TeSys Active

TeSys Tera Motor Management System

EtherNet/IP Communication Guide

TeSys offers innovative and connected solutions for motor starters.

DOCA0258EN-00
11/2025

Legal Information

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

This document is not intended as a substitute for a detailed study or operational and site-specific development or schematic plan. It is not to be used for determining suitability or reliability of the products/solutions for specific user applications. It is the duty of any such user to perform or have any professional expert of its choice (integrator, specifier or the like) perform the appropriate and comprehensive risk analysis, evaluation and testing of the products/solutions with respect to the relevant specific application or use thereof.

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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 necessary technical information to operate the LTMT main unit with the following Ethernet communication protocols:

- Modbus TCP/IP
- EtherNet/IP

This guide is intended for:

- Design engineers
- System integrators
- Maintenance engineers

Validity Note

This guide is valid for the following LTMT main units:

- LTMTEFM: LTMT main unit with EtherNet/IP or Modbus TCP/IP protocol, 100–240 Vac/Vdc.
- LTMTEBD: LTMT main unit with EtherNet/IP or Modbus TCP/IP 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.

Product Related Cybersecurity Information

Refer to *TeSys Tera Motor Management System Cybersecurity Guide – DOCA0260EN*.

Environmental Data

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

For EtherNet/IP or Modbus TCP/IP Environmental Data Program, refer to ENVPEP2503014EN.

Available Languages of the Document

The document is available in these languages:

- English
- Chinese
- French
- German
- Italian
- Korean
- Spanish

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 modules, 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 modules, 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 Cybersecurity Guide	This guide provides information on cybersecurity aspects for the TeSys Tera Motor Management System. This guide addresses on how to secure your operational technology network, or your company serial or Ethernet network.	DOCA0260EN
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

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.

Trademarks

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

TeSys Tera System

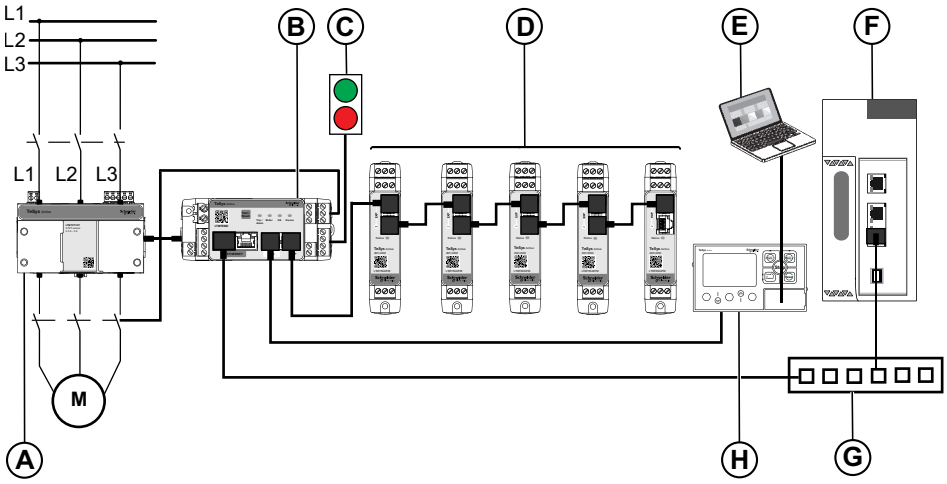
Overview

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, metering, 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 standalone HMI device.
- 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 modules

E PC running SoMove FDT container software with TeSys Tera DTM installed and equipped with standard web server capability

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

G Ethernet switch

H LTMTCUF control operator unit

Functional Characteristics

The TeSys Tera system manages:

- Single-phase or three-phase AC induction motors and heaters rated up to 100 A and 690 V operational voltage, with an integral sensor module.
- Single-phase or three-phase AC induction motors and heaters rated up to 810 A and 690 V operational voltage, with 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 EtherNet/IP Protocol

Overview

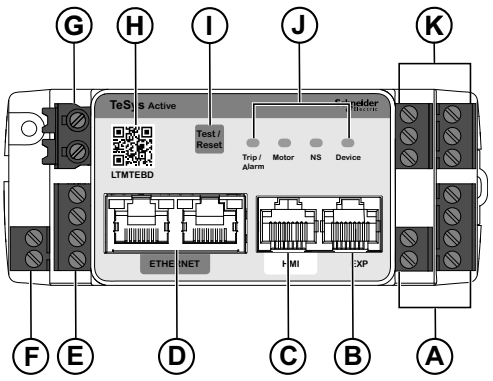
NOTICE
UNAUTHORIZED ETHERNET PORT USAGE • Use only one Ethernet communication port at a time, even though both ports are functionally identical. **Failure to follow these instructions can result in equipment damage.**

The LTMT main unit with EtherNet/IP or Modbus TCP/IP communication protocol is equipped with two RJ45 Ethernet ports on the front face. These ports comply with IEEE 802.3 Ethernet standard.

The main physical characteristics of Ethernet ports are:

Physical Interface	Ethernet 10BASE-T/100BASE-T
Connector	RJ45

Description



A Digital input connectors

B RJ45 port for LTMT expansion module connection

C RJ45 port for HMI connection

D RJ45 ports for EtherNet/IP or Modbus TCP/IP communication

E Device shield ground terminals

F Temperature input connector

G Power supply connector

H QR code to product information page

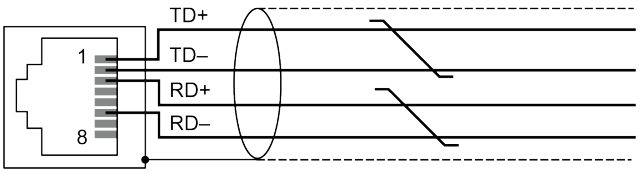
I Test/Reset button

J Status LEDs

K Digital output connectors

RJ45 Connector Pinout

The LTMT main unit is connected to the Ethernet network using either or both of the RJ45 Ethernet communication ports in compliance with the following wiring:



The RJ45 wiring layout is:

Pin No.	Signal	Pair	Description
1	TD+	A	Transmit +
2	TD-	A	Transmit –
3	RD+	B	Receive +
4	Do not connect	–	–
5	Do not connect	–	–
6	RD-	B	Receive –
7	Do not connect	–	–
8	Do not connect	–	–

Auto-MDIX Interface

Each RJ45 connector on the LTMT main unit Ethernet network port is an MDIX (media-dependent interface crossover) interface. Each connector automatically senses the:

- Cable type (straight or crossed) plugged into the connector
- Pin requirements of the device to which the LTMT main unit is connected

Using this information, each connector assigns transmit and receive functions to pin combinations 1 and 2, and 3 and 6 as necessary to communicate with the device on the other end of the cable.

NOTE: Auto-MDIX allows the use of shielded category 5E or higher straight-through twisted-pair Ethernet cables to connect the LTMT main unit to another device.

Wiring Information

What's in This Part

Overview

This chapter describes how to connect the LTMT main unit to an Ethernet network.

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

Ethernet Network Characteristics

Overview

This chapter describes the characteristics of the Ethernet network over EtherNet/IP or Modbus TCP/IP communication line. The LTMT main unit complies with the specification of the EtherNet/IP and Modbus TCP/IP protocols.

Characteristics for Connection to the Ethernet Network

The main characteristics to connect the Ethernet network are:

Characteristics	Value
Type of cable	Shielded category 5E or higher straight-through twisted-pair cable
Maximum cable length(1)	100 m (328 ft)
Transmission speed	10 or 100 Mbps

(1) If the cable length exceeds 100 m, use a switch.

Wiring Rules

NOTICE
COMMUNICATION MALFUNCTION 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 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 the distance as large as possible between the communication cable and the power or control cables.
- Cross over the Ethernet cable 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*.
- All RJ45 connectors must be metallic.
- Use an Ethernet cable that is category 5E or higher.
- Ethernet cable must be shielded:
  - Cable shield must be connected to a protective ground.
  - Connection of the cable shield to the protective ground must be as short as possible.
  - Connect the shields, if necessary.
- When the LTMT main unit is installed in a withdrawable drawer:
  - Connect all shield contacts of the withdrawable drawer part of the auxiliary connector to the ground of the panel, to create an electromagnetic barrier. Refer to the *Okken Communications Cabling & Wiring Guide*, *Blokset Guide*, and *Model 6 Guide* (available on request).
  - Do not connect the cable shield at the fixed part of the auxiliary connector.
- Connect the cable between each connector directly, without intermediate terminal blocks.
- The common polarity (0 V) must be connected directly to the protective ground, preferably at a single point for the entire bus. This connection is typically made either at the primary device or at the polarization device. If the cable is short and located within the electrical panel, this connection is acceptable. However, if the cable length exceeds 10 m, do not connect the common polarity (0 V) to the protective ground.

  NOTE: If the cable length exceeds 10 m, do not short the shield and local ground, as this can cause transient voltage failures.

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

Installation Rules in a Switchboard

The installation of the LTMT main unit in the withdrawable drawer of a switchboard presents 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 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.

Connection to the Network

Every LTMT main unit includes an embedded two-port Ethernet switch with one IP address.

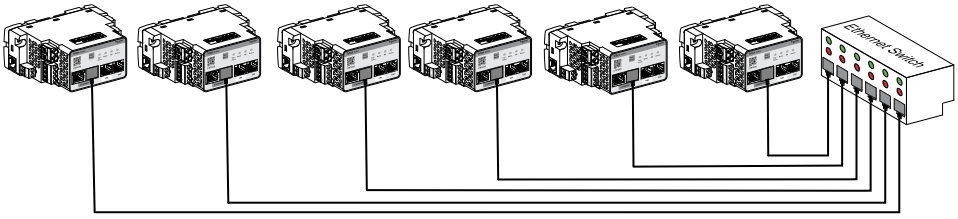
NOTE: The LTMT main unit includes an internal two-port bridge. Both RJ45 ports share one IP address. Use only star or point-to-point topologies.

The IEEE 802.3 standard defines EthernetLTMT main unit

Ethernet Network Topologies

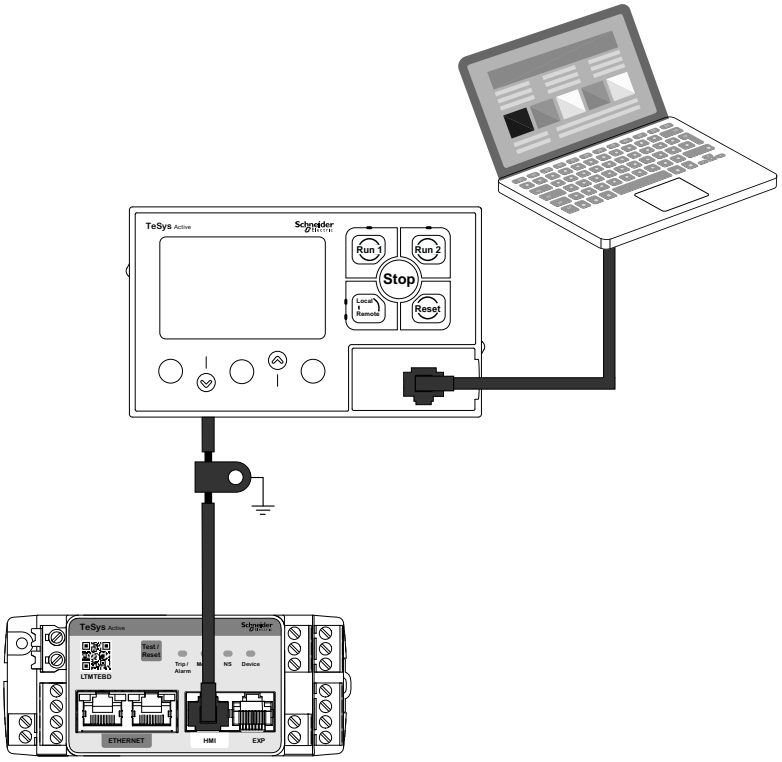
Star Topology

A star topology is a network configuration in which all the LTMT main units are directly connected to an Ethernet switch.



Point-to-Point Topology

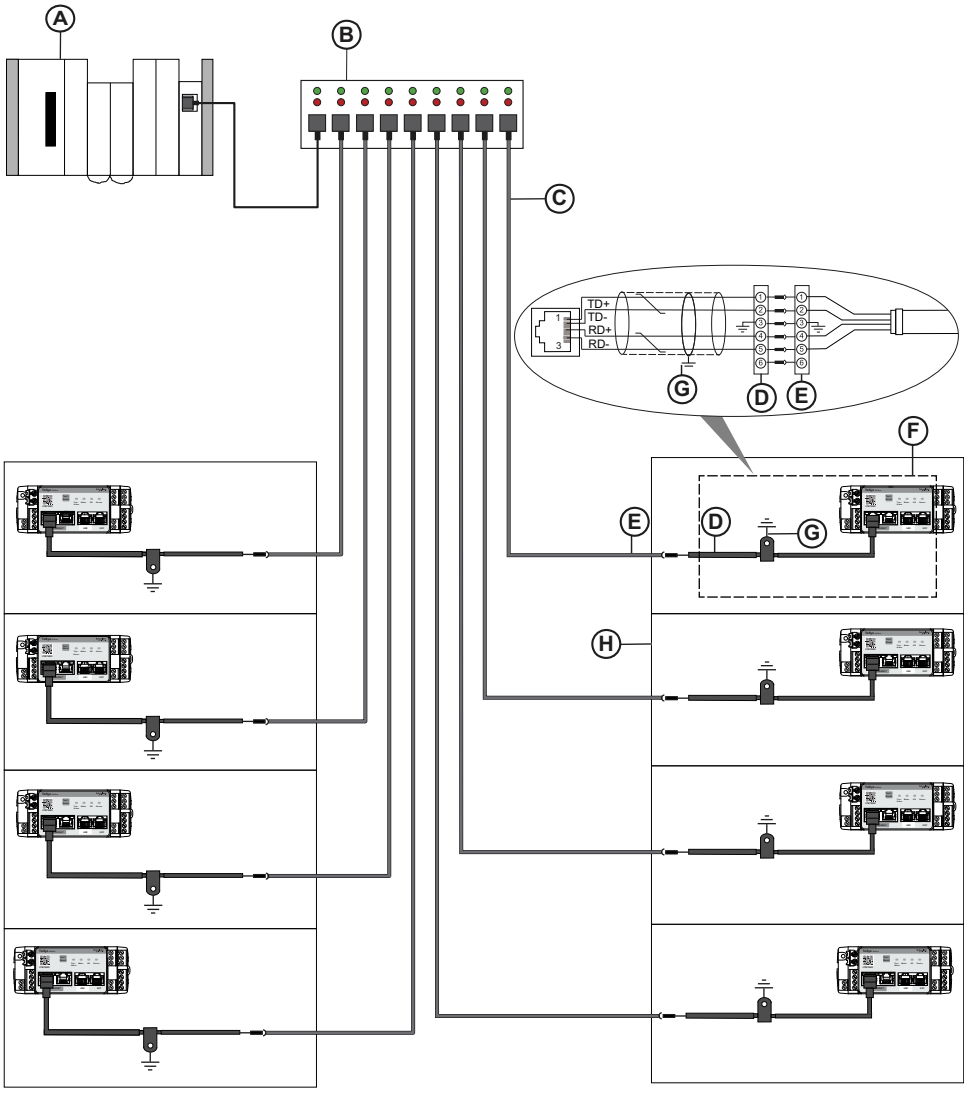
A point-to-point topology is a network configuration in which the LTMTCUF control operator unit connects the LTMT main unit to the PC.



NOTE: In point-to-point topology, you can also connect the LTMT main unit directly to the PC.

Example of Wiring Diagram

The wiring diagram below indicates how to connect LTMT main units installed in withdrawable drawers to the Ethernet network through the RJ45 connector and hardwired cables.



A Client (PLC, PC, or communication module) with line terminator

B Ethernet switch

C Ethernet shielded cable 490NTW00002 or 490NTW00005 or 490NTW00012

D Withdrawable drawer part of the auxiliary connector for drawers

E Fixed part of the auxiliary connector

F Withdrawable drawer

G Grounding of the Ethernet cable shield

H Switch board column

Implementation of EtherNet/IP Protocols

What's in This Part

Implementation of Ethernet Services

What's in This Chapter

Overview

TeSys Tera Ethernet variant offers Ethernet services that can control, monitor, and configure the TeSys Tera system from a remote location through a network.

Configuration of Ethernet Network Port

Communication Settings

Configure the following Ethernet communication services and settings before initiating network port communication:

- Client IP address setting
- IP address settings
- Modbus TCP/IP endian setting
- Network protocol setting
- Communication loss settings
- IP allowlist
- Network Time Protocol (NTP) or Simple Network Time Protocol (SNTP)
- IP configuration
- Modbus TCP/IP unit ID

  NOTE: The Modbus TCP/IP unit id is 255.

Client IP Address Setting

Configure the client IP address parameter to specify the IP address of the client device, such as PC, PLC, or DCS. This parameter consists of four integer values, ranging from 0 to 255, separated by dots (xxx.xxx.xxx.xxx).

IP Address Settings

A unique set of IP address settings must be assigned to the LTMT main unit (including an IP address, a subnet mask, and a gateway address) to enable the communication over an Ethernet network. You can acquire the TeSys Tera IP address through the following options:

- DHCP server
- Manual IP address settings

You can set the IP acquisition mode from the LTMTCUF control operator unit, TeSys Tera DTM, or the standard web server. When the IP acquisition mode is set to DHCP, TeSys Tera obtains its IP address from the DHCP server.

Modbus TCP/IP Endian Setting

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.

The Modbus TCP/IP endian setting allows you to swap the two words in a double word.

- 0 = Big endian
- 1 = Little endian

The default Modbus TCP/IP endian setting is big endian. This setting applies only to the Modbus TCP/IP protocol.

Fieldbus Protocol Setting

The fieldbus protocol setting allows you to select any one of the following network protocols.

- Modbus TCP/IP
- EtherNet/IP

  NOTE: Enabling EtherNet/IP protocol does not disable Modbus TCP/IP protocol.

For more information on fieldbus protocol setting, refer to Field Bus Protocol Page, page 257.

Communication Loss Settings

The communication loss setting specifies the duration after which the system declares a communication loss. You can configure the following parameter using the communication loss setting.

- Ethernet client IP address setting: Declares which PC, PLC, and DCS will be the primary for network port Communication loss strategy. For more information, refer to Client IP, page 38.
- Network port communication loss time out: If the LTMT main unit loses communication with the PLC (Client IP address) and a time delay is configured, the LTMT main unit waits for the configured duration. After the delay, it declares an alarm or trip, as configured.
  - Range = 1 to 6000 s
  - Increments = 1 s
  - Default setting = 2 s
- Fieldbus communication trip enable: Triggers a network communication interruption trip after the network port communication loss time delay setting has expired.
- Fieldbus communication alarm enable: Triggers a network alarm after the network port communication loss time delay setting has expired.

  NOTE: When the PLC is in Run mode, no trip or alarm is generated. When the PLC is in Idle mode, an alarm or trip is generated for communication loss if this setting is configured as Alarm + Trip.

IP Allowlist

The IP services can be used without access control from the client. The TeSys Tera system supports the IP allowlist feature to secure the Ethernet connection in a controlled manner.

The IP allowlist can be used to configure up to five individual and one global IP addresses along with their access levels. The different access levels are listed below.

- None
- Read and write

The different types of client IP are:

- Individual: Definite IPV4 address (Example: 10.155.16.137).
- Group of IP addresses: Set of IPV4 addresses (Example: 10.155.16.*** or 10.155.***.*** or 10.***.***.***).

- Anonymous: An IPV4 address (***.***.***.***).

The access levels for anonymous IPV4 can be read and write or none. The IP allowlist can only block fieldbus protocol when the IP allow list is enabled and the client IP is not listed in the allow list.

For more information on IP allowlist setting, refer to IP Allow List Page, page 262.

NTP or SNTP

The NTP or SNTP is used to update the date and time of the LTMT main unit in accordance with the access parameter of the remote NTP or SNTP server. The NTP or SNTP time of the device can synchronize with the NTP or SNTP server every 2 minutes.

The LTMT main unit provides the provision to configure the following NTP or SNTP servers.

- Primary server
- Secondary server

You can configure the NTP or SNTP server using:

- Server IP address
- Server name(2)

The LTMT main unit will check for the primary server first, and if it receives the time from the primary server, then it will remain connected with the primary server. However, if in case after three retries also, the LTMT main unit does not receive any timestamp from the primary server, then it switches to the secondary server. If it receives the time from the secondary server, then it will remain connected with the secondary server. In case after three retries also, the LTMT main unit does not receive any timestamp from the secondary server, then it switches to the primary server. This cycle will continue until the LTMT main unit gets the timestamp from any of the servers.

IP Configuration

The TeSys Tera system provides following options through which you can configure the device IP address.

IP Configuration through DHCP Server

The Dynamic Host Configuration Protocol (DHCP) follows RFC2132 standard to obtain the TeSys Tera system IP address from the DHCP server connected to the network.

NOTE: The default IP configuration mode is DHCP.

The IP configuration through DHCP server service can be activated in the following conditions:

- TeSys Tera system is configured during production.
- User intentionally configures the DHCP mode.
- User performs the factory reset in the TeSys Tera system.

When the TeSys Tera system is configured in DHCP mode with any of the above-mentioned conditions, then it performs the following actions.

(2) If you configure the NTP server using its IP address, specifying a server name is not required. However, if you use a server name instead of an IP address, DNS settings must be configured in the IP address settings to ensure proper name resolution.

1. **Acquire DHCP IP through DORA**

   When a DHCP server is connected to the network, TeSys Tera system uses the DHCP protocol to automatically obtain its IP address. It follows the discover, offer, request, and acknowledge (DORA) sequence, as defined in RFC 2132.

   During the cycle, if the user configures the Domain Name System (DNS) manually, the DNS accepts the configured parameters. If DNS is configured automatically, the parameters are configured through the DHCP server.

2. **Fall Back IP**

   If the DHCP server is not available for 50 seconds, the TeSys Tera system enter into fall back IP address (default IP address). The default IP address is 169.254.xx.yy (subnet mask 255.255.0.0) with a gateway of 0.0.0.0, where xx.yy are the last two bytes of the Media Access Control (MAC) address.

   For example, for a hexadecimal MAC address 00-00-54-EF-10-01, the last two bytes are 0x10 and 0x01. The last two digits are translated to hexadecimal values. So the default IP address is 169.254.01.01.

   NOTE: The TeSys Tera system will initiate the DHCP request at the back end, even though it is configured with a fallback IP address. If the DHCP server is available, the TeSys Tera system will be configured with a DHCP IP address, and the fallback IP address will no longer be available.

IP Configuration through Static IP

You can configure the TeSys Tera system IP address according to their network requirements. When you switch the TeSys Tera system configuration from DHCP (automatic) to static (manual), you must provide the following details.

- IP address
- Subnet mask
- Gateway: You can configure the gateway, based on network conditions, or keep it as 0.0.0.0
- DNS: You can configure the DNS, based on network conditions, or keep it as 0.0.0.0

After configuring the device with a static IP, the device will be configured with the stored IP address after every re-initialization. The LTMT main unit starts the IP addressing that:

- Obtains IP address settings
- Validates IP address settings
- Assigns the received IP address settings to the LTMT main unit

Modbus TCP/IP Unit ID

There are two Ethernet network ports available for Ethernet messaging. You can perform the Ethernet messaging through the Modbus TCP/IP unit ID is 255.

For more details on Modbus TCP/IP unit IDs, refer to Modbus Requests, page 48

Ethernet Link Management

Overview

The LTMT main unit can receive or provide Ethernet services only if an Ethernet communications link exists. An Ethernet communications link can be established only when a cable connects one of the LTMT main units network ports to the network. If no network cable is connected, Ethernet services cannot start.

The behavior of the LTMT main unit in relation to Ethernet connectivity is described in the following scenarios:

- The Ethernet communication link connected at startup.
- The Ethernet communications link disconnected after startup.
- The Ethernet communication link reconnected after disconnection.

Ethernet Communication Link Connected at Startup

When, after the LTMT main unit has started up, an Ethernet network cable is initially connected to a previously disconnected LTMT main unit.

- The LTMT main unit initiates the IP addressing service, which:
  - Obtains IP address settings
  - Validates IP address settings
  - Assigns the received IP address settings to the LTMT main unit.
- After the IP address settings are assigned, the LTMT main unit initiates the Modbus service.

Ethernet Communications Link Disconnected After Startup

When all the EtherNet/IP communication links are disconnected from the LTMT main unit after startup:

- The IP addressing service is disabled and a network port configuration alarm is generated.
- All Modbus service connections are reset.
- If a client IP connection exists:
  - The link cannot be re-established before the network port communication loss timeout expires.
  - The link is re-established before the network port communication loss timeout expires.

Ethernet Communication Link Reconnected After Disconnection

When one or more EtherNet/IP communication links are re-established to the LTMT main unit and after all the links had been disconnected following startup, the LTMT main unit performs many, but not all, of the same tasks as it does when no communication link is present at startup. The LTMT main unit:

- Assumes that the previously obtained IP address settings remain valid, the system proceeds with the following steps:
  - Verifies the IP address settings are not duplicate.
  - Re-assigns the IP address settings to the LTMT main unit.
- After the IP address settings are assigned, the LTMT main unit initiates the Modbus service.

Client IP

Overview

Each LTMT main unit can configure itself to recognize another Ethernet device (typically a PLC or DCS which is going to control LTMT main unit) as the client device that controls the motor. This device usually initiates communication to exchange process data, such as control and status information. The client IP is the IP address of this device.

The PLC should continuously maintain at least one connection.

If the connection between the client IP device and the LTMT server is interrupted, the LTMT main unit waits for a prescribed duration (referred to as the communication loss timeout) to consider it as a communication loss.

If a connection is not re-established and messages are not received from the client IP device before the timeout expires, the LTMT main unit enters the communication loss phase. As a result, the communication loss event cannot be triggered.

If the field bus protocol communication is not established with the client IP device, the communication loss timeout timer will not start. As a result, the communication loss event cannot be triggered.

⚠WARNING

LOSS OF COMMUNICATION

- Configure a server IP on the Ethernet network.
- Do not use an IP address other than client IP to send network start and stop commands to the LTMT main unit.
- Design the Ethernet network to block unauthorized network start and stop commands sent to the LTMT main unit.

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

Connections with Modbus TCP/IP

If Ethernet reaches its limit of eight simultaneous Modbus connections, the LTMT main unit cannot open a new connection.

All connections (up to eight) between the LTMT main unit and the client IP client are preserved once communication has been established between them. The LTMT main unit will not close a connection with the client IP address to open a new connection from a non-client IP address.

Configuration of Client IP

To enable connections to a Modbus client, use the configuration tool to set the following parameters:

Parameter	Setting Range	Factory Setting
Ethernet client IP address setting	Valid class A, B, and C address ranges 0.0.0.0 - 255.255.255.255	192.168.1.100 = No client IP
Network port communication loss timeout	Range = 0 - 100, step 1	2 s

IP Addressing

Getting IP Parameters from a DHCP Server

The device operates in DHCP mode by default. When the device is connected to a DHCP server, it takes about 50 seconds to obtain an IP address. After the IP address is assigned, the NS LED blinks green. If the DHCP server does not respond within the specified time, the device switches to the fallback IP address. In this case, the NS LED turns off.

Implementation of Stored IP Parameters

The LTMT main unit can be configured to apply IP settings that are pre-configured and stored on the device itself. These stored IP parameters can be configured using your preferred configuration tool.

The LTMT main unit uses:

- IP address: as the Ethernet address setting parameter
- Subnet mask: as the Ethernet subnet mask setting parameter
- Gateway address: as the Ethernet gateway address setting parameter

If these parameters are not pre-configured, the LTMT main unit cannot apply the stored settings and will instead use the default IP parameters, as described below.

Configuration of Default IP Parameters from the MAC Address

The LTMT main unit derives the default IP parameters from the MAC address (stored in the device Ethernet MAC address parameter). The MAC address is a unique identifier associated with the device Network Interface Card (NIC).

After a factory reset, if DHCP is unable to obtain an IP address from the DHCP server, the device will use a default IP address in the format 169.254.xx.yy (subnet mask 255.255.0.0) with a gateway of 0.0.0.0, where xx.yy are the last two bytes of the Media Access Control (MAC) address.

For example, for a hexadecimal MAC address 00-00-54-EF-10-01, the last two bytes are 0x10 and 0x01. The last two digits are translated to hexadecimal values. So the default IP address is 169.254.01.01.

IP Assignment and NS LED

During the IP address assignment process, while the LTMT main unit is operating normally, the NS LED may indicate the following conditions:

LED name	Status (Color indication)	Description
NS	Off	Device is either not powered on, does not have an IP address, or is using a fallback IP address
	Steady green on	Device is connected and an I/O connection is established
	Flashing green	IP address is assigned, but no I/O connections are established
	Flashing red	Communication lost or connection timed out
	Flashing green or red once	Device is performing a self-test during power-up for 1 second only

DPWS

The Devices Profile for Web Services (DPWS) is a device discovery feature used to identify the existing IP address of the TeSys Tera system. The TeSys Tera system must be connected to the network to identify the device IP address. The TeSys Tera system enables the DPWS feature by default.

The user must connect the PC to the TeSys Tera system and open the network option on the PC when the TeSys Tera system is connected to the network. The TeSys Tera system will be detected over the network and given its assigned name once it is connected.

Configure the network device name in the **User Application Name** option for the EtherNet/IP protocol and in the **Name Tag** option for the Modbus TCP/IP protocol. This ensures the name appears in the network device list. You can also disable the DPWS feature.

NOTE:

- The device must be on the same network to be discovered.
- The device name must be 10 characters length.
- Verify that the link is detected and the TeSys Tera system is connected to the network.
- To enable DPWS functionality, make sure the firewall is disabled. If the firewall is active, DPWS communication may be blocked. Enable Windows network discovery if DPWS communication is blocked.

Ethernet Diagnostics

Overview

The LTMT main unit reports diagnostic data describing its Ethernet network communications interface, including:

- Data parameters that describe the LTMT main units:
  - IP addressing settings
  - IP address assignment processes
  - Virtual connections
  - Communication history
  - Communication services and their status
- One parameter that describes the validity of the data in each data parameter.

NOTE:

- It is recommended to read the diagnostics registers every second.
- The response to the first request contains either all zeros or old data. The response to the second and subsequent requests contains current network port diagnostic data.

For more information, refer to Ethernet Diagnostic Data, page 190.

Ethernet Basic Diagnostic Validity

The Ethernet basic diagnostic validity parameter evaluates and reports the validity of Ethernet network diagnostic data. A bit in this parameter represents the state of an associated Ethernet network data parameter.

Bit values are:

Value	Indicates the Parameter Data is...
0	Invalid
1	Valid

The Ethernet basic diagnostic validity parameter is 32 bits long.

The bits of this parameter represent the validity of the following Ethernet data parameters:

Bit	Describes the Validity of Data in this Parameter...
0	IP address assignment mode
1	Ethernet device name
2	Ethernet MB messages received counter
3	Ethernet MB messages sent counter
4	Ethernet MB detected error messages sent counter
5	Ethernet opened servers counter
6	Ethernet opened clients counter
7	Ethernet transmitted correct frames counter
8	Ethernet received correct frames counter
9	Ethernet frame format
10	Ethernet MAC address
11	Ethernet gateway
12	Ethernet subnet mask
13	EtherNet/IP address
14	Ethernet service status
15	Not applicable - always 0
16	Ethernet services
17	Ethernet global status
18-31	Reserved - always 0

Ethernet Global Status

The Ethernet global status parameter indicates the status of the Modbus port 502 messaging (Modbus TCP/IP only) services. The parameter is two bits long.

Parameter values are:

Bit	Indicates...
0	At least one enabled service is operating with an unresolved detected error
1	All enabled services are operating properly

The Ethernet global status is cleared on power cycle and LTMT main unit reset.

Ethernet Services Validity

The Ethernet service validity parameter indicates whether the LTMT main unit supports the port 502 messaging service.

NOTE: The port 502 is exclusively reserved for Modbus messages.

The Ethernet supported services parameter is one bit long.

The parameter values are:

Value	Indicates the Port 502 Messaging Service is...
0	Not supported
1	Supported

Ethernet Services Status

The Ethernet services status parameter indicates the status of the Ethernet supported services parameter. It is the status of the LTMT main units port 502 messaging service.

This parameter is three bits long.

The parameter values are:

Value	Indicates the Port 502 Messaging Service is...
1	Idle
2	Operational

The Ethernet services status is cleared on power cycle and LTMT main unit reset.

Ethernet Address

The Ethernet address parameter describes the IP address that has been assigned to the LTMT main unit by the IP address assignment process.

The Ethernet address consists of 4 byte values, in dot-decimal notation. Each byte value is an integer of 255.

Ethernet Subnet Mask

The Ethernet subnet mask parameter is applied to the Ethernet address value to define the host address of the LTMT main unit.

The Ethernet subnet mask consists of four byte values, in dot-decimal notation. Each byte value is an integer of 255.

Ethernet Gateway Address

The Ethernet gateway address parameter describes the address of the default gateway, that is, the node that serves as an access point to other networks for communications from or to the LTMT main unit.

The Ethernet gateway address consists of four byte values, in dot-decimal notation. Each byte value is an integer from of 255.

Ethernet MAC Address

The Ethernet MAC address parameter describes the media access control (MAC) address, or hardware identifier, uniquely assigned to an LTMT main unit.

The Ethernet MAC address consists of six hexadecimal byte values, from 0x00-0xFF.

Ethernet Modbus Messages Sent Counter

The Ethernet Modbus messages sent counter parameter contains the total number of Modbus messages, excluding Modbus error messages, that have been sent by this LTMT main unit.

This parameter is an UDINT parameter. It is cleared on power cycle and LTMT main unit reset.

For more information on the total transmitted messages, refer to Modbus TCP Global Diagnostics, page 192.

Ethernet Modbus Messages Received Counter

The Ethernet MB messages received counter parameter contains the total number of Modbus messages that have been received by this LTMT main unit.

This parameter is an UDINT parameter. It is cleared on power cycle and LTMT main unit reset.

For more information on the total received messages, refer to Modbus TCP Global Diagnostics, page 192.

Number of Device Connected through Ethernet Modbus

The Ethernet device name parameter contains the 16 character string used to identify the LTMT main unit. The parameter is 16 bytes long.

For more information on the open TCP connection, refer to Modbus TCP Global Diagnostics, page 192.

Implementation of Modbus TCP/IP Communication Protocol

What's in This Chapter

Overview

This section describes the Ethernet services and related configuration parameters supported by EtherNet/IP and Modbus TCP/IP protocols.

NOTE: The changes in protocol for any Ethernet service take effect only after the LTMT main unit is power-cycled.

⚠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 emergency 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. For additional information, refer to NEMA ICS 1.1 (latest edition), Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control.
- Each implementation of the 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.

⚠WARNING

UNEXPECTED MOTOR RESTART

Ensure that the PLC application software handles:

- Forced start command.
- Mode change from local to remote.
- Motor control commands during transition from local to remote.
- Multiple Modbus client with undefined control management.

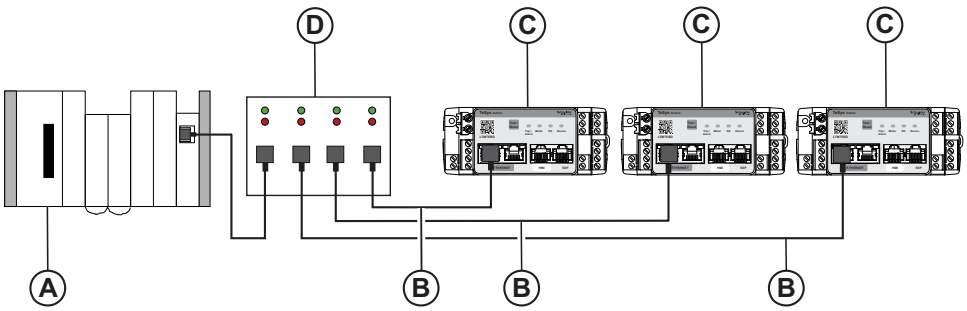
Failure to follow these instructions can result in death, serious injury, or equipment damage.

When switching to the network control channels, depending on the communication protocol configuration, the LTMT main unit may take into account the latest known state of the motor control commands issued from the PLC and automatically restart the motor.

Modbus TCP/IP Protocol Principle

Overview

The Modbus TCP/IP protocol is a client or server protocol.



A Client (PLC, PC, or communication module)

B Shielded category five straight-through twisted-pair Ethernet cable with RJ45 connector

C Server (LTMT main unit)

D Ethernet switch

The client manages and initiates the exchange. It interrogates each of the servers in succession. No server can send a message unless it is invited to do so.

The client repeats the request if an incorrect exchange occurs and declares the interrogated server unavailable if no response is received within a specified time period.

If a server does not understand a message, it does nothing. It sends an exception response to the client when a message is understood however contains errors, or when the server is unable to handle the request (for example, due to resource problems). The client may or may not retransmit the request.

NOTE: For further details on Modbus function codes, visit the website https://www.modbus.org/modbus-specifications.

Modbus TCP/IP Messaging

Modbus TCP/IP is the Modbus protocol encapsulated in TCP. The Modbus TCP/IP communication protocol combines the:

- Modbus application layer protocol (layer 7 of OSI model), which provides the messaging structure for organizing and interpreting data.
- TCP transport layer protocol (layer 4 of the TCP/IP stack), which provides a transmission medium for communications between devices on an Ethernet network.

The TCP frame, with embedded Modbus data, is sent via TCP to system port 502, which is exclusively reserved for Modbus applications, and added to a TCP/IP Ethernet data packet for network transmission.

Virtual Connections

Although there can be either one or two physical connections between a client and a server depending upon the network topology, Modbus TCP/IP supports the use of multiple virtual connections.

A virtual connection or socket combines:

- Client IP address (for example, the Modbus TCP/IP client)

- Unique port on the server
- Server IP address (the LTMT main unit server)
- Unique port on the client
- TCP protocol

Modbus TCP/IP supports the following client or server transactions:

Transaction Type	Limits on the Number of Simultaneous Virtual Connections
Modbus	Eight connection maximum • Modbus TCP/IP supports up to eight simultaneous connections. **NOTE:** A new connection is not allowed if already eight connections exist.

Modbus Requests

⚠WARNING

UNINTENDED EQUIPMENT OPERATION

- Use of this device on a Modbus network that uses the broadcast function should be considered with caution.
- This device has a large number of registers that must not be modified during normal operation. Unintended writing of these registers by the broadcast function may cause unexpected and unwanted product operation.

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

There are two Ethernet network ports available for Ethernet messaging. The LTMT main unit supports the following Ethernet requests, which can be performed using the physical ports and Unit ID/Server address combinations described below:

Function Code/ Subcode	Request Description	Network Port Modbus/ TCP
3	Read N output words (multiple registers)	Unit ID = 255
6	Write one output word (single register)	Unit ID = 255
16	Write N output words (multiple registers)	Unit ID = 255
23	Read/write multiple registers	Unit ID = 255
43	Read identification (identification register)	Reserved

The maximum number of registers per request is limited to 125. For more details on Modbus function codes, visit the website https://www.modbus.org/modbus-specifications.

NOTE: The use of an incorrect combination of Modbus TCP port configuration and Unit ID/Server address will cause the LTMT main unit to return a Modbus exception response.

Modbus Exception Management

Overview

The LTMT main unit generally follows the Modbus requirements for the exception management.

LTMT main unit has the following special cases for the exception management:

- Bit-Field Registers
- Exception Code 01 - Illegal Data Function Code
- Exception Code 02 - Illegal Data Address
- Exception Code 03 - Illegal Data Value

Bit-Field Registers

Some registers in the register map are bit field. Based on the LTMT main unit state, some bits in those registers shall not be writable. In this case, the LTMT main unit shall reject the write access to those bits and no exception shall be returned.

For example, bits that can be written only in configuration mode will be ignored (no exception returned) if the LTMT main unit is out of the configuration mode.

Exception Code 01 - Illegal Data Function Code

The function code received in the request is not an authorized action for the server. The server may be in the wrong state to process a special request.

Exception Code 02 - Illegal Data Address

The data address received by the server is not an authorized address for the server.

Exception Code 03 - Illegal Data Value

The value in the request data field is not an authorized value for the server.

I/O Scanning Configuration

Mirroring Registers

The LTMT main unit provides a block of nine continuous registers dedicated to scanning that mirror the values and functionality of selected mirroring registers.

The LTMT main unit reads the values of all mirroring registers whenever it detects a change to any single mirroring register.

Because the mirroring registers are continuous, it is possible to execute a single Modbus block read or block write request to these registers. Thereby saving the time it would take to make separate Modbus read or write requests directly to each underlying mirroring register.

Mirroring Status

Mirroring status is the first register in the sequence of eight continuous mirroring registers.

- Bits 0-2 of this register describe the status of read-only commands
- Bits 8-10 describe the status of read or write commands

Configuring I/O Scanning

The configuration of I/O register scanning depends on the following factors:

- Register type
- I/O scanning period
- I/O scanning health timeout period

The total number of registers accessed (read and write) in I/O scan (counting the repeated registers also) should not exceed 500 registers per second. This limit should be calculated with all the combinations of request and also take into account multiple connections. If there are multiple connections to the LTMT main unit, the I/O scanning and I/O scanning health timeout settings for read and write transactions for registers are reduced. Any settings for I/O scan period or I/O scan health timeout, lower than described below, can cause the LTMT main unit to send Modbus exception packets.

For higher performance, it is recommended to use the mirror registers when possible. Using the mirror registers decreases the load on LTMT main unit as the registers are managed more efficiently in the mirror registers. For example:

- Instead of register 457 use mirroring register 2504
- Instead of register 704 use mirroring register 2507

I/O scanning is used for fast monitoring and control. The setting of parameters and diagnostics must be performed using acyclic requests.

NOTE: The cyclic writes to registers can overwrite values or commands sent through acyclic communication.

The following table describes the I/O scanning and I/O scanning health timeout settings, for read and write transactions for registers of varying types with only one connection on the LTMT main unit:

Transaction	Register Type	I/O Scan Period (Minimum)	I/O Scan Health Timeout (Minimum)
Standard register read/write	Any standard register except Mirror register	200 ms	600 ms
Fast read only	Monitoring Registers: 2500 to 2505 address range	5 ms	100 ms
Fast read or write	Mirror Registers: • 2500 to 2505 address range: read • 2506 to 2508 address range: write	50 ms	200 ms

NOTE: All the connections and I/O scanning lines should not exceed limit of 500 registers per second for one LTMT main unit. Each PLC has its own data connection limits and register per second limit. I/O scanning table should be built considering the LTMT main unit performance as well as the PLC and network constraints.

Implementation of EtherNet/IP Communication Protocol

What's in This Chapter

EtherNet/IP Protocol Principles

Overview

This section describes how to use the LTMT main unit over an EtherNet/IP communication protocol network.

⚠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 emergency 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. For additional information, refer to NEMA ICS 1.1 (latest edition), Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control.
- Each implementation of the 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.

⚠WARNING

UNEXPECTED MOTOR RESTART

Ensure that the PLC application software handles:

- Forced start command.
- Mode change from local to remote.
- Motor control commands during transition from local to remote.
- Multiple Modbus client with undefined control management.

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

When you switch to the network control channels, the LTMT main unit checks the communication protocol configuration. It then uses the latest known motor control commands from the PLC to automatically restart the motor.

EtherNet/IP is an application layer protocol treating devices on the network as a series of objects. It is an implementation of the Common Industrial Protocol (CIP) over TCP/IP.

The network carries control data and the properties of the device being controlled. It enables you to operate either in a client/server or a peer-to-peer mode.

The messages can be exchanged through:

- I/O messaging: dedicated to exchanges of process data. It is also called as class one messaging or implicit messaging.
- Explicit messaging: dedicated to exchanges such as configuration, settings, or diagnostics data. It is also called as class three messaging.

Connections and Data Exchange

I/O Messaging

The I/O messages contain application-specific data. They are communicated across single or multicast connections between an application producer and its corresponding consuming application. Because I/O messages carry time-critical messages, they have high-priority identifiers.

An I/O message includes a connection ID and the associated I/O data. The connection ID defines the meaning of the data. Both connection endpoints understand how to use the I/O message.

Connection ID

The connection ID identifies a transmission linked to a specific connection between producers and consumers. It also defines a specific piece of application data.

I/O Message Types

EtherNet/IP devices produce cyclic I/O messages as part of their configuration. It produce data at precisely defined intervals. This type of I/O messaging lets you configure the system to send data at a rate that suits the application. Depending on the application, this approach reduces network traffic and uses available bandwidth more efficiently. The system defines the following connections:

ID	Name	Output Assembly	Output Assembly Size	Input Assembly	Input Assembly Size
1	Tera Profile	Instance 107	4	Instance 117	40
2	Tera Basic Overload	Instance 2	1	Instance 50	1
3	Tera Extended Overload	Instance 2	1	Instance 51	1
4	Tera Basic Motor Starter	Instance 3	1	Instance 52	1
5	Tera Extended Contactor	Instance 4	1	Instance 53	1
6	Tera Extended Motor Starter 1	Instance 4	1	Instance 54	1
7	Tera Extended Motor Starter 2	Instance 5	1	Instance 54	1
8	Tera Control and Monitoring	Instance 100	6	Instance 110	8
9	Tera PKW	Instance 101	8	Instance 111	8
10	Tera PKW and Extended Motor Starter	Instance 102	10	Instance 112	10
11	Tera PKW and Management	Instance 103	14	Instance 113	16
12	Tera E_TeSys Tera Fast Access	Instance 105	6	Instance 115	12
13	Tera EIOS_ TeSys Tera	Instance 106	10	Instance 116	128

For more information on defined assembly objects, refer to Assembly Object, page 58 section.

Explicit Messaging

The explicit messaging connections create multipurpose, point-to-point communication paths between two devices. You use explicit messages to command specific tasks and report the results. You also use them to configure nodes and diagnose problems. These messages are used to:

- Command specific tasks and report results
- Configure nodes
- Diagnose problems

Explicit messages are intended for non-time-critical communication, such as configuration, diagnostics, and parameter setting. The characteristics of explicit messaging is listed below.

