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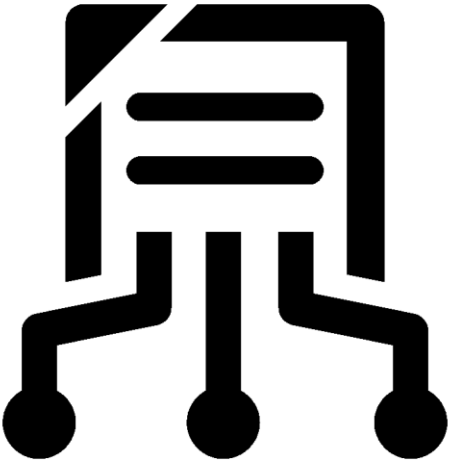

USER MANUAL

PQM-750
MODBUS PROTOCOL

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MODBUS PROTOCOL

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- Due to continuous product development, the manufacturer reserves the right to make changes to functionality, features and technical parameters of the analyzers. The manufacturer provides long-term support for the product, adding new functionalities and fixing noticed errors.
- This manual describes the firmware version 1.01.

CONTENTS

1 Introduction

This document describes the Modbus™ protocol implementation and the register maps of PQM-750 Power Quality Analyzer. To communicate with external devices, PQM-750 features both Modbus RTU via RS-485 port and Modbus TCP/IP via Ethernet port. Both interfaces supports the same functionality and registers ranges. Modbus protocol can be used to read or change analyzer configuration and to read measured values. The device can respond to frames over the TCP and RS-485 simultaneously and independently. One traffic does not affect the other. PQM-750 can operate only as a slave device. It can only respond to frames and never sends any requests.

2 Modbus protocol

The analyzer is equipped with two serial communication ports marked on the enclosure as RS-485-1 and RS-485-2. Modbus RTU functionality is available only on the RS-485-1 port. Default serial port settings are: baudrate 115200 bit/s, 8 data bits, 1 stop bit, Even parity. PQM-750 Modbus device (slave) address is by default set as 2. Broadcast mode using address 0 is not supported. Available baudrates: 57600, 115200, 128000, 230400, 256000, 460800, 921600. Supported parity: Even, Odd, None. To connect the device to PC an USB to RS-485 converter is needed.

The TCP port on which device listens on is standard Modbus TCP port number 502. Meter IP address can be read from the LCD screen on **NETWORK** screen or obtained via other protocols. IP address can be set manually as static or assigned from DHCP server, for more details see PQM-750 User Manual.

Every parameter has its own data type. Parameters can be type of 16-bit integer, 32-bit integer, 32-bit float (IEEE-754) or string. Two bytes from the 16-bit register are transferred in big endian format. If a parameter is bigger than one 16-bit Modbus register, its 16-bit data words are transmitted in Little Endian format, see Tab. 1.

Tab. 1. Data types formating examples

Data type	Decimal value	Hexadecimal value	Frame content order (hexadecimal)
16-bit integer	1234	0x04D2	04, D2
32-bit integer	123456789	0x075BCD15	CD, 15, 07, 5B
32-bit floating point	200.071	0x43481234	12, 34, 43, 48
String	“PQM-750”	-	51, 50, 2D, 35, 37, 00, 30 → “QP”, “-M”, “57”, \00

PQM-750 supports Modbus function codes listed in Tab. 2. Due to the large number of parameters, holding registers and input registers have their own, non-overlapping address spaces in the range from 0 to 65535. All parameters and its register addresses are listed and described in Tables 4-9. Holding register function code 03 is used for configuration and input register function code 04 is used for reading measurements data.

Tab. 2. Supported Modbus functions

Function code	Function name
03_{dec} (0x03)	Read Holding Registers
04_{dec} (0x04)	Read Input Registers
06_{dec} (0x06)	Write Single Register
16_{dec} (0x10)	Write Multiple Registers

Analyzer returns an exception response frame when error occurs during request processing. There are four exceptions in Modbus protocol that the meter can return (Tab. 3).

Tab. 3. Modbus exceptions

Exception code	Exception name	Description
01	Illegal function	Non supported function code
02	Illegal data address	Non supported register address
03	Illegal data value	Wrong data to write
04	Server device failure	Unexpected meter error

For detailed information on the Modbus protocol refer to the *Modbus Protocol Reference Guide* available at **https://modbus.org/tech.php**

3 Configuration register maps

PQM-750 analyzer can be configured using Modbus protocol. All configuration settings are divided into several groups: general analyzer (Tab. 5), network (Tab. 6), relay (Tab. 7), IEC 61850 (Tab. 8), special purpose (Tab. 9) and measurements (Tab. 10). Modbus registers are implemented as continuous set without any holes, some registers are marked as reserved. The reserved registers can be read, but can't be written. This cause illegal data address exception. When specific parameter span over multiple registers (all UINT32, FLOAT32 and String values) Modbus implementation in PQM-750 allows writing to this parameter only starting from the first Modbus register that are assigned to this parameter. Writing to any other will cause illegal data address exception. Note that currently not all parameters are supported. In the below tables every parameter has Modbus register address, read and/or write permission, parameter value unit and its data type. There are also information about parameter size in Modbus registers which can be helpful to manipulate string parameters.

Configuration registers are accessible via Modbus holding registers function code 03. All configuration register groups are detailed in Tab. 4. In most cases registers have read and write permissions but some parameters are read only and cannot be changed. The measurement configuration group can be used to adjust all meter measurements settings. This group starts from 2000_{dec} (0x7D0) register address.

Tab. 4. Configuration register groups

Group	Address range	Registers list
General analyzer configuration	0-1499	Tab. 5
Ethernet network configuration	1500-1999	Tab. 6
Measurement configuration	2000-3999	Tab. 10
Relay configuration	4000-4999	Tab. 7
IEC 61850 configuration	5000-5999	Tab. 8
Special purpose registers	8192-8459	Tab. 9

Modification (writing) of the configuration registers requires special procedure outlined in the main PQM-750 user manual in the chapter "Configuration changes and multi-access". The transaction of changing settings in case of Modbus protocols always consists of the following steps:

1) entering the admin PIN and unlocking the settings for modification,
2) changing the configuration parameters,
3) locking the settings.

The PIN mentioned is the GUI admin PIN, 4-8 digits long. Even if the admin PIN is disabled in GUI, it is necessary to write the dummy PIN (4 digits at least) for unlocking the settings. There are special registers for this purpose: addresses 8448-8456. See the description of these registers in chapter 3.1.5 and Tab. 9.

3.1 Analyzer configuration registers

3.1.1 General analyzer configuration registers

Tab. 5. General analyzer confguration registers

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
METER_NAME	R	-	String	10	0	Model name, e.g. “PQM-750”
FIRMWARE_VERSION	R	-	String	5	10	Firmware version, e.g. “1.00”
HARDWARE_VERSION	R	-	String	1	15	Hardware version, e.g. “b”
SERIAL_NUMBER	R	-	String	4	16	Serial number, e.g. “CE0001”
METER_USER_INFO	R/W	-	String	20	20	Description string
LOCATION	R/W	-	String	20	40	Location string
METER_FEATURES	R	-	String	50	60	Analyzer installed & connected options/modules, e.g. “AC, GPS”.
CONFIG_NAME	R/W	-	String	123	110	Configuration description
CONFIG_FILENAME	R	-	String	6	233	Active configuration filename
TIMEZONE	R/W	min	Int16	1	239	UTC – local time shift in minutes, -720…840
DAYLIGHT_SAVINGS_TIME	R/W	-	Uint16	1	240	0 – DST disabled 1 – DST enabled (+1 hour to Time zone)
TIME_SYNC_MODE	R/W	-	Uint16	1	241	Time sync mode: 0 – Auto (automatic selection between RTC/NTP/GPS/IRIG-B) 1 – RTC mode only
GUI_LANGUAGE	R/W	-	Uint16	1	242	GUI language: 0 – English 1 – Polish 2 – Spanish 3 – German
WIFI_ENABLE	R	-	Uint16	1	243	Reserved
GSM_ENABLE	R	-	Uint16	1	244	Reserved
ANTI_THEFT_ENABLE	R	-	Uint16	1	245	Reserved
HEATER_ENABLE	R	-	Uint16	1	246	Reserved
BATTERY_AUTO_OFF	R	s	Uint16	1	247	Reserved
LCD_SLEEP_TIMEOUT	R/W	s	Uint16	1	248	LCD sleep mode timeout in seconds, 0…1000 0 – sleep mode disabled
LCD_BRIGHTNESS	R/W	%	Uint16	1	249	LCD brightness, 0…100 0 – minimum 100 – maximum
BUZZER_ENABLE	R/W	-	Uint16	1	250	0 – buzzer disabled 1 – buzzer enabled

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
COM_PORT_2_MODE	R	-	Uint16	1	251	Reserved
PHASOR_ROTATION_ANGLE	R/W	degree	Uint16	1	252	GUI phasor plot rotation angle, 0…359 90 – U1 vector on 12 o'clock
USER_RECORDING_SPACE_QUOTA	R/W	%	Uint16	1	253	User data memory quota in percent, 0…100
STD_RECORDING_SPACE_QUOTA	R/W	%	Uint16	1	254	Standard data memory quota in percent, 0…100
ENERGY_COUNTERS_SPACE_QUOTA	R/W	%	Uint16	1	255	Energy counter data memory quota in percent, 0…1
GSM_IP_ADDRESS	R	-	Uint32	2	256	Reserved
GSM_APN_NAME	R	-	String	32	258	Reserved
GSM_APN_USERNAME	R	-	String	32	290	Reserved
GSM_APN_PASSWORD	R	-	String	16	322	Reserved
GSM_SMS_PHONE_NUMBER_1	R	-	String	10	338	Reserved
GSM_SMS_PHONE_NUMBER_2	R	-	String	10	348	Reserved
GSM_SMS_PHONE_NUMBER_3	R	-	String	10	358	Reserved
GSM_SMS_PHONE_NUMBER_4	R	-	String	10	368	Reserved
GSM_SMS_PHONE_NUMBER_1_ACTIVE	R	-	Uint16	1	378	Reserved
GSM_SMS_PHONE_NUMBER_2_ACTIVE	R	-	Uint16	1	379	Reserved
GSM_SMS_PHONE_NUMBER_3_ACTIVE	R	-	Uint16	1	380	Reserved
GSM_SMS_PHONE_NUMBER_4_ACTIVE	R	-	Uint16	1	381	Reserved
GSM_SIM_PIN	R	-	String	4	382	Reserved
GPS_RESYNC_COEFFICIENT	R	%	Float	2	386	Reserved
GPS_STEP_TIME_THRESHOLD	R	s	Uint16	1	388	Reserved
	-	-	-	1	389	Reserved
WIFI_ACCESS_POINT_ENABLE	R	-	Uint16	1	390	Reserved
WIFI_TCP_SOCKET	R	-	Uint16	1	391	Reserved
WIFI_MAC_ADDRESS	R	-	3x Uint16	3	392	Reserved
WIFI_DHCP_ENABLE	R	-	Uint16	1	395	Reserved
WIFI_IP_ADDRESS	R	-	Uint32	2	396	Reserved
WIFI_NETWORK_MASK	R	-	Uint32	2	398	Reserved
WIFI_GATEWAY_ADDRESS	R	-	Uint32	2	400	Reserved
WIFI_DNS	R	-	Uint32	2	402	Reserved
WIFI_SSID	R	-	String	17	404	Reserved
WIFI_KEY	R	-	String	32	421	Reserved
	-	-	-	1	453	Reserved
MODBUS_RTU_ENABLE	R/W	-	Uint16	1	454	0 – Modbus RTU disabled 1 – Modbus RTU enabled
MODBUS_RTU_SLAVE_ADDRESS	R/W	-	Uint16	1	455	Modbus RTU slave address, 0…255

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
MODBUS_RTU_COM_PORT	R	-	Uint16	1	456	Reserved
MODBUS_RTU_BAUDRATE	R/W	-	Uint16	1	457	Modbus RTU baudrate (bytes/s): 0 – 57600 1 – 115200 2 – 128000 3 – 230400 4 – 256000 5 – 460800 6 – 921600
MODBUS_RTU_PARITY	R/W	-	Uint16	1	458	Modbus RTU parity: 0 – None 1 – Even 2 – Odd
MODBUS_RTU_ENDIANNESS	R/W	-	Uint16	1	459	Modbus RTU word endianness: 0 – Little Endian 1 – Big Endian
INSTALLED_ TRANSIENT	R	-	Uint16	1	460	Transient Module status: 0 – not installed 1 – installed
INSTALLED_ GPS	R	-	Uint16	1	461	GPS Module status: 0 – not installed 1 – installed
INSTALLED_ GSM	R	-	Uint16	1	462	GSM Module status: 0 – not installed 1 – installed
INSTALLED_ IO	R	-	Uint16	1	463	I/O Module status: 0 – not installed 1 – installed
SDCARD_CAPACITY_EXT	R	kB	Uint32	2	464	External memory card capacity (kB)
SDCARD_CAPACITY_INT	R	kB	Uint32	2	466	Internal memory card capacity (kB)
FAN_ENABLE_THRESHOLD	R/W	ºC	Uint16	1	468	Fan enable threshold temperature (ºC), 0…100 0 – Auto
	-	-	-	-	469-1499	Reserved

3.1.2 Network configuration registers

Tab. 6. Network confguration registers

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
ETHERNET_MAC_ADDRESS	R/W	-	3x Uint16	3	1500	Analyzer MAC address
ETHERNET_DHCP_ENABLE	R/W	-	Uint16	1	1503	0 – DHCP disabled 1 – DHCP enabled
ETHERNET_IP_ADDRESS	R/W	-	Uint32	2	1504	IP address
ETHERNET_NETWORK_MASK	R/W	-	Uint32	2	1506	Network mask
ETHERNET_GATEWAY_ADDRESS	R/W	-	Uint32	2	1508	Gateway address
ETHERNET_DNS_ADDRESS	R/W	-	Uint32	2	1510	DNS address
NTP_ENABLE	R/W	-	Uint16	1	1512	0 – NTP time synchronization disabled 1 – NTP enabled
	-	-	-	-	1513	Reserved
NTP_SERVER_1_NAME	R/W	-	String	32	1514	NTP server 1 name
NTP_SERVER_2_NAME	R/W	-	String	32	1546	NTP server 2 name
NTP_SERVER_3_NAME	R/W	-	String	32	1578	NTP server 3 name
NTP_SERVER_4_NAME	R/W	-	String	32	1610	NTP server 4 name
FTP_ENABLE	R/W	-	Uint16	1	1642	0 – FTP client disabled 1 – FTP client enabled
FTP_CONNECTION_TYPE	R/W	-	Uint16	1	1643	0 – FTP (unencrypted) 1 – FTPS (encrypted)
FTP_MODE	R/W	-	Uint16	1	1644	FTP transfer mode selection: 0 – active mode 1 – passive mode
FTP_UPLOAD_TIME	R/W	hour	Uint16	1	1645	FTP upload time relative to UTC midnight, 0…24
FTP_SERVER_IP	R/W	-	Uint32	2	1646	FTP server IP address
FTP_SERVER_PORT	R/W	-	Uint16	1	1648	FTP server TCP port
FTP_USER_DATA_UPLOAD	-	-	Uint16	1	1649	Reserved
FTP_USER_NAME	R/W	-	String	16	1650	FTP username
FTP_PASSWORD	-	-	String	16	1666	Reserved
FTP_DEST_DIRECTORY	R/W	-	String	120	1682	FTP remote directory path
MODBUS_TCP_ENABLE	R/W	-	Uint16	1	1802	0 – Modbus TCP disabled 1 – Modbus TCP enabled
MODBUS_TCP_SLAVE_ADDRESS	R	-	Uint16	1	1803	Modbus TCP slave address, 0…255
MODBUS_TCP_PORT	R/W	-	Uint16	1	1804	Modbus TCP port, 0…65535
MODBUS_TCP_ENDIANNESS	R/W	-	Uint16	1	1805	Modbus TCP word endianness: 0 – Little Endian 1 – Big Endian

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
IEC61850_ENABLE	R/W	-	Uint16	1	1806	0 – IEC 61850 protocol disabled 1 – IEC 61850 protocol enabled
SF_PORT_4005_ENABLE	R/W	-	Uint16	1	1807	0 – SonelFrame protocol disabled 1 – SonelFrame protocol enabled
	-	-	-	-	1808-1999	Reserved

3.1.3 Relay configuration registers

Tab. 7. Relay configuration registers

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RELAY1_ACTIVESTATE	R/W	-	Uint16	1	4000	Relay 1 active state: 0 – OFF (not energized) 1 – ON (energized)
RELAY1_MODE	R	-	Uint16	1	4001	Relay 1 operating mode: 0 – Alarm mode 1 – Pulse mode
RELAY1_ACTIVE_TIME	R/W	ms	Uint16	1	4002	Relay 1 active time (ms), 10…1000
RELAY1_DEAD_TIME	R/W	ms	Uint16	1	4003	Relay 1 dead time (ms), 0…10000
RELAY2_ACTIVESTATE	R/W	-	Uint16	1	4004	Relay 2 active state: 0 – OFF (not energized) 1 – ON (energized)
RELAY2_MODE	R	-	Uint16	1	4005	Relay 2 operating mode: 0 – Alarm mode 1 – Pulse mode
RELAY2_ACTIVE_TIME	R/W	ms	Uint16	1	4006	Relay 2 active time (ms), 10…1000
RELAY2_DEAD_TIME	R/W	ms	Uint16	1	4007	Relay 2 dead time (ms), 0…10000
RELAY3_ACTIVESTATE	R/W	-	Uint16	1	4008	Reserved
RELAY3_MODE	R	-	Uint16	1	4009	Reserved
RELAY3_ACTIVE_TIME	R/W	ms	Uint16	1	4010	Reserved
RELAY3_DEAD_TIME	R/W	ms	Uint16	1	4011	Reserved
RELAY4_ACTIVESTATE	R/W	-	Uint16	1	4012	Reserved
RELAY4_MODE	R	-	Uint16	1	4013	Reserved
RELAY4_ACTIVE_TIME	R/W	ms	Uint16	1	4014	Reserved
RELAY4_DEAD_TIME	R/W	ms	Uint16	1	4015	Reserved
RELAY5_ACTIVESTATE	R/W	-	Uint16	1	4016	Reserved
RELAY5_MODE	R	-	Uint16	1	4017	Reserved
RELAY5_ACTIVE_TIME	R/W	ms	Uint16	1	4018	Reserved
RELAY5_DEAD_TIME	R/W	ms	Uint16	1	4019	Reserved
RELAY6_ACTIVESTATE	R/W	-	Uint16	1	4020	Reserved
RELAY6_MODE	R	-	Uint16	1	4021	Reserved
RELAY6_ACTIVE_TIME	R/W	ms	Uint16	1	4022	Reserved
RELAY6_DEAD_TIME	R/W	ms	Uint16	1	4023	Reserved
RELAY7_ACTIVESTATE	R/W	-	Uint16	1	4024	Reserved
RELAY7_MODE	R	-	Uint16	1	4025	Reserved
RELAY7_ACTIVE_TIME	R/W	ms	Uint16	1	4026	Reserved

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RELAY7_DEAD_TIME	R/W	ms	Uint16	1	4027	Reserved
RELAY8_ACTIVESTATE	R/W	-	Uint16	1	4028	Reserved
RELAY8_MODE	R	-	Uint16	1	4029	Reserved
RELAY8_ACTIVE_TIME	R/W	ms	Uint16	1	4030	Reserved
RELAY8_DEAD_TIME	R/W	ms	Uint16	1	4031	Reserved
RELAY9_ACTIVESTATE	R/W	-	Uint16	1	4032	Reserved
RELAY9_MODE	R	-	Uint16	1	4033	Reserved
RELAY9_ACTIVE_TIME	R/W	ms	Uint16	1	4034	Reserved
RELAY9_DEAD_TIME	R/W	ms	Uint16	1	4035	Reserved
RELAY10_ACTIVESTATE	R/W	-	Uint16	1	4036	Reserved
RELAY10_MODE	R	-	Uint16	1	4037	Reserved
RELAY10_ACTIVE_TIME	R/W	ms	Uint16	1	4038	Reserved
RELAY10_DEAD_TIME	R/W	ms	Uint16	1	4039	Reserved
RELAY_VOLTAGE_DIP1_REC_OPT	R/W	-	Uint16	1	4040	Relay action for voltage dip, channel U1: 0x0000 – relay action disabled 0x0002 – relay action enabled
RELAY_VOLTAGE_DIP1_MAP	R/W	-	Uint16	1	4041	Relay selection for voltage dip, channel U1: 0x0000 – no relays 0x0001 – relay 1 activated 0x0002 – relay 2 activated 0x0003 – relays 1 and 2 activated (bit 0 – relay 1, bit 1 – relay 2)
RELAY_VOLTAGE_DIP1_THRESHOLD_MIN	R	V	Float	2	4042	Voltage dip channel U1 event threshold for relay action in volts
RELAY_VOLTAGE_DIP2_REC_OPT	R/W	-	Uint16	1	4044	Relay action for voltage dip, channel U2
RELAY_VOLTAGE_DIP2_MAP	R/W	-	Uint16	1	4045	Relay selection for voltage dip, channel U2
RELAY_VOLTAGE_DIP2_THRESHOLD_MIN	R	V	Float	2	4046	Voltage dip channel U2 event threshold for relay action in volts
RELAY_VOLTAGE_DIP3_REC_OPT	R/W	-	Uint16	1	4048	Relay action for voltage dip, channel U3
RELAY_VOLTAGE_DIP3_MAP	R/W	-	Uint16	1	4049	Relay selection for voltage dip, channel U3
RELAY_VOLTAGE_DIP3_THRESHOLD_MIN	R	V	Float	2	4050	Voltage dip channel U3 event threshold for relay action in volts
RELAY_VOLTAGE_DIP4_REC_OPT	R/W	-	Uint16	1	4052	Relay action for voltage dip, channel U4
RELAY_VOLTAGE_DIP4_MAP	R/W	-	Uint16	1	4053	Relay selection for voltage dip, channel U4
RELAY_VOLTAGE_DIP4_THRESHOLD_MIN	R	V	Float	2	4054	Voltage dip channel U4 event threshold for relay action in volts
RELAY_VOLTAGE_SWELL1_REC_OPT	R/W	-	Uint16	1	4056	Relay action for voltage swell, channel U1: 0x0000 – relay action disabled 0x0004 – relay action enabled

