pmax	U3	UINT16	R	
+13	0x0C0D	kVA L2	0-Pmax	U3	UINT16	R	
+14	0x0C0E	kVA L3	0-Pmax	U3	UINT16	R	
+15	0x0C0F	Power factor L1	-1.000-1.000	0.001	INT16	R	
+16	0x0C10	Power factor L2	-1.000-1.000	0.001	INT16	R	
+17	0x0C11	Power factor L3	-1.000-1.000	0.001	INT16	R	
+18	0x0C12	V1/V12 Voltage THD	0-999.9	0.1%	UINT16	R	2, 5
+19	0x0C13	V2/V23 Voltage THD	0-999.9	0.1%	UINT16	R	2, 5
+20	0x0C14	V3/V31 Voltage THD	0-999.9	0.1%	UINT16	R	2, 5
+21	0x0C15	I1 Current THD	0-999.9	0.1%	UINT16	R	5
+22	0x0C16	I2 Current THD	0-999.9	0.1%	UINT16	R	5
+23	0x0C17	I3 Current THD	0-999.9	0.1%	UINT16	R	5
+24	0x0C18	I1 K-Factor	1.0-999.9	0.1	UINT16	R	5
+25	0x0C19	I2 K-Factor	1.0-999.9	0.1	UINT16	R	5
+26	0x0C1A	I3 K-Factor	1.0-999.9	0.1	UINT16	R	5
+27	0x0C1B	I1 Current TDD	0-100.0	0.1%	UINT16	R	5
+28	0x0C1C	I2 Current TDD	0-100.0	0.1%	UINT16	R	5
+29	0x0C1D	I3 Current TDD	0-100.0	0.1%	UINT16	R	5
+30	0x0C1E	V12 Voltage	0-Vmax	U1	UINT16	R	
+31	0x0C1F	V23 Voltage	0-Vmax	U1	UINT16	R	
+32	0x0C20	V31 Voltage	0-Vmax	U1	UINT16	R	
4544-4556		1-Cycle Total Values					
+0	0x0F00	Total kW	-Pmax-Pmax	U3	INT16	R	
+1	0x0F01	Total kvar	-Pmax-Pmax	U3	INT16	R	
+2	0x0F02	Total kVA	0-Pmax	U3	UINT16	R	
+3	0x0F03	Total PF	-1.000-1.000	0.001	INT16	R	
+4	0x0F04	Total PF lag	0-1.000	0.001	UINT16	R	
+5	0x0F05	Total PF lead	0-1.000	0.001	UINT16	R	
+5	0x0F06	Total kW import	0-Pmax	U3	UINT32	R	
+7	0x0F07	Total kW export	0-Pmax	U3	UINT32	R	
+8	0x0F08	Total kvar import	0-Pmax	U3	UINT32	R	
+9	0x0F09	Total kvar export	0-Pmax	U3	UINT32	R	
+10	0x0FOA	3-phase average L-N/L-L voltage	0-Vmax	U1	UINT32	R	1
+11	0x0FOB	3-phase average L-L voltage	0-Vmax	U1	UINT32	R	
+12	0x0FOC	3-phase average current	0-Imax	U2	UINT32	R	
4608-4612		1-Cycle Auxiliary Values					
+0	0x1000	Not used			UINT16	R	
+1	0x1001	In (neutral) Current	0-Imax	U2	UINT16	R	
+2	0x1002	Frequency	0-Fmax	0.01Hz	UINT16	R	
+3	0x1003	Voltage unbalance	0-300.0	0.1%	UINT16	R	
+4	0x1004	Current unbalance	0-300.0	0.1%	UINT16	R	
4640-4655		Phasor					
+0	0x1080	V1/V12 Voltage magnitude	0-Vmax	U1	UINT16	R	2

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
+1	0x1081	V2/V23 Voltage magnitude	0-Vmax	U1	UINT16	R	2
+2	0x1082	V3/V31 Voltage magnitude	0-Vmax	U1	UINT16	R	2
+3	0x1083	Not used			UINT16	R	
+4	0x1084	I1 Current magnitude	0-Imax	U2	UINT16	R	
+5	0x1085	I2 Current magnitude	0-Imax	U2	UINT16	R	
+5	0x1086	I3 Current magnitude	0-Imax	U2	UINT16	R	
+7	0x1087	Not used			UINT16	R	
+8	0x1088	V1/V12 Voltage angle	-180.0-180.0	0.1°	INT16	R	2
+9	0x1089	V2/V23 Voltage angle	-180.0-180.0	0.1°	INT16	R	2
+10	0x108A	V3/V31 Voltage angle	-180.0-180.0	0.1°	INT16	R	2
+11	0x108B	Not used			INT16	R	
+12	0x108C	I1 Current angle	-180.0-180.0	0.1°	INT16	R	
+13	0x108D	I2 Current angle	-180.0-180.0	0.1°	INT16	R	
+14	0x108E	I3 Current angle	-180.0-180.0	0.1°	INT16	R	
+15	0x108F	Not used			INT16	R	
4672-4704		1-Second Phase Values					
+0	0x1100	V1/V12 Voltage	0-Vmax	U1	UINT16	R	1
+1	0x1101	V2/V23 Voltage	0-Vmax	U1	UINT16	R	1
+2	0x1102	V3/V31 Voltage	0-Vmax	U1	UINT16	R	1
+3	0x1103	I1 Current	0-Imax	U2	UINT16	R	
+4	0x1104	I2 Current	0-Imax	U2	UINT16	R	
+5	0x1105	I3 Current	0-Imax	U2	UINT16	R	
+6	0x1106	kW L1	-Pmax-Pmax	U3	INT16	R	
+7	0x1107	kW L2	-Pmax-Pmax	U3	INT16	R	
+8	0x1108	kW L3	-Pmax-Pmax	U3	INT16	R	
+9	0x1109	kvar L1	-Pmax-Pmax	U3	INT16	R	
+10	0x110A	kvar L2	-Pmax-Pmax	U3	INT16	R	
+11	0x110B	kvar L3	-Pmax-Pmax	U3	INT16	R	
+12	0x110C	kVA L1	0-Pmax	U3	UINT16	R	
+13	0x110D	kVA L2	0-Pmax	U3	UINT16	R	
+14	0x110E	kVA L3	0-Pmax	U3	UINT16	R	
+15	0x110F	Power factor L1	-1.000-1.000	0.001	INT16	R	
+16	0x1110	Power factor L2	-1.000-1.000	0.001	INT16	R	
+17	0x1111	Power factor L3	-1.000-1.000	0.001	INT16	R	
+18	0x1112	V1/V12 Voltage THD	0-999.9	0.1%	UINT16	R	2, 6
+19	0x1113	V2/V23 Voltage THD	0-999.9	0.1%	UINT16	R	2, 6
+20	0x1114	V3/V31 Voltage THD	0-999.9	0.1%	UINT16	R	2, 6
+21	0x1115	I1 Current THD	0-999.9	0.1%	UINT16	R	6
+22	0x1116	I2 Current THD	0-999.9	0.1%	UINT16	R	6
+23	0x1117	I3 Current THD	0-999.9	0.1%	UINT16	R	6
+24	0x1118	I1 K-Factor	1.0-999.9	0.1	UINT16	R	6
+25	0x1119	I2 K-Factor	1.0-999.9	0.1	UINT16	R	6
+26	0x111A	I3 K-Factor	1.0-999.9	0.1	UINT16	R	6

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
+27	0x111B	I1 Current TDD	0-100.0	0.1%	UINT16	R	6
+28	0x111C	I2 Current TDD	0-100.0	0.1%	UINT16	R	6
+29	0x111D	I3 Current TDD	0-100.0	0.1%	UINT16	R	6
+30	0x111E	V12 Voltage	0-Vmax	U1	UINT16	R	
+31	0x111F	V23 Voltage	0-Vmax	U1	UINT16	R	
+32	0x1120	V31 Voltage	0-Vmax	U1	UINT16	R	
4768-4783		3-Second Powers					
+0	0x1280	kW L1	-Pmax-Pmax	U3	INT16	R	
+1	0x1281	kW L2	-Pmax-Pmax	U3	INT16	R	
+2	0x1282	kW L3	-Pmax-Pmax	U3	INT16	R	
+3	0x1283	kvar L1	-Pmax-Pmax	U3	INT16	R	
+4	0x1284	kvar L2	-Pmax-Pmax	U3	INT16	R	
+5	0x1285	kvar L3	-Pmax-Pmax	U3	INT16	R	
+6	0x1286	kVA L1	0-Pmax	U3	UINT16	R	
+7	0x1287	kVA L2	0-Pmax	U3	UINT16	R	
+8	0x1288	kVA L3	0-Pmax	U3	UINT16	R	
+9	0x1289	Power factor L1	-1.000-1.000	0.001	INT16	R	
+10	0x128A	Power factor L2	-1.000-1.000	0.001	INT16	R	
+11	0x128B	Power factor L3	-1.000-1.000	0.001	INT16	R	
+12	0x128C	Total kW	-Pmax-Pmax	U3	INT16	R	
+13	0x128D	Total kvar	-Pmax-Pmax	U3	INT16	R	
+14	0x128E	Total kVA	0-Pmax	U3	UINT16	R	
+15	0x128F	Total PF	-1.000-1.000	0.001	INT16	R	
4864-4876		1-Second Total Values					
+0	0x1400	Total kW	-Pmax-Pmax	U3	INT16	R	
+1	0x1401	Total kvar	-Pmax-Pmax	U3	INT16	R	
+2	0x1402	Total kVA	0-Pmax	U3	UINT16	R	
+3	0x1403	Total PF	-1.000-1.000	0.001	INT16	R	
+4	0x1404	Total PF lag	0-1.000	0.001	UINT16	R	
+5	0x1405	Total PF lead	0-1.000	0.001	UINT16	R	
+5	0x1406	Total kW import	0-Pmax	U3	UINT32	R	
+7	0x1407	Total kW export	0-Pmax	U3	UINT32	R	
+8	0x1408	Total kvar import	0-Pmax	U3	UINT32	R	
+9	0x1409	Total kvar export	0-Pmax	U3	UINT32	R	
+10	0x140A	3-phase average L-N/L-L voltage	0-Vmax	U1	UINT32	R	1
+11	0x140B	3-phase average L-L voltage	0-Vmax	U1	UINT32	R	
+12	0x140C	3-phase average current	0-Imax	U2	UINT32	R	
4928-4932		1-Second Auxiliary Values					
+0	0x1500	Not used			UINT16	R	
+1	0x1501	In (neutral) Current	0-Imax	U2	UINT16	R	
+2	0x1502	Frequency	0-Fmax	0.01Hz	UINT16	R	
+3	0x1503	Voltage unbalance	0-300.0	0.1%	UINT16	R	
+4	0x1504	Current unbalance	0-300.0	0.1%	UINT16	R	

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
4960-4971		Present Harmonic Demands					
+0	0x1580	V1/V12 THD demand	0-999.9	0.1%	UINT16	R	2
+1	0x1581	V2/V23 THD demand	0-999.9	0.1%	UINT16	R	2
+2	0x1582	V3/V31 THD demand	0-999.9	0.1%	UINT16	R	2
+3	0x1583	Not used			UINT16	R	
+4	0x1584	I1 THD demand	0-999.9	0.1%	UINT16	R	
+5	0x1585	I2 THD demand	0-999.9	0.1%	UINT16	R	
+5	0x1586	I3 THD demand	0-999.9	0.1%	UINT16	R	
+7	0x1587	Not used			UINT16	R	
+8	0x1588	I1 TDD demand	0-100.0	0.1%	UINT16	R	
+9	0x1589	I2 TDD demand	0-100.0	0.1%	UINT16	R	
+10	0x158A	I3 TDD demand	0-100.0	0.1%	UINT16	R	
+11	0x158B	Not used			UINT16	R	
4992-5021		Present Volt, Ampere and Power Demands					
+0	0x1600	V1/V12 Volt demand	0-Vmax	U1	UINT16	R	2
+1	0x1601	V2/V23 Volt demand	0-Vmax	U1	UINT16	R	2
+2	0x1602	V3/V31 Volt demand	0-Vmax	U1	UINT16	R	2
+3	0x1603	I1 Ampere demand	0-Imax	U2	UINT16	R	
+4	0x1604	I2 Ampere demand	0-Imax	U2	UINT16	R	
+5	0x1605	I3 Ampere demand	0-Imax	U2	UINT16	R	
+6	0x1606	kW import block demand	0-Pmax	U3	UINT16	R	
+7	0x1607	kvar import block demand	0-Pmax	U3	UINT16	R	
+8	0x1608	kVA block demand	0-Pmax	U3	UINT16	R	
+9	0x1609	kW import sliding window demand	0-Pmax	U3	UINT16	R	
+10	0x160A	kvar import sliding window demand	0-Pmax	U3	UINT16	R	
+11	0x160B	kVA sliding window demand	0-Pmax	U3	UINT16	R	
+12	0x160C	Not used			UINT16	R	
+13	0x160D	Not used			UINT16	R	
+14	0x160E	Not used			UINT16	R	
+15	0x160F	kW import accumulated demand	0-Pmax	U3	UINT16	R	
+16	0x1610	kvar import accumulated demand	0-Pmax	U3	UINT16	R	
+17	0x1611	kVA accumulated demand	0-Pmax	U3	UINT16	R	
+18	0x1612	kW import predicted sliding window demand	0-Pmax	U3	UINT16	R	
+19	0x1613	kvar import predicted sliding window demand	0-Pmax	U3	UINT16	R	
+20	0x1614	kVA predicted sliding window demand	0-Pmax	U3	UINT16	R	
+21	0x1615	PF (import) at Max. kVA sliding window demand	0-1.000	0.001	UINT16	R	
+22	0x1616	kW export block demand	0-Pmax	U3	UINT16	R	
+23	0x1617	kvar export block demand	0-Pmax	U3	UINT16	R	
+24	0x1618	kW export sliding window demand	0-Pmax	U3	UINT16	R	
+25	0x1619	kvar export sliding window demand	0-Pmax	U3	UINT16	R	
+26	0x161A	kW export accumulated demand	0-Pmax	U3	UINT16	R	
+27	0x161B	kvar export accumulated demand	0-Pmax	U3	UINT16	R	
+28	0x161C	kW export predicted sliding window demand	0-Pmax	U3	UINT16	R	

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
+29	0x161D	kvar export predicted sliding window demand	0-Pmax	U3	UINT16	R	
5056-5073		Total Energies					
+0,1	0x1700	kWh import	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x1701	kWh export	0-999,999,999	1 kWh	UINT32	R	
+4,5	0x1702	Not used			INT32	R	
+6,7	0x1703	Not used			UINT32	R	
+8,9	0x1704	kvarh import	0-999,999,999	1 kvarh	UINT32	R	
+10,11	0x1705	kvarh export	0-999,999,999	1 kvarh	UINT32	R	
+12,13	0x1706	Not used			INT32	R	
+14,15	0x1707	Not used			UINT32	R	
+16,17	0x1708	kVAh total	0-999,999,999	1 kVAh	UINT32	R	
5120-5137		Phase Energies					
+0,1	0x1800	kWh import L1	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x1801	kWh import L2	0-999,999,999	1 kWh	UINT32	R	
+4,5	0x1802	kWh import L3	0-999,999,999	1 kWh	UINT32	R	
+6,7	0x1803	kvarh import L1	0-999,999,999	1 kvarh	UINT32	R	
+8,9	0x1804	kvarh import L2	0-999,999,999	1 kvarh	UINT32	R	
+10,11	0x1805	kvarh import L3	0-999,999,999	1 kvarh	UINT32	R	
+12,13	0x1806	kVAh total L1	0-999,999,999	1 kVAh	UINT32	R	
+14,15	0x1807	kVAh total L2	0-999,999,999	1 kVAh	UINT32	R	
+16,17	0x1808	kVAh total L3	0-999,999,999	1 kVAh	UINT32	R	
5152-5161		Symmetrical Components					
+0	0x1880	Positive-sequence voltage	0-Vmax	U1	UINT16	R	
+1	0x1881	Negative-sequence voltage	0-Vmax	U1	UINT16	R	
+2	0x1882	Zero-sequence voltage	0-Vmax	U1	UINT16	R	
+3	0x1883	Negative-sequence voltage unbalance	0-300.0	0.1%	UINT16	R	
+4	0x1884	Zero-sequence voltage unbalance	0-300.0	0.1%	UINT16	R	
+5	0x1885	Positive-sequence current	0-Imax	U2	UINT16	R	
+6	0x1886	Negative-sequence current	0-Imax	U2	UINT16	R	
+7	0x1887	Zero-sequence current	0-Imax	U2	UINT16	R	
+8	0x1888	Negative-sequence current unbalance	0-300.0	0.1%	UINT16	R	
+9	0x1889	Zero-sequence current unbalance	0-300.0	0.1%	UINT16	R	
5184-5233		V1/V12 Harmonics					2,7
+0	0x1900	H01 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
+1	0x1901	H02 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
		...					
+49	0x1931	H50 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
5248-5297		V2/V23 Harmonics					2,7
+0	0x1A00	H01 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
+1	0x1A01	H02 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
		...					
+49	0x1A31	H50 Harmonic magnitude	0-100.00	0.01%	UINT16	R	

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
5312-5361		V3/V31 Harmonics					2,7
+0	0x1B00	H01 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
+1	0x1B01	H02 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
		...					
+49	0x1B31	H50 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
5376-5425		I1 Harmonics					7
+0	0x1C00	H01 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
+1	0x1C01	H02 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
		...					
+49	0x1C31	H50 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
5440-5489		I2 Harmonics					7
+0	0x1D00	H01 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
+1	0x1D01	H02 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
		...					
+49	0x1D31	H50 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
5504-5553		I3 Harmonics					7
+0	0x1E00	H01 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
+1	0x1E01	H02 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
		...					
+49	0x1E31	H50 Harmonic magnitude	0-100.00	0.01%	UINT16	R	
6208-6225		Fundamental Phase Values					5
+0	0x2900	V1/V12 Voltage	0-Vmax	U1	UINT16	R	2
+1	0x2901	V2/V23 Voltage	0-Vmax	U1	UINT16	R	2
+2	0x2902	V3/V31 Voltage	0-Vmax	U1	UINT16	R	2
+3	0x2903	I1 Current	0-Imax	U2	UINT16	R	
+4	0x2904	I2 Current	0-Imax	U2	UINT16	R	
+5	0x2905	I3 Current	0-Imax	U2	UINT16	R	
+6	0x2906	kW L1	-Pmax-Pmax	U3	INT16	R	
+7	0x2907	kW L2	-Pmax-Pmax	U3	INT16	R	
+8	0x2908	kW L3	-Pmax-Pmax	U3	INT16	R	
+9	0x2909	kvar L1	-Pmax-Pmax	U3	INT16	R	
+10	0x290A	kvar L2	-Pmax-Pmax	U3	INT16	R	
+11	0x290B	kvar L3	-Pmax-Pmax	U3	INT16	R	
+12	0x290C	kVA L1	0-Pmax	U3	UINT16	R	
+13	0x290D	kVA L2	0-Pmax	U3	UINT16	R	
+14	0x290E	kVA L3	0-Pmax	U3	UINT16	R	
+15	0x290F	Power factor L1	-1.000-1.000	0.001	INT16	R	
+16	0x2910	Power factor L2	-1.000-1.000	0.001	INT16	R	
+17	0x2911	Power factor L3	-1.000-1.000	0.001	INT16	R	
6240-6251		Flicker					2
+0	0x2980	V1 Pst	0-100.00	0.01	UINT16	R	
+1	0x2981	V2 Pst	0-100.00	0.01	UINT16	R	
+2	0x2982	V3 Pst	0-100.00	0.01	UINT16	R	

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
+3	0x2983	V1 Plt	0-100.00	0.01	UINT16	R	
+4	0x2984	V2 Plt	0-100.00	0.01	UINT16	R	
+5	0x2985	V3 Plt	0-100.00	0.01	UINT16	R	
6272-6275		Fundamental Total Values					5
+0	0x2A00	Total fundamental kW	-Pmax-Pmax	U3	INT16	R	
+1	0x2A01	Total fundamental kvar	-Pmax-Pmax	U3	INT16	R	
+2	0x2A02	Total fundamental kVA	0-Pmax	U3	UINT16	R	
+3	0x2A03	Total fundamental PF	-1.000-1.000	0.001	INT16	R	
6400-6429		Minimum 1-Cycle Phase Values					
+0	0x2C00	V1/V12 Voltage	0-Vmax	U1	UINT16	R	2
+1	0x2C01	V2/V23 Voltage	0-Vmax	U1	UINT16	R	2
+2	0x2C02	V3/V31 Voltage	0-Vmax	U1	UINT16	R	2
+3	0x2C03	I1 Current	0-Imax	U2	UINT16	R	
+4	0x2C04	I2 Current	0-Imax	U2	UINT16	R	
+5	0x2C05	I3 Current	0-Imax	U2	UINT16	R	
+6-17	0x2C06-0x2C11	Not used	0		INT16	R	
+18	0x2C12	V1/V12 Voltage THD	0-9999	0.1%	UINT16	R	2,5
+19	0x2C13	V2/V23 Voltage THD	0-9999	0.1%	UINT16	R	2,5
+20	0x2C14	V3/V31 Voltage THD	0-999.9	0.1%	UINT16	R	2,5
+21	0x2C15	I1 Current THD	0-999.9	0.1%	UINT16	R	5
+22	0x2C16	I2 Current THD	0-999.9	0.1%	UINT16	R	5
+23	0x2C17	I3 Current THD	0-999.9	0.1%	UINT16	R	5
+24	0x2C18	I1 K-Factor	1.0-999.9	0.1	UINT16	R	5
+25	0x2C19	I2 K-Factor	1.0-999.9	0.1	UINT16	R	5
+26	0x2C1A	I3 K-Factor	1.0-999.9	0.1	UINT16	R	5
+27	0x2C1B	I1 Current TDD	0-100.0	0.1%	UINT16	R	5
+28	0x2C1C	I2 Current TDD	0-100.0	0.1%	UINT16	R	5
+29	0x2C1D	I3 Current TDD	0-100.0	0.1%	UINT16	R	5
6464-6467		Minimum 1-Cycle Total Values					
+0	0x2D00	Total kW	-Pmax-Pmax	U3	INT16	R	
+1	0x2D01	Total kvar	-Pmax-Pmax	U3	INT16	R	
+2	0x2D02	Total kVA	0-Pmax	U3	UINT16	R	
+3	0x2D03	Total PF	0-1.000	0.001	UINT16	R	Absolute value
6528-6530		Minimum 1-Cycle Auxiliary Values					
+0	0x2E00	Not used		U2	UINT16	R	
+1	0x2E01	In Current	0-Imax	U2	UINT16	R	
+2	0x2E02	Frequency	0-Fmax	0.01Hz	UINT16	R	
6912-6941		Maximum 1-Cycle Phase Values					
+0	0x3400	V1/V12 Voltage	0-Vmax	U1	UINT16	R	2
+1	0x3401	V2/V23 Voltage	0-Vmax	U1	UINT16	R	2
+2	0x3402	V3/V31 Voltage	0-Vmax	U1	UINT16	R	2
+3	0x3403	I1 Current	0-Imax	U2	UINT16	R	

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
+4	0x3404	I2 Current	0-Imax	U2	UINT16	R	
+5	0x3405	I3 Current	0-Imax	U2	UINT16	R	
+6-17	0x3406-0x3411	Not used	0		INT16	R	
+18	0x3412	V1 Voltage THD	0-999.9	0.1%	UINT16	R	2, 5
+19	0x3413	V2 Voltage THD	0-999.9	0.1%	UINT16	R	2, 5
+20	0x3414	V3 Voltage THD	0-999.9	0.1%	UINT16	R	2, 5
+21	0x3415	I1 Current THD	0-999.9	0.1%	UINT16	R	5
+22	0x3416	I2 Current THD	0-999.9	0.1%	UINT16	R	5
+23	0x3417	I3 Current THD	0-999.9	0.1%	UINT16	R	5
+24	0x3418	I1 K-Factor	1.0-999.9	0.1	UINT16	R	5
+25	0x3419	I2 K-Factor	1.0-999.9	0.1	UINT16	R	5
+26	0x341A	I3 K-Factor	1.0-999.9	0.1	UINT16	R	5
+27	0x341B	I1 Current TDD	0-100.0	0.1%	UINT16	R	5
+28	0x341C	I2 Current TDD	0-100.0	0.1%	UINT16	R	5
+29	0x341D	I3 Current TDD	0-100.0	0.1%	UINT16	R	5
6976-6979		Maximum 1-Cycle Total Values					
+0	0x3500	Total kW	-Pmax-Pmax	U3	INT16	R	
+1	0x3501	Total kvar	-Pmax-Pmax	U3	INT16	R	
+2	0x3502	Total kVA	0-Pmax	U3	UINT16	R	
+3	0x3503	Total PF	0-1.000	0.001	UINT16	R	Absolute value
7040-7042		Maximum 1-Cycle Auxiliary Values					
+0	0x3600	Not used		U2	UINT16	R	
+1	0x3601	In Current	0-Imax	U2	UINT16	R	
+2	0x3602	Frequency	0-Fmax	0.01Hz	UINT16	R	
7104-7120		Maximum Demands					
+0	0x3700	V1/V12 Maximum volt demand	0-Vmax	U1	UINT16	R	2
+1	0x3701	V2/V23 Maximum volt demand	0-Vmax	U1	UINT16	R	2
+2	0x3702	V3/V31 Maximum volt demand	0-Vmax	U1	UINT16	R	2
+3	0x3703	I1 Maximum ampere demand	0-Imax	U2	UINT16	R	
+4	0x3704	I2 Maximum ampere demand	0-Imax	U2	UINT16	R	
+5	0x3705	I3 Maximum ampere demand	0-Imax	U2	UINT16	R	
+6	0x3706	Not used			UINT16	R	
+7	0x3707	Not used			UINT16	R	
+8	0x3708	Not used			UINT16	R	
+9	0x3709	Maximum kW import sliding window demand	0-Pmax	U3	UINT16	R	
+10	0x370A	Maximum kvar import sliding window demand	0-Pmax	U3	UINT16	R	
+11	0x370B	Maximum kVA sliding window demand	0-Pmax	U3	UINT16	R	
+12	0x370C	Not used			UINT16	R	
+13	0x370D	Not used			UINT16	R	
+14	0x370E	Not used			UINT16	R	
+15	0x370F	Maximum kW export sliding window demand	0-Pmax	U3	UINT16	R	
+16	0x3710	Maximum kvar export sliding window demand	0-Pmax	U3	UINT16	R	

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
7200-7211		Maximum Harmonic Demands					
+0	0x3880	V1/V12 THD demand	0-999.9	0.1%	UINT16	R	2
+1	0x3881	V2/V23 THD demand	0-999.9	0.1%	UINT16	R	2
+2	0x3882	V3/V31 THD demand	0-999.9	0.1%	UINT16	R	2
+3	0x3883	Not used			UINT16	R	
+4	0x3884	I1 THD demand	0-999.9	0.1%	UINT16	R	
+5	0x3885	I2 THD demand	0-999.9	0.1%	UINT16	R	
+6	0x3886	I3 THD demand	0-999.9	0.1%	UINT16	R	
+7	0x3887	Not used			UINT16	R	
+8	0x3888	I1 TDD demand	0-100.0	0.1%	UINT16	R	
+9	0x3889	I2 TDD demand	0-100.0	0.1%	UINT16	R	
+10	0x388A	I3 TDD demand	0-100.0	0.1%	UINT16	R	
+11	0x388B	Not used			UINT16	R	
7360-7361		Scaled Analog Inputs					
+0	0x3B00	Analog input AI1	AI1min-AI1Max		UINT16	R	
+1	0x3B01	Analog input AI2	AI2min-AI2Max		UINT16	R	
7392-7393		Raw Analog Inputs					
+0	0x3B80	Analog input AI1	0-4095		UINT16	R	
+1	0x3B81	Analog input AI2	0-4095		UINT16	R	
7424-7425		TOU Parameters					
+0	0x3C00	Active tariff	0-7		UINT16	R/W	
+1	0x3C01	Active profile	0-15: 0-3 = Season 1 Profile #1-4, 4-7 = Season 2 Profile #1-4, 8-11 = Season 3 Profile #1-4, 12-15 = Season 4 Profile #1-4		UINT16	R/W	
7456-7457		Scaled Analog Outputs					
+0	0x3C80	Analog output AO1	0-4095		UINT16	R/W	
+1	0x3C81	Analog output AO2	0-4095		UINT16	R/W	
7488-7503		TOU Energy Register #1					
+0,1	0x3D00	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x3D01	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	
+14,15	0x3D07	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
7552-7567		TOU Energy Register #2					
+0,1	0x3E00	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x3E01	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	
+14,15	0x3E07	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
7616-7631		TOU Energy Register #3					
+0,1	0x3F00	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x3F01	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
+14,15	0x3F07	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
7680-7695		TOU Energy Register #4					
+0,1	0x4000	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x4001	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	
+14,15	0x4007	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
7744-7759		TOU Energy Register #5					
+0,1	0x4100	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x4101	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	
+14,15	0x4107	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
7808-7823		TOU Energy Register #6					
+0,1	0x4200	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x4201	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	
+14,15	0x4207	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
7872-7887		TOU Energy Register #7					
+0,1	0x4300	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x4301	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	
+14,15	0x4307	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
7936-7951		TOU Energy Register #8					
+0,1	0x4400	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x4401	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	
+14,15	0x4407	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
8000-8007		Summary Energy Accumulated Demands					
+0	0x4500	Summary register #1 demand	0-Pmax	U3	UINT16	R	
+1	0x4501	Summary register #2 demand	0-Pmax	U3	UINT16	R	
		...				R	
+7	0x4507	Summary register #8 demand	0-Pmax	U3	UINT16	R	
8032-8039		Summary Energy Block Demands					
+0	0x4580	Summary register #1 demand	0-Pmax	U3	UINT16	R	
+1	0x4581	Summary register #2 demand	0-Pmax	U3	UINT16	R	
		...				R	
+7	0x4587	Summary register #8 demand	0-Pmax	U3	UINT16	R	
8064-8071		Summary Energy Sliding Window Demands					
+0	0x4600	Summary register #1 demand	0-Pmax	U3	UINT16	R	
+1	0x4601	Summary register #2 demand	0-Pmax	U3	UINT16	R	
		...				R	
+7	0x4607	Summary register #8 demand	0-Pmax	U3	UINT16	R	
8160-8167		Summary Energy Maximum Demands					
+0	0x4780	Summary register #1 maximum demand	0-Pmax	U3	UINT16	R	

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
+1	0x4781	Summary register #2 maximum demand	0-Pmax	U3	UINT16	R	
		...				R	
+7	0x4787	Summary register #8 maximum demand	0-Pmax	U3	UINT16	R	
8192-8199		TOU Maximum Demand Register #1					
+0	0x4800	Tariff #1 maximum demand	0-Pmax	U3	UINT16	R	
+1	0x4801	Tariff #2 maximum demand	0-Pmax	U3	UINT16	R	
		...				R	
+7	0x4807	Tariff #8 maximum demand	0-Pmax	U3	UINT16	R	
8256-8263		TOU Maximum Demand Register #2					
+0	0x4900	Tariff #1 maximum demand	0-Pmax	U3	UINT16	R	
+1	0x4901	Tariff #2 maximum demand	0-Pmax	U3	UINT16	R	
		...				R	
+7	0x4907	Tariff #8 maximum demand	0-Pmax	U3	UINT16	R	
8320-8327		TOU Maximum Demand Register #3					
+0	0x4A00	Tariff #1 maximum demand	0-Pmax	U3	UINT16	R	
+1	0x4A01	Tariff #2 maximum demand	0-Pmax	U3	UINT16	R	
		...				R	
+7	0x4A07	Tariff #8 maximum demand	0-Pmax	U3	UINT16	R	
8224-8231		TOU Maximum Demand Register #4					
+0	0x4880	Tariff #1 maximum demand	0-Pmax	U3	UINT16	R	
+1	0x4881	Tariff #2 maximum demand	0-Pmax	U3	UINT16	R	
		...				R	
+7	0x4887	Tariff #8 maximum demand	0-Pmax	U3	UINT16	R	
8288-8295		TOU Maximum Demand Register #5					
+0	0x4980	Tariff #1 maximum demand	0-Pmax	U3	UINT16	R	
+1	0x4981	Tariff #2 maximum demand	0-Pmax	U3	UINT16	R	
		...				R	
+7	0x4987	Tariff #8 maximum demand	0-Pmax	U3	UINT16	R	
8352-8359		TOU Maximum Demand Register #6					
+0	0x4A80	Tariff #1 maximum demand	0-Pmax	U3	UINT16	R	
+1	0x4A81	Tariff #2 maximum demand	0-Pmax	U3	UINT16	R	
		...				R	
+7	0x4A87	Tariff #8 maximum demand	0-Pmax	U3	UINT16	R	
8896-8903		TOU Maximum Demand Register #7					
+0	0x5300	Tariff #1 maximum demand	0-Pmax	U3	UINT16	R	
+1	0x5301	Tariff #2 maximum demand	0-Pmax	U3	UINT16	R	
		...				R	
+7	0x5307	Tariff #8 maximum demand	0-Pmax	U3	UINT16	R	
8928-8935		TOU Maximum Demand Register #8					
+0	0x5380	Tariff #1 maximum demand	0-Pmax	U3	UINT16	R	
+1	0x5381	Tariff #2 maximum demand	0-Pmax	U3	UINT16	R	
		...				R	
+7	0x5387	Tariff #8 maximum demand	0-Pmax	U3	UINT16	R	

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
9984-10033		V1/V12 Harmonic Angles					2, 4
+0	0x6400	H01 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
+1	0x6401	H02 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
		...					
+49	0x6431	H50 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
10048-10097		V2/V23 Harmonic Angles					2, 4
+0	0x6500	H01 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
+1	0x6501	H02 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
		...					
+49	0x6531	H50 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
10112-10161		V3/V31 Harmonic Angles					2, 4
+0	0x6600	H01 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
+1	0x6601	H02 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
		...					
+49	0x6631	H50 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
10240-10289		I1 Harmonic Angles					4
+0	0x6800	H01 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
+1	0x6801	H02 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
		...					
+49	0x6831	H50 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
10304-10353		I2 Harmonic Angles					4
+0	0x6900	H01 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
+1	0x6901	H02 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
		...					
+49	0x6931	H50 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
10368-10417		I3 Harmonic Angles					4
+0	0x6A00	H01 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
+1	0x6A01	H02 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
		...					
+49	0x6A31	H50 Harmonic angle	-180.0-180.0	0.1°	INT16	R	
10528-10554		3-Second RMS Values					
+0	0x6C80	V1 voltage	0-Vmax	U1	UINT16	R	2
+1	0x6C81	V2 voltage	0-Vmax	U1	UINT16	R	2
+2	0x6C82	V3 voltage	0-Vmax	U1	UINT16	R	2
+3-16	0x6C83-0x6C90	Not used	0		UINT16	R	
+17	0x6C91	Zero-sequence voltage	0-Vmax	U1	UINT16	R	
+18	0x6C92	Zero-sequence current	0-Imax	U2	UINT16	R	
+19	0x6C93	Not used	0		UINT16	R	
+20	0x6C94	Negative-sequence voltage unbalance	0-300.0	0.1%	UINT16	R	
+21	0x6C95	Negative-sequence current unbalance	0-300.0	0.1%	UINT16	R	
+22-23	0x6C96-0x6C97	Not used	0		UINT16	R	

