TeSys Active

TeSys Tera Motor Management System

Modbus RTU Communication Guide

TeSys offers innovative and connected solutions for motor starters.

DOCA0355EN-00
03/2025

Legal Information

The information provided in this document contains general descriptions, technical characteristics and/or recommendations related to products/solutions.

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Table of Contents

Safety Information

Important Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result** in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Document

Document Scope

This guide provides users, installers, and maintenance personnel with the technical information needed to operate the Modbus RTU protocol on the LTMT main unit.

This guide is intended for:

- Design engineers
- System integrators
- Maintenance engineers

Validity Note

This guide is valid for the following LTMT main units:

- LTMTMFM: LTMT main unit with Modbus RTU protocol, 100–240 Vac/Vdc.
- LTMTMBD: LTMT main unit with Modbus RTU protocol, 24 Vdc.

General Cybersecurity Information

In recent years, the growing number of networked machines and production plants has seen a corresponding increase in the potential for cyber threats, such as unauthorized access, data breaches, and operational disruptions. You must, therefore, consider all possible cybersecurity measures to help protect assets and systems against such threats.

To help keep your Schneider Electric products secure and protected, it is in your best interest to implement the cybersecurity best practices as described in the Cybersecurity Best Practices document.

Schneider Electric provides additional information and assistance:

- Subscribe to the Schneider Electric security newsletter.
- Visit the Cybersecurity Support Portal web page to:
  - Find Security Notifications.
  - Report vulnerabilities and incidents.
- Visit the Schneider Electric Cybersecurity and Data Protection Posture web page to:
  - Access the cybersecurity posture.
  - Learn more about cybersecurity in the cybersecurity academy.
  - Explore the cybersecurity services from Schneider Electric.

Environmental Data

For product compliance and environmental information, refer to the Schneider Electric Environmental Data Program.

Available Languages of the Document

The document is available in these languages:

- English

Related Documents

Title of documentation	Description	Reference number
TeSys Tera Motor Management System User Guide	This is the main user guide that introduces the complete TeSys Tera system. It describes the main functions of the LTMT main units, LTMTCT/LTMTCTV sensor modules, LTMT expansion units, and LTMTCUF control operator unit.	DOCA0257EN
TeSys Tera Motor Management System Installation Guide	This guide describes the installation, commissioning, and maintenance of the LTMT main unit, LTMTCT/LTMTCTV sensor modules, LTMT expansion units, and LTMTCUF control operator unit.	DOCA0356EN
TeSys Tera Motor Management System LTMTCUF control operator unit User Guide	This guide describes how to install, configure, and use the LTMTCUF control operator unit.	DOCA0233EN
TeSys Tera Motor Management System DTM library Online Help Guide	This guide describes the TeSys Tera DTM library which allows the customization of the control functions of the TeSys Tera Motor Management System.	DOCA0275EN
TeSys Tera Motor Management System DTM library Software Release Notes	This document provides important information about the TeSys Tera DTM library software and provides summary of new features and enhancement.	DOCA0279EN
TeSys Tera Motor Management System Firmware Release Notes	This guide provides important information about the TeSys Tera system firmware packages and provides summary of new features and enhancement.	DOCA0276EN
Electrical Installation Guide (wiki version)	The aim of the Electrical Installation Guide (and now wiki) is to help electrical designers and contractors to design electrical installations according to the standards such as the IEC60364 or other relevant standards.	www.electrical-installation.org
Modbus RTU official site	This site describes Modbus RTU and its various products.	www.modbus.org

To find documents online, visit the Schneider Electric download center (www.se.com/ww/en/download/).

Information on Non-Inclusive or Insensitive Terminology

As a responsible, inclusive company, Schneider Electric is constantly updating its communications and products that contain non-inclusive or insensitive terminology. However, despite these efforts, our content may still contain terms that are deemed inappropriate by some customers.

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Precautions

Read and understand the following precautions before performing any procedures in this guide.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying to this equipment before working on this equipment.
- Use only the specified voltage when operating this equipment and any associated products.
- Always use a properly rated voltage sensing device to confirm power is off.
- Use appropriate interlocks where personnel and/or equipment hazards exist.
- Power line circuits must be wired and protected in compliance with local and national regulatory requirements.
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices per NFPA 70E, NOM-029-STPS, or CSA Z462 or local equivalent.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

UNINTENDED EQUIPMENT OPERATION

- Do not disassemble, repair, or modify this equipment. There are no user serviceable parts.
- Install and operate this equipment in an enclosure appropriately rated for its intended application environment.
- Each implementation of this equipment must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

California Proposition 65 Warning

⚠

WARNING: This product can expose you to chemicals such as, Humiseal 1A33 Polyurethane, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Qualified Personnel

Only appropriately trained personnel who are familiar with and understand the content of this guide and all other related product documentation are authorized to work on and with this product.

The qualified personnel must be able to detect possible hazards that may arise from modifying parameter values and generally from mechanical, electrical, or electronic equipment. The qualified personnel must be familiar with the standards, provisions, and regulations for the prevention of industrial accidents, which they must observe when designing and implementing the system.

The use and application of the information contained in this guide requires expertise in the design and programming of automated control systems. Only you,

the user, panel builder, or integrator, can be aware of all the conditions and factors present during installation, setup, operation, and maintenance of a process plant or machine, and can therefore determine the automation and associated equipment and the related safeties and interlocks which can be effectively and properly used when selecting automation and control equipment, and any other related equipment or software, for a particular application. You must also consider applicable local, regional, or national standards and/or regulations.

Pay particular attention to conformance with any safety information, electrical requirements, and normative standards that apply to your process plant or machine in the use of this equipment.

Intended Use

The products described in this guide, together with software, accessories, and options, are a part of starters for low-voltage electrical loads, intended for industrial use according to the instructions, directions, examples, and safety information contained in the present document and other supporting documentation.

The product may only be used in compliance with all applicable safety regulations and directives, the specified requirements, and the technical data.

Before using the product, you must perform a risk assessment of the planned application. Based on the results, appropriate safety-related measures must be implemented.

Since the product is used as a component of a process plant or machine, you must ensure the safety of personnel by means of the overall system design.

Operate the product only with the specified cables and accessories. Use only genuine accessories and spare parts.

Any use other than the use explicitly permitted is prohibited and can result in unanticipated hazards.

Introduction to TeSys Tera System and Protocol

What's in This Part

TeSys Master Range

TeSys is an innovative motor control and management solution from the global market leader. TeSys offers connected, efficient products and solutions for switching, and protection of motors and electrical loads in compliance with all major global electrical standards.

TeSys Tera System

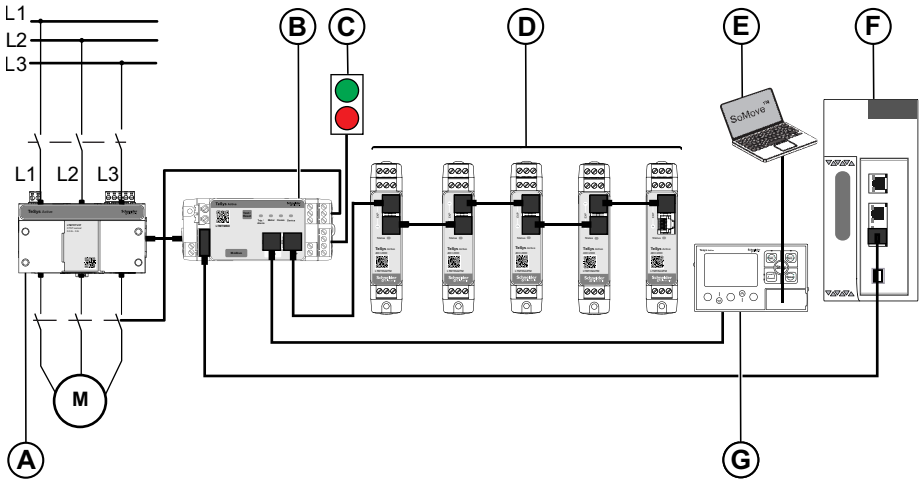
Overview

The TeSys Tera Motor Management System (or TeSys Tera system) is part of the TeSys Active range of intelligent relays and motor starters. The TeSys Tera system is designed as a reliable building block for Intelligent Motor Control Centres (iMCCs) to provide complete protection, control, and monitoring capabilities for single-phase or three-phase AC induction motors.

The TeSys Tera system is installed in the low voltage switch gear system and connects the higher level automation system via field bus network and the motor feeder.

TeSys Tera system:

- Covers conventional and advanced motor protection, metering, and monitoring in iMCC feeders into single, easy to configure, compact communicating module with a display.
- Provides protection controller for low voltage contactor-controlled motor starter feeders.
- Provides flexible and modular motor management system for motors with constant speeds in low voltage applications.



A LTMTCT/LTMTCTV sensor module

B LTMT main unit

C Start/Stop commands

D LTMT expansion units

E PC running the TeSys Tera DTM embedded in a FDT container, such as SoMove software

F Programmable Logic Controller (PLC) or Distributed Control System (DCS)

G LTMTCUF control operator unit

Functional Characteristics

The TeSys Tera system manages:

- Single-phase or three-phase AC induction motors up to 100 A with integral sensor module.
- Single-phase or three-phase AC induction motors up to 810 A when using external current transformers.
- The connection between the control system and the motor feeder, increases plant availability.

- Significant savings to the installation, commissioning, operation, and maintenance.
- Numerical microprocessor equipped controller that allows to set parameters of the motor according to the application and process requirements.

LTMT Main Unit with Modbus RTU Protocol

Overview

The LTMT main unit with Modbus RTU protocol is equipped with two Modbus RTU communication connector types on the front face:

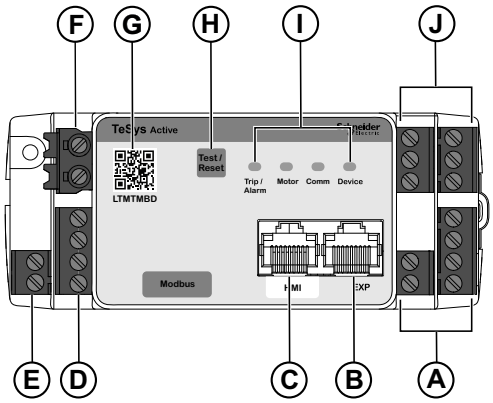
- Plug-in 4-terminal connector
- RJ45 port for HMI connection

The communication connectors follow the Modbus RTU interoperability standards. The use of the Modbus RTU 4-terminal connector is recommended. It allows daisy chain and point-to-point connection. The HMI port allows only point-to-point connection.

NOTE: You can connect the Modbus RTU client to any one of the two ports:

- Terminal connection port
- HMI port

Description



A	Digital input terminals
B	RJ45 port for expansion unit connection
C	RJ45 port for HMI connection or Modbus RTU communication
D	Modbus RTU communication open-style connector
E	Temperature input terminal
F	Power supply terminal
G	QR code to product information page
H	Test/Reset button
I	Status LEDs
J	Digital output terminals

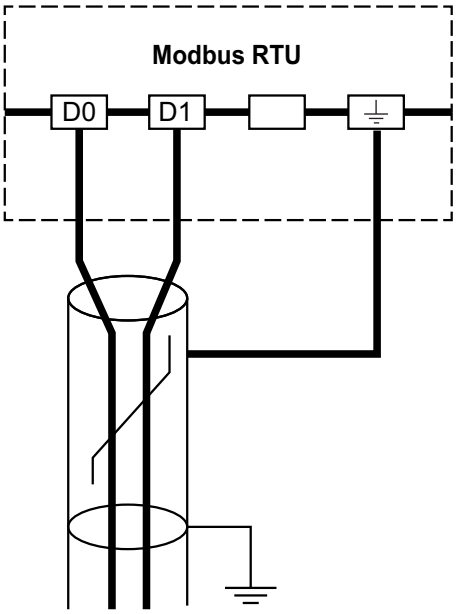
Modbus RTU Terminal Connection Port

Terminal Connector

The main physical characteristics of the Modbus RTU port are:

Physical interface	Multipoint 2-wire RS 485 – electrical networking
Connector	Screw terminal connector

Wiring Diagram



Terminal Assignment

The table lists the terminal assignment for the Modbus RTU port.

Terminal	Description
D0	Data -
D1	Data +
Blank	Not connected
⏚	Shielded earth

Wiring Characteristics

Modbus RTU cable must be a shielded twisted pair cable.

The following table describes the characteristics of screw terminals:

Pitch	5 mm	0.2 in.
Tightening torque	0.2 N•m	3 lb-in
Flat screwdriver	3 mm	0.10 in.

Port Settings

The Modbus RTU port has the following configurable settings:

Setting	Setting range	Default setting
Node address	1–247 in step of 1	1
Parity	• None • Odd • Even	Even
Baud rate	• 2400 bps • 4800 bps • 9600 bps • 19200 bps • 38400 bps • 57600 bps • 115200 bps	19200 bps
Timeout	1–60000 s in step of 1 s	1 s
Endianness	• Big-endian • Little-endian	Big-endian

The Modbus RTU port settings can be configured using the following interfaces:

- A PC running the TeSys Tera DTM embedded in a FDT container, such as SoMove software
- The LTMTCUF control operator unit
- A PLC or DCS via the communication protocol

Modbus RTU HMI Connection Port

The HMI port on LTMT main unit with Modbus RTU protocol can also be used as an optional Modbus RTU communication port.

When the LTMT HMI port is used as Modbus RTU communication port:

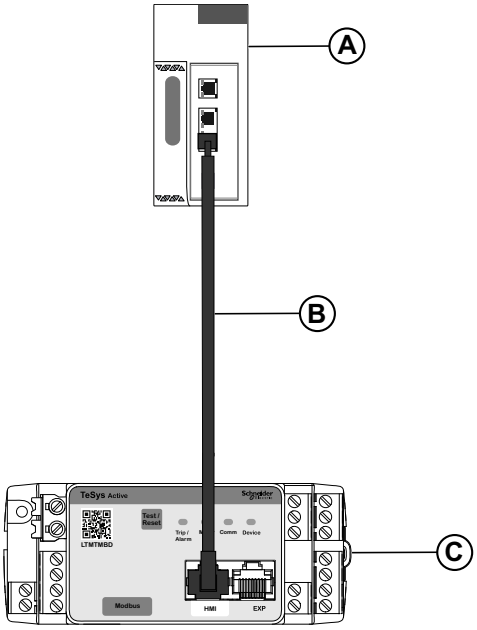
- LTMT main unit is connected to a Modbus RTU client in a point-to-point connection.
- Modbus RTU client can be connected to the HMI port.
- HMI port can be connected temporarily to a PC running the TeSys Tera DTM embedded in a FDT container for TeSys Tera system configuration.

The HMI port characteristics are:

Physical interface	RS 485 wire
Connector	RJ45

Connection Diagram

A Modbus RTU client can be connected to the HMI port on the front face of the LTMT main unit, as shown in the diagram below.



A	Modbus RTU client (PC or PLC)
B	Modbus RTU cable
C	LTMT main unit

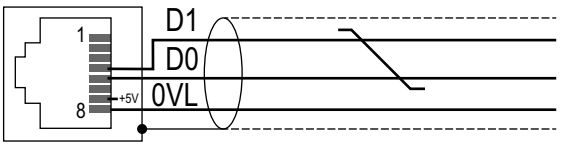
Modbus RTU Cables

The table lists the Modbus RTU cables used for connection.

Designation	Length	Reference Number
Shielded cable for Modbus RTU bus, with two RJ45 connectors	0.3 m (1 ft)	–
	1 m (3.2 ft)	–
	3 m (9.8 ft)	–
Connection cable USB or RJ45	2.5 m (8.20 ft)	–

LTMT HMI Port Pinout

The LTMT main unit is connected to the Modbus RTU network with a shielded RJ45 connector in compliance with the following wiring:



Pin No.	Signal	Description
1	–	Not connected
2	–	Not connected
3	–	Not connected
4	D1 or D(B)	Transceiver terminal 1
5	D0 or D(A)	Transceiver terminal 0
6	–	Not connected
7	+5V	Auxiliary supply to HMI
8	0VL	Signal and power supply common

LTMT HMI Port Settings

The LTMT HMI port has the following configurable settings:

Setting	Setting range	Default setting
Node address	1–247 in step of 1	1
Parity	• None • Odd • Even	Even
Baud rate	• 2400 bps • 4800 bps • 9600 bps • 19200 bps • 38400 bps • 57600 bps • 115200 bps	19200 bps
Endianness	• Big-endian • Little-endian	Big-endian

NOTE: If LTMTCUF control operator unit is connected on HMI port, HMI port must be configured as follows:

- Node address: 1
- Baud rate: 19200 bps
- Parity: Even
- Endianness: Big-endian

The LTMT HMI port settings can be configured using the following interfaces:

- A PC running the TeSys Tera DTM embedded in a FDT container, such as SoMove software.
- A PLC or DCS via the communication protocol.

Wiring Information

What's in This Part

Overview

This part describes how to connect an LTMT main unit to a RS 485 Modbus RTU network via its 4-terminal connector.

Always follow the recommendations for wiring and connection.

⚠WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are forced stop and overtravel stop.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of anticipated transmission delays or failures of the link.
- Each implementation of an LTMT main unit must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: For additional information, refer to NEMA ICS 1.1 (latest edition), Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control.

Modbus RTU Network Characteristics

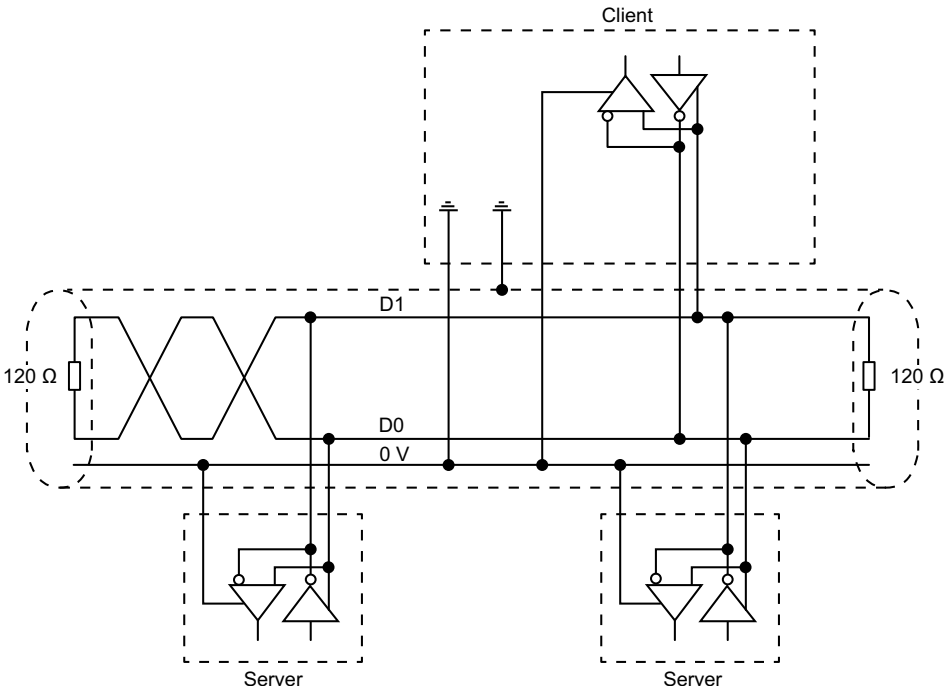
Overview

This section defines the characteristics of the Modbus RTU network over serial communication line. The Modbus RTU unit complies with the serial line specification. For information on serial line specification and implementation, see *Serial Line Specification and Implementation Guide* published on www.Modbus.org.

Standard Diagram

The standard diagram corresponds to the Modbus RTU specification on the www.Modbus.org site and in particular to the two-wire multidrop serial bus diagram.

The simplified diagram is as follows:



Characteristics for Connection to Modbus RTU RS 485 Bus

The RS 485 standard allows variants with characteristics like:

- Line terminator
- Number of servers
- Bus length

Characteristics	Value
Maximum number of stations (without repeater)	32 stations, which is 31 servers
Type of trunk cable	Single, shielded, twisted pair cable, with 120 Ω characteristic impedance, and at least a third conductor
Maximum bus length	1000 m (3300 ft) at 19200 bps

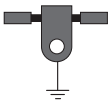
Characteristics	Value
Maximum length of tap-offs	• 20 m (66 ft) for one tap-off • 40 m (131 ft) divided by the number of tap-offs on the multiple junction box
Line terminator	120 Ω resistor +/- 5% at both ends of the bus
Common polarity	Common polarity is connected to the protective ground in at least one point on the bus.

Wiring Rules

NOTICE
COMMUNICATION MALFUNCTION Respect all the wiring and grounding rules in order to avoid communication malfunctions due to Electromagnetic Compatibility (EMC) disturbance. **Failure to follow these instructions can result in equipment damage.**

The following wiring rules must be respected in order to reduce disturbance due to EMC on the behavior of the LTMT main unit:

- Keep a distance as large as possible between the communication cable and the power or control cables (30 cm or 11.8 in. is recommended).
- Cross over the Modbus RTU cables and the power cables at right angles, if necessary.
- Install the communication cables as close as possible to the grounded plate.
- Do not bend or damage the cables. The maximum bending radius is 10 times the cable diameter.
- Avoid sharp angles of paths or passage of the cable.
- Use the recommended cables only. For more information, refer to Cables section in *TeSys Tera Motor Management System User Guide – DOCA0257EN*.
- Modbus RTU cable must be a shielded twisted pair cable:
  - The twisted pair cable shield must be connected to a protective ground.
  - The connection of the twisted pair cable shield to the protective ground must be as short as possible.
  - Connect together all the shields, if necessary.
  - Connect the shield to the ⏚ terminal.
  - Perform the grounding of the shield with a metal clip.



- When the LTMT main unit is installed in a withdrawable drawer:
  - Connect together all the shield contacts of the withdrawable drawer part of the auxiliary connector to the ground of the withdrawable drawer to create an electromagnetic barrier.
  - Do not connect the cable shield at the fixed part of the auxiliary connector.
- Place a line terminator at each end of the bus to avoid malfunctions on the communication bus. A line terminator is generally already integrated in the client.
- Wire the bus between each connector directly, without intermediate terminal blocks.
- The common polarity (0 V) must be connected directly to protective ground, preferably at one point only for the entire bus. In general, this point is chosen either on the client device or on the polarization device.