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RELAY_VOLTAGE_SWELL1_MAP	R/W	-	Uint16	1	4057	Relay selection for voltage swell, channel U1: 0x0000 – no relays 0x0001 – relay 1 activated 0x0002 – relay 2 activated 0x0003 – relays 1 and 2 activated (bit 0 – relay 1, bit 1 – relay 2)
RELAY_VOLTAGE_SWELL1_THRESHOLD_MAX	R	V	Float	2	4058	Voltage swell channel U1 event threshold for relay action in volts
RELAY_VOLTAGE_SWELL2_REC_OPT	R/W	-	Uint16	1	4060	Relay action for voltage swell, channel U2
RELAY_VOLTAGE_SWELL2_MAP	R/W	-	Uint16	1	4061	Relay selection for voltage swell, channel U2
RELAY_VOLTAGE_SWELL2_THRESHOLD_MAX	R	V	Float	2	4062	Voltage swell channel U2 event threshold for relay action (V)
RELAY_VOLTAGE_SWELL3_REC_OPT	R/W	-	Uint16	1	4064	Relay action for voltage swell, channel U3
RELAY_VOLTAGE_SWELL3_MAP	R/W	-	Uint16	1	4065	Relay selection for voltage swell, channel U3
RELAY_VOLTAGE_SWELL3_THRESHOLD_MAX	R	V	Float	2	4066	Voltage swell channel U3 event threshold for relay action (V)
RELAY_VOLTAGE_SWELL4_REC_OPT	R/W	-	Uint16	1	4068	Relay action for voltage swell, channel U4
RELAY_VOLTAGE_SWELL4_MAP	R/W	-	Uint16	1	4069	Relay selection for voltage swell, channel U4
RELAY_VOLTAGE_SWELL4_THRESHOLD_MAX	R	V	Float	2	4070	Voltage swell channel U4 event threshold for relay action (V)
RELAY_VOLTAGE_INTERRUPTION1_REC_OPT	R/W	-	Uint16	1	4072	Relay action for voltage interruption, channel U1: 0x0000 – relay action disabled 0x0002 – relay action enabled
RELAY_VOLTAGE_ INTERRUPTION1_MAP	R/W	-	Uint16	1	4073	Relay selection for voltage interruption, channel U1: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_VOLTAGE_ INTERRUPTION1_THRESHOLD_MIN	R	V	Float	2	4074	Voltage interruption channel U1 event threshold for relay action (V)
RELAY_VOLTAGE_INTERRUPTION2_REC_OPT	R/W	-	Uint16	1	4076	Relay action for voltage interruption, channel U2
RELAY_VOLTAGE_ INTERRUPTION2_MAP	R/W	-	Uint16	1	4077	Relay selection for voltage interruption, channel U2
RELAY_VOLTAGE_ INTERRUPTION2_THRESHOLD_MIN	R	V	Float	2	4078	Voltage interruption channel U2 event threshold for relay action (V)
RELAY_VOLTAGE_INTERRUPTION3_REC_OPT	R/W	-	Uint16	1	4080	Relay action for voltage interruption, channel U3
RELAY_VOLTAGE_ INTERRUPTION3_MAP	R/W	-	Uint16	1	4081	Relay selection for voltage interruption, channel U3
RELAY_VOLTAGE_ INTERRUPTION3_THRESHOLD_MIN	R	V	Float	2	4082	Voltage interruption channel U3 event threshold for relay action (V)
RELAY_VOLTAGE_INTERRUPTION4_REC_OPT	R/W	-	Uint16	1	4084	Relay action for voltage interruption, channel U4
RELAY_VOLTAGE_ INTERRUPTION4_MAP	R/W	-	Uint16	1	4085	Relay selection for voltage interruption, channel U4
RELAY_VOLTAGE_ INTERRUPTION4_THRESHOLD_MIN	R	V	Float	2	4086	Voltage interruption channel U4 event threshold for relay action (V)

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RELAY_CURRENT1_REC_OPT	R/W	-	Uint16	1	4088	Relay action for rms current event, channel I1: 0x0000 – relay action disabled 0x0002 – relay action enabled for I<min (not currently supported) 0x0004 – relay action enabled for I>max 0x0006 – relay action enabled for both I<min and I>max (not currently supported) (bit 1: I<min; (bit 2: I>max)
RELAY_CURRENT1_MAP	R/W	-	Uint16	1	4089	Relay selection for rms current event, channel I1: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_CURRENT1_THRESHOLD_MIN	R	A	Float	2	4090	Reserved
RELAY_CURRENT1_THRESHOLD_MAX	R	A	Float	2	4092	Rms current channel I1 I>max event threshold for relay action (A)
RELAY_CURRENT2_REC_OPT	R/W	-	Uint16	1	4094	Relay action for rms current event, channel I2
RELAY_CURRENT2_MAP	R/W	-	Uint16	1	4095	Relay selection for rms current event, channel I2
RELAY_CURRENT2_THRESHOLD_MIN	R	A	Float	2	4096	Reserved
RELAY_CURRENT2_THRESHOLD_MAX	R	A	Float	2	4098	Rms current channel I2 I>max event threshold for relay action (A)
RELAY_CURRENT3_REC_OPT	R/W	-	Uint16	1	4100	Relay action for rms current event, channel I3
RELAY_CURRENT3_MAP	R/W	-	Uint16	1	4101	Relay selection for rms current event, channel I3
RELAY_CURRENT3_THRESHOLD_MIN	R	A	Float	2	4102	Reserved
RELAY_CURRENT3_THRESHOLD_MAX	R	A	Float	2	4104	Rms current channel I3 I>max event threshold for relay action (A)
RELAY_CURRENT4_REC_OPT	R/W	-	Uint16	1	4106	Relay action for rms current event, channel I4
RELAY_CURRENT4_MAP	R/W	-	Uint16	1	4107	Relay selection for rms current event, channel I4
RELAY_CURRENT4_THRESHOLD_MIN	R	A	Float	2	4108	Reserved
RELAY_CURRENT4_THRESHOLD_MAX	R	A	Float	2	4110	Rms current channel I4 I>max event threshold for relay action (A)
RELAY_CURRENT5_REC_OPT	R/W	-	Uint16	1	4112	Relay action for rms current event, channel I5
RELAY_CURRENT5_MAP	R/W	-	Uint16	1	4113	Relay selection for rms current event, channel I5
RELAY_CURRENT5_THRESHOLD_MIN	R	A	Float	2	4114	Reserved
RELAY_CURRENT5_THRESHOLD_MAX	R	A	Float	2	4116	Rms current channel I5 I>max event threshold for relay action (A)
RELAY_FREQUENCY_REC_OPT	R/W	-	Uint16	1	4118	Relay action for frequency event: 0x0000 – relay action disabled 0x0002 – relay action enabled for f<min 0x0004 – relay action enabled for f>max 0x0006 – relay action enabled for both f<min and f>max (bit 1: f<min; (bit 2: f>max)

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RELAY_ FREQUENCY_MAP	R/W	-	Uint16	1	4119	Relay selection for frequency event: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_ FREQUENCY_THRESHOLD_MIN	R	Hz	Float	2	4120	f<min event threshold for relay action (Hz)
RELAY_ FREQUENCY_THRESHOLD_MAX	R	Hz	Float	2	4122	f>max event threshold for relay action (Hz)
RELAY_ACTIVE_POWER_PLUS1_REC_OPT	R/W	-	Uint16	1	4124	Relay action for active power P+ phase L1 event: 0x0000 – relay action disabled 0x0002 – relay action enabled for P+<min (not currently supported) 0x0004 – relay action enabled for P+>max 0x0006 – relay action enabled for both P+<min and P+>max (not currently supported) (bit 1: P+<min; (bit 2: P+>max)
RELAY_ACTIVE_POWER_PLUS1_MAP	R/W	-	Uint16	1	4125	Relay selection for active power P+ phase L1 event: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_ACTIVE_POWER_PLUS1_THRESHOLD_MIN	R	W	Float	2	4126	Reserved
RELAY_ACTIVE_POWER_PLUS1_THRESHOLD_MAX	R	W	Float	2	4128	P+>max event threshold (phase L1) for relay action (W)
RELAY_ACTIVE_POWER_PLUS2_REC_OPT	R/W	-	Uint16	1	4130	Relay action for active power P+ phase L2 event
RELAY_ACTIVE_POWER_PLUS2_MAP	R/W	-	Uint16	1	4131	Relay selection for active power P+ phase L2 event
RELAY_ACTIVE_POWER_PLUS2_THRESHOLD_MIN	R	W	Float	2	4132	Reserved
RELAY_ACTIVE_POWER_PLUS2_THRESHOLD_MAX	R	W	Float	2	4134	P+>max event threshold (phase L2) for relay action (W)
RELAY_ACTIVE_POWER_PLUS3_REC_OPT	R/W	-	Uint16	1	4136	Relay action for active power P+ phase L3 event
RELAY_ACTIVE_POWER_PLUS3_MAP	R/W	-	Uint16	1	4137	Relay selection for active power P+ phase L3 event
RELAY_ACTIVE_POWER_PLUS3_THRESHOLD_MIN	R	W	Float	2	4138	Reserved
RELAY_ACTIVE_POWER_PLUS3_THRESHOLD_MAX	R	W	Float	2	4140	P+>max event threshold (phase L3) for relay action (W)
RELAY_ACTIVE_POWER_PLUS4_REC_OPT	R/W	-	Uint16	1	4142	Relay action for active power P+ (TOTAL) event
RELAY_ACTIVE_POWER_PLUS4_MAP	R/W	-	Uint16	1	4143	Relay selection for active power P+ (TOTAL) event
RELAY_ACTIVE_POWER_PLUS4_THRESHOLD_MIN	R	W	Float	2	4144	Reserved
RELAY_ACTIVE_POWER_PLUS4_THRESHOLD_MAX	R	W	Float	2	4146	P+>max event threshold (TOTAL) for relay action (W)

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RELAY_ACTIVE_POWER_MINUS1_REC_OPT	R/W	-	Uint16	1	4148	Relay action for active power P- phase L1 event: 0x0000 – relay action disabled 0x0002 – relay action enabled for P-<min (not currently supported) 0x0004 – relay action enabled for P->max 0x0006 – relay action enabled for both P-<min and P->max (not currently supported) (bit 1: P-<min; (bit 2: P->max)
RELAY_ACTIVE_POWER_MINUS1_MAP	R/W	-	Uint16	1	4149	Relay selection for active power P- phase L1 event: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_ACTIVE_POWER_MINUS1_THRESHOLD_MIN	R	W	Float	2	4150	Reserved
RELAY_ACTIVE_POWER_MINUS1_THRESHOLD_MAX	R	W	Float	2	4152	P->max event threshold (phase L1) for relay action (W)
RELAY_ACTIVE_POWER_MINUS2_REC_OPT	R/W	-	Uint16	1	4154	Relay action for active power P- phase L2 event
RELAY_ACTIVE_POWER_MINUS2_MAP	R/W	-	Uint16	1	4155	Relay selection for active power P- phase L2 event
RELAY_ACTIVE_POWER_MINUS2_THRESHOLD_MIN	R	W	Float	2	4156	Reserved
RELAY_ACTIVE_POWER_MINUS2_THRESHOLD_MAX	R	W	Float	2	4158	P->max event threshold (phase L2) for relay action (W)
RELAY_ACTIVE_POWER_MINUS3_REC_OPT	R/W	-	Uint16	1	4160	Relay action for active power P- phase L3 event
RELAY_ACTIVE_POWER_MINUS3_MAP	R/W	-	Uint16	1	4161	Relay selection for active power P- phase L3 event
RELAY_ACTIVE_POWER_MINUS3_THRESHOLD_MIN	R	W	Float	2	4162	Reserved
RELAY_ACTIVE_POWER_MINUS3_THRESHOLD_MAX	R	W	Float	2	4164	P->max event threshold (phase L3) for relay action (W)
RELAY_ACTIVE_POWER_MINUS4_REC_OPT	R/W	-	Uint16	1	4166	Relay action for active power P- (TOTAL) event
RELAY_ACTIVE_POWER_MINUS4_MAP	R/W	-	Uint16	1	4167	Relay selection for active power P- (TOTAL) event
RELAY_ACTIVE_POWER_MINUS4_THRESHOLD_MIN	R	W	Float	2	4168	Reserved
RELAY_ACTIVE_POWER_MINUS4_THRESHOLD_MAX	R	W	Float	2	4170	P->max event threshold (TOTAL) for relay action (W)
RELAY_REACTIVE_POWER1_REC_OPT	R/W	-	Uint16	1	4172	Relay action for reactive power Q phase L1 event: 0x0000 – relay action disabled 0x0002 – relay action enabled for Q<min (not currently supported) 0x0004 – relay action enabled for Q>max 0x0006 – relay action enabled for both Q<min and Q>max (not currently supported) (bit 1: Q<min; (bit 2: Q>max)

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RELAY_REACTIVE_POWER1_MAP	R/W	-	Uint16	1	4173	Relay selection for reactive power Q phase L1 event: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_REACTIVE_POWER1_THRESHOLD_MIN	R	Var	Float	2	4174	Reserved
RELAY_REACTIVE_POWER1_THRESHOLD_MAX	R	Var	Float	2	4176	Q>max event threshold (phase L1) for relay action (Var)
RELAY_REACTIVE_POWER2_REC_OPT	R/W	-	Uint16	1	4178	Relay action for reactive power Q phase L2 event
RELAY_REACTIVE_POWER2_MAP	R/W	-	Uint16	1	4179	Relay selection for reactive power Q phase L2 event
RELAY_REACTIVE_POWER2_THRESHOLD_MIN	R	Var	Float	2	4180	Reserved
RELAY_REACTIVE_POWER2_THRESHOLD_MAX	R	Var	Float	2	4182	Q>max event threshold (phase L2) for relay action (Var)
RELAY_REACTIVE_POWER3_REC_OPT	R/W	-	Uint16	1	4184	Relay action for reactive power Q phase L3 event
RELAY_REACTIVE_POWER3_MAP	R/W	-	Uint16	1	4185	Relay selection for reactive power Q phase L3 event
RELAY_REACTIVE_POWER3_THRESHOLD_MIN	R	Var	Float	2	4186	Reserved
RELAY_REACTIVE_POWER3_THRESHOLD_MAX	R	Var	Float	2	4188	Q>max event threshold (phase L3) for relay action (Var)
RELAY_REACTIVE_POWER4_REC_OPT	R/W	-	Uint16	1	4190	Relay action for reactive power Q (TOTAL) event
RELAY_REACTIVE_POWER4_MAP	R/W	-	Uint16	1	4191	Relay selection for reactive power Q (TOTAL) event
RELAY_REACTIVE_POWER4_THRESHOLD_MIN	R	Var	Float	2	4192	Reserved
RELAY_REACTIVE_POWER4_THRESHOLD_MAX	R	Var	Float	2	4194	Q>max event threshold (TOTAL) for relay action (Var)
RELAY_APPARENT_POWER1_REC_OPT	R/W	-	Uint16	1	4196	Relay action for apparent power S phase L1 event: 0x0000 – relay action disabled 0x0002 – relay action enabled for S<min (not currently supported) 0x0004 – relay action enabled for S>max 0x0006 – relay action enabled for both S<min and S>max (not currently supported) (bit 1: S<min; (bit 2: S>max)
RELAY_APPARENT_POWER1_MAP	R/W	-	Uint16	1	4197	Relay selection for apparent power S phase L1 event: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_APPARENT_POWER1_THRESHOLD_MIN	R	VA	Float	2	4198	Reserved
RELAY_APPARENT_POWER1_THRESHOLD_MAX	R	VA	Float	2	4200	S>max event threshold (phase L1) for relay action (VA)
RELAY_APPARENT_POWER2_REC_OPT	R/W	-	Uint16	1	4202	Relay action for apparent power S phase L2 event
RELAY_APPARENT_POWER2_MAP	R/W	-	Uint16	1	4203	Relay selection for apparent power S phase L2 event
RELAY_APPARENT_POWER2_THRESHOLD_MIN	R	VA	Float	2	4204	Reserved
RELAY_APPARENT_POWER2_THRESHOLD_MAX	R	VA	Float	2	4206	S>max event threshold (phase L2) for relay action (VA)

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RELAY_APPARENT_POWER3_REC_OPT	R/W	-	Uint16	1	4208	Relay action for apparent power S phase L3 event
RELAY_APPARENT_POWER3_MAP	R/W	-	Uint16	1	4209	Relay selection for apparent power S phase L3 event
RELAY_APPARENT_POWER3_THRESHOLD_MIN	R	VA	Float	2	4210	Reserved
RELAY_APPARENT_POWER3_THRESHOLD_MAX	R	VA	Float	2	4212	S>max event threshold (phase L3) for relay action (VA)
RELAY_APPARENT_POWER4_REC_OPT	R/W	-	Uint16	1	4214	Relay action for apparent power S (TOTAL) event
RELAY_APPARENT_POWER4_MAP	R/W	-	Uint16	1	4215	Relay selection for apparent power S (TOTAL) event
RELAY_APPARENT_POWER4_THRESHOLD_MIN	R	VA	Float	2	4216	Reserved
RELAY_APPARENT_POWER4_THRESHOLD_MAX	R	VA	Float	2	4218	S>max event threshold (TOTAL) for relay action (VA)
RELAY_DISPLACEMENT_POWER_FACTOR1_REC_OPT	R/W	-	Uint16	1	4220	Relay action for displacement power factor DPF phase L1 event: 0x0000 – relay action disabled 0x0002 – relay action enabled for DPF<min (not currently supported) 0x0004 – relay action enabled for DPF>max 0x0006 – relay action enabled for both DPF<min and DPF>max (not currently supported) (bit 1: DPF<min; (bit 2: DPF>max)
RELAY_DISPLACEMENT_POWER_FACTOR1_MAP	R/W	-	Uint16	1	4221	Relay selection for displacement power factor DPF phase L1 event: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_DISPLACEMENT_POWER_FACTOR1_THRESHOLD_MIN	R	-	Float	2	4222	Reserved
RELAY_DISPLACEMENT_POWER_FACTOR1_THRESHOLD_MAX	R	-	Float	2	4224	DPF>max event threshold (phase L1) for relay action
RELAY_DISPLACEMENT_POWER_FACTOR2_REC_OPT	R/W	-	Uint16	1	4226	Relay action for displacement power factor DPF phase L2 event
RELAY_DISPLACEMENT_POWER_FACTOR2_MAP	R/W	-	Uint16	1	4227	Relay selection for displacement power factor DPF phase L2 event
RELAY_DISPLACEMENT_POWER_FACTOR2_THRESHOLD_MIN	R	-	Float	2	4228	Reserved
RELAY_DISPLACEMENT_POWER_FACTOR2_THRESHOLD_MAX	R	-	Float	2	4230	DPF >max event threshold (phase L2) for relay action
RELAY_DISPLACEMENT_POWER_FACTOR3_REC_OPT	R/W	-	Uint16	1	4232	Relay action for displacement power factor DPF phase L3 event
RELAY_DISPLACEMENT_POWER_FACTOR3_MAP	R/W	-	Uint16	1	4233	Relay selection for displacement power factor DPF phase L3 event
RELAY_DISPLACEMENT_POWER_FACTOR3_THRESHOLD_MIN	R	-	Float	2	4234	Reserved
RELAY_DISPLACEMENT_POWER_FACTOR3_THRESHOLD_MAX	R	-	Float	2	4236	DPF >max event threshold (phase L3) for relay action
RELAY_DISPLACEMENT_POWER_FACTOR4_REC_OPT	R/W	-	Uint16	1	4238	Relay action for displacement power factor DPF (TOTAL) event
RELAY_DISPLACEMENT_POWER_FACTOR4_MAP	R/W	-	Uint16	1	4239	Relay selection for displacement power factor DPF (TOTAL) event
RELAY_DISPLACEMENT_POWER_FACTOR4_THRESHOLD_MIN	R	-	Float	2	4240	Reserved
RELAY_DISPLACEMENT_POWER_FACTOR4_THRESHOLD_MAX	R	-	Float	2	4242	DPF >max event threshold (TOTAL) for relay action