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
+24	0x6C98	Frequency	0-100.00	0.01Hz	UINT16	R	10-sec value GOST 514149, 20-sec value GOST 13109
+25	0x6C99	Positive-sequence voltage	0-Vmax	U1	UINT16	R	
+26	0x6C9A	Zero-sequence voltage unbalance	0-300.0	0.1%	UINT16	R	
11136-11162		1-Minute RMS Values					GOST 13109 only
+0	0x7600	V1 Voltage	0-Vmax	U1	UINT16	R	²
+1	0x7601	V2 Voltage	0-Vmax	U1	UINT16	R	²
+2	0x7602	V3 Voltage	0-Vmax	U1	UINT16	R	²
+3-16	0x7603-0x7610	Not used	0		UINT16	R	
+17	0x7611	Zero-sequence voltage	0-Vmax	U1	UINT16	R	
+18	0x7612	Zero-sequence current	0-Imax	U2	UINT16	R	
+19	0x7613	Not used	0		UINT16	R	
+20	0x7614	Negative-sequence voltage unbalance	0-300.0	0.1%	UINT16	R	
+21	0x7615	Negative-sequence current unbalance	0-300.0	0.1%	UINT16	R	
+22-24	0x7616-0x7618	Not used	0		UINT16	R	
+25	0x7619	Positive-sequence voltage	0-Vmax	U1	UINT16	R	
+26	0x761A	Zero-sequence voltage unbalance	0-300.0	0.1%	UINT16	R	
10560-10586		10-Minute RMS Values					
+0	0x6D00	V1 Voltage	0-Vmax	U1	UINT16	R	²
+1	0x6D01	V2 Voltage	0-Vmax	U1	UINT16	R	²
+2	0x6D02	V3 Voltage	0-Vmax	U1	UINT16	R	²
+3-16	0x6D03-0x6D10	Not used	0		UINT16	R	
+17	0x6D11	Zero-sequence voltage	0-Vmax	U1	UINT16	R	
+18	0x6D12	Zero-sequence current	0-Imax	U2	UINT16	R	
+19	0x6D13	Not used	0		UINT16	R	
+20	0x6D14	Negative-sequence voltage unbalance	0-300.0	0.1%	UINT16	R	
+21	0x6D15	Negative-sequence current unbalance	0-300.0	0.1%	UINT16	R	
+22-24	0x6D16-0x6D18	Not used	0		UINT16	R	
+25	0x6D19	Positive-sequence voltage	0-Vmax	U1	UINT16	R	
+26	0x6D1A	Zero-sequence voltage unbalance	0-300.0	0.1%	UINT16	R	
10656-10674		3-Second Total Harmonics					
+0	0x6E80	V1 THD	0-999.9	0.1%	UINT16	R	²
+1	0x6E81	V2 THD	0-999.9	0.1%	UINT16	R	²
+2	0x6E82	V3 THD	0-999.9	0.1%	UINT16	R	²
+3	0x6E03	Not used	0		UINT16	R	
+4	0x6E84	I1 THD	0-999.9	0.1%	UINT16	R	
+5	0x6E85	I2 THD	0-999.9	0.1%	UINT16	R	
+6	0x6E86	I3 THD	0-999.9	0.1%	UINT16	R	
+7	0x6E03	Not used	0		UINT16	R	

Address	Point ID	Description	Low and High Scales ³	Units ³	Type	R/W	Notes
+8-15	0x6E04-0x6E89	Not used	0		UINT16	R	
+16	0x6E90	I1 TDD	0-100.0	0.1%	UINT16	R	
+17	0x6E91	I2 TDD	0-100.0	0.1%	UINT16	R	
+18	0x6E92	I3 TDD	0-100.0	0.1%	UINT16	R	
10688-10706		10-Minute Total Harmonics					
+0	0x6F00	V1 THD	0-999.9	0.1%	UINT16	R	²
+1	0x6F01	V2 THD	0-999.9	0.1%	UINT16	R	²
+2	0x6F02	V3 THD	0-999.9	0.1%	UINT16	R	²
+3	0x6F03	Not used	0		UINT16	R	
+4	0x6F04	I1 THD	0-999.9	0.1%	UINT16	R	
+5	0x6F05	I2 THD	0-999.9	0.1%	UINT16	R	
+6	0x6F06	I3 THD	0-999.9	0.1%	UINT16	R	
+7	0x6F07	Not used	0		UINT16	R	
+8	0x6F08	V1 interharmonic THD	0-999.9	0.1%	UINT16	R	
+9	0x6F09	V2 interharmonic THD	0-999.9	0.1%	UINT16	R	
+10	0x6FOA	V3 interharmonic THD	0-999.9	0.1%	UINT16	R	
+11	0x6FOB	Not used	0		UINT16	R	
+12	0x6FOC	I1 interharmonic THD	0-999.9	0.1%	UINT16	R	
+13	0x6F0D	I2 interharmonic THD	0-999.9	0.1%	UINT16	R	
+14	0x6FOE	I3 interharmonic THD	0-999.9	0.1%	UINT16	R	
+15	0x6FOF	Not used	0		UINT16	R	
+16	0x6F10	I1 TDD	0-100.0	0.1%	UINT16	R	
+17	0x6F11	I2 TDD	0-100.0	0.1%	UINT16	R	
+18	0x6F12	I3 TDD	0-100.0	0.1%	UINT16	R	

NOTES:

- ¹ When the 4LN3, 4LL3, 3LN3, 3LL3, 3BLN3 or 3BLL3 wiring mode is selected, the voltages will be line-to-neutral; for any other wiring mode, they will be line-to-line.
- ² When the 4LN3, 3LN3 or 3BLN3 wiring mode is selected, the voltages will be line-to-neutral; for any other wiring mode, they will be line-to-line voltages.
- ³ For volts, amps, power and frequency scales and units refer to Section 4 "Data Scales and Units". For analog data scaling formulas and examples, see Section 2.6.1, "16-bit Scaled Integer Format".
- ⁴ Harmonic angles are referenced to the fundamental voltage harmonic H01 on phase L1.
- ⁵ On a 16-cycle interval.
- ⁶ On a 3-s interval.
- ⁷ 16-cycle interval for GOST 13109, programmable 0.2-s, 3-s, 10-min interval for GOST 32144.

3.4 32-bit Analog Registers, Binary Registers and Counters

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
11776-11777	0x0000	None	0		UINT32	R	
11840	0x0080	Setpoint Status SP1-SP16 (bitmap)	0x00000000-0x0000FFFF		UINT32	R	
11904-11907		Special Inputs					
+0,1	0x0100	Not used	0		UINT32	R	
+2,3	0x0101	Phase rotation order	0=error, 1=positive (ABC), 2=negative (CBA)		UINT32	R	
12160-12161	0x0300	Event Flags (bitmap)	0x00000000-0x000000FF		UINT32	R	
12544-12545	0x0600	Digital Inputs (bitmap)	0x00000000-0x0000000F		UINT32	R	
12800-12801	0x0800	Relay Outputs (bitmap)	0x00000000-0x0000000F		UINT32	R	
13056-13063		Counters					
+0,1	0x0A00	Counter #1	0-999,999		UINT32	R/W	
+2,3	0x0A01	Counter #2	0-999,999		UINT32	R/W	
+4,5	0x0A02	Counter #3	0-999,999		UINT32	R/W	
+6,7	0x0A03	Counter #4	0-999,999		UINT32	R/W	
13248-13297		1/2-Cycle Values					
+0,1	0x0B80	V1 Voltage	0-Vmax	U1	UINT32	R	1
+2,3	0x0B81	V2 Voltage	0-Vmax	U1	UINT32	R	1
+4,5	0x0B82	V3 Voltage	0-Vmax	U1	UINT32	R	1
+6,7	0x0B83	Not used	0		UINT32	R	
+8,9	0x0B84	V12 Voltage	0-Vmax	U1	UINT32	R	
+10,11	0x0B85	V23 Voltage	0-Vmax	U1	UINT32	R	
+12,13	0x0B86	V31 Voltage	0-Vmax	U1	UINT32	R	
+14,15	0x0B87	I1 Current	0-Imax	U2	UINT32	R	
+16,17	0x0B88	I2 Current	0-Imax	U2	UINT32	R	
+18,19	0x0B89	I3 Current	0-Imax	U2	UINT32	R	
+20,21	0x0B8A	Not used	0		UINT32	R	
+22,23	0x0B8B	In Current	0-Imax	U2	UINT32	R	
13312-13377		1-Cycle Phase Values					
+0,1	0x0C00	V1/V12 Voltage	0-Vmax	U1	UINT32	R	1
+2,3	0x0C01	V2/V23 Voltage	0-Vmax	U1	UINT32	R	1
+4,5	0x0C02	V3/V31 Voltage	0-Vmax	U1	UINT32	R	1
+6,7	0x0C03	I1 Current	0-Imax	U2	UINT32	R	
+8,9	0x0C04	I2 Current	0-Imax	U2	UINT32	R	
+10,11	0x0C05	I3 Current	0-Imax	U2	UINT32	R	
+12,13	0x0C06	kW L1	-Pmax-Pmax	U3	INT32	R	
+14,15	0x0C07	kW L2	-Pmax-Pmax	U3	INT32	R	
+16,17	0x0C08	kW L3	-Pmax-Pmax	U3	INT32	R	
+18,19	0x0C09	kvar L1	-Pmax-Pmax	U3	INT32	R	
+20,21	0x0C0A	kvar L2	-Pmax-Pmax	U3	INT32	R	
+22,23	0x0C0B	kvar L3	-Pmax-Pmax	U3	INT32	R	

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
+24,25	0x0C0C	kVA L1	0-Pmax	U3	UINT32	R	
+26,27	0x0C0D	kVA L2	0-Pmax	U3	UINT32	R	
+28,29	0x0C0E	kVA L3	0-Pmax	U3	UINT32	R	
+30,31	0x0C0F	Power factor L1	-1000-1000	×0.001	INT32	R	
+32,33	0x0C10	Power factor L2	-1000-1000	×0.001	INT32	R	
+34,35	0x0C11	Power factor L3	-1000-1000	×0.001	INT32	R	
+36,37	0x0C12	V1/V12 Voltage THD	0-9999	×0.1%	UINT32	R	2, 5
+38,39	0x0C13	V2/V23 Voltage THD	0-9999	×0.1%	UINT32	R	2, 5
+40,41	0x0C14	V3/V31 Voltage THD	0-9999	×0.1%	UINT32	R	2, 5
+42,43	0x0C15	I1 Current THD	0-9999	×0.1%	UINT32	R	5
+44,45	0x0C16	I2 Current THD	0-9999	×0.1%	UINT32	R	5
+46,47	0x0C17	I3 Current THD	0-9999	×0.1%	UINT32	R	5
+48,49	0x0C18	I1 K-Factor	10-9999	×0.1	UINT32	R	5
+50,51	0x0C19	I2 K-Factor	10-9999	×0.1	UINT32	R	5
+52,53	0x0C1A	I3 K-Factor	10-9999	×0.1	UINT32	R	5
+54,55	0x0C1B	I1 Current TDD	0-1000	×0.1%	UINT32	R	5
+56,57	0x0C1C	I2 Current TDD	0-1000	×0.1%	UINT32	R	5
+58,59	0x0C1D	I3 Current TDD	0-1000	×0.1%	UINT32	R	5
+60,61	0x0C1E	V12 Voltage	0-Vmax	U1	UINT32	R	
+62,63	0x0C1F	V23 Voltage	0-Vmax	U1	UINT32	R	
+64,65	0x0C20	V31 Voltage	0-Vmax	U1	UINT32	R	
13696-13703		1-Cycle Total Values					
+0,1	0x0F00	Total kW	-Pmax-Pmax	U3	INT32	R	
+2,3	0x0F01	Total kvar	-Pmax-Pmax	U3	INT32	R	
+4,5	0x0F02	Total kVA	0-Pmax	U3	UINT32	R	
+6,7	0x0F03	Total PF	-1000-1000	×0.001	INT32	R	
+8,9	0x0F04	Total PF lag	0-1.000	×0.001	UINT16	R	
+10,11	0x0F05	Total PF lead	0-1.000	×0.001	UINT16	R	
+12,13	0x0F06	Total kW import	0-Pmax	U3	UINT32	R	
+14,15	0x0F07	Total kW export	0-Pmax	U3	UINT32	R	
+16,17	0x0F08	Total kvar import	0-Pmax	U3	UINT32	R	
+18,19	0x0F09	Total kvar export	0-Pmax	U3	UINT32	R	
+20,21	0x0FOA	3-phase average L-N/L-L voltage	0-Vmax	U1	UINT32	R	1
+22,23	0x0FOB	3-phase average L-L voltage	0-Vmax	U1	UINT32	R	
+24,25	0x0FOC	3-phase average current	0-Imax	U2	UINT32	R	
13824-13833		1-Cycle Auxiliary Values					
+0,1	0x1000	Not used			UINT32	R	
+2,3	0x1001	In (neutral) Current	0-Imax	U2	UINT32	R	
+4,5	0x1002	Frequency	0-Fmax	×0.01Hz	UINT32	R	
+6,7	0x1003	Voltage unbalance	0-3000	×0.1%	UINT32	R	
+8,9	0x1004	Current unbalance	0-3000	×0.1%	UINT32	R	
13888-13919		Phasor					
+0,1	0x1080	V1/V12 Voltage magnitude	0-Vmax	U1	UINT32	R	2

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
+2,3	0x1081	V2/V23 Voltage magnitude	0-Vmax	U1	UINT32	R	2
+4,5	0x1082	V3/V31 Voltage magnitude	0-Vmax	U1	UINT32	R	2
+6,7	0x1083	Not used			UINT32	R	
+8,9	0x1084	I1 Current magnitude	0-Imax	U2	UINT32	R	
+10,11	0x1085	I2 Current magnitude	0-Imax	U2	UINT32	R	
+12,13	0x1086	I3 Current magnitude	0-Imax	U2	UINT32	R	
+14,15	0x1087	Not used			UINT32	R	
+16,17	0x1088	V1/V12 Voltage angle	-1800-1800	×0.1°	INT32	R	2
+18,19	0x1089	V2/V23 Voltage angle	-1800-1800	×0.1°	INT32	R	2
+20,21	0x108A	V3/V31 Voltage angle	-1800-1800	×0.1°	INT32	R	2
+22,23	0x108B	Not used			INT32	R	
+24,25	0x108C	I1 Current angle	-1800-1800	×0.1°	INT32	R	
+26,27	0x108D	I2 Current angle	-1800-1800	×0.1°	INT32	R	
+28,29	0x108E	I3 Current angle	-1800-1800	×0.1°	INT32	R	
+30,31	0x108F	Not used			INT32	R	
13952-14017		1-Second Phase Values					
+0,1	0x1100	V1/V12 Voltage	0-Vmax	U1	UINT32	R	1
+2,3	0x1101	V2/V23 Voltage	0-Vmax	U1	UINT32	R	1
+4,5	0x1102	V3/V31 Voltage	0-Vmax	U1	UINT32	R	1
+6,7	0x1103	I1 Current	0-Imax	U2	UINT32	R	
+8,9	0x1104	I2 Current	0-Imax	U2	UINT32	R	
+10,11	0x1105	I3 Current	0-Imax	U2	UINT32	R	
+12,13	0x1106	kW L1	-Pmax-Pmax	U3	INT32	R	
+14,15	0x1107	kW L2	-Pmax-Pmax	U3	INT32	R	
+16,17	0x1108	kW L3	-Pmax-Pmax	U3	INT32	R	
+18,19	0x1109	kvar L1	-Pmax-Pmax	U3	INT32	R	
+20,21	0x110A	kvar L2	-Pmax-Pmax	U3	INT32	R	
+22,23	0x110B	kvar L3	-Pmax-Pmax	U3	INT32	R	
+24,25	0x110C	kVA L1	0-Pmax	U3	UINT32	R	
+26,27	0x110D	kVA L2	0-Pmax	U3	UINT32	R	
+28,29	0x110E	kVA L3	0-Pmax	U3	UINT32	R	
+30,31	0x110F	Power factor L1	-1000-1000	×0.001	INT32	R	
+32,33	0x1110	Power factor L2	-1000-1000	×0.001	INT32	R	
+34,35	0x1111	Power factor L3	-1000-1000	×0.001	INT32	R	
+36,37	0x1112	V1/V12 Voltage THD	0-9999	×0.1%	UINT32	R	2,6
+38,39	0x1113	V2/V23 Voltage THD	0-9999	×0.1%	UINT32	R	2,6
+40,41	0x1114	V3/V31 Voltage THD	0-9999	×0.1%	UINT32	R	2,6
+42,43	0x1115	I1 Current THD	0-9999	×0.1%	UINT32	R	6
+44,45	0x1116	I2 Current THD	0-9999	×0.1%	UINT32	R	6
+46,47	0x1117	I3 Current THD	0-9999	×0.1%	UINT32	R	6
+48,49	0x1118	I1 K-Factor	10-9999	×0.1	UINT32	R	6
+50,51	0x1119	I2 K-Factor	10-9999	×0.1	UINT32	R	6
+52,53	0x111A	I3 K-Factor	10-9999	×0.1	UINT32	R	6

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
+54,55	0x111B	I1 Current TDD	0-1000	×0.1%	UINT32	R	6
+56,57	0x111C	I2 Current TDD	0-1000	×0.1%	UINT32	R	6
+58,59	0x111D	I3 Current TDD	0-1000	×0.1%	UINT32	R	6
+60,61	0x111E	V12 Voltage	0-Vmax	U1	UINT32	R	
+62,63	0x111F	V23 Voltage	0-Vmax	U1	UINT32	R	
+64,65	0x1120	V31 Voltage	0-Vmax	U1	UINT32	R	
14144-14175		3-Second Powers					
+0,1	0x1280	kW L1	-Pmax-Pmax	U3	INT32	R	
+2,3	0x1281	kW L2	-Pmax-Pmax	U3	INT32	R	
+4,5	0x1282	kW L3	-Pmax-Pmax	U3	INT32	R	
+6,7	0x1283	kvar L1	-Pmax-Pmax	U3	INT32	R	
+8,9	0x1284	kvar L2	-Pmax-Pmax	U3	INT32	R	
+10,11	0x1285	kvar L3	-Pmax-Pmax	U3	INT32	R	
+12,13	0x1286	kVA L1	0-Pmax	U3	UINT32	R	
+14,15	0x1287	kVA L2	0-Pmax	U3	UINT32	R	
+16,17	0x1288	kVA L3	0-Pmax	U3	UINT32	R	
+18,19	0x1289	Power factor L1	-1000-1000	×0.001	INT32	R	
+20,21	0x128A	Power factor L2	-1000-1000	×0.001	INT32	R	
+22,23	0x128B	Power factor L3	-1000-1000	×0.001	INT32	R	
+24,25	0x128C	Total kW	-Pmax-Pmax	U3	INT32	R	
+26,27	0x128D	Total kvar	-Pmax-Pmax	U3	INT32	R	
+28,29	0x128E	Total kVA	0-Pmax	U3	UINT32	R	
+30,31	0x128F	Total PF	-1000-1000	×0.001	INT32	R	
14336-14343		1-Second Total Values					
+0,1	0x1400	Total kW	-Pmax-Pmax	U3	INT32	R	
+2,3	0x1401	Total kvar	-Pmax-Pmax	U3	INT32	R	
+4,5	0x1402	Total kVA	0-Pmax	U3	UINT32	R	
+6,7	0x1403	Total PF	-1000-1000	×0.001	INT32	R	
+8,9	0x1404	Total PF lag	0-1.000	×0.001	UINT16	R	
+10,11	0x1405	Total PF lead	0-1.000	×0.001	UINT16	R	
+12,13	0x1406	Total kW import	0-Pmax	U3	UINT32	R	
+14,15	0x1407	Total kW export	0-Pmax	U3	UINT32	R	
+16,17	0x1408	Total kvar import	0-Pmax	U3	UINT32	R	
+18,19	0x1409	Total kvar export	0-Pmax	U3	UINT32	R	
+20,21	0x140A	3-phase average L-N/L-L voltage	0-Vmax	U1	UINT32	R	1
+22,23	0x140B	3-phase average L-L voltage	0-Vmax	U1	UINT32	R	
+24,25	0x140C	3-phase average current	0-Imax	U2	UINT32	R	
14464-14473		1-Second Auxiliary Values					
+0,1	0x1500	Not used			UINT32	R	
+2,3	0x1501	In (neutral) Current	0-Imax	U2	UINT32	R	
+4,5	0x1502	Frequency	0-Fmax	×0.01Hz	UINT32	R	
+6,7	0x1503	Voltage unbalance	0-3000	×0.1%	UINT32	R	
+8,9	0x1504	Current unbalance	0-3000	×0.1%	UINT32	R	

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
14528-14551		Present Harmonic Demands					
+0,1	0x1580	V1/V12 THD demand	0-9999	×0.1%	UINT32	R	2
+2,3	0x1581	V2/V23 THD demand	0-9999	×0.1%	UINT32	R	2
+4,5	0x1582	V3/V31 THD demand	0-9999	×0.1%	UINT32	R	2
+6,7	0x1583	Not used			UINT32	R	
+8,9	0x1584	I1 THD demand	0-9999	×0.1%	UINT32	R	
+10,11	0x1585	I2 THD demand	0-9999	×0.1%	UINT32	R	
+12,13	0x1586	I3 THD demand	0-9999	×0.1%	UINT32	R	
+14,15	0x1587	Not used			UINT32	R	
+16,17	0x1588	I1 TDD demand	0-1000	×0.1%	UINT32	R	
+18,19	0x1589	I2 TDD demand	0-1000	×0.1%	UINT32	R	
+20,21	0x158A	I3 TDD demand	0-1000	×0.1%	UINT32	R	
+22,23	0x158B	Not used			UINT32	R	
14592-14651		Present Volt, Ampere and Power Demands					
+0,1	0x1600	V1/V12 Volt demand	0-Vmax	U1	UINT32	R	2
+2,3	0x1601	V2/V23 Volt demand	0-Vmax	U1	UINT32	R	2
+4,5	0x1602	V3/V31 Volt demand	0-Vmax	U1	UINT32	R	2
+6,7	0x1603	I1 Ampere demand	0-Imax	U2	UINT32	R	
+8,9	0x1604	I2 Ampere demand	0-Imax	U2	UINT32	R	
+10,11	0x1605	I3 Ampere demand	0-Imax	U2	UINT32	R	
+12,13	0x1606	kW import block demand	0-Pmax	U3	UINT32	R	
+14,15	0x1607	kvar import block demand	0-Pmax	U3	UINT32	R	
+16,17	0x1608	kVA block demand	0-Pmax	U3	UINT32	R	
+18,19	0x1609	kW import sliding window demand	0-Pmax	U3	UINT32	R	
+20,21	0x160A	kvar import sliding window demand	0-Pmax	U3	UINT32	R	
+22,23	0x160B	kVA sliding window demand	0-Pmax	U3	UINT32	R	
+24,25	0x160C	Not used			UINT32	R	
+26,27	0x160D	Not used			UINT32	R	
+28,29	0x160E	Not used			UINT32	R	
+30,31	0x160F	kW import accumulated demand	0-Pmax	U3	UINT32	R	
+32,33	0x1610	kvar import accumulated demand	0-Pmax	U3	UINT32	R	
+34,35	0x1611	kVA accumulated demand	0-Pmax	U3	UINT32	R	
+36,37	0x1612	kW import predicted sliding window demand	0-Pmax	U3	UINT32	R	
+38,39	0x1613	kvar import predicted sliding window demand	0-Pmax	U3	UINT32	R	
+40,41	0x1614	kVA predicted sliding window demand	0-Pmax	U3	UINT32	R	
+42,43	0x1615	PF (import) at Max. kVA sliding window demand	0-1000	×0.001	UINT32	R	
+44,45	0x1616	kW export block demand	0-Pmax	U3	UINT32	R	
+46,47	0x1617	kvar export block demand	0-Pmax	U3	UINT32	R	
+48,49	0x1618	kW export sliding window demand	0-Pmax	U3	UINT32	R	
+50,51	0x1619	kvar export sliding window demand	0-Pmax	U3	UINT32	R	
+52,53	0x161A	kW export accumulated demand	0-Pmax	U3	UINT32	R	
+54,55	0x161B	kvar export accumulated demand	0-Pmax	U3	UINT32	R	
+56,57	0x161C	kW export predicted sliding window demand	0-Pmax	U3	UINT32	R	

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
+58,59	0x161D	kvar export predicted sliding window demand	0-Pmax	U3	UINT32	R	
14720-14737		Total Energies					
+0,1	0x1700	kWh import	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x1701	kWh export	0-999,999,999	1 kWh	UINT32	R	
+4,5	0x1702	Not used			INT32	R	
+6,7	0x1703	Not used			UINT32	R	
+8,9	0x1704	kvarh import	0-999,999,999	1 kvarh	UINT32	R	
+10,11	0x1705	kvarh export	0-999,999,999	1 kvarh	UINT32	R	
+12,13	0x1706	Not used			INT32	R	
+14,15	0x1707	Not used			UINT32	R	
+16,17	0x1708	kVAh total	0-999,999,999	1 kVAh	UINT32	R	
14784-14799		Summary Energy Registers					
+0,1	0x1780	Summary energy register #1	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x1781	Summary energy register #2	0-999,999,999	1 kWh	UINT32	R	
		...					
+14,15	0x1787	Summary energy register #8	0-999,999,999	1 kWh	UINT32	R	
14848-14865		Phase Energies					
+0,1	0x1800	kWh import L1	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x1801	kWh import L2	0-999,999,999	1 kWh	UINT32	R	
+4,5	0x1802	kWh import L3	0-999,999,999	1 kWh	UINT32	R	
+6,7	0x1803	kvarh import L1	0-999,999,999	1 kvarh	UINT32	R	
+8,9	0x1804	kvarh import L2	0-999,999,999	1 kvarh	UINT32	R	
+10,11	0x1805	kvarh import L3	0-999,999,999	1 kvarh	UINT32	R	
+12,13	0x1806	kVAh total L1	0-999,999,999	1 kVAh	UINT32	R	
+14,15	0x1807	kVAh total L2	0-999,999,999	1 kVAh	UINT32	R	
+16,17	0x1808	kVAh total L3	0-999,999,999	1 kVAh	UINT32	R	
14912-14931		Symmetrical Components					
+0, 1	0x1880	Positive-sequence voltage	0-Vmax	U1	UINT32	R	
+2, 3	0x1881	Negative-sequence voltage	0-Vmax	U1	UINT32	R	
+4, 5	0x1882	Zero-sequence voltage	0-Vmax	U1	UINT32	R	
+6, 7	0x1883	Negative-sequence voltage unbalance	0-3000	×0.1%	UINT32	R	
+8, 9	0x1884	Zero-sequence voltage unbalance	0-3000	×0.1%	UINT32	R	
+10, 11	0x1885	Positive-sequence current	0-Imax	U2	UINT32	R	
+12, 13	0x1886	Negative-sequence current	0-Imax	U2	UINT32	R	
+14, 15	0x1887	Zero-sequence current	0-Imax	U2	UINT32	R	
+16, 17	0x1888	Negative-sequence current unbalance	0-3000	×0.1%	UINT32	R	
+18, 19	0x1889	Zero-sequence current unbalance	0-3000	×0.1%	UINT32	R	
14976-15075		V1/V12 Harmonics					2,7
+0,1	0x1900	H01 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
+2,3	0x1901	H02 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
		...					
+98,99	0x1931	H50 Harmonic magnitude	0-10000	×0.01%	UINT32	R	

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
15104-15203		V2/V23 Harmonics					2,7
+0,1	0x1A00	H01 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
+2,3	0x1A01	H02 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
		...					
+98,99	0x1A31	H50 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
15232-15331		V3/V31 Harmonics					2,7
+0,1	0x1B00	H01 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
+2,3	0x1B01	H02 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
		...					
+98,99	0x1B31	H50 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
15360-15459		I1 Harmonics					7
+0,1	0x1C00	H01 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
+2,3	0x1C01	H02 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
		...					
+98,99	0x1C31	H50 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
15488-15587		I2 Harmonics					7
+0,1	0x1D00	H01 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
+2,3	0x1D01	H02 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
		...					
+98,99	0x1D31	H50 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
15616-15715		I3 Harmonics					7
+0,1	0x1E00	H01 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
+2,3	0x1E01	H02 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
		...					
+98,99	0x1E31	H50 Harmonic magnitude	0-10000	×0.01%	UINT32	R	
17024-17059		Fundamental Phase Values					5
+0,1	0x2900	V1/V12 Voltage	0-Vmax	U1	UINT32	R	2
+2,3	0x2901	V2/V23 Voltage	0-Vmax	U1	UINT32	R	2
+4,5	0x2902	V3/V31 Voltage	0-Vmax	U1	UINT32	R	2
+6,7	0x2903	I1 Current	0-Imax	U2	UINT32	R	
+8,9	0x2904	I2 Current	0-Imax	U2	UINT32	R	
+10,11	0x2905	I3 Current	0-Imax	U2	UINT32	R	
+12,13	0x2906	kW L1	-Pmax-Pmax	U3	INT32	R	
+14,15	0x2907	kW L2	-Pmax-Pmax	U3	INT32	R	
+16,17	0x2908	kW L3	-Pmax-Pmax	U3	INT32	R	
+18,19	0x2909	kvar L1	-Pmax-Pmax	U3	INT32	R	
+20,21	0x290A	kvar L2	-Pmax-Pmax	U3	INT32	R	
+22,23	0x290B	kvar L3	-Pmax-Pmax	U3	INT32	R	
+24,25	0x290C	kVA L1	0-Pmax	U3	UINT32	R	
+26,27	0x290D	kVA L2	0-Pmax	U3	UINT32	R	
+28,29	0x290E	kVA L3	0-Pmax	U3	UINT32	R	
+30,31	0x290F	Power factor L1	-1000-1000	×0.001	INT32	R	
+32,33	0x2910	Power factor L2	-1000-1000	×0.001	INT32	R	

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
+34,35	0x2911	Power factor L3	-1000-1000	×0.001	INT32	R	
17088-17099		Flicker					2
+0,1	0x2980	V1 Pst	0-10000	×0.01	UINT32	R	
+2,3	0x2981	V2 Pst	0-10000	×0.01	UINT32	R	
+4,5	0x2982	V3 Pst	0-10000	×0.01	UINT32	R	
+6,7	0x2983	V1 Plt	0-10000	×0.01	UINT32	R	
+8,9	0x2984	V2 Plt	0-10000	×0.01	UINT32	R	
+10,11	0x2985	V3 Plt	0-10000	×0.01	UINT32	R	
17152-17159		Fundamental Total Values					5
+0,1	0x2A00	Total fundamental kW	-Pmax-Pmax	U3	INT32	R	
+2,3	0x2A01	Total fundamental kvar	-Pmax-Pmax	U3	INT32	R	
+4,5	0x2A02	Total fundamental kVA	0-Pmax	U3	UINT32	R	
+6,7	0x2A03	Total fundamental PF	-1000-1000	×0.001	INT32	R	
17408-17467		Minimum 1-Cycle Phase Values					
+0,1	0x2C00	V1/V12 Voltage	0-Vmax	U1	UINT32	R	2
+2,3	0x2C01	V2/V23 Voltage	0-Vmax	U1	UINT32	R	2
+4,5	0x2C02	V3/V31 Voltage	0-Vmax	U1	UINT32	R	2
+6,7	0x2C03	I1 Current	0-Imax	U2	UINT32	R	
+8,9	0x2C04	I2 Current	0-Imax	U2	UINT32	R	
+10,11	0x2C05	I3 Current	0-Imax	U2	UINT32	R	
+12-35	0x2C06-0x2C11	Not used	0		INT32	R	
+36,37	0x2C12	V1/V12 Voltage THD	0-9999	×0.1%	UINT32	R	2, 5
+38,39	0x2C13	V2/V23 Voltage THD	0-9999	×0.1%	UINT32	R	2, 5
+40,41	0x2C14	V3/V31 Voltage THD	0-9999	×0.1%	UINT32	R	2, 5
+42,43	0x2C15	I1 Current THD	0-9999	×0.1%	UINT32	R	5
+44,45	0x2C16	I2 Current THD	0-9999	×0.1%	UINT32	R	5
+46,47	0x2C17	I3 Current THD	0-9999	×0.1%	UINT32	R	5
+48,49	0x2C18	I1 K-Factor	10-9999	×0.1	UINT32	R	5
+50,51	0x2C19	I2 K-Factor	10-9999	×0.1	UINT32	R	5
+52,53	0x2C1A	I3 K-Factor	10-9999	×0.1	UINT32	R	5
+54,55	0x2C1B	I1 Current TDD	0-1000	×0.1%	UINT32	R	5
+56,57	0x2C1C	I2 Current TDD	0-1000	×0.1%	UINT32	R	5
+58,59	0x2C1D	I3 Current TDD	0-1000	×0.1%	UINT32	R	5
17536-17543		Minimum 1-Cycle Total Values					
+0,1	0x2D00	Total kW	-Pmax-Pmax	U3	INT32	R	
+2,3	0x2D01	Total kvar	-Pmax-Pmax	U3	INT32	R	
+4,5	0x2D02	Total kVA	0-Pmax	U3	UINT32	R	
+6,7	0x2D03	Total PF	0-1000	×0.001	UINT32	R	Absolute value
17664-17669		Minimum 1-Cycle Auxiliary Values					
+0,1	0x2E00	Not used			UINT32	R	
+2,3	0x2E01	In Current	0-Imax	U2	UINT32	R	
+4,5	0x2E02	Frequency	0-Fmax	×0.01Hz	UINT32	R	

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
18432-18491		Maximum 1-Cycle Phase Values					
+0,1	0x3400	V1/V12 Voltage	0-Vmax	U1	UINT32	R	2
+2,3	0x3401	V2/V23 Voltage	0-Vmax	U1	UINT32	R	2
+4,5	0x3402	V3/V31 Voltage	0-Vmax	U1	UINT32	R	2
+6,7	0x3403	I1 Current	0-Imax	U2	UINT32	R	
+8,9	0x3404	I2 Current	0-Imax	U2	UINT32	R	
+10,11	0x3405	I3 Current	0-Imax	U2	UINT32	R	
+12-35	0x3406-0x3411	Not used	0		INT32	R	
+36,37	0x3412	V1/V12 Voltage THD	0-9999	×0.1%	UINT32	R	2, 5
+38,39	0x3413	V2/V23 Voltage THD	0-9999	×0.1%	UINT32	R	2, 5
+40,41	0x3414	V3/V31 Voltage THD	0-9999	×0.1%	UINT32	R	2, 5
+42,43	0x3415	I1 Current THD	0-9999	×0.1%	UINT32	R	5
+44,45	0x3416	I2 Current THD	0-9999	×0.1%	UINT32	R	5
+46,47	0x3417	I3 Current THD	0-9999	×0.1%	UINT32	R	5
+48,49	0x3418	I1 K-Factor	10-9999	×0.1	UINT32	R	5
+50,51	0x3419	I2 K-Factor	10-9999	×0.1	UINT32	R	5
+52,53	0x341A	I3 K-Factor	10-9999	×0.1	UINT32	R	5
+54,55	0x341B	I1 Current TDD	0-1000	×0.1%	UINT32	R	5
+56,57	0x341C	I2 Current TDD	0-1000	×0.1%	UINT32	R	5
+58,59	0x341D	I3 Current TDD	0-1000	×0.1%	UINT32	R	5
18560-18567		Maximum 1-Cycle Total Values					
+0,1	0x3500	Total kW	-Pmax-Pmax	U3	INT32	R	
+2,3	0x3501	Total kvar	-Pmax-Pmax	U3	INT32	R	
+4,5	0x3502	Total kVA	0-Pmax	U3	UINT32	R	
+6,7	0x3503	Total PF	0-1000	×0.001	UINT32	R	Absolute value
18688-18693		Maximum 1-Cycle Auxiliary Values					
+0,1	0x3600	Not used			UINT32	R	
+2,3	0x3601	In Current	0-Imax	U2	UINT32	R	
+4,5	0x3602	Frequency	0-Fmax	×0.01Hz	UINT32	R	
18816-18849		Maximum Demands					
+0,1	0x3700	V1/V12 Maximum volt demand	0-Vmax	U1	UINT32	R	2
+2,3	0x3701	V2/V23 Maximum volt demand	0-Vmax	U1	UINT32	R	2
+4,5	0x3702	V3/V31 Maximum volt demand	0-Vmax	U1	UINT32	R	2
+6,7	0x3703	I1 Maximum ampere demand	0-Imax	U2	UINT32	R	
+8,9	0x3704	I2 Maximum ampere demand	0-Imax	U2	UINT32	R	
+10,11	0x3705	I3 Maximum ampere demand	0-Imax	U2	UINT32	R	
+12,13	0x3706	Not used			UINT32	R	
+14,15	0x3707	Not used			UINT32	R	
+16,17	0x3708	Not used			UINT32	R	
+18,19	0x3709	Maximum kW import sliding window demand	0-Pmax	U3	UINT32	R	
+20,21	0x370A	Maximum kvar import sliding window demand	0-Pmax	U3	UINT32	R	
+22,23	0x370B	Maximum kVA sliding window demand	0-Pmax	U3	UINT32	R	