For more information, refer to Electrical Installation Guide (available in English only).

Wiring Diagram of LTMT Main Units Installed in an Enclosure

Overview

This section describes the connection of LTMT main units installed in an enclosure to the RS 485 bus via open-style connectors. Daisy chain connection is not possible when using the HMI port.

Precautions

Always follow the recommendations for wiring and connection.

⚠WARNING

UNINTENDED EQUIPMENT OPERATION

This equipment must be installed, programmed, and serviced only by qualified personnel.

- Follow all up-to-date instructions, standards and regulations.
- Check the function settings before starting the motor.
- Do not downgrade or modify these devices.

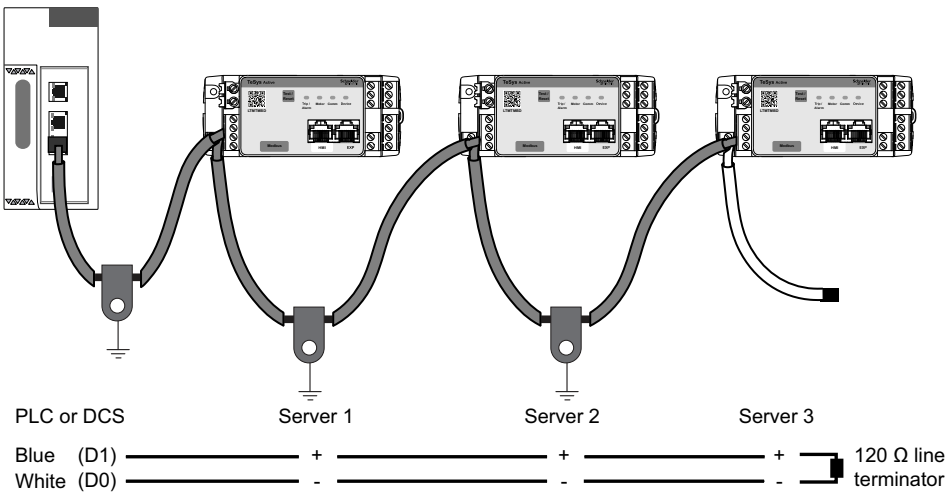
Incorrect configuration can result in unpredictable behavior of the devices.

Respect all the wiring and grounding rules in order to avoid communication malfunctions due to EMC disturbance.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

LTMT Main Units Installed in an Enclosure

The wiring diagram for the connection of LTMT main units installed in an enclosure to the RS 485 bus via open-style connectors is as follows:



Installation Rules in a Switchboard

The installation of the LTMT main unit in the withdrawable drawer of a switchboard contains constraints specific to the type of switchboard:

- For installation of the LTMT main unit in a Schneider Electric Okken switchboard, refer to the *Okken Communications Cabling & Wiring Guide* (available on request).
- For installation of the LTMT main unit in a Schneider Electric BlokSeT switchboard, refer to the *BlokSeT Communications Cabling & Wiring Guide* (available on request).
- For installation of the LTMT main unit in a Schneider Electric Model 6 switchboard, refer to the *Model 6 Communications Cabling & Wiring Guide* (available on request).
- For installation of the LTMT main unit in other types of switchboard, follow the specific EMC instructions described in this guide and refer to the relative instructions specific to your type of switchboard.

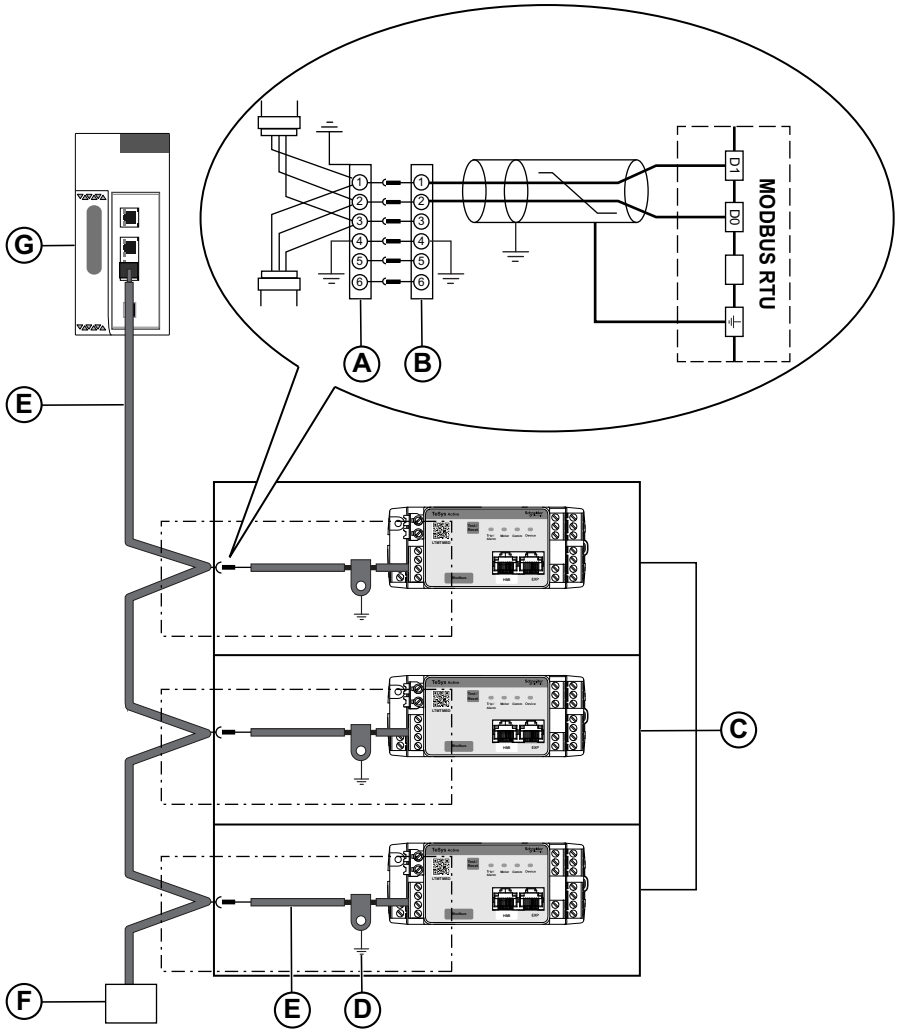
Modbus RTU Accessories

The table lists the Modbus RTU accessories.

Designation	Description	Reference Number
Line terminator for open-style connector	R = 120 Ω	–

Wiring Diagram of LTMT Main Units Installed in Withdrawable Drawers With Hardwired Cables

The wiring diagram for the connection of LTMT main units installed in the withdrawable drawers to the RS 485 bus via hardwired cables is as follows:



A Fixed part of the auxiliary connector

B Withdrawable drawer part of the auxiliary connector

C Withdrawable drawer

D Grounding of the Modbus RTU cable shield

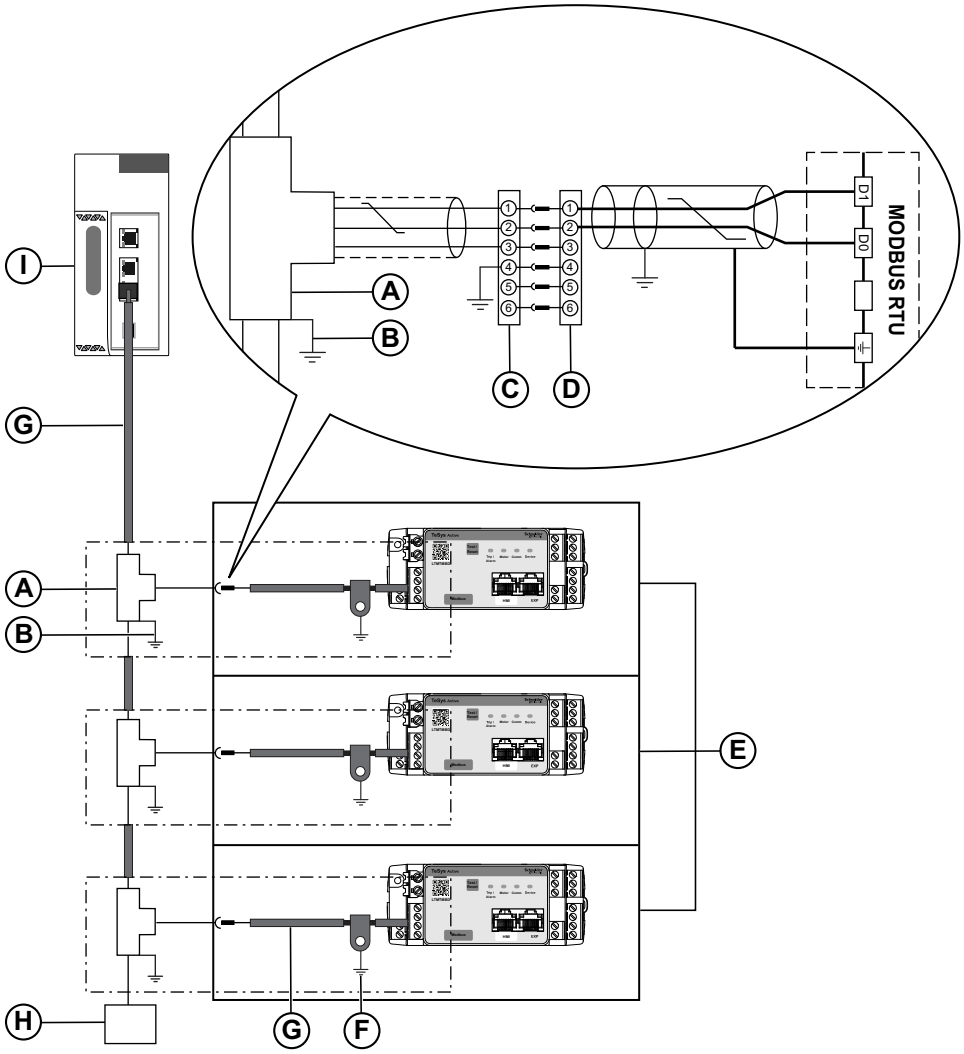
E Modbus RTU shielded cable TSXCSA•00

F Line terminator (120 Ω)

G Modbus RTU client (PC or PLC) with line terminator

Wiring Diagram of LTMT Main Units Installed in Withdrawable Drawers With T-Junction Boxes

The wiring diagram for the connection of LTMT main units installed in the withdrawable drawers to the RS 485 bus via hardwired cables and T-junction boxes is as follows:



A	Modbus T-junction boxes VW3A8306TF• (with cable)
B	Grounding of the Modbus RTU T-junction boxes
C	Fixed part of the auxiliary connector
D	Withdrawable drawer part of the auxiliary connector
E	Withdrawable drawer
F	Grounding of the Modbus cable shield
G	Modbus shielded cable TSXCSA•00
H	Line terminator (120 Ω)
I	Modbus RTU client (PC or PLC) with line terminator

Wiring Accessories

Modbus RTU Accessories

The table lists the Modbus RTU accessories used for connection.

Designation	Description	Reference Number
T-junction boxes	Box with two RJ45 socket for trunk cable and an integrated 0.3 m (1 ft) cable with one RJ45 connector for tap-off	–
	Box with two RJ45 socket for trunk cable and an integrated 1 m (3.2 ft) cable with one RJ45 connector for tap-off	–
Line terminator for RJ45 connector	R = 120 Ω	–
Line terminator for open-style connector	R = 120 Ω	–

Modbus RTU Cables

The table lists the Modbus RTU cables used for connection.

Designation	Length	Reference Number
Shielded cable for Modbus RTU bus, with two RJ45 connectors	0.3 m (1 ft)	–
	1 m (3.2 ft)	–
	3 m (9.8 ft)	–
Shielded cable for Modbus RTU bus, with one RJ45 connectors and one stripped end	3 m (9.8 ft)	–
Shielded cable for Modbus RTU bus, with two stripped ends	100 m (320 ft)	TSXCSA100
	200 m (640 ft)	TSXCSA200
	500 m (1600 ft)	TSXCSA500
Belden cable	–	–

Implementation of Modbus RTU Protocol

What's in This Part

Overview

The Modbus RTU communication is a serial protocol that supports the communication between single client device and multiple server devices. In the Modbus RTU network:

- Protocol governs how each Intelligent Electronic Device (IED) will know its device address.
- Recognizes a message addressed to it.
- Determines the kind of action to be taken.
- Extracts any data or other information contained in the message.

If a response is required, the IED will construct the response message and send it using the Modbus RTU communication protocol.

Function Codes

The TeSys Tera system supports the following Modbus RTU function codes:

Function Code	Description
2 (0x02)	Read discrete inputs
3 (0x03)	Read holding registers
4 (0x04)	Read input registers
6 (0x06)	Write single holding register
16 (0x10)	Write multiple holding registers
23 (0x17)	Read or Write multiple holding registers
43 or 14 (0x2B or 0x0E)	Read device identification

Example of Modbus RTU Frames

Request

Request from the client to the LTMT Modbus RTU server at address 5 to read the L1 RMS current, available in a UINT32 register at address 0x157C.

Definition	Number of Bytes	Value	Comment
Server address	1 byte	0x05	TeSys Tera Modbus RTU server address
Function code	1 byte	0x03	Reads n output or internal words
Address	2 bytes	0x157C	Address of the first 16-bit register to read
Number of words	2 bytes	0x0002	Reads 2 16-bit registers
CRC	2 bytes	xyzt	Value of CRC16

Response

Response from the LTMT Modbus RTU server at address 5: L1 RMS current = 87 485 mA.

Definition	Number of Bytes	Value	Comment
Server address	1 byte	0x05	TeSys Tera Modbus RTU server address
Function code	1 byte	0x03	Reads n output or internal words
Number of bytes	1 byte	0x04	Number of bytes to read
Value of words read	4 bytes	0x0001 55BD (87 485 mA)	Reads 2 registers (L1 RMS curent in mA)
CRC	2 bytes	xyzt	Value of CRC16

Table Formats

The TeSys Tera system supports the following Modbus RTU data. Data tables have the following columns:

Address	Register	No.	Function Code	RW	X	Unit	Type	Range	Default Value	Svd	Description

Designation	Description
Address	16-bit register address in hexadecimal. The address is the data used in the Modbus frame.
Register	16-bit register number in decimal. Register = Address + 1
No	Number of 16-bit registers that need to be read/written to access the complete information.
Function code	Codes of Modbus functions that can be used to read and/or write the register.
RW	Whether the data is read only (R) or read-write (RW).
X	Scale factor: • A scale of 1 means that the value of the data is the right one with the unit indicated. • A scale of 10 means that the data contains the value multiplied by 10. The actual value is therefore the value of the data divided by 10. • A scale of 0.1 means that the data contains the value multiplied by 0.1. The actual value is therefore the value of the data multiplied by 10.
Unit	Unit of the value of the data.
Type	Coding data type (see **Data Types** table below).
Range	Range of permitted values for the parameter, usually a subset of what the format allows. For BITMAP data type, the content range does not exist.
Default Value	Default value for the parameter.
Svd	Value saved when the power supply to the TeSys Tera system is switched off: • **Y**: the value of the data is saved. • **N**: the value is lost. **NOTE:** The saved values are retrieved when the power supply to the LTMT main unit is switched on.
Description	Information about the data and the restrictions that apply.

Data Types

The TeSys Tera system supports the following Modbus RTU data types:

Name	Description	Range
INT16	16-bit signed integer (1 word)	-32768...+32767
UINT16	16-bit unsigned integer (1 word)	0...65535
UINT32	32-bit unsigned integer (2 words)	0...4 294 967 295
UINT64	64-bit unsigned integer (4 words)	0...18 446 744 073 709 600 000
BOOL	1-bit data	0–1
ASCII	String of 8-bit alphanumeric character	Table of ASCII characters
BITMAP	16-bit field (1 word)	–

NOTE:

INT16, UINT16, and ASCII data are transmitted with big-endian coding by default:

- The most significant byte is transmitted first.
- The least significant byte is transmitted second.

UINT32 and UINT64 data are transmitted with big-endian coding by default:

- The most significant byte of the most significant word is transmitted first.
- The least significant byte of the most significant word is transmitted second, and so on.

The byte format setting can be changed to little-endian, refer to Modbus RTU Port Settings, page 18.

Endianness

Endianness is the order in which bytes within a word of digital data are transmitted through a data communication medium. Endianness is represented in two ways:

- Big Endian:

  A big-endian system stores the most significant byte at the smallest memory address and the least significant byte at the largest memory address.
- Little Endian:

  A little-endian system stores the most significant byte at the largest memory address and the least significant byte at the smallest memory address.

Example of Endianness

Data Type	Value	Value in Hexadecimal	Big-endian	Little-endian
UINT16/INT16	1000	03E8	03 E8	E8 03
UINT32/INT32	70000	00011170	00 01 11 70	70 11 01 00
UINT64/INT64	100000	00000000000186A0	00 00 00 00 00 01 86 A0	A0 86 01 00 00 00 00 00

Date and Time

The date and time in data logs is coded in four UINT16 data.

Data	Type	Range	Description
1	UINT16	0x01–0x1F	MSB: Day
		0x01–0x0C	LSB: Month
2	UINT16	0x00–0x63	MSB: Year 0–99 (0x00–0x63) corresponds to years 2000 to 2099 For example, 0x17 (23) corresponds to year 2023
		0x00–0x17	LSB: Hours
3	UINT16	0x00–0x3B	MSB: Minutes
		0x00–0x3B	LSB: Seconds
4	UINT16	0x0000–0x03E7	Milliseconds

For setting date and time, refer to the Real-Time Clock (RTC) Settings, page 102.

Modbus Register

The address of register number n is n-1. The tables detailed in the following parts of this document provides both register numbers (in decimal format) and corresponding addresses (in hexadecimal format).

For example, the address of register number 20 is shown in the following table:

Data	Address (Decimal)	Address (Hexadecimal)
20	19	0x0013

Data Tables

What's in This Part

Command Data

The TeSys Tera system supports the following Modbus RTU command data:

Address	Register	No.	RW	Type	Svd	Function code	Description
0x02BC	701	1	RW	BITMAP	N	0x03, 0x06, 0x10	Permissive command data • Bit 0: Permissive command 1 • Bit 1: Permissive command 2 • Bit 2: Permissive command 3 • Bit 3: Permissive command 4 • Bit 4: Permissive command 5 • Bit 5: Permissive command 6 • Bit 6: Permissive command 7 • Bit 7: Permissive command 8 • Bits 8–15: Reserved
0x02BD	702–704	3	–	–	–	–	Reserved
0x02C0	705	1	RW	BITMAP	N	0x03, 0x06, 0x10	Command data 1 • Bit 0: Motor run forward/High speed forward command • Bit 1: Motor run reverse/High speed reverse command • Bit 2: Local/Remote mode selection 1 • Bit 3: Trip reset command • Bit 4: Local/Remote mode selection 2 • Bit 5: Self-test (without trip) command • Bit 6: Motor low speed forward command • Bit 7: Motor low speed reverse command • Bit 8: Reset Inhibit command • Bit 9: Reset number of starts command • Bit 10: Reset number of stops command • Bit 11: Clear energy command • Bit 12: Motor stop command • Bit 13: Logic test command • Bit 14: Reset run hour command • Bit 15: Self-test (with trip) command
0x02C1	706	1	RW	BITMAP	N	0x03, 0x06, 0x10	Command data 2 • Bit 0: Clear all command • Bit 1: Reserved • Bit 2: Clear thermal capacity level command • Bit 3: Clear controller settings command • Bit 4: Clear network port settings command • Bit 5: Clear trip counter command • Bit 6: Factory reset command • Bit 7: Soft starter reset command • Bits 8–12: Reserved • Bit 13: Store reference start curve command • Bit 14: Clear trip logs command • Bit 15: Clear event logs command

User Map Data for Registers

The user map data are designed to optimize the access to 100 non-continuous registers maximum in one single request.

You can define several read and write areas.

The user map can be defined via:

- PC running the TeSys Tera DTM Library embedded in a FDT container like SoMove software.
- PLC or DCS via the communication network.

User Map Addresses

The user map addresses are used to select a list of addresses to read or write. It can be considered as a configuration area.

Address	Register	No.	Function code	RW	Type	Range	Svd	Description
0x0320	801	1	0x03, 0x06, 0x10	RW	UINT16	1-9249	Y	User map address 1
0x0321	802	1	0x03, 0x06, 0x10	RW	UINT16	1-9249	Y	User map address 2
0x0322	803	1	0x03, 0x06, 0x10	RW	UINT16	1-9249	Y	User map address 3
…	…	…	…	…	…	…	…	…
0x0383	900	1	0x03, 0x06, 0x10	RW	UINT16	1-9249	Y	User map address 100

User Map Values

The user map values are used to read or write values associated to addresses configured in the user map addresses.

Address	Register	No.	Function code	RW	Type	Range	Svd	Description
0x0384	901	1	0x03, 0x06, 0x10	RW	UINT16	1-65535	N	User map value 1
0x0385	902	1	0x03, 0x06, 0x10	RW	UINT16	1-65535	N	User map value 2
0x0386	903	1	0x03, 0x06, 0x10	RW	UINT16	1-65535	N	User map value 3
…	…	…	…	…	…	…	…	…
0x03E7	1000	1	0x03, 0x06, 0x10	RW	UINT16	1-65535	N	User map value 100

Read or write of address 0x0384 or register 901 allows to read or write the value in address defined in address 0x0320 or register 801.

Read or write of address 0x0385 or register 902 allows to read or write the value in address defined in address 0x0321 or register 802, and so on.

Examples

The following table gives an example of user map address configuration to access non-continuous registers:

Address	Register	Register Value (user map address to be configured)	Description of user map address
0x0320	801	0x15B5	Motor status
0x0321	802	0x15C8	Motor stop cause
0x0322	803	0x160D	Trip status MSW
0x0323	804	0x160E	Trip status LSW
0x0324	805	0x15B6	Thermal memory
0x0325	806	0x1586	Average current (0.001 A) MSW
0x0326	807	0x1587	Average current (0.001 A) LSW
0x0352	851	0x02C0	Control register 1
0x0353	852	0x02C1	Control register 2

With this configuration, monitoring information is accessible with one single read request through addresses 0x0384 to 0x038A or registers 901 to 907.

Configuration and command can be written with one single write using addresses 0x03B6 to 0x03B7 or registers 951 to 952.

