TeSys Active

TeSys Tera Motor Management System

LTMTCUF Control Operator Unit User Guide

TeSys offers innovative and connected solutions for motor starters.

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Legal Information

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

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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 describes how to configure, navigate, and use the TeSys™ Tera LTMTCUF control operator unit.

This guide is intended for:

- Design engineers
- System integrators
- Maintenance engineers

Validity Note

This guide is valid for a LTMTCUF control operator unit connected to a LTMT main unit. The availability of some functions depends on the firmware version of the LTMTCUF control operator unit.

The LTMTCUF control operator unit is compatible with TeSys Tera system with firmware package TeSysTera_V001.000.001.sedp.

General Cybersecurity Information

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

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

Schneider Electric provides additional information and assistance:

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

Environmental Data

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

Available Languages of the Document

The document is available in these languages:

- English
- 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 units, LTMTCT/LTMTCTV sensor modules, LTMT expansion modules, and LTMTCUF control operator unit.	DOCA0356EN
TeSys Tera Motor Management System DTM library Online Help Guide	This online help provides the summary of the TeSys Tera DTM library which allows the customization of the functions of the TeSys Tera Motor Management System.	DOCA0275EN
TeSys Tera Motor Management System Modbus RTU Communication Guide	This guide describes the Modbus RTU network protocol communication of the LTMT main unit.	DOCA0355EN
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
TeSys Tera Motor Management System DTM library 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 PROFIBUS DP Guide	This guide describes the PROFIBUS DP network protocol communication of the LTMT main unit.	DOCA0256EN
TeSys Tera Motor Management System EtherNet/IP Guide	This guide describes the EtherNet/IP network protocol communication of the LTMT main unit.	DOCA0258EN
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

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

Information on Non-Inclusive or Insensitive Terminology

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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

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 and solutions for switching and protection of motors and electrical loads in compliance with all major global electrical standards.

TeSys Tera System

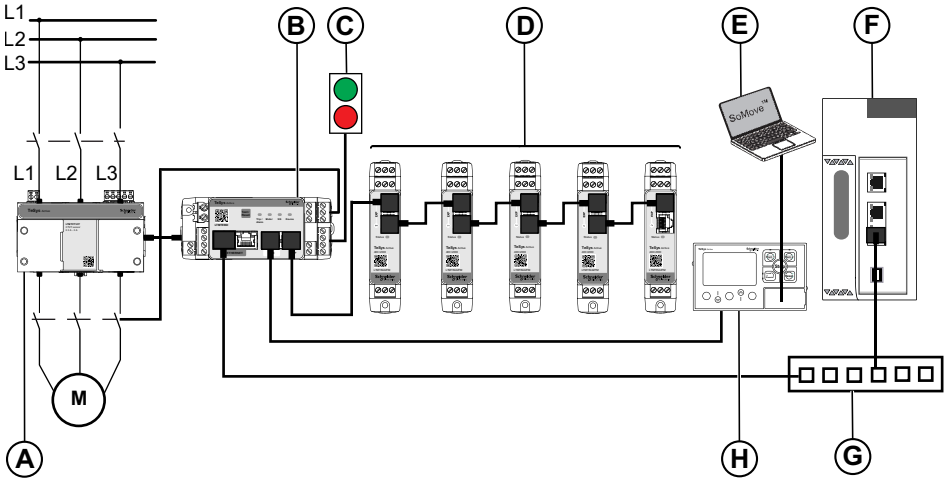
Overview

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

The TeSys Tera system is installed in the low voltage switchgear system and connects the higher level automation system through fieldbus 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.

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:

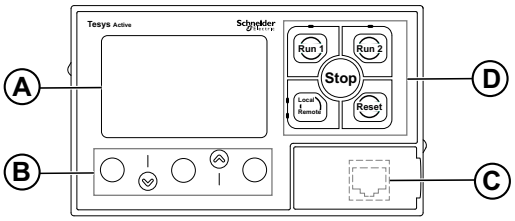
- Single-phase or three-phase AC induction motors and heaters rated up to 100 A and 690 V operational voltage, with an integral sensor module.
- Single-phase or three-phase AC induction motors and heaters rated up to 810 A and 690 V operational voltage, with external current transformers.
- The connection 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.

Presentation of the LTMTCUF Control Operator Unit

The LTMTCUF control operator unit is a local Human Machine Interface (HMI) that enables the configuration, monitoring, and control of the LTMT main unit, as part of the TeSys Tera Motor Management System. The LTMTCUF control operator unit has been specially developed to act as the HMI of the LTMT main unit, and is internally powered by the LTMT main unit.

Front Face Description

The LTMTCUF control operator unit front face is shown in the following diagram:



A LCD display

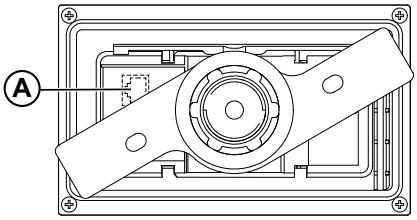
B Contextual navigation keys

C Front face RJ45 for PC connection (covered)

D Local control interface, including five control keys and four LEDs

Rear Face Description

The LTMTCUF control operator unit rear face is shown in the following diagram:



A Rear face RJ45 port for connection with LTMT main unit

LTMTCUF Control Operator Unit Functions

The LTMTCUF control operator unit can be used to:

- Configure parameters for the LTMT main unit.
- Displays metering, motor parameters, and I/O status.
- Displays trips and alarms detected by the LTMT main unit.
- Control the motor locally using the local control interface.

LTMTCUF Control Operator Unit Languages

The LTMTCUF control operator unit can display languages, with the help of an embedded dictionary. The default (factory setting) language is English.

Configuring the LTMT Main Unit

The LTMT main unit can be configured using the LTMTCUF control operator unit or a PC running SoMove FDT container software with TeSys Tera DTM installed. For more information, refer to *TeSys Tera Motor Management System DTM Library Online Help Guide – DOCA0275EN*.

The TeSys Tera DTM is a specific DTM that enables the configuration, monitoring, control, and customization of the control functions of the LTMT main unit, as part of the TeSys Tera Motor Management System.

SoMove software is the setup software for motor control devices. It is a software for PC, using the open FDT or DTM technology. SoMove software contains many DTMs.

For information on the TeSys Tera functions, parameter values (including default values), and commissioning instructions, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.

For information on the installation of LTMTCUF control operator unit, refer to the *TeSys Tera Motor Management System Installation Guide – DOCA0356EN*.

LTMT HMI Port Settings

The LTMT HMI port has the following configurable settings:

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

NOTE: If LTMTCUF control operator unit is connected on HMI port of LTMT main unit. HMI port must be configured with default settings:

- Node address: 1
- Baud rate: 19200 bps

  NOTE: If the baud rate is changed, the device will be disconnected.
- Parity: Even
- Endianness: Big-endian

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

- A PC running SoMove FDT container software with TeSys Tera DTM installed.
- A PLC or DCS through the communication protocol.

Fast Device Replacement Services

LTMTCUF Fast Device Replacement (FDR) services facilitate the replacement of a drawer in a high continuity of service environment, without needing a PC or expertise in configuring LTMT main unit.

FDR Services

FDR services are provided by the LTMTCUF control operator unit. It allows to:

- Backup LTMT main unit memory into LTMTCUF memory.
- Restore LTMT main unit memory from LTMTCUF memory.

The LTMTCUF contains a non-volatile memory of 8 MB to enable LTMT main unit configuration to be saved.

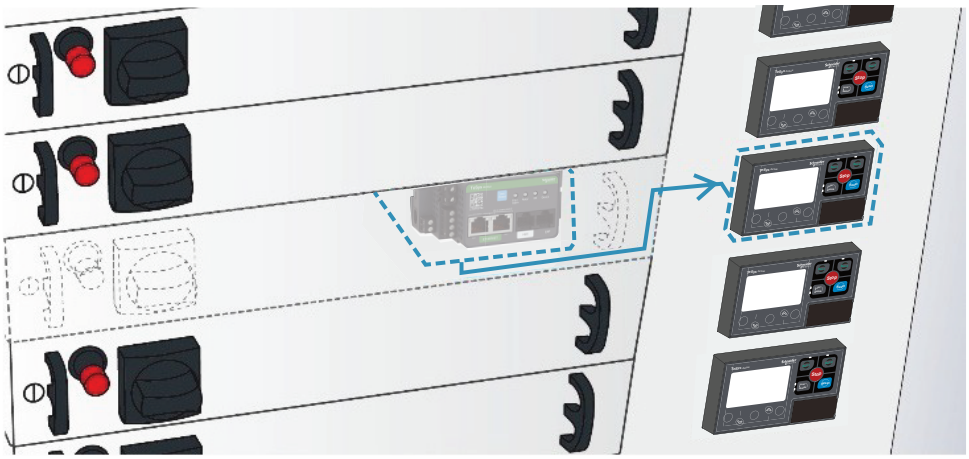
FDR services do not require a network connection and are available for all LTMT main unit regardless of the communication protocol or power supply.
They are independent from the type of power supply.

Principles

The whole operation can be automatically completed with minimal work for the operator.

Backup Service

After the LTMT main unit is set up at commissioning stage, use the LTMTCUF control operator unit to save the LTMT main unit memory into the LTMTCUF memory.