- Request/Response model
- Message includes function codes and addresses
- Typically slower and less frequent than implicit messaging

Example: You can use explicit messaging to read a device's firmware version or to write a configuration parameter.

Implicit Messaging

Implicit messaging is used for time-critical data exchange. It provides high-priority communication for deterministic performance in real-time applications.

Data is transmitted cyclically at predefined intervals, ensuring timely updates. Unlike explicit messaging, implicit messaging uses Connection IDs instead of explicit addressing.

RPI Parameter

The Request Packet Interval (RPI) specifies how frequently a remote device sends data. In a star topology or in larger networks, the TeSys Tera system supports an RPI ranges from 8ms to 3200 ms.

Device Profiles and EDS Files

Device Profiles

The EtherNet/IP device model defines physical connections and promote interoperability among standard devices.

The devices that implement the same device model support common identity and communication status data. The device-specific data appears in device profiles defined for various device types. A device profile typically defines the following:

- Object model
- I/O data format
- Configurable parameters

The above information is made available to other vendors through the device Electronic Data Sheet (EDS).

To view a full description of the objects in the LTMT main unit device profile, refer to Object Dictionary, page 56.

EDS

An EDS is a standardized ASCII file that describes a network device communication functions and the contents of its object dictionary, as defined by ODVA (Open DeviceNet Vendors Association). The EDS also defines device-specific and manufacturer-specific objects.

You use an EDS with standardized tools to:

- Configure EtherNet/IP devices.
- Design networks for EtherNet/IP devices.
- Manage project information across platforms.

The parameters of a device depend on the objects that reside on it. These objects include parameter, application, and communication objects.

LTMT Main Unit EDS Files

You can download the EDS files and associated icons that describe the LTMT main units configurations from the Schneider Electric website.

To access the files, go to **Products and Services** > **Automation and Control** > **Product offers** > **Motor Control** > TeSys Tera > **Downloads** > **Software/ Firmware** > **EDS&GSD**

The EDS files and icons are grouped in a single compressed zip file. To use them, unzip the file to one directory on your hard disk.

Selection Criteria for LTMT Main Unit Variants

You can choose from two EDS files, each corresponding to a different configuration of the TeSys Tera Motor Management System:

Choose...	When You Want to Use...
LTMTEFM.eds	TeSys Tera system with AC power supply
LTMTEBD.eds	TeSys Tera system with DC power supply

Object Dictionary

Overview

The EtherNet/IP protocol uses object modeling to organize related data and procedures into entities called object. An object is a logical grouping of attributes and services:

- Attributes represent the characteristics of an object. These are values that may indicate status or control the objects behavior. The value of an attribute can influence how the object operates, not all attributes affect behavior.
- Services are the procedures or actions that an object can perform.

An objects behavior defines how it responds to specific events or conditions.

Objects are grouped into classes, and each object instance is a unique representation of an object within a class. While all instances in a class share the same set of attributes, each instance maintains its own attribute values. These unique values distinguish one instance from another.

The object dictionary defines the attribute values for each object in the device profile, providing a standardized reference for implementation and integration.

LTMT Main Unit Object Dictionary

The general structure of the Ethernet brick object dictionary in the LTMT main unit follows the same format used across all EtherNet/IP devices.

Class Code	Object	Description
0x01	Identity object	Identifiers, such as device type, vendor ID, and serial number.
0x04	Assembly object	Provides collection of other objects attributes (frequently used for I/O messaging).
0x06	Connection manager object	Provides for and manages the run-time exchange of messages.
0x48	QoS object	Manages the traffic streams with different relative priorities or other delivery characteristics.
0xF5	TCP/IP object	Provides description of an opened explicit connection and associated communicator.
0xF6	Ethernet link object	Manages the functionality of the physical attachment to the Ethernet network.
0x29	Control supervisor object	Manages controller functions, operational states, and control.
0x2C	Overload object	Implements overload behavior.
0xC5	Periodically Kept Acyclic Words (PKW) object	Enables cyclic I/O messaging for manufacturer-specific registers.
0xC6	TeSys Tera monitoring control object	Used to select monitoring data available on Assembly 110.
0x300	Stack diagnostic object	Provides information about the EIP stack.
0x302	Adapter diagnostic object	Provides diagnostic information about all the target I/O connections to the EIP stack.
0x303	Explicit messages diagnostic object	Provides a description of an opened Explicit Connection and associated communication.
0x304	Explicit message diagnostic list object	Provides a snapshot of the list of instantiated explicit connection diagnostic objects.
0x109	Link Layer Discovery Protocol (LLDP) management object	Contains administrative information for the LLDP protocol.
0x10A	LLDP data table object	Displays a record of all adjacent LLDP implementing devices that are currently active according to the receive state machine of the LLDP protocol.

These objects are described in detail in the following pages.

Identity Object

Description

The identity object, included in all EtherNet/IP devices, provides identification and general information about the device.

Class Code

The Identity object class code is 0x01 as defined by CIP.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The Identity Objects implementation revision. Returns 0x01.
0x02	Maximum Instance	R	The largest instance number. Returns 0x01.
0x03	Number of Instances	R	The number of object instances. Returns 0x01.

Class Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all class attributes.
0x0E	Get Attribute Single	Returns the value of the specified attribute.

Instance Codes

Only one instance is implemented: Instance 1.

Instance Attributes

Attribute ID	Name	Access	Description
0x01	Vendor ID	R	Vendor ID (243: Schneider Electric)
0x02	Device Type	R	Motor starter profile (22)
0x03	Device Code	R	TeSys Tera EtherNet/IP code: • 13313 (0x3401): LTMTEFM • 13314 (0x3402): LTMTEBD
0x04	Identity Revision	R	Product version. product communication version
0x05	Identity Status	R	Current status of the device

Attribute ID	Name	Access	Description
0x06	Device Serial Number	R	Based on device entity and MAC: • 0x20: Byte 0 (Entity ID for TeSys Tera) • Bytes 1-3: Last 3 bytes of MAC address
0x07	Product Name	R	Commercial reference

Instance Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all instance attributes with the access type of R.
0x05	Reset	Reboots the device (only type 0 Power Cycle is supported).
0x0E	Get Attribute Single	Returns the value of the specified identity attribute with the access type of R.

Assembly Object

Description

The Assembly Object binds attribute of multiple objects, which enables each objects data to be sent or received over a single connection. Assembly Object can be used to bind input data or output data. The terms input and output are defined from the networks point of view. An input sends (produces) data on the network, and an output receives (consumes) data from the network.

The assembly object binds attributes from multiple objects, allowing their data to be sent or received over a single connection. It can be used to group input or output data:

- Input refers to data produced and sent onto the network.
- Output refers to data consumed and received from the network.

Assembly Object supports static assemblies only.

Class Code

The Assembly Object class code is 0x04 as defined by CIP.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The revision of the Assembly Object.
0x02	Maximum Instance	R	The maximum numeric value of the instance number.
0x03	Number of Instances	R	The number of supported assembly instances.

Class Services

Service Code	Name	Description
0x0E	Get Attribute Single	Returns the value of the specified attribute.

Instance Codes

Only one active cyclic connection at a time is supported per instance.

Instance Attributes

Attribute ID	Name	Access	Description
0x03	Assembly Instance Data	RW	Instance data returned as an array of bytes. Access is Read Only for the input data assemblies and Read/Write for the output data assemblies.

Instance Services

Service Code	Name	Description
0x0E	Get Attribute Single	Returns the value of the specified attribute.
0x10	Set Attribute Single	Sets the value of the specified instance attribute.

Output Assembly Data

Instance 2: Basic Overload

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Reserved	Reserved	Reserved	Reserved	Reserved	TripReset	Reserved	Reserved

Instance 3: Basic Motor Starter

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Reserved	Reserved	Reserved	Reserved	Reserved	TripReset	Reserved	Run 1

Instance 4: Extended Contactor

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Run 2	Run 1

Instance 5: Extended Motor Starter

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Reserved	Reserved	Reserved	Reserved	Reserved	TripReset	Run 2	Run 1

NOTE: Trip Reset, Run1, and Run2 are commands in the Control register 1.

Instance 100: LTMT main unit Control Registers

This assembly contains several control registers commonly used with an LTMT main unit.

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
path: 6C : 01 : 05 (Register 704)		path: 6C : 01 : 04 (Register 703)		path: 6C : 01 : 01 (Register 700)	
Least Significant Byte (LSB)	Most Significant Byte (MSB)	LSB Reserved (value = 0)	MSB Reserved (value = 0)	LSB	MSB

Instance 101: PKW Request Object

This assembly is vendor-specific. It is used to implement the request object of PKW protocol.

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
For details, refer to PKW Objects, page 74							

Instance 102: PKW Request and Extended Motor Starter

This assembly is vendor-specific.

Bytes 0 to 7	Byte 8	Byte 9
See Instance 101 above.	Reserved (value=0)	See Instance 5 above.

Instance 103: PKW Request and LTMT main unit Control Registers

This assembly is vendor-specific.

Bytes 0 to 7	Byte 8 to 13
See Instance 101 above.	See Instance 100 above.

Instance 105: E_TeSys Tera Fast Access Output

This assembly is vendor-specific. All registers are in little endian.

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
path: 8C : 01 : 07 (Register 2506)		path: 8C : 01 : 08 (Register 2507)		path: 8C : 01 : 09 (Register 2508)	

Instance 106: EIOS_TeSys Tera Output

This assembly is vendor-specific. All registers are in little endian.

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
path: 6C : 01 : 01 (Register 700)		path: 6C : 01 : 02 Reserved (value = 0)		path: 6C : 01 : 03 Reserved (value = 0)	

Byte 6	Byte 7	Byte 8	Byte 9
path: 6C : 01 : 04 Reserved (value = 0)		path: 6C : 01 : 05 (Register 704)	

Instance 107: TeSys Tera Profile

This assembly is vendor-specific. All registers are in little endian.

Byte 0	Byte 1	Byte 2	Byte 3
path: 6C : 01 : 05 (Register 704)		path: 6C : 01 : 06 (Register 705)	path: 6C : 01 : 01 (Register 700)
LSB	MSB	LSB	-

Input Assembly Data

Instance 50: Basic Overload

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Tripped

Instance 51: Extended Overload

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Alarm	Tripped

Instance 52: Basic Motor Starter

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Reserved	Reserved	Reserved	Reserved	Reserved	Running1	Reserved	Tripped

Instance 53: Extended Motor Starter 1

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Reserved	Reserved	CntrlfromNet	Ready	Reserved	Running1	Alarm	Tripped

Instance 54: Extended Motor Starter 2

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Reserved	Reserved	CntrlfromNet	Ready	Running2	Running1	Alarm	Tripped

NOTE: The instances contain data processed from the System status register 1 and the Control register 1:

- CntrlfromNet = In remote (status bit)
- Ready = System ready (status bit)
- Running2 = Motor running (status bit) AND Motor run reverse command (control bit)
- Running1 = Motor running (status bit) AND Motor run forward command (control bit)
- Alarm = System alarm (status bit)
- Trip = System Trip (status bit) OR System Tripped (status bit)

Instance 110: LTMT Monitoring Registers (with dynamic configuration)

This assembly contains several monitoring registers commonly used with an LTMT main unit. You can choose registers by setting attributes 1...4 of Monitoring Control Object. For more information, refer to Monitoring Control Object, page 77.

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Value of register pointed to in path: C6 : 01 : 01 Register 455 at power-up		Value of register pointed to in path: C6: 01 : 02 Register 456 at power-up		Value of register pointed to in path: C6 : 01 : 03 Register 457 at power-up		Value of register pointed to in path: C6 : 01 : 04 Register 459 at power-up	
LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB

Instance 111: PKW Response Object

This assembly is vendor-specific. It is used to implement the response object of PKW protocol.

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
For details, refer to PKW Objects, page 74.							

Instance 112: PKW Response and Extended Motor Starter

This assembly is vendor-specific.

Bytes 0 to 7	Byte 8	Byte 9
See Instance 111 above.	Reserved (value=0)	See Instance 54 above.

Instance 113: PKW Response and LTMT main unit Monitoring Registers

This assembly is vendor-specific.

Bytes 0 to 7	Byte 8 to 15
See Instance 111 above.	See Instance 110 above.

Instance 115: E_TeSys Tera Fast Access Input

This assembly is vendor-specific. All registers are in little endian.

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
path: 8C : 01 : 01 (Register 2500)		path: 8C : 01 : 02 (Register 2501)		path: 8C : 01 : 03 (Register 2502)	

Byte 6	Byte 7	Byte 8	Byte 9	Byte 10	Byte 11
path: 8C : 01 : 04 (Register 2503)		path: 8C : 01 : 05 (Register 2504)		path: 8C : 01 : 06 (Register 2505)	

Instance 116: EIOS_TeSys Tera Input

This assembly is vendor specific. All registers are in little endian.

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
path: 68 : 01 : 02 (Register 451)		path: 68 : 01 : 03 (Register 452)		path: 68 : 01 : 04 (Register 453)		path: 68 : 01 : 05 (Register 454)	

Byte 8	Byte 9	Byte 10	Byte 11	Byte 12	Byte 13	Byte 14	Byte 15
path: 68 : 01 : 06 (Register 455)		path: 68 : 01 : 07 (Register 456)		path: 68 : 01 : 08 (Register 457)		path: 68 : 01 : 09 (Register 458)	

Byte 16	Byte 17	Byte 18	Byte 19	Byte 20	Byte 21	Byte 22	Byte 23
path: 68 : 01 : 0A (Register 459)		path: 68 : 01 : 0B (Register 460)		path: 68 : 01 : 0C (Register 461)		path: 68 : 01 : 0D (Register 462)	

Byte 24	Byte 25	Byte 26	Byte 27	Byte 28	Byte 29	Byte 30	Byte 31
path: 68 : 01 : 0E (Register 463)		path: 68 : 01 : 0F (Register 464)		path: 68 : 01 : 10 (Register 465)		path: 68 : 01 : 11 (Register 466)	

Byte 32	Byte 33	Byte 34	Byte 35	Byte 36	Byte 37	Byte 38	Byte 39
path: 68 : 01 : 12 (Register 467)		path: 68 : 01 : 13 (Register 468)		path: 68 : 01 : 14 (Register 469)		path: 68 : 01 : 15 (Register 470)	

Byte 40	Byte 41	Byte 42	Byte 43	Byte 44	Byte 45	Byte 46	Byte 47
path: 68 : 01 : 16 (Register 471)		path: 68 : 01 : 17 (Register 472)		path: 68 : 01 : 18 (Register 473)		path: 68 : 01 : 19 (Register 474)	

Byte 48	Byte 49	Byte 50	Byte 51	Byte 52	Byte 53	Byte 54	Byte 55
path: 68 : 01 : 1A (Register 475)		path: 68 : 01 : 1B (Register 476)		path: 68 : 01 : 1C (Register 477)		path: 68 : 01 : 1D (Register 478)	

Byte 56	Byte 57	Byte 58	Byte 59	Byte 60	Byte 61	Byte 62	Byte 63
path: 68 : 01 : 1E (Register 479)		path: 68 : 01 : 1F (Register 480)		path: 68 : 01 : 20 (Register 481)		path: 68 : 01 : 21 (Register 482)	

Byte 64	Byte 65	Byte 66	Byte 67	Byte 68	Byte 69	Byte 70	Byte 71
path: 68 : 01 : 22 (Register 483)		path: 68 : 01 : 23 (Register 484)		path: 68 : 01 : 24 (Register 485)		path: 68 : 01 : 25 (Register 486)	

Byte 72	Byte 73	Byte 74	Byte 75	Byte 76	Byte 77	Byte 78	Byte 79
path: 68 : 01 : 26 (Register 487)		path: 68 : 01 : 27 (Register 488)		path: 68 : 01 : 28 (Register 489)		path: 68 : 01 : 29 (Register 490)	

Byte 80	Byte 81	Byte 82	Byte 83	Byte 84	Byte 85	Byte 86	Byte 87
path: 68 : 01 : 2A (Register 491)		path: 68 : 01 : 2B (Register 492)		path: 68 : 01 : 2C (Register 493)		path: 68 : 01 : 2D (Register 494)	

Byte 88	Byte 89	Byte 90	Byte 91	Byte 92	Byte 93	Byte 94	Byte 95
path: 68 : 01 : 2E (Register 495)		path: 68 : 01 : 2F (Register 496)		path: 68 : 01 : 30 (Register 497)		path: 68 : 01 : 31 (Register 498)	

Byte 96	Byte 97	Byte 98	Byte 99	Byte 100	Byte 101	Byte 102	Byte 103
path: 68 : 01 : 32 (Register 499)		path: 68 : 01 : 33 (Register 500)		path: 68 : 01 : 34 (Register 501)		path: 68 : 01 : 35 (Register 502)	

Byte 104	Byte 105	Byte 106	Byte 107	Byte 108	Byte 109	Byte 110	Byte 111
path: 68 : 01 : 36 (Register 503)		path: 68 : 01 : 37 (Register 504)		path: 68 : 01 : 38 (Register 505)		path: 68 : 01 : 39 (Register 506)	

Byte 112	Byte 113	Byte 114	Byte 115	Byte 116	Byte 117	Byte 118	Byte 119
path: 68 : 01 : 3A (Register 507)		path: 68 : 01 : 3B (Register 508)		path: 68 : 01 : 3C (Register 509)		path: 68 : 01 : 3D (Register 510)	

Byte 120	Byte 121	Byte 122	Byte 123	Byte 124	Byte 125	Byte 126	Byte 127
path: 68 : 01 : 3E (Register 511)		path: 68 : 01 : 3F (Register 512)		path: 68 : 01 : 40 (Register 513)		path: 68 : 01 : 41 (Register 514)	

Instance 117: TeSys Tera Profile

This assembly is vendor specific. All registers are in little endian.

Byte 0	Byte 4	Byte 8	Byte 12	Byte 14	Byte 16	Byte 20	Byte 24
path: 72 : 01 : 01 (Register 4501)	path: 72 : 01 : 02 (Register 45503)	path: 72 : 01 : 03 (Register 45505)	path: 72 : 06 : 13 (Register 45641)	path: 72 : 06 : 12 (Register 45640)	path: 72 : 06 : 01 (Register 45626)	path: 72 : 06 : 02 (Register 45628)	path: 72 : 02 : 13 (Register 45558)

Byte 26	Byte 28	Byte 32	Byte 36
path: 72 : 02 : 02 (Register 45559)	path: 72 : 01 : 09 (Register 45515)	path: 72 : 01 : 10 (Register 45517)	path: 72 : 01 : 11 (Register 45519)

Connection Manager Object

Description

The connection manager object establishes and manages the run-time exchange of messages between devices.

Class Code

The connection manager object class code is 0x06 as defined by CIP.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The Connection Manager implementation revision. Returns 0x01.
0x02	Maximum Instance	R	The largest instance number. Returns 0x01.
0x03	Number of Instances	R	The number of object instances. Returns 0x01.

Class Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all class attributes.
0x0E	Get Attribute Single	Returns the value of the specified attribute.

Instance Codes

Only one instance is implemented: Instance 1.

Instance Attributes

Attribute ID	Name	Access	Description
0x01	Incoming Forward Open requests count	RW	Total number of incoming connection open requests.
0x02	Forward Open Format Unsuccessful count	RW	The number of Forward Open requests rejected because of the unexpected format of the Forward Open request.
0x03	Forward Open Resource Unsuccessful count	RW	The number of Forward Open requests rejected because of insufficient resources.
0x04	Forward Open Parameter Value count	RW	The number of Forward Open requests rejected because of the parameter value sent with Forward Open.
0x05	Incoming Forward Close requests count	RW	Total number of incoming connection close requests.
0x06	Forward Close Format Unsuccessful count	RW	The number of Forward Close requests that has invalid format.

Attribute ID	Name	Access	Description
0x07	Forward Close Matching Unsuccessful count	RW	The number of Forward Close requests that could not be matched to an active connection.
0x08	Timed out Connections count	RW	The number of connections that has timed out because the other side stopped producing or there was a network interruption.

Instance Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all instance attributes.
0x0E	Get Attribute Single	Returns the value of the specified instance attribute.
0x4E	Forward Close	Closes an existing connection.
0x54	Forward Open	Opens a new connection.
0x5B	Large Forward Open	Opens a new connection with maximum size buffer.

QoS Object

Description

The QoS object is used to manage the traffic streams with different relative priorities or other delivery characteristics. The standard QoS mechanisms includes IEEE 802.1D/Q (Ethernet frame priority) and differentiated services (DiffServ). The QoS Object provides a mechanism to configure certain QoS-related behaviors in EtherNet/IP device.

Class Code

The QoS Object class code is 0x48 as defined by CIP.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The QoS implementation revision. Returns 0x01.
0x02	Maximum Instance	R	The largest instance number. Returns 0x01.
0x03	Number of Instances	R	The number of object instances. Returns 0x01.

Class Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all class attributes.
0x0E	Get Attribute Single	Returns the value of the specified attribute.

Instance Codes

Only one instance is implemented: Instance 1.

Instance Attributes

Attribute ID	Name	Access	Description
0x04	Differentiated Services Code Point (DSCP) Urgent	RW	DSCP value for CIP transport class 0 or 1 is urgent priority messages
0x05	DSCP Schedule	RW	DSCP value for CIP transport class 0 or 1 is scheduled priority messages
0x06	DSCP High	RW	DSCP value for CIP transport class 0 or 1 is high priority messages
0x07	DSCP Low	RW	DSCP value for CIP transport class 0 or 1 is low priority messages
0x08	DSCP Explicit	RW	DSCP value for CIP explicit messages (transport class 2 or 3 and UCMM) and all other EtherNet/IP encapsulation messages

Instance Services

Service Code	Name	Description
0x0E	Get Attribute Single	Returns the value of the specified instance attribute.
0x10	Set Attribute Single	Sets the value of the specified instance attribute.

TCP/IP Object

Description

The TCP/IP object describes an open explicit connection and its associated communicator.

Class Code

The TCP/IP object class code is 0xF5 as defined by CIP.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The TCP/IP Object implementation revision. Returns 0x04.
0x02	Maximum Instance	R	Indicate that there is only one host IP address. Returns 0x01.
0x03	Number of Instances	R	The number of object instances. Returns 0x01.

Class Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all class attributes
0x0E	Get Attribute Single	Returns the value of the specified attribute.

Instance Codes

Only one instance is implemented: Instance 1.

Instance Attributes

Attribute ID	Name	Access	Description
0x01	Configuration Status	R	Indicates whether you configured TCP/IP object and its parameters or not.
0x02	Configuration Capability	R	Indicates whether TCP/IP object with all parameters can be configured using DHCP, and whether it can resolve the host names using the DNS server. DHCP client Hardware configurable
0x03	Configuration Control	R	Indicates the configuration of device on startup, that is, the first attempt initiated. This returns the following values: • 0: To use stored IP address. • 2: To use the DHCP attempt first.
0x04	Physical Link	R	Returns electronic path to the physical link object, which is the Ethernet link class. The first word contains the size of the EPATH in words. The path that follows specifies instance 1 of the Ethernet link object (0x20 0xF6 0x24 0x01).
0x05	Interface Configuration	R	TCP/IP DWORD contains the following parameters: • Device IP address • Subnet mask • Gateway address • Name server IP address. **NOTE:** The value of 0 indicates that the server is not configured with name server address. • Second name server IP address. **NOTE:** The value of 0 indicates that the server is not configured with name server address. • Number of ASCII characters in the domain, if applicable
0x06	Host Name	R	The first word contains the number of ASCII bytes in the device host name. The ASCII host name string follows. Returns the product name as the identity object.
0x0D	Encapsulation Inactivity Timeout	RW	Number of seconds of inactivity before TCP connection is closed.

Instance Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all instance attributes.
0x0E	Get Attribute Single	Returns the value of the specified instance attribute.
0x10	Set Attribute Single	Sets the value of the specified instance attribute.

Ethernet Link Object

Description

The Ethernet Link Object provides the characteristics for each Ethernet links of the product.

Class Code

The Ethernet Link Object class code is 0xF6 as defined by CIP.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The Ethernet Link Object implementation revision. Returns 0x04.
0x02	Maximum Instance	R	Returns 0x02 to represent two Ethernet port instances.
0x03	Number of Instances	R	The number of object instances. Returns 0x02 to represent two Ethernet port instances.

Class Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all class attributes
0x0E	Get Attribute Single	Returns the value of the specified attribute.

Instance Codes

Two instances are implemented for the Ethernet Link object. Each instance represents one of the two Ethernet ports.

Instance 1 for Port 1, and Instance 2 for Port 2.

Instance Attributes

Attribute ID	Name	Access	Description
0x01	Interface Speed	R	Interface speed in Mbps (10 or 100 Mbps).
0x02	Interface Flag	R	Returns a word, where the bits are set depending on: • Link state (active/inactive). • Negotiation state. • Link detected trips. • Full/half duplex connection type. Duplex mode is reflected in bit 1.
0x03	Physical Addess	R	MAC layer address
0x04	Interface Counters	R	Octets received on the interface
0x05	Media Counter	R	Media-specific counters
0x07	Interface Type	R	Indicates the type of interface, for example, twisted pair, fiber, internal. Returns 0x02 to indicate twisted pair.
0x08	Interface State	R	Indicates the current state of the interface, for example, operational (0x01), disabled (0x02).
0x0A	Interface Label	R	Readable identification: • Port 1 • Port 2
0x0B	Interface Capability	R	Indication of capabilities of the interface.

Instance Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all instance attributes.
0x0E	Get Attribute Single	Returns the value of the specified instance attribute.
0x10	Set Attribute Single	Sets the value of the specified instance attribute.
0x4C	Get and Clear Single	Returns the value of the specified instance attribute and clears the same

Control Supervisor Object

Description

The control supervisor object models the management functions for devices within the motor control hierarchy.

Class Code

The Control Supervisor Object class code is 0x29 as defined by CIP.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The Control Supervisor Object implementation revision. Returns 0x01.
0x02	Maximum Instance	R	Returns 0x01 to represent a single instance.
0x03	Number of Instances	R	Returns 0x01 to represent a single instance.
0x06	Maximum Class Attribute	R	The largest class attribute value. Returns 0x07.
0x07	Maximum Instance Attribute	R	The largest instance attribute value. Returns 0x14.

Class Services

Service Code	Name	Description
0x0E	Get Attribute Single	Returns the value of the specified attribute.

Instance Codes

Only one instance is implemented: Instance 1.

Instance Attributes

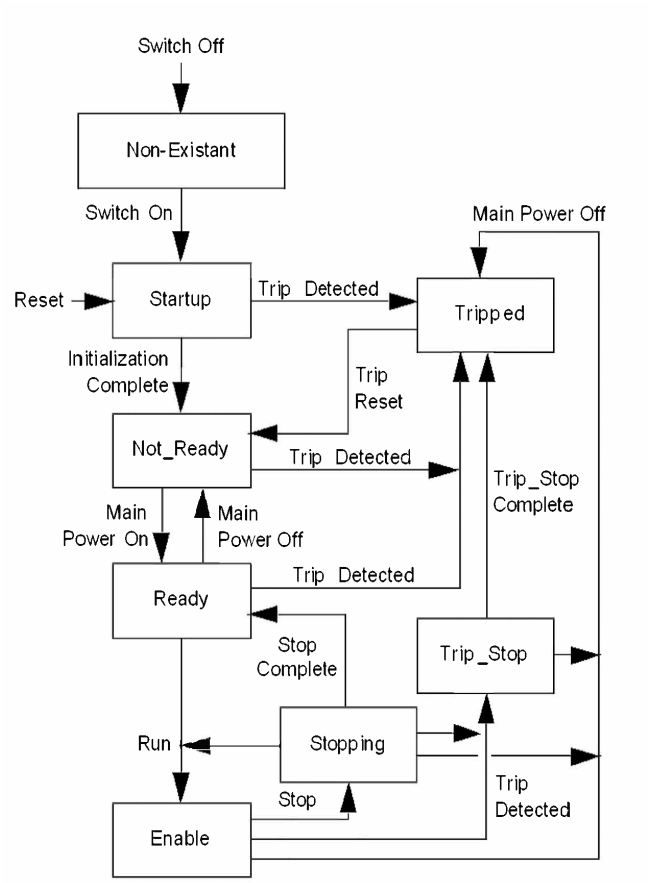
Attribute ID	Name	Access	Description
0x03	Run 1	RW	Motor run forward command
0x04	Run 2	RW	Motor run reverse command
0x06	State	R	0 = Vendor specific 1 = Startup 2 = Not ready 3 = Ready 4 = Enabled 5 = Stopping 6 = Trip stop 7 = Tripped
0x07	Running 1	R	Motor running and Motor run forward command
0x08	Running 2	R	Motor running and Motor run reverse command
0x09	Ready	R	System ready
0x0A	Tripped	R	System trip
0x0B	Alarm	R	System alarm
0x0C	Trip Reset	RW	Trip reset command
0x0D	Trip Code	R	Trip code
0x0E	Alarm Code	R	Alarm code
0x0F	Control from Network	R	0 = Control is local 1 = Control is from network

Instance Service

Service Code	Name	Description
0x05	Reset	Resets the device to the start-up state. **NOTE:** This service is not identical to Reset of the Identity object.
0x0E	Get Attribute Single	Returns the value of the specified instance attribute.
0x10	Set Attribute Single	Sets the value of the specified instance attribute.

Control Supervisor State Event

The following diagram shows the control supervisor state event matrix:



The following table describes the run or stop event matrix:

Event	State (N/A = No Action)							
	Non-exist	**Startup**	**Not_Ready**	**Ready**	**Enabled**	**Stopping**	**Trip-Stop**	**Tripped**
Switch OFF	N/A	Transition to Non-exist	Transition to Non-exist	Transition to Non-exist	Transition to Non-exist	Transition to Non-exist	Transition to Non-exist	Transition to Non-exist
Switch ON	Transi-tion to Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Initialization Complete	N/A	Transition to Not_Ready	N/A	N/A	N/A	N/A	N/A	N/A
Main Power ON	N/A	N/A	Transition to Ready	N/A	N/A	N/A	N/A	N/A
Run	N/A	N/A	N/A	Transition to Enable	N/A	Transition to Enable	N/A	N/A

Event	State (N/A = No Action)							
	Non-exist	**Startup**	**Not_Ready**	**Ready**	**Enabled**	**Stopping**	**Trip-Stop**	**Tripped**
Stop	N/A	N/A	N/A	N/A	Transition to Stopping	N/A	N/A	N/A
Stop Complete	N/A	N/A	N/A	N/A	N/A	Transition to Ready	N/A	N/A
Reset	N/A	N/A	Transition to Startup	Transition to Startup	Transition to Startup	Transition to Startup	Transition to Startup	Transition to Startup
Main Power OFF	N/A	N/A	N/A	Transition to Not Ready	Transition to Tripped	Transition to Tripped	Transition to Tripped	N/A
Trip Detected	N/A	Transition to Tripped	Transition to Tripped	Transition to Tripped	Transition to Trip_Stop	Transition to Trip_Stop	N/A	N/A
Trip_Stop Complete	N/A	N/A	N/A	N/A	N/A	N/A	Transition to Tripped	
Trip Reset	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Transition to Not_Ready

Overload Object

Description

The Overload Object models all the functions specific to an AC motor overload protection device.

Class Code

The Overload Object class code is 0x2C as defined by CIP.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The Overload Object implementation revision. Returns 0x01.
0x02	Maximum Instance	R	Returns 0x01 to represent a single instance.
0x03	Number of Instances	R	Returns 0x01 to represent a single instance.
0x06	Maximum Class Attribute	R	The largest class attribute value. Returns 0x07.
0x07	Maximum Instance Attribute	R	The largest instance attribute value. Returns 0xB2.

Class Service

Service Code	Name	Description
0x0E	Get Attribute Single	Returns the value of the specified attribute.

Instance Codes

Only one instance is implemented: Instance 1.

Instance Attributes

Attribute ID	Name	Access	Description
0x01	Attribute count	R	Returns the supported attribute count (46).
0x04	TripClass	R	Trip Class Setting (5, 10, 15, 20, 25, 30)
0x05	AvgCurrent	R	0.1 A
0x06	%PhImbal	R	% Phase imbalance
0x07	%Thermal	R	% Thermal capacity
0x08	IL1 Current	R	0.1 A
0x09	IL2 Current	R	0.1 A
0x0A	IL3 Current	R	0.1 A
0x0B	Ground Current	R	0.1 A
0x65	IL1 Current	R	0.1 A
0x66	IL2 Current	R	0.1 A
0x67	IL3 Current	R	0.1 A
0x68	Ground Current	R	0.1 A
0x69	IL1 Current Ratio	R	% of FLC
0x6A	IL2 Current Ratio	R	% of FLC
0x6B	IL3 Current Ratio	R	% of FLC
0x6C	IAV Average Current Ratio	R	% of FLC
0x6D	Thermal Capacity Level	R	% TripLevel
0x6E	Ground Current	R	0.1 A
0x6F	Current phase imbalance	R	% Imbalance
0x70	Time to trip	R	Seconds
0x71	Time to Reset	R	Seconds
0x7F	Single/Three Ph	RW	0 = Single phase 1 = Three phases
0x80	TripFLCSet	RW	% of FLA max
0x81	Trip Class	RW	Seconds
0x84	Thermal Alarm Level	RW	% Trip Level
0x86	PL Trip Delay	RW	0.1 seconds
0x88	Ground Current Trip Delay	RW	0.1...25.0 seconds
0x89	Ground Current Trip Level	RW	20...500% FLC
0x8A	Ground Current Alarm Level	RW	20...500% FLC
0x8C	Stall Trip Level	RW	100...800 % FLC
0x8E	Jam Trip Delay	RW	1...30 seconds
0x8F	Jam Trip Level	RW	100...800 % FLC
0x90	Jam Alarm Level	RW	100...800 % FLC
0x92	UL Trip Delay	RW	1...200 seconds
0x93	UL Trip Level	RW	30...100 % FLC
0x94	UL Alarm Level	RW	30...100 % FLC

Attribute ID	Name	Access	Description
0x96	CI Trip Delay	RW	0.1 seconds
0x97	CI Trip Level	RW	0...70 % Imbalance
0x98	CI Alarm Level	RW	0...70 % Imbalance
0xB2	CT Ratio	RW	–

NOTE: In the table above:

- PL = Current phase loss
- Stall = Long start
- UL = Underload
- CI = Current phase imbalance

Instance Service

Service Code	Name	Description
0x0E	Get Attribute Single	Returns the value of the specified instance attribute.
0x10	Set Attribute Single	Sets the value of the specified instance attribute.

PKW Objects

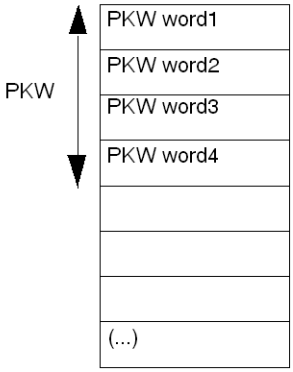
Overview

The LTMT main unit supports PKW. The PKW feature consists of:

- Four input words mapped in input assembly objects 111, 112, and 113
- Four output words mapped in output assembly objects 101, 102, and 103

These four words tables enable a EtherNet/IP scanner to read or write any register using I/O messaging.

As shown in the table below, the PKW area is located at the beginning of the corresponding assembly objects 112, 113, 102, and 103.



PKW OUT Data

PKW OUT data requests from the EtherNet/IP scanner to the LTMT main unit are mapped in assembly objects 101, 102, and 103.

To access registers, select one of the following function codes:

- R_REG_16 (0x25) to read 1 register
- R_REG_32 (0x26) to read 2 registers
- W_REG_16 (0x2A) to write 1 register
- W_REG_32 (0x2B) to write 2 registers

Word 1	**Word 2**			**Word 3**	**Word 4**
	MSB		**LSB**		
Register address	Toggle bit (bit 15)	Function bits (bits 8 - 14)	Not used (bits 0 - 7)	Data to write	
Register number	0 / 1	R_REG_16Code 0x25	0x00	–	–
		R_REG_32Code 0x26		–	–
		W_REG_16Code 0x2A		Data to write in register	–
		W_REG_32Code 0x2B		Data to write in register 1	Data to write in register 2

Any change in the function code triggers the handling of the request (unless function code [bit 8 to bit 14] = 0x00).

NOTE: The highest bit of function code (bit 15) is a toggle bit. It is changed for each consecutive request.

This mechanism enables the request initiator to detect that a response is ready by polling bit 15 of the function code in word 2. When this bit in the OUT data becomes equal to the response emitted toggle bit in the IN data (when starting the request), then the response is ready.

PKW IN Data

PKW IN data response from the LTMT main unit to the EtherNet/IP scanner are mapped in assembly objects 111, 112, and 113.

The LTMT main unit echoes the same register address and function code or, eventually, a detected error code.

Word 1	**Word 2**			**Word 3**	**Word 4**
	MSB		**LSB**		
Register address	Toggle bit (bit 15)	Function bits (bits 8 - 14)	Not used (bits 0 - 7)	Data to write	
Same register number as in the request	Same as in the request	ErrorCode 0x4E	0x00	Error code	
		R_REG_16Code 0x25		–	–
		R_REG_32Code 0x26		Data read in register	–
		W_REG_16Code 0x2A		Data read in register 1	Data read in register 2
		W_REG_32Code 0x2B		–	–

If the initiator tries to write a TeSys Tera object or register to an unauthorized value, or tries to access an inaccessible register, a detected error code is returned (Function code = toggle bit + 0x4E). The detected error code can be found in words 3 and 4. The request is not accepted and the object/register remains at the old value.

To re trigger exactly the same command, you need to:

1. Reset the function code to 0x00.
2. Wait for the response frame with the function code equal to 0x00.
3. Reset it to its previous value.

This is useful for a limited primary like an HMI.

Another way of re-triggering exactly the same command is to invert the toggle bit in the function code byte.

The response is valid when the toggle bit of the response is equal to the toggle bit written in the answer (this is a more efficient method, which requires higher programming capabilities).

PKW Detected Error Codes

Case of a detected write error:

Detected Error Code	Detected Error Name	Explanation
3	FGP_ERR_REGISTER_NOT_FOUND	Register not managed (or the request needs super user access rights)
7	FGP_ERR_INVALID_FUNCTION_OR_ADDRESS	Using an undefined PWK function code or read/write to an undefined register address.

Case of a detected read error:

Detected Error Code	Detected Error Name	Explanation
3	FGP_ERR_REGISTER_NOT_FOUND	Register not managed (or the request needs super user access rights)
7	FGP_ERR_NOT_ALL_REGISTER_FOUND	One or both registers cannot be found

Class Code

The PKW Object class code is 0xC5, vendor specific definition.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	–	The PKW Object implementation revision. Returns 0x01.
0x02	Maximum instance	–	Returns 0x01 to represent a single instance.
0x03	Number of instances	–	The number of object instances. Returns 0x01.
0x06	Maximum class attribute	–	The largest class attribute value. Returns 0x07.
0x07	Maximum instance attribute	–	The largest instance attribute value. Returns 0x02.

Class Services

Service Code	Name	Description
0x01	Get attribute all	Returns the value of all class attributes.
0x0E	Get attribute single	Returns the value of the specified attribute.

Instance Codes

Only one instance is implemented: Instance 1.

Instance Attributes

Attribute ID	Name	Access	Description
0x01	Request object	–	Array of eight bytes to represent the PKW request.
0x02	Response object	–	Array of eight bytes to represent the PKW response.

Instance Services

Service Code	Name	Description
0x0E	Get attribute single	Returns the value of the specified instance attribute.
0x10	Set attribute single	Modifies the instance attribute value with the access type of RW.

Monitoring Control Object

Description

The Monitoring Control Object allows selection of four different LTMT main unit internal data to monitor.

Class Code

The Monitoring Control Object class code is 0xC6, vendor specific definition.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The Monitoring Control Object implementation revision. Returns 0x01.
0x02	Maximum Instance	R	Returns 0x01 to represent a single instance.
0x03	Number of Instances	R	The number of object instances. Returns 0x01.
0x06	Maximum Class Attribute	R	The largest class attribute value. Returns 0x07.
0x07	Maximum Instance Attribute	R	The largest instance attribute value. Returns 0x04.

Class Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all class attributes.
0x0E	Get Attribute Single	Returns the value of the specified attribute.

Instance Codes

Only one instance is implemented: Instance 1.

Instance Attributes

Attribute ID	Name	Access	Description
0x01	Monitoring Word 0 Address	RW	UINT type to represent the address of Monitoring Word 0. At power up, it is defaulted to 455.
0x02	Monitoring Word 1 Address	RW	UINT type to represent the address of Monitoring Word 1. At power up, it is defaulted to 456.
0x03	Monitoring Word 2 Address	RW	UINT type to represent the address of Monitoring Word 2. At power up, it is defaulted to 457.
0x04	Monitoring Word 3 Address	RW	UINT type to represent the address of Monitoring Word 3. At power up, it is defaulted to 459.

Instance Services

Service Code	Name	Description
0x10	Set Attribute Single	Modifies the instance attribute value with the access type of RW.
0x0E	Get Attribute Single	Returns the value of the specified instance attribute.

Stack Diagnostic Object

Description

The Stack Diagnostic Object provides information about the EtherNet/IP stack.
The class ID can be changed with the definition OBJ_CLASS_DIAG_STACK.

Class Code

The Stack Diagnostic Object class code is 0x300, vendor specific definition.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The Stack Diagnostic Object implementation revision. Returns 0x01.
0x02	Maximum Instance	R	Returns 0x01 to indicate that there is only one instance.
0x03	Number of Instances	R	The number of object instances. Returns 0x01.

Instance Codes

Only one instance is implemented: Instance 1 for the EtherNet/IP Interface Diagnostic object.

Instance Attributes

The following instance attributes are supported:

<table>
<tr><th>Attribute ID</th><th>Name</th><th>Type</th><th>Access</th><th>Description</th></tr>
<tr><td>0x01</td><td>Stack state</td><td>WORD</td><td>R</td><td>• The table list the bit values of the stack state:<table><tr><th>Bit</th><th>Description</th><th>Value</th></tr><tr><td>Bit 15</td><td>Run or Idle</td><td>◦ 1: Run
◦ 2: Idle</td></tr><tr><td>Bit 7–10</td><td>State machine</td><td>◦ 0: Non_ Existent
◦ 1: Offline
◦ 2: Online
◦ 3: IO_ Running</td></tr></table></td></tr>
<tr><td rowspan="4">0x02</td><td>Stack Information</td><td>STRUCT</td><td rowspan="4">R</td><td>–</td></tr>
<tr><td>• Stack type</td><td>WORD</td><td>The stack types are given as follows:
• 0x0001: Adapter stack
• 0x0003: Scanner or Adapter stack</td></tr>
<tr><td>• Stack version</td><td>BYTE[4]</td><td>Example:
• Major: 3
• Minor: 0
• Build: 0
• Special: 0</td></tr>
<tr><td>• User version</td><td>BYTE[4]</td><td>Received from USER_GetVersion()</td></tr>
<tr><td>0x03</td><td>Stack Option</td><td>DWORD</td><td>R</td><td>The bit field are given as follows:
• B0: Debug
• B1: Debug stack
• B2: Debug sockets
• B3: Reserved
• B4: QoS_Support
• B5: UDP_Optmizations
• B6: Multitasks</td></tr>
</table>

Attribute ID	Name	Type	Access	Description
0x04	Stack define	STRUCT	R	–
		UINT		Number of structure (one per defined stack)
		STRUCT[]		Table of structure for each defined stack
		BYTE		Size of string name in bytes
		CHAR[]		String name of the defined stack
		UDINT		Stack value
0x05	Configuration	STRUCT	R	–
		WORD		Received CNF version from file header
		UDINT		CRC
0x06	I/O connection	STRUCT	R	–
	• Size table	WORD		Sze in byte (CIP_TARGET_IO+CIP_ORIGINATOR_IO)/ 8 in bytes
	• Table	WORD[]		Table of IO status
	• Size table	WORD		Sze in byte (CIP_TARGET_IO+CIP_ORIGINATOR_IO)/ 8 in bytes
	• Table	WORD[]		Table of IO status
0x07	Connection Information	STRUCT	R	–
	• Maximum CIP IO connections opened	UINT		Number of class 1 connections opened since the last reset
	• Current CIP IO connections	UINT		Number of class 1 connections currently opened
	• Maximum CIP explicit connections opened	UINT		Number of class 3 connections opened since the last reset
	• Current CIP explicit connections	UINT		Number of class 3 connections currently opened
	• CIP connection opening error	UINT		Increments each time a forward open is unsuccessful (originator and target)
	• CIP connection time out error	UINT		Increments when the connection is time out (originator and target)
	• Maximum EIP TCP connections opened	UINT		Number of TCP connections opened since the last reset
	• Current EIP TCP connections	UINT		Number of TCP connections currently opened
0x08	IO messaging Diag	STRUCT	RW	–
	• IO production counter	UDINT		Increments each time a class 0 or 1 message is sent
	• IO consumption counter	UDINT		Increments each time a class 0 or 1 message is received
	• IO production send errors counter	UINT		Increments each time a class 0 or 1 message is not sent
	• IO consumption receive errors counter	UINT		Increments each time a consumption is received with an error
0x09	Explicit messaging Diag	STRUCT	RW	–
	• Class 3 message send counter	UDINT		Increments each time a class 3 message is sent
	• Class 3 message receive counter	UDINT		Increments each time a class 3 message is received
	• UCMM message send counter	UDINT		Increments each time a UCMM message is not sent
	• UCMM message receive counter	UDINT		Increments each time a UCMM message is received

Attribute ID	Name	Type	Access	Description
0x10	CCO mode	WORD	RW	• 0x01: Activate access to CCO in the module • 0x00: Block access to CCO

Instance Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all class attributes.
0x0E	Get Attribute Single	Returns the value of the specified attribute.
0x10	Set Attribute Single	Modifies the instance attribute value with the access type of RW
0x4B-0x66	Internal services	Reserved

Adapter Diagnostic Object

Description

The Adapter Diagnostic Object provides diagnostic information about all the target I/O connections to the EtherNet/IP stack. The class ID can be changed with the definition OBJ_CLASS_DIAG_ADAPTER.

