

RELION® PROTECTION AND CONTROL

REX640

Modification Sales Guideline





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This product complies with the directive of the Council of the European Communities on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive 2014/30/EU) and concerning electrical equipment for use within specified voltage limits (Low-voltage directive 2014/35/EU). This conformity is the result of tests conducted by the third party testing laboratory Intertek in accordance with the product standard EN 60255-26 for the EMC directive, and with the product standards EN 60255-1 and EN 60255-27 for the low voltage directive. The product is designed in accordance with the international standards of the IEC 60255 series.

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Section 1 Introduction

1.1 This manual

The modification sales guideline contains instructions on how to handle the Modification Sales process. The manual provides procedures for ordering, installation and verification of the Modification Sales delivery. The chapters are organized in the chronological order in which the Modification Sales process should be carried out.

1.2 Intended audience

This manual addresses the personnel responsible for ordering or installing the Modification Sales delivery.

The installation personnel must have the necessary skills to carry out the modification. They must be familiar with the REX640 relay configuration, parameter setting and testing using the Protection and Control IED Manager PCM600.

1.3 Product documentation

1.3.1 Product documentation set

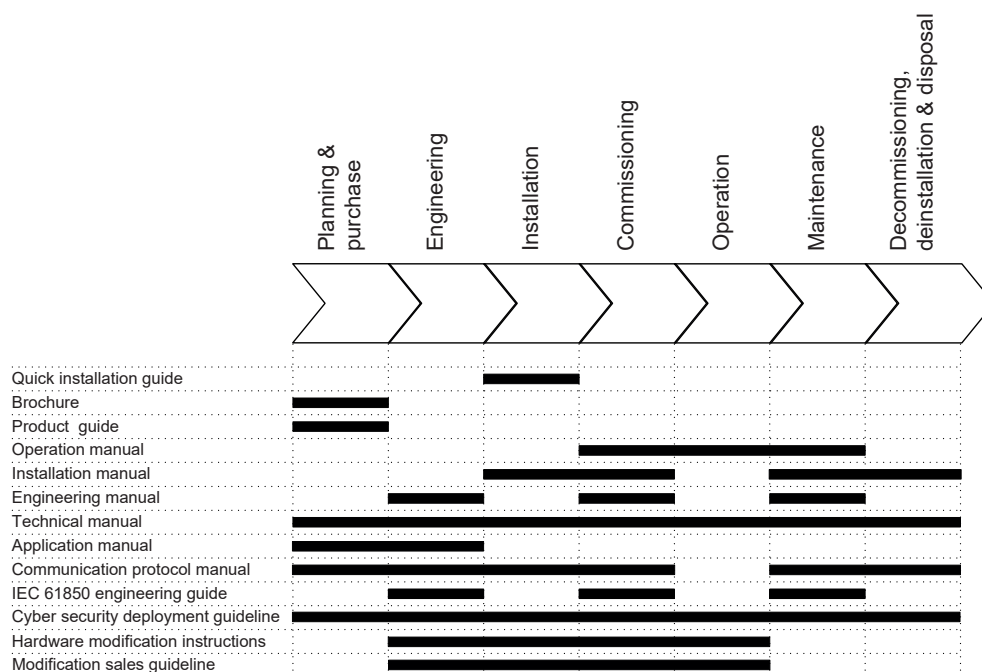


Figure 1: The intended use of documents during the product life cycle

1.3.2 Document revision history

Document revision/date	Product connectivity level	History
A/2019-06-06	PCL1	First release
B/2020-02-21	PCL2	Content updated to correspond to the product connectivity level

1.3.3 Related documentation



Download the latest documents from the ABB Web site
www.abb.com/mediumvoltage.

1.4 Symbols and conventions

1.4.1 Symbols



The caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which could result in corruption of software or damage to equipment or property.



The information icon alerts the reader of important facts and conditions.



The tip icon indicates advice on, for example, how to design your project or how to use a certain function.

Although warning hazards are related to personal injury, it is necessary to understand that under certain operational conditions, operation of damaged equipment may result in degraded process performance leading to personal injury or death. Therefore, comply fully with all warning and caution notices.

1.4.2 Document conventions

A particular convention may not be used in this manual.