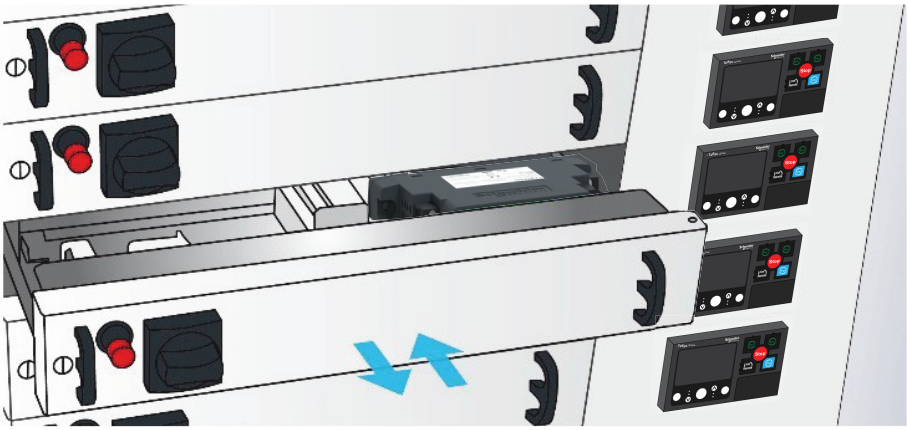


Restore Service

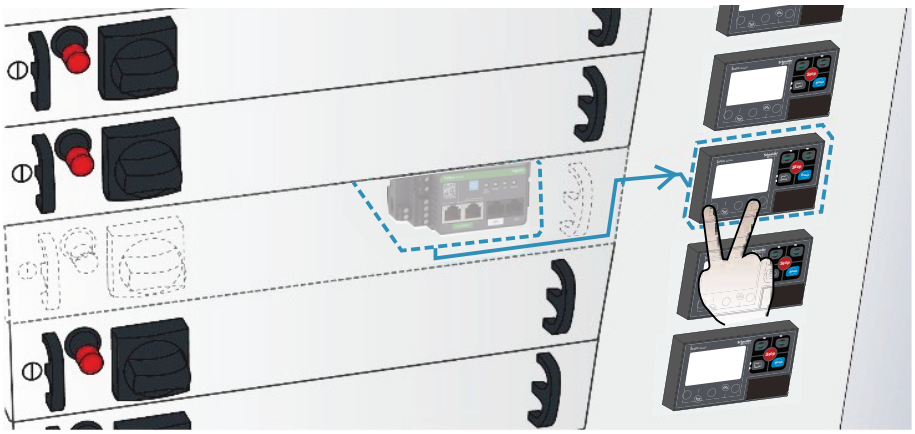
In case of a drawer replacement, proceed as follows:

1. Rack out the drawer to be replaced.
2. If LTMTCUF control operator unit is installed in the drawer itself, remove the LTMTCUF control operator unit from the drawer and install it in the spare drawer.

3. Rack in a spare drawer. The LTMTCUF control operator unit installed in a fixed part of the panel will automatically detect the new LTMT main unit and upload the recorded configuration to the new LTMT main unit.



4. Acknowledge the message for uploading the configuration to the LTMT main unit (optional).



Fast Device Replacement

Fast Device Replacement Settings

The FDR services can be configured on the LTMTCUF control operator unit only through the HMI FDR sub-menu.

On the HMI FDR sub-menu, you can enable or disable the FDR services (disabled by default).

If the FDR services are enabled, select the restore behavior at LTMT main unit power up automatic or with confirmation. Start manually to back up and restore the LTMT main unit memory into LTMTCUF memory.

Backup Service

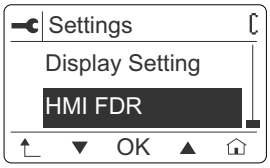
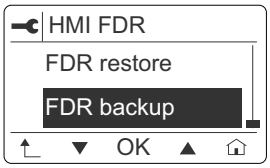
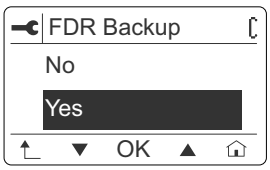
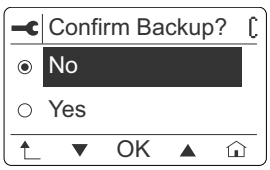
The backup service allows you to download all LTMT main unit settings into the internal non-volatile memory of LTMTCUF control operator unit, including the configuration settings.

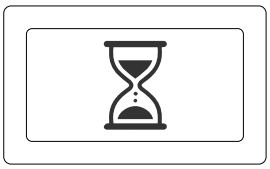
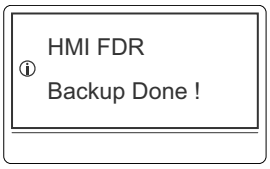
The backup operation should be performed if the motor is stopped.

Backup Procedure

The backup procedure can be performed in **Admin** mode only. For more information, refer to Login Procedure, page 35.

The below procedure describes how to back up the LTMT main unit settings:

Step	Description	Screen display
1	Press ▼ to select the HMI **FDR** sub-menu from the **Settings** menu and press **OK** to enter.	
2	Press ▼ to select **FDR Backup** and press **OK** to enter.	
3	Press ▼ to select **Yes** and press **OK**. **Confirm Backup?** screen is displayed.	
4	Press ▼ to select **Yes** and press **OK** to start the backup service. If any issue occurs when you perform the backup service, an **HMI FDR Error detected** pop-up message is displayed. You can also: • Select **No** to return to **FDR Backup** sub-menu.	

Step	Description	Screen display
	• Press ↵ to return to the previous menu or press ⌂ on the right to return to the main menu.	
5	Backup is in progress.	
6	Once the backup is completed, HMI **FDR Backup Done !** pop-up message is displayed. After 5 s, the display will return to the **Settings** menu automatically.	

Restore Service

If the FDR services are enabled, restoring the LTMT main unit memory is possible after the LTMT main unit is powered up.

⚠WARNING

UNINTENDED EQUIPMENT OPERATION

- The motor must be stopped during the entire FDR process.
- Before any operation, verify that the configuration saved into LTMTCUF control operator unit is suitable for the application of the targeted LTMT main unit.
- If an error detected message appears during FDR operation, a qualified personnel must check the root cause of the error detected and recheck the configuration.

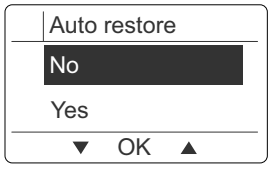
Failure to follow these instructions can result in death, serious injury, or equipment damage.

The restore operation can be performed if:

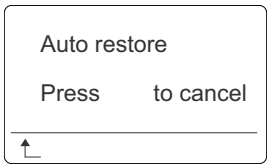
- Motor stops.
- Backed-up memory is valid inside LTMTCUF control operator unit.

Confirm at Start allows the selection of the restore behavior when LTMT main unit is powered up:

- **Yes**: After LTMT main unit is powered up, a confirmation is requested to start the restore service (**Yes** or **No**).



- **No**: No confirmation is requested to start the restore service. You have 5 seconds after LTMT main unit is powered up to cancel the restore service by pressing the LTMTCUF ↵. Otherwise, after 5 seconds the restore service will start automatically.



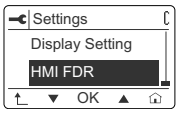
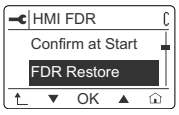
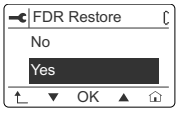
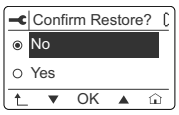
FDR compatibility

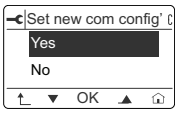
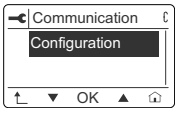
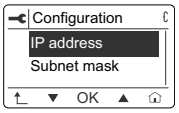
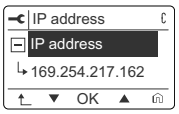
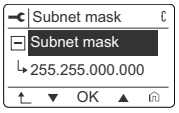
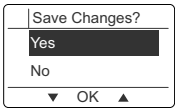
- Non compatible for LTMT main unit with different communication protocol. For example, FDR backup taken from LTMTMFM (LTMT main unit Modbus RTU), can not be restore on LTMTPFM (LTMT main unit PROFIBUS DP)
- Refer to *TeSys Tera Motor Management System Firmware Release Notes – DOCA0276EN* for the compatibility of LTMTCUF firmware with LTMT main unit firmware. FDR backup taken on older LTMT main unit firmware may not be compatible with new LTMT main unit firmware.

Restore Procedure

The restore procedure can be performed in **Admin** mode only. For more information, refer to Login Procedure, page 35.

The below procedure describes how to restore manually the LTMT main unit settings.

Step	Description	Screen display
1	Press ▼ to select the HMI **FDR** sub-menu from the **Settings** main menu and press **OK** to enter.	
2	Press ▼ to select **FDR Restore** and press **OK** to enter. Make sure that backup service has been done before restore service. You can also: • Select **Confirm at Start** to perform restore service. For more information refer to Restore Service, page 21.	
3	Press ▼ to select **Yes** and press **OK**. **Confirm Restore?** screen is displayed.	
4	Press ▼ to select **Yes** and press **OK** to start the restore service. If backup service is not done, or if any issue occurs during the backup service, an **HMI FDR Error detected** pop-up message is displayed. You can also: • Select **No** to return to **FDR Restore** sub-menu. • Press ↵ to return to the previous menu or press ⌂ on the right to return to the main menu .	
5	Restore is in progress.	

Step	Description	Screen display
6	Once the restore is completed, **HMI FDR Restore Done !** pop-up message is displayed.	
7	After restore completes successfully, the display will show **Set new com config** Press **Yes** to set new **communication** related configuration for the connected main unit device and press **No** to return to the **HMI FDR** sub-menu.	
8	When the **communication** menu is highlighted, press **OK** to enter the **configuration** menu.	
9	When the **configuration** menu is highlighted, press **OK** to enter the options **IP address**and **Subnet mask** menu.	
10	Press **IP address** and screen will be displayed.	
11	Press **Subnet mask** and screen will be displayed.	
12	**Save Changes?** pop-up screen will appear. This screen provides option to save the modified settings or discard the modifications.	