Class Code

The I/O Connection Diagnostic Object class code is 0x302.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The I/O Connection Diagnostic Object implementation revision. Returns 0x01.
0x02	Maximum Instance	R	Returns the maximum instance number created that varies from 0 to N (N = maximum number of CIP I/O connections = 32).
0x03	Number of Instances	R	Returns the number of instances created that varies from 0 to N (N = maximum number of CIP I/O connections = 32).

Instance Attributes

The following instance attributes are supported:

Attribute ID	Name	Type	Access	Description
0x01	Control Bits	WORD	RW	• True: Activate checking time for production and consumption • False: Inactive (default)
0x02	ST_DIAG_CNT	STRUCT	RW	–
	• wErrFrameCnt	UINT		Increment the counter each time the system is unable to send a frame due to missing resources or an inability to transmit it
	• wErrTimeOutCnt	UINT		Increment when one connection is timed out
	• wErrRefusedCnt	UINT		Increment the counter when the remote station refuses a connection.
	• dwProdCnt	UDINT		Increment at each production
	• dwConsCnt	UDINT		Increment at each consumption
	• dwProdByteCnt	UDINT		Total number of bytes produced
	• dwConsByteCnt	UDINT		Total number of bytes consumed
0x03	Input status	WORD	R	–
0x04	Output status	WORD	R	–
0x05	ST_LINK	STRUCT	R	–
	• CIP status	UINT		–
	• Extended status	UINT		–
	• Production connection ID	DWORD		Connection ID
	• Consumed connection ID	DWORD		Connection ID
	• O to T API	UDINT		API of the connection
	• T to O API	UDINT		API of the connection
	• O to T RPI	UDINT		RPI of the connection
	• T to O RPI	UDINT		RPI of the connection
	• O to T NetPar	UDINT		Network parameters
	• T to O NetPar	UDINT		Network parameters
	• OriCnxSN	UINT		Originator connection serial number
	• OriVendorId	UINT		Originator vendor ID
	• OriSN	UDINT		Originator serial number

Attribute ID	Name	Type	Access	Description
0x06	ST_SOCK_PARAM	STRUCT	R	Send
	• lpSockId	DWORD		Internal identifier
	• lpForeign	DWORD		IP of the remote station
	• wPortForeign	UINT		Port number of the remote station
	• lpLocal	DWORD		IP of the local station
	• wPortLocal	UINT		Port number of the local station
	ST_SOCK_PARAM	STRUCT		RECV
	• lpSockId	DWORD		Internal identifier
	• lpForeign	DWORD		IP of the remote station
	• wPortForeign	UINT		Port number of the remote station
	• lpLocal	DWORD		IP of the local station
	• wPortLocal	UINT		Port number of the local station
0x07	ST_PRODUCTION	STRUCT	R	–
	• bValid	WORD		• 0: Struct production data is not valid • 1: Struct production data is valid
	• dwCurrentTime	UDINT		Internal number of tick before next production
	• dwProductionTime	UDINT		Internal number of tick before between production
	• SequenceNumber	UDINT		Number of sequence in the production
	• stCheckTime	STRUCT		–
	• dwLastTime	UDINT		Internal use
	• dwMaxTime	UDINT		Maximum time between two productions
	• dwMinTime	UDINT		Minimum time between two productions
	• dwRPI	UDINT		API of the connection
	• wOverRun	UINT		Number of times when the production is too long
	• wUnderRun	UINT		Number of times when the production is too fast
	• dwCurrentTime	UDINT		Internal use

Attribute ID	Name	Type	Access	Description
0x08	ST_CONSUMPTION	STRUCT	R	–
	• bValid	WORD		• 0: Struct consumption data is not valid • 1: Struct consumption data is valid
	• dwCurrentTime	UDINT		Internal number of tick before time out
	• dwconsumptionTime	UDINT		Internal number of tick of the time out
	• SequenceNumber	UDINT		Number of sequence in the consumption
	• stCheckTime	STRUCT		–
	• dwLastTime	UDINT		Internal use
	• dwMaxTime	UDINT		Maximum time between two consumptions
	• dwMinTime	UDINT		Minimum time between two consumptions
	• dwRPI	UDINT		API of the connection
	• wOverRun	UINT		Number of times when the consumption is too long
	• wUnderRun	UINT		Number of times when the consumption is too fast
	• dwCurrentTime	UDINT		Internal use
0x09	ASM status	STRUCT	R	Status of assembly object
	• byGeneralStatus	BYTE		–
	• byReserved	BYTE		–
	• Extended Status	WORD		–

Instance Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all instance attributes(3)
0x0E	Get Attribute Single	Returns the value of the specified instance attribute
0x10	Set Attribute Single	Sets the value of the specified instance attribute
0x61	Get Output	Returns the status and values of the output Response: **Offset** / **Type** / **Description** 0 / UINT / Status 2 / USINT (0 to 509) / Output data
0x62	Get Input	Returns the status and values of the input Response: **Offset** / **Type** / **Description** 0 / UINT / Status 2 / USINT (0 to 509) / Intput data
0x63	Reset Diag Counters	Set the value of structure from ST_DIAG to to 0

(3) Get Attribute All supports attributes from 1 to 9.

Explicit Messages Diagnostic Object

Description

The Explicit Messages Diagnostic Object provides diagnostic information about all the explicit messages to the EtherNet/IP stack. The class ID can be changed with the definition OBJ_CLASS_DIAG_EM.

Class Code

The Explicit Connection Diagnostic Object class code is 0x303.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The explicit message diagnostic object implementation revision. Returns 0x01.
0x02	Maximum Instance	R	Returns the maximum instance number created that varies from 0 to N (N = maximum number of CIP explicit connections = 32).
0x03	Number of Instance	R	Returns the number of instances created that varies from 0 to N (N = maximum number of CIP explicit connections = 32).

Instance Codes

The number of instances created varies from 0 to N, where N is the maximum number of CIP explicit connections which is 32 at present.

Instance Attributes

The following instance attributes are supported:

Attribute ID	Name	Access	Description
0x01	isUsed	R	Uses explicit message
0x02	wType	R	Client (1)(4) or Server (2)(5)
0x03	bConnected	R	Connected (1) or UCMM (0)
0x04	Originator connection ID	R	O to T connection ID
0x05	Originator IP	R	–
0x06	Originator TCP Port	R	–
0x07	Target connection ID	R	T to O Connection ID
0x08	Target IP	R	–
0x09	Target TCP Port	R	–
0x10	Message Send Counter	R	Incremented each time a Class 3 CIP message is sent on the connection.
0x11	Message Receive Counter	R	Incremented each time a Class 3 CIP message is received on the connection.

(4) The explicit message is available on instance 1 to NB_DEVICE_FOR_EM.
(5) The explicit message is available on instance NB_DEVICE_FOR_EM+1to NB_TARGET_DEVICE.

Attribute ID	Name	Access	Description
0x12	Status	R	CIP status of the last explicit message response
0x13	Extended status	R	–

Instance Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all instance attributes
0x0E	Get Attribute Single	Returns the value of the specified attribute

Explicit Message Diagnostic List Object

Description

The Explicit Messages Diagnostic List Object provides diagnostic information about all the explicit messages to the EtherNet/IP stack. The class id can be changed with the definition OBJ_CLASS_DIAG_EM_LIST.

Class Code

The Explicit Connection Diagnostic List Object class code is 0x304.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The Explicit Connection Diagnostic List Object implementation revision. Returns 0x01.
0x02	Maximum Instance	R	Returns the maximum instance number created that varies from 0 to N (N = maximum number of concurrent list access supported = 2).
0x03	Number of Instance	R	Returns the number of instances created that varies from 0 to N (N = maximum number of concurrent list access supported = 2).

Instance Codes

The number of instances created varies from 0 to N, where N is the maximum number of concurrent list access supported, which are 2.

Instance Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all class attributes.
0x0E	Get Attribute Single	Returns the value of the specified attribute.
0x08	Create(6)	This service creates an instance of the Explicit Connections Diagnostic List object.
0x09	Delete(7)	This service deletes an instance of the Explicit Connections Diagnostic List object.
0x4B	Explicit Connections Diagnostic Read	This service reads the explicit connections diagnostics data from the list. For more information, refer to next section.

Explicit Connections Diagnostic Read

Request

ID	Description	Type	Value
0000	Explicit message diagnostic index	UINT	To read the index of the next explicit message diagnostic (first index value is 0).
0002	To read the number of explicit message diagnostic	UINT	Number of explicit message diagnostic that the requester wants to read. • =0: Requester has not specify a value. In this case, the service will provide the maximum possible value in accordance with the response maximum size. • <>0: Requester specifies the number of explicit message diagnostic to be returned

Response

ID	Description	Type	Value
0000	Number of explicit message diagnostic	UINT	Number of explicit message diagnostic in the response
0002+X	Explicit messaging connection diagnostic list	ARRAY of STRUCT	–
	Explicit message diagnostic index	UINT	Index in accordance to the object instance 0x303
	isUsed	UINT	Explicit message used
	wType	UINT	Client (1) or Server (2)
	bConnected	UINT	Connected (1) or UCMM (0)
	Originator connection id	UDINT	O to T connection ID
	Originator IP	UDINT	–
	Originator TCP port	UINT	–
	Target connection id	UDINT	T to O connection ID

(6) The Create service creates an instance of the explicit message diagnostic list object. During the read access the create service builds a snapshot of the explicit message diagnostic, that cannot be changed. Else the explicit message diagnostic can be changed. If the list of explicit message diagnostic is changed, the integrity of the list becomes bad.
(7) The Delete service can delete the instance of explicit message diagnostic list object.

ID	Description	Type	Value
	Target IP	UDINT	–
	Target TCP port	UINT	–
	Msg send counter	UDINT	Increments each time a class 3 CIP message is sent to the connection
	Msg receeive counter	UDINT	Increments each time a class 3 CIP message is received from the connection

Status

General Status	Extended Status	Status Name	Description
0x00	0000	Success	No explicit message diagnostic to read.
	8000	Success with bad integrity	No explicit message diagnostic to read, however the set of explicit message diagnostic has changed since the instance was created. The client must delete the instance and create a new one.
	0001	Success	Mode explicit message diagnostic to read.
	8001	Success with bad integrity	Mode explicit message diagnostic to read, however the set of explicit message diagnostic has changed since the instance was created. The client must delete the instance and create a new one.

LLDP Management Object

Description

The LLDP management object contains the administrative information for the LLDP protocol.

Class Code

The LLDP management object class code is 0x109.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The LDP management object implementation revision. Returns 0x01.
0x02	Maximum instance	R	The largest instance number. Returns 0x01.
0x03	Number of instances	R	The number of object instances. Returns 0x01.

Class Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all class attributes.
0x0E	Get Attribute Single	Returns the value of the specified attribute.

Instance Attributes

Attribute ID	Name	Access	Description
0x01	LDP Enable (LLDP enable array length, LLDP enable array)	RW	Number of bits defined in the LLDP enabled array member of the structure
0x02	msgTxInterval	RW	Interval at which LLDP frames are transmitted from the device(8)
0x03	MsgTxHold	RW	Multiplier of msgTxInterval to determine the value of the TTL TLV sent to neighboring devices(8)
0x04	LLDP Datastore	R	Indication of the retrieval methods for the LLDP database supported devices
0x05	Last Change	R	Value of sysUpTime taken the last time any entry in the local LLDP database (ignoring TTL) changed

Instance Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all class attributes.
0x0E	Get Attribute Single	Returns the value of the specified attribute.
0x10	Set Attribute Single	Sets the value of the specified instance attribute.

LLDP Data Table Object

Description

The LLDP data table object displays a record of all the adjacent LLDP implementing devices that are currently active according to the receive state machine of the LLDP protocol.

Class Code

The LLDP data table object class code is 0x10A.

(8) Interval range from 802.1AB to 2016.

Class Attributes

Attribute ID	Name	Access	Description
0x01	Revision	R	The LDP data table object implementation revision. Returns 0x01.
0x02	Maximum Instance	R	Returns 0x01 to represent a single instance.
0x03	Number of Instances	R	The number of object instances. Returns 0x01.

Class Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all class attributes.
0x0E	Get Attribute Single	Returns the value of the specified attribute.
0x11	Find Next Object Instance	Locate the next object instance, if any

Instance Attributes

Attribute ID	Name	Access	Description
0x01	Ethernet link instance number	R	Local instance number of the Ethernet link object that corresponds to the physical Ethernet port on which the LLDP frame for this instance was received, if known.
0x02	MAC address	R	Neighboring MAC address received from the CIP MAC address, chassis ID, or port ID TLV.
0x03	Interface label	R	Neighboring interface label received from the CIP Interface Label, Chassis ID, or Port ID TLV.
0x04	Time to live	R	Number of seconds the neighboring information is considered valid.
0x05	System capabilities TLV, system capabilities and enabled capabilities	R	Contain bitmaps representing the capabilities that define the primary function(s) of the neighboring system.
0x06	IPv4 management addresses: Management address count and management address	R	Contains neighboring device CIP.
0x07	CIP Identification: Vendor ID, device type, product code, major revision, minor revision and CIP serial number	R	Identification of CIP TLV of the neighboring device.
0x08	Additional Ethernet capabilities	R	TLV indicating Ethernet Preemption Support from the neighboring device.
0x09	Last change	R	Value of sysUpTime recorded the last time any attribute in this instance changed.

Instance Services

Service Code	Name	Description
0x01	Get Attribute All	Returns the value of all class attributes.
0x0E	Get Attribute Single	Returns the value of the specified attribute.

Table Formats

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

Modbus TCP/ IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default Value	Svd	Description

Designation	Description
Modbus TCP/IP Address (Register)	Register information for Modbus TCP/IP protocol: • 16-bit register address in hexadecimal. The address is the data used in the Modbus frame. • 16-bit register number in decimal. Register = Address +1. When a parameter is coded in more than one 16-bit register, the range of registers is indicated. Examples: • L1 RMS current parameter is a UINT32 parameter, coded in two 16-bit registers. Modbus TCP/IP Address (Register): 0x157C-0x157D (5501-5502) • Current imbalance is a UINT16 parameter, coded in one 16-bit register. Modbus TCP/IP Address (Register): 0x1588 (5513)
EtherNet/IP Address	Address for EtherNet/IP protocol. The address is composed of class : instance : attribute in hexadecimal. When a parameter is coded with more than one address, the range of addresses is indicated. Examples: • L1 RMS current parameter is a UINT32 parameter, coded in one address 72 : 01 : 01 • Current imbalance is a UINT16 parameter, coded in one address 72 : 01 : 06 • TT1 output 1 index is a UINT32 parameter, coded from address 87 : 03 : 06 to 87 : 03 : 07
RW	Whether the data is read only (R) or read-write (RW). • Modbus TCP/IPsupports read (R) and write (W) services. • EtherNet/IPsupports get (R) and set (W) services.
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 of this domain is **–**.
Default value	Default value for the parameter
Svd	Value saved when the power supply to the LTMT main unit 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 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, UINT32, UINT64, 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.

32-bit variables saved on two 16-bit words (e.g. consumption meters) are in big-endian format:

- The most significant word is transmitted first, then the least significant.

64-bit variables saved on four 16-bit words (e.g. dates) are in big-endian format:

- The most significant word is transmitted first, and so on.

Date and Time

The date and time in data records 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 Date and Time Settings, page 163.

Modbus Register

The address of register number n is n-1. The tables detailed in 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 table lists the command data for Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	Type	Svd	Description
0x02BC (701)	6C : 01 : 01	RW	BITMAP	N	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–0x02BF (702–704)	6C : 01 : 02 – 6C : 01 : 04	–	–	–	Reserved
0x02C0 (705)	6C : 01 : 05	RW	BITMAP	N	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: Reserved • Bit 13: Logic test command • Bit 14: Reset run hour command • Bit 15: Self-test (with trip) command
0x02C1 (706)	6C : 01 : 06	RW	BITMAP	N	Command data 2 • Bits 0–1: Reserved • Bit 2: Clear thermal capacity level command • Bits 3–4: Reserved • 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 records command • Bit 15: Clear event records command

User Map Data for Registers

The user map data are designed to optimize the access to 100 non-contiguous registers maximum in one single request. You can define several read and write areas.

The user map can be defined through:

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

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	Type	Range	Svd	Description
0x0320 (801)	6D : 01 : 01	RW	UINT16	1-9249	Y	User map address 1
0x0321 (802)	6D : 01 : 02	RW	UINT16	1-9249	Y	User map address 2
0x0322 (803)	6D : 01 : 03	RW	UINT16	1-9249	Y	User map address 3
…	…	…	…	…	…	…
0x0383 (900)	6D : 01 : 64	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.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	Type	Range	Svd	Description
0x0384 (901)	6E : 01 : 01	RW	UINT16	1-65535	N	User map value 1
0x0385 (902)	6E : 01 : 02	RW	UINT16	1-65535	N	User map value 2
0x0386 (903)	6E : 01 : 03	RW	UINT16	1-65535	N	User map value 3
…	…	…	…	…	…	…
0x03E7 (1000)	6E : 01 : 64	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.

Example

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

Modbus TCP/IP Address (Register)	EtherNet/IP Address	Modbus TCP/IP Address configured	Description
0x0320 (801)	6D : 01 : 01	0x15B5	Motor status
0x0321 (802)	6D : 01 : 02	0x15C8	Motor stop cause
0x0322 (803)	6D : 01 : 03	0x160D	Trip status MSW
0x0323 (804)	6D : 01 : 04	0x160E	Trip status LSW
0x0324 (805)	6D : 01 : 05	0x15B6	Thermal memory
0x0325 (806)	6D : 01 : 06	0x1586	Average current (0.001 A) MSW
0x0326 (807)	6D : 01 : 07	0x1587	Average current (0.001 A) LSW
0x0352 (851)	6D : 01 : 33	0x02C0	Control register 1
0x0353 (852)	6D : 01 : 34	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 registers 1 to 704) can be configured in status words. For more information on the registers, refer to chapter Status Data, page 111.

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

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	Description
0x2616–0x2625 (9751–9766)	87 : 0A : 01 – 87 : 0A : 10	RW	Bitwise status word 1 configuration
0x2626–0x2635 (9767–9782)	87 : 0A : 11 – 87 : 0A : 20	RW	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

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x2616 (9751)	87 : 0A : 01	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 0 configuration
0x2617 (9752)	87 : 0A : 02	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 1 configuration
0x2618 (9753)	87 : 0A : 03	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 2 configuration
0x2619 (9754)	87 : 0A : 04	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 3 configuration
0x261A (9755)	87 : 0A : 05	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 4 configuration
0x261B (9756)	87 : 0A : 06	RW	1	–	UINT16	• 0: None	0	Y	Bit 5 configuration

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
						• 1-704: Selectable register address from Status Data, page 111			
0x261C (9757)	87 : 0A : 07	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 6 configuration
0x261D (9758)	87 : 0A : 08	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 7 configuration
0x261E (9759)	87 : 0A : 09	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 8 configuration
0x261F (9760)	87 : 0A : 0A	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 9 configuration
0x2620 (9761)	87 : 0A : 0B	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 10 configuration
0x2621 (9762)	87 : 0A : 0C	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 11 configuration
0x2622 (9763)	87 : 0A : 0D	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 12 configuration
0x2623 (9764)	87 : 0A : 0E	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 13 configuration
0x2624 (9765)	87 : 0A : 0F	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 14 configuration
0x2625 (9766)	87 : 0A : 10	RW	1	–	UINT16	• 0: None • 1-704: Selectable register address from Status Data, page 111	0	Y	Bit 15 configuration

Custom Logic Data

The table lists the custom logic data for Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	Type	Svd	Description
0x04B0 (1201)	71 : 01 : 01	R	UINT16	N	Custom logic status register
0x04B1 (1202)	71 : 01 : 02	R	UINT16	N	Custom logic version
0x04B2 (1203)	71 : 01 : 03	R	UINT16	N	Custom logic memory space
0x04B3 (1204)	71 : 01 : 04	R	UINT16	N	Custom logic memory used
0x04B4 (1205)	71 : 01 : 05	R	UINT16	N	Custom logic temporary space
0x04B5 (1206)	71 : 01 : 06	R	UINT16	N	Custom logic non-volatile space
0x04B6 (1207)	71 : 01 : 07	-	-	-	Reserved
0x04E2 (1251)	71 : 01 : 33	R	UINT16	Y	Custom logic setting register 1
0x04E3 (1252)	71 : 01 : 34	-	-	-	Reserved
0x04F6 (1271)	71 : 01 : 47	RW	UINT16	Y	Custom logic command register 1
0x04F7 (1272)	71 : 01 : 48	–	–	–	Reserved
0x0500 (1281)	71 : 01 : 51	RW	UINT16	N	Custom logic monitoring register 1
0x0501 (1282)	71 : 01 : 52	–	–	–	Reserved
0x050B (1292)	71 : 01 : 5C	R	UINT16	N	Custom logic DO input information Bit 0: Custom logic DO1 input information Bit 1: Custom logic DO2 input information Bit 2: Custom logic DO3 input information Bit 3: Custom logic DO4 input information Bit 4: Custom logic DO5 input information Bit 5: Custom logic DO6 input information Bit 6: Custom logic DO7 input information Bit 7: Custom logic DO8 input information Bit 8: Custom logic DO9 input information Bit 9: Custom logic DO10 input information Bit 10: Custom logic DO11 input information Bit 11: Custom logic DO12 input information Bit 12: Custom logic DO13 input information Bits 13-15: Reserved
0x050C (1293)	71 : 01 : 5D	–	–	–	Reserved
0x0515 (1302)	71 : 01 : 66	RW	UINT16	Y	Custom logic general purpose register 1
0x0516 (1303)	71 : 01 : 67	RW	UINT16	Y	Custom logic general purpose register 2
0x0517 (1304)	71 : 01 : 68	RW	UINT16	Y	Custom logic general purpose register 3
…	…	…	…	…	…
0x0577 (1400)	71 : 01 : C8	RW	UINT16	Y	Custom logic general purpose register 99

Mirroring Data

The table lists the mirroring data for Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	Type	Svd	Description
0x02BC (2501)	8C : 01 : 01	R	UINT16	N	Mirror register 1: Not applicable
0x02BD (2502)	8C : 01 : 02	R	UINT16	N	Mirror register 2: Not applicable
0x02C0 (2503)	8C : 01 : 03	R	UINT16	N	System status register 1
0x02C1 (2504)	8C : 01 : 04	R	UINT16	N	System status register 2
0x02C1 (2505)	8C : 01 : 05	R	UINT16	N	Logic input status register
0x02C1 (2506)	8C : 01 : 06	R	UINT16	N	Logic output status register
0x02C1 (2507)	8C : 01 : 07	RW	UINT16	N	Permissive command register • 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
0x02C1 (2508)	8C : 01 : 08	RW	UINT16	N	Command register 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 (2509)	8C : 01 : 09	–	–	–	Reserved

Measurement and Monitoring Data

What's in This Chapter

Metering Data

The table lists the metering data for Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x157C–0x157D (5501–5502)	72 : 01 : 01	R	0.001	A	UINT32	N	L1 RMS current
0x157E–0x157F (5503–5504)	72 : 01 : 02	R	0.001	A	UINT32	N	L2 RMS current
0x1580–0x1581 (5505–5506)	72 : 01 : 03	R	0.001	A	UINT32	N	L3 RMS current
0x1582–0x1583 (5507–5508)	72 : 01 : 04	R	0.001	A	UINT32	N	Measured ground current
0x1584–0x1585 (5509–5510)	72 : 01 : 05	R	0.001	A	UINT32	N	Calculated ground current
0x1586–0x1587 (5511–5512)	72 : 01 : 06	R	0.001	A	UINT32	N	Average current
0x1588 (5513)	72 : 01 : 07	R	0.01	%	UINT16	N	Current imbalance
0x1589 (5514)	72 : 01 : 08	R	1	–	UINT16	N	Current phase sequence • 0: – • 1: L123 • 2: L132 • 3: CT wiring error
0x158A–0x158B (5515–5516)	72 : 01 : 09	R	0.1	V	UINT32	N	L1–L2 RMS voltage
0x158C–0x158D (5517–5518)	72 : 01 : 0A	R	0.1	V	UINT32	N	L2–L3 RMS voltage
0x158E–0x158F (5519–5520)	72 : 01 : 0B	R	0.1	V	UINT32	N	L3–L1 RMS voltage
0x1590–0x1591 (5521–5522)	72 : 01 : 0C	R	0.1	V	UINT32	N	Average voltage
0x1592 (5523)	72 : 01 : 0D	R	0.01	%	UINT16	N	Voltage imbalance
0x1593 (5524)	72 : 01 : 0E	R	1	–	UINT16	N	Voltage phase sequence • 0: – • 1: L123 • 2: L132
0x1594 (5525)	72 : 01 : 0F	R	0.01	Hz	UINT16	N	System frequency
0x1595 (5526)	72 : 01 : 10	R	0.01	–	UINT16	N	System power factor
0x1596–0x1597 (5527–5528)	72 : 01 : 11	R	0.001	kW	UINT32	N	Total active power
0x1598–0x1599 (5529–5530)	72 : 01 : 12	R	0.001	kvar	UINT32	N	Total reactive power
0x159A–0x159B (5531–5532)	72 : 01 : 13	R	0.001	kVA	UINT32	N	Total apparent power
0x159C–0x159F (5533–5536)	72 : 01 : 14	R	0.001	kWh	UINT64	Y	Total active energy
0x15A0–0x15A3 (5537–5540)	72 : 01 : 15	R	0.001	kvarh	UINT64	Y	Total reactive energy
0x15A4–0x15A7 (5541–5544)	72 : 01 : 16	R	0.001	kVAh	UINT64	Y	Total apparent energy
0x15A8 (5545)	72 : 01 : 17	R	1	%	UINT16	N	L1 Current THD

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x15A9 (5546)	72 : 01 : 18	R	1	%	UINT16	N	L2 Current THD
0x15AA (5547)	72 : 01 : 19	R	1	%	UINT16	N	L3 Current THD
0x15AB (5548)	72 : 01 : 1A	R	1	%	UINT16	N	L1 Voltage THD
0x15AC (5549)	72 : 01 : 1B	R	1	%	UINT16	N	L2 Voltage THD
0x15AD (5550)	72 : 01 : 1C	R	1	%	UINT16	N	L3 Voltage THD
0x15AE (5551)	72 : 01 : 1D	R	0.1	°C	UINT16	N	Temperature measured by PT100 sensor
0x15AF (5552)	72 : 01 : 1E	R	1	Ω	UINT16	N	Temperature measured by binary PTC sensor
0x15B0–0x15B4 (5553–5557)	72 : 01 : 1F – 72 : 01 : 21	–	–	–	–	–	Reserved

Motor Data

The table lists the motor data for Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x15B5 (5558)	72 : 02 : 01	R	1	–	UINT16	N	Motor status • 1: Stop • 2: Start • 4: Run
0x15B6 (5559)	72 : 02 : 02	R	1	%	UINT16	Y	Thermal memory
0x15B7–0x15B8 (5560–5561)	72 : 02 : 03	R	1	s	UINT32	N	Thermal time to trip
0x15B9–0x15BA (5562–5563)	72 : 02 : 04	R	1	s	UINT32	N	Thermal time to cool
0x15BB (5564)	72 : 02 : 05	R	1	–	UINT16	Y	Max starts counter/Max starts per hour counter
0x15BC–0x15BD (5565–5566)	72 : 02 : 06	R	1	s	UINT32	Y	Max start time/Max start inhibit time
0x15BE–0x15BF (5567–5568)	72 : 02 : 07	R	0.001	A	UINT32	N	Motor starting peak current
0x15C0–0x15C1 (5569–5570)	72 : 02 : 08	R	0.001	s	UINT32	N	Motor starting time
0x15C2–0x15C3 (5571–5572)	72 : 02 : 09	R	1	min	UINT32	Y	Total run hour
0x15C4–0x15C5 (5573–5574)	72 : 02 : 0A	R	1	min	UINT32	Y	Last run hour
0x15C6 (5575)	72 : 02 : 0B	R	1	–	UINT16	Y	Number of starts
0x15C7 (5576)	72 : 02 : 0C	R	1	–	UINT16	Y	Number of stops

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x15C8 (5577)	72 : 02 : 0D	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: No current • 8: Forced stop • 9: Direction change • 10: No feedback • 11: Speed change • 12: Custom stop • 13: Mode transfer • 14: Internal Controller Malfunction (ICM) • 15: No voltage
0x15C9 (5578)	72 : 02 : 0E	R	1	–	UINT16	Y	Trip counter

Last Motor Start Time Stamp

The table lists the last motor start time stamp data for Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x15CA (5579)	72 : 03 : 01	R	1	0	UINT16	Y	Day
0x15CB (5580)	72 : 03 : 02	R	1	0	UINT16	Y	Month
0x15CC (5581)	72 : 03 : 03	R	1	0	UINT16	Y	Year
0x15CD (5582)	72 : 03 : 04	R	1	h	UINT16	Y	Hour
0x15CE (5583)	72 : 03 : 05	R	1	min	UINT16	Y	Minute
0x15CF (5584)	72 : 03 : 06	R	1	s	UINT16	Y	Second
0x15D0 (5585)	72 : 03 : 07	–	–	–	–	–	Reserved

Analog Module Data

The table lists the analog module data for Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x15D1 (5586)	72 : 04 : 01	R	0.1	mA	INT16	N	Analog input 1
0x15D2 (5587)	72 : 04 : 02	R	0.1	mA	INT16	N	Analog input 2
0x15D3 (5588)	72 : 04 : 03	R	0.1	mA	INT16	N	Analog input 3
0x15D4 (5589)	72 : 04 : 04	R	0.1	mA	INT16	N	Analog input 4
0x15D5–0x15D8 (5590–5593)	72 : 04 : 05 – 72 : 04 : 08	–	–	–	–	–	Reserved
0x15D9 (5594)	72 : 04 : 09	R	0.1	mA	INT16	N	Analog output 1
0x15DA (5595)	72 : 04 : 0A	R	0.1	mA	INT16	N	Analog output 2
0x15DB–0x15DC (5596–5597)	72 : 04 : 0B – 72 : 04 : 0C	–	–	–	–	–	Reserved

Statistic Data

The table lists the statistic data for Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x1676 (5751)	72 : 07 : 01	R	1	ms	UINT16	N	Timer 1 - Actual value
0x1677 (5752)	72 : 07 : 02	R	1	ms	UINT16	N	Timer 2 - Actual value
0x1678 (5753)	72 : 07 : 03	R	1	ms	UINT16	N	Timer 3 - Actual value
0x1679 (5754)	72 : 07 : 04	R	1	ms	UINT16	N	Timer 4 - Actual value
0x167A (5755)	72 : 07 : 05	R	1	–	UINT16	N	Counter 1 - Actual value
0x167B (5756)	72 : 07 : 06	R	1	–	UINT16	N	Counter 2 - Actual value
0x167C (5757)	72 : 07 : 07	R	1	–	UINT16	N	Counter 3 - Actual value
0x167D (5758)	72 : 07 : 08	R	1	–	UINT16	N	Counter 4 - Actual value
0x167E (5759)	72 : 07 : 09	R	1	–	UINT16	N	Thermal overload trip counter
0x167F (5760)	72 : 07 : 0A	R	1	–	UINT16	N	Stalled rotor trip counter

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x1680 (5761)	72 : 07 : 0B	R	1	–	UINT16	N	Locked rotor trip counter
0x1681 (5762)	72 : 07 : 0C	R	1	–	UINT16	N	Definite time overcurrent trip counter
0x1682 (5763)	72 : 07 : 0D	R	1	–	UINT16	N	Normal inverse overcurrent trip counter
0x1683 (5764)	72 : 07 : 0E	R	1	–	UINT16	N	Short time overcurrent trip counter
0x1684 (5765)	72 : 07 : 0F	R	1	–	UINT16	N	Calculated ground trip counter
0x1685 (5766)	72 : 07 : 10	R	1	–	UINT16	N	Measured ground trip counter
0x1686 (5767)	72 : 07 : 11	R	1	–	UINT16	N	Phase under current trip counter
0x1687 (5768)	72 : 07 : 12	R	1	–	UINT16	N	Current imbalance trip counter
0x1688 (5769)	72 : 07 : 13	R	1	–	UINT16	N	Current phase loss trip counter
0x1689 (5770)	72 : 07 : 14	R	1	–	UINT16	N	Current phase reversal trip counter
0x168A (5771)	72 : 07 : 15	R	1	–	UINT16	N	Phase under voltage trip counter
0x168B (5772)	72 : 07 : 16	R	1	–	UINT16	N	Phase over voltage trip counter
0x168C (5773)	72 : 07 : 17	R	1	–	UINT16	N	Voltage phase loss trip counter
0x168D (5774)	72 : 07 : 18	R	1	–	UINT16	N	Voltage imbalance trip counter
0x168E (5775)	72 : 07 : 19	R	1	–	UINT16	N	Voltage phase reversal trip counter
0x168F (5776)	72 : 07 : 1A	R	1	–	UINT16	N	Under frequency trip counter
0x1690 (5777)	72 : 07 : 1B	R	1	–	UINT16	N	Over frequency trip counter
0x1691 (5778)	72 : 07 : 1C	R	1	–	UINT16	N	Excessive start time trip counter
0x1692 (5779)	72 : 07 : 1D	R	1	–	UINT16	N	Communication loss trip counter
0x1693 (5780)	72 : 07 : 1E	R	1	–	UINT16	N	LTMT main unit temperature trip counter
0x1694 (5781)	72 : 07 : 1F	R	1	–	UINT16	N	Under power trip counter
0x1695 (5782)	72 : 07 : 20	R	1	–	UINT16	N	Over power trip counter
0x1696 (5783)	72 : 07 : 21	R	1	–	UINT16	N	Under power factor trip counter
0x1697–0x169D (5784–5790)	72 : 07 : 22 – 72 : 07 : 28	–	–	–	–	–	Reserved
0x169E (5791)	72 : 07 : 29	R	1	–	UINT16	N	DI interlock 1 trip counter
0x169F (5792)	72 : 07 : 2A	R	1	–	UINT16	N	DI interlock 2 trip counter

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x16A0 (5793)	72 : 07 : 2B	R	1	–	UINT16	N	DI interlock 3 trip counter
0x16A1 (5794)	72 : 07 : 2C	R	1	–	UINT16	N	DI interlock 4 trip counter
0x16A2 (5795)	72 : 07 : 2D	R	1	–	UINT16	N	DI interlock 5 trip counter
0x16A3 (5796)	72 : 07 : 2E	R	1	–	UINT16	N	DI interlock 6 trip counter
0x16A4 (5797)	72 : 07 : 2F	R	1	–	UINT16	N	DI interlock 7 trip counter
0x16A5 (5798)	72 : 07 : 30	R	1	–	UINT16	N	DI interlock 8 trip counter
0x16A6 (5799)	72 : 07 : 31	R	1	–	UINT16	N	DI interlock 9 trip counter
0x16A7 (5800)	72 : 07 : 32	R	1	–	UINT16	N	DI interlock 10 trip counter
0x16A8 (5801)	72 : 07 : 33	R	1	–	UINT16	N	DI interlock 11 trip counter
0x16A9 (5802)	72 : 07 : 34	R	1	–	UINT16	N	DI interlock 12 trip counter
0x16AA–0x16AD (5803–5806)	72 : 07 : 35 – 72 : 07 : 38	–	–	–	–	–	Reserved
0x16AE (5807)	72 : 07 : 39	R	1	–	UINT16	N	Temperature input 1 trip counter
0x16AF (5808)	72 : 07 : 3A	R	1	–	UINT16	N	Temperature input 2 trip counter
0x16B0 (5809)	72 : 07 : 3B	R	1	–	UINT16	N	Temperature input 3 trip counter
0x16B1 (5810)	72 : 07 : 3C	R	1	–	UINT16	N	Temperature input 4 trip counter
0x16B2 (5811)	72 : 07 : 3D	R	1	–	UINT16	N	Temperature input 5 trip counter
0x16B3 (5812)	72 : 07 : 3E	R	1	–	UINT16	N	Temperature input 6 trip counter
0x16B4 (5813)	72 : 07 : 3F	R	1	–	UINT16	N	Temperature input 7 trip counter
0x16B5 (5814)	72 : 07 : 40	R	1	–	UINT16	N	Temperature input 8 trip counter
0x16B6 (5815)	72 : 07 : 41	R	1	–	UINT16	N	Temperature input 9 trip counter
0x16B7 (5816)	72 : 07 : 42	R	1	–	UINT16	N	Temperature input 10 trip counter
0x16B8 (5817)	72 : 07 : 43	R	1	–	UINT16	N	Temperature input 11 trip counter
0x16B9 (5818)	72 : 07 : 44	R	1	–	UINT16	N	Temperature input 12 trip counter
0x16BA (5819)	72 : 07 : 45	R	1	–	UINT16	N	Temperature input 13 trip counter
0x16BB (5820)	72 : 07 : 46	R	1	–	UINT16	N	Temperature input 14 trip counter
0x16BC (5821)	72 : 07 : 47	R	1	–	UINT16	N	Temperature input 15 trip counter

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x16BD (5822)	72 : 07 : 48	–	–	–	–	–	Reserved
0x16BE (5823)	72 : 07 : 49	R	1	–	UINT16	N	Analog input 1 trip counter
0x16BF (5824)	72 : 07 : 4A	R	1	–	UINT16	N	Analog input 2 trip counter
0x16C0 (5825)	72 : 07 : 4B	R	1	–	UINT16	N	Analog input 3 trip counter
0x16C1 (5826)	72 : 07 : 4C	R	1	–	UINT16	N	Analog input 4 trip counter
0x16C2 (5827)	72 : 07 : 4D	R	1	–	UINT16	N	Calculator 1 output
0x16C3 (5828)	72 : 07 : 4E	R	1	–	UINT16	N	Calculator 2 output
0x16C4 (5829)	72 : 07 : 4F	R	1	–	UINT16	N	Motor stop error detection trip counter
0x16C5 (5830)	72 : 07 : 50	R	1	–	UINT16	N	Logic test interrupted trip counter
0x16C6 (5831)	72 : 07 : 51	R	1	–	UINT16	N	Stucked reset key trip counter

Extended Monitoring Data

The table lists the extended monitoring data for Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x16F3 (5876)	72 : 08 : 01	R	1	–	UINT16	N	Status word 1
0x16F4 (5877)	72 : 08 : 02	R	1	–	UINT16	N	Status word 2
0x16F5 (5878)	72 : 08 : 03	R	1	%IFLC	UINT16	N	L1 current (%IFLC)
0x16F6 (5879)	72 : 08 : 04	R	1	%IFLC	UINT16	N	L2 current (%IFLC)
0x16F7 (5880)	72 : 08 : 05	R	1	%IFLC	UINT16	N	L3 current (%IFLC)
0x16F8 (5881)	72 : 08 : 06	R	1	%IFLC	UINT16	N	Calculated earth trip (%IFLC)
0x16F9 (5882)	72 : 08 : 07	R	1	%IFLC	UINT16	N	Average current (%IFLC)
0x16FA (5883)	72 : 08 : 08	R	1	%IFLC	UINT16	N	Maximum current (Imax)
0x16FB (5884)	72 : 08 : 09	R	0.1	V	UINT16	N	L1–L2 voltage
0x16FC (5885)	72 : 08 : 0A	R	0.1	V	UINT16	N	L2–L3 voltage
0x16FD (5886)	72 : 08 : 0B	R	0.1	V	UINT16	N	L3–L1 voltage

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x16FE (5887)	72 : 08 : 0C	R	0.1	V	UINT16	N	Average voltage
0x16FF (5888)	72 : 08 : 0D	R	1	Hr	UINT16	N	Total RUN hour
0x1700 (5889)	72 : 08 : 0E	R	1	Hr	UINT16	N	Last RUN hour
0x1701 (5890)	72 : 08 : 0F	R	1	Sec	UINT16	N	Motor starting time
0x1702 (5891)	72 : 08 : 10	R	1	%IFLC	UINT16	N	Motor starting current (%IFLC)
0x1703 (5892)	72 : 08 : 11	R	1	KW	UINT16	N	Active power
0x1704 (5893)	72 : 08 : 12	R	1	KVAR	UINT16	N	Reactive power
0x1705 (5894)	72 : 08 : 13	R	1	KVA	UINT16	N	Apparent power
0x1706–0x1707 (5895–5896)	72 : 08 : 14	R	1	KWH	UINT32	N	Active energy
0x1708–0x1709 (5897–5898)	72 : 08 : 15	R	1	KVARh	UINT32	N	Reactive energy
0x170A–0x170B (5899–5900)	72 : 08 : 16	R	1	KVAh	UINT32	N	Apparent energy
0x170C (5901)	72 : 08 : 17	R	1	–	UINT16	N	Mode status • 0: Local1 • 1: Remote • 2: Local2 • 3: Local3

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
- From Boolean data, read with function code 0x02

The table lists the status data for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	Type	Svd	Description
0x15F9–0x15FA (5626–5627)	72 : 06 : 01	R	BITMAP	N	Digital Input Status, page 113
0x15FB–0x15FC (5628–5629)	72 : 06 : 02	R	BITMAP	N	Digital Output Status, page 114
0x15FD (5630)	72 : 06 : 03	R	BITMAP	N	Custom Logic Input Status, page 115
0x15FE (5631)	72 : 06 : 04	–	–	–	Reserved
0x15FF–0x1600 (5632–5633)	72 : 06 : 05	R	BITMAP	N	
0x1601 (5634)	72 : 06 : 06	R	BITMAP	N	Timer Status, page 115
0x1602(5635)	72 : 06 : 07	R	BITMAP	N	Counter Status, page 116
0x1603 (5636)	72 : 06 : 08	R	BITMAP	N	Signal Conditioner Status, page 116
0x1604 (5637)	72 : 06 : 09	R	BITMAP	N	Non-Volatile Element Status, page 116
0x1605 (5638)	72 : 06 : 0A	R	BITMAP	N	Analog Comparator Output Status, page 116
0x1606 (5639)	72 : 06 : 0B	–	–	–	Reserved
0x1607 (5640)	72 : 06 : 0C	R	BITMAP	N	Common Trip, Alarm, and Pickup Status, page 117
0x1608 (5641)	72 : 06 : 0D	R	BITMAP	N	Motor Status, page 117
0x1609–0x160A (5642–5643)	72 : 06 : 0E	R	BITMAP	N	Protection Alarm Status, page 118
0x160B–0x160C (5644–5645)	72 : 06 : 0F	R	BITMAP	N	Protection Pickup Status, page 119
0x160D–0x160E (5646–5647)	72 : 06 : 10	R	BITMAP	N	Protection Trip Status, page 120
0x160F (5648)	72 : 06 : 11	R	BITMAP	N	Interlock Protection Alarm Status, page 121
0x1610 (5649)	72 : 06 : 12	R	BITMAP	N	Interlock Protection Pickup Status, page 121
0x1611 (5650)	72 : 06 : 13	R	BITMAP	N	Interlock Protection Trip Status, page 122
0x1612 (5651)	72 : 06 : 14	R	BITMAP	N	Analog Protection Alarm Status, page 122
0x1613 (5652)	72 : 06 : 15	R	BITMAP	N	Analog Protection Pickup Status, page 122
0x1614 (5653)	72 : 06 : 16	R	BITMAP	N	Analog Protection Trip Status, page 123
0x1615 (5654)	72 : 06 : 17	R	BITMAP	N	Temperature Protection Alarm Status
0x1616 (5655)	72 : 06 : 18	R	BITMAP	N	Temperature Protection Pickup Status
0x1617 (5656)	72 : 06 : 19	R	BITMAP	N	Temperature Protection Trip Status
0x1618–0x1619 (5657–5658)	72 : 06 : 1A	R	BITMAP	N	Starter Commands, page 123
0x161A (5659)	72 : 06 : 1B	R	BITMAP	N	Motor Run Indicators, page 123
0x161B–0x161C (5660–5661)	72 : 06 : 1C	R	BITMAP	N	Permissive Commands Status, page 124

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	Type	Svd	Description
0x161D–0x161E (5662–5663)	72 : 06 : 1D	R	BITMAP	N	Inhibit Status, page 124
0x161F–0x1620 (5664–5665)	72 : 06 : 1E	R	BITMAP	N	Internal LTMT Main Unit Malfunction Status, page 125
0x1621–0x1622 (5666–5667)	72 : 06 : 1F	R	BITMAP	N	Internal LTMTCT/LTMTCTV Sensor Module Malfunction Status, page 126
0x1623 (5668)	72 : 06 : 20	R	BITMAP	N	Communication Status, page 126

Digital Input Status

The table lists the digital input status for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x0000 (1)	R	BOOL	N	Digital input 1
0x0001 (2)	R	BOOL	N	Digital input 2
0x0002 (3)	R	BOOL	N	Digital input 3
0x0003 (4)	R	BOOL	N	Digital input 4
0x0004 (5)	R	BOOL	N	Digital input 5
0x0005 (6)	R	BOOL	N	Digital input 6
0x0006 (7)	R	BOOL	N	Digital input 7
0x0007 (8)	R	BOOL	N	Digital input 8
0x0008 (9)	R	BOOL	N	Digital input 9
0x0009 (10)	R	BOOL	N	Digital input 10
0x000A (11)	R	BOOL	N	Digital input 11
0x000B (12)	R	BOOL	N	Digital input 12
0x000C (13)	R	BOOL	N	Digital input 13
0x000D (14)	R	BOOL	N	Digital input 14
0x000E (15)	R	BOOL	N	Digital input 15
0x000F (16)	R	BOOL	N	Digital input 16
0x0010 (17)	R	BOOL	N	Digital input 17
0x0011 (18)	R	BOOL	N	Digital input 18
0x0012 (18)	R	BOOL	N	Digital input 19
0x0013 (19)	R	BOOL	N	Digital input 20
0x0014 (20)	R	BOOL	N	Digital input 21
0x0015 (21)	R	BOOL	N	Digital input 22
0x0016 (22)	R	BOOL	N	Digital input 23
0x0017 (23)	R	BOOL	N	Digital input 24
0x0018 (24)–0x001F (31)	–	–	–	Reserved

Digital Output Status

The table lists the digital output status for the Modbus TCP/IP and EtherNet/IP communication.