User Defined Bitwise Status Words

Description

Two configurable status word data addresses (address: 0x16F3 and 0x16F4) are available. All the bitwise parameters (mapped in register 1 to register 704) can be configured in status words.

To configure the bit information of status words, use following registers.

Address	Register	RW	Function code	Description
0x2616–0x2625	9751–9766	RW	0x03,0x06,0x10	Bitwise status word 1 configuration
0x2626–0x2635	9767–9782	RW	0x03,0x06,0x10	Bitwise status word 2 configuration

NOTE: The order and the description of the settings for status word 1 configuration is valid for status word 2 configuration.

Status Word 1 Configuration

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x2616	9751	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 0 configuration
0x2617	9752	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 1 configuration
0x2618	9753	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 2 configuration
0x2619	9754	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 3 configuration
0x261A	9755	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None	0	Y	Bit 4 configuration

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
								• 1-704: Selectable register address from Status, page 53 sheet			
0x261B	9756	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 5 configuration
0x261C	9757	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 6 configuration
0x261D	9758	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 7 configuration
0x261E	9759	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 8 configuration
0x261F	9760	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 9 configuration
0x2620	9761	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 10 configuration
0x2621	9762	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 11 configuration

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x2622	9763	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 12 configuration
0x2623	9764	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 13 configuration
0x2624	9765	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 14 configuration
0x2625	9766	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status, page 53 sheet	0	Y	Bit 15 configuration

Examples

The following table gives an example of user defined bitwise status word 1 to access non-continuous bitwise registers:

Address	Register	Register Value (user map address to be configured)	Description of user map address
0x2616	9751	227	Trip status
0x2617	9752	226	Alarm status
0x2618	9753	1	Digital input 1
0x2619	9754	2	Digital input 2
0x261A	9755	243	Motor run
0x261B	9756	244	Motor inhibit
0x261C	9757	241	Motor stop

1. To get parameter:
   a. Trip status in Bit 0 of status word 1, configure the register 9751 with register value 227.
   b. Alarm status in Bit 1 of status word 1, configure the register 9752 with register value 226.
   c. Digital input 1 in Bit 2 of status word 1, configure the register 9753 with register value 1.
   d. Digital input 2 in Bit 3 of status word 1, configure the register 9754 with register value 2.
   e. Motor run in Bit 4 of status word 1, configure the register 9755 with register value 243.
   f. Motor inhibit in Bit 5 of status word 1, configure the register 9756 with register value 244.
   g. Motor stop in Bit 6 of status word 1, configure the register 9757 with register value 241.
2. After configuration, monitor the respective bit parameters through the status word 1 register 5876 (addresses 0x16F3).

   With this configuration, non-continuous bitwise information is accessible with one single register 5876 (addresses 0x16F3).

   If the parameter value is 0, the respective bit value of the status word register is 0. If the parameter value is 1, the respective bit value of the status word register is 1.

   In Bit 0:
   - If the motor is tripped, the Bit 0 value is 1.
   - If the motor is not tripped, the Bit 0 value is 0.

   In Bit 1:
   - If the alarm status is ON, the Bit 1 value is 1.
   - If the alarm status is OFF, the Bit 1 value is 0.

   In Bit 2:
   - If the digital Input 1 status is ON, the Bit 2 value is 1.
   - If the digital Input 1 status is OFF, the Bit 2 value is 0.

   In Bit 3:
   - If the digital Input 2 status is ON, the Bit 3 value is 1.
   - If the digital Input 2 status is OFF, the Bit 3 value is 0.

   In Bit 4:
   - If the motor is in run state, the Bit 4 value is 1, or else the Bit 4 value is 0.

   In Bit 5:
   - If the motor inhibit status is ON, the Bit 5 value is 1.
   - If the motor inhibit status is OFF, the Bit 5 value is 0.

   In Bit 6:
   - If the motor is in stop state, the Bit 6 value is 1, or else the Bit 6 value is 0.

Measurement and Monitoring Data

What's in This Chapter

Metering Data

The table lists the metering data for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Svd	Description
0x157C	5501	2	0x03	R	0.001	A	UINT32	N	L1 RMS current
0x157E	5503	2	0x03	R	0.001	A	UINT32	N	L2 RMS current
0x1580	5505	2	0x03	R	0.001	A	UINT32	N	L3 RMS current
0x1582	5507	2	0x03	R	0.001	A	UINT32	N	Measured ground current
0x1584	5509	2	0x03	R	0.001	A	UINT32	N	Calculated ground current
0x1586	5511	2	0x03	R	0.001	A	UINT32	N	Average current
0x1588	5513	1	0x03	R	0.01	%	UINT16	N	Current imbalance
0x1589	5514	1	0x03	R	1	–	UINT16	N	Current phase sequence • 0: – • 1: L123 • 2: L132 • 3: CT wiring error
0x158A	5515	2	0x03	R	0.1	V	UINT32	N	For single phase, L1–N RMS voltage For three phase, L1–L2 RMS voltage
0x158C	5517	2	0x03	R	0.1	V	UINT32	N	L2–L3 RMS voltage
0x158E	5519	2	0x03	R	0.1	V	UINT32	N	L3–L1 RMS voltage
0x1590	5521	2	0x03	R	0.1	V	UINT32	N	Average voltage
0x1592	5523	1	0x03	R	0.01	%	UINT16	N	Voltage imbalance
0x1593	5524	1	0x03	R	1	–	UINT16	N	Voltage phase sequence • 0: – • 1: L123 • 2: L132
0x1594	5525	1	0x03	R	0.01	Hz	UINT16	N	System frequency
0x1595	5526	1	0x03	R	0.01	–	UINT16	N	System power factor
0x1596	5527	2	0x03	R	0.001	kW	UINT32	N	Total active power
0x1598	5529	2	0x03	R	0.001	kvar	UINT32	N	Total reactive power
0x159A	5531	2	0x03	R	0.001	kVA	UINT32	N	Total apparent power
0x159C	5533	4	0x03	R	0.001	kWh	UINT64	Y	Total active energy
0x15A0	5537	4	0x03	R	0.001	kvarh	UINT64	Y	Total reactive energy
0x15A4	5541	4	0x03	R	0.001	kVAh	UINT64	Y	Total apparent energy
0x15A8	5545	1	0x03	R	1	%	UINT16	N	L1 Current THD
0x15A9	5546	1	0x03	R	1	%	UINT16	N	L2 Current THD
0x15AA	5547	1	0x03	R	1	%	UINT16	N	L3 Current THD
0x15AB	5548	1	0x03	R	1	%	UINT16	N	For single phase, L1–N Voltage THD For three phase, L1–L2 Voltage THD
0x15AC	5549	1	0x03	R	1	%	UINT16	N	L2–L3 Voltage THD
0x15AD	5550	1	0x03	R	1	%	UINT16	N	L3–L1 Voltage THD

Address	Register	No.	Function code	RW	X	Unit	Type	Svd	Description
0x15AE	5551	1	0x03	R	0.1	°C or F	UINT16	N	Temperature measured by PT100 sensor[1]
0x15AF	5552	1	0x03	R	1	Ω	UINT16	N	Temperature measured by binary PTC sensor
0x15B0	5553 - 5556	3	–	–	–	–	–	–	Reserved

Motor Data

The table lists the motor data for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Svd	Description
0x15B5	5558	1	0x03	R	1	–	UINT16	N	Motor status • 1: Stop • 2: Start • 4: Run
0x15B6	5559	1	0x03	R	1	%	UINT16	Y	Thermal memory
0x15B7	5560	2	0x03	R	1	s	UINT32	N	Thermal time to trip
0x15B9	5562	2	0x03	R	1	s	UINT32	N	Thermal time to cool
0x15BB	5564	1	0x03	R	1	–	UINT16	Y	Max starts counter or Max starts per hour counter
0x15BC	5565	2	0x03	R	1	s	UINT32	Y	Max start time or Max start inhibit time
0x15BE	5567	2	0x03	R	0.001	A	UINT32	N	Motor starting peak current
0x15C0	5569	2	0x03	R	0.001	s	UINT32	N	Motor starting time
0x15C2	5571	2	0x03	R	1	min	UINT32	Y	Total run hour
0x15C4	5573	2	0x03	R	1	min	UINT32	Y	Last run hour
0x15C6	5575	1	0x03	R	1	–	UINT16	Y	Number of starts
0x15C7	5576	1	0x03	R	1	–	UINT16	Y	Number of stops
0x15C8	5577	1	0x03	R	1	–	UINT16	Y	Motor stop cause • 0: None • 1: HMI • 2: Local DI • 3: Remote DI • 4: Communication • 5: Auto restart • 6: Trip • 7: Auto • 8: Forced stop • 9: Direction change • 10: No feedback • 11: Speed change • 12: Custom stop • 13: Mode transfer • 14: Device internal error detection setting • 15: No voltage
0x15C9	5578	1	0x03	R	1	–	UINT16	Y	Trip counter

1. For temperature measurement, refer to the unit selected.

Last Motor Start Time Stamp

The table lists the last motor start time stamp for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Svd	Description
0x15CA	5579	1	0x03	R	1	0	UINT16	Y	Day
0x15CB	5580	1	0x03	R	1	0	UINT16	Y	Month
0x15CC	5581	1	0x03	R	1	0	UINT16	Y	Year
0x15CD	5582	1	0x03	R	1	h	UINT16	Y	Hour
0x15CE	5583	1	0x03	R	1	min	UINT16	Y	Minute
0x15CF	5584	1	0x03	R	1	s	UINT16	Y	Second
0x15D0	5585	1	–	–	–	–	–	–	Reserved

Statistic Data

The table lists the statistic data for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Svd	Description
0x1676	5751	1	0x03	R	1	ms	UINT16	N	Timer 1 - Actual value
0x1677	5752	1	0x03	R	1	ms	UINT16	N	Timer 2 - Actual value
0x1678	5753	1	0x03	R	1	ms	UINT16	N	Timer 3 - Actual value
0x1679	5754	1	0x03	R	1	ms	UINT16	N	Timer 4 - Actual value
0x167A	5755	1	0x03	R	1	–	UINT16	N	Counter 1 - Actual value
0x167B	5756	1	0x03	R	1	–	UINT16	N	Counter 2 - Actual value
0x167C	5757	1	0x03	R	1	–	UINT16	N	Counter 3 - Actual value
0x167D	5758	1	0x03	R	1	–	UINT16	N	Counter 4 - Actual value
0x167E	5759	1	0x03	R	1	–	UINT16	N	Thermal overload trip counter
0x167F	5760	1	0x03	R	1	–	UINT16	N	Locked rotor trip counter
0x1680	5761	1	0x03	R	1	–	UINT16	N	Stalled rotor trip counter
0x1681	5762	1	0x03	R	1	–	UINT16	N	Definite time overcurrent trip counter
0x1682	5763	1	0x03	R	1	–	UINT16	N	Normal inverse overcurrent trip counter
0x1683	5764	1	0x03	R	1	–	UINT16	N	Short time overcurrent trip counter
0x1684	5765	1	0x03	R	1	–	UINT16	N	Calculated ground trip counter
0x1685	5766	1	0x03	R	1	–	UINT16	N	Measured ground trip counter
0x1686	5767	1	0x03	R	1	–	UINT16	N	Phase under current trip counter
0x1687	5768	1	0x03	R	1	–	UINT16	N	Current imbalance trip counter
0x1688	5769	1	0x03	R	1	–	UINT16	N	Current phase loss trip counter
0x1689	5770	1	0x03	R	1	–	UINT16	N	Current phase reversal trip counter
0x168A	5771	1	0x03	R	1	–	UINT16	N	Phase under voltage trip counter

Address	Register	No.	Function code	RW	X	Unit	Type	Svd	Description
0x168B	5772	1	0x03	R	1	–	UINT16	N	Phase over voltage trip counter
0x168C	5773	1	0x03	R	1	–	UINT16	N	Voltage phase loss trip counter
0x168D	5774	1	0x03	R	1	–	UINT16	N	Voltage imbalance trip counter
0x168E	5775	1	0x03	R	1	–	UINT16	N	Voltage phase reversal trip counter
0x168F	5776	1	0x03	R	1	–	UINT16	N	Under frequency trip counter
0x1690	5777	1	0x03	R	1	–	UINT16	N	Over frequency trip counter
0x1691	5778	1	0x03	R	1	–	UINT16	N	Excessive start time trip counter
0x1692	5779	1	0x03	R	1	–	UINT16	N	Communication loss trip counter
0x1693	5780	1	0x03	R	1	–	UINT16	N	LTMT main unit temperature trip counter
0x1694	5781	1	0x03	R	1	–	UINT16	N	Under power trip counter
0x1695	5782	1	0x03	R	1	–	UINT16	N	Over power trip counter
0x1696	5783	1	0x03	R	1	–	UINT16	N	Under power factor trip counter
0x1697	5784	1	–	–	–	–	–	–	Reserved
0x1698	5785	1	0x03	R	1	–	UINT16	N	Device internal trip counter
0x1699	5786	1	0x03	R	1	–	UINT16	N	HMI communication loss trip counter
0x169A–0x169D	5787 – 5790	1	–	–	–	–	–	–	Reserved
0x169E	5791	1	0x03	R	1	–	UINT16	N	DI interlock 1 trip counter
0x169F	5792	1	0x03	R	1	–	UINT16	N	DI interlock 2 trip counter
0x16A0	5793	1	0x03	R	1	–	UINT16	N	DI interlock 3 trip counter
0x16A1	5794	1	0x03	R	1	–	UINT16	N	DI interlock 4 trip counter
0x16A2	5795	1	0x03	R	1	–	UINT16	N	DI interlock 5 trip counter
0x16A3	5796	1	0x03	R	1	–	UINT16	N	DI interlock 6 trip counter
0x16A4	5797	1	0x03	R	1	–	UINT16	N	DI interlock 7 trip counter
0x16A5	5798	1	0x03	R	1	–	UINT16	N	DI interlock 8 trip counter
0x16A6	5799	1	0x03	R	1	–	UINT16	N	DI interlock 9 trip counter
0x16A7	5800	1	0x03	R	1	–	UINT16	N	DI interlock 10 trip counter
0x16A8	5801	1	0x03	R	1	–	UINT16	N	DI interlock 11 trip counter
0x16A9	5802	1	0x03	R	1	–	UINT16	N	DI interlock 12 trip counter
0x16AA	5803	1	–	–	–	–	–	–	Reserved
0x16AF–0x16C1	5807–5826	1	–	–	–	–	–	–	Reserved
0x16C2	5827	1	0x03	R	1	–	UINT16	N	Calculator 1 output
0x16C3	5828	1	0x03	R	1	–	UINT16	N	Calculator 2 output
0x16C4	5829	1	0x03	R	1	–	UINT16	N	Motor stop error detection trip counter
0x16C5	5830	1	0x03	R	1	–	UINT16	N	Logic test interrupted trip counter
0x16C6	5831	1	0x03	R	1	–	UINT16	N	Stucked reset key trip counter

Extended Monitoring Data

The table lists the extended monitoring data for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Svd	Description
0x16F3	5876	1	0x03	R	1	–	UINT16	N	Status word 1
0x16F4	5877	1	0x03	R	1	–	UINT16	N	Status word 2
0x16F5	5878	1	0x03	R	1	%IFLC	UINT16	N	L1 current (%IFLC)
0x16F6	5879	1	0x03	R	1	%IFLC	UINT16	N	L2 current (%IFLC)
0x16F7	5880	1	0x03	R	1	%IFLC	UINT16	N	L3 current (%IFLC)
0x16F8	5881	1	0x03	R	1	%IFLC	UINT16	N	Calculated ground fault (%IFLC)
0x16F9	5882	1	0x03	R	1	%IFLC	UINT16	N	Average current (%IFLC)
0x16FA	5883	1	0x03	R	1	%IFLC	UINT16	N	Maximum current (Imax)
0x16FB	5884	1	0x03	R	0.1	V	UINT16	N	For three phase, L1–L2 voltage For single phase, L1–N voltage
0x16FC	5885	1	0x03	R	0.1	V	UINT16	N	L2–L3 voltage
0x16FD	5886	1	0x03	R	0.1	V	UINT16	N	L3–L1 voltage
0x16FE	5887	1	0x03	R	0.1	V	UINT16	N	Average voltage
0x16FF	5888	1	0x03	R	1	Hr	UINT16	N	Total RUN hour
0x1700	5889	1	0x03	R	1	Hr	UINT16	N	Last RUN hour
0x1701	5890	1	0x03	R	1	Sec	UINT16	N	Motor starting time
0x1702	5891	1	0x03	R	1	%IFLC	UINT16	N	Motor starting current (% IFLC)
0x1703	5892	1	0x03	R	1	KW	UINT16	N	Active power
0x1704	5893	1	0x03	R	1	KVAR	UINT16	N	Reactive power
0x1705	5894	1	0x03	R	1	KVA	UINT16	N	Apparent power
0x1706	5895	2	0x03	R	1	KWH	UINT32	N	Active energy
0x1708	5897	2	0x03	R	1	KVARh	UINT32	N	Reactive energy
0x170A	5899	2	0x03	R	1	KVAh	UINT32	N	Apparent energy
0x170C	5901	1	0x03	R	1	–	UINT16	N	Mode status • 0: Local1 • 1: Remote • 2: Local2 • 3: Local3
0x170D	5902	1	0x03	R	1	–	UINT16	N	Active trip count
0x170E	5903	1	0x03	R	1	–	UINT16	N	Active alarm count
0x170F	5904	1	0x03	R	1	–	UINT16	N	Trip code

Status Data Parameters

What's in This Chapter

Description

There are two ways to get the status data:

- From BITMAP register, read with function code 0x03, where each register bit corresponds to one boolean data. For more information, refer to BITMAP Representation of Boolean Data, page 55.
- From Boolean data, read with function code 0x02.

The table lists the status data for the Modbus RTU communication.

Address	Register	No.	Function code	RW	Type	Svd	Description
0x15F9	5626	2	0x03	R	BITMAP	N	Digital Input Status, page 56.
0x15FB	5628	2	0x03	R	BITMAP	N	Digital Output Status, page 57.
0x15FD–0x1605	5630–5638	1	–	–	–	–	Reserved
0x1606	5639	1	–	–	–	–	Reserved
0x1607	5640	1	0x03	R	BITMAP	N	Common Trip, Alarm, and Pickup Status, page 57.
0x1608	5641	1	0x03	R	BITMAP	N	Motor Status, page 57.
0x1609	5642	2	0x03	R	BITMAP	N	Protection Alarm Status, page 59.
0x160B	5644	2	0x03	R	BITMAP	N	Protection Pickup Status, page 60.
0x160D	5646	2	0x03	R	BITMAP	N	Protection Trip Status, page 61.
0x160F	5648	1	0x03	R	BITMAP	N	Interlock Protection Alarm Status, page 62.
0x1610	5649	1	0x03	R	BITMAP	N	Interlock Protection Pickup Status, page 62.
0x1611	5650	1	0x03	R	BITMAP	N	Interlock Protection Trip Status, page 63.
0x1612–0x1617	5651–5656	1	–	–	–	–	Reserved
0x1618	5657	2	0x03	R	BITMAP	N	Starter Commands, page 63.
0x161A	5659	1	0x03	R	BITMAP	N	Motor Run Indicators, page 63.
0x161B	5660	2	0x03	R	BITMAP	N	Permissive Commands Status, page 64.
0x161D	5662	2	0x03	R	BITMAP	N	Inhibit Status, page 64.
0x161F	5664	2	0x03	R	BITMAP	N	LTMT Main Unit Device Internal Error Detection Setting, page 65.
0x1621	5666	2	0x03	R	BITMAP	N	LTMTCT/LTMTCTV Sensor Module Device Internal Error Detection Setting, page 66.
0x1622	5668	2	0x03	R	BITMAP	N	Communication Status, page 66

BITMAP Representation of Boolean Data

The boolean data can also be mapped using bitwise data. For example, the Digital Input Status, page 56 is mapped bitwise in the following table.

