TERASAKI
Innovators in Protection Technology

Exclusive
Partner

NHP

TemBreak PRO

TemCom *PRO*

Modbus Communication Module for P Model SMART Energy Moulded Case Circuit Breakers

USER MANUAL

Version

1.0.0

Using this manual

Safety Precautions

Authorised Personal Only
The product or system described in this documentation must be installed, operated and maintained by qualified personnel only. NHP or Terasaki accept no responsibility for the consequences of the use of this equipment by unqualified personnel.
A qualified person is one with the necessary skills and knowledge of the construction and operation of the installation of electrical equipment and has been trained to identify and avoid risks.

Appropriate use of NHP / Terasaki products
NHP / Terasaki products are intended to be used only for the applications described in the catalog and technical documentation, which is dedicated to them.
If products and components from other manufacturers are used, they must be recommended or approved by NHP or Terasaki.
Appropriate use of NHP / Terasaki products during transport, storage, installation, assembly, commissioning, operation and maintenance is necessary to ensure safe operation and without any problems.
The permissible ambient conditions must be met. The information contained in the technical documentation must be observed.

Publication of responsibility
The contents of this document have been reviewed to ensure that the reliability of the information is correct at time of publication.
NHP or Terasaki are not responsible for printing or damage resulting from errors. NHP or Terasaki reserve the right to make corrections and changes needed in subsequent edition.

Warnings and notes
This documentation contains safety instructions that you must follow for your personal safety and to prevent damage to property.
Safety instructions, referring to your personal safety are reported in the literature by a safety alert symbol.

Safety warning symbols and the words below are classified according to the degree of risk.

WARNING: Indicates an imminently hazardous situation which, if it can not be avoided, will result in death or serious injury.

WARNING: Indicates a potentially hazardous situation which, if it can not be avoided, can result serious injury or death.

WARNING: Indicates a potentially hazardous situation which, if it can not be avoided, may cause minor or moderate injury.

Notice: Indicates a warning of property damage and can also indicate important operating and especially useful information on the product, that it should pay particular attention to efficient and safe operation.

Summary of Changes

This section highlights the details of changes made since the previous issue of this document.

The versioning convention used to track changes in this document follows the structure V**x.y.z** where:

x: Major revision, where extensive changes are made which is generally incompatible with the previous version. Such changes may include new products and/or features, or removal of information which is no longer relevant or applicable to the previous version

y: Minor revision, where changes made do not change the overall scope of the previous version, but may include additional information which complements or corrects the previous version, or provides additional clarity on an existing topic.

z: Patch version, where small changes are made to correct minor errors or adjust existing text, charts, figures and/or images, and which do not add or remove information from the previous version. Example changes may include spelling corrections, image re-sizing and adjustments, updated images, etc.

Version	Publication date	Changes	By
V 1.0.0	19-Apr-2021	Initial release	D.NAT

Table of Contents

Using this manual **2**
Safety Precautions 2
Summary of Changes **3**
Table of Contents **4**
Introduction **5**
Who Should Use This Manual 5
Additional Resources 5
Terminology and Abbreviations 6
Product Information **7**
TPCM Part Numbers 7
Connection Cables 7
Technical Data 8
Plugs and Ports **9**
P_SE 9
TPCM 9
Installation **10**
MCCB CIP Connection Cable 10
Side Mounting 12
DIN Rail Mounting 14
Wiring 15
Modbus RTU (RS-485) 15
MCCB, Power supply, and Digital inputs 16
Modbus RTU and Digital output 16
Configuration **17**
Modbus RTU Parameters 17
LED status indicators 17
Write Protection **18**
Remote Write Authorization 18
Password Management 19
Changing the Password 19
Reading Data **20**
Writing Data **21**
Password entry 23
Token acquisition 24
Send Data 25
Process confirmation 26
Setting confirmation 27
TPCM Embedded I/O **28**
Digital Inputs 28
Digital Outputs 29
Continuous mode 30
Pulse mode 31
Date & Time **32**
Troubleshooting **33**
ANNEX A – Modbus Address Map **35**
Device Identification 35
Measure 36
Indicator 46
History 50
Configuration 55
Communication 57
ANNEX B – Custom Alarms **58**
ANNEX C – Trip Events **62**
ANNEX D – Optional Alarms **63**
ANNEX E – Writing Command List **64**
Security Level 0 64
[Command ID: 1] User time settings 64
[Command ID: 2] Custom field 1 setting 64
[Command ID: 3] Custom field 2 setting 65
Security Level 1 66
[Command ID: 101] System phase sequence setting 66
[Command ID: 102] System topology setting 66
[Command ID: 103] Power flow direction setting 67
[Command ID: 104] Calculation formula for Reactive and Apparent power setting 67
[Command ID: 105] Power factor sign convention setting 68
[Command ID: 106] Demand setting 68
[Command ID: 107] Custom Alarm setting 69
[Command ID: 108] LTD trip log priority setting 70
[Command ID: 109] STD trip log priority setting 71
[Command ID: 110] INST trip log priority setting 71
[Command ID: 111] GF trip log priority setting 72
[Command ID: 112] Test trip log priority setting 72
[Command ID: 113] Pre trip Alarm Pick-up threshold I_p setting 73
[Command ID: 114] Pre trip Alarm Time-delay t_p setting 73
[Command ID: 115] Pre trip Alarm setting (disable/enable) 74
[Command ID: 116] Optional Alarm contact operation mode setting 74
[Command ID: 117] Optional Alarm assignment setting 75
[Command ID: 118] Reset Pre trip Alarm counter 75
[Command ID: 119] Reset Optional Alarm counter 76
[Command ID: 120] Reset Custom Alarm counter 76
[Command ID: 121] Reset AX and AL on Smart Aux counter 77
[Command ID: 122] Erase Logs of Trip events with No priority 77
[Command ID: 123] Erase Logs of Trip events with Low priority 78
[Command ID: 124] Erase Logs of Trip events with Medium priority 78
[Command ID: 125] Erase Logs of Trip events with High priority 79
[Command ID: 126] Erase Logs of Trip events with All priorities 79
[Command ID: 127] Erase Logs of Alarm events with No priority 80
[Command ID: 128] Erase Logs of Alarm events with Low priority 80
[Command ID: 129] Erase Logs of Alarm events with Medium priority 81
[Command ID: 130] Erase Logs of Alarm events with High priority 81
[Command ID: 131] Erase Logs of Alarm events with All priorities 82
[Command ID: 132] Trigger signal of Bus synchronisation Demand mode 82
[Command ID: 133] Reset Max. and Min. values of Current measurement 83
[Command ID: 134] Reset Max. and Min. values of Voltage measurement 83
[Command ID: 135] Reset Max. and Min. values of Power measurement 84
[Command ID: 136] Reset Max. and Min. values of Power factor measurement 84
[Command ID: 137] Reset Max. and Min. values of THD measurement 85
[Command ID: 138] Reset Max. and Min. values of Frequency measurement 85
[Command ID: 139] Reset partial Energy counters 86
[Command ID: 140] Reset Max. and Min. values of Demand Current measurement 86
[Command ID: 141] Reset Max. and Min. values of Demand Power measurement 87
Security Level 2 88
[Command ID: 201] LTD Start mode setting 88
[Command ID: 202] LTD Pick-up threshold I_r setting 88
[Command ID: 203] LTD Time-delay t_r setting 89
[Command ID: 204] STD setting (disable/enable) 89
[Command ID: 205] STD Pick-up threshold I_{sd} setting 90
[Command ID: 206] STD Time-delay t_{sd} setting 90
[Command ID: 207] I^2t for STD setting (disable/enable) 91
[Command ID: 208] Zone interlocking (ZSI) for STD setting (disable/enable) 91
[Command ID: 209] INST Pick-up threshold I_i setting 92
[Command ID: 210] GF Setting (disable/enable) 92
[Command ID: 211] GF Pick-up threshold I_g setting 93
[Command ID: 212] LTD Time-delay t_r setting 93
[Command ID: 213] I^2t for GF setting (disable/enable) 94
[Command ID: 214] Zone interlocking (ZSI) for GF setting (disable/enable) 94
[Command ID: 215] NP setting (disable/enable) 95
[Command ID: 216] N Coefficient setting 95
Security Level 1 or 2 96
[Command ID: 2001] Level1/Level2 Password setting 96

Introduction

The TemCom *PRO* Communication Module (**TPCM**) enables Modbus RTU Communication with the NHP/Terasaki TemBreak *PRO* Smart Energy (**P_SE)** MCCBs via serial RS-485 connection. The communication module allows remote access to information including instantaneous and historic energy and power measurements, status indicators, and detailed trip and alarm history; as well as remote reading and writing of configuration and protection settings.

This user manual describes the TPCM features and instructions for use and provides information for commissioning and configuring.

Who Should Use This Manual

This manual aims to provide users, electricians, panel builders and maintenance personnel, with the technical information required for commissioning and operation of the NHP/Terasaki TPCM.

Users of this document must have at minimum a basic understanding of the following:

- Modbus RTU communication
- Serial RS-485 wiring practices
- Power distribution and reticulation
- Circuit protection devices
- Fault currents
- Arc faults
- Temperature rise and thermal derating of switchgear

Additional Resources

The following resources contain additional information which should be read in conjunction with this document.

Resource	Description
NHP/Terasaki TemCom *PRO* Installation Instructions TemCom_PRO-IN-001-EN	Information on installing, mounting, and wiring the TemCom *PRO* communications module
NHP/Terasaki TemBreak *PRO* P_SE Installation Instructions P160_3_SE-IN-001-EN P160_4_SE-IN-001-EN P250_3_SE-IN-001-EN P250_4_SE-IN-001-EN P400_3_SE-IN-001-EN P400_4_SE-IN-001-EN P630_3_SE-IN-001-EN P630_4_SE-IN-001-EN	Information on installing, mounting, and wiring the TemBreak *PRO* Smart Energy MCCB.
NHP/Terasaki TemBreak *PRO* P_SE MCCB User Manual P_SE-UM-001-EN	Reference guide for the TemBreak *PRO* Smart Energy MCCB including information for installation, wiring, commissioning, configuration, and troubleshooting.

Introduction

Terminology and Abbreviations

Abbreviation	Description	Abbreviation	Description
ACP	Auxiliary Communications port: Plug for Smart auxiliary / alarm contact block	**MCCB**	Moulded Case Circuit Breaker
AL	Alarm: An auxiliary contact indicating trip status	**microSD**	Micro Secure Digital
ASCII	American Standard Code for Information Interchange	**MIP**	Maintenance Interface Port: Plug for temporary connection to OCR testing, servicing, and maintenance tools
AX or AUX	Auxiliary: Auxiliary contact indicating open / closed	**N**	Neutral
BE	Basic Electronic Trip Unit (dial type, **LSI** and **LSIG**)	**NP**	Neutral Protection
CCW	Connected Components Workbench software	**OAC**	Optional Alarm Contact: Connection connector optional alarm output contact
CIP [1] [2]	[1] Communication Interface Port: Plug for control power and data for use with the TPED and TPCM [2] Common Industrial Protocol	**OCR**	Over Current Relay
CRC	Cyclic Redundancy Check – error-detecting code used at the end of each Modbus message	**P or PTA**	Pre-trip Alarm
dec	Decimal (base-10) numbering system	**PDU**	Protocol Data Unit
DINT	Signed Double Integer datatype (4 bytes or 32 bits in length)	**PELV**	Protected Extra Low Voltage (earthed system)
EIPM	TemBreak *PRO* Ethernet/IP Module	**PTA**	Pre-Trip Alarm: is a programmable output contact to advise when a trip may be imminent.
FF	Fixed Thermal and Fixed Magnetic	**RTU**	Remote Terminal Unit
FM	Fixed Thermal and Adjustable Magnetic	**S or STD**	Short Time Protection
G or GF	Ground Fault Protection	**SE**	Smart Energy Trip Unit
hex	Hexadecimal (base-16) numbering system	**SELV**	Separated Extra Low Voltage
I or INST	Instantaneous Protection	**SN**	Solid Neutral
IEC	International Electrotechnical Commission	**SSID**	Service Set Identifier (name of the Wi-Fi wireless network)
IEEE	Institute of Electrical and Electronics Engineers	**STR**	String datatype
I_g	Ground Fault Protection Current	**TCP**	Transmission Control Protocol
I_i	Instantaneous Protection Current	**TF**	Adjustable Thermal and Fixed Magnetic
I_n	Rated Current	**THD**	Total Harmonic Distortion
I_N	Neutral Protection Current	**TM**	Adjustable Thermal Magnetic
INT	Signed Integer datatype (2 bytes or 16 bits in length)	**TPCM**	TemCom *PRO* Communication Module
IP	International Protection (Ingress Protection)	**TPED**	TemView *PRO* External Display
I_r	Long Time Protection Current	t_r	Long Time Delay or Long Time Time
I_{sd}	Short Time Protection Current	t_{sd}	Short Time Delay or Short Time Time
I_{tsp}	Thermal Self Protection Current	t_{tsp}	Thermal Self Protection Time
L or LTD	Long Time Protection	**UDINT**	Unsigned Integer (2 bytes or 16-bits in length)
LCD	Liquid Crystal Display (LCD)	**UINT**	Unsigned Integer (2 bytes or 16 bits in length)
LED	Light Emitting Diode	**ULINT**	Unsigned Long Integer datatype (8 bytes or 64 bits in length)
LINT	Signed Long Integer datatype (8 bytes or 64 bits in length)	**URLs**	Uniform Resource Locator (address of an Internet website)
LSI	Long Time, Short Time and Instantaneous Protection	**WORD**	2 bytes or 16-bits of data
LSIG	Long Time, Short Time, Instantaneous and Ground Fault Protection	**ZSI**	Zone Selective Interlocking (zone selectivity)

Product Information

The TemCom *PRO* Communications Module (TPCM) communicates directly with the TemBreak *PRO* Smart Energy (P_SE) MCCB OCR via its CIP connection cable, enabling the MCCB to operate as a slave device on a Modbus RTU network via RS-485.

The TPCM polls the MCCB at regular intervals, making data accessible within Modbus holding registers. Where Local Data Write Authorization has been enabled via the MCCB LCD, data may also be written to specific Holding Registers to enact changes to the configuration and protection settings of the OCR.

TPCM Part Numbers

There are two variants of the TPCM. The **TPCM00D02W** model features embedded Digital I/O which is accessible over Modbus. See TPCM Embedded I/O section for more information.

TPCM00D02N
No embedded I/O

TPCM00D02W
Embedded I/O included
2x Digital input
2x Digital output

Connection Cables

The physical connection between the TPCM and the P_SE MCCB is via the CIP adapter cable, which provides both the proprietary communications link and auxiliary power supply to the MCCB.

The CIP adapter cable is comprised on one end a CIP connector which plugs into the CIP socket on the MCCB, and the other end either RJ9 plug for connection to the TPCM.

These are pre-wired adapters which are available in various lengths as required.

Connector	Part number reference	Compatible P_SE MCCB	Length
CIP	TPPHQTT330H – CIP to RJ9	P160 / P250	0.5 m
	TPPHQTT340H – CIP to RJ9	P160 / P250	1.5 m
	TPPHQTT350H – CIP to RJ9	P160 / P250	3 m
	TPPHQTT360H – CIP to RJ9	P160 / P250	5 m
	TPPHQTT370H – CIP to RJ9	P160 / P250	10 m
	TPPHQTT140H – CIP to free wire (un-terminated end for hardwired 24V dc to MCCB)	P160 / P250	1.2m
	TPPHQTT430H – CIP to RJ9	P400 / P630	0.5 m
	TPPHQTT440H – CIP to RJ9	P400 / P630	1.5 m
	TPPHQTT450H – CIP to RJ9	P400 / P630	3 m
	TPPHQTT460H – CIP to RJ9	P400 / P630	5 m
	TPPHQTT470H – CIP to RJ9	P400 / P630	10 m
	TPPHQTT160H – CIP to free wire (un-terminated end for hardwired 24V dc to MCCB)	P400 / P630	1.2m

Product Information

Technical Data

Attribute	Value
Width	2 modules (17.5mm per module)
Communications Protocol	Modbus RTU (RS-485)
Compatible MCCBs	P_SE MCCBs ONLY (1 required per MCCB)
Temperature Ratings	Operational: -25 - +70 °C
	Storage: -35 - +70 °C
Humidity	Operational: 95% RH @ 40 °C
	Storage: 95 % RH @ 55 °C

Terminals/Plugs	Ratings	Terminal Number/s	Cable Size
Power Supply	Voltage – 24 V DC ± 30%	+ /-	Solid and Stranded 0.5 … 1.5 mm²
	Current Consumption - 40 mA		
Inputs (TPCM00D02W version only)	Voltage – DC 24 V (15 - 30 V DC)	1, 2, 3, 4	
	Current – 2 mA - 15 mA		
Output (TPCM00D02W version only)	Voltage – ≤ 100V DC (typically 24, 48 V DC)	5, 6, 7, 8	
	Max Current – 50mA		
MCCB Coms	Signal / Control Voltage – 24VDC	COM	RJ9
Modbus (RTU)	–	MODBUS 1 & 2	RJ45

Notice: For critical applications, an uninterruptible 24V dc power supply is recommended to ensure full-service continuity and smooth operation in case of unexpected distribution network failure.

Product Information

Plugs and Ports

P_SE

The TemBreak *PRO* Smart Energy (P_SE) MCCB is equipped with specific connectors for connecting communication devices and accessories.
The Communication Input Port (**CIP**) are used to connect the TPCM to the MCCB, see below for their locations.

Port		Description	LSI	LISG	SMART
MIP		Maintenance Interface Port – for temporary connection to OCR testing, servicing, and maintenance tools. Located to the right of the embedded display front cover.	✓	✓	✓
CIP		Communications Input Port – Multiple concurrent CIP connections are possible and are used to connect the TPED, an external 24V dc power supply and/or the TPCM as required. Located under the front cover.	–	–	✓

TPCM

The TPCM includes the following ports and connections.

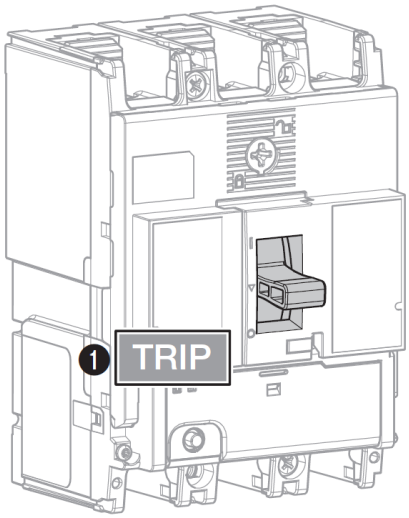
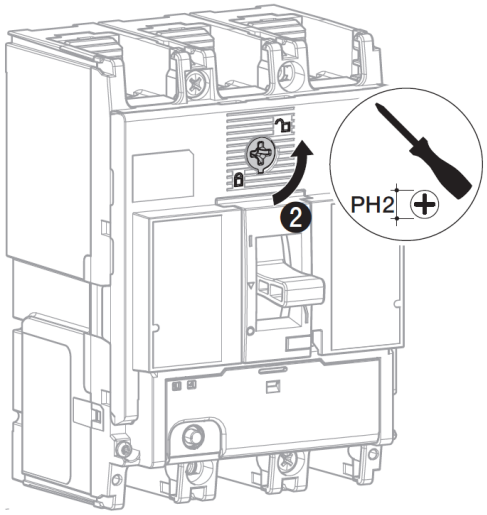
Port		Description	Numbering
RJ9		Connection port for TPPHQTT* CIP cable assembly for communication between a P_SE MCCB and TPCM	N/A
Power Supply		24V dc power supply port	- / +
Inputs		Digital Input port (TPCM00D02W version only)	Input 1 – 1 / 2 Input 2 – 3 / 4
Output		Digital Output port (TPCM00D02W version only)	Output 1 – 5 / 6 Output 2 – 7 / 8
RS-485 Port 1		Modbus RS-485 RJ45 port 1	Modbus 1 Pin 4 D1 / RS-485 Data + Pin 5 D0 / RS-485 Data - Pin 8 SG / RS-485 GND
RS-485 Port 2		Modbus RS-485 RJ45 port 2	Modbus 2 Pin 4 D1 / RS-485 Data + Pin 5 D0 / RS-485 Data - Pin 8 SG / RS-485 GND

Installation

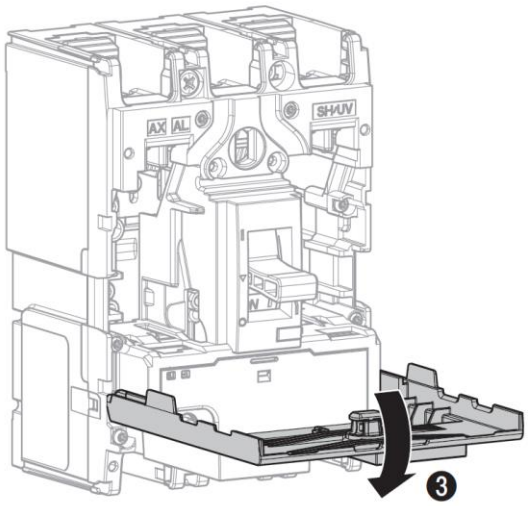
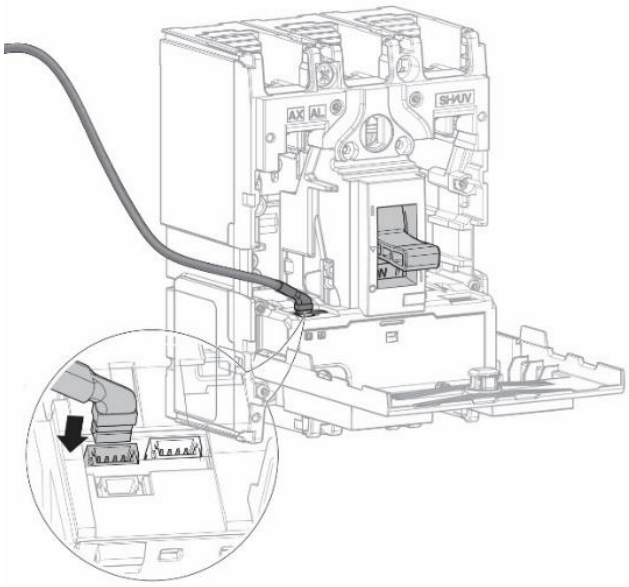
WARNING: Local wiring rules shall be respected (e.g. AS/NZS 3000: Wiring Rules) and shall provide:
- Separation of the power cables and ELV / communication cables
- Secure the cable along the routing.

The TPCM may be mounted on either side of the MCCB using a side-support, or separately using DIN rail.

MCCB CIP Connection Cable

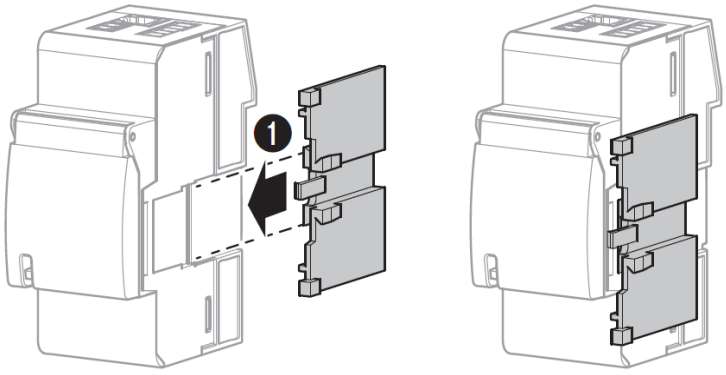
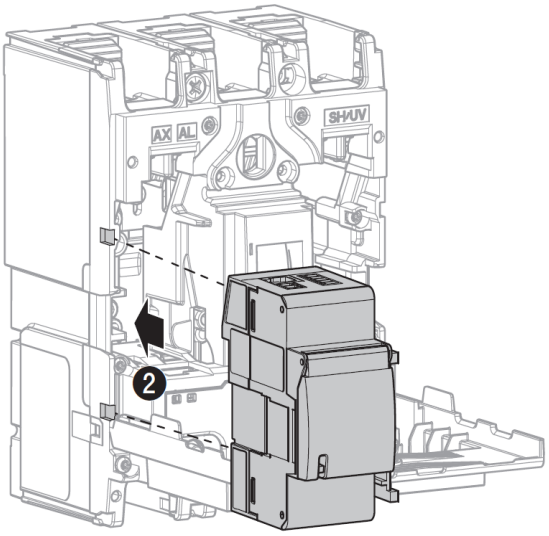
	Action	Note / Illustration
1	Switch the MCCB to the OFF or TRIP position.	
2	Using a No.2 Phillips screwdriver, unlock the front cover by rotating the lock counter-clockwise	

Installation

	Action	Note / Illustration
3	Open the front cover of the MCCB	
4	Insert the CIP connector for the CIP adapter in one of the connectors marked CIP inside the circuit breaker on the left-hand side. Route the cable for the CIP adapter along the left-hand side cable channel of the circuit breaker provided for this purpose.	 Respect the direction of insertion for the connector: The adapter part marked CIP must be visible from the front. Avoid forcing the connector when inserting.