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

Custom Logic Input Status

The table lists the custom logic input status for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x0040 (65)	R	BOOL	N	Local-START> DI
0x0041 (66)	R	BOOL	N	Local-STOP DI
0x0042 (67)	R	BOOL	N	Local-START>> DI
0x0043 (68)	R	BOOL	N	Mode selection 1
0x0044 (69)	R	BOOL	N	Local-START< DI
0x0045 (70)	R	BOOL	N	Local-START<< DI
0x0046 (71)	R	BOOL	N	Remote-START> DI
0x0047 (72)	R	BOOL	N	Remote-STOP DI
0x0048 (73)	R	BOOL	N	Remote-START>> DI
0x0049 (74)	R	BOOL	N	Mode selection 2
0x004A (75)	R	BOOL	N	Remote-START< DI
0x004B (76)	R	BOOL	N	Remote-START<< DI
0x004C (77)	R	BOOL	N	Run DI
0x004D (78)	R	BOOL	N	Speed change DI
0x004E–0x005F (79–96)	–	–	–	Reserved

Logic Module Status

TeSys Tera system has the following types of logic modules:

Timer Status

The table lists the timer status for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	Function code	RW	Type	Svd	Description
0x0080 (129)	0x02	R	BOOL	N	Timer OP 1
0x0081 (130)	0x02	R	BOOL	N	Timer OP 2
0x0082 (131)	0x02	R	BOOL	N	Timer OP 3
0x0083 (132)	0x02	R	BOOL	N	Timer OP 4
0x0084–0x008F (133–144)	–	–	–	–	Reserved

Counter Status

The table lists the counter status for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	Function code	RW	Type	Svd	Description
0x0090 (145)	0x02	R	BOOL	N	Counter OP 1
0x0091 (146)	0x02	R	BOOL	N	Counter OP 2
0x0092 (147)	0x02	R	BOOL	N	Counter OP 3
0x0093 (148)	0x02	R	BOOL	N	Counter OP 4
0x0094–0x009F (149–160)	–	–	–	–	Reserved

Signal Conditioner Status

The table lists the signal conditioner status for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	Function code	RW	Type	Svd	Description
0x00A0 (161)	0x02	R	BOOL	N	Signal conditioner OP 1
0x00A1 (162)	0x02	R	BOOL	N	Signal conditioner OP 2
0x00A2 (163)	0x02	R	BOOL	N	Signal conditioner OP 3
0x00A3 (164)	0x02	R	BOOL	N	Signal conditioner OP 4
0x00A4–0x00AF (165–176)	–	–	–	–	Reserved

Non-Volatile Element Status

The table lists the non-volatile element status for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	Function code	RW	Type	Svd	Description
0x00B0 (177)	0x02	R	BOOL	N	Non-volatile element OP 1
0x00B1 (178)	0x02	R	BOOL	N	Non-volatile element OP 2
0x00B2 (179)	0x02	R	BOOL	N	Non-volatile element OP 3
0x00B3 (180)	0x02	R	BOOL	N	Non-volatile element OP 4
0x00B4–0x00BF (181–192)	–	–	–	–	Reserved

Analog Comparator Output Status

The table lists the analog comparator output status for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x00C0 (193)	R	BOOL	N	Analog comparator output 1
0x00C1 (194)	R	BOOL	N	Analog comparator output 2
0x00C2 (195)	R	BOOL	N	Analog comparator output 3
0x00C3 (196)	R	BOOL	N	Analog comparator output 4
0x00C4–0x00CF (197–208)	–	–	–	Reserved

Common Trip, Alarm, and Pickup Status

The table lists the common trip, alarm, and pickup status for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x00E0 (225)	R	BOOL	N	Pickup status
0x00E1 (226)	R	BOOL	N	Alarm status
0x00E2 (227)	R	BOOL	N	Trip status
0x00E3 (228)	R	BOOL	N	Motor stop error detection trip
0x00E4 (229)	–	–	–	Reserved
0x00E5 (230)	R	BOOL	N	Block output
0x00E6 (231)	R	BOOL	N	Logic test interrupted trip
0x00E7 (232)	R	BOOL	N	Logic test interrupted pickup
0x00E8 (233)	R	BOOL	N	Stucked reset key trip
0x00E9–0x00EF (234–240)	–	–	–	Reserved

Motor Status

The table lists the motor status for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x00F0 (241)	R	BOOL	N	Motor Stop
0x00F1 (242)	R	BOOL	N	Motor Start
0x00F2 (243)	R	BOOL	N	Motor Run
0x00F3 (244)	R	BOOL	N	Motor Inhibit
0x00F4 (245)	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 TCP/IP and EtherNet/IP communication.

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

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

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

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x0160 (353)	R	BOOL	N	Interlock 1 alarm
0x0161 (354)	R	BOOL	N	Interlock 2 alarm
0x0162 (355)	R	BOOL	N	Interlock 3 alarm
0x0163 (356)	R	BOOL	N	Interlock 4 alarm
0x0164 (357)	R	BOOL	N	Interlock 5 alarm
0x0165 (358)	R	BOOL	N	Interlock 6 alarm
0x0166 (359)	R	BOOL	N	Interlock 7 alarm
0x0167 (360)	R	BOOL	N	Interlock 8 alarm
0x0168 (361)	R	BOOL	N	Interlock 9 alarm
0x0169 (362)	R	BOOL	N	Interlock 10 alarm
0x016A (363)	R	BOOL	N	Interlock 11 alarm
0x016B (364)	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 TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x0170 (369)	R	BOOL	N	Interlock 1 pickup
0x0171 (370)	R	BOOL	N	Interlock 2 pickup
0x0172 (371)	R	BOOL	N	Interlock 3 pickup
0x0173 (372)	R	BOOL	N	Interlock 4 pickup
0x0174 (373)	R	BOOL	N	Interlock 5 pickup
0x0175 (374)	R	BOOL	N	Interlock 6 pickup
0x0176 (375)	R	BOOL	N	Interlock 7 pickup
0x0177 (376)	R	BOOL	N	Interlock 8 pickup
0x0178 (377)	R	BOOL	N	Interlock 9 pickup
0x0179 (378)	R	BOOL	N	Interlock 10 pickup
0x017A (379)	R	BOOL	N	Interlock 11 pickup
0x017B (380)	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 TCP/IP and EtherNet/IP communication.

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

Analog Protection Status

Analog Protection Alarm Status

The table lists the analog protection alarm status for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x0190 (401)	R	BOOL	N	AI1 alarm
0x0191 (402)	R	BOOL	N	AI2 alarm
0x0192 (403)	R	BOOL	N	AI3 alarm
0x0193 (404)	R	BOOL	N	AI4 alarm
0x0194–0x019F (405–416)	–	–	–	Reserved

Analog Protection Pickup Status

The table lists the analog protection pickup status for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x01A0 (417)	R	BOOL	N	AI1 pickup
0x01A1 (418)	R	BOOL	N	AI2 pickup
0x01A2 (419)	R	BOOL	N	AI3 pickup

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x01A3 (420)	R	BOOL	N	AI4 pickup
0x01A4–0x01AF (421–432)	–	–	–	Reserved

Analog Protection Trip Status

The table lists the analog protection trip status for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x01B0 (433)	R	BOOL	N	AI1 trip
0x01B1 (434)	R	BOOL	N	AI2 trip
0x01B2 (435)	R	BOOL	N	AI3 trip
0x01B3 (436)	R	BOOL	N	AI4 trip
0x01B4–0x01BF (437–448)	–	–	–	Reserved

Starter Commands

The table lists the starter commands for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x01F0 (497)	R	BOOL	N	CONTACTOR OUTPUT 1
0x01F1 (498)	R	BOOL	N	CONTACTOR OUTPUT 2
0x01F2 (499)	R	BOOL	N	CONTACTOR OUTPUT 3
0x01F3 (500)	R	BOOL	N	CONTACTOR OUTPUT 4
0x01F4 (501)	R	BOOL	N	CONTACTOR OUTPUT 5
0x01F5–0x020E (502–527)	–	–	–	Reserved
0x020F (528)	R	BOOL	N	Motor Stop

Motor Run Indicators

The table lists the motor run indicators for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x0210 (529)	R	BOOL	N	Motor forward running
0x0211 (530)	R	BOOL	N	Motor reverse running
0x0212 (531)	R	BOOL	N	Motor fast forward running
0x0213 (532)	R	BOOL	N	Motor fast reverse running
0x0214 (533)	R	BOOL	N	Motor running in star (forward)

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x0215 (534)	R	BOOL	N	Motor running in delta (forward)
0x0216 (535)	R	BOOL	N	Motor running in star (reverse)
0x0217 (536)	R	BOOL	N	Motor running in delta (reverse)
0x0218 (537)	R	BOOL	N	Motor in star-delta changeover (forward)
0x0219 (538)	R	BOOL	N	Motor in star-delta changeover (reverse)
0x021A (539)	R	BOOL	N	Interlocking time active
0x021B (540)	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 TCP/IP and EtherNet/IP communication.

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

Inhibit Status

The table lists the inhibit status for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x0240 (577)	R	BOOL	N	No voltage inhibit
0x0241 (578)	R	BOOL	N	Under voltage inhibit
0x0242 (579)	R	BOOL	N	Trip inhibit
0x0243 (580)	R	BOOL	N	Thermal inhibit
0x0244 (581)	R	BOOL	N	Max starts inhibit
0x0245 (582)	R	BOOL	N	Interlock 1 inhibit
0x0246 (583)	R	BOOL	N	Interlock 2 inhibit
0x0247 (584)	R	BOOL	N	Interlock 3 inhibit
0x0248 (585)	R	BOOL	N	Interlock 4 inhibit

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x0249 (586)	R	BOOL	N	Interlock 5 inhibit
0x024A (587)	R	BOOL	N	Interlock 6 inhibit
0x024B (588)	R	BOOL	N	Interlock 7 inhibit
0x024C (589)	R	BOOL	N	Interlock 8 inhibit
0x024D (590)	R	BOOL	N	Interlock 9 inhibit
0x024E (591)	R	BOOL	N	Interlock 10 inhibit
0x024F (592)	R	BOOL	N	Interlock 11 inhibit
0x0250 (593)	R	BOOL	N	Interlock 12 inhibit
0x0251 (594)	R	BOOL	N	Local DI stop inhibit
0x0252 (595)	R	BOOL	N	Remote DI stop inhibit
0x0253 (596)	R	BOOL	N	Communication stop inhibit
0x0254 (597)	R	BOOL	N	Force stop inhibit
0x0255 (598)	R	BOOL	N	Antibackspin inhibit
0x0256 (599)	–	–	–	Reserved
0x0257 (600)	R	BOOL	N	Direction change inhibit
0x0258 (601)	R	BOOL	N	Speed change inhibit
0x0259 (602)	R	BOOL	N	Custom stop inhibit
0x025A (603)	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.

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x0260 (609)	R	BOOL	N	Sensor module communication error detected
0x0261 (610)	R	BOOL	N	LTMT expansion module communication error detected
0x0262 (611)	R	BOOL	N	HMI communication error detected
0x0263 (612)	R	BOOL	N	EEPROM interface error detected
0x0264 (613)	R	BOOL	N	EEPROM checksum error detected
0x0265 (614)	R	BOOL	N	Configuration error detected
0x0266–0x0267 (616–615)	R	BOOL	N	Reserved
0x0268 (617)	R	BOOL	N	Watchdog timeout detected
0x0269–0x026B (618–620)	R	BOOL	N	Reserved
0x026C (621)	R	BOOL	N	Energy register overflow
0x026D (622)	R	BOOL	N	Error detected during LTMT expansion module initialization
0x026FE–0x027F (623–640)	–	–	–	Reserved

Internal 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 TCP/IP Address (Register)	RW	Type	Svd	Description
0x0280 (641)	R	BOOL	N	Watchdog timeout detected
0x0281 (642)	R	BOOL	N	ADC conversion error detected
0x0282 (643)	R	BOOL	N	Flash error detected
0x0283 (644)	R	BOOL	N	UART error detected
0x0284 (645)	R	BOOL	N	Voltage configuration not detected
0x0285 (646)	–	–	–	Reserved
0x0286 (647)	R	BOOL	N	Calibration error detected
0x0287 (648)	R	BOOL	N	VL1 measurement error detected
0x0288 (649)	R	BOOL	N	VL2 measurement error detected
0x0289 (650)	R	BOOL	N	VL3 measurement error detected
0x028A (651)	R	BOOL	N	IL1 low gain measurement error detected
0x028B (652)	R	BOOL	N	IL1 high gain measurement error detected
0x028C (653)	R	BOOL	N	IL2 low gain measurement error detected
0x028D (654)	R	BOOL	N	IL2 high gain measurement error detected
0x028E (655)	R	BOOL	N	IL3 low gain measurement error detected
0x028F (656)	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 TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	RW	Type	Svd	Description
0x02A0 (673)	R	BOOL	N	Modbus RTU port: No communication
0x02A1 (674)	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 TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	Type	Svd	Description
0x23A5 (9126)	73 : 01 : 01	R	UINT32	Y	Product Id
0x23A7 (9128)	73 : 01 : 02	R	ASCII	Y	Product serial number
0x23B7 (9144)	73 : 01 : 03	R	UINT16	Y	Manufacture day
0x23B8 (9145)	73 : 01 : 04	R	UINT16	Y	Manufacture month
0x23B9 (9146)	73 : 01 : 05	R	UINT16	Y	Manufacture year
0x23BA (9147)	73 : 01 : 06	R	UINT16	Y	Manufacture hour
0x23BB (9148)	73 : 01 : 07	R	UINT16	Y	Manufacture minute
0x23BC (9149)	73 : 01 : 08	R	UINT16	Y	Manufacture second
0x23BD (9150)	73 : 01 : 09	R	UINT16	Y	Standard package version
0x23BF (9152)	73 : 01 : 0A	–	–	–	Reserved
0x23C0 (9153)	73 : 01 : 0B	R	ASCII	Y	Product order code

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

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	Type	Svd	Description
0x23CA (9163)	73 : 01 : 0C	R	UINT32	Y	LTMT main unit hardware version
0x23CC (9165)	73 : 01 : 0D	R	UINT32	Y	LTMT main unit firmware version
0x23CE (9167)	73 : 01 : 0E	R	UINT32	Y	LTMT main unit boot firmware version
0x23D0 (9169)	73 : 01 : 0F	R	UINT32	Y	LTMTCT/LTMTCTV sensor module hardware version
0x23D2 (9171)	73 : 01 : 10	R	UINT32	Y	LTMTCT/LTMTCTV sensor module firmware version

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	Type	Svd	Description
0x23D4 (9173)	73 : 01 : 11	R	UINT32	Y	LTMTCT/LTMTCTV sensor module boot firmware version
0x23D6 (9175)	73 : 01 : 12	R	UINT32	Y	LTMTCUF control operator unit hardware version
0x23D8 (9177)	73 : 01 : 13	R	UINT32	Y	LTMTCUF control operator unit firmware version
0x23DA (9179)	73 : 01 : 14	R	UINT32	Y	LTMTCUF control operator unit boot firmware version
0x23DC (9181)	73 : 01 : 15	R	UINT32	Y	LTMT expansion module 1 hardware version
0x23DE (9183)	73 : 01 : 16	R	UINT32	Y	LTMT expansion module 1 firmware version
0x23E0 (9185)	73 : 01 : 17	R	UINT32	Y	LTMT expansion module 1 boot firmware version
0x23E2 (9187)	73 : 01 : 18	R	UINT32	Y	LTMT expansion module 2 hardware version
0x23E4 (9189)	73 : 01 : 19	R	UINT32	Y	LTMT expansion module 2 firmware version
0x23E6 (9191)	73 : 01 : 1A	R	UINT32	Y	LTMT expansion module 2 boot firmware version
0x23E8 (9193)	73 : 01 : 1B	R	UINT32	Y	LTMT expansion module 3 hardware version
0x23EA (9195)	73 : 01 : 1C	R	UINT32	Y	LTMT expansion module 3 firmware version
0x23EC (9197)	73 : 01 : 1D	R	UINT32	Y	LTMT expansion module 3 boot firmware version
0x23EE (9199)	73 : 01 : 1E	R	UINT32	Y	LTMT expansion module 4 hardware version
0x23F0 (9201)	73 : 01 : 1F	R	UINT32	Y	LTMT expansion module 4 firmware version
0x23F2 (9203)	73 : 01 : 20	R	UINT32	Y	LTMT expansion module 4 boot firmware version
0x23F4 (9205)	73 : 01 : 21	R	UINT32	Y	LTMT expansion module 5 hardware version
0x23F6 (9207)	73 : 01 : 22	R	UINT32	Y	LTMT expansion module 5 firmware version
0x23F8 (9209)	73 : 01 : 23	R	UINT32	Y	LTMT expansion module 5 boot firmware version

Detected Modules

The table lists the detected modules for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	Type	Svd	Description
0x2400 (9217)	73 : 01 : 2A	R	UINT16	N	LTMTCT/LTMTCTV Sensor Module Type, page 130
0x2401 (9218)	73 : 01 : 2A	–	–	–	Reserved
0x2402 (9219)	73 : 01 : 2C	R	UINT16	N	LTMT Expansion Module 1 Type, page 130
0x2403 (9220)	73 : 01 : 2D	R	UINT16	N	LTMT Expansion Module 2 Type, page 130
0x2404 (9221)	73 : 01 : 2E	R	UINT16	N	LTMT Expansion Module 3 Type, page 130
0x2405 (9222)	73 : 01 : 2F	R	UINT16	N	LTMT Expansion Module 4 Type, page 130
0x2406 (9223)	73 : 01 : 30	R	UINT16	N	LTMT Expansion Module 5 Type, page 130

LTMTCT/LTMTCTV Sensor Module Type

The table lists the type of sensor modules used for the Modbus TCP/IP and EtherNet/IP communication.

Register value	Reference	Sensor module	Current range
0	–	None	–
1–2	–	Reserved	–
3	LTMTCT3T	LTMT horizontal sensor module	0.3–3 A
4	LTMTCTV3T	LTMT horizontal sensor module	0.3–3 A
5–6	–	Reserved	–
7	LTMTCT25T	LTMT horizontal sensor module	2.5–25 A
8	LTMTCTV25T	LTMT horizontal sensor module	2.5–25 A
9–10	–	Reserved	–
11	LTMTCT100T	LTMT horizontal sensor module	10–100 A
12	LTMTCTV100T	LTMT horizontal sensor module	10–100 A
13–14	–	Reserved	–
15	LTMTCTV3UT	LTMT horizontal sensor module for UL applications	0.3–3 A
16	LTMTCTV25UT	LTMT horizontal sensor module for UL applications	2.5–25 A
17	LTMTCTV100UT	LTMT horizontal sensor module for UL applications	10–100 A

LTMT Expansion Module Type

The table lists the type of LTMT expansion modules used for the Modbus TCP/IP and EtherNet/IP communication.

Register value	Reference	Expansion module	DI rating
0	–	None	–
1	LTMTIN42FM	4 DI and 2 DO	• 100–265 Vac/Vdc for IEC • 110–240 Vac/Vdc for UL
2	LTMTIN42BD	4 DI and 2 DO	24 Vdc
3–6	–	Reserved	–
7	LTMTAN21	2 AI and 1 AO	4–20 mA
8	–	Reserved	–

Motor Protection Settings

What's in This Chapter

Thermal Overload Protection

The table lists the thermal overload protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DAC (3501)	83 : 01 : 01	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	3	Y	Function setting
0x0DAD (3502)	83 : 01 : 02	RW	0.01	–	UINT16	100–150 (step 5)	115	Y	Service factor
0x0DAE (3503)	83 : 01 : 03	RW	1	–	UINT16	5–40 (step 5)	10	Y	Trip class
0x0DAF (3504)	83 : 01 : 04	RW	1	%TM (9)	UINT16	80–100 (step 5)	80	Y	Alarm level
0x0DB0 (3505)	83 : 01 : 05	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	8	Y	Reset mode
0x0DB1 (3506)	83 : 01 : 06	RW	1	%TM (9)	UINT16	30–95 (step 5)	90	Y	Thermal reset level
0x0DB2 (3507)	83 : 01 : 07	RW	1	%TM (9)	UINT16	5–100 (step 5)	90	Y	Start inhibit level
0x0DB3 (3508)	83 : 01 : 08	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Cool down function
0x0DB4 (3509)	83 : 01 : 09	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Cool down time
0x0DB5 (3510)	83 : 01 : 0A	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Pause function
0x0DB6 (3511)	83 : 01 : 0B	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Pause time
0x0DB7 (3512)	83 : 01 : 0C	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Block function
0x0DB8 (3513)	83 : 01 : 0D	RW	1	%TM (9)	UINT16	80–95 (step 5)	80	Y	Block level
0x0DB9 (3514)	83 : 01 : 0E	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Block time
0x0DBA (3515)	83 : 01 : 0F	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Auxiliary fan
0x0DBB (3516)	83 : 01 : 10	–	–	–	–	–	–	–	Reserved

(9) %TM = % of thermal memory

Stalled Rotor Protection

The table lists the stalled rotor protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DBE (3519)	83 : 01 : 13	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0DBF (3520)	83 : 01 : 14	RW	1	%IFLC	UINT16	50–1000 (step 1)	200	Y	Pickup
0x0DC0 (3521)	83 : 01 : 15	RW	0.1	s	UINT16	1–60000 (step 1)	20	Y	Time delay
0x0DC1 (3522)	83 : 01 : 16	RW	1	%IFLC	UINT16	50–1000 (step 1)	200	Y	Alarm level
0x0DC2 (3523)	83 : 01 : 17	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode
0x0DC3 (3524)	83 : 01 : 18	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 TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DC4 (3525)	83 : 01 : 19	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0DC5 (3526)	83 : 01 : 1A	RW	1	%IFLC	UINT16	150–1000 (step 1)	200	Y	Pickup
0x0DC6 (3527)	83 : 01 : 1B	RW	0.1	s	UINT16	1–60000 (step 1)	100	Y	Time delay
0x0DC7 (3528)	83 : 01 : 1C	RW	1	%IFLC	UINT16	150–1000 (step 1)	200	Y	Alarm level
0x0DC8 (3529)	83 : 01 : 1D	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communication • Bit 3: Auto	3	Y	Reset mode
0x0DC9 (3530)	83 : 01 : 1E	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto–Reset delay

Temperature Protection

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

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0ECD (3790)	83 : 01 : 28	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0ECE (3791)	83 : 01 : 29	RW	0.1	°C	UINT16	250–1800 (step 1)	1300	Y	PT100 pickup(10)
				F		770–3560 (step 1)			
0x0ECF (3792)	83 : 01 : 2A	RW	1	Ω	UINT16	2700–4000 (step 1)	2700	Y	PTC pickup
0x0ED0 (3793)	83 : 01 : 2B	RW	1	Ω	UINT16	1600–2300 (step 1)	1600	Y	PTC pickup reset
0x0ED1 (3794)	83 : 01 : 2C	RW	0.1	s	UINT16	1–60000 (step 1)	10	Y	Time delay
0x0ED2 (3795)	83 : 01 : 2D	RW	0.1	°C	UINT16	250–1800 (step 1)	1300	Y	PT100 alarm level (10)
				F		770–3560 (step 1)			
0x0ED3 (3796)	83 : 01 : 2E	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode
0x0ED4 (3797)	83 : 01 : 2F	RW	0.1	–	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0ED5 (3798)	83 : 01 : 30	RW	0	–	UINT16	–	–	–	Reserved

(10) 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 TCP/IP and EtherNet/IP communication.

Modbus TCP/ IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DCA (3531)	83 : 01 : 1F	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0DCB (3532)	83 : 01 : 20	RW	1	%IFLC	UINT16	20–1000 (step 1)	110	Y	Pickup
0x0DCC (3533)	83 : 01 : 21	RW	0.1	s	UINT16	1–60000 (step 1)	300	Y	Time delay during motor start (T_pS)
0x0DCD (3534)	83 : 01 : 22	RW	0.1	s	UINT16	1–60000 (step 1)	200	Y	Time delay during motor run (T_pR)
0x0DCE (3535)	83 : 01 : 23	RW	1	%IFLC	UINT16	20–1000 (step 1)	110	Y	Alarm level
0x0DCF (3536)	83 : 01 : 24	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communication • Bit 3: Auto	3	Y	Reset mode
0x0DD0 (3537)	83 : 01 : 25	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0DD1 (3538)	83 : 01 : 26	–	–	–	–	–	–	–	Reserved

Normal Inverse Overcurrent Protection

The table lists the normal inverse overcurrent protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DD2 (3539)	83 : 01 : 27	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0DD3 (3540)	83 : 01 : 28	RW	1	%IFLC	UINT16	20–1000 (step 1)	50	Y	Pickup
0x0DD4 (3541)	83 : 01 : 29	RW	0.1	s	UINT16	1–200 (step 1)	1	Y	Time delay (TMS)
0x0DD5 (3542)	83 : 01 : 2A	RW	1	%IFLC	UINT16	20–1000 (step 1)	50	Y	Alarm level
0x0DD6 (3543)	83 : 01 : 2B	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communication • Bit 3: Auto	3	Y	Reset mode

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DD7 (3544)	83 : 01 : 2C	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0DD8 (3545)	83 : 01 : 2D	–	–	–	–	–	–	–	Reserved

Short Time Overcurrent Protection

The table lists the short time overcurrent protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DD9 (3546)	83 : 01 : 2E	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0DDA (3547)	83 : 01 : 2F	RW	1	%IFLC	UINT16	100–1000 (step 1)	100	Y	Pickup
0x0DDB (3548)	83 : 01 : 30	RW	0.01	s	UINT16	5–1000 (step 1)	5	Y	Time delay
0x0DDC (3549)	83 : 01 : 31	RW	1	%IFLC	UINT16	100–1000 (step 1)	100	Y	Alarm level
0x0DDD (3550)	83 : 01 : 32	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communication • Bit 3: Auto	3	Y	Reset mode
0x0DDE (3551)	83 : 01 : 33	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0DDF (3552)	83 : 01 : 34	–	–	–	–	–	–	–	Reserved

Calculated Ground Trip

The table lists the calculated ground trip for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DE0 (3553)	83 : 01 : 35	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0DE1 (3554)	83 : 01 : 36	RW	1	%IFLC	UINT16	10–500 (step 1)	20	Y	Pickup
0x0DE2 (3555)	83 : 01 : 37	RW	0.10	s	UINT16	5–60000 (step 1)	20	Y	Time delay

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DE3 (3556)	83 : 01 : 38	RW	1	%IFLC	UINT16	10–500 (step 1)	20	Y	Alarm level
0x0DE4 (3557)	83 : 01 : 39	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communication • Bit 3: Auto	3	Y	Reset mode
0x0DE5 (3558)	83 : 01 : 3A	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0DE6 (3559)	83 : 01 : 3B	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	N	Function while motor starting

Measured Ground Trip

The table lists the measured ground trip for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DE7 (3560)	83 : 01 : 3C	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0DE8 (3561)	83 : 01 : 3D	RW	1	mA	UINT16	20–20000 (step 10)	30	Y	Pickup
0x0DE9 (3562)	83 : 01 : 3E	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0DEA (3563)	83 : 01 : 3F	RW	1	mA	UINT16	20–20000 (step 10)	30	Y	Alarm level
0x0DEB (3564)	83 : 01 : 40	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode
0x0DEC (3565)	83 : 01 : 41	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0DED (3566)	83 : 01 : 42	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 TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DEE (3567)	83 : 01 : 43	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	1	Y	Function setting
0x0DEF (3568)	83 : 01 : 44	RW	1	% IFLC	UINT16	15–100 (step 1)	50	Y	Pickup
0x0DF0 (3569)	83 : 01 : 45	RW	0.1	s	UINT16	1–60000 (step 1)	100	Y	Time delay
0x0DF1 (3570)	83 : 01 : 46	RW	1	% IFLC	UINT16	15–100 (step 1)	50	Y	Alarm level
0x0DF2 (3571)	83 : 01 : 47	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	8	Y	Reset mode
0x0DF3 (3572)	83 : 01 : 48	RW	0.1	s	UINT16	0–60000 (step 1)	50	Y	Auto-Reset delay
0x0DF4 (3573)	83 : 01 : 49	–	–	–	–	–	–	–	Reserved

Current Imbalance Protection

The table lists the current imbalance protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DF6 (3575)	83 : 01 : 4B	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	3	Y	Function setting
0x0DF7 (3576)	83 : 01 : 4C	RW	1	%	UINT16	5–100 (step 5)	20	Y	Pickup
0x0DF8 (3577)	83 : 01 : 4D	RW	0.1	s	UINT16	1–60000 (step 1)	50	Y	Time delay
0x0DF9 (3578)	83 : 01 : 4E	RW	1	–	UINT16	5–100 (step 5)	20	Y	Alarm level
0x0DFA (3579)	83 : 01 : 4F	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DFB (3580)	83 : 01 : 50	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0DFC (3581)	83 : 01 : 51	–	–	–	–	–	–	–	Reserved

Current Phase Loss Protection

The table lists the current phase loss protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0DFD (3582)	83 : 01 : 52	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0DFE (3583)	83 : 01 : 53	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0DFF (3584)	83 : 01 : 54	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode
0x0E00 (3585)	83 : 01 : 55	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E01 (3586)	83 : 01 : 56	–	–	–	–	–	–	–	Reserved

Current Phase Reversal Protection

The table lists the current phase reversal protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E02 (3587)	83 : 01 : 57	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0E03 (3588)	83 : 01 : 58	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0E04 (3589)	83 : 01 : 59	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communication • Bit 3: Auto	3	Y	Reset mode

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E05 (3590)	83 : 01 : 5A	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E06 (3591)	83 : 01 : 5B	–	–	–	–	–	–	–	Reserved

Voltage Protection Settings

What's in This Chapter

Phase Under Voltage Protection

The table lists the phase under voltage protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E29 (3626)	83 : 02 : 01	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0E2A (3627)	83 : 02 : 02	RW	1	%Vn	UINT16	20–100 (step 1)	80	Y	Pickup
0x0E2B (3628)	83 : 02 : 03	RW	0.1	s	UINT16	1–60000 (step 1)	100	Y	Time delay
0x0E2C (3629)	83 : 02 : 04	RW	1	%Vn	UINT16	20–100 (step 1)	80	Y	Alarm level
0x0E2D (3630)	83 : 02 : 05	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	8	Y	Reset mode
0x0E2E (3631)	83 : 02 : 06	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E2F (3632)	83 : 02 : 07	–	–	–	–	–	–	–	Reserved

Phase Over Voltage Protection

The table lists the phase over voltage protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E31 (3634)	83 : 02 : 09	RW	1	–	UINT16	• 0 - Disable • 1 - Alarm • 2 - Trip • 3 - Alarm and Trip	2	Y	Function setting
0x0E32 (3635)	83 : 02 : 0A	RW	1	%Vn	UINT16	101–130 (step 1)	110	Y	Pickup
0x0E33 (3636)	83 : 02 : 0B	RW	0.1	s	UINT16	1–60000 (step 1)	50	Y	Time delay
0x0E34 (3637)	83 : 02 : 0C	RW	1	%Vn	UINT16	101–130 (step 1)	110	Y	Alarm level
0x0E35 (3638)	83 : 02 : 0D	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E36 (3639)	83 : 02 : 0E	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E37 (3640)	83 : 02 : 0F	–	–	–	–	–	–	–	Reserved

Voltage Imbalance Protection

The table lists the voltage imbalance protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E3D (3646)	83 : 02 : 15	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	3	Y	Function setting
0x0E3E (3647)	83 : 02 : 16	RW	1	%Vn	UINT16	5–50 (step 5)	10	Y	Pickup
0x0E3F (3648)	83 : 02 : 17	RW	0.1	s	UINT16	1–60000 (step 1)	100	Y	Time delay
0x0E40 (3649)	83 : 02 : 18	RW	1	–	UINT16	5–50 (step 5)	10	N	Alarm level
0x0E41 (3650)	83 : 02 : 19	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communication • Bit 3: Auto	3	Y	Reset mode
0x0E42 (3651)	83 : 02 : 1A	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E43 (3652)	83 : 02 : 1B	–	–	–	–	–	–	–	Reserved

Voltage Phase Loss Protection

The table lists the voltage phase loss protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E38 (3641)	83 : 02 : 10	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0E39 (3642)	83 : 02 : 11	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0E3A (3643)	83 : 02 : 12	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI	3	Y	Reset mode

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
						• Bit 2: Communica-tion • Bit 3: Auto			
0x0E3B (3644)	83 : 02 : 13	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E3C (3645)	83 : 02 : 14	–	–	–	–	–	–	–	Reserved

Voltage Phase Reversal Protection

The table lists the voltage phase reversal protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E44 (3653)	83 : 02 : 1C	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	2	Y	Function setting
0x0E45 (3654)	83 : 02 : 1D	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0E46 (3655)	83 : 02 : 1E	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode
0x0E47 (3656)	83 : 02 : 1F	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E48 (3657)	83 : 02 : 20	–	–	–	–	–	–	–	Reserved

Power Protection Settings

What's in This Chapter

Under Frequency Protection

The table lists the under frequency protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E49 (3658)	83 : 02 : 21	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0E4A (3659)	83 : 02 : 22	RW	1	%F (11)	UINT16	90–100 (step 1)	94	Y	Pickup
0x0E4B (3660)	83 : 02 : 23	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0E4C (3661)	83 : 02 : 24	RW	1	%F (11)	UINT16	90–100 (step 1)	94	Y	Alarm level
0x0E4D (3662)	83 : 02 : 25	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode
0x0E4E (3663)	83 : 02 : 26	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E4F (3664)	83 : 02 : 27	–	–	–	–	–	–	–	Reserved

Over Frequency Protection

The table lists the over frequency protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E50 (3665)	83 : 02 : 28	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0E51 (3666)	83 : 02 : 29	RW	1	%F(11)	UINT16	100–110 (step 1)	105	Y	Pickup
0x0E52 (3667)	83 : 02 : 2A	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0E53 (3668)	83 : 02 : 2B	RW	1	%F(11)	UINT16	100–110 (step 1)	105	Y	Alarm level
0x0E54 (3669)	83 : 02 : 2C	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode

(11) %F = % of nominal frequency

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E55 (3670)	83 : 02 : 2D	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E56 (3671)	83 : 02 : 2E	–	–	–	–	–	–	–	Reserved

Under Power Protection

The table lists the under power protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E57 (3672)	83 : 02 : 2F	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0E58 (3673)	83 : 02 : 30	RW	1	%P(12)	UINT16	20–1000 (step 1)	60	Y	Pickup
0x0E59 (3674)	83 : 02 : 31	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0E5A (3675)	83 : 02 : 32	RW	1	%P(12)	UINT16	20–1000 (step 1)	60	Y	Alarm level
0x0E5B (3676)	83 : 02 : 33	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communi-cation • Bit 3: Auto	3	Y	Reset mode
0x0E5C (3677)	83 : 02 : 34	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E5D (3678)	83 : 02 : 35	–	–	–	–	–	–	–	Reserved

(12) %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 TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E5E (3679)	83 : 02 : 36	RW	1	–	UIN-T16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0E5F (3680)	83 : 02 : 37	RW	1	%P(13)	UIN-T16	20–1000 (step 1)	110	Y	Pickup
0x0E60 (3681)	83 : 02 : 38	RW	0.1	s	UIN-T16	1–60000 (step 1)	1	Y	Time delay
0x0E61 (3682)	83 : 02 : 39	RW	1	%P(13)	UIN-T16	20–1000 (step 1)	110	Y	Alarm level
0x0E62 (3683)	83 : 02 : 3A	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode
0x0E63 (3684)	83 : 02 : 3B	RW	0.1	s	UIN-T16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E64 (3685)	83 : 02 : 3C	–	–	–	–	–	–	–	Reserved

Under Power Factor Protection

The table lists the under power factor protection for the The table lists the over power protection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E65 (3686)	83 : 02 : 3D	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0E66 (3687)	83 : 02 : 3E	RW	0.10	PF	UINT16	40–100 (step 1)	60	Y	Pickup
0x0E67 (3688)	83 : 02 : 3F	RW	0.1	s	UINT16	1–60000 (step 1)	1	Y	Time delay
0x0E68 (3689)	83 : 02 : 40	RW	0.10	PF	UINT16	40–100 (step 1)	60	Y	Alarm level

(13) %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

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0E69 (3690)	83 : 02 : 41	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode
0x0E6A (3691)	83 : 02 : 42	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0E6B (3692)	83 : 02 : 43	–	–	–	–	–	–	–	Reserved

Motor Control Function Settings

What's in This Chapter

Voltage Dip

The table lists the voltage dip for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	No.	X	Unit	Type	Range	Default value	Svd	Description
0x0EAD (3758)	83 : 03 : 08	1	1	–	UINT16	• 0: Disable • 1: Load shedding • 2: Auto restart	0	Y	Function setting
0x0EAE (3759)	83 : 03 : 09	1	1	%Vn	UINT16	20–90 (step 5)	90	Y	Voltage dip
0x0EAF (3760)	83 : 03 : 0A	1	1	%Vn	UINT16	20–95 (step 5)	95	Y	Voltage restoration
0x0EB0 (3761)	83 : 03 : 0B	1	1	s	UINT16	0–9999 (step 1)	2	Y	Voltage dip restart timeout
0x0EB1 (3762)	83 : 03 : 0C	1	1	s	UINT16	0–301 (step 1)	4	Y	Delayed restart timeout
0x0EB2 (3763)	83 : 03 : 0D	1	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Bypass STOP DI
0x0EB3 (3764)	83 : 03 : 0E	1	1	s	UINT16	0–4 (step 1)	2	Y	Immediate restart timeout
0x0EB4 (3765)	83 : 03 : 0F	1	1	s	UINT16	1–9999 (step 1)	10	Y	Load shedding timeout
0x0EB5 (3766)	83 : 03 : 10	1	–	–	–	–	–	–	Reserved

Maximum Number of Starts

The table lists the maximum number of starts for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EB6 (3767)	83 : 03 : 11	RW	1	–	UINT16	• 0: Disable • 1: Enable	1	Y	Function setting
0x0EB7 (3768)	83 : 03 : 12	RW	1	–	UINT16	1–30 (step 1)	6	Y	Permissive starts
0x0EB8 (3769)	83 : 03 : 13	RW	1	min	UINT16	15–60 (step 1)	30	Y	Reference time
0x0EB9 (3770)	83 : 03 : 14	RW	1	min	UINT16	1–120 (step 1)	5	Y	Inhibit period
0x0EBA (3771)	83 : 03 : 15	RW	1	min	UINT16	0–120 (step 1)	0	Y	Time between starts
0x0EBB (3772)	83 : 03 : 16	–	–	–	–	–	–	–	Reserved

Motor Stop Error Detection

The table lists the motor stop error detection for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/ IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EBE (3775)	83 : 03 : 19	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Function setting
0x0EBF (3776)	83 : 03 : 1A	RW	0.1	s	UINT16	1–60000 (step 1)	10	Y	Time delay
0x0EC0 (3777)	83 : 03 : 1B	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion	3	Y	Reset mode
0x0EC1 (3778)	83 : 03 : 01	–	–	–	–	–	–	–	Reserved

Device Internal

The table lists the device internal setting for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EC3 (3780)	83 : 03 : 1E	RW	1	–	UINT16	• 0: Disable • 1: Enable	1	Y	Function setting
0x0EC4 (3781)	83 : 03 : 1F	RW	0.1	Sec-onds	UINT16	–	10	Y	Time delay
0x0EC5 (3782)	83 : 03 : 20	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion	3	Y	Reset mode
0x0EC6–0x0EC7 (3783–3784)	83 : 03 : 21– 83 : 03 : 22	–	–	–	–	–	–	–	Reserved

Communication Loss

The table lists the communication loss for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EC8 (3785)	83 : 03 : 23	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0EC9 (3786)	83 : 03 : 24	RW	0.1	s	UINT16	1–60000 (step 1)	10	Y	Time delay
0x0ECA (3787)	83 : 03 : 25	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion	3	Y	Reset mode

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
						• Bit 3: Auto			
0x0ECB (3788)	83 : 03 : 26	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0ECC (3789)	83 : 03 : 27	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Trip only in remote mode

Block Output

The table lists the block output for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0ED6 (3799)	83 : 03 : 31	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Function setting
0x0ED7 (3800)	83 : 03 : 32	RW	0.01	s	UINT16	0–60000 (step 1)	0	Y	Contactor or Breaker open time
0x0ED8 (3801)	83 : 03 : 33	–	–	–	–	–	–	–	Reserved

Anti-Backspin Timer

The table lists the anti-backspin timer for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EDA (3803)	83 : 03 : 35	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Function setting
0x0EDB (3804)	83 : 03 : 36	RW	1	s	UINT16	0–60000 (step 1)	0	Y	Time delay
0x0EDC (3805)	83 : 03 : 37	–	–	–	–	–	–	–	Reserved

HMI Communication Loss

The table lists the HMI communication loss for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EDE (3807)	83 : 03 : 39	RW	1	–	UINT16	• 0: Disable • 1: Trip • 2: Alarm +Trip	0	Y	Function setting
0x0EDF (3808)	83 : 03 : 3A	RW	0.1	s	UINT16	–	10	Y	Time delay

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0EE0 (3809)	83 : 03 : 3B	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode
0x0EE1 (3810)	83 : 03 : 3C	RW	0.1	s	UINT16	–	0	Y	Auto-Reset delay
0x0EE2 (3811)	83 : 03 : 3D	–	–	–	–	–	–	–	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	Description
0x0F23–0x0F27	3876–3880	RW	Digital input 1 interlock protection settings
0x0F28–0x0F2C	3881–3885	RW	Digital input 2 interlock protection settings
0x0F2D–0x0F31	3886–3890	RW	Digital input 3 interlock protection settings
0x0F32–0x0F36	3891–3895	RW	Digital input 4 interlock protection settings
0x0F37–0x0F3B	3896–3900	RW	Digital input 5 interlock protection settings
0x0F3C–0x0F40	3901–3905	RW	Digital input 6 interlock protection settings
0x0F41–0x0F45	3906–3910	RW	Digital input 7 interlock protection settings
0x0F46–0x0F4A	3911–3915	RW	Digital input 8 interlock protection settings
0x0F4B–0x0F4F	3916–3920	RW	Digital input 9 interlock protection settings
0x0F50–0x0F54	3921–3925	RW	Digital input 10 interlock protection settings
0x0F55–0x0F59	3926–3930	RW	Digital input 11 interlock protection settings
0x0F5A–0x0F5E	3931–3935	RW	Digital input 12 interlock protection settings

Digital Input 1 Interlock Protection Settings

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

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0F23 (3876)	84 : 01 : 01	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0F24 (3877)	84 : 01 : 02	RW	0.1	s	UINT16	0–6000 (step 1)	0	Y	Time delay
0x0F25 (3878)	84 : 01 : 03	RW	1	–	BITMAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0F26 (3879)	84 : 01 : 04	RW	0.1	s	UINT16	0–6000 (step 1)	0	Y	Auto-Reset delay
0x0F27 (3880)	84 : 01 : 05	–	–	–	–	–	–	–	Reserved

Analog Input Protection Settings

Description

The TeSys Tera system supports up to four analog inputs with two LTMTAN21 expansion modules.
Each analog input protection settings are made up of eight registers. The order and the description of the settings for analog input 1 are valid for the other analog inputs.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	Description
0x0FA0–0x0FA7 (4001–4008)	84 : 02 : 01 – 84 : 02 : 08	RW	Analog input 1 protection settings
0x0FA8–0x0FAF (4009–4016)	84 : 02 : 09 – 84 : 02 : 16	RW	Analog input 2 protection settings
0x0FB0–0x0FB7 (4017-4024)	84 : 02 : 17 – 84 : 02 : 24	RW	Analog input 3 protection settings
0x0FB8–0x0FBF (4025–4032)	84 : 02 : 25 – 84 : 02 : 32	RW	Analog input 4 protection settings

Analog Input 1 Protection Settings

The table lists the registers for the analog input protection settings.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x0FA0 (4001)	84 : 02 : 01	RW	1	–	UINT16	• 0: Disable • 1: Alarm • 2: Trip • 3: Alarm and Trip	0	Y	Function setting
0x0FA1 (4002)	84 : 02 : 02	RW	1	–	UINT16	• 0: Under • 1: Over	0	Y	Detection
0x0FA2 (4003)	84 : 02 : 03	RW	0.1	mA	UINT16	40–200 (step 1)	40	Y	Pickup
0x0FA3 (4004)	84 : 02 : 04	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Time delay
0x0FA4 (4005)	84 : 02 : 05	RW	0.1	mA	UINT16	40–200 (step 1)	40	Y	Alarm
0x0FA5 (4006)	84 : 02 : 06	RW	1	–	BIT-MAP	• Bit 0: Reset key • Bit 1: DI • Bit 2: Communica-tion • Bit 3: Auto	3	Y	Reset mode
0x0FA6 (4007)	84 : 02 : 07	RW	0.1	s	UINT16	0–60000 (step 1)	0	Y	Auto-Reset delay
0x0FA7 (4008)	84 : 02 : 08	RW	1	–	UINT16	• 0: Disable • 1: Enable	0	Y	Diagnostic

Hysteresis Settings

The table lists the registers for the hysteresis settings.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x109A (4251)	84 : 04 : 01	RW	1	%	UINT16	3–15 (step 1)	3	Y	Current protection
0x109B (4252)	84 : 04 : 02	RW	1	%	UINT16	3–15 (step 1)	3	Y	Voltage protection
0x109C (4253)	84 : 04 : 03	RW	1	%	UINT16	1–15 (step 1)	3	Y	Frequency protection
0x109D (4254)	84 : 04 : 04	RW	1	%	UINT16	3–15 (step 1)	3	Y	Power protection
0x109E (4255)	84 : 04 : 05	RW	1	mA	UINT16	1–3 (step 1)	1	Y	Analog input protection
0x109F (4256)	84 : 04 : 06	RW	1	°C	UINT16	2–15 (step 1)	5	Y	Temperature protection

General Settings

What's in This Chapter

Device Configuration

The table lists the device configuration for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1117 (4376)	85 : 01 : 01	RW	1	–	UINT16	1–15	8	Y	LTMTCT/ LTMTCTV Sensor Module Type
0x1118 (4377)	85 : 01 : 02	–	–	–	–	–	–	–	Reserved
0x1119 (4378)	85 : 01 : 01	RW	1	–	UINT16	0–8	0	Y	LTMT Expansion Module 1 Type, page 130
0x111B (4380)	85 : 01 : 01	RW	1	–	UINT16	0–8	0	Y	LTMT Expansion Module 2 Type, page 130
0x111D (4382)	85 : 01 : 02	RW	1	–	UINT16	0–8	0	Y	LTMT Expansion Module 3 Type, page 130
0x111F (4384)	85 : 01 : 04	RW	1	–	UINT16	0–8	0	Y	LTMT Expansion Module 4 Type, page 130
0x1121 (4386)	85 : 01 : 06	RW	1	–	UINT16	0–8	0	Y	LTMT Expansion Module 5 Type, page 130
0x1123 (4388)	85 : 01 : 08	RW	1	–	UINT16	0–2	0	Y	LTMT main unit temperature sensor type(14): • 0: None • 1: PT100 • 2: Binary PTC
0x1124 (4389–4393)	85 : 01 : 09– 85 : 01 : 0A– 85 : 01 : 0B– 85 : 01 : 0C– 85 : 01 : 0D	–	–	–	–	–	–	–	Reserved

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

LTMT HMI Port Settings

The table lists the HMI port settings for the Modbus TCP/IP and EtherNet/IP communication.