BITMAP register	BITMAP function code	Boolean register	Boolean function code	Description
5627.0	0x03	1	0x02	Digital Input 1
5627.1	0x03	2	0x02	Digital Input 2
5627.2	0x03	3	0x02	Digital Input 3
5627.3	0x03	4	0x02	Digital Input 4
5627.4	0x03	5	0x02	Digital Input 5
5627.5	0x03	6	0x02	Digital Input 6
5627.6	0x03	7	0x02	Digital Input 7
5627.7	0x03	8	0x02	Digital Input 8
5627.8	0x03	9	0x02	Digital Input 9
5627.9	0x03	10	0x02	Digital Input 10
5627.10	0x03	11	0x02	Digital Input 11
5627.11	0x03	12	0x02	Digital Input 12
5627.12	0x03	13	0x02	Digital Input 13
5627.13	0x03	14	0x02	Digital Input 14
5627.14	0x03	15	0x02	Digital Input 15
5627.15	0x03	16	0x02	Digital Input 16
5626.0	0x03	17	0x02	Digital Input 17
5626.1	0x03	18	0x02	Digital Input 18
5626.2	0x03	19	0x02	Digital Input 19
5626.3	0x03	20	0x02	Digital Input 20
5626.4	0x03	21	0x02	Digital Input 21
5626.5	0x03	22	0x02	Digital Input 22
5626.6	0x03	23	0x02	Digital Input 23
5626.7	0x03	24	0x02	Digital Input 24

Digital Input Status

The table lists the digital input status for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x0000	1	0x02	R	BOOL	N	Digital input 1
0x0001	2	0x02	R	BOOL	N	Digital input 2
0x0002	3	0x02	R	BOOL	N	Digital input 3
0x0003	4	0x02	R	BOOL	N	Digital input 4
0x0004	5	0x02	R	BOOL	N	Digital input 5
0x0005	6	0x02	R	BOOL	N	Digital input 6
0x0006	7	0x02	R	BOOL	N	Digital input 7
0x0007	8	0x02	R	BOOL	N	Digital input 8
0x0008	9	0x02	R	BOOL	N	Digital input 9
0x0009	10	0x02	R	BOOL	N	Digital input 10
0x000A	11	0x02	R	BOOL	N	Digital input 11
0x000B	12	0x02	R	BOOL	N	Digital input 12
0x000C	13	0x02	R	BOOL	N	Digital input 13
0x000D	14	0x02	R	BOOL	N	Digital input 14
0x000E	15	0x02	R	BOOL	N	Digital input 15
0x000F	16	0x02	R	BOOL	N	Digital input 16
0x0010	17	0x02	R	BOOL	N	Digital input 17
0x0011	18	0x02	R	BOOL	N	Digital input 18
0x0012	19	0x02	R	BOOL	N	Digital input 19
0x0013	20	0x02	R	BOOL	N	Digital input 20
0x0014	21	0x02	R	BOOL	N	Digital input 21
0x0015	22	0x02	R	BOOL	N	Digital input 22
0x0016	23	0x02	R	BOOL	N	Digital input 23
0x0017	24	0x02	R	BOOL	N	Digital input 24
0x0018–0x001F	25–32	–	–	–	–	Reserved

Digital Output Status

The table lists the digital output status for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x0020	33	0x02	R	BOOL	N	Digital output 1
0x0021	34	0x02	R	BOOL	N	Digital output 2
0x0022	35	0x02	R	BOOL	N	Digital output 3
0x0023	36	0x02	R	BOOL	N	Digital output 4
0x0024	37	0x02	R	BOOL	N	Digital output 5
0x0025	38	0x02	R	BOOL	N	Digital output 6
0x0026	39	0x02	R	BOOL	N	Digital output 7
0x0027	40	0x02	R	BOOL	N	Digital output 8
0x0028	41	0x02	R	BOOL	N	Digital output 9
0x0029	42	0x02	R	BOOL	N	Digital output 10
0x002A	43	0x02	R	BOOL	N	Digital output 11
0x002B	44	0x02	R	BOOL	N	Digital output 12
0x002C	45	0x02	R	BOOL	N	Digital output 13
0x002D–0x003F	46–64	–	–	–	–	Reserved

Common Trip, Alarm, and Pickup Status

The table lists the common trip, alarm and pickup status for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x00E0	225	0x02	R	BOOL	N	Pickup status
0x00E1	226	0x02	R	BOOL	N	Alarm status
0x00E2	227	0x02	R	BOOL	N	Trip status
0x00E3	228	0x02	R	BOOL	N	Motor stop error detection
0x00E4	229	–	–	–	–	Reserved
0x00E5	230	0x02	R	BOOL	N	Block output
0x00E6–0x00EF	231–240	–	–	–	–	Reserved

Motor Status

The table lists the motor status for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x00F0	241	0x02	R	BOOL	N	Motor Stop
0x00F1	242	0x02	R	BOOL	N	Motor Start
0x00F2	243	0x02	R	BOOL	N	Motor Run
0x00F3	244	0x02	R	BOOL	N	Motor Inhibit

Address	Register	Function code	RW	Type	Svd	Description
0x00F4	245	0x02	R	BOOL	N	Remote Mode
0x00F5–0x00FF	246–256	–	–	–	–	Reserved

Protection Function Status

Protection Alarm Status

The table lists the protection alarm status for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x0100	257	0x02	R	BOOL	N	Thermal overload alarm
0x0101	258	0x02	R	BOOL	N	Locked rotor alarm
0x0102	259	0x02	R	BOOL	N	Stalled rotor alarm
0x0103	260	0x02	R	BOOL	N	Definite time overcurrent alarm
0x0104	261	0x02	R	BOOL	N	Normal inverse overcurrent alarm
0x0105	262	0x02	R	BOOL	N	Short time overcurrent alarm
0x0106	263	0x02	R	BOOL	N	Calculated ground current alarm
0x0107	264	0x02	R	BOOL	N	Measured ground current alarm
0x0108	265	0x02	R	BOOL	N	Phase under current alarm
0x0109	266	0x02	R	BOOL	N	Current imbalance alarm
0x010A	267	0x02	R	BOOL	N	Current phase loss alarm
0x010B	268	0x02	R	BOOL	N	Current phase reversal alarm
0x010C	269	0x02	R	BOOL	N	Phase under voltage alarm
0x010D	270	0x02	R	BOOL	N	Phase over voltage alarm
0x010E	271	0x02	R	BOOL	N	Voltage phase loss alarm
0x010F	272	0x02	R	BOOL	N	Voltage imbalance alarm
0x0110	273	0x02	R	BOOL	N	Voltage phase reversal alarm
0x0111	274	0x02	R	BOOL	N	Under frequency alarm
0x0112	275	0x02	R	BOOL	N	Over frequency alarm
0x0113	276	0x02	R	BOOL	N	Reserved
0x0114	277	0x02	R	BOOL	N	Communication loss alarm
0x0115	278	0x02	R	BOOL	N	Over temperature alarm
0x0116	279	0x02	R	BOOL	N	Under power alarm
0x0117	280	0x02	R	BOOL	N	Over power alarm
0x0118	281	0x02	R	BOOL	N	Under power factor alarm
0x0119	282	–	–	–	–	Reserved
0x011A	283	0x02	R	BOOL	N	Device internal temperature alarm
0x011B	284	0x02	R	BOOL	N	HMI communication loss alarm
0x011C–0x011F	285–288	–	–	–	–	Reserved

Protection Pickup Status

The table lists the protection pickup status for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x0120	289	0x02	R	BOOL	N	Thermal overload pickup
0x0121	290	0x02	R	BOOL	N	Locked rotor pickup
0x0122	291	0x02	R	BOOL	N	Stalled rotor pickup
0x0123	292	0x02	R	BOOL	N	Definite time overcurrent pickup
0x0124	293	0x02	R	BOOL	N	Normal inverse overcurrent pickup
0x0125	294	0x02	R	BOOL	N	Short time overcurrent pickup
0x0126	295	0x02	R	BOOL	N	Calculated ground current pickup
0x0127	296	0x02	R	BOOL	N	Measured ground current pickup
0x0128	297	0x02	R	BOOL	N	Phase under current pickup
0x0129	298	0x02	R	BOOL	N	Current imbalance pickup
0x012A	299	0x02	R	BOOL	N	Current phase loss pickup
0x012B	300	0x02	R	BOOL	N	Current phase reversal pickup
0x012C	301	0x02	R	BOOL	N	Phase under voltage pickup
0x012D	302	0x02	R	BOOL	N	Phase over voltage pickup
0x012E	303	0x02	R	BOOL	N	Voltage phase loss pickup
0x012F	304	0x02	R	BOOL	N	Voltage imbalance pickup
0x0130	305	0x02	R	BOOL	N	Voltage phase reversal pickup
0x0131	306	0x02	R	BOOL	N	Under frequency pickup
0x0132	307	0x02	R	BOOL	N	Over frequency pickup
0x0133	308	0x02	R	BOOL	N	Excessive start time pickup
0x0134	309	0x02	R	BOOL	N	Communication loss pickup
0x0135	310	0x02	R	BOOL	N	Over temperature pickup
0x0136	311	0x02	R	BOOL	N	Under power pickup
0x0137	312	0x02	R	BOOL	N	Over power pickup
0x0138	313	0x02	R	BOOL	N	Under power factor pickup
0x0139	314	–	–	–	–	Reserved
0x013A	315	0x02	R	BOOL	N	Device internal pickup
0x013B	316	0x02	R	BOOL	N	HMI communication loss pickup
0x013C–0x013F	317–320	–	–	–	–	Reserved

Protection Trip Status

The table lists the protection trip status for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x0140	321	0x02	R	BOOL	N	Thermal overload trip
0x0141	322	0x02	R	BOOL	N	Locked rotor trip
0x0142	323	0x02	R	BOOL	N	Stalled rotor trip
0x0143	324	0x02	R	BOOL	N	Definite time overcurrent trip
0x0144	325	0x02	R	BOOL	N	Normal inverse overcurrent trip
0x0145	326	0x02	R	BOOL	N	Short time overcurrent trip
0x0146	327	0x02	R	BOOL	N	Calculated ground current trip
0x0147	328	0x02	R	BOOL	N	Measured ground current trip
0x0148	329	0x02	R	BOOL	N	Phase under current trip
0x0149	330	0x02	R	BOOL	N	Current imbalance trip
0x014A	331	0x02	R	BOOL	N	Current phase loss trip
0x014B	332	0x02	R	BOOL	N	Current phase reversal trip
0x014C	333	0x02	R	BOOL	N	Phase under voltage trip
0x014D	334	0x02	R	BOOL	N	Phase over voltage trip
0x014E	335	0x02	R	BOOL	N	Voltage phase loss trip
0x014F	336	0x02	R	BOOL	N	Voltage imbalance trip
0x0150	337	0x02	R	BOOL	N	Voltage phase reversal trip
0x0151	338	0x02	R	BOOL	N	Under frequency trip
0x0152	339	0x02	R	BOOL	N	Over frequency trip
0x0153	340	0x02	R	BOOL	N	Excessive start time trip
0x0154	341	0x02	R	BOOL	N	Communication loss trip
0x0155	342	0x02	R	BOOL	N	Over temperature trip
0x0156	343	0x02	R	BOOL	N	Under power trip
0x0157	344	0x02	R	BOOL	N	Over power trip
0x0158	345	0x02	R	BOOL	N	Under power factor trip
0x0159	346	–	–	–	–	Reserved
0x015A	347	0x02	R	BOOL	N	Device internal trip
0x015B	348	0x02	R	BOOL	N	HMI communication loss trip
0x015C–0x015F	349–352	–	–	–	–	Reserved

Interlock Protection Status

Interlock Protection Alarm Status

The table lists the interlock protection alarm status for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x0160	353	0x02	R	BOOL	N	Interlock 1 alarm
0x0161	354	0x02	R	BOOL	N	Interlock 2 alarm
0x0162	355	0x02	R	BOOL	N	Interlock 3 alarm
0x0163	356	0x02	R	BOOL	N	Interlock 4 alarm
0x0164	357	0x02	R	BOOL	N	Interlock 5 alarm
0x0165	358	0x02	R	BOOL	N	Interlock 6 alarm
0x0166	359	0x02	R	BOOL	N	Interlock 7 alarm
0x0167	360	0x02	R	BOOL	N	Interlock 8 alarm
0x0168	361	0x02	R	BOOL	N	Interlock 9 alarm
0x0169	362	0x02	R	BOOL	N	Interlock 10 alarm
0x016A	363	0x02	R	BOOL	N	Interlock 11 alarm
0x016B	364	0x02	R	BOOL	N	Interlock 12 alarm
0x016C–0x016F	365–368	–	–	–	–	Reserved

Interlock Protection Pickup Status

The table lists the interlock protection pickup status for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x0170	369	0x02	R	BOOL	N	Interlock 1 pickup
0x0171	370	0x02	R	BOOL	N	Interlock 2 pickup
0x0172	371	0x02	R	BOOL	N	Interlock 3 pickup
0x0173	372	0x02	R	BOOL	N	Interlock 4 pickup
0x0174	373	0x02	R	BOOL	N	Interlock 5 pickup
0x0175	374	0x02	R	BOOL	N	Interlock 6 pickup
0x0176	375	0x02	R	BOOL	N	Interlock 7 pickup
0x0177	376	0x02	R	BOOL	N	Interlock 8 pickup
0x0178	377	0x02	R	BOOL	N	Interlock 9 pickup
0x0179	378	0x02	R	BOOL	N	Interlock 10 pickup
0x017A	379	0x02	R	BOOL	N	Interlock 11 pickup
0x017B	380	0x02	R	BOOL	N	Interlock 12 pickup
0x017C–0x017F	381–384	–	–	–	–	Reserved

Interlock Protection Trip Status

The table lists the interlock protection trip status for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x0180	385	0x02	R	BOOL	N	Interlock 1 trip
0x0181	386	0x02	R	BOOL	N	Interlock 2 trip
0x0182	387	0x02	R	BOOL	N	Interlock 3 trip
0x0183	388	0x02	R	BOOL	N	Interlock 4 trip
0x0184	389	0x02	R	BOOL	N	Interlock 5 trip
0x0185	390	0x02	R	BOOL	N	Interlock 6 trip
0x0186	391	0x02	R	BOOL	N	Interlock 7 trip
0x0187	392	0x02	R	BOOL	N	Interlock 8 trip
0x0188	393	0x02	R	BOOL	N	Interlock 9 trip
0x0189	394	0x02	R	BOOL	N	Interlock 10 trip
0x018A	395	0x02	R	BOOL	N	Interlock 11 trip
0x018B	396	0x02	R	BOOL	N	Interlock 12 trip
0x018C–0x018F	397–400	–	–	–	–	Reserved

Starter Commands

The table lists the starter commands for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x01F0	497	0x02	R	BOOL	N	Contactor output 1
0x01F1	498	0x02	R	BOOL	N	Contactor output 2
0x01F2	499	0x02	R	BOOL	N	Contactor output 3
0x01F3	500	0x02	R	BOOL	N	Contactor output 4
0x01F4	501	0x02	R	BOOL	N	Contactor output 5
0x01F5–0x020E	502–527	–	–	–	–	Reserved
0x020F	528	0x02	R	BOOL	N	Motor Stop

Motor Run Indicators

The table lists the motor run indicators for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x0210	529	0x02	R	BOOL	N	Motor forward running
0x0211	530	0x02	R	BOOL	N	Motor reverse running
0x0212	531	0x02	R	BOOL	N	Motor fast forward running
0x0213	532	0x02	R	BOOL	N	Motor fast reverse running
0x0214	533	0x02	R	BOOL	N	Motor running in star (forward)
0x0215	534	0x02	R	BOOL	N	Motor running in delta (forward)

Address	Register	Function code	RW	Type	Svd	Description
0x0216	535	0x02	R	BOOL	N	Motor running in star (reverse)
0x0217	536	0x02	R	BOOL	N	Motor running in delta (reverse)
0x0218	537	0x02	R	BOOL	N	Motor in star-delta changeover (forward)
0x0219	538	0x02	R	BOOL	N	Motor in star-delta changeover (reverse)
0x021A	539	0x02	R	BOOL	N	Interlocking time active
0x021B	540	0x02	R	BOOL	N	Change-over pause active
0x021C–0x021F	541–544	–	–	–	–	Reserved

Permissive Commands Status

The table lists the permissive commands status for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x0220	545	0x02	R	BOOL	N	Status - Permissive Command 1
0x0221	546	0x02	R	BOOL	N	Status - Permissive Command 2
0x0222	547	0x02	R	BOOL	N	Status - Permissive Command 3
0x0223	548	0x02	R	BOOL	N	Status - Permissive Command 4
0x0224	549	0x02	R	BOOL	N	Status - Permissive Command 5
0x0225	550	0x02	R	BOOL	N	Status - Permissive Command 6
0x0226	551	0x02	R	BOOL	N	Status - Permissive Command 7
0x0227	552	0x02	R	BOOL	N	Status - Permissive Command 8
0x0228–0x023F	553–576	–	–	–	–	Reserved

Inhibit Status

The table lists the inhibit status for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x0240	577	0x02	R	BOOL	N	No voltage inhibit
0x0241	578	0x02	R	BOOL	N	Under voltage inhibit
0x0242	579	0x02	R	BOOL	N	Trip inhibit
0x0243	580	0x02	R	BOOL	N	Thermal inhibit
0x0244	581	0x02	R	BOOL	N	Max starts inhibit
0x0245	582	0x02	R	BOOL	N	Interlock 1 inhibit
0x0246	583	0x02	R	BOOL	N	Interlock 2 inhibit
0x0247	584	0x02	R	BOOL	N	Interlock 3 inhibit
0x0248	585	0x02	R	BOOL	N	Interlock 4 inhibit
0x0249	586	0x02	R	BOOL	N	Interlock 5 inhibit
0x024A	587	0x02	R	BOOL	N	Interlock 6 inhibit
0x024B	588	0x02	R	BOOL	N	Interlock 7 inhibit
0x024C	589	0x02	R	BOOL	N	Interlock 8 inhibit

Address	Register	Function code	RW	Type	Svd	Description
0x024D	590	0x02	R	BOOL	N	Interlock 9 inhibit
0x024E	591	0x02	R	BOOL	N	Interlock 10 inhibit
0x024F	592	0x02	R	BOOL	N	Interlock 11 inhibit
0x0250	593	0x02	R	BOOL	N	Interlock 12 inhibit
0x0251	594	0x02	R	BOOL	N	Local DI stop inhibit
0x0252	595	0x02	R	BOOL	N	Remote DI stop inhibit
0x0253	596	0x02	R	BOOL	N	Communication stop inhibit
0x0254	597	0x02	R	BOOL	N	Force stop inhibit
0x0255	598	0x02	R	BOOL	N	Antibackspin inhibit
0x0256	599	–	–	–	–	Reserved
0x0257	600	0x02	R	BOOL	N	Direction change inhibit
0x0258	601	0x02	R	BOOL	N	Speed change inhibit
0x0259	602	0x02	R	BOOL	N	Custom stop inhibit
0x025A	603	0x02	R	BOOL	N	Firmware update inhibit
0x025B–0x025F	604–608	–	–	–	–	Reserved

LTMT Main Unit Device Internal Error Detection Setting

The table lists the different device internal error detection setting of LTMT main unit.

Address	Register	Function code	RW	Type	Svd	Description
0x0260	609	0x02	R	BOOL	N	Sensor module communication error detected
0x0261	610	0x02	R	BOOL	N	Expansion unit communication error detected
0x0262	611	0x02	R	BOOL	N	HMI communication error detected
0x0263	612	0x02	R	BOOL	N	EEPROM interface error detected
0x0264	613	0x02	R	BOOL	N	EEPROM checksum error detected
0x0265	614	0x02	R	BOOL	N	Configuration error detected
0x0266	615	0x02	R	BOOL	N	PROFIBUS DP interface error detected
0x0267	616	0x02	R	BOOL	N	Internal temperature major error detected
0x0268	617	0x02	R	BOOL	N	Watchdog timeout detected
0x0269	618	0x02	R	BOOL	N	Low Battery detected
0x026A–0x026B	619–620	–	–	–	–	Reserved
0x026C	621	0x02	R	BOOL	N	Energy register overflow
0x026D	622	0x02	R	BOOL	N	Error detected during expansion unit initialization
0x026E	623	0x02	R	BOOL	N	RTC initialization error detected
0x026F	624	0x02	R	BOOL	N0	Internal temperature minor error detected
0x0270–0x027F	625–640	–	–	–	–	Reserved

LTMTCT/LTMTCTV Sensor Module Device Internal Error Detection Setting

The table lists the different device Internal error detection setting for the LTMTCT/ LTMTCTV sensor module Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x0280	641	0x02	R	BOOL	N	Watchdog timeout detected
0x0281	642	0x02	R	BOOL	N	ADC conversion error detected
0x0282	643	0x02	R	BOOL	N	Flash error detected
0x0283	644	–	–	–	–	Reserved
0x0284	645	0x02	R	BOOL	N	Voltage configuration not detected
0x0285	646	–	–	–	–	Reserved
0x0286	647	0x02	R	BOOL	N	Calibration error detected
0x0287	648	0x02	R	BOOL	N	VL1 measurement error detected
0x0288	649	0x02	R	BOOL	N	VL2 measurement error detected
0x0289	650	0x02	R	BOOL	N	VL3 measurement error detected
0x028A	651	0x02	R	BOOL	N	IL1 low gain measurement error detected
0x028B	652	0x02	R	BOOL	N	IL1 high gain measurement error detected
0x028C	653	0x02	R	BOOL	N	IL2 low gain measurement error detected
0x028D	654	0x02	R	BOOL	N	IL2 high gain measurement error detected
0x028E	655	0x02	R	BOOL	N	IL3 low gain measurement error detected
0x028F	656	0x02	R	BOOL	N	IL3 high gain measurement error detected
0x0290–0x029F	657–672	–	–	–	–	Reserved

Communication Status

The table lists the communication status for the Modbus RTU communication.

Address	Register	Function code	RW	Type	Svd	Description
0x02A0	673	0x02	R	BOOL	N	Modbus RTU or PROFIBUS DP port – No communication
0x02A1	674	0x02	R	BOOL	N	HMI port – No communication
0x02A2–0x02BF	675–704	–	–	–	–	Reserved

Product Information Data

What's in This Chapter

Manufacturing Data

The table lists the manufacturing data for the Modbus RTU communication.

Address	Register	No.	Function code	RW	Type	Svd	Description
0x23A5	9126	2	0x03	R	UINT32	Y	Product Id
0x23A7	9128	16	0x03	R	ASCII	Y	Product serial number
0x23B7	9144	1	0x03	R	UINT16	Y	Manufacture day
0x23B8	9145	1	0x03	R	UINT16	Y	Manufacture month
0x23B9	9146	1	0x03	R	UINT16	Y	Manufacture year
0x23BA	9147	1	0x03	R	UINT16	Y	Manufacture hour
0x23BB	9148	1	0x03	R	UINT16	Y	Manufacture minute
0x23BC	9149	1	0x03	R	UINT16	Y	Manufacture second
0x23BD	9150	2	0x03	R	UINT16	Y	Standard package version
0x23BF	9152	1	–	–	–	–	Reserved
0x23C0	9153	10	0x03	R	ASCII	Y	Commercial reference

Product Versions

The hardware versions of the TeSys Tera system are coded XXYY in UINT32 registers, with the following format:

- Register 0: Reserved
- Register 1:
  - XXYY: Hexa code of ASCII characters

Example: the LTMT main unit hardware version A is coded:

- Register 9163 = 0x0000
- Register 9164 = 0x0041

The firmware versions of the TeSys Tera system are coded aaa.bbb.ccc in UINT32 registers, with the following format:

- Register 0: ccc, revision
- Register 1:
  - MSB: aaa, major version
  - LSB: bbb, minor version

Example: the LTMT main unit firmware version 001.002.004 is coded:

- Register 9165 = 0x0004
- Register 9166 = 0x0102

Address	Register	No.	Function code	RW	Type	Svd	Description
0x23CA	9163	2	0x03	R	UINT32	Y	LTMT main unit hardware version
0x23CC	9165	2	0x03	R	UINT32	Y	LTMT main unit firmware version
0x23CE	9167	2	0x03	R	UINT32	Y	LTMT main unit boot firmware version
0x23D0	9169	2	0x03	R	UINT32	Y	LTMTCT/LTMTCTV sensor module hardware version
0x23D2	9171	2	0x03	R	UINT32	Y	LTMTCT/LTMTCTV sensor module firmware version
0x23D4	9173	2	0x03	R	UINT32	Y	LTMTCT/LTMTCTV sensor module boot firmware version
0x23D6	9175	2	0x03	R	UINT32	Y	LTMTCUF control operator unit hardware version

Address	Register	No.	Function code	RW	Type	Svd	Description
0x23D8	9177	2	0x03	R	UINT32	Y	LTMTCUF control operator unit firmware version
0x23DA	9179	2	0x03	R	UINT32	Y	LTMTCUF control operator unit boot firmware version
0x23DC	9181	2	0x03	R	UINT32	Y	LTMT expansion unit 1 hardware version
0x23DE	9183	2	0x03	R	UINT32	Y	LTMT expansion unit 1 firmware version
0x23E0	9185	2	0x03	R	UINT32	Y	LTMT expansion unit 1 boot firmware version
0x23E2	9187	2	0x03	R	UINT32	Y	LTMT expansion unit 2 hardware version
0x23E4	9189	2	0x03	R	UINT32	Y	LTMT expansion unit 2 firmware version
0x23E6	9191	2	0x03	R	UINT32	Y	LTMT expansion unit 2 boot firmware version
0x23E8	9193	2	0x03	R	UINT32	Y	LTMT expansion unit 3 hardware version
0x23EA	9195	2	0x03	R	UINT32	Y	LTMT expansion unit 3 firmware version
0x23EC	9197	2	0x03	R	UINT32	Y	LTMT expansion unit 3 boot firmware version
0x23EE	9199	2	0x03	R	UINT32	Y	LTMT expansion unit 4 hardware version
0x23F0	9201	2	0x03	R	UINT32	Y	LTMT expansion unit 4 firmware version
0x23F2	9203	2	0x03	R	UINT32	Y	LTMT expansion unit 4 boot firmware version
0x23F4	9205	2	0x03	R	UINT32	Y	LTMT expansion unit 5 hardware version
0x23F6	9207	2	0x03	R	UINT32	Y	LTMT expansion unit 5 firmware version
0x23F8	9209	2	0x03	R	UINT32	Y	LTMT expansion unit 5 boot firmware version

Detected Modules

The table lists the detected modules for the Modbus RTU communication.