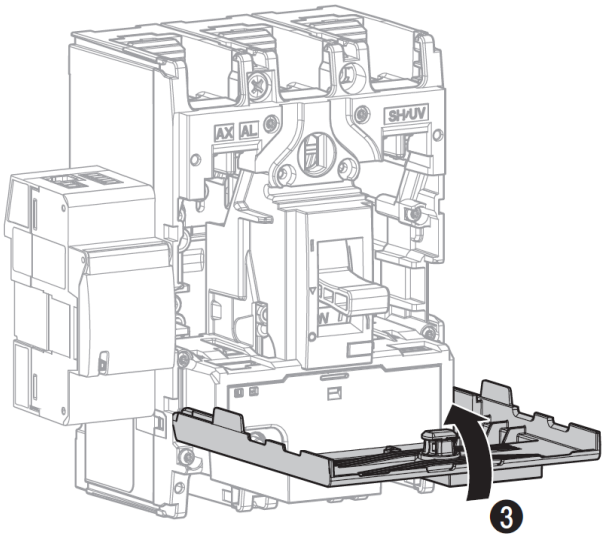
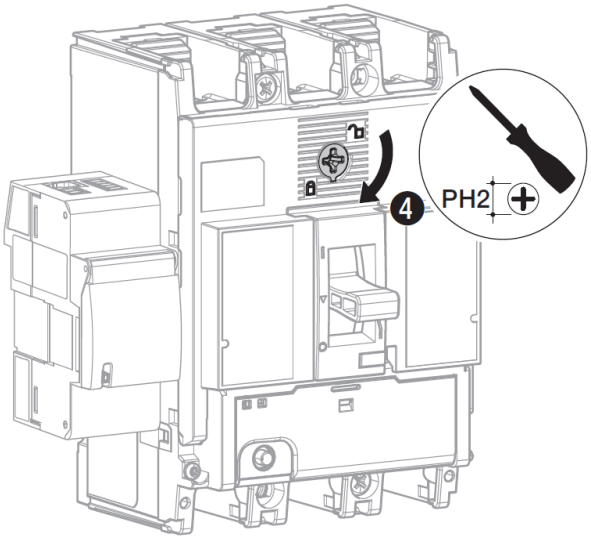
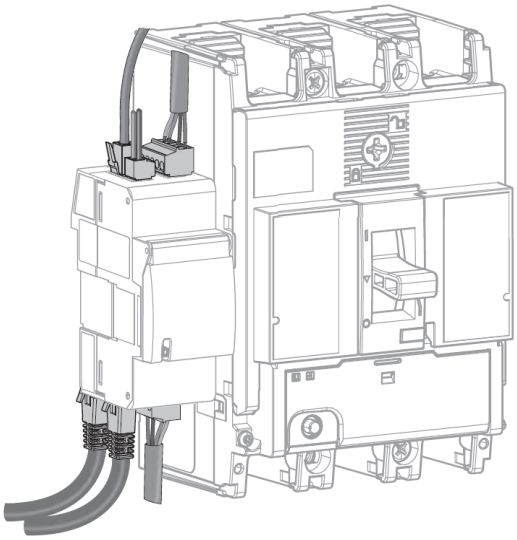
Installation

Side Mounting

	Action	Note / Illustration
1	Secure the side support to the TPCM. (Right hand is recommended, due to the CIP cable plug located on the left-hand side of the MCCB)	
2	Slide the assembly along the left-hand side cable channel of the circuit breaker.	

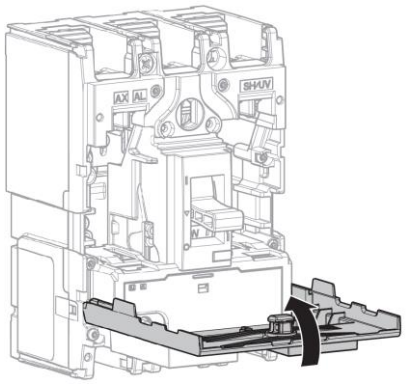
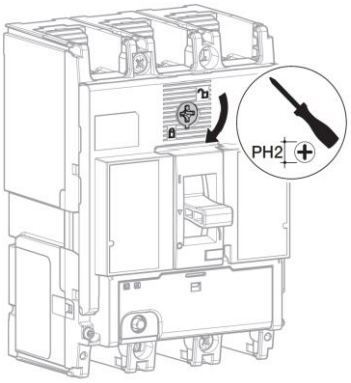
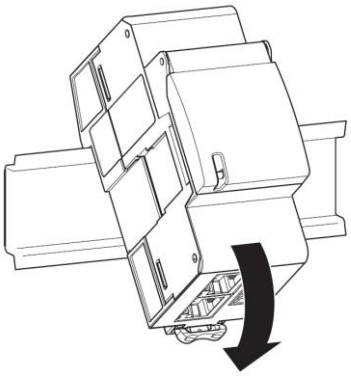
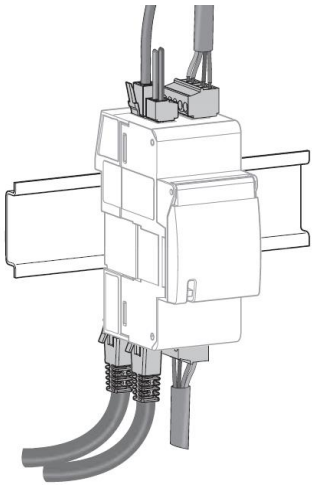
Installation

Side Mounting

	Action	Note / Illustration
3	Close the front cover of the MCCB	
4	Using a No.2 Phillips screwdriver, lock the front cover by rotating the lock clockwise	
5	Insert the RJ9 plug of the CIP cable into the TPCM port labeled **COM** (top side).	

Installation

DIN Rail Mounting

	Action	Note / Illustration
1	Close the front cover of the MCCB	
2	Using a No.2 Phillips screwdriver, lock the front cover by rotating the lock clockwise	
3	Mount the TPCM on DIN rail: (EN 50022 – 35x7.5 or EN 50022 – 35x15).	
4	Insert the RJ9 plug of the CIP cable into the TPCM port labeled **COM** (top side).	

Installation

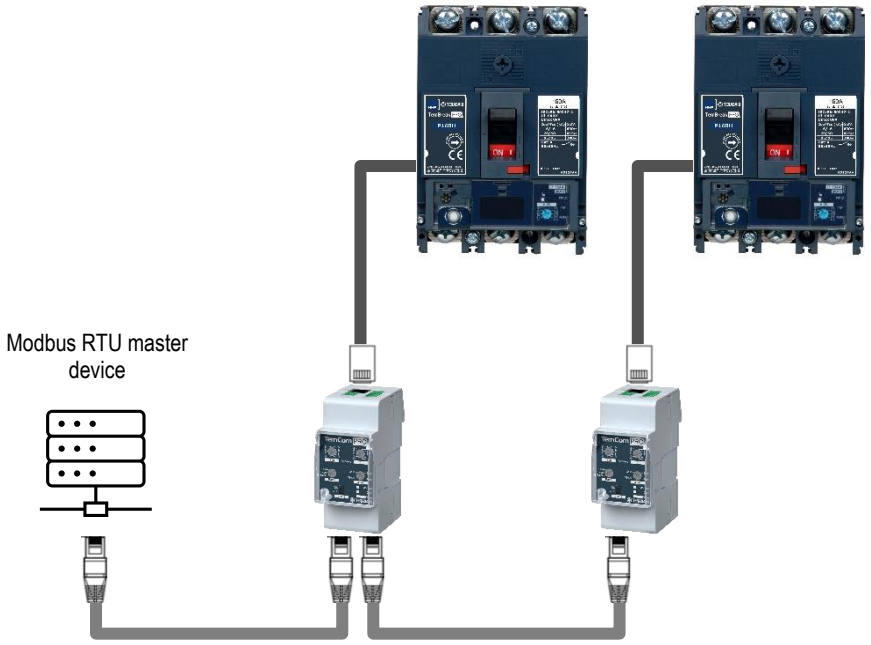
Wiring

Modbus RTU (RS-485)

The TPCM utilizes either or both of the RJ45 MODBUS ports for RS-485 communication. The use of both ports allows daisy chaining of multiple TPCM and with other third-party Modbus RTU devices.

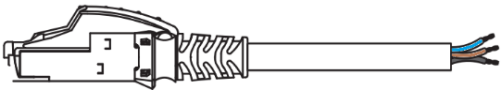
A standard Ethernet patch lead with 8P8C RJ-45 plugs may be used as an RS-485 serial cable to connect between the TPCM and the various other Modbus RTU devices.

> **Notice**: For installation in areas of high electromagnetic disturbance, a shielded RS-485 serial cable should be used. The shielding shall be grounded on one end of the cable only, and **shall not** be connected to the RS-485 GND conductor of the serial cable.

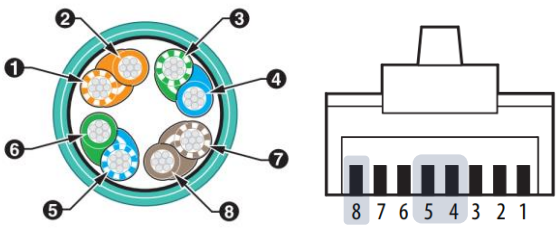


Connection to third-party Modbus RTU devices which do not utilize the same RJ-45 connectors or pinout requires modification to the RJ-45 cable assembly as follows:

1. Cut one end of the RJ-45 cable and strip outer insulation and to expose twisted pair conductor colours (and shielding, where used).



2. Separate and strip insulation of the following conductors for wiring into the RS-485 serial communication terminals of the third-party Modbus RTU device.

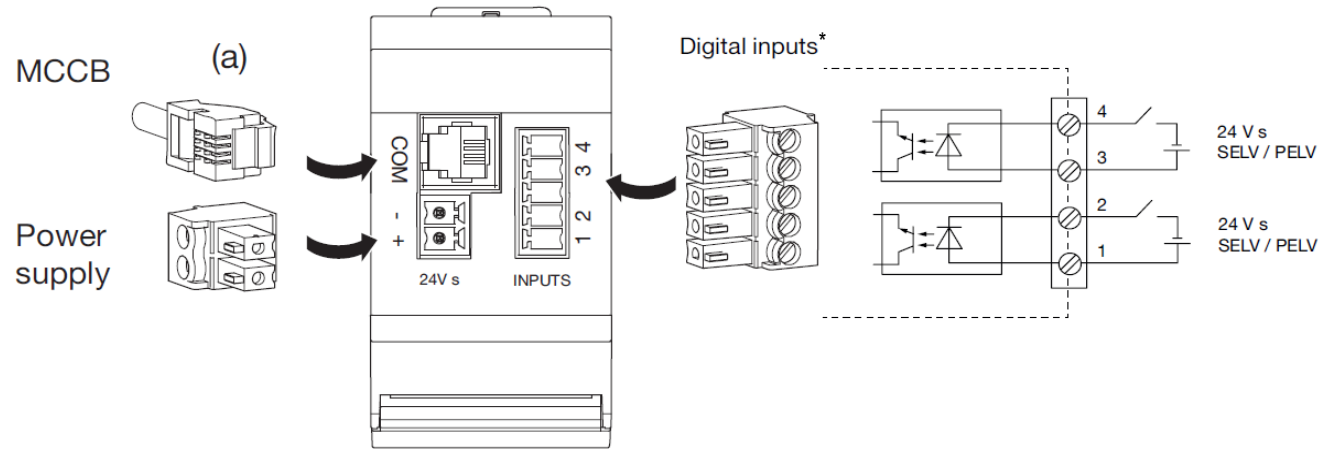


RJ-45 cable assembly				
Pin	Conductor		Terminal	Description
4	Blue		D1	RS-485 Data +
5	White/Blue		D0	RS-485 Data -
8	Brown		0V	RS-485 GND
Shield (optional)			Functional earth / ground	

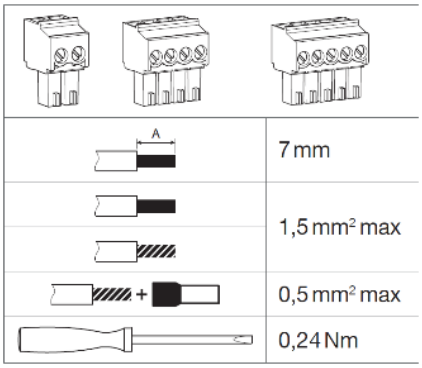
Installation

Wiring

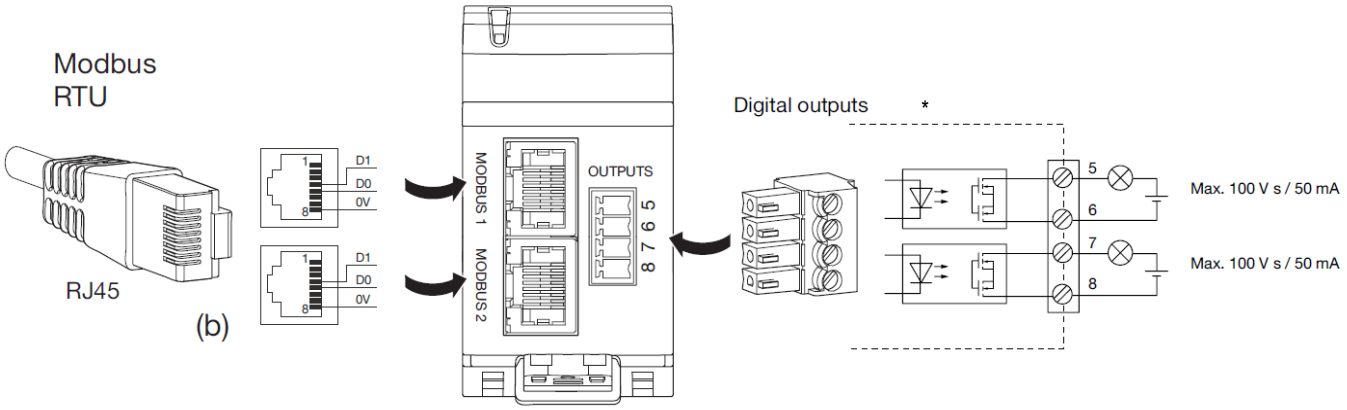
MCCB, Power supply, and Digital inputs
Top view



*TPCM00D02W with embedded Digital I/O only



Modbus RTU and Digital output
Bottom view

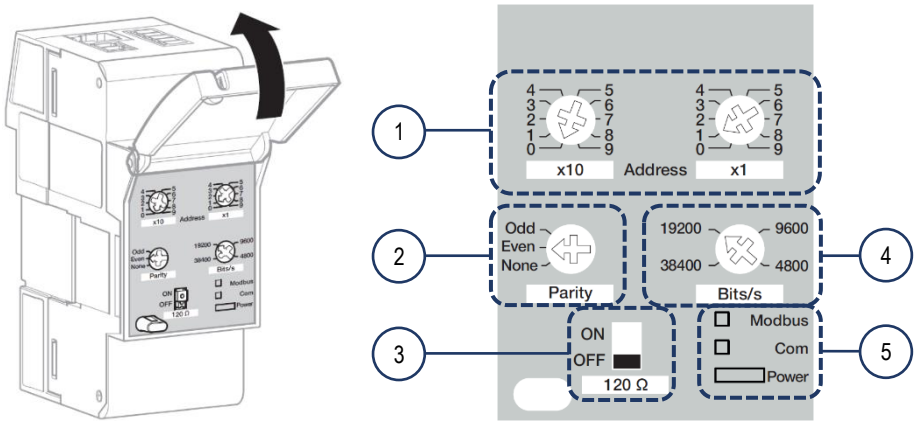


*TPCM00D02W with embedded Digital I/O only

Configuration

Modbus RTU Parameters

Modbus RTU serial parameters of the TPCM are configured via the dials and switch located on the front of the device by lifting to clear cover.



	Description	Default setting
1	**Modbus device address / slave ID:** 1 to 99 by two rotary switches **x1** and **x10** Example: To set to address 21 – x10 dial set to 2 x1 dial set to 1 The address for each device on a single RS-485 network must be unique.	01 (x10 dial = 0) (x1 dial = 1)
2	**Parity setting:** None – Odd – Even The number of stop bits is automatically set according to the parity setting; the number of data bits is always set to 8-bits. All devices on a single RS-485 network must share the same Parity and Stop bit settings as the Master device.	Even (stop bit 1)
3	**Internal 120 Ω resistor:** ON – OFF Set to ON where the TPCM is the last device in an RS-485 daisy chain topology	OFF
4	**Baud rate setting:** 4800 – 9600 – 19200 – 38400 bps All devices on a single RS-485 network must share the same Baud rate as the master device.	19200 bps
5	**LED status indicators** – See below	N/A

Parity	Stop Bits	Data Bits
None	2	8
Even	1	8
Odd	1	8

LED status indicators

LED	LED Status	Description
Modbus	YELLOW blinking	Modbus communication traffic present
	OFF	No Modbus traffic
	RED blinking	There is an error in receiving Modbus communications. Check the Modbus configuration/address.
	RED fixed	Adjustment dials in wrong position on product. Example: The dial/s are not in a position that is programmed to a device ID value.
Com	YELLOW blinking	Communicating with breaker
	RED blinking	Communication error from breaker
	RED fixed	Not compatible with breaker
Power	GREEN fixed	Product ready
	GREEN blinking	Product initialisation
	RED fixed	Product default

Write Protection

WARNING: Changes and adjustments to protection settings and levels (either local or remotely) should only be performed by qualified personnel. Failure to comply may result in malfunction or damage of protective equipment, serious injury or death.

Modifications made remotely over communications to the MCCB configuration settings may be dangerous for personnel near the circuit breaker or may cause damage to the equipment if the protection parameters are modified.

Therefore, remote data write commands are secured with two levels of protection:

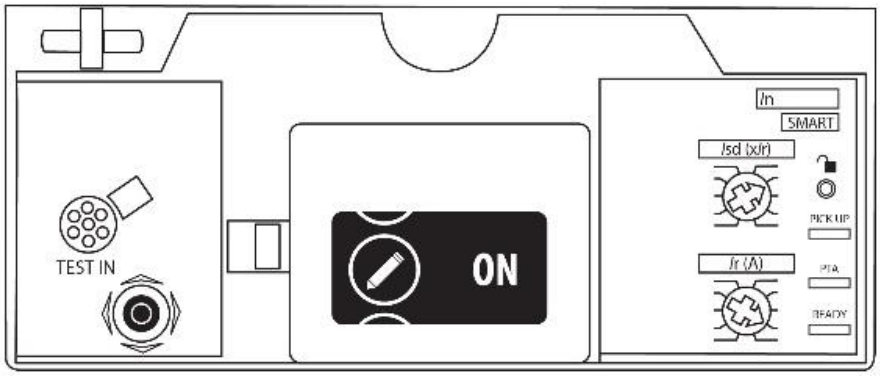
- Remote Write Authorization parameter at the MCCB for localized locking out of individual circuit breakers from remote writing access.
- Password Management with various security access levels for limiting accessibility of performing certain write commands.

Remote Write Authorization

To permit writing of data to the MCCB via remote devices (i.e. external to the MCCB, such as TPCM, TPED, etc.), the remote write authorization parameter must be enabled on the MCCB via the embedded LCD display menu.

This parameter is enabled via the Configuration menu of the embedded display by navigating to the Remote Write Authorization symbol as shown below and changing the value to “ON”.

Refer to the TemBreak *PRO* P_SE MCCB User Manual for further information on navigating the embedded display.



Remote Write Authorization	Default setting
ON – OFF ON – enabled, data write commands for remote devices permitted OFF – disabled, data write commands for remote devices prohibited.	ON

Write Protection

Password Management

Changes to certain configuration settings are protected by varying security access levels. A password corresponding to the required security level must be used when writing data to the TPCM.

Security access levels and their default passwords are as follows:

Security Access Level	Classification	Default Password
0	Settings that do not cause damage even if the settings are incorrect. No password required.	N/A
1	Settings that can cause undesired operation or malfunction if settings are incorrect. Level 1 or Level 2 password required	“Level1”
2	Settings that can cause damage of protective equipment, serious injury or death if settings are incorrect. Level 2 password required.	“Level2”

Changing the Password

WARNING: Level 1 and Level 2 passwords should be changed during commissioning to prevent unauthorized modification to protected settings.

Password changes are performed using the Writing Data process with Command ID: 2001.

The new password must be between 4 and 8 characters inclusive; and may consist of a combination of alphabetic and numerical characters (A-Z, a-z, 0-9, case-sensitive, no special symbols or characters).

- The Level 1 password can be modified with security access level 1 or 2.
- The Level 2 password can only be modified with security access level 2.

WARNING: If the Level 2 password is lost, it can only be reset or restored via authorised service and maintenance tools via the Maintenance Interface Port. Contact NHP for information on restoring lost passwords.

Reading Data

Notice: The update cycle between the TPCM and the associated P_SE MCCB is dependent of the volume of data being exchanged at any given time. A typical update cycle is less than 2.5 seconds, however, may take up to 7 seconds to respond to requests via Modbus.

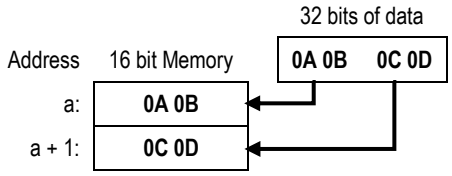
Modbus holding register addresses are provided in this user manual in both raw hexadecimal format and in decimal holding register format (4xxxx) which is offset by 1 from the hexadecimal address (e.g. holding register address dec 40001 = hex 00 00).

Read-Only data may be accessed by addressing the TPCM holding registers using function code "**0x03 – Read Multiple Holding Registers**".

The holding register addresses are provided in ANNEX A – Modbus Address Map.

Data is stored and retrieved from the Modbus holding registers as one or multiple 16-bit WORDs. Data which requires more than 16-bits may be split across several registers using Big-Endian byte order (MSB – most significant bit first); whereby the most-significant WORD of a multi-WORD object is stored at the lowest memory address of a storage location.

Example : A 32-bit integer (dec 168496141 = hex 0A 0B 0C 0D) is split across two 16-bit WORDs in memory.



Example: Read the Phase1 to Phase2 Voltage [U12] by directly addressing the two required holding registers (dec) 44353 and 44354 or (hex) 11 00 and 11 01, communication with Modbus device address # 2.

Excerpt from Modbus Address Map for required data:

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Phase to Phase Voltage between Phase1 and Phase2 [U12]	V	0.001	44353	11 00	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40

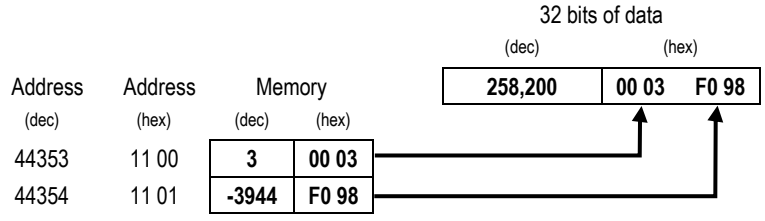
Data request sent from Modbus RTU Master Device:

Byte	1	2	3	4	5	6	7	8
Data (hex)	02	03	11	00	00	02	C1	04
Description	Device address	Function code	Starting address		Qty of registers		CRC	

Data response received from TPCM:

Byte	1	2	3	3	4	5	6	7	8
Data (hex)	02	03	04	00	03	F0	98	7C	99
Description	Device address	Function code	Byte count	Data (11 00)		Data (11 01)		CRC	

The data is stored and transmitted from memory in Big-Endian byte order (MSB – most significant bit first). It must be recombined by using the hexadecimal values in each respective holding register, concatenating the two values into one value and converting the result back to decimal.



The resultant decimal number of 258,200 is expressed in mV, and therefore the Phase1 to Phase2 voltage measurement of U12 is 258.2V.

Writing Data

The TPCM may be used to remotely make changes and adjustments to TemBreak *PRO* Smart Energy MCCBs, including changes to protection level and system settings, configuring custom alarms, reset of historical data and energizing digital outputs on the TPCM.

