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Firmware update release 6.0.1 for REX615 PCL1 protection and control relays

Scope

Update release 6.0.1 concerns REX615 PCL1 protection relay.

To verify whether the update applies to the protection relay at hand, there are two things to check:

1. Product Connectivity Level (PCL) shall be PCL1. This information can be checked from LHMI, WHMI or from the product label. The PCL is a part of product composition code, as the example below shows.

REX615A10GN + COMx + PSMx + BIOx + xxxx + **PCL1**

2. Relay Firmware version is 6.0. This can be checked from LHMI or from WHMI

Following figures show how to locate the above-mentioned information from the LHMI Device Information page and from the WHMI Product Identifiers page. The relay Firmware version is referred as “SW version”. The “PCL” part of the composition code is pointed out as well.

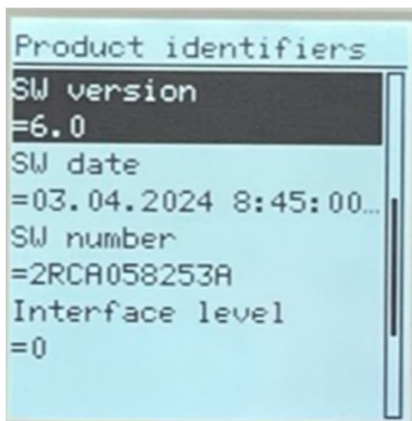


Fig 1. LHMI Product Identifiers menu

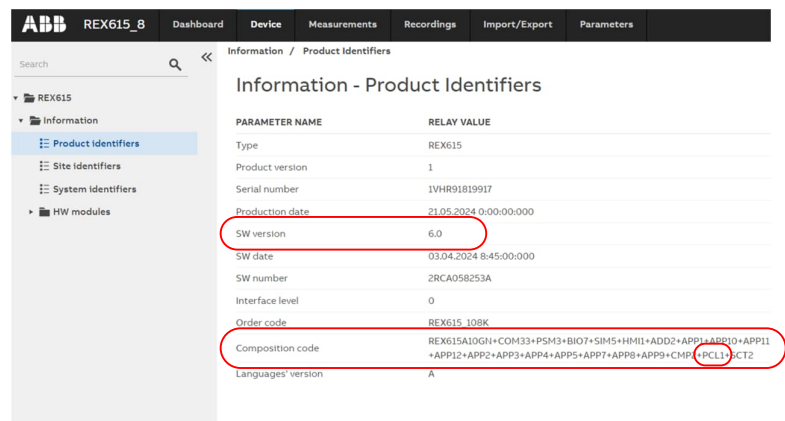


Fig 2. WHMI Product Identifiers page

Implemented usability improvements

The firmware update release includes usability and operational improvements. The following improvements have been implemented:¹

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Communication

Functionality and Symptom	Impact	Solution
Ethernet communication. Under exceptional ethernet packet storm rear ethernet port could end to non-responsive state.	Relay could end to situation where rear ethernet port it is not communicating in network. Manual restart required to restore communication.	Update enhances communication buffering and supervision to endure better in the exceptional communication storm situations. Relay can restore communication without restart.

Cyber Security

Functionality and Symptom	Impact	Solution
Private key encryption. No visible symptom but encryption password not taken account when the communication certificate is generated.	Does not directly affect relay operation or the user experience. Relay communicates normally while Administrator and Security Administrator level users could fetch the certificate and its private key info from the device.	This update strengthens Cyber Security by correcting the encryption password handling while generating new communication certificates. NOTE: Updating relay will not automatically generate new communication certificates. If a new certificate is required. Administrator and Security Administrator level users can manually remove the certificate (the PEM file named with the device serial number) from "C:/cert" directory and allow the device to generate a new certificate and encrypted private key by restarting relay.

¹ The relay firmware update may also include some minor usability improvements not listed in this note.