Address	Register	No.	Function code	RW	Type	Svd	Description
0x2400	9217	1	0x03	R	UINT16	N	LTMTCT/LTMTCTV Sensor Module Type, page 69
0x2401	9218	1	–	–	–	–	Reserved
0x2402	9219	1	0x03	R	UINT16	N	LTMT Expansion Unit 1 Type, page 70
0x2403	9220	1	0x03	R	UINT16	N	LTMT Expansion Unit 2 Type, page 70
0x2404	9221	1	0x03	R	UINT16	N	LTMT Expansion Unit 3 Type, page 70
0x2405	9222	1	0x03	R	UINT16	N	LTMT Expansion Unit 4 Type, page 70
0x2406	9223	1	0x03	R	UINT16	N	LTMT Expansion Unit 5 Type, page 70

LTMTCT/LTMTCTV Sensor Module Type

The table lists the type of sensor modules used for the Modbus RTU communication.

Register value	Reference	Sensor module	Current range
0	–	None	–
1–2	–	Reserved	–
3	LTMTCT3T	LTMTCT horizontal module	0.3–3 A
4	LTMTCTV3T	LTMTCTV horizontal module	0.3–3 A
5–6	–	Reserved	–

Register value	Reference	Sensor module	Current range
7	LTMTCT25T	LTMTCT horizontal module	2.5–25 A
8	LTMTCTV25T	LTMTCTV horizontal module	2.5–25 A
9–10	–	Reserved	–
11	LTMTCT100T	LTMTCT horizontal module	10–100 A
12	LTMTCTV100T	LTMTCTV horizontal module	10–100 A
13–14	–	Reserved	–
15	LTMTCTV3UT	LTMTCTV horizontal module for UL applications	0.3–3 A
16	LTMTCTV25UT	LTMTCTV horizontal module for UL applications	2.5–25 A
17	LTMTCTV100UT	LTMTCTV horizontal module for UL applications	10–100 A

LTMT Expansion Unit Type

The table lists the type of expansion units used for the Modbus RTU communication.

Register value	Reference	Expansion unit	DI rating
0	–	None	–
1	LTMTIN42FM	4 DI and 2 DO	100/240 Vac/Vdc
2	LTMTIN42BD	4 DI and 2 DO	24 Vdc
3–8	–	Reserved	–

Motor Protection Settings

What's in This Chapter

Thermal Overload Protection

The table lists the thermal overload protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DAC	3501	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	3	Y	Function setting
0x0DAD	3502	1	0x03, 0x06, 0x10	RW	0.01	–	UINT16	100–150 (step 5)	115	Y	Service factor
0x0DAE	3503	1	0x03, 0x06, 0x10	RW	1	–	UINT16	5–40 (step 5)	10	Y	Trip class
0x0DAF	3504	1	0x03, 0x06, 0x10	RW	1	% TM[2]	UINT16	80–100 (step 5)	80	Y	Alarm level
0x0DB0	3505	1	0x03, 0x06, 0x10	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Commu-nication • Bit 3: Auto	8	Y	Reset mode[3]
0x0DB1	3506	1	0x03, 0x06, 0x10	RW	1	% TM[2]	UINT16	30–95 (step 5)	90	Y	Thermal reset level
0x0DB2	3507	1	0x03, 0x06, 0x10	RW	1	% TM[2]	UINT16	5–100 (step 5)	90	Y	Start inhibit level
0x0DB3	3508	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Cool down function
0x0DB4	3509	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Cool down time
0x0DB5	3510	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Pause function
0x0DB6	3511	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Pause time
0x0DB7	3512	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Block function
0x0DB8	3513	1	0x03, 0x06, 0x10	RW	1	% TM[2]	UINT16	80–95 (step 5)	80	Y	Block level
0x0DB9	3514	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Block time

2. %TM = % of thermal memory
3. If the Auto reset mode is selected, you cannot configure any other reset modes.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DBA	3515	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Auxiliary fan
0x0DBB	3516	3	–	–	–	–	–	–	–	–	Reserved

Stalled Rotor Protection

The table lists the stalled rotor protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DBE	3519	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0DBF	3520	1	0x03, 0x06, 0x10	RW	1	% IFLC	UINT16	50–1000 (step 1)	200	Y	Pickup
0x0DC0	3521	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	20	Y	Time delay
0x0DC1	3522	1	0x03, 0x06, 0x10	RW	1	% IFLC	UINT16	50–1000 (step 1)	200	Y	Alarm level
0x0DC2	3523	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communi-cation • Bit 3: Auto	3	Y	Reset mode
0x0DC3	3524	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset Delay

Locked Rotor Protection

The table lists the locked rotor protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DC4	3525	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0DC5	3526	1	0x03, 0x06, 0x10	RW	1	%IFLC	UINT16	150–1000 (step 1)	200	Y	Pickup
0x0DC6	3527	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	100	Y	Time delay
0x0DC7	3528	1	0x03, 0x06, 0x10	RW	1	%IFLC	UINT16	150–1000 (step 1)	200	Y	Alarm level

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DC8	3529	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communi-cation • Bit 3: Auto	3	Y	Reset mode
0x0DC9	3530	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto–Reset delay

Temperature Protection

The table lists the temperature protection for the LTMT main unit.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0ECD	3790	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0ECE	3791	1	0x03, 0x06, 0x10	RW	0.1	°C	UINT16	250–1800 (step 1)	1300	Y	PT100 pickup[4]
						F		770-3560 (step 1)			
0x0ECF	3792	1	0x03, 0x06, 0x10	RW	1	Ω	UINT16	2700–4000 (step 1)	2700	Y	PTC pickup
0x0ED0	3793	1	0x03, 0x06, 0x10	RW	1	Ω	UINT16	1600–2300 (step 1)	1600	Y	PTC pickup reset
0x0ED1	3794	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	10	Y	Time delay
0x0ED2	3795	1	0x03, 0x06, 0x10	RW	0.1	°C	UINT16	250–1800 (step 1)	1300	Y	PT100 alarm level[4]
						F		770-3560 (step 1)			
0x0ED3	3796	1	0x03, 0x06, 0x10	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communi-cation • Bit 3: Auto	3	Y	Reset mode
0x0ED4	3797	1	0x03, 0x06, 0x10	RW	0.1	–	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0ED5	3798	1	0x03, 0x06, 0x10	RW	0	–	UINT16	–	–	–	Reserved

4. For temperature measurement, refer to range value in accordance with the unit selected.

Current Protection Settings

What's in This Chapter

Definite Time Overcurrent Protection

The table lists the definite time overcurrent protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DCA	3531	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0DCB	3532	1	0x03, 0x06, 0x10	RW	1	%IFLC	UINT16	20–1000 (step 1)	110	Y	Pickup
0x0DCC	3533	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	300	Y	Time delay during motor start (T_pS)
0x0DCD	3534	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	200	Y	Time delay during motor run (T_pR)
0x0DCE	3535	1	0x03, 0x06, 0x10	RW	1	%IFLC	UINT16	20–1000 (step 1)	110	Y	Alarm level
0x0DCF	3536	1	0x03, 0x06, 0x10	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communi-cation • Bit 3: Auto	3	Y	Reset mode
0x0DD0	3537	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0DD1	3538	1	–	–	–	–	–	–	–	–	Reserved

Normal Inverse Overcurrent Protection

The table lists the normal inverse overcurrent protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Descrip-tion
0x0DD2	3539	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0DD3	3540	1	0x03, 0x06, 0x10	RW	1	%IFLC	UINT16	20–1000 (step 1)	50	Y	Pickup
0x0DD4	3541	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–200 (step 1)	1	Y	Time delay (TMS)
0x0DD5	3542	1	0x03, 0x06, 0x10	RW	1	%IFLC	UINT16	20–1000 (step 1)	50	Y	Alarm level
0x0DD6	3543	1	0x03, 0x06, 0x10	RW	1	–	BITMAP	• Bit 0: Reset key	3	Y	Reset mode

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Descrip-tion
								• Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto			
0x0DD7	3544	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0DD8	3545	1	–	–	–	–	–	–	–	–	Reserved

Short Time Overcurrent Protection

The table lists the short time overcurrent protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Descrip-tion
0x0DD9	3546	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0DDA	3547	1	0x03, 0x06, 0x10	RW	1	%IFLC	UINT16	100–1000 (step 1)	100	Y	Pickup
0x0DDB	3548	1	0x03, 0x06, 0x10	RW	0.01	s	UINT16	5–1000 (step 1)	5	Y	Time delay
0x0DDC	3549	1	0x03, 0x06, 0x10	RW	1	%IFLC	UINT16	100–1000 (step 1)	100	Y	Alarm level
0x0DDD	3550	1	0x03, 0x06, 0x10	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode
0x0DDE	3551	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0DDF	3552	1	–	–	–	–	–	–	–	–	Reserved

Calculated Ground Fault

The table lists the calculated ground fault for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Descrip-tion
0x0DE0	3553	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0DE1	3554	1	0x03, 0x06,	RW	1	% IFLC	UINT16	10–500 (step 1)	20	Y	Pickup

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
			0x10								
0x0DE2	3555	1	0x03, 0x06, 0x10	RW	0.-10	s	UINT16	5–60000 (step 1)	20	Y	Time delay
0x0DE3	3556	1	0x03, 0x06, 0x10	RW	1	% IFLC	UINT16	10–500 (step 1)	20	Y	Alarm level
0x0DE4	3557	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communication • Bit 3: Auto	3	Y	Reset mode
0x0DE5	3558	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0DE6	3559	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	N	Function while motor starting

Measured Ground Fault

The table lists the measured ground fault for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DE7	3560	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0DE8	3561	1	0x03, 0x06, 0x10	RW	1	mA	UINT16	20–20000 (step 10)	30	Y	Pickup
0x0DE9	3562	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0DEA	3563	1	0x03, 0x06, 0x10	RW	1	mA	UINT16	20–20000 (step 10)	30	Y	Alarm level
0x0DEB	3564	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communication • Bit 3: Auto	3	Y	Reset mode
0x0DEC	3565	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0DED	3566	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	N	Function while motor starting

Phase Under Current Protection

The table lists the phase under current protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DEE	3567	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	1	Y	Function setting
0x0DEF	3568	1	0x03, 0x06, 0x10	RW	1	% IFLC	UINT16	15–100 (step 1)	50	Y	Pickup
0x0DF0	3569	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	100	Y	Time delay
0x0DF1	3570	1	0x03, 0x06, 0x10	RW	1	% IFLC	UINT16	15–100 (step 1)	50	Y	Alarm level
0x0DF2	3571	1	0x03, 0x06, 0x10	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communi-cation • Bit 3: Auto	8	Y	Reset mode
0x0DF3	3572	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	50	Y	Auto-Reset delay
0x0DF4	3573	2	–	–	–	–	–	–	–	–	Reserved

Current Imbalance Protection

The table lists the current imbalance protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DF6	3575	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	3	Y	Function setting
0x0DF7	3576	1	0x03, 0x06, 0x10	RW	1	%	UINT16	5–100 (step 5)	20	Y	Pickup
0x0DF8	3577	1	0x03, 0x06, 0x10	RW	0.-1	s	UINT16	1–60000 (step 1)	50	Y	Time delay
0x0DF9	3578	1	0x03, 0x06, 0x10	RW	1	–	UINT16	5–100 (step 5)	20	Y	Alarm level
0x0DFA	3579	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Commu-nication	3	Y	Reset mode

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
								• Bit 3: Auto			
0x0DFB	3580	1	0x03, 0x06, 0x10	RW	0.-1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0DFC	3581	1	–	–	–	–	–	–	–	–	Reserved

Current Phase Loss Protection

The table lists the current phase loss protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DFD	3582	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0DFE	3583	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0DFF	3584	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communi-cation • Bit 3: Auto	3	Y	Reset mode
0x0E00	3585	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E01	3586	1	–	–	–	–	–	–	–	–	Reserved

Current Phase Reversal Protection

The table lists the current phase reversal protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E02	3587	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0E03	3588	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0E04	3589	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communi-cation • Bit 3: Auto	3	Y	Reset mode

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Descrip-tion
0x0E05	3590	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E06	3591	1	–	–	–	–	–	–	–	–	Reserved

Voltage Protection Settings

What's in This Chapter

Phase Under Voltage Protection

The table lists the phase under voltage protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E29	3626	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0E2A	3627	1	0x03, 0x06, 0x10	RW	1	%Vn	UINT16	20–100 (step 1)	80	Y	Pickup
0x0E2B	3628	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	100	Y	Time delay
0x0E2C	3629	1	0x03, 0x06, 0x10	RW	1	%Vn	UINT16	20–100 (step 1)	80	Y	Alarm level
0x0E2D	3630	1	0x03, 0x06, 0x10	RW	1	–	BITMAP	• Bit 0 - Reset key • Bit 1 - DI • Bit 2 - Com-munica-tion • Bit 3 - Auto	8	Y	Reset mode
0x0E2E	3631	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E2F	3632	2	–	–	–	–	–	–	–	–	Reserved

Phase Over Voltage Protection

The table lists the phase over voltage protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E31	3634	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0 - Disable • 1 - Alarm • 2 - Trip • 3 - Alarm and Trip	2	Y	Function setting
0x0E32	3635	1	0x03, 0x06, 0x10	RW	1	%Vn	UINT16	101–130 (step 1)	110	Y	Pickup
0x0E33	3636	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	50	Y	Time delay
0x0E34	3637	1	0x03, 0x06, 0x10	RW	1	%Vn	UINT16	101–130 (step 1)	110	Y	Alarm level
0x0E35	3638	1	0x03, 0x06, 0x10	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI	3	Y	Reset mode

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
								• Bit 2: Communi-cation • Bit 3: Auto			
0x0E36	3639	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E37	3640	1	–	–	–	–	–	–	–	–	Reserved

Voltage Imbalance Protection

The table lists the voltage imbalance protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E3D	3646	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	3	Y	Function setting
0x0E3E	3647	1	0x03, 0x06, 0x10	RW	1	%Vn	UINT16	5–50 (step 5)	10	Y	Pickup
0x0E3F	3648	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	100	Y	Time delay
0x0E40	3649	1	0x03, 0x06, 0x10	RW	1	–	UINT16	5–50 (step 5)	10	N	Alarm level
0x0E41	3650	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communi-cation • Bit 3: Auto	3	Y	Reset mode
0x0E42	3651	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E43	3652	1	–	–	–	–	–	–	–	–	Reserved

Voltage Phase Loss Protection

The table lists the voltage phase loss protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Descrip-tion
0x0E38	3641	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0E39	3642	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0E3A	3643	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Commu-nication • Bit 3: Auto	3	Y	Reset mode
0x0E3B	3644	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E3C	3645	1	–	–	–	–	–	–	–	–	Reserved

Voltage Phase Reversal Protection

The table lists the voltage phase reversal protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E44	3653	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0E45	3654	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0E46	3655	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Commu-nication • Bit 3: Auto	3	Y	Reset mode
0x0E47	3656	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E48	3657	1	–	–	–	–	–	–	–	–	Reserved

Power Protection Settings

What's in This Chapter

Under Frequency Protection

The table lists the under frequency protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E49	3658	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0E4A	3659	1	0x03, 0x06, 0x10	RW	1	%F[5]	UINT16	90–100 (step 1)	94	Y	Pickup
0x0E4B	3660	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0E4C	3661	1	0x03, 0x06, 0x10	RW	1	%F[5]	UINT16	90–100 (step 1)	94	Y	Alarm level
0x0E4D	3662	1	0x03, 0x06, 0x10	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Commu-nication • Bit 3: Auto	3	Y	Reset mode
0x0E4E	3663	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E4F	3664	1	–	–	–	–	–	–	–	–	Reserved

Over Frequency Protection

The table lists the over frequency protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E50	3665	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0E51	3666	1	0x03, 0x06, 0x10	RW	1	%F[5]	UINT16	100–110 (step 1)	105	Y	Pickup
0x0E52	3667	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0E53	3668	1	0x03, 0x06, 0x10	RW	1	%F[5]	UINT16	100–110 (step 1)	105	Y	Alarm level
0x0E54	3669	1	0x03, 0x06, 0x10	RW	1	–	BITMAP	• Bit 0: Reset Key • Bit 1: DI	3	Y	Reset mode

5. %F = % of nominal frequency

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Descrip-tion
								• Bit 2: Commu-nication • Bit 3: Auto			
0x0E55	3670	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E56	3671	1	–	–	–	–	–	–	–	–	Reserved

Under Power Protection

The table lists the under power protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E57	3672	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0E58	3673	1	0x03, 0x06, 0x10	RW	1	%P[6]	UINT16	20–1000 (step 1)	60	Y	Pickup
0x0E59	3674	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0E5A	3675	1	0x03, 0x06, 0x10	RW	1	%P[6]	UINT16	20–1000 (step 1)	60	Y	Alarm level
0x0E5B	3676	1	0x03, 0x06, 0x10	RW	1	–	BITMAP	• Bit 0: Reset Key • Bit 1: DI • Bit 2: Com-muni-cation • Bit 3: Auto	3	Y	Reset mode
0x0E5C	3677	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E5D	3678	1	–	–	–	–	–	–	–	–	Reserved

6. %P = % of nominal power.

   The nominal power (Pn) is calculated by the LTMT main unit from the system settings: Pn = VT primary * Full load current.

   In case of two-speed motor starters, the nominal power is:

   - Pn1 = VT primary * Full load current, when the motor runs in speed 1 or low speed
   - Pn2 = VT primary * Speed 2 Full load current, when the motor runs in speed 2 or high speed

Over Power Protection

The table lists the over power protection for the Modbus RTU communication.

Address	Register	No.	Function code	R-W	X	Unit	Type	Range	Default value	Svd	Description
0x0E5E	3679	1	0x03, 0x06, 0x10	R-W	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0E5F	3680	1	0x03, 0x06, 0x10	R-W	1	%P[7]	UINT16	20–1000 (step 1)	110	Y	Pickup
0x0E60	3681	1	0x03, 0x06, 0x10	R-W	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0E61	3682	1	0x03, 0x06, 0x10	R-W	1	%P[7]	UINT16	20–1000 (step 1)	110	Y	Alarm level
0x0E62	3683	1	0x03, 0x06, 0x10	R-W	1	–	BITMAP	• Bit 0: Reset Key • Bit 1: DI • Bit 2: Communication • Bit 3: Auto	3	Y	Reset mode
0x0E63	3684	1	0x03, 0x06, 0x10	R-W	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E64	3685	1	–	–	–	–	–	–	–	–	Reserved

Under Power Factor Protection

The table lists the under power factor protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E65	3686	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0E66	3687	1	0x03, 0x06, 0x10	RW	0.1-0	PF	UINT16	40–100 (step 1)	60	Y	Pickup
0x0E67	3688	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay

7. %P = % of nominal power.

   The nominal power (Pn) is calculated by the LTMT main unit from the system settings: Pn = VT primary * Full load current.