WARNING: Changes and adjustments to protection settings and levels (either local or remotely) should only be performed by qualified personnel. Failure to comply may result in malfunction or damage of protective equipment, serious injury or death.

Notice: The update cycle between the TPCM and the associated P_SE MCCB is dependent of the volume of data being exchanged at any one time. A typical update cycle is less than 2.5 seconds, however, may take up to 7 seconds to respond to requests via Modbus.

Modbus holding register addresses are provided in this user manual in both raw hexadecimal format and in decimal holding register format (4xxxx) which is offset by 1 from the hexadecimal address (e.g. holding register address dec 40001 = hex 00 00).

Configuration and protection setting changes and other writing commands are issued to the TPCM written by writing to a series of special purpose holding registers using either function code "**0x06 – Preset Single Register**" or "**0x10 – Preset Multiple Registers**".

These registers are reserved for the writing function but may also be read using function code "**0x03 – Read Multiple Holding Registers**".

Writing commands are associated with a Command ID and specific set of required data. The Command ID list and data format for each type is provided in ANNEX E – Writing Command List.

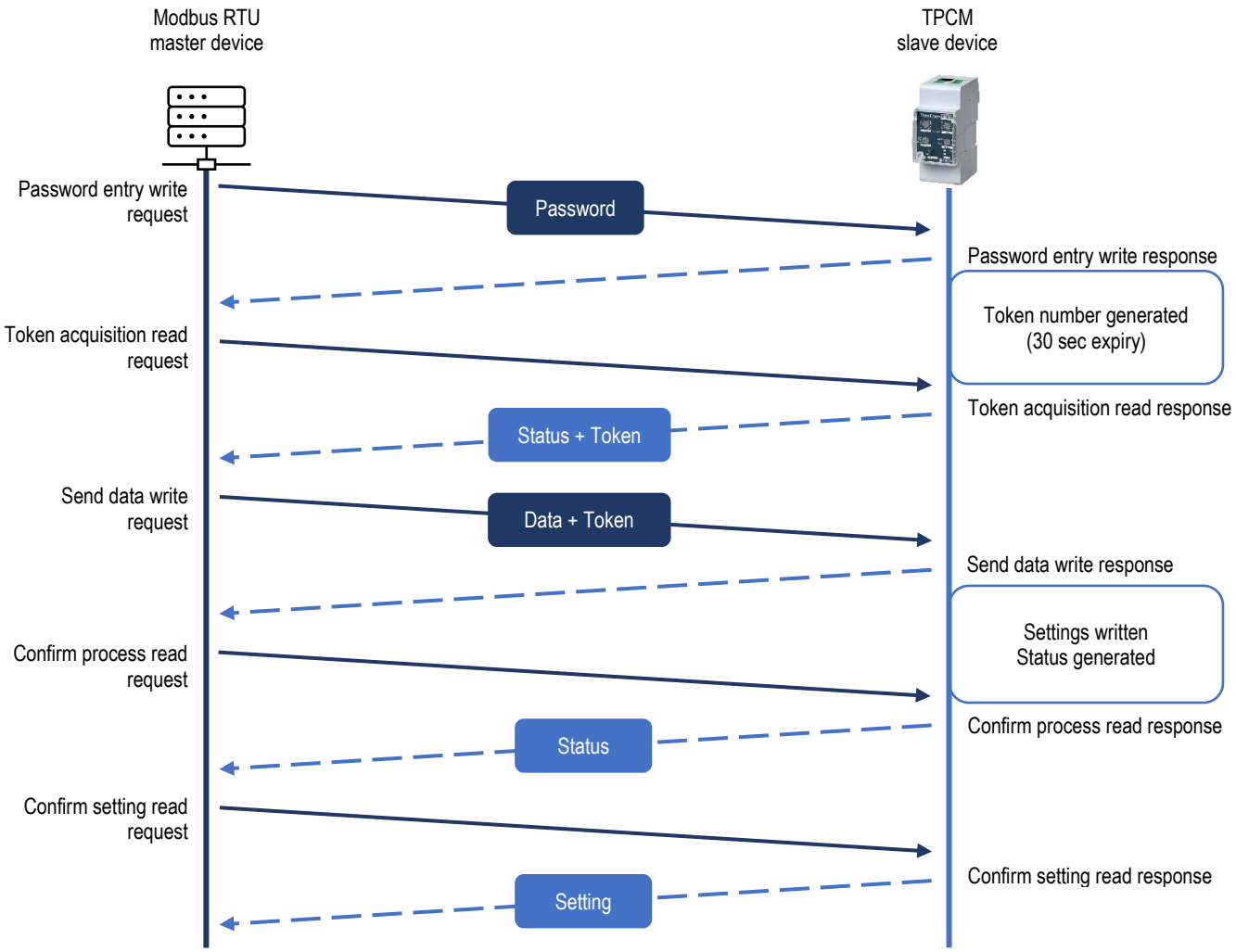
Remote writing of data is also subject to write protection settings and security access levels with password management – refer to Write Protection.

Writing Data

Writing function sequence

The writing function follows a multi-step process to implement certain writing commands:

1. Password entry (Write)
2. Token acquisition (Read)
3. Send data with token (Write)
4. Process confirmation (Read)
5. Setting confirmation (Read)



Writing Data

Password entry

Command IDs are protected by varying security access levels. See Password Management.
For example, Command ID: 107 which is used to configure custom alarms, has a security access level of 1.

The password for the intended writing command must first be written to the following registers using function code "**0x10 – Preset Multiple Registers**".

Password entry register table

Address (dec)	Address (hex)	Data
48707	22 02	Target security level (0, 1 or 2)
48708	22 03	Number of characters of the password (between 4 and 8 inclusive)
48709	22 04	Password data entered as 2 characters per register in MSB (Big endian order). Convert each pair of characters to their respective ASCII hex values and concatenate into one hex number. Unused trailing characters must be filled with NULL (value 00). Example: "Level1" **Register (hex)** **Character** **ASCII Code (hex)** 22 04 'L' 'e' 4C 65 22 05 'v' 'e' 76 65 22 06 'l' '1' 6C 31 22 07 (null) 00 00
48710	22 05	
48711	22 06	
48712	22 07	

Example: Security Level 2 using default password "Level2", communication with Modbus device address # 2.

Password entry write request sent from Modbus RTU Master Device:

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Data (hex)	02	10	22	02	00	06	0C	00	02	00	06	4C	65	76	65	6C	32	00	00	9D	E2
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 02)		Data (22 03)		Data (22 04)		Data (22 05)		Data (22 06)		Data (22 07)		CRC	
								Security Level 2		Number of chars		'L' 'e'		'v' 'e'		'l' '2'		(null)			

Password entry write response received from TPCM:

Byte	1	2	3	4	5	6	7	8
Data (hex)	02	10	22	02	00	06	EB	80
Description	Device address	Function code	Starting address		Qty of registers		CRC	

Writing Data

Token acquisition

After receiving the response PDU from the previous password entry step, the TPCM will generate a unique token number which is used in the next step for sending the data for the write request. The token is only valid for 30 seconds after the password entry and can be used as many times as necessary to send subsequent write commands for the security level the token was generated for.

To acquire the token, use function code "**0x03 – Read Multiple Holding Registers**" to read the following registers, confirming the token status to ensure the previous step after password entry was successful.

Token data register table

Register (dec)	Register (hex)	Data
48713	22 08	Token status: **Status** **Description** 00 00 Processing completed successfully 00 01 The password level is abnormal (0x04 or more) 00 02 MCCB write protection is enabled 00 03 Incorrect password 00 04 Unacceptable characters entered in password 00 05 The number of characters of the entered password is too short (3 or less) 00 06 The number of characters in the entered password is too long (9 or more)
48714	22 09	Token number – High WORD (00 00 if status is not completed successfully)
48715	22 0A	Token number – Low WORD (00 00 if status is not completed successfully)

Example: Retrieve token number generated after successful password entry, communication with Modbus device address # 2.

Token acquisition read request sent from Modbus RTU Master Device:

Byte	1	2	3	4	5	6	7	8
Data (hex)	02	03	22	08	00	03	8E	42
Description	Device address	Function code	Starting address		Qty of registers		CRC	

Token acquisition read response received from TPCM:

Byte	1	2	3	4	5	6	7	8	9	10	11
Data (hex)	02	03	06	00	00	A3	A6	E3	8D	7E	B7
Description	Device address	Function code	Byte count	Data (22 08)		Data (22 09)		Data (22 0A)		CRC	
				Status		Token					

The data received from holding register 48713 (hex 22 08) is 00 00, therefore the status confirms that the password entry was processed successfully, and a token number generated.

The data received from holding registers 48714 and 48715 (hex 22 09 and 22 0A) is the token number "A3 A6 E3 8D".

Writing Data

Send Data

Once the token has been acquired, the token is valid for 30 seconds before expiring. Within this 30 second frame, one or more write requests can be made to send write commands for the security level the token was generated for. The data sent during the write command request is dependent on the specific Command ID used, but must begin with the token acquired from the previous step, and always use write to the same set of dedicated holding registers.

Refer to ANNEX E – Writing Command List for the required data structure for each writing Command ID

The token number along with the data for the writing command must be written to the following registers using function code "**0x10 – Preset Multiple Registers**".

Write request data register table

Register (dec)	Register (hex)	Data
48738	22 21	Token number – High WORD
48739	22 22	Token number – Low WORD
48740	22 23	Command ID
48741 … 48757	22 24	Write data (refer to ANNEX E – Writing Command List)

Example: Using the token acquired from the previous step, write the Command ID: 209 to adjust the INST pick-up threshold I_i setting to 15x I_n, communication with Modbus device address # 2.

Send Data write request sent from Modbus RTU Master Device:

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	20	21
Data (hex)	02	10	22	21	00	05	0A	A3	A6	E3	8D	00	D1	00	02	00	1E	99	95
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 209		2 bytes of data		15 x I_n			

Send Data write response received from TPCM:

Byte	1	2	3	4	5	6	7	8
Data (hex)	02	10	22	02	00	06	EB	80
Description	Device address	Function code	Starting address		Qty of registers		CRC	

Writing Data

Process confirmation

After receiving the response PDU from sending a write request, it is good practice to confirm the write request has been received and processed correctly. This is done by reading a single status register using function code "**0x03 – Read Multiple Holding Registers**":

Data write confirmation data register table

Register (dec)	Register (hex)	Data
48737	22 20	Processing status: **Status** **Description** 00 00 Processing completed successfully 00 01 Incorrect token entered 00 02 Command ID entered is abnormal 00 03 Token entered does not meet security level requirements 00 04 Input data length is abnormal 00 05 Internal processing error 00 0A Processing in progress

Example: Confirm write request from previous step was completed successfully, communication with Modbus device address # 2.

Process confirmation read request sent from Modbus RTU Master Device:

Byte	1	2	3	4	5	6	7	8
Data (hex)	02	03	22	20	00	01	8F	8B
Description	Device address	Function code	Starting address		Qty of registers		CRC	

Process confirmation read response received from TPCM:

Byte	1	2	3	4	5	6	7
Data (hex)	02	03	02	00	00	44	FC
Description	Device address	Function code	Byte count	Data (22 20)		CRC	
				Status			

The data received from holding register 48737 (hex 22 20) is 00 00, therefore the status confirms that the write request was processed successfully.

Writing Data

Setting confirmation

After confirming that the write request has been successful, it is also good practice to confirm the required changes have been enacted correctly. This is done by reading the respective holding registers using function code "**0x03 – Read Multiple Holding Registers**".

The holding register addresses are provided in ANNEX A – Modbus Address Map.

Example: Confirm that the INST pick-up threshold I_i setting has been changed 15x I_n per the previous write request, communication with Modbus device address # 2.
The INST protection settings are found in the **MODBUS MAP**

Excerpt from Modbus Address Map for required data:

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
INST Pick-up threshold Ii setting	x In	0.5	47014	1B 65	1	UINT	03	Example: "15xIn": Hex 00 1E

Setting confirmation read request sent from Modbus RTU Master Device:

Byte	1	2	3	4	5	6	7	8
Data (hex)	02	03	1B	65	00	01	92	C2
Description	Device address	Function code	Starting address		Qty of registers		CRC	

Setting confirmation read response received from TPCM:

Byte	1	2	3	3	4	7	8
Data (hex)	02	03	02	00	1E	7C	4C
Description	Device address	Function code	Byte count	Data (1B 65)		CRC	
				15 x I_n			

The data received from holding register 47014 (hex 1B 65) is 00 1E, or 15 in decimal or 15xI_n, which is the correct setting made by the write request, therefore was processed successfully.

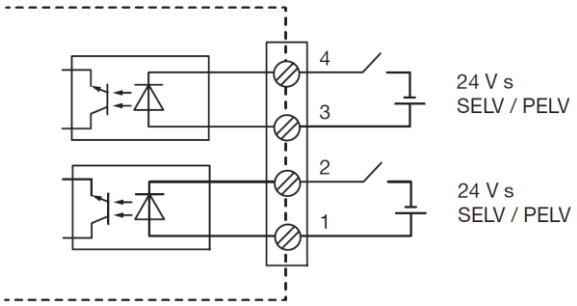
TPCM Embedded I/O

The TPCM model **TPCM00D02W** features 2 digital inputs and 2 digital outputs which are accessible be addressing their respective holding registers.

Notice: The TPCM embedded I/O should not be used where fast response times are necessary.
The update cycle between the TPCM and the associated P_SE MCCB is dependent of the volume of data being exchanged at any given time. A typical update cycle is less than 2.5 seconds, however, may take up to 7 seconds to respond to requests via Modbus.

Digital Inputs

Digital input terminals are located on the top of the TPCM, via the Digital Input port. To enable the input, apply a 24V dc signal to the respective input terminal per the wiring diagram below, noting the dc polarity of the terminals.



The status of each digital input can be read via Modbus holding registers using function code "**0x03 – Read Multiple Holding Registers**".

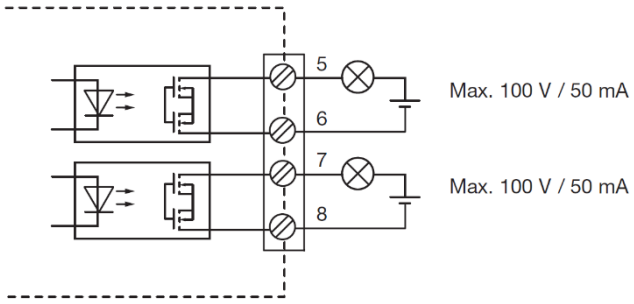
Digital input holding register table

Description	Address (dec)	Address (hex)	Function code	Data Type	Further information
Digital input 1 status (24V dc voltage is needed)	48233	20 28	03	BOOL	"Input not detected" = Hex 00 00, "Input detected" = Hex 00 01
Digital input 2 status (24V dc voltage is needed)	48234	20 29	03	BOOL	

TPCM Embedded I/O

Digital Outputs

Digital output terminals are located on the bottom of the TPCM, via the Digital Output port. Note the dc polarity of the terminals and the maximum load characteristics. Interposing relays are recommended for interfacing with loads of varying characteristics with respect to voltage, current, and utilization category.



To enable the outputs, the respective Modbus holding registers must be written to. Each digital output is configurable as either continuous ON/OFF or pulsed to within 1ms resolution. Depending on the desired function, each digital output utilizes a pair of holding registers to specify the mode and operation.

The mode and operation holding registers for each digital output are not contiguous with the digital output contact number (i.e. contact 1 mode and operation registers are not immediately one after the other in the Modbus holding register table). Therefore, to avoid unintended operation of the other digital output, it is recommended that the holding registers are written to using function code written to using function code "**0x06 – Preset Single Register**". Function code "**0x10 – Preset Multiple Registers**" may also be used where the quantity of registers is limited to one at a time.

Digital output holding register table

Description	Address (dec)	Address (hex)	Function code	Data Type	Further information
Configuration of Digital output contact 1 mode	48321	20 80	03 / 06 / 16	BOOL	"Continuous output mode" = Hex 00 00, "Pulse output mode" = Hex 00 01
Configuration of Digital output contact 2 mode	48322	20 81		BOOL	
Digital output contact 1 operation	48323	20 82	03 / 06 / 16	UINT	In case of Continuous output mode "Contact not activated" = Hex 00 00, "Contact activated continuously" = other than Hex 00 00 In case of Pulse output mode Example: "Contact activate 1234milliseconds" = Hex 04 D2
Digital output contact 2 operation	48324	20 83		UINT	

Notice: Interruption to TPCM power supply will result in all values stored in the digital output mode and operation holding registers to revert back to 0.

TPCM Embedded I/O

Digital Outputs

Continuous mode

Write value of 0 to the respective "mode" holding register to configure the output to continuous mode. This configuration is retained until another value is written to this register or power is removed from the TPCM.

Write any value (Δt) to the respective "operation" holding register to energize the output. The output contact will remain energized until a value of 0 is written to the "operation" holding register or power is removed from the TPCM.

If the respective "mode" holding register value is changed to 1, the output will enter pulse mode and remain energized for whatever value (Δt) in milliseconds is stored in the respective "operation" holding register.

Timing diagram – Cycle time delay (< 7s) not shown.

Continuous example: Output contact 2 in continuous mode. ON and OFF, communication with Modbus device address # 2.

1. Write value of 0 to holding register 48322 (hex 20 81) to configure continuous output mode for contact 2.

Byte	1	2	3	4	5	6	7	8	9	10	11
Data (hex)	02	06	20	81	00	01	02	00	00	0C	55
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (20 81)		CRC	
								Continuous mode			

2. To energize output 2, write any value other than 0 to holding register 48324 (hex 20 83).

Byte	1	2	3	4	5	6	7	8	9	10	11
Data (hex)	02	06	20	83	00	01	02	00	01	CC	77
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (20 83)		CRC	
								Energize output			

3. To de-energize output 2, write value of 0 to holding register 48324 (hex 2083).

Byte	1	2	3	4	5	6	7	8	9	10	11
Data (hex)	02	06	20	83	00	01	02	00	00	0D	B7
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (20 83)		CRC	
								De-energize output			

Continuous example timing diagram – Cycle time delay (< 7s) not shown.

TPCM Embedded I/O

Digital Outputs

Pulse mode

Write value of 1 to the respective “mode” holding register to configure the output to pulse mode. This configuration is retained until another value is written to this register or power is removed from the TPCM.

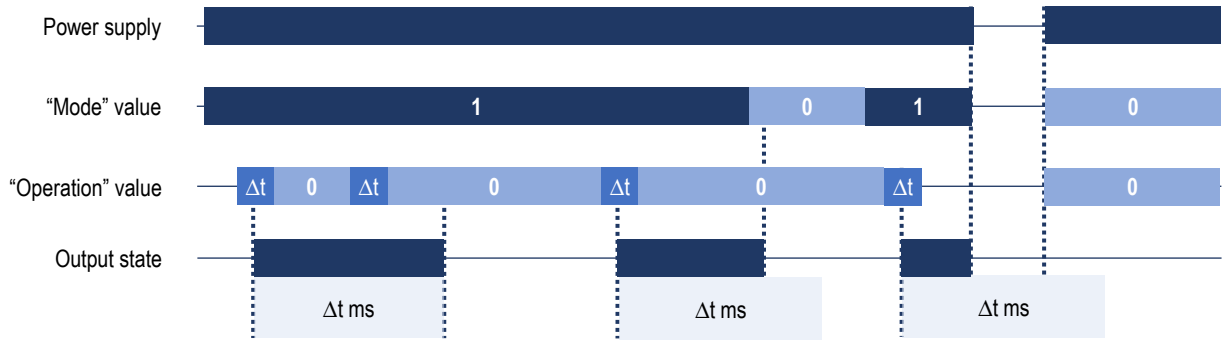
Write the pulse time value in milliseconds to the respective “operation” holding register to energize the output. The output contact will remain energized for the time specified and automatically de-energize once the time has elapsed or power is removed from the TPCM.

The maximum pulse time is 65,535 milliseconds (65.5 seconds).

Whilst the output is still energized from the previous pulsed command, all other write commands to the respective “operation” holding register are ignored.

To de-energize the output prematurely, change the respective “mode” holding register to 0 to put it into continuous mode.

Timing diagram – Cycle time delay (< 7s) not shown.



Pulse example: Output contact 1 with 200ms pulsed output, communication with Modbus device address # 2.

1. Write value of 1 to holding register 48321 (hex 20 80) to configure pulsed output mode for contact 1.

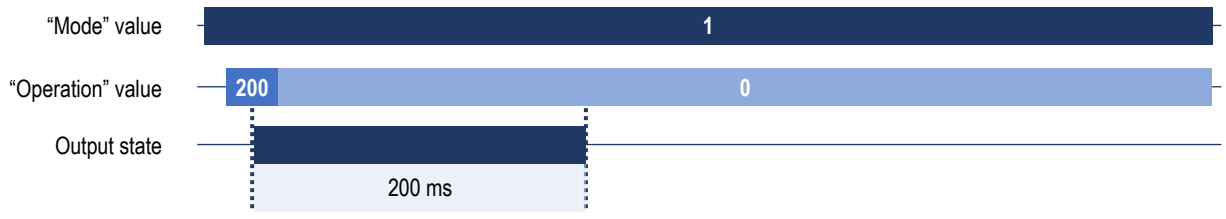
Byte	1	2	3	4	5	6	7	8	9	10	11
Data (hex)	02	06	20	80	00	01	02	00	01	CC	44
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (20 80)		CRC	
								Pulse mode			

2. Write value of 200 (Hex 00 C8) to holding register 48323 (hex 20 82) to energize output 1 for 200ms.

Byte	1	2	3	4	5	6	7	8	9	10	11
Data (hex)	02	06	20	82	00	01	02	00	C8	0D	F0
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (20 82)		CRC	
								200ms pulse			

3. Output contact 1 energizes for 200ms once Modbus request is written and cycle delay has elapsed

Pulse example timing diagram – Cycle time delay (< 7s) not shown.



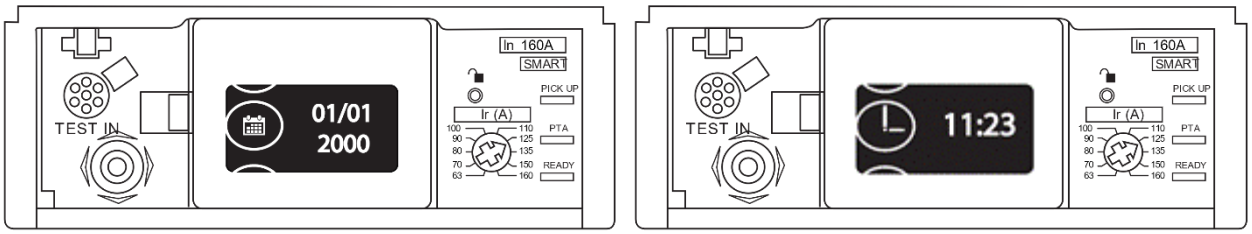
Date & Time

There are two types of Date & Time accessible from the OCR of the MCCB and which are used as timestamp of trips, alarms, and events, and which are affected by the presence of supply or control power to the OCR.

OCR Time: Non-resettable time which is the absolute operating time of the OCR seconds. OCR time increments whilst the OCR is in service and is stored in the OCR non-volatile memory. OCR time does not increment if power is removed from the OCR.

User Time: Resettable time which is configurable by the user locally via the MCCB embedded display, or remotely under Command ID: 1. This time is displayed on the MCCB embedded display. Unlike the OCR time, however, the User Time is stored in volatile memory, and is cleared back to 1st January 2000, 00:00:00 if power is removed from the OCR.

On the embedded display of the MCCB, the date and time is represented in the format DD/MM/YYYY (or YYYY/MM/DD depending on settings) and HH:MM (24H or AM/PM depending on settings).



Refer to the NHP/Terasaki TemBreak *PRO* P_SE MCCB User Manual for further information on accessing information via the embedded display and power requirements.

User Time is represented as the absolute number of seconds since 1st January 2000, 00:00:00 and is split across two datapoint elements in the form of a High WORD and Low WORD in Big-Endian byte order.

Example: "27th July 2020, 09:25:20" is represented as 649157142 seconds. The hexadecimal equivalent to this number is hex 26 B1 5A 16.