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RELAY_POWER_FACTOR1_REC_OPT	R/W	-	Uint16	1	4244	Relay action for power factor PF phase L1 event: 0x0000 – relay action disabled 0x0002 – relay action enabled for PF<min (not currently supported) 0x0004 – relay action enabled for PF>max 0x0006 – relay action enabled for both PF<min and PF>max (not currently supported) (bit 1: PF<min; (bit 2: PF>max)
RELAY_POWER_FACTOR1_MAP	R/W	-	Uint16	1	4245	Relay selection for power factor PF phase L1 event: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_POWER_FACTOR1_THRESHOLD_MIN	R	-	Float	2	4246	Reserved
RELAY_POWER_FACTOR1_THRESHOLD_MAX	R	-	Float	2	4248	PF>max event threshold (phase L1) for relay action
RELAY_POWER_FACTOR2_REC_OPT	R/W	-	Uint16	1	4250	Relay action for power factor PF phase L2 event
RELAY_POWER_FACTOR2_MAP	R/W	-	Uint16	1	4251	Relay selection for power factor PF phase L2 event
RELAY_POWER_FACTOR2_THRESHOLD_MIN	R	-	Float	2	4252	Reserved
RELAY_POWER_FACTOR2_THRESHOLD_MAX	R	-	Float	2	4254	PF >max event threshold (phase L2) for relay action
RELAY_POWER_FACTOR3_REC_OPT	R/W	-	Uint16	1	4256	Relay action for power factor PF phase L3 event
RELAY_POWER_FACTOR3_MAP	R/W	-	Uint16	1	4257	Relay selection for power factor PF phase L3 event
RELAY_POWER_FACTOR3_THRESHOLD_MIN	R	-	Float	2	4258	Reserved
RELAY_POWER_FACTOR3_THRESHOLD_MAX	R	-	Float	2	4260	PF >max event threshold (phase L3) for relay action
RELAY_POWER_FACTOR4_REC_OPT	R/W	-	Uint16	1	4262	Relay action for power factor PF (TOTAL) event
RELAY_POWER_FACTOR4_MAP	R/W	-	Uint16	1	4263	Relay selection for power factor PF (TOTAL) event
RELAY_POWER_FACTOR4_THRESHOLD_MIN	R	-	Float	2	4264	Reserved
RELAY_POWER_FACTOR4_THRESHOLD_MAX	R	-	Float	2	4266	PF >max event threshold (TOTAL) for relay action
RELAY_VOLTAGE_THDF1_REC_OPT	R/W	-	Uint16	1	4268	Relay action for voltage THD-F phase L1 event: 0x0000 – relay action disabled 0x0004 – relay action enabled for THD>max
RELAY_VOLTAGE_THDF1_MAP	R/W	-	Uint16	1	4269	Relay selection for voltage THD-F phase L1 event: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_VOLTAGE_THDF1_THRESHOLD_MAX	R	%	Float	2	4270	THD>max event threshold (phase L1) for relay action
RELAY_VOLTAGE_THDF2_REC_OPT	R/W	-	Uint16	1	4272	Relay action for voltage THD-F phase L2 event
RELAY_VOLTAGE_THDF2_MAP	R/W	-	Uint16	1	4273	Relay selection for voltage THD-F phase L2 event
RELAY_VOLTAGE_THDF2_THRESHOLD_MAX	R	%	Float	2	4274	THD>max event threshold (phase L2) for relay action

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RELAY_VOLTAGE_THDF3_REC_OPT	R/W	-	Uint16	1	4276	Relay action for voltage THD-F phase L3 event
RELAY_VOLTAGE_THDF3_MAP	R/W	-	Uint16	1	4277	Relay selection for voltage THD-F phase L3 event
RELAY_VOLTAGE_THDF3_THRESHOLD_MAX	R	%	Float	2	4278	THD>max event threshold (phase L3) for relay action
RELAY_VOLTAGE_THDF4_REC_OPT	R/W	-	Uint16	1	4280	Relay action for voltage THD-F (TOTAL) event
RELAY_VOLTAGE_THDF4_MAP	R/W	-	Uint16	1	4281	Relay selection for voltage THD-F (TOTAL) event
RELAY_VOLTAGE_THDF4_THRESHOLD_MAX	R	%	Float	2	4282	THD>max event threshold (TOTAL) for relay action
RELAY_CURRENT_THDF1_REC_OPT	R/W	-	Uint16	1	4284	Relay action for current THD-F channel I1 event: 0x0000 – relay action disabled 0x0004 – relay action enabled for THD>max
RELAY_CURRENT_THDF1_MAP	R/W	-	Uint16	1	4285	Relay selection for current THD-F channel I1 event: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_CURRENT_THDF1_THRESHOLD_MAX	R	%	Float	2	4286	THD>max event threshold (channel I1) for relay action
RELAY_CURRENT_THDF2_REC_OPT	R/W	-	Uint16	1	4288	Relay action for current THD-F channel I2 event
RELAY_CURRENT_THDF2_MAP	R/W	-	Uint16	1	4289	Relay selection for current THD-F channel I2 event
RELAY_CURRENT_THDF2_THRESHOLD_MAX	R	%	Float	2	4290	THD>max event threshold (channel I2) for relay action
RELAY_CURRENT_THDF3_REC_OPT	R/W	-	Uint16	1	4292	Relay action for current THD-F channel I3 event
RELAY_CURRENT_THDF3_MAP	R/W	-	Uint16	1	4293	Relay selection for current THD-F channel I3 event
RELAY_CURRENT_THDF3_THRESHOLD_MAX	R	%	Float	2	4294	THD>max event threshold (channel I3) for relay action
RELAY_CURRENT_THDF4_REC_OPT	R/W	-	Uint16	1	4296	Relay action for current THD-F channel I4 event
RELAY_CURRENT_THDF4_MAP	R/W	-	Uint16	1	4297	Relay selection for current THD-F channel I4 event
RELAY_CURRENT_THDF4_THRESHOLD_MAX	R	%	Float	2	4298	THD>max event threshold (channel I4) for relay action
RELAY_FLICKER_PST1_REC_OPT	R/W	-	Uint16	1	4300	Relay action for flicker Pst channel U1 event: 0x0000 – relay action disabled 0x0004 – relay action enabled for Pst>max
RELAY_FLICKER_PST1_MAP	R/W	-	Uint16	1	4301	Relay selection for flicker Pst channel U1 event: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_FLICKER_PST1_THRESHOLD_MAX	R	-	Float	2	4302	Pst>max event threshold (channel U1) for relay action
RELAY_FLICKER_PST2_REC_OPT	R/W	-	Uint16	1	4304	Relay action for flicker Pst channel U2 event
RELAY_FLICKER_PST2_MAP	R/W	-	Uint16	1	4305	Relay selection for flicker Pst channel U2 event
RELAY_FLICKER_PST2_THRESHOLD_MAX	R	-	Float	2	4306	Pst>max event threshold (channel U2) for relay action
RELAY_FLICKER_PST3_REC_OPT	R/W	-	Uint16	1	4308	Relay action for flicker Pst channel U3 event
RELAY_FLICKER_PST3_MAP	R/W	-	Uint16	1	4309	Relay selection for flicker Pst channel U3 event

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RELAY_FLICKER_PST3_THRESHOLD_MAX	R	-	Float	2	4310	Pst>max event threshold (channel U3) for relay action
RELAY_FLICKER_PLT1_REC_OPT	R/W	-	Uint16	1	4312	Relay action for flicker Plt channel U1 event: 0x0000 – relay action disabled 0x0004 – relay action enabled for Plt>max
RELAY_FLICKER_PLT1_MAP	R/W	-	Uint16	1	4313	Relay selection for flicker Plt channel U1 event: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_FLICKER_PLT1_THRESHOLD_MAX	R	-	Float	2	4314	Plt>max event threshold (channel U1) for relay action
RELAY_FLICKER_PLT2_REC_OPT	R/W	-	Uint16	1	4316	Relay action for flicker Plt channel U2 event
RELAY_FLICKER_PLT2_MAP	R/W	-	Uint16	1	4317	Relay selection for flicker Plt channel U2 event
RELAY_FLICKER_PLT2_THRESHOLD_MAX	R	-	Float	2	4318	Plt>max event threshold (channel U2) for relay action
RELAY_FLICKER_PLT3_REC_OPT	R/W	-	Uint16	1	4320	Relay action for flicker Plt channel U3 event
RELAY_FLICKER_PLT3_MAP	R/W	-	Uint16	1	4321	Relay selection for flicker Plt channel U3 event
RELAY_FLICKER_PLT3_THRESHOLD_MAX	R	-	Float	2	4322	Plt>max event threshold (channel U3) for relay action
RELAY_WAVESHAPE1_REC_OPT	R/W	-	Uint16	1	4324	Relay action for waveshape variation channel U1 event: 0x0000 – relay action disabled 0x0004 – relay action enabled
RELAY_WAVESHAPE1_MAP	R/W	-	Uint16	1	4325	Relay selection for waveshape variation channel U1 event: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_WAVESHAPE1_THRESHOLD_MAX	R	V	Float	2	4326	Waveshape variation event threshold (channel U1) for relay action
RELAY_WAVESHAPE2_REC_OPT	R/W	-	Uint16	1	4328	Relay action for waveshape variation channel U2 event
RELAY_WAVESHAPE2_MAP	R/W	-	Uint16	1	4329	Relay selection for waveshape variation channel U2 event
RELAY_WAVESHAPE2_THRESHOLD_MAX	R	V	Float	2	4330	Waveshape variation event threshold (channel U2) for relay action
RELAY_WAVESHAPE3_REC_OPT	R/W	-	Uint16	1	4332	Relay action for waveshape variation channel U3 event
RELAY_WAVESHAPE3_MAP	R/W	-	Uint16	1	4333	Relay selection for waveshape variation channel U3 event
RELAY_WAVESHAPE3_THRESHOLD_MAX	R	V	Float	2	4334	Waveshape variation event threshold (channel U3) for relay action
RELAY_PHASE_JUMP1_REC_OPT	R/W	-	Uint16	1	4336	Relay action for phase jump channel U1 event: 0x0000 – relay action disabled 0x0004 – relay action enabled

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RELAY_PHASE_JUMP1_MAP	R/W	-	Uint16	1	4337	Relay selection for phase jump channel U1 event: 0x0000 – no relays 0x0001 – relay 1 selected 0x0002 – relay 2 selected 0x0003 – relays 1 and 2 selected (bit 0 – relay 1, bit 1 – relay 2)
RELAY_PHASE_JUMP1_THRESHOLD_MAX	R	degree	Float	2	4338	Phase jump event threshold (channel U1) for relay action
RELAY_PHASE_JUMP2_REC_OPT	R/W	-	Uint16	1	4340	Relay action for phase jump channel U2 event
RELAY_PHASE_JUMP2_MAP	R/W	-	Uint16	1	4341	Relay selection for phase jump channel U2 event
RELAY_PHASE_JUMP2_THRESHOLD_MAX	R	degree	Float	2	4342	Phase jump event threshold (channel U2) for relay action
RELAY_PHASE_JUMP3_REC_OPT	R/W	-	Uint16	1	4344	Relay action for phase jump channel U3 event
RELAY_PHASE_JUMP3_MAP	R/W	-	Uint16	1	4345	Relay selection for phase jump channel U3 event
RELAY_PHASE_JUMP3_THRESHOLD_MAX	R	degree	Float	2	4346	Phase jump event threshold (channel U3) for relay action
	-	-	-	-	4348-4999	Reserved

3.1.4 IEC 61850 protocol configuration registers

Tab. 8. IEC 61850 protocol configuration registers

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
IEC61850_IED_NAME	R/W		String	20	5000	IEC 61850 IED name
IEC61850_IP_ADDRESS	R		Uint32	2	5020	IEC 61850 IP address
IEC61850_IP_PORT	R		Uint16	1	5022	IEC 61850 TCP port
	-	-	-	-	5023	Reserved
IEC61850_PHASE_VOLTAGE_DB_REF	R/W	V	Float	2	5024	IEC 61850 phase voltage deadband reference (V)
IEC61850_PHASE_VOLTAGE_DB	R/W	0.001%	Uint32	2	5026	IEC 61850 phase voltage deadband (0.001 % unit) 0 = 0% 1000 = 1%
IEC61850_PHASE_TO_PHASE_VOLTAGE_DB_REF	R/W	V	Float	2	5028	IEC 61850 phase to phase voltage deadband reference (V)
IEC61850_PHASE_TO_PHASE_VOLTAGE_DB	R/W	0.001%	Uint32	2	5030	IEC 61850 phase to phase voltage deadband (0.001 % unit)
IEC61850_UNE_VOLTAGE_DB_REF	R/W	V	Float	2	5032	IEC 61850 U_{NE} voltage deadband reference (V)
IEC61850_UNE_VOLTAGE_DB	R/W	0.001%	Uint32	2	5034	IEC 61850 U_{NE} voltage deadband (0.001 % unit)
IEC61850_PHASE_CURRENT_DB_REF	R/W	A	Float	2	5036	IEC 61850 phase current deadband reference (A)
IEC61850_PHASE_CURRENT_DB	R/W	0.001%	Uint32	2	5038	IEC 61850 phase current deadband (0.001 % unit)
IEC61850_N_CURRENT_DB_REF	R/W	A	Float	2	5040	IEC 61850 I_N current deadband reference (A)
IEC61850_N_CURRENT_DB	R/W	0.001%	Uint32	2	5042	IEC 61850 I_N current deadband (0.001 % unit)
IEC61850_E_CURRENT_DB_REF	R/W	A	Float	2	5044	IEC 61850 I_E current deadband reference (A)
IEC61850_E_CURRENT_DB	R/W	0.001%	Uint32	2	5046	IEC 61850 I_E current deadband (0.001 % unit)
IEC61850_ACTIVE_POWER_TOTAL_DB_REF	R/W	W	Float	2	5048	IEC 61850 total active power deadband reference (W)
IEC61850_ACTIVE_POWER_TOTAL_D	R/W	0.001%	Uint32	2	5050	IEC 61850 total active power deadband (0.001 % unit)
IEC61850_REACTIVE_POWER_TOTAL_DB_REF	R/W	Var	Float	2	5052	IEC 61850 total reactive power deadband reference (Var)
IEC61850_REACTIVE_POWER_TOTAL_DB	R/W	0.001%	Uint32	2	5054	IEC 61850 total reactive power deadband (0.001 % unit)
IEC61850_APPARENT_POWER_TOTAL_DB_REF	R/W	VA	Float	2	5056	IEC 61850 total apparent power deadband reference (VA)
IEC61850_APPARENT_POWER_TOTAL_DB	R/W	0.001%	Uint32	2	5058	IEC 61850 total apparent power deadband (0.001 % unit)
IEC61850_ACTIVE_POWER_PHASE_DB_REF	R/W	W	Float	2	5060	IEC 61850 phase active power deadband reference (W)
IEC61850_ACTIVE_POWER_PHASE_DB	R/W	0.001%	Uint32	2	5062	IEC 61850 phase active power deadband (0.001 % unit)
IEC61850_REACTIVE_POWER_PHASE_DB_REF	R/W	Var	Float	2	5064	IEC 61850 phase reactive power deadband reference (Var)
IEC61850_REACTIVE_POWER_PHASE_DB	R/W	0.001%	Uint32	2	5066	IEC 61850 phase reactive power deadband (0.001 % unit)
IEC61850_APPARENT_POWER_PHASE_DB_REF	R/W	VA	Float	2	5068	IEC 61850 phase apparent power deadband reference (VA)
IEC61850_APPARENT_POWER_PHASE_DB	R/W	0.001%	Uint32	2	5070	IEC 61850 phase apparent power deadband (0.001 % unit)
IEC61850_FREQUENCY_DB_REF	R/W	Hz	Float	2	5072	IEC 61850 frequency deadband reference (Hz)
IEC61850_FREQUENCY_DB	R/W	0.001%	Uint32	2	5074	IEC 61850 frequency deadband (0.001 % unit)
IEC61850_VOLTAGE_HARMONICS_DB_REF	R/W	V	Float	2	5076	IEC 61850 voltage harmonics deadband reference (V)

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
IEC61850_VOLTAGE_HARMONICS_DB_REF	R/W	0.001%	Uint32	2	5078	IEC 61850 voltage harmonics deadband (0.001 % unit)
IEC61850_CURRENT_HARMONICS_DB	R/W	A	Float	2	5080	IEC 61850 current harmonics deadband reference (A)
IEC61850_CURRENT_HARMONICS_DB_REF	R/W	0.001%	Uint32	2	5082	IEC 61850 current harmonics deadband (0.001 % unit)
IEC61850_VOLTAGE_INTERHARMONICS_DB_REF	R/W	V	Float	2	5084	IEC 61850 voltage interharmonics deadband reference (V)
IEC61850_VOLTAGE_INTERHARMONICS_DB	R/W	0.001%	Uint32	2	5086	IEC 61850 voltage interharmonics deadband (0.001 % unit)
IEC61850_CURRENT_INTERHARMONICS_DB_REF	R/W	A	Float	2	5088	IEC 61850 current interharmonics deadband reference (A)
IEC61850_CURRENT_INTERHARMONICS_DB	R/W	0.001%	Uint32	2	5090	IEC 61850 current interharmonics deadband (0.001 % unit)
IEC61850_VOLTAGE_THD_DB_REF	R/W	%	Float	2	5092	IEC 61850 voltage THD deadband reference (%)
IEC61850_VOLTAGE_THD_DB	R/W	0.001%	Uint32	2	5094	IEC 61850 voltage THD deadband (0.001 % unit)
IEC61850_CURRENT_THD_DB_REF	R/W	%	Float	2	5096	IEC 61850 current THD deadband reference (%)
IEC61850_CURRENT_THD_DB	R/W	0.001%	Uint32	2	5098	IEC 61850 current THD deadband (0.001 % unit)
IEC61850_VOLTAGE_TID_DB_REF	R/W	%	Float	2	5100	IEC 61850 voltage TID deadband reference (%)
IEC61850_VOLTAGE_TID_DB	R/W	0.001%	Uint32	2	5102	IEC 61850 voltage TID deadband (0.001 % unit)
IEC61850_CURRENT_TID_DB_REF	R/W	%	Float	2	5104	IEC 61850 current TID deadband reference (%)
IEC61850_CURRENT_TID_DB	R/W	0.001%	Uint32	2	5106	IEC 61850 current TID deadband (0.001 % unit)
IEC61850_UNBALANCE_VOLTAGE_POSITIVE_SEQUENCE_DB_REF	R/W	V	Float	2	5108	IEC 61850 voltage unbalance positive sequence component U1 deadband reference (V)
IEC61850_UNBALANCE_VOLTAGE_POSITIVE_SEQUENCE_DB	R/W	0.001%	Uint32	2	5110	IEC 61850 voltage unbalance positive sequence component U1 deadband (0.001 % unit)
IEC61850_UNBALANCE_VOLTAGE_NEGATIVE_SE-QUENCE_DB_REF	R/W	V	Float	2	5112	IEC 61850 voltage unbalance negative sequence component U2 deadband reference (V)
IEC61850_UNBALANCE_VOLTAGE_NEGATIVE_SEQUENCE_DB	R/W	0.001%	Uint32	2	5114	IEC 61850 voltage unbalance negative sequence component U2 deadband (0.001 % unit)
IEC61850_UNBALANCE_VOLTAGE_ZERO_SEQUENCE_DB_REF	R/W	V	Float	2	5116	IEC 61850 voltage unbalance zero sequence component U0 deadband reference (V)
IEC61850_UNBALANCE_VOLTAGE_ZERO_SEQUENCE_DB	R/W	0.001%	Uint32	2	5118	IEC 61850 voltage unbalance zero sequence component U0 deadband (0.001 % unit)
IEC61850_UNBALANCE_CURRENT_POSITIVE_SEQUENCE_DB_REF	R/W	A	Float	2	5120	IEC 61850 current unbalance positive sequence component I1 deadband reference (A)
IEC61850_UNBALANCE_CURRENT_POSITIVE_SEQUENCE_DB	R/W	0.001%	Uint32	2	5122	IEC 61850 current unbalance positive sequence component I1 deadband (0.001 % unit)
IEC61850_UNBALANCE_CURRENT_NEGATIVE_SE-QUENCE_DB_REF	R/W	A	Float	2	5124	IEC 61850 current unbalance negative sequence component I2 deadband reference (A)
IEC61850_UNBALANCE_CURRENT_NEGATIVE_SEQUENCE_DB	R/W	0.001%	Uint32	2	5126	IEC 61850 current unbalance negative sequence component I2 deadband (0.001 % unit)
IEC61850_UNBALANCE_CURRENT_ZERO_SEQUENCE_DB_REF	R/W	A	Float	2	5128	IEC 61850 current unbalance zero sequence component I0 deadband reference (A)
IEC61850_UNBALANCE_CURRENT_ZERO_SEQUENCE_DB	R/W	0.001%	Uint32	2	5130	IEC 61850 current unbalance zero sequence component I0 deadband (0.001 % unit)
IEC61850_UNBALANCE_VOLTAGE_NEGATIVE_DB_REF	R/W	%	Float	2	5132	IEC 61850 voltage negative sequence unbalance deadband reference (%)
IEC61850_UNBALANCE_VOLTAGE_NEGATIVE_DB	R/W	0.001%	Uint32	2	5134	IEC 61850 voltage negative sequence unbalance deadband (0.001 % unit)

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
IEC61850_UNBALANCE_CURRENT_NEGATIVE_DB_REF	R/W	%	Float	2	5136	IEC 61850 current negative sequence unbalance deadband reference (%)
IEC61850_UNBALANCE_CURRENT_NEGATIVE_DB	R/W	0.001%	Uint32	2	5138	IEC 61850 current negative sequence unbalance deadband (0.001 % unit)
IEC61850_FLICKER_PST_DB_REF	R/W	-	Float	2	5140	IEC 61850 flicker P_{ST} deadband reference (-)
IEC61850_FLICKER_PST_DB	R/W	0.001%	Uint32	2	5142	IEC 61850 flicker P_{ST} deadband (0.001 % unit)
IEC61850_FLICKER_PLT_DB_REF	R/W	-	Float	2	5144	IEC 61850 flicker P_{LT} deadband reference (-)
IEC61850_FLICKER_PLT_DB	R/W	0.001%	Uint32	2	5146	IEC 61850 flicker P_{LT} deadband (0.001 % unit)
IEC61850_2_9_KHZ_VOLTAGE_DB_REF	R/W	V	Float	2	5148	IEC 61850 voltage emissions in 2-9 kHz band deadband reference (V)
IEC61850_2_9_KHZ_VOLTAGE_DB	R/W	0.001%	Uint32	2	5150	IEC 61850 voltage emissions in 2-9 kHz band deadband (0.001 % unit)
IEC61850_2_9_KHZ_VOLTAGE_MAX_DB_REF	R/W	V	Float	2	5152	IEC 61850 maximum voltage emission in 2-9 kHz band deadband reference (V)
IEC61850_2_9_KHZ_VOLTAGE_MAX_DB	R/W	0.001%	Uint32	2	5154	IEC 61850 maximum voltage emission in 2-9 kHz band deadband (0.001 % unit)
IEC61850_8_150_KHZ_VOLTAGE_DB_REF	R/W	V	Float	2	5156	IEC 61850 voltage emissions in 8-150 kHz band deadband reference (V)
IEC61850_8_150_KHZ_VOLTAGE_DB	R/W	0.001%	Uint32	2	5158	IEC 61850 voltage emissions in 8-150 kHz band deadband (0.001 % unit)
IEC61850_8_150_KHZ_VOLTAGE_MAX_DB_REF	R/W	V	Float	2	5160	IEC 61850 maximum voltage emission in 8-150 kHz band deadband reference (V)
IEC61850_8_150_KHZ_VOLTAGE_MAX_DB	R/W	0.001%	Uint32	2	5162	IEC 61850 maximum voltage emission in 8-150 kHz band deadband (0.001 % unit)
IEC61850_BATTERY_VOLTAGE_DB_REF	R/W	V	Float	2	5164	IEC 61850 battery voltage deadband reference (V)
IEC61850_BATTERY_VOLTAGE_DB	R/W	0.001%	Uint32	2	5166	IEC 61850 battery voltage deadband (0.001 % unit)
	-	-	-	1	5168-8191	Reserved

3.1.5 Special purpose configuration registers

Tab. 9. Special purpose configuration registers

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
REC_STATUS	R	-	Uint16	1	8192	Recording status: 0 – recording stopped 1 – recording in progress
SDCARD_STATUS_EXT	R	-	Uint16	1	8193	External memory card status: 0 – format state 1 – eject state 2 – ejected state 3 – inserted state 4 – error state 5 – normal state 6 – blocked state 7 – verify state 8 – missing state
SDCARD_STATUS_INT	R	-	Uint16	1	8194	Internal memory card status (see SDCARD_STATUS_EXT register)
OPERATION_PROGRESS	R	-	Uint16	1	8195	Reserved
ANALYZER_STATUS	R	-	Uint16	1	8196	Reserved
	-	-	-	1	8197-8447	Reserved
SETTINGS_UNLOCK	R/W	-	8x Uint16	8	8448	To unlock settings for writing and modification the GUI PIN should be written to SETTINGS_UNLOCK registers. All of 4 to 8 Uint16 registers should be written with GUI PIN characters with one Modbus write command. For example, if digit one of GUI PIN is '1' then register 8448 should be written with a value 0x0031 (ASCII '1' character). Note: In case of Modbus TCP it is required to write all 8 registers even when the PIN has fewer characters. Write 0x0000 value to the unused registers. If all registers are written correctly then the settings of the analyzer will unlock, allowing for modification of all configuration registers. After all the configuration registers are written, then user has to write to SETTINGS_RELOAD register to activate new settings. Read operation of register 8448 returns write lock status: 0 – write lock active 1 – write lock inactive
SETTINGS_RELOAD	W	-	Uint16	1	8456	This register should be written with a value of 0x0001 to activate and reload modified settings. The settings will lock again after writing this register. See the SETTINGS_UNLOCK register description. Writes of other values than 0x0001 will be rejected.