LTMTCUF Firmware Upgrade and Language Files Upgrade Using DTM

For more information on LTMTCUF Firmware Upgrade and Language Files Upgrade using DTM, refer to TeSys Tera Motor Management System DTM Library Online Help Guide – DOCA0275EN

Technical Characteristics

Environmental Characteristics

Certification[1]	UL, CSA, CE, EAC/GOST, RCM/CTIC'K		
Conformity to Standards	IEC/EN 61131-2, UL60947-4-1A, CSA C22.2 no. 60947-4-1		
European community directives	CE marking, satisfies the essential requirements of the low voltage (LV) machinery and electromagnetic compatibility (EMC) directives.		
Ambient air temperature around the device	Storage		-40 to +80 °C (-40 to +176 °F)
	Operation	Inside cabinet	-20 to +60 °C (-4 to +140 °F)
		Outside cabinet	-20 to +55 °C (-4 to +131 °F)
Humidity range			15 to 95 % (without condensation)
Cycled humidity	According to IEC/EN 60068-2-30 (variant 2)		55 °C (131 °F); 12 cycles
Degree of protection	According to IEC 60947-1 (protection against direct contact)		IP54 (part outside cabinet)
			IP20 (part inside cabinet)
	According to NEMA		Type 12 (part outside cabinet)
			Type 1 (part inside cabinet)
Resistance to shocks[2]	According to IEC 60068-2-27		Semi-sine mechanical shock impulse: 11 ms, 15 g on 3 axes
Resistance to vibration[2]	According to IEC 60068-2-6		5 to 300 Hz: 4 g
Fire resistance	According to IEC 60947-1		650 °C (1,202 °F)
	According to UL94		V2 V1 for plastic parts on front cover
Degree of pollution	According to IEC/EN 61131		Degree 2
Overvoltage category	According to IEC/EN 61131		II

Electrical Noise Immunity

Immunity to electrostatic discharge	According to EN61000-4-2	Through air	8 kV level 3
		Over surface	6 kV level 3
Radiated RF	According to EN61000-4-3	80 MHz to 2 GHz	10 V/m level 3
Immunity to fast transient bursts	According to EN61000-4-4	Power supply	2 kV level 3
		Communication	1 kV level 3
Immunity to radioelectric fields	According to EN61000-4-6		10 V rms level 3
Surge immunity	According to IEC/EN 61000-4-5	Line to earth/ground	1 kV (2 Ω/18 µF) level 3
		Line to line	2 kV (2 Ω/18 µF) level 3

(1) Some certifications are in progress.
(2) NOTICE: This product has been designed for use in Zone A as defined in IEC 61131-2. Use of this product in Zone B may cause unwanted electromagnetic disturbance, which may require the implementation of adequate mitigation measures.

Physical Characteristics

Dimensions	117 x 70 x 55 mm (4.61 x 2.76 x 2.17 in.)	
Mounting	• Mounted by 1 spring-clip (supplied) for panels 0.8 to 6 mm (0.03 to 0.23 in.) thick • Cut-out dimensions: 45 x 92 mm (1.77 x 3.62 in.)	
Display unit	Type	Backlight LCD
	Backlight	Continuous
	Electrical life with backlight on	70,000 h
Signaling	4 LEDs	
Connection	Front port	RJ45 socket-type connector (unshielded)
	Rear port	RJ45 socket-type connector (unshielded)

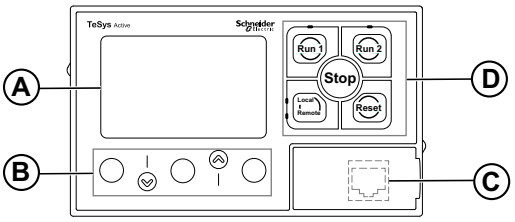
Implementation of LTMTCUF Control Operator Unit

What's in This Part

LTMTCUF Control Operator Unit Description

Front Face

The front face of the LTMTCUF control operator unit is shown below:



A LCD display

B Contextual navigation keys

C Front face RJ45 port for PC connection (covered)

D Local control interface, including five control keys and four LEDs

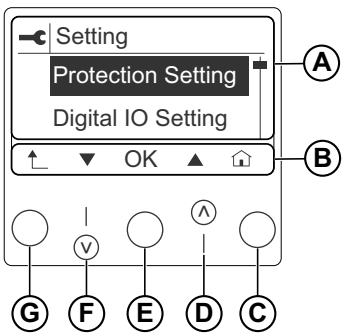
Contextual Navigation Keys

The LTMTCUF control operator unit navigation keys are contextual, their function depends on the associated icons shown on the LCD display. These icons change with different displays, which also alters the function of the navigation keys.

The navigation keys can be used to:

- Navigate menus and sub-menus
- Scroll within a value list
- Select a setting in a value list
- Exit a value list without making a selection
- Return to the main (first-level) menu

The diagram below shows an example of the different functions of each of the navigation keys associated with an icon on the LCD display:



A Information area of the LCD display

B Contextual navigation icons area of the LCD display

C Return to the main menu

D Move up to the previous item in the menu

E Select an item

F Move down to the next item in the menu

G Move up to the next higher-level menu

Contextual Navigation Icons

The following table describes the icons used with the contextual navigation keys on the LTMTCUF display:

Icon	Description
	Enables access to the main menu from a sub-menu or from Quick View
	Scroll down
	Scroll up
	Validates a setting or value and enables access to a sub-menu when a menu is selected
	Cancel and go to higher level
	Quick View Mode
	Used to increment a setting in menu mode
	Used to decrement a setting in menu mode

Information Icons

The following table describes the icons provided as information in the information area of the LTMTCUF display. They indicate the selected menu or parameter.

Icon	Description
	Menu
	Metering
	Motor Data
	Settings
	Status
	Records

Icon	Description
	Device Info
	Commands
	First Setup
	Quick View
	Radio button selected
	Radio button unselected
	Parameter present (in status screens)
	Check box selected
	Check box unselected
	Indicates that a trip or alarm has been detected by the LTMT main unit
	Information
	LTMT main unit in Configuration mode

Power Up

When the LTMTCUF control operator unit is connected to the LTMT main unit, it powers up and performs a series of self tests. During this time, the LCD display lights up, displaying the firmware version, along with the available languages and their corresponding versions for a few seconds.

After a successful initialization:

- If the pin is not yet defined for **Admin** mode (no pin per default), set the pin. For more information, refer to Pin Setting Procedure, page 36.
- If the pin is already defined for **Admin** mode, the Quick View is displayed. For more information, refer to Quick View Mode, page 38.

Screen Saver Timeout

If no LTMTCUF keys are pressed for a duration equal to the timeout setting. For more information, refer to Display Setting, page 53:

- The display backlight turns OFF.

- The **Quick View** is displayed.

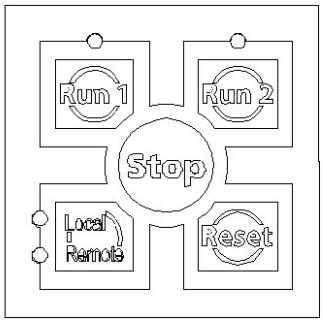
The value of timeout setting varies from 0 to 60 minutes. If 0 minutes is set, the timeout functionality is disabled.

Implementation of Local Control Interface

Description

The local control interface consists of five control keys and four LEDs. The control keys, if active, enable you to control the LTMT main unit. Pressing a control key sends a signal to the LTMT main unit to activate the associated function.

The four LEDs provide information about the LTMT main unit state. These LEDs are driven from the LTMT main unit and are not related to the LTMTCUF state.



Control Key Labeling

⚠WARNING

UNINTENDED EQUIPMENT OPERATION

Proper labeling of the control keys must be validated.

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

The label on each of the control keys depends on the label set you have inserted.

Run 1 and Run 2 Control Keys

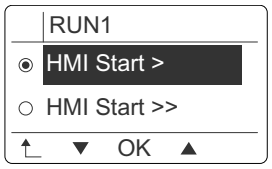
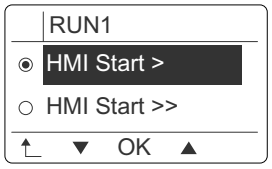
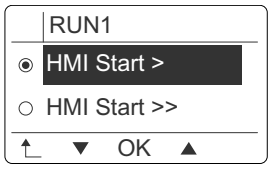
The function of the Run 1 and Run 2 control keys depends on the starter type set. The following table lists their functions for each starter type:

Starter type	Run 1	Run 2
Direct Online	HMI_START >	No action
Reverse Direct Online	HMI_START > (FWD START)	HMI_START < (REV START)
Star-Delta	HMI_START >	No action
Overload	OFF	OFF

For more information about starter types and output assignments, refer to *TeSys Tera Motor Management System User Guide – DOCA0257EN*.

Run Control Procedure

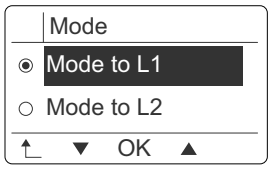
The following table describes the RUN1 and RUN2 control procedure:

Step	Description	Screen display
1	Press the Run 1 key. The **RUN1** screen is displayed.	
2	Use ▼ or ▲ to select a control command, depending on the starter type.	
3	Press **OK** to execute the selected command, or ↰ to exit.	
4	The Home screen is displayed.	

For more information about starter types and output assignments, refer to *TeSys Tera Motor Management System User Guide – DOCA0257EN*.

Active Control Source

1. The Active control mode can be selected through LTMTCUF control operator unit. Configure **First Setup > Starter Settings > Mode** selection as HMI.
2. To select active mode from LTMTCUF control operator unit, press the **Local-Remote** key and select the required control mode by using the up and down navigation keys. Press **OK** to activate the required mode.



Stop Control Key

Press the **Stop** control key to stop the motor when the operating mode selected allows stop commands from the LTMTCUF control operator unit.

For more information about starter types and output assignments, see the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.

The **Stop** control key can be pressed at any time and is active in any of the screen displayed.