The hex number is then split across the two datapoints as follows:

Address (dec)	Address (hex)	Value	
		hex	dec
46913	1B 00	26 B1	9905
6914	1B 01	5A 16	23062

Converting the value into traditional date & time format may be performed using any preferred algorithm, for example:

Year: 649157142 seconds divided by 31557600 sec/year = 20.57… years.
Remove the remainder and add to the year 2000 = **2020** with remainder of 18,005,142 seconds

Day: Previous remainder 18005142 seconds divided by 86400 sec/day = 208.39… days
Remove the remainder, this is the number of days where Day 0 is 1st January = **208** (or day **209** where Day 1 is 1st Jan) with remainder of 33,942 seconds.

Hour: Previous remainder 33942 seconds divided by 3600 sec/hour = 9.43… hours
Remove the remainder, this is the hour of the day = **9** with remainder of 1,542 seconds

Minute: Previous remainder 1542 seconds divided by 60 sec/min = 25.7 minutes
Remove the remainder, this is the minute of the hour = **25** with remainder of 42 seconds

Seconds: Previous remainder **42** seconds.

Year 2020, Day 209, 09:25:42

The day of year may be converted to day-of-the-month format using a conversion algorithm or look up table, as this varies dependent on the presence of leap years. Day 209 in the year 2020 is 27th July (where Day 1 is 1st January).

Troubleshooting

In the event of a problem when using the TPCM, this section provides advice on how to resolve issues.

	Problem	Possible cause	Remedial advice
1.	Read/Write Data is not refreshing or not returning correct values.	Incorrect or faulty wiring	Check Modbus RTU wiring. Refer to Wiring section. Check for and correct any: ▪ Loose connections ▪ Incorrect terminals / conductors / connector pins ▪ Segregation of communication and power wiring ▪ Long cable runs, use shielded cabling and terminating resistor
		Fault with TPCM	Confirm correct operation of TPCM Check LED Status indicators: • Modbus Flashing Amber • Com Flashing Amber • Power Solid Green If Modbus LED status is off or flashing red there is a problem with the Modbus traffic: • Confirm Modbus RTU dial settings • Confirm Modbus RTU master device configuration is compatible with TPCM dial settings • Confirm correct Holding register addresses (hex or dec with and without offset), size, and datatype. • Check for incorrect or faulty wiring If Com LED status is off or, flashing red or fixed red there is a problem with the communication traffic between the TPCM and the MCCB: • Confirm quality of CIP cable assembly connection to MCCB If Power LED status is red, there is a fault with the TPCM . • Confirm Modbus RTU dial settings are valid (dials are in correct locations, and not between values). • Confirm Modbus address is not set to 0, 0. • TPCM is faulty. Replace. If Power LED status is off, there is no power to the TPCM . • Check for incorrect or faulty wiring. • Confirm power supply connection and voltage. Refer to Configuration section
		Incorrect settings on TPCM	Confirm dial settings are correct and compatible with Modbus RTU master device configuration: • Baudrate • Parity (stop bit) • Address • Terminating resistor Refer to Configuration section
		Incorrect Modbus RTU Master connection or configuration.	Refer to Modbus RTU Master device instructions. Try: ▪ Check serial configuration settings (e.g. baudrate, parity, stop bit) are compatible with TPCM configuration ▪ Check for incorrect or faulty wiring ▪ Confirm correct Holding register addresses (hex or dec with and without offset), size, and datatype. ▪ Ensure function code 0x03 is used to read holding registers. ▪ Ensure function codes 0x06 or 0x10 (dec 16) are used for writing to holding registers. Refer to Configuration, Reading Data and Writing Data sections

Troubleshooting

	Problem	Possible cause	Remedial advice
2.	Writing data does not work / configuration settings are not updated.	Remote Write Authorization not enabled	Remote write authorization must be enabled on the target MCCB to make remote changes to the configuration settings. Refer to Remote Write Authorization section
		Incorrect security access level	Configuration settings require the input of the correct security access level. Confirm the correct security access level for the target configuration setting. Refer to ANNEX E – Writing Command List section. Ensure the Security access level is entered into the required datapoint element or holding register before sending the write command. Refer to Writing Data section.
		Incorrect Password	Ensure correct password is entered for the corresponding command security access level. Default password for Level 1 is “Level1” Default password for Level 2 is “Level2” Password entry must be performed two ASCII characters per holding register between 4 and 8 characters inclusive and unused characters must be filled with zeros (NULL, 0x00 or 0) Refer to Password entry section.
		Invalid data	Data entered into Configuration Write Data array elements is not in the correct format for the target configuration setting. Refer to ANNEX E – Writing Command List and Writing Data sections for correct data and examples.
3.	Password change not registering	Incorrect security access level	Changing the Level 1 password requires either Level 1 or Level 2 access. Changing the Level 2 password requires Level 2 access only. Ensure the correct security access level is selected for changing the respective password. Refer to Changing the Password and Command ID: 2001 sections.
		Incorrect new password entry	Data entered into write command holding registers is not in the correct format. Password entry must be performed two ASCII characters per holding register between 4 and 8 characters inclusive and unused characters must be filled with zeros (NULL, 0x00 or 0) Refer to Changing the Password and Command ID: 2001 sections.
4.	Lost / forgotten password	N/A	If the Level 1 password is lost, it can be reset using Level 2 access. If the Level 2 password is lost, it cannot be reset. If the Level 2 password is lost, it can only be reset or restored via authorized service and maintenance tools via the Maintenance Interface Port. Contact NHP for information on restoring lost passwords. Refer to Changing the Password section.

ANNEX A – Modbus Address Map

Device Identification

Communication module and OCR identification information

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Communication module Manufacturer name	-	-	44097	10 00	16	STR	03	"Terasaki Electric" = Hex 54 65 72 61 73 61 6B 69 20 45 6C 65 63 74 72 69 63 00...
Communication module Product code	-	-	44113	10 10	16	STR	03	"TPCM00D02WA" = Hex 54 50 43 4D 30 30 44 30 32 57 41 00... "TPCM00D02NA" = Hex 54 50 43 4D 30 30 44 30 32 4E 41 00...
Communication module Software version	-	-	44129	10 20	2	UINT	03	Example: "1.2.3" = Hex 01 02 03 00
Communication module Vendor URL	-	-	44131	10 22	16	STR	03	"http://www.terasaki.co.jp/" = Hex 68 74 74 70 3A 2F 2F 77 77 77 2E 74 65 72 61 73 61 6B 69 2E 63 6F 2E 6A 70 2F 00...
Communication module Product name	-	-	44147	10 32	16	STR	03	"Modbus RTU interface" = Hex 4D 6F 64 62 75 73 20 52 54 55 20 69 6E 74 65 72 66 61 63 65 00...
Communication module Model name	-	-	44163	10 42	16	STR	03	TPCM00D02WA: "Module with IO" = Hex 4D 6F 64 75 6C 65 20 77 69 74 68 20 49 4F 00...
Communication module User application name	-	-	44179	10 52	16	STR	03	"APL" = Hex 41 50 4C 00…
Communication module Hardware version	-	-	44195	10 62	2	UDINT	03	Example: "1.2.3" = Hex 01 02 03 00
Communication module Serial number	-	-	44197	10 64	16	STR	03	Example: "19H01001" = Hex 31 39 48 30 31 30 30 31 00...
Communication module Site code	-	-	44213	10 74	2	UINT	03	Example: "H" = Hex 00 00 00 48
Communication module Production Day	-	-	44215	10 76	1	UINT	03	Example: "1" = Hex 00 01 (Day-Of-Year)
Communication module Production Year	-	-	44216	10 77	1	UINT	03	Last two digits of the year, Example: "2019" = Hex 00 13
Reserved			44217	10 78	24			
MCCB Production site	-	-	44241	10 90	1	STR	03	Example: "J" = Hex 00 4A
MCCB Serial number	-	-	44242	10 91	2	UDINT	03	Example: "42123456" => 4123456 = Hex 00 3E EB 40 (The second digit from top of MCCB Serial Number is omitted.)
MCCB Production Day	-	-	44244	10 93	1	UINT	03	Example: "1" = Hex 00 01 (Day-Of-Year)
MCCB Production Year	-	-	44245	10 94	1	UINT	03	Last two digits of the year, Example: "2019" = Hex 00 13
MCCB Hardware version	-	-	44246	10 95	2	UDINT	03	Example: "1.2.3" = Hex 01 02 03 00
MCCB Software version	-	-	44248	10 97	2	UDINT	03	Example: "1.2.3" = Hex 01 02 03 00
MCCB Communication version	-	-	44250	10 99	2	UDINT	03	Example: "1.2.3" = Hex 01 02 03 00
MCCB Manufacturer code	-	-	44252	10 9B	1	UINT	03	"Terasaki Electric" = Hex 00 01
MCCB Range code	-	-	44253	10 9C	1	UINT	03	"TemBreak PRO" = Hex 00 01
MCCB Frame size	-	-	44254	10 9D	1	UINT	03	"P160" = Hex 00 00, "P250" = Hex 00 01. "P400 / P630" = Hex 00 03
MCCB Rated Current [In]	-	-	44255	10 9E	1	UINT	03	40A / 100A / 125A / 160A / 250A / 400A / 630A Example: "40A" = Hex 00 28
MCCB Number of Pole	-	-	44256	10 9F	1	UINT	03	"3 poles" = Hex 00 03, "4 poles" = Hex 00 04
MCCB OCR type	-	-	44257	10 A0	1	UINT	03	"SMART (TPOU)" = Hex 00 03

ANNEX A – Modbus Address Map

Measure

Measurement data on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Phase to Phase Voltage between Phase1 and Phase2 [U12]	V	0.001	44353	11 00	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Phase to Phase Voltage between Phase2 and Phase3 [U23]	V	0.001	44355	11 02	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Phase to Phase Voltage between Phase3 and Phase1 [U31]	V	0.001	44357	11 04	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Phase to Neutral Voltage between Phase1 and Neutral [V1N]	V	0.001	44359	11 06	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Phase to Neutral Voltage between Phase2 and Neutral [V2N]	V	0.001	44361	11 08	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Phase to Neutral Voltage between Phase3 and Neutral [V3N]	V	0.001	44363	11 0A	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Max. Phase to Phase Voltage between U12, U23 & U31 [Umax]	V	0.001	44365	11 0C	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Min. Phase to Phase Voltage between U12, U23 & U31 [Umin]	V	0.001	44367	11 0E	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Max. Phase to Neutral Voltage between V1N, V2N & V3N [Vmax]	V	0.001	44369	11 10	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Min. Phase to Neutral Voltage between V1N, V2N & V3N [Vmin]	V	0.001	44371	11 12	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Calculated average Phase to Phase Voltage of U12, U23, U31 [Uavg]	V	0.001	44373	11 14	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Calculated average Phase to Neutral Voltage of V1N, V2N, V3N [Vavg]	V	0.001	44375	11 16	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Unbalance Phase to Phase Voltage of U12 [U12 Unb]	%	0.1	44377	11 18	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Unbalance Phase to Phase Voltage of U23 [U23 Unb]	%	0.1	44379	11 1A	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Unbalance Phase to Phase Voltage of U31 [U31 Unb]	%	0.1	44381	11 1C	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. Unbalance Phase to Phase Voltage between U12, U23 and U31 [Umax Unb]	%	0.1	44383	11 1E	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Unbalance Phase to Neutral Voltage of V1N [V1N Unb]	%	0.1	44385	11 20	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Unbalance Phase to Neutral Voltage of V2N [V2N Unb]	%	0.1	44387	11 22	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Unbalance Phase to Neutral Voltage of V3N [V3N Unb]	%	0.1	44389	11 24	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. Unbalance Phase to Neutral Voltage between V1N, V2N and V3N [Vmax Unb]	%	0.1	44391	11 26	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Phase Current of Phase1 [I1]	A	0.001	44393	11 28	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Phase Current of Phase2 [I2]	A	0.001	44395	11 2A	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Phase Current of Phase3 [I3]	A	0.001	44397	11 2C	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Phase Current of Neutral [IN]	A	0.001	44399	11 2E	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Calculated Ground Current [Ig]	A	0.001	44401	11 30	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Max. Phase Current between I1, I2, I3 and IN [Imax]	A	0.001	44403	11 32	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Min. Phase Current between I1, I2 and I3 [Imin]	A	0.001	44405	11 34	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Calculated average Phase Current of I1, I2, I3 [Iavg]	A	0.001	44407	11 36	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Unbalance Phase Current of I1 [I1 Unb]	%	0.1	44409	11 38	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Unbalance Phase Current of I2 [I2 Unb]	%	0.1	44411	11 3A	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Unbalance Phase Current of I3 [I3 Unb]	%	0.1	44413	11 3C	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Unbalance Phase Current of IN [IN Unb]	%	0.1	44415	11 3E	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. Unbalance Phase Current between I1, I2, I3 and IN [Imax Unb]	%	0.1	44417	11 40	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Active power of Phase1 [P1]	W	1	44419	11 42	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Active power of Phase2 [P2]	W	1	44421	11 44	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0

ANNEX A – Modbus Address Map

Measure
Measurement data on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Active power of Phase3 [P3]	W	1	44423	11 46	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Total Active power [Ptot]	W	1	44425	11 48	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Reactive power of Phase1 [Q1]	VAr	1	44427	11 4A	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Reactive power of Phase2 [Q2]	VAr	1	44429	11 4C	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Reactive power of Phase3 [Q3]	VAr	1	44431	11 4E	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Total Reactive power [Qtot]	VAr	1	44433	11 50	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Apparent power of Phase1 [S1]	VA	1	44435	11 52	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Apparent power of Phase2 [S2]	VA	1	44437	11 54	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Apparent power of Phase3 [S3]	VA	1	44439	11 56	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Total Apparent power [Stot]	VA	1	44441	11 58	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Power factor of Phase1 [PF1]	-	0.0001	44443	11 5A	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Power factor of Phase2 [PF2]	-	0.0001	44445	11 5C	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Power factor of Phase3 [PF3]	-	0.0001	44447	11 5E	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Total Power factor [PFtot]	-	0.0001	44449	11 60	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Displacement Power factor of Phase1 [Cosφ1]	-	0.0001	44451	11 62	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Displacement Power factor of Phase2 [Cosφ2]	-	0.0001	44453	11 64	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Displacement Power factor of Phase3 [Cosφ3]	-	0.0001	44455	11 66	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Total Displacement Power factor [Cosφtot]	-	0.0001	44457	11 68	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Network Frequency [F]	Hz	0.001	44459	11 6A	2	UDINT	03	Example: "50.000Hz" = Hex 00 00 C3 50
THD of Phase to Phase Voltage U12 [THD U12]	%	0.1	44461	11 6C	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
THD of Phase to Phase Voltage U23 [THD U23]	%	0.1	44463	11 6E	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
THD of Phase to Phase Voltage U31 [THD U31]	%	0.1	44465	11 70	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
THD of Phase to Neutral Voltage V1N [THD V1N]	%	0.1	44467	11 72	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
THD of Phase to Neutral Voltage V2N [THD V2N]	%	0.1	44469	11 74	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
THD of Phase to Neutral Voltage V3N [THD V3N]	%	0.1	44471	11 76	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
THD of Phase Current I1 [THD I1]	%	0.1	44473	11 78	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
THD of Phase Current I2 [THD I2]	%	0.1	44475	11 7A	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
THD of Phase Current I3 [THD I3]	%	0.1	44477	11 7C	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Max. THD between Phase Current I1, I2 and I3 [THD Imax]	%	0.1	44479	11 7E	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Min. Phase to Phase Voltage of U12 since last reset	V	0.001	44481	11 80	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Min. Phase to Phase Voltage of U12 since last reset	sec	1	44483	11 82	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E

ANNEX A – Modbus Address Map

Measure
Measurement data on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Timestamp user (settable by user) when Min. Phase to Phase Voltage of U12 since last reset	sec	1	44485	11 84	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Min. Phase to Phase Voltage of U23 since last reset	V	0.001	44487	11 86	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Min. Phase to Phase Voltage of U23 since last reset	sec	1	44489	11 88	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Min. Phase to Phase Voltage of U23 since last reset	sec	1	44491	11 8A	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Min. Phase to Phase Voltage of U31 since last reset	V	0.001	44493	11 8C	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Min. Phase to Phase Voltage of U31 since last reset	sec	1	44495	11 8E	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Min. Phase to Phase Voltage of U31 since last reset	sec	1	44497	11 90	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Min. Phase to Neutral Voltage of V1N since last reset	V	0.001	44499	11 92	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Min. Phase to Neutral Voltage of V1N since last reset	sec	1	44501	11 94	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Min. Phase to Neutral Voltage of V1N since last reset	sec	1	44503	11 96	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Min. Phase to Neutral Voltage of V2N since last reset	V	0.001	44505	11 98	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Min. Phase to Neutral Voltage of V2N since last reset	sec	1	44507	11 9A	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Min. Phase to Neutral Voltage of V2N since last reset	sec	1	44509	11 9C	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Min. Phase to Neutral Voltage of V3N since last reset	V	0.001	44511	11 9E	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Min. Phase to Neutral Voltage of V3N since last reset	sec	1	44513	11 A0	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Min. Phase to Neutral Voltage of V3N since last reset	sec	1	44515	11 A2	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Min. Calculated average Phase to Phase Voltage of U12, U23, U31 (Uavg) since last reset	V	0.001	44517	11 A4	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Min. Calculated average Phase to Neutral Voltage of V1N, V2N, V3N (Vavg) since last reset	V	0.001	44519	11 A6	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Min. Unbalance Phase to Phase Voltage of U12 since last reset	%	0.1	44521	11 A8	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Min. Unbalance Phase to Phase Voltage of U23 since last reset	%	0.1	44523	11 AA	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Min. Unbalance Phase to Phase Voltage of U31 since last reset	%	0.1	44525	11 AC	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Min. of [Max. Unbalance Phase to Phase Voltage between U12, U23 and U31] since last reset	%	0.1	44527	11 AE	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Min. Unbalance Unbalance Phase to Neutral Voltage of V1N since last reset	%	0.1	44529	11 B0	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Min. Unbalance Unbalance Phase to Neutral Voltage of V2N since last reset	%	0.1	44531	11 B2	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Min. Unbalance Unbalance Phase to Neutral Voltage of V3N since last reset	%	0.1	44533	11 B4	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85

ANNEX A – Modbus Address Map

Measure

Measurement data on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Min. of [Max. Unbalance Phase to Neutral Voltage between V1N, V2N and V3N] since last reset	%	0.1	44535	11 B6	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Min. Phase Current I1 since last reset	A	0.001	44537	11 B8	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Min. Phase Current I2 since last reset	A	0.001	44539	11 BA	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Min. Phase Current I3 since last reset	A	0.001	44541	11 BC	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Min. Phase Current IN since last reset	A	0.001	44543	11 BE	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Min. Calculated Ground Current Ig since last reset	A	0.001	44545	11 C0	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Min. of [Max. Phase Current between I1, I2, I3 and IN] since last reset	A	0.001	44547	11 C2	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Min. of [Min. Phase Current between I1, I2 and I3] since last reset	A	0.001	44549	11 C4	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Min. Calculated average Phase Current of I1, I2, I3 (Iavg) since last reset	A	0.001	44551	11 C6	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Min. Unbalance Phase Current of I1 since last reset	%	0.1	44553	11 C8	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Min. Unbalance Phase Current of I2 since last reset	%	0.1	44555	11 CA	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Min. Unbalance Phase Current of I3 since last reset	%	0.1	44557	11 CC	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Min. Unbalance Phase Current of IN since last reset	%	0.1	44559	11 CE	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Min. of [Max. Unbalance Phase Current between I1, I2, I3 and IN] since last reset	%	0.1	44561	11 D0	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Min. Active power P1 since last reset	W	1	44563	11 D2	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Min. Active power P2 since last reset	W	1	44565	11 D4	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Min. Active power P3 since last reset	W	1	44567	11 D6	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Min. Total Active power Ptot since last reset	W	1	44569	11 D8	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Min. Reactive power Q1 since last reset	VAr	1	44571	11 DA	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Min. Reactive power Q2 since last reset	VAr	1	44573	11 DC	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Min. Reactive power Q3 since last reset	VAr	1	44575	11 DE	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Min. Total Reactive power Qtot since last reset	VAr	1	44577	11 E0	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Min. Apparent power S1 since last reset	VA	1	44579	11 E2	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Min. Apparent power S2 since last reset	VA	1	44581	11 E4	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Min. Apparent power S3 since last reset	VA	1	44583	11 E6	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Min. Total Apparent power Stot since last reset	VA	1	44585	11 E8	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Min. Power factor of PF1 since last reset	-	0.0001	44587	11 EA	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Min. Power factor of PF2 since last reset	-	0.0001	44589	11 EC	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Min. Power factor of PF3 since last reset	-	0.0001	44591	11 EE	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Min. Total Power factor PFtot since last reset	-	0.0001	44593	11 F0	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Min. Displacement Power factor Cosφ1 since last reset	-	0.0001	44595	11 F2	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E

ANNEX A – Modbus Address Map

Measure
Measurement data on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Min. Displacement Power factor Cosφ2 since last reset	-	0.0001	44597	11 F4	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Min. Displacement Power factor Cosφ3 since last reset	-	0.0001	44599	11 F6	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Min. Total Displacement Power factor Cosφtot since last reset	-	0.0001	44601	11 F8	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Min. Network Frequency F since last reset	Hz	0.001	44603	11 FA	2	UDINT	03	Example: "50.000Hz" = Hex 00 00 C3 50
Timestamp OCR (non resetable time) when Min. Network Frequency F since last reset	sec	1	44605	11 FC	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Min. Network Frequency F since last reset	sec	1	44607	11 FE	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Min. THD of Phase to Phase Voltage U12 since last reset	%	0.1	44609	12 00	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Min. THD of Phase to Phase Voltage U23 since last reset	%	0.1	44611	12 02	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Min. THD of Phase to Phase Voltage U31 since last reset	%	0.1	44613	12 04	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Min. THD of Phase to Neutral Voltage V1N since last reset	%	0.1	44615	12 06	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Min. THD of Phase to Neutral Voltage V2N since last reset	%	0.1	44617	12 08	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Min. THD of Phase to Neutral Voltage V3N since last reset	%	0.1	44619	12 0A	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Min. THD of Phase Current I1 since last reset	%	0.1	44621	12 0C	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Min. THD of Phase Current I2 since last reset	%	0.1	44623	12 0E	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Min. THD of Phase Current I3 since last reset	%	0.1	44625	12 10	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Min. of [Max. THD between Phase Current I1, I2 and I3] since last reset	%	0.1	44627	12 12	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Max. Phase to Phase Voltage of U12 since last reset	V	0.001	44629	12 14	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Max. Phase to Phase Voltage of U12 since last reset	sec	1	44631	12 16	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Max. Phase to Phase Voltage of U12 since last reset	sec	1	44633	12 18	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Max. Phase to Phase Voltage of U23 since last reset	V	0.001	44635	12 1A	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Max. Phase to Phase Voltage of U23 since last reset	sec	1	44637	12 1C	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Max. Phase to Phase Voltage of U23 since last reset	sec	1	44639	12 1E	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Max. Phase to Phase Voltage of U31 since last reset	V	0.001	44641	12 20	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Max. Phase to Phase Voltage of U31 since last reset	sec	1	44643	12 22	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Max. Phase to Phase Voltage of U31 since last reset	sec	1	44645	12 24	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Max. Phase to Neutral Voltage of V1N since last reset	V	0.001	44647	12 26	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Max. Phase to Neutral Voltage of V1N since last reset	sec	1	44649	12 28	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Max. Phase to Neutral Voltage of V1N since last reset	sec	1	44651	12 2A	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Max. Phase to Neutral Voltage of V2N since last reset	V	0.001	44653	12 2C	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Max. Phase to Neutral Voltage of V2N since last reset	sec	1	44655	12 2E	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E