Modbus/TCP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x112F (4400)	85 : 02 : 01	RW	1	–	UINT16	1–247 (step 1)	1	Y	Node address
0x1130 (4401)	85 : 02 : 02	RW	1	–	UINT16	0: None 1: Odd 2: Even	2	Y	Modbus parity
0x1131 (4402)	85 : 02 : 03	RW	1	bps	UINT16	0: 2400 1: 4800 2: 9600 3: 19200 4: 38400 5: 57600 6: 115200	3	Y	Baud rate
0x1132 (4403)	85 : 02 : 04	RW	1	–	UINT16	0: Default 1: Programmable	–	N	Control keys
0x1133 (4404)	85 : 02 : 05	RW	1	s	UINT16	1–6000 (step 1)	1	Y	Timeout
0x1134 (4405)	85 : 02 : 06	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

Date and Time Settings

The table lists the date and time settings for the Modbus TCP/IP and EtherNet/IP communication.

NOTE: To write date and time, update the register 4420 value to 1.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x113B (4412)	85 : 03 : 01	RW	1	–	UINT16	1–31 (step 1)	1	Y	Date
0x113C (4413)	85 : 03 : 02	RW	1	–	UINT16	1–12 (step 1)	1	Y	Month
0x113D (4414)	85 : 03 : 03	RW	1	–	UINT16	2000–2099 (step 1)	2016	Y	Year
0x113E (4415)	85 : 03 : 04	RW	1	–	UINT16	0–23 (step 1)	0	Y	Hour
0x113F (4416)	85 : 03 : 05	RW	1	–	UINT16	0–59 (step 1)	0	Y	Minute
0x1140 (4417)	85 : 03 : 06	RW	1	–	UINT16	0–59 (step 1)	0	Y	Second
0x1141 (4418)	85 : 03 : 07	–	–	–	–	–	–	–	Reserved
0x1142 (4419)	85 : 03 : 08								
0x1143 (4420)	85 : 03 : 09	RW	1	–	UINT16	0–1	0	N	Update date and time setting

Write date and time to the following Modbus holding registers with address –4412, function code 16 (multiple holding registers), No of registers –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 date and time setting	4420	0	0x0001

For more information, refer to NTP or SNTP, page 34

Starter Settings

The table lists the starter settings for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1144 (4421)	85 : 04 : 01	RW	1	–	UINT16	0: Motor 1: Heater	0	Y	Load type
0x1145 (4422)	85 : 04 : 02	RW	1	–	UINT16	0–10 (step 1)	1	Y	Starter Type, page 166
0x1146 (4423)	85 : 04 : 03	RW	1	–	UINT16	0: Disable 1: HMI 2: DI 3: Communication	0	Y	Mode selection
0x1147 (4424)	85 : 04 : 04	RW	1	–	BITMAP	Bit 0: None Bit 1: HMI Bit 2: Local DI Bit 3: Remote DI Bit 4: Communication Bit 5: Custom logic	–	Y	Local 1 start source
0x1148 (4425)	85 : 04 : 05	RW	1	–	BITMAP	Bit 0: None Bit 1: HMI Bit 2: Local DI Bit 3: Remote DI Bit 4: Communication Bit 5: Custom logic	11	Y	Local 2 start source
0x1149 (4426)	85 : 04 : 06	RW	1	–	BITMAP	Bit 0: None Bit 1: HMI Bit 2: Local DI Bit 3: Remote DI Bit 4: Communication Bit 5: Custom logic	11	Y	Local 3 start source
0x114A (4427)	85 : 04 : 07	RW	1	–	BITMAP	Bit 0: None Bit 1: HMI Bit 2: Local DI Bit 3: Remote DI Bit 4: Communication Bit 5: Custom logic	11	Y	Remote start source
0x114B (4428)	85 : 04 : 08	RW	1	–	BITMAP	Bit 0: None Bit 1: HMI Bit 2: Local DI Bit 3: Remote DI Bit 4: Communication Bit 5: Custom logic	11	Y	Local 1 stop source

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x114C (4429)	85 : 04 : 09	RW	1	–	BITMAP	Bit 0: None Bit 1: HMI Bit 2: Local DI Bit 3: Remote DI Bit 4: Communication Bit 5: Custom logic	11	Y	Local 2 stop source
0x114D (4430)	85 : 04 : 0A	RW	1	–	BITMAP	Bit 0: None Bit 1: HMI Bit 2: Local DI Bit 3: Remote DI Bit 4: Communication Bit 5: Custom logic	11	Y	Local 3 stop source
0x114E (4431)	85 : 04 : 0B	RW	1	–	BITMAP	Bit 0: None Bit 1: HMI Bit 2: Local DI Bit 3: Remote DI Bit 4: Communication Bit 5: Custom logic	11	Y	Remote stop source
0x114F (4432)	85 : 04 : 0C	RW	1	–	UINT16	0: Momentary 1: Maintained	0	Y	Local DI start input
0x1150 (4433)	85 : 04 : 0D	RW	1	–	UINT16	0: Momentary 1: Maintained	0	Y	Remote DI start input
0x1151 (4434)	85 : 04 : 0E	RW	1	–	UINT16	0: Momentary 1: Maintained	0	Y	Custom start input
0x1152 (4435)	85 : 04 : 0F	RW	1	–	UINT16	0: Bump 1: Bumpless	0	N	Mode transfer
0x1153 (4436)	85 : 04 : 10	RW	1	–	UINT16	0: Momentary 1: Maintained	0	Y	Cmmunication start input
0x1154–0x1155 (4437–4438)	85 : 04 : 11–85 : 04 : 12	–	–	–	–	–	–	–	Reserved
0x1156 (4439)	85 : 04 : 13	RW	1	–	UINT16	0: Disable 1: Enable	1	Y	Change direction
0x1157 (4440)	85 : 04 : 14	RW	0.01	s	UINT16	1–60000 (step 1)	50	Y	Feedback response time
0x1158 (4441)	85 : 04 : 15	RW	0.01	s	UINT16	1–60000 (step 1)	50	Y	Motor current sensing time
0x1159 (4442)	85 : 04 : 16	RW	0.01	s	UINT16	1–60000 (step 1)	6000	Y	Interlocking time
0x115A (4443	85 : 04 : 17	RW	0.01	s	UINT16	1–60000 (step 1)	1000	Y	Delay 1 Time in star
0x115B (4444)	85 : 04 : 18	RW	0.01	s	UINT16	1–60000 (step 1)	30	Y	Delay 2 Changeover time

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x115C (4445)	85 : 04 : 19	RW	0.01	s	UINT16	1–60000 (step 1)	1	Y	Delay 3 Main contactor turn off time
0x115D (4446)	85 : 04 : 1A	RW	0.01	s	UINT16	1–60000 (step 1)	1	Y	Delay 4 Capacitor control time
0x115E–0x1160 (4447–4449)	85 : 04 : 1B–85 : 04 : 1C–85 : 04 : 1D	–	–	–	–	–	–	–	Reserved
0x1161 (4450)	85 : 04 : 1E	RW	1	–	UINT16	0: Three phase 1: Single phase	0	Y	Number of phases
0x1162 (4451)	85 : 04 : 1F	RW	1	–	UINT16	0: DI+Current based 1: Current based	1	Y	Stop detection
0x1163 (4452)	85 : 04 : 20	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
Overload	0	–	–	–	–
Direct online	1	–	–	–	–
Reverse direct online(15)	2	–	–	–	–
Star delta	3	Time in star	Change over time	–	–

(15) The interlocking time ranges from 0.01 to 600 s.

System Settings

The table lists the system settings for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/ IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1164 (4453)	85 : 05 : 01	RW	1	A	UINT16	1–1000 (step 1)	1	Y	Phase CT primary
0x1165 (4454)	85 : 05 : 02	RW	1	A	UINT16	1–5 (step 4)	1	Y	Phase CT secondary
0x1166 (4455)	85 : 05 : 03	–	–	–	–	–	–	–	Reserved
0x1168 (4456)	85 : 05 : 04	RW	1	A	UINT16	1–1000 (step 1)	1	Y	Speed 2 CT primary
0x1169 (4457)	85 : 05 : 05	RW	1	A	UINT16	1–5 (step 4)	1	Y	Speed 2 CT secondary
0x116A–0x116C (4459–4461)	85 : 05 : 06	–	–	–	–	–	–	–	Reserved
0x116D (4462)	85 : 05 : 0A	RW	0.1	V	UINT16	1100–6900 (step 1)	4150	Y	Nominal voltage (Vn)
0x116E (4463)	85 : 05 : 0B	RW	1	–	UINT16	0: 50Hz 1: 60Hz	0	Y	Nominal frequency (Fn)
0x116F (4464)	85 : 05 : 0C	RW	1	–	UINT16	0: L123 1: L132	0	Y	Phase rotation
0x1170 (4465)	85 : 05 : 0D	RW	1	–	UINT16	0: Disable 1: Enable	0	Y	Voltage input(16)
0x1171 (4466)	85 : 05 : 0E	–	–	–	–	–	–	–	Reserved
0x1172 (4467)	85 : 05 : 0F	RW	0.1	A	UINT16	1–10000 (step 1)	25	Y	Full load current (FLC1)
0x1173 (4468)	85 : 05 : 10	RW	0.1	A	UINT16	1–10000 (step 1)	25	Y	Speed 2 full load current (FLC2)
0x1174 (4469)	85 : 05 : 11	RW	0	–	UINT16	1–10 (step 1)	1	N	Phase CT secondary passes
0x1175 (4470)	85 : 05 : 12	RW	1	–	UINT16	1–10 (step 1)	1	N	Speed 2 phase secondary passes
0x1176 (4471)	85 : 05 : 13	–	–	–	–	–	–	–	Reserved
0x1179 (4474)	85 : 05 : 16	RW	1	–	UINT16	0: Disable 1: Enable	1	Y	Test mode
0x117A (4475)	85 : 05 : 17	RW	1	–	UINT16	0: No 1: Yes	0	Y	Bypass interlocks during test

(16) Parameter applicable only for LTMTCTV sensor modules. If the voltage input parameter is disabled, TeSys Tera system will not provide voltage protections and measurements.

Motor Name Plate Details

The table lists the details of the motor name plate.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x117B (4476)	85 : 06 : 01	RW	1	–	ASCII	–	MM-R0000001	Y	Motor tag
0x1180 (4481)	85 : 06 : 06	RW	1	–	UINT16	0: kW 1: HP	0	Y	Power unit
0x1181 (4482)	85 : 06 : 07	RW	0.1	kW	UINT16	0–65535 (step 1)	1	Y	Nominal power (KW)
0x1182 (4483)	85 : 06 : 08	RW	0.1	HP	UINT16	0–65535 (step 1)	1	Y	Nominal power (HP)
0x1183 (4484)	85 : 06 : 09	RW	1	–	UINT16	0: °C 1: °F	0	Y	Temperature unit
0x1184–0x118B (4485–4491)	85 : 06 : 0A	–	–	–	–	–	–	–	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 modules.

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.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	No.	Description	DI location
0x1194 (4501)	86 : 01 : 01	3	Digital input 1 settings	DI1 on LTMT main unit
0x1197 (4504)	86 : 01 : 04	3	Digital input 2 settings	DI2 on LTMT main unit
0x119A (4507)	86 : 01 : 07	3	Digital input 3 settings	DI3 on LTMT main unit
0x119D (4510)	86 : 01 : 0A	3	Digital input 4 settings	DI4 on LTMT main unit
0x11A0 (4513)	86 : 01 : 0D	3	Digital input 5 settings	DI5 on LTMT expansion module
0x11A3 (4516)	86 : 01 : 10	3	Digital input 6 settings	DI6 on LTMT expansion module
0x11A6 (4519)	86 : 01 : 13	3	Digital input 7 settings	DI7 on LTMT expansion module
0x11A9 (4522)	86 : 01 : 16	3	Digital input 8 settings	DI8 on LTMT expansion module
0x11AC (4525)	86 : 01 : 19	3	Digital input 9 settings	DI9 on LTMT expansion module
0x11AF (4528)	86 : 01 : 1C	3	Digital input 10 settings	DI10 on LTMT expansion module
0x11B2 (4531)	86 : 01 : 1F	3	Digital input 11 settings	DI11 on LTMT expansion module
0x11B5 (4534)	86 : 01 : 22	3	Digital input 12 settings	DI12 on LTMT expansion module
0x11B8 (4537)	86 : 01 : 25	3	Digital input 13 settings	DI13 on LTMT expansion module
0x11BB (4540)	86 : 01 : 28	3	Digital input 14 settings	DI14 on LTMT expansion module
0x11BE (4543)	86 : 01 : 2B	3	Digital input 15 settings	DI15 on LTMT expansion module
0x11C1 (4546)	86 : 01 : 2E	3	Digital input 16 settings	DI16 on LTMT expansion module
0x11C4 (4549)	86 : 01 : 31	3	Digital input 17 settings	DI17 on LTMT expansion module
0x11C7 (4552)	86 : 01 : 34	3	Digital input 18 settings	DI18 on LTMT expansion module

Modbus TCP/IP Address (Register)	EtherNet/IP Address	No.	Description	DI location
0x11CA (4555)	86 : 01 : 37	3	Digital input 19 settings	DI19 on LTMT expansion module
0x11CD (4558)	86 : 01 : 3A	3	Digital input 20 settings	DI20 on LTMT expansion module
0x11D0 (4561)	86 : 01 : 3D	3	Digital input 21 settings	DI21 on LTMT expansion module
0x11D3 (4564)	86 : 01 : 40	3	Digital input 22 settings	DI22 on LTMT expansion module
0x11D6 (4567)	86 : 01 : 43	3	Digital input 23 settings	DI23 on LTMT expansion module
0x11D9 (4570)	86 : 01 : 46	3	Digital input 24 settings	DI24 on LTMT expansion module
0x11DC (4573)–0x11F1 (4594	86 : 01 : 49– 86 : 01 : 5E	–	–	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 module are defined according to the LTMT expansion module configuration.

Example:

If the TeSys Tera system is composed of:

- One LTMT main unit.
- One LTMTIN42BD expansion module or LTMTIN42FM expansion module with four digital inputs, configured as expansion module 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 DI5 to DI8 on the LTMTIN42BD expansion module or LTMTIN42FM expansion module.

Digital Input 1 Settings

The table lists the registers for the digital input settings.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1194 (4501)	86 : 01 : 01	RW	1	–	UINT16	0: Active high 1: Active low	0	Y	Digital input 1 trigger type
0x1195 (4502)	86 : 01 : 02	RW	1	–	UINT16	0–38 (step 1)	4	Y	DI Input Source, page 170
0x1196 (4503)	86 : 01 : 03	RW	1	ms	UINT16	0–60000 (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	Soft Starter Reset DI
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 modules.

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.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	Description	
0x1211 (4626)	86 : 02 : 01	Digital output 1 settings	DO1 on LTMT main unit
0x1216 (4631)	86 : 02 : 06	Digital output 2 settings	DO2 on LTMT main unit
0x121B (4636)	86 : 02 : 0B	Digital output 3 settings	DO3 on LTMT main unit
0x1220 (4641)	86 : 02 : 10	Digital output 4 settings	DO4 on LTMT expansion module
0x1225 (4646)	86 : 02 : 15	Digital output 5 settings	DO5 on LTMT expansion module
0x122A (4651)	86 : 02 : 1A	Digital output 6 settings	DO6 on LTMT expansion module
0x122F (4656)	86 : 02 : 1F	Digital output 7 settings	DO7 on LTMT expansion module
0x1234 (4661)	86 : 02 : 24	Digital output 8 settings	DO8 on LTMT expansion module
0x1239 (4666)	86 : 02 : 29	Digital output 9 settings	DO9 on LTMT expansion module
0x123E (4671)	86 : 02 : 2E	Digital output 10 settings	DO10 on LTMT expansion module
0x1242 (4675)	86 : 02 : 32	Digital output 11 settings	DO11 on LTMT expansion module
0x1243 (4676)	86 : 02 : 33	Digital output 12 settings	DO12 on LTMT expansion module
0x1248 (4681)	86 : 02 : 38	Digital output 13 settings	DO13 on LTMT expansion module
0x124D (4686)	86 : 02 : 3D	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 module are defined according to the expansion module configuration.

Example:

If the TeSys Tera system is composed of:

- One LTMT main unit.
- One LTMTIN42BD expansion module or LTMTIN42FM expansion module with two digital outputs, configured as expansion module 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 DO4 and DO5 on the LTMTIN42BD expansion module or LTMTIN42FM expansion module.

Digital Output 1 Settings

The table lists the registers for the digital output settings.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	No.	Function code	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1211 (4626)	86 : 02 : 01	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Active high 1: Active low	0	Y	Digital output 1 active type
0x1212 (4627)	86 : 02 : 02	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0–65535 (step 1)	504	Y	Digital output 1 input source, page 174
0x1213 (4628)	86 : 02 : 03	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0–12 (step 1)	7	Y	Digital output 1 tag, page 173
0x1214 (4629)	86 : 02 : 04	1	0x03, 0x06, 0x10	RW	1	–	UINT16	0: Level 1: Pulse	0	Y	Digital output 1 output type
0x1215 (4630)	86 : 02 : 05	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
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

Register value	Digital output input source
53–231	Reserved
232	Pickup status
233	Alarm status
234	Trip Status
235	Motor stop error detection
236	Device internal error detected
237	Block Output
238–247	Reserved
248	Motor Stop
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
289–295	Reserved
296	Thermal overload pickup
297	Locked rotor pickup
298	Stalled rotor pickup
299	Definite time overcurrent pickup
300	Normal inverse overcurrent pickup

Register value	Digital output input source
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
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
321–327	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

Register value	Digital output input source
349	Over temperature trip
350	Under power trip
351	Over power trip
352	Under power factor trip
353–359	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

Register value	Digital output input source
404–503	Reserved
504	CONTACTOR OUTPUT 1
505	CONTACTOR OUTPUT 2
506	CONTACTOR OUTPUT 3
507	CONTACTOR OUTPUT 4
508	CONTACTOR OUTPUT 5
509–534	Reserved
535	Motor Stop
536	Motor Forward Running
537	Motor Reverse Running
538–539	Reserved
540	Motor Running in Star
541	Motor Running in Delta
542	Motor Changeover
543–551	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
601	Local DI Stop Inhibit
602	Remote DI Stop Inhibit
603	Communication Stop Inhibit
604	Forced Stop Inhibit

Register value	Digital output input source
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	LTMT expansion module communication error detected
618	HMI communication error detected
619	EEPROM interface error detected
620	EEPROM checksum error detected
621	Configuration error detected
622	Reserved
623	Internal temperature error detected
624	Watchdog timeout detected
625–626	Reserved
627	Input out of range detected
628	Energy Register Overflow
629	Error detected during LTMT expansion module initialization
630–647	Reserved
648	Watchdog timeout detected
649	ADC conversion error detected
650	Flash error detected
651	UART error detected
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
664–65534	Reserved
65535	Custom logic

Analog Output Settings

The TeSys Tera system supports up to two analog outputs with two LTMTAN21 expansion modules.

The settings of each analog output are made up of five registers.

The characteristics (Range, Unit, and X) of the setting registers depend on the analog output source selected. Refer to Analog Output Source Settings, page 180.

Modbus TCP/ IP Address (Register)	EtherNet/IP Address	RW	Type	Default value	Svd	Description
0x128E (4751)	86 : 03 : 01	RW	UINT16	0	Y	AO1 source
0x128F (4752)	86 : 03 : 02	–	–	–	–	Reserved
0x1290 (4753)	86 : 03 : 03	RW	UINT16	0	Y	AO1 source minimum range
0x1291 (4754)	86 : 03 : 04	–	–	–	–	Reserved
0x1292 (4755)	86 : 03 : 05	RW	UINT16	0	Y	AO1 source maximum range
0x1293–0x1298 (4756–4761)	86 : 03 : 06	–	–	–	–	Reserved
0x1299 (4762)	86 : 03 : 0C	RW	UINT16	0	Y	AO2 source
0x129A (4763)	86 : 03 : 0D	–	–	–	–	Reserved
0x129B (4764)	86 : 03 : 0E	RW	UINT16	0	Y	AO2 source minimum range
0x129C (4765)	86 : 03 : 0F	–	–	–	–	Reserved
0x129D (4766)	86 : 03 : 10	RW	UINT16	0	Y	AO2 source maximum range
0x129E–0x12A3 (4767–4772)	86 : 03 : 11	–	–	–	–	Reserved

Analog Output Source Settings

The table lists the minimum and maximum setting values for each analog output source.

Analog Output source	Value	AO source minimum range	AO source maximum range	X	Unit
None	0	–	–	–	–
L1 RMS current	1	10	1000	1	%FLC1
L2 RMS current	2	10	1000	1	%FLC1
L3 RMS current	3	10	1000	1	%FLC1
Average current	4	10	1000	1	%FLC1
L1-L2 RMS voltage	5	20	150	1	%Vn
L2-L3 RMS voltage	6	20	150	1	%Vn
L3-L1 RMS voltage	7	20	150	1	%Vn
Average voltage	8	20	150	1	%Vn
System frequency	9	50	150	1	%Fn
Total active power	10	20	1000	1	%Pn
Total apparent power	11	20	1000	1	%Pn

EtherNet/IP Settings

What's in This Chapter

Port Configuration

The table lists the port configuration for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x130B (4876)	88 : 01 : 01	RW	1	N/A	UINT16	0: Modbus TCP/IP 1: EtherNet/IP	1	Y	Protocol selection
0x130C (4877)	88 : 01 : 02	RW	1	N/A	UINT16	0: RSTP 1: DLR 1: MRP	0	Y	Reserved
0x130D (4878)	88 : 01 : 03	RW	1	N/A	UINT16	0: Tera Profile 1: Tera Basic Overload 2: Tera Extended Overload 3: Tera Basic Motor Starter 4: Tera Extended Contactor 5: Tera Extended Motor Starter 1 6: Tera Extended Motor Starter 2 7: Tera LTMT Control and Monitoring 8: Tera PKW 9: Tera PKW and Extended Motor Starter 10: Tera PKW and LTMT Management 11: Tera E_TeSys Tera Fast Access 12: Tera EIOS_TeSys Tera	0	Y	EIP Device Profile Selection(17)
0x130E (4879)	88 : 01 : 04	RW	1	N/A	UINT16	0–255 (step 1)	169	Y	IP address Byte 3
0x130F (4880)	88 : 01 : 05	RW	1	N/A	UINT16	0–255 (step 1)	254	Y	IP address Byte 2
0x1310 (4881)	88 : 01 : 06	RW	1	N/A	UINT16	0–255 (step 1)	2nd Last Byte of MAC	Y	IP address Byte 1
0x1311 (4882)	88 : 01 : 07	RW	1	N/A	UINT16	0–255 (step 1)	Last Byte Of MAC	Y	IP address Byte 0
0x112I (4883)	88 : 01 : 08	RW	1	N/A	UINT16	0–255 (step 1)	255	Y	Subnet Mask Byte 3
0x1313 (4884)	88 : 01 : 09	RW	1	N/A	UINT16	0–255 (step 1)	255	Y	Subnet Mask Byte 2
0x1314 (4885)	88 : 01 : 0A	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	Subnet Mask Byte 1
0x1315 (4886)	88 : 01 : 0B	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	Subnet Mask Byte 0

(17) To change the EIP profile, use the acyclic communication EtherNet/IP profile address 0x88: 0x01: 0x03.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1316 (4887)	88 : 01 : 0C	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	Default gateway Byte 3
0x1317 (4888)	88 : 01 : 0D	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	Default gateway Byte 2
0x1318 (4889)	88 : 01 : 0E	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	Default gateway Byte 1
0x1319 (4890)	88 : 01 : 0F	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	Default gateway Byte 0
0x131A (4891)	88 : 01 : 10	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	NTP/SNTP primary server Byte 3
0x131B (4892)	88 : 01 : 11	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	NTP/SNTP primary server Byte 2
0x131C (4893)	88 : 01 : 12	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	NTP/SNTP primary server Byte 1
0x131D (4894)	88 : 01 : 13	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	NTP/SNTP primary server Byte 0
0x131E (4895)	88 : 01 : 14	RW	1	N/A	UINT16	0–2 (step 1)	0	Y	SNTP selection
0x131F (4896)	88 : 01 : 15	RW	1	N/A	UINT16	1–28 (step 1)	19	N	SNTP Time Zone
0x1320 (4897)	88 : 01 : 16	RW	1	N/A	UINT16	0–2 (step 1)	0	Y	IP Configuration
0x1321 (4898)	88 : 01 : 17	RW	1	N/A	UINT16	0–1 (step 1)	0	N	Modbus TCP/ IP Endian Selection
0x1322 (4899)	88 : 01 : 18	RW	1	N/A	UINT16	-	255	N	Modbus TCP/ IP Unit ID

HTTPS

The table lists the HTTPS for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1373 (4980)	85 : 01 : 69	RW	1	N/A	UINT16	0–0 (step 1)	0	Y	Reserved
0x1372 (4981)	85 : 01 : 6A	RW	1	N/A	UINT16	0–65535 (step 1)	443	Y	Port number

DPWS

The table lists the DPWS for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1375 (4982)	88 : 01 : 6B	RW	N/A	N/A	UINT16	0: Disable 1: Enable	0	Y	Enable/disable
0x1376 (4983)	88 : 01 : 6C	RW	1	N/A	UINT16	0: Silent 1: Non Silent	0	Y	Silent Mode
0x1377 (4984)	88 : 01 : 6D	RW	1	N/A	UINT16	(18)	5357	Y	Port foot note : port no

Communication Configuration

The table lists the communication configuration for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x137B (4988)	88 : 01 : 71	RW	1	N/A	UINT16	0–255 (step 1)	192	Y	client IP Address - Byte 3
0x137C (4989)	88 : 01 : 72	RW	1	N/A	UINT16	0–255 (step 1)	168	Y	client IP Address - Byte 2
0x137D (4990)	88 : 01 : 73	RW	1	N/A	UINT16	0–255 (step 1)	1	Y	client IP Address - Byte 1
0x137E (4991)	88 : 01 : 74	RW	1	N/A	UINT16	0–255 (step 1)	100	Y	client IP Address - Byte 0
0x137F (4992)	88 : 01 : 75	RW	1	N/A	UINT16	0–100 (step 1)	2	Y	Communica-tion timeout
0x1380 (4993)	88 : 01 : 76	RW	1	N/A	UINT16	0: Both Pri and Sec as Str name 1: Pri as IP and Sec as Str name 2: Pri as Str name and Sec as IP	0	Y	Numeric or String for NTP Primary and Secondary for internal Purpose

(18) Port number = 5357

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
						3: Pri as IP and Sec as IP			
0x1381 (4994)	88 : 01 : 77	RW	1	N/A	UINT16	1–65535 (step 1)	502	Y	Modbus TCP port
0x1382 (4995)	88 : 01 : 78	RW	1	N/A	UINT16	0: Disable 1: Enable	0	Y	Broadcast Storm Protection Enable/ Disable
0x1383 (4996)	88 : 01 : 79	RW	1	N/A	UINT16	0: lowest (Display Name and not rate) 1000 packets/ seconds 1: low: 2000 packets/ seconds 2: Medium Low: 3000 packets/seconds 3: Medium High 4: High 5 - Highest	0	Y	Broadcast Storm Protection

IP address allowlist

The table lists the IP address for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1384 (4997)	88 : 01 : 7A	RW	1	N/A	UINT16	0: Disable 1: Enable	0	Y	IP filter selection

IP Filtering Global Access List

The table lists the IP Filtering Global Access for the Modbus TCP/IP and EtherNet/ IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x1385 (4998)	88 : 01 : 7B	RW	1	N/A	UINT16	0: None 1: Read/ Write	0	Y	Access Level for first IP allow list
0x1386 (4999)	88 : 01 : 7C	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range1 address - Byte 3
0x1387 (5000)	88 : 01 : 7D	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range1 address - Byte 2
0x1388 (5001)	88 : 01 : 7E	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range1 address - Byte 1
0x1389 (5002)	88 : 01 : 7F	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range1 address - Byte 0
0x138A (5003)	88 : 01 : 80	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	NTP/SNTP secondary server Byte 3

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x138B (5004)	88 : 01 : 81	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	NTP/SNTP secondary server Byte 2
0x138C (5005)	88 : 01 : 82	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	NTP/SNTP secondary server Byte 1
0x138D (5006) –	88 : 01 : 83	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	NTP/SNTP secondary server Byte 0

IP Filtering Exceptional List

The table lists the IP Filtering Exceptional List for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x138E (5007)	88 : 01 : 84	RW	1	N/A	UINT16	1: None 1: Read/ Write	0	Y	Access Level for first IP
0x138F (5008)	88 : 01 : 85	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range1 address - Byte 3
0x1390 (5009)	88 : 01 : 86	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range1 address - Byte 2
0x1391 (5010)	88 : 01 : 87	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range1 address - Byte 1
0x1392 (5011)	88 : 01 : 88	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range1 address - Byte 0
0x1393 (5012)	88 : 01 : 89	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	DNS Primary Server address Byte 3
0x1394 (5013)	88 : 01 : 8A	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	DNS Primary Server address Byte 2
0x1395 (5014)	88 : 01 : 8B	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	DNS Primary Server address Byte 1
0x1396 (5015)	88 : 01 : 8C	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	DNS Primary Server address Byte 0
0x1397 (5016)	88 : 01 : 8D	RW	1	N/A	UINT16	1: None 1: Read/ Write	0	Y	Access Level for second IP
0x1398 (5017)	88 : 01 : 8E	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range3 address - Byte 3
0x1399 (5018)	88 : 01 : 8F	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range3 address - Byte 2
0x139A (5019)	88 : 01 : 90	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range3 address - Byte 1
0x139B (5020)	88 : 01 : 91	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range3 address - Byte 0
0x139C (5021)	88 : 01 : 92	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	DNS Secondary Server address Byte 3
0x139D (5022)	88 : 01 : 93	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	DNS Secondary Server address Byte 2

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x139E (5023)	88 : 01 : 94	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	DNS Secondary Server address Byte 1
0x139F (5024)	88 : 01 : 95	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	DNS Secondary Server address Byte 0
0x13A0 (5025)	88 : 01 : 96	RW	1	N/A	UINT16	1: None 1: Read/ Write	0	Y	Access Level for fourth IP
0x13A1 (5026)	88 : 01 : 97	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range4 address - Byte 3
0x13A2 (5027)	88 : 01 : 98	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range4 address - Byte 2
0x13A3 (5028)	88 : 01 : 99	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range4 address - Byte 1
0x13A4 (5029)	88 : 01 : 9A	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range4 address - Byte 0
0x13A5 (5030)	88 : 01 : 9B	RW	1	N/A	UINT16	-	0	Y	reserved
0x13A6 (5031)	88 : 01 : 9C	RW	1	N/A	UINT16	-	0	Y	reserved
0x13A7 (5032)	88 : 01 : 9D	RW	1	N/A	UINT16	-	0	Y	reserved
0x13A8 (5033)	88 : 01 : 9E	RW	1	N/A	UINT16	-	0	Y	reserved
0x13A9 (5034)	88 : 01 : 9F	RW	1	N/A	UINT16	1: None 1: Read/ Write	0	Y	Access Level for fourth IP
0x13AA (5035)	88 : 01 : A0	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range5 address - Byte 3
0x13AB (5036)	88 : 01 : A1	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range5 address - Byte 2
0x13AC (5037)	88 : 01 : A2	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range5 address - Byte 1
0x13AD (5038)	88 : 01 : A3	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range5 address - Byte 0
0x13AE (5039)	88 : 01 : A4	RW	1	N/A	UINT16	-	0	Y	reserved
0x13AF (5040)	88 : 01 : A5	RW	1	N/A	UINT16	-	0	Y	reserved
0x13B0 (5041)	88 : 01 : A6	RW	1	N/A	UINT16	-	0	Y	reserved
0x13B1 (5042)	88 : 01 : A7	RW	1	N/A	UINT16	-	0	Y	reserved
0x13B2 (5043)	88 : 01 : A8	RW	1	N/A	UINT16	1: None 1: Read/ Write	0	Y	Access Level for fifth IP
0x13B3 (5044)	88 : 01 : A9	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range5 address - Byte 3
0x13B4 (5045)	88 : 01 : AA	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range5 address - Byte 2
0x13B5 (5046)	88 : 01 : AB	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range5 address - Byte 1
0x13B6 (5047)	88 : 01 : AC	RW	1	N/A	UINT16	0–255 (step 1)	0	Y	IP allowlist range5 address - Byte 0
0x13B7 (5048)	88 : 01 : AD	RW	1	N/A	UINT16	-	0	Y	reserved
0x13B8 (5049)	88 : 01 : AE	RW	1	N/A	UINT16	-	0	Y	reserved
0x13B9 (5050)	88 : 01 : AF	RW	1	N/A	UINT16	-	0	Y	reserved
0x13BA (5051)	88 : 01 : B0	RW	1	N/A	UINT16	-	0	Y	reserved

Modbus Enable or Disable Setting

The table lists the Modbus enable or disable settings for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x13CF (5072)	88 : 01 : C5	RW	1	N/A	UINT16	0: Disable 1: Enable	1	Y	Modbus HMI Selection
0x13D0 (5073)	88 : 01 : C6	RW	1	N/A	UINT16	0: Disable 1: Enable	1	Y	Modbus TCP Selection

Daylight Saving Settings

The table lists the Daylight Saving Settings for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x13D1 (5074)	88 : 01 : C7	RW	1	N/A	UINT16	0: Disable 1: Enable	0	Y	Daylight Saving Selection
0x13D2 (5075)	88 : 01 : C8	RW	1	N/A	UINT16	1–5 (step 1)	1	Y	Start Day
0x13D3 (5076)	88 : 01 : C9	RW	1	N/A	UINT16	1: Sunday 2: Monday 3: Tuesday 4: Wednes-day 5: Thursday 6: Friday 7: Saturday	1	Y	Start Week
0x13D4 (5077)	88 : 01 : CA	RW	1	N/A	UINT16	1–12 (step 1)	1	Y	Start Month
0x13D5 (5078)	88 : 01 : CB	RW	1	N/A	UINT16	0–23 (step 1)	0	Y	Start Time
0x13D6 (5079)	88 : 01 : CC	RW	1	N/A	UINT16	1–5 (step 1)	1	Y	End Day
0x13D7 (5080)	88 : 01 : CD	RW	1	N/A	UINT16	1: Sunday 2: Monday 3: Tuesday 4: Wednes-day 5: Thursday 6: Friday 7: Saturday	1	Y	End Week

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x13D8 (5081)	88 : 01 : CE	RW	1	N/A	UINT16	1–12 (step 1)	1	Y	End Month
0x13D9 (5082)	88 : 01 : CF	RW	1	N/A	UINT16	0–23 (step 1)	0	Y	End Time

Primary and Secondary NTP or SNTP Server Name

The table lists the Primary and Secondary NTP or SNTP server name for the Modbus TCP/IP and EtherNet/IP communication.

Modbus TCP/IP Address (Register)	EtherNet/ IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x13DA (5083)	88 : 01 : D0	RW	1	N/A	UINT16	0–65535 (step 1)	1	Y	primary server name (NTP/ SNTP)
0x13EA (5099)	88 : 01 : E0	RW	1	N/A	UINT16	0–65535 (step 1)	0	Y	Secondary server name (NTP/ SNTP)
0x13FA (5115)	88 : 01 : F0	RW	1	N/A	UINT16	0: Obtain IP from DHCP/ BOOTP 1: Manual	0	Y	DNS Enable Disable
0x13FB (5116)	88 : 01 : F1	RW	1	N/A	UINT16	-	169	Y	reserved

Ethernet Diagnostic Data

What's in This Chapter

Ethernet Global Statistics

The table lists the Ethernet global statistics for the Modbus TCP/IP communication.

Modbus TCP/IP Address (Register)	RW	X	Unit	Range	Default value	Svd	Description
0xA7F8 (43001)	R	1	–	0–4294967295	–	–	Frames Received OK
0xA7FA (43003)	R	1	–	0–4294967295	–	–	Frames Transmitted OK
0xA7FC (43005)	R	1	–	0–4294967295	–	–	Reception Error
0xA7FE (43007)	R	1	–	0–4294967295	–	–	Transmission Errors

Port 1 Statistics

The table lists the port 1 statistic for the Modbus TCP/IP communication.

Modbus TCP/IP Address (Register)	RW	X	Unit	Range	Default value	Svd	Description
0xA800 (43009)	R	1	–	0: 100 Mbps 1: 10 Mbps 2: Auto Negotiation 3: NA	0	–	Link Speed
0xA801 (43010)	R	1	–	0: Full Duplex 1: Half Duplex 2: Auto Negotiation 3: NA	0	–	Duplex

Port 2 Statistics

The table lists the port 2 statistic for the Modbus TCP/IP communication.

Modbus TCP/IP Address (Register)	RW	X	Unit	Range	Default value	Svd	Description
0xA802 (43011)	R	1	–	0: 100 Mbps 1: 10 Mbps 2: Auto Negotiation 3: NA	0	–	Link Speed
0xA803 (43012)	R	1	–	0: Full Duplex 1: Half Duplex 2: Auto Negotiation 3: NA	0	–	Duplex

Modbus TCP Global Diagnostics

The table lists the Modbus TCP global diagnostics for the Modbus TCP/IP communication.

Modbus TCP/IP Address (Register)	RW	X	Unit	Range	Default value	Svd	Description
0xA804 (43013)	R	1	–	0–1	–	–	Port Status
0xA805 (43014)	R	1	–	0–1	–	–	Open TCP Connection
0xA806 (43015)	R	1	–	0–4294967295	–	–	Total Received Messages
0xA8048 (43017)	R	1	–	0–4294967295	–	–	Total Transmitted Messages

Modbus TCP Port Diagnostics

The table lists the Modbus TCP global diagnostics for the Modbus TCP/IP communication.

Modbus TCP/IP Address (Register)	RW	X	Unit	Range	Default value	Svd	Description
0xA80A (43019)	R	1	–	0–4294967295	–	–	Connection 1 Remote IP
0xA80C (43021)	R	1	–	0–65536	–	–	Connection 1 Remote port
0xA80D (43022)	R	1	–	0–65535	–	–	Connection 1 Local Port
0xA80E (43023)	R	1	–	0–4294967295	–	–	Connection 1 Received Messages
0xA810 (43025)	R	1	–	0–4294967295	–	–	Connection 1 Transmitted Messages
0xA812 (43027)	R	1	–	0–4294967295	–	–	Connection 1 Sent Errors
0xA814 (43029)	R	1	–	0–4294967295	–	–	Connection 2 Remote IP
0xA816 (43031)	R	1	–	0–65536	–	–	Connection 2 Remote port
0xA817 (43032)	R	1	–	0–65535	–	–	Connection 2 Local Port
0xA818 (43033)	R	1	–	0–4294967295	–	–	Connection 2 Received Messages
0xA81A (43035)	R	1	–	0–4294967295	–	–	Connection 2 Transmitted Messages
0xA81C (43037)	R	1	–	0–4294967295	–	–	Connection 2 Sent Errors
0xA81E (43039)	R	1	–	0–4294967295	–	–	Connection 3 Remote IP
0xA820 (43041)	R	1	–	0–65536	–	–	Connection 3 Remote port
0xA821 (43042)	R	1	–	0–65535	–	–	Connection 3 Local Port
0xA822 (43043)	R	1	–	0–4294967295	–	–	Connection 3 Received Messages
0xA824 (43045)	R	1	–	0–4294967295	–	–	Connection 3 Transmitted Messages
0xA826 (43047)	R	1	–	0–4294967295	–	–	Connection 3 Sent Errors
0xA828 (43049)	R	1	–	0–4294967295	–	–	Connection 4 Remote IP
0xA82A (43051)	R	1	–	0–65536	–	–	Connection 4 Remote port
0xA82B (43052)	R	1	–	0–65535	–	–	Connection 4 Local Port
0xA82C (43053)	R	1	–	0–4294967295	–	–	Connection 4 Received Messages
0xA82E (43055)	R	1	–	0–4294967295	–	–	Connection 4 Transmitted Messages
0xA830 (43057)	R	1	–	0–4294967295	–	–	Connection 4 Sent Errors
0xA832 (43059)	R	1	–	0–4294967295	–	–	Connection 5 Remote IP
0xA834 (43061)	R	1	–	0–65536	–	–	Connection 5 Remote port
0xA835 (43062)	R	1	–	0–65535	–	–	Connection 5 Local Port

Modbus TCP/IP Address (Register)	RW	X	Unit	Range	Default value	Svd	Description
0xA836 (43063)	R	1	–	0–4294967295	–	–	Connection 5 Received Messages
0xA838 (43065)	R	1	–	0–4294967295	–	–	Connection 5 Transmitted Messages
0xA83A (43067)	R	1	–	0–4294967295	–	–	Connection 5 Sent Errors
0xA83C (43069)	R	1	–	0–4294967295	–	–	Connection 6 Remote IP
0xA83E (43071)	R	1	–	0–65536	–	–	Connection 6 Remote port
0xA83F (43072)	R	1	–	0–65535	–	–	Connection 6 Local Port
0xA840 (43073)	R	1	–	0–4294967295	–	–	Connection 6 Received Messages
0xA842 (43075)	R	1	–	0–4294967295	–	–	Connection 6 Transmitted Messages
0xA844 (43077)	R	1	–	0–4294967295	–	–	Connection 6 Sent Errors
0xA846 (43079)	R	1	–	0–4294967295	–	–	Connection 7 Remote IP
0xA848 (43081)	R	1	–	0–65536	–	–	Connection 7 Remote port
0xA849 (43082)	R	1	–	0–65535	–	–	Connection 7 Local Port
0xA84A (43083)	R	1	–	0–4294967295	–	–	Connection 7 Received Messages
0xA84C (43085)	R	1	–	0–4294967295	–	–	Connection 7 Transmitted Messages
0xA84E (43087)	R	1	–	0–4294967295	–	–	Connection 7 Sent Errors
0xA850 (43089)	R	1	–	0–4294967295	–	–	Connection 8 Remote IP
0xA852 (43091)	R	1	–	0–65536	–	–	Connection 8 Remote port
0xA853 (43092)	R	1	–	0–65535	–	–	Connection 8 Local Port
0xA854 (43093)	R	1	–	0–4294967295	–	–	Connection 8 Received Messages
0xA856 (43095)	R	1	–	0–4294967295	–	–	Connection 8 Transmitted Messages
0xA858 (43097)	R	1	–	0–4294967295	–	–	Connection 8 Sent Errors

Modbus RTU Diagnostics

The table lists the Modbus RTU diagnostics for the Modbus TCP/IP communication.

Modbus TCP/IP Address (Register)	RW	X	Unit	Range	Default value	Svd	Description
0xA85A (43099)	R	1	–	0–4294967295	–	–	Frames Received
0xA85C (43101)	R	1	–	0–4294967295	–	–	Frames Transmitted
0xA85E (43103)	R	1	–	0: 2400 1: 4800 2: 9600 3: 19200 4: 38400 5: 57600 6: 115200	–	–	Baud rate
0xA85F (43104)	R	1	–	0: None 1: Odd 2: Even	–	–	Parity
0xA860 (43105)	R	1	–	0: 0 1: 1 2: 2	–	–	Stop Bit
0xA861 (43106)	R	1	–	1–247	–	–	Server ID

Date Time Statistics

The table lists the date time statistics for the Modbus TCP/IP communication.

Modbus TCP/IP Address (Register)	RW	X	Unit	Range	Default value	Svd	Description
0xA894 (43157)	R	1	–	0: Manual 1: NTP 2: FB	–	–	Time Source
0xA895 (43158)	R	1	–	0–1	–	–	Last Synchronized
0xA89B (43164)	R	1	–	0: Not synchronized 1: Synchronised	–	–	NTP Synchronization status

Syslog

What's in This Chapter

Overview

Syslog is a standardized protocol used to record and transmit log messages from systems, devices, and applications. It defines a consistent format for capturing system events, facilitating easier monitoring, troubleshooting, and security management.

Table Format

The TeSys Tera system supports the following Syslog data formats. The data tables have the following columns:

Severity	Version	Time-Stamp	HostName	AppName	PROCID	MsgID	Sequen-ceID	Structured Data	Description

Designation	Description
Severity	Indicates the urgency of the message. The values range from 0 (Emergency) to 7 (Debug)
Version	Specifies the version of the Syslog protocol
TimeStamp	Date and time when the message was generated
HostName	Name of the host system generating the log message
AppName	Name of the application generating the log message
PROCID	Process ID of the application that generated the message
MsgID	Unique identifier for the type of message
SequenceID	Additional identifier for the event type
Structured Data	Structured metadata or contextual information about the event
Description	Actual content or message body describing the event

Syslog Types

The following list shows the different types of Syslog messages that may be generated.