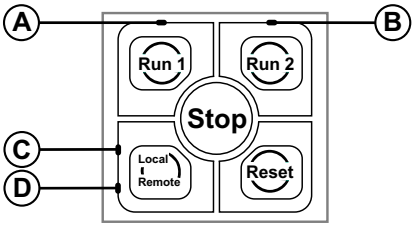
Reset Control Key

Press the **Reset** control key to:

- Reset the protection functions with **Reset** Mode set to **Reset Key**.

The **Reset** control key can be pressed at any time and is active in any of the screen displayed.

LEDs



The function of LED A and LED B depends on the starter type. The following table describes LED A and LED B:

Starter type	Start Active	LED A (Run 1)	LED B (Run 2)
Direct Online	HMI_START >	RED ON	OFF
Reverse Direct Online	HMI_START > (FWD START)	RED ON	OFF
	HMI_START < (REV START)	OFF	RED ON
Star-Delta	HMI_START >	RED ON	OFF
Overload	–	RED ON	OFF

The following table describes LED C and LED D:

LED	When active, indicates that:	Color
C	The active control source is the local source: Local 1 or Local 2 or Local 3	Amber
D	The active control source is the remote source	Amber

Login Modes

User Mode

User mode allows monitoring and viewing of settings (read only). Configuration of device and commands are restricted in user mode.

The top right corner of the setting screens will appear blank, and the **OK** icon will not be displayed on the setting screens.

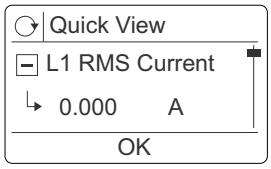
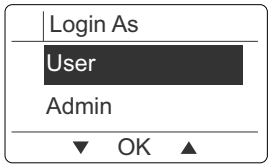
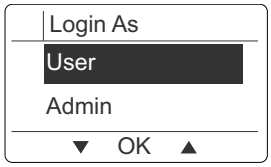
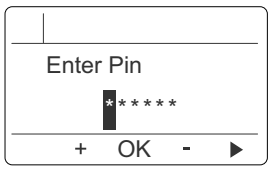
Admin Mode

Admin mode allows complete access (read/write) to configuration settings and commands.

The top right corner of the setting screens will display the icon to denote that the LTMTCUF control operator unit is in configuration mode, and the **OK** icon will be displayed on the setting screens.

Login Procedure

The following table describes the procedure to log in as **User** or **Admin**:

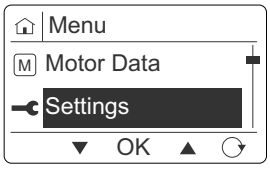
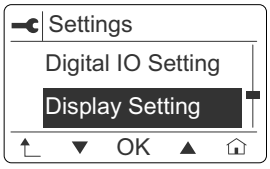
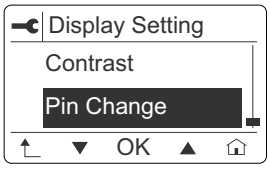
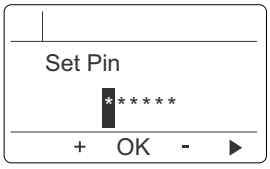
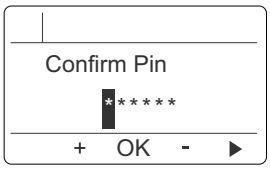
Step	Description	Screen display
1	Go to **Quick View** mode.	
2	Press **OK**, the login modes are displayed.	
3	• Select **User** and press **OK**. You are logged in as a user. The main menu is displayed. • Select **Admin** and press **OK**. **Enter Pin** screen is displayed.	
4	Enter the six digits of the pin. The way to enter the pin is the same as for modifying the pin, page 36: • If the pin is correct, the main menu is displayed. • If the pin is incorrect, **Incorrect pin!** pop-up message is displayed before switching to **Quick View**.	

Pin Setting Procedure

The LTMTCUF control operator unit has no pin set by default.

After the first LTMTCUF control operator unit power up, the **Set Pin** screen is displayed to force the pin setting. The procedure to set the pin for the first time is described in the following table, from step 4.

Once the pin is set, it can be changed in the **Settings** menu. The modification of the pin is allowed in **Admin** mode. The following table describes the procedure to change the pin.

Step	Description	Screen display
1	Select **Settings** from the main menu. Press **OK** to enter the **Settings** menu.	
2	Select the **Display Setting** sub-menu and press **OK** to enter.	
3	Select **Pin Change** from the **Display Setting** sub-menu and press **OK** to enter.	
4	The **Set Pin** screen is displayed, with the first digit of the pin highlighted. 1. Enter the first digit (0-9) of the new pin by using **+** and **–**. 2. Press ▶: the first digit is saved and the second digit is highlighted. 3. Enter the other digits in the same way. 4. Press **OK** when the last digit is set, to save the new pin.	
5	The **Confirm Pin** screen is displayed. Enter the new pin as in the **Set Pin** screen and press **OK**.	
6	• If both the pins are identical, the **Pin Set!** pop-up message is displayed, to confirm the new pin is set. • If both the pins are not identical, the **Incorrect Pin!** pop-up message is displayed.	

Forgotten Pin

If the PIN is forgotten, perform a factory reset from the LTMT main unit. After the reset, the main module will also load default values.

HMI Display Modes

Overview

The LTMTCUF control operator unit supports the following display modes:

- **Quick View** mode to display a selection of data.
- **Menu** navigation mode to access all data through a menu structure.

When a trip is detected by the LTMT main unit, a **Trip** pop-up message appears and overrides the **Quick View** or **Menu** screen.

Quick View Mode

Quick View is the default HMI display mode. It displays a selection of data screens, page 38.

Menu Navigation Mode

In **Menu** navigation display mode, use the contextual buttons to navigate in the menu structure. Menu navigation display mode presents a single network of menus, with monitoring values and editable configuration settings.

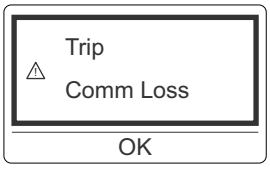
Menu navigation is always accessible from **Quick View** screens by pressing the home button.

For more information on:

- How to navigate the menu structure, refer to Menu Navigation Mode, page 39.
- How to access and edit settings, refer to Editing Values, page 41.

Trip Pop-Up Message

When a trip is detected by the LTMT main unit, a **Trip** pop-up message appears with the indication of the detected trip.



Press **OK** to acknowledge the **Trip** pop-up message. After acknowledgement of the **Trip** pop-up message, the LTMTCUF control operator unit falls back in the display mode active before the trip, **Quick View** or **Menu** navigation mode.

The trip data are available in the trip records. For more information, refer to trip records, page 61.

Quick View Mode

Overview

The **Quick View** presents scrolling list of dynamically changing values for pre-selected parameters.

The **Quick View** is displayed:

- Automatically after the main menu is displayed with no key pressed for the screen saver timeout, page 30.
- By pressing **OK** to acknowledge a **Trip** pop-up message.

Quick View Parameters

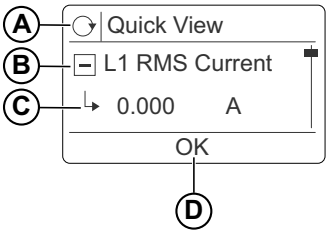
By default, the following nine parameters of three phase are displayed in **Quick View**:

- L1 RMS current
- Avg. current
- Avg. voltage
- L1 current THD
- Motor status
- Thermal memory
- Thermal time to trip
- Motor start current
- Last run hour

You can select the parameters to display using the Display Settings Menu, page 53. You can select up to 15 parameters.

Automatic Scroll Mode

The following screen shows a **Quick View** in automatic scroll mode. In this mode, each parameter is displayed for a few seconds at a time.



A Quick View icon and heading

B Name of the parameter currently displayed

C Value of the parameter currently displayed

D Return to the Login screen

Menu Navigation Mode

Overview

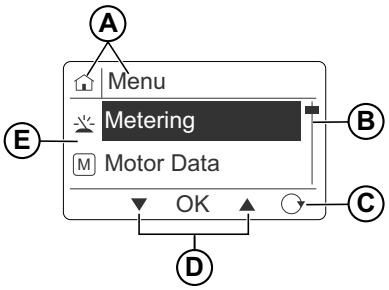
Use **Menu** navigation mode to navigate manually through the LTMTCUF menu structure.

The main menu appears:

- Select **Quick View > OK > User/Admin (login mode) > Main Menu**.
- By pressing the button. The LTMTCUF main menu gives access to sub-menus which enable access to the LTMT main unit parameters. For more information, refer to Main Menu, page 45

Main Menu Display

The following diagram shows the elements in the main menu display:



A Main menu icon and title

B Scroll bar, indicating level in the main menu

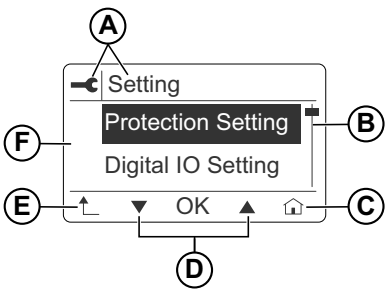
C Short key to Quick View

D Contextual menu navigation keys

E Display area, with list of sub-menus identified by icon and title

Sub-Menu Display

The following diagram shows an example of a sub-menu display:



A Menu icon and title

B Scroll bar, indicating level in sub-menu

C Short key to main menu

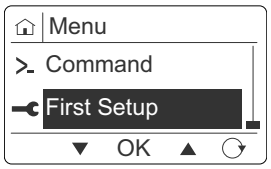
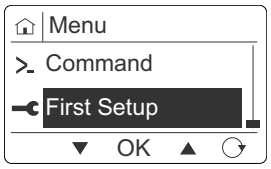
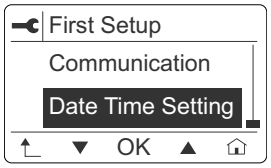
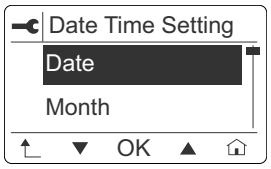
D Contextual menu navigation keys

E Return to higher-level menu key

F Display area, with list of sub-menus

Navigating the Menu Structure

The following example describes how to navigate the menu structure to display the date and time settings:

Step	Description	Screen display
1	Press ▼ to scroll down to other menu choices.	
2	When the **First Setup** menu is highlighted, press **OK** to enter the **First Setup** menu.	
3	Press ▼ to select the **Date Time Setting** sub-menu and press **OK** to enter.	
4	Press ↰ to return to the previous menu (**First Setup**), or press ⌂ on the right to return to the main menu.	