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
+24,25	0x3737	Not used			UINT32	R	
+26,27	0x370D	Not used			UINT32	R	
+28,29	0x370E	Not used			UINT32	R	
+30,31	0x370F	Maximum kW export sliding window demand	0-Pmax	U3	UINT32	R	
+32,33	0x3710	Maximum kvar export sliding window demand	0-Pmax	U3	UINT32	R	
19008-19031		Maximum Harmonic Demands					
+0,1	0x3880	V1/V12 THD demand	0-9999	×0.1%	UINT32	R	²
+2,3	0x3881	V2/V23 THD demand	0-9999	×0.1%	UINT32	R	²
+4,5	0x3882	V3/V31 THD demand	0-9999	×0.1%	UINT32	R	²
+6,7	0x3883	Not used			UINT32	R	
+8,9	0x3884	I1 THD demand	0-9999	×0.1%	UINT32	R	
+10,11	0x3885	I2 THD demand	0-9999	×0.1%	UINT32	R	
+12,13	0x3886	I3 THD demand	0-9999	×0.1%	UINT32	R	
+14,15	0x3887	Not used			UINT32	R	
+16,17	0x3888	I1 TDD demand	0-1000	×0.1%	UINT32	R	
+18,19	0x3889	I2 TDD demand	0-1000	×0.1%	UINT32	R	
+20,21	0x388A	I3 TDD demand	0-1000	×0.1%	UINT32	R	
+22,23	0x388B	Not used			UINT32	R	
19328-19359		Scaled Analog Inputs					
+0,1	0x3B00	Analog input AI1	AI1min-AI1Max		UINT32	R	
+2,3	0x3B01	Analog input AI2	AI2min-AI2Max		UINT32	R	
19392-19393		Raw Analog Inputs					
+0,1	0x3B80	Analog input AI1	0-4095		UINT32	R	
+2,3	0x3B81	Analog input AI2	0-4095		UINT32	R	
19456-19459		TOU Parameters					
+0,1	0x3C00	Active tariff	0-7		UINT32	R	
+2,3	0x3C01	Active profile	0-15: 1-3 = Season 1 Profile #1-4, 4-7 = Season 2 Profile #1-4, 8-11 = Season 3 Profile #1-4, 12-15 = Season 4 Profile #1-4		UINT32	R	
19520-19524		Scaled Analog Outputs					
+0,1	0x3C80	Analog output AO1	0-4095		UINT32	R/W	
+2,3	0x3C81	Analog output AO2	0-4095		UINT32	R/W	
19584-19599		TOU Energy Register #1					
+0,1	0x3D00	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x3D01	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	
+14,15	0x3D07	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
19712-19727		TOU Energy Register #2					
+0,1	0x3E00	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x3E01	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
+14,15	0x3E07	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
19840-19855		TOU Energy Register #3					
+0,1	0x3F00	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x3F01	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	
+14,15	0x3F07	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
19968-19983		TOU Energy Register #4					
+0,1	0x4000	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x4001	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	
+14,15	0x4007	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
20096-20111		TOU Energy Register #5					
+0,1	0x4100	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x4101	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	
+14,15	0x4107	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
20224-20239		TOU Energy Register #6					
+0,1	0x4200	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x4201	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	
+14,15	0x4207	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
20352-20367		TOU Energy Register #7					
+0,1	0x4300	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x4301	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	
+14,15	0x4307	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
20480-20495		TOU Energy Register #8					
+0,1	0x4400	Tariff #1 register	0-999,999,999	1 kWh	UINT32	R	
+2,3	0x4401	Tariff #2 register	0-999,999,999	1 kWh	UINT32	R	
		...				R	
+14,15	0x4407	Tariff #8 register	0-999,999,999	1 kWh	UINT32	R	
20608-20623		Summary Energy Accumulated Demands					
+0,1	0x4500	Summary register #1 demand	0-Pmax	U3	UINT32	R	
+2,3	0x4501	Summary register #2 demand	0-Pmax	U3	UINT32	R	
		...					
+14,15	0x4507	Summary register #8 demand	0-Pmax	U3	UINT32	R	
20672-20687		Summary Energy Block Demands					
+0,1	0x4580	Summary register #1 demand	0-Pmax	U3	UINT32	R	
+2,3	0x4581	Summary register #2 demand	0-Pmax	U3	UINT32	R	
		...					
+14,15	0x4587	Summary register #8 demand	0-Pmax	U3	UINT32	R	
20736-20751		Summary Energy Sliding Window Demands					
+0,1	0x4600	Summary register #1 demand	0-Pmax	U3	UINT32	R	

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
+2,3	0x4601	Summary register #2 demand	0-Pmax	U3	UINT32	R	
		...					
+14,15	0x4607	Summary register #8 demand	0-Pmax	U3	UINT32	R	
20928-20943		Summary Energy Maximum Demands					
+0,1	0x4780	Summary register #1 maximum demand	0-Pmax	U3	UINT32	R	
+2,3	0x4781	Summary register #2 maximum demand	0-Pmax	U3	UINT32	R	
		...					
+14,15	0x4787	Summary register #8 maximum demand	0-Pmax	U3	UINT32	R	
20992-21023		TOU Maximum Demand Register #1					
+0,1	0x4800	Tariff #1 maximum demand	0-Pmax	U3	UINT32	R	
+2,3	0x4801	Tariff #2 maximum demand	0-Pmax	U3	UINT32	R	
		...				R	
+14,15	0x4807	Tariff #8 maximum demand	0-Pmax	U3	UINT32	R	
21120-21135		TOU Maximum Demand Register #2					
+0,1	0x4900	Tariff #1 maximum demand	0-Pmax	U3	UINT32	R	
+2,3	0x4901	Tariff #2 maximum demand	0-Pmax	U3	UINT32	R	
		...				R	
+14,15	0x4907	Tariff #8 maximum demand	0-Pmax	U3	UINT32	R	
21248-21263		TOU Maximum Demand Register #3					
+0,1	0x4A00	Tariff #1 maximum demand	0-Pmax	U3	UINT32	R	
+2,3	0x4A01	Tariff #2 maximum demand	0-Pmax	U3	UINT32	R	
		...				R	
+14,15	0x4A07	Tariff #8 maximum demand	0-Pmax	U3	UINT32	R	
21056-21071		TOU Maximum Demand Register #4					
+0,1	0x4880	Tariff #1 maximum demand	0-Pmax	U3	UINT32	R	
+2,3	0x4881	Tariff #2 maximum demand	0-Pmax	U3	UINT32	R	
		...				R	
+14,15	0x4887	Tariff #8 maximum demand	0-Pmax	U3	UINT32	R	
21184-21199		TOU Maximum Demand Register #5					
+0,1	0x4980	Tariff #1 maximum demand	0-Pmax	U3	UINT32	R	
+2,3	0x4981	Tariff #2 maximum demand	0-Pmax	U3	UINT32	R	
		...				R	
+14,15	0x4987	Tariff #8 maximum demand	0-Pmax	U3	UINT32	R	
21312-21325		TOU Maximum Demand Register #6					
+0,1	0x4A80	Tariff #1 maximum demand	0-Pmax	U3	UINT32	R	
+2,3	0x4A81	Tariff #2 maximum demand	0-Pmax	U3	UINT32	R	
		...				R	
+14,15	0x4A87	Tariff #8 maximum demand	0-Pmax	U3	UINT32	R	
22400-22415		TOU Maximum Demand Register #7					
+0,1	0x5300	Tariff #1 maximum demand	0-Pmax	U3	UINT32	R	
+2,3	0x5301	Tariff #2 maximum demand	0-Pmax	U3	UINT32	R	
		...				R	
+14,15	0x5307	Tariff #8 maximum demand	0-Pmax	U3	UINT32	R	

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
22464-22479		TOU Maximum Demand Register #8					
+0,1	0x5380	Tariff #1 maximum demand	0-Pmax	U3	UINT32	R	
+2,3	0x5381	Tariff #2 maximum demand	0-Pmax	U3	UINT32	R	
		...				R	
+14,15	0x5387	Tariff #8 maximum demand	0-Pmax	U3	UINT32	R	
24576-24675		V1/V12 Harmonic Angles					2, 4
+0,1	0x6400	H01 Harmonic angle	-1800-1800	×0.1°	INT32	R	
+2,3	0x6401	H02 Harmonic angle	-1800-1800	×0.1°	INT32	R	
		...					
+98,99	0x6431	H50 Harmonic angle	-1800-1800	×0.1°	INT32	R	
24704-24803		V2/V23 Harmonic Angles					2, 4
+0,1	0x6500	H01 Harmonic angle	-1800-1800	×0.1°	INT32	R	
+2,3	0x6501	H02 Harmonic angle	-1800-1800	×0.1°	INT32	R	
		...					
+98,99	0x6531	H50 Harmonic angle	-1800-1800	×0.1°	INT32	R	
24832-24931		V3/V31 Harmonic Angles					2, 4
+0,1	0x6600	H01 Harmonic angle	-1800-1800	×0.1°	INT32	R	
+2,3	0x6601	H02 Harmonic angle	-1800-1800	×0.1°	INT32	R	
		...					
+98,99	0x6631	H50 Harmonic angle	-1800-1800	×0.1°	INT32	R	
25088-25187		I1 Harmonic Angles					4
+0,1	0x6800	H01 Harmonic angle	-1800-1800	×0.1°	INT32	R	
+2,3	0x6801	H02 Harmonic angle	-1800-1800	×0.1°	INT32	R	
		...					
+98,99	0x6831	H50 Harmonic angle	-1800-1800	×0.1°	INT32	R	
25216-25315		I2 Harmonic Angles					4
+0,1	0x6900	H01 Harmonic angle	-1800-1800	×0.1°	INT32	R	
+2,3	0x6901	H02 Harmonic angle	-1800-1800	×0.1°	INT32	R	
		...					
+98,99	0x6931	H50 Harmonic angle	-1800-1800	×0.1°	INT32	R	
25344-25443		I3 Harmonic Angles					4
+0,1	0x6A00	H01 Harmonic angle	-1800-1800	×0.1°	INT32	R	
+2,3	0x6A01	H02 Harmonic angle	-1800-1800	×0.1°	INT32	R	
		...					
+98,99	0x6A31	H50 Harmonic angle	-1800-1800	×0.1°	INT32	R	
25664-25713		3-Second RMS Values					
+0,1	0x6C80	V1 voltage	0-Vmax	U1	UINT32	R	2
+2,3	0x6C81	V2 voltage	0-Vmax	U1	UINT32	R	2
+4,5	0x6C82	V3 voltage	0-Vmax	U1	UINT32	R	2
+6-33	0x6C83-0x6C90	Not used	0		UINT32	R	
+34,35	0x6C91	Zero-sequence voltage	0-Vmax	U1	UINT32	R	
+36,37	0x6C92	Zero-sequence current	0-Imax	U2	UINT32	R	

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
+38,39	0x6C93	Not used	0		UIN32	R	
+40,41	0x6C94	Negative-sequence voltage unbalance	0-3000	×0.1%	UIN32	R	
+42,43	0x6C95	Negative-sequence current unbalance	0-3000	×0.1%	UIN32	R	
+44-47	0x6C96- 0x6C97	Not used	0		UIN32	R	
+48,49	0x6C98	Frequency	0-10000	×0.01Hz	UIN32	R	10-sec value GOST 514149, 20-sec value GOST 13109
+50,51	0x6C99	Positive-sequence voltage	0-Vmax	U1	UIN32	R	
+52,53	0x6C9A	Zero-sequence voltage unbalance	0-300.0	×0.1%	UIN32	R	
26880-26993		1-Minute RMS Values					
+0,1	0x7600	V1 Voltage	0-Vmax	U1	UIN32	R	²
+2,3	0x7601	V2 Voltage	0-Vmax	U1	UIN32	R	²
+4,5	0x7602	V3 Voltage	0-Vmax	U1	UIN32	R	²
+6-33	0x7603- 0x7610	Not used	0		UIN32	R	
+34,35	0x7611	Zero-sequence voltage	0-Vmax	U1	UIN32	R	
+36,37	0x7612	Zero-sequence current	0-Imax	U2	UIN32	R	
+38,39	0x7613	Not used	0		UIN32	R	
+40,41	0x7614	Negative-sequence voltage unbalance	0-3000	×0.1%	UIN32	R	
+42,43	0x7615	Negative-sequence current unbalance	0-3000	×0.1%	UIN32	R	
+44-49	0x7616- 0x7618	Not used	0		UIN32	R	
+50,51	0x7619	Positive-sequence voltage	0-Vmax	U1	UIN32	R	
+52,53	0x761A	Zero-sequence voltage unbalance	0-300.0	×0.1%	UIN32	R	
25728-25781		10-Minute RMS Values					
+0,1	0x6D00	V1 Voltage	0-Vmax	U1	UIN32	R	²
+2,3	0x6D01	V2 Voltage	0-Vmax	U1	UIN32	R	²
+4,5	0x6D02	V3 Voltage	0-Vmax	U1	UIN32	R	²
+6-33		Not used	0		UIN32	R	
+34,35	0x6D11	Zero-sequence voltage	0-Vmax	U1	UIN32	R	
+36,37	0x6D12	Zero-sequence current	0-Imax	U2	UIN32	R	
+38,39	0x6D13	Not used	0		UIN32	R	
+40,41	0x6D14	Negative-sequence voltage unbalance	0-3000	×0.1%	UIN32	R	
+42,43	0x6D15	Negative-sequence current unbalance	0-3000	×0.1%	UIN32	R	
+44-49	0x6D16- 0x6D18	Not used	0		UIN32	R	
+50,51	0x6D19	Positive-sequence voltage	0-Vmax	U1	UIN32	R	
+52,53	0x6D1A	Zero-sequence voltage unbalance	0-300.0	×0.1%	UIN32	R	
25920-25957		3-Sec Total Harmonics					
+0,1	0x6E80	V1 THD	0-9999	×0.1%	UIN32	R	²
+2,3	0x6E81	V2 THD	0-9999	×0.1%	UIN32	R	²
+4,5	0x6E82	V3 THD	0-9999	×0.1%	UIN32	R	²
+6,7	0x6E83	Not used	0		UIN32	R	

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
+8,9	0x6E84	I1 THD	0-9999	×0.1%	UINT32	R	
+10,11	0x6E85	I2 THD	0-9999	×0.1%	UINT32	R	
+12,13	0x6E86	I3 THD	0-9999	×0.1%	UINT32	R	
+14-31	0x6E87- 0x6E8F	Not used	0		UINT32	R	
+32,33	0x6E90	I1 TDD	0-1000	×0.1%	UINT32	R	
+34,35	0x6E91	I2 TDD	0-1000	×0.1%	UINT32	R	
+36,37	0x6E92	I3 TDD	0-1000	×0.1%	UINT32	R	
25984-26021		10-Minute Total Harmonics					
+0,1	0x6F00	V1 THD	0-9999	×0.1%	UINT32	R	2
+2,3	0x6F01	V2 THD	0-9999	×0.1%	UINT32	R	2
+4,5	0x6F02	V3 THD	0-9999	×0.1%	UINT32	R	2
+6,7	0x6F03	Not used	0		UINT32	R	
+8,9	0x6F04	I1 THD	0-9999	×0.1%	UINT32	R	
+10,11	0x6F05	I2 THD	0-9999	×0.1%	UINT32	R	
+12,13	0x6F06	I3 THD	0-9999	×0.1%	UINT32	R	
+14,15	0x6F07	Not used	0		UINT32	R	
+16,17	0x6F08	Not used	0-9999	×0.1%	UINT32	R	
+18,19	0x6F09	Not used	0-9999	×0.1%	UINT32	R	
+20,21	0x6FOA	Not used	0-9999	×0.1%	UINT32	R	
+22,23	0x6FOB	Not used	0		UINT32	R	
+24,25	0x6FOC	Not used	0-9999	×0.1%	UINT32	R	
+26,27	0x6FOD	Not used	0-9999	×0.1%	UINT32	R	
+28,29	0x6FOE	Not used	0-9999	×0.1%	UINT32	R	
+30,31	0x6FOF	Not used	0		UINT32	R	
+32,33	0x6F10	I1 TDD	0-1000	×0.1%	UINT32	R	
+34,35	0x6F11	I2 TDD	0-1000	×0.1%	UINT32	R	
+36,37	0x6F12	I3 TDD	0-1000	×0.1%	UINT32	R	
27136-27215		Present PQ Measurements (GOST 13109)					
+0,1	0x7800	Voltage variation (δU_y) on phase A/AB, +/-%Un		0.01%	INT32	R	Last 1-min measurement
+2,3	0x7801	Voltage variation (δU_y) on phase B/BC, +/-%Un		0.01%	INT32	R	"
+4,5	0x7802	Voltage variation (δU_y) on phase C/CA, +/-%Un		0.01%	INT32	R	"
+6,7	0x7803	Positive sequence voltage variation (δU_y), +/-%Un		0.01%	INT32	R	"
+8,9	0x7804	Voltage change (δU_t) on phase A/AB, %Un		0.01%	UINT32	R	Last 10-min measurement
+10,11	0x7805	Repetition rate of voltage changes ($F\delta U_t$) A/AB, 1/min		1/min × 0.01	UINT32	R	"
+12,13	0x7806	Voltage change (δU_t) on phase B/BC, %Un		0.01%	UINT32	R	"
+14,15	0x7807	Repetition rate of voltage changes ($F\delta U_t$) B/BC, 1/min		1/min × 0.01	UINT32	R	"
+16,17	0x7808	Voltage change (δU_t) on phase C/CA, %Un		0.01%	UINT32	R	"
+18,19	0x7809	Repetition rate of voltage changes ($F\delta U_t$) C/CA, 1/min		1/min × 0.01	UINT32	R	"
+20,21	0x780A	Voltage Pst on phase A/AB		0.01	UINT32	R	Last 10-min measurement
+22,23	0x780B	Voltage Pst on phase B/BC		0.01	UINT32	R	"
+24,25	0x780C	Voltage Pst on phase C/CA		0.01	UINT32	R	"
+26,27	0x780D	Voltage Plt on phase A/AB		0.01	UINT32	R	Last 2-hour measurement

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
+28,29	0x780E	Voltage Plt on phase B/BC		0.01	UINT32	R	"
+30,31	0x780F	Voltage Plt on phase C/CA		0.01	UINT32	R	"
+32,33	0x7810	Voltage THD (KU) on phase A/AB, %		0.1%	UINT32	R	Last 3-s measurement
+34,35	0x7811	Voltage THD (KU) on phase B/BC, %		0.1%	UINT32	R	"
+36,37	0x7812	Voltage THD (KU) on phase C/CA, %		0.1%	UINT32	R	"
+38,39	0x7813	Negative-sequence voltage unbalance (K2u), %		0.1%	UINT32	R	"
+40,41	0x7814	Zero-sequence voltage unbalance (K0u), %		0.1%	UINT32	R	"
+42,43	0x7815	Frequency variation (Δf), +/-Hz		0.01 Hz	INT32	R	Last 20-s measurement
+44,45	0x7816	Not used			UINT32	R	
+46,47	0x7817	Not used			UINT32	R	
+48,49	0x7818	Not used			UINT32	R	
+50,51	0x7819	Not used			UINT32	R	
+52,53	0x781A	Voltage dip, dip depth on phase A/AB, %Un		0.01%	UINT32	R	
+54,55	0x781B	Voltage dip, dip depth on phase B/BC, %Un		0.01%	UINT32	R	
+56,57	0x781C	Voltage dip, dip depth on phase C/CA, %Un		0.01%	UINT32	R	
+58,59	0x781D	Voltage dip, duration of a polyphase dip		ms	UINT32	R	
+60,61	0x781E	Overvoltage, voltage magnitude on phase A/AB, %Un		0.01%	UINT32	R	
+62,63	0x781F	Overvoltage, voltage magnitude on phase B/BC, %Un		0.01%	UINT32	R	
+64,65	0x7820	Overvoltage, voltage magnitude on phase C/CA, %Un		0.01%	UINT32	R	
+66,67	0x7821	Overvoltage, duration of a polyphase overvoltage		ms	UINT32	R	
+68,69	0x7822	Impulsive voltage on phase A/AB, %Un peak		0.01%	UINT32	R	
+70,71	0x7823	Impulsive voltage, impulse duration on phase A/AB		us	UINT32	R	
+72,73	0x7824	Impulsive voltage on phase B/BC, %Un peak		0.01%	UINT32	R	
+74,75	0x7825	Impulsive voltage, impulse duration on phase B/BC		us	UINT32	R	
+76,77	0x7826	Impulsive voltage on phase C/CA, %Un peak		0.01%	UINT32	R	
+78,79	0x7827	Impulsive voltage, impulse duration on phase C/CA		us	UINT32	R	
27136-27215		Present PQ Measurements (GOST 32144)					
+0,1	0x7800	Voltage variation on phase A/AB, +/-%Un		0.01%	INT32	R	Last 10-min measurement
+2,3	0x7801	Voltage variation on phase B/BC, +/-%Un		0.01%	INT32	R	"
+4,5	0x7802	Voltage variation on phase C/CA, +/-%Un		0.01%	INT32	R	"
+6,7	0x7803	Not used			INT32	R	
+8,9	0x7804	Rapid voltage change on phase A/AB, %Un		0.01%	UINT32	R	Last 3-sec measurement
+10,11	0x7805	Not used			UINT32	R	"
+12,13	0x7806	Rapid voltage change on phase B/BC, %Un		0.01%	UINT32	R	"
+14,15	0x7807	Not used			UINT32	R	"
+16,17	0x7808	Rapid voltage change on phase C/CA, %Un		0.01%	UINT32	R	"
+18,19	0x7809	Not used			UINT32	R	"
+20,21	0x780A	Voltage Pst on phase A/AB		0.01	UINT32	R	Last 10-min measurement
+22,23	0x780B	Voltage Pst on phase B/BC		0.01	UINT32	R	"
+24,25	0x780C	Voltage Pst on phase C/CA		0.01	UINT32	R	"
+26,27	0x780D	Voltage Plt on phase A/AB		0.01	UINT32	R	Last 2-hour measurement
+28,29	0x780E	Voltage Plt on phase B/BC		0.01	UINT32	R	"
+30,31	0x780F	Voltage Plt on phase C/CA		0.01	UINT32	R	"

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
+32,33	0x7810	Voltage THD (KU) on phase A/AB, %		0.1%	UINT32	R	Last 10-min measurement
+34,35	0x7811	Voltage THD (KU) on phase B/BC, %		0.1%	UINT32	R	"
+36,37	0x7812	Voltage THD (KU) on phase C/CA, %		0.1%	UINT32	R	"
+38,39	0x7813	Negative-sequence voltage unbalance (K2u), %		0.1%	UINT32	R	"
+40,41	0x7814	Zero-sequence voltage unbalance (K0u), %		0.1%	UINT32	R	"
+42,43	0x7815	Frequency variation, +/-Hz		0.01 Hz	INT32	R	Last 10-s measurement
+44,45	0x7816	Voltage interruption, residual voltage A/AB, %Un		0.01%	UINT32	R	
+46,47	0x7817	Voltage interruption, residual voltage B/BC, %Un		0.01%	UINT32	R	
+48,49	0x7818	Voltage interruption, residual voltage C/CA, %Un		0.01%	UINT32	R	
+50,51	0x7819	Duration of a polyphase interruption		ms	UINT32	R	
+52,53	0x781A	Voltage dip, residual voltage oh phase A/AB, %Un		0.01%	UINT32	R	
+54,55	0x781B	Voltage dip, residual voltage on phase B/BC, %Un		0.01%	UINT32	R	
+56,57	0x781C	Voltage dip, residual voltage on phase C/CA, %Un		0.01%	UINT32	R	
+58,59	0x781D	Voltage dip, duration of a polyphase dip		ms	UINT32	R	
+60,61	0x781E	Voltage swell, voltage magnitude on phase A/AB, %Un		0.01%	UINT32	R	
+62,63	0x781F	Voltage swell, voltage magnitude on phase B/BC, %Un		0.01%	UINT32	R	
+64,65	0x7820	Voltage swell, voltage magnitude on phase C/CA, %Un		0.01%	UINT32	R	
+66,67	0x7821	Voltage swell, duration of a polyphase swell		ms	UINT32	R	
+68,69	0x7822	Impulsive voltage on phase A/AB, %Un peak		0.01%	UINT32	R	
+70,71	0x7823	Impulsive voltage, impulse duration on phase A/AB		us	UINT32	R	
+72,73	0x7824	Impulsive voltage on phase B/BC, %Un peak		0.01%	UINT32	R	
+74,75	0x7825	Impulsive voltage, impulse duration on phase B/BC		us	UINT32	R	
+76,77	0x7826	Impulsive voltage on phase C/CA, %Un peak		0.01%	UINT32	R	
+78,79	0x7827	Impulsive voltage, impulse duration on phase C/CA		us	UINT32	R	
30208-30307		V1/V12 Voltage Interharmonics					2,7
+0,1	0x9000	H01 Interharmonic magnitude	0-10000	×0.01%	UINT32	R	
+2,3	0x9001	H02 Interharmonic magnitude	0-10000	×0.01%	UINT32	R	
		...					
+98,99	0x9031	H50 Interharmonic magnitude	0-10000	×0.01%	UINT32	R	
30336-39435		V2/V23 Voltage Interharmonics					2,7
+0,1	0x9100	H01 Interharmonic magnitude	0-10000	×0.01%	UINT32	R	
+2,3	0x9101	H02 Interharmonic magnitude	0-10000	×0.01%	UINT32	R	
		...					
+98,99	0x9131	H50 Interharmonic magnitude	0-10000	×0.01%	UINT32	R	
30464-30563		V3/V31 Voltage Interharmonics					2,7
+0,1	0x9200	H01 Interharmonic magnitude	0-10000	×0.01%	UINT32	R	
+2,3	0x9201	H02 Interharmonic magnitude	0-10000	×0.01%	UINT32	R	
		...					
+98,99	0x9231	H50 Interharmonic magnitude	0-10000	×0.01%	UINT32	R	
		Generic TOU Energy Registers					Point references
	0x7000	Tariff #1 register	0-999,999,999	1 kWh	UINT32		
	0x7001	Tariff #2 register	0-999,999,999	1 kWh	UINT32		
		...					

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
	0x7007	Tariff #8 register	0-999,999,999	1 kWh	UINT32		
		Generic TOU Maximum Demand Registers					Point references
	0x7100	Tariff #1 register	0-Pmax	U3	UINT32		
	0x7101	Tariff #2 register	0-Pmax	U3	UINT32		
		...					
	0x7107	Tariff #8 register	0-Pmax	U3	UINT32		
		Generic Data					Point references
	0x7400	V1 voltage	0-Vmax	U1	UINT32		1
	0x7401	V2 voltage	0-Vmax	U1	UINT32		1
	0x7402	V3 voltage	0-Vmax	U1	UINT32		1
	0x7404	V12 voltage	0-Vmax	U1	UINT32		
	0x7405	V23 voltage	0-Vmax	U1	UINT32		
	0x7406	V31 voltage	0-Vmax	U1	UINT32		
	0x7407	I1 current	0-Imax	U2	UINT32		
	0x7408	I2 current	0-Imax	U2	UINT32		
	0x7409	I3 current	0-Imax	U2	UINT32		
	0x7414	Voltage unbalance	0-3000	×0.1%	UINT32		
	0x7418	Frequency	0-10000	×0.01Hz	UINT32		
	0x7419	V1 THD	0-9999	×0.1%	UINT32		2
	0x741A	V2 THD	0-9999	×0.1%	UINT32		2
	0x741B	V3 THD	0-9999	×0.1%	UINT32		2
	0x7421	V1 interharmonic THD	0-9999	×0.1%	UINT32		2
	0x7422	V2 interharmonic THD	0-9999	×0.1%	UINT32		2
	0x7423	V3 interharmonic THD	0-9999	×0.1%	UINT32		2
	0x7421	Not used	0-9999	×0.1%	UINT32		
	0x7422	Not used	0-9999	×0.1%	UINT32		
	0x7423	Not used	0-9999	×0.1%	UINT32		
	0x750A	Positive-sequence voltage	0-Vmax	U1	UINT32		2
	0x750B	Negative-sequence voltage	0-Vmax	U1	UINT32		2
	0x750C	Zero-sequence voltage	0-Vmax	U1	UINT32		2
	0x750D	Negative-sequence voltage unbalance	0-3000	×0.1%	UINT32		2
	0x750E	Zero-sequence voltage unbalance	0-3000	×0.1%	UINT32		2
	0x1900	V1 H01 harmonic voltage	0-10000	×0.01%	UINT32		2
	0x1901	V1 H02 harmonic voltage	0-10000	×0.01%	UINT32		2
		...					
	0x1931	V1 H50 harmonic voltage	0-10000	×0.01%	UINT32		2
	0x1A00	V2 H01 harmonic voltage	0-10000	×0.01%	UINT32		2
	0x1A01	V2 H02 harmonic voltage	0-10000	×0.01%	UINT32		2
		...					
	0x1A31	V2 H50 harmonic voltage	0-10000	×0.01%	UINT32		2
	0x1B00	V3 H01 harmonic voltage	0-10000	×0.01%	UINT32		2
	0x1B01	V3 H02 harmonic voltage	0-10000	×0.01%	UINT32		2
		...					

Address	Point ID	Description	Options/Range ³	Units ³	Type	R/W	Notes
	0x1B31	V3 H50 harmonic voltage	0-10000	×0.01%	UINT32		2
	0x2980	V1 Pst	0-10000	×0.01	UINT32		2
	0x2981	V2 Pst	0-10000	×0.01	UINT32		2
	0x2982	V3 Pst	0-10000	×0.01	UINT32		2
	0x2983	V1 Plt	0-10000	×0.01	UINT32		2
	0x2984	V2 Plt	0-10000	×0.01	UINT32		2
	0x2985	V3 Plt	0-10000	×0.01	UINT32		2
	0xC481	Voltage change on phase A/AB, %Un	0-10000	×0.01%	UINT32		2
	0xC486	Voltage change on phase B/BC, %Un	0-10000	×0.01%	UINT32		2
	0xC48B	Voltage change on phase C/CA, %Un	0-10000	×0.01%	UINT32		2
	0xCF02	Rapid voltage change on phase A/AB, %Un	0-10000	×0.01%	UINT32		2
	0xCF04	Rapid voltage change on phase B/BC, %Un	0-10000	×0.01%	UINT32		2
	0xCF06	Rapid voltage change on phase C/CA, %Un	0-10000	×0.01%	UINT32		2
	0xD083	Maximum 1st signaling voltage A/AB magnitude, %Un	0-10000	×0.01%	UINT32		2
	0xD084	Maximum 2nd signaling voltage A/AB magnitude, %Un	0-10000	×0.01%	UINT32		2
	0xD085	Maximum 3rd signaling voltage A/AB magnitude, %Un	0-10000	×0.01%	UINT32		2
	0xD086	Maximum 4th signaling voltage A/AB magnitude, %Un	0-10000	×0.01%	UINT32		2
	0xD087	Maximum 1st signaling voltage B/BC magnitude, %Un	0-10000	×0.01%	UINT32		2
	0xD088	Maximum 2nd signaling voltage B/BC magnitude, %Un	0-10000	×0.01%	UINT32		2
	0xD089	Maximum 3rd signaling voltage B/BC magnitude, %Un	0-10000	×0.01%	UINT32		2
	0xD08A	Maximum 4th signaling voltage B/BC magnitude, %Un	0-10000	×0.01%	UINT32		2
	0xD08B	Maximum 1st signaling voltage C/CA magnitude, %Un	0-10000	×0.01%	UINT32		2
	0xD08C	Maximum 2nd signaling voltage C/CA magnitude, %Un	0-10000	×0.01%	UINT32		2
	0xD08D	Maximum 3rd signaling voltage C/CA magnitude, %Un	0-10000	×0.01%	UINT32		2
	0xD08E	Maximum 4th signaling voltage C/CA magnitude, %Un	0-10000	×0.01%	UINT32		2

NOTES:

- ¹ When the 4LN3, 4LL3, 3LN3, 3LL3, 3BLN3 or 3BLL3 wiring mode is selected, the voltages will be line-to-neutral; for any other wiring mode, they will be line-to-line.
- ² When the 4LN3, 3LN3 or 3BLN3 wiring mode is selected, the voltages will be line-to-neutral; for any other wiring mode, they will be line-to-line voltages.
- ³ For volts, amps, power and frequency scales and units, refer to Section 4 "Data Scales and Units".
- ⁴ Harmonic angles are referenced to the fundamental voltage harmonic H01 on phase L1.
- ⁵ On a 16-cycle interval GOST 13109, 200-ms interval GOST 32144.
- ⁶ On a 3-s interval.
- ⁷ 16-cycle interval for GOST 13109, programmable 0.2-s, 3-s, 10-min interval for GOST 32144.