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RECORDING_CONTROL	W	-	Uint16	1	8457	Recording control register. 0 – writing 0 when recording is in progress will stop the recording. 1 – writing 1 when recording is stopped will start recording.
SDCARD_FORMAT_EXT	W		Uint16	1	8458	Format of external memory card. 1 – writing 1 when recording is stopped will format the external memory card.
SDCARD_FORMAT_INT	W		Uint16	1	8459	Format of internal memory card. 1 – writing 1 when recording is stopped will format the internal memory card.
	-	-	-	1	8460-65535	Reserved

3.2 Measurements configuration registers

Tab. 10. Measurements configuration registers

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
NOMINAL_VOLTAGE	R/W	V	Float	2	2000	Mains nominal voltage
NOMINAL_CURRENT_CH1	R/W	A	Float	2	2002	Nominal current for channel I1
NOMINAL_CURRENT_CH2	R/W	A	Float	2	2004	Nominal current for channel I2
NOMINAL_CURRENT_CH3	R/W	A	Float	2	2006	Nominal current for channel I3
NOMINAL_CURRENT_CH4	R/W	A	Float	2	2008	Nominal current for channel I4
NOMINAL_CURRENT_CH5	R/W	A	Float	2	2010	Nominal current for channel I5
NOMINAL_FREQUENCY	R/W	-	Uint16	1	2012	Nominal frequency: 0 – 50 Hz 1 – 60 Hz
SYSTEM_TYPE	R/W	-	Uint16	1	2013	Mains system type: 0 – Single phase 1 – Split-phase 2 – Three phase 4-wire 3 – Three phase 3-wire 4 – Three phase 3-wire Aron
CURRENT_PROBE_CH1	R/W	-	Uint16	1	2014	Current input type for channel I1: 0 – no probes (channel disabled) 11 – direct CT 5A
CURRENT_PROBE_CH2	R/W	-	Uint16	1	2015	Current input type for channel I2: 0 – no probes (channel disabled) 11 – direct CT 5A
CURRENT_PROBE_CH3	R/W	-	Uint16	1	2016	Current input type for channel I3: 0 – no probes (channel disabled) 11 – direct CT 5A
CURRENT_PROBE_CH4	R/W	-	Uint16	1	2017	Current input type for channel I4: 0 – no probes (channel disabled) 11 – direct CT 5A
CURRENT_PROBE_CH5	R/W	-	Uint16	1	2018	Current input type for channel I5: 0 – no probes (channel disabled) 11 – direct CT 5A
	-	-	-	1	2019	Reserved
VOLTAGE_TRANSDUCER_RATIO	R/W	-	Float	2	2020	Voltage channels transducers ratio. If greater than zero takes precedence over VOLTAGE_TRANSDUCER_PRIMARY and VOLTAGE_TRANS-DUCER_SECONDARY
VOLTAGE_CH1_TRANSDUCER_RATIO	R/W	-	Float	2	2022	Reserved
VOLTAGE_CH2_TRANSDUCER_RATIO	R/W	-	Float	2	2024	Reserved
VOLTAGE_CH3_TRANSDUCER_RATIO	R/W	-	Float	2	2026	Reserved

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
VOLTAGE_CH4_TRANSDUCER_RATIO	R/W	-	Float	2	2028	Reserved
VOLTAGE_CH5_TRANSDUCER_RATIO	R/W	-	Float	2	2030	Reserved
VOLTAGE_TRANSDUCER_PRIMARY	R/W	V	Float	2	2032	Voltage transducer primary side voltage. Together with VOLTAGE_TRANSDUCER_SECONDARY creates voltage transducer ratio. Valid only if VOLTAGE_TRANSDUCER_RATIO is zero.
VOLTAGE_CH1_TRANSDUCER_PRIMARY	R/W	V	Float	2	2034	Reserved
VOLTAGE_CH2_TRANSDUCER_PRIMARY	R/W	V	Float	2	2036	Reserved
VOLTAGE_CH3_TRANSDUCER_PRIMARY	R/W	V	Float	2	2038	Reserved
VOLTAGE_CH4_TRANSDUCER_PRIMARY	R/W	V	Float	2	2040	Reserved
VOLTAGE_CH5_TRANSDUCER_PRIMARY	R/W	V	Float	2	2042	Reserved
VOLTAGE_TRANSDUCER_SECONDARY	R/W	V	Float	2	2044	Voltage transducer secondary side voltage. Together with VOLTAGE_TRANSDUCER_PRIMARY creates voltage transducer ratio. Valid only if VOLTAGE_TRANSDUCER_RATIO is zero.
VOLTAGE_CH1_TRANSDUCER_SECONDARY	R/W	V	Float	2	2046	Reserved
VOLTAGE_CH2_TRANSDUCER_SECONDARY	R/W	V	Float	2	2048	Reserved
VOLTAGE_CH3_TRANSDUCER_SECONDARY	R/W	V	Float	2	2050	Reserved
VOLTAGE_CH4_TRANSDUCER_SECONDARY	R/W	V	Float	2	2052	Reserved
VOLTAGE_CH5_TRANSDUCER_SECONDARY	R/W	V	Float	2	2054	Reserved
CURRENT_TRANSDUCER_RATIO	R/W	-	Float	2	2056	Current transducer ratio for all channels.
CURRENT_CH1_TRANSDUCER_RATIO	R/W	-	Float	2	2058	Current transducer ratio for channel I1. Valid only if CURRENT_TRANSDUCER_RATIO is zero.
CURRENT_CH2_TRANSDUCER_RATIO	R/W	-	Float	2	2060	Current transducer ratio for channel I2. Valid only if CURRENT_TRANSDUCER_RATIO is zero.
CURRENT_CH3_TRANSDUCER_RATIO	R/W	-	Float	2	2062	Current transducer ratio for channel I3. Valid only if CURRENT_TRANSDUCER_RATIO is zero.
CURRENT_CH4_TRANSDUCER_RATIO	R/W	-	Float	2	2064	Current transducer ratio for channel I4. Valid only if CURRENT_TRANSDUCER_RATIO is zero.
CURRENT_CH5_TRANSDUCER_RATIO	R/W	-	Float	2	2066	Current transducer ratio for channel I5. Valid only if CURRENT_TRANSDUCER_RATIO is zero.
CURRENT_TRANSDUCER_PRIMARY	R/W	A	Float	2	2068	Current transducer primary side current. If this field and CURRENT_TRANSDUCER_SECONDARY is greater than zero it makes current transducer ratio for all channels and takes precedence over CURRENT_TRANSDUCER_RATIO.
CURRENT_CH1_TRANSDUCER_PRIMARY	R/W	-	Float	2	2070	Reserved
CURRENT_CH2_TRANSDUCER_PRIMARY	R/W	-	Float	2	2072	Reserved
CURRENT_CH3_TRANSDUCER_PRIMARY	R/W	-	Float	2	2074	Reserved
CURRENT_CH4_TRANSDUCER_PRIMARY	R/W	-	Float	2	2076	Reserved
CURRENT_CH5_TRANSDUCER_PRIMARY	R/W	-	Float	2	2078	Reserved

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
CURRENT_TRANSDUCER_SECONDARY	R/W	A	Float	2	2080	Current transducer secondary side current. If this field and CURRENT_TRANSDUCER_PRIMARY is greater than zero it makes current transducer ratio for all channels and takes precedence over CURRENT_TRANSDUCER_RATIO.
CURRENT_CH1_TRANSDUCER_SECONDARY	R/W	-	Float	2	2082	Reserved
CURRENT_CH2_TRANSDUCER_SECONDARY	R/W	-	Float	2	2084	Reserved
CURRENT_CH3_TRANSDUCER_SECONDARY	R/W	-	Float	2	2086	Reserved
CURRENT_CH4_TRANSDUCER_SECONDARY	R/W	-	Float	2	2088	Reserved
CURRENT_CH5_TRANSDUCER_SECONDARY	R/W	-	Float	2	2090	Reserved
USER_DATA_REC_ENABLE	R/W	-	Uint16	1	2092	User data recording: 0 – disabled 1 – enabled
STD_DATA_REC_ENABLE	R/W	-	Uint16	1	2093	Normative data recording: 0 – disabled 1 – enabled
USER_WAVEFORMS_AND_RMS12_REC_ENABLE	R/W	-	Uint16	1	2094	Recording of waveforms and RMS1/2 plots for user data: 0 – disabled 1 – enabled
STD_WAVEFORMS_AND_RMS12_REC_ENABLE	R/W	-	Uint16	1	2095	Recording of waveforms and RMS1/2 plots for normative data: 0 – disabled 1 – enabled
AGGREGATION_PERIOD_USER	R/W	-	Uint16	1	2096	Aggregation period for user recording: 3 – 200 ms 4 – 1 s 5 – 3 s 6 – 5 s 7 – 10 s 8 – 15 s 9 – 30 s 10 – 1 min. 11 – 3 min. 12 – 5 min. 13 – 10 min. 14 – 15 min. 15 – 30 min.
ENERGY_PERIOD	R/W	-	Uint16	1	2097	Aggregation period for energy counters recording: 13 – 10 min. 14 – 15 min. 15 – 30 min. 16 – 60 min.
VOLTAGE_MIN_MAX_AVERAGING_PERIOD	R/W	-	Uint16	1	2098	Reserved
CURRENT_MIN_MAX_AVERAGING_PERIOD	R/W	-	Uint16	1	2099	Reserved
EVENTS_HYSTERESIS	R/W	%	Float	2	2100	Event detection hysteresis, 0.1…10

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RECORDING_START_MODE	R/W	-	Uint16	1	2102	Reserved
				1	2103	Reserved
SCHEDULE_DATETIME_START_1	R/W	-	Uint32	2	2104	Reserved
SCHEDULE_DATETIME_STOP_1	R/W	-	Uint32	2	2106	Reserved
SCHEDULE_DATETIME_START_2	R/W	-	Uint32	2	2108	Reserved
SCHEDULE_DATETIME_STOP_2	R/W	-	Uint32	2	2110	Reserved
SCHEDULE_DATETIME_START_3	R/W	-	Uint32	2	2112	Reserved
SCHEDULE_DATETIME_STOP_3	R/W	-	Uint32	2	2114	Reserved
SCHEDULE_DATETIME_START_4	R/W	-	Uint32	2	2116	Reserved
SCHEDULE_DATETIME_STOP_4	R/W	-	Uint32	2	2118	Reserved
WAVEFORM_REC_DURATION_1	R/W	ms	Float	2	2120	Waveform recording duration, 100…60000
WAVEFORM_PRETRIGGER_DURATION_1	R/W	ms	Float	2	2122	Waveform pretrigger duration, 40…1000
WAVEFORM_FORMAT_1	R/W	-	Uint16	1	2124	Waveform recording format: 0 – 8-bit resolution, 10 kHz sampling
	-	-	-	1	2125	Reserved
WAVEFORM_CHANNELS_BITMAP_1	R/W	-	Uint32	2	2126	Reserved
WAVEFORM_REC_DURATION_2	R/W	ms	Float	2	2128	Reserved
WAVEFORM_PRETRIGGER_DURATION_2	R/W	ms	Float	2	2130	Reserved
WAVEFORM_FORMAT_2	R/W	-	Uint16	1	2132	Reserved
	-	-	-	1	2133	Reserved
WAVEFORM_CHANNELS_BITMAP_2	R/W	-	Uint32	2	2134	Reserved
WAVEFORM_REC_DURATION_3	R/W	ms	Float	2	2136	Reserved
WAVEFORM_PRETRIGGER_DURATION_3	R/W	ms	Float	2	2138	Reserved
WAVEFORM_FORMAT_3	R/W	-	Uint16	1	2140	Reserved
	-	-	-	1	2141	Reserved
WAVEFORM_CHANNELS_BITMAP_3	R/W	-	Uint32	2	2142	Reserved
WAVEFORM_REC_DURATION_3	R/W	ms	Float	2	2144	Reserved
WAVEFORM_PRETRIGGER_DURATION_4	R/W	ms	Float	2	2146	Reserved
WAVEFORM_FORMAT_4	R/W	-	Uint16	1	2148	Reserved
	-	-	-	1	2149	Reserved
WAVEFORM_CHANNELS_BITMAP_4	R/W	-	Uint32	2	2150	Reserved
WAVEFORM_REC_DURATION_5	R/W	ms	Float	2	2152	Reserved
WAVEFORM_PRETRIGGER_DURATION_3	R/W	ms	Float	2	2154	Reserved
WAVEFORM_FORMAT_5	R/W	-	Uint16	1	2156	Reserved
	-	-	-	1	2157	Reserved
WAVEFORM_CHANNELS_BITMAP_5	R/W	-	Uint32	2	2158	Reserved
WAVEFORM_REC_DURATION_6	R/W	ms	Float	2	2160	Reserved

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
WAVEFORM_PRETRIGGER_DURATION_6	R/W	ms	Float	2	2162	Reserved
WAVEFORM_FORMAT_6	R/W	-	Uint16	1	2164	Reserved
	-	-	-	1	2165	Reserved
WAVEFORM_CHANNELS_BITMAP_6	R/W	-	Uint32	2	2166	Reserved
WAVEFORM_REC_DURATION_7	R/W	ms	Float	2	2168	Reserved
WAVEFORM_PRETRIGGER_DURATION_7	R/W	ms	Float	2	2170	Reserved
WAVEFORM_FORMAT_7	R/W	-	Uint16	1	2172	Reserved
	-	-	-	1	2173	Reserved
WAVEFORM_CHANNELS_BITMAP_7	R/W	-	Uint32	2	2174	Reserved
WAVEFORM_REC_DURATION_8	R/W	ms	Float	2	2176	Reserved
WAVEFORM_PRETRIGGER_DURATION_8	R/W	ms	Float	2	2178	Reserved
WAVEFORM_FORMAT_8	R/W	-	Uint16	1	2180	Reserved
	-	-	-	1	2181	Reserved
WAVEFORM_CHANNELS_BITMAP_8	R/W	-	Uint32	2	2182	Reserved
RMS12_REC_TIME_1	R/W	ms	Float	2	2184	RMS1/2 recording duration, 1000…60000
RMS12_PRETRIGGER_TIME_1	R/W	ms	Float	2	2186	RMS1/2 pretrigger duration, 100…5000
RMS12_CHANNELS_BITMAP_1	R/W	-	Uint32	2	2188	Reserved
RMS12_REC_TIME_2	R/W	ms	Float	2	2190	Reserved
RMS12_PRETRIGGER_TIME_2	R/W	ms	Float	2	2192	Reserved
RMS12_CHANNELS_BITMAP_2	R/W	-	Uint32	2	2194	Reserved
RMS12_REC_TIME_3	R/W	ms	Float	2	2196	Reserved
RMS12_PRETRIGGER_TIME_3	R/W	ms	Float	2	2198	Reserved
RMS12_CHANNELS_BITMAP_3	R/W	-	Uint32	2	2200	Reserved
RMS12_REC_TIME_4	R/W	ms	Float	2	2202	Reserved
RMS12_PRETRIGGER_TIME_4	R/W	ms	Float	2	2204	Reserved
RMS12_CHANNELS_BITMAP_4	R/W	-	Uint32	2	2206	Reserved
RMS12_REC_TIME_5	R/W	ms	Float	2	2208	Reserved
RMS12_PRETRIGGER_TIME_5	R/W	ms	Float	2	2210	Reserved
RMS12_CHANNELS_BITMAP_5	R/W	-	Uint32	2	2212	Reserved
RMS12_REC_TIME_6	R/W	ms	Float	2	2214	Reserved
RMS12_PRETRIGGER_TIME_6	R/W	ms	Float	2	2216	Reserved
RMS12_CHANNELS_BITMAP_6	R/W	-	Uint32	2	2218	Reserved
RMS12_REC_TIME_7	R/W	ms	Float	2	2220	Reserved
RMS12_PRETRIGGER_TIME_7	R/W	ms	Float	2	2222	Reserved
RMS12_CHANNELS_BITMAP_7	R/W	-	Uint32	2	2224	Reserved
RMS12_REC_TIME_8	R/W	ms	Float	2	2226	Reserved
RMS12_PRETRIGGER_TIME_8	R/W	ms	Float	2	2228	Reserved

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
RMS12_CHANNELS_BITMAP_8	R/W	-	Uint32	2	2230	Reserved
USER_AGGREGATION_WAVEFORM_DEFINITION	R/W	-	Uint16	1	2232	Reserved
STD_AGGREGATION_WAVEFORM_DEFINITION	R/W	-	Uint16	1	2233	Reserved
USER_AGGREGATION_WAVEFORM_ENABLE	R/W	-	Uint16	1	2234	Recording of waveform snapshot at the end of user recording aggregation period: 0 – disabled 1 - enabled
STD_AGGREGATION_WAVEFORM_ENABLE	R/W	-	Uint16	1	2235	Recording of waveform snapshot at the end of normative recording aggregation period: 0 – disabled 1 - enabled
STD_TYPE	R/W	-	Uint16	1	2236	Standard (norm) selection: 0 – EN 50160 Low Voltage 1 – EN 50160 Medium Voltage 2 – EN 50160 High Voltage 3 – EN 50160 Extra High Voltage
THD_HARMONICS_NUM	R/W	-	Uint16	1	2237	Harmonics max. order for calculating THD, 40…256
POWER_CALCULATION_METHOD	R/W	-	Uint16	1	2238	Reactive power calculation method selection: 0 – IEEE 1459 1 - Budeanu
PHASE_ROTATION_SEQUENCE	R/W	-	Uint16	1	2239	Phase rotation selection: 0 – L1→L2→L3 1 – L1→L3→L2
UNPE_CHANNEL_ENABLE	R/W	-	Uint16	1	2240	Measurement of voltage channel U_{NE}: 0 – disabled 1 - enabled
CURRENT_CH4_ENABLE	R/W	-	Uint16	1	2241	Measurement of current channel I_4: 0 – disabled 1 - enabled
CURRENT_CH4_CALCULATED	R/W	-	Uint16	1	2242	Reserved
CURRENT_CH5_ENABLE	R/W	-	Uint16	1	2243	Measurement of current channel I_5: 0 – disabled 1 - enabled
CURRENT_CH5_CALCULATED	R/W	-	Uint16	1	2244	Reserved
CURRENT_ZEROING_ENABLE	R/W	-	Uint16	1	2245	Reserved
CURRENT_ZEROING_THRESHOLD	R/W	%	Float	2	2246	Reserved
CURRENT_CH1_INVERT_ENABLE	R/W	-	Uint16	1	2248	Reserved
CURRENT_CH2_INVERT_ENABLE	R/W	-	Uint16	1	2249	Reserved
CURRENT_CH3_INVERT_ENABLE	R/W	-	Uint16	1	2250	Reserved
CURRENT_CH4_INVERT_ENABLE	R/W	-	Uint16	1	2251	Reserved
CURRENT_CH5_INVERT_ENABLE	R/W	-	Uint16	1	2252	Reserved
FLICKER_LAMP	R/W	-	Uint16	1	2253	Reserved