ANNEX A – Modbus Address Map

Measure

Measurement data on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Timestamp user (settable by user) when Max. Phase to Neutral Voltage of V2N since last reset	sec	1	44657	12 30	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Max. Phase to Neutral Voltage of V3N since last reset	V	0.001	44659	12 32	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Max. Phase to Neutral Voltage of V3N since last reset	sec	1	44661	12 34	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Max. Phase to Neutral Voltage of V3N since last reset	sec	1	44663	12 36	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Max. Calculated average Phase to Phase Voltage of U12, U23, U31 (Uavg) since last reset	V	0.001	44665	12 38	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Max. Calculated average Phase to Neutral Voltage of V1N, V2N, V3N (Vavg) since last reset	V	0.001	44667	12 3A	2	UDINT	03	Example: "123.456V" = Hex 00 01 E2 40
Max. Unbalance Phase to Phase Voltage of U12 since last reset	%	0.1	44669	12 3C	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. Unbalance Phase to Phase Voltage of U23 since last reset	%	0.1	44671	12 3E	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. Unbalance Phase to Phase Voltage of U31 since last reset	%	0.1	44673	12 40	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. of [Max. Phase to Phase Voltage between U12, U23 and U31] since last reset	%	0.1	44675	12 42	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. Unbalance Unbalance Phase to Neutral Voltage of V1N since last reset	%	0.1	44677	12 44	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. Unbalance Unbalance Phase to Neutral Voltage of V2N since last reset	%	0.1	44679	12 46	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. Unbalance Unbalance Phase to Neutral Voltage of V3N since last reset	%	0.1	44681	12 48	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. of [Max. Unbalance Phase to Neutral Voltage between V1N, V2N and V3N] since last reset	%	0.1	44683	12 4A	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. Phase Current I1 since last reset	A	0.001	44685	12 4C	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Max. Phase Current I1 since last reset	sec	1	44687	12 4E	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Max. Phase Current I1 since last reset	sec	1	44689	12 50	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Max. Phase Current I2 since last reset	A	0.001	44691	12 52	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Max. Phase Current I2 since last reset	sec	1	44693	12 54	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Max. Phase Current I2 since last reset	sec	1	44695	12 56	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Max. Phase Current I3 since last reset	A	0.001	44697	12 58	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Max. Phase Current I3 since last reset	sec	1	44699	12 5A	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Max. Phase Current I3 since last reset	sec	1	44701	12 5C	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Max. Phase Current IN since last reset	A	0.001	44703	12 5E	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Timestamp OCR (non resetable time) when Max. Phase Current IN since last reset	sec	1	44705	12 60	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Max. Phase Current IN since last reset	sec	1	44707	12 62	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Max. Calculated Ground Current Ig since last reset	A	0.001	44709	12 64	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Max. of [Max. Phase Current between I1, I2, I3 and IN] since last reset	A	0.001	44711	12 66	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Max. of [Min. Phase Current between I1, I2 and I3] since last reset	A	0.001	44713	12 68	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Max. Calculated average Phase Current of I1, I2, I3 (Iavg) since last reset	A	0.001	44715	12 6A	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Max. Unbalance Phase Current of I1 since last reset	%	0.1	44717	12 6C	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. Unbalance Phase Current of I2 since last reset	%	0.1	44719	12 6E	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. Unbalance Phase Current of I3 since last reset	%	0.1	44721	12 70	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85

ANNEX A – Modbus Address Map

Measure

Measurement data on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Max. Unbalance Phase Current of IN since last reset	%	0.1	44723	12 72	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. of [Max. Unbalance Phase Current between I1, I2, I3 and IN] since last reset	%	0.1	44725	12 74	2	DINT	03	Example: "12.3%" = Hex 00 00 00 7B, "-12.3%" = Hex FF FF FF 85
Max. Active power P1 since last reset	W	1	44727	12 76	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Max. Active power P2 since last reset	W	1	44729	12 78	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Max. Active power P3 since last reset	W	1	44731	12 7A	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Max. Total Active power Ptot since last reset	W	1	44733	12 7C	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Max. Reactive power Q1 since last reset	VAr	1	44735	12 7E	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Max. Reactive power Q2 since last reset	VAr	1	44737	12 80	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Max. Reactive power Q3 since last reset	VAr	1	44739	12 82	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Max. Total Reactive power Qtot since last reset	VAr	1	44741	12 84	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Max. Apparent power S1 since last reset	VA	1	44743	12 86	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Max. Apparent power S2 since last reset	VA	1	44745	12 88	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Max. Apparent power S3 since last reset	VA	1	44747	12 8A	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Max. Total Apparent power Stot since last reset	VA	1	44749	12 8C	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Max. Power factor of PF1 since last reset	-	0.0001	44751	12 8E	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Max. Power factor of PF2 since last reset	-	0.0001	44753	12 90	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Max. Power factor of PF3 since last reset	-	0.0001	44755	12 92	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Max. Total Power factor PFtot since last reset	-	0.0001	44757	12 94	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Max. Displacement Power factor Cosφ1 since last reset	-	0.0001	44759	12 96	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Max. Displacement Power factor Cosφ2 since last reset	-	0.0001	44761	12 98	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Max. Displacement Power factor Cosφ3 since last reset	-	0.0001	44763	12 9A	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Max. Total Displacement Power factor Cosφtot since last reset	-	0.0001	44765	12 9C	2	DINT	03	Example: "0.1234" = Hex 00 00 04 D2, "-0.1234" = Hex FF FF FB 2E
Max. Network Frequency F since last reset	Hz	0.001	44767	12 9E	2	UDINT	03	Example: "50.000Hz" = Hex 00 00 C3 50
Timestamp OCR (non resetable time) when Max. Network Frequency F since last reset	sec	1	44769	12 A0	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Max. Network Frequency F since last reset	sec	1	44771	12 A2	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Max. THD of Phase to Phase Voltage U12 since last reset	%	0.1	44773	12 A4	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Max. THD of Phase to Phase Voltage U23 since last reset	%	0.1	44775	12 A6	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Max. THD of Phase to Phase Voltage U31 since last reset	%	0.1	44777	12 A8	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Max. THD of Phase to Neutral Voltage V1N since last reset	%	0.1	44779	12 AA	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Max. THD of Phase to Neutral Voltage V2N since last reset	%	0.1	44781	12 AC	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Max. THD of Phase to Neutral Voltage V3N since last reset	%	0.1	44783	12 AE	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B

ANNEX A – Modbus Address Map

Measure

Measurement data on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Max. THD of Phase Current I1 since last reset	%	0.1	44785	12 B0	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Max. THD of Phase Current I2 since last reset	%	0.1	44787	12 B2	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Max. THD of Phase Current I3 since last reset	%	0.1	44789	12 B4	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Max. of [Max. THD between Phase Current I1, I2 and I3] since last reset	%	0.1	44791	12 B6	2	UDINT	03	Example: "12.3%" = Hex 00 00 00 7B
Absolute Active Energy [Eaabs] (Eaabs = EaIn + EaOut) since last reset	Wh	1	44793	12 B8	4	ULINT	03	Example: "1234567890123456Wh" = Hex 00 04 62 D5 3C 8A BA C0
Net Active Energy [Ea] (Ea = EaIn - EaOut) since last reset	Wh	1	44797	12 BC	4	LINT	03	Example: "1234567890123456Wh" = Hex 00 04 62 D5 3C 8A BA C0, "-1234567890123456Wh" = Hex FF FB 9D 2A C3 75 45 40
Direct Active Energy [EaIn] since last reset	Wh	1	44801	12 C0	4	ULINT	03	Example: "1234567890123456Wh" = Hex 00 04 62 D5 3C 8A BA C0
Reverse Active Energy [EaOut] since last reset	Wh	1	44805	12 C4	4	ULINT	03	Example: "1234567890123456Wh" = Hex 00 04 62 D5 3C 8A BA C0
Direct Active Energy [EaIn] non resettable	Wh	1	44809	12 C8	4	ULINT	03	Example: "1234567890123456Wh" = Hex 00 04 62 D5 3C 8A BA C0
Reverse Active Energy [EaOut] non resettable	Wh	1	44813	12 CC	4	ULINT	03	Example: "1234567890123456Wh" = Hex 00 04 62 D5 3C 8A BA C0
Absolute Reactive Energy [Erabs] (Erabs = ErIn + ErOut) since last reset	VArh	1	44817	12 D0	4	ULINT	03	Example: "1234567890123456VArh" = Hex 00 04 62 D5 3C 8A BA C0
Net Reactive Energy [Er] (Er = ErIn - ErOut) since last reset	VArh	1	44821	12 D4	4	LINT	03	Example: "1234567890123456VArh" = Hex 00 04 62 D5 3C 8A BA C0, "-1234567890123456VArh" = Hex FF FB 9D 2A C3 75 45 40
Direct Reactive Energy [ErIn] since last reset	VArh	1	44825	12 D8	4	ULINT	03	Example: "1234567890123456VArh" = Hex 00 04 62 D5 3C 8A BA C0
Reverse Reactive Energy [ErOut] since last reset	VArh	1	44829	12 DC	4	ULINT	03	Example: "1234567890123456VArh" = Hex 00 04 62 D5 3C 8A BA C0
Apparent Energy [Es] since last reset	VAh	1	44833	12 E0	4	ULINT	03	Example: "1234567890123456VAh" = Hex 00 04 62 D5 3C 8A BA C0
Demand Phase Current of Phase1 [I1 Dmd]	A	0.001	44837	12 E4	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Demand Phase Current of Phase2 [I2 Dmd]	A	0.001	44839	12 E6	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Demand Phase Current of Phase3 [I3 Dmd]	A	0.001	44841	12 E8	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Demand Phase Current of PhaseN [IN Dmd]	A	0.001	44843	12 EA	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Demand Calculated average Phase Current of I1, I2, I3 [Iavg Dmd]	A	0.001	44845	12 EC	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Max. Demand Phase Current I1 Dmd since last reset	A	0.001	44847	12 EE	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Max. Demand Phase Current I2 Dmd since last reset	A	0.001	44849	12 F0	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Max. Demand Phase Current I3 Dmd since last reset	A	0.001	44851	12 F2	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Max. Demand Phase Current IN Dmd since last reset	A	0.001	44853	12 F4	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Max. Demand Calculated average Phase Current of I1, I2, I3 (Iavg Dmd) since last reset	A	0.001	44855	12 F6	2	UDINT	03	Example: "123.456A" = Hex 00 01 E2 40
Demand Active power of Phase1 [P1 Dmd]	W	1	44857	12 F8	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Demand Active power of Phase2 [P2 Dmd]	W	1	44859	12 FA	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Demand Active power of Phase3 [P3 Dmd]	W	1	44861	12 FC	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Demand Total Active power [Ptot Dmd]	W	1	44863	12 FE	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Max. Demand Active power P1 Dmd since last reset	W	1	44865	13 00	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Max. Demand Active power P2 Dmd since last reset	W	1	44867	13 02	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0

ANNEX A – Modbus Address Map

Measure
Measurement data on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Max. Demand Active power P3 Dmd since last reset	W	1	44869	13 04	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Max. Demand Total Active power Ptot Dmd since last reset	W	1	44871	13 06	2	DINT	03	Example: "123456W" = Hex 00 01 E2 40, "-123456W" = Hex FF FE 1D C0
Demand Reactive power of Phase1 [Q1 Dmd]	VAr	1	44873	13 08	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Demand Reactive power of Phase2 [Q2 Dmd]	VAr	1	44875	13 0A	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Demand Reactive power of Phase3 [Q3 Dmd]	VAr	1	44877	13 0C	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Demand Total Reactive power [Qtot Dmd]	VAr	1	44879	13 0E	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Max. Demand Reactive power Q1 Dmd since last reset	VAr	1	44881	13 10	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Max. Demand Reactive power Q2 Dmd since last reset	VAr	1	44883	13 12	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Max. Demand Reactive power Q3 Dmd since last reset	VAr	1	44885	13 14	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Max. Demand Total Reactive power Qtot Dmd since last reset	VAr	1	44887	13 16	2	DINT	03	Example: "123456VAr" = Hex 00 01 E2 40, "-123456VAr" = Hex FF FE 1D C0
Demand Apparent power of Phase1 [S1 Dmd]	VA	1	44889	13 18	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Demand Apparent power of Phase2 [S2 Dmd]	VA	1	44891	13 1A	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Demand Apparent power of Phase3 [S3 Dmd]	VA	1	44893	13 1C	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Demand Total Apparent power [Stot Dmd]	VA	1	44895	13 1E	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Max. Demand Apparent power S1 Dmd since last reset	VA	1	44897	13 20	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Max. Demand Apparent power S2 Dmd since last reset	VA	1	44899	13 22	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Max. Demand Apparent power S3 Dmd since last reset	VA	1	44901	13 24	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Max. Demand Total Apparent power Stot Dmd since last reset	VA	1	44903	13 26	2	UDINT	03	Example: "123456VA" = Hex 00 01 E2 40
Operating quadrant	-	1	44905	13 28	1	UINT	03	"Q1" = Hex 00 01, "Q2" = Hex 00 02, "Q3" = Hex 00 03, "Q4" = Hex 00 04
Phase rotation (Phase sequence)	-	1	44906	13 29	1	UINT	03	"1->2->3" = Hex 00 01, "1->3->2" = Hex 00 02
Timestamp OCR (non resetable time) when Reset concerning Current	sec	1	44907	13 2A	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Reset concerning Current	sec	1	44909	13 2C	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp OCR (non resetable time) when Reset concerning Voltage	sec	1	44911	13 2E	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Reset concerning Voltage	sec	1	44913	13 30	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp OCR (non resetable time) when Reset concerning Power	sec	1	44915	13 32	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Reset concerning Power	sec	1	44917	13 34	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp OCR (non resetable time) when Reset concerning Power factor	sec	1	44919	13 36	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Reset concerning Power factor	sec	1	44921	13 38	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp OCR (non resetable time) when Reset concerning THD	sec	1	44923	13 3A	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E

ANNEX A – Modbus Address Map

Measure

Measurement data on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Timestamp user (settable by user) when Reset concerning THD	sec	1	44925	13 3C	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp OCR (non resetable time) when Reset concerning Network Frequency	sec	1	44927	13 3E	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Reset concerning Network Frequency	sec	1	44929	13 40	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp OCR (non resetable time) when Reset concerning Energy	sec	1	44931	13 42	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Reset concerning Energy	sec	1	44933	13 44	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp OCR (non resetable time) when Reset concerning Demand Current	sec	1	44935	13 46	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Reset concerning Demand Current	sec	1	44937	13 48	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp OCR (non resetable time) when Reset concerning Demand Power	sec	1	44939	13 4A	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Timestamp user (settable by user) when Reset concerning Demand Power	sec	1	44941	13 4C	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E

ANNEX A – Modbus Address Map

Indicator
Status and Maintenance indicators about OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
AX switch on Smart Aux status	-	-	45377	15 00	1	UINT	03	"AX contact is opened" = Hex 00 00, "AX contact is closed" = Hex 00 01
AL switch on Smart Aux status	-	-	45378	15 01	1	UINT	03	"AL contact is opened" = Hex 00 00, "AL contact is closed" = Hex 00 01
Absolute AX switch on Smart Aux counter (Non resetable counter)	-	1	45379	15 02	1	UINT	03	Example: "12345" = Hex 30 39
Absolute AL switch on Smart Aux counter (Non resetable counter)	-	1	45380	15 03	1	UINT	03	Example: "12345" = Hex 30 39
AX switch on Smart Aux counter (Resetable counter)	-	1	45381	15 04	1	UINT	03	Example: "12345" = Hex 30 39
AL switch on Smart Aux counter (Resetable counter)	-	1	45382	15 05	1	UINT	03	Example: "12345" = Hex 30 39
Date & Time synchronisation	-	1	45383	15 06	1	UINT	03	"Not synchronised" = Hex 00 00, "Synchronised" = Hex 00 01
Reserved			45384	15 07	2			
Measuring function availability status	-	-	45386	15 09	1	UINT	03	"Not available" = Hex 00 00, "Available" = Hex 00 01
Custom Alarms configuration status	-	-	45387	15 0A	1	UINT	03	Custom Alarms configuration status bit 0 = Custom Alarm 1 bit 1 = Custom Alarm 2 bit 2 = Custom Alarm 3 bit 3 = Custom Alarm 4 bit 4 = Custom Alarm 5 bit 5 = Custom Alarm 6 bit 6 = Custom Alarm 7 bit 7 = Custom Alarm 8 bit 8 = Custom Alarm 9 bit 9 = Custom Alarm 10 bit 10 = Custom Alarm 11 bit 11 = Custom Alarm 12 bit 12-15 = Reserved Alarm is not configured = Value 0 Alarm is configured = Value 1 Example: "Custom Alarms 1 and 2 are configured" = Hex 00 03

ANNEX A – Modbus Address Map

Indicator
Status and Maintenance indicators about OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Custom Alarms status	-	-	45388	15 0B	1	UINT	03	Custom Alarms status bit 0 = Custom Alarm 1 bit 1 = Custom Alarm 2 bit 2 = Custom Alarm 3 bit 3 = Custom Alarm 4 bit 4 = Custom Alarm 5 bit 5 = Custom Alarm 6 bit 6 = Custom Alarm 7 bit 7 = Custom Alarm 8 bit 8 = Custom Alarm 9 bit 9 = Custom Alarm 10 bit 10 = Custom Alarm 11 bit 11 = Custom Alarm 12 bit 12-15 = Reserved Alarm is not activated = Value 0 Alarm is activated = Value 1 Example: "Custom Alarms 1 and 2 are activated" = Hex 00 03
Reserved			45389	15 0C	2			
Protection function availability status	-	-	45391	15 0E	1	UINT	03	Protection function availability status bit 0 = Long time trip (LTD) bit 1 = Short time trip (STD) bit 2 = Instantaneous trip (INST) bit 3 = Ground fault trip (GF) bit 4-15 = Reserved Protection function is not available = Value 0 Protection function is available = Value 1 Example: "LTD&STD&INST&GF protection function are available" = Hex 00 0F
Trip Alarm status	-	-	45392	15 0F	1	UINT	03	"Alarm is not activated" = Hex 00 00, "Alarm is activated" = Hex 00 01
Pre trip Alarm status	-	-	45393	15 10	1	UINT	03	"Alarm is not activated" = Hex 00 00, "Alarm is activated" = Hex 00 01
Pre trip Alarm OUT contact status	-	-	45394	15 11	1	UINT	03	"Contact is opened" = Hex 00 00, "Contact is closed" = Hex 00 01
Optional Alarm status	-	-	45395	15 12	1	UINT	03	"Alarm is not activated" = Hex 00 00, "Alarm is activated" = Hex 00 01
Optional Alarm OUT contact status	-	-	45396	15 13	1	UINT	03	"Contact is opened" = Hex 00 00, "Contact is closed" = Hex 00 01
OCR internal temperature	°C	1	45397	15 14	1	INT	03	Example: "40°C" = Hex 00 28
OCR internal temperature Alarm status	-	-	45398	15 15	1	UINT	03	"Alarm is not activated" = Hex 00 00, "Alarm is activated" = Hex 00 01
Reserved			45399	15 16	8			
Zone interlocking (STD) Input status	-	-	45407	15 1E	1	UINT	03	"No input from downstream breakers" = Hex 00 00, "Input from downstream breakers" = Hex 00 01
Zone interlocking (STD) Output status	-	-	45408	15 1F	1	UINT	03	"No output to upstream breaker" = Hex 00 00, "Output to upstream breaker" = Hex 00 01

ANNEX A – Modbus Address Map

Indicator
Status and Maintenance indicators about OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Zone interlocking (GF) Input status	-	-	45409	15 20	1	UINT	03	"No input from downstream breakers" = Hex 00 00, "Input from downstream breakers" = Hex 00 01
Zone interlocking (GF) Output status	-	-	45410	15 21	1	UINT	03	"No output to upstream breaker" = Hex 00 00, "Output to upstream breaker" = Hex 00 01
Operating time counter	sec	1	45411	15 22	2	UDINT	03	Example: "1234567890sec" = Hex 49 96 02 D2
Reserved			45413	15 24	19			
OCR Error status	-	-	45432	15 37	1	UINT	03	Error status bit 0 = Trip coil disconnection bit 1 = Current sensor Phase 1 disconnection bit 2 = Current sensor Phase 2 disconnection bit 3 = Current sensor Phase 3 disconnection bit 4 = Current sensor Phase neutral disconnection bit 5-15 = Reserved Error is not detected = Value 0 Error is detected = Value 1 Example: "Trip coil disconnection" = Hex 00 01
Reserved			45433	15 38	8			
Time before trip	sec	1	45441	15 40	1	UINT	03	Example: "1234sec" = Hex 04 D2
LTD protection trip counter	-	1	45442	15 41	1	UINT	03	Example: "123" = Hex 00 7B
STD protection trip counter	-	1	45443	15 42	1	UINT	03	Example: "123" = Hex 00 7B
INST protection trip counter	-	1	45444	15 43	1	UINT	03	Example: "123" = Hex 00 7B
GF protection trip counter	-	1	45445	15 44	1	UINT	03	Example: "123" = Hex 00 7B
Test trip counter	-	1	45446	15 45	1	UINT	03	Example: "123" = Hex 00 7B
Pre trip Alarm counter	-	1	45447	15 46	1	UINT	03	Example: "123" = Hex 00 7B
Optional Alarm counter	-	1	45448	15 47	1	UINT	03	Example: "123" = Hex 00 7B
Custom Alarm #1 counter	-	1	45449	15 48	1	UINT	03	Example: "123" = Hex 00 7B
Custom Alarm #2 counter	-	1	45450	15 49	1	UINT	03	Example: "123" = Hex 00 7B
Custom Alarm #3 counter	-	1	45451	15 4A	1	UINT	03	Example: "123" = Hex 00 7B
Custom Alarm #4 counter	-	1	45452	15 4B	1	UINT	03	Example: "123" = Hex 00 7B
Custom Alarm #5 counter	-	1	45453	15 4C	1	UINT	03	Example: "123" = Hex 00 7B
Custom Alarm #6 counter	-	1	45454	15 4D	1	UINT	03	Example: "123" = Hex 00 7B
Custom Alarm #7 counter	-	1	45455	15 4E	1	UINT	03	Example: "123" = Hex 00 7B
Custom Alarm #8 counter	-	1	45456	15 4F	1	UINT	03	Example: "123" = Hex 00 7B
Custom Alarm #9 counter	-	1	45457	15 50	1	UINT	03	Example: "123" = Hex 00 7B
Custom Alarm #10 counter	-	1	45458	15 51	1	UINT	03	Example: "123" = Hex 00 7B
Custom Alarm #11 counter	-	1	45459	15 52	1	UINT	03	Example: "123" = Hex 00 7B
Custom Alarm #12 counter	-	1	45460	15 53	1	UINT	03	Example: "123" = Hex 00 7B
Reserved			45461	15 54	1			
Ready to protect LED (Green) status	-	1	45462	15 55	1	UINT	03	"No power to operate" = Hex 00 00, "Ready to protect" = Hex 00 02
Ready to protect LED (Orange) status	-	1	45463	15 56	1	UINT	03	"Error is not detected" = Hex 00 00, "Error is detected" = Hex 00 01

ANNEX A – Modbus Address Map

Indicator
Status and Maintenance indicators about OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Pre trip Alarm LED status	-	1	45464	15 57	1	UINT	03	"Alarm is not activated" = Hex 00 00, "Current is reached PTA threshold" = Hex 00 01, "Alarm is activated" = Hex 00 02
LTD pick up LED status	-	1	45465	15 58	1	UINT	03	"No pick up" = Hex 00 00, "Current is over 105% Ir" = Hex 00 01, "Current is over 112.5% Ir" = Hex 00 02