3.5 Minimum/Maximum Log Registers

Address	Point ID	Description	Options/Range/Format ²	Units ²	Type	R/W	Notes
35840-35959		Minimum Phase Values					
+0,1 +2,3	0x2C00	Min. V1/V12 Voltage Timestamp	0-Vmax F1	U1 sec	UINT32 UINT32	R R	¹
+4,5 +6,7	0x2C01	Min. V2/V23 Voltage Timestamp	0-Vmax F1	U1 sec	UINT32 UINT32	R R	¹
+8,9 +10,11	0x2C02	Min. V3/V31 Voltage Timestamp	0-Vmax F1	U1 sec	UINT32 UINT32	R R	¹
+12,13 +14,15	0x2C03	Min. I1 Current Timestamp	0-Imax F1	U2 sec	UINT32 UINT32	R R	
+16,17 +18,19	0x2C04	Min. I2 Current Timestamp	0-Imax	U2 sec	UINT32 UINT32	R R	
+20,21 +22,23	0x2C05	Min. I3 Current Timestamp	0-Imax	U2 sec	UINT32 UINT32	R R	
+24-71	0x2C06- 0x2C11	Not used	0		INT32	R	
+72,73 +74,75	0x2C12	Min. V1/V12 Voltage THD Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	^{1, 3}
+76,77 +78,79	0x2C13	Min. V2/V23 Voltage THD Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	^{1, 3}
+80,81 +82,83	0x2C14	Min. V3/V31 Voltage THD Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	^{1, 3}
+84,85 +86,87	0x2C15	Min. I1 Current THD Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	³
+88,89 +90,91	0x2C16	Min. I2 Current THD Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	³
+92,93 +94,95	0x2C17	Min. I3 Current THD Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	³
+96,97 +98,99	0x2C18	Min. I1 K-Factor Timestamp	10-9999	×0.1 sec	UINT32 UINT32	R R	³
+100,101 +102,103	0x2C19	Min. I2 K-Factor Timestamp	10-9999	×0.1 sec	UINT32 UINT32	R R	³
+104,105 +106,107	0x2C1A	Min. I3 K-Factor Timestamp	10-9999	×0.1 sec	UINT32 UINT32	R R	³
+108,109 +110,111	0x2C1B	Min. I1 Current TDD Timestamp	0-1000	×0.1% sec	UINT32 UINT32	R R	³
+112,113 +114,115	0x2C1C	Min. I2 Current TDD Timestamp	0-1000	×0.1% sec	UINT32 UINT32	R R	³
+116,117 +118,119	0x2C1D	Min. I3 Current TDD Timestamp	0-1000	×0.1% sec	UINT32 UINT32	R R	³

Address	Point ID	Description	Options/Range/Format ²	Units ²	Type	R/W	Notes
36096-36111		Minimum Total Values					
+0,1 +2,3	0x2D00	Min. Total kW Timestamp	-Pmax-Pmax	U3 sec	UINT32 UINT32	R R	
+4,5 +6,7	0x2D01	Min. Total kvar Timestamp	-Pmax-Pmax	U3 sec	UINT32 UINT32	R R	
+8,9 +10,11	0x2D02	Min. Total kVA Timestamp	0-Pmax	U3 sec	UINT32 UINT32	R R	
+12,13 +14,15	0x2D03	Min. Total PF Timestamp	-1000-1000	×0.001 sec	INT32 UINT32	R R	
36352-36362		Minimum Auxiliary Values					
+0,1 +2,3	0x2E00	Not used			UINT32 UINT32	R R	
+4,5 +6,7	0x2E01	Min. In Current Timestamp	0-Imax	U2 sec	UINT32 UINT32	R R	
+8,9 +10,11	0x2E02	Min. Frequency Timestamp	0-Fmax	×0.01Hz sec	UINT32 UINT32	R R	
36864-36983		Maximum Phase Values					
+0,1 +2,3	0x3400	Max. V1/V12 Voltage Timestamp	0-Vmax	U1 sec	UINT32 UINT32	R R	¹
+4,5 +6,7	0x3401	Max. V2/V23 Voltage Timestamp	0-Vmax	U1 sec	UINT32 UINT32	R R	¹
+8,9 +10,11	0x3402	Max. V3/V31 Voltage Timestamp	0-Vmax	U1 sec	UINT32 UINT32	R R	¹
+12,13 +14,15	0x3403	Max. I1 Current Timestamp	0-Imax	U2 sec	UINT32 UINT32	R R	
+16,17 +18,19	0x3404	Max. I2 Current Timestamp	0-Imax	U2 sec	UINT32 UINT32	R R	
+20,21 +22,23	0x3405	Max. I3 Current Timestamp	0-Imax	U2 sec	UINT32 UINT32	R R	
+24-71	0x3406- 0x3411	Not used	0		INT32	R	
+72,73 +74,75	0x3412	Max. V1/V12 Voltage THD Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	^{1, 3}
+76,77 +78,79	0x3413	Max. V2/V23 Voltage THD Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	^{1, 3}
+80,81 +82,83	0x3414	Max. V3/V31 Voltage THD Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	^{1, 3}
+84,85 +86,87	0x3415	Max. I1 Current THD Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	³
+88,89 +90,91	0x3416	Max. I2 Current THD Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	³
+92,93 +94,95	0x3417	Max. I3 Current THD Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	³
+96,97	0x3418	Max. I1 K-Factor	10-9999	×0.1	UINT32	R	³

Address	Point ID	Description	Options/Range/Format ²	Units ²	Type	R/W	Notes
+98,99		Timestamp		sec	UINT32	R	
+100,101 +102,103	0x3419	Max. I2 K-Factor Timestamp	10-9999	×0.1 sec	UINT32 UINT32	R R	³
+104,105 +106,107	0x341A	Max. I3 K-Factor Timestamp	10-9999	×0.1 sec	UINT32 UINT32	R R	³
+108,109 +110,111	0x341B	Max. I1 Current TDD Timestamp	0-1000	×0.1% sec	UINT32 UINT32	R R	³
+112,113 +114,115	0x341C	Max. I2 Current TDD Timestamp	0-1000	×0.1% sec	UINT32 UINT32	R R	³
+116,117 +118,119	0x341D	Max. I3 Current TDD Timestamp	0-1000	×0.1% sec	UINT32 UINT32	R R	³
37120-37135		Maximum Total Values					
+0,1 +2,3	0x3500	Max. Total kW Timestamp	-Pmax-Pmax	U3 sec	INT32 UINT32	R R	
+4,5 +6,7	0x3501	Max. Total kvar Timestamp	-Pmax-Pmax	U3 sec	INT32 UINT32	R R	
+8,9 +10,11	0x3502	Max. Total kVA Timestamp	0-Pmax	U3 sec	UINT32 UINT32	R R	
+12,13 +14,15	0x3503	Max. Total PF Timestamp	-1000-1000	×0.001 sec	INT32 UINT32	R R	
37376-37387		Maximum Auxiliary Values					
+0,1 +2,3	0x3600	Not used			UINT32 UINT32	R R	
+4,5 +6,7	0x3601	Max. In Current Timestamp	0-Imax	U2 sec	UINT32 UINT32	R R	
+8,9 +10,11	0x3602	Max. Frequency Timestamp	0-Fmax	×0.01Hz sec	UINT32 UINT32	R R	
37504-37535		Summary Energy Maximum Demands					
+0,1 +2,3	0x4780	Summary register #1 Maximum Demand Timestamp	0-Pmax	U3	UINT32	R	
+4,5 +6,7	0x4781	Summary register #2 Maximum Demand Timestamp	0-Pmax	U3	UINT32	R	
		...					
+28,29 +30,31	0x4783	Summary register #8 Maximum Demand Timestamp	0-Pmax	U3	UINT32	R	
37632-37695		Maximum Demands					
+0,1 +2,3	0x3700	V1/V12 Maximum volt demand Timestamp	0-Vmax	U1 sec	UINT32 UINT32	R R	¹
+4,5 +6,7	0x3701	V2/V23 Maximum volt demand Timestamp	0-Vmax	U1 sec	UINT32 UINT32	R R	¹
+8,9 +10,11	0x3702	V3/V31 Maximum volt demand Timestamp	0-Vmax	U1 sec	UINT32 UINT32	R R	¹
+12,13 +14,15	0x3703	I1 Maximum ampere demand Timestamp	0-Imax	U2 sec	UINT32 UINT32	R R	

Address	Point ID	Description	Options/Range/Format ²	Units ²	Type	R/W	Notes
+16,17 +18,19	0x3704	I2 Maximum ampere demand Timestamp	0-I _{max}	U2 sec	UINT32 UINT32	R R	
+20,21 +22,23	0x3705	I3 Maximum ampere demand Timestamp	0-I _{max}	U2 sec	UINT32 UINT32	R R	
+24,25 +26,27	0x3706	Not used Timestamp			UINT32 UINT32	R R	
+28,29 +30,31	0x3707	Not used Timestamp			UINT32 UINT32	R R	
+32,33 +34,35	0x3708	Not used Timestamp			UINT32 UINT32	R R	
+36,37 +38,39	0x3709	Maximum kW import sliding window demand Timestamp	0-P _{max}	U3 sec	UINT32 UINT32	R R	
+40,41 +42,43	0x370A	Maximum kvar import sliding window demand Timestamp	0-P _{max}	U3 sec	UINT32 UINT32	R R	
+44,45 +46,47	0x370B	Maximum kVA sliding window demand Timestamp	0-P _{max}	U3 sec	UINT32 UINT32	R R	
+48,49 +50,51	0x3737	Not used Timestamp			UINT32 UINT32	R R	
+52,53 +54,55	0x370D	Not used Timestamp			UINT32 UINT32	R R	
+56,57 +58,59	0x370E	Not used Timestamp			UINT32 UINT32	R R	
+60,61 +62,63	0x370F	Maximum kW export sliding window demand Timestamp	0-P _{max}	U3 sec	UINT32 UINT32	R R	
+64,65 +66,67	0x3710	Maximum kvar export sliding window demand Timestamp	0-P _{max}	U3 sec	UINT32 UINT32	R R	
38016-38063		Maximum Harmonic Demands					
+0,1 +2,3	0x3880	V1/V12 THD demand Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	¹
+4,5 +6,7	0x3881	V2/V23 THD demand Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	¹
+8,9 +10,11	0x3882	V3/V31 THD demand Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	¹
+12,13 +14,15	0x3883	Not used			UINT32 UINT32	R R	
+16,17 +18,19	0x3884	I1 THD demand Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	
+20,21 +22,23	0x3885	I2 THD demand Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	
+24,25 +26,27	0x3886	I3 THD demand Timestamp	0-9999	×0.1% sec	UINT32 UINT32	R R	
+28,29 +30,31	0x3887	Not used			UINT32 UINT32	R R	
+32,33	0x3888	I1 TDD demand	0-1000	×0.1%	UINT32	R	

Address	Point ID	Description	Options/Range/Format ²	Units ²	Type	R/W	Notes
+34,35		Timestamp		sec	UINT32	R	
+36,37	0x3889	I2 TDD demand	0-1000	×0.1%	UINT32	R	
+38,39		Timestamp		sec	UINT32	R	
+40,41	0x388A	I3 TDD demand	0-1000	×0.1%	UINT32	R	
+42,43		Timestamp		sec	UINT32	R	
+44,45	0x388B	Not used			UINT32	R	
+46,47					UINT32	R	
38144-38175		TOU Maximum Demand Register #1					
+0,1	0x4800	Tariff #1 maximum demand	0-Pmax	U3	UINT32	R	
+2,3		Timestamp		sec	UINT32	R	
+4,5	0x4801	Tariff #2 maximum demand	0-Pmax	U3	UINT32	R	
+6,7		Timestamp		sec	UINT32	R	
		...				R	
+28,29	0x4807	Tariff #8 maximum demand	0-Pmax	U3	UINT32	R	
+30,31		Timestamp		sec	UINT32	R	
38400-38431		TOU Maximum Demand Register #2					
+0,1	0x4900	Tariff #1 maximum demand	0-Pmax	U3	UINT32	R	
+2,3		Timestamp		sec	UINT32	R	
+4,5	0x4901	Tariff #2 maximum demand	0-Pmax	U3	UINT32	R	
+6,7		Timestamp		sec	UINT32	R	
		...				R	
+28,29	0x4907	Tariff #8 maximum demand	0-Pmax	U3	UINT32	R	
+30,31		Timestamp		sec	UINT32	R	
38656-38687		TOU Maximum Demand Register #3					
+0,1	0x4A00	Tariff #1 maximum demand	0-Pmax	U3	UINT32	R	
+2,3		Timestamp		sec	UINT32	R	
+4,5	0x4A01	Tariff #2 maximum demand	0-Pmax	U3	UINT32	R	
+6,7		Timestamp		sec	UINT32	R	
		...				R	
+28,29	0x4A07	Tariff #8 maximum demand	0-Pmax	U3	UINT32	R	
+30,31		Timestamp		sec	UINT32	R	
38272-38313		TOU Maximum Demand Register #4					
+0,1	0x4880	Tariff #1 maximum demand	0-Pmax	U3	UINT32	R	
+2,3		Timestamp		sec	UINT32	R	
+4,5	0x4881	Tariff #2 maximum demand	0-Pmax	U3	UINT32	R	
+6,7		Timestamp		sec	UINT32	R	
		...				R	
+28,29	0x4887	Tariff #8 maximum demand	0-Pmax	U3	UINT32	R	
+30,31		Timestamp		sec	UINT32	R	
38528-38559		TOU Maximum Demand Register #5					
+0,1	0x4980	Tariff #1 maximum demand	0-Pmax	U3	UINT32	R	
+2,3		Timestamp		sec	UINT32	R	
+4,5	0x4981	Tariff #2 maximum demand	0-Pmax	U3	UINT32	R	
+6,7		Timestamp		sec	UINT32	R	

Address	Point ID	Description	Options/Range/Format ²	Units ²	Type	R/W	Notes
		...				R	
+28,29 +30,31	0x4987	Tariff #8 maximum demand Timestamp	0-Pmax	U3 sec	UINT32 UINT32	R R	
38784-38815		TOU Maximum Demand Register #6					
+0,1 +2,3	0x4A80	Tariff #1 maximum demand Timestamp	0-Pmax	U3 sec	UINT32 UINT32	R R	
+4,5 +6,7	0x4A81	Tariff #2 maximum demand Timestamp	0-Pmax	U3 sec	UINT32 UINT32	R R	
		...				R	
+28,29 +30,31	0x4A87	Tariff #8 maximum demand Timestamp	0-Pmax	U3 sec	UINT32 UINT32	R R	
38912-38943		TOU Maximum Demand Register #7					
+0,1 +2,3	0x5300	Tariff #1 maximum demand Timestamp	0-Pmax	U3 sec	UINT32 UINT32	R R	
+4,5 +6,7	0x5301	Tariff #2 maximum demand Timestamp	0-Pmax	U3 sec	UINT32 UINT32	R R	
		...				R	
+28,29 +30,31	0x5307	Tariff #8 maximum demand Timestamp	0-Pmax	U3 sec	UINT32 UINT32	R R	
39040-39071		TOU Maximum Demand Register #8					
+0,1 +2,3	0x5380	Tariff #1 maximum demand Timestamp	0-Pmax	U3 sec	UINT32 UINT32	R R	
+4,5 +6,7	0x5381	Tariff #2 maximum demand Timestamp	0-Pmax	U3 sec	UINT32 UINT32	R R	
		...				R	
+28,29 +30,31	0x5387	Tariff #8 maximum demand Timestamp	0-Pmax	U3 sec	UINT32 UINT32	R R	

NOTES:

¹ When the 4LN3, 3LN3 or 3BLN3 wiring mode is selected, the voltages will be line-to-neutral; for any other wiring mode, they will be line-to-line voltages.

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

³ On a 16-cycle interval.

3.6 Device Control and Status Registers

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
Device Restart Register							
2560		Warm restart of the device	0 when read, 0xFFFF when written = restart the device		UINT16	R/W	
Device Identification							
2561-2562		Not used	0		UINT16	R	
2563		Firmware build number	1-99		UINT16	R	
2564		Not used	0		UINT16	R	
2565		Firmware version number	2500-2599		UINT16	R	Two higher decimal digits = major version number, two lower decimal digits = minor version number
2566,2567		Instrument options	F28		UINT32	R	
Device Authorization Registers							
2575		Write: 4-digit password. Read: 0 = access permitted, -1 = authorization required.	0-9999 (write) 0/-1 (read)		INT16	R/W	
44378-44379		Write: 8-digit password. Read: 0 = access permitted, -1 = authorization required.	0 - 99999999 (write) 0/-1 (read)		INT32	R/W	
User Event Flags Registers (bit map)							
44032		Event flags set register (0 = no effect, 1 = set)	0x0000 - 0x00FF		UINT16	W	
44034		Event flags clear register (0=clear, 1 = no effect)	0x0000 - 0x00FF		UINT16	W	
44036		Event flags status (0 = cleared, 1 = set)	0x0000 - 0x00FF		UINT16	R	
Remote Relay Control Registers (bit map)							
44038-44045		Not used			UINT16		
44046		Force relay operate register (0 = no effect, 1 = operate)	0x0000 - 0x000F		UINT16	W	
44050		Force relay release register (0 = no effect, 1 = release)	0x0000 - 0x000F		UINT16	W	
44054		Locally latched relays status (0 = unlatched, 1 = locally latched)	0x0000 - 0x000F		UINT16	R	
44058		Remote latched relays status (0 = unlatched, 1 = remote latched)	0x0000 - 0x000F		UINT16	R	
44062		Remote relay control disabled status (0 = remote control enabled, 1 = remote control disabled)	0x0000 - 0x000F		UINT16	R	Remote relay control is disabled if the internal pulse source is linked to the relay
44066		Relay status (0 = open, 1 = closed)	0x0000 - 0x000F		UINT16	R	
44070		Latch relays (0 = not latched mode, 1 = latched mode)	0x0000 - 0x000F		UINT16	R	
44074		Pulse relays (0 = not pulse mode, 1 = pulse mode)	0x0000 - 0x000F		UINT16	R	
44078		KYZ relays (0 = not KYZ mode, 1 = KYZ mode)	0x0000 - 0x000F		UINT16	R	
44082		Relay polarity (0 = normal mode, 1 = inverting mode)	0x0000 - 0x000F		UINT16	R	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
44086-44101		Reserved			UINT16		
Reset/Clear Registers							
44102		Clear energies	0		UINT16	W	
44103		Clear maximum demands	0 = clear all maximum demands 1 = clear power demands 2 = clear volt, ampere and harmonic demands		UINT16	W	
44104		Clear summary and TOU energy registers	0		UINT16	W	
44105		Clear summary and TOU maximum demands	0		UINT16	W	
44106		Clear counters	0 = clear all counters, 1-4 = clear counter #1-#4		UINT16	W	
44107		Clear Min/Max log	0		UINT16	W	
44108		Clear operation/event counters	0 = clear GOST 13109 statistics 1 = clear communication counters		UINT16	W	
44109-44133		Reserved			UINT16		
Device Mode Control Registers							
44134-44135		Reserved			UINT16		
44136		PQ recorder	0 = disabled, 1 = enabled		UINT16	R/W	
44137-44165		Reserved			UINT16		
Memory Status Registers							
44262-44263		Memory size, bytes			UINT32	R	
44264-44265		Free memory, bytes			UINT32	R	
44266-44277		Reserved			UINT32	R	
Log Notification Registers (bit map)							
44278-44279		Files 0-31 (0 = no new logs, 1 = new record logged)	0x00000000 - 0xFFFFFFFF		UINT32	R	
44280-44293		Reserved	0		UINT32	R	
Setpoint Status Registers (bit map)							
44294-44295		Setpoints 1-16 status (0 = released, 1 = operated)	0x00000000 - 0x0000FFFF		UINT32	R	
44296-44309		Reserved			UINT32	R	
Setpoint Alarm Latch Registers (bit map)							
44310-44311		Setpoints 1-16 alarm status. When read: 0 = no setpoint operations logged, 1 = setpoint has been operated at least once since the last alarm bit reset. When written: 0 = clear setpoint alarm bit, 1 = no effect.	0x00000000 - 0x0000FFFF		UINT32	R/W	
44312-44325		Reserved					
Device Diagnostics Register (bit map)							
44326-44327		Device self-diagnostics flags. When read: 0 = no faults logged, 1 = a fault bit has been set at least once since the last reset. When written: 0 = clear a fault bit, 1 = no effect.	F23		UINT32	R/W	
44328-44341		Reserved					
Current Port Number							
44342		Active port number	0-1 = serial port COM1-COM2		UINT16	R	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
44343-44345		Reserved					
Current Network Settings							
44346-44377							
+0, 1		Active device IP Address			UINT32	R	Network byte order
+2, 3		Active network subnet mask			UINT32	R	Network byte order
+4, 5		Active network default gateway			UINT32	R	Network byte order
44352-44377		Reserved					
Communication Status							
44394		RSSI (received signal strength)	0 = not known or not detectable, 51-113 = -51 to -113 dBm		UINT16	R	
44395		GPRS status	0 = not connected, 1 = not registered, 2 = registered		UINT16	R	
44396-44409		Reserved			UINT16	R	65535 = N/A
Communication Counters							
44410		Successful eXpertPower client connections	0-65534		UINT16	R	
44411		Failed eXpertPower client connections	0-65534		UINT16	R	
44412		Successful TCP notification client connections	0-65534		UINT16	R	
44413		Failed TCP notification client connections	0-65534		UINT16	R	
44414-44441		Reserved			UINT16	R	65535 = N/A

3.7 Device Setup Registers

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
Device Identification							
46080-46111							
+0,1		Device serial number	0-999999		UINT32	R	
+2,3		Device model ID	17500		UINT32	R	
+4-11		Device model name	"PM175"		CHAR16	R	Null-terminated string
+12-13		Device options (bitmap)	0		UINT32	R	
+14-19		Not used			UINT16	R	
+20		Device firmware version number	2500-2599		UINT16	R	Two higher decimal digits = major version number, two lower decimal digits = minor version number
+21		Device firmware build number	1-99		UINT16	R	
+22,23		Not used			UINT16	R	
+24		Boot loader version number			UINT16	R	Two higher decimal digits = major version number, two lower decimal digits = minor version number
+25		Boot loader build number	1-99		UINT16	R	
+26-31		Reserved			UINT16	R	
Factory Device Settings							
46112-46178							
+0		V1-V3 input range	690, 120 (option U)	V	UINT16	R	Does not limit the 690V input range
+1		V1-V3 input overload	120	%	UINT16	R	
+2,3		Not used			UINT16	R	
+4		I1-I3 input range	1, 5	A	UINT16	R	
+5		I1-I3 input overload	200	%	UINT16	R	
+6-13		Not used			UINT16	R	
+13-63		Not used			UINT16	R	
+64		Ethernet MAC address 0-1	0x0500		UINT16	R	
+65		Ethernet MAC address 2-3	0x00F0		UINT16	R	
+66		Ethernet MAC address 4-5	0x0000-0xFFFF		UINT16	R	
Basic Setup							
2304-2324							
+0		Wiring mode	F26		UINT16	R/W	
+1		PT ratio	10 to 65000	×0.1	UINT16	R/W	
+2		CT primary current	1 to 50,000	A	UINT16	R/W	
+3		Power block demand period	1,2,3,5,10,15,20,30,60 min, 255 = external synchronization	min	UINT16	R/W	If the external synchronization is selected, the DI1 input is considered a pulse or KYZ input. The pulse edge restarts the power demand block accumulation interval.

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
+4		Volt/ampere/harmonic demand period	0 to 1800	sec	UINT16	R/W	
+5-7		Reserved			UINT16	R	Read as 65535
+8		Number of blocks in a sliding window	1 to 15		UINT16	R/W	
+9-10		Reserved			UINT16	R	Read as 65535
+11		Nominal line frequency	50, 60	Hz	UINT16	R/W	
+12		Maximum demand load current	0 to 50,000 (0 = CT primary current)	A	UINT16	R/W	
+13		Nominal secondary voltage (alternative register)	500 to 7000, 65535 = N/A	×0.1V	UINT16	R/W	
+14-17		Reserved			UINT16	R	Read as 65535
+18		Nominal secondary voltage	50 to 700	V	UINT16	R/W	
+19		Reserved			UINT16	R	Read as 65535
+20		PT ratio multiplication factor	×1, ×10		UINT16	R/W	
Communication Ports Setup							
2344-2359							
+0		Communication protocol	COM1: 0=Modbus RTU, 1=Modbus ASCII, 2=DNP3.0, 5=Profibus DP COM2: 0=Modbus RTU, 1=Modbus ASCII, 2=DNP3.0		UINT16	R/W	
+1		Interface	COM1: 0=RS-232, 1=RS-422, 2=RS-485, 4=Dial-up Modem, 6=Ethernet, 7=Profibus, 8=GSM/GPRS COM2: 1=RS-422, 2=RS-485		UINT16	R/W	
+2		Device address	Modbus: 1-247 DNP3.0: 0-65532 Profibus DP: 0-126		UINT16	R/W	
+3		Baud rate	1=300 bps, 2=600 bps, 3=1200 bps, 4=2400 bps, 5=4800 bps, 6=9600 bps, 7=19200 bps, 8=38400 bps, 9=57600 bps, 10=115200 bps		UINT16	R/W	
+4		Data format	0=7 bits/even parity, 1=8 bits/no parity, 2=8 bits/even parity		UINT16	R/W	
+5		Flow control	0=no flow control 1=software (XON/XOFF) 2=hardware (CTS)		UINT16	R/W	N/A for COM2 (read as 65535)
+6		RTS mode	0=not used, 1=RTS is permanently asserted 2=RTS is asserted during the transmission		UINT16	R/W	N/A for COM2 (read as 65535)
2344-2351		COM1 Setup					
2352-2359		COM2 Setup					

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
Device Options Setup							
2376-2386							
+0		Power calculation mode	0=using reactive power: $S=f(P,Q)$, 1=using non-active power: $Q=f(S,P)$		UINT16	R/W	
+1		Energy roll value	0= 1×10^4 , 1= 1×10^5 , 2= 1×10^6 , 3= 1×10^7 , 4= 1×10^8 , 5= 1×10^9		UINT16	R/W	
+2		Phase energy calculation mode	0=disabled, 1=enabled		UINT16	R/W	
+3		Reserved			UINT16	R/W	Read as 65535
+4		Analog expander output option	0=none 1=0-20 mA 2=4-20 mA 3=0-1 mA 4= ± 1 mA		UINT16	R/W	
+5		Battery mode	0 = battery is OFF, 1 = battery is ON		UINT16	R/W	
+6-9		Reserved			UINT16	R/W	Read as 65535
+10		Energy LED test mode	0=disabled, 1=Wh test, 2=varh test		UINT16	R/W	LED pulse rate is 10,000 pulses/kWh
Alarm/Event Setpoints Setup							
352-1055							
+0		Condition #1: Logical operator	0 = OR, 1 = AND		UINT16	R/W	
+1		Condition #1: Trigger parameter ID	F12		UINT16	R/W	
+2		Condition #1: Not used	0		UINT16	R/W	
+3		Condition #1: Not used	0		UINT16	R/W	
+4,5		Condition #1: Operate limit	See Section 3.3		UINT32	R/W	Scaled value
+6,7		Condition #1: Release limit	See Section 3.3		UINT32	R/W	Scaled value
+8		Condition #2: Logical operator	0 = OR, 1 = AND		UINT16	R/W	
+9		Condition #2: Trigger parameter ID	F12		UINT16	R/W	
+10		Condition #2: Not used	0		UINT16	R/W	
+11		Condition #2: Not used	0		UINT16	R/W	
+12,13		Condition #2: Operate limit	See Section 3.3		UINT32	R/W	Scaled value
+14,15		Condition #2: Release limit	See Section 3.3		UINT32	R/W	Scaled value
+16		Condition #3: Logical operator	0 = OR, 1 = AND		UINT16	R/W	
+17		Condition #3: Trigger parameter ID	F12		UINT16	R/W	
+18		Condition #3: Not used	0		UINT16	R/W	
+19		Condition #3: Not used	0		UINT16	R/W	
+20,21		Condition #3: Operate limit	See Section 3.3		UINT32	R/W	Scaled value
+22,23		Condition #3: Release limit	See Section 3.3		UINT32	R/W	Scaled value
+24		Condition #4: Logical operator	0 = OR, 1 = AND		UINT16	R/W	
+25		Condition #4: Trigger parameter ID	F12		UINT16	R/W	
+26		Condition #4: Not used	0		UINT16	R/W	
+27		Condition #4: Not used	0		UINT16	R/W	
+28,29		Condition #4: Operate limit	See Section 3.3		UINT32	R/W	Scaled value

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
+30,31		Condition #4: Release limit	See Section 3.3		UINT32	R/W	Scaled value
+32		Action #1: Action type	F14		UINT16	R/W	
+33		Action #1: Action target	F14		UINT16	R/W	
+34		Action #2: Action type	F14		UINT16	R/W	
+35		Action #2: Action target	F14		UINT16	R/W	
+36		Action #3: Action type	F14		UINT16	R/W	
+37		Action #3: Action target	F14		UINT16	R/W	
+38		Action #4: Action type	F14		UINT16	R/W	
+39		Action #4: Action target	F14		UINT16	R/W	
+40		Not used	0		UINT16	R/W	
+41		Operate delay	0-9999	×0.1 sec	UINT16	R/W	
+42		Release delay	0-9999	×0.1 sec	UINT16	R/W	
+43		Not used	0		UINT16	R/W	
352-395		Setpoint #1					
396-439		Setpoint #2					
440-483		Setpoint #3					
484-527		Setpoint #4					
528-571		Setpoint #5					
572-615		Setpoint #6					
616-659		Setpoint #7					
660-703		Setpoint #8					
704-747		Setpoint #9					
748-791		Setpoint #10					
792-835		Setpoint #11					
836-879		Setpoint #12					
880-923		Setpoint #13					
924-967		Setpoint #14					
968-1011		Setpoint #15					
1012-1055		Setpoint #16					
Pulse Counters Setup							
2940-2947							
+0		Source digital input ID	0=not assigned, 1-4=DI1-DI4		UINT16	R/W	
+1		Multiplier	0-9999		UINT16	R/W	
2940-2941		Counter #1 Setup					
2942-2943		Counter #2 Setup					
2944-2945		Counter #3 Setup					
2946-2947		Counter #4 Setup					
Local Settings							
46400-46415							
+0		Reserved			INT16	R/W	
+1		Daylight savings time (DST) option	0=DST disabled (standard time only), 1=DST enabled		UINT16	R/W	
+2		DST start month	1-12		UINT16	R/W	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
+3		DST start week of the month	1=1st, 2=2nd, 3=3rd, 4=4th week, 5=the last week of the month		UINT16	R/W	
+4		DST start weekday	1-7 (1=Sun, 7=Sat)		UINT16	R/W	
+5		DST end month	1-12		UINT16	R/W	
+6		DST end week of the month	1=1st, 2=2nd, 3=3rd, 4=4th week, 5=the last week of the month		UINT16	R/W	
+7		DST end weekday	1-7 (1=Sun, 7=Sat)		UINT16	R/W	
+8		Clock synchronization source	1-4 = DI1-DI4, 32767 = meter clock		UINT16	R/W	A DI input is considered a pulse or KYZ input. The pulse edge adjusts the clock at the nearest whole minute.
+9		Country code	ITU country calling code		UINT16	R/W	
+10		DST start hour	1-6		UINT16	R/W	
+11		DST end hour	1-6		UINT16	R/W	
+12-15		Reserved			UINT16	R/W	
Clock Indication and Setup							
46416-46447							
+0,1		Local time, in seconds, since Jan 1, 1970	F1	sec	UINT32	R/W	
+2,3		Fractional seconds, μ sec		μ sec	UINT32	R/W	
+4		Fractional seconds, milliseconds	0-999	ms	UINT16	R/W	
+5		Seconds	0-59		UINT16	R/W	
+6		Minutes	0-59		UINT16	R/W	
+7		Hour	0-23		UINT16	R/W	
+8		Day of month	1-31		UINT16	R/W	
+9		Month	1-12		UINT16	R/W	
+10		Year (calendar year minus 2000)	0-99		UINT16	R/W	
+11		Weekday	1-7 (1=Sun, 7=Sat)		UINT16	R	
+12		Daylight savings time status	0=standard time is active, 1=daylight savings time is active		UINT16	R	
+13-31		Reserved			UINT16		
Network Setup							
46576-46703							
+0,1		Device IP Address	0x01000000-0xFFFFFFFF		UINT32	R/W	Network byte order
+2,3		Network subnet mask	0x00000001-0xFFFFFFFF		UINT32	R/W	Network byte order
+4,5		Network default gateway	0x00000000-0xFFFFFFFF		UINT32	R/W	Network byte order
+6,7		Use DHCP	0 = NO, 1 = YES		UINT32	R/W	
+8,9		TCP service port	502 = Modbus/TCP, 20000 = DNP3.0/TCP		UINT32	R/W	
+10-127		Reserved				R/W	
Password Setup							
46704-46707							
+0,1		Communications password (4 digits)	0-9999		UINT32	R/W	Read as 0
+2		Password protection enabled	0 = disabled, 1 = enabled		UINT16	R/W	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
+3		Reserved			UINT16	R/W	
Expert Power Service Setup							
46768-46783							
+0,1		Expert Power server IP Address	0x01000000-0xFFFFFFFF		UINT32	R/W	Default = 207.232.60.18
+2,3		Expert Power server TCP service port	0-65535		UINT32	R/W	Default = 5001
+4,5		Expert Power client enabled	0 = client disabled, 1 = client enabled		UINT32	R/W	
+6,7		Time to next session	1-99999	min	UINT32	R/W	
+8,9		Time to next session	1-99999	min	UINT32	R	Same as previous
+10-15		Reserved					
Internet Service Provider (ISP) accounts							
46784-46831							
+0-15		ISP telephone number			CHAR32	R/W	
+16-31		Login name			CHAR32	R/W	
+32-47		Login password			CHAR32	R/W	
GPRS Setup							
46832-46879							
+0-15		Access Point Name (APN)			CHAR32	R/W	
+16-31		User name			CHAR32	R/W	
+32-39		Password			CHAR16	R/W	
+40-47		Reserved			CHAR16	R/W	
TCP Notification Client Setup							
46896-46991							
+0,1		Client enabled	0 = disabled, 1 = enabled		UINT32	R/W	
+2,3		Server address	0x01000000-0xFFFFFFFF		UINT32	R/W	
+4,5		Server port	0-65535		UINT32	R/W	
+6,7		Message exchange address	0-65535		UINT32	R/W	
+8-15		Reserved					
DNP Options Setup							
51158-51183							
+0		Default Binary Input static object variation	F24 (default 0)		UINT16	R/W	
+1		Default Binary Input Change object variation	F24 (default 1)		UINT16	R/W	
+2		Default Binary Counter object variation	F24 (default 3)		UINT16	R/W	
+3		Default Frozen Binary Counter object variation	F24 (default 4)		UINT16	R/W	
+4		Reserved			UINT16	R/W	
+5		Default Binary Counter Change Event object variation	F24 (default 2)		UINT16	R/W	
+6		Default Analog Input object variation	F24 (default 3)		UINT16	R/W	
+7		Reserved			UINT16	R/W	
+8		Reserved			UINT16	R/W	
+9		Default Analog Input Change Event object variation	F24 (default 2)		UINT16	R/W	
+10		Re-mapping static point indices for event objects	0=disabled (default), 1=enabled		UINT16	R/W	
+11		16-bit BC Scaling	0= $\times 1$ (default), 1= $\times 10$, 2= $\times 100$, 3= $\times 1000$		UINT16	R/W	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
+12		16-bit AI Scaling	0=disabled, 1=enabled (default)		UINT16	R/W	
+13		Number of points allocated for Analog Input change events	0 to 64 (default 32)		UINT16	R/W	
+14		Number of points allocated for Binary Input change events	0 to 32 (default 0)		UINT16	R/W	
+15		Number of points allocated for Binary Counter change events	0 to 64 (default 0)		UINT16	R/W	
+16		Select/Operate Timeout	2 to 30 seconds (default 10 sec)		UINT16	R/W	
+17		Multi Fragment Interval	50 to 500 ms (default 50 ms)		UINT16	R/W	
+18-21		Reserved	Read as 65535		UINT16	R/W	
+22,23		Time Sync Period	1 to 86400 seconds (default 86400 sec)		UINT32	R/W	
+24		Voltage scale, volts secondary	60 to 828V (default 144V)	V	UINT16	R/W	
+25		Current scale, amps secondary	100	×0.1A	UINT16	R/W	
51184-51189		Reserved					
DNP Events Setup							
51190-51445							
+0,1		Threshold/Deadband	0 to 4.3×10^9		UINT32	R/W	A hysteresis for the point return threshold is 0.05Hz for frequency and 2% of the operating threshold for other points
+2		DNP point number	DNP point number available for the selected object		UINT16	R/W	
+3		Event scan control field (bitmap)	Bits 0-1 - DNP Object: 0 = none, 1=AI, 2=BI, 3=BC Bit 2 – Object change event scan: 0= event disabled, 1=enabled Bits 5-6 - DNP event poll class: 0=Class 1, 1=Class 2, 2=Class 3 Bit 7 - Event log on an event: 0= disabled, 1=enabled Bits 8-9 – Threshold/Deadband relation: 0=Delta, 1= more than (over threshold), 2=less than (under threshold)		UINT16	R/W	If Event log is enabled, the source of a DNP event will be recorded to the device Event log file as a general Setpoint #17.
51190-51193		DNP Event #1					
51194-51197		DNP Event #2					
		...					
51442-51445		DNP Event #64					
51446-51701		Reserved					
DNP Class 0 Point Assignments							
51702-51797							
+0		DNP object and variation	F25		UINT16	R/W	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
	+1	Start point number	Point number for the selected object		UINT16	R/W	
	+2	Number of points in a range	0-128		UINT16	R/W	
51702-51704		DNP Class 0 Points Range 1					
51705-51707		DNP Class 0 Points Range 2					
		...					
51795-51797		DNP Class 0 Points Range 32					
51798-51893		Reserved					
GOST 13109 PQ Recorder Triggers Setup							
50134-50453							
	+0	High normally permissible limit, %	-2000-20000	×0.01%	INT16	R/W	
	+1	Hysteresis, % of threshold	0-500	×0.1%	UINT16	R/W	
	+2	Log options, bitmap	Bit 0 – waveform log on event start: 0 = disabled, 1 = enabled; Bit 1 – waveform log on event end: 0 = disabled, 1 = enabled; Bit 2 – PQ log on normally permissible limit: 0 = enabled, 1 = disabled. Bit 3 – PQ log on maximum permissible limit: 0 = enabled, 1 = disabled.		UINT16	R/W	
	+3	Waveform log number	0-1 = log #1-#2		UINT16	R/W	
	+4-11	Not used	0		UINT16	R/W	
	+12	High maximum permissible limit, %	-2000-20000	×0.01%	INT16	R/W	
	+13	Low normally permissible limit, %	-2000-20000	×0.01%	INT16	R/W	
	+14	Low maximum permissible limit, %	-2000-20000	×0.01%	INT16	R/W	
	+15	Not used	0		UINT16	R/W	
50134-50149		Voltage variation, peak load, +/-dU, %Un					
50150-50165		Voltage variation, light load, +/-dU, %Un					
50166-50181		Voltage change, +/-dU, %Un					
50182-50197		Short-term flicker, Pst					
50198-50213		Long-term flicker, Plt					
50214-50229		Voltage THD, %					
50230-50245		Voltage harmonic components, %					
50246-50261		Negative-sequence voltage unbalance, %					
50262-50277		Zero-sequence voltage unbalance, %					
50278-50293		Frequency variation, +/-dF, %Fn					
50294-50309		Voltage dip, %Un					
50310-50325		Impulsive voltage, %Un peak					
50326-50341		Temporary overvoltage, %Un					
50342-50453		Reserved					
GOST 13109 Advanced Setup							
50838-50879							