Editing Values

Overview

Use ▼, ▲, and **OK** keys to select and edit settings. There are three ways to edit setting values using the LTMTCUF control operator unit:

- Select an item in a value list.
- Select multiple values.
- Edit a numerical value, one digit at a time.

NOTE: Some settings, although they are represented as numerical values, are selected in the same way as an item in a value list. For example, if a setting with a value expressed in units, it can only be incremented or decremented by tens or hundreds of units, it is edited by scrolling through a value list.

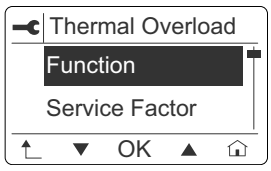
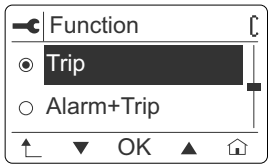
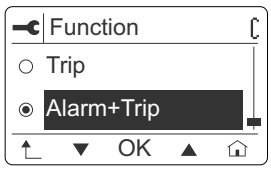
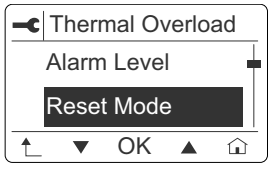
Editing values is allowed in **Admin** mode only. See the Login Modes, page 35.

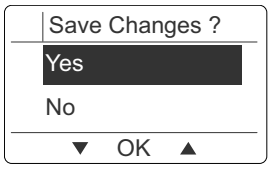
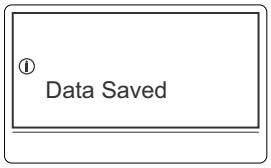
Editing any value requires familiarity with the LTMTCUF menu structure, and general navigation principles.

- For information on the menu navigation, see Navigating the Menu Structure, page 40.
- For information on the menu structure, see Main Menu, page 45.

Selecting Values in a List

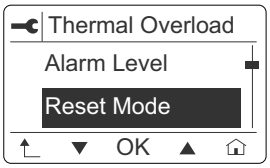
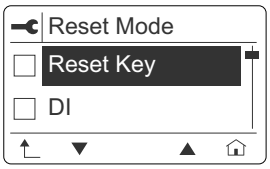
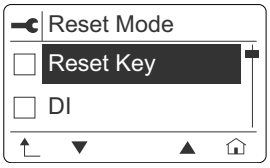
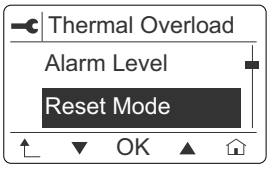
The following example describes how to set the **Thermal Overload > Function** parameter by selecting a value in a list:

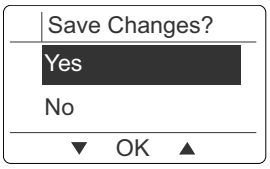
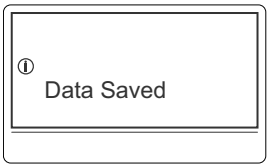
Step	Description	Screen display
1	Select **Settings > Protection Settings > Current > Thermal Overload > Function** .	
2	Press **OK** to enter the **Function** parameter. Value of the **Function** parameter is highlighted. If round boxes are in front of the values, only one value can be selected. Check that is displayed on top right corner of the screen indicating that you are logged in as **Admin**.	
3	Use ▼ or ▲ to select the required new value and press **OK**. Press ↰ to return to previous menu.	
4	You can modify any other parameter available in **Thermal Overload** sub menu. Press ↰ once the thermal overload settings are completed.	

Step	Description	Screen display
5	**Save Changes?** pop-up screen will appear. This screen provides option to save the modified settings or discard the modifications.	
6	If **Yes** is selected, **Data Saved** pop-up message will appear. If you selected **No**, then **Current** menu screen will be displayed.	

Multiple Selection Value Settings

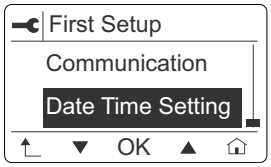
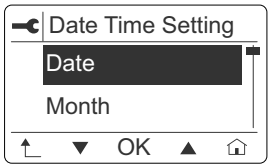
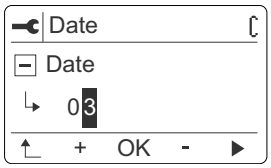
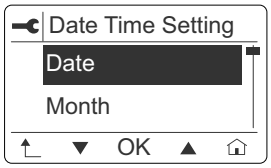
The following example describes the settings of the **Thermal Overload > Reset Mode** with multiple values:

Step	Description	Screen display
1	Select **Settings > Protection Settings > Current > Thermal Overload > Reset Mode**.	
2	Press **OK** to enter **Reset Mode**. Value of the **Reset Mode** is highlighted. If square boxes are in front of the values, multiple values can be selected. Check that is displayed on top right corner of the screen indicating that you are logged in as **Admin**.	
3	Use ▼ or ▲ to select the required new value and press **OK**. You can select multiple values as shown. After selecting the new values, press ↵ to return to previous menu.	
4	You can modify any other parameter available in **Thermal Overload** sub-menu. Press ↵ once the **Thermal Overload** settings are completed,	

Step	Description	Screen display
5	**Save Changes?** pop-up screen will appear. This screen provides option to save the modified settings or discard the modifications.	
6	If **Yes** is selected **Data Saved** pop-up screen will appear. If you selected **No**, then **Current** menu screen will be displayed.	

Editing Numerical Values

The following example describes the settings of the date and time parameters by editing numerical values:

Step	Description	Screen display
1	Select **First Setup > Date Time Setting** to navigate to the date and time parameters, then press **OK**.	
2	Use ▼ or ▲ to select **Date** and press **OK**. Check that is displayed on top right corner of the screen indicating that you are logged in as **Admin**.	
4	Press ▶ to select the next digit for editing. Use + or − to increase or decrease the selected value, then press **OK** to save the setting.	
5	The display then automatically returns to the **Date Time Setting** screen.	

Menu Description

What's in This Part

Main Menu

The **Main Menu** of the LTMTCUF control operator unit gives access to sub-menus which enable access to the parameters required to configure the LTMT main unit. The menus are described below:

Level 1 (Menu)	Description
Metering	Metering Menu, page 46
Motor Data	Motor Data Menu, page 47
Settings	Settings Menu, page 48
Status	Status Menu, page 55
Records	Record Menu, page 59
Device Info	Device Information Menu, page 62
Command	Command Menu, page 65
First Setup	First Setup Menu, page 66

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

Metering Menu

The **Metering Menu** contains the following sub-menus:

Level 1	Level 2	Parameter name
Metering	L1 RMS current	Phase 1 RMS current
	L2 RMS current	Phase 2 RMS current
	L3 RMS current	Phase 3 RMS current
	Calc ground curr	Calculated ground current
	Meas ground curr	Measured ground current
	Avg. current	Average current
	Current imb	Current imbalance
	Ph seq current	Current phase sequence. Possible values: • L123 • L132 • CTWF (CT wiring error detected)
	L1-L2 RMS voltage	Phase 1 to phase 2 RMS voltage
	L2-L3 RMS voltage	Phase 2 to phase 3 RMS voltage
	L3-L1 RMS voltage	Phase 3 to phase 1 RMS voltage
	Avg. voltage	Average voltage
	Voltage imb	Voltage imbalance
	Ph seq voltage	Voltage phase sequence. Possible values: • L123 • L132
	Frequency	Frequency
	Power factor	Power factor
	T. Active power	Total Active power
	T. Reactive power	Total Reactive power
	T. Apparent power	Total Apparent power
	T. Active energy	Total active energy
	T. Reactive energy	Total reactive energy
	T. Apparent energy	Total apparent energy
	PT100	Main unit temperature measured by PT100 sensor
	PTC	Main unit temperature measured by PTC sensor
	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)
	L1-L2 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)

Motor Data Menu

The **Motor Data** setting menu contains the following sub-menus:

Level 1	Level 2	Parameter name
Motor Data	Motor Status	Motor Status. Possible values: • Stop • Start • Run
	Thermal memory	Thermal memory
	Thermal time to trip	Thermal time to trip
	Time to cool	Thermal time to cool
	Max starts count	Maximum starts counter
	Max start inh time	Maximum start inhibit time
	Motor start current	Motor start current
	Motor start time	Motor starting time
	Total run hour	Total run hour
	Last run hour	Last run hour
	No. of Starts	Number of starts
	No. of Stops	Number of stops
	Stop cause	Motor stop cause. Possible values: • None • HMI/DTM • Local DI • Remote DI • Communication • Voltage dip • Trip • No current • Force stop • Direction change • No feedback • Speed change • Custom command • Mode transfer • Fallback Mode • No voltage
	Trip counter	Display Numbers of trips

Settings Menu

The **Settings Menu** contains the following sub-menus:

Level 1 (Menu)	Level 2	Level 3
Settings	Protection setting	Current
		Voltage
		Control
		DI Interlock
		AI(3)
		Temperature
		Misc. settings
	AO Setting	AO 1
		AO 2
	Digital IO setting	DI setting
		DO setting
	Display setting	Quick View
		Timeout
		Contrast
		Pin change
	HMI FDR	Confirm at Start
		FDR restore
		FDR backup
		FDR disable

Protection Setting > Current Sub-Menu

The **Protection Setting > Current** sub-menu contains the following editable parameters. For the detailed list of parameters of each protection function, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.