- Abbreviations and acronyms are spelled out in the glossary. The glossary also contains definitions of important terms.
- Menu paths are presented in bold.
Select **Main menu/Settings**.
- Parameter names are shown in italics.
The function can be enabled and disabled with the *Operation* setting.
- Parameter values are indicated with quotation marks.
The corresponding parameter values are "On" and "Off".
- Input/output messages and monitored data names are shown in Courier font.
When the function starts, the `START` output is set to `TRUE`.
- This document assumes that the parameter setting visibility is "Advanced".

Section 2 Overview

Modification Sales is a process that supports change of functionality of a REX640 relay that has been already delivered from the factory. The Modification Sales order offers the same flexibility as the original relay order.

The Modification Sales process is based on the relay serial number. Each relay to be modified is handled individually. This applies to quoting, ordering, delivery and installation of the modification. One relay can be modified several times but the precondition for an additional modification is that the previous modification has been installed to the relay.

Modification Sales is available for the asset owners and their delegated service providers. ABB Service can also perform the necessary modifications even for turnkey deliveries.

2.1 Relay hardware

It is possible to add new hardware modules into empty module slots in the relay. It is also possible to change an existing hardware module type to a different one. The rules for module slot allocation are the same as when configuring a new relay. The Product Selection Tool (PST) can be used to determine the feasibility of the planned change.

A spare hardware module alone cannot be used to modify a relay. The relay always requires a new license when its hardware or software is modified. The new license is a part of the Modification Sales delivery. Inserting an additional module into a relay or replacing a module type with another one without a proper license causes an internal fault in the relay.

2.2 Relay software

It is possible to add new application packages and related add-on packages. Existing application or add-on packages can be removed but they are not refunded.

It is possible to change the existing communication protocol support to a different one. In this case, the original protocols are removed.

Section 3 Quotation and ordering

Quotation for the planned modification must be requested via the local ABB channel or directly from the factory sales representative. The following technical information must be included in the request:

- Relay serial numbers
- Detailed description of the planned modification for each serial number separately

Based on the received information, ABB verifies the feasibility of the requested modification and prepares a quotation.



If installation and verification of the modification is also needed, contact the nearest ABB Service representative for a turnkey delivery of modification.

Section 4 Delivery

The modification package contains hardware and software or software only for one or several relays. By default the modifications for several relays within a single request are delivered as a single package containing the required licenses, software and related hardware. If the delivery should be split into several packages, ABB must be informed within the request for quotation.

Licenses and software are delivered on a USB memory stick containing a software package (.cab file) signed with a digital signature by ABB. If necessary, licenses and software can be delivered, for example, via email. The delivery address (postal and email) must be confirmed during the quotation process.

The guarantee period for the delivered hardware is the same as originally given for the relay for which the modification is installed. The guarantee period for the Modification Sales delivery starts on the date it is dispatched from the factory.

Section 5 Installation

5.1 Prerequisites

- Computer with PCM600 Ver.2.9 Hotfix 1 or later and a REX640 connectivity package Ver.1.1 or later installed. It is recommended to use the latest REX640 connectivity package available in the Update Manager.
- Up-to-date projects in PCM600 containing all the relays under modification
- Modification Sales package delivered as a .zip file
- CAT 6 Ethernet cable
- Adequate access rights to perform software update for the relay



As the relay is in the factory default configuration state after the update process, ensure that the current configuration of the relay under modification is available in the PCM600 project. If needed, select **Read from IED** before starting the update process.

5.2 Adding or changing hardware modules

1. See REX640 Hardware modification instructions (1MRS759101) for the required tools and other information related to the modification. The document is included in the delivery.



Disconnect the relay's auxiliary voltage and carry out modifications on a de-energized feeder.



Check the printed documentation included in the modification package delivery. Follow in detail the Relay module modification table in the Modified Product document.

2. Replace the existing product labels with the new ones (two copies) included in the delivery.



If the delivery contains material for the modification of several relays, check the correct label based on the serial number of each relay under modification.

5.3 Updating license and software

1. Connect the relay to a computer with PCM600 using an Ethernet cable. It is recommended to disconnect/disable all the other wired and wireless network connections of the computer except the one used in connecting to the relay.
 - If the LHMI is in use and is connected to the relay, connect the cable to service port X1.2 of the LHMI. Use DHCP in the computer running PCM600.