   In case of two-speed motor starters, the nominal power is:

   - Pn1 = VT primary * Full load current, when the motor runs in speed 1 or low speed
   - Pn2 = VT primary * Speed 2 Full load current, when the motor runs in speed 2 or high speed

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E68	3689	1	0x03, 0x06, 0x10	RW	0.1-0	PF	UINT16	40–100 (step 1)	60	Y	Alarm level
0x0E69	3690	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	• Bit 0: Reset Key • Bit 1: DI • Bit 2: Communication • Bit 3: Auto	3	Y	Reset mode
0x0E6A	3691	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E6B	3692	1	–	–	–	–	–	–	–	–	Reserved

Motor Control Function Settings

What's in This Chapter

Excessive Start Time Protection

The table lists the excessive start time protection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EA6	3751	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Function setting
0x0EA7	3752	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	100	Y	Time delay
0x0EA8	3753	1	0x03, 0x06, 0x10	RW	1	–	BITMAP	• Bit 0: Reset Key • Bit 1: DI • Bit 2: Communi-cation • Bit 3: Auto	3	Y	Reset mode
0x0EA9	3754	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0EAA	3755	1	0x03, 0x06, 0x10	RW	1	% IFLC	UINT16	80–300 (step 1)	100	Y	Run Threshold
0x0EAB–0x0EAC	3756–3757	1	–	–	–	–	–	–	–	–	Reserved

Voltage Dip

The table lists the voltage dip for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EAD	3758	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Load shedding • 2: Auto restart	0	Y	Function setting
0x0EAE	3759	1	0x03, 0x06, 0x10	RW	1	%Vn	UINT16	20–90 (step 5)	90	Y	Voltage dip
0x0EAF	3760	1	0x03, 0x06, 0x10	RW	1	%Vn	UINT16	20–95 (step 5)	95	Y	Voltage restoration
0x0EB0	3761	1	0x03, 0x06, 0x10	RW	1	s	UINT16	0–9999 (step 1)	2	Y	Voltage dip restart timeout
0x0EB1	3762	1	0x03, 0x06, 0x10	RW	1	s	UINT16	0–301 (step 1)	4	Y	Delayed restart timeout
0x0EB2	3763	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Bypass STOP DI
0x0EB3	3764	1	0x03, 0x06, 0x10	RW	1	s	UINT16	0–4 (step 1)	2	Y	Immediate restart timeout
0x0EB4	3765	1	0x03, 0x06, 0x10	RW	1	s	UINT16	1–9999 (step 1)	10	Y	Load shedding timeout
0x0EB5	3766	1	–	–	–	–	–	–	–	–	Reserved

Maximum Number of Starts

The table lists the maximum number of starts for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EB6	3767	1	0x03, 0x06, 0x10	RW	1	–	UIN-T16	• 0: Disable • 1: Enable	1	Y	Function setting
0x0EB7	3768	1	0x03, 0x06, 0x10	RW	1	–	UIN-T16	1–30 (step 1)	6	Y	Permissive starts
0x0EB8	3769	1	0x03, 0x06, 0x10	RW	1	min	UIN-T16	15–60 (step 1)	30	Y	Reference time
0x0EB9	3770	1	0x03, 0x06, 0x10	RW	1	min	UIN-T16	1–120 (step 1)	5	Y	Inhibit period
0x0EBA	3771	1	0x03, 0x06, 0x10	RW	1	min	UIN-T16	0–120 (step 1)	0	Y	Time between starts
0x0EBB	3772	2	–	–	–	–	–	–	–	–	Reserved

Motor Stop Error Detection

The table lists the motor stop error detection for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EBE	3775	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Enable	1	Y	Function setting
0x0EBF	3776	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	10	Y	Time delay
0x0EC0	3777	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communi-cation	3	Y	Reset mode
0x0EC1	3778	1	–	–	–	–	–	–	–	–	Reserved

Device Internal Status

The table lists the device internal status for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EC4	3781	1	0x03, 0x06, 0x10	RW	0.1	Sec-onds	UINT16	1–60000 (step 1)	10	Y	Time delay
0x0EC5	3782	1	0x03, 0x06, 0x10	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communi-cation	3	Y	Reset mode

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EC6	3783	1	0x03, 0x06, 0x12	RW	0	–	UINT16	• 0: Disable • 1: Enable	1	N	Internal temperature alarm
0x0EC6–0x0EC7	3783–3784	1	–	–	–	–	–	–	–	–	Reserved

Communication Loss

The table lists the communication loss for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EC8	3785	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0EC9	3786	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	1–60000 (step 1)	10	Y	Time delay
0x0ECA	3787	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communi-cation • Bit 3: Auto	3	Y	Reset mode
0x0ECB	3788	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0ECC	3789	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Trip in remote mode only

Block Output

The table lists the block output for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0ED6	3799	1	0x03, 0x06, 0x10	RW	1	–	UIN-T16	• 0: Disable • 1: Enable	0	Y	Function setting
0x0ED7	3800	1	0x03, 0x06, 0x10	RW	0.01	s	UIN-T16	0–60000 (step 1)	0	Y	Contactor or Breaker open time
0x0ED8	3801	2	–	–	–	–	–	–	–	–	Reserved

Anti-Backspin Timer

The table lists the anti-backspin timer for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EDA	3803	1	0x03, 0x06, 0x10	RW	1	–	UIN-T16	• 0: Disable • 1: Enable	0	Y	Function setting
0x0EDB	3804	1	0x03, 0x06, 0x10	RW	1	s	UIN-T16	0–60000 (step 1)	0	Y	Time delay
0x0EDC	3805	2	–	–	–	–	–	–	–	–	Reserved

HMI Communication Loss

The table lists the HMI communication loss for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EDE	3807	1	0x03, 0x06, 0x10	RW	1	–	UIN-T16	• 0: Disable • 1: Enable • 2: Trip • 3: Alarm +Trip	0	Y	Function setting
0x0EDF	3808	1	0x03, 0x06, 0x10	RW	0.1	s	UIN-T16	–	10	Y	Time delay
0x0EE0	3809	1	0x03, 0x06, 0x10 –	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Commu-nication • Bit 3: Auto	3	Y	Reset mode
0x0EE1	3810	1	0x03, 0x06, 0x10	RW	0.1	s	UIN-T16	–	0	Y	Auto-Reset delay
0x0EE2	3811	1	–	–	–	–	–	–	–	–	Reserved

Digital Input Interlock Protection Settings

Description

Each digital input interlock protection settings are made up of five registers. The order and the description of the settings for digital input 1 interlock are valid for the other digital inputs.

Address	Register	RW	Function code	Description
0x0F23–0x0F27	3876–3880	RW	0x03,0x06,0x10	Digital input 1 interlock protection settings
0x0F28–0x0F2C	3881–3885	RW	0x03,0x06,0x10	Digital input 2 interlock protection settings
0x0F2D–0x0F31	3886–3890	RW	0x03,0x06,0x10	Digital input 3 interlock protection settings
0x0F32–0x0F36	3891–3895	RW	0x03,0x06,0x10	Digital input 4 interlock protection settings
0x0F37–0x0F3B	3896–3900	RW	0x03,0x06,0x10	Digital input 5 interlock protection settings
0x0F3C–0x0F40	3901–3905	RW	0x03,0x06,0x10	Digital input 6 interlock protection settings
0x0F41–0x0F45	3906–3910	RW	0x03,0x06,0x10	Digital input 7 interlock protection settings
0x0F46–0x0F4A	3911–3915	RW	0x03,0x06,0x10	Digital input 8 interlock protection settings
0x0F4B–0x0F4F	3916–3920	RW	0x03,0x06,0x10	Digital input 9 interlock protection settings
0x0F50–0x0F54	3921–3925	RW	0x03,0x06,0x10	Digital input 10 interlock protection settings
0x0F55–0x0F59	3926–3930	RW	0x03,0x06,0x10	Digital input 11 interlock protection settings
0x0F5A–0x0F5E	3931–3935	RW	0x03,0x06,0x10	Digital input 12 interlock protection settings

Digital Input 1 Interlock Protection Settings

The table lists the registers for the digital input interlock protection settings.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0F23	3876	1	0x03, 0x06, 0x10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0F24	3877	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–6000 (step 1)	0	Y	Time delay
0x0F25	3878	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communi-cation • Bit 3: Auto	3	Y	Reset mode

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0F26	3879	1	0x03, 0x06, 0x10	RW	0.1	s	UINT16	0–6000 (step 1)	0	Y	Auto-Reset delay
0x0F27	3880	1	–	–	–	–	–	–	–	–	Reserved

Hysteresis Settings

The table lists the registers for the hysteresis settings.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x109A	4251	1	0x03, 0x06, 0x10	RW	1	%	UIN-T16	3–15 (step 1)	3	Y	Current protection
0x109B	4252	1	0x03, 0x06, 0x10	RW	1	%	UIN-T16	3–15 (step 1)	3	Y	Voltage protection
0x109C	4253	1	0x03, 0x06, 0x10	RW	1	%	UIN-T16	1–15 (step 1)	3	Y	Frequency protection
0x109D	4254	1	0x03, 0x06, 0x10	RW	1	%	UIN-T16	3–15 (step 1)	3	Y	Power protection
0x109E–0x109F	4255–4256	1	–	–	–	–	–	–	–	–	Reserved

General Settings

What's in This Chapter

Device Configuration

The table lists the device configuration for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1117	4376	1	0x03, 0x06, 0x10	RW	1	–	UINT16	1–15	8	Y	LTMTCT/ LTMTCTV Sensor Module Type, page 69
0x1118	4377	1	–	–	–	–	–	–	–	–	Reserved
0x1119	4378	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0–8	0	Y	LTMT Expansion Unit 1 Type, page 70
0x111B	4380	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0–8	0	Y	LTMT Expansion Unit 2 Type, page 70
0x111D	4382	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0–8	0	Y	LTMT Expansion Unit 3 Type, page 70
0x111F	4384	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0–8	0	Y	LTMT Expansion Unit 4 Type, page 70
0x1121	4386	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0–8	0	Y	LTMT Expansion Unit 5 Type, page 70
0x1123	4388	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0–2	0	Y	LTMT main unit temperature sensor type[8]: • 0: None • 1: PT100 • 2: Binary PTC
0x1124	4389–4393	5	–	–	–	–	–	–	–	–	Reserved

Modbus RTU Settings

The table lists the Modbus RTU settings for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1129	4394	1	0x03, 0x10	RW	1	–	UINT16	1–247 (step 1)	1	Y	Node address
0x112A	4395	1	0x03, 0x10	RW	1	–	UINT16	0: None 1: Odd 2: Even	2	Y	Parity
0x112B	4396	1	0x03, 0x10	RW	1	bps	UINT16	0: 2400 1: 4800 2: 9600 3: 19200 4: 38400 5: 57600 6: 115200	3	Y	Baud rate

8. If the Main Unit Temperature value is set to None, the Control Panel operations will not be available for configuration.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x112C	4397	1	–	–	–	–	–	–	–	–	Reserved
0x112D	4398	1	0x03, 0x10	RW	1	s	UINT16	1–60000 (step 1)	1	Y	Timeout[9]
0x112E	4399	1	0x03, 0x10	RW	–	–	BITMAP	0: Big-endian 1: Little-endian	0	Y	Byte format

The TeSys Tera system detects communication loss or timeout after the timeout period. A time delay is implemented following the detection of communication loss or timeout.

LTMT HMI Port Settings

The table lists the HMI port settings for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x112F	4400	1	0x03,0x10	RW	1	–	UINT16	1–247 (step 1)	1	Y	Node address
0x1130	4401	1	0x03,0x10	RW	1	–	UINT16	0: None 1: Odd 2: Even	2	Y	Modbus parity
0x1131	4402	1	0x03,0x10	RW	1	bps	UINT16	0: 2400 1: 4800 2: 9600 3: 19200 4: 38400 5: 57600 6: 115200	3	Y	Baud rate
0x1132	4403	1	0x03,0x10	RW	1	–	UINT16	0: Default 1: Programmable	–	N	Control keys
0x1133	4404	1	0x03,0x10	RW	1	s	UINT16	1–6000 (step 1)	1	Y	Timeout
0x1134	4405	1	0x03,0x10	RW	–	–	BITMAP	0: Big-endian 1: Little-endian	0	Y	Byte format

NOTE: If LTMTCUF control operator unit is connected on HMI port, HMI port must be configured as follows:

- Node address: 1
- Baud rate: 19200 bps
- Parity: Even
- Endianness: Big-endian

9. The TeSys Tera system detects communication loss or timeout after the timeout period. A time delay is implemented following the detection of communication loss or timeout.

Real-Time Clock Settings

The TeSys Tera system has an internal clock and remembers the date and time for 12 hours without power.

The table lists the Real-Time Clock (RTC) settings for the Modbus RTU communication.

NOTE: To write date and time, update RTC register (4420) value to 1.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Descrip-tion
0x113B	4412	1	0x03, 0x10	RW	1	–	UINT16	1–31 (step 1)	1	Y	Date
0x113C	4413	1	0x03, 0x10	RW	1	–	UINT16	1–12 (step 1)	1	Y	Month
0x113D	4414	1	0x03, 0x10	RW	1	–	UINT16	2000–2099 (step 1)	2016	Y	Year
0x113E	4415	1	0x03, 0x10	RW	1	–	UINT16	0–23 (step 1)	0	Y	Hour
0x113F	4416	1	0x03, 0x10	RW	1	–	UINT16	0–59 (step 1)	0	Y	Minute
0x1140	4417	1	0x03, 0x10	RW	1	–	UINT16	0–59 (step 1)	0	Y	Second
0x1141	4418	2	–	–	–	–	–	–	–	–	Reserved
0x1143	4420	1	0x03, 0x10	RW	1	–	UINT16	0–1	0	N	Update RTC

Write date and time to the following Modbus holding registers with address 4412, function code 16 (multiple holding registers), and number of register is 9.

For example, to update 01-Jan-2023 12:00:00, register values should be as below format:

Parameter name	Register	Example data	Data format (Big-endian)
Date	4412	1	0x0001
Month	4413	1	0x0001
Year	4414	2023	0x07E7
Hour	4415	12	0x000C
Minute	4416	0	0x0000
Second	4417	0	0x0000
Reserved	4418	0	0x0000
Update RTC	4420	0	0x0001

Starter Settings

The table lists the starter settings for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1144	4421	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Motor 1: Heater	0	Y	Load type
0x1145	4422	1	0x03, 0x06 ,0x10	RW	1	–	UINT16	0–10 (step 1)	1	Y	Starter Type, page 105
0x1146	4423	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Disable 1: HMI 2: DI 3: Communication	0	Y	Mode selection
0x1147	4424	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	Bit 0: Disable Bit 1: HMI Bit 2: DI Bit 3: Communication Bit 4: Custom logic	11	Y	Local 1 start source
0x1148	4425	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	Bit 0: Disable Bit 1: HMI Bit 2: DI Bit 3: Communication Bit 4: Custom logic	11	Y	Local 2 start source
0x1149	4426	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	Bit 0: Disable Bit 1: HMI Bit 2: DI Bit 3: Communication Bit 4: Custom logic	11	Y	Local 3 start source
0x114A	4427	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	Bit 0: Disable Bit 1: HMI Bit 2: DI Bit 3: Communication Bit 4: Custom logic	11	Y	Remote start source
0x114B	4428	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	Bit 0: Disable Bit 1: HMI Bit 2: DI Bit 3: Communication Bit 4: Custom logic	11	Y	Local 1 stop source
0x114C	4429	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	Bit 0: Disable Bit 1: HMI Bit 2: DI Bit 3: Communication	11	Y	Local 2 stop source

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
								Bit 4: Custom logic			
0x114D	4430	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	Bit 0: Disable Bit 1: HMI Bit 2: DI Bit 3: Communication Bit 4: Custom logic	11	Y	Local 3 stop source
0x114E	4431	1	0x03, 0x06, 0x10	RW	1	–	BIT-MAP	Bit 0: Disable Bit 1: HMI Bit 2: DI Bit 3: Communication Bit 4: Custom logic	11	Y	Remote stop source
0x114F	4432	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Momentary 1: Permanent	0	Y	Local DI start input
0x1150	4433	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Momentary 1: Permanent	0	Y	Remote DI start input
0x1151	4434	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Momentary 1: Maintained	0	Y	Custom start input
0x1152	4435	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Bump 1: Bumpless	0	N	Mode transfer
0x1153	4436	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Momentary 1: Maintained	0	Y	Communica-tion start input
0x1154–0x1155	4437–4438	3	–	–	–	–	–	–	–	–	Reserved
0x1156	4439	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Disable 1: Enable	0	Y	Change direction
0x1157	4440	1	0x03, 0x06, 0x10	RW	0.01	s	UINT16	1–60000 (step 1)	50	Y	Feedback response time
0x1158	4441	1	0x03, 0x06, 0x10	RW	0.01	s	UINT16	1–60000 (step 1)	50	Y	Motor current sensing time
0x1159	4442	1	0x03, 0x06, 0x10	RW	0.01	s	UINT16	1–60000 (step 1)	6000	Y	Interlocking time
0x115E–0x1160	4443–4449	3	–	–	–	–	–	–	–	–	Reserved
0x1161	4450	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Three phase 1: Single phase	0	Y	Number of phases
0x1162	4451	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: DI+Current based 1: Current based	1	Y	Stop detection
0x1163	4452	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Disable 1: Enable	0	Y	Forced start function

Starter Type

The table lists the type of starters and the time delays related to the starter types.

Starter type	Value	Delay 1	Delay 2	Delay 3	Delay 4
Direct online	1	–	–	–	–
Reverse direct online	2	–	–	–	–
Star delta	3	Time in star	Change over time	–	–

System Settings

The table lists the system settings for the Modbus RTU communication.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1164	4453	1	0x03, 0x10	RW	1	A	UINT16	1–1000 (step 1)	1	Y	Phase CT primary
0x1165	4454	1	0x03, 0x10	RW	1	A	UINT16	1–5 (step 4)	1	Y	Phase CT secondary
0x1166	4455	2	–	–	–	–	–	–	–	–	Reserved
0x1168	4457	1	0x03, 0x10	RW	1	A	UINT16	1–1000 (step 1)	1	Y	Speed 2 CT primary
0x1169	4458	1	0x03, 0x10	RW	1	A	UINT16	1–5 (step 4)	1	Y	Speed 2 CT secondary
0x116A–0x116C	4459–4461	3	–	–	–	–	–	–	–	–	Reserved
0x116D	4462	1	0x03, 0x10	RW	0.1	V	UINT16	1100–6900 (step 1)	4150	Y	Nominal voltage (Vn)
0x116E	4463	1	0x03, 0x10	RW	1	–	UINT16	0: 50Hz 1: 60Hz	0	Y	Nominal frequency (Fn)
0x116F	4464	1	0x03, 0x10	RW	1	–	UINT16	0: L123 1: L132	0	Y	Phase rotation
0x1170	4465	1	0x03, 0x10	RW	1	–	UINT16	0: Disable 1: Enable	1	Y	Voltage input[10]
0x1171	4466	1	–	–	–	–	–	–	–	–	Reserved
0x1172	4467	1	0x03, 0x10	RW	0.1	A	UINT16	1–10000 (step 1)	25	Y	Full load current (FLC1)
0x1173	4468	1	0x03, 0x10	RW	0.1	A	UINT16	1–10000 (step 1)	25	Y	Speed 2 full load current (FLC2)
0x1174	4469	1	0x03, 0x10	RW	0	–	UINT16	1–10 (step 1)	1	N	Phase CT secondary passes
0x1175	4470	1	0x03, 0x10	RW	1	–	UINT16	1–10 (step 1)	1	N	Speed 2 phase secondary passes
0x1176	4471	3	–	–	–	–	–	–	–	–	Reserved

10. Parameter applicable only for LTMTCTV sensor modules.

If the voltage input parameter is disabled, Tesys Tera system will not provide voltage protections and measurements.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1179	4474	1	0x03, 0x10	RW	1	–	UINT16	0: Disable 1: Enable	1	Y	Test mode
0x117A	4475	1	0x03, 0x10	RW	1	–	UINT16	0: No 1: Yes	0	Y	Bypass interlocks during test

Motor Name Plate Details

The table lists the details of the motor name plate.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x117B	4476	5	0x03, 0x06, 0x10	RW	1	–	ASCII	–	MM-R0000001	Y	Motor tag
0x1180	4481	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: kW 1: HP	0	Y	Power unit
0x1181	4482	1	0x03, 0x06, 0x10	RW	0.1	kW	UINT16	0–65535 (step 1)	1	Y	Nominal power (KW)[11]
0x1182	4483	1	0x03, 0x06, 0x10	RW	0.1	HP	UINT16	0–65535 (step 1)	1	Y	Nominal power (HP)[12]
0x1183	4484	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: °C 1: °F	0	Y	Temperature unit
0x1184–0x118B	4485–4491	1	–	–	–	–	–	–	–	–	Reserved

Digital Input Settings

Description

The TeSys Tera system supports maximum 32 digital inputs:

- Four digital inputs on the LTMT main unit.
- Up to 28 digital inputs with LTMT expansion units.

Each digital input setting is made up of three registers. The order and the description of the settings for digital input 1 are valid for the other digital inputs.

Address	Register	No.	Description	DI location
0x1194	4501	3	Digital input 1 settings	DI1 on LTMT main unit
0x1197	4504	3	Digital input 2 settings	DI2 on LTMT main unit
0x119A	4507	3	Digital input 3 settings	DI3 on LTMT main unit
0x119D	4510	3	Digital input 4 settings	DI4 on LTMT main unit
0x11A0	4513	3	Digital input 5 settings	DI on LTMT expansion unit
0x11A3	4516	3	Digital input 6 settings	DI on LTMT expansion unit
0x11A6	4519	3	Digital input 7 settings	DI on LTMT expansion unit

11. If you configure the nominal power in KW, use register 4482 (address 0x1181).
12. If you configure the nominal power in HP, use register 4483 (address 0x1182).

Address	Register	No.	Description	DI location
0x11A9	4522	3	Digital input 8 settings	DI on LTMT expansion unit
0x11AC	4525	3	Digital input 9 settings	DI on LTMT expansion unit
0x11AF	4528	3	Digital input 10 settings	DI on LTMT expansion unit
0x11B2	4531	3	Digital input 11 settings	DI on LTMT expansion unit
0x11B5	4534	3	Digital input 12 settings	DI on LTMT expansion unit
0x11B8	4537	3	Digital input 13 settings	DI on LTMT expansion unit
0x11BB	4540	3	Digital input 14 settings	DI on LTMT expansion unit
0x11BE	4543	3	Digital input 15 settings	DI on LTMT expansion unit
0x11C1	4546	3	Digital input 16 settings	DI on LTMT expansion unit
0x11C4	4549	3	Digital input 17 settings	DI on LTMT expansion unit
0x11C7	4552	3	Digital input 18 settings	DI on LTMT expansion unit
0x11CA	4555	3	Digital input 19 settings	DI on LTMT expansion unit
0x11CD	4558	3	Digital input 20 settings	DI on LTMT expansion unit
0x11D0	4561	3	Digital input 21 settings	DI on LTMT expansion unit
0x11D3	4564	3	Digital input 22 settings	DI on LTMT expansion unit
0x11D6	4567	3	Digital input 23 settings	DI on LTMT expansion unit
0x11D9	4570	3	Digital input 24 settings	DI on LTMT expansion unit
0x11DC–0x11F1	4573–4594	3	–	Reserved

The settings of the four digital inputs on the LTMT main unit corresponds to the settings of digital input 1 to digital input 4.

The settings of digital inputs on a LTMT expansion unit are defined according to the expansion unit configuration.

Example: If the TeSys Tera system is composed of:

- One LTMT main unit.
- One LTMTIN42 expansion unit with four digital inputs, configured as expansion unit 1.

Then,

- Digital input 1 settings to Digital input 4 settings are valid for DI1 to DI4 on the LTMT main unit.
- Digital input 5 settings to Digital input 8 settings are valid for DI1 to DI4 on the LTMTIN42 expansion unit.