Syslog Types	Description
Web server login	Successful login to the standard web server
Web server logout	Manual logout or timed logout after a predefined period of inactivity elapses
Create new password	Create new password
Modify password	Modify new password
Upload configuration	Uploading configuration
Downloading configuration	Downloading configuration
View audit log	Downloading or viewing of audit log
Downloading audit log	Downloading or viewing of audit log
Login failed	Invalid credentials or invalid certificate
Unauthorized access	Any authorized and unauthorized operation request sent to the device
Audit storage capacity full	Storage capacity full
Three unsuccessful password entries	Unsuccessful login attempts due to several incorrect password entries

Syslog Types	Description
Invalid configuration attempt	Attempted use of unauthorized configuration software
Firmware update	A new firmware has been successfully verified and installed. After firmware upgrade or downgrade, new version log will be updated before reboot
Invalid firmware update	A new firmware is not installed due to error. Standardized errors are specified in event result (MSG).
Modification of the time of the device	A user request to change date and time
Configuration change (outside cybersecurity)	A new non-cybersecurity configuration has been successfully uploaded, verified and changed. Standardized objects are PLC application and standard web server
Invalid configuration (outside cybersecurity)	A new non-cybersecurity configuration is uninstalled due to an error. Standardized errors are specified in event result (MSG)
Startup	Restarting of the component after power interruption or outage, reboot or power-up sequence
Factory reset	Factory reset command is executed
Factory reset failure	Factory reset command is not processed successfully
Commands	Command processed by device. Commands are specified in event result (MSG)

For information on accessing a Syslog file, refer to Syslog Page, page 264.

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.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	Description
0x1770 (6001–6032)	82 : 01: 01 – 82 : 01 : 32	Trip log 1 (most recent log)
0x1790 (6033–6064)	82 : 02 : 01 – 82 : 02 : 32	Trip log 2
0x17B0 (6065–6096)	82 : 03: 01 – 82 : 03 : 32	Trip log 3
0x17D0 (6097–6128)	82 : 04: 01 – 82 : 04 : 32	Trip log 4
0x17F0 (6129–6160)	82 : 05: 01 – 82 : 05 : 32	Trip log 5
0x1810 (6161–6192)	82 : 06: 01 – 82 : 06 : 32	Trip log 6
0x1830 (6193–6224)	82 : 07: 01 – 82 : 07 : 32	Trip log 7
0x1850 (6225–6256)	82 : 08: 01 – 82 : 08 : 32	Trip log 8
0x1870 (6257–6288)	82 : 09: 01 – 82 : 09 : 32	Trip log 9
0x1890 6289–6320()	82 : 10 : 01 – 82 : 10 : 32	Trip log 10
0x18B0 (6321–6352)	82 : 11: 01 – 82 : 11 : 32	Trip log 11
0x18D0 (6353–6384)	82 : 12 : 01 – 82 : 12 : 32	Trip log 12
0x18F0 (6385–6416)	82 : 13 : 01 – 82 : 13 : 32	Trip log 13
0x1910 (6417–6448)	82 : 14 : 01 – 82 : 14 : 32	Trip log 14
0x1930 (6449–6480)	82 : 15 : 01 – 82 : 15 : 32	Trip log 15
0x1950 (6481–6512)	82 : 16 : 01 – 82 : 16 : 32	Trip log 16
0x1970 (6513–6544)	82 : 17 : 01 – 82 : 17 : 32	Trip log 17
0x1990 (6545–6576)	82 : 18 : 01 – 82 : 18 : 32	Trip log 18
0x19B0 (6577–6608)	82 : 19 : 01 – 82 : 19 : 32	Trip log 19
0x19D0 (6609–6640)	82 : 20 : 01 – 82 : 21 : 32	Trip log 20

Trip Log 1 Registers

The table lists the registers for the trip log 1.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x1770 (6001)	82 : 01: 01	R	–	–	UINT16	Y	Date and Time
0x1774 (6005)	82 : 01: 02	R	–	–	UINT16	Y	Trip code, page 267
0x1775 (6006)	82 : 01: 03	R	1	%	UINT16	Y	Thermal memory
0x1776 (6007)	82 : 01: 04	R	0.001	A	UINT32	Y	L1 RMS current
0x1778 (6009)	82 : 01: 05	R	0.001	A	UINT32	Y	L2 RMS current
0x177A (6011)	82 : 01: 06	R	0.001	A	UINT32	Y	L3 RMS current

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x177C (6013)	82 : 01: 07	R	0.001	A	UINT32	Y	Calculated ground current
0x177E (6015)	82 : 01: 08	R	0.001	A	UINT32	Y	Measured ground current
0x1780 (6017)	82 : 01: 09	R	0.01	%	UINT16	Y	Current imbalance
0x1781 (6018)	82 : 01: 10	R	1	–	UINT16	Y	Current phase sequence
0x1782 (6019)	82 : 01: 11	R	0.1	V	UINT16	Y	L1-L2 RMS voltage
0x1783 (6020)	82 : 01: 12	R	0.1	V	UINT16	Y	L2-L3 RMS voltage
0x1784 (6021)	82 : 01: 13	R	0.1	V	UINT16	Y	L3-L1 RMS voltage
0x1785 (6022)	82 : 01: 14	R	0.01	%	UINT16	Y	Voltage imbalance
0x1787 (6023)	82 : 01: 15	R	1	–	UINT16	Y	Voltage phase sequence
0x1787 (6024)	82 : 01: 16	R	0.01	Hz	UINT16	Y	System frequency
0x1788 (6025)	82 : 01: 17	R	–	–	UINT16	Y	MSB: System PF LSB: Motor status
0x1789 (6026)	82 : 01: 18	R	0.1	–	UINT16	Y	MSB: L1 current THD LSB: L2 current THD
0x178A (6027)	82 : 01: 19	R	0.1	–	UINT16	Y	MSB: L3 current THD LSB: L1 voltage THD
0x178B (6028)	82 : 01: 20	R	0.1	–	UINT16	Y	MSB: L2 voltage THD LSB: L3 voltage THD
0x178C (6029)	82 : 01: 21	R	0.001	–	UINT32	Y	Total active power
0x178E (6031)	82 : 01: 22	–	–	–	–	–	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.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	Description
0x1B58–0x1B5F (7001–7008)	82 : 15 : 01 – 82 : 15 : 08	Event log 1 (most recent log)
...	...	...
0x1858–0x1B57 (7001+8x(n-1) – 7008+8x(n-1))	...	Event log n
...	...	...
0x1E70–0x1E77 (7793–7800)	82 : 114 : 01 – 82 : 114 : 08	Event log 100

Event Log 1 Registers

The table lists the registers for the event log 1.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x1B58 (7001)	82 : 15 : 01	R	–	–	UINT16	Y	Date and Time
0x1B5C	82 : 15 : 05	R	–	–	UINT16	Y	Event code, page 269
0x1B5D	82 : 15 : 06	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.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	Description
0x1F40–0x1F47 (8001–8008)	82 : 79 : 01 – 82 : 79 : 08	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)	82 : 8C : 01 – 82 : 8C : 08	Detected internal error log 20

Detected Internal Error Log 1 Registers

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

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Svd	Description
0x1F40 (8001)	82 : 79 : 01	R	–	–	UINT16	Y	Date and time, page 92
0x1F44 (8005)	82 : 79 : 05	R	–	–	UINT16	Y	Device internal error code, page 287
0x1F45 (8006)	82 : 79 : 06	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 through 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 through 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.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x20B7 (8376)	82 : 8D : 01	R	–	–	UINT16	–	–	Y	Date and Time, page 92

Reference Log Registers

The table lists the registers for the reference log.

Modbus TCP/IP Address (Register)	EtherNet/IP Address	RW	X	Unit	Type	Range	Default value	Svd	Description
0x222E (8751)	82 : 8E : 01	R	–	–	UINT16	–	–	Y	Date and Time, page 92

Implementation of Standard Web Server User Interface

What's in This Part

Overview

This chapter describes the functions of the standard web server pages and how to use the data to operate an LTMT main unit.

Description of Standard Web Server User Interface

What's in This Chapter

Overview

The standard web server serves as a remote user interface, enabling you to monitor and control motor operations through a web browser. It provides access to real-time status updates and configuration settings, eliminating the need for physical interaction with the motor. The standard web server supports only one connection at a time.

Prerequisites

System Requirements

The standard web server operates on the Microsoft Windows® 11 operating system.

Browser Requirements for Using the Interface

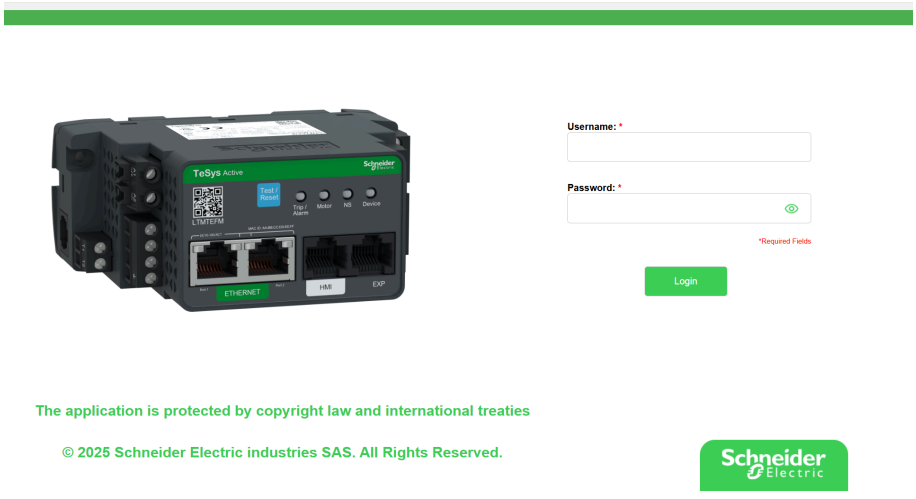
The standard web server can be accessed using any of the following supported web browsers.

- Microsoft Edge Pro version 14 or later.
- Mozilla Firefox version 13 or later.
- Google Chrome version 19 or later.

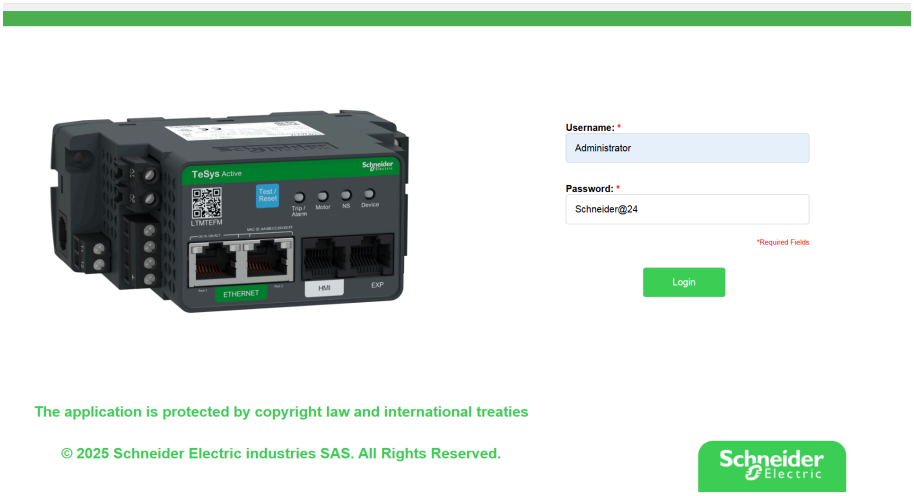
Access to Standard Web Server

The section explains how to connect the TeSys Tera system to the standard web server.

1. Connect the LTMT main unit to your PC.
2. Open a web browser.
3. In the address bar, enter the IP address assigned to the LTMT main unit. For more information on the IP addressing, refer to IP Addressing, page 39.
4. If the connection is accepted, the login page appears.

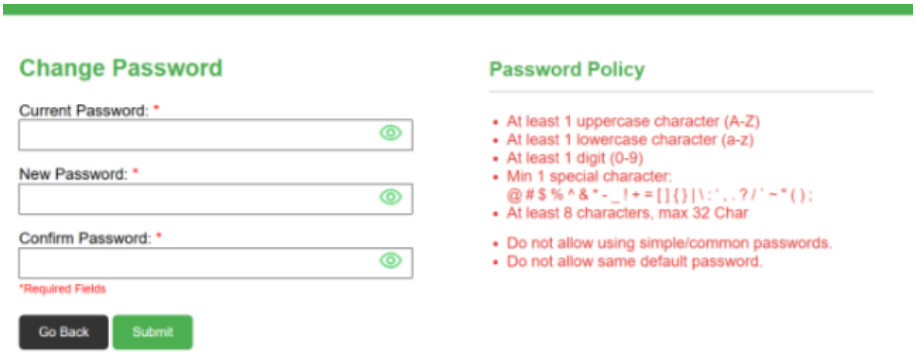


5. When you connect for the first time, enter `Administrator` in the **Username** field and `Schneider@24` in the **Password** field.



6. Click **Login**.

   Result: You are prompted to change your password.



7. Provide the following information and click **Submit**:
   - **Current Password**
   - **New Password**
   - **Confirm Password**

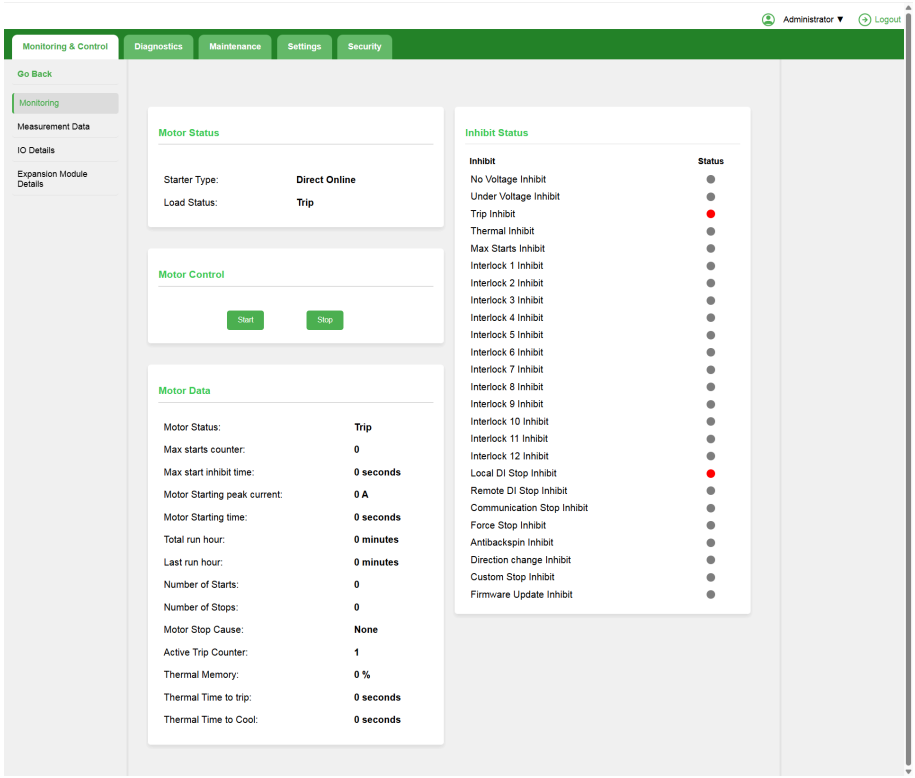
   NOTE: To ensure account security, your new password must:
   - Be at least eight characters long.
   - Include at least one uppercase and lowercase letters from a to z.
   - Contain at least one number from 0 to 9.
   - Include at least one special character (example: !, @, &, * and so on).
   - Avoid using three or more consecutive identical or sequential characters (example: aaa, 111, 123, and so on).
   - Avoid using most common passwords.

   Result: The **Password Modified Successfully** pop-up message appears.
8. Click **OK**.

   Result: You are redirected to the login page.
9. Enter `Administrator` in the **Username** field and your new password in the **Password** field.

10. Click **Login**.

    Result: The **Monitoring & Control** page appears.



Change Password

Overview

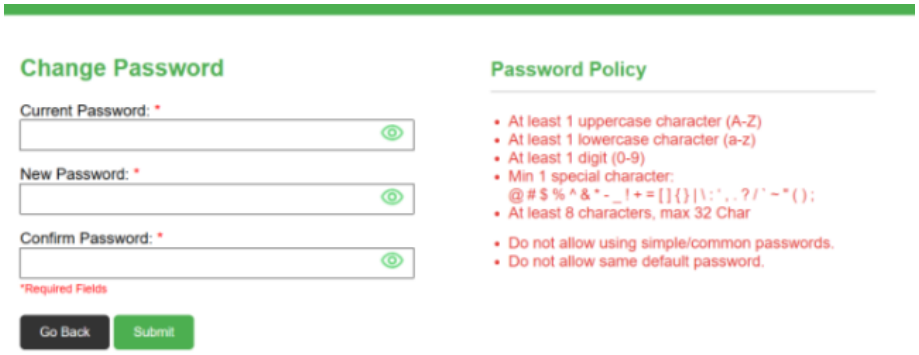
The **Change Password** feature allows you to update the account credentials securely. This helps maintain account security and ensures that only authorized users can access the standard web server.

Change Your Password

To change your password in the standard web server, proceed as follows.

1. Navigate to **Administrator > Change Password** in the top-right corner of the screen.

   Result: The **Change Password** dialog box appears.



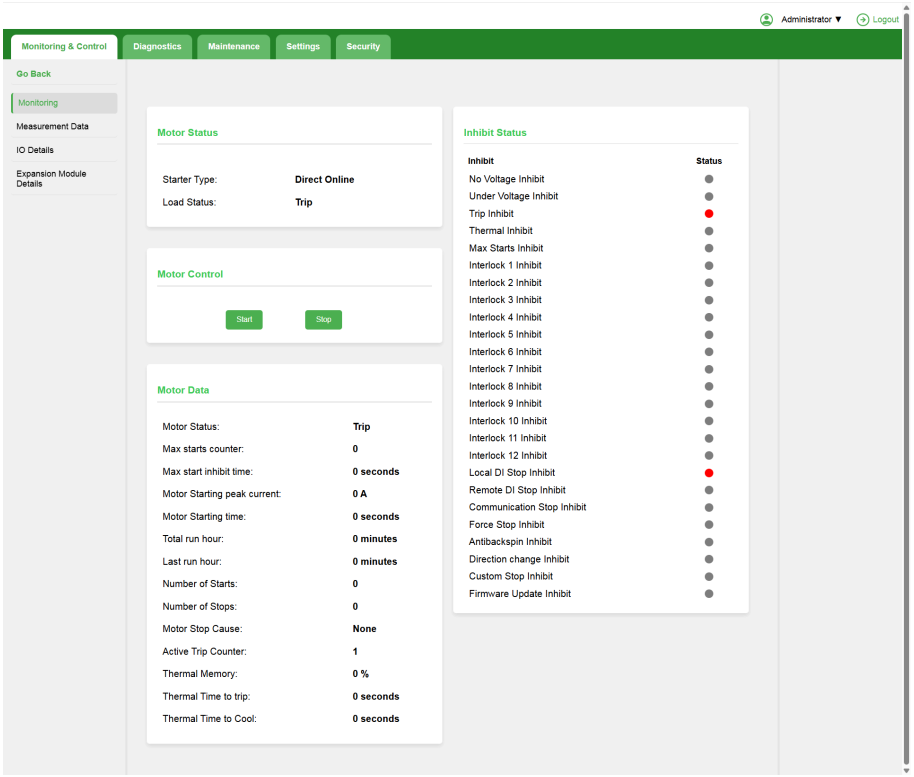
2. Provide the following information and click **Submit**:
   - **Current Password**
   - **New Password**
   - **Confirm Password**

   NOTE: To ensure account security, your new password must:
   - Be at least eight characters long.
   - Include at least one uppercase and lowercase letters from a to z.
   - Contain at least one number from 0 to 9.
   - Include at least one special character (example: !, @, &, * and so on).
   - Avoid using three or more consecutive identical or sequential characters (example: aaa, 111, 123, and so on).
   - Avoid using most common passwords.

   Result: The **Password Modified Successfully** message appears.
3. Click **OK**.

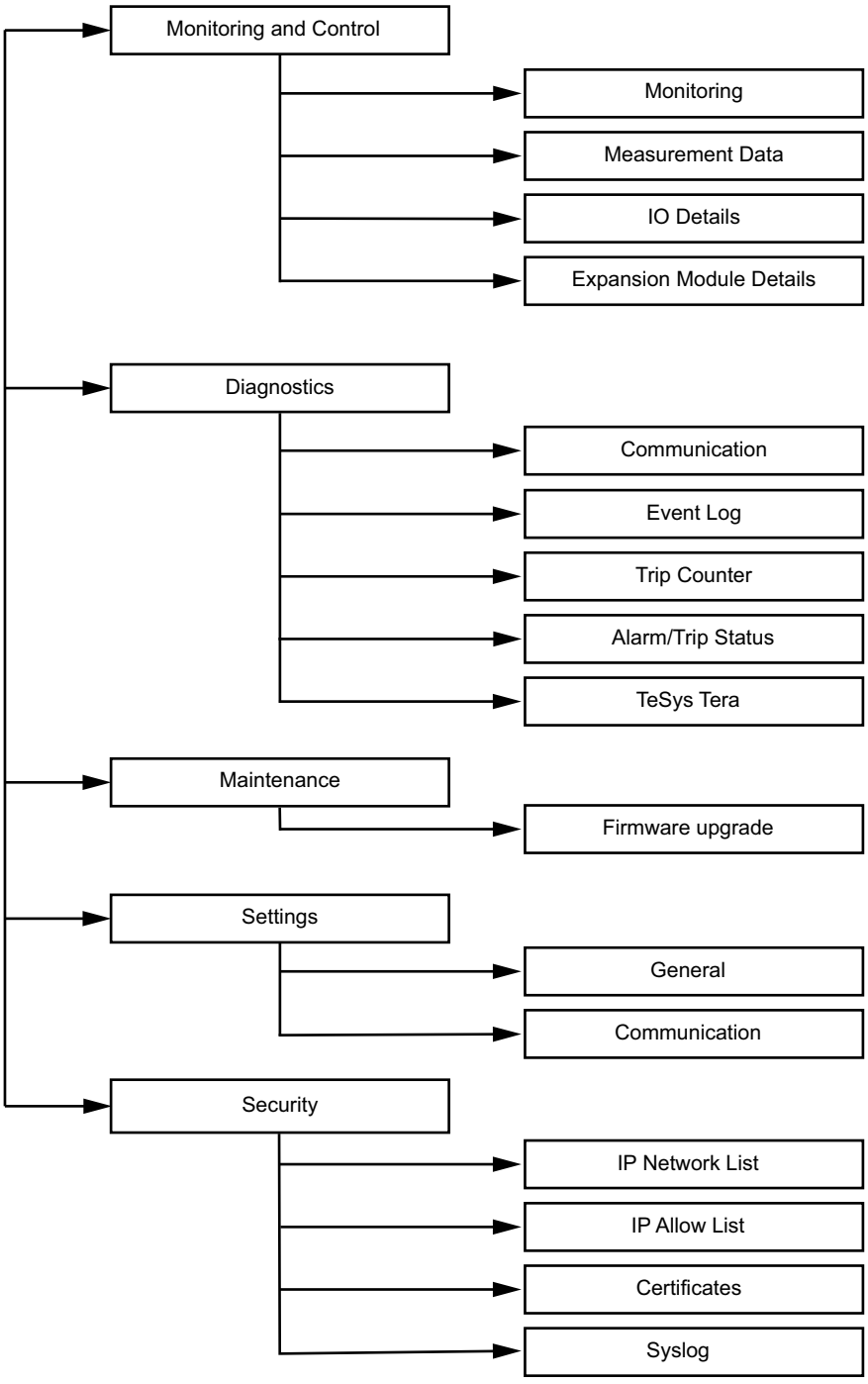
   Result: You are redirected to the login page.
4. Enter `Administrator` in the **Username** field and your new password in the **Password** field.
5. Click **Login**.

   Result: The **Monitoring & Control** page appears.



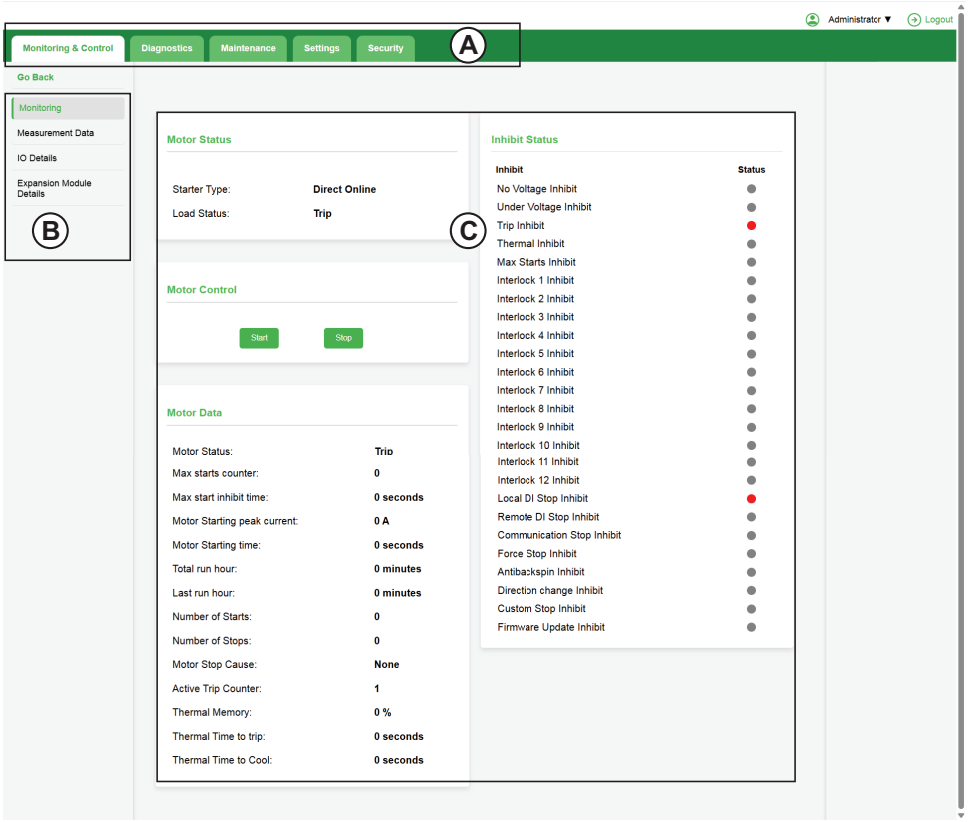
Navigation of Web Sever User Interface

The flowchart below shows the navigation structure of standard web server pages:



Standard Web Server User Interface

All web server pages share a consistent layout, with the window divided into three distinct sections.



Legend	Area	Description
A	Menu	Banner displayed on every page, showing links to the menus: • Monitoring & Control • Diagnostics • Maintenance • Settings • Security
B	Sub-menu treeview	Links to the pages related to the selected menu. The treeview always displays the menu name in which the user is navigating
C	Page body	Information related to the contextual page selected in the menu or sub-menu

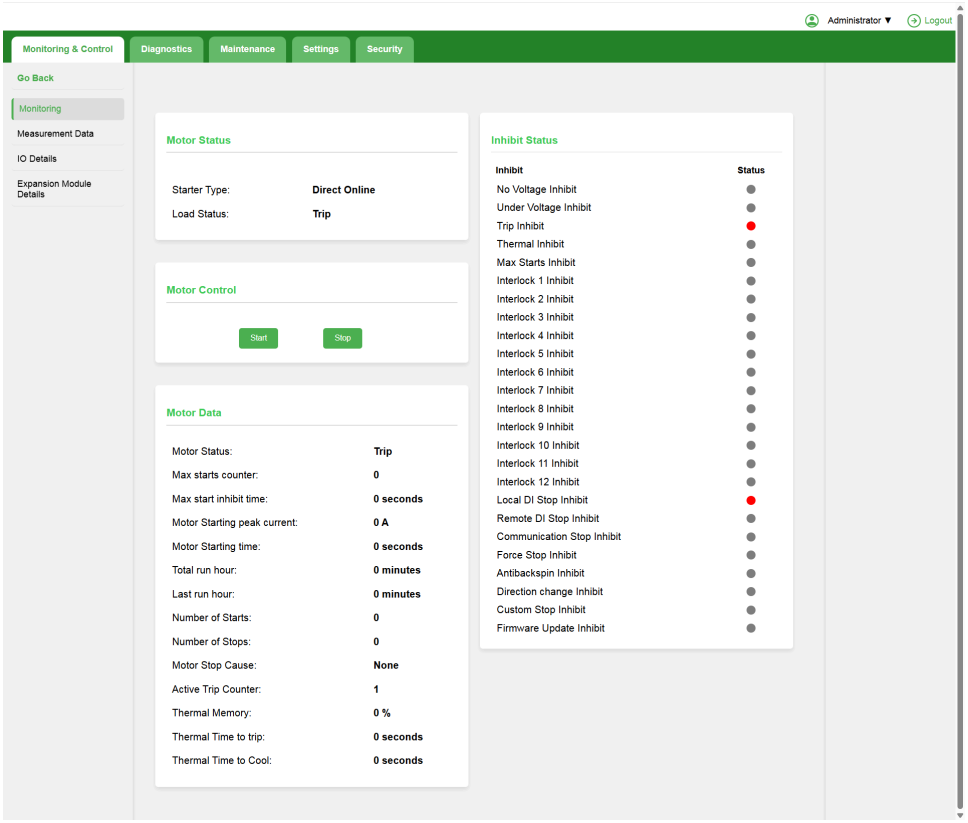
NOTE: Not all the parameters listed in the following pages will appear in the web server sub-menus. The parameters available depend on the LTMT main unit type and configuration of the TeSys Tera system.

Monitoring & Control Page

What's in This Chapter

Overview

The **Monitoring & Control** page provides a real-time interface to observe motor or heater data and manage its operation.



Access to the Monitoring & Control Page

The **Monitoring & Control** page is displayed:

- After you connect to the standard web server.
- When you click **Monitoring & Control** in the menu headers at any moment during navigation and from any page displayed.

Monitoring & Control Page Sub-Menu

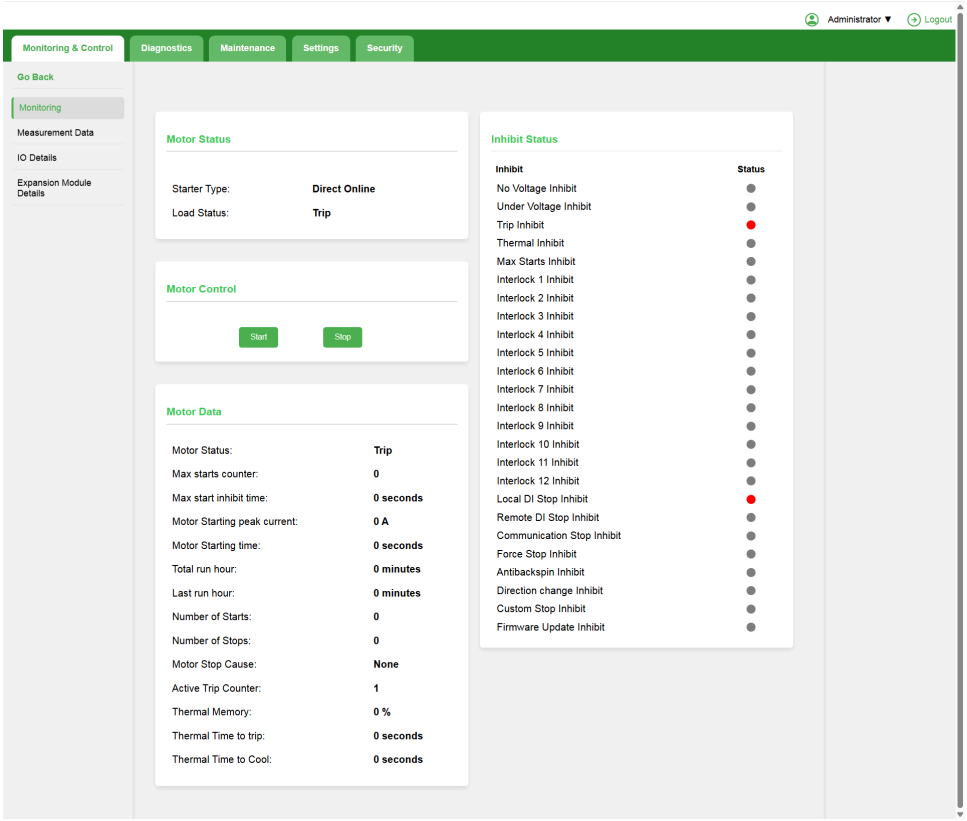
The **Monitoring & Control** page sub-menu allows you to access the following pages:

- Monitoring, page 217
- Measurement Data, page 219
- IO Details, page 221
- Expansion Module Details, page 221

Monitoring Page

Overview

The **Monitoring** page allows you to monitor the required parameters.



Monitoring Page Body

The **Monitoring** page contains the following read-only data:

Level 1	Level 2	Parameter Name
Motor Status(19)	Starter Type	Starter type. Possible values: • Direct online • Reversible Direct Online • Star Delta • Overload • Heater
	Load Status	Load status. Possible values: • Stop • Start • Run
Motor Control(19)	Motor control. Possible values: • Start • Stop	
Motor Data	Motor Status	Motor status. Possible values: • Stop • Start • Run

(19) The parameters shown on the page change based on the selected starter type or load type.

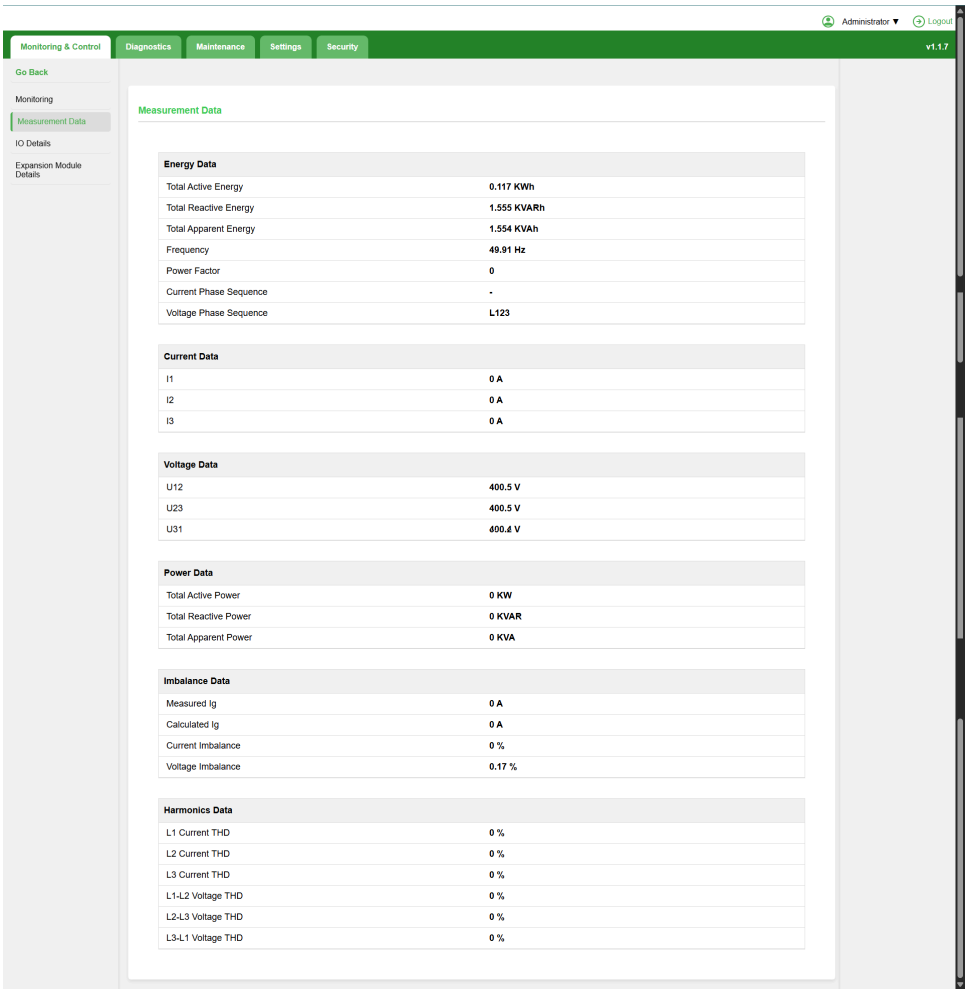
Level 1	Level 2	Parameter Name
		• Trip • Inhibit • Forward start & Run • Reverse Start & Run
	Max Starts Counter	Maximum starts counter
	Max Start Inhibit Time	Maximum start inhibit time
	Motor Starting Peak Current	Motor starting peak current
	Motor Starting Time	Motor starting time
	Total Run Hour	Total run hour
	Last Run Hour	Last run hour
	Number of Starts	Number of starts
	Number of Stops	Number of stops
	Motor Stop Cause	Motor stop cause. Possible values: • None • HMI • Local DI • Remote DI • Communication • Auto restart • Trip • No current • Force stop • Direction change • No feedback • Speed change • Custom stop • Mode transfer • Device internal • No voltage • Voltage dip
	Active Trip Counter	Active trip counter
	Thermal Memory	Thermal memory
	Thermal Time to Trip	Thermal time to trip
	Thermal Time to Cool	Thermal time to cool
Inhibit Status	No Voltage Inhibit	No voltage inhibit
	Under Voltage Inhibit	Under voltage inhibit
	Trip Inhibit	Trip Inhibit
	Thermal Inhibit	Thermal Inhibit
	Max Starts Inhibit	Maximum starts inhibit
	Interlock 1 Inhibit	Interlock 1 Inhibit
	Interlock 2 Inhibit	Interlock 2 Inhibit
	Interlock 3 Inhibit	Interlock 3 Inhibit
	Interlock 4 Inhibit	Interlock 4 Inhibit
	Interlock 5 Inhibit	Interlock 5 Inhibit
	Interlock 6 Inhibit	Interlock 6 Inhibit
	Interlock 7 Inhibit	Interlock 7 Inhibit
	Interlock 8 Inhibit	Interlock 8 Inhibit
	Interlock 9 Inhibit	Interlock 9 Inhibit

Level 1	Level 2	Parameter Name
	Interlock 10 Inhibit	Interlock 10 Inhibit
	Interlock 11 Inhibit	Interlock 11 Inhibit
	Interlock 12 Inhibit	Interlock 12 Inhibit
	Local DI Stop Inhibit	Local DI Stop Inhibit
	Remote DI Stop Inhibit	Remote DI Stop Inhibit
	Communication Stop Inhibit	Communication Stop Inhibit
	Force Stop Inhibit	Force Stop Inhibit
	Antibackspin Inhibit	Antibackspin Inhibit
	Direction Change Inhibit	Direction Change Inhibit
	Custom Stop Inhibit	Custom Stop Inhibit
	Firmware Update Inhibit	Firmware Update Inhibit

Measurement Data Page

Overview

The **Measurement Data** page displays the metering data of the motor.



Measurement Data Page Body

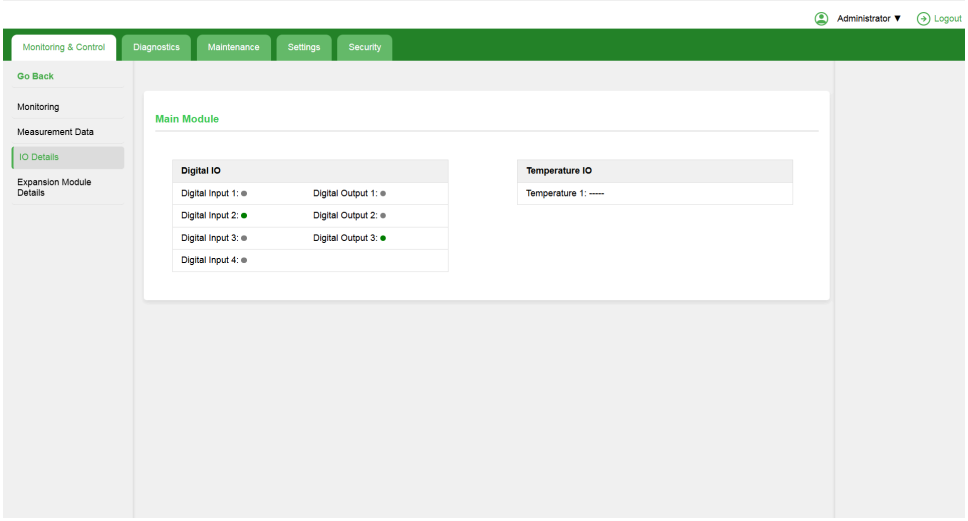
The **Measurement Data** page contains the following sub-menus:

Level 1	Level 2	Parameter Name
Energy Data	Total Active Energy	Total Active Energy
	Total Reactive Energy	Total Reactive Energy
	Total Apparent Energy	Total Apparent Energy
	Frequency	Frequency
	Power Factor	Power Factor
	Current Phase Sequence	Current Phase Sequence
	Voltage Phase Sequence	Voltage Phase Sequence
Current Data	I1	RMS Current
	I2	RMS Current
	I3	RMS Current
Voltage Dta	U12	RMS Voltage
	U23	RMS Voltage
	U31	RMS Voltage
Power Data	Total Active Power	Active Power
	Total Reactive Power	Reactive Power
	Total Apparent Power	Apparent Power
Imbalance Data	Measured Ig	Measured Ig
	Current Ig	Current Ig
	Current Imbalance	Current Imbalance
	Voltage Imbalance	Voltage Imbalance
THD Data	L1 Current THD	Phase 1 current total harmonic distortion (THD)
	L2 Current THD	Phase 2 current total harmonic distortion (THD)
	L3 Current THD	Phase 3 current total harmonic distortion (THD)
Voltage THD Data	L1–L2 Voltage THD / L1–N Voltage THD	Phase 1 voltage total harmonic distortion (THD)
	L2–L3 Voltage THD	Phase 2 voltage total harmonic distortion (THD)
	L3–L1 Voltage THD	Phase 3 voltage total harmonic distortion (THD)

IO Details Page

Overview

The **IO Details** page displays the digital input and output details of the LTMT main unit.



IO Details Page Body

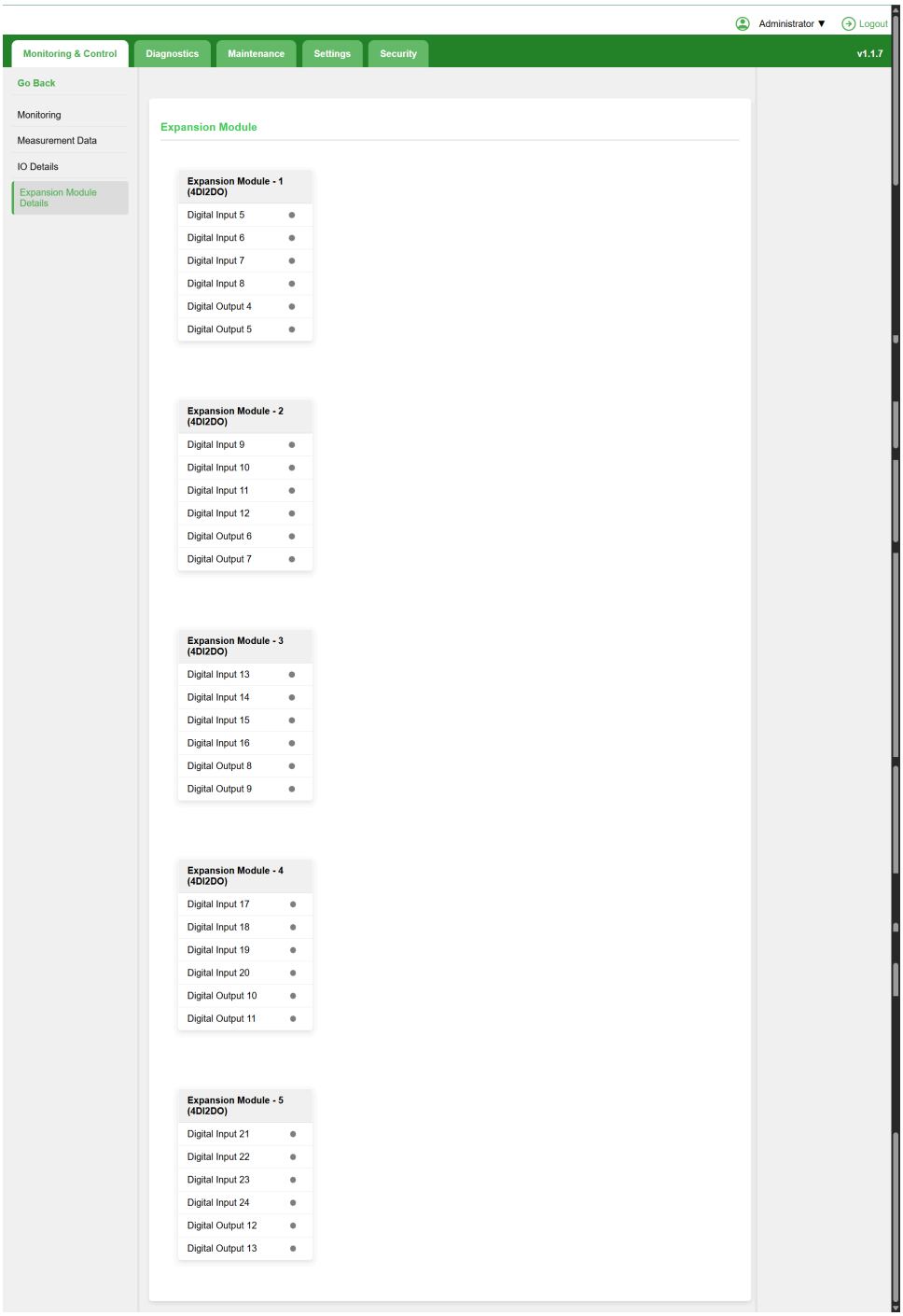
The **IO Details** page contains the following sub-menus:

Level 1	Level 2	Level 3	Parameter Name
Main Module	Digital IO	Digital Input 1	Digital Input 1
		Digital Input 2	Digital Input 2
		Digital Input 3	Digital Input 3
		Digital Input 4	Digital Input 4
		Digital Output 1	Digital Output 1
		Digital Output 2	Digital Output 2
		Digital Output 3	Digital Output 3

Expansion Module Details Page

Overview

The **Expansion Module Details** page displays the digital input, digital output, analog input and analog output details of the LTMT expansion modules.