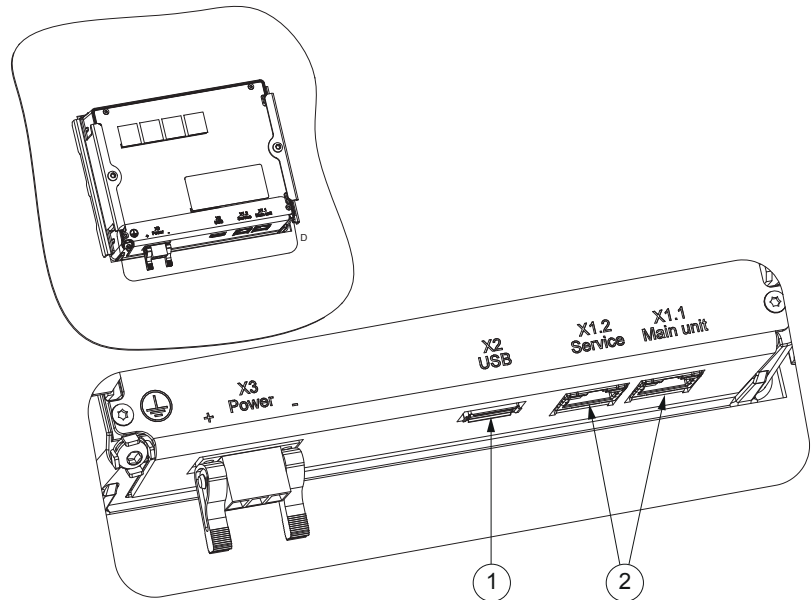


Figure 2: Local HMI connectors

- 1 USB port
- 2 RJ-45 ports

- If the LHMI is not in use, connect the cable directly to the HMI port X0 on the relay's communication module. A fixed IP address, for example 192.168.0.10, can be configured in the computer. 192.168.0.10 is used for communication with the relay's HMI port that has always the same fixed IP address 192.168.0.254.

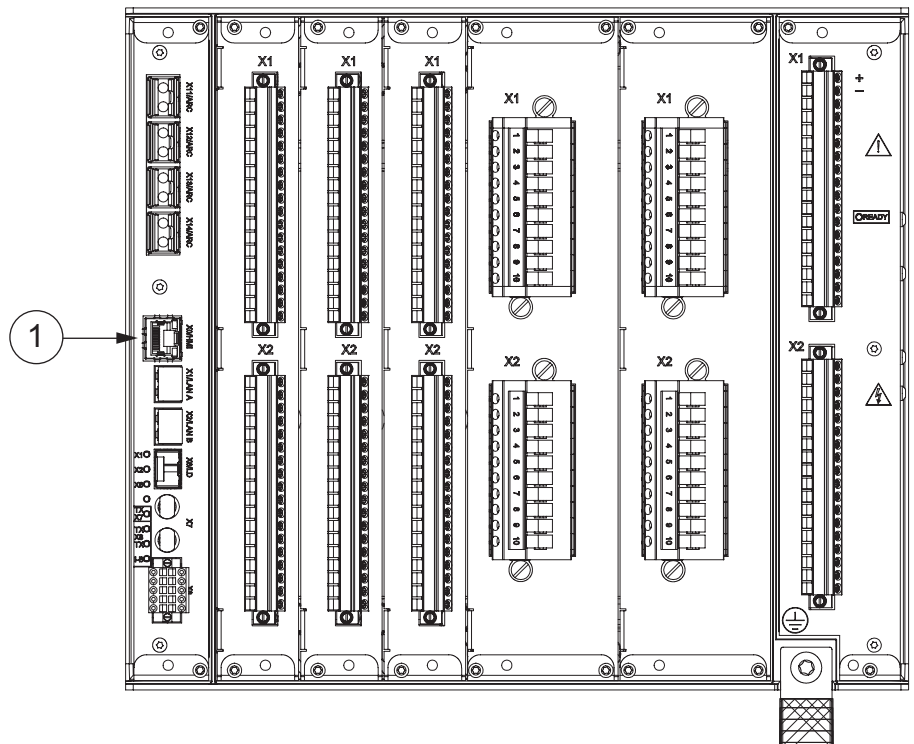


Figure 3: HMI port X0 on the communication module

1 HMI port



Disconnect all Ethernet station communication interfaces (LAN) of the relay.