Level 3	Level 4	Level 5
Current	Thermal overload	Access to the thermal overload protection settings.
	Stalled rotor	Access to the stalled rotor protection settings.
	Locked rotor	Access to the locked rotor protection settings.
	DT overcurrent	Access to the definite time overcurrent protection settings.
	NI overcurrent	Access to the normal inverse overcurrent protection settings.
	Short Time OC	Access to the short time overcurrent protection settings.
	Calc. gnd fault	Access to the calculated ground-fault protection settings.
	Meas. gnd fault	Access to the measured ground-fault protection settings.
	Under current	Access to the under current protection settings.
	Current imb	Access to the current imbalance protection settings.
	Current ph loss	Access to the current phase loss protection settings.
	Current ph rev	Access to the current phase reversal protection settings.

(3) Select the analog setting based on the device configuration.

NOTE:

- These parameters are displayed only when an LTMTCTV type sensor module is configured and the voltage input option is enabled in the system settings.
- Thermal overload, stalled rotor, and locked rotor conditions are visible only when the load type is configured as motor.

Protection Setting > Voltage Sub-Menu

The **Protection Setting > Voltage** sub-menu contains the following editable parameters. For the detailed list of parameters of each protection function, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.

Level 3	Level 4	Level 5
Voltage	Under voltage	Access to the phase under voltage protection settings.
	Over voltage	Access to the phase over voltage protection settings.
	Voltage ph loss	Access to the voltage phase loss protection settings.
	Voltage imb	Access to the voltage imbalance protection settings.
	Voltage ph rev	Access to the voltage phase reversal protection settings.
	Under freq.	Access to the under frequency protection settings.
	Over freq.	Access to the over frequency protection settings.
	Under power	Access to the under power protection settings.
	Over power	Access to the over power protection settings.
	Under P.F.	Access to the under power factor protection settings.

NOTE:

These parameters are displayed only when an LTMTCTV type sensor module is configured and the voltage input option is enabled in the system settings.

Protection Setting > Control Sub-Menu

The **Protection Setting > Control** sub-menu contains the following editable parameters. For the detailed list of parameters of each protection function, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.

Level 3	Level 4	Level 5
	Voltage Dip	Access to the voltage dip management function settings. **NOTE:** Base on the configuration.
	Max.no of start	Access to the maximum number of starts function settings.
	Stop error detection	Access to the motor stop error detection function settings.
	Device Internal	Access to the controller self-diagnosis function settings.
	Comm loss	Access to the communication loss function settings.
	Temperature	Access to the temperature protection function settings, with temperature measured by the LTMT main unit.
	Block output	Access to the block output function settings.
	Anti Backspin	Access to the anti-backspin timer function settings.
	HMI Comm Loss	Access to the communication loss function settings.

Protection Setting > DI Interlock Sub-Menu

The **Protection Setting > DI Interlock** sub-menu contains the following editable parameters:

Level 3	Level 4	Level 5
DI Interlock	• DI 1 Interlock • DI 2 Interlock • DI 3 Interlock • DI 4 Interlock • DI 5 Interlock • DI 6 Interlock • DI 7 Interlock • DI 8 Interlock • DI 9 Interlock • DI 10 Interlock • DI 11 Interlock • DI 12 Interlock	Access to the settings of the 12 digital input interlock protection functions. For the detailed list of parameters, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.

Protection Setting > AI Setting

The **Protection Setting > AI Setting** sub-menu contains the following editable parameters. For the detailed list of parameters of each protection function, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*

Level 3	Level 4	Level 5
AI Setting	• AI 1 • AI 2 • AI 3 • AI 4	Access to the settings of the analog input setting functions. For the detailed list of parameters, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.

Protection Setting > Misc. Settings Sub-Menu

The **Protection Setting > Misc. settings** sub-menu contains the following editable parameters

Level 3	Level 4	Level 5
Misc. Settings	Hysteresis	Access to the hysteresis function settings. For the detailed list of parameters, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.

AO Settings

The **AO settings** sub-menu contains the following editable parameters:

Level 2	Level 3	Level 4	Level 5
AO setting	AO 1	AO1 Src	Access to the settings of each analog output configured in the TeSys Tera system. For the detailed list of parameters, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.
		AO1 Min	
		AO1 Max	

Level 2	Level 3	Level 4	Level 5
	AO 2	AO2 Src	Access to the settings of each analog output configured in the TeSys Tera system. For the detailed list of parameters, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.
		AO2 Min	
		AO2 Max	

Digital IO Setting

The **Digital IO setting** sub-menu contains the following editable parameters:

Level 2	Level 3	Level 4	Level 5
Digital IO setting	DI Setting	DI 1	Access to the settings of each digital input configured in the TeSys Tera system.For the detailed list of parameters, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.
		DI 2	
		DI 3	
		DI 4	
		DI 5	
		DI 6	
		DI 7	
		DI 8	
		DI 9	
		DI 10	
		DI 11	
		DI 12	
		DI 13	
		DI 14	
		DI 15	
		DI 16	
		DI 17	
		DI 18	
		DI 19	
		DI 20	
		DI 21	
		DI 22	
		DI 23	
		DI 24	
	DO Setting	DO 1	Access to the settings of each digital output configured in the TeSys Tera system. For the detailed list of parameters, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.
		DO 2	
		DO 3	
		DO 4	
		DO 5	
		DO 6	
		DO 7	
		DO 8	
		DO 9	
		DO 10	
		DO 11	

		DO 12	
		DO 13	

NOTE:

DI settings and DO settings (DO4 to DO13) are displayed based on the expansion type configured in the system.

Display Setting

The **Display Setting** sub-menu contains the following editable parameters:

Level 2	Level 3	Level 4	Parameter name
Display Setting	Quick View	Parameter 1–15	List of parameters that can be selected for the Quick View (15 parameters maximum): • L1 RMS current • L2 RMS current • L3 RMS current • Calc Ground curr • Meas Ground curr • Avg. current • Current imb • Ph Seq current • L1-L2 RMS voltage • L2-L3 RMS voltage • L3-L1 RMS voltage • Avg. voltage • Voltage imb • Ph seq voltage • Frequency • Power factor • T. Active Power • T. Reactive Power • T. Apparent Power • T. Active Energy • T. Reactive Energy • T. Apparent Energy • PT100 • PTC • L1 current THD • L2 current THD • L3 current THD • L1–L2 Voltage THD • L2–L3 Voltage THD • L3–L1 Voltage THD • Motor status • Thermal memory • Thermal time to trip • Motor start current • Last run hour
	Timeout	Time Delay	Time delay for activation of the screen saver. If not key is pressed during the time delay: • The display backlight is turned off. • The Quick View is displayed. Setting range: 0-60 minutes.
	Contrast	-	Contrast option is available.
	Pin Change	-	Refer to the pin change procedure, page 36.

HMI FDR

Level 2	Level 3
HMI FDR	Confirm at start
	FDR Restore
	FDR Backup
	FDR Disable

Status Menu

The **Status Menu** contains the following sub-menu:

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Level 4</th></tr>
<tr><td rowspan="4">Status Menu</td><td rowspan="3">IO status</td><td rowspan="2">DI Status</td><td>DI 1-16</td></tr>
<tr><td>DI 17-32</td></tr>
<tr><td>DO Status</td><td>DO 1-13</td></tr>
<tr><td>Trip status</td><td colspan="2">Trip descriptions that can be displayed:
Thermal Overload
Stalled Rotor
Locked Rotor
DT Over Current
NI Over Current
Short Time OC
Calc Ground Trip
Meas. Ground Trip
Under Current
Current imb
Current ph loss
Current ph rev
Under Voltage
Over Voltage
Voltage ph loss
Voltage imb
Voltage ph rev
Under Freq.
Over Freq.
Under Power
Over Power
Under P.F.
Excessive Tstart
Voltage Dip
Max.no of start
Motor Stop Err Det.
Device Internal
Comm Loss
LTMT main unit temperature
DI 1 Interlock
DI 2 Interlock
DI 3 Interlock
DI 4 Interlock
DI 5 Interlock
DI 6 Interlock
DI 7 Interlock
DI 8 Interlock
DI 9 Interlock
DI 10 Interlock
DI 11 Interlock
DI 12 Interlock
HMI comm loss
Stucked reset key
Logic test interrupted
Motor stop error detection</td></tr>
</table>

Level 1	Level 2	Level 3	Level 4
	Alarm status	Alarm descriptions that can be displayed: • Thermal Overload • Stalled Rotor • Locked Rotor • DT Over Current • NI Over Current • Short Time OC • Calc Ground Trip • Meas. Ground Trip • Under Current • Current imb • Current ph loss • Current ph rev • Under Voltage • Over Voltage • Voltage ph loss • Voltage imb • Voltage ph rev • Under Freq. • Over Freq. • Under Power • Over Power • Under P.F. • Excessive Tstart • Voltage Dip • Max.no of start • Motor Stop Err Det. • Device internal temperature • Comm Loss • LTMT main unit temperature • DI 1 Interlock • DI 2 Interlock • DI 3 Interlock • DI 4 Interlock • DI 5 Interlock • DI 6 Interlock • DI 7 Interlock • DI 8 Interlock • DI 9 Interlock • DI 10 Interlock • DI 11 Interlock • DI 12 Interlock • AI 1 Interlock • AI 2 Interlock • AI 3 Interlock • AI 4 Interlock • AI 5 Interlock • AI 6 Interlock • AI 7 Interlock • AI 8 Interlock • AI 9 Interlock • AI 10 Interlock • AI 11 Interlock • AI 12 Interlock • AI 13 Interlock • AI 14 Interlock	
	Inhibit status	Inhibit cause descriptions that can be displayed:	

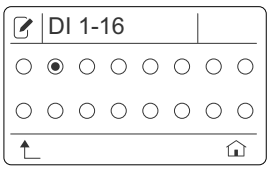
Level 1	Level 2	Level 3	Level 4
		• No Voltage • Under Voltage • Trip • Thermal • Max Starts • Interlock 1 • Interlock 2 • Interlock 3 • Interlock 4 • Interlock 5 • Interlock 6 • Interlock 7 • Interlock 8 • Interlock 9 • Interlock 10 • Interlock 11 • Interlock 12 • Local DI Stop • Remote DI Stop • Communication Stop • Forced Stop • Antibackspin • Fallback Mode Inhibit • Direction change • Speed change • Custom Stop	

DI and DO Status Screen

The status of up to 32 digital inputs or 13 digital outputs are presented on one screen.