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
HARMONICS_PROCESS_NUM	R/W	-	Uint16	1	2254	Max. order of processed harmonics, 50…256
INTERHARMONICS_PROCESS_NUM	R/W	-	Uint16	1	2255	Max. order of processed interharmonics, 50…256
VOLTAGE_HARMONICS_REC_NUM	R/W	-	Uint16	1	2256	Max. order of recorded voltage harmonics in files, 50…256
CURRENT_HARMONICS_REC_NUM	R/W	-	Uint16	1	2257	Max. order of recorded current harmonics in files, 50…256
VOLTAGE_INTERHARMONICS_REC_NUM	R/W	-	Uint16	1	2258	Max. order of recorded voltage interharmonics in files, 50…256
CURRENT_INTERHARMONICS_REC_NUM	R/W	-	Uint16	1	2259	Max. order of recorded current interharmonics in files, 50…256
HARMONICS_ANGLES_UI_REC_NUM	R/W	-	Uint16	1	2260	Max. order of recorded voltage-current harmonics angles in files, 50…256
	-	-	-	1	2261	Reserved
PLL_OK_SIGNAL_LEVEL_THRESHOLD	R/W	V	Float	2	2262	Reserved
FACTORK_E_COEFFICIENT	R/W	-	Float	2	2264	e coefficient value for Factor K calculation, 0.01…1
FACTORK_Q_COEFFICIENT	R/W	-	Float	2	2266	q coefficient value for Factor K calculation, 1…2
USER_DATA_MEMORY_MODEL	R/W	-	Uint16	1	2268	Memory data recording model for user data space: 0 – linear 1 - circular
STD_DATA_MEMORY_MODEL	R/W	-	Uint16	1	2269	Memory data recording model for normative data space: 0 – linear 1 - circular
ENERGY_DATA_MEMORY_MODEL	R/W	-	Uint16	1	2270	Memory data recording model for energy counters data space: 0 – linear 1 - circular
USER_DATA_HISTORY	R/W	days	Uint16	1	2271	Reserved
STD_DATA_HISTORY	R/W	days	Uint16	1	2272	Reserved
ENERGY_DATA_HISTORY	R/W	days	Uint16	1	2273	Reserved
	-	-	-	1	2274	Reserved
	-	-	-	1	2275	Reserved
CURRENT_CH1_FUND_ANGLE_EXT	R/W	degree	Float	2	2276	Additional correction fundamental phase angle for current channel I1, -20…20
CURRENT_CH2_FUND_ANGLE_EXT	R/W	degree	Float	2	2278	Additional correction fundamental phase angle for current channel I2, -20…20
CURRENT_CH3_FUND_ANGLE_EXT	R/W	degree	Float	2	2280	Additional correction fundamental phase angle for current channel I3, -20…20
CURRENT_CH4_FUND_ANGLE_EXT	R/W	degree	Float	2	2282	Additional correction fundamental phase angle for current channel I4, -20…20
CURRENT_CH5_FUND_ANGLE_EXT	R/W	degree	Float	2	2284	Additional correction fundamental phase angle for current channel I5, -20…20

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
VOLTAGE_RMS_REC_OPT	R/W	-	Uint32	2	2286	Recording options for voltage rms (bitfield): bit 0: average value recording enabled if set bit 1: minimum value recording enabled if set bit 2: maximum value recording enabled if set bit 3: instantaneous value recording enabled if set bit 4: event thresholds given in percent if set, otherwise in parameter's unit bit 5: event detection enabled if set bit 6: waveform recording enabled for events if set bit 7: $RMS_{1/2}$ recording enabled for events if set bits 8-10: reserved, must be set to 0 bits 11-13: reserved, must be set to 0 bits 14-31: reserved
VOLTAGE_RMS_EVENT_THRESHOLD_USER_DIP	R/W	V/%	Float	2	2288	Dip threshold for user voltage rms recording
VOLTAGE_RMS_EVENT_THRESHOLD_USER_SWELL	R/W	V/%	Float	2	2290	Swell threshold for user voltage rms recording
VOLTAGE_RMS_EVENT_THRESHOLD_USER_INTERRUPTION	R/W	V/%	Float	2	2292	Interruption threshold for user voltage rms recording
VOLTAGE_RMS_EVENT_THRESHOLD_MAX_CH4	R/W	V/%	Float	2	2294	Event threshold for U_{NE} channel
VOLTAGE_RMS_EVENT_THRESHOLD_MAX_CH5	R/W	V/%	Float	2	2296	Reserved
CURRENT_RMS_REC_OPT	R/W	-	Uint32	2	2298	Recording options for current rms (bitfield), see VOLTAGE_RMS_REC_OPT
CURRENT_RMS_EVENT_THRESHOLD_MIN	R/W	A/%	Float	2	2300	Event threshold for $I_1/I_2/I_3$ < min
CURRENT_RMS_EVENT_THRESHOLD_MAX	R/W	A/%	Float	2	2302	Event threshold for $I_1/I_2/I_3$ > max
CURRENT_RMS_EVENT_THRESHOLD_MIN_CH4	R/W	A/%	Float	2	2304	Event threshold for I_4 < min
CURRENT_RMS_EVENT_THRESHOLD_MAX_CH4	R/W	A/%	Float	2	2306	Event threshold for I_4 > max
CURRENT_RMS_EVENT_THRESHOLD_MIN_CH5	R/W	A/%	Float	2	2308	Event threshold for I_5 < min
CURRENT_RMS_EVENT_THRESHOLD_MAX_CH5	R/W	A/%	Float	2	2310	Event threshold for I_5 > max
CURRENT_RMS_EVENT_THRESHOLD_MIN_NS	R/W	A/%	Float	2	2312	Reserved
CURRENT_RMS_EVENT_THRESHOLD_MAX_NS	R/W	A/%	Float	2	2314	Reserved
CURRENT_RMS_EVENT_THRESHOLD_MIN_DNS	R/W	A/%	Float	2	2316	Reserved
CURRENT_RMS_EVENT_THRESHOLD_MAX_DNS	R/W	A/%	Float	2	2318	Reserved
VOLTAGE_CREST_FACTOR_REC_OPT	R/W	-	Uint32	2	2320	Recording options for voltage CF (bitfield), see VOLTAGE_RMS_REC_OPT
VOLTAGE_CREST_FACTOR_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2322	Reserved
VOLTAGE_CREST_FACTOR_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2324	Reserved
CURRENT_CREST_FACTOR_REC_OPT	R/W	-	Uint32	2	2326	Recording options for current CF (bitfield), see VOLTAGE_RMS_REC_OPT
CURRENT_CREST_FACTOR_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2328	Reserved
CURRENT_CREST_FACTOR_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2330	Reserved
FREQUENCY_REC_OPT	R/W	-	Uint32	2	2332	Recording options for frequency (bitfield), see VOLTAGE_RMS_REC_OPT
FREQUENCY_EVENT_THRESHOLD_MIN	R/W	Hz/%	Float	2	2334	Event threshold for f < min
FREQUENCY_EVENT_THRESHOLD_MAX	R/W	Hz/%	Float	2	2336	Event threshold for f > max
ACTIVE_POWER_REC_OPT	R/W	-	Uint32	2	2338	Recording options for active power P (bitfield), see VOLTAGE_RMS_REC_OPT

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
ACTIVE_POWER_EVENT_THRESHOLD_MIN	R/W	W	Float	2	2340	Reserved
ACTIVE_POWER_EVENT_THRESHOLD_MAX	R/W	W	Float	2	2342	Event threshold for P > max
ACTIVE_POWER_PLUS_REC_OPT	R/W	-	Uint32	2	2344	Recording options for active power P+ (bitfield), see VOLTAGE_RMS_REC_OPT
ACTIVE_POWER_PLUS_EVENT_THRESHOLD_MIN	R/W	W	Float	2	2346	Reserved
ACTIVE_POWER_PLUS_EVENT_THRESHOLD_MAX	R/W	W	Float	2	2348	Event threshold for P+ > max
ACTIVE_POWER_MINUS_REC_OPT	R/W	-	Uint32	2	2350	Recording options for active power P- (bitfield), see VOLTAGE_RMS_REC_OPT
ACTIVE_POWER_MINUS_EVENT_THRESHOLD_MIN	R/W	W	Float	2	2352	Reserved
ACTIVE_POWER_MINUS_EVENT_THRESHOLD_MAX	R/W	W	Float	2	2354	Event threshold for P- > max
ACTIVE_POWER_FUNDAMENTAL_REC_OPT	R/W	-	Uint32	2	2356	Recording options for fundamental active power P1 (bitfield), see VOLTAGE_RMS_REC_OPT
ACTIVE_POWER_FUNDAMENTAL_EVENT_THRESHOLD_MIN	R/W	W	Float	2	2358	Reserved
ACTIVE_POWER_FUNDAMENTAL_EVENT_THRESHOLD_MAX	R/W	W	Float	2	2360	Reserved
REACTIVE_POWER_REC_OPT	R/W	-	Uint32	2	2362	Recording options for reactive power Q (bitfield), see VOLTAGE_RMS_REC_OPT
REACTIVE_POWER_EVENT_THRESHOLD_MIN	R/W	Var	Float	2	2364	Reserved
REACTIVE_POWER_EVENT_THRESHOLD_MAX	R/W	Var	Float	2	2366	Event threshold for Q > max
REACTIVE_POWER_FUNDAMENTAL_REC_OPT	R/W	-	Uint32	2	2368	Recording options for reactive power Q1 (bitfield), see VOLTAGE_RMS_REC_OPT
REACTIVE_POWER_FUNDAMENTAL_EVENT_THRESHOLD_MIN	R/W	Var	Float	2	2370	Reserved
REACTIVE_POWER_FUNDAMENTAL_EVENT_THRESHOLD_MAX	R/W	Var	Float	2	2372	Reserved
REACTIVE_POWER_BUDEANU_REC_OPT	R/W	-	Uint32	2	2374	Reserved
REACTIVE_POWER_BUDEANU_EVENT_THRESHOLD_MIN	R/W	Var	Float	2	2376	Reserved
REACTIVE_POWER_BUDEANU_EVENT_THRESHOLD_MAX	R/W	Var	Float	2	2378	Reserved
APPARENT_POWER_REC_OPT	R/W	-	Uint32	2	2380	Recording options for apparent power S (bitfield), see VOLTAGE_RMS_REC_OPT
APPARENT_POWER_EVENT_THRESHOLD_MIN	R/W	VA	Float	2	2382	Reserved
APPARENT_POWER_EVENT_THRESHOLD_MAX	R/W	VA	Float	2	2384	Event threshold for S > max
APPARENT_POWER_FUNDAMENTAL_REC_OPT	R/W	-	Uint32	2	2386	Recording options for apparent fundamental power S1 (bitfield), see VOLTAGE_RMS_REC_OPT
APPARENT_POWER_FUNDAMENTAL_EVENT_THRESHOLD_MIN	R/W	VA	Float	2	2388	Reserved
APPARENT_POWER_FUNDAMENTAL_EVENT_THRESHOLD_MAX	R/W	VA	Float	2	2390	Reserved
APPARENT_POWER_NONFUNDAMENTAL_REC_OPT	R/W	-	Uint32	2	2392	Recording options for apparent nonfundamental power S_N (bitfield), see VOLTAGE_RMS_REC_OPT
APPARENT_POWER_NONFUNDAMENTAL_EVENT_THRESHOLD_MIN	R/W	VA	Float	2	2394	Reserved
APPARENT_POWER_NONFUNDAMENTAL_EVENT_THRESHOLD_MAX	R/W	VA	Float	2	2396	Reserved

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
DISTORTION_POWER_BUDEANU_REC_OPT	R/W	-	Uint32	2	2398	Recording options for distortion power D (bitfield), see VOLTAGE_RMS_REC_OPT
DISTORTION_POWER_BUDEANU_EVENT_THRESHOLD_MIN	R/W	VA	Float	2	2400	Reserved
DISTORTION_POWER_BUDEANU_EVENT_THRESHOLD_MAX	R/W	VA	Float	2	2402	Reserved
DISPLACEMENT_POWER_FACTOR_REC_OPT	R/W	-	Uint32	2	2404	Recording options for displacement power factor DPF (bitfield), see VOLTAGE_RMS_REC_OPT
DISPLACEMENT_POWER_FACTOR_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2406	Reserved
DISPLACEMENT_POWER_FACTOR_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2408	Event threshold for DPF > max
DISPLACEMENT_POWER_FACTOR_4Q_REC_OPT	R/W	-	Uint32	2	2410	Reserved
DISPLACEMENT_POWER_FACTOR_QUADRANT1_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2412	Reserved
DISPLACEMENT_POWER_FACTOR_QUADRANT1_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2414	Reserved
DISPLACEMENT_POWER_FACTOR_QUADRANT2_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2416	Reserved
DISPLACEMENT_POWER_FACTOR_QUADRANT2_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2418	Reserved
DISPLACEMENT_POWER_FACTOR_QUADRANT3_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2420	Reserved
DISPLACEMENT_POWER_FACTOR_QUADRANT3_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2422	Reserved
DISPLACEMENT_POWER_FACTOR_QUADRANT4_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2424	Reserved
DISPLACEMENT_POWER_FACTOR_QUADRANT4_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2426	Reserved
POWER_FACTOR_REC_OPT	R/W	-	Uint32	2	2428	Recording options for power factor PF (bitfield), see VOLTAGE_RMS_REC_OPT
POWER_FACTOR_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2430	Reserved
POWER_FACTOR_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2432	Event threshold for PF > max
POWER_FACTOR_FUNDAMENTAL_REC_OPT	R/W	-	Uint32	2	2434	Reserved
POWER_FACTOR_FUNDAMENTAL_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2436	Reserved
POWER_FACTOR_FUNDAMENTAL_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2438	Reserved
POWER_FACTOR_4Q_REC_OPT	R/W	-	Uint32	2	2440	Reserved
POWER_FACTOR_QUADRANT1_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2442	Reserved
POWER_FACTOR_QUADRANT1_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2444	Reserved
POWER_FACTOR_QUADRANT2_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2446	Reserved
POWER_FACTOR_QUADRANT2_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2448	Reserved
POWER_FACTOR_QUADRANT3_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2450	Reserved
POWER_FACTOR_QUADRANT3_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2452	Reserved
POWER_FACTOR_QUADRANT4_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2454	Reserved

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
POWER_FACTOR_QUADRANT4_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2456	Reserved
POWER_FACTOR_FUNDAMENTAL_4Q_REC_OPT	R/W	-	Uint32	2	2458	Reserved
POWER_FACTOR_FUNDAMENTAL_QUADRANT1_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2460	Reserved
POWER_FACTOR_FUNDAMENTAL_QUADRANT1_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2462	Reserved
POWER_FACTOR_FUNDAMENTAL_QUADRANT2_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2464	Reserved
POWER_FACTOR_FUNDAMENTAL_QUADRANT2_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2466	Reserved
POWER_FACTOR_FUNDAMENTAL_QUADRANT3_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2468	Reserved
POWER_FACTOR_FUNDAMENTAL_QUADRANT3_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2470	Reserved
POWER_FACTOR_FUNDAMENTAL_QUADRANT4_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2472	Reserved
POWER_FACTOR_FUNDAMENTAL_QUADRANT4_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2474	Reserved
TANGENT_4Q_REC_OPT	R/W	-	Uint32	2	2476	Recording options for 4-quadrant tanφ (bitfield), see VOLTAGE_RMS_REC_OPT
TANGENT_QUADRANT1_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2478	Reserved
TANGENT_QUADRANT1_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2480	Event threshold for tanφ Q1 > max
TANGENT_QUADRANT2_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2482	Reserved
TANGENT_QUADRANT2_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2484	Event threshold for tanφ Q2 > max
TANGENT_QUADRANT3_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2486	Reserved
TANGENT_QUADRANT3_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2488	Event threshold for tanφ Q3 > max
TANGENT_QUADRANT4_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2490	Reserved
TANGENT_QUADRANT4_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2492	Event threshold for tanφ Q4 > max
ACTIVE_ENERGY_REC_OPT	R/W	-	Uint32	2	2494	Recording options for active energy (bitfield), see VOLTAGE_RMS_REC_OPT
ACTIVE_ENERGY_PLUS_EVENT_THRESHOLD_MAX	R/W	Wh	Float	2	2496	Event threshold for EP+ > max
ACTIVE_ENERGY_MINUS_EVENT_THRESHOLD_MAX	R/W	Wh	Float	2	2498	Event threshold for EP- > max
REACTIVE_ENERGY_4Q_REC_OPT	R/W	-	Uint32	2	2500	Recording options for 4-quadrant reactive energy (bitfield), see VOLTAGE_RMS_REC_OPT
REACTIVE_ENERGY_QUADRANT1_EVENT_THRESHOLD_MAX	R/W	Varh	Float	2	2502	Event threshold for E_Q Q1 > max
REACTIVE_ENERGY_QUADRANT2_EVENT_THRESHOLD_MAX	R/W	Varh	Float	2	2504	Event threshold for E_Q Q2 > max
REACTIVE_ENERGY_QUADRANT3_EVENT_THRESHOLD_MAX	R/W	Varh	Float	2	2506	Event threshold for E_Q Q3 > max
REACTIVE_ENERGY_QUADRANT4_EVENT_THRESHOLD_MAX	R/W	Varh	Float	2	2508	Event threshold for E_Q Q4 > max
REACTIVE_ENERGY_BUDEANU_4Q_REC_OPT	R/W	-	Uint32	2	2510	Reserved
REACTIVE_ENERGY_BUDEANU_QUADRANT1_EVENT_THRESHOLD_MAX	R/W	Varh	Float	2	2512	Reserved

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
REACTIVE_ENERGY_BUDEANU_QUADRANT2_EVENT_THRESH-OLD_MAX	R/W	Varh	Float	2	2514	Reserved
REACTIVE_ENERGY_BUDEANU_QUADRANT3_EVENT_THRESH-OLD_MAX	R/W	Varh	Float	2	2516	Reserved
REACTIVE_ENERGY_BUDEANU_QUADRANT4_EVENT_THRESH-OLD_MAX	R/W	Varh	Float	2	2518	Reserved
APPARENT_ENERGY_REC_OPT	R/W	-	Uint32	2	2520	Recording options for apparent energy (bitfield), see VOLT-AGE_RMS_REC_OPT
APPARENT_ENERGY_EVENT_THRESHOLD_MAX	R/W	VAh	Float	2	2522	Event threshold for ES > max
VOLTAGE_HARMONICS_REC_OPT	R/W	-	Uint32	2	2524	Recording options for voltage harmonics (bitfield), see VOLT-AGE_RMS_REC_OPT
VOLTAGE_HARMONICS_EVENT_1_THRESHOLD_MAX	R/W	V/%	Float	2	2526	Reserved
VOLTAGE_HARMONICS_EVENT_1_ORDER	R/W	-	Uint16	1	2528	Reserved
	-	-	-	1	2529	Reserved
VOLTAGE_HARMONICS_EVENT_2_THRESHOLD_MAX	R/W	V/%	Float	2	2530	Reserved
VOLTAGE_HARMONICS_EVENT_2_ORDER	R/W	-	Uint16	1	2532	Reserved
	-	-	-	1	2533	Reserved
VOLTAGE_HARMONICS_EVENT_3_THRESHOLD_MAX	R/W	V/%	Float	2	2534	Reserved
VOLTAGE_HARMONICS_EVENT_3_ORDER	R/W	-	Uint16	1	2536	Reserved
	-	-	-	1	2537	Reserved
VOLTAGE_HARMONICS_EVENT_4_THRESHOLD_MAX	R/W	V/%	Float	2	2538	Reserved
VOLTAGE_HARMONICS_EVENT_4_ORDER	R/W	-	Uint16	1	2540	Reserved
	-	-	-	1	2541	Reserved
VOLTAGE_HARMONICS_EVENT_5_THRESHOLD_MAX	R/W	V/%	Float	2	2542	Reserved
VOLTAGE_HARMONICS_EVENT_5_ORDER	R/W	-	Uint16	1	2544	Reserved
	-	-	-	1	2545	Reserved
VOLTAGE_HARMONICS_EVENT_6_THRESHOLD_MAX	R/W	V/%	Float	2	2546	Reserved
VOLTAGE_HARMONICS_EVENT_6_ORDER	R/W	-	Uint16	1	2548	Reserved
	-	-	-	1	2549	Reserved
VOLTAGE_HARMONICS_EVENT_7_THRESHOLD_MAX	R/W	V/%	Float	2	2550	Reserved
VOLTAGE_HARMONICS_EVENT_7_ORDER	R/W	-	Uint16	1	2552	Reserved
	-	-	-	1	2553	Reserved
VOLTAGE_HARMONICS_EVENT_8_THRESHOLD_MAX	R/W	V/%	Float	2	2554	Reserved
VOLTAGE_HARMONICS_EVENT_8_ORDER	R/W	-	Uint16	1	2556	Reserved
	-	-	-	1	2557	Reserved
VOLTAGE_HARMONICS_EVENT_9_THRESHOLD_MAX	R/W	V/%	Float	2	2558	Reserved
VOLTAGE_HARMONICS_EVENT_9_ORDER	R/W	-	Uint16	1	2560	Reserved
	-	-	-	1	2561	Reserved