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
		GOST 13109 Compliance Statistics					
+0		Evaluation	0=disabled, 1=enabled		UINT16	R/W	
+1		Evaluation period	0=daily		UINT16	R/W	
+2		Start time	0-1439	min	UINT16	R/W	
+3		Not used	0		UINT16	R/W	
		GOST 13109 Harmonic Statistics					
+4		Evaluation	0=disabled, 1=enabled		UINT16	R/W	
+5		Evaluation period	0=daily		UINT16	R/W	
+6-8		Not used	0		UINT16	R/W	
		Voltage Change					
+9		GOST 13109-97 limit curve	0=curve 1, 1= curve 2		UINT16	R/W	
		Flicker					
+10		Pst period	1-10	min	UINT16	R/W	
+11-13		Not used	0		UINT16	R/W	
		Harmonic Voltage					
+14		IEC 61000-4-7 harmonics grouping	0=disabled, 1=enabled		UINT16	R/W	
+15-35		Not used	0		UINT16	R/W	
		Peak Load Time Intervals					
+36		Start weekday	0=disabled, 1-7 – Sunday-Saturday		UINT16	R/W	
+37		End weekday	0=disabled, 1-7 – Sunday-Saturday		UINT16	R/W	
+38		Interval 1 start time	0-1439	min	UINT16	R/W	
+39		Interval 1 end time	0-1439	min	UINT16	R/W	
+40		Interval 2 start time	0-1439	min	UINT16	R/W	
+41		Interval 2 end time	0-1439	min	UINT16	R/W	
50880-50901		Reserved	0		UINT16	R/W	
		GOST 13109 Harmonic Voltage Limits					
50902-50965							
+0		H02 limit	1-10000	×0.01%	UINT16	R/W	
+1		H03 limit	1-10000	×0.01%	UINT16	R/W	
+2		H04 limit	1-10000	×0.01%	UINT16	R/W	
		...					
+38		H40 limit	1-10000	×0.01%	UINT16	R/W	
+39-63		Reserved					
		GOST 32144 PQ Recorder Triggers Setup					
50134-50373							
+0		High 95% permissible limit, %	-2000-20000	×0.01%	INT16	R/W	
+1		Hysteresis, % of threshold	0-500	×0.1%	UINT16	R/W	
+2		Log options, bitmap	Bit 0 – waveform log on event start: 0 = disabled, 1 = enabled; Bit 1 – waveform log on event end: 0 = disabled, 1 = enabled; Bit 2 – PQ log on 95% permissible limit:		UINT16	R/W	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
			0 = enabled, 1 = disabled. Bit 3 – PQ log on 100% permissible limit: 0 = enabled, 1 = disabled.				
+3		Waveform log number	0-1 = log #1-#2		UINT16	R/W	
+4-11		Not used	0		UINT16	R/W	
+12		High 100% permissible limit, %	-2000-20000	×0.01%	INT16	R/W	
+13		Low 95% permissible limit, %	-2000-20000	×0.01%	INT16	R/W	
+14		Low 100% permissible limit, %	-2000-20000	×0.01%	INT16	R/W	
+15		Not used	0		UINT16	R/W	
50134-50149		Frequency variation, +/-dF, %Fn					
50150-50165		Voltage variation, +/-dU, %Un					
50166-50181		Rapid voltage changes, +/-dU, %Un					
50182-50197		Short-term flicker, Pst					
50198-50213		Long-term flicker, Plt					
50214-50229		Voltage THD, %					
50230-50245		Voltage harmonic components, %					
50246-50261		Voltage interharmonic components, %					
50262-50277		Signaling voltage, %Un					
50278-50293		Voltage unbalance, %					
50294-50309		Voltage interruptions					
50310-50325		Voltage dips, %Un					
50326-50341		Voltage swells, %Un					
50342-50357		Impulsive voltage, %Un peak					
50358-50373		Voltage variation, light load +/-dU, %Un					
50373-50453		Reserved					
GOST 32144 Advanced Setup							
50838-50879		GOST 32144 Compliance Statistics					
+0		Evaluation	0=disabled, 1=enabled		UINT16	R/W	
+1		Evaluation period	0=daily, 1=weekly		UINT16	R/W	
+2		First day of the week	1=Sunday, 7=Saturday		UINT16	R/W	
+3		Start time	0-1439	min	UINT16	R/W	
+4-7		Not used			UINT16	R/W	
		Rapid Voltage Changes					
+8		Repetition rate, per hour, maximum	1-10		UINT16	R/W	
+9		Not used			UINT16	R/W	
		Flicker					
+10		Pst period	1-10	min	UINT16	R/W	
+11		Not used			UINT16	R/W	
		Harmonic Voltage					
+12		THD, up to order	25-50		UINT16	R/W	
+13		Harmonics, up to order	25-50		UINT16	R/W	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
+14-15		Not used			UINT16	R/W	
		Interharmonic Voltage					
+16		Evaluation	0=disabled, 1=enabled		UINT16	R/W	
+17		THD, up to order	25-50		UINT16	R/W	
+18		Interharmonics, up to order	25-50		UINT16	R/W	
+19		Not used			UINT16	R/W	
		Mains Signaling Voltage					
+20		Evaluation	0=disabled, 1=enabled		UINT16	R/W	
+21		1st signaling frequency	1100-30000	×0.1Hz	UINT16	R/W	
+22		2nd signaling frequency	1100-30000	×0.1Hz	UINT16	R/W	
+23		3rd signaling frequency	1100-30000	×0.1Hz	UINT16	R/W	
+24		4th signaling frequency	1100-30000	×0.1Hz	UINT16	R/W	
+25-34		Not used	0		UINT16	R/W	
		Data Monitoring Options					
+35		Harmonics aggregation interval	0=0.2 s, 1=3 s, 2=10 min		UINT16	R/W	
		Peak Load Time Intervals					
+36		Start weekday	0=disabled, 1-7 = Sunday-Saturday		UINT16	R/W	
+37		End weekday	0=disabled, 1-7 = Sunday-Saturday		UINT16	R/W	
+38		Interval 1 start time	0-1439	min	UINT16	R/W	
+39		Interval 1 end time	0-1439	min	UINT16	R/W	
+40		Interval 2 start time	0-1439	min	UINT16	R/W	
+41		Interval 2 end time	0-1439	min	UINT16	R/W	
50880-50901		Reserved	0		UINT16	R/W	
GOST 32144 Harmonic Voltage Limits							
50902-50965							
+0		H02 limit	1-10000	×0.01%	UINT16	R/W	
+1		H03 limit	1-10000	×0.01%	UINT16	R/W	
+2		H04 limit	1-10000	×0.01%	UINT16	R/W	
		...					
+48		H50 limit	1-10000	×0.01%	UINT16	R/W	
+49-63		Reserved					
GOST 32144 Interharmonic Voltage Limits							
50966-51029							
+0		H02 limit	1-10000	×0.01%	UINT16	R/W	
+1		H03 limit	1-10000	×0.01%	UINT16	R/W	
+2		H04 limit	1-10000	×0.01%	UINT16	R/W	
		...					
+48		H50 limit	1-10000	×0.01%	UINT16	R/W	
+49-63		Reserved					
File Setup							
52598-53877							
+0		File type	0		UINT16	R/W	
+1		File attributes (bitmap)	F3		UINT16	R/W	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
+2		Number of records in the file	0-65535 (0 = delete file)		UINT16	R/W	
+3		Number of sections/channels in the file	0-32		UINT16	R/W	0 = non-partitioned file
+4		Number of parameters per section record	1-16 for conventional data files, 40 for GOST 13109 Statistics log, 80 for GOST 13109 Harmonics log, 42 for GOST 32144 Statistics log, 80 for GOST 32144 Harmonics log		UINT16	R/W	Not changeable for non-conventional files
+5		Not used	0		UINT16	R/W	
+6		Section record size, bytes (for info only)			UINT16	R	
+7		File record size, bytes (for info only)			UINT16	R	
+8, 9		Allocated file size, bytes (for info only)			UINT32	R	
52598-52607		Event Log File Setup					
52608-52617		Data Log #1 File Setup					
52618-52627		Data Log #2 File Setup					
52628-52637		Data Log #3 File Setup					
52638-52647		Data Log #4 File Setup					
52648-52657		Data Log #5 File Setup					
52658-52667		Data Log #6 File Setup					
52668-52677		Data Log #7 File Setup					
52678-52687		Data Log #8 File Setup					
52688-52697		Data Log #9 File Setup					GOST 13109 compliance statistics
52698-52707		Data Log #10 File Setup					GOST 13109 harmonic statistics
52708-52717		Data Log #11 File Setup					
52718-52727		Data Log #12 File Setup					
52728-52737		Data Log #13 File Setup					
52738-52747		Data Log #14 File Setup					
52748-52757		Data Log #15 File Setup					
52758-52767		Data Log #16 File Setup					
52768-52777		Waveform Log #1 File Setup					
52778-52787		Waveform Log #2 File Setup					
52788-52857		Reserved					
52858-52867		GOST 13109/32144 PQ Log File Setup					
52868-53877		Reserved					
Waveform Recorder Setup							
53878-53949							
+0		Sampling rate, samples per cycle	32, 64, 128		UINT16	R/W	Ignored when written
+1		Number of cycles per series	16-2560 (32 samples/cycle), 8-1280 (64 samples/cycle), 4-640 (128 samples/cycle)		UINT16	R/W	
+3		Not used	0		UINT16	R/W	
+4		Number of cycles before a trigger	1-20		UINT16	R/W	
+4,5		File channel mask, bitmap	F9, 0x00000033		UINT32	R/W	Ignored when written
+6,7		Not used	0		UINT32	R/W	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
53878-53885		Waveform Log #1 Setup					
53886-53893		Waveform Log #2 Setup					
Data Log Setup							
54006-55541							
+0		Data log parameter #1 ID	0x0000-0xFFFF		UINT16	R/W	
+1		Data log parameter #2 ID	0x0000-0xFFFF		UINT16	R/W	
+2		Data log parameter #3 ID	0x0000-0xFFFF		UINT16	R/W	
+3		Data log parameter #4 ID	0x0000-0xFFFF		UINT16	R/W	
+4		Data log parameter #5 ID	0x0000-0xFFFF		UINT16	R/W	
+5		Data log parameter #6 ID	0x0000-0xFFFF		UINT16	R/W	
+6		Data log parameter #7 ID	0x0000-0xFFFF		UINT16	R/W	
+7		Data log parameter #8 ID	0x0000-0xFFFF		UINT16	R/W	
+8		Data log parameter #9 ID	0x0000-0xFFFF		UINT16	R/W	
+9		Data log parameter #10 ID	0x0000-0xFFFF		UINT16	R/W	
+10		Data log parameter #11 ID	0x0000-0xFFFF		UINT16	R/W	
+11		Data log parameter #12 ID	0x0000-0xFFFF		UINT16	R/W	
+12		Data log parameter #13 ID	0x0000-0xFFFF		UINT16	R/W	
+13		Data log parameter #14 ID	0x0000-0xFFFF		UINT16	R/W	
+14		Data log parameter #15 ID	0x0000-0xFFFF		UINT16	R/W	
+15		Data log parameter #16 ID	0x0000-0xFFFF		UINT16	R/W	
+16-31		Reserved			UINT16	R/W	
54006-54037		Data log #1 Setup					
54038-54069		Data log #2 Setup					
54070-54101		Data log #3 Setup					
54102-54133		Data log #4 Setup					
54134-54165		Data log #5 Setup					
54166-54197		Data log #6 Setup					
54198-54229		Data log #7 Setup					
54230-54261		Data log #8 Setup					
54262-54293		Data log #9 Setup					Auto-configured. Read as NONE.
54294-54325		Data log #10 Setup					Auto-configured. Read as NONE.
54326-54357		Data log #11 Setup					
54358-54389		Data log #12 Setup					
54390-54421		Data log #13 Setup					
54422-54453		Data log #14 Setup					
54454-54485		Data log #15 Setup					
54486-54517		Data log #16 Setup					
TOU Daily Profile Setup							
55574-55701							
+0		1 st tariff change	F10		UINT16	R/W	
+1		2 nd tariff change	F10		UINT16	R/W	
+2		3 rd tariff change	F10		UINT16	R/W	
+3		4 th tariff change	F10		UINT16	R/W	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
+4		5 th tariff change	F10		UINT16	R/W	
+5		6 th tariff change	F10		UINT16	R/W	
+6		7 th tariff change	F10		UINT16	R/W	
+7		8 th tariff change	F10		UINT16	R/W	
55574-55581		Daily profile #1: Season 1, Day type 1					
55582-55589		Daily profile #2: Season 1, Day type 2					
55590-55597		Daily profile #3: Season 1, Day type 3					
55598-55605		Daily profile #4: Season 1, Day type 4					
55606-55613		Daily profile #5: Season 2, Day type 1					
55614-55621		Daily profile #6: Season 2, Day type 2					
55622-55629		Daily profile #7: Season 2, Day type 3					
55630-55637		Daily profile #8: Season 2, Day type 4					
55638-55645		Daily profile #9: Season 3, Day type 1					
55646-55653		Daily profile #10: Season 3, Day type 2					
55654-55661		Daily profile #11: Season 3, Day type 3					
55662-55669		Daily profile #12: Season 3, Day type 4					
55670-55677		Daily profile #13: Season 4, Day type 1					
55678-55685		Daily profile #14: Season 4, Day type 2					
55686-55693		Daily profile #15: Season 4, Day type 3					
55694-55701		Daily profile #16: Season 4, Day type 4					
55702-55711		Reserved					
TOU Calendar Setup							
55712-56031							
+0-9		Calendar entry record				R/W	
+0		Daily profile	0-3 = Season 1, Day types 0-3 4-7 = Season 2, Day types 0-3 8-11 = Season 3, Day types 0-3 12-15 = Season 4, Day types 0-3		UINT16	R/W	
+1		Week of month	0=all, 1=1st, 2=2nd, 3=3 rd , 4=4th, 5=last week of the month		UINT16	R/W	
+2		Weekday	0=all, 1-7 (Sun=1, Sat=7)		UINT16	R/W	
+3		Till Weekday	0=all, 1-7 (Sun=1, Sat=7)		UINT16	R/W	
+4		Month	0=all, 1-12=January - December		UINT16	R/W	
+5		Day of month	0=all, 1-31= day 1-31		UINT16	R/W	
+6		Till Month	0=all, 1-12=January - December		UINT16	R/W	
+7		Till Day of month	0=all, 1-31= day 1-31		UINT16	R/W	
+8-9		Not used			UINT16	R/W	
55712-55721		Calendar entry #1					
55722-55731		Calendar entry #2					
55732-55741		Calendar entry #3					
...							
56022-56031		Calendar entry #32					
56032-56191		Reserved					

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
Summary Energy/TOU Registers Setup							
56672-56703							
+0		Not used			UINT16	R/W	
+1		Units of measurement	0=none, 1=kWh, 2=kvarh, 3=kVAh, 4=m ³ , 5=CF (cubic feet), 6=CCF (hundred cubic feet)		UINT16	R/W	
+2		Flags (bitmap)	Bit 0=1 - TOU enabled Bit 1=1 - Use profile enabled Bit 2=1 - Max. Demand profile enabled Bit 3=1 - Summary (total) profile enabled		UINT16	R/W	
+3		Not used	0		UINT16	R/W	
56672-56675		Register #1 Setup					
56676-56679		Register #2 Setup					
56680-56683		Register #3 Setup					
56684-56687		Register #4 Setup					
56688-56691		Register #5 Setup					
56692-56695		Register #6 Setup					
56696-56699		Register #7 Setup					
56700-56703		Register #8 Setup					
Summary Energy/TOU Registers Source Setup							
56928-57183							
+0		Energy source ID	F11		UINT16	R/W	
+1		Target summary register number	0-7 = register #1-#8		UINT16	R/W	
+2,3		Multiplier	0-1000000	×0.001	INT32	R/W	
56928-56931		Energy Source #1					
56932-56935		Energy Source #2					
56936-56939		Energy Source #3					
56940-56943		Energy Source #4					
56944-56947		Energy Source #5					
56948-56951		Energy Source #6					
56952-56955		Energy Source #7					
56956-56959		Energy Source #8					
Periodic Timers Setup							
61024-61031							
+0, 1		Time interval, in seconds	0=timer disabled, 1,000-9999,000 ms (1-9999 sec)	0.001 s	UINT32	R/W	
61024-61025		Timer #1 Setup		0.001 s	UINT32	R/W	
61026-61027		Timer #2 Setup		0.001 s	UINT32	R/W	
61028-61029		Timer #3 Setup		0.001 s	UINT32	R/W	
61030-61031		Timer #4 Setup		0.001 s	UINT32	R/W	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
Digital Inputs Setup							
61728-61743							
+0		Pulse mode	0 = pulse, 1 = KYZ		UINT16	R/W	
+1		Polarity	0 = normal, 1 = inverting		UINT16	R/W	
+2		De-bounce time, ms	1-1000		UINT16	R/W	Debounce time will be the same for both inputs
+3		Not used			UINT16	R/W	
61728-61731		DI1 Setup					
61732-61735		DI2 Setup					
61736-61739		DI3 Setup					
61740-61743		DI4 Setup					
Relay Outputs Setup							
61984-62007							
+0		Operation Mode	0=latched, 1=unlatched, 2=pulse, 3=KYZ		UINT16	R/W	
+1		Polarity	Bit 0 - Polarity: 0=normal, 1=inverting, Bit 1 - Retentive mode: 0=disabled, 1=enabled		UINT16	R/W	
+2		Pulse width, ms	1-1000		UINT16	R/W	
+3		Pulse source ID	F17		UINT16	R/W	
+4		Units per pulse	1-10000	x0.1	UINT16	R/W	
+5		Not used			UINT16	R/W	
61984-61989		RO1 Setup					
61990-61995		RO2 Setup					
61996-62001		RO3 Setup					
62002-62007		RO4 Setup					
Analog Inputs Setup							
62368-62379							
+0		Input parameter ID	0 = input not assigned		UINT16	R/W	
+1		Not used	0		UINT16	R/W	
+2,3		Zero scale value (0/4 mA)			INT32	R/W	
+4,5		Full scale value (20/1 mA)			INT32	R/W	
62368-62373		AI1 Setup					
62374-62379		AI2 Setup					
Analog Outputs Setup							
62560-62571							
+0		Output parameter ID	F18		UINT16	R/W	
+1		Not used	0		UINT16	R/W	
+2,3		Zero scale value (0/4 mA)	See Section 3.4		INT32	R/W	
+4,5		Full scale value (20/1 mA)	See Section 3.4		INT32	R/W	
62560-62565		AO1 Setup					
62566-62571		AO2 Setup					

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
Analog Expander Setup							
62752-62847							Analog expander outputs settings will not be in effect until the analog expander output is globally enabled through the Device Options setup
+0		Output parameter ID	F18		UINT16	R/W	
+1		Not used	0		UINT16	R/W	
+2,3		Zero scale value (0/4 mA)	See Section 3.4		INT32	R/W	
+4,5		Full scale value (20/1 mA)	See Section 3.4		INT32	R/W	
62752-62757		AX8 #1 Channel 1 Setup					
62758-62763		AX8 #1 Channel 2 Setup					
...		...					
62794-62799		AX8 #1 Channel 8 Setup					
62800-62805		AX8 #2 Channel 1 Setup					
62806-62811		AX8 #2 Channel 2 Setup					
...		...					
62842-62847		AX8 #2 Channel 8 Setup					

3.8 Analog and Digital I/O Configuration

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
I/O Slots Configuration Info							
63008-63055							
+0		I/O type	F29		UINT16	R	
+1		Number of I/Os on the slot	0-4		UINT16	R	
+2		First I/O number on the slot	0		UINT16	R	
+3		Last I/O number on the slot	0-3		UINT16	R	
63008-63011		DI Slot Configuration					
63012-63015		RO Slot Configuration					
63016-63019		AI/AO Slot Configuration					
63020-63055		Reserved					
I/O Type Info							
63056-63119							
+0		Number of I/O slots of this type	0-1		UINT16	R	
+1		Total number of I/O's of this type	0-4		UINT16	R	
+2		Number of I/O's in the slot	0-4		UINT16	R	
+3		Not used	0		UINT16	R	
63056-63059		DI Type Info					
63060-63063		RO Type Info					
63064-63067		AI Type Info					
63068-63071		AO Type Info					
63076-63119		Reserved					

3.9 File Transfer Registers

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
File Transfer Control Blocks							
63120-63151		File Request Block					
+0		File function	1 = ACK - acknowledgement 3 = set file position 5 = reset file position 7 = find 11 = read file 127 = erase file		UINT16	R/W	1 - clears the file transfer block 3 - changes the file position 5 - sets the file position at the first (oldest) record 7 - finds a record matching an event or/and time (see Note 3) 11 - opens the file for reading from the present file position
+1		File ID	F2		UINT16	R/W	
+2		Section number (functions 3, 5, 11)	0-31, 0xFFFF = use channel ID		UINT16	R/W	
+3		Section channel ID (functions 3, 5, 11)	F6, F7		UINT16	R/W	
+4		Record sequence number (functions 3, 11)	0-65535		UINT16	R/W	The record sequence number with function 11 does not change the file position (see Note 2).
+5		Request variation (function 11)	0, 4		UINT16	R/W	See file response headings
+6		Find key: Event type	F22		UINT16	R/W	
+7		Find key: Event number	1-65535		UINT16	R/W	
+8, 9		Find key: Start time, seconds since 1/1/1970	F1	sec	UINT32	R/W	Note 3
+10, 11		Find key: Start time, fractional seconds in µsec		µsec	UINT32	R/W	Note 3
+12, 13		Find key: End time, seconds since 1/1/1970	F1	sec	UINT32	R/W	Note 3
+14, 15		Find key: End time, fractional seconds in µsec		µsec	UINT32	R/W	Note 3
+16-31		Not used			UINT16	R/W	
63152-64943		File Response Block					
		Data transfer area [0 - 1791]			UINT16	R	
64944-64951		File Info Request Block					
+0		File function	9 = read file info		UINT16	R/W	
+1		File ID	F2		UINT16	R/W	
+2		Section number	0-31, 0xFFFF = use channel ID		UINT16	R/W	
+3		Section channel ID	F6, F7		UINT16	R/W	
+4		Not used	0		UINT16	R/W	
+5		Request variation	0, 1, 2		UINT16	R/W	
+6-7		Not used			UINT16	R/W	
64952-65151		File Info Response Block					
		Data transfer area [0 - 199]			UINT16	R	

NOTES:

1. File sections for partitioned (multi-section) files, like Billing/TOU profile log files, can be requested either by a section number, or by a section channel ID. If a section number is set to 0xFFFF, the section channel ID will be used to identify the section. The section number will be returned in the response block. If a section number is written, then the corresponding channel ID will be returned in the file response block.
2. The record sequence number with function 11 (Read-File) does not change the file position and is used only as a reference to track the order of records. The file transfer block will continue to hold the same data until it is acknowledged, or until the file position is explicitly moved to another record. For multi-section, the Read-File request, which addresses a different file section, will refill the transfer block with data of the record from the requested file section with the identical sequence number. After acknowledgment, the file position will be moved to the next record.
3. Function 7 (Find) puts into the file request block the sequence number of the first record in the file that matches the event time. Any one of the find keys can be omitted by setting it to 0. If one or a number of find keys are omitted, the device will use the remaining keys to locate the matching record. If the record could not be found, the device responds to the write request with the exception code 3 (illegal data). The status of the operation can be read through the file status word in the file info block.

File Response Blocks

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
File Info Response Block (Variation 0 – File info)							
64952-64959		Block Heading					
+0		File function	9		UINT16	R	
+1		File ID	16		UINT16	R	
+2		Section number	0-31		UINT16	R	
+3		Section channel ID	F6, F7		UINT16	R	
+4		Number of records in the block	1		UINT16	R	
+5		Record size, words	36		UINT16	R	
+6		Request variation	0		UINT16	R	
+7		Not used	0		UINT16	R	
64960-64997		File Info					
+0		File type	0		UINT16	R	
+1		File attributes	F3		UINT16	R	
+2		File (section) status	F4		UINT16	R	
+3		Number of sections in the file	0-32		UINT16	R	0 = non-partitioned file
+4, 5		File channel mask (channels 1-32), bitmap	F8, F9		UINT32	R	
+6, 7		File channel mask (channels 33-64), bitmap	F8, F9		UINT32	R	
+8		Number of records in the file	0-65535		UINT16	R	
+9		Number of records until the end of the file	0-65535		UINT16	R	
+10		Current record (read position) sequence number	0-65535		UINT16	R	
+11		Current write position sequence number	0-65535		UINT16	R	
+12		First (oldest) record sequence number	0-65535		UINT16	R	
+13		Last (newest) record sequence number	0-65535		UINT16	R	
+14, 15		Last record time, seconds since 1/1/1970	F1	sec	UINT32	R	
+16, 17		Last record time, fractional seconds		µsec	UINT32	R	
+18, 19		First record time, seconds since 1/1/1970	F1	sec	UINT32	R	
+20, 21		First record time, fractional seconds		µsec	UINT32	R	
+22, 23		Null	0		UINT32	R	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
+24, 25		Null	0	µsec	UINT32	R	
+26, 27		Null	0	sec	UINT32	R	
+28, 29		Null	0	µsec	UINT32	R	
+30		Maximum number of records	0-65535		UINT16	R	
+31		Number of parameters per data section record	0-16		UINT16	R	
+32		Section record size, bytes		Byte	UINT16	R	
+33		File record size, bytes		Byte	UINT16	R	
+34, 35		Allocated file size, bytes		Byte	UINT32	R	
File Info Response Block (Variation 1 – Current record info)							
64952-64959		Block Heading					
+0		File function	9		UINT16	R	
+1		File ID	F2		UINT16	R	
+2		Section number	0-31		UINT16	R	
+3		Section channel ID	F6, F7		UINT16	R	
+4		Number of records in the block	1		UINT16	R	
+5		Record size, words	8		UINT16	R	
+6		Request variation	1		UINT16	R	
+7		Not used	0		UINT16	R	
64960-64997		File Info					
+0		File (section) status	F4		UINT16	R	
+1		Number of records in the file	0-65535		UINT16	R	
+2		Number of records until the end of the file	0-65535		UINT16	R	
+3		Current record (read position) sequence number	0-65535		UINT16	R	
+4, 5		Current record time, seconds since 1/1/1970	F1	sec	UINT32	R	
+6, 7		Current record time, fractional seconds		µsec	UINT32	R	
File Info Response Block (Variation 2 – Data log record structure)							
64952-64959		Block Heading					
+0		File function	9		UINT16	R	
+1		File ID	1-16		UINT16	R	
+2		Section number	0-15		UINT16	R	
+3		Section channel ID	F6, F7		UINT16	R	
+4		Number of records in the block	1		UINT16	R	
+5		Record size, words	2 + Number of parameters		UINT16	R	
+6		Request variation	2		UINT16	R	
+7		Not used	0		UINT16	R	
64960-64997		File Info					
+0		Not used	0		UINT16	R	
+1		Number of fields in a data record	1-16 for conventional files, 40 for GOST 13109 Compliance log, 80 for GOST 13109 Harmonics log, 42 for GOST 32144 Compliance log, 80 for GOST 32144 Harmonics log		UINT16	R	
+2		Field 1 parameter ID	0-0xFFFF		UINT16	R	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
+3		Field 2 parameter ID	0-0xFFFF		UINT16	R	
...		...					
Event Log Response Block							
63152-63159		Block Heading					
+0		Last file function	1, 3, 5, 11		UINT16	R	
+1		File ID	0		UINT16	R	
+2		Section number	0		UINT16	R	
+3		Section channel ID	0		UINT16	R	
+4		Number of records in the block	1-32		UINT16	R	
+5		Record size, words	12		UINT16	R	
+6		Request variation	0		UINT16	R	
+7		Not used	0		UINT16	R	
63160-63543		Event Log Records					
+0		Record status	F5		INT16	R	
+1		Record sequence number	0-65535		UINT16	R	
+2, 3		Trigger time, seconds since 1/1/1970	F1	sec	UINT32	R	
+4, 5		Trigger time, fractional seconds in μ sec		μ sec	UINT32	R	
+6		Event number	1-65535		UINT16	R	
+7		Event point/source ID	F19		UINT16	R	
+8		Event effect	F20		UINT16	R	
+9		Not used	0		UINT16	R	
+10, 11		Value triggered			INT32	R	
63160-63171		Record #1					
...		...					
63532-63543		Record #32					
Data Log Response Block							
63152-63159		Block Heading					
+0		Last file function	1, 3, 5, 11		UINT16	R	
+1		File ID	1-16		UINT16	R	
+2		Section number	0-7		UINT16	R	
+3		Section channel ID	F6		UINT16	R	
+4		Number of records in the block	1-16		UINT16	R	
+5		Record size, words	8 + 2×Number of parameters		UINT16	R	
+6		Request variation	0 = regular log, 4 = GOST 13109/ GOST 32144 online statistics (with file ID = 9, 10)		UINT16	R	
+7		Not used	0		UINT16	R	
63160-64439		Data Log Records					
+0		Record status	F5		INT16	R	
+1		Record sequence number	0-65535		UINT16	R	
+2, 3		Record time, seconds since 1/1/1970	F1	sec	UINT32	R	
+4, 5		Record time, fractional seconds in μ sec		μ sec	UINT32	R	
+6		Trigger event type	F22		INT16	R	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
+7		Trigger event number	0-65535		UINT16	R	
+8, 9		Log value #1			INT32	R	
+10, 11		Log value #2			INT32	R	
...		...				R	
63160-...		Record #1 (variable length)					
		...					
		Record #16 (variable length)					
Waveform Log Response Block							
63152-63159		Block Heading					
+0		Last file function	1, 3, 5, 11		UINT16	R	
+1		File ID	17-18, 128 (F2)		UINT16	R	
+2		Section number	0-9		UINT16	R	
+3		Section channel ID	F7		UINT16	R	
+4		Number of records in the block	1		UINT16	R	
+5		Record size, words	640		UINT16	R	
+6		Request variation	0		UINT16	R	
+7		Not used	0		UINT16	R	
63160-63799		Waveform Log Record					
+0		Record status	F5		INT16	R	
+1		Record sequence number	0-65535		UINT16	R	
+2, 3		Start time, seconds since 1/1/1970	F1	sec	UINT32	R	
+4, 5		Start time, fractional seconds		µsec	UINT32	R	
+6, 7		Trigger time, seconds since 1/1/1970	F1	sec	UINT32	R	
+8, 9		Trigger time, fractional seconds		µsec	UINT32	R	
+10		Record series number	1-65535		UINT16	R	
+11		Record serial number in a series	0-65535		UINT16	R	
+12		Trigger event type	F22		UINT16	R	
+13		Trigger event number	1-65535		UINT16	R	
+14		Source point ID (generic)	See Generic Data in Section 3.4		UINT16	R	
+15		Trigger reference sample index	0-511		UINT16	R	
+16		Sampling rate, µsec/sample	600-27000	×0.1 µsec	UINT16	R	
+17		Sampling rate, samples/cycle	32, 64, 128		UINT16	R	
+18		Sampling frequency	4500-6500	×0.01 Hz	UINT16	R	
+19		Channel offset, sampling units	0		INT16	R	
+20, 21		Channel multiplier, primary units	See Generic Data in Section 3.4		UINT32	R	
+22		Channel divisor, sampling units	32767		UINT16	R	
+23		Length of a sample series, data points	512		UINT16	R	
+24-127		Not used	0		UINT16	R	
+128		Sample Series					
+128-639		Sample data series points [0...511]	-32768 - 32767		INT16	R	¹
Power Quality (PQ) Log Response Block							
63152-63159		Block Heading					
+0		Last file function	1, 3, 5, 11		UINT16	R	

Address	Point ID	Description	Options/Range	Units	Type	R/W	Notes
+1		File ID	26		UINT16	R	
+2		Section number	0		UINT16	R	
+3		Section channel ID	0		UINT16	R	
+4		Number of records in the block	1-16		UINT16	R	
+5		Record size, words	18		UINT16	R	
+6		Request variation	0		UINT16	R	
+7		Not used	0		UINT16	R	
63160-63799		PQ Log Records					
+0		Record status	F5		INT16	R	
+1		Record sequence number	0-65535		UINT16	R	
+2, 3		Start time, seconds since 1/1/1970	F1	sec	UINT32	R	
+4, 5		Start time, fractional seconds in μ sec		μ sec	UINT32	R	
+6, 7		End time, seconds since 1/1/1970	F1	sec	UINT32	R	
+8, 9		End time, fractional seconds in μ sec		μ sec	UINT32	R	
+10		PQ event type	F22		UINT16	R	
+11		PQ event number	1-65535		UINT16	R	
+12		Point ID (generic)	See Generic Data in Section 3.4		UINT16	R	
+13		Not used	0		UINT16	R	
+14, 15		Value reference (base), primary units	See Generic Data in Section 3.4		INT32	R	
+16, 17		Value magnitude, primary units	See Generic Data in Section 3.4		INT32	R	
63160-63179		Record #1					
		...					
63430-63447		Record #16					

¹ To restore the original sampled data in the channel units (e.g., Volts, Amps), the following conversion should be applied:

$$\text{Sampled Data [primary units]} = \frac{(\text{Data Sample} - \text{Channel Offset}) \times \text{Channel Multiplier}}{\text{Channel Divisor}}$$

NOTES:

1. If a file is read through a TCP connection, your assignments for the transfer will be effective only within the current connection socket. Since the device cannot guarantee that your next connection will be made through the same socket, you should not make any assumptions regarding the present block settings. When you open a new connection, always check the file status and pointers before reading file records.
2. When the 4LN3, 3LN3 or 3BLN3 wiring mode is selected, the voltages will be line-to-neutral; for any other wiring mode, they will be line-to-line.