2. Connect the relay's auxiliary voltage and wait for the relay to fully start up.



In case a hardware module has been changed or added, the hardware composition is no longer valid for the current license and the relay is in Internal Relay Fault (IRF) state. This is normal, proceed to the next step.

3. Save the delivered Modification software package (.zip file) to the local disk of the computer.
4. Start PCM600 and select the relay under modification from the Plant Structure.
5. Right-click the relay and select **IED Summary** to check the relay's serial number.

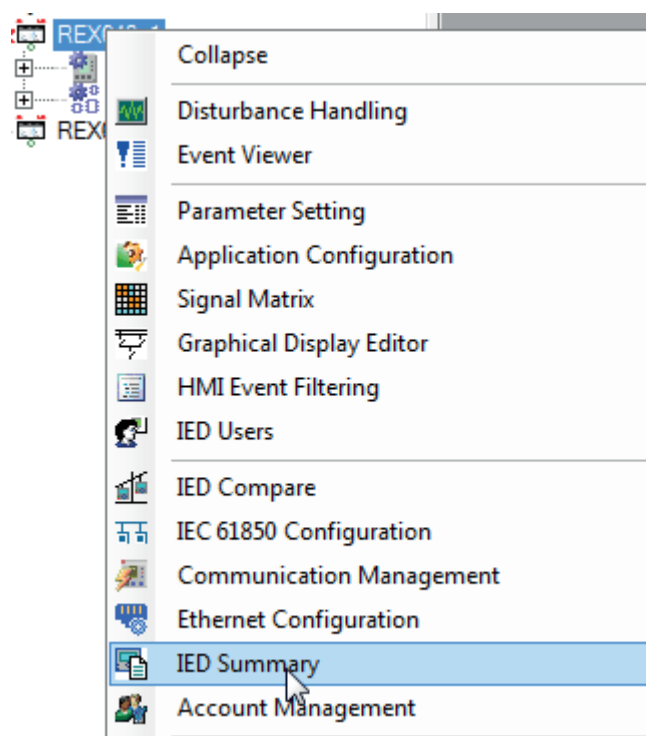


Figure 4: Accessing IED Summary

6. Start Update IED.

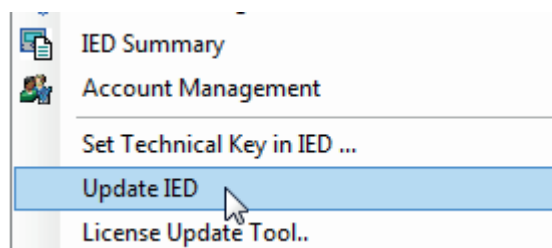


Figure 5: Starting Update IED

7. Browse for the .zip file from the local disk and open it.

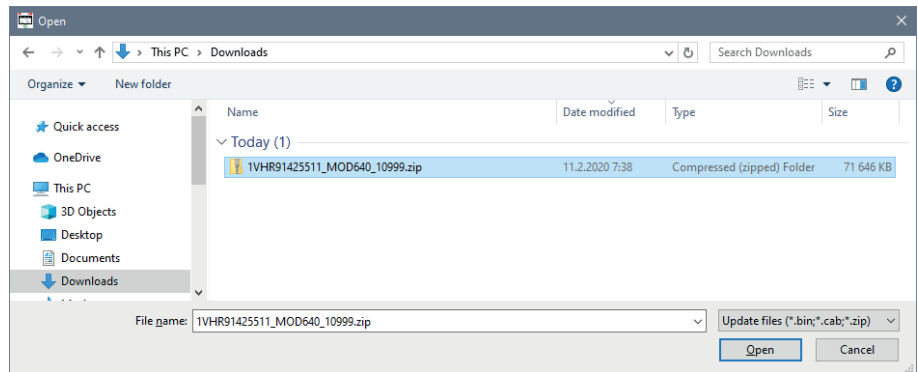


Figure 6: Opening the .zip file

8. Follow the instructions given by the update wizard.
The process takes several minutes and afterwards the relay is in the default factory state. For example, the technical key must be reconfigured to enable the PCM600 communication. If the LHMI is in use, it needs to be paired with the relay again after the update process.
9. After the relay license and software update is completed, start License Update if the license update has not been carried out offline (see Enabling new hardware or functions in relay configuration). This updates the PCM600 configuration to match the new relay license.