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
VOLTAGE_HARMONICS_EVENT_10_THRESHOLD_MAX	R/W	V/%	Float	2	2562	Reserved
VOLTAGE_HARMONICS_EVENT_10_ORDER	R/W	-	Uint16	1	2564	Reserved
	-	-	-	1	2565	Reserved
CURRENT_HARMONICS_REC_OPT	R/W	-	Uint32	2	2566	Recording options for current harmonics (bitfield), see VOLTAGE_RMS_REC_OPT
CURRENT_HARMONICS_EVENT_1_THRESHOLD_MAX	R/W	A/%	Float	2	2568	Reserved
CURRENT_HARMONICS_EVENT_1_ORDER	R/W	-	Uint16	1	2570	Reserved
	-	-	-	1	2571	Reserved
CURRENT_HARMONICS_EVENT_2_THRESHOLD_MAX	R/W	A/%	Float	2	2572	Reserved
CURRENT_HARMONICS_EVENT_2_ORDER	R/W	-	Uint16	1	2574	Reserved
	-	-	-	1	2575	Reserved
CURRENT_HARMONICS_EVENT_3_THRESHOLD_MAX	R/W	A/%	Float	2	2576	Reserved
CURRENT_HARMONICS_EVENT_3_ORDER	R/W	-	Uint16	1	2578	Reserved
	-	-	-	1	2579	Reserved
CURRENT_HARMONICS_EVENT_4_THRESHOLD_MAX	R/W	A/%	Float	2	2580	Reserved
CURRENT_HARMONICS_EVENT_4_ORDER	R/W	-	Uint16	1	2582	Reserved
	-	-	-	1	2583	Reserved
CURRENT_HARMONICS_EVENT_5_THRESHOLD_MAX	R/W	A/%	Float	2	2584	Reserved
CURRENT_HARMONICS_EVENT_5_ORDER	R/W	-	Uint16	1	2586	Reserved
	-	-	-	1	2587	Reserved
CURRENT_HARMONICS_EVENT_6_THRESHOLD_MAX	R/W	A/%	Float	2	2588	Reserved
CURRENT_HARMONICS_EVENT_6_ORDER	R/W	-	Uint16	1	2590	Reserved
	-	-	-	1	2591	Reserved
CURRENT_HARMONICS_EVENT_7_THRESHOLD_MAX	R/W	A/%	Float	2	2592	Reserved
CURRENT_HARMONICS_EVENT_7_ORDER	R/W	-	Uint16	1	2594	Reserved
	-	-	-	1	2595	Reserved
CURRENT_HARMONICS_EVENT_8_THRESHOLD_MAX	R/W	A/%	Float	2	2596	Reserved
CURRENT_HARMONICS_EVENT_8_ORDER	R/W	-	Uint16	1	2598	Reserved
	-	-	-	1	2599	Reserved
CURRENT_HARMONICS_EVENT_9_THRESHOLD_MAX	R/W	A/%	Float	2	2600	Reserved
CURRENT_HARMONICS_EVENT_9_ORDER	R/W	-	Uint16	1	2602	Reserved
	-	-	-	1	2603	Reserved
CURRENT_HARMONICS_EVENT_10_THRESHOLD_MAX	R/W	A/%	Float	2	2604	Reserved
CURRENT_HARMONICS_EVENT_10_ORDER	R/W	-	Uint16	1	2606	Reserved
	-	-	-	1	2607	Reserved
VOLTAGE_HARMONICS_ANGLES_REC_OPT	R/W	-	Uint32	2	2608	Recording options for voltage harmonics absolute angles (bitfield), see VOLTAGE_RMS_REC_OPT

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
CURRENT_HARMONICS_ANGLES_REC_OPT	R/W	-	Uint32	2	2610	Recording options for current harmonics absolute angles (bitfield), see VOLTAGE_RMS_REC_OPT
HARMONICS_ANGLES_UI_REC_OPT	R/W	-	Uint32	2	2612	Recording options for voltage-current harmonics angles (bitfield), see VOLTAGE_RMS_REC_OPT
ACTIVE_POWER_HARMONICS_REC_OPT	R/W	-	Uint32	2	2614	Recording options for active power harmonics (bitfield), see VOLTAGE_RMS_REC_OPT
REACTIVE_POWER_HARMONICS_REC_OPT	R/W	-	Uint32	2	2616	Recording options for reactive power harmonics (bitfield), see VOLTAGE_RMS_REC_OPT
VOLTAGE_DC_REC_OPT	R/W	-	Uint32	2	2618	Recording options for DC voltage (bitfield), see VOLTAGE_RMS_REC_OPT
VOLTAGE_DC_EVENT_THRESHOLD_MIN	R/W	V	Float	2	2620	Reserved
VOLTAGE_DC_EVENT_THRESHOLD_MAX	R/W	V	Float	2	2622	Reserved
VOLTAGE_DC_P2P_EVENT_THRESHOLD_MIN	R/W	V	Float	2	2624	Reserved
VOLTAGE_DC_P2P_EVENT_THRESHOLD_MAX	R/W	V	Float	2	2626	Reserved
CURRENT_DC_REC_OPT	R/W	-	Uint32	2	2628	Reserved
CURRENT_DC_EVENT_THRESHOLD_MIN	R/W	A	Float	2	2630	Reserved
CURRENT_DC_EVENT_THRESHOLD_MAX	R/W	A	Float	2	2632	Reserved
VOLTAGE_THDF_REC_OPT	R/W	-	Uint32	2	2634	Recording options for voltage THD-F (bitfield), see VOLTAGE_RMS_REC_OPT
VOLTAGE_THDF_THRESHOLD_MAX	R/W	%	Float	2	2636	Event threshold for voltage THD-F > max
VOLTAGE_THDR_REC_OPT	R/W	-	Uint32	2	2638	Recording options for voltage THD-R (bitfield), see VOLTAGE_RMS_REC_OPT
VOLTAGE_THDR_THRESHOLD_MAX	R/W	%	Float	2	2640	Reserved
VOLTAGE_THD0_REC_OPT	R/W	-	Uint32	2	2642	Reserved
VOLTAGE_THD0_THRESHOLD_MAX	R/W	%	Float	2	2644	Reserved
VOLTAGE_THD1_REC_OPT	R/W	-	Uint32	2	2646	Reserved
VOLTAGE_THD1_THRESHOLD_MAX	R/W	%	Float	2	2648	Reserved
VOLTAGE_THD2_REC_OPT	R/W	-	Uint32	2	2650	Reserved
VOLTAGE_THD2_THRESHOLD_MAX	R/W	%	Float	2	2652	Reserved
CURRENT_THDF_REC_OPT	R/W	-	Uint32	2	2654	Recording options for current THD-F (bitfield), see VOLTAGE_RMS_REC_OPT
CURRENT_THDF_THRESHOLD_MAX	R/W	%	Float	2	2656	Event threshold for current THD-F > max
CURRENT_THDR_REC_OPT	R/W	-	Uint32	2	2658	Recording options for current THD-R (bitfield), see VOLTAGE_RMS_REC_OPT
CURRENT_THDR_THRESHOLD_MAX	R/W	%	Float	2	2660	Reserved
CURRENT_THD0_REC_OPT	R/W	-	Uint32	2	2662	Reserved
CURRENT_THD0_THRESHOLD_MAX	R/W	%	Float	2	2664	Reserved
CURRENT_THD1_REC_OPT	R/W	-	Uint32	2	2666	Reserved
CURRENT_THD1_THRESHOLD_MAX	R/W	%	Float	2	2668	Reserved
CURRENT_THD2_REC_OPT	R/W	-	Uint32	2	2670	Reserved

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
CURRENT_THD2_THRESHOLD_MAX	R/W	%	Float	2	2672	Reserved
KFACTOR_REC_OPT	R/W	-	Uint32	2	2674	Recording options for K-Factor (bitfield), see VOLTAGE_RMS_REC_OPT
KFACTOR_THRESHOLD_MAX	R/W	-	Float	2	2676	Reserved
FACTORK_REC_OPT	R/W	-	Uint32	2	2678	Recording options for Factor K (bitfield), see VOLTAGE_RMS_REC_OPT
FACTORK_THRESHOLD_MAX	R/W	-	Float	2	2680	Reserved
VOLTAGE_UNBALANCE_REC_OPT	R/W	-	Uint32	2	2682	Recording options for voltage unbalance (bitfield), see VOLTAGE_RMS_REC_OPT
VOLTAGE_UNBALANCE_THRESHOLD_MAX	R/W	%	Float	2	2684	Event threshold for voltage unbalance u2 > max
CURRENT_UNBALANCE_REC_OPT	R/W	-	Uint32	2	2686	Recording options for current unbalance (bitfield), see VOLTAGE_RMS_REC_OPT
CURRENT_UNBALANCE_THRESHOLD_MAX	R/W	%	Float	2	2688	Reserved
FLICKER_PST_REC_OPT	R/W	-	Uint32	2	2690	Recording options for flicker P_{ST} (bitfield), see VOLTAGE_RMS_REC_OPT
FLICKER_PST_THRESHOLD_MAX	R/W	-	Float	2	2692	Event threshold for voltage P_{ST} > max
FLICKER_PLT_REC_OPT	R/W	-	Uint32	2	2694	Recording options for flicker P_{LT} (bitfield), see VOLTAGE_RMS_REC_OPT
FLICKER_PLT_THRESHOLD_MAX	R/W	-	Float	2	2696	Event threshold for voltage P_{LT} > max
VOLTAGE_INTERHARMONICS_REC_OPT	R/W	-	Uint32	2	2698	Recording options for voltage interharmonics (bitfield), see VOLTAGE_RMS_REC_OPT
VOLTAGE_INTERHARMONICS_EVENT_1_THRESHOLD_MAX	R/W	V	Float	2	2700	Reserved
VOLTAGE_INTERHARMONICS_EVENT_1_ORDER	R/W	-	Uint16	1	2702	Reserved
	-	-	-	1	2703	Reserved
VOLTAGE_INTERHARMONICS_EVENT_2_THRESHOLD_MAX	R/W	V	Float	2	2704	Reserved
VOLTAGE_INTERHARMONICS_EVENT_2_ORDER	R/W	-	Uint16	1	2706	Reserved
	-	-	-	1	2707	Reserved
VOLTAGE_INTERHARMONICS_EVENT_3_THRESHOLD_MAX	R/W	V	Float	2	2708	Reserved
VOLTAGE_INTERHARMONICS_EVENT_3_ORDER	R/W	-	Uint16	1	2710	Reserved
	-	-	-	1	2711	Reserved
VOLTAGE_INTERHARMONICS_EVENT_4_THRESHOLD_MAX	R/W	V	Float	2	2712	Reserved
VOLTAGE_INTERHARMONICS_EVENT_4_ORDER	R/W	-	Uint16	1	2714	Reserved
	-	-	-	1	2715	Reserved
VOLTAGE_INTERHARMONICS_EVENT_5_THRESHOLD_MAX	R/W	V	Float	2	2716	Reserved
VOLTAGE_INTERHARMONICS_EVENT_5_ORDER	R/W	-	Uint16	1	2718	Reserved
	-	-	-	1	2719	Reserved
VOLTAGE_INTERHARMONICS_EVENT_6_THRESHOLD_MAX	R/W	V	Float	2	2720	Reserved
VOLTAGE_INTERHARMONICS_EVENT_6_ORDER	R/W	-	Uint16	1	2722	Reserved
	-	-	-	1	2723	Reserved
VOLTAGE_INTERHARMONICS_EVENT_7_THRESHOLD_MAX	R/W	V	Float	2	2724	Reserved
VOLTAGE_INTERHARMONICS_EVENT_7_ORDER	R/W	-	Uint16	1	2726	Reserved
	-	-	-	1	2727	Reserved

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
VOLTAGE_INTERHARMONICS_EVENT_8_THRESHOLD_MAX	R/W	V	Float	2	2728	Reserved
VOLTAGE_INTERHARMONICS_EVENT_8_ORDER	R/W	-	Uint16	1	2730	Reserved
	-	-	-	1	2731	Reserved
VOLTAGE_INTERHARMONICS_EVENT_9_THRESHOLD_MAX	R/W	V	Float	2	2732	Reserved
VOLTAGE_INTERHARMONICS_EVENT_9_ORDER	R/W	-	Uint16	1	2734	Reserved
	-	-	-	1	2735	Reserved
VOLTAGE_INTERHARMONICS_EVENT_10_THRESHOLD_MAX	R/W	V	Float	2	2736	Reserved
VOLTAGE_INTERHARMONICS_EVENT_10_ORDER	R/W	-	Uint16	1	2738	Reserved
	-	-	-	1	2739	Reserved
CURRENT_INTERHARMONICS_REC_OPT	R/W	-	Uint32	2	2740	Recording options for current interharmonics (bitfield), see VOLTAGE_RMS_REC_OPT
CURRENT_INTERHARMONICS_EVENT_1_THRESHOLD_MAX	R/W	A	Float	2	2742	Reserved
CURRENT_INTERHARMONICS_EVENT_1_ORDER	R/W	-	Uint16	1	2744	Reserved
	-	-	-	1	2745	Reserved
CURRENT_INTERHARMONICS_EVENT_2_THRESHOLD_MAX	R/W	A	Float	2	2746	Reserved
CURRENT_INTERHARMONICS_EVENT_2_ORDER	R/W	-	Uint16	1	2748	Reserved
	-	-	-	1	2749	Reserved
CURRENT_INTERHARMONICS_EVENT_3_THRESHOLD_MAX	R/W	A	Float	2	2750	Reserved
CURRENT_INTERHARMONICS_EVENT_3_ORDER	R/W	-	Uint16	1	2752	Reserved
	-	-	-	1	2753	Reserved
CURRENT_INTERHARMONICS_EVENT_4_THRESHOLD_MAX	R/W	A	Float	2	2754	Reserved
CURRENT_INTERHARMONICS_EVENT_4_ORDER	R/W	-	Uint16	1	2756	Reserved
	-	-	-	1	2757	Reserved
CURRENT_INTERHARMONICS_EVENT_5_THRESHOLD_MAX	R/W	A	Float	2	2758	Reserved
CURRENT_INTERHARMONICS_EVENT_5_ORDER	R/W	-	Uint16	1	2760	Reserved
	-	-	-	1	2761	Reserved
CURRENT_INTERHARMONICS_EVENT_6_THRESHOLD_MAX	R/W	A	Float	2	2762	Reserved
CURRENT_INTERHARMONICS_EVENT_6_ORDER	R/W	-	Uint16	1	2764	Reserved
	-	-	-	1	2765	Reserved
CURRENT_INTERHARMONICS_EVENT_7_THRESHOLD_MAX	R/W	A	Float	2	2766	Reserved
CURRENT_INTERHARMONICS_EVENT_7_ORDER	R/W	-	Uint16	1	2768	Reserved
	-	-	-	1	2769	Reserved
CURRENT_INTERHARMONICS_EVENT_8_THRESHOLD_MAX	R/W	A	Float	2	2770	Reserved
CURRENT_INTERHARMONICS_EVENT_8_ORDER	R/W	-	Uint16	1	2772	Reserved
	-	-	-	1	2773	Reserved
CURRENT_INTERHARMONICS_EVENT_9_THRESHOLD_MAX	R/W	A	Float	2	2774	Reserved
CURRENT_INTERHARMONICS_EVENT_9_ORDER	R/W	-	Uint16	1	2776	Reserved

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
	-	-	-	1	2777	Reserved
CURRENT_INTERHARMONICS_EVENT_10_THRESHOLD_MAX	R/W	A	Float	2	2778	Reserved
CURRENT_INTERHARMONICS_EVENT_10_ORDER	R/W	-	Uint16	1	2780	Reserved
	-	-	-	1	2781	Reserved
VOLTAGE_TIDF_REC_OPT	R/W	-	Uint32	2	2782	Recording options for voltage TID-F (bitfield), see VOLTAGE_RMS_REC_OPT
VOLTAGE_TIDF_THRESHOLD_MAX	R/W	%	Float	2	2784	Reserved
VOLTAGE_TIDR_REC_OPT	R/W	-	Uint32	2	2786	Recording options for voltage TID-R (bitfield), see VOLTAGE_RMS_REC_OPT
VOLTAGE_TIDR_THRESHOLD_MAX	R/W	%	Float	2	2788	Reserved
CURRENT_TIDF_REC_OPT	R/W	-	Uint32	2	2790	Recording options for current TID-F (bitfield), see VOLTAGE_RMS_REC_OPT
CURRENT_TIDF_THRESHOLD_MAX	R/W	%	Float	2	2792	Reserved
CURRENT_TIDR_REC_OPT	R/W	-	Uint32	2	2794	Recording options for current TID-R (bitfield), see VOLTAGE_RMS_REC_OPT
CURRENT_TIDR_THRESHOLD_MAX	R/W	%	Float	2	2796	Reserved
MAINS_SIGNALLING_UR1_REC_OPT	R/W	-	Uint32	2	2798	Recording options for mains signalling U_{R1} (bitfield), see VOLTAGE_RMS_REC_OPT
MAINS_SIGNALLING_UR1_FREQUENCY	R/W	Hz	Float	2	2800	Mains signalling U_{R1} frequency, 5…30000
MAINS_SIGNALLING_UR1_THRESHOLD_MAX	R/W	V/%	Float	2	2802	Reserved
MAINS_SIGNALLING_UR1_REC_DURATION	R/W	S	Uint16	1	2804	Reserved
	-	-	-	1	2805	Reserved
MAINS_SIGNALLING_UR2_REC_OPT	R/W	-	Uint32	2	2806	Recording options for mains signalling U_{R2} (bitfield), see VOLTAGE_RMS_REC_OPT
MAINS_SIGNALLING_UR2_FREQUENCY	R/W	Hz	Float	2	2808	Mains signalling U_{R2} frequency, 5…30000
MAINS_SIGNALLING_UR2_THRESHOLD_MAX	R/W	V/%	Float	2	2810	Reserved
MAINS_SIGNALLING_UR2_REC_DURATION	R/W	s	Uint16	1	2812	Reserved
	-	-	-	1	2813	Reserved
TRANSIENTS_REC_OPT	R/W	-	Uint32	2	2814	Recording options for transients (bitfield), see VOLTAGE_RMS_REC_OPT
TRANSIENTS_THRESHOLD	R/W	V	Float	2	2816	Event threshold for transients
TRANSIENTS_SAMPLING_FREQUENCY	R/W	-	Uint16	1	2818	Transients sampling frequency: 0 – 10 MHz 1 – 5 MHz 2 – 1 MHz 3 – 500 kHz 4 – 100 kHz
TRANSIENTS_REFERENCE_CHANNEL	R/W	-	Uint16	1	2819	Transients measurement reference channel: 0 – Neutral (U_{1N}, U_{2N}, U_{3N}, U_{NE}) 1 – Ground (U_{1E}, U_{2E}, U_{3E}, U_{NE})

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
TRANSIENTS_METHOD	R/W	-	Uint16	1	2820	Transients measurement detection method: 0 – transient amplitude 1 – dV/dT 2 – absolute voltage
TRANSIENTS_REC_DURATION	R/W	-	Uint16	1	2821	Transient event plot recording in samples, 2000…20000
TRANSIENTS_PRETRIGGER_DURATION	R/W	-	Uint16	1	2822	Transient event plot pretrigger in samples, 200…18000
	-	-	-	1	2823	Reserved
RVC_REC_OPT	R/W	-	Uint32	2	2824	Recording options for RVC, see VOLTAGE_RMS_REC_OPT
RVC_HYSTERESIS	R/W	V/%	Float	2	2826	RVC event hysteresis
RVC_THRESHOLD	R/W	V/%	Float	2	2828	RVC event threshold
WAVESHAPE_VARIATIONS_REC_OPT	R/W	-	Uint32	2	2830	Recording options for waveshape variations, see VOLT-AGE_RMS_REC_OPT
WAVESHAPE_VARIATIONS_THRESHOLD	R/W	V/%	Float	2	2832	Waveshape variation event threshold
WAVESHAPE_VARIATIONS_DEADTIME	R/W	s	Uint16	1	2834	Waveshape variation event dead time, 0…100
	-	-	-	1	2835	Reserved
PHASE_JUMPS_REC_OPT	R/W	-	Uint32	2	2836	Recording options for phase jumps, see VOLTAGE_RMS_REC_OPT
PHASE_JUMPS_THRESHOLD	R/W	degree	Float	2	2838	Event threshold for phase jumps
TDD_REC_OPT	R/W	-	Uint32	2	2840	Recording options for TDD, see VOLTAGE_RMS_REC_OPT
TDD_IL	R/W	A	Float	2	2842	I_L value for TDD calculation
TDD_THRESHOLD	R/W	%	Float	2	2844	Event threshold for TDD
PHASOR_REC_OPT	R/W	-	Uint32	2	2846	Recording options for phasor, see VOLTAGE_RMS_REC_OPT
DIGITAL_INPUT_INTERNAL1_REC_OPT	R/W	-	Uint32	2	2848	Recording options for digital input 1, see VOLTAGE_RMS_REC_OPT
DIGITAL_INPUT_INTERNAL1_ACTIVE_STATE	R/W	-	Uint16	1	2850	Active state for digital input 1: 0 – low 1 – high
	-	-	-	1	2851	Reserved
DIGITAL_INPUT_INTERNAL2_REC_OPT	R/W	-	Uint32	2	2852	Recording options for digital input 2, see VOLTAGE_RMS_REC_OPT
DIGITAL_INPUT_INTERNAL2_ACTIVE_STATE	R/W	-	Uint16	1	2854	Active state for digital input 2: 0 – low 1 – high
	-	-	-	1	2855	Reserved
DIGITAL_INPUT_EXTERNAL1_REC_OPT	R/W	-	Uint32	2	2856	Reserved
DIGITAL_INPUT_EXTERNAL1_ACTIVE_STATE	R/W	-	Uint16	1	2858	Reserved
	-	-	-	1	2859	Reserved
DIGITAL_INPUT_EXTERNAL2_REC_OPT	R/W	-	Uint32	2	2860	Reserved
DIGITAL_INPUT_EXTERNAL2_ACTIVE_STATE	R/W	-	Uint16	1	2862	Reserved
	-	-	-	1	2863	Reserved
DIGITAL_INPUT_EXTERNAL3_REC_OPT	R/W	-	Uint32	2	2864	Reserved
DIGITAL_INPUT_EXTERNAL3_ACTIVE_STATE	R/W	-	Uint16	1	2866	Reserved