Expansion Module Details Page Body

The **Expansion Module Details** page contains the following sub-menus:

Level 1	Level 2	Parameter Name
Expansion Module - 1 (4DI2DO)	Digital Input 5	Digital input
	Digital Input 6	Digital input
	Digital Input 7	Digital input
	Digital Input 8	Digital input
	Digital Output 4	Digital output
	Digital Output 5	Digital output
Expansion Module - 2 (4DI2DO)	Digital Input 9	Digital input

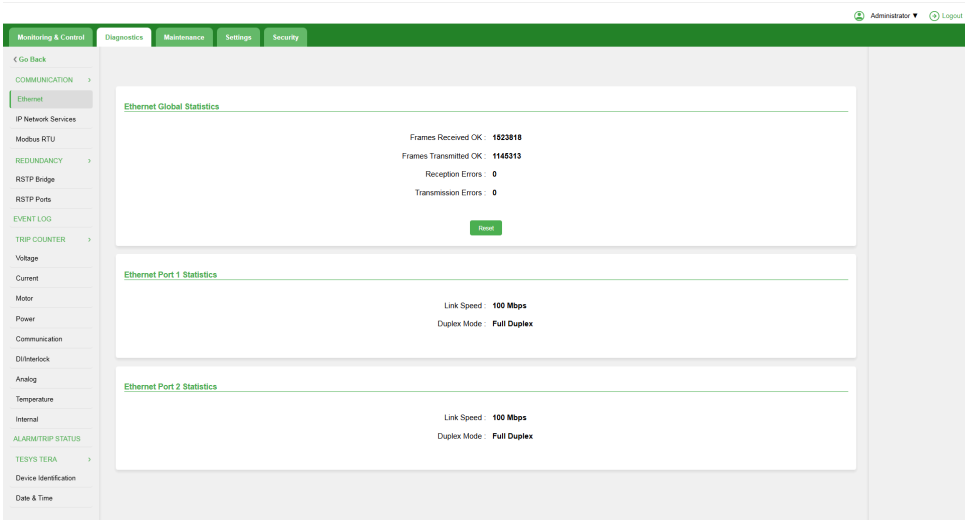
Level 1	Level 2	Parameter Name
	Digital Input 10	Digital input
	Digital Input 11	Digital input
	Digital Input 12	Digital input
	Digital Output 6	Digital output
	Digital Output 7	Digital output
Expansion Module - 3 (4DI2DO)	Digital Input 13	Digital input
	Digital Input 14	Digital input
	Digital Input 15	Digital input
	Digital Input 16	Digital input
	Digital Output 8	Digital output
	Digital Output 9	Digital output
Expansion Module - 4 (4DI2DO)	Digital Input 17	Digital input
	Digital Input 18	Digital input
	Digital Input 19	Digital input
	Digital Input 20	Digital input
	Digital Output 10	Digital output
	Digital Output 11	Digital output
Expansion Module - 5 (4DI2DO)	Digital Input 21	Digital input
	Digital Input 22	Digital input
	Digital Input 23	Digital input
	Digital Input 24	Digital input
	Digital Output 12	Digital output
	Digital Output 13	Digital output

Diagnostics Page

What's in This Chapter

Overview

The **Diagnostics** page displays the motor status, alarm or trip status, logs, device internal status, communication status, trip counters, and device information of the TeSys Tera system.



Access to the Diagnostics Page

The **Diagnostics** page displays when you click **Diagnostics** in the menu headers at any moment during navigation and from any page displayed.

Diagnostics Page Sub-Menu

The **Diagnostics** page sub-menu allows you to access the following pages:

- Communication
- Event Log, page 229
- Trip Counter, page 229
- Trip/Alarm Status, page 239
- TeSys Tera, page 245

Communication Page

Overview

The **Communication** page displays the Ethernet, IP network services, and Modbus RTU parameter settings of the TeSys Tera system.

Communication Page Sub-Menu

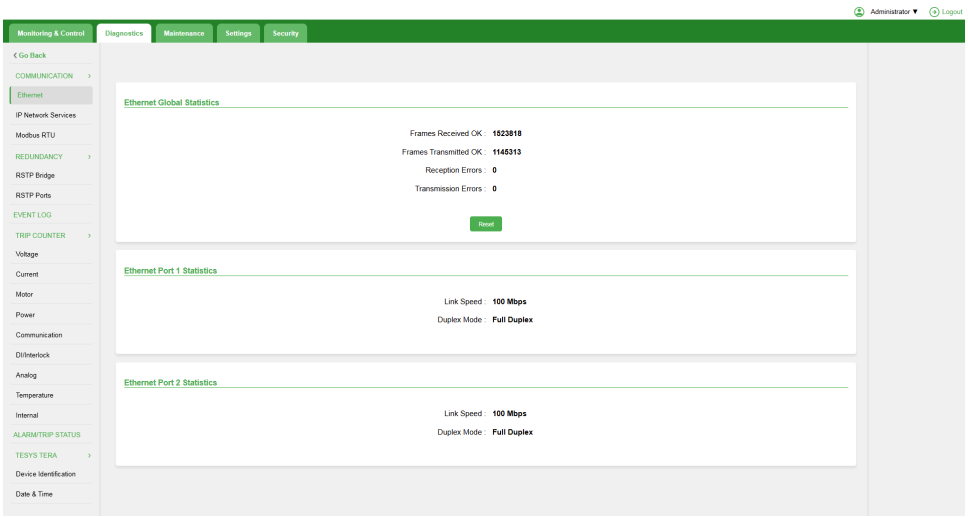
The **Communication** page sub-menu allows you to access the following pages:

- Ethernet, page 226
- IP Network Service, page 227
- Modbus RTU, page 228

Ethernet Page

Overview

The **Ethernet** page displays global Ethernet statistics and diagnostics, including detailed performance data for port 1 and port 2 of the LTMT main unit.



Ethernet Page Body

The **Ethernet** page contains the following sub-menus:

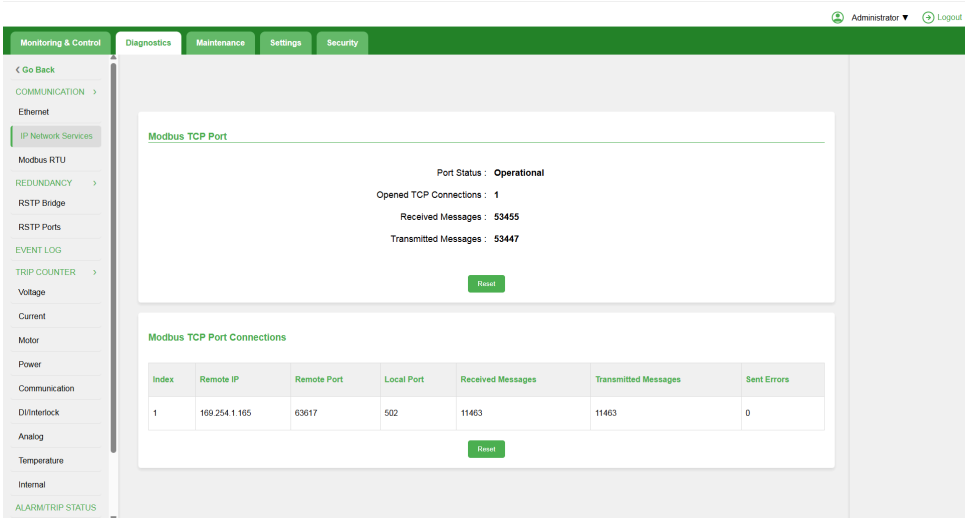
Level 1	Level 2	Parameter Name
Ethernet Global Statistics(20)	Frames Received OK	Frames Received
	Frames Transmitted OK	Frames Transmitted
	Reception Errors	Reception Errors
	Transmission Errors	Transmission Errors
Ethernet Port 1 Statistics	Link Speed	Link Speed
	Duplex Mode	Duplex Mode
Ethernet Port 2 Statistics	Link Speed	Link Speed
	Duplex Mode	Duplex Mode

(20) You can also reset the parameter.

IP Network Services Page

Overview

The **IP Network Services** page displays the Modbus TCP port status.



IP Network Services Page Body

The **IP Network Services** page contains the following sub-menus:

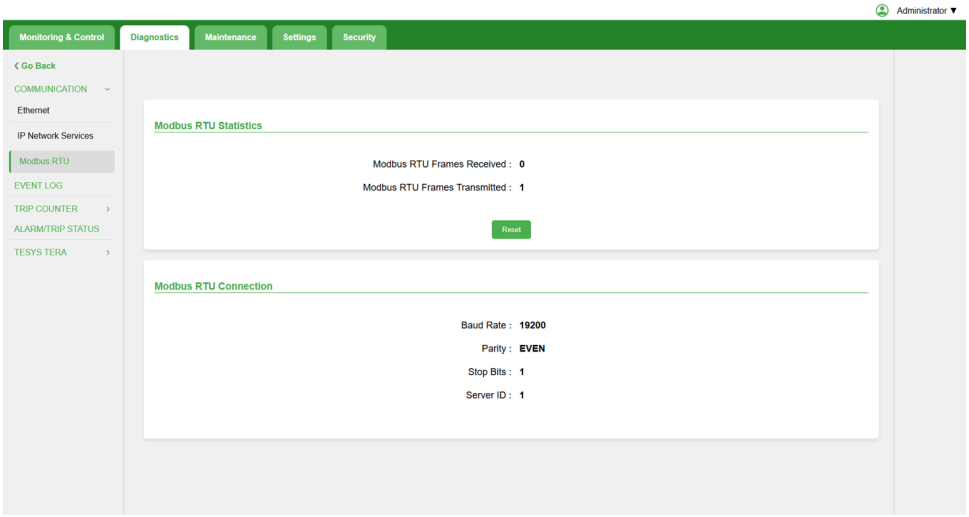
Level 1	Level 2	Parameter Name
Modbus TCP Port(21)	Port Status	Port Status
	Opened TCP Connections	Opened TCP Connections
	Received Messages	Received Messages
	Transmitted Messages	Transmitted Messages
Modbus TCP Port Connections(21)	Modbus TCP port connections. It contains the following parameter values: • Remote IP • Remote Port • Local Port • Received Messages • Transmitted Messages • Sent Errors	

(21) You can also reset the parameter.

Modbus RTU Page

Overview

The **Modbus RTU** page displays the statistics and connection settings.



Modbus RTU Page Body

The **Modbus RTU** page contains the following sub-menus:

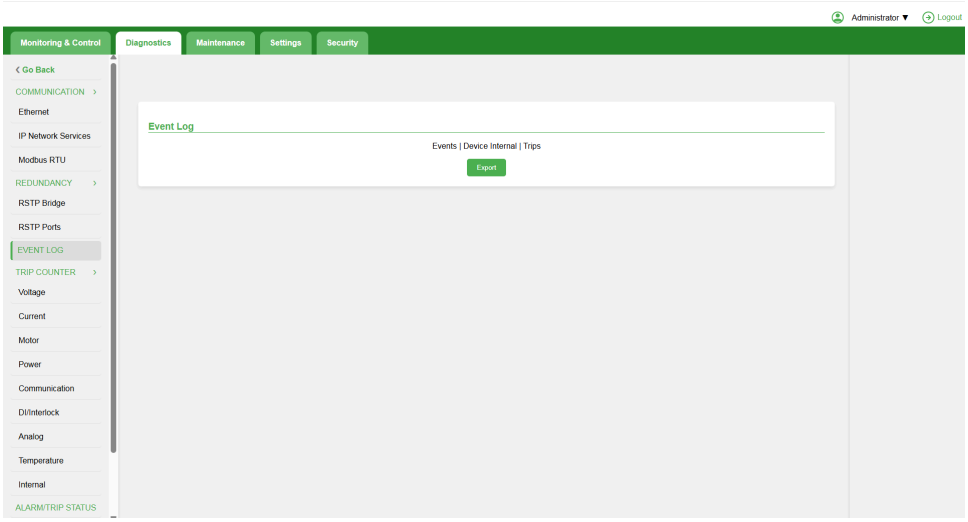
Level 1	Level 2	Parameter Name
Modbus RTU Statistics(22)	Modbus RTU Frames Received	Modbus RTU Frames Received
	Modbus RTU Frames Transmitted	Modbus RTU Frames Transmitted
Modbus RTU Connections	Baud Rate	Baud rate. Possible values: • 2400 • 4800 • 9600 • 19200 • 38400 • 57600 • 115200
	Parity	Parity. Possible values: • None • Odd • Even
	Stop Bits	Stop bits. Possible values: • 1 • 2
	Server ID	Server ID

(22) You can also reset the parameter.

Event Log Page

Overview

The **Event Log** page allows you to export the list of event, trip, and device internal records for the TeSys Tera system.



Event Log Page Body

On the **Event Log** page, select the **Export** option to export the list of event, trip, and device internal records.

Result: Your PC records the report.

NOTE: The download includes a zipped file with event, trip, and device internal logs.

Trip Counter Page

Overview

The **Trip Counter** page displays the number of trip generated.

Trip Counter Page Sub-Menu

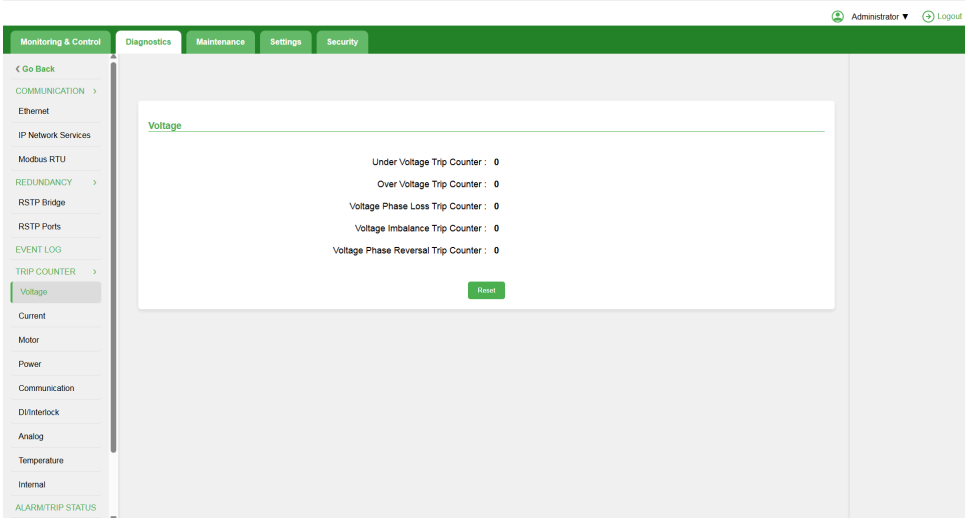
The **Trip Counter** page sub-menu allows you to access the following pages:

- Voltage, page 230
- Current, page 231
- Motor, page 232
- Power, page 232
- Communication, page 233
- DI/Interlock, page 235
- Analog, page 236
- Temperature, page 237
- Internal, page 237

Voltage Page

Overview

The **Voltage** page displays the number of voltage trips generated.



Voltage Page Body

The **Voltage** page contains the following sub-menus:

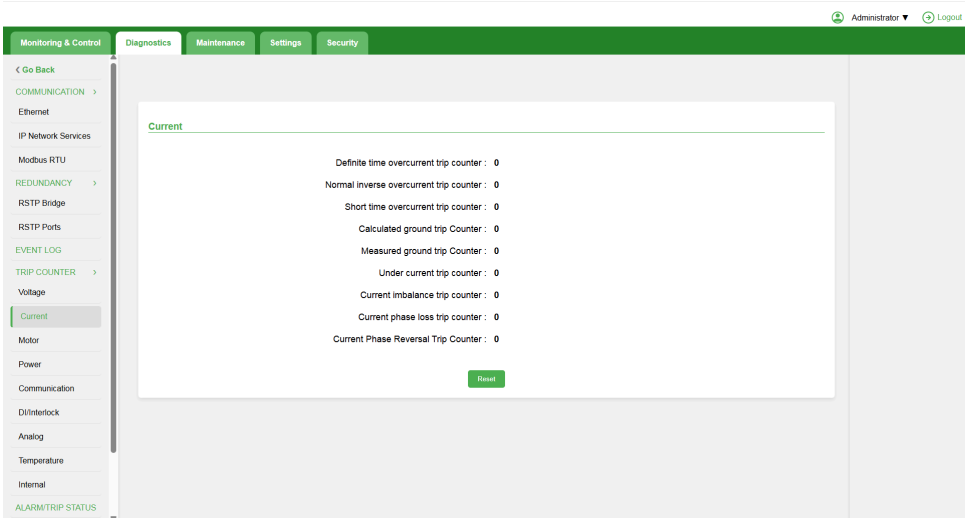
Level 1	Level 2	Parameter Name
Voltage(23)	Under Voltage Trip Counter	Under Voltage Trip Counter
	Over Voltage Trip Counter	Over Voltage Trip Counter
	Voltage Phase Loss Trip Counter	Voltage Phase Loss Trip Counter
	Voltage Imbalance Trip Counter	Voltage Imbalance Trip Counter
	Voltage Phase Reversal Trip Counter	Voltage Phase Reversal Trip Counter

(23) You can also reset the parameter.

Current Page

Overview

The **Current** page displays the number of current trips generated.



Current Page Body

The **Current** page contains the following sub-menus:

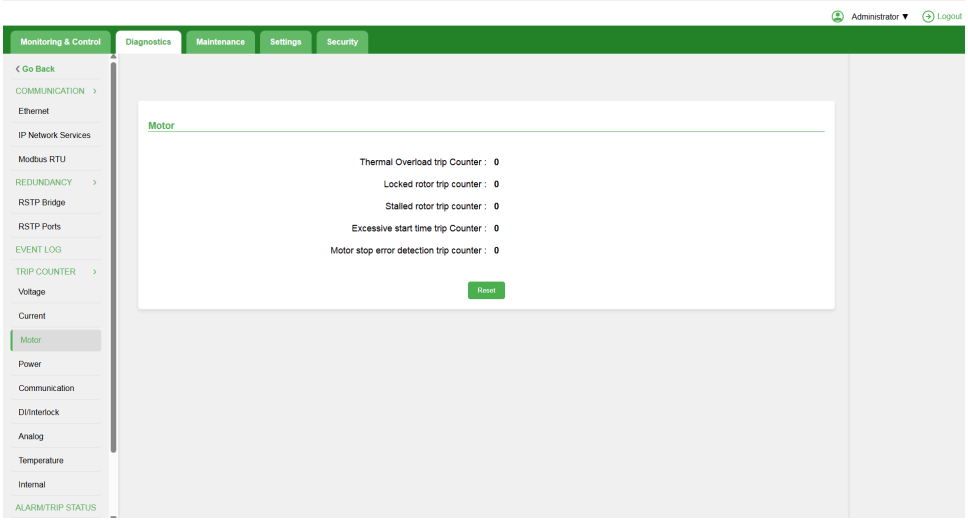
Level 1	Level 2	Parameter Name
Current(24)	Definite time overcurrent trip counter	Definite time overcurrent trip counter
	Normal inverse overcurrent trip counter	Normal inverse overcurrent trip counter
	Short time overcurrent trip counter	Short time overcurrent trip counter
	Calculated ground trip counter	Calculated ground trip counter
	Measured ground trip counter	Measured ground trip counter
	Under current trip counter	Under current trip counter
	Current imbalance trip counter	Current imbalance trip counter
	Current phase loss trip counter	Current phase loss trip counter
	Current phase reversal trip counter	Current phase reversal trip counter

(24) You can also reset the parameter.

Motor Page

Overview

The **Motor** page displays the number of motor trips generated.



Motor Page Body

The **Motor** page contains the following sub-menus:

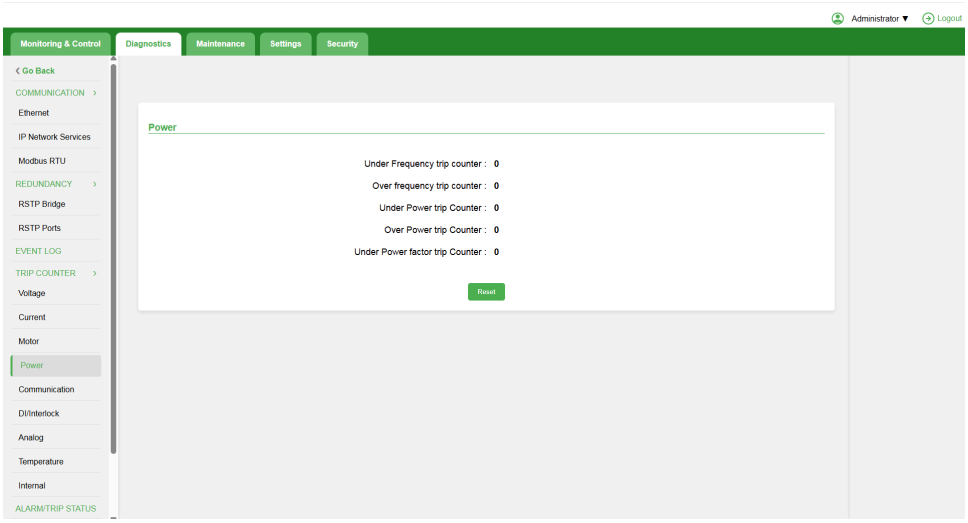
Level 1	Level 2	Parameter Name
Motor(25)	Thermal Overload trip counter	Thermal Overload trip counter
	Locked rotor trip counter	Locked rotor trip counter
	Stalled rotor trip counter	Stalled rotor trip counter
	Excessive start time trip counter	Excessive start time trip counter
	Motor stop error detection trip counter	Motor stop error detection trip counter

Power Page

Overview

The **Power** page displays the number of power trips generated.

(25) You can also reset the parameter.



Power Page Body

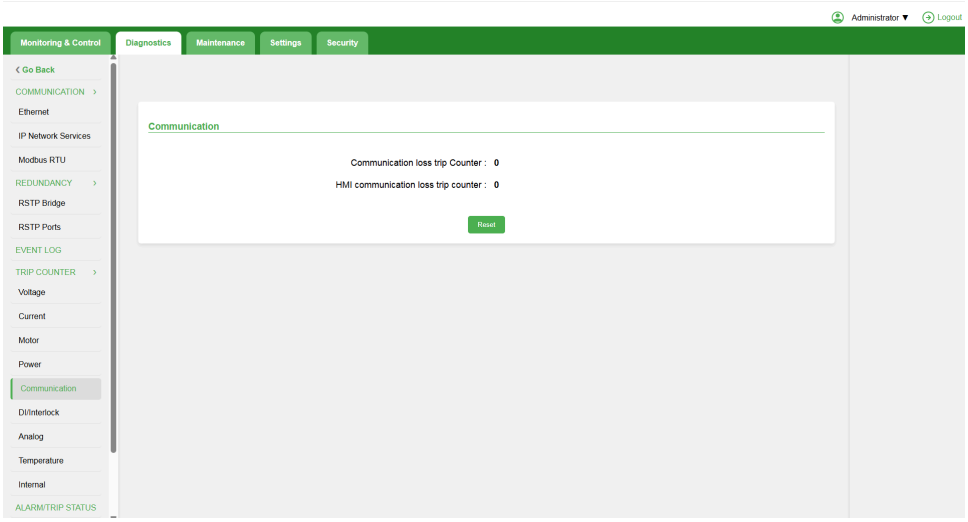
The **Power** page contains the following sub-menus:

Level 1	Level 2	Parameter Name
Power(26)	Under frequency trip counter	Under frequency trip counter
	Over frequency trip counter	Over frequency trip counter
	Under power trip counter	Under power trip counter
	Over power trip counter	Over power trip counter
	Under power factor trip counter	Under power factor trip counter

Communication Page

Overview

The **Communication** page displays the number of communication trips generated.



(26) You can also reset the parameter.

Communication Page Body

The **Communication** page contains the following sub-menus:

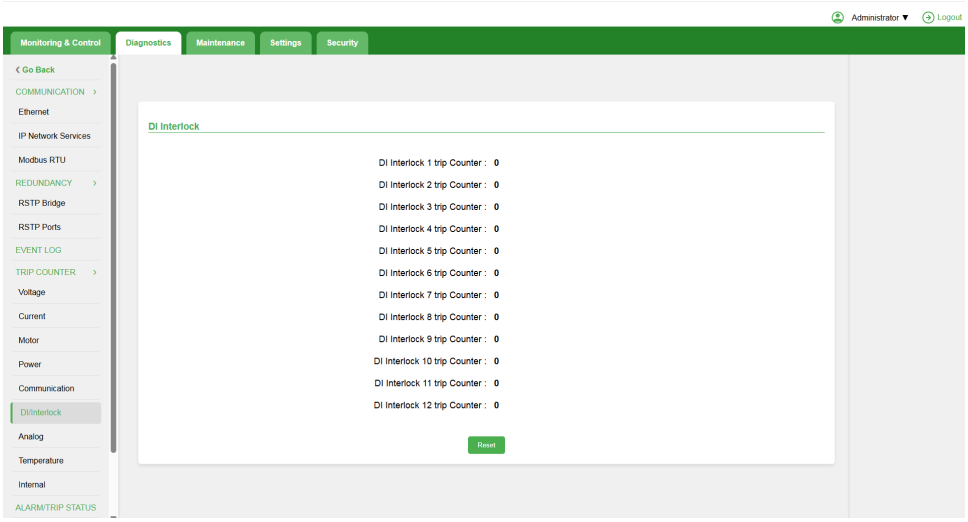
Level 1	Level 2	Parameter Name
Communication(27)	Communication loss trip counter	Communication loss trip counter
	HMI communication loss trip counter	HMI communication loss trip counter

(27) You can also reset the parameter.

DI/Interlock Page

Overview

The **DI/Interock** page displays the number of DI Interlock trips generated.



DI/Interlock Page Body

The **DI/Interlock** page contains the following sub-menus:

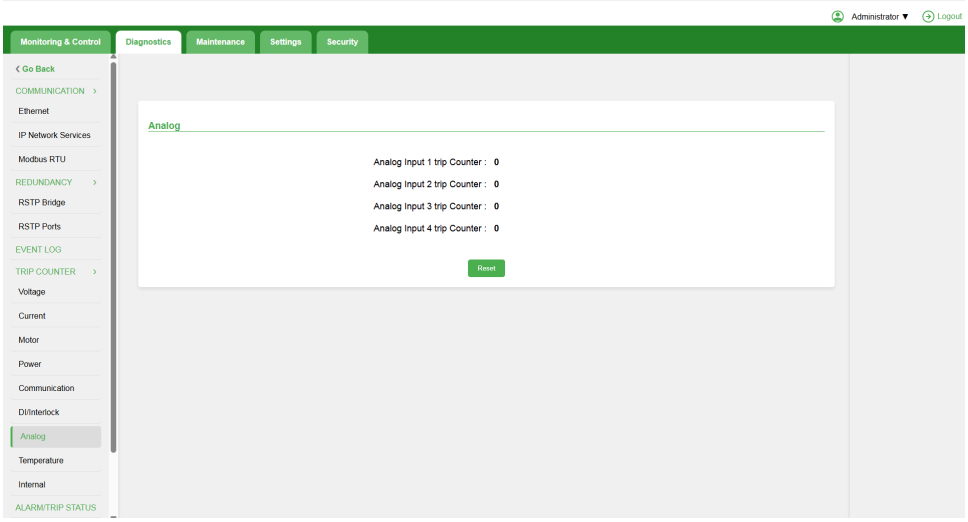
Level 1	Level 2	Parameter Name
DI/Interlock(28)	DI interlock 1 trip counter	DI interlock trip counter
	DI interlock 2 trip counter	DI interlock trip counter
	DI interlock 3 trip counter	DI interlock trip counter
	DI interlock 4 trip counter	DI interlock trip counter
	DI interlock 5 trip counter	DI interlock trip counter
	DI interlock 6 trip counter	DI interlock trip counter
	DI interlock 7 trip counter	DI interlock trip counter
	DI interlock 8 trip counter	DI interlock trip counter
	DI interlock 9 trip counter	DI interlock trip counter
	DI interlock 10 trip counter	DI interlock trip counter
	DI interlock 11 trip counter	DI interlock trip counter
	DI interlock 12 trip counter	DI interlock trip counter

(28) You can also reset the parameter.

Analog Page

Overview

The **Analog** page displays the number of analog trips generated.



Analog Page Body

The **Analog** page contains the following sub-menus:

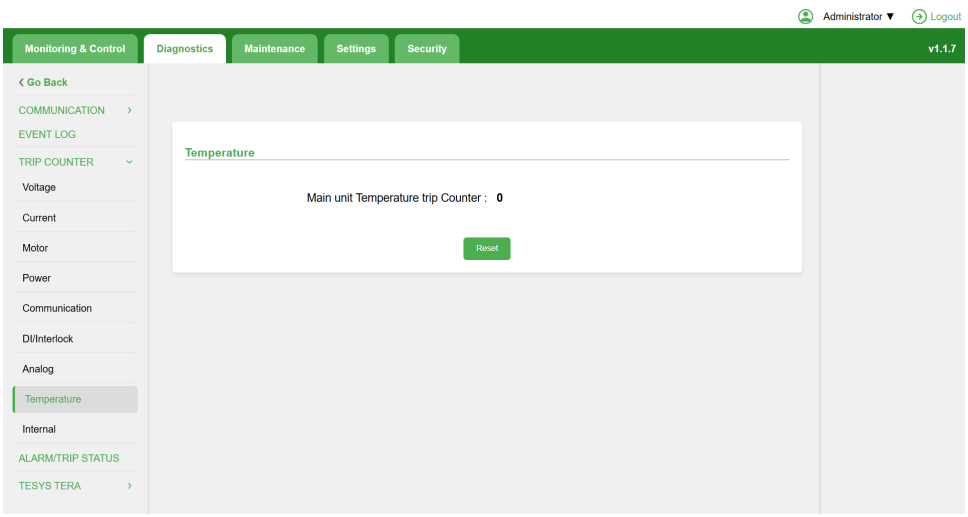
Level 1	Level 2	Parameter Name
Analog(29)	Analog input 1 trip counter	Analog input trip counter
	Analog input 2 trip counter	Analog input trip counter
	Analog input 3 trip counter	Analog input trip counter
	Analog input 4 trip counter	Analog input trip counter

(29) You can also reset the parameter.

Temperature Page

Overview

The **Temperature** page displays the number of temperature trips generated.



Temperature Page Body

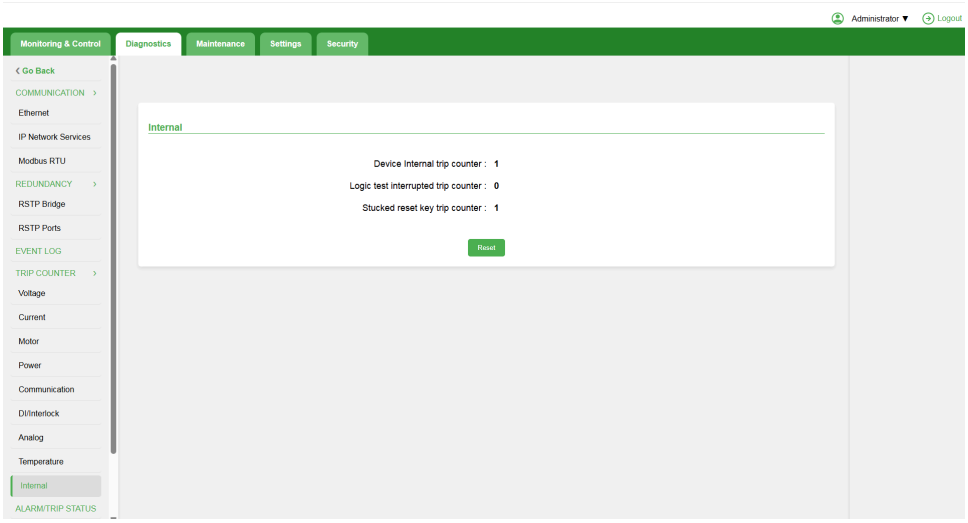
The **Temperature** page contains the following sub-menus:

Level 1	Level 2	Parameter Name
Temperature(30)	Main unit temperature trip counter	LTMT main unit temperature trip counter

Internal Page

Overview

The **Internal** page displays the number of internal trips generated.



(30) You can also reset the parameter.

Internal Page Body

The **Internal** page contains the following sub-menus:

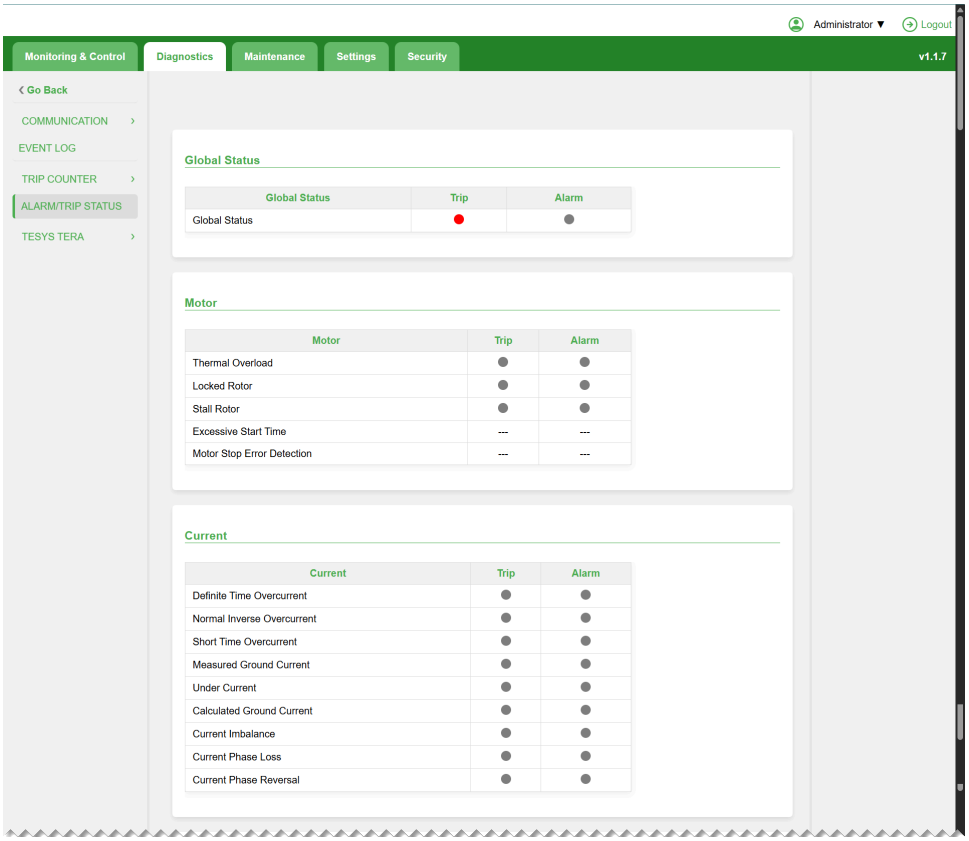
Level 1	Level 2	Parameter Name
Internal(31)	Device internal trip counter	Device internal trip counter
	Logic test interrupted trip counter	Logic test interrupted trip counter
	Stucked reset key trip counter	Stucked reset key trip counter

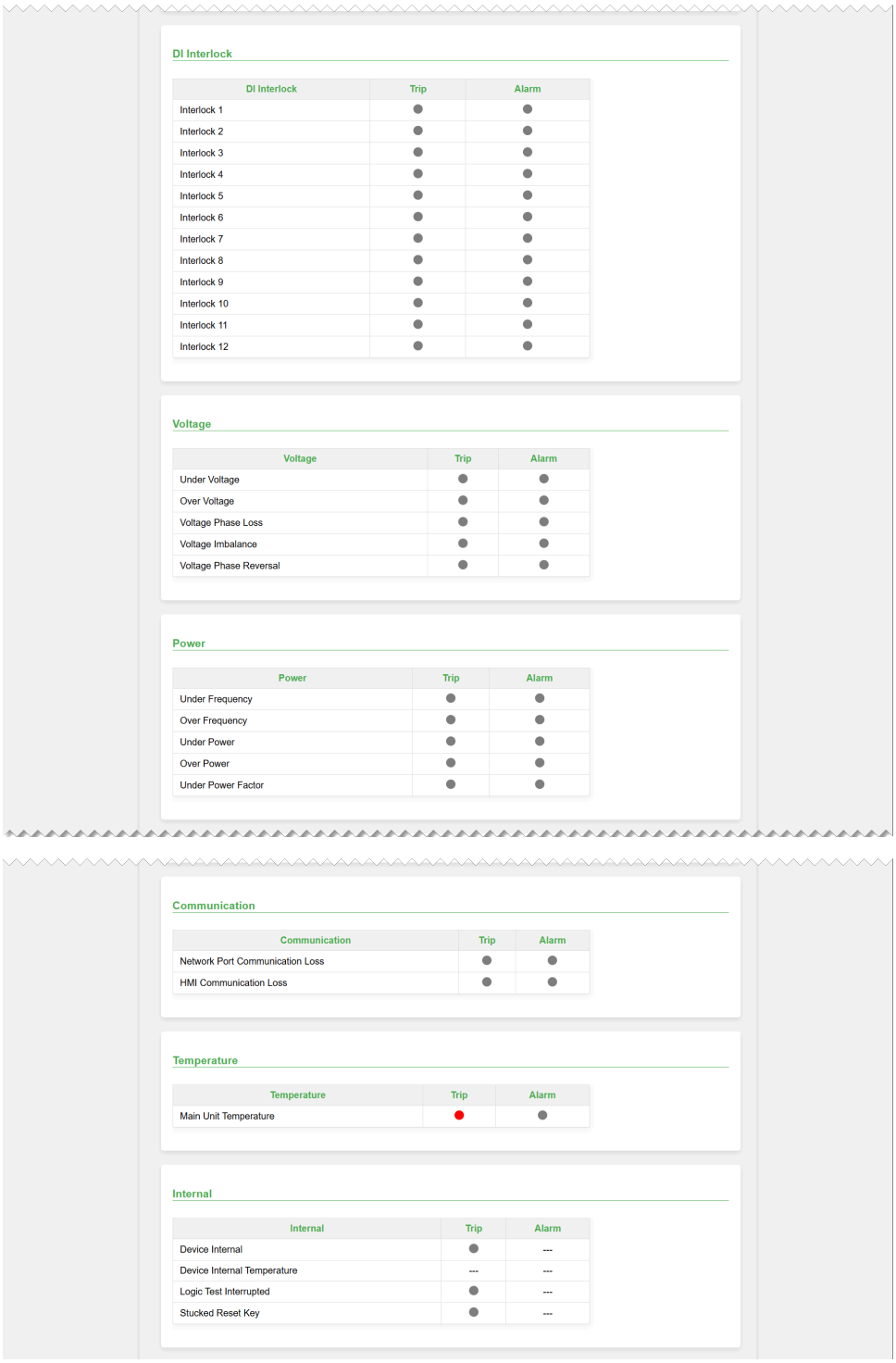
(31) You can also reset the parameter.

Alarm/Trip Status Page

Overview

The **Alarm/Trip Status** page displays the global status and the individual statuses of various triggered parameters.





DI Interlock

DI Interlock	Trip	Alarm
Interlock 1	●	●
Interlock 2	●	●
Interlock 3	●	●
Interlock 4	●	●
Interlock 5	●	●
Interlock 6	●	●
Interlock 7	●	●
Interlock 8	●	●
Interlock 9	●	●
Interlock 10	●	●
Interlock 11	●	●
Interlock 12	●	●

Voltage

Voltage	Trip	Alarm
Under Voltage	●	●
Over Voltage	●	●
Voltage Phase Loss	●	●
Voltage Imbalance	●	●
Voltage Phase Reversal	●	●

Power

Power	Trip	Alarm
Under Frequency	●	●
Over Frequency	●	●
Under Power	●	●
Over Power	●	●
Under Power Factor	●	●

Communication

Communication	Trip	Alarm
Network Port Communication Loss	●	●
HMI Communication Loss	●	●

Temperature

Temperature	Trip	Alarm
Main Unit Temperature	●	●

Internal

Internal	Trip	Alarm
Device Internal	●	---
Device Internal Temperature	---	---
Logic Test Interrupted	●	---
Stucked Reset Key	●	---

Alarm/Trip Status Page Body

Global Alarm/Trip Status

The **Global Status** section contains the following read-only parameter:

Level 1	Level 2	Parameter Name
Global Status	Global status(32). Possible values: • Alarm • Trip	

Current Alarm/Trip Status

The **Current** section contains the following read-only parameters:

Level 1	Level 2	Parameter Name
Current	Definite time overcurrent	Definite time overcurrent(32). Possible values: • Alarm • Trip
	Normal inverse overcurrent	Normal inverse overcurrent(32). Possible values: • Alarm • Trip
	Short time overcurrent	Short time overcurrent(32). Possible values: • Alarm • Trip
	Calculated ground current	Calculated ground(32). Possible values: • Alarm • Trip
	Measured ground current	Measured ground(32). Possible values: • Alarm • Trip
	Under current	Under current(32). Possible values: • Alarm • Trip
	Current imbalance	Current imbalance(32). Possible values: • Alarm • Trip
	Current phase loss	Current phase loss(32). Possible values: • Alarm • Trip
	Current phase reversal	Current phase reversal(32). Possible values: • Alarm • Trip

DI Interlock Alarm/Trip Status

The **DI Interlock** section contains the following read-only parameters:

(32) Status colors indicate different conditions:
- Red represents a trip condition.
- Orange represents an alarm condition.
- Grey indicates the condition is applicable to both trip and alarm.
- A hyphen (-) means the condition is disabled.

Level 1	Level 2	Parameter Name
DI Interlock	Interlock 1	Interlock 1(33). Possible values: • Alarm • Trip
	Interlock 2	Interlock 2(33). Possible values: • Alarm • Trip
	Interlock 3	Interlock 3(33). Possible values: • Alarm • Trip
	Interlock 4	Interlock 4(33). Possible values: • Alarm • Trip
	Interlock 5	Interlock 5(33). Possible values: • Alarm • Trip
	Interlock 6	Interlock 6(33). Possible values: • Alarm • Trip
	Interlock 7	Interlock 7(33). Possible values: • Alarm • Trip
	Interlock 8	Interlock 8(33). Possible values: • Alarm • Trip
	Interlock 9	Interlock 9(33). Possible values: • Alarm • Trip
	Interlock 10	Interlock 10(33). Possible values: • Alarm • Trip
	Interlock 11	Interlock 11(33). Possible values: • Alarm • Trip
	Interlock 12	Interlock 12(33). Possible values: • Alarm • Trip

(33) Status colors indicate different conditions:

- Red represents a trip condition.
- Orange represents an alarm condition.
- Grey indicates the condition is applicable to both trip and alarm.
- A hyphen (-) means the condition is disabled.

Voltage Alarm/Trip Status

The **Voltage** section contains the following read-only parameters:

Level 1	Level 2	Parameter Name
Voltage	Under Voltage	Under Voltage(34). Possible values: • Alarm • Trip
	Over Voltage	Over Voltage(34). Possible values: • Alarm • Trip
	Voltage Phase Loss	Voltage Phase Loss(34). Possible values: • Alarm • Trip
	Voltage Imbalance	Voltage Imbalance(34). Possible values: • Alarm • Trip
	Voltage Phase Reversal	Voltage Phase Reversal(34). Possible values: • Alarm • Trip

Power Alarm/Trip Status

The **Power** section contains the following read-only parameters:

Level 1	Level 2	Parameter Name
Power	Under frequency	Under frequency(34). Possible values: • Alarm • Trip
	Over frequency	Over frequency(34). Possible values: • Alarm • Trip
	Under power	Under power(34). Possible values: • Alarm • Trip
	Over power	Over power(34). Possible values: • Alarm • Trip
	Under power factor	Under power factor(34). Possible values: • Alarm • Trip

(34) Status colors indicate different conditions:

- Red represents a trip condition.
- Orange represents an alarm condition.
- Grey indicates the condition is applicable to both trip and alarm.
- A hyphen (-) means the condition is disabled.

Communication Alarm/Trip Status

The **Communication** section contains the following read-only parameters:

Level 1	Level 2	Parameter Name
Communication	Network port communication loss	Network port communication loss(35). Possible values: • Alarm • Trip
	HMI communication loss	HMI communication loss(35). Possible values: • Alarm • Trip

Analog Alarm/Trip Status

The **Analog** section contains the following read-only parameters:

Level 1	Level 2	Parameter Name
Analog	Analog input-1	Analog input(35). Possible values: • Alarm • Trip
	Analog input-2	Analog input(35). Possible values: • Alarm • Trip
	Analog input-3	Analog input(35). Possible values: • Alarm • Trip
	Analog input-4	Analog input(35). Possible values: • Alarm • Trip

Internal Alarm/Trip Status

The **Internal** section contains the following read-only parameters:

Level 1	Level 2	Parameter Name
Internal	Device internal	Device internal(35). Possible values: • Alarm • Trip
	Device internal temperature	Device internal temperature(35). Possible values: • Alarm • Trip
	Logic test interrupted	Logic test interrupted(35). Possible values: • Alarm • Trip

(35) Status colors indicate different conditions:

- Red represents a trip condition.
- Orange represents an alarm condition.
- Grey indicates the condition is applicable to both trip and alarm.
- A hyphen (-) means the condition is disabled.

Level 1	Level 2	Parameter Name
	Stucked reset key	Stucked reset key(36). Possible values: • Alarm • Trip

TeSys Tera Page

Overview

The **TeSys Tera** page displays the device identification, date and time information of the TeSys Tera system.