Example: DI 1-16 screen displays the status of 16 digital inputs on two rows:

- First row: status of digital inputs DI 1 to DI 8, from left to right.
- Second row: status of digital inputs DI 9 to DI 16, from left to right.



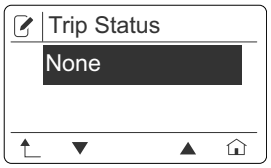
In this example, the digital input DI 2 is on, all other digital inputs are off.

- ◉ Digital input is on
- ○ Digital input is off

For more information about detection of DI status, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*

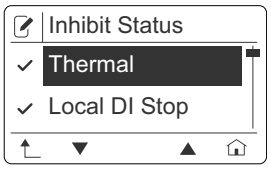
Trip, Alarm, and Inhibit Status Screens

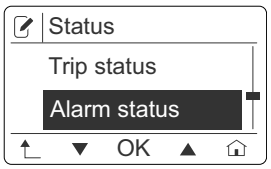
If no trip, alarm, or inhibit cause is present, **None** is displayed on the respective status screen.

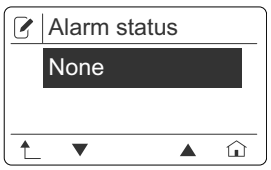


If there is a trip, alarm, or inhibit cause, the description of that cause will be displayed on the respective status screen.

If there are more than two trip, alarm, or inhibit causes, you can use the ▲ and ▼ to scroll through the descriptions of each cause. The descriptions are not presented in chronological order.







Record Menu

The **Record Menu** contains the following sub-menus:

Level 1	Level 2	Event 3	Level 4
Record Menu	Event	Event 1-10	Selection of one event record from event 1 to event 10.
		Event 11-20	Selection of one event record from event 11 to event 20.
		Event 21-30	Selection of one event record from event 21 to event 30.
		Event 31-40	Selection of one event record from event 31 to event 40.
		Event 41-50	Selection of one event record from event 41 to event 50.
		Event 51-60	Selection of one event record from event 51 to event 60.
		Event 61-70	Selection of one event record from event 61 to event 70.
		Event 71-80	Selection of one event record from event 71 to event 80.
		Event 81-90	Selection of one event record from event 81 to event 90.
		Event 91-100	Selection of one event record from event 91 to event 100.
	Trip	Trip 1-20	Selection of one of the 20 trip records.
	Device Internal	Device Internal 1-20	Selection of one of the 20 device internal.

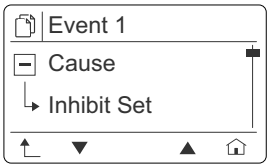
Event and Device Internal

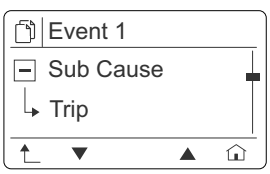
After selection of one event or internal controller error detected (Device Internal) record, the following recorded data are displayed on four different screens:

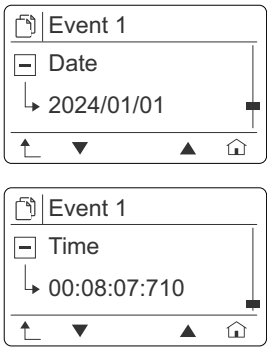
- On screen 1: event or Device Internal cause
- On screen 2: event or Device Internal sub-cause
- On screen 3: event or Device Internal date of occurrence
- On screen 4: event or Device Internal time of occurrence

Use the ▲ and ▼ to scroll through the four screens.

Example: the data recorded for event 1 are presented in four screens as follows.






Event 1
Date
2024/01/01
Event 1
Time
00:08:07:710

Trip Record Screens

After selection of one trip record, the following recorded data are displayed on different screens:

- On screen 1 to 3: trip cause, date of occurrence, and time of occurrence, similar to event and device Internal records.
- On the following screens, values recorded when the trip cause is detected are displayed.

The following values are displayed in this order, one value per screen:

- Thermal Memory
- L1 RMS Current
- L2 RMS Current
- L3 RMS Current
- Calc Ground Curr
- Meas Ground Curr
- Current imb
- Ph Seq Current
- L1-L2 RMS Voltage
- L2-L3 RMS Voltage
- L3-L1 RMS Voltage
- Voltage imb
- Ph Seq voltage
- Frequency
- Power Factor
- Motor status
- L1 Current THD
- L2 Current THD
- L3 Current THD
- L1–L2 Voltage THD
- L2–L3 Voltage THD
- L3–L1 Voltage THD
- Active Power
- Full load current
- MU temperature

NOTE:

- Use the ▲ and ▼ arrows to scroll through the screens.
- The parameter list may vary depending on device configuration and system settings.

Device Information Menu

The **Device Info** menu contains the following sub-menu:

Level 1	Level 2
Device Info	Product Info
	Main module
	Sensor module
	HMI
	EM 1
	EM 2
	EM 3
	EM 4
	EM 5
	MAC address
	EIP prod details

NOTE:

These screens are displayed based on the expansion module configuration.

Product Info

The **Product Info** sub-menu contains the following parameters:

Level 2	Level 3	Parameter name
Product Info	Order code	LTMT main unit commercial reference.
	Standard package	-

Main Module

The **Main Module** sub-menu contains the following parameters:

Level 2	Level 3	Parameter name
Main Module	Hardware version	LTMT main unit hardware version.
	Firmware version	LTMT main unit firmware version.
	Boot software version	LTMT main unit boot firmware version.
	Serial number	LTMT main unit serial number.

Sensor Module

The **Sensor Module** sub-menu contains the following parameters:

Level 2	Level 4	Parameter name
Sensor Module	Commercial ref	LTMTCT/LTMTCTV sensor module commercial reference.
	Hardware version	LTMTCT/LTMTCTV sensor module hardware version.
	Firmware version	LTMTCT/LTMTCTV sensor module firmware version.
	Boot software version	LTMTCT/LTMTCTV sensor module boot firmware version.
	Serial number	LTMTCT/LTMTCTV sensor module serial number.

HMI

The **HMI** sub-menu contains the following parameters:

Level 2	Level 3	Parameter name
HMI	Firmware version	LTMTCUF control operator unit firmware version.
	Boot software version	LTMTCUF control operator unit boot software version.

EM 1

The **EM 1** sub-menu contains the following parameters:

Level 2	Level 3	Parameter name
EM 1	Commercial ref	LTMT expansion module 1 commercial reference.
	Hardware version	LTMT expansion module 1 hardware version.
	Firmware version	LTMT expansion module1 firmware version.
	Boot software version	LTMT expansion module 1 boot firmware version.
	Serial number	LTMT expansion module 1 serial number.

EM 2

The **EM 2** sub-menu contains the following editable parameters:

Level 2	Level 3	Parameter name
EM 2	Commercial ref	LTMT expansion module 2 commercial reference.
	Hardware version	LTMT expansion module 2 hardware version.
	Firmware version	LTMT expansion module 2 firmware version.
	Boot software version	LTMT expansion module 2 boot firmware version.
	Serial number	LTMT expansion module 2 serial number.

EM 3

The **EM 3** sub-menu contains the following parameters:

Level 2	Level 3	Parameter name
EM 3	Commercial ref	LTMT expansion module 3 commercial reference.
	Hardware version	LTMT expansion module 3 hardware version.

Level 2	Level 3	Parameter name
	Firmware version	LTMT expansion module 3 firmware version.
	Boot software version	LTMT expansion module 3 boot firmware version.
	Serial number	LTMT expansion module 3 serial number.

EM 4

The **EM 4** sub-menu contains the following parameters:

Level 2	Level 3	Parameter name
EM 4	Commercial ref	LTMT expansion module 4 commercial reference.
	Hardware version	LTMT expansion module 4 hardware version.
	Firmware version	LTMT expansion module 4 firmware version.
	Boot software version	LTMT expansion module 4 boot firmware version.
	Serial number	LTMT expansion module 4 serial number.

EM 5

The **EM 5** sub-menu contains the following parameters:

Level 2	Level 3	Parameter name
EM 5	Commercial ref	LTMT expansion module 5 commercial reference.
	Hardware version	LTMT expansion module 5 hardware version.
	Firmware version	LTMT expansion module 5 firmware version.
	Boot software version	LTMT expansion module 5 boot firmware version.
	Serial number	LTMT expansion module 5 serial number.

MAC address

Level 2	Level 3	Parameter name
MAC address	–	–

EIP prod details

Level 2	Level 3	Parameter name
EIP prod details	Vendor ID	–
	Device profile	–
	Product code	0*3402
	CIP s.no	0*0.001

Command Menu

The **Command Menu** contains the following editable parameters:

Level 1	Level 2	Parameter name
Command	Reset Inhibit-Max start	Reset inhibit command.
	Reset no. of start	Reset number of starts command.
	Reset no. of stop	Reset number of stops command.
	Clear thermal memory	Clear thermal capacity level command.
	Clear total run hours	Reset total run hour command.
	Reset energy	Clear energy command.
	Reset trip counter	Clear trip counter command.
	Store ref curve	Store reference start curve command.
	Clear trip rec	Clear trip records command.
	Clear event rec	Clear event records command.
	Factory reset	Factory reset command.
	ST-with Trip	Self test with trip command.
	Clear controller settings command	Restores the LTMT controller protection factory setting.
	Clear All command	To change the configuration of the LTMT controller.