3.10 GOST 13109 Compliance Statistics Data Log

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
0/0				Voltage Variation, peak load				
	1	Nnv	0xC400	Number of non-valid 1-min intervals			UINT32	
	2	N	0xC401	Number of valid 1-min intervals			UINT32	
	3	V1 N1	0xC402	Number of values exceeded normally permissible limit on phase A/AB			UINT32	
	4	V1 N2	0xC403	Number of values exceeded maximum permissible limit on phase A/AB			UINT32	
	5	V1 dU min1	0xC404	Minimum 95% probability daily variation on phase A/AB, +/-%Un		0.01%	INT32	
	6	V1 dU max1	0xC405	Maximum 95% probability daily variation on phase A/AB, +/-%Un		0.01%	INT32	
	7	V1 dU min2	0xC406	Minimum daily variation on phase A/AB, +/-%Un		0.01%	INT32	
	8	V1 dU max2	0xC407	Maximum daily variation on phase A/AB, +/-%Un		0.01%	INT32	
	9	V2 N1	0xC408	Number of values exceeded normally permissible limit on phase B/BC			UINT32	
	10	V2 N2	0xC409	Number of values exceeded maximum permissible limit on phase B/BC			UINT32	
	11	V2 dU min1	0xC40A	Minimum 95% probability daily variation on phase B/BC, +/-%Un		0.01%	INT32	
	12	V2 dU max1	0xC40B	Maximum 95% probability daily variation on phase B/BC, +/-%Un		0.01%	INT32	
	13	V2 dU min2	0xC40C	Minimum daily variation on phase B/BC, +/-%Un		0.01%	INT32	
	14	V2 dU max2	0xC40D	Maximum daily variation on phase B/BC, +/-%Un		0.01%	INT32	
	15	V3 N1	0xC40E	Number of values exceeded normally permissible limit on phase C/CA			UINT32	
	16	V3 N2	0xC40F	Number of values exceeded maximum permissible limit on phase C/CA			UINT32	
	17	V3 dU min1	0xC410	Minimum 95% probability daily variation on phase C/CA, +/-%Un		0.01%	INT32	
	18	V3 dU max1	0xC411	Maximum 95% probability daily variation on phase C/CA, +/-%Un		0.01%	INT32	
	19	V3 dU min2	0xC412	Minimum daily variation on phase C/CA, +/-%Un		0.01%	INT32	
	20	V3 dU max2	0xC413	Maximum daily variation on phase C/CA, +/-%Un		0.01%	INT32	
	21	Vp N1	0xC414	Number of positive sequence values exceeded normally permissible limit			UINT32	
	22	Vp N2	0xC415	Number of positive sequence values exceeded maximum permissible limit			UINT32	
	23	Vp dU min1	0xC416	Minimum positive sequence 95% probability daily variation, +/-%Un		0.01%	INT32	
	24	Vp dU max1	0xC417	Maximum positive sequence 95% probability daily variation, +/-%Un		0.01%	INT32	
	25	Vp dU min2	0xC418	Minimum positive sequence daily variation, +/-%Un		0.01%	INT32	
	26	Vp dU max2	0xC419	Maximum positive sequence daily variation, +/-%Un		0.01%	INT32	
	27	dU lim1 high	0xC41A	High normally permissible limit of voltage variation, %Un		0.01%	UINT32	
	28	dU lim2 high	0xC41B	High maximum permissible limit of voltage variation, %Un		0.01%	UINT32	
	29	dU lim1 low	0xC41C	Low normally permissible limit of voltage variation, %Un		0.01%	UINT32	
	30	dU lim2 low	0xC41D	Low maximum permissible limit of voltage variation, %Un		0.01%	UINT32	
1/1				Voltage Variation, light load				
	1	Nnv	0xC400	Number of non-valid 1-min intervals			UINT32	
	2	N	0xC401	Number of valid 1-min intervals			UINT32	
	3	V1 N1	0xC402	Number of values exceeded normally permissible limit on phase A/AB			UINT32	
	4	V1 N2	0xC403	Number of values exceeded maximum permissible limit on phase A/AB			UINT32	
	5	V1 dU min1	0xC404	Minimum 95% probability daily variation on phase A/AB, +/-%Un		0.01%	INT32	
	6	V1 dU max1	0xC405	Maximum 95% probability daily variation on phase A/AB, +/-%Un		0.01%	INT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
	7	V1 dU min2	0xC406	Minimum daily variation on phase A/AB, +/-%Un		0.01%	INT32	
	8	V1 dU max2	0xC407	Maximum daily variation on phase A/AB, +/-%Un		0.01%	INT32	
	9	V2 N1	0xC408	Number of values exceeded normally permissible limit on phase B/BC			UINT32	
	10	V2 N2	0xC409	Number of values exceeded maximum permissible limit on phase B/BC			UINT32	
	11	V2 dU min1	0xC40A	Minimum 95% probability daily variation on phase B/BC, +/-%Un		0.01%	INT32	
	12	V2 dU max1	0xC40B	Maximum 95% probability daily variation on phase B/BC, +/-%Un		0.01%	INT32	
	13	V2 dU min2	0xC40C	Minimum daily variation on phase B/BC, +/-%Un		0.01%	INT32	
	14	V2 dU max2	0xC40D	Maximum daily variation on phase B/BC, +/-%Un		0.01%	INT32	
	15	V3 N1	0xC40E	Number of values exceeded normally permissible limit on phase C/CA			UINT32	
	16	V3 N2	0xC40F	Number of values exceeded maximum permissible limit on phase C/CA			UINT32	
	17	V3 dU min1	0xC410	Minimum 95% probability daily variation on phase C/CA, +/-%Un		0.01%	INT32	
	18	V3 dU max1	0xC411	Maximum 95% probability daily variation on phase C/CA, +/-%Un		0.01%	INT32	
	19	V3 dU min2	0xC412	Minimum daily variation on phase C/CA, +/-%Un		0.01%	INT32	
	20	V3 dU max2	0xC413	Maximum daily variation on phase C/CA, +/-%Un		0.01%	INT32	
	21	Vp N1	0xC414	Number of positive sequence values exceeded normally permissible limit			UINT32	
	22	Vp N2	0xC415	Number of positive sequence values exceeded maximum permissible limit			UINT32	
	23	Vp dU min1	0xC416	Minimum positive sequence 95% probability daily variation, +/-%Un		0.01%	INT32	
	24	Vp dU max1	0xC417	Maximum positive sequence 95% probability daily variation, +/-%Un		0.01%	INT32	
	25	Vp dU min2	0xC418	Minimum positive sequence daily variation, +/-%Un		0.01%	INT32	
	26	Vp dU max2	0xC419	Maximum positive sequence daily variation, +/-%Un		0.01%	INT32	
	27	dU lim1 high	0xC41A	High normally permissible limit of voltage variation, %Un		0.01%	UINT32	
	28	dU lim2 high	0xC41B	High maximum permissible limit of voltage variation, %Un		0.01%	UINT32	
	29	dU lim1 low	0xC41C	Low normally permissible limit of voltage variation, %Un		0.01%	UINT32	
	30	dU lim2 low	0xC41D	Low maximum permissible limit of voltage variation, %Un		0.01%	UINT32	
2/2				Voltage Variation, daily load				
	1	Nnv	0xC400	Number of non-valid 1-min intervals			UINT32	
	2	N	0xC401	Number of valid 1-min intervals			UINT32	
	3	V1 N1	0xC402	Number of values exceeded normally permissible limit on phase A/AB			UINT32	
	4	V1 N2	0xC403	Number of values exceeded maximum permissible limit on phase A/AB			UINT32	
	5	V1 dU min1	0xC404	Minimum 95% probability daily variation on phase A/AB, +/-%Un		0.01%	INT32	
	6	V1 dU max1	0xC405	Maximum 95% probability daily variation on phase A/AB, +/-%Un		0.01%	INT32	
	7	V1 dU min2	0xC406	Minimum daily variation on phase A/AB, +/-%Un		0.01%	INT32	
	8	V1 dU max2	0xC407	Maximum daily variation on phase A/AB, +/-%Un		0.01%	INT32	
	9	V2 N1	0xC408	Number of values exceeded normally permissible limit on phase B/BC			UINT32	
	10	V2 N2	0xC409	Number of values exceeded maximum permissible limit on phase B/BC			UINT32	
	11	V2 dU min1	0xC40A	Minimum 95% probability daily variation on phase B/BC, +/-%Un		0.01%	INT32	
	12	V2 dU max1	0xC40B	Maximum 95% probability daily variation on phase B/BC, +/-%Un		0.01%	INT32	
	13	V2 dU min2	0xC40C	Minimum daily variation on phase B/BC, +/-%Un		0.01%	INT32	
	14	V2 dU max2	0xC40D	Maximum daily variation on phase B/BC, +/-%Un		0.01%	INT32	
	15	V3 N1	0xC40E	Number of values exceeded normally permissible limit on phase C/CA			UINT32	
	16	V3 N2	0xC40F	Number of values exceeded maximum permissible limit on phase C/CA			UINT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
	17	V3 dU min1	0xC410	Minimum 95% probability daily variation on phase C/CA, +/-%Un		0.01%	INT32	
	18	V3 dU max1	0xC411	Maximum 95% probability daily variation on phase C/CA, +/-%Un		0.01%	INT32	
	19	V3 dU min2	0xC412	Minimum daily variation on phase C/CA, +/-%Un		0.01%	INT32	
	20	V3 dU max2	0xC413	Maximum daily variation on phase C/CA, +/-%Un		0.01%	INT32	
	21	Vp N1	0xC414	Number of positive sequence values exceeded normally permissible limit			UINT32	
	22	Vp N2	0xC415	Number of positive sequence values exceeded maximum permissible limit			UINT32	
	23	Vp dU min1	0xC416	Minimum positive sequence 95% probability daily variation, +/-%Un		0.01%	INT32	
	24	Vp dU max1	0xC417	Maximum positive sequence 95% probability daily variation, +/-%Un		0.01%	INT32	
	25	Vp dU min2	0xC418	Minimum positive sequence daily variation, +/-%Un		0.01%	INT32	
	26	Vp dU max2	0xC419	Maximum positive sequence daily variation, +/-%Un		0.01%	INT32	
	27	dU lim1 high	0xC41A	High normally permissible limit of voltage variation, %Un		0.01%	UINT32	
	28	dU lim2 high	0xC41B	High maximum permissible limit of voltage variation, %Un		0.01%	UINT32	
	29	dU lim1 low	0xC41C	Low normally permissible limit of voltage variation, %Un		0.01%	UINT32	
	30	dU lim2 low	0xC41D	Low maximum permissible limit of voltage variation, %Un		0.01%	UINT32	
3/3				Voltage Change				
	1	V1 N1	0xC480	Number of incidents on phase A/AB			UINT32	
	2	V1 dUt	0xC481	Maximum voltage change on phase A/AB, %Un		0.01%	UINT32	
	3	V1 FdUt	0xC482	Repetition rate of voltage changes on phase A/AB, 1/min		1/min × 0.01	UINT32	
	4	V1 dUt lim	0xC483	Exceeded voltage change limit on phase A/AB, Un%		0.01%	UINT32	
	5	V1 FdUt lim	0xC484	Exceeded repetition rate of voltage changes on phase A/AB, 1/min			UINT32	
	6	V2 N1	0xC485	Number of incidents on phase B/BC			UINT32	
	7	V2 dUt	0xC486	Maximum voltage change on phase B/BC, %Un		0.01%	UINT32	
	8	V2 FdUt	0xC487	Repetition rate of voltage changes on phase B/BC, 1/min		1/min × 0.01	UINT32	
	9	V2 dUt lim	0xC488	Exceeded voltage change limit on phase B/BC, Un%		0.01%	UINT32	
	10	V2 FdUt lim	0xC489	Exceeded repetition rate of voltage changes on phase B/BC, 1/min			UINT32	
	11	V3 N1	0xC48A	Number of incidents on phase C/CA			UINT32	
	12	V3 dUt	0xC48B	Maximum voltage change on phase C/CA, %Un		0.01%	UINT32	
	13	V3 FdUt	0xC48C	Repetition rate of voltage changes on phase C/CA, 1/min		1/min × 0.01	UINT32	
	14	V3 dUt lim	0xC48D	Exceeded voltage change limit on phase C/CA, Un%		0.01%	UINT32	
	15	V3 FdUt lim	0xC48E	Exceeded repetition rate of voltage changes on phase C/CA, 1/min			UINT32	
4/4				Flicker				
	1	Pst Nnv	0xC500	Number of non-valid 10-min intervals			UINT32	
	2	Pst N	0xC501	Number of valid 10-min intervals			UINT32	
	3	V1 Pst N1	0xC502	Number of Pst values exceeded maximum permissible limit on phase A/AB			UINT32	
	4	V1 Pst Max	0xC503	Maximum Pst on phase A/AB		0.01	UINT32	
	5	V2 Pst N1	0xC504	Number of Pst values exceeded maximum permissible limit on phase B/BC			UINT32	
	6	V2 Pst Max	0xC505	Maximum Pst on phase B/BC		0.01	UINT32	
	7	V3 Pst N1	0xC506	Number of Pst values exceeded maximum permissible limit on phase C/CA			UINT32	
	8	V3 Pst Max	0xC507	Maximum Pst on phase C/CA		0.01	UINT32	
	9	Pst lim	0xC508	Maximum permissible limit for Pst		0.01	UINT32	
	10	Plt Nnv	0xC509	Number of non-valid 2-hour intervals			UINT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
	11	Plt N	0xC50A	Number of valid 2-hour intervals			UINT32	
	12	V1 Plt N1	0xC50B	Number of Plt values exceeded maximum permissible limit on phase A/AB			UINT32	
	13	V1 Plt Max	0xC50C	Maximum Plt on phase A/AB		0.01	UINT32	
	14	V2 Plt N1	0xC50D	Number of Plt values exceeded maximum permissible limit on phase B/BC			UINT32	
	15	V2 Plt Max	0xC50E	Maximum Plt on phase B/BC		0.01	UINT32	
	16	V3 Plt N1	0xC50F	Number of Plt values exceeded maximum permissible limit on phase C/CA			UINT32	
	17	V3 Plt Max	0xC510	Maximum Plt on phase C/CA		0.01	UINT32	
	18	Plt lim	0xC511	Maximum permissible limit for Plt		0.01	UINT32	
5/5				Voltage THD				
	1	Nnv	0xC580	Number of non-valid 3-sec intervals			UINT32	
	2	N	0xC581	Number of valid 3-sec intervals			UINT32	
	3	V1 N1	0xC582	Number of THD values exceeded normally permissible limit on phase A/AB			UINT32	
	4	V1 N2	0xC583	Number of THD values exceeded maximum permissible limit on phase A/AB			UINT32	
	5	V1 THD max1	0xC584	Maximum 95% probability daily THD on phase A/AB, %		0.1%	UINT32	
	6	V1 THD max2	0xC585	Maximum daily THD on phase A/AB, %		0.1%	UINT32	
	7	V2 N1	0xC586	Number of THD values exceeded normally permissible limit on phase B/BC			UINT32	
	8	V2 N2	0xC587	Number of THD values exceeded maximum permissible limit on phase B/BC			UINT32	
	9	V2 THD max1	0xC588	Maximum 95% probability daily THD on phase B/BC, %		0.1%	UINT32	
	10	V2 THD max2	0xC589	Maximum daily THD on phase B/BC, %		0.1%	UINT32	
	11	V3 N1	0xC58A	Number of THD values exceeded normally permissible limit on phase C/CA			UINT32	
	12	V3 N2	0xC58B	Number of THD values exceeded maximum permissible limit on phase C/CA			UINT32	
	13	V3 THD max1	0xC58C	Maximum 95% probability daily THD on phase C/CA, %		0.1%	UINT32	
	14	V3 THD max2	0xC58D	Maximum daily THD on phase C/CA, %		0.1%	UINT32	
	15	THD lim1	0xC58E	Normally permissible limit of THD, %		0.1%	UINT32	
	16	THD lim2	0xC58F	Maximum permissible limit of THD, %		0.1%	UINT32	
6/6				Voltage Unbalance				
	1	Nnv	0xC600	Number of non-valid 3-sec intervals			UINT32	
	2	N	0xC601	Number of valid 3-sec intervals			UINT32	
	3	K2u N1	0xC602	Number of negative-sequence values exceeded normally permissible limit			UINT32	
	4	K2u N2	0xC603	Number of negative-sequence values exceeded maximum permissible limit			UINT32	
	5	K2u max1	0xC604	Maximum 95% probability daily negative-sequence unbalance, %		0.1%	UINT32	
	6	K2u max2	0xC605	Maximum daily negative-sequence unbalance, %		0.1%	UINT32	
	7	K2u lim1	0xC606	Normally permissible limit of negative-sequence unbalance, %		0.1%	UINT32	
	8	K2u lim2	0xC607	Maximum permissible limit of negative-sequence unbalance, %		0.1%	UINT32	
	9	K0u N1	0xC608	Number of zero-sequence values exceeded normally permissible limit			UINT32	
	10	K0u N2	0xC609	Number of zero-sequence values exceeded maximum permissible limit			UINT32	
	11	K0u max1	0xC60A	Maximum 95% probability daily zero-sequence unbalance, %		0.1%	UINT32	
	12	K0u max2	0xC60B	Maximum daily zero-sequence unbalance, %		0.1%	UINT32	
	13	K0u lim1	0xC60C	Normally permissible limit of zero-sequence unbalance, %		0.1%	UINT32	
	14	K0u lim2	0xC60D	Maximum permissible limit of zero-sequence unbalance, %		0.1%	UINT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
7/7				Frequency Variation				
	1	Nnv	0xC680	Number of non-valid 20-sec intervals			UINT32	
	2	N	0xC681	Number of valid 20-sec intervals			UINT32	
	3	N1	0xC682	Number of values exceeded normally permissible limit			UINT32	
	4	N2	0xC683	Number of values exceeded maximum permissible limit			UINT32	
	5	df min1	0xC684	Minimum 95% probability daily frequency variation, +/-Hz		0.01 Hz	INT32	
	6	df max1	0xC685	Maximum 95% probability daily frequency variation, +/-Hz		0.01 Hz	INT32	
	7	df min2	0xC686	Minimum daily frequency variation, +/-Hz		0.01 Hz	INT32	
	8	df max2	0xC687	Maximum daily frequency variation, +/-Hz		0.01 Hz	INT32	
	9	df lim1 high	0xC688	High normally permissible limit of frequency variation, Hz		0.01 Hz	UINT32	
	10	df lim2 high	0xC689	High maximum permissible limit of frequency variation, Hz		0.01 Hz	UINT32	
	11	df lim1 low	0xC68A	Low normally permissible limit of frequency variation, Hz		0.01 Hz	UINT32	
	12	df lim2 low	0xC68B	Low maximum permissible limit of frequency variation, Hz		0.01 Hz	UINT32	
8/8				Voltage Dips (indicative statistics)				
	1	N11 10%/0.2s	0xC700	Number of polyphase dips with depth >10% and duration <=0.2 s			UINT32	
	2	N12 35%/0,2s	0xC701	Number of polyphase dips with depth >35% and duration <=0.2 s			UINT32	
	3	N13 99%/0,2s	0xC702	Number of polyphase dips with depth >99% and duration <=0.2 s			UINT32	
	4	N21 10%/0.5s	0xC703	Number of polyphase dips with depth >10% and duration <=0.5 s			UINT32	
	5	N22 35%/0,5s	0xC704	Number of polyphase dips with depth >35% and duration <=0.5 s			UINT32	
	6	N23 99%/0,5s	0xC705	Number of polyphase dips with depth >99% and duration <=0.5 s			UINT32	
	7	N31 10%/0.7s	0xC706	Number of polyphase dips with depth >10% and duration <=0.7 s			UINT32	
	8	N32 35%/0,7s	0xC707	Number of polyphase dips with depth >35% and duration <=0.7 s			UINT32	
	9	N33 99%/0,7s	0xC708	Number of polyphase dips with depth >99% and duration <=0.7 s			UINT32	
	10	N41 10%/1.5s	0xC709	Number of polyphase dips with depth >10% and duration <=1.5 s			UINT32	
	11	N42 35%/1,5s	0xC70A	Number of polyphase dips with depth >35% and duration <=1.5 s			UINT32	
	12	N43 99%/1,5s	0xC70B	Number of polyphase dips with depth >99% and duration <=1.5 s			UINT32	
	13	N51 10%/3.0s	0xC70C	Number of polyphase dips with depth >10% and duration <=3.0 s			UINT32	
	14	N52 35%/3,0s	0xC70D	Number of polyphase dips with depth >35% and duration <=3.0 s			UINT32	
	15	N53 99%/3,0s	0xC70E	Number of polyphase dips with depth >99% and duration <=3.0 s			UINT32	
	16	N61 10%/30s	0xC70F	Number of polyphase dips with depth >10% and duration <=30 s			UINT32	
	17	N62 35%/30s	0xC710	Number of polyphase dips with depth >35% and duration <=30 s			UINT32	
	18	N63 99%/30s	0xC711	Number of polyphase dips with depth >99% and duration <=30 s			UINT32	
	19	N71 10%/>30s	0xC712	Number of polyphase dips with depth >10% and duration >30 s			UINT32	
	20	N72 35%/>30s	0xC713	Number of polyphase dips with depth >35% and duration >30 s			UINT32	
	21	N73 99%/>30s	0xC714	Number of polyphase dips with depth >99% and duration >30 s			UINT32	
	22	dt max 10%	0xC715	Maximum duration of polyphase dips with depth >10%		ms	UINT32	
	23	dt max 35%	0xC716	Maximum duration of polyphase dips with depth >35%		ms	UINT32	
	24	dt max 99%	0xC717	Maximum duration of polyphase dips with depth >99%		ms	UINT32	
	25	dU 0.2s	0xC718	Maximum depth of polyphase dips with duration <=0.2 s, %Un		0.01%	UINT32	
	26	dU 0.5s	0xC719	Maximum depth of polyphase dips with duration <=0.5 s, %Un		0.01%	UINT32	
	27	dU 0.7s	0xC71A	Maximum depth of polyphase dips with duration <=0.7 s, %Un		0.01%	UINT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
	28	dU 1.5s	0xC71B	Maximum depth of polyphase dips with duration <=1.5 s, %Un		0.01%	UINT32	
	29	dU 3.0s	0xC71C	Maximum depth of polyphase dips with duration <=3.0 s, %Un		0.01%	UINT32	
	30	dU 30s	0xC71D	Maximum depth of polyphase dips with duration <=30 s, %Un		0.01%	UINT32	
	31	dU >30s	0xC71E	Maximum depth of polyphase dips with duration >30 s, %Un		0.01%	UINT32	
	32	dt tot	0xC71F	Total duration of polyphase dips		ms	UINT32	
	33	V1 N1	0xC720	Number of dips on phase A/AB			UINT32	
	34	V1 dU max	0xC721	Maximum depth of dips on phase A/AB, %Un		0.01%	UINT32	
	35	V2 N1	0xC722	Number of dips on phase B/BC			UINT32	
	36	V2 dU max	0xC723	Maximum depth of dips on phase B/BC, %Un		0.01%	UINT32	
	37	V3 N1	0xC724	Number of dips on phase C/CA			UINT32	
	38	V3 dU max	0xC725	Maximum depth of dips on phase C/CA, %Un		0.01%	UINT32	
9/9				Impulsive Voltages (indicative statistics)				
	1	N1 20%	0xC780	Number of polyphase impulses with amplitude >20%			UINT32	
	2	N2 100%	0xC781	Number of polyphase impulses with amplitude >100%			UINT32	
	3	N3 200%	0xC782	Number of polyphase impulses with amplitude >200%			UINT32	
	4	N4 300%	0xC783	Number of polyphase impulses with amplitude >300%			UINT32	
	5	N5 400%	0xC784	Number of polyphase impulses with amplitude >400%			UINT32	
	6	V1 N1 20%	0xC785	Number of impulses on phase A/AB with amplitude >20%			UINT32	
	7	V1 N2 100%	0xC786	Number of impulses on phase A/AB with amplitude >100%			UINT32	
	8	V1 N3 200%	0xC787	Number of impulses on phase A/AB with amplitude >200%			UINT32	
	9	V1 N4 300%	0xC788	Number of impulses on phase A/AB with amplitude >300%			UINT32	
	10	V1 N5 400%	0xC789	Number of impulses on phase A/AB with amplitude >400%			UINT32	
	11	V2 N1 20%	0xC78A	Number of impulses on phase B/BC with amplitude >20%			UINT32	
	12	V2 N2 100%	0xC78B	Number of impulses on phase B/BC with amplitude >100%			UINT32	
	13	V2 N3 200%	0xC78C	Number of impulses on phase B/BC with amplitude >200%			UINT32	
	14	V2 N4 300%	0xC78D	Number of impulses on phase B/BC with amplitude >300%			UINT32	
	15	V2 N5 400%	0xC78E	Number of impulses on phase B/BC with amplitude >400%			UINT32	
	16	V3 N1 20%	0xC78F	Number of impulses on phase C/CA with amplitude >20%			UINT32	
	17	V3 N2 100%	0xC790	Number of impulses on phase C/CA with amplitude >100%			UINT32	
	18	V3 N3 200%	0xC791	Number of impulses on phase C/CA with amplitude >200%			UINT32	
	19	V3 N4 300%	0xC792	Number of impulses on phase C/CA with amplitude >300%			UINT32	
	20	V3 N5 400%	0xC793	Number of impulses on phase C/CA with amplitude >400%			UINT32	
	21	V1 max	0xC794	Maximum impulsive voltage on phase A/AB		U1	UINT32	
	22	V1 dt	0xC795	Duration of the maximum voltage impulse on phase A/AB		us	UINT32	
	23	V2 max	0xC796	Maximum impulsive voltage on phase B/BC		U1	UINT32	
	24	V2 dt	0xC797	Duration of the maximum voltage impulse on phase B/BC		us	UINT32	
	25	V3 max	0xC798	Maximum impulsive voltage on phase C/CA		U1	UINT32	
	26	V4 dt	0xC799	Duration of the maximum voltage impulse on phase C/CA		us	UINT32	
10/10				Temporary Overvoltages (indicative statistics)				
	1	N11 110%/1s	0xC800	Number of polyphase overvoltages with U _a >110% and duration <=1 s			UINT32	
	2	N12 120%/1s	0xC801	Number of polyphase overvoltages with U _a >120% and duration <=1 s			UINT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
	3	N13 140%/1s	0xC802	Number of polyphase overvoltages with Ua >140% and duration <=1 s			UINT32	
	4	N14 160%/1s	0xC803	Number of polyphase overvoltages with Ua >160% and duration <=1 s			UINT32	
	5	N15 200%/1s	0xC804	Number of polyphase overvoltages with Ua >200% and duration <=1 s			UINT32	
	6	N21 110%/20s	0xC805	Number of polyphase overvoltages with Ua >110% and duration <=20s			UINT32	
	7	N22 120%/20s	0xC806	Number of polyphase overvoltages with Ua >120% and duration <=20 s			UINT32	
	8	N23 140%/20s	0xC807	Number of polyphase overvoltages with Ua >140% and duration <=20 s			UINT32	
	9	N24 160%/20s	0xC808	Number of polyphase overvoltages with Ua >160% and duration <=20 s			UINT32	
	10	N25 200%/20s	0xC809	Number of polyphase overvoltages with Ua >200% and duration <=20 s			UINT32	
	11	N31 110%/60s	0xC80A	Number of polyphase overvoltages with Ua >110% and duration <=60 s			UINT32	
	12	N31 120%/60s	0xC80B	Number of polyphase overvoltages with Ua >120% and duration <=60 s			UINT32	
	13	N33 140%/60s	0xC80C	Number of polyphase overvoltages with Ua >140% and duration <=60 s			UINT32	
	14	N34 160%/60s	0xC80D	Number of polyphase overvoltages with Ua >160% and duration <=60 s			UINT32	
	15	N35 200%/60s	0xC80E	Number of polyphase overvoltages with Ua >200% and duration <=60 s			UINT32	
	16	N41 110%/>60s	0xC80F	Number of polyphase overvoltages with Ua >110% and duration >60 s			UINT32	
	17	N42 120%/>60s	0xC810	Number of polyphase overvoltages with Ua >120% and duration >60 s			UINT32	
	18	N43 140%/>60s	0xC811	Number of polyphase overvoltages with Ua >140% and duration >60 s			UINT32	
	19	N44 160%/>60s	0xC812	Number of polyphase overvoltages with Ua >160% and duration >60 s			UINT32	
	20	N45 200%/>60s	0xC813	Number of polyphase overvoltages with Ua >200% and duration >60 s			UINT32	
	21	dt max 110%	0xC814	Maximum duration of polyphase overvoltages with Ua >110%		ms	UINT32	
	22	dt max 120%	0xC815	Maximum duration of polyphase overvoltages with Ua >120%		ms	UINT32	
	23	dt max 140%	0xC816	Maximum duration of polyphase overvoltages with Ua >140%		ms	UINT32	
	24	dt max 160%	0xC817	Maximum duration of polyphase overvoltages with Ua >160%		ms	UINT32	
	25	dt max 200%	0xC818	Maximum duration of polyphase overvoltages with Ua >200%		ms	UINT32	
	26	Vpu max 1s	0xC819	Maximum polyphase overvoltage factor with duration <=1 s		0.01	UINT32	
	27	Vpu max 20s	0xC81A	Maximum polyphase overvoltage factor with duration <=20 s		0.01	UINT32	
	28	Vpu max 60s	0xC81B	Maximum polyphase overvoltage factor with duration <=60 s		0.01	UINT32	
	29	Vpu max >60s	0xC81C	Maximum polyphase overvoltage factor with duration >60 s		0.01	UINT32	
	30	dt tot	0xC81D	Total duration of polyphase overvoltages		ms	UINT32	
	31	V1 N1	0xC81E	Number of overvoltages on phase A/AB			UINT32	
	32	V1pu max	0xC81F	Maximum overvoltage factor on phase A/AB		0.01	UINT32	
	33	V2 N1	0xC820	Number of overvoltages on phase B/BC			UINT32	
	34	V2pu max	0xC821	Maximum overvoltage factor on phase B/BC		0.01	UINT32	
	35	V3 N1	0xC822	Number of overvoltages on phase C/CA			UINT32	
	36	V3pu max	0xC823	Maximum overvoltage factor on phase C/CA		0.01	UINT32	

¹ When the 4LN3, 3LN3 or 3BLN wiring mode is selected, the voltages will be line-to-neutral; for any other wiring mode, they will be line-to-line voltages.

3.11 GOST 13109 Harmonic Statistics Data Log

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
0/0				V1 Harmonic Compliance			UINT32	
	1	Nnv	0xCC00	Number of non-valid 3-sec intervals			UINT32	
	2	N	0xCC01	Number of valid 3-sec intervals			UINT32	
	3	H02 N1	0xCC02	Number of H02 values exceeded normally permissible limit on phase A/AB			UINT32	
	4	H03 N1	0xCC03	Number of H03 values exceeded normally permissible limit on phase A/AB			UINT32	
		...					UINT32	
	41	H40 N1	0xCC28	Number of H40 values exceeded normally permissible limit on phase A/AB			UINT32	
	42	H02 N2	0xCC29	Number of H02 values exceeded maximum permissible limit on phase A/AB			UINT32	
	43	H03 N2	0xCC2A	Number of H03 values exceeded maximum permissible limit on phase A/AB			UINT32	
		...					UINT32	
	80	H40 N2	0xCC4F	Number of H40 values exceeded maximum permissible limit on phase A/AB			UINT32	
1/1				V2 Harmonic Compliance			UINT32	
	1	Nnv	0xCC00	Number of non-valid 3-sec intervals			UINT32	
	2	N	0xCC01	Number of valid 3-sec intervals			UINT32	
	3	H02 N1	0xCC02	Number of H02 values exceeded normally permissible limit on phase B/BC			UINT32	
	4	H03 N1	0xCC03	Number of H03 values exceeded normally permissible limit on phase B/BC			UINT32	
		...					UINT32	
	41	H40 N1	0xCC28	Number of H40 values exceeded normally permissible limit on phase B/BC			UINT32	
	42	H02 N2	0xCC29	Number of H02 values exceeded maximum permissible limit on phase B/BC			UINT32	
	43	H03 N2	0xCC2A	Number of H03 values exceeded maximum permissible limit on phase B/BC			UINT32	
		...					UINT32	
	80	H40 N2	0xCC4F	Number of H40 values exceeded maximum permissible limit on phase B/BC			UINT32	
2/2				V3 Harmonic Compliance			UINT32	
	1	Nnv	0xCC00	Number of non-valid 3-sec intervals			UINT32	
	2	N	0xCC01	Number of valid 3-sec intervals			UINT32	
	3	H02 N1	0xCC02	Number of H02 values exceeded normally permissible limit on phase C/CA			UINT32	
	4	H03 N1	0xCC03	Number of H03 values exceeded normally permissible limit on phase C/CA			UINT32	
		...					UINT32	
	41	H40 N1	0xCC28	Number of H40 values exceeded normally permissible limit on phase C/CA			UINT32	
	42	H02 N2	0xCC29	Number of H02 values exceeded maximum permissible limit on phase C/CA			UINT32	
	43	H03 N2	0xCC2A	Number of H03 values exceeded maximum permissible limit on phase C/CA			UINT32	
		...					UINT32	
	80	H40 N2	0xCC4F	Number of H40 values exceeded maximum permissible limit on phase C/CA			UINT32	
3/3				V1 Harmonic Components			UINT32	
	1	%H02 max1	0xCC80	Maximum 95% probability daily value of H02 on phase A/AB, %		0.01%	UINT32	
	2	%H03 max1	0xCC81	Maximum 95% probability daily value of H03 on phase A/AB, %		0.01%	UINT32	
		...					UINT32	
	39	%H40 max1	0xCCA6	Maximum 95% probability daily value of H40 on phase A/AB, %		0.01%	UINT32	
	40	%H02 max2	0xCCA7	Maximum daily value of H02 on phase A/AB, %		0.01%	UINT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
	41	%H03 max2	0xCCA8	Maximum daily value of H03 on phase A/AB, %		0.01%	UINT32	
		...					UINT32	
	78	%H40 max2	0xCCCD	Maximum daily value of H40 on phase A/AB, %		0.01%	UINT32	
4/4				V2 Harmonic Components			UINT32	
	1	%H02 max1	0xCC80	Maximum 95% probability daily value of H02 on phase B/BC, %		0.01%	UINT32	
	2	%H03 max1	0xCC81	Maximum 95% probability daily value of H03 on phase B/BC, %		0.01%	UINT32	
		...					UINT32	
	39	%H40 max1	0xCCA6	Maximum 95% probability daily value of H40 on phase B/BC, %		0.01%	UINT32	
	40	%H02 max2	0xCCA7	Maximum daily value of H02 on phase B/BC, %		0.01%	UINT32	
	41	%H03 max2	0xCCA8	Maximum daily value of H03 on phase B/BC, %		0.01%	UINT32	
		...					UINT32	
	78	%H40 max2	0xCCCD	Maximum daily value of H40 on phase B/BC, %		0.01%	UINT32	
5/5				V3 Harmonic Components			UINT32	
	1	%H02 max1	0xCC80	Maximum 95% probability daily value of H02 on phase C/CA, %		0.01%	UINT32	
	2	%H03 max1	0xCC81	Maximum 95% probability daily value of H03 on phase C/CA, %		0.01%	UINT32	
		...					UINT32	
	39	%H40 max1	0xCCA6	Maximum 95% probability daily value of H40 on phase C/CA, %		0.01%	UINT32	
	40	%H02 max2	0xCCA7	Maximum daily value of H02 on phase C/CA, %		0.01%	UINT32	
	41	%H03 max2	0xCCA8	Maximum daily value of H03 on phase C/CA, %		0.01%	UINT32	
		...					UINT32	
	78	%H40 max2	0xCCCD	Maximum daily value of H40 on phase C/CA, %		0.01%	UINT32	

¹ When the 4LN3, 3LN3 or 3BLN wiring mode is selected, the voltages will be line-to-neutral; for any other wiring mode, they will be line-to-line voltages.