ANNEX A – Modbus Address Map

History
Custom Alarms and Trip events logs and Protection settings change logs on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Custom Alarm event log #1 - Custom alarm ID	-	-	45889	17 00	1	UINT	03	Example: "Over current demand I1 (ID number 106)" = Hex 00 6A, Refer to ANNEX B - Custom Alarms
Custom Alarm event log #1 - Timestamp OCR (non resetable time)	sec	1	45890	17 01	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Custom Alarm event log #1 - Timestamp user (settable by user)	sec	1	45892	17 03	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Custom Alarm event log #1 - Event category	-	-	45894	17 05	1	UINT	03	"Alarm cut off" = Hex 00 00, "Alarm rose up" = Hex 00 01
Custom Alarm event log #2 (6 following registers, same as Custom Alarm event log #1)	-	-	45895	17 06	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #3 (6 following registers, same as Custom Alarm event log #1)	-	-	45901	17 0C	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #4 (6 following registers, same as Custom Alarm event log #1)	-	-	45907	17 12	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #5 (6 following registers, same as Custom Alarm event log #1)	-	-	45913	17 18	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #6 (6 following registers, same as Custom Alarm event log #1)	-	-	45919	17 1E	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #7 (6 following registers, same as Custom Alarm event log #1)	-	-	45925	17 24	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #8 (6 following registers, same as Custom Alarm event log #1)	-	-	45931	17 2A	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #9 (6 following registers, same as Custom Alarm event log #1)	-	-	45937	17 30	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #10 (6 following registers, same as Custom Alarm event log #1)	-	-	45943	17 36	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #11 (6 following registers, same as Custom Alarm event log #1)	-	-	45949	17 3C	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #12 (6 following registers, same as Custom Alarm event log #1)	-	-	45955	17 42	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #13 (6 following registers, same as Custom Alarm event log #1)	-	-	45961	17 48	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #14 (6 following registers, same as Custom Alarm event log #1)	-	-	45967	17 4E	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #15 (6 following registers, same as Custom Alarm event log #1)	-	-	45973	17 54	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #16 (6 following registers, same as Custom Alarm event log #1)	-	-	45979	17 5A	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #17 (6 following registers, same as Custom Alarm event log #1)	-	-	45985	17 60	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #18 (6 following registers, same as Custom Alarm event log #1)	-	-	45991	17 66	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #19 (6 following registers, same as Custom Alarm event log #1)	-	-	45997	17 6C	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #20 (6 following registers, same as Custom Alarm event log #1)	-	-	46003	17 72	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #21 (6 following registers, same as Custom Alarm event log #1)	-	-	46009	17 78	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #22 (6 following registers, same as Custom Alarm event log #1)	-	-	46015	17 7E	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #23 (6 following registers, same as Custom Alarm event log #1)	-	-	46021	17 84	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #24 (6 following registers, same as Custom Alarm event log #1)	-	-	46027	17 8A	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #25 (6 following registers, same as Custom Alarm event log #1)	-	-	46033	17 90	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #26 (6 following registers, same as Custom Alarm event log #1)	-	-	46039	17 96	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #27 (6 following registers, same as Custom Alarm event log #1)	-	-	46045	17 9C	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #28 (6 following registers, same as Custom Alarm event log #1)	-	-	46051	17 A2	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #29 (6 following registers, same as Custom Alarm event log #1)	-	-	46057	17 A8	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #30 (6 following registers, same as Custom Alarm event log #1)	-	-	46063	17 AE	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #31 (6 following registers, same as Custom Alarm event log #1)	-	-	46069	17 B4	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #32 (6 following registers, same as Custom Alarm event log #1)	-	-	46075	17 BA	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #33 (6 following registers, same as Custom Alarm event log #1)	-	-	46081	17 C0	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #34 (6 following registers, same as Custom Alarm event log #1)	-	-	46087	17 C6	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #35 (6 following registers, same as Custom Alarm event log #1)	-	-	46093	17 CC	6	UINT	03	Refer to Custom Alarm event log #1

ANNEX A – Modbus Address Map

History
Custom Alarms and Trip events logs and Protection settings change logs on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Custom Alarm event log #36 (6 following registers, same as Custom Alarm event log #1)	-	-	46099	17 D2	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #37 (6 following registers, same as Custom Alarm event log #1)	-	-	46105	17 D8	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #38 (6 following registers, same as Custom Alarm event log #1)	-	-	46111	17 DE	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #39 (6 following registers, same as Custom Alarm event log #1)	-	-	46117	17 E4	6	UINT	03	Refer to Custom Alarm event log #1
Custom Alarm event log #40 (6 following registers, same as Custom Alarm event log #1)	-	-	46123	17 EA	6	UINT	03	Refer to Custom Alarm event log #1
Trip event log #1 - Trip event ID	-	-	46129	17 F0	1	UINT	03	Example: "INST Phase 1 (ID number 10)" = Hex 00 0A, Refer to ANNEX C – Trip Events
Trip event log #1 - Timestamp OCR (non resetable time)	sec	1	46130	17 F1	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Trip event log #1 - Timestamp user (settable by user)	sec	1	46132	17 F3	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Trip event log #1 - Fault duration	sec	1	46134	17 F5	1	UINT	03	Example: "160sec" = Hex 00 00 00 A0
Trip event log #1 - Fault current	A	1	46135	17 F6	1	UINT	03	Example: "20000A" = Hex 4E 20, RMS current in case of LTD, Peak current in other cases, Maximum value is limited 25-45xIn (depends on MCCB frame and In)
Trip event log #2 (7 following registers, same as Trip event log #1)	-	-	46136	17 F7	7	UINT	03	Refer to Trip event log #1
Trip event log #3 (7 following registers, same as Trip event log #1)	-	-	46143	17 FE	7	UINT	03	Refer to Trip event log #1
Trip event log #4 (7 following registers, same as Trip event log #1)	-	-	46150	18 05	7	UINT	03	Refer to Trip event log #1
Trip event log #5 (7 following registers, same as Trip event log #1)	-	-	46157	18 0C	7	UINT	03	Refer to Trip event log #1
Trip event log #6 (7 following registers, same as Trip event log #1)	-	-	46164	18 13	7	UINT	03	Refer to Trip event log #1
Trip event log #7 (7 following registers, same as Trip event log #1)	-	-	46171	18 1A	7	UINT	03	Refer to Trip event log #1
Trip event log #8 (7 following registers, same as Trip event log #1)	-	-	46178	18 21	7	UINT	03	Refer to Trip event log #1
Trip event log #9 (7 following registers, same as Trip event log #1)	-	-	46185	18 28	7	UINT	03	Refer to Trip event log #1
Trip event log #10 (7 following registers, same as Trip event log #1)	-	-	46192	18 2F	7	UINT	03	Refer to Trip event log #1
Last Trip event log - Trip event ID	-	-	46199	18 36	1	UINT	03	Example: "INST Phase 1 (ID number 10)" = Hex 00 0A, Refer to ANNEX C – Trip Events
Last Trip event log - Timestamp OCR (non resetable time)	sec	1	46200	18 37	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Last Trip event log - Timestamp user (settable by user)	sec	1	46202	18 39	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Last Trip event log - Fault duration	sec	1	46204	18 3B	1	UINT	03	Example: "160sec" = Hex 00 00 00 A0
Last Trip event log - Fault current	A	1	46205	18 3C	1	UINT	03	Example: "20000A" = Hex 4E 20, RMS current in case of LTD, Peak current in other cases, Maximum value is limited 25-45xIn (depends on MCCB frame and In)
Ir setting log #1 - Previous Ir setting	A	1	46206	18 3D	1	UINT	03	Example: "160A" = Hex 00 A0
Ir setting log #1 - Timestamp OCR (non resetable time)	sec	1	46207	18 3E	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Ir setting log #1 - Timestamp user (settable by user)	sec	1	46209	18 40	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Ir setting log #2 (5 following registers, same as Ir setting log #1)	-	-	46211	18 42	5	UINT	03	Refer to Ir setting log #1
Ir setting log #3 (5 following registers, same as Ir setting log #1)	-	-	46216	18 47	5	UINT	03	Refer to Ir setting log #1
Ir setting log #4 (5 following registers, same as Ir setting log #1)	-	-	46221	18 4C	5	UINT	03	Refer to Ir setting log #1
Ir setting log #5 (5 following registers, same as Ir setting log #1)	-	-	46226	18 51	5	UINT	03	Refer to Ir setting log #1
tr setting log #1 - Previous tr setting	sec	0.25	46231	18 56	1	UINT	03	Example: "5sec" = Hex 00 14
tr setting log #1 - Timestamp OCR (non resetable time)	sec	1	46232	18 57	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E

ANNEX A – Modbus Address Map

History

Custom Alarms and Trip events logs and Protection settings change logs on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
tr setting log #1 - Timestamp user (settable by user)	sec	1	46234	18 59	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
tr setting log #2 (5 following registers, same as tr setting log #1)	-	-	46236	18 5B	5	UINT	03	Refer to tr setting log #1
tr setting log #3 (5 following registers, same as tr setting log #1)	-	-	46241	18 60	5	UINT	03	Refer to tr setting log #1
tr setting log #4 (5 following registers, same as tr setting log #1)	-	-	46246	18 65	5	UINT	03	Refer to tr setting log #1
tr setting log #5 (5 following registers, same as tr setting log #1)	-	-	46251	18 6A	5	UINT	03	Refer to tr setting log #1
STD setting [disable/enable] log #1 - Previous STD setting [disable/enable] status	-	-	46256	18 6F	1	UINT	03	"Protection disable" = Hex 00 00, "Protection enable" = Hex 00 01
STD setting [disable/enable] log #1 - Timestamp OCR (non resetable time)	sec	1	46257	18 70	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
STD setting [disable/enable] log #1 - Timestamp user (settable by user)	sec	1	46259	18 72	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
STD setting [disable/enable] log #2 (5 following registers, same as STD setting [disable/enable] log #1)	-	-	46261	18 74	5	UINT	03	Refer to STD setting [disable/enable] log #1
STD setting [disable/enable] log #3 (5 following registers, same as STD setting [disable/enable] log #1)	-	-	46266	18 79	5	UINT	03	Refer to STD setting [disable/enable] log #1
STD setting [disable/enable] log #4 (5 following registers, same as STD setting [disable/enable] log #1)	-	-	46271	18 7E	5	UINT	03	Refer to STD setting [disable/enable] log #1
STD setting [disable/enable] log #5 (5 following registers, same as STD setting [disable/enable] log #1)	-	-	46276	18 83	5	UINT	03	Refer to STD setting [disable/enable] log #1
Isd setting log #1 - Previous Isd setting	x Ir	0.5	46281	18 88	1	UINT	03	Example: "10xIr": Hex 00 14
Isd setting log #1 - Timestamp OCR (non resetable time)	sec	1	46282	18 89	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Isd setting log #1 - Timestamp user (settable by user)	sec	1	46284	18 8B	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Isd setting log #2 (5 following registers, same as Isd setting log #1)	-	-	46286	18 8D	5	UINT	03	Refer to Isd setting log #1
Isd setting log #3 (5 following registers, same as Isd setting log #1)	-	-	46291	18 92	5	UINT	03	Refer to Isd setting log #1
Isd setting log #4 (5 following registers, same as Isd setting log #1)	-	-	46296	18 97	5	UINT	03	Refer to Isd setting log #1
Isd setting log #5 (5 following registers, same as Isd setting log #1)	-	-	46301	18 9C	5	UINT	03	Refer to Isd setting log #1
tsd setting log #1 - Previous tsd time delay	-	-	46306	18 A1	1	UINT	03	"50ms" = Hex 00 00, "100ms" = Hex 00 01, "200ms" = Hex 00 02, "300ms" = Hex 00 03, "400ms" = Hex 00 04
tsd setting log #1 - Timestamp OCR (non resetable time)	sec	1	46307	18 A2	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
tsd setting log #1 - Timestamp user (settable by user)	sec	1	46309	18 A4	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
tsd setting log #2 (5 following registers, same as tsd setting log #1)	-	-	46311	18 A6	5	UINT	03	Refer to tsd setting log #1
tsd setting log #3 (5 following registers, same as tsd setting log #1)	-	-	46316	18 AB	5	UINT	03	Refer to tsd setting log #1
tsd setting log #4 (5 following registers, same as tsd setting log #1)	-	-	46321	18 B0	5	UINT	03	Refer to tsd setting log #1
tsd setting log #5 (5 following registers, same as tsd setting log #1)	-	-	46326	18 B5	5	UINT	03	Refer to tsd setting log #1
I2t for STD setting log #1 - Previous I2t for STD setting	-	-	46331	18 BA	1	UINT	03	"Setting disable" = Hex 00 00, "Setting enable" = Hex 00 01
I2t for STD setting log #1 - Timestamp OCR (non resetable time)	sec	1	46332	18 BB	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
I2t for STD setting log #1 - Timestamp user (settable by user)	sec	1	46334	18 BD	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
I2t for STD setting log #2 (5 following registers, same as I2t for STD setting log #1)	-	-	46336	18 BF	5	UINT	03	Refer to I2t for STD setting log #1
I2t for STD setting log #3 (5 following registers, same as I2t for STD setting log #1)	-	-	46341	18 C4	5	UINT	03	Refer to I2t for STD setting log #1
I2t for STD setting log #4 (5 following registers, same as I2t for STD setting log #1)	-	-	46346	18 C9	5	UINT	03	Refer to I2t for STD setting log #1
I2t for STD setting log #5 (5 following registers, same as I2t for STD setting log #1)	-	-	46351	18 CE	5	UINT	03	Refer to I2t for STD setting log #1
Ii setting log #1 - Previous Ii setting	x In	0.5	46356	18 D3	1	UINT	03	Example: "15xIn": Hex 00 1E

ANNEX A – Modbus Address Map

History

Custom Alarms and Trip events logs and Protection settings change logs on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Ii setting log #1 - Timestamp OCR (non resetable time)	sec	1	46357	18 D4	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Ii setting log #1 - Timestamp user (settable by user)	sec	1	46359	18 D6	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Ii setting log #2 (5 following registers, same as Ii setting log #1)	-	-	46361	18 D8	5	UINT	03	Refer to Ii setting log #1
Ii setting log #3 (5 following registers, same as Ii setting log #1)	-	-	46366	18 DD	5	UINT	03	Refer to Ii setting log #1
Ii setting log #4 (5 following registers, same as Ii setting log #1)	-	-	46371	18 E2	5	UINT	03	Refer to Ii setting log #1
Ii setting log #5 (5 following registers, same as Ii setting log #1)	-	-	46376	18 E7	5	UINT	03	Refer to Ii setting log #1
GF setting [disable/enable] log #1 - Previous GF setting [disable/enable] status	-	-	46381	18 EC	1	UINT	03	"Protection disable" = Hex 00 00, "Protection enable" = Hex 00 01
GF setting [disable/enable] log #1 - Timestamp OCR (non resetable time)	sec	1	46382	18 ED	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
GF setting [disable/enable] log #1 - Timestamp user (settable by user)	sec	1	46384	18 EF	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
GF setting [disable/enable] log #2 (5 following registers, same as GF setting [disable/enable] log #1)	-	-	46386	18 F1	5	UINT	03	Refer to GF setting [disable/enable] log #1
GF setting [disable/enable] log #3 (5 following registers, same as GF setting [disable/enable] log #1)	-	-	46391	18 F6	5	UINT	03	Refer to GF setting [disable/enable] log #1
GF setting [disable/enable] log #4 (5 following registers, same as GF setting [disable/enable] log #1)	-	-	46396	18 FB	5	UINT	03	Refer to GF setting [disable/enable] log #1
GF setting [disable/enable] log #5 (5 following registers, same as GF setting [disable/enable] log #1)	-	-	46401	19 00	5	UINT	03	Refer to GF setting [disable/enable] log #1
Ig setting log #1 - Previous Ig setting	x In	0.05	46406	19 05	1	UINT	03	Example: "0.20xIn": Hex 00 04
Ig setting log #1 - Timestamp OCR (non resetable time)	sec	1	46407	19 06	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Ig setting log #1 - Timestamp user (settable by user)	sec	1	46409	19 08	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Ig setting log #2 (5 following registers, same as Ig setting log #1)	-	-	46411	19 0A	5	UINT	03	Refer to Ig setting log #1
Ig setting log #3 (5 following registers, same as Ig setting log #1)	-	-	46416	19 0F	5	UINT	03	Refer to Ig setting log #1
Ig setting log #4 (5 following registers, same as Ig setting log #1)	-	-	46421	19 14	5	UINT	03	Refer to Ig setting log #1
Ig setting log #5 (5 following registers, same as Ig setting log #1)	-	-	46426	19 19	5	UINT	03	Refer to Ig setting log #1
tg setting log #1 - Previous tg time delay	-	-	46431	19 1E	1	UINT	03	"50ms" = Hex 00 00, "100ms" = Hex 00 01, "200ms" = Hex 00 02, "300ms" = Hex 00 03, "400ms" = Hex 00 04, "500ms" = Hex 00 05
tg setting log #1 - Timestamp OCR (non resetable time)	sec	1	46432	19 1F	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
tg setting log #1 - Timestamp user (settable by user)	sec	1	46434	19 21	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
tg setting log #2 (5 following registers, same as tg setting log #1)	-	-	46436	19 23	5	UINT	03	Refer to tg setting log #1
tg setting log #3 (5 following registers, same as tg setting log #1)	-	-	46441	19 28	5	UINT	03	Refer to tg setting log #1
tg setting log #4 (5 following registers, same as tg setting log #1)	-	-	46446	19 2D	5	UINT	03	Refer to tg setting log #1
tg setting log #5 (5 following registers, same as tg setting log #1)	-	-	46451	19 32	5	UINT	03	Refer to tg setting log #1
I2t for GF setting log #1 - Previous I2t for GF setting	-	-	46456	19 37	1	UINT	03	"Setting disable" = Hex 00 00, "Setting enable" = Hex 00 01
I2t for GF setting log #1 - Timestamp OCR (non resetable time)	sec	1	46457	19 38	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
I2t for GF setting log #1 - Timestamp user (settable by user)	sec	1	46459	19 3A	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
I2t for GF setting log #2 (5 following registers, same as I2t for GF setting log #1)	-	-	46461	19 3C	5	UINT	03	Refer to I2t for GF setting log #1
I2t for GF setting log #3 (5 following registers, same as I2t for GF setting log #1)	-	-	46466	19 41	5	UINT	03	Refer to I2t for GF setting log #1
I2t for GF setting log #4 (5 following registers, same as I2t for GF setting log #1)	-	-	46471	19 46	5	UINT	03	Refer to I2t for GF setting log #1
I2t for GF setting log #5 (5 following registers, same as I2t for GF setting log #1)	-	-	46476	19 4B	5	UINT	03	Refer to I2t for GF setting log #1

ANNEX A – Modbus Address Map

History

Custom Alarms and Trip events logs and Protection settings change logs on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
NP setting [disable/enable] log #1 - Previous NP setting [disable/enable] status	-	-	46481	19 50	1	UINT	03	"Protection disable" = Hex 00 00, "Protection enable" = Hex 00 01
NP setting [disable/enable] log #1 - Timestamp OCR (non resetable time)	sec	1	46482	19 51	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
NP setting [disable/enable] log #1 - Timestamp user (settable by user)	sec	1	46484	19 53	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
NP setting [disable/enable] log #2 (5 following registers, same as NP setting [disable/enable] log #1)	-	-	46486	19 55	5	UINT	03	Refer to NP setting [disable/enable] log #1
NP setting [disable/enable] log #3 (5 following registers, same as NP setting [disable/enable] log #1)	-	-	46491	19 5A	5	UINT	03	Refer to NP setting [disable/enable] log #1
NP setting [disable/enable] log #4 (5 following registers, same as NP setting [disable/enable] log #1)	-	-	46496	19 5F	5	UINT	03	Refer to NP setting [disable/enable] log #1
NP setting [disable/enable] log #5 (5 following registers, same as NP setting [disable/enable] log #1)	-	-	46501	19 64	5	UINT	03	Refer to NP setting [disable/enable] log #1
N Coefficient setting log #1 - Previous N Coefficient setting	-	-	46506	19 69	1	UINT	03	"50%xIr" = Hex 00 00, "100%xIr" = Hex 00 01
N Coefficient setting log #1 - Timestamp OCR (non resetable time)	sec	1	46507	19 6A	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
N Coefficient setting log #1 - Timestamp user (settable by user)	sec	1	46509	19 6C	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
N Coefficient setting log #2 (5 following registers, same as N Coefficient setting log #1)	-	-	46511	19 6E	5	UINT	03	Refer to IN setting log #1
N Coefficient setting log #3 (5 following registers, same as N Coefficient setting log #1)	-	-	46516	19 73	5	UINT	03	Refer to IN setting log #1
N Coefficient setting log #4 (5 following registers, same as N Coefficient setting log #1)	-	-	46521	19 78	5	UINT	03	Refer to IN setting log #1
N Coefficient setting log #5 (5 following registers, same as N Coefficient setting log #1)	-	-	46526	19 7D	5	UINT	03	Refer to IN setting log #1
Zone interlocking (STD) setting log #1 - Previous Zone interlocking (STD) setting status	-	-	46531	19 82	1	UINT	03	"Setting disable" = Hex 00 00, "Setting enable" = Hex 00 01
Zone interlocking (STD) setting log #1 - Timestamp OCR (non resetable time)	sec	1	46532	19 83	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Zone interlocking (STD) setting log #1 - Timestamp user (settable by user)	sec	1	46534	19 85	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Zone interlocking (STD) setting log #2 (5 following registers, same as Zone interlocking (STD) setting log #1)	-	-	46536	19 87	5	UINT	03	Refer to Zone interlocking (STD) setting log #1
Zone interlocking (STD) setting log #3 (5 following registers, same as Zone interlocking (STD) setting log #1)	-	-	46541	19 8C	5	UINT	03	Refer to Zone interlocking (STD) setting log #1
Zone interlocking (STD) setting log #4 (5 following registers, same as Zone interlocking (STD) setting log #1)	-	-	46546	19 91	5	UINT	03	Refer to Zone interlocking (STD) setting log #1
Zone interlocking (STD) setting log #5 (5 following registers, same as Zone interlocking (STD) setting log #1)	-	-	46551	19 96	5	UINT	03	Refer to Zone interlocking (STD) setting log #1
Zone interlocking (GF) setting log #1 - Previous Zone interlocking (GF) setting status	-	-	46556	19 9B	1	UINT	03	"Setting disable" = Hex 00 00, "Setting enable" = Hex 00 01
Zone interlocking (GF) setting log #1 - Timestamp OCR (non resetable time)	sec	1	46557	19 9C	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Zone interlocking (GF) setting log #1 - Timestamp user (settable by user)	sec	1	46559	19 9E	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
Zone interlocking (GF) setting log #2 (5 following registers, same as Zone interlocking (GF) setting log #1)	-	-	46561	19 A0	5	UINT	03	Refer to Zone interlocking (GF) setting log #1
Zone interlocking (GF) setting log #3 (5 following registers, same as Zone interlocking (GF) setting log #1)	-	-	46566	19 A5	5	UINT	03	Refer to Zone interlocking (GF) setting log #1
Zone interlocking (GF) setting log #4 (5 following registers, same as Zone interlocking (GF) setting log #1)	-	-	46571	19 AA	5	UINT	03	Refer to Zone interlocking (GF) setting log #1
Zone interlocking (GF) setting log #5 (5 following registers, same as Zone interlocking (GF) setting log #1)	-	-	46576	19 AF	5	UINT	03	Refer to Zone interlocking (GF) setting log #1

ANNEX A – Modbus Address Map

Configuration

Measurements settings, Alarm settings and Protection settings on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
User time	sec	1	46913	1B 00	2	UDINT	03	Example: "12345678sec from 1st January 2000" = Hex 00 BC 61 4E
System phase sequence setting	-	-	46915	1B 02	1	UINT	03	"1->2->3" = Hex 00 00, "1->3->2" = Hex 00 01
System topology setting	-	-	46916	1B 03	1	UINT	03	"3Phase-3Wire system" = Hex 00 01,"3Phase-4Wire system" = Hex 00 02
Power flow direction setting	-	-	46917	1B 04	1	UINT	03	"Normal(ON side to OFF side)" = Hex 00 00, "Reverse(OFF side to ON side)" = Hex 00 01
Calculation formula for Reactive power and Apparent power setting	-	-	46918	1B 05	1	UINT	03	"Arithmetic" = Hex 00 00, "Vector" = Hex 00 01
Power factor sign convention setting	-	-	46919	1B 06	1	UINT	03	"IEEE" = Hex 00 00, "IEC" = Hex 00 01
Duration of Demand window setting	min	1	46920	1B 07	1	UINT	03	Example: "30min" = Hex 00 1E
Demand window mode setting	-	-	46921	1B 08	1	UINT	03	"Fix window" = Hex 00 00, "Sliding window" = Hex 00 01,"Bus synchronisation" = Hex 00 02
Reserved			46922	1B 09	1			
Custom Alarm setting #1 - ID alarm	-	-	46923	1B 0A	1	UINT	03	Example: "Over current demand I1 (ID number 106)" = Hex 00 6A, Refer to ANNEX B - Custom Alarms
Custom Alarm setting #1 - Alarm priority	-	-	46924	1B 0B	1	UINT	03	"No priority" = Hex 00 00, "Low priority" = Hex 00 01, "Medium priority" = Hex 00 02, "High priority" = Hex 00 03
Custom Alarm setting #1 - Pick-up threshold	-	-	46925	1B 0C	1	UINT	03	Example: "160.0A" = Hex 06 40, Refer to ANNEX B - Custom Alarms
Custom Alarm setting #1 - Pick-up time delay	sec	1	46926	1B 0D	1	UINT	03	Example: "1234sec" = Hex 04 D2
Custom Alarm setting #1 - Drop-out threshold	-	-	46927	1B 0E	1	UINT	03	Example: "120.0A" = Hex 04 B0, Refer to ANNEX B - Custom Alarms
Custom Alarm setting #1 - Drop-out time delay	sec	1	46928	1B 0F	1	UINT	03	Example: "1234sec" = Hex 04 D2
Custom Alarm setting #2 (6 following registers, same as Custom Alarm setting #1)	-	-	46929	1B 10	6	UINT	03	Refer to Custom Alarm event setting #1
Custom Alarm setting #3 (6 following registers, same as Custom Alarm setting #1)	-	-	46935	1B 16	6	UINT	03	Refer to Custom Alarm event setting #1
Custom Alarm setting #4 (6 following registers, same as Custom Alarm setting #1)	-	-	46941	1B 1C	6	UINT	03	Refer to Custom Alarm event setting #1
Custom Alarm setting #5 (6 following registers, same as Custom Alarm setting #1)	-	-	46947	1B 22	6	UINT	03	Refer to Custom Alarm event setting #1
Custom Alarm setting #6 (6 following registers, same as Custom Alarm setting #1)	-	-	46953	1B 28	6	UINT	03	Refer to Custom Alarm event setting #1
Custom Alarm setting #7 (6 following registers, same as Custom Alarm setting #1)	-	-	46959	1B 2E	6	UINT	03	Refer to Custom Alarm event setting #1
Custom Alarm setting #8 (6 following registers, same as Custom Alarm setting #1)	-	-	46965	1B 34	6	UINT	03	Refer to Custom Alarm event setting #1
Custom Alarm setting #9 (6 following registers, same as Custom Alarm setting #1)	-	-	46971	1B 3A	6	UINT	03	Refer to Custom Alarm event setting #1
Custom Alarm setting #10 (6 following registers, same as Custom Alarm setting #1)	-	-	46977	1B 40	6	UINT	03	Refer to Custom Alarm event setting #1
Custom Alarm setting #11 (6 following registers, same as Custom Alarm setting #1)	-	-	46983	1B 46	6	UINT	03	Refer to Custom Alarm event setting #1
Custom Alarm setting #12 (6 following registers, same as Custom Alarm setting #1)	-	-	46989	1B 4C	6	UINT	03	Refer to Custom Alarm event setting #1
LTD trip log priority setting	-	-	46995	1B 52	1	UINT	03	"No priority" = Hex 00 00, "Low priority" = Hex 00 01, "Medium priority" = Hex 00 02, "High priority" = Hex 00 03
STD trip log priority setting	-	-	46996	1B 53	1	UINT	03	"No priority" = Hex 00 00, "Low priority" = Hex 00 01, "Medium priority" = Hex 00 02, "High priority" = Hex 00 03