The check box **Start License Update automatically** is selected by default.

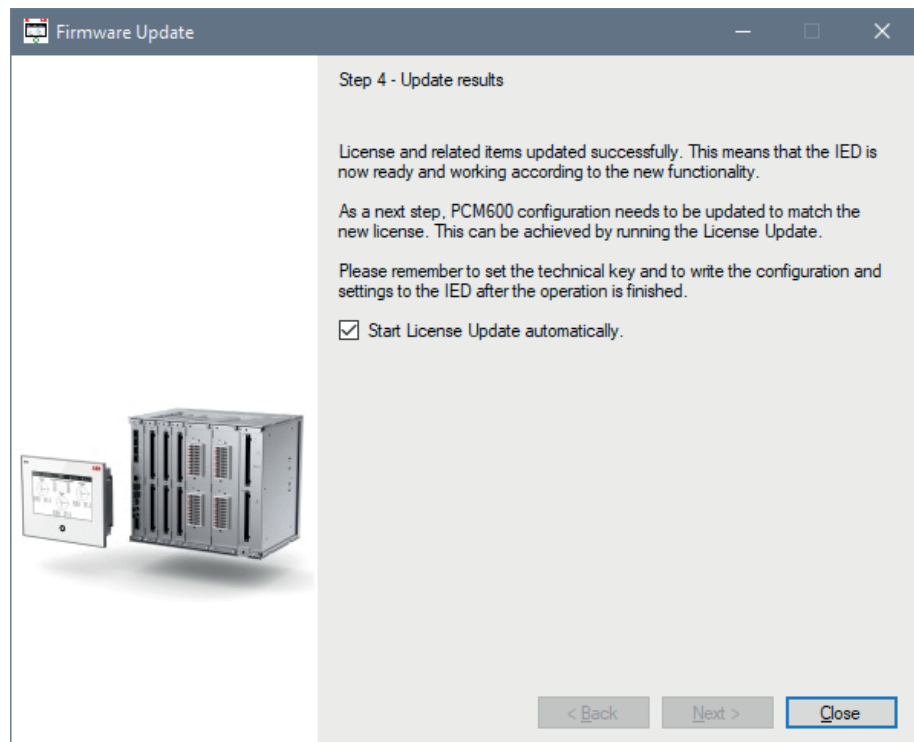


Figure 7: Starting license update

10. Follow the instructions given by the License Update wizard.

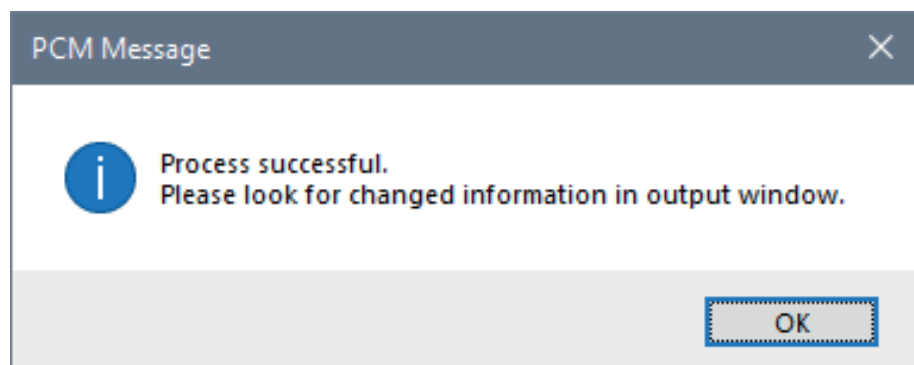


Figure 8: Successful license update

The relay configuration in PCM600 can now be modified with the required changes to enable the new functionality. Or, if already prepared offline, the configuration and settings can be written to the relay (**Write to IED**).

5.4 Enabling new hardware or functions in relay configuration

IED Update updates only the license and the relay and LHMI software for the modified hardware and software. In addition, the relay and the LHMI configurations need to be modified to enable the required new functions. The configuration modification contains two steps.

1. Update the PCM600 configuration online or offline to match the new relay license using License Update.
 - The configuration is updated online when PCM600 has a connection to the relay: License Update reads the updated license information from the relay, shows the relay composition information and updates the PCM600 configuration.