TeSys Tera Page Sub-Menu

The **TeSys Tera** page sub-menu allows you to access the following pages:

- Device identification, page 246
- Date & Time, page 248

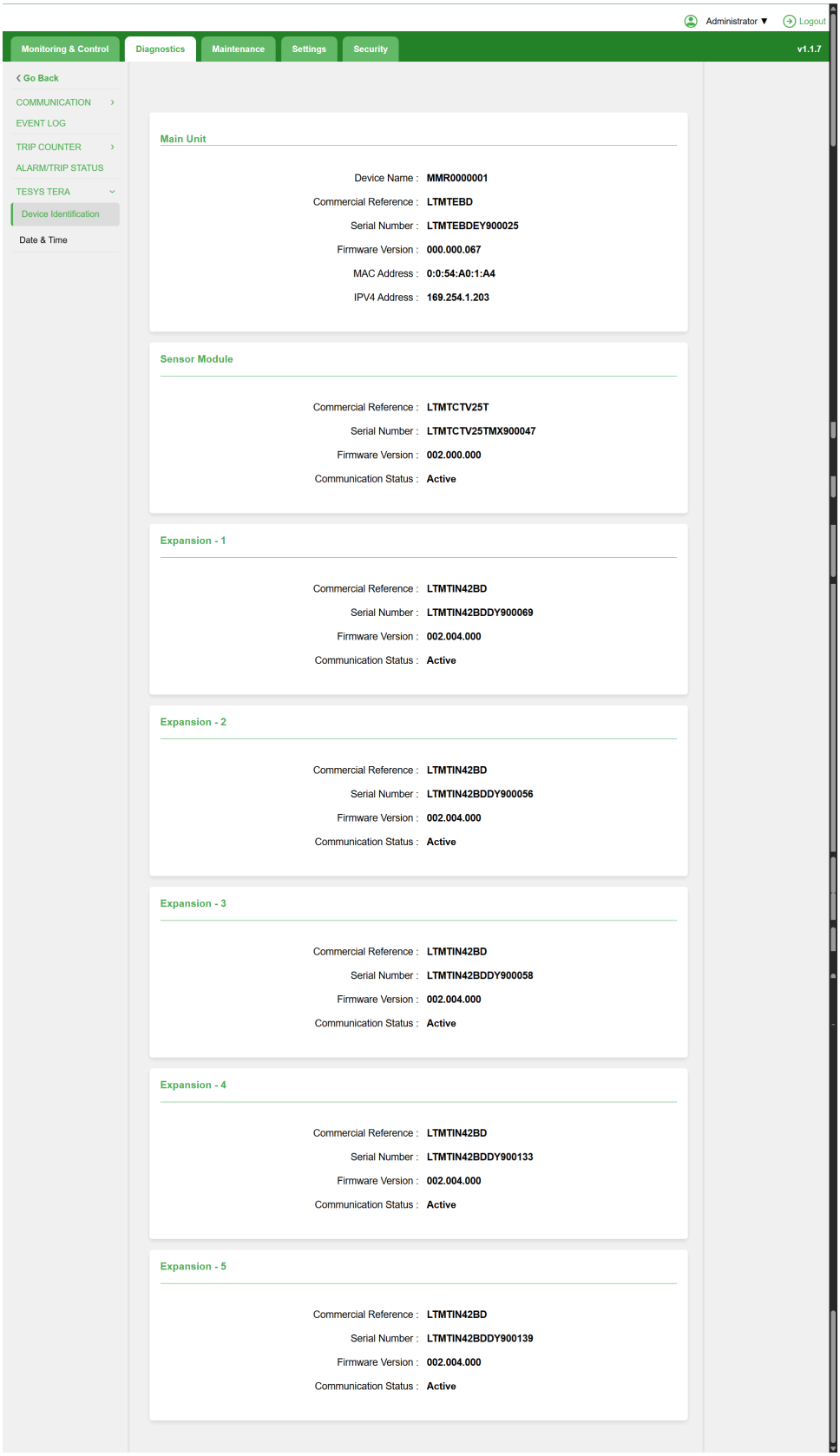
(36) Status colors indicate different conditions:

- Red represents a trip condition.
- Orange represents an alarm condition.
- Grey indicates the condition is applicable to both trip and alarm.
- A hyphen (-) means the condition is disabled.

Device Identification Page

Overview

The **Device Identification** page provides key details such as device name, commercial reference, serial number, firmware version, MAC address, and IP addresses for various TeSys Tera system components.



Device Identification Page Body

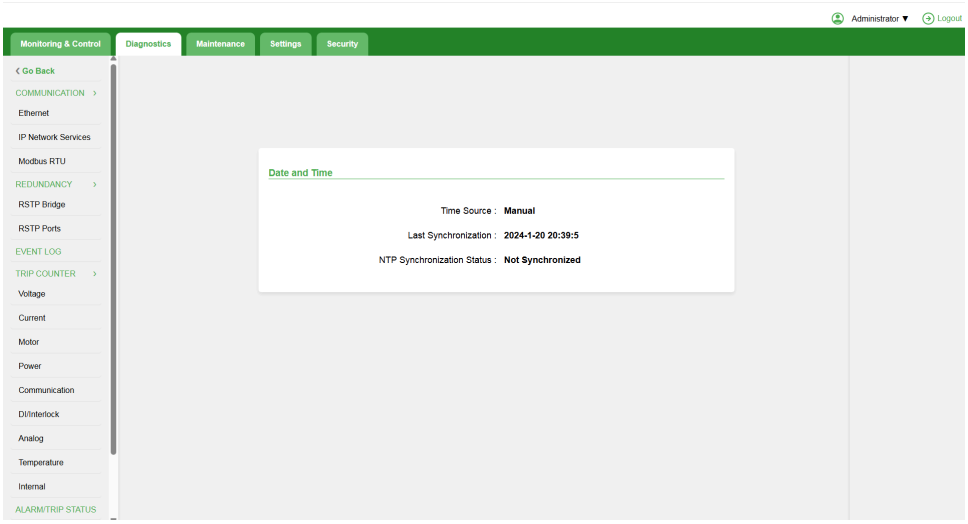
The **Device Identification** page contains the following sections:

Level 1	Level 2	Parameter Name
Main Unit	Device Name	Ethernet Device Name
	Commercial Reference	Ethernet Commercial Reference
	Serial Number	Ethernet Serial Number
	Firmware Version	Ethernet Firmware Version
	MAC Address	Ethernet MAC Address
	IPV4 Address	Ethernet IP Address
Sensor Module	Commercial Reference	Ethernet Commercial Reference
	Serial Number	Ethernet Serial Number
	Firmware Version	Ethernet Firmware Version
	Communication Status	Ethernet Communication Status
Expansion - 1	Commercial Reference	Ethernet Commercial Reference
	Serial Number	Ethernet Serial Number
	Firmware Version	Ethernet Firmware Version
	Communication Status	Ethernet Communication Status
Expansion - 2	Commercial Reference	Ethernet Commercial Reference
	Serial Number	Ethernet Serial Number
	Firmware Version	Ethernet Firmware Version
	Communication Status	Ethernet Communication Status
Expansion - 3	Commercial Reference	Ethernet Commercial Reference
	Serial Number	Ethernet Serial Number
	Firmware Version	Ethernet Firmware Version
	Communication Status	Ethernet Communication Status
Expansion - 4	Commercial Reference	Ethernet Commercial Reference
	Serial Number	Ethernet Serial Number
	Firmware Version	Ethernet Firmware Version
	Communication Status	Ethernet Communication Status
Expansion - 5	Commercial Reference	Ethernet Commercial Reference
	Serial Number	Ethernet Serial Number
	Firmware Version	Ethernet Firmware Version
	Communication Status	Ethernet Communication Status

Date and Time Page

Overview

The **Date and Time** page displays the date and time settings of the LTMT main unit.



Date and Time Page Body

The **Date and Time** page contains the following sub-menus:

Level 1	Level 2	Parameter Name
Date and Time	Time Source	Time Source
	Last Synchronization	Last Synchronization
	NTP Synchronization Status	NTP Synchronization Status

Maintenance Page

What's in This Chapter

Overview

The **Maintenance** page provides an option to upgrade the firmware of LTMT main unit, LTMTCT/LTMTCTV sensor module, and LTMT expansion modules, ensuring they operate with the latest features, improvements, and security updates.

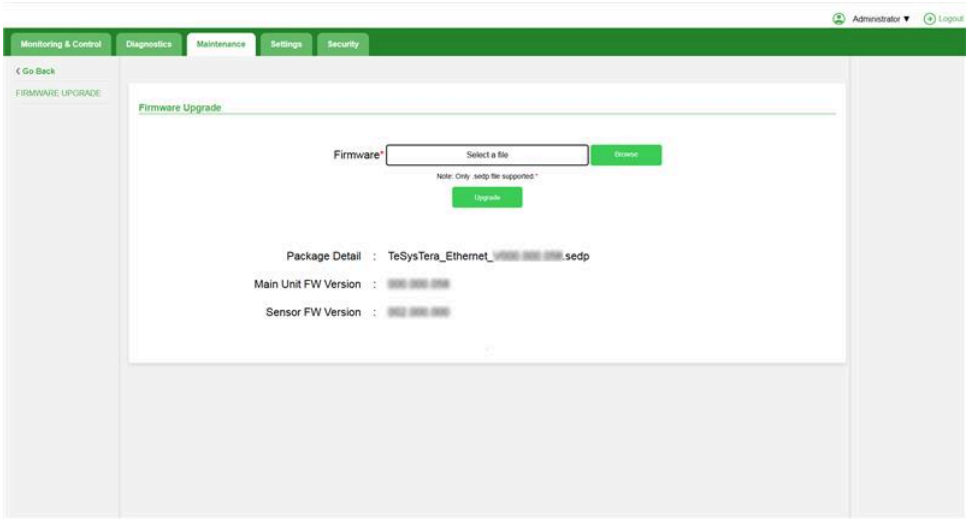
Maintenance Page Sub-Menu

The **Maintenance** page sub-menu allows you to access the Firmware upgrade, page 250.

Firmware Upgrade Page

Overview

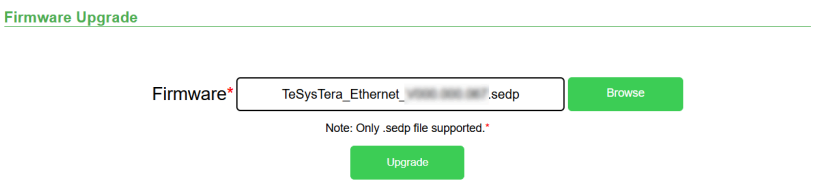
The **Firmware Upgrade** page is used to upgrade the firmware of the LTMT main unit, LTMTCT/LTMTCTV sensor module, and LTMT expansion modules.



Firmware Upgrade Page Body

To update the firmware of the LTMT main unit, LTMTCT/LTMTCTV sensor module, and LTMT expansion modules, proceed as follows.

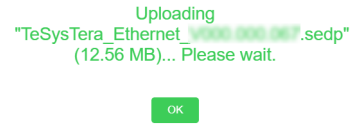
1. On the **Firmware Upgrade** section, click **Browse** to choose the firmware package file from your PC.



NOTE: The standard web server supports only files with .sedp extension.

2. Click **Upgrade** to start the firmware upgrade.

   Result: An **Uploading** message appears.



3. Click **OK**.

   Result: A **Package verification in progress** message appears.

4. Click **OK**.

   Result: An update successful message appears.

   NOTE: If no new firmware is available, **No Firmware to Update** message appears.

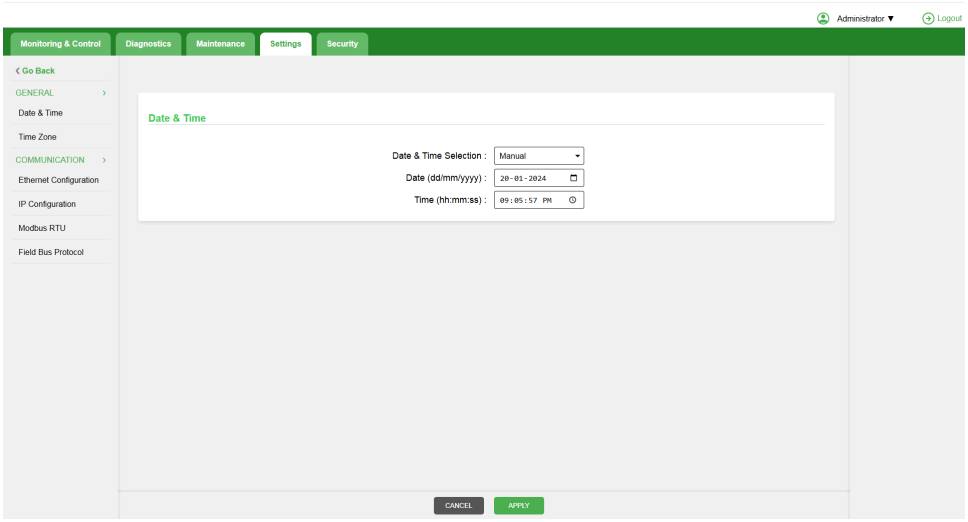
5. If the update is successful, **Firmware Update Failed** message appears. Repeat the procedure to update the firmware.

Settings Page

What's in This Chapter

Overview

The **Settings** page allows you to view and update the general and communication settings of the TeSys Tera system.



Settings Page Sub-Menu

The **Settings** page sub-menu allows you to access the following pages:

- General, page 253
- Communication, page 255

General Settings Page

Overview

The **General** settings page allows you to modify the time zone, date and time settings of the LTMT main unit.

General Settings Page Sub-Menu

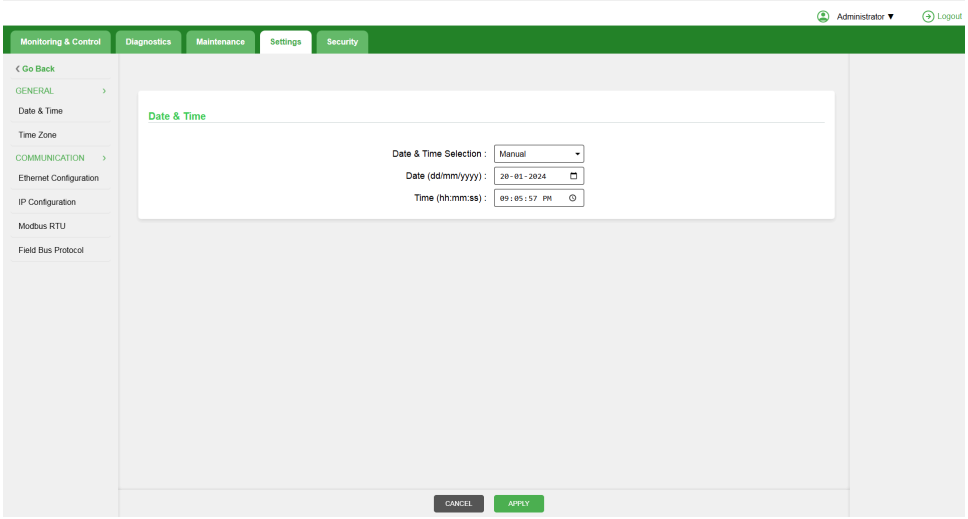
The **General** settings page sub-menu allows you to access the following pages:

- Date and Time, page 253
- Time Zone, page 254

Date and Time Setting Page

Overview

The **Date and Time** settings page allows you to modify the date and time settings of the LTMT main unit.



Date and Time Settings Page Body

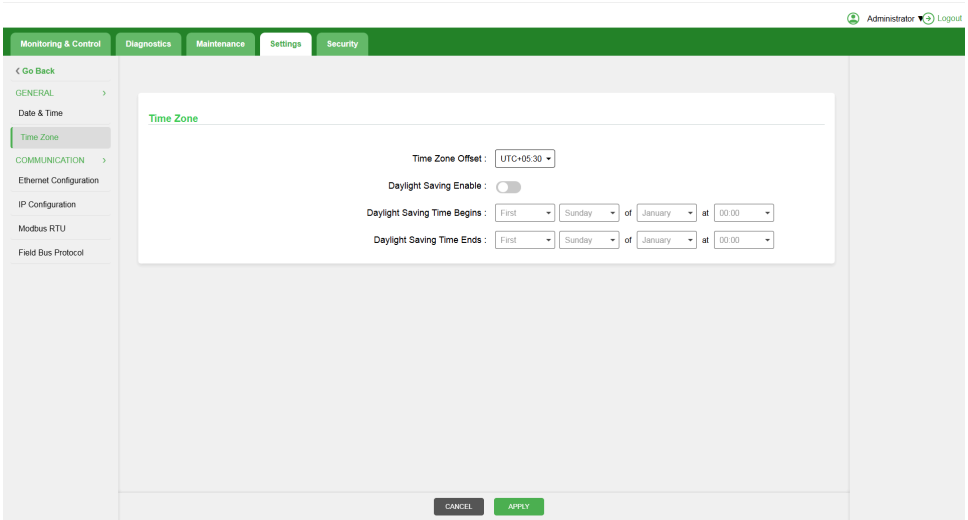
The **Date and Time** settings page contains the following sub-menus:

Level 1	Level 2	Parameter Name
Date and Time	Date and Time Selection	Date and Time Selection. Possible values: • Manual(37) • NTP/SNTP • Field Bus Protocol
	Date (dd/mm/yyyy)	Date
	Time (hh:mm:ss)	Time

Time Zone Settings Page

Overview

The **Time Zone** settings page allows you to modify the time zone of the LTMT main unit.



(37) When the date and time are set manually, the LTMT main unit resets to factory settings upon reboot.

Time Zone Settings Page Body

The **Time Zone** settings page contains the following sub-menus:

Level 1	Level 2	Parameter Name
Time Zone	Time Zone Offset	Time Zone Offset. Use the toggle key to enable or disable the feature.
	Daylight Saving Enable	Daylight Saving Enable
	Daylight Saving Time Begins	Daylight Saving Time Begins
	Daylight Saving Time Ends	Daylight Saving Time Ends

Communication Settings Page

Overview

The **Communication** settings page allows you to view or modify the Ethernet configuration, IP configuration, Modbus RTU and field bus protocol settings of the TeSys Tera system.

Communication Settings Page Sub-Menu

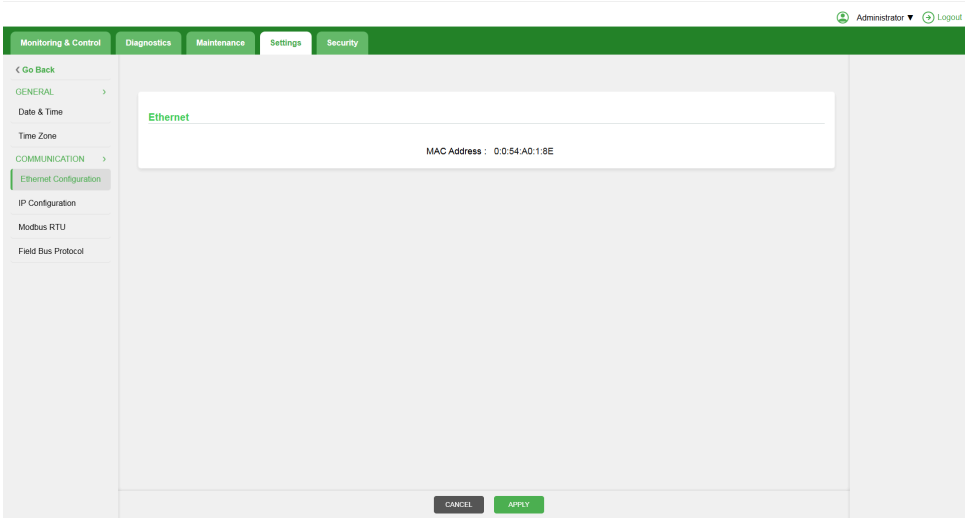
The **Communication** settings page sub-menu allows you to access the following pages:

- Ethernet Configuration, page 255
- IP Configuration, page 256
- Modbus RTU, page 256
- Field Bus Protocol, page 257

Ethernet Configuration Page

Overview

The **Ethernet Configuration** page displays the MAC address of the TeSys Tera system.



Ethernet Configuration Page Body

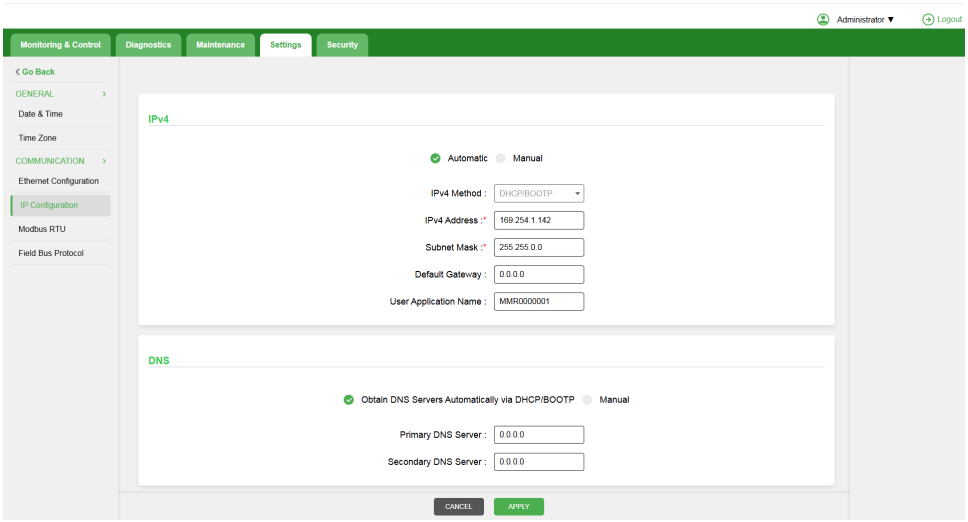
The **Ethernet Configuration** page contains the following sub-menus:

Level 1	Level 2	Parameter Name
Ethernet	MAC Address	Ethernet MAC address

IP Configuration Page

Overview

The **IP Configuration** page allows you to modify the IPV4 and DNS settings of the TeSys Tera system.



IP Configuration Page Body

The **IP Configuration** page contains the following sub-menus:

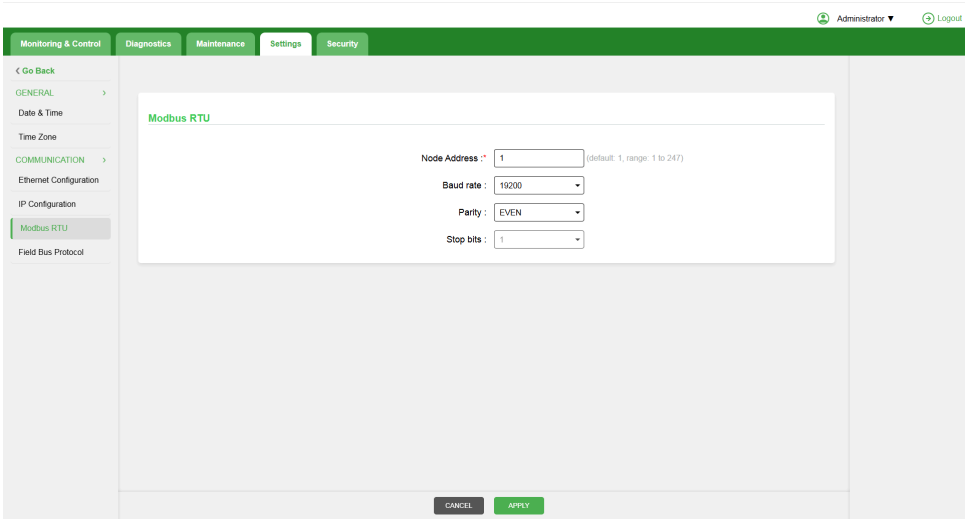
Level 1	Level 2	Parameter Name
IPv4(38)	IPv4 Method	IPv4 Method
	IPv4 Address	IPv4 Address
	Subnet Mask	Subnet Mask
	Default Gateway	Default Gateway
	User Application Name	User Application Name
DNS(38)	Primary DNS Server	Primary DNS Server
	Secondary DNS Server	Secondary DNS Server

Modbus RTU Page

Overview

The **Modbus RTU** page allows you to modify the Modbus RTU settings of the TeSys Tera system.

(38) You can configure the parameters manually or automatically.



Modbus RTU Page Body

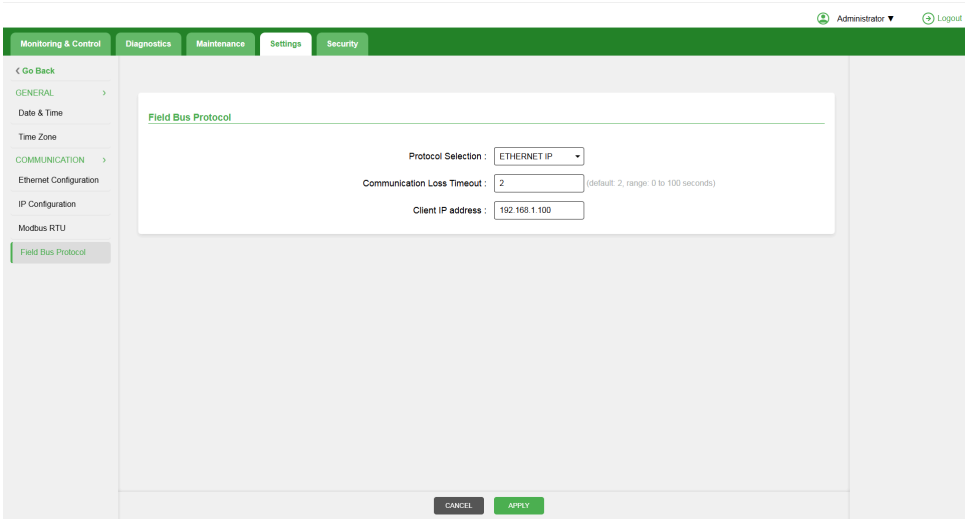
The **Modbus RTU** page contains the following sub-menus:

Level 1	Level 2	Parameter Name
Modbus RTU	Node Address	Node Address. The note address ranges 1 to 247.
	Baud rate	Baud rate. Possible values: • 2400 • 4800 • 9600 • 19200 • 38400 • 57600 • 115200
	Parity	Parity. Possible values: • None • Odd • Even
	Stop bits	Stop bits

Field Bus Protocol Page

Overview

The **Field Bus Protocol** page allows you to modify the field bus protocol settings of the TeSys Tera system.



Field Bus Protocol Page Body

The **Field Bus Protocol** page contains the following sub-menus:

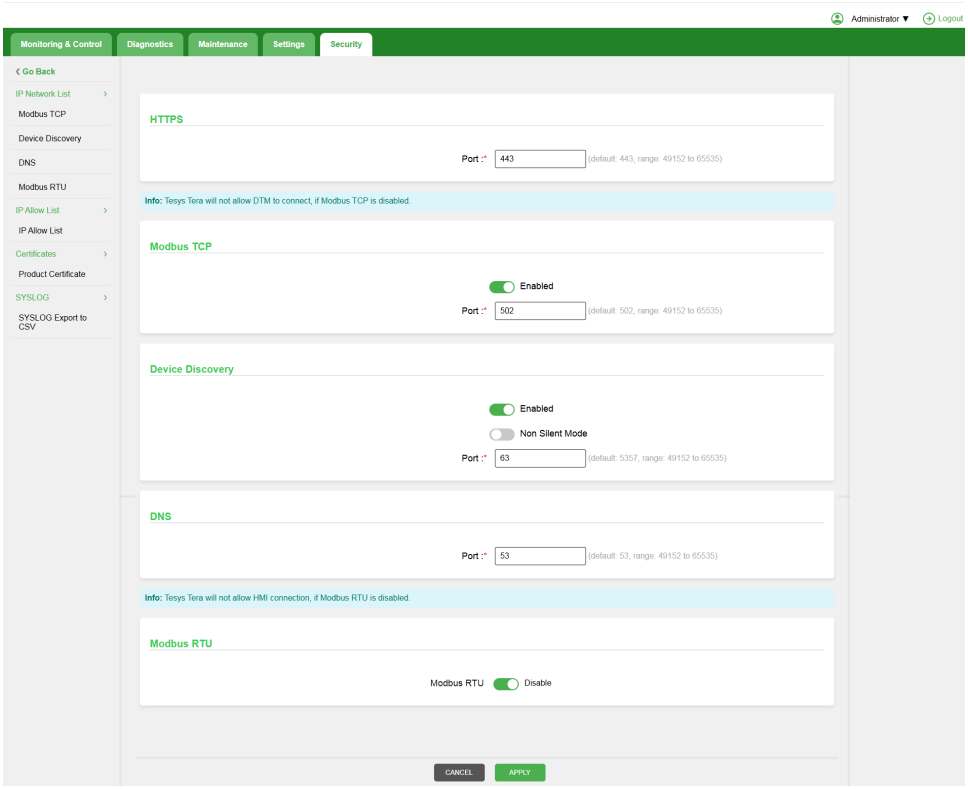
Level 1	Level 2	Parameter Name
Field Bus Protocol	Protocol selection	Protocol selection. Possible values: • Modbus TCP • EtherNet/IP
	Communication Loss Timeout	Communication Loss Timeout
	Client IP address	Client IP address

Security Page

What's in This Chapter

Overview

The **Security** page allows you to view and update the security settings of the TeSys Tera system.



Security Page Sub-Menu

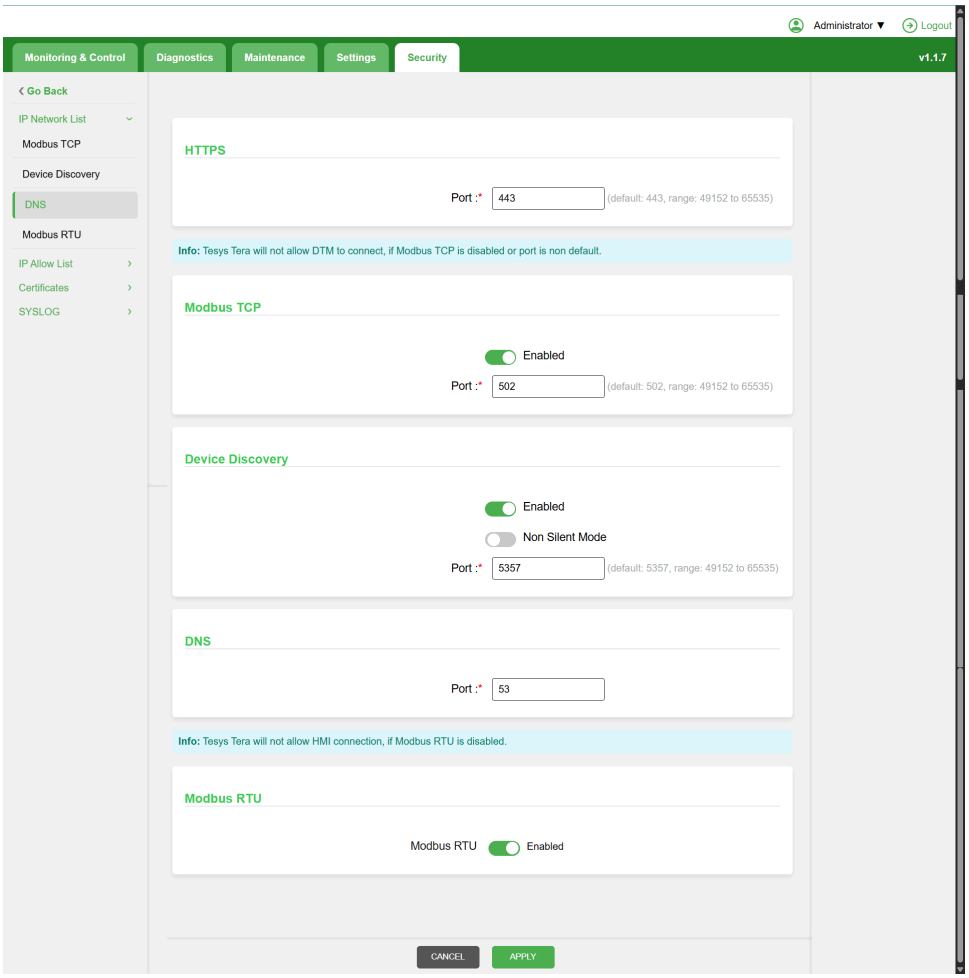
The **Security** page sub-menu allows you to access the following pages:

- IP Network List, page 260
- IP Allow List, page 262
- Certificates, page 263
- Syslog, page 264

IP Network List Page

Overview

The **IP Network List** page allows you to modify the protocol settings of the TeSys Tera system.



IP Network List Page Body

HTTPS Section

On the **HTTP** section, proceed as follows.

1. Enter the port number in the **Port** box.

   NOTE: The default port number is 443.
2. Confirm with **APPLY**.

Modbus TCP Section

On the **Modbus TCP** section, proceed as follows.

1. Use the toggle key to turn the Modbus TCP protocol on or off.
2. Enter the port number in the **Port** box.

   NOTE: The default port number is 502.
3. Confirm with **APPLY**.

   NOTE: The TeSys Tera system does not allow TeSys Tera DTM to connect if Modbus TCP is turned off.

Device Discovery Section

On the **Device Discovery** section, proceed as follows.

1. Use the toggle key to turn the **Device Discovery** feature on or off.

2. Use the toggle key to turn the **Non Silent Mode** feature on or off.
3. Enter the port number in the **Port** box.

   NOTE: The default port number is 63.
4. Confirm with **APPLY**.

DNS Section

On the **DNS** section, proceed as follows.

1. Enter the port number in the **Port** box.

   NOTE: The default port number is 53.
2. Confirm with **APPLY**.

Modbus RTU Section

On the **Modbus RTU** section, proceed as follows.

1. Use the toggle key to turn the Modbus RTU protocol on or off.
2. Confirm with **APPLY**.

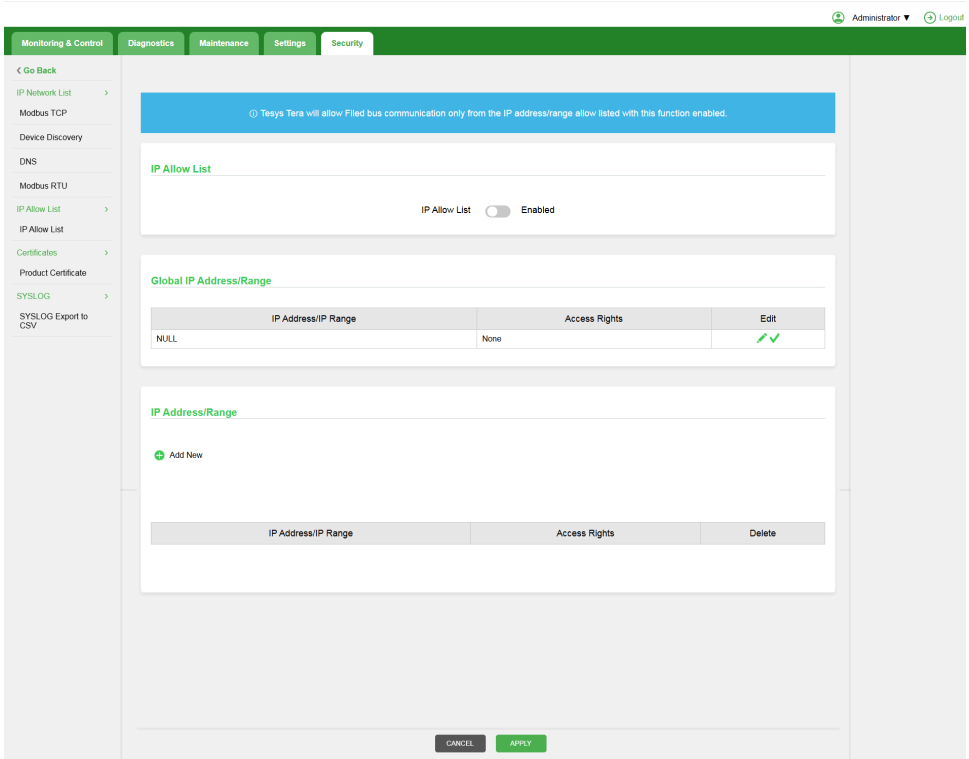
   NOTE: The TeSys Tera system does not allow TeSys Tera DTM to connect if Modbus RTU is turned off.

IP Allow List Page

Overview

The **IP Allow list** page allows you to modify the IP address settings of the TeSys Tera system.

NOTE: The TeSys Tera system supports field bus communication only from IP addresses or ranges that are approved and have this function enabled.



IP Allow List Page Body

IP Allow List Section

On the **IP Allow List** section, proceed as follows.

1. Use the toggle key to turn the **IP Allow List** on or off.
2. Confirm with **APPLY**.

Global IP Address/Range Section

On the **Global IP Address/Range** section, proceed as follows.

1. Add or remove the global IP address in the **IP Address/IP Range** field.
2. Select the appropriate access rights in the **Access Rights** field.
3. Confirm with **APPLY**.

IP Address/Range Section

On the **IP Address/Range** section, proceed as follows.

1. Use **Add New** option to add the IP address.
2. Confirm with **APPLY**.

Certificates Page

Overview

The **Certificates** page allows you to import a third-party CA-signed certificate to the TeSys Tera system. This enables secure access to the standard web server.

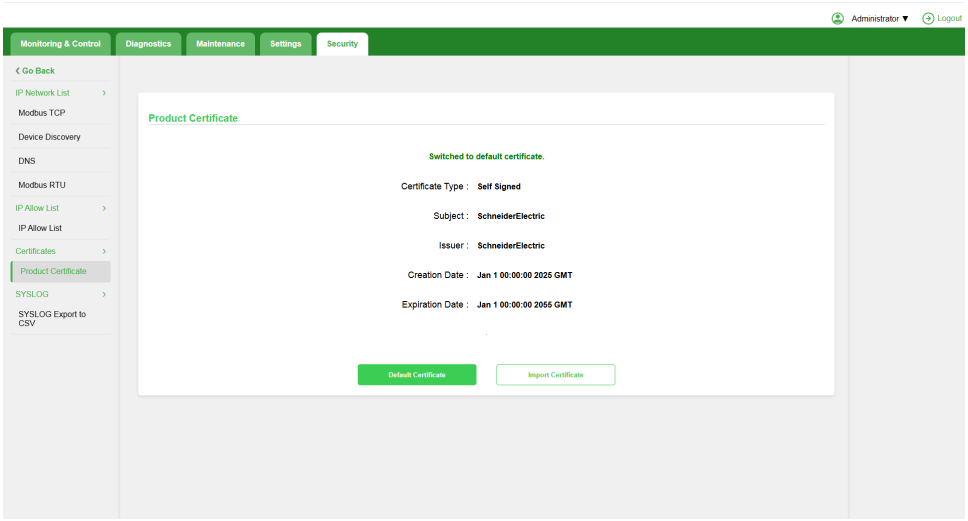
Certificates Page Sub-Menu

The **Certificates** page sub-menu allows you to access the Product Certificate, page 263.

Product Certificate Page

Overview

The **Product Certificate** page allows to use a third-party CA-signed certificate for the TeSys Tera system.



Product Certificate Page Body

On the **Product Certificate** page, select the **Import Certificate** option to upload a new certificate to the TeSys Tera system.

For information on certified product certificate formats, refer to *TeSys Tera Motor Management System Cybersecurity Guide – DOCA0260EN*.

Syslog Page

Overview

The **Syslog** page allows you to download the audit logs to your PC.

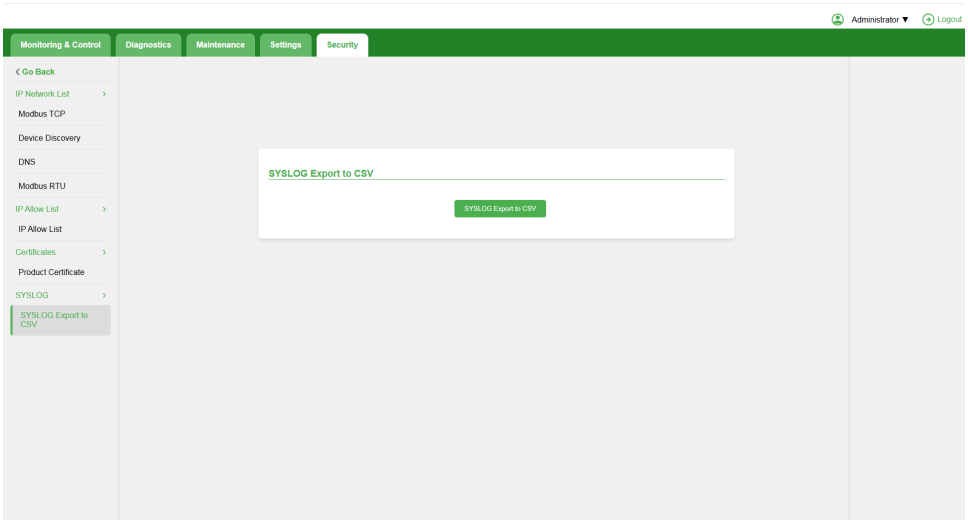
Syslog Sub-Menu

The **Syslog** page sub-menu allows you to access the Syslog Export to CSV, page 265.

Syslog Export to CSV Page

Overview

The **Syslog Export to CSV** page allows you to export all the audit log reports to your PC.



Syslog Export to CSV Page Body

On the **Syslog Export to CSV** page, select the **Syslog Export to CSV** option to export all the audit log reports to your PC.

Result: The **File export successful** message appears.

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
45–64	Reserved
65	Analog input 1 trip
66	Analog input 2 trip
67	Analog input 3 trip
68	Analog input 4 trip
69-94	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 trip alarm
14	Calculated ground trip alarm reset
15	Measured ground trip alarm
16	Measured ground trip 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 alarm
54	Device internal 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
89–128	Reserved
129	AI1 alarm
130	AI1 alarm reset
131	AI2 alarm
132	AI2 alarm reset
133	AI3 alarm

Event code	Description
134	AI3 alarm reset
135	AI4 alarm
136	AI4 alarm reset
137-192	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 trip pickup
206	Calculated ground trip pickup reset
207	Measured ground trip pickup
208	Measured ground trip 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

Event code	Description
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
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

Event code	Description
277	Interlock 11 pickup
278	Interlock 11 pickup reset
279	Interlock 12 pickup
280	Interlock 12 pickup reset
281-320	Reserved
321	AI1 pickup
322	AI1 pickup reset
323	AI2 pickup
324	AI2 pickup reset
325	AI3 pickup
326	AI3 pickup reset
327	AI4 pickup
328	AI4 pickup reset
329-384	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

Event code	Description
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
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

Event code	Description
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

Event code	Description
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
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
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

Event code	Description
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
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 <<
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 trip trip reset
904	Measured ground trip trip reset
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

Event code	Description
940	Interlock 12 trip reset
941-960	Reserved
961	AI1 trip reset
962	AI2 trip reset
963	AI3 trip reset
964	AI4 trip reset
965–991	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
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

Event code	Description
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
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	Motor/Heater Stopped
1227	Stop Cause - HMI
1228	Stop Cause - LOCAL_DI
1229	Stop Cause - REMOTE_DI
1230	Stop Cause - Communication
1231	Stop Cause - Voltage Dip
1232	Stop Cause - Trip
1233	Stop Cause - No Current
1234	Stop Cause - Forced Stop
1235	Stop Cause - Change Direction
1236	Reserved
1237	Stop Cause - Change Speed
1238	Stop Cause - Custom Command
1239	Stop Cause - Mode Transfer

Event code	Description
1240	Reserved
1241	Stop Cause - No Voltage
1242–1280	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
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 module FW valid
1378	LTMT expansion module invalid sign

Event code	Description
1379	LTMT expansion module incompatible ver
1380	LTMT expansion module FW update success
1381	LTMT expansion module FW update timeout
1382–1392	Reserved
1393	Device Configuration modified
1394	Modbus settings modified
1395	HMI settings modified
1396–1397	Reserved
1398	Starter settings modified
1399	System settings modified
1400	Motor Name Plate settings modified
1401	Session Management settings modified
1402	Digital input settings modified
1403	Digital output settings modified
1404	Analog output settings modified
1405–1408	Reserved
1409	Thermal Overload protection setting modified
1410	Locked Rotor protection setting modified
1411	Stall Rotor protection setting modified
1412	Definite time overcurrent protection setting modified
1413	Normal inverse overcurrent protection setting modified
1414	Short time overcurrent protection setting modified
1415	Calculated ground fault protection setting modified
1416	Measured ground fault protection setting modified
1417	Under Current protection setting modified
1418	Current Imbalance protection setting modified
1419	Current Phase Loss protection setting modified
1420	Current Phase Reversal protection setting modified
1421	Under Voltage protection setting modified
1422	Over Voltage protection setting modified
1423	Voltage Phase Loss protection setting modified
1424	Voltage Imbalance protection setting modified
1425	Voltage Phase Reversal protection setting modified
1426	Under Frequency protection setting modified
1427	Over Frequency protection setting modified
1428	Reserved
1429	Communication loss protection setting modified
1430	Over Temperature protection setting modified
1431	Under Power protection setting modified
1432	Over Power protection setting modified
1433	Under Power Factor protection setting modified
1434	Reserved

Event code	Description
1435	Device Internal protection setting modified
1436	HMI Communication loss protection setting modified
1437–1440	Reserved
1441	Interlock 1 protection setting modified
1442	Interlock 2 protection setting modified
1443	Interlock 3 protection setting modified
1444	Interlock 4 protection setting modified
1445	Interlock 5 protection setting modified
1446	Interlock 6 protection setting modified
1447	Interlock 7 protection setting modified
1448	Interlock 8 protection setting modified
1449	Interlock 9 protection setting modified
1450	Interlock 10 protection setting modified
1451	Interlock 11 protection setting modified
1452	Interlock 12 protection setting modified
1453–1472	Reserved
1473	AI1 protection setting modified
1474	AI2 protection setting modified
1475	AI3 protection setting modified
1476	AI4 protection setting modified
1477–1503	Reserved
1504	Logic Test Interrupted protection setting modified
1505	Motor stop error detection protection setting modified
1506	Miscellaneous Hysteresis Settings Modified
1507	Voltage Dip Function Settings Modified
1508	Maximum number of Starts settings Modified
1509	Anti back spin settings modified
1510	Block out settings modified
1511–1536	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
13-14	Reserved
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
19–22	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 module initiation
28	Expansion module initiation error reset
29	Reserved
30	Date and time setting 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
74	Voltage configuration error reset
75–76	Reserved
77	Calibration error detected
78	Calibration error reset

Detected internal error code	Description
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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