ANNEX A – Modbus Address Map

Configuration

Measurements settings, Alarm settings and Protection settings on OCR

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
INST trip log priority setting	-	-	46997	1B 54	1	UINT	03	"No priority" = Hex 00 00, "Low priority" = Hex 00 01, "Medium priority" = Hex 00 02, "High priority" = Hex 00 03
GF trip log priority setting	-	-	46998	1B 55	1	UINT	03	"No priority" = Hex 00 00, "Low priority" = Hex 00 01, "Medium priority" = Hex 00 02, "High priority" = Hex 00 03
Test trip log priority setting	-	-	46999	1B 56	1	UINT	03	"No priority" = Hex 00 00, "Low priority" = Hex 00 01, "Medium priority" = Hex 00 02, "High priority" = Hex 00 03
Pre trip Alarm Pick-up threshold Ip setting	x Ir	0.01	47000	1B 57	1	UINT	03	Example: "0.8xIr" = Hex 00 50
Pre trip Alarm Time delay tp setting	x tr	0.01	47001	1B 58	1	UINT	03	Example: "0.5xtr" = Hex 00 32
Pre trip Alarm setting [disable/enable]	-	-	47002	1B 59	1	UINT	03	"Alarm disable" = Hex 00 00, "Alarm enable" = Hex 00 01
Optional Alarm contact operation mode setting	-	-	47003	1B 5A	1	UINT	03	"Auto reset mode" = Hex 00 00, "Latching mode" = Hex 00 01
Optional Alarm setting Index setting	-	-	47004	1B 5B	1	UINT	03	Example: "High OCR internal temperature (ID number 1)" = Hex 00 01, Refer to ANNEX D – Optional Alarms
LTD Start mode setting	-	-	47005	1B 5C	1	UINT	03	"Cold start mode" = Hex 00 00, "Hot start mode" = Hex 00 01
LTD Pick-up threshold Ir setting	A	1	47006	1B 5D	1	UINT	03	Example: "160A" = Hex 00 A0
LTD Time delay tr setting	sec	0.25	47007	1B 5E	1	UINT	03	Example: "5sec" = Hex 00 14
STD setting [disable/enable]	-	-	47008	1B 5F	1	UINT	03	"Protection disable" = Hex 00 00, "Protection enable" = Hex 00 01
STD Pick-up threshold Isd setting	x Ir	0.5	47009	1B 60	1	UINT	03	Example: "10xIr": Hex 00 14
STD Time delay tsd setting	-	-	47010	1B 61	1	UINT	03	"50ms" = Hex 00 00, "100ms" = Hex 00 01, "200ms" = Hex 00 02, "300ms" = Hex 00 03, "400ms" = Hex 00 04
I2t for STD setting	-	-	47011	1B 62	1	UINT	03	"Setting disable" = Hex 00 00, "Setting enable" = Hex 00 01
Zone interlocking (ZSI) for STD setting	-	-	47012	1B 63	1	UINT	03	"Setting disable" = Hex 00 00, "Setting enable" = Hex 00 01
INST setting [disable/enable]	-	-	47013	1B 64	1	UINT	03	"Protection disable" = Hex 00 00, "Protection enable" = Hex 00 01
INST Pick-up threshold Ii setting	x In	0.5	47014	1B 65	1	UINT	03	Example: "15xIn": Hex 00 1E
GF setting [disable/enable]	-	-	47015	1B 66	1	UINT	03	"Protection disable" = Hex 00 00, "Protection enable (3P)" = Hex 00 01, "Protection enable (4P)" = Hex 00 02
GF Pick-up threshold Ig setting	x In	0.05	47016	1B 67	1	UINT	03	Example: "0.20xIn": Hex 00 04
GF Time delay tg setting	-	-	47017	1B 68	1	UINT	03	"50ms" = Hex 00 00, "100ms" = Hex 00 01, "200ms" = Hex 00 02, "300ms" = Hex 00 03, "400ms" = Hex 00 04, "500ms" = Hex 00 05
I2t for GF setting	-	-	47018	1B 69	1	UINT	03	"Setting disable" = Hex 00 00, "Setting enable" = Hex 00 01
Zone interlocking (ZSI) for GF setting	-	-	47019	1B 6A	1	UINT	03	"Setting disable" = Hex 00 00, "Setting enable" = Hex 00 01
NP setting [disable/enable]	-	-	47020	1B 6B	1	UINT	03	"Protection disable" = Hex 00 00, "Protection enable" = Hex 00 01
N Coefficient setting	-	-	47021	1B 6C	1	UINT	03	"0.5xIr" = Hex 00 00, "1xIr" = Hex 00 01
External writing authorisation setting	-	-	47022	1B 6D	1	UINT	03	"Access allowed" = Hex 00 00, "Access not allowed" = Hex 00 01
Custom field 1 set by user (32 characters)	-	-	47023	1B 6E	16	STR	03	Example: "TERASAKI": Hex 54 45 52 41 53 41 4B 49 00...
Custom field 2 set by user (32 characters)	-	-	47039	1B 7E	16	STR	03	Example: "TERASAKI": Hex 54 45 52 41 53 41 4B 49 00...

ANNEX A – Modbus Address Map

Communication

Communication registers between TPCM and OCR

Registers for Digital input and output on TPCM

Description	Unit	RES	Address (dec)	Address (hex)	Length (WORD)	Data Type	Function code	Further information
Communication status between Communication module and OCR	-	-	48193	2000	1	UINT	03	"Not connected" = Hex 00 00, "Initializing" = Hex 00 01, "Operating normal but found some error" = Hex 00 02, "Operating without error" = Hex 00 03
Reserved			48194	2001	7			
Number of Modbus communication error	-	-	48201	2008	2	UDINT	03	Example: "1234" = Hex 00 00 04 D2
Number of Digital output contact 1 (count only on Pulse output mode)	-	-	48203	200A	1	UINT	03	Example: "1234" = Hex 04 D2, Available only Module with IO model
Number of Digital output contact 2 (count only on Pulse output mode)	-	-	48204	200B	1	UINT	03	Example: "1234" = Hex 04 D2, Available only Module with IO model
Operating duration counter of Communication module	hours	1	48205	200C	2	UDINT	03	Example: "1234hours" = Hex 00 00 04 D2
Reserved			48207	200E	15			
Modbus configuration of communication module - Address	-	-	48222	201D	1	UINT	03	Example: "1" = Hex 00 01
Modbus configuration of communication module - Baudrate	-	-	48223	201E	2	UDINT	03	Example: "19200bps" = Hex 00 00 4B 00
Modbus configuration of communication module - Stop bits	-	-	48225	2020	1	UINT	03	"1 (Even or Odd parity)" = Hex 00 01, "2 (None parity)" = Hex 00 02
Modbus configuration of communication module - Parity	-	-	48226	2021	1	UINT	03	"Odd" = Hex 00 00, "Even" = Hex 00 01, "None" = Hex 00 02
Reserved			48227	2022	4			
Modbus configuration of communication module - Embedded termination resistor	-	-	48231	2026	1	UINT	03	"Resistor not activated" = Hex 00 00, "Resistor activated" = Hex 00 01
Reserved			48232	2027	1			
Digital input 1 status (24VDC voltage is needed)	-	-	48233	2028	1	UINT	03	"Input not detected" = Hex 00 00, "Input detected" = Hex 00 01, Available only Module with IO model
Digital input 2 status (24VDC voltage is needed)	-	-	48234	2029	1	UINT	03	"Input not detected" = Hex 00 00, "Input detected" = Hex 00 01, Available only Module with IO model
Reserved			48235	202A	1			
OCR data Refresh time	ms	1	48236	202B	1	UINT	03	Example: "1234milliseconds" = Hex 04 D2
Reserved			48237	202A	84			
Configuration of Digital output contact 1 mode	-	-	48321	2080	1	UINT	03 / 06 / 16	"Continuous output mode" = Hex 00 00, "Pulse output mode" = Hex 00 01
Configuration of Digital output contact 2 mode	-	-	48322	2081	1	UINT	03 / 06 / 16	"Continuous output mode" = Hex 00 00, "Pulse output mode" = Hex 00 01
Digital output contact 1 operation	-	-	48323	2082	1	UINT	03 / 06 / 16	In case of Continuous output mode "Contact not activated" = Hex 00 00, "Contact activated continuously" = other than Hex 00 00 In case of Pulse output mode Example: "Contact activate 1234milliseconds" = Hex 04 D2
Digital output contact 2 operation	-	-	48324	2083	1	UINT	03 / 06 / 16	In case of Continuous output mode "Contact not activated" = Hex 00 00, "Contact activated continuously" = other than Hex 00 00 In case of Pulse output mode Example: "Contact activate 1234milliseconds" = Hex 04 D2

ANNEX B – Custom Alarms

ID	Name	Pick-up or Drop-out threshold value				Pick-up or Drop-out time delay value				Remark
		Format	Resolution	Min. value	Max. value	Format	Resolution	Min. value	Max. value	
0	No assignment	-	-	-	-	-	-	-	-	
1	Over Instantaneous Current [I1]	A	0.1	8	6300	sec	1	1	3000	
2	Over Instantaneous Current [I2]	A	0.1	8	6300	sec	1	1	3000	
3	Over Instantaneous Current [I3]	A	0.1	8	6300	sec	1	1	3000	
4	Over Instantaneous Current [IN]	A	0.1	8	6300	sec	1	1	3000	Only available for 3Phase-4Wire system
5	Over Instantaneous Current [Imax]	A	0.1	8	6300	sec	1	1	3000	
6	Under Instantaneous Current [I1]	A	0.1	8	6300	sec	1	1	3000	
7	Under Instantaneous Current [I2]	A	0.1	8	6300	sec	1	1	3000	
8	Under Instantaneous Current [I3]	A	0.1	8	6300	sec	1	1	3000	
9	Under Instantaneous Current [IN]	A	0.1	8	6300	sec	1	1	3000	Only available for 3Phase-4Wire system
10	Ground Current	x Ig	0.01	0.1	1	sec	1	1	3000	
11	Over Unbalance Current [I1]	x Iavg	0.1%	5%	60%	sec	1	1	3000	
12	Over Unbalance Current [I2]	x Iavg	0.1%	5%	60%	sec	1	1	3000	
13	Over Unbalance Current [I3]	x Iavg	0.1%	5%	60%	sec	1	1	3000	
14	Over Unbalance Current [Imax Unb]	x Iavg	0.1%	5%	60%	sec	1	1	3000	
15	Over Average Current [Iavg]	A	0.1	8	6300	sec	1	1	3000	
16	Under Average Current [Iavg]	A	0.1	8	6300	sec	1	1	3000	
17	Over Instantaneous Voltage [V1N]	V	0.1	80	800	sec	1	1	3000	Only available for 3Phase-4Wire system
18	Over Instantaneous Voltage [V2N]	V	0.1	80	800	sec	1	1	3000	Only available for 3Phase-4Wire system
19	Over Instantaneous Voltage [V3N]	V	0.1	80	800	sec	1	1	3000	Only available for 3Phase-4Wire system
20	Over Instantaneous Voltage [Vmax]	V	0.1	80	800	sec	1	1	3000	Only available for 3Phase-4Wire system
21	Under Instantaneous Voltage [V1N]	V	0.1	80	800	sec	1	1	3000	Only available for 3Phase-4Wire system
22	Under Instantaneous Voltage [V2N]	V	0.1	80	800	sec	1	1	3000	Only available for 3Phase-4Wire system
23	Under Instantaneous Voltage [V3N]	V	0.1	80	800	sec	1	1	3000	Only available for 3Phase-4Wire system
24	Under Instantaneous Voltage [Vmin]	V	0.1	80	800	sec	1	1	3000	Only available for 3Phase-4Wire system
25	Over Unbalance Voltage [V1N]	x Vavg	0.1%	2%	30%	sec	1	1	3000	Only available for 3Phase-4Wire system
26	Over Unbalance Voltage [V2N]	x Vavg	0.1%	2%	30%	sec	1	1	3000	Only available for 3Phase-4Wire system
27	Over Unbalance Voltage [V3N]	x Vavg	0.1%	2%	30%	sec	1	1	3000	Only available for 3Phase-4Wire system
28	Over Unbalance Voltage [Vmax Unb]	x Vavg	0.1%	2%	30%	sec	1	1	3000	Only available for 3Phase-4Wire system
29	Over Average Voltage [Vavg]	V	0.1	80	800	sec	1	1	3000	Only available for 3Phase-4Wire system
30	Under Average Voltage [Vavg]	V	0.1	80	800	sec	1	1	3000	Only available for 3Phase-4Wire system
31	Over Instantaneous Voltage [U12]	V	0.1	80	800	sec	1	1	3000	
32	Over Instantaneous Voltage [U23]	V	0.1	80	800	sec	1	1	3000	
33	Over Instantaneous Voltage [U31]	V	0.1	80	800	sec	1	1	3000	
34	Over Instantaneous Voltage [Umax]	V	0.1	80	800	sec	1	1	3000	
35	Under Instantaneous Voltage [U12]	V	0.1	80	800	sec	1	1	3000	
36	Under Instantaneous Voltage [U23]	V	0.1	80	800	sec	1	1	3000	
37	Under Instantaneous Voltage [U31]	V	0.1	80	800	sec	1	1	3000	
38	Under Instantaneous Voltage [Umin]	V	0.1	80	800	sec	1	1	3000	
39	Over Unbalance Voltage [U12]	x Uavg	0.1%	2%	30%	sec	1	1	3000	
40	Over Unbalance Voltage [U23]	x Uavg	0.1%	2%	30%	sec	1	1	3000	
41	Over Unbalance Voltage [U31]	x Uavg	0.1%	2%	30%	sec	1	1	3000	

ANNEX B – Custom Alarms

ID	Name	Pick-up or Drop-out threshold value				Pick-up or Drop-out time delay value				Remark
		Unit	Resolution	Min. value	Max. value	Unit	Resolution	Min. value	Max. value	
42	Over Unbalance Voltage [Umax Unb]	x Uavg	0.1%	2%	30%	sec	1	1	3000	
43	Over Direct Active power [P1] (Positive component of P1)	kW	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
44	Over Direct Active power [P2] (Positive component of P2)	kW	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
45	Over Direct Active power [P3] (Positive component of P3)	kW	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
46	Over Direct Active power [Ptot] (Positive component of Ptot)	kW	0.1	1	3000	sec	1	1	3000	
47	Under Direct Active power [P1] (Positive component of P1)	kW	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
48	Under Direct Active power [P2] (Positive component of P2)	kW	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
49	Under Direct Active power [P3] (Positive component of P3)	kW	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
50	Under Direct Active power [Ptot] (Positive component of Ptot)	kW	0.1	1	3000	sec	1	1	3000	
51	Over Return Active power [P1] (Negative component of P1)	kW	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
52	Over Return Active power [P2] (Negative component of P2)	kW	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
53	Over Return Active power [P3] (Negative component of P3)	kW	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
54	Over Return Active power [Ptot] (Negative component of Ptot)	kW	0.1	1	3000	sec	1	1	3000	
55	Under Return Active power [P1] (Negative component of P1)	kW	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
56	Under Return Active power [P2] (Negative component of P2)	kW	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
57	Under Return Active power [P3] (Negative component of P3)	kW	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
58	Under Return Active power [Ptot] (Negative component of Ptot)	kW	0.1	1	3000	sec	1	1	3000	
59	Over Direct Reactive power [Q1] (Positive component of Q1)	kVAr	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
60	Over Direct Reactive power [Q2] (Positive component of Q2)	kVAr	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
61	Over Direct Reactive power [Q3] (Positive component of Q3)	kVAr	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
62	Over Direct Reactive power [Qtot] (Positive component of Qtot)	kVAr	0.1	1	3000	sec	1	1	3000	
63	Under Direct Reactive power [Q1] (Positive component of Q1)	kVAr	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
64	Under Direct Reactive power [Q2] (Positive component of Q2)	kVAr	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
65	Under Direct Reactive power [Q3] (Positive component of Q3)	kVAr	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
66	Under Direct Reactive power [Qtot] (Positive component of Qtot)	kVAr	0.1	1	3000	sec	1	1	3000	
67	Over Return Reactive power [Q1] (Negative component of Q1)	kVAr	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
68	Over Return Reactive power [Q2] (Negative component of Q2)	kVAr	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
69	Over Return Reactive power [Q3] (Negative component of Q3)	kVAr	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
70	Over Return Reactive power [Qtot] (Negative component of Qtot)	kVAr	0.1	1	3000	sec	1	1	3000	
71	Under Return Reactive power [Q1] (Negative component of Q1)	kVAr	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
72	Under Return Reactive power [Q2] (Negative component of Q2)	kVAr	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
73	Under Return Reactive power [Q3] (Negative component of Q3)	kVAr	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
74	Under Return Reactive power [Qtot] (Negative component of Qtot)	kVAr	0.1	1	3000	sec	1	1	3000	
75	Over Apparent power [S1]	kVA	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
76	Over Apparent power [S2]	kVA	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
77	Over Apparent power [S3]	kVA	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
78	Over Apparent power [Stot]	kVA	0.1	1	3000	sec	1	1	3000	
79	Under Apparent power [S1]	kVA	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
80	Under Apparent power [S2]	kVA	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
81	Under Apparent power [S3]	kVA	0.1	1	1000	sec	1	1	3000	Only available for 3Phase-4Wire system
82	Under Apparent power [Stot]	kVA	0.1	1	3000	sec	1	1	3000	
83	Lagging power factor [PF1] (Negative in IEEE)	-	0.01	0	0.99	sec	1	1	3000	Only available for 3Phase-4Wire system

ANNEX B – Custom Alarms

ID	Name	Pick-up or Drop-out threshold value				Pick-up or Drop-out time delay value				Remark
		Unit	Resolution	Min. value	Max. value	Unit	Resolution	Min. value	Max. value	
84	Lagging power factor [PF2] (Negative in IEEE)	-	0.01	0	0.99	sec	1	1	3000	Only available for 3Phase-4Wire system
85	Lagging power factor [PF3] (Negative in IEEE)	-	0.01	0	0.99	sec	1	1	3000	Only available for 3Phase-4Wire system
86	Lagging power factor [PFtot] (Negative in IEEE)	-	0.01	0	0.99	sec	1	1	3000	
87	Leading displacement power factor [Cosφ1] (Positive in IEEE)	-	0.01	0	0.99	sec	1	1	3000	Only available for 3Phase-4Wire system
88	Leading displacement power factor [Cosφ2] (Positive in IEEE)	-	0.01	0	0.99	sec	1	1	3000	Only available for 3Phase-4Wire system
89	Leading displacement power factor [Cosφ3] (Positive in IEEE)	-	0.01	0	0.99	sec	1	1	3000	Only available for 3Phase-4Wire system
90	Leading displacement power factor [Cosφtot] (Positive in IEEE)	-	0.01	0	0.99	sec	1	1	3000	
91	Lagging displacement power factor [Cosφ1] (Negative in IEEE)	-	0.01	0	0.99	sec	1	1	3000	Only available for 3Phase-4Wire system
92	Lagging displacement power factor [Cosφ2] (Negative in IEEE)	-	0.01	0	0.99	sec	1	1	3000	Only available for 3Phase-4Wire system
93	Lagging displacement power factor [Cosφ3] (Negative in IEEE)	-	0.01	0	0.99	sec	1	1	3000	Only available for 3Phase-4Wire system
94	Lagging displacement power factor [Cosφtot] (Negative in IEEE)	-	0.01	0	0.99	sec	1	1	3000	
95	Over THD Current [THDI1]	-	0.1%	0%	1000%	sec	1	1	3000	
96	Over THD Current [THDI2]	-	0.1%	0%	1000%	sec	1	1	3000	
97	Over THD Current [THDI3]	-	0.1%	0%	1000%	sec	1	1	3000	
98	Over THD Voltage [THDV1N]	-	0.1%	0%	1000%	sec	1	1	3000	Only available for 3Phase-4Wire system
99	Over THD Voltage [THDV2N]	-	0.1%	0%	1000%	sec	1	1	3000	Only available for 3Phase-4Wire system
100	Over THD Voltage [THDV3N]	-	0.1%	0%	1000%	sec	1	1	3000	Only available for 3Phase-4Wire system
101	Over THD Voltage [THDU12]	-	0.1%	0%	1000%	sec	1	1	3000	
102	Over THD Voltage [THDU23]	-	0.1%	0%	1000%	sec	1	1	3000	
103	Over THD Voltage [THDU31]	-	0.1%	0%	1000%	sec	1	1	3000	
104	Over frequency [F]	Hz	0.01	45	65	sec	1	1	3000	
105	Under frequency [F]	Hz	0.01	45	65	sec	1	1	3000	
106	Over Current demand [I1 Dmd]	A	0.1	8	6300	sec	1	1	3000	
107	Over Current demand [I2 Dmd]	A	0.1	8	6300	sec	1	1	3000	
108	Over Current demand [I3 Dmd]	A	0.1	8	6300	sec	1	1	3000	
109	Over Current demand [IN Dmd]	A	0.1	8	6300	sec	1	1	3000	Only available for 3Phase-4Wire system
110	Over Current demand [Iavg Dmd]	A	0.1	8	6300	sec	1	1	3000	
111	Under Current demand [I1 Dmd]	A	0.1	8	6300	sec	1	1	3000	
112	Under Current demand [I2 Dmd]	A	0.1	8	6300	sec	1	1	3000	
113	Under Current demand [I3 Dmd]	A	0.1	8	6300	sec	1	1	3000	
114	Under Current demand [IN Dmd]	A	0.1	8	6300	sec	1	1	3000	Only available for 3Phase-4Wire system
115	Under Current demand [Iavg Dmd]	A	0.1	8	6300	sec	1	1	3000	
116	Over Active power demand [Ptot Dmd]	kW	0.1	1	3000	sec	1	1	3000	
117	Under Active power demand [Ptot Dmd]	kW	0.1	1	3000	sec	1	1	3000	
118	Over Reactive power demand [Qtot Dmd]	kVAr	0.1	1	3000	sec	1	1	3000	
119	Under Reactive power demand [Qtot Dmd]	kVAr	0.1	1	3000	sec	1	1	3000	
120	Over apparent power demand [Stot Dmd]	kVA	0.1	1	3000	sec	1	1	3000	
121	Under apparent power demand [Stot Dmd]	kVA	0.1	1	3000	sec	1	1	3000	
122	Operating quadrant 1 (P>0, Q>0)	-	-	1	1	sec	1	1	3000	
123	Operating quadrant 2 (P<0, Q>0)	-	-	2	2	sec	1	1	3000	
124	Operating quadrant 3 (P<0, Q<0)	-	-	3	3	sec	1	1	3000	
125	Operating quadrant 4 (P>0, Q<0)	-	-	4	4	sec	1	1	3000	

ANNEX B – Custom Alarms

ID	Name	Pick-up or Drop-out threshold value				Pick-up or Drop-out time delay value				Remark
		Unit	Resolution	Min. value	Max. value	Unit	Resolution	Min. value	Max. value	
126	Phase sequence 1->2->3	-	-	0	0	sec	1	1	3000	
127	Phase sequence 1->3->2	-	-	1	1	sec	1	1	3000	
128	Operating quadrant 2 or 4 (Capacitive)	-	-	0	0	sec	1	1	3000	
129	Operating quadrant 1 or 3 (Inductive)	-	-	1	1	sec	1	1	3000	
130	Leading Power factor [PF1] (Positive in IEEE)	-	0.01	0	0.99	sec	1	1	3000	Only available for 3Phase-4Wire system
131	Leading Power factor [PF2] (Positive in IEEE)	-	0.01	0	0.99	sec	1	1	3000	Only available for 3Phase-4Wire system
132	Leading Power factor [PF3] (Positive in IEEE)	-	0.01	0	0.99	sec	1	1	3000	Only available for 3Phase-4Wire system
133	Leading Power factor [PFtot] (Positive in IEEE)	-	0.01	0	0.99	sec	1	1	3000	

ANNEX C – Trip Events

ID	Name	Remark
0	No log	
1	LTD trip on Phase1	
2	LTD trip on Phase2	
3	LTD trip on Phase3	
4	LTD trip on Neutral phase	3Ph+N only
5	STD trip on Phase1	
6	STD trip on Phase2	
7	STD trip on Phase3	
8	STD trip on Neutral phase	3Ph+N only
9	GF trip	
10	INST trip on Phase1	
11	INST trip on Phase2	
12	INST trip on Phase3	
13	INST trip on Neutral phase	3Ph+N only

ANNEX D – Optional Alarms

ID	Name	Remark
0	None	
1	High OCR internal temperature	
2	Neutral monitoring wire disconnection (Overvoltage protection according to EN50550)	Only available for 3Phase-4Wire system
3	OCR self-test failure	
4	Reserved	
5	PTA (Pre trip Alarm)	
6	Custom Alarm 1	
7	Custom Alarm 2	
8	Custom Alarm 3	
9	Custom Alarm 4	
10	Custom Alarm 5	
11	Custom Alarm 6	
12	Custom Alarm 7	
13	Custom Alarm 8	
14	Custom Alarm 9	
15	Custom Alarm 10	
16	Custom Alarm 11	
17	Custom Alarm 12	

ANNEX E – Writing Command List

Security Level 0
No password required.