REX640 License Update Tool

Composition code detection

Please click the Next button after the composition code has been read from the IED into the fields.

REX640B10NN	APP1	APP2	APP7	APP10	APP11	ADD1	COM2	BIO2	RTD1	RTD2
BIO2	AIM2	PSM2	CMP5	LNG1	SCT3	PCL2				

Copy Paste

☒ Main Code
 ☒ Applications
 ☒ Slots
 ☒ Protocols
 ☒ Languages
 ☒ Connectors
 ☒ Connectivity

Product: REX640 Multiapplication IED
 Standard: B IEC
 Product Version: 1
 Interface Level: 0
 Reserved: N
 Conformal Coating: N No

Cancel Next >

Figure 9: Using License Update online

- The configuration is updated offline when PCM600 does not have a connection to the relay: the relay composition information is manually edited in License Update to correspond to the new functionality. The PCM600 configuration is then updated to match the new relay composition, that is, the license.
2. After the license update, modify the relay configuration to enable the required functions in the relay by using Application Configuration, Graphical Display

Editor, Signal Matrix, IEC 61850 Configuration or other tool components in PCM600 depending on the function.

The relay configuration and settings in PCM600 can be modified offline without a connection to the relay even before the relay license and software update. The prerequisite is to have the new relay composition updated to PCM600 using License Update. The needed modifications of the relay configuration can then be done and saved in a PCM600 project. If this is done before the relay license and software update, License Update does not have to be started automatically as it is enough to write the modified configuration and settings to the relay (Write to IED).



The new relay composition updated offline in License Update must be identical to the license updated in the relay. Otherwise the modified configuration cannot be written to the relay until the composition matches the license found in the relay.

Section 6 Verification

Before the relay and the LHMI are returned to normal service, the installed modifications have to be tested and commissioned. The recommendation is that the changed functionality of both the hardware and the software be tested. The testing procedure for the modified part must be the same as when commissioning a new relay.

If the relay's hardware is extended by additional modules, the functionality that the new modules offer the relay has to be tested. If the relay hardware setup is modified by changing an existing module type to a different one, additional checks regarding the removed functionality must be done.

Section 7 Hardware modification example

Table 1: *Example of the Relay module modification information table included in the relay modification delivery*

Slot	Original relay		Action	Modified relay	
	Item	Description		Item	Description
A1	Empty		Unchanged	Empty	
A2	2RCA034483A 0001	COM1002	Unchanged	2RCA034483A 0001	COM1002
B	2RCA034506A 0001	BIO1001	Unchanged	2RCA034506A 0001	BIO1001
C	2RCA034536A 0001	BIO1002	Changed	2RCA034450A 0001	RTD1001
D	2RCA034536A 0001	BIO1002	Unchanged	2RCA034536A 0001	BIO1002
E	Empty		Added	2RCA034931A 0001	BIO1004
F	2RCA034442A 0001	AIM1001	Unchanged	2RCA034442A 0001	AIM1001
G	2RCA034455A 0001	PSM1001	Unchanged	2RCA034455A 0001	PSM1001

Explanations

- Original relay columns define the slot allocation of the different modules that are included in the relay to be modified.
- Action column defines the action to be done per each slot of the relay.
 - Unchanged: slot is not affected by the modification
 - Changed: slot content is changed by the modification, that is, to another module type
 - Added: a new module is added to an empty slot by the modification
- Modified relay columns define the slot allocation of the different modules after the modification is completed.

Section 8 Glossary

CAT 6	Cable standard for gigabit Ethernet and other network protocols that is backward compatible with CAT 5/5e and CAT 3 cable standards
DHCP	Dynamic Host Configuration Protocol
EMC	Electromagnetic compatibility
Ethernet	A standard for connecting a family of frame-based computer networking technologies into a LAN
HMI	Human-machine interface
IEC	International Electrotechnical Commission
IED	Intelligent electronic device
IRF	1. Internal fault 2. Internal relay fault
LAN	Local area network
LHMI	Local human-machine interface
PCM600	Protection and Control IED Manager
PST	1. Parameter Setting tool in PCM600 2. Product Selection Tool
RJ-45	Galvanic connector type
USB	Universal serial bus



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