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
	-	-	-	1	2867	Reserved
DIGITAL_INPUT_EXTERNAL4_REC_OPT	R/W	-	Uint32	2	2868	Reserved
DIGITAL_INPUT_EXTERNAL4_ACTIVE_STATE	R/W	-	Uint16	1	2870	Reserved
	-	-	-	1	2871	Reserved
DIGITAL_INPUT_EXTERNAL5_REC_OPT	R/W	-	Uint32	2	2872	Reserved
DIGITAL_INPUT_EXTERNAL5_ACTIVE_STATE	R/W	-	Uint16	1	2874	Reserved
	-	-	-	1	2875	Reserved
DIGITAL_INPUT_EXTERNAL6_REC_OPT	R/W	-	Uint32	2	2876	Reserved
DIGITAL_INPUT_EXTERNAL6_ACTIVE_STATE	R/W	-	Uint16	1	2878	Reserved
	-	-	-	1	2879	Reserved
DIGITAL_INPUT_EXTERNAL7_REC_OPT	R/W	-	Uint32	2	2880	Reserved
DIGITAL_INPUT_EXTERNAL7_ACTIVE_STATE	R/W	-	Uint16	1	2882	Reserved
	-	-	-	1	2883	Reserved
DIGITAL_INPUT_EXTERNAL8_REC_OPT	R/W	-	Uint32	2	2884	Reserved
DIGITAL_INPUT_EXTERNAL8_ACTIVE_STATE	R/W	-	Uint16	1	2886	Reserved
	-	-	-	1	2887	Reserved
ANALOG_INPUT1_REC_OPT	R/W	-	Uint32	2	2888	Reserved
ANALOG_INPUT1_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2890	Reserved
ANALOG_INPUT1_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2892	Reserved
ANALOG_INPUT2_REC_OPT	R/W	-	Uint32	2	2894	Reserved
ANALOG_INPUT2_EVENT_THRESHOLD_MIN	R/W	-	Float	2	2896	Reserved
ANALOG_INPUT2_EVENT_THRESHOLD_MAX	R/W	-	Float	2	2898	Reserved
TEMPERATURE_1WIRE_CH1_REC_OPT	R/W	-	Uint32	2	2900	Recording options for 1-wire temperature T1, see VOLTAGE_RMS_REC_OPT
TEMPERATURE_1WIRE_CH1_EVENT_THRESHOLD_MIN	R/W	°C	Float	2	2902	Event threshold for T1<min
TEMPERATURE_1WIRE_CH1_EVENT_THRESHOLD_MAX	R/W	°C	Float	2	2904	Event threshold for T1>max
TEMPERATURE_1WIRE_CH2_REC_OPT	R/W	-	Uint32	2	2906	Recording options for 1-wire temperature T2, see VOLTAGE_RMS_REC_OPT
TEMPERATURE_1WIRE_CH2_EVENT_THRESHOLD_MIN	R/W	°C	Float	2	2908	Event threshold for T2<min
TEMPERATURE_1WIRE_CH2_EVENT_THRESHOLD_MAX	R/W	°C	Float	2	2910	Event threshold for T2>max
TEMPERATURE_1WIRE_CH3_REC_OPT	R/W	-	Uint32	2	2912	Recording options for 1-wire temperature T3, see VOLTAGE_RMS_REC_OPT
TEMPERATURE_1WIRE_CH3_EVENT_THRESHOLD_MIN	R/W	°C	Float	2	2914	Event threshold for T3<min
TEMPERATURE_1WIRE_CH3_EVENT_THRESHOLD_MAX	R/W	°C	Float	2	2916	Event threshold for T3>max
TEMPERATURE_1WIRE_CH4_REC_OPT	R/W	-	Uint32	2	2918	Recording options for 1-wire temperature T4, see VOLTAGE_RMS_REC_OPT
TEMPERATURE_1WIRE_CH4_EVENT_THRESHOLD_MIN	R/W	°C	Float	2	2920	Event threshold for T4<min
TEMPERATURE_1WIRE_CH4_EVENT_THRESHOLD_MAX	R/W	°C	Float	2	2922	Event threshold for T4>max

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
TEMPERATURE_INTERNAL_CH1_REC_OPT	R/W	-	Uint32	2	2924	Reserved
TEMPERATURE_INTERNAL_CH1_EVENT_THRESHOLD_MIN	R/W	°C	Float	2	2926	Reserved
TEMPERATURE_INTERNAL_CH1_EVENT_THRESHOLD_MAX	R/W	°C	Float	2	2928	Reserved
TEMPERATURE_INTERNAL_CH2_REC_OPT	R/W	-	Uint32	2	2930	Reserved
TEMPERATURE_INTERNAL_CH2_EVENT_THRESHOLD_MIN	R/W	°C	Float	2	2932	Reserved
TEMPERATURE_INTERNAL_CH2_EVENT_THRESHOLD_MAX	R/W	°C	Float	2	2934	Reserved
VOLTAGE_2_9K_REC_OPT	R/W	-	Uint32	2	2936	Recording options for emissions in the 2-9 kHz band, see VOLTAGE_RMS_REC_OPT
VOLTAGE_2_9K_EVENT_THRESHOLD_MAX	R/W	V	Float	2	2938	Reserved
VOLTAGE_2_9K_EVENT_1_FREQENCY	R/W	Hz	Float	2	2940	Reserved
VOLTAGE_2_9K_EVENT_1_THRESHOLD_MAX	R/W	V	Float	2	2942	Reserved
VOLTAGE_2_9K_EVENT_2_FREQENCY	R/W	Hz	Float	2	2944	Reserved
VOLTAGE_2_9K_EVENT_2_THRESHOLD_MAX	R/W	V	Float	2	2946	Reserved
VOLTAGE_2_9K_EVENT_3_FREQENCY	R/W	Hz	Float	2	2948	Reserved
VOLTAGE_2_9K_EVENT_3_THRESHOLD_MAX	R/W	V	Float	2	2950	Reserved
VOLTAGE_2_9K_EVENT_4_FREQENCY	R/W	Hz	Float	2	2952	Reserved
VOLTAGE_2_9K_EVENT_4_THRESHOLD_MAX	R/W	V	Float	2	2954	Reserved
VOLTAGE_2_9K_EVENT_5_FREQENCY	R/W	Hz	Float	2	2956	Reserved
VOLTAGE_2_9K_EVENT_5_THRESHOLD_MAX	R/W	V	Float	2	2958	Reserved
VOLTAGE_2_9K_REFERENCE_CHANNEL	R/W	-	Uint16	1	2960	Reserved
	-	-	-	1	2961	Reserved
VOLTAGE_8_150K_REC_OPT	R/W	-	Uint32	2	2962	Recording options for emissions in the 8-150 kHz band, see VOLTAGE_RMS_REC_OPT
VOLTAGE_8_150K_EVENT_THRESHOLD_MAX	R/W	V	Float	2	2964	Reserved
VOLTAGE_8_150K_EVENT_1_FREQENCY	R/W	Hz	Float	2	2966	Reserved
VOLTAGE_8_150K_EVENT_1_THRESHOLD_MAX	R/W	V	Float	2	2968	Reserved
VOLTAGE_8_150K_EVENT_2_FREQENCY	R/W	Hz	Float	2	2970	Reserved
VOLTAGE_8_150K_EVENT_2_THRESHOLD_MAX	R/W	V	Float	2	2972	Reserved
VOLTAGE_8_150K_EVENT_3_FREQENCY	R/W	Hz	Float	2	2974	Reserved
VOLTAGE_8_150K_EVENT_3_THRESHOLD_MAX	R/W	V	Float	2	2976	Reserved
VOLTAGE_8_150K_EVENT_4_FREQENCY	R/W	Hz	Float	2	2978	Reserved
VOLTAGE_8_150K_EVENT_4_THRESHOLD_MAX	R/W	V	Float	2	2980	Reserved
VOLTAGE_8_150K_EVENT_5_FREQENCY	R/W	Hz	Float	2	2982	Reserved
VOLTAGE_8_150K_EVENT_5_THRESHOLD_MAX	R/W	V	Float	2	2984	Reserved
VOLTAGE_8_150K_REFERENCE_CHANNEL	R/W	-	Uint16	1	2986	Reserved
	-	-	-	1	2987	Reserved
VOLTAGE_RMS_STD_REC_OPT	R/W	-	Uint32	2	2988	Recording options for normative events, see VOLTAGE_RMS_REC_OPT. Only bits 4 and 5 are supported.

Parameter	R/W	Units	Type	Modbus register size	Modbus address	Notes
VOLTAGE_RMS_EVENT_THRESHOLD_STD_DIP	R/W	V/%	Float	2	2990	Event threshold for voltage dip, normative recording
VOLTAGE_RMS_EVENT_THRESHOLD_STD_SWELL	R/W	V/%	Float	2	2992	Event threshold for voltage swell, normative recording
VOLTAGE_RMS_EVENT_THRESHOLD_STD_INTERRUPTION	R/W	V/%	Float	2	2994	Event threshold for voltage interruption, normative recording
					2996	Reserved

4 Measurements register maps

Measurements data is accessible via Modbus input registers function code 04. This set of registers are read only. They are placed in a continuous data memory model. Some registers are reserved and are zeroed. Almost all parameters are float data type. Register addresses in this group are in the range from 0 to almost 63 000. They are divided into three subgroups:

- 10/12-cycle (~200 ms) measurement data: registers 0-20999,
- 150/180-cycle (~3 second) aggregation data: registers 21000-41999,
- 10-minute aggregation data: registers 42000-62999.

Modbus register addresses for 10/12-cycles live measurements data are shown in Tab. 11. Most of the parameters names should be self-explanatory. To read 150/180-cycle (3-second) aggregation data measurements values add 21000_{dec} offset to addresses given in Tab. 11. Similarly, to read 10-minute aggregation data add 42000_{dec} offset to addresses given in Tab. 11. All values are updated after the aggregation time period has elapsed. To read specific harmonics / interharmonics / conducted emissions parameters calculate Modbus address using formula from *Notes* column.

4.1 Data measurements registers

Tab. 11. Measurements Modbus registers

Parameter	R/W	Type	Units	Modbus register size	Modbus address	Notes
TIME_SOURCE	R	Uint32	-	2	0	Time source: 0 – RTC 1 – NTP 2 – GPS 3 – IRIG-B
DATETIME	R	Uint32	-	2	2	Date and time of the data set (marks beginning of the interval), bitfield: bits 0…4: day (1-31) bits 5…8: month (1-12) bits 9…14: year (0-63), offset 2000 bits 15…20: second (0-59) bits 21…26: minute (0-59) bits 27…31: hour (0-23)
DAY_TIMESTAMP	R	Uint32	-	2	4	Timestamp of the day, 25 µs resolution, offset 0x10000000 from 00:00:00.
RECORDING_DATETIME_START	R	Uint32	-	2	6	Recording start date and time, bitfield. See DATETIME
RECORDING_DURATION	R	Uint32	s	2	8	Recording duration in seconds
VOLTAGE_RMS_U1E	R	Float	V	2	10	
VOLTAGE_RMS_U2E	R	Float	V	2	12	
VOLTAGE_RMS_U3E	R	Float	V	2	14	
VOLTAGE_RMS_UNE	R	Float	V	2	16	
VOLTAGE_RMS_U1N	R	Float	V	2	18	
VOLTAGE_RMS_U2N	R	Float	V	2	20	
VOLTAGE_RMS_U3N	R	Float	V	2	22	
VOLTAGE_RMS_U12	R	Float	V	2	24	
VOLTAGE_RMS_U23	R	Float	V	2	26	
VOLTAGE_RMS_U31	R	Float	V	2	28	
VOLTAGE_DC_U1E	R	Float	V	2	30	
VOLTAGE_DC_U2E	R	Float	V	2	32	
VOLTAGE_DC_U3E	R	Float	V	2	34	
VOLTAGE_DC_UNE	R	Float	V	2	36	

Parameter	R/W	Type	Units	Modbus register size	Modbus address	Notes
VOLTAGE_DC_U1N	R	Float	V	2	38	
VOLTAGE_DC_U2N	R	Float	V	2	40	
VOLTAGE_DC_U3N	R	Float	V	2	42	
VOLTAGE_DC_U12	R	Float	V	2	44	
VOLTAGE_DC_U23	R	Float	V	2	46	
VOLTAGE_DC_U31	R	Float	V	2	48	
FREQUENCY_200MS	R	Float	Hz	2	50	10/12-cycle frequency
FREQUENCY_10S	R	Float	Hz	2	52	10-second frequency
VOLTAGE_FUNDAMENTAL_RMS_U1E	R	Float	V	2	54	
VOLTAGE_FUNDAMENTAL_RMS_U2E	R	Float	V	2	56	
VOLTAGE_FUNDAMENTAL_RMS_U3E	R	Float	V	2	58	
VOLTAGE_FUNDAMENTAL_RMS_UNE	R	Float	V	2	60	
VOLTAGE_FUNDAMENTAL_RMS_U1N	R	Float	V	2	62	
VOLTAGE_FUNDAMENTAL_RMS_U2N	R	Float	V	2	64	
VOLTAGE_FUNDAMENTAL_RMS_U3N	R	Float	V	2	66	
VOLTAGE_FUNDAMENTAL_RMS_U12	R	Float	V	2	68	
VOLTAGE_FUNDAMENTAL_RMS_U23	R	Float	V	2	70	
VOLTAGE_FUNDAMENTAL_RMS_U31	R	Float	V	2	72	
CURRENT_RMS_I1	R	Float	A	2	74	
CURRENT_RMS_I2	R	Float	A	2	76	
CURRENT_RMS_I3	R	Float	A	2	78	
CURRENT_RMS_IN	R	Float	A	2	80	
CURRENT_RMS_IE	R	Float	A	2	82	
CURRENT_DC_I1	R	Float	A	2	84	
CURRENT_DC_I2	R	Float	A	2	86	
CURRENT_DC_I3	R	Float	A	2	88	
CURRENT_DC_IN	R	Float	A	2	90	
CURRENT_DC_IE	R	Float	A	2	92	
CURRENT_FUNDAMENTAL_RMS_I1	R	Float	A	2	94	
CURRENT_FUNDAMENTAL_RMS_I2	R	Float	A	2	96	
CURRENT_FUNDAMENTAL_RMS_I3	R	Float	A	2	98	
CURRENT_FUNDAMENTAL_RMS_I4	R	Float	A	2	100	
CURRENT_FUNDAMENTAL_RMS_IE	R	Float	A	2	102	
VOLTAGE_FUNDAMENTAL_ANGLE_U1E	R	Float	radians	2	104	
VOLTAGE_FUNDAMENTAL_ANGLE_U2E	R	Float	radians	2	106	
VOLTAGE_FUNDAMENTAL_ANGLE_U3E	R	Float	radians	2	108	
VOLTAGE_FUNDAMENTAL_ANGLE_UNE	R	Float	radians	2	110	
VOLTAGE_FUNDAMENTAL_ANGLE_U1N	R	Float	radians	2	112	
VOLTAGE_FUNDAMENTAL_ANGLE_U2N	R	Float	radians	2	114	
VOLTAGE_FUNDAMENTAL_ANGLE_U3N	R	Float	radians	2	116	
VOLTAGE_FUNDAMENTAL_ANGLE_U12	R	Float	radians	2	118	
VOLTAGE_FUNDAMENTAL_ANGLE_U23	R	Float	radians	2	120	
VOLTAGE_FUNDAMENTAL_ANGLE_U31	R	Float	radians	2	122	
CURRENT_FUNDAMENTAL_ANGLE_I1	R	Float	radians	2	124	
CURRENT_FUNDAMENTAL_ANGLE_I2	R	Float	radians	2	126	
CURRENT_FUNDAMENTAL_ANGLE_I3	R	Float	radians	2	128	
CURRENT_FUNDAMENTAL_ANGLE_IN	R	Float	radians	2	130	
CURRENT_FUNDAMENTAL_ANGLE_IE	R	Float	radians	2	132	
VOLTAGE_THDF_U1E	R	Float	%	2	134	
VOLTAGE_THDF_U2E	R	Float	%	2	136	
VOLTAGE_THDF_U3E	R	Float	%	2	138	
VOLTAGE_THDF_UNE	R	Float	%	2	140	
VOLTAGE_THDF_U1N	R	Float	%	2	142	
VOLTAGE_THDF_U2N	R	Float	%	2	144	
VOLTAGE_THDF_U3N	R	Float	%	2	146	
VOLTAGE_THDF_U12	R	Float	%	2	148	
VOLTAGE_THDF_U23	R	Float	%	2	150	

Parameter	R/W	Type	Units	Modbus register size	Modbus address	Notes
VOLTAGE_THDF_U31	R	Float	%	2	152	
CURRENT_THDF_I1	R	Float	%	2	154	
CURRENT_THDF_I2	R	Float	%	2	156	
CURRENT_THDF_I3	R	Float	%	2	158	
CURRENT_THDF_IN	R	Float	%	2	160	
CURRENT_THDF_IE	R	Float	%	2	162	
VOLTAGE_THDR_U1E	R	Float	%	2	164	
VOLTAGE_THDR_U2E	R	Float	%	2	166	
VOLTAGE_THDR_U3E	R	Float	%	2	168	
VOLTAGE_THDR_UNE	R	Float	%	2	170	
VOLTAGE_THDR_U1N	R	Float	%	2	172	
VOLTAGE_THDR_U2N	R	Float	%	2	174	
VOLTAGE_THDR_U3N	R	Float	%	2	176	
VOLTAGE_THDR_U12	R	Float	%	2	178	
VOLTAGE_THDR_U23	R	Float	%	2	180	
VOLTAGE_THDR_U31	R	Float	%	2	182	
CURRENT_THDR_I1	R	Float	%	2	184	
CURRENT_THDR_I2	R	Float	%	2	186	
CURRENT_THDR_I3	R	Float	%	2	188	
CURRENT_THDR_IN	R	Float	%	2	190	
CURRENT_THDR_IE	R	Float	%	2	192	
VOLTAGE_THDF0_U1E	R	Float	%	2	194	
VOLTAGE_THDF0_U2E	R	Float	%	2	196	
VOLTAGE_THDF0_U3E	R	Float	%	2	198	
VOLTAGE_THDF0_UNE	R	Float	%	2	200	
VOLTAGE_THDF0_U1N	R	Float	%	2	202	
VOLTAGE_THDF0_U2N	R	Float	%	2	204	
VOLTAGE_THDF0_U3N	R	Float	%	2	206	
VOLTAGE_THDF0_U12	R	Float	%	2	208	
VOLTAGE_THDF0_U23	R	Float	%	2	210	
VOLTAGE_THDF0_U31	R	Float	%	2	212	
CURRENT_THDF0_I1	R	Float	%	2	214	
CURRENT_THDF0_I2	R	Float	%	2	216	
CURRENT_THDF0_I3	R	Float	%	2	218	
CURRENT_THDF0_IN	R	Float	%	2	220	
CURRENT_THDF0_IE	R	Float	%	2	222	
VOLTAGE_THDF1_U1E	R	Float	%	2	224	
VOLTAGE_THDF1_U2E	R	Float	%	2	226	
VOLTAGE_THDF1_U3E	R	Float	%	2	228	
VOLTAGE_THDF1_UNE	R	Float	%	2	230	
VOLTAGE_THDF1_U1N	R	Float	%	2	232	
VOLTAGE_THDF1_U2N	R	Float	%	2	234	
VOLTAGE_THDF1_U3N	R	Float	%	2	236	
VOLTAGE_THDF1_U12	R	Float	%	2	238	
VOLTAGE_THDF1_U23	R	Float	%	2	240	
VOLTAGE_THDF1_U31	R	Float	%	2	242	
CURRENT_THDF1_I1	R	Float	%	2	244	
CURRENT_THDF1_I2	R	Float	%	2	246	
CURRENT_THDF1_I3	R	Float	%	2	248	
CURRENT_THDF1_IN	R	Float	%	2	250	
CURRENT_THDF1_IE	R	Float	%	2	252	
VOLTAGE_THDF2_U1E	R	Float	%	2	254	
VOLTAGE_THDF2_U2E	R	Float	%	2	256	
VOLTAGE_THDF2_U3E	R	Float	%	2	258	
VOLTAGE_THDF2_UNE	R	Float	%	2	260	
VOLTAGE_THDF2_U1N	R	Float	%	2	262	
VOLTAGE_THDF2_U2N	R	Float	%	2	264	

Parameter	R/W	Type	Units	Modbus register size	Modbus address	Notes
VOLTAGE_THDF2_U3N	R	Float	%	2	266	
VOLTAGE_THDF2_U12	R	Float	%	2	268	
VOLTAGE_THDF2_U23	R	Float	%	2	270	
VOLTAGE_THDF2_U31	R	Float	%	2	272	
CURRENT_THDF2_I1	R	Float	%	2	274	
CURRENT_THDF2_I2	R	Float	%	2	276	
CURRENT_THDF2_I3	R	Float	%	2	278	
CURRENT_THDF2_IN	R	Float	%	2	280	
CURRENT_THDF2_IE	R	Float	%	2	282	
VOLTAGE_TIDF_U1E	R	Float	%	2	284	
VOLTAGE_TIDF_U2E	R	Float	%	2	286	
VOLTAGE_TIDF_U3E	R	Float	%	2	288	
VOLTAGE_TIDF_UNE	R	Float	%	2	290	
VOLTAGE_TIDF_U1N	R	Float	%	2	292	
VOLTAGE_TIDF_U2N	R	Float	%	2	294	
VOLTAGE_TIDF_U3N	R	Float	%	2	296	
VOLTAGE_TIDF_U12	R	Float	%	2	298	
VOLTAGE_TIDF_U23	R	Float	%	2	300	
VOLTAGE_TIDF_U31	R	Float	%	2	302	
CURRENT_TIDF_I1	R	Float	%	2	304	
CURRENT_TIDF_I2	R	Float	%	2	306	
CURRENT_TIDF_I3	R	Float	%	2	308	
CURRENT_TIDF_IN	R	Float	%	2	310	
CURRENT_TIDF_IE	R	Float	%	2	312	
VOLTAGE_TIDR_U1E	R	Float	%	2	314	
VOLTAGE_TIDR_U2E	R	Float	%	2	316	
VOLTAGE_TIDR_U3E	R	Float	%	2	318	
VOLTAGE_TIDR_UNE	R	Float	%	2	320	
VOLTAGE_TIDR_U1N	R	Float	%	2	322	
VOLTAGE_TIDR_U2N	R	Float	%	2	324	
VOLTAGE_TIDR_U3N	R	Float	%	2	326	
VOLTAGE_TIDR_U12	R	Float	%	2	328	
VOLTAGE_TIDR_U23	R	Float	%	2	330	
VOLTAGE_TIDR_U31	R	Float	%	2	332	
CURRENT_TIDR_I1	R	Float	%	2	334	
CURRENT_TIDR_I2	R	Float	%	2	336	
CURRENT_TIDR_I3	R	Float	%	2	338	
CURRENT_TIDR_IN	R	Float	%	2	340	
CURRENT_TIDR_IE	R	Float	%	2	342	
VOLTAGE_CREST_FACTOR_U1E	R	Float	-	2	344	
VOLTAGE_CREST_FACTOR_U2E	R	Float	-	2	346	
VOLTAGE_CREST_FACTOR_U3E	R	Float	-	2	348	
VOLTAGE_CREST_FACTOR_UNE	R	Float	-	2	350	
VOLTAGE_CREST_FACTOR_U1N	R	Float	-	2	352	
VOLTAGE_CREST_FACTOR_U2N	R	Float	-	2	354	
VOLTAGE_CREST_FACTOR_U3N	R	Float	-	2	356	
VOLTAGE_CREST_FACTOR_U12	R	Float	-	2	358	
VOLTAGE_CREST_FACTOR_U23	R	Float	-	2	360	
VOLTAGE_CREST_FACTOR_U31	R	Float	-	2	362	
CURRENT_CREST_FACTOR_I1	R	Float	-	2	364	
CURRENT_CREST_FACTOR_I2	R	Float	-	2	366	
CURRENT_CREST_FACTOR_I3	R	Float	-	2	368	
CURRENT_CREST_FACTOR_IN	R	Float	-	2	370	
CURRENT_CREST_FACTOR_IE	R	Float	-	2	372	
FLICKER_PINST_U1	R	Float	-	2	374	
FLICKER_PINST_U2	R	Float	-	2	376	
FLICKER_PINST_U3	R	Float	-	2	378	