[Command ID: 1] User time settings

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 01	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 04	UINT	-	-	-	-
48742	22 25	2	Date/time	Time from 1st January 2000 (31557600 seconds per year)	UDINT	0 (1st Jan 2000 00:00:00)	4294967295 (6th Feb 2156, 06:28:15)	1	sec

Example: Set user time to "27th Jul 2020, 09:25:20 (649157142 sec)" = Hex 26 B1 5A 16
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Data (hex)	02	10	22	21	00	06	0C	AA	BB	CC	DD	00	01	00	04	26	B1	5A	16	C7	19
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		Data (22 26)		CRC	
								Token				Command ID 1		Length of parameter		Date/time					

[Command ID: 2] Custom field 1 setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 02	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 20	UINT	-	-	-	-
48742	22 25	16	Custom field 1 set by user	Any strings (32characters in ASCII code, Unused char must be filled with null 0x00)	STR	-	-	-	Char.

Example: Set Custom field 1 to "TemCom PRO"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26 … 47		48	49
Data (hex)	02	10	22	21	00	14	28	AA	BB	CC	DD	00	02	00	20	54	65	6D	43	6F	6D	20	50	52	4F	00	00	51	06
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		Data (22 26)		Data (22 27)		Data (22 28)		Data (22 29)		Data (22 2A … 20 34)		CRC	
								Token				Command ID 2		Length of parameter		'T'	'e'	'm'	'C'	'o'	'm'	' '	'P'	'R'	'O'	null			

ANNEX E – Writing Command List

Security Level 0
No password required.

[Command ID: 3] Custom field 2 setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 02	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 20	UINT	-	-	-	-
48742	22 25	16	Custom field 2 set by user	Any strings (32characters in ASCII code, Unused char must be filled with null 0x00)	STR	-	-	-	Char.

Example: Set Custom field 2 to “TemCom PRO”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26 … 47		48	49
Data (hex)	02	10	22	21	00	14	28	AA	BB	CC	DD	00	03	00	20	54	65	6D	43	6F	6D	20	50	52	4F	00	00	7D	C6
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		Data (22 26)		Data (22 27)		Data (22 28)		Data (22 29)		Data (22 2A … 20 34)		CRC	
								Token				Command ID 3		Length of parameter		‘T’	‘e’	‘m’	‘C’	‘o’	‘m’	‘ ‘	‘P’	‘R’	‘O’	null			

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 101] System phase sequence setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 65	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	System phase sequence	"1,2,3" = Hex 00 00 "1,3,2" = Hex 00 01	UINT	0	1	1	-

Example: Set System phase sequence to "1,2,3"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	65	00	02	00	00	FE	A5
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 101		Length of parameter		"1,2,3"			

[Command ID: 102] System topology setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 66	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	System topology	"3Phase-3Wire system" = Hex 00 01 "3Phase-4Wire system" = Hex 00 02	UINT	1	2	1	-

Example: Set System topology to "3Phase-3Wire system"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	66	00	02	00	01	7B	65
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 102		Length of parameter		"3Phase-3Wire system"			

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 103] Power flow direction setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 67	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Power flow direction	"Forward/normal (ON side to OFF side)" = Hex 00 00 "Reverse (OFF side to ON side)" = Hex 00 01	UINT	0	1	1	-

Example: Set Power flow direction to “Forward/normal”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	67	00	02	00	00	87	65
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 103		Length of parameter		“Forward/normal”			

[Command ID: 104] Calculation formula for Reactive and Apparent power setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 68	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Calculation formula	"Arithmetic" = Hex 00 00 "Vector" = Hex 00 01	UINT	0	1	1	-

Example: Set Calculation formula to “Arithmetic”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	68	00	02	00	00	D3	64
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 104		Length of parameter		“Arithmetic”			

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 105] Power factor sign convention setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 69	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Convention	"IEEE" = Hex 00 00 "IEC" = Hex 00 01	UINT	0	1	1	-

Example: Set Convention to “IEEE”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	69	00	02	00	00	EE	A4
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 105		Length of parameter		“IEEE”			

[Command ID: 106] Demand setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 6A	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 04	UINT	-	-	-	-
48742	22 25	1	Duration	Demand duration (minutes)	UINT	5	60	1	Min
48743	22 26	1	Mode	"Fix window" = Hex 00 00 "Sliding window" = Hex 00 01 "Bus synchronisation" = Hex 00 02	UINT	0	2	1	-

Example: Set Demand setting to "60 min, Sliding window”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Data (hex)	02	10	22	21	00	06	0C	AA	BB	CC	DD	00	6A	00	04	00	3C	00	01	FC	12
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		Data (22 26)		CRC	
								Token				Command ID 106		Length of parameter		“60 min”		“Sliding window”			

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 107] Custom Alarm setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 6B	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 0E	UINT	-	-	-	-
48742	22 25	1	Slot	Custom Alarm slot number	UINT	1	12	1	-
48743	22 26	1	Alarm ID	Refer to ANNEX B - Custom Alarms	UINT	-	-	1	-
48738	22 27	1	Alarm priority	"No priority" = Hex 00 00 "Low priority" = Hex 00 01 "Medium priority" = Hex 00 02 "High priority" = Hex 00 03	UINT	0	3	1	
48739	22 28	1	Pick-up threshold	Refer to ANNEX B - Custom Alarms	UINT	-	-	-	-
48740	22 29	1	Pick-up time delay		UINT	-	-	-	-
48741	22 2A	1	Drop-out threshold		UINT	-	-	-	-
48742	22 2B	1	Drop-out time delay		UINT	1	12	1	-

Example: Set "Custom alarm #7, 105 Under Frequency, high priority, pickup 45Hz 1s delay, dropout 55Hz 10s delay"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Data (hex)	02	10	22	21	00	0B	16	AA	BB	CC	DD	00	6B	00	0E	00	07	00	69	00	03	11	94	00	01	15	7C	00	0A	C7	42
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		Data (22 26)		Data (22 27)		Data (22 28)		Data (22 29)		Data (22 2A)		Data (22 2B)		CRC	
								Token				Command ID 107		Length of parameter		Slot 7		Alarm ID 105		High priority		Pickup 45Hz		Delay 1s		Dropout 55Hz		Delay 10s			

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 108] LTD trip log priority setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 6C	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Alarm priority	"No priority" = Hex 00 00 "Low priority" = Hex 00 01 "Medium priority" = Hex 00 02 "High priority" = Hex 00 03	UINT	0	3	1	

Example: Set Alarm priority to "High priority"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	6C	00	02	00	03	62	A5
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 108		Length of parameter		"High priority"			

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 109] STD trip log priority setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 6D	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Alarm priority	"No priority" = Hex 00 00 "Low priority" = Hex 00 01 "Medium priority" = Hex 00 02 "High priority" = Hex 00 03	UINT	0	3	1	

Example: Set Alarm priority to "High priority"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	6D	00	02	00	03	5F	65
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 109		Length of parameter		"High priority"			

[Command ID: 110] INST trip log priority setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 6E	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Alarm priority	"No priority" = Hex 00 00 "Low priority" = Hex 00 01 "Medium priority" = Hex 00 02 "High priority" = Hex 00 03	UINT	0	3	1	

Example: Set Alarm priority to "High priority"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	6E	00	02	00	03	1B	65
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 110		Length of parameter		"High priority"			

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 111] GF trip log priority setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 6F	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Alarm priority	"No priority" = Hex 00 00 "Low priority" = Hex 00 01 "Medium priority" = Hex 00 02 "High priority" = Hex 00 03	UINT	0	3	1	

Example: Set Alarm priority to "High priority"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	6F	00	02	00	03	26	A5
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 111		Length of parameter		"High priority"			

[Command ID: 112] Test trip log priority setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 70	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Alarm priority	"No priority" = Hex 00 00 "Low priority" = Hex 00 01 "Medium priority" = Hex 00 02 "High priority" = Hex 00 03	UINT	0	3	1	

Example: Set Alarm priority to "High priority"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	70	00	02	00	03	B3	67
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 112		Length of parameter		"High priority"			

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 113] Pre trip Alarm Pick-up threshold I_p setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 71	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Pick-up threshold	Multiple of I_r (increments of 5%)	UINT	0.60	0.95	0.01	x I_r

Example: Set pick-up threshold to "0.8x I_r"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	71	00	02	00	50	CE	9A
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 113		Length of parameter		"0.8x I_r"			

[Command ID: 114] Pre trip Alarm Time-delay t_p setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 72	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Pick-up time-delay	Multiple of t_r (increments of 5%)	UINT	0.05	0.80	0.01	x t_r

Example: Set pick-up time-delay to "0.5x t_r"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	72	00	02	00	32	0B	73
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 114		Length of parameter		"0.5x t_r"			

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 115] Pre trip Alarm setting (disable/enable)

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 73	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Status	"Alarm disable" = Hex 00 00 "Alarm enable" = Hex 00 01	UINT	0	1	1	-

Example: Set Status to “Alarm enable”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	73	00	02	00	01	76	A6
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 115		Length of parameter		"Alarm enable"			

[Command ID: 116] Optional Alarm contact operation mode setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 74	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Mode	"Auto reset mode" = Hex 00 00 "Latching mode" = Hex 00 01	UINT	0	1	1	-

Example: Set Mode to "Auto reset mode”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	74	00	02	00	00	02	A6
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 116		Length of parameter		"Auto reset mode”			

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 117] Optional Alarm assignment setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 75	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Alarm ID	Refer to ANNEX D – Optional Alarms	UINT	0	1	1	-

Example: Set "Optional Alarm #1 High OCR internal temperature"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	75	00	02	00	01	FE	A6
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 117		Length of parameter		Optional Alarm #1			

[Command ID: 118] Reset Pre trip Alarm counter

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 76	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Reset counter"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	76	00	00	00	00	DA	A6
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 118		"Reset"					

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 119] Reset Optional Alarm counter

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 77	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Reset counter"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	77	00	00	00	00	E7	66
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 119		"Reset"					

[Command ID: 120] Reset Custom Alarm counter

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 78	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Reset counter"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	78	00	00	00	00	B3	67
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 120		"Reset"					

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 121] Reset AX and AL on Smart Aux counter

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 79	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Reset counter"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	79	00	00	00	00	8E	A7
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 121		"Reset"					

[Command ID: 122] Erase Logs of Trip events with No priority

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 7A	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Erase logs"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	7A	00	00	00	00	CA	A7
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 122		"Erase"					

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 123] Erase Logs of Trip events with Low priority

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 7B	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Erase logs"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	7B	00	00	00	00	F7	67
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 123		"Erase"					

[Command ID: 124] Erase Logs of Trip events with Medium priority

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 7C	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Erase logs"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	7C	00	00	00	00	42	A7
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 124		"Erase"					

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 125] Erase Logs of Trip events with High priority

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 7D	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Erase logs"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	7D	00	00	00	00	7F	67
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 125		"Erase"					

[Command ID: 126] Erase Logs of Trip events with All priorities

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 7E	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Erase logs"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	7E	00	00	00	00	3B	67
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 126		"Erase"					

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 127] Erase Logs of Alarm events with No priority

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 7F	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Erase logs"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	7F	00	00	00	00	06	A7
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 127		"Erase"					

[Command ID: 128] Erase Logs of Alarm events with Low priority

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 80	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Erase logs"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	80	00	00	00	00	12	B3
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 128		"Erase"					

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 129] Erase Logs of Alarm events with Medium priority

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 81	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Erase logs"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	81	00	00	00	00	2F	73
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 129		"Erase"					

[Command ID: 130] Erase Logs of Alarm events with High priority

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 82	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Erase logs"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	82	00	00	00	00	6B	73
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 130		"Erase"					

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 131] Erase Logs of Alarm events with All priorities

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 83	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Erase logs"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	83	00	00	00	00	56	B3
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 131		"Erase"					

[Command ID: 132] Trigger signal of Bus synchronisation Demand mode

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 84	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Trigger signal"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	84	00	00	00	00	E3	73
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 132		"Trigger signal"					

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 133] Reset Max. and Min. values of Current measurement

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 85	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Reset values"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	85	00	00	00	00	DE	B3
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 133		"Reset values"					

[Command ID: 134] Reset Max. and Min. values of Voltage measurement

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 86	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Reset values"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	86	00	00	00	00	9A	B3
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 134		"Reset values"					

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 135] Reset Max. and Min. values of Power measurement

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 87	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Reset values"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	87	00	00	00	00	A7	73
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 135		"Reset values"					

[Command ID: 136] Reset Max. and Min. values of Power factor measurement

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 88	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Reset values"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	88	00	00	00	00	F3	72
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 136		"Reset values"					

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 137] Reset Max. and Min. values of THD measurement

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 89	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Reset values"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	89	00	00	00	00	CE	B2
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 137		"Reset values"					

[Command ID: 138] Reset Max. and Min. values of Frequency measurement

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 8A	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Reset values"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	8A	00	00	00	00	8A	B2
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 138		"Reset values"					

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 139] Reset partial Energy counters

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 8B	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Reset values"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	8B	00	00	00	00	B7	72
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 139		"Reset values"					

[Command ID: 140] Reset Max. and Min. values of Demand Current measurement

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 8C	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Reset values"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	8C	00	00	00	00	02	B2
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 140		"Reset values"					

ANNEX E – Writing Command List

Security Level 1
Password Level 1 or 2 required.

[Command ID: 141] Reset Max. and Min. values of Demand Power measurement

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 8D	UINT	-	-	-	-
48741	22 24	2	Fixed value	Hex 00 00 00 00	UDINT	-	-	-	-

Example: "Reset values"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	8D	00	00	00	00	3F	72
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 141		"Reset values"					

ANNEX E – Writing Command List

Security Level 2
Password Level 2 required.

[Command ID: 201] LTD Start mode setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 C9	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Mode	"Cold start mode" = Hex 00 00 "Hot start mode" = Hex 00 01	UINT	0	1	1	-

Example: Set mode to “Cold start mode”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	C9	00	02	00	00	6E	BD
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 201		Length of parameter		“Cold start mode”			

[Command ID: 202] LTD Pick-up threshold I_r setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 CA	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Pick-up threshold	I_r in A (Min-Max values dependent on MCCB frame size and front-dial setting)	UINT	14	630	1	A

Example: Set Pick-up threshold to “160A”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	CA	00	02	00	A0	2A	C5
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 202		Length of parameter		“160A”			

ANNEX E – Writing Command List

Security Level 2
Password Level 2 required.

[Command ID: 203] LTD Time-delay t_r setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 CB	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Time-delay	Select from: 0.5 / 1.5 / 2.5 / 5 / 7.5 / 9 / 10 / 12 / 14 / 16	UINT	0.5	16	0.25	sec

Example: Set Time-delay to “5 sec”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	CB	00	02	00	14	17	72
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 203		Length of parameter		“5 sec”			

[Command ID: 204] STD setting (disable/enable)

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 CC	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Status	"Setting disable" = Hex 00 00 "Setting enable" = Hex 00 01	UINT	0	1	1	-

Example: Set Status to “Setting enable”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	CC	00	02	00	01	63	7D
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 204		Length of parameter		“Setting enable”			

ANNEX E – Writing Command List

Security Level 2
Password Level 2 required.

[Command ID: 205] STD Pick-up threshold I_{sd} setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 CD	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Pick-up threshold	Multiple of I_r	UINT	1.5	10	0.5	x I_r

Example: Set Pick-up threshold to "10x I_r"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	CD	00	02	00	14	9F	72
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 205		Length of parameter		"10x I_r"			

[Command ID: 206] STD Time-delay t_{sd} setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 CE	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Time-delay	Select from: 50 / 100 / 200 / 300 / 400	UINT	50	400	1	ms

Example: Set Time-delay to "100 ms"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	CE	00	02	00	64	DA	96
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 206		Length of parameter		"100 ms"			

ANNEX E – Writing Command List

Security Level 2
Password Level 2 required.

[Command ID: 207] I²t for STD setting (disable/enable)

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 CF	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Status	"Setting disable" = Hex 00 00 "Setting enable" = Hex 00 01	UINT	0	1	1	-

Example: Set Status to “Setting enable”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	CF	00	02	00	01	27	7D
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 207		Length of parameter		“Setting enable”			

[Command ID: 208] Zone interlocking (ZSI) for STD setting (disable/enable)

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 D0	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Status	"Setting disable" = Hex 00 00 "Setting enable" = Hex 00 01	UINT	0	1	1	-

Example: Set Status to “Setting enable”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	D0	00	02	00	01	B2	BF
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 208		Length of parameter		“Setting enable”			

ANNEX E – Writing Command List

Security Level 2
Password Level 2 required.

[Command ID: 209] INST Pick-up threshold I_i setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 D1	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Pick-up threshold	Multiple of I_n	UINT	3	15	0.5	x I_n

Example: Set Pick-up threshold to "15x I_n"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	D1	00	02	00	1E	CE	B7
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 209		Length of parameter		"15x I_n"			

[Command ID: 210] GF Setting (disable/enable)

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 D2	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Status	"Setting disable" = Hex 00 00 "Setting enable (3P)" = Hex 00 01 "Setting enable (4P)" = Hex 00 02	UINT	0	2	1	-

Example: Set Status to "Setting enable (3P)"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	D2	00	02	00	01	CB	7F
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 210		Length of parameter		"Setting enable (3P)"			

ANNEX E – Writing Command List

Security Level 2
Password Level 2 required.

[Command ID: 211] GF Pick-up threshold I_g setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 D3	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Pick-up threshold	Multiple of I_n	UINT	0.2	1	0.05	x I_n

Example: Set Pick-up threshold to "0.20x I_n"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	D3	00	02	00	04	36	BC
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 211		Length of parameter		"0.20x I_n"			

[Command ID: 212] LTD Time-delay t_r setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 D4	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Time-delay	Select from: 50 / 100 / 200 / 300 / 400 / 500	UINT	50	500	1	ms

Example: Set Time-delay to "200 ms"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	D4	00	02	00	C8	83	29
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 212		Length of parameter		"200 ms"			

ANNEX E – Writing Command List

Security Level 2
Password Level 2 required.

[Command ID: 213] I²t for GF setting (disable/enable)

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 D5	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Status	"Setting disable" = Hex 00 00 "Setting enable" = Hex 00 01	UINT	0	1	1	-

Example: Set Status to “Setting enable”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	D5	00	02	00	01	7E	BF
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 213		Length of parameter		“Setting enable”			

[Command ID: 214] Zone interlocking (ZSI) for GF setting (disable/enable)

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 D6	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Status	"Setting disable" = Hex 00 00 "Setting enable" = Hex 00 01	UINT	0	1	1	-

Example: Set Status to “Setting enable”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	D6	00	02	00	01	3A	BF
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 214		Length of parameter		“Setting enable”			

ANNEX E – Writing Command List

Security Level 2
Password Level 2 required.

[Command ID: 215] NP setting (disable/enable)

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 D7	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Status	"Setting disable" = Hex 00 00 "Setting enable" = Hex 00 01	UINT	0	1	1	-

Example: Set Status to “Setting enable”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	D7	00	02	00	01	07	7F
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 215		Length of parameter		“Setting enable”			

[Command ID: 216] N Coefficient setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 00 D8	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 02	UINT	-	-	-	-
48742	22 25	1	Status	"0.5x I_r" = Hex 00 00 "1x I_r" = Hex 00 01	UINT	0	1	1	-

Example: Set Status to “1x I_r”
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data (hex)	02	10	22	21	00	05	0A	AA	BB	CC	DD	00	D8	00	02	00	01	53	7E
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		CRC	
								Token				Command ID 216		Length of parameter		“1x I_r”			

ANNEX E – Writing Command List

Security Level 1 or 2

Password Level 1 or 2 required depending on Command setting – See further information for respective Command for details.

[Command ID: 2001] Level1/Level2 Password setting

Address (dec)	Address (hex)	Length (WORD)	Description	Further information	Data Type	Min	Max	Res.	Unit
48738	22 21	2	Token	Given token	UDINT	-	-	-	-
48740	22 23	1	Command ID	Hex 07 D1	UINT	-	-	-	-
48741	22 24	1	Length of parameter	Hex 00 0E	UINT	-	-	-	-
48742	22 25	1	Fixed number	Fixed code required for password changes only = Hex CA FE	UINT	-	-	-	-
48743	22 26	1	Level to set	"Level1" = Hex 00 01 "Level2" = Hex 00 02	UINT	1	2	1	-
48744	22 27	1	Length of string	Select from: 4 / 5 / 6 / 7 / 8	UINT	4	8	1	Char.
48745	22 28	4	Value of password	Any strings (8 characters in ASCII code, 2 char per WORD, Unused char must be filled with 0x00)	STR	-	-	-	-

Example: New Level 2 password: "NHPas2"
Token # AA BB CC DD, communication with Modbus device address # 2.

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Data (hex)	02	10	22	21	00	0B	16	AA	BB	CC	DD	07	D1	00	0E	CA	FE	00	02	00	06	4E	48	50	61	73	32	00	00	7C	84
Description	Device address	Function code	Starting address		Qty of registers		Byte count	Data (22 21)		Data (22 22)		Data (22 23)		Data (22 24)		Data (22 25)		Data (22 26)		Data (22 27)		Data (22 28)		Data (22 29)		Data (22 2A)		Data (22 2B)		CRC	
								Token				Command ID 2001		Length of parameter		Fixed number		"Level 2"		Length of string		"N"	"H"	"P"	"a"	"s"	"2"	"null"			

This page is intentionally left blank

TemCom_PRO-UM-001-EN

Version
1.0.0
Published
19th April 2021

NHP Electrical Engineering Products

AU 1300 NHP NHP
NZ 0800 NHP NHP

nhp.com.au
nhp-nz.com