3.12 GOST 32144 Compliance Statistics Data Log

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
0/0				Frequency Variation				
	1	Nnv	0xCE00	Number of non-valid 10-sec intervals			UINT32	
	2	N	0xCE01	Number of valid 10-sec intervals			UINT32	
	3	N1	0xCE02	Number of values exceeded 95% permissible limit			UINT32	
	4	N2	0xCE03	Number of values exceeded maximum permissible limit			UINT32	
	5	df min1	0xCE04	Minimum 95% probability weekly frequency variation, +/-Hz		0.01 Hz	INT32	
	6	df max1	0xCE05	Maximum 95% probability weekly frequency variation, +/-Hz		0.01 Hz	INT32	
	7	df min2	0xCE06	Minimum weekly frequency variation, +/-Hz		0.01 Hz	INT32	
	8	df max2	0xCE07	Maximum weekly frequency variation, +/-Hz		0.01 Hz	INT32	
	9	df lim1 high	0xCE08	High 95% permissible limit of frequency variation, Hz		0.01 Hz	INT32	
	10	df lim2 high	0xCE09	High maximum permissible limit of frequency variation, Hz		0.01 Hz	INT32	
	11	df lim1 low	0xCE0A	Low 95% permissible limit of frequency variation, Hz		0.01 Hz	INT32	
	12	df lim2 low	0xCE0B	Low maximum permissible limit of frequency variation, Hz		0.01 Hz	INT32	
1/1				Voltage Variation, peak load				
	1	Nnv	0xCE80	Number of non-valid 10-min intervals			UINT32	
	2	N	0xCE81	Number of valid 10-min intervals			UINT32	
	3	V1 N1	0xCE82	Number of values exceeded maximum permissible limit on phase A/AB			UINT32	
	4	V1 dU min	0xCE83	Minimum weekly variation on phase A/AB, +/-%Un		0.01%	INT32	
	5	V1 dU max	0xCE84	Maximum weekly variation on phase A/AB, +/-%Un		0.01%	INT32	
	6	V2 N1	0xCE85	Number of values exceeded maximum permissible limit on phase B/BC			UINT32	
	7	V2 dU min	0xCE86	Minimum weekly variation on phase B/BC, +/-%Un		0.01%	INT32	
	8	V2 dU max	0xCE87	Maximum weekly variation on phase B/BC, +/-%Un		0.01%	INT32	
	9	V3 N1	0xCE88	Number of values exceeded maximum permissible limit on phase C/CA			UINT32	
	10	V3 dU min	0xCE89	Minimum weekly variation on phase C/CA, +/-%Un		0.01%	INT32	
	11	V3 dU max	0xCE8A	Maximum weekly variation on phase C/CA, +/-%Un		0.01%	INT32	
	12	dU lim high	0xCE8B	High maximum permissible limit of voltage variation, %Un		0.01%	INT32	
	13	dU lim low	0xCE8C	Low maximum permissible limit of voltage variation, %Un		0.01%	INT32	
2/2				Rapid Voltage Changes				
	1	N1	0xCF00	Number of polyphase incidents			UINT32	
	2	V1 N1	0xCF01	Number of incidents on phase A/AB			UINT32	
	3	V1 dU	0xCF02	Maximum voltage change on phase A/AB, %Un		0.01%	UINT32	
	4	V2 N1	0xCF03	Number of incidents on phase B/BC			UINT32	
	5	V2 dU	0xCF04	Maximum voltage change on phase B/BC, %Un		0.01%	UINT32	
	6	V3 N1	0xCF05	Number of incidents on phase C/CA			UINT32	
	7	V3 dU	0xCF06	Maximum voltage change on phase C/CA, %Un		0.01%	UINT32	
	8	dU lim	0xCF07	Maximum permissible limit of voltage changes, Un%		0.01%	UINT32	
3/3				Flicker				
	1	Pst Nnv	0xCF80	Number of non-valid 10-min intervals			UINT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
	2	Pst N	0xCF81	Number of valid 10-min intervals			UINT32	
	3	V1 Pst N1	0xCF82	Number of Pst values exceeded maximum permissible limit on phase A/AB			UINT32	
	4	V1 Pst max	0xCF83	Maximum Pst on phase A/AB		0.01	UINT32	
	5	V2 Pst N1	0xCF84	Number of Pst values exceeded maximum permissible limit on phase B/BC			UINT32	
	6	V2 Pst max	0xCF85	Maximum Pst on phase B/BC		0.01	UINT32	
	7	V3 Pst N1	0xCF86	Number of Pst values exceeded maximum permissible limit on phase C/CA			UINT32	
	8	V3 Pst max	0xCF87	Maximum Pst on phase C/CA		0.01	UINT32	
	9	Pst lim	0xCF88	Maximum permissible limit for Pst		0.01	UINT32	
	10	Plt Nnv	0xCF89	Number of non-valid 2-hour intervals			UINT32	
	11	Plt N	0xCF8A	Number of valid 2-hour intervals			UINT32	
	12	V1 Plt N1	0xCF8B	Number of Plt values exceeded maximum permissible limit on phase A/AB			UINT32	
	13	V1 Plt max	0xCF8C	Maximum Plt on phase A/AB		0.01	UINT32	
	14	V2 Plt N1	0xCF8D	Number of Plt values exceeded maximum permissible limit on phase B/BC			UINT32	
	15	V2 Plt max	0xCF8E	Maximum Plt on phase B/BC		0.01	UINT32	
	16	V3 Plt N1	0xCF8F	Number of Plt values exceeded maximum permissible limit on phase C/CA			UINT32	
	17	V3 Plt max	0xCF90	Maximum Plt on phase C/CA		0.01	UINT32	
	18	Plt lim	0xCF91	Maximum permissible limit for Plt		0.01	UINT32	
4/4				Voltage THD				
	1	Nnv	0xD000	Number of non-valid 10-min intervals			UINT32	
	2	N	0xD001	Number of valid 10-min intervals			UINT32	
	3	V1 N1	0xD002	Number of THD values exceeded 95% permissible limit on phase A/AB			UINT32	
	4	V1 N2	0xD003	Number of THD values exceeded maximum permissible limit on phase A/AB			UINT32	
	5	V1 THD max1	0xD004	Maximum 95% probability weekly THD on phase A/AB, %		0.1%	UINT32	
	6	V1 THD max2	0xD005	Maximum weekly THD on phase A/AB, %		0.1%	UINT32	
	7	V2 N1	0xD006	Number of THD values exceeded 95% permissible limit on phase B/BC			UINT32	
	8	V2 N2	0xD007	Number of THD values exceeded maximum permissible limit on phase B/BC			UINT32	
	9	V2 THD max1	0xD008	Maximum 95% probability weekly THD on phase B/BC, %		0.1%	UINT32	
	10	V2 THD max2	0xD009	Maximum weekly THD on phase B/BC, %		0.1%	UINT32	
	11	V3 N1	0xD00A	Number of THD values exceeded 95% permissible limit on phase C/CA			UINT32	
	12	V3 N2	0xD00B	Number of THD values exceeded maximum permissible limit on phase C/CA			UINT32	
	13	V3 THD max1	0xD00C	Maximum 95% probability weekly THD on phase C/CA, %		0.1%	UINT32	
	14	V3 THD max2	0xD00D	Maximum weekly THD on phase C/CA, %		0.1%	UINT32	
	15	THD lim1	0xD00E	95% permissible limit of THD, %		0.1%	UINT32	
	16	THD lim2	0xD00F	Maximum permissible limit of THD, %		0.1%	UINT32	
5/5				Voltage Unbalance				
	1	Nnv	0xD100	Number of non-valid 10-min intervals			UINT32	
	2	N	0xD101	Number of valid 10-min intervals			UINT32	
	3	K2u N1	0xD102	Number of negative-sequence values exceeded 95% permissible limit			UINT32	
	4	K2u N2	0xD103	Number of negative-sequence values exceeded maximum permissible limit			UINT32	
	5	K2u max1	0xD104	Maximum 95% probability weekly negative-sequence unbalance, %		0.1%	UINT32	
	6	K2u max2	0xD105	Maximum weekly negative-sequence unbalance, %		0.1%	UINT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
	7	K2u lim1	0xD106	95% permissible limit of negative-sequence unbalance, %		0.1%	UINT32	
	8	K2u lim2	0xD107	Maximum permissible limit of negative-sequence unbalance, %		0.1%	UINT32	
	9	K0u N1	0xD108	Number of zero-sequence values exceeded 95% permissible limit			UINT32	
	10	K0u N2	0xD109	Number of zero-sequence values exceeded maximum permissible limit			UINT32	
	11	K0u max1	0xD10A	Maximum 95% probability weekly zero-sequence unbalance, %		0.1%	UINT32	
	12	K0u max2	0xD10B	Maximum weekly zero-sequence unbalance, %		0.1%	UINT32	
	13	K0u lim1	0xD10C	95% permissible limit of zero-sequence unbalance, %		0.1%	UINT32	
	14	K0u lim2	0xD10D	Maximum permissible limit of zero-sequence unbalance, %		0.1%	UINT32	
6/6				Signaling Voltage				
	1	Nnv	0xD080	Number of non-valid 3-sec intervals			UINT32	
	2	N	0xD081	Number of valid 3-sec intervals			UINT32	
	3	N1	0xD082	Number of polyphase incidents, N1			UINT32	
	4	V1 Sig1	0xD083	Maximum 1st signaling voltage magnitude on phase V1, %Un		0.01%	UINT32	
	5	V1 Sig2	0xD084	Maximum 2nd signaling voltage magnitude on phase V1, %Un		0.01%	UINT32	
	6	V1 Sig3	0xD085	Maximum 3rd signaling voltage magnitude on phase V1, %Un		0.01%	UINT32	
	7	V1 Sig4	0xD086	Maximum 4th signaling voltage magnitude on phase V1, %Un		0.01%	UINT32	
	8	V2 Sig1	0xD087	Maximum 1st signaling voltage magnitude on phase V2, %Un		0.01%	UINT32	
	9	V2 Sig2	0xD088	Maximum 2nd signaling voltage magnitude on phase V2, %Un		0.01%	UINT32	
	10	V2 Sig3	0xD089	Maximum 3rd signaling voltage magnitude on phase V2, %Un		0.01%	UINT32	
	11	V2 Sig4	0xD08A	Maximum 4th signaling voltage magnitude on phase V2, %Un		0.01%	UINT32	
	12	V3 Sig1	0xD08B	Maximum 1st signaling voltage magnitude on phase V3, %Un		0.01%	UINT32	
	13	V3 Sig2	0xD08C	Maximum 2nd signaling voltage magnitude on phase V3, %Un		0.01%	UINT32	
	14	V3 Sig3	0xD08D	Maximum 3rd signaling voltage magnitude on phase V3, %Un		0.01%	UINT32	
	15	V3 Sig4	0xD08E	Maximum 4th signaling voltage magnitude on phase V3, %Un		0.01%	UINT32	
	16	Sig1 frq	0xD08F	1st signaling frequency		0.01Hz	UINT32	
	17	Sig2 frq	0xD090	2nd signaling frequency		0.01Hz	UINT32	
	18	Sig3 frq	0xD091	3rd signaling frequency		0.01Hz	UINT32	
	19	Sig4 frq	0xD092	4th signaling frequency		0.01Hz	UINT32	
	20	V Sig1 lim	0xD093	Maximum permissible 1st signaling voltage magnitude, %Un		0.01%	UINT32	
	21	V Sig2 lim	0xD094	Maximum permissible 2nd signaling voltage magnitude, %Un		0.01%	UINT32	
	22	V Sig3 lim	0xD095	Maximum permissible 3rd signaling voltage magnitude, %Un		0.01%	UINT32	
	23	V Sig4 lim	0xD096	Maximum permissible 4th signaling voltage magnitude, %Un		0.01%	UINT32	
7/7				Voltage Interruptions (indicative statistics)				
	1	N1 0,5s	0xD180	Number of polyphase interruptions <=500ms			UINT32	
	2	N2 1s	0xD181	Number of polyphase interruptions <=1s			UINT32	
	3	N3 5s	0xD182	Number of polyphase interruptions <=5s			UINT32	
	4	N4 20s	0xD183	Number of polyphase interruptions <=20s			UINT32	
	5	N5 60s	0xD184	Number of polyphase interruptions <=60s			UINT32	
	6	N6 180s	0xD185	Number of polyphase interruptions <=180s			UINT32	
	7	N7 >180s	0xD186	Number of polyphase interruptions >180s			UINT32	
	8	V min	0xD187	Minimum residual voltage, %Un		0.01%	UINT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
	9	dt max	0xD188	Maximum duration of a polyphase interruption		ms	UINT32	
	10	dt tot	0xD189	Total duration of polyphase interruptions		ms	UINT32	
8/8				Voltage Dips (indicative statistics)				
	1	N11 90%/0,2s	0xD200	Number of polyphase dips <90% and duration <=0.2 s			UINT32	
	2	N12 90%/0,5s	0xD205	Number of polyphase dips <90% and duration <=0.5 s			UINT32	
	3	N13 90%/1s	0xD20A	Number of polyphase dips <90% and duration <=1 s			UINT32	
	4	N14 90%/5s	0xD20F	Number of polyphase dips <90% and duration <=5 s			UINT32	
	5	N15 90%/20s	0xD214	Number of polyphase dips <90% and duration <=20 s			UINT32	
	6	N16 90%/60s	0xD219	Number of polyphase dips <90% and duration <=60 s			UINT32	
	7	N21 85%/0,2s	0xD201	Number of polyphase dips <85% and duration <=0.2 s			UINT32	
	8	N22 85%/0,5s	0xD206	Number of polyphase dips <85% and duration <=0.5 s			UINT32	
	9	N23 85%/1s	0xD20B	Number of polyphase dips <85% and duration <=1 s			UINT32	
	10	N24 85%/5s	0xD210	Number of polyphase dips <85% and duration <=5 s			UINT32	
	11	N25 85%/20s	0xD215	Number of polyphase dips <85% and duration <=20 s			UINT32	
	12	N26 85%/60s	0xD21A	Number of polyphase dips <85% and duration <=60 s			UINT32	
	13	N31 70%/0,2s	0xD202	Number of polyphase dips <70% and duration <=0.2 s			UINT32	
	14	N32 70%/0,5s	0xD207	Number of polyphase dips <70% and duration <=0.5 s			UINT32	
	15	N33 70%/1s	0xD20C	Number of polyphase dips <70% and duration <=1 s			UINT32	
	16	N34 70%/5s	0xD211	Number of polyphase dips <70% and duration <=5 s			UINT32	
	17	N35 70%/20s	0xD216	Number of polyphase dips <70% and duration <=20 s			UINT32	
	18	N36 70%/60s	0xD21B	Number of polyphase dips <70% and duration <=60 s			UINT32	
	19	N41 40%/0,2s	0xD203	Number of polyphase dips <40% and duration <=0.2 s			UINT32	
	20	N42 40%/0,5s	0xD208	Number of polyphase dips <40% and duration <=0.5 s			UINT32	
	21	N43 40%/1s	0xD20D	Number of polyphase dips <40% and duration <=1 s			UINT32	
	22	N44 40%/5s	0xD212	Number of polyphase dips <40% and duration <=5 s			UINT32	
	23	N45 40%/20s	0xD217	Number of polyphase dips <40% and duration <=20 s			UINT32	
	24	N46 40%/60s	0xD21C	Number of polyphase dips <40% and duration <=60 s			UINT32	
	25	N51 10%/0,2s	0xD204	Number of polyphase dips <10% and duration <=0.2 s			UINT32	
	26	N52 10%/0,5s	0xD209	Number of polyphase dips <10% and duration <=0.5 s			UINT32	
	27	N53 10%/1s	0xD20E	Number of polyphase dips <10% and duration <=1 s			UINT32	
	28	N54 10%/5s	0xD213	Number of polyphase dips <10% and duration <=5 s			UINT32	
	29	N55 10%/20s	0xD218	Number of polyphase dips <10% and duration <=20 s			UINT32	
	30	N56 10%/60s	0xD21D	Number of polyphase dips <10% and duration <=60 s			UINT32	
	31	dt max 90%	0xD21E	Maximum duration of a polyphase dip < 90%		ms	UINT32	
	32	dt max 85%	0xD21F	Maximum duration of a polyphase dip < 85%		ms	UINT32	
	33	dt max 70%	0xD220	Maximum duration of a polyphase dip < 70%		ms	UINT32	
	34	dt max 40%	0xD221	Maximum duration of a polyphase dip < 40%		ms	UINT32	
	35	dt max 10%	0xD222	Maximum duration of a polyphase dip < 10%		ms	UINT32	
	36	V min 0.2s	0xD223	Minimum residual voltage of polyphase dips with duration <=0.2 s, %Un		0.01%	UINT32	
	37	V min 0.5s	0xD224	Minimum residual voltage of polyphase dips with duration <=0.5 s, %Un		0.01%	UINT32	
	38	V min 1s	0xD225	Minimum residual voltage of polyphase dips with duration <=1 s, %Un		0.01%	UINT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
	39	V min 5s	0xD226	Minimum residual voltage of polyphase dips with duration <=5 s, %Un		0.01%	UINT32	
	40	V min 20s	0xD227	Minimum residual voltage of polyphase dips with duration <=20 s, %Un		0.01%	UINT32	
	41	V min 60s	0xD228	Minimum residual voltage of polyphase dips with duration <=60 s, %Un		0.01%	UINT32	
	42	dt tot	0xD229	Total duration of polyphase dips		ms	UINT32	
9/9				Voltage Swells (indicative statistics)				
	1	N11 110%/0,2s	0xD280	Number of polyphase swells >110% and duration <=0.2 s			UINT32	
	2	N12 110%/0,5s	0xD284	Number of polyphase swells >110% and duration <=0.5 s			UINT32	
	3	N13 110%/1s	0xD288	Number of polyphase swells >110% and duration <=1 s			UINT32	
	4	N14 110%/5s	0xD28C	Number of polyphase swells >110% and duration <=5 s			UINT32	
	5	N15 110%/20s	0xD290	Number of polyphase swells >110% and duration <=20 s			UINT32	
	6	N16 110%/60s	0xD294	Number of polyphase swells >110% and duration <=60 s			UINT32	
	7	N21 120%/0,2s	0xD281	Number of polyphase swells >120% and duration <=0.2 s			UINT32	
	8	N22 120%/0,5s	0xD285	Number of polyphase swells >120% and duration <=0.5 s			UINT32	
	9	N23 120%/1s	0xD289	Number of polyphase swells >120% and duration <=1 s			UINT32	
	10	N24 120%/5s	0xD28D	Number of polyphase swells >120% and duration <=5 s			UINT32	
	11	N25 120%/20s	0xD291	Number of polyphase swells >120% and duration <=20 s			UINT32	
	12	N26 120%/60s	0xD295	Number of polyphase swells >120% and duration <=60 s			UINT32	
	13	N31 140%/0,2s	0xD282	Number of polyphase swells >140% and duration <=0.2 s			UINT32	
	14	N32 140%/0,5s	0xD286	Number of polyphase swells >140% and duration <=0.5 s			UINT32	
	15	N33 140%/1s	0xD28A	Number of polyphase swells >140% and duration <=1 s			UINT32	
	16	N34 140%/5s	0xD28E	Number of polyphase swells >140% and duration <=5 s			UINT32	
	17	N35 140%/20s	0xD292	Number of polyphase swells >140% and duration <=20 s			UINT32	
	18	N36 140%/60s	0xD296	Number of polyphase swells >140% and duration <=60 s			UINT32	
	19	N41 160%/0,2s	0xD283	Number of polyphase swells >160% and duration <=0.2 s			UINT32	
	20	N42 160%/0,5s	0xD287	Number of polyphase swells >160% and duration <=0.5 s			UINT32	
	21	N43 160%/1s	0xD28B	Number of polyphase swells >160% and duration <=1 s			UINT32	
	22	N44 160%/5s	0xD28F	Number of polyphase swells >160% and duration <=5 s			UINT32	
	23	N45 160%/20s	0xD293	Number of polyphase swells >160% and duration <=20 s			UINT32	
	24	N46 160%/60s	0xD297	Number of polyphase swells >160% and duration <=60 s			UINT32	
	25	dt max 110%	0xD298	Maximum duration of polyphase swells with >110%		ms	UINT32	
	26	dt max 120%	0xD299	Maximum duration of polyphase swells with >120%		ms	UINT32	
	27	dt max 140%	0xD29A	Maximum duration of polyphase swells with >140%		ms	UINT32	
	28	dt max 160%	0xD29B	Maximum duration of polyphase swells with >160%		ms	UINT32	
	29	V max 0,2s	0xD29C	Maximum polyphase swell voltage with duration <=0.2 s, %Un		0.01%	UINT32	
	30	V max 0,5s	0xD29D	Maximum polyphase swell voltage with duration <=0.5 s, %Un		0.01%	UINT32	
	31	V max 1s	0xD29E	Maximum polyphase swell voltage with duration <=1 s, %Un		0.01%	UINT32	
	32	V max 5s	0xD29F	Maximum polyphase swell voltage with duration <=5 s, %Un		0.01%	UINT32	
	33	V max 20s	0xD2A0	Maximum polyphase swell voltage with duration <=20 s, %Un		0.01%	UINT32	
	34	V max 60s	0xD2A1	Maximum polyphase swell voltage with duration <=60 s, %Un		0.01%	UINT32	
	35	dt tot	0xD2A2	Total duration of polyphase swells		ms	UINT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
10/10				Impulsive Voltages (indicative statistics)				
	1	N11 20%/0,1ms	0xD300	Number of polyphase impulses >20% and duration <=0.1 ms			UINT32	
	2	N12 20%/0,2ms	0xD301	Number of polyphase impulses >20% and duration <=0.2 ms			UINT32	
	3	N13 20%/0,5ms	0xD302	Number of polyphase impulses >20% and duration <=0.5 ms			UINT32	
	4	N14 20%/1ms	0xD303	Number of polyphase impulses >20% and duration <=1 ms			UINT32	
	5	N15 20%/5ms	0xD304	Number of polyphase impulses >20% and duration <=5 ms			UINT32	
	6	N16 20%/10ms	0xD305	Number of polyphase impulses >20% and duration <=10 ms			UINT32	
	7	N21 100%/0,1ms	0xD306	Number of polyphase impulses >100% and duration <=0.1 ms			UINT32	
	8	N22 100%/0,2ms	0xD307	Number of polyphase impulses >100% and duration <=0.2 ms			UINT32	
	9	N23 100%/0,5ms	0xD308	Number of polyphase impulses >100% and duration <=0.5 ms			UINT32	
	10	N24 100%/1ms	0xD309	Number of polyphase impulses >100% and duration <=1 ms			UINT32	
	11	N25 100%/5ms	0xD30A	Number of polyphase impulses >100% and duration <=5 ms			UINT32	
	12	N26 100%/10ms	0xD30B	Number of polyphase impulses >100% and duration <=10 ms			UINT32	
	13	N31 200%/0,1ms	0xD30C	Number of polyphase impulses >200% and duration <=0.1 ms			UINT32	
	14	N32 200%/0,2ms	0xD30D	Number of polyphase impulses >200% and duration <=0.2 ms			UINT32	
	15	N33 200%/0,5ms	0xD30E	Number of polyphase impulses >200% and duration <=0.5 ms			UINT32	
	16	N34 200%/1ms	0xD30F	Number of polyphase impulses >200% and duration <=1 ms			UINT32	
	17	N35 200%/5ms	0xD310	Number of polyphase impulses >200% and duration <=5 ms			UINT32	
	18	N36 200%/10ms	0xD311	Number of polyphase impulses >200% and duration <=10 ms			UINT32	
	19	N41 300%/0,1ms	0xD312	Number of polyphase impulses >300% and duration <=0.1 ms			UINT32	
	20	N42 300%/0,2ms	0xD313	Number of polyphase impulses >300% and duration <=0.2 ms			UINT32	
	21	N43 300%/0,5ms	0xD314	Number of polyphase impulses >300% and duration <=0.5 ms			UINT32	
	22	N44 300%/1ms	0xD315	Number of polyphase impulses >300% and duration <=1 ms			UINT32	
	23	N45 300%/5ms	0xD316	Number of polyphase impulses >300% and duration <=5 ms			UINT32	
	24	N46 300%/10ms	0xD317	Number of polyphase impulses >300% and duration <=10 ms			UINT32	
	25	N51 400%/0,1ms	0xD318	Number of polyphase impulses >400% and duration <=0.1 ms			UINT32	
	26	N52 400%/0,2ms	0xD319	Number of polyphase impulses >400% and duration <=0.2 ms			UINT32	
	27	N53 400%/0,5ms	0xD31A	Number of polyphase impulses >400% and duration <=0.5 ms			UINT32	
	28	N54 400%/1ms	0xD31B	Number of polyphase impulses >400% and duration <=1 ms			UINT32	
	29	N55 400%/5ms	0xD31C	Number of polyphase impulses >400% and duration <=5 ms			UINT32	
	30	N56 400%/10ms	0xD31D	Number of polyphase impulses >400% and duration <=10 ms			UINT32	
	31	V max 0,1ms	0xD31E	Maximum impulsive voltage with duration <=0.1 ms, %Un peak		0.01%	UINT32	
	32	V max 0,2ms	0xD31F	Maximum impulsive voltage with duration <=0.2 ms, %Un peak		0.01%	UINT32	
	33	V max 0,5ms	0xD320	Maximum impulsive voltage with duration <=0.5 ms, %Un peak		0.01%	UINT32	
	34	V max 1ms	0xD321	Maximum impulsive voltage with duration <=1 ms, %Un peak		0.01%	UINT32	
	35	V max 5ms	0xD322	Maximum impulsive voltage with duration <=5 ms, %Un peak		0.01%	UINT32	
	36	V max 10ms	0xD323	Maximum impulsive voltage with duration <=10 ms, %Un peak		0.01%	UINT32	
11/11				Voltage Variation, light load				
	1	Nnv	0xD380	Number of non-valid 10-min intervals			UINT32	
	2	N	0xD381	Number of valid 10-min intervals			UINT32	
	3	V1 N1	0xD382	Number of values exceeded maximum permissible limit on phase A/AB			UINT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
	4	V1 dU min	0xD383	Minimum weekly variation on phase A/AB, +/-%Un		0.01%	INT32	
	5	V1 dU max	0xD384	Maximum weekly variation on phase A/AB, +/-%Un		0.01%	INT32	
	6	V2 N1	0xD385	Number of values exceeded maximum permissible limit on phase B/BC			UINT32	
	7	V2 dU min	0xD386	Minimum weekly variation on phase B/BC, +/-%Un		0.01%	INT32	
	8	V2 dU max	0xD387	Maximum weekly variation on phase B/BC, +/-%Un		0.01%	INT32	
	9	V3 N1	0xD388	Number of values exceeded maximum permissible limit on phase C/CA			UINT32	
	10	V3 dU min	0xD389	Minimum weekly variation on phase C/CA, +/-%Un		0.01%	INT32	
	11	V3 dU max	0xD38A	Maximum weekly variation on phase C/CA, +/-%Un		0.01%	INT32	
	12	dU lim high	0xD38B	High maximum permissible limit of voltage variation, %Un		0.01%	INT32	
	13	dU lim low	0xD38C	Low maximum permissible limit of voltage variation, %Un		0.01%	INT32	
12/12				Flagged Data (daily)				
	1	BegTm1	0xD400	1st weekday: beginning time	F1		UINT32	
	2	EndTm1	0xD401	1st weekday: end time	F1		UINT32	
	3	N1	0xD402	1st weekday: total number of 10-min measurement intervals			UINT32	
	4	Nnv1	0xD403	1st weekday: number of non-valid (flagged) 10-min intervals			UINT32	
	5	BegTm2	0xD404	2nd weekday: beginning time	F1		UINT32	
	6	EndTm2	0xD405	2nd weekday: end time	F1		UINT32	
	7	N2	0xD406	2nd weekday: total number of 10-min measurement intervals			UINT32	
	8	Nnv2	0xD407	2nd weekday: number of non-valid (flagged) 10-min intervals			UINT32	
	9	BegTm3	0xD408	3rd weekday: beginning time	F1		UINT32	
	10	EndTm3	0xD409	3rd weekday: end time	F1		UINT32	
	11	N3	0xD40A	3rd weekday: total number of 10-min measurement intervals			UINT32	
	12	Nnv3	0xD40B	3rd weekday: number of non-valid (flagged) 10-min intervals			UINT32	
	13	BegTm4	0xD40C	4th weekday: beginning time	F1		UINT32	
	14	EndTm4	0xD40D	4th weekday: end time	F1		UINT32	
	15	N4	0xD40E	4th weekday: total number of 10-min measurement intervals			UINT32	
	16	Nnv4	0xD40F	4th weekday: number of non-valid (flagged) 10-min intervals			UINT32	
	17	BegTm5	0xD410	5th weekday: beginning time	F1		UINT32	
	18	EndTm5	0xD411	5th weekday: end time	F1		UINT32	
	19	N5	0xD412	5th weekday: total number of 10-min measurement intervals			UINT32	
	20	Nnv5	0xD413	5th weekday: number of non-valid (flagged) 10-min intervals			UINT32	
	21	BegTm6	0xD414	6th weekday: beginning time	F1		UINT32	
	22	EndTm6	0xD415	6th weekday: end time	F1		UINT32	
	23	N6	0xD416	6th weekday: total number of 10-min measurement intervals			UINT32	
	24	Nnv6	0xD417	6th weekday: number of non-valid (flagged) 10-min intervals			UINT32	
	25	BegTm7	0xD418	7th weekday: beginning time	F1		UINT32	
	26	EndTm7	0xD419	7th weekday: end time	F1		UINT32	
	27	N7	0xD41A	7th weekday: total number of 10-min measurement intervals			UINT32	
	28	Nnv7	0xD41B	7th weekday: number of non-valid (flagged) 10-min intervals			UINT32	

¹ When the 4LN3, 3LN3 or 3BLN wiring mode is selected, the voltages will be line-to-neutral; for any other wiring mode, they will be line-to-line voltages.

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File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
0/0				V1 Harmonic Compliance			UINT32	
	1	Nnv	0xCC00	Number of non-valid 10-min intervals			UINT32	
	2	N	0xCC01	Number of valid 10-min intervals			UINT32	
	3	H02 N1	0xCC02	Number of H02 values exceeded normally permissible limit on phase A/AB			UINT32	
	4	H03 N1	0xCC03	Number of H03 values exceeded normally permissible limit on phase A/AB			UINT32	
		...					UINT32	
	41	H40 N1	0xCC28	Number of H40 values exceeded normally permissible limit on phase A/AB			UINT32	
	42	H02 N2	0xCC29	Number of H02 values exceeded maximum permissible limit on phase A/AB			UINT32	
	43	H03 N2	0xCC2A	Number of H03 values exceeded maximum permissible limit on phase A/AB			UINT32	
		...					UINT32	
	80	H40 N2	0xCC4F	Number of H40 values exceeded maximum permissible limit on phase A/AB			UINT32	
1/1				V2 Harmonic Compliance			UINT32	
	1	Nnv	0xCC00	Number of non-valid 10-min intervals			UINT32	
	2	N	0xCC01	Number of valid 10-min intervals			UINT32	
	3	H02 N1	0xCC02	Number of H02 values exceeded normally permissible limit on phase B/BC			UINT32	
	4	H03 N1	0xCC03	Number of H03 values exceeded normally permissible limit on phase B/BC			UINT32	
		...					UINT32	
	41	H40 N1	0xCC28	Number of H40 values exceeded normally permissible limit on phase B/BC			UINT32	
	42	H02 N2	0xCC29	Number of H02 values exceeded maximum permissible limit on phase B/BC			UINT32	
	43	H03 N2	0xCC2A	Number of H03 values exceeded maximum permissible limit on phase B/BC			UINT32	
		...					UINT32	
	80	H40 N2	0xCC4F	Number of H40 values exceeded maximum permissible limit on phase B/BC			UINT32	
2/2				V3 Harmonic Compliance			UINT32	
	1	Nnv	0xCC00	Number of non-valid 10-min intervals			UINT32	
	2	N	0xCC01	Number of valid 10-min intervals			UINT32	
	3	H02 N1	0xCC02	Number of H02 values exceeded normally permissible limit on phase C/CA			UINT32	
	4	H03 N1	0xCC03	Number of H03 values exceeded normally permissible limit on phase C/CA			UINT32	
		...					UINT32	
	41	H40 N1	0xCC28	Number of H40 values exceeded normally permissible limit on phase C/CA			UINT32	
	42	H02 N2	0xCC29	Number of H02 values exceeded maximum permissible limit on phase C/CA			UINT32	
	43	H03 N2	0xCC2A	Number of H03 values exceeded maximum permissible limit on phase C/CA			UINT32	
		...					UINT32	
	80	H40 N2	0xCC4F	Number of H40 values exceeded maximum permissible limit on phase C/CA			UINT32	
3/3				V1 Harmonic Components			UINT32	
	1	%H02 max1	0xCC80	Maximum 95% probability weekly value of H02 on phase A/AB, %		0.01%	UINT32	
	2	%H03 max1	0xCC81	Maximum 95% probability weekly value of H03 on phase A/AB, %		0.01%	UINT32	
		...					UINT32	
	39	%H40 max1	0xCCA6	Maximum 95% probability weekly value of H40 on phase A/AB, %		0.01%	UINT32	
	40	%H02 max2	0xCCA7	Maximum weekly value of H02 on phase A/AB, %		0.01%	UINT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
	41	%H03 max2	0xCCA8	Maximum weekly value of H03 on phase A/AB, %		0.01%	UINT32	
		...					UINT32	
	78	%H40 max2	0xCCCD	Maximum weekly value of H40 on phase A/AB, %		0.01%	UINT32	
4/4				V2 Harmonic Components			UINT32	
	1	%H02 max1	0xCC80	Maximum 95% probability weekly value of H02 on phase B/BC, %		0.01%	UINT32	
	2	%H03 max1	0xCC81	Maximum 95% probability weekly value of H03 on phase B/BC, %		0.01%	UINT32	
		...					UINT32	
	39	%H40 max1	0xCCA6	Maximum 95% probability weekly value of H40 on phase B/BC, %		0.01%	UINT32	
	40	%H02 max2	0xCCA7	Maximum weekly value of H02 on phase B/BC, %		0.01%	UINT32	
	41	%H03 max2	0xCCA8	Maximum weekly value of H03 on phase B/BC, %		0.01%	UINT32	
		...					UINT32	
	78	%H40 max2	0xCCCD	Maximum weekly value of H40 on phase B/BC, %		0.01%	UINT32	
5/5				V3 Harmonic Components			UINT32	
	1	%H02 max1	0xCC80	Maximum 95% probability weekly value of H02 on phase C/CA, %		0.01%	UINT32	
	2	%H03 max1	0xCC81	Maximum 95% probability weekly value of H03 on phase C/CA, %		0.01%	UINT32	
		...					UINT32	
	39	%H40 max1	0xCCA6	Maximum 95% probability weekly value of H40 on phase C/CA, %		0.01%	UINT32	
	40	%H02 max2	0xCCA7	Maximum weekly value of H02 on phase C/CA, %		0.01%	UINT32	
	41	%H03 max2	0xCCA8	Maximum weekly value of H03 on phase C/CA, %		0.01%	UINT32	
		...					UINT32	
	78	%H40 max2	0xCCCD	Maximum weekly value of H40 on phase C/CA, %		0.01%	UINT32	
6/-				V1 Interharmonic Compliance (reserved)			UINT32	
	1	Nnv	0xCC00	Number of non-valid 10-min intervals			UINT32	
	2	N	0xCC01	Number of valid 10-min intervals			UINT32	
	3	H02 N1	0xCC02	Number of H02 values exceeded normally permissible limit on phase A/AB			UINT32	
	4	H03 N1	0xCC03	Number of H03 values exceeded normally permissible limit on phase A/AB			UINT32	
		...					UINT32	
	41	H40 N1	0xCC28	Number of H40 values exceeded normally permissible limit on phase A/AB			UINT32	
	42	H02 N2	0xCC29	Number of H02 values exceeded maximum permissible limit on phase A/AB			UINT32	
	43	H03 N2	0xCC2A	Number of H03 values exceeded maximum permissible limit on phase A/AB			UINT32	
		...					UINT32	
	80	H40 N2	0xCC4F	Number of H40 values exceeded maximum permissible limit on phase A/AB			UINT32	
7/-				V2 Interharmonic Compliance (reserved)			UINT32	
	1	Nnv	0xCC00	Number of non-valid 10-min intervals			UINT32	
	2	N	0xCC01	Number of valid 10-min intervals			UINT32	
	3	H02 N1	0xCC02	Number of H02 values exceeded normally permissible limit on phase B/BC			UINT32	
	4	H03 N1	0xCC03	Number of H03 values exceeded normally permissible limit on phase B/BC			UINT32	
		...					UINT32	
	41	H40 N1	0xCC28	Number of H40 values exceeded normally permissible limit on phase B/BC			UINT32	
	42	H02 N2	0xCC29	Number of H02 values exceeded maximum permissible limit on phase B/BC			UINT32	
	43	H03 N2	0xCC2A	Number of H03 values exceeded maximum permissible limit on phase B/BC			UINT32	

File Channel/ Section	Record Field No.	Point Label	Point ID	Description ¹	Range	Units	Type	Notes
		...					UINT32	
	80	H40 N2	0xCC4F	Number of H40 values exceeded maximum permissible limit on phase B/BC			UINT32	
8/-				V3 Interharmonic Compliance (reserved)			UINT32	
	1	Nnv	0xCC00	Number of non-valid 10-min intervals			UINT32	
	2	N	0xCC01	Number of valid 10-min intervals			UINT32	
	3	H02 N1	0xCC02	Number of H02 values exceeded normally permissible limit on phase C/CA			UINT32	
	4	H03 N1	0xCC03	Number of H03 values exceeded normally permissible limit on phase C/CA			UINT32	
		...					UINT32	
	41	H40 N1	0xCC28	Number of H40 values exceeded normally permissible limit on phase C/CA			UINT32	
	42	H02 N2	0xCC29	Number of H02 values exceeded maximum permissible limit on phase C/CA			UINT32	
	43	H03 N2	0xCC2A	Number of H03 values exceeded maximum permissible limit on phase C/CA			UINT32	
		...					UINT32	
	80	H40 N2	0xCC4F	Number of H40 values exceeded maximum permissible limit on phase C/CA			UINT32	
9/6				V1 Interharmonic Components			UINT32	
	1	%H02 max1	0xCC80	Maximum 95% probability weekly value of H02 on phase A/AB, %		0.01%	UINT32	
	2	%H03 max1	0xCC81	Maximum 95% probability weekly value of H03 on phase A/AB, %		0.01%	UINT32	
		...					UINT32	
	39	%H40 max1	0xCCA6	Maximum 95% probability weekly value of H40 on phase A/AB, %		0.01%	UINT32	
	40	%H02 max2	0xCCA7	Maximum weekly value of H02 on phase A/AB, %		0.01%	UINT32	
	41	%H03 max2	0xCCA8	Maximum weekly value of H03 on phase A/AB, %		0.01%	UINT32	
		...					UINT32	
	78	%H40 max2	0xCCCD	Maximum weekly value of H40 on phase A/AB, %		0.01%	UINT32	
10/7				V2 Interharmonic Components			UINT32	
	1	%H02 max1	0xCC80	Maximum 95% probability weekly value of H02 on phase B/BC, %		0.01%	UINT32	
	2	%H03 max1	0xCC81	Maximum 95% probability weekly value of H03 on phase B/BC, %		0.01%	UINT32	
		...					UINT32	
	39	%H40 max1	0xCCA6	Maximum 95% probability weekly value of H40 on phase B/BC, %		0.01%	UINT32	
	40	%H02 max2	0xCCA7	Maximum weekly value of H02 on phase B/BC, %		0.01%	UINT32	
	41	%H03 max2	0xCCA8	Maximum weekly value of H03 on phase B/BC, %		0.01%	UINT32	
		...					UINT32	
	78	%H40 max2	0xCCCD	Maximum weekly value of H40 on phase B/BC, %		0.01%	UINT32	
11/8				V3 Interharmonic Components			UINT32	
	1	%H02 max1	0xCC80	Maximum 95% probability weekly value of H02 on phase C/CA, %		0.01%	UINT32	
	2	%H03 max1	0xCC81	Maximum 95% probability weekly value of H03 on phase C/CA, %		0.01%	UINT32	
		...					UINT32	
	39	%H40 max1	0xCCA6	Maximum 95% probability weekly value of H40 on phase C/CA, %		0.01%	UINT32	
	40	%H02 max2	0xCCA7	Maximum weekly value of H02 on phase C/CA, %		0.01%	UINT32	
	41	%H03 max2	0xCCA8	Maximum weekly value of H03 on phase C/CA, %		0.01%	UINT32	
		...					UINT32	
	78	%H40 max2	0xCCCD	Maximum weekly value of H40 on phase C/CA, %		0.01%	UINT32	

¹ When the 4LN3, 3LN3 or 3BLN wiring mode is selected, the voltages will be line-to-neutral; for any other wiring mode, they will be line-to-line voltages.