Digital Input 1 Settings

The table lists the registers for the digital input settings.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1194	4501	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Active high 1: Active low	0	Y	Digital input 1 trigger type
0x1195	4502	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0–38 (step 1)	4	Y	Digital input 1 input source, page 108
0x1196	4503	1	0x03, 0x06, 0x10	RW	1	ms	UINT16	1–60000 (step 10)	10	Y	Digital input 1 validation time

DI Input Source

The table lists the input source for the digital input settings.

Register value	DI input source
0	Other
1	Trip Reset DI
2	Breaker Close DI
3	Breaker Open DI
4	Local-START> DI
5	Local-START>> DI
6	Local-STOP DI
7	Local-START< DI
8	Local-START<< DI
9	Remote-START> DI
10	Remote-START>> DI
11	Remote-STOP DI
12	Remote-START< DI
13	Remote-START<< DI
14	Interlock 1
15	Interlock 2
16	Interlock 3
17	Interlock 4
18	Interlock 5
19	Interlock 6
20	Interlock 7
21	Interlock 8
22	Interlock 9
23	Interlock 10
24	Interlock 11
25	Interlock 12
26	Contactor Open DI
27	Run DI
28	Block Input
29	Logic Test DI
30	Mode Selection 1
31	Mode Selection 2
32	Speed Change
33	Forced Start
34	Forced Stop
35	Self Test without Trip
36	Self Test with Trip
37	Reserved
38	None

Digital Output Settings

Description

The TeSys Tera system supports maximum 13 digital outputs:

- Three digital outputs on the LTMT main unit.
- Up to 10 digital outputs with LTMT expansion units.

Each digital output setting is made up of five registers. The order and the description of the settings for digital output 1 are valid for the other digital outputs.

Address	Register	No.	Description	
0x1211	4626	5	Digital output 1 settings	DO1 on LTMT main unit
0x1216	4631	5	Digital output 2 settings	DO2 on LTMT main unit
0x121B	4636	5	Digital output 3 settings	DO3 on LTMT main unit
0x1220	4641	5	Digital output 4 settings	DO on LTMT expansion unit
0x1225	4646	5	Digital output 5 settings	DO on LTMT expansion unit
0x122A	4651	5	Digital output 6 settings	DO on LTMT expansion unit
0x122F	4656	5	Digital output 7 settings	DO on LTMT expansion unit
0x1234	4661	5	Digital output 8 settings	DO on LTMT expansion unit
0x1239	4666	5	Digital output 9 settings	DO on LTMT expansion unit
0x123E	4671	5	Digital output 10 settings	DO on LTMT expansion unit
0x1242	4675	5	Digital output 11 settings	DO on LTMT expansion unit
0x1243	4676	5	Digital output 12 settings	DO on LTMT expansion unit
0x1248	4681	5	Digital output 13 settings	DO on LTMT expansion unit
0x124D	4686	5	Reserved	–

The settings of the three digital outputs on the LTMT main unit corresponds to the settings of digital output 1 to digital output 3.

The settings of digital outputs on a LTMT expansion unit are defined according to the expansion unit configuration.

Example: If the TeSys Tera system is composed of:

- One LTMT main unit
- One LTMTIN42 expansion unit with two digital outputs, configured as expansion unit 1

Then,

- Digital output 1 settings to Digital output 3 settings are valid for DO1 to DO3 on the LTMT main unit
- Digital output 4 settings and Digital output 5 settings are valid for DO1 and DO2 on the LTMTIN42 expansion unit

Digital Output 1 Settings

The table lists the registers for the digital output settings.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1211	4626	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Active high 1: Active low	0	Y	Digital output 1 active type
0x1212	4627	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0–65535 (step 1)	504	Y	Digital output 1 input source, page 110
0x1213	4628	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0–12 (step 1)	7	Y	Digital output 1 tag, page 110
0x1214	4629	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Level 1: Pulse	0	Y	Digital output 1 output type
0x1215	4630	1	0x03, 0x06, 0x10	RW	1	ms	UINT16	0–60000 (step 10)	0	Y	Digital output 1 pulse time

Digital Output Tag

The table lists the output source for the digital output settings.

Register value	Digital output tag
0	Other
1	Device internal DO
2	Trip DO
3	Alarm DO
4	Pickup DO
5	Inhibit DO
6	Block OP
7	CNTR OP 1
8	CNTR OP 2
9	CNTR OP 3
10	CNTR OP 4
11	CNTR OP 5
12	CNTR OP 6

Digital Output Input Source

The table lists the output input source for the digital output settings.

Register value	Digital output input source
0	None
1	Fixed 0
2	Fixed 1
3–6	Reserved
7	Reset button on LTMT main unit
8	DI 1

Register value	Digital output input source
9	DI 2
10	DI 3
11	DI 4
12	DI 5
13	DI 6
14	DI 7
15	DI 8
16	DI 9
17	DI 10
18	DI 11
19	DI 12
20	DI 13
21	DI 14
22	DI 15
23	DI 16
24	DI 17
25	DI 18
26	DI 19
27	DI 20
28	DI 21
29	DI 22
30	DI 23
31	DI 24
32–39	Reserved
40	DO 1
41	DO 2
42	DO 3
43	DO 4
44	DO 5
45	DO 6
46	DO 7
47	DO 8
48	DO 9
49	DO 10
50	DO 11
51	DO 12
52	DO 13
53–231	Reserved
232	Pickup status
233	Alarm status
234	Trip Status
235	Motor stop error detection
236	Reserved
237	Block Output
238–247	Reserved
248	Motor Stop

Register value	Digital output input source
249	Motor Start
250	Motor Run
251	Motor Inhibit
252–263	Reserved
264	Thermal overload alarm
265	Locked rotor alarm
266	Stalled rotor alarm
267	Definite time overcurrent alarm
268	Normal inverse overcurrent alarm
269	Short time overcurrent alarm
270	Calculated ground current alarm
271	Measured ground current alarm
272	Under current alarm
273	Current imbalance alarm
274	Current phase loss alarm
275	Current phase reversal alarm
276	Under voltage alarm
277	Over voltage alarm
278	Voltage phase loss alarm
279	Voltage imbalance alarm
280	Voltage phase reversal alarm
281	Under frequency alarm
282	Over frequency alarm
283	Reserved
284	Communication loss alarm
285	Over temperature alarm
286	Under power alarm
287	Over power alarm
288	Under power factor alarm
289–290	Reserved
291	HMI communication loss alarm
292–295	Reserved
296	Thermal overload pickup
297	Locked rotor pickup
298	Stalled rotor pickup
299	Definite time overcurrent pickup
300	Normal inverse overcurrent pickup
301	Short time overcurrent pickup
302	Calculated ground current pickup
303	Measured ground current pickup
304	Under current pickup
305	Current imbalance pickup
306	Current phase loss pickup
307	Current phase reversal pickup

Register value	Digital output input source
308	Under voltage pickup
309	Over voltage pickup
310	Voltage phase loss pickup
311	Voltage imbalance pickup
312	Voltage phase reversal pickup
313	Under frequency pickup
314	Over frequency pickup
315	Excessive start time pickup
316	Communication loss pickup
317	Over temperature pickup
318	Under power pickup
319	Over power pickup
320	Under power factor pickup
321	Reserved
322	Device internal pickup
323	HMI communication loss pickup
324–327	Reserved
328	Thermal overload trip
329	Locked rotor trip
330	Stalled rotor trip
331	Definite time overcurrent trip
332	Normal inverse overcurrent trip
333	Short time overcurrent trip
334	Calculated ground current trip
335	Measured ground current trip
336	Under current trip
337	Current imbalance trip
338	Current phase loss trip
339	Current phase reversal trip
340	Under voltage trip
341	Over voltage trip
342	Voltage phase loss trip
343	Voltage imbalance trip
344	Voltage phase reversal trip
345	Under frequency trip
346	Over frequency trip
347	Excessive start time trip
348	Communication loss trip
349	Over temperature trip
350	Under power trip
351	Over power trip
352	Under power factor trip

Register value	Digital output input source
353	Reserved
354	Device internal trip
355	HMI communication loss trip
356–359	Reserved
360	Interlock 1 alarm
361	Interlock 2 alarm
362	Interlock 3 alarm
363	Interlock 4 alarm
364	Interlock 5 alarm
365	Interlock 6 alarm
366	Interlock 7 alarm
367	Interlock 8 alarm
368	Interlock 9 alarm
369	Interlock 10 alarm
370	Interlock 11 alarm
371	Interlock 12 alarm
372–375	Reserved
376	Interlock 1 pickup
377	Interlock 2 pickup
378	Interlock 3 pickup
379	Interlock 4 pickup
380	Interlock 5 pickup
381	Interlock 6 pickup
382	Interlock 7 pickup
383	Interlock 8 pickup
384	Interlock 9 pickup
385	Interlock 10 pickup
386	Interlock 11 pickup
387	Interlock 12 pickup
388–391	Reserved
392	Interlock 1 trip
393	Interlock 2 trip
394	Interlock 3 trip
395	Interlock 4 trip
396	Interlock 5 trip
397	Interlock 6 trip
398	Interlock 7 trip
399	Interlock 8 trip
400	Interlock 9 trip
401	Interlock 10 trip
402	Interlock 11 trip
403	Interlock 12 trip
404–503	Reserved
504	Contactor output 1

Register value	Digital output input source
505	Contactor output 2
506	Contactor output 3
507	Contactor output 4
508	Contactor output 5
509–535	Reserved
536	Motor forward running
537	Motor reverse running
538	Motor fast forward running
539	Motor fast reverse running
540	Motor running in star (forward)
541	Motor running in delta (forward)
542	Motor running in star (reverse)
543	Motor running in delta (reverse)
544	Motor in star-delta changeover (forward)
545	Motor in star-delta changeover (reverse)
546	Interlocking time active
547	Change-over pause active
548–551	Reserved
552	Status - Permissive Command 1
553	Status - Permissive Command 2
554	Status - Permissive Command 3
555	Status - Permissive Command 4
556	Status - Permissive Command 5
557	Status - Permissive Command 6
558	Status - Permissive Command 7
559	Status - Permissive Command 8
560–583	Reserved
584	No Voltage Inhibit
585	Under Voltage Inhibit
586	Trip Inhibit
587	Thermal Inhibit
588	Max Starts Inhibit
589	Interlock 1 Inhibit
590	Interlock 2 Inhibit
591	Interlock 3 Inhibit
592	Interlock 4 Inhibit
593	Interlock 5 Inhibit
594	Interlock 6 Inhibit
595	Interlock 7 Inhibit
596	Interlock 8 Inhibit
597	Interlock 9 Inhibit
598	Interlock 10 Inhibit
599	Interlock 11 Inhibit
600	Interlock 12 Inhibit

Register value	Digital output input source
601	Local DI Stop Inhibit
602	Remote DI Stop Inhibit
603	Communication Stop Inhibit
604	Forced Stop Inhibit
605	Antibackspin Inhibit
606	Reserved
607	Direction change Inhibit
608	Speed change Inhibit
609	Custom Stop Inhibit
610–615	Reserved
616	Sensor module communication error detected
617	Expansion unit communication error detected
618	HMI communication error detected
619	EEPROM interface error detected
620	EEPROM checksum error detected
621	Configuration error detected
622	PROFIBUS DP interface error detected
623	Internal temperature major error detected
624	Watchdog timeout detected
625	Low Battery detected
626–627	Reserved
628	Energy Register Overflow
629	Error detected during expansion unit initialization
630	RTC initialization error detected
631	Internal temperature minor error detected
632–647	Reserved
648	SM watchdog timeout detected
649	ADC conversion error detected
650	Flash error detected
651	Reserved
652	Voltage configuration not detected
653	Reserved
654	Calibration error detected
655	VL1 measurement error detected
656	VL2 measurement error detected
657	VL3 measurement error detected
658	IL1 low gain measurement error detected
659	IL1 high gain measurement error detected
660	IL2 low gain measurement error detected
661	IL2 high gain measurement error detected
662	IL3 low gain measurement error detected
663	IL3 high gain measurement error detected
664–65535	Reserved

Data Logs

What's in This Chapter

Trip Logs

Description

The last 20 encountered trips are recorded by the LTMT main unit. Each trip log is composed of 32 registers.

A read request of 32xn registers is necessary to read the last n trip logs, where 32 is the number of registers for each trip log.

The order and the description of the registers for trip log 1 are valid for the other trip logs.

Address	Register	Description
0x1770	6001–6032	Trip log 1 (most recent log)
0x1790	6033–6064	Trip log 2
0x17B0	6065–6096	Trip log 3
0x17D0	6097–6128	Trip log 4
0x17F0	6129–6160	Trip log 5
0x1810	6161–6192	Trip log 6
0x1830	6193–6224	Trip log 7
0x1850	6225–6256	Trip log 8
0x1870	6257–6288	Trip log 9
0x1890	6289–6320	Trip log 10
0x18B0	6321–6352	Trip log 11
0x18D0	6353–6384	Trip log 12
0x18F0	6385–6416	Trip log 13
0x1910	6417–6448	Trip log 14
0x1930	6449–6480	Trip log 15
0x1950	6481–6512	Trip log 16
0x1970	6513–6544	Trip log 17
0x1990	6545–6576	Trip log 18
0x19B0	6577–6608	Trip log 19
0x19D0	6609–6640	Trip log 20

Trip Log 1 Registers

The table lists the registers for the trip log 1.

Address	Register	No.	Function code	RW	X	Unit	Type	Svd	Description
0x1770	6001	4	0x03	R	–	–	UINT16	Y	Date and Time, page 37
0x1774	6005	1	0x03	R	–	–	UINT16	Y	Trip Code, page 125
0x1775	6006	1	0x03	R	1	%	UINT16	Y	Thermal memory
0x1776	6007	2	0x03	R	0.001	A	UINT32	Y	L1 RMS current
0x1778	6009	2	0x03	R	0.001	A	UINT32	Y	L2 RMS current
0x177A	6011	2	0x03	R	0.001	A	UINT32	Y	L3 RMS current

Address	Register	No.	Function code	RW	X	Unit	Type	Svd	Description
0x177C	6013	2	0x03	R	0.001	A	UINT32	Y	Calculated ground current
0x177E	6015	2	0x03	R	0.001	A	UINT32	Y	Measured ground current
0x1780	6017	1	0x03	R	0.01	%	UINT16	Y	Current imbalance
0x1781	6018	1	0x03	R	1	–	UINT16	Y	Current phase sequence
0x1782	6019	1	0x03	R	0.1	V	UINT16	Y	L1-L2 RMS voltage
0x1783	6020	1	0x03	R	0.1	V	UINT16	Y	L2-L3 RMS voltage
0x1784	6021	1	0x03	R	0.1	V	UINT16	Y	L3-L1 RMS voltage
0x1785	6022	1	0x03	R	0.01	%	UINT16	Y	Voltage imbalance
0x1787	6023	1	0x03	R	1	–	UINT16	Y	Voltage phase sequence
0x1787	6024	1	0x03	R	0.01	Hz	UINT16	Y	System frequency
0x1788	6025	1	0x03	R	–	–	UINT16	Y	MSB: System PF LSB: Motor status
0x1789	6026	1	0x03	R	0.1	–	UINT16	Y	MSB: L1 current THD LSB: L2 current THD
0x178A	6027	1	0x03	R	0.1	–	UINT16	Y	MSB: L3 current THD LSB: L1 voltage THD
0x178B	6028	1	0x03	R	0.1	–	UINT16	Y	MSB: L2 voltage THD LSB: L3 voltage THD
0x178C	6029	2	0x03	R	0.001	–	UINT32	Y	Total active power
0x178E	6031	2	–	–	–	–	–	–	Reserved

Event Logs

Description

The last 100 events are recorded by the LTMT main unit. Each event log is composed of 8 registers.

A read request of 8xn registers is necessary to read n event logs, where 8 is the number of registers for each event log.

The order and the description of the registers for event log 1 are valid for the other event logs.

Address	Register	Description
0x1B58–0x1B5F	7001–7008	Event log 1 (most recent log)
...	...	...
0x1858–0x1B57	7001+8x(n-1) – 7008+8x(n-1)	Event log n
...	...	...
0x1E70–0x1E77	7793–7800	Event log 100

Event Log 1 Registers

The table lists the registers for the event log 1.

Address	Register	No.	Function code	RW	X	Unit	Type	Svd	Description
0x1B58	7001	4	0x03	R	–	–	UINT16	Y	Date and Time, page 37
0x1B5C	7005	1	0x03	R	–	–	UINT16	Y	Event Code, page 127
0x1B5D	7006	3	0x03	R	–	–	UINT16	Y	Reserved

Detected Internal Error Logs

Description

The last 20 detected internal errors are recorded by the LTMT main unit. Each detected internal error log is composed of 8 registers.

A read request of 8xn registers is necessary to read n detected internal error logs, where 8 is the number of registers for each detected internal error log.

The order and the description of the registers for detected internal error log 1 are valid for the other detected internal error logs.

Address	Register	Description
0x1F40–0x1F47	8001–8008	Detected internal error log 1 (most recent log)
...	...	...
0x1F40–0x1F47	8001+8x(n-1) – 8008+8x(n-1)	Detected internal error log n
...	...	...
0x1FD8–0x1FDF	8153–8160	Detected internal error log 20

Detected Internal Error Log 1 Registers

The table lists the registers for the detected internal error log 1.

Address	Register	No.	Function code	RW	X	Unit	Type	Svd	Description
0x1F40	8001	4	0x03	R	–	–	UINT16	Y	Date and Time, page 37
0x1F44	8005	1	0x03	R	–	–	UINT16	Y	Detected Internal Error Code, page 143
0x1F45	8006	3	0x03	R	–	–	UINT16	Y	Reserved

Motor Start Logs

Description

The LTMT main unit records 250 current values measured during the last motor start.

One log can be saved to serve as motor start reference log.

The last motor start log can be saved as reference log by using:

- The TeSys Tera DTM.
- A command from a PLC or DCS via the communication network.

The last motor start log and the reference log:

- Can be displayed with the TeSys Tera DTM.
- Are available for PLC or DCS via the communication network.

Two read requests of 128 registers are necessary to read the last motor start log, and two read requests of 128 registers are necessary to read the reference log.

Sampling Interval

The sampling interval is based on the trip class selected in the thermal overload settings.

Trip class	Sampling interval
5	20 ms
10	40 ms
15	60 ms
20	80 ms
25	100 ms
30	120 ms
35	140 ms
40	160 ms

Last Motor Start Log Registers

The table lists the registers for the last motor start log.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x20B7	8376	4	0x03	R	–	–	UINT16	–	–	Y	Date and Time, page 37
0x20BB	8380	1	0x03	R	1	ms	UINT16	20–160	–	Y	Sampling interval
0x20BC	8381	1	0x03	R	0.1	A	UINT16	3–50000	–	Y	Full load current (IFLC)
0x20BD	8382	1	0x03	R	0.1	%IFLC	UINT16	–	–	Y	Sample 1
0x20BE	8383	1	0x03	R	0.1	%IFLC	UINT16	–	–	Y	Sample 2
0x20BF	8384	1	0x03	R	0.1	%IFLC	UINT16	–	–	Y	Sample 3
…	…	…	…	…	…	…	…	…	…	…	…
0x22B6	8631	1	0x03	R	0.1	%IFLC	UINT16	–	–	Y	Sample 250

Reference Log Registers

The table lists the registers for the reference log.