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Engineering

Functionality and Symptom	Impact	Solution
Improvement to user-defined names (UDN) handling for disturbance recorder channels. User might not been able to revert from UDN to default Disturbance recorder channel naming. DR channels was showing UDN names even after disabling UDN setting.	This may affect user workflows and clarity regarding channel identification, although the product remains fully functional.	Within update disturbance recorder channel naming handling improved. Now channel naming will follow selected naming type.
Extension to GOOSE Tx functionalities. Maximum number of GOOSE Tx datasets has been increased from 6 datasets up to 8 datasets.	Relay GOOSE function capabilities has been extended. After update user can configure up to 8 GOOSE Tx datasets with new PCM600 projects.	After update user can configure from PCM600 tool all the way up to 8 GOOSE Tx dataset effectively. Note: Minimum requirements for engineering 8 GOOSE Tx datasets for new projects are: Relay Firmware: REX615 6.0.1 Connectivity package: REX615 6.0.1 PCM600 2.12 + Hotfix 20240520

HMI

Functionality and Symptom	Impact	Solution
WHMI session handling improvement. Login to WHMI may have got failed and received message "Login failed: The maximum number of logged in users has been reached."	When relay has been at long term use and several WHMI users are using web-interface, and do not logout from the WHMI session manually by pressing "Logout" button but rather just closing the web browser. Eventually it might come to situation where more users could not login to WHMI, unless restating the relay.	Within update WHMI automatic timeout logic has been fixed that all sessions that have left hanging after browser close will be cleared. WHMI login issue can be also cleared temporary by restarting the relay.

Supervision

Functionality and Symptom	Impact	Solution
IEC 61850 Flexible product naming (FPN) configuration file supervision improvement, to avoid unwanted rebooting during relay configuration process.	In case relay self-supervision detected incomplete FPN files during relay configuration, it tries to recover from file issue by restating. In some cases, relay might have been rebooting continuously and might not started properly.	Within update FPN configuration file supervision and error handling are enhanced. In case incomplete FPN files detected, supervision will remove the FPN configuration files and return back to default 61850 naming.
File system error handling enhancement. In rare case of memory access error, LHMI and WHMI controls might not respond.	Accessing to file system not possible, LHMI and WHMI controls might not respond to commands	This update improves error recovery action in case of memory access error. LHMI and WHMI responsiveness issue can be also cleared by restarting the relay.
Self-supervision watchdog functionality. During relay software reset "Watchdog reset" reported at user log occasionally.	No impact for operation. Only unnecessary "Watchdog reset" reported at user log.	Watchdog supervision has been enhanced to avoid false logging during software reset.



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Tools for updating the REX615 (PCL1) relay

Tools needed to update to SW version 6.0.1:

- PCM600 2.12 (+ Hotfix 20240520) or later
- REX615 Connectivity package 6.0.1 or later
- Relay Update file version 6.0.1 (REX615_ALL_Config_615_Version_6.0.1_2RCA0xxxx.cab)

Update policy

Firmware updates represent an integral part of ABB's life cycle management of distribution protection and control relays. The updates ensure optimized usability throughout the relay's entire life cycle by offering the latest improvements. The ideal time for a firmware update would be at device commissioning, during periodical testing or during a maintenance break.

Please note that ABB will not be liable for any direct or indirect costs related to the firmware update procedure. The update procedure shall be performed at the sole responsibility of the possessor of the devices.

Glossary

Abbreviations and acronyms are spelled out in the glossary. The glossary also contains definitions of important terms.

FPN	Flexible Product Naming
FUT	Firmware Update Tool
FW	Firmware
GOOSE	Generic Object-Oriented Substation Event
HMI	Human-machine interface
HW	Hardware
IEC 61850	International standard for substation communication and modelling
IRF	1. Internal fault 2. Internal relay fault
LHMI	Local human-machine interface
PCL	Product Connectivity Level
PCM600	Protection and Control IED Manager – Software
SW	Software
TCP/IP	Transmission Control Protocol / Internet Protocol
UDN	User Defined Names
WHMI	Web human-machine interface