3.14 Billing/TOU Daily Profile Data Log

File Channel/ Section ¹	Record Field No. ²	Point Label	Point ID	Description	Range	Units ³	Type	Notes
0/0				Energy Register #1				
	1	REG1	0x1780	Summary (total) energy reading	0-999,999,999	1 kWh	UINT32	
	2	TRF1	0x7000	Tariff #1 energy reading	0-999,999,999	1 kWh	UINT32	
	3	TRF2	0x7001	Tariff #2 energy reading	0-999,999,999	1 kWh	UINT32	
	4	TRF3	0x7002	Tariff #3 energy reading	0-999,999,999	1 kWh	UINT32	
	5	TRF4	0x7003	Tariff #4 energy reading	0-999,999,999	1 kWh	UINT32	
	6	TRF5	0x7004	Tariff #5 energy reading	0-999,999,999	1 kWh	UINT32	
	7	TRF6	0x7005	Tariff #6 energy reading	0-999,999,999	1 kWh	UINT32	
	8	TRF7	0x7006	Tariff #7 energy reading	0-999,999,999	1 kWh	UINT32	
	9	TRF8	0x7007	Tariff #8 energy reading	0-999,999,999	1 kWh	UINT32	
...				...				
7/7				Energy Register #8				
	1	REG8	0x1787	Summary (total) energy reading	0-999,999,999	1 kWh	UINT32	
	2	TRF1	0x7000	Tariff #1 energy reading	0-999,999,999	1 kWh	UINT32	
	3	TRF2	0x7001	Tariff #2 energy reading	0-999,999,999	1 kWh	UINT32	
	4	TRF3	0x7002	Tariff #3 energy reading	0-999,999,999	1 kWh	UINT32	
	5	TRF4	0x7003	Tariff #4 energy reading	0-999,999,999	1 kWh	UINT32	
	6	TRF5	0x7004	Tariff #5 energy reading	0-999,999,999	1 kWh	UINT32	
	7	TRF6	0x7005	Tariff #6 energy reading	0-999,999,999	1 kWh	UINT32	
	8	TRF7	0x7006	Tariff #7 energy reading	0-999,999,999	1 kWh	UINT32	
	9	TRF8	0x7007	Tariff #8 energy reading	0-999,999,999	1 kWh	UINT32	
16/8				Daily Maximum Demand Register #1				
	1	REG1 MD	0x4780	Summary (total) max. demand reading	0-Pmax	U3	UINT32	
	2	TRF1 MD	0x7100	Tariff #1 max. demand reading	0-Pmax	U3	UINT32	
	3	TRF2 MD	0x7101	Tariff #2 max. demand reading	0-Pmax	U3	UINT32	
	4	TRF3 MD	0x7102	Tariff #3 max. demand reading	0-Pmax	U3	UINT32	
	5	TRF4 MD	0x7103	Tariff #4 max. demand reading	0-Pmax	U3	UINT32	
	6	TRF5 MD	0x7104	Tariff #5 max. demand reading	0-Pmax	U3	UINT32	
	7	TRF6 MD	0x7105	Tariff #6 max. demand reading	0-Pmax	U3	UINT32	
	8	TRF7 MD	0x7106	Tariff #7 max. demand reading	0-Pmax	U3	UINT32	
	9	TRF8 MD	0x7107	Tariff #8 max. demand reading	0-Pmax	U3	UINT32	
...				...				
23/15				Daily Maximum Demand Register #8				
	1	REG8 MD	0x4787	Summary (total) max. demand reading	0-Pmax	U3	UINT32	
	2	TRF1 MD	0x7100	Tariff #1 max. demand reading	0-Pmax	U3	UINT32	
	3	TRF2 MD	0x7101	Tariff #2 max. demand reading	0-Pmax	U3	UINT32	
	4	TRF3 MD	0x7102	Tariff #3 max. demand reading	0-Pmax	U3	UINT32	
	5	TRF4 MD	0x7103	Tariff #4 max. demand reading	0-Pmax	U3	UINT32	
	6	TRF5 MD	0x7104	Tariff #5 max. demand reading	0-Pmax	U3	UINT32	

File Channel/Section ¹	Record Field No. ²	Point Label	Point ID	Description	Range	Units ³	Type	Notes
	7	TRF6 MD	0x7105	Tariff #6 max. demand reading	0-Pmax	U3	UINT32	
	8	TRF7 MD	0x7106	Tariff #7 max. demand reading	0-Pmax	U3	UINT32	
	9	TRF8 MD	0x7107	Tariff #8 max. demand reading	0-Pmax	U3	UINT32	

¹ An energy use profile section is allocated for registers for which a source input is selected in the Billing/TOU Register setup and for which energy use profile is enabled. A maximum demand profile section is allocated for registers for which maximum demand profile is enabled in the Billing/TOU Register setup. Not configured sections/channels are not available for download. Refer to the file channel mask in the file info for configured channels.

² The number of parameters in a section is automatically configured depending on the number of actually used tariffs selected in the TOU Daily Profiles.

³ For power scale and units, refer to Section 4 "Data Scales and Units".

4 Data Scales and Units

Code	Condition	Value/Range	Notes
Data Scales			
Vmax		Voltage scale \times PT Ratio, V	2
I _{max}		Current scale $(2A/10A) \times$ CT Ratio = CT Primary current \times 2, A	1, 3
P _{max}	Wiring 4LN3, 3LN3, 3BLN3	$V_{max} \times I_{max} \times 3$, W	4
	Wiring 4LL3, 3LL3, 3BLL3, 3OP2, 3OP3, 3DIR2	$V_{max} \times I_{max} \times 2$, W	
F _{max}	Nominal frequency 50 or 60 Hz	100 Hz	
AI _{min} AI _{max}	+/-1mA	AI _{min} = -AI full scale \times 2 AI _{max} = AI full scale \times 2	
	0-20mA	AI _{min} = AI zero scale AI _{max} = AI full scale	
	4-20mA	AI _{min} = AI zero scale AI _{max} = AI full scale	
	0-1mA	AI _{min} = AI zero scale AI _{max} = AI full scale	
Data Units			
U1	PT Ratio = 1	0.1 V	
	PT Ratio > 1	1 V	
U2		0.01 A	
U3	PT Ratio = 1	0.001 kW/kvar/kVA	
	PT Ratio > 1	1 kW/kvar/kVA	

¹ CT Ratio = CT primary current/CT secondary current

² The default Voltage scale is 144V (120V +20%). You can change it via the Device Data Scale setup (see Section 3.1) or via the Device Options setup in PAS.

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

⁴ P_{max} is rounded to whole kilowatts. With PT=1.0, if P_{max} is greater than 9,999,000 W, it is truncated to 9,999,000 W.

5 Data Formats

Format Code	Value	Description	Notes
Timestamp			
F1		Local time in a UNIX-style format. Represents the number of seconds since midnight (00:00:00), January 1, 1970. The time is valid after January 1, 2000.	
File ID			
F2	0	Event log	
	1-8, 11-16	Data log #1-8, #11-16	
	9	Data log #9 – GOST 13109/32144 Compliance Statistics	
	10	Data log #10 – GOST 13109/32144 Harmonic Statistics	
	17-18	Waveform log #1-2	
	26	Power quality (PQ) log	
	128	Real time waveform capture	
File Attributes			
F3	Bit 0 = 0	Non-wrap file (stop when full)	
	Bit 0 = 1	Wrap-around (circular) file	
	Bit 1 = 1	Fixed (non-changeable) file attributes	
	Bits 4:7 =	Multi-section data log file attributes:	
	0	Regular file	
	2	TOU daily profile log	Multi-section file
	5	GOST 13109 Compliance Statistics	Multi-section file
	6	GOST 13109 Harmonic Statistics	Multi-section file
	7	GOST 32144 Compliance Statistics	Multi-section file
8	GOST 32144 Harmonic Statistics	Multi-section file	
File Status Word (bitmap)			
F4	Bit 0 = 1	The last record of the file is being read	
	Bit 8 = 1	File is empty	
	Bit 9 = 1	Reading after EOF	
	Bit 10 = 1	Corrupted record (CRC error)	
	Bit 11 = 1	No file section found for the requested channel	
	Bit 12 = 1	Reading after the end of a data block	
	Bit 13 = 1	File is not accessible	
	Bit 14 = 1	Record not found	
	Bit 15 = 1	Generic read error (with one of the bits 8-14)	
File Record Status Word (bitmap)			
F5	Bit 0 = 1	The last record of the file is being read	
	Bit 8 = 1	File is empty	
	Bit 9 = 1	Reading after EOF	
	Bit 10 = 1	Corrupted record (CRC error)	
	Bit 11 = 1	No file section found for the requested channel	
	Bit 12 = 1	Reading after the end of a data block	
	Bit 13 = 1	File is not accessible	
	Bit 14 = 1	Record not found	
	Bit 15 = 1	Generic read error (with one of the bits 8-14)	
TOU Profile Log Channel ID			
F6	0-7	Billing/TOU energy usage registers #1-#8	
	16-23	Billing/TOU maximum demand registers #1-#8	
Waveform Log Channel ID			
F7	0	V1/V12	1
	1	V2/V23	1
	2	V3/V31	1
	4	I1	
	5	I2	
	6	I3	
	Profile Log Sections Mask		
F8	Bit 0:7 = 1	Billing/TOU energy usage registers #1-#8	
	Bit 16:23 = 1	Billing/TOU maximum demand registers #1-#8	
Waveform Log Channel Mask			
F9	Bit 0 = 1	Channel V1/V12	1
	Bit 1 = 1	Channel V2/V23	1
	Bit 2 = 1	Channel V3/V31	1
	Bit 3 = 1	N/A	
	Bit 4 = 1	Channel I1	
	Bit 5 = 1	Channel I2	

Format Code	Value	Description	Notes
	Bit 6 = 1	Channel I3	
TOU Tariff Change Time			
F10	Bits 8:15 = 0-7	Tariff number #1-#8	
	Bits 2:7 = 0-23	Tariff start hour	
	Bits 0:1 = 0-3	Tariff start quarter of an hour	
Billing/TOU Energy Register Source ID			
F11	0x0000	None	
	0x0700-0x0703	Pulse input DI1-DI4	
	0x1700	kWh import	
	0x1701	kWh export	
	0x1704	kvarh import	
	0x1705	kvarh export	
	0x1708	kVAh total	
Setpoint Trigger Parameters ID			
F12	0x0000	None (condition is not active)	
		Setpoint Status	
	0x0080-0x008F	Setpoint #1-#16 ON	
		Event Flags	
	0x0300-0x0307	Event flag #1-#8 ON	
	0x8300-0x8307	Event flag #1-#8 OFF	
		Internal Events	
	0x0400	kWh import pulse	
	0x0401	kWh export pulse	
	0x0403	kvarh import pulse	
	0x0404	kvarh export pulse	
	0x0405	kvarh total pulse	
	0x0406	kVAh total pulse	
	0x0407	Start new demand interval	
	0x0408	Start new tariff interval	
	0x0409	Start new volt/ampere demand interval	
	0x040A	Start new sliding window demand interval	
		Timers	
	0x0500	Timer #1	
	0x0501	Timer #2	
		Status Inputs	
	0x0600	Status input #1 ON	
	0x0601	Status input #2 ON	
	0x0602	Status input #3 ON	
	0x0603	Status input #4 ON	
	0x8600	Status input #1 OFF	
	0x8601	Status input #2 OFF	
	0x8602	Status input #3 OFF	
	0x8603	Status input #4 OFF	
		Pulse Inputs	
	0x0700	Pulse input #1	
	0x0701	Pulse input #2	
	0x0702	Pulse input #3	
	0x0703	Pulse input #4	
		Relays	
	0x0800	Relay #1 ON	
	0x0801	Relay #2 ON	
	0x0802	Relay #3 ON	
	0x0803	Relay #4 ON	
	0x8800	Relay #1 OFF	
	0x8801	Relay #2 OFF	
	0x8802	Relay #3 OFF	
	0x8803	Relay #4 OFF	
		Static Events	
	0x8901	Positive phase rotation reversal	3
	0x8902	Negative phase rotation reversal	3
	0x0903	GOST13109/32144 PQ event	
		Pulse Counters	
	0x0A00	High pulse counter #1	
	0x0A01	High pulse counter #2	
	0x0A02	High pulse counter #3	
	0x0A03	High pulse counter #4	
		Time and Date Parameters	

Format Code	Value	Description	Notes
	0x0B02	Day of week	
	0x0B03	Year	
	0x0B04	Month	
	0x0B05	Day of month	
	0x0B06	Hour	
	0x0B07	Minutes	
	0x0B08	Seconds	
	0x0B09	Minute interval (1,2,3,4,5,10,15,20,30,60 min)	
		1-Cycle Phase Values	
	0x0C03	High I1 current	
	0x0C04	High I2 current	
	0x0C05	High I3 current	
	0x8C03	Low I1 current	
	0x8C04	Low I2 current	
	0x8C05	Low I3 current	
		1-Cycle Values on any Phase	
	0x0E00	High voltage	1
	0x8D00	Low voltage	1
	0x0E01	High current	
	0x8D01	Low current	
	0x0E07	High voltage THD	1
	0x0E08	High current THD	
	0x0E09	High K-Factor	
	0x0E0A	High current TDD	
		1-Cycle Auxiliary Values	
	0x1002	High frequency	
	0x9002	Low frequency	
	0x1003	High voltage unbalance	1
	0x1004	High current unbalance	
		1-Sec Phase Values	
	0x1103	High I1 current	
	0x1104	High I2 current	
	0x1105	High I3 current	
	0x9103	Low I1 current	
	0x9104	Low I2 current	
	0x9105	Low I3 current	
		1-Sec Values on any Phase	
	0x1300	High voltage	1
	0x9200	Low voltage	1
	0x1301	High current	
	0x9201	Low current	
		1-Sec Total Values	
	0x1406	High total kW import	
	0x1407	High total kW export	
	0x1408	High total kvar import	
	0x1409	High total kvar export	
	0x1402	High total kVA	
	0x9404	Low total PF Lag	
	0x9405	Low total PF Lead	
		1-Sec Auxiliary Values	
	0x1501	High neutral current	
	0x1502	High frequency	
	0x9502	Low frequency	
	0x1503	High voltage unbalance	1
	0x1504	High current unbalance	
		Present Demands	
	0x1600	High V1/V12 Volt demand	1
	0x1601	High V2/V23 Volt demand	1
	0x1602	High V3/V31 Volt demand	1
	0x1603	High I1 Ampere demand	
	0x1604	High I2 Ampere demand	
	0x1605	High I3 Ampere demand	
	0x1606	High block kW import demand	
	0x1607	High block kvar import demand	
	0x1608	High block kVA demand	
	0x1609	High sliding window kW import demand	
	0x160A	High sliding window kvar import demand	

Format Code	Value	Description	Notes
	0x160B	High sliding window kVA demand	
	0x160F	High accumulated kW import demand	
	0x1610	High accumulated kvar import demand	
	0x1611	High accumulated kVA demand	
	0x1612	High predicted kW import demand	
	0x1613	High predicted kvar import demand	
	0x1614	High predicted kVA demand	
	0x1616	High block kW export demand	
	0x1617	High block kvar export demand	
	0x1618	High sliding window kW export demand	
	0x1619	High sliding window kvar export demand	
	0x161A	High accumulated kW export demand	
	0x161B	High accumulated kvar export demand	
	0x161C	High predicted kW export demand	
	0x161D	High predicted kvar export demand	
Setpoint Action ID			
F14	Action type	Target	
	0x00	0x00	No action
	0x20	0x00	Set Event flag #1
	0x20	0x01	Set Event flag #2
	0x20	0x02	Set Event flag #3
	0x20	0x03	Set Event flag #4
	0x21	0x00	Clear Event flag #1
	0x21	0x01	Clear Event flag #2
	0x21	0x02	Clear Event flag #3
	0x21	0x03	Clear Event flag #4
	0x30	0x00	Operate Relay #1
	0x30	0x01	Operate Relay #2
	0x30	0x02	Operate Relay #3
	0x30	0x03	Operate Relay #4
	0x31	0x00	Release latched Relay #1
	0x31	0x01	Release latched Relay #2
	0x31	0x02	Release latched Relay #3
	0x31	0x03	Release latched Relay #4
	0x40	0x00	Increment counter #1
	0x40	0x01	Increment counter #2
	0x40	0x02	Increment counter #3
	0x40	0x03	Increment counter #4
	0x41	0x00	Clear counter #1
	0x41	0x01	Clear counter #2
	0x41	0x02	Clear counter #3
	0x41	0x03	Clear counter #4
	0x64	0x00	Clear all counters
	0x51	0x00	Send event notification
	0x60	0x00	Reset total energy
	0x61	0x00	Reset all total maximum demands
	0x61	0x01	Reset power maximum demands
	0x61	0x02	Reset volt/ampere/harmonic maximum demands
	0x62	0x00	Reset TOU energy
	0x63	0x00	Reset TOU maximum demands
	0x65	0x00	Clear Min/Max registers
	0x70	0x00	Event log
	0x71	0x00	Data log #1
	0x71	0x01	Data log #2
	0x71	0x02	Data log #3
	0x71	0x03	Data log #4
	0x71	0x04	Data log #5
	0x71	0x05	Data log #6
	0x71	0x06	Data log #7
	0x71	0x07	Data log #8
	0x71	0x0A	Data log #11
	0x71	0x0B	Data log #12
	0x71	0x0C	Data log #13
	0x71	0x0D	Data log #14
	0x71	0x0E	Data log #15
	0x71	0x0F	Data log #16
	0x72	0x00	Waveform log #1

Format Code	Value	Description	Notes	
	0x73	0x00	Waveform log #2	
Counter Source ID				
F16	0x0000	None		
	0x0001-0x0004	Pulse input DI1-DI4		
Relay Output Pulse Source ID				
F17	0x0000	None		
	0x0400	kWh import pulse		
	0x0401	kWh export pulse		
	0x0403	kvarh import pulse		
	0x0404	kvarh export pulse		
	0x0405	kvarh total pulse		
	0x0406	kVAh pulse		
AO Output/Analog Expander Parameters ID				
F18	0x0000	None (output disabled)	²	
		1-Cycle Phase Values		
	0x0C00	V1/V12 Voltage		
	0x0C01	V2/V23 Voltage		
	0x0C02	V3/V31 Voltage		
	0x0C03	I1 Current		
	0x0C04	I2 Current		
	0x0C05	I3 Current		
	0x0C1E	V12 Voltage		
	0x0C1F	V23 Voltage		
	0x0C20	V31 Voltage		
		1-Cycle Total Values		
	0x0F00	Total kW		
	0x0F01	Total kvar		
	0x0F02	Total kVA		
	0x0F03	Total PF		
	0x0F04	Total PF Lag		
	0x0F05	Total PF Lead		
	0x0F0A	3-phase average L-N/L-L voltage	¹	
	0x0F0B	3-phase average L-L voltage		
	0x0F0C	3-phase average current		
		1-Cycle Auxiliary Values		
	0x1001	In Current		
	0x1002	Frequency		
		1-Sec Phase Values		
	0x1100	V1/V12 Voltage		
	0x1101	V2/V23 Voltage		
	0x1102	V3/V31 Voltage		
	0x1103	I1 Current		
	0x1104	I2 Current		
	0x1105	I3 Current		
	0x111E	V12 Voltage		
	0x111F	V23 Voltage		
	0x1120	V31 Voltage		
		1-Sec Total Values		
	0x1400	Total kW		
	0x1401	Total kvar		
	0x1402	Total kVA		
	0x1403	Total PF		
	0x1404	Total PF Lag		
	0x1405	Total PF Lead		
	0x140A	3-phase average L-N/L-L voltage	¹	
	0x140B	3-phase average L-L voltage		
	0x140C	3-phase average current		
		1-Sec Auxiliary Values		
	0x1501	In Current		
	0x1502	Frequency		
		Present Demands		
	0x160F	Accumulated kW import demand		
	0x1610	Accumulated kvar import demand		
	0x1611	Accumulated kVA demand		
	0x161A	Accumulated kW export demand		
	0x161B	Accumulated kvar export demand		

Format Code	Value	Description	Notes
Event Cause/Point ID			
F19		Setpoint Operation Events	
	0x0000-0x59FF	Trigger parameter ID	
	0x6400-0xFFFF	Trigger parameter ID	
		Setpoint Action Events	
	0x5A00-0x5A0F	Setpoint #1-#16	
		Communications Events	
	0x5B00-0x5BFF	Point ID (low byte, see F21)	
		Front Panel Operations	
	0x5C00-0x5CFF	Point ID (low byte, see F21)	
		Self-Check Diagnostics Events	
	0x5D00-0x5DFF	Point ID (low byte, see F21)	
		Self-Update Events	
	0x5E08	RTC DST/Standard time update	4
		Hardware Diagnostics Events	
	0x6202	RAM/Data error	
	0x6203	Hardware watchdog reset	
	0x6204	Sampling fault	
	0x6205	CPU exception	
	0x6206	Reserved	
	0x6207	Software watchdog reset	
	0x620D	Low battery	
	0x620F	EEPROM fault	
		External Events	
0x6300	Power down		
0x6308	Power up		
0x6309	External reset		
Event Effect ID			
F20		Communications/Self-check/Front Panel Events	
	0x0000	None	
	0x6000	Total energy registers cleared	
	0x6100	All total maximum demands cleared	
	0x6101	Power maximum demands cleared	
	0x6102	Volt/Ampere/Harmonic maximum demands cleared	
	0x6200	Billing/TOU energy registers cleared	
	0x6300	Billing/TOU maximum demand registers cleared	
	0x6400	All counters cleared	
	0x6401-0x6403	Counter cleared (low byte = counter ID)	
	0x6500	Min/Max log cleared	
	0x6A00-0x6A1A	Log file cleared (low byte = File ID)	
	0x6B00	GOST 13109/32144 statistics cleared	
	0xF100-0xF10F	Setpoint cleared (low byte = setpoint ID)	
	0xF200	Setup/Data cleared	
	0xF300	Setup reset (set by default)	
	0xF400	Setup changed	
	0xF500	RTC set	
		Setpoint Operation Events	
	0xE100-0xE10F	Setpoint operated (low byte = setpoint ID)	
	0xE200-0xE20F	Setpoint released (low byte = setpoint ID)	
		Setpoint Action Events	
	See F14	Setpoint action ID	
Data Point ID			
F21		Data Locations	
	0x03	Data memory	
	0x04	Factory setup	
	0x05	Access/Password setup	
	0x06	Basic setup	
	0x07	Communications setup	
	0x08	Real-time clock	4
	0x09	Digital inputs setup	
	0x0A	Pulse counters setup	
	0x0B	AO setup	
	0x0E	Timers setup	
	0x10	Event/alarm setpoints	
	0x11	Pulsing setup	
	0x12	User assignable register map	
0x13	Programmable Min/Max log setup		

Format Code	Value	Description	Notes
	0x14	Data log setup	
	0x15	File/Memory setup	
	0x16	TOU energy registers setup	
	0x18	TOU daily profiles	
	0x19	TOU calendar	
	0x1B	RO Setup	
	0x1C	User selectable options	
	0x1F	DNP 3.0 class 0 map	
	0x20	DNP 3.0 options setup	
	0x21	DNP 3.0 events setup	
	0x22	DNP 3.0 event setpoints	
	0x23	Calibration registers	
	0x24	Date/Time Setup	
	0x25	Net setup	
	0x26	AI setup	
	0x27	Waveform log setup	
	0x2B-0x4E	Reserved	
	0x4F	Tampering attempt	
Event Type ID			
F22		Setpoint Events	
	0x0000	SP: Generic setpoint event	
	0x0001-0x0010	SP1-SP16: Setpoint #1-#16 event	
		PQ Events (GOST 13109 categories)	
	0x0600	PQE: Generic PQ event	
	0x0601	PQE1: Voltage variation	
	0x0602	PQE2: Voltage change	
	0x0603	PQE3: Flicker	
	0x0604	PQE4: Voltage THD	
	0x0605	PQE5: Voltage harmonic components	
	0x0606	PQE6: Voltage unbalance	
	0x0607	PQE7: Frequency variation	
	0x0608	PQE8: Voltage dips	
	0x0609	PQE9: Impulsive voltage	
	0x060A	PQE10: Temporary overvoltages	
		PQ Events (GOST 32144 categories)	
	0x0700	PQE: Generic PQ event	
	0x0701	PQE1: Frequency variation	
	0x0702	PQE2: Voltage variation	
	0x0703	PQE3: Rapid voltage change	
	0x0704	PQE4: Flicker	
	0x0705	PQE5: Voltage THD	
	0x0706	PQE6: Voltage harmonic components	
	0x0707	PQE7: Voltage interharmonic components	
	0x0708	PQE8: Signaling voltage	
	0x0709	PQE9: Voltage unbalance	
	0x070A	PQE10: Voltage interruptions	
	0x070B	PQE11: Voltage dips	
	0x070C	PQE12: Voltage swells	
	0x070D	PQE13: Impulsive voltage	
		Data Log Events	
	0x0900	Online PQ statistics	
Device Diagnostics			
F23	Bit 0	Reserved	
	Bit 1	Reserved	
	Bit 2 = 1	RAM/Data error	
	Bit 3 = 1	CPU watchdog reset	
	Bit 4 = 1	Sampling fault	
	Bit 5 = 1	CPU exception	
	Bit 6	Reserved	
	Bit 7 = 1	Software watchdog reset	
	Bit 8 = 1	Power down	
	Bit 9 = 1	Device reset	
	Bit 10 = 1	Configuration reset	
	Bit 11 = 1	RTC fault	
	Bit 12	Reserved	
	Bit 13 = 1	Low battery	
	Bit 14	Reserved	

Format Code	Value	Description	Notes	
	Bit 15 = 1	EEPROM fault		
DNP Object Types				
F24		Static Binary Input Objects		
	0	Single-Bit Binary Input		
	1	Binary Input With Status		
		Binary Input Change Event Objects		
	0	Binary Input Change Without Time		
	1	Binary Input Change With Time		
		Static Binary Counters		
	0	32-bit Binary Counter		
	1	32-bit Binary Counter Without Flag		
	2	16-bit Binary Counter		
	3	16-bit Binary Counter Without Flag		
		Binary Counter Change Events		
	0	32-bit Counter Change Event Without Time		
	1	32-bit Counter Change Event With Time		
	2	16-bit Counter Change Event Without Time		
	3	16-bit Counter Change Event With Time		
		Frozen Binary Counters		
	0	32-bit Frozen Counter		
	1	32-bit Frozen Counter Without Flag		
	2	32-bit Frozen Counter With Time of Freeze		
	3	16-bit Frozen Counter		
	4	16-bit Frozen Counter Without Flag		
	5	16-bit Frozen Counter With Time of Freeze		
		Static Analog Input Objects		
	0	32-bit Analog Input		
	1	32-bit Analog Input Without Flag		
	2	16-bit Analog Input		
	3	16-bit Analog Input Without Flag		
		Analog Input Change Events		
	0	32-bit Analog Change Event Without Time		
	1	32-bit Analog Change Event With Time		
	2	16-bit Analog Change Event Without Time		
3	16-bit Analog Change Event With Time			
DNP Class 0 Objects				
F25	0x1E01	Analog Input 30:01		
	0x1E02	Analog Input 30:02		
	0x1E03	Analog Input 30:03		
	0x1E04	Analog Input 30:04		
	0x2801	Analog Output 40:01		
	0x2802	Analog Output 40:02		
	0x0101	Binary Input 01:01		
	0x0102	Binary Input 01:02		
	0x1401	Binary Counter 20:01		
	0x1402	Binary Counter 20:02		
	0x1405	Binary Counter 20:05		
	0x1406	Binary Counter 20:06		
	0x1501	Frozen Counter 21:01		
	0x1502	Frozen Counter 21:02		
	0x1505	Frozen Counter 21:05		
	0x1506	Frozen Counter 21:06		
	0x1509	Frozen Counter 21:09		
	0x150A	Frozen Counter 21:10		
	Wiring Mode			
	F26	0	3OP2 - 3-wire open delta with 2 CTs (2 element)	
1		4LN3 - 4-wire WYE with 3 PTs (3 element), line-to-neutral voltage readings		
2		3DIR2 - 3-wire direct connection with 2 CTs (2 element)		
3		4LL3 - 4-wire WYE with 3 PTs (3 element), line-to-line voltage readings		
4		3OP3 - 3-wire open delta with 3 CTs (2 1/2 element)		
5		3LN3 - 4-wire WYE with 2 PTs (2 1/2 element), line-to-neutral voltage readings		
6		3LL3 - 4-wire WYE with 2 PTs (2 1/2 element), line-to-line voltage readings		
8		3BLN3 - 3-wire broken delta with 2 PTs (2 1/2 element), line-to-neutral voltage readings		

Format Code	Value		Description	Notes	
	9		3BLL3 - 3-wire broken delta with 2 PTs (2 1/2 element), line-to-line voltage readings		
Instrument Options					
F28	Bit 0=1		120V Option		
	Bit 1=1		690V Option		
	Bits 2-5		Reserved		
	Bit 6=1		Analog output 0/4 or 4/20mA		
	Bit 7=1		Analog output 0-1mA		
	Bit 8=1		Analog output ± 1 mA		
	Bit 9=1		RO option		
	Bit 10=1		DI option		
	Bit 11		Reserved		
	Bit 12=1		Setup is secured by a password (authorization required)		
	Bit 13		Reserved		
	Bit 14=1		Analog expander option ± 1 mA		
	Bit 15		Reserved		
	Bits 16-18		Number of RO - 1		
	Bits 19-22		Number of DI - 1		
Bits 23-24		Number of AO - 1			
Bits 25-29		Reserved			
Bits 30-31=11		Memory module 1MBytes			
I/O Slot Types					
F29	DI	DRY	00000000B		
	RO		00100000B		
	AI	± 1 mA	01010000B		
	AI	0-20 mA	01010001B		
	AI	4-20 mA	01010010B		
	AI	0-1 mA	01010011B		
	AO	± 1 mA	01100000B		
	AO	0-20 mA	01100001B		
	AO	4-20 mA	01100010B		
	AO	0-1 mA	01100011B		
	Empty slot			1111xxxxxB	x = don't care

NOTES:

¹ **Voltage**

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

² **Analog Outputs**

1) For bi-directional analog output (± 1 mA), the zero scale setup corresponds to the center (0 mA) of the scale range, and the direction of the current matches the sign of the output parameter. Unsigned parameters are output within the current range 0 to +1 mA and can be scaled as in the case of single-ended analog output (0-1 mA).

For signed values, such as powers and signed power factor, the scale is always symmetrical with regard to 0 mA, and the full scale corresponds to +1 mA output for positive readings and to -1 mA output for negative readings. The zero scale (0 mA output) is permanently set in the instrument to zero for all parameters except the signed power factor for which it is set to 1.000 (see Note 2). In write requests, the zero scale is ignored.

2) Except for the signed power factor, the setup scale is continuous within the entire value range. For signed power factor, the setup scale is broken at +1.000 in order to provide continuous output current when the power factor changes close to ± 1.000 . The setup scale is symmetrical in the range of -0 to +0 with a center at 1.000 (-1.000 is assumed to be equal to +1.000). Negative power factor is output as -1.000 minus measured value, and non-negative power factor is output as +1.000 minus measured value. To set the entire range for power factor from -0 to +0, the scales would be specified as -0 to 0. Because of the fact that negative zero may not be transmitted through communications, the value of -0.001 is used to specify the scale of -0, and both +0.001 and 0.000 are used to specify the scale of +0.

³ **Phase Reversal Trigger**

The setpoint is operated when the actual phase sequence does not match the designated phase rotation order.

⁴ The event value field shows the present meter time in the F1 format.