Address	Register	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x222E	8751	4	0x03	R	–	–	UINT16	–	–	Y	Date and Time, page 37
0x2232	8755	1	0x03	R	1	ms	UINT16	20–160	–	Y	Sampling interval
0x2233	8756	1	0x03	R	0.1	A	UINT16	3–50000	–	Y	Full load current (IFLC)
0x2234	8757	1	0x03	R	0.1	%IFLC	UINT16	–	–	Y	Sample 1
0x2235	8758	1	0x03	R	0.1	%IFLC	UINT16	–	–	Y	Sample 2
0x2236	8759	1	0x03	R	0.1	%IFLC	UINT16	–	–	Y	Sample 3
…	…	…	…	…	…	…	…	…	…	…	…
0x232D	9006	1	0x03	R	0.1	%IFLC	UINT16	–	–	Y	Sample 250

Appendices

What’s in This Part

Trip Code

Trip code	Trip description
1	Thermal overload trip
2	Locked rotor trip
3	Stalled rotor trip
4	Definite time overcurrent trip
5	Normal inverse overcurrent trip
6	Short time overcurrent trip
7	Calculated ground trip
8	Measured ground trip
9	Phase under current trip
10	Current imbalance trip
11	Current phase loss trip
12	Current phase reversal trip
13	Phase under voltage trip
14	Phase over voltage trip
15	Voltage phase loss trip
16	Voltage imbalance trip
17	Voltage phase reversal trip
18	Under frequency trip
19	Over frequency trip
20	Excessive start time trip
21	Communication loss trip
22	Over Temperature trip
23	Under power trip
24	Over power trip
25	Under power factor trip
26	Reserved
27	Device internal trip
28	HMI communication loss trip
29	Wiring error detection trip
30-32	Reserved
33	Interlock 1 trip
34	Interlock 2 trip
35	Interlock 3 trip
36	Interlock 4 trip
37	Interlock 5 trip
38	Interlock 6 trip
39	Interlock 7 trip
40	Interlock 8 trip
41	Interlock 9 trip
42	Interlock 10 trip

Trip code	Trip description
43	Interlock 11 trip
44	Interlock 12 trip
45–48	Reserved
49	LTMT main unit temperature
50-94	Reserved
95	Stucked reset key
96	Logic test interrupted trip
97	Motor stop error detection trip
98	Reserved

Event Code

Alarm Events

Event code	Description
1	Thermal overload alarm
2	Thermal overload alarm reset
3	Locked rotor alarm
4	Locked rotor alarm reset
5	Stalled rotor alarm
6	Stalled rotor alarm reset
7	Definite time overcurrent alarm
8	Definite time overcurrent alarm reset
9	Normal inverse overcurrent alarm
10	Normal inverse overcurrent alarm reset
11	Short time overcurrent alarm
12	Short time overcurrent alarm reset
13	Calculated ground fault alarm
14	Calculated ground fault alarm reset
15	Measured ground fault alarm
16	Measured ground fault alarm reset
17	Phase under current alarm
18	Phase under current alarm reset
19	Current imbalance alarm
20	Current imbalance alarm reset
21	Current phase loss alarm
22	Current phase loss alarm reset
23	Current phase reversal alarm
24	Current phase reversal alarm reset
25	Phase under voltage alarm
26	Phase under voltage alarm reset
27	Phase over voltage alarm
28	Phase over voltage alarm reset
29	Voltage phase loss alarm
30	Voltage phase loss alarm reset
31	Voltage imbalance alarm
32	Voltage imbalance alarm reset
33	Voltage phase reversal alarm
34	Voltage phase reversal alarm reset
35	Under frequency alarm
36	Under frequency alarm reset
37	Over frequency alarm
38	Over frequency alarm reset
39-40	Reserved

Event code	Description
41	Communication loss alarm
42	Communication loss alarm reset
43	Over temperature alarm
44	Over temperature alarm reset
45	Under power alarm
46	Under power alarm reset
47	Over power alarm
48	Over power alarm reset
49	Under power factor alarm
50	Under power factor alarm reset
51-52	Reserved
53	Device internal temperature alarm
54	Device internal temperature alarm reset
55	HMI communication loss alarm
56	HMI communication loss alarm reset
57-64	Reserved
65	Interlock 1 alarm
66	Interlock 1 alarm reset
67	Interlock 2 alarm
68	Interlock 2 alarm reset
69	Interlock 3 alarm
70	Interlock 3 alarm reset
71	Interlock 4 alarm
72	Interlock 4 alarm reset
73	Interlock 5 alarm
74	Interlock 5 alarm reset
75	Interlock 6 alarm
76	Interlock 6 alarm reset
77	Interlock 7 alarm
78	Interlock 7 alarm reset
79	Interlock 8 alarm
80	Interlock 8 alarm reset
81	Interlock 9 alarm
82	Interlock 9 alarm reset
83	Interlock 10 alarm
84	Interlock 10 alarm reset
85	Interlock 11 alarm
86	Interlock 11 alarm reset
87	Interlock 12 alarm
88	Interlock 12 alarm reset
89–96	Reserved
97	LTMT main unit temperature alarm
98	LTMT main unit temperature alarm reset
99-128	Reserved
129-192	Reserved

Pickup Events

Event code	Description
193	Thermal overload pickup
194	Thermal overload pickup reset
195	Locked rotor pickup
196	Locked rotor pickup reset
197	Stalled rotor pickup
198	Stalled rotor pickup reset
199	Definite time overcurrent pickup
200	Definite time overcurrent pickup reset
201	Normal inverse overcurrent pickup
202	Normal inverse overcurrent pickup reset
203	Short time overcurrent pickup
204	Short time overcurrent pickup reset
205	Calculated ground fault pickup
206	Calculated ground fault pickup reset
207	Measured ground fault pickup
208	Measured ground fault pickup reset
209	Phase under current pickup
210	Phase under current pickup reset
211	Current imbalace pickup
212	Current imbalace pickup reset
213	Current phase loss pickup
214	Current phase loss pickup reset
215	Current phase reversal pickup
216	Current phase reversal pickup reset
217	Phase under voltage pickup
218	Phase under voltage pickup reset
219	Phase over voltage pickup
220	Phase over voltage pickup reset
221	Voltage phase loss pickup
222	Voltage phase loss pickup reset
223	Voltage imbalace pickup
224	Voltage imbalace pickup reset
225	Voltage phase reversal pickup
226	Voltage phase reversal pickup reset
227	Under frequency pickup
228	Under frequency pickup reset
229	Over frequency pickup
230	Over frequency pickup reset
231	Excessive start time pickup
232	Excessive start time pickup reset

Event code	Description
233	Communication loss pickup
234	Communication loss pickup reset
235	Over temperature pickup
236	Over temperature pickup reset
237	Under power pickup
238	Under power pickup reset
239	Over power pickup
240	Over power pickup reset
241	Under power factor pickup
242	Under power factor pickup reset
243-244	Reserved
245	Device internal pickup
246	Device internal pickup reset
247	HMI communication loss pickup
248	HMI communication loss pickup reset
249-256	Reserved
257	Interlock 1 pickup
258	Interlock 1 pickup reset
259	Interlock 2 pickup
260	Interlock 2 pickup reset
261	Interlock 3 pickup
262	Interlock 3 pickup reset
263	Interlock 4 pickup
264	Interlock 4 pickup reset
265	Interlock 5 pickup
266	Interlock 5 pickup reset
267	Interlock 6 pickup
268	Interlock 6 pickup reset
269	Interlock 7 pickup
270	Interlock 7 pickup reset
271	Interlock 8 pickup
272	Interlock 8 pickup reset
273	Interlock 9 pickup
274	Interlock 9 pickup reset
275	Interlock 10 pickup
276	Interlock 10 pickup reset
277	Interlock 11 pickup
278	Interlock 11 pickup reset
279	Interlock 12 pickup
280	Interlock 12 pickup reset
281-288	Reserved
289	LTMT main unit temperature pickup

Event code	Description
290	LTMT main unit temperature pickup reset
291-384	Reserved

Digital Input Events

Event code	Description
385	DI 1 ON
386	DI 1 OFF
387	DI 2 ON
388	DI 2 OFF
389	DI 3 ON
390	DI 3 OFF
391	DI 4 ON
392	DI 4 OFF
393	DI 5 ON
394	DI 5 OFF
395	DI 6 ON
396	DI 6 OFF
397	DI 7 ON
398	DI 7 OFF
399	DI 8 ON
400	DI 8 OFF
401	DI 9 ON
402	DI 9 OFF
403	DI 10 ON
404	DI 10 OFF
405	DI 11 ON
406	DI 11 OFF
407	DI 12 ON
408	DI 12 OFF
409	DI 13 ON
410	DI 13 OFF
411	DI 14 ON
412	DI 14 OFF
413	DI 15 ON
414	DI 15 OFF
415	DI 16 ON
416	DI 16 OFF
417	DI 17 ON
418	DI 17 OFF
419	DI 18 ON
420	DI 18 OFF
421	DI 19 ON
422	DI 19 OFF
423	DI 20 ON

Event code	Description
424	DI 20 OFF
425	DI 21 ON
426	DI 21 OFF
427	DI 22 ON
428	DI 22 OFF
429	DI 23 ON
430	DI 23 OFF
431	DI 24 ON
432	DI 24 OFF
433–448	Reserved

Digital Output Events

Event code	Description
449	DO 1 ON
450	DO 1 OFF
451	DO 2 ON
452	DO 2 OFF
453	DO 3 ON
454	DO 3 OFF
455	DO 4 ON
456	DO 4 OFF
457	DO 5 ON
458	DO 5 OFF
459	DO 6 ON
460	DO 6 OFF
461	DO 7 ON
462	DO 7 OFF
463	DO 8 ON
464	DO 8 OFF
465	DO 9 ON
466	DO 9 OFF
467	DO 10 ON
468	DO 10 OFF
469	DO 11 ON
470	DO 11 OFF
471	DO 12 ON
472	DO 12 OFF
473	DO 13 ON
474	DO 13 OFF
475-512	Reserved

Digital Input Events

Event code	Description
513	Trip reset DI ON
514	Trip reset DI OFF
515	Breaker close DI ON
516	Breaker close DI OFF
517	Breaker open DI ON
518	Breaker open DI OFF
519	Local-START> DI ON
520	Local-START> DI OFF
521	Local-START>> DI ON
522	Local-START>> DI OFF
523	Local-STOP DI ON
524	Local-STOP DI OFF
525	Local-START< DI ON
526	Local-START< DI OFF
527	Local-START<< DI ON
528	Local-START<< DI OFF
529	Remote-START> DI ON
530	Remote-START> DI OFF
531	Remote-START>> DI ON
532	Remote-START>> DI OFF
533	Remote-STOP DI ON
534	Remote-STOP DI OFF
535	Remote-START< DI ON
536	Remote-START< DI OFF
537	Remote-START<< DI ON
538	Remote-START<< DI OFF
539	Interlock 1 DI ON
540	Interlock 1 DI OFF
541	Interlock 2 DI ON
542	Interlock 2 DI OFF
543	Interlock 3 DI ON
544	Interlock 3 DI OFF
545	Interlock 4 DI ON
546	Interlock 4 DI OFF
547	Interlock 5 DI ON
548	Interlock 5 DI OFF
549	Interlock 6 DI ON
550	Interlock 6 DI OFF
551	Interlock 7 DI ON
552	Interlock 7 DI OFF
553	Interlock 8 DI ON
554	Interlock 8 DI OFF
555	Interlock 9 DI ON
556	Interlock 9 DI OFF

Event code	Description
557	Interlock 10 DI ON
558	Interlock 10 DI OFF
559	Interlock 11 DI ON
560	Interlock 11 DI OFF
561	Interlock 12 DI ON
562	Interlock 12 DI OFF
563	Contactor open DI ON
564	Contactor open DI OFF
565	RUN DI ON
566	RUN DI OFF
567	Block input DI ON
568	Block input DI OFF
569	Logic test DI ON
570	Logic test DI OFF
571	Mode selection 1 DI ON
572	Mode selection 1 DI OFF
573	Mode selection 2 DI ON
574	Mode selection 2 DI OFF
575	Speed change DI ON
576	Speed change DI OFF
577	Forced start DI ON
578	Forced start DI OFF
579	Forced stop DI ON
580	Forced stop DI OFF
581	Self test without trip DI ON
582	Self test without trip DI OFF
583	Self test with trip DI ON
584	Self test with trip DI OFF
585	Soft starter reset DI ON
586	Soft starter reset DI OFF
587-640	Reserved

Inhibit Events

Event code	Description
641	No voltage inhibit
642	No voltage inhibit reset
643	Under voltage inhibit
644	Under voltage inhibit reset
645	Trip inhibit
646	Trip inhibit reset
647	Thermal inhibit
648	Thermal inhibit reset

Event code	Description
649	Max starts inhibit
650	Max starts inhibit reset
651	Interlock 1 inhibit
652	Interlock 1 inhibit reset
653	Interlock 2 inhibit
654	Interlock 2 inhibit reset
655	Interlock 3 inhibit
656	Interlock 3 inhibit reset
657	Interlock 4 inhibit
658	Interlock 4 inhibit reset
659	Interlock 5 inhibit
660	Interlock 5 inhibit reset
661	Interlock 6 inhibit
662	Interlock 6 inhibit reset
663	Interlock 7 inhibit
664	Interlock 7 inhibit reset
665	Interlock 8 inhibit
666	Interlock 8 inhibit reset
667	Interlock 9 inhibit
668	Interlock 9 inhibit reset
669	Interlock 10 inhibit
670	Interlock 10 inhibit reset
671	Interlock 11 inhibit
672	Interlock 11 inhibit reset
673	Interlock 12 inhibit
674	Interlock 12 inhibit reset
675	Local DI stop inhibit
676	Local DI stop inhibit reset
677	Remote DI stop inhibit
678	Remote DI stop inhibit reset
679	Comm stop inhibit
680	Comm stop inhibit reset
681	Forced stop inhibit
682	Forced stop inhibit reset
683	Anti backspin inhibit
684	Anti backspin inhibit reset
685	Device internal error inhibit
686	Device internal error inhibit reset
687	Interlock time inhibit
688	Interlock time inhibit reset
689	Speed change inhibit
690	Speed change inhibit reset
691	Custom stop inhibit
692	Custom stop inhibit reset
693	Firmware update inhibit

Event code	Description
694	Firmware update inhibit reset
695-768	Reserved

HMI Command Events

Event code	Description
769	HMI or DTM Start >
770	HMI or DTM start >>
771	HMI or DTM stop
772	HMI or DTM start <
773	HMI or DTM start <<
774	HMI or DTM trip reset
775	HMI or DTM inhibit reset (max starts)
776	HMI or DTM reset starts counter
777	HMI or DTM reset stops counter
778	HMI or DTM clear thermal memory
779	HMI or DTM reset total run hour
780	HMI or DTM reset energy
781	HMI or DTM forced start
782	HMI or DTM logic test input
783	HMI or DTM self test without trip
784	HMI or DTM self test with trip
785	HMI or DTM reset soft starter
786	HMI or DTM reset trip counter
787-792	Reserved
793	HMI or DTM reset network port setting
794	HMI or DTM reset all
795	HMI or DTM clear statistics
796	HMI or DTM reset protection setting
797	HMI or DTM save reference curve
798	HMI or DTM clear trip logs
799	HMI or DTM clear event logs
800	HMI or DTM factory reset

Communication Command Events

Event code	Description
801	COMM Start >
802	COMM Start >>
803	COMM Stop
804	COMM Start <
805	COMM Start <<

Event code	Description
806	COMM Trip reset
807	COMMInhibit reset (max starts)
808	COMM Reset starts counter
809	COMM Reset stops counter
810	COMM Clear thermal memory
811	COMM Reset total run hour
812	COMM Reset energy
813	COMM Forced start
814	COMM Logic test input
815	COMM Self test without trip
816	COMMSelf test with trip
817	COMMReset soft starter
818	COMM Reset trip counter
819-824	Reserved
825	COMM Reset network port setting
826	COMM Reset all
827	COMM Clear statistics
828	COMM Reset protection settings
829	COMM Save reference curve
830	COMM Clear trip logs
831	COMM Clear event logs
832	COMM Factory reset
833	Permissive command 1
834	Permissive command 2
835	Permissive command 3
836	Permissive command 4
837	Permissive command 5
838	Permissive command 6
839	Permissive command 7
840	Permissive command 8
841-896	Reserved

Trip Reset Events

Event code	Description
897	Thermal overload trip reset
898	Locked rotor trip reset
899	Stalled rotor trip reset
900	Definite time overcurrent trip reset
901	Normal inverse overcurrent trip reset
902	Short time overcurrent trip reset
903	Calculated ground fault trip reset
904	Measured ground fault trip reset

Event code	Description
905	Phase under current trip reset
906	Current imbalance trip reset
907	Current phase loss trip reset
908	Current phase reversal trip reset
909	Phase under voltage trip reset
910	Phase over voltage trip reset
911	Voltage phase loss trip reset
912	Voltage imbalance trip reset
913	Voltage phase reversal trip reset
914	Under frequency trip reset
915	Over frequency trip reset
916	Excessive start time trip reset
917	Communication loss trip reset
918	Over temperature trip reset
919	Under power trip reset
920	Over power trip reset
921	Under power factor trip reset
922	Reserved
923	Device internal trip reset
924	HMI communication loss trip reset
925-928	Reserved
929	Interlock 1 trip reset
930	Interlock 2 trip reset
931	Interlock 3 trip reset
932	Interlock 4 trip reset
933	Interlock 5 trip reset
934	Interlock 6 trip reset
935	Interlock 7 trip reset
936	Interlock 8 trip reset
937	Interlock 9 trip reset
938	Interlock 10 trip reset
939	Interlock 11 trip reset
940	Interlock 12 trip reset
941-944	Reserved
945	LTMT main unit temperature trip reset
946-991	Reserved
992	Logic test interrupted trip reset
993	Motor stop error detection trip reset
994-1024	Reserved

Digital Output

Event code	Description
1025	Device internal DO ON
1026	Device internal DO OFF
1027	Trip DO ON
1028	Trip DO OFF
1029	Alarm DO ON
1030	Alarm DO OFF
1031	Pickup DO ON
1032	Pickup DO OFF
1033	inhibit DO ON
1034	inhibit DO OFF
1035	Block OP DO ON
1036	Block OP DO OFF
1037	CNTR OP1 DO ON
1038	CNTR OP1 DO OFF
1039	CNTR OP2 DO ON
1040	CNTR OP2 DO OFF
1041	CNTR OP3 DO ON
1042	CNTR OP3 DO OFF
1043	CNTR OP4 DO ON
1044	CNTR OP4 DO OFF
1045	CNTR OP5 DO ON
1046	CNTR OP5 DO OFF
1047	CNTR OP6 DO ON
1048	CNTR OP6 DO OFF
1049-1152	Reserved

System and Control Events

Event code	Description
1153	Power down
1154	Power up
1155	Mode changed to Local1
1156	Mode changed to Local2
1157	Mode changed to Local3
1158	Mode changed to Remote
1159	Device internal error detected
1160	Self test WO trip start
1161	Self test with trip start
1162	Logic test start
1163	Reset button OFF
1164	Reset button ON

Event code	Description
1165	Reserved
1166	Date/Time updated
1167	Invalid start command
1168	Start error detected - No feedback
1169	Start error detected - Inhibit present
1170	Start error detected - Current or RUN DI feedback present
1171	Start error detected - No access
1172	Stop error detected - No access
1173	Logic test interrupted
1174	Communication loss detected
1175	Communication restored
1176	Mode shifted from Remote to Local1
1177	Auto restart
1178	Auto stopped
1179	Factory reset – test/reset key
1180	Bypass stop DI function disabled
1181	Bypass stop DI function enabled
1182	HMI Login Success
1183	HMI Login Error - Incorrect Pin
1184	HMI Logout Success
1185	HMI Logout - Session Timeout
1186	HMI Logout- Connection Lost
1187	DTM Login Success
1188	DTM Login Error - Incorrect Pin
1189	DTM Logout Success
1190	DTM Logout - Session Timeout
1191	DTM Logout- Connection Lost
1192	DTM New Pin Set
1193	DTM New Pin set Error - Invalid pin format
1194	DTM Pin Change Success
1195	DTM Pin Change Error
1196	DTM Pin Change Error - Invalid pin format
1197	DTM Pin Reset Success
1198	DTM Pin Reset Error - Incorrect Pin
1199	COMM Login Success
1200	COMM Login Error – Incorrect Pin
1201	COMM Logout Success
1202	COMM Logout – Session Timeout
1203	COMM Logout – Connection Lost
1204	COMM New Pin Set
1205	COMM New Pin Set Error – Invalid pin format
1206	COMM Pin Change Success
1207	COMM Change Error – Incorrect Pin

Event code	Description
1208	COMM Change Error – Invalid Format
1209	COMM Password Reset Success
1210	COMM Reset Error – Incorrect Pin
1211	Error - Pin not saved
1212	Error - Wrong LoginID
1213–1216	Reserved
1217	Custom Start >
1218	Custom Start >>
1219	Custom Stop
1220	Custom Start <
1221	Custom Start <<
1222	Start > Command Executed
1223	Start >> Command Executed
1224	Start < Command Executed
1225	Start << Command Executed
1226	Stop Command Executed
1227–1280	Reserved
1281	DPV1 Start >
1282	DPV1 Start >>
1283	DPV1 Stop
1284	DPV1 Start <
1285	DPV1 Start <<
1286	DPV1 Trip reset
1287	DPV1 Inhibit reset (Max Starts)
1288	DPV1 Reset starts counter
1289	DPV1 Reset stops counter
1290	DPV1 Clear thermal memory
1291	DPV1 Reset total run hour
1292	DPV1 Reset energy
1293	DPV1 Forced start
1294	DPV1 Logic test
1295	DPV1 Self test without trip
1296	DPV1 Self test with trip
1297	DPV1 Reset soft starter
1298	DPV1 Reset trip counter
1299–1312	Reserved
1313	DPV1 Permissive Command 1
1314	DPV1 Permissive Command 2
1315	DPV1 Permissive Command 3
1316	DPV1 Permissive Command 4
1317	DPV1 Permissive Command 5
1318	DPV1 Permissive Command 6
1319	DPV1 Permissive Command 7
1320	DPV1 Permissive Command 8
1321-1344	Reserved

Event code	Description
1345	LTMT main unit FW valid
1346	LTMT main unit invalid sign
1347	LTMT main unit incompatible ver
1348	LTMT main unit FW update success
1349–1360	Reserved
1361	LTMTCT/LTMTCTV sensor module FW valid
1362	LTMTCT/LTMTCTV sensor module invalid sign
1363	LTMTCT/LTMTCTV sensor module incompatible ver
1364	LTMTCT/LTMTCTV sensor module FW update success
1365	LTMTCT/LTMTCTV sensor module FW update timeout
1366–1376	Reserved
1377	LTMT expansion unit FW valid
1378	LTMT expansion unit invalid sign
1379	LTMT expansion unit incompatible ver
1380	LTMT expansion unit FW update success
1381	LTMT expansion unit FW update timeout
1382–1408	Reserved

Device Internal Error Code

Detected internal error code	Description
1	Sensor module communication error detected
2	Sensor module communication error reset
3	Expansion module communication error detected
4	Expansion module communication error reset
5	HMI communication error detected
6	HMI communication error reset
7	EEPROM interface error detected
8	EEPROM interface error reset
9	EEPROM checksum error detected
10	EEPROM checksum error reset
11	Configuration error detected
12	Configuration error reset
13	PROFIBUS DP interface error detected
14	PROFIBUS DP interface error reset
15	Internal temperature major error detected
16	Internal temperature major error reset
17	Main unit watchdog timeout detected
18	Main unit watchdog timeout error reset
19	Low Battery detected
20	Low Battery error reset
21–22	Reserved
23	LTMT main unit temperature input error detected
24	LTMT main unit temperature input error reset
25	Energy register overflow
26	Energy register overflow error reset
27	Error detected during expansion unit initiation
28	Expansion unit initiation error reset
29	RTC initialization error detected
30	RTC initialization error reset
31	Internal temperature minor error detected
32	Internal temperature minor error reset
33–64	Reserved
65	LTMTCT/LTMTCTV sensor module watchdog timeout detected
66	LTMTCT/LTMTCTV sensor module watchdog timeout error reset
67	ADC conversion error detected
68	ADC conversion error reset
69	Flash error detected
70	Flash error reset
71	UART error detected
72	UART error reset
73	Voltage configuration not detected

Detected internal error code	Description
74	Voltage configuration error reset
75–76	Reserved
77	Calibration error detected
78	Calibration error reset
79	VL1 measurement error detected
80	VL1 measurement error reset
81	VL2 measurement error detected
82	VL2 measurement error reset
83	VL3 measurement error detected
84	VL3 measurement error reset
85	IL1 low gain measurement error detected
86	IL1 low gain measurement error reset
87	IL1 high gain measurement error detected
88	IL1 high gain measurement error reset
89	IL2 low gain measurement error detected
90	IL2 low gain measurement error reset
91	IL2 high gain measurement error detected
92	IL2 high gain measurement error reset
93	IL3 low gain measurement error detected
94	IL3 low gain measurement error reset
95	IL3 high gain measurement error detected
96	IL3 high gain measurement error reset
97–128	Reserved

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DOCA0355EN-00