NOTE: Clear controller settings command

The Clear Controller Settings Command restores the LTMT controller protection factory settings (time outs and thresholds)

The following settings are not cleared by this command:

- Controller characteristics.
- Connections (CT, temperature sensor, and I/O settings)
- Operating mode.

Controller setting parameters are cleared without the controller being forced into configuration mode. Static characteristics are preserved.

NOTE: Clear All command

If you want to change the configuration of the LTMT controller, you may want to clear all existing parameters in order to set new parameters for the controller.

The Clear All Command forces the controller to enter configuration mode. A power-cycle is performed to restart correctly in this mode. This enables the controller to pick up the new values for the cleared parameters.

First Setup Menu

The **First Setup Menu** contains the following sub-menu:

Level 1	Level 2	Level 3
First Setup	Device confg	For more information about sub-menu refer to Device Configuration, page 66
	Starter setting	For more information about sub-menu refer to Starter Setting, page 67
	System setting	For more information about sub-menu refer to System Setting, page 68
	Communication	Modbus Profibus Ethernet
	Datetime settings	• Date • Month • Year • Hour • Minutes • Seconds
	Language selection	For more information about sub-menu refer to Language Selection, page 71
	Motor name plate	Tag Power Unit Nominal Power Main Unit Temperature
	Product Tag	• Main Module • Sensor Module • EM 1 • EM 2 • EM 3 • EM 4 • EM 5 **NOTE:** These screens are displayed based on the expansion module configuration.

Device Configuration

The **Device Configuration** sub-menu contains the following editable parameters. For the detailed list of device configuration parameters, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.

Level 2	**Level 3**	**Parameter name**
Device Configuration	Sensor module	LTMTCT/LTMTCTV sensor module commercial reference.
	MU temperature	LTMT main unit temperature sensor type.
	EM 1 type	LTMT expansion module 1 commercial reference.
	EM 2 type	LTMT expansion module 2 commercial reference.

	EM 3 type	LTMT expansion module 3 commercial reference.
	EM 4 type	LTMT expansion module 4 commercial reference.
	EM 5 type	LTMT expansion module 5 commercial reference.

NOTE:

- EM 1 is displayed by default. Configure EM 1 to make EM 2 visible; then EM 1 and EM 2 will be visible. Configure EM 2 to make EM 3 visible; then EM 1 and EM 3 will be visible. This pattern continues up to EM 5
- These parameters are visible, based on load and starter type.

Starter Setting

The **Starter Setting** sub-menu contains the following editable parameters. For the detailed list of parameters, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.

Level 2	Level 3	Parameter name
Starter Setting	Load	Load type: • Motor • Heater
	Starter Type	• Overload • Direct Online • Reverse Direct Online • Star-Delta • Custom logic 256 to Custom logic 511
	Mode	Selection of the control source: • Disable • HMI • Local DI • Comm
	Local1-start	• Selection of a combination of the 5 control sources: HMI, Local DI, Remote DI, Communication, and Custom logic **NOTE:** Not all five control sources may be applicable, as this depends on the customer's configuration.
	Local2-start	• Selection of a combination of the 5 control sources: HMI, Local DI, Remote DI, Communication, and Custom logic
	Local3-start	• Selection of a combination of the 5 control sources: HMI, Local DI, Remote DI, Communication, and Custom logic
	Remote-start	• Selection of a combination of the 5 control sources: HMI, Local DI, Remote DI, Communication, and Custom logic
	Local1-stop	• Selection of a combination of the 5 control sources: HMI, Local DI, Remote DI, Communication, and Custom logic
	Local2-stop	• Selection of a combination of the 5 control sources: HMI, Local DI, Remote DI, Communication, and Custom logic

	Local3-stop	• Selection of a combination of the 5 control sources: HMI, Local DI, Remote DI, Communication, and Custom logic
	Remote-stop	• Selection of a combination of the 5 control sources: HMI, Local DI, Remote DI, Communication, and Custom logic
	LDI start I/P	Local DI start input type: • Momentary • Maintained
	RDI start I/P	Remote DI start input type • Momentary • Maintained
	Custom start I/P	Custom start input type: • Momentary • Maintained
	Mode transfer	Transfer mode selection: • Bump • Bumpless
	Comm start I/P	Comm start input type: • Momentary • Maintained
	Direction	Change direction configuration: • Disable • Enable
	Response time	Feedback response time setting.
	Curr sensing time	Motor current sensing time setting.
	Number of Phases	• Single-phase • Three-phase
	Stop Detection	Stop detection configuration: • DI+IFLC • IFLC
	Interlock time	Interlocking time setting.
	Time in star	Time in start timer setting.
	Changeover time	Changeover timer setting.
	Capacitor control time	Capacitor control time.
	Forced start	Forced start function configuration: • Disable • Enable

System Setting

The **System Setting** sub-menu contains the following editable parameters. For the detailed list of System Setting, refer to the *TeSys Tera Motor Management System User Guide – DOCA0257EN*.

Level 2	Level 3	Parameter name
System Setting	Ph CT primary	1–1000 A in step of 1 A
	Ph CT secondary	1 A or 5 A
	Full load Current	0.1–1000 A in step of 0.1 A
	Voltage input	• Disable • Enable

	Voltage nominal	110.0–690.0 V
	Nominal Frequency	• 50 Hz • 60 Hz
	Phase rotation	• L123 • L132
	Test Mode	• Disable • Enable
	Interlock bypass	• No • Yes

NOTE:

- Full load current, Phase CT primary, Phase CT secondary, secondary passes settings, and sensor module type are interlinked.
- Phase CT primary, Phase CT secondary and Full load current value may change to default based on Sensor module type.
- Full load current value may change to minimum possible suitable value based on Phase CT primary, Phase CT secondary, secondary passes, and Sensor module type setting.

Communication

The **Communication** sub-menu contains the following editable parameters. For information about the detailed list of communication settings, refer to the appropriate guides:

- *TeSys Tera Motor Management System Modbus RTU Communication Guide – DOCA0355EN*
- *TeSys Tera Motor Management System PROFIBUS DP Communication Guide – DOCA0256EN*
- *TeSys Tera Motor Management System EtherNet/IP Communication Guide - DOCA0258EN*

Level 2	Level 3	Level 4	Level 5	Level 6
Communication	Modbus	Node Address	LTMT main unit server address	–
		Parity	• None • Odd • Even	–
		Baud Rate	• 2400 • 4800 • 9600 • 19.2 K • 38.4 K • 57.6 K • 1.15 M	–
		Timeout	–	–
		Byte Format	Endianness configuration: • Big Endian • Little Endian	–
	Profibus	Node Address	2–125	–
		Endian	• Big Endian • Little Endian	–
	Ethernet	Port Configuration	Protocol	• Modbus TCP/IP • Ethernet IP

			IP configuration	• DHCP • Manual
			SNTP time selection	• Manual • SNTP • Fieldbus protocol
			SNTP timezone	• UTC+05:30 • UTC+06:00 • UTC+07:00 • UTC+08:00 • UTC+09:00 • UTC+09:30 • UTC+10:00 • UTC+11:00 • UTC+12:00 • UTC+13:00
			IP address	–
			Subnet mask	–
			Default gateway	–
			TCP endian	• Big endian • Little endian
		Comm Config	Client IP address	–
			Comm tout	2
		Daylight settings	Function	• Disable • Enable
			• Start day • End day	• 1 • 1
			Start week	• Sunday • Monday • Tuesday • Wednesday • Thursday • Friday • Saturday
			• Start Month • End Month	• 1 • 2
			• Start time • End time	• 0 • 0
			End week	• Sunday • Monday • Tuesday • Wednesday • Thursday • Friday • Saturday

Datetime Setting

The **Datetime Setting** sub-menu contains the following editable parameters:

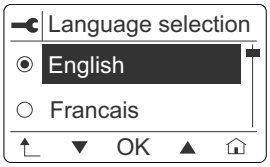
Level 2	**Level 3**
Datetime Setting	Date
	Month

	Year
	Hour
	Minutes
	Seconds

Language Selection

To select the language follow the below steps:

1. Select First Setup from Main Menu.
2. Click **Language selection** to select the desired language.
3. Use the ▲ and ▼ arrows to select the language and click **OK**.



Motor Name Plate

The **Motor Name Plate** sub-menu contains the following editable parameters:

Level 2	**Level 3**
Motor Name Plate	Tag
	Power Unit
	Nominal Power
	Main Unit Temperature

Product Tag

The **Product Tag** sub-menu contains the following editable parameters:

Level 2	**Level 3**
Product Tag	Main Module
	Sensor Module
	EM1
	EM2
	EM3
	EM4
	EM5

NOTE: EM1, EM2, EM3, EM4 and EM5 LTMTAN21 expansion modules are visible and available for settings only if they are physically connected and should be configured to the LTMT main unit.

Troubleshooting

Error Messages

When an error detected occurs, press ↵ to return to the main menu.

Error detected message	Probable cause	Checks or repairs
Incorrect Pin	Entered pin is not correct.	Enter the correct pin.
	While setting up pin entered, new pin and re-entered new pin is not matching.	Enter the same pin for new pin and re-enter new pin.
Error detected (Data save)	Motor is running.	Stop the motor and resume configuration.
	New register is added in LTMT main unit.	Check firmware version and use compatible LTMTCUF and LTMT main unit firmwares.
FDR Backup Error detected	New register is added in LTMT main unit.	Check firmware version and use compatible LTMTCUF and LTMT main unit firmwares.
FDR Restore Error detected	New register is added in LTMT main unit.	Check firmware version and use compatible LTMTCUF and LTMT main unit firmwares.
	LTMT main unit with different communication protocol.	Use compatible LTMT main unit.
	Motor is running.	Stop the motor and perform FDR restore service.

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