Parameter	R/W	Type	Units	Modbus register size	Modbus address	Notes
FLICKER_PST_U1	R	Float	-	2	380	
FLICKER_PST_U2	R	Float	-	2	382	
FLICKER_PST_U3	R	Float	-	2	384	
FLICKER_PLT_U1	R	Float	-	2	386	
FLICKER_PLT_U2	R	Float	-	2	388	
FLICKER_PLT_U3	R	Float	-	2	390	
UNBALANCE_VOLTAGE_ZERO_SEQUENCE	R	Float	V	2	392	U0
UNBALANCE_VOLTAGE_POSITIVE_SEQUENCE	R	Float	V	2	394	U1
UNBALANCE_VOLTAGE_NEGATIVE_SEQUENCE	R	Float	V	2	396	U2
UNBALANCE_VOLTAGE_ZERO	R	Float	%	2	398	u0=U0/U1
UNBALANCE_VOLTAGE_NEGATIVE	R	Float	%	2	400	u2=U2/U1
UNBALANCE_CURRENT_ZERO_SEQUENCE	R	Float	A	2	402	I0
UNBALANCE_CURRENT_POSITIVE_SEQUENCE	R	Float	A	2	404	I1
UNBALANCE_CURRENT_NEGATIVE_SEQUENCE	R	Float	A	2	406	I2
UNBALANCE_CURRENT_ZERO	R	Float	%	2	408	i0=I0/I1
UNBALANCE_CURRENT_NEGATIVE	R	Float	%	2	410	i2=I2/I1
POWER_ACTIVE_L1	R	Float	W	2	412	
POWER_ACTIVE_L2	R	Float	W	2	414	
POWER_ACTIVE_L3	R	Float	W	2	416	
POWER_ACTIVE_TOTAL	R	Float	W	2	418	
POWER_ACTIVE_PLUS_L1	R	Float	W	2	420	
POWER_ACTIVE_PLUS_L2	R	Float	W	2	422	
POWER_ACTIVE_PLUS_L3	R	Float	W	2	424	
POWER_ACTIVE_PLUS_TOTAL	R	Float	W	2	426	
POWER_ACTIVE_MINUS_L1	R	Float	W	2	428	
POWER_ACTIVE_MINUS_L2	R	Float	W	2	430	
POWER_ACTIVE_MINUS_L3	R	Float	W	2	432	
POWER_ACTIVE_MINUS_TOTAL	R	Float	W	2	434	
POWER_REACTIVE_L1	R	Float	Var	2	436	
POWER_REACTIVE_L2	R	Float	Var	2	438	
POWER_REACTIVE_L3	R	Float	Var	2	440	
POWER_REACTIVE_TOTAL	R	Float	Var	2	442	
POWER_APPARENT_L1	R	Float	VA	2	444	
POWER_APPARENT_L2	R	Float	VA	2	446	
POWER_APPARENT_L3	R	Float	VA	2	448	
POWER_APPARENT_TOTAL	R	Float	VA	2	450	
DISTORTION_BUDEANU_L1	R	Float	VA	2	452	
DISTORTION_BUDEANU_L2	R	Float	VA	2	454	
DISTORTION_BUDEANU_L3	R	Float	VA	2	456	
DISTORTION_BUDEANU_TOTAL	R	Float	VA	2	458	
POWER_NONFUNDAMENTAL_APPARENT_L1	R	Float	VA	2	460	
POWER_NONFUNDAMENTAL_APPARENT_L2	R	Float	VA	2	462	
POWER_NONFUNDAMENTAL_APPARENT_L3	R	Float	VA	2	464	
POWER_NONFUNDAMENTAL_APPARENT_TOTAL	R	Float	VA	2	466	
DPF_L1	R	Float	-	2	468	
DPF_L2	R	Float	-	2	470	
DPF_L3	R	Float	-	2	472	
DPF_TOTAL	R	Float	-	2	474	
POWER_FACTOR_L1	R	Float	-	2	476	
POWER_FACTOR_L2	R	Float	-	2	478	
POWER_FACTOR_L3	R	Float	-	2	480	
POWER_FACTOR_TOTAL	R	Float	-	2	482	
TANGENT_Q1_L1	R	Float	-	2	484	
TANGENT_Q2_L1	R	Float	-	2	486	
TANGENT_Q3_L1	R	Float	-	2	488	
TANGENT_Q4_L1	R	Float	-	2	490	
TANGENT_Q1_L2	R	Float	-	2	492	

Parameter	R/W	Type	Units	Modbus register size	Modbus address	Notes
TANGENT_Q2_L2	R	Float	-	2	494	
TANGENT_Q3_L2	R	Float	-	2	496	
TANGENT_Q4_L2	R	Float	-	2	498	
TANGENT_Q1_L3	R	Float	-	2	500	
TANGENT_Q2_L3	R	Float	-	2	502	
TANGENT_Q3_L3	R	Float	-	2	504	
TANGENT_Q4_L3	R	Float	-	2	506	
TANGENT_Q1_TOTAL	R	Float	-	2	508	
TANGENT_Q2_TOTAL	R	Float	-	2	510	
TANGENT_Q3_TOTAL	R	Float	-	2	512	
TANGENT_Q4_TOTAL	R	Float	-	2	514	
ENERGY_ACTIVE_PLUS_L1	R	Float	Wh	2	516	
ENERGY_ACTIVE_PLUS_L2	R	Float	Wh	2	518	
ENERGY_ACTIVE_PLUS_L3	R	Float	Wh	2	520	
ENERGY_ACTIVE_PLUS_TOTAL	R	Float	Wh	2	522	
ENERGY_ACTIVE_MINUS_L1	R	Float	Wh	2	524	
ENERGY_ACTIVE_MINUS_L2	R	Float	Wh	2	526	
ENERGY_ACTIVE_MINUS_L3	R	Float	Wh	2	528	
ENERGY_ACTIVE_MINUS_TOTAL	R	Float	Wh	2	530	
ENERGY_REACTIVE_Q1_L1	R	Float	Varh	2	532	
ENERGY_REACTIVE_Q2_L1	R	Float	Varh	2	534	
ENERGY_REACTIVE_Q3_L1	R	Float	Varh	2	536	
ENERGY_REACTIVE_Q4_L1	R	Float	Varh	2	538	
ENERGY_REACTIVE_Q1_L2	R	Float	Varh	2	540	
ENERGY_REACTIVE_Q2_L2	R	Float	Varh	2	542	
ENERGY_REACTIVE_Q3_L2	R	Float	Varh	2	544	
ENERGY_REACTIVE_Q4_L2	R	Float	Varh	2	546	
ENERGY_REACTIVE_Q1_L3	R	Float	Varh	2	548	
ENERGY_REACTIVE_Q2_L3	R	Float	Varh	2	550	
ENERGY_REACTIVE_Q3_L3	R	Float	Varh	2	552	
ENERGY_REACTIVE_Q4_L3	R	Float	Varh	2	554	
ENERGY_REACTIVE_Q1_TOTAL	R	Float	Varh	2	556	
ENERGY_REACTIVE_Q2_TOTAL	R	Float	Varh	2	558	
ENERGY_REACTIVE_Q3_TOTAL	R	Float	Varh	2	560	
ENERGY_REACTIVE_Q4_TOTAL	R	Float	Varh	2	562	
ENERGY_APPARENT_L1	R	Float	VAh	2	564	
ENERGY_APPARENT_L2	R	Float	VAh	2	566	
ENERGY_APPARENT_L3	R	Float	VAh	2	568	
ENERGY_APPARENT_TOTAL	R	Float	VAh	2	570	
KFACTOR_I1	R	Float	-	2	572	
KFACTOR_I2	R	Float	-	2	574	
KFACTOR_I3	R	Float	-	2	576	
KFACTOR_IN	R	Float	-	2	578	
FACTORK_I1	R	Float	-	2	580	
FACTORK_I2	R	Float	-	2	582	
FACTORK_I3	R	Float	-	2	584	
FACTORK_IN	R	Float	-	2	586	
MAINS_SIGNALLING_UR1_U1	R	Float	V	2	588	
MAINS_SIGNALLING_UR2_U1	R	Float	V	2	590	
MAINS_SIGNALLING_UR1_U2	R	Float	V	2	592	
MAINS_SIGNALLING_UR2_U2	R	Float	V	2	594	
MAINS_SIGNALLING_UR1_U3	R	Float	V	2	596	
MAINS_SIGNALLING_UR2_U3	R	Float	V	2	598	
TEMPERATURE_1WIRE_1	R	Float	°C	2	600	
TEMPERATURE_1WIRE_2	R	Float	°C	2	602	
TEMPERATURE_1WIRE_3	R	Float	°C	2	604	
TEMPERATURE_1WIRE_4	R	Float	°C	2	606	

Parameter	R/W	Type	Units	Modbus register size	Modbus address	Notes
TEMPERATURE_CPU	R	Float	°C	2	608	
TEMPERATURE_RTC	R	Float	°C	2	610	
INTERNAL_VOLTAGE_MAIN	R	Float	V	2	612	
INTERNAL_VOLTAGE_POE	R	Float	V	2	614	
INTERNAL_VOLTAGE_BATTERY	R	Float	V	2	616	
INTERNAL_VOLTAGE_COIN	R	Float	V	2	618	
INPUT_DIGITAL_INTERNAL_1	R	Float	-	2	620	
INPUT_DIGITAL_INTERNAL_2	R	Float	-	2	622	
INPUT_DIGITAL_EXTERNAL_1	R	Float	-	2	624	
INPUT_DIGITAL_EXTERNAL_2	R	Float	-	2	626	
INPUT_DIGITAL_EXTERNAL_3	R	Float	-	2	628	
INPUT_DIGITAL_EXTERNAL_4	R	Float	-	2	630	
INPUT_DIGITAL_EXTERNAL_5	R	Float	-	2	632	
INPUT_DIGITAL_EXTERNAL_6	R	Float	-	2	634	
INPUT_DIGITAL_EXTERNAL_7	R	Float	-	2	636	
INPUT_DIGITAL_EXTERNAL_8	R	Float	-	2	638	
HARMONIC_n_U1	R	Float	V	2	640 + n × 2	n = 0…256
HARMONIC_n_U2	R	Float	V	2	1154 + n × 2	n = 0…256
HARMONIC_n_U3	R	Float	V	2	1668 + n × 2	n = 0…256
HARMONIC_n_UNE	R	Float	V	2	2182 + n × 2	n = 0…256
HARMONIC_n_I1	R	Float	A	2	2696 + n × 2	n = 0…256
HARMONIC_n_I2	R	Float	A	2	3210 + n × 2	n = 0…256
HARMONIC_n_I3	R	Float	A	2	3724 + n × 2	n = 0…256
HARMONIC_n_I4	R	Float	A	2	4238 + n × 2	n = 0…256
HARMONIC_ANGLE_n_U1	R	Float	radians	2	4752 + n × 2	n = 0…256
HARMONIC_ANGLE_n_U2	R	Float	radians	2	5266 + n × 2	n = 0…256
HARMONIC_ANGLE_n_U3	R	Float	radians	2	5780 + n × 2	n = 0…256
HARMONIC_ANGLE_n_UNE	R	Float	radians	2	6294 + n × 2	n = 0…256
HARMONIC_ANGLE_n_I1	R	Float	radians	2	6808 + n × 2	n = 0…256
HARMONIC_ANGLE_n_I2	R	Float	radians	2	7322 + n × 2	n = 0…256
HARMONIC_ANGLE_n_I3	R	Float	radians	2	7836 + n × 2	n = 0…256
HARMONIC_ANGLE_n_I4	R	Float	radians	2	8350 + n × 2	n = 0…256
HARMONIC_ANGLE_n_U1_I1	R	Float	radians	2	8864 + n × 2	n = 0…256
HARMONIC_ANGLE_n_U2_I2	R	Float	radians	2	9378 + n × 2	n = 0…256
HARMONIC_ANGLE_n_U3_I3	R	Float	radians	2	9892 + n × 2	n = 0…256
HARMONIC_ANGLE_n_UNE_IN	R	Float	radians	2	10406 + n × 2	n = 0…256
HARMONIC_ACTIVE_POWER_n_U1_I1	R	Float	W	2	10920 + n × 2	n = 0…256
HARMONIC_ACTIVE_POWER_n_U2_I2	R	Float	W	2	11434 + n × 2	n = 0…256
HARMONIC_ACTIVE_POWER_n_U3_I3	R	Float	W	2	11948 + n × 2	n = 0…256
HARMONIC_ACTIVE_POWER_n_UNE_IN	R	Float	W	2	12462 + n × 2	n = 0…256

Parameter	R/W	Type	Units	Modbus register size	Modbus address	Notes
HARMONIC_REACTIVE_POWER_n_U1_I1	R	Float	Var	2	12976 + n × 2	n = 0…256
HARMONIC_REACTIVE_POWER_n_U2_I2	R	Float	Var	2	13490 + n × 2	n = 0…256
HARMONIC_REACTIVE_POWER_n_U3_I3	R	Float	Var	2	14004 + n × 2	n = 0…256
HARMONIC_REACTIVE_POWER_n_UNE_IN	R	Float	Var	2	14518 + n × 2	n = 0…256
INTERHARMONIC_n_U1	R	Float	V	2	15032 + n × 2	n = 0…256
INTERHARMONIC_n_U2	R	Float	V	2	15546 + n × 2	n = 0…256
INTERHARMONIC_n_U3	R	Float	V	2	16060 + n × 2	n = 0…256
INTERHARMONIC_n_UNE	R	Float	V	2	16574 + n × 2	n = 0…256
INTERHARMONIC_n_I1	R	Float	A	2	17088 + n × 2	n = 0…256
INTERHARMONIC_n_I2	R	Float	A	2	17602 + n × 2	n = 0…256
INTERHARMONIC_n_I3	R	Float	A	2	18116 + n × 2	n = 0…256
INTERHARMONIC_n_I4	R	Float	A	2	18630 + n × 2	n = 0…256
LOW_CONDUCTED_EMISSION_2100_HZ_U1	R	Float	V	2	19144	Conducted emission 2-9 kHz, channel U1, bin 2100 Hz
LOW_CONDUCTED_EMISSION_2300_HZ_U1	R	Float	V	2	19146	Conducted emission 2-9 kHz, channel U1, bin 2300 Hz
LOW_CONDUCTED_EMISSION_n_HZ_U1	R	Float	V	2	→	Conducted emission 2-9 kHz, channel U1, bin n Hz Register address: 19144 + ((n - 2100) / 200) × 2
LOW_CONDUCTED_EMISSION_8900_HZ_U1	R	Float	V	2	19212	Conducted emission 2-9 kHz, channel U1, bin 8900 Hz
LOW_CONDUCTED_EMISSION_2100_HZ_U2	R	Float	V	2	19214	Conducted emission 2-9 kHz, channel U2, bin 2100 Hz
LOW_CONDUCTED_EMISSION_2300_HZ_U2	R	Float	V	2	19216	Conducted emission 2-9 kHz, channel U2, bin 2300 Hz
LOW_CONDUCTED_EMISSION_n_HZ_U2	R	Float	V	2	→	Conducted emission 2-9 kHz, channel U2, bin n Hz Register address: 19214 + ((n - 2100) / 200) × 2
LOW_CONDUCTED_EMISSION_8900_HZ_U2	R	Float	V	2	19282	Conducted emission 2-9 kHz, channel U2, bin 8900 Hz
LOW_CONDUCTED_EMISSION_2100_HZ_U3	R	Float	V	2	19284	Conducted emission 2-9 kHz, channel U3, bin 2100 Hz
LOW_CONDUCTED_EMISSION_2300_HZ_U3	R	Float	V	2	19286	Conducted emission 2-9 kHz, channel U3, bin 2300 Hz
LOW_CONDUCTED_EMISSION_n_HZ_U3	R	Float	V	2	→	Conducted emission 2-9 kHz, channel U3, bin n Hz Register address: 19284 + ((n - 2100) / 200) × 2
LOW_CONDUCTED_EMISSION_8900_HZ_U3	R	Float	V	2	19352	Conducted emission 2-9 kHz, channel U3, bin 8900 Hz
LOW_CONDUCTED_EMISSION_2100_HZ_UNE	R	Float	V	2	19354	Conducted emission 2-9 kHz, channel U_{NE}, bin 2100 Hz
LOW_CONDUCTED_EMISSION_2300_HZ_UNE	R	Float	V	2	19356	Conducted emission 2-9 kHz, channel U_{NE}, bin 2300 Hz

Parameter	R/W	Type	Units	Modbus register size	Modbus address	Notes
LOW_CONDUCTED_EMISSION_n_HZ_UNE	R	Float	V	2	→	Conducted emission 2-9 kHz, channel U_{NE}, bin n Hz Register address: 19354 + ((n - 2100) / 200) × 2
LOW_CONDUCTED_EMISSION_8900_HZ_UNE	R	Float	V	2	19422	Conducted emission 2-9 kHz, channel U_{NE}, bin 8900 Hz
LOW_CONDUCTED_EMISSION_MAX_VALUE	R	Float	V	2	19424	Max. 2-9 kHz emission among all channels
LOW_CONDUCTED_EMISSION_MAX_FREQ	R	Float	Hz	2	19426	Max. 2-9 kHz emission frequency
LOW_CONDUCTED_EMISSION_MAX_CHANNEL	R	Uint16	-	1	19428	Max. 2-9 kHz emission channel: 0 – U1 1 – U2 2 – U3
Reserved	-	-	-	1	19429	
HIGH_CONDUCTED_EMISSION_8000_HZ_U1	R	Float	V	2	19430	Conducted emission 8-150 kHz, channel U1, bin 8 kHz
HIGH_CONDUCTED_EMISSION_10000_HZ_U1	R	Float	V	2	19432	Conducted emission 8-150 kHz, channel U1, bin 10 kHz
HIGH_CONDUCTED_EMISSION_n_HZ_U1	R	Float	V	2	→	Conducted emission 8-150 kHz, channel U1, bin n kHz Register address: 19430 + ((n - 8) / 2) × 2
HIGH_CONDUCTED_EMISSION_150000_HZ_U1	R	Float	V	2	19572	Conducted emission 8-150 kHz, channel U1, bin 150 kHz
HIGH_CONDUCTED_EMISSION_8000_HZ_U2	R	Float	V	2	19574	Conducted emission 8-150 kHz, channel U2, bin 8 kHz
HIGH_CONDUCTED_EMISSION_10000_HZ_U2	R	Float	V	2	19576	Conducted emission 8-150 kHz, channel U2, bin 10 kHz
HIGH_CONDUCTED_EMISSION_n_HZ_U2	R	Float	V	2	→	Conducted emission 8-150 kHz, channel U2, bin n kHz Register address: 19574 + ((n - 8) / 2) × 2
HIGH_CONDUCTED_EMISSION_150000_HZ_U2	R	Float	V	2	19716	Conducted emission 8-150 kHz, channel U2, bin 150 kHz
HIGH_CONDUCTED_EMISSION_8000_HZ_U3	R	Float	V	2	19718	Conducted emission 8-150 kHz, channel U3, bin 8 kHz
HIGH_CONDUCTED_EMISSION_10000_HZ_U3	R	Float	V	2	19720	Conducted emission 8-150 kHz, channel U3, bin 10 kHz
HIGH_CONDUCTED_EMISSION_n_HZ_U3	R	Float	V	2	→	Conducted emission 8-150 kHz, channel U3, bin n kHz Register address: 19718 + ((n - 8) / 2) × 2
HIGH_CONDUCTED_EMISSION_150000_HZ_U3	R	Float	V	2	19860	Conducted emission 8-150 kHz, channel U3, bin 150 kHz
HIGH_CONDUCTED_EMISSION_MAX_VALUE	R	Float	V	2	19862	Max. 8-150 kHz emission among all channels
HIGH_CONDUCTED_EMISSION_MAX_FREQ	R	Float	Hz	2	19864	Max. 8-150 kHz emission frequency

Parameter	R/W	Type	Units	Modbus register size	Modbus address	Notes
HIGH_CONDUCTED_EMISSION_MAX_CHANNEL	R	Uint16	-	1	19866	Max. 8-150 kHz emission channel: 0 – U1 1 – U2 2 – U3
	-	-	-	1	19867	Reserved
EVENTS_COUNTER_DIP	R	Uint32	-	2	19868	Number of detected dip events
EVENTS_COUNTER_SWELL	R	Uint32	-	2	19870	Number of detected swell events
EVENTS_COUNTER_INTERRUPTION	R	Uint32	-	2	19872	Number of detected interruption events
EVENTS_COUNTER_OTHER	R	Uint32	-	2	19874	Number of detected other events
EVENTS_COUNTER_TOTAL_STD	R	Uint32	-	2	19876	Number of detected events in normative recording
EVENTS_COUNTER_TOTAL_USER	R	Uint32	-	2	19878	Number of detected events in user recording

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