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Firmware update release 4.0.8 for 615 series IEC product version 4.0 protection relays

Scope

Firmware update release 4.0.8 is for the following 615 series protection relays:

- REF615
- REM615
- RET615
- REU615
- RED615

To verify that the firmware update applies to the protection relay version, ensure that the second and last two characters of the order code on the label on top of the human-machine interface (HMI) match the corresponding characters of the order code in Fig. 1.

```
xBXXXXXXXXXXXXXXXXXE  
↑                          ↑↑↑
```

Fig 1. Order code of the 615 series protection relays

To identify the current firmware revision of the 615 series protection relay, please refer to Fig. 2.

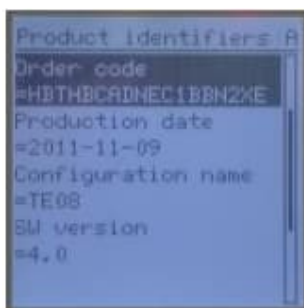


Fig. 2 Current firmware revision of the 615 series protection relay

Implemented usability improvements

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

Firmware update release 4.0.8:

Supervision

- Improvement to self-supervision watchdog function, by enhanced task scheduling.

Communication

- Improvement to relay communication stack software handling in case of misconfigured IEC 61850 Edition 2 fixed length GOOSE messages.

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

Firmware update release 4.0.7:

Cyber Security

- Cyber Security improvements to the "Ripple20" vulnerability in TCP/IP communication stack for normal product usage conditions. The following vulnerabilities have been identified in the product and fixed by the update:
 - CVE-2020-11907
 - CVE-2020-11909
 - CVE-2020-11910
 - CVE-2020-11911
 - CVE-2020-11912

Note! Some of the security scanners might still report existence of Ripple20 vulnerability after the update. This is a false positive, since the scanners indicate the presence of the IP stack, without being able to check the vulnerability and its fixes.

Supervision

- Improvement to relay CPU FPGA (IRF 83) internal fault supervision – the supervision interval speed is fastened to reach faster issue detection.
- Improving Time counter rollover in relay's communication module that may have caused internal relay fault with error code IRF116 COM card error and relay to self-reboot after time interval(s) which is divisible by ~50 days from previous restart.
- Self-supervision improvement for composition detection.
- Internal diagnostic improvement for the self-supervision.

Protection

- Improvement to Intermittent earth-fault protection function (INTRPTEF) in "Intermittent EF" mode in case of very small earth fault current I_0 and high earth fault voltage U_0 .

Communication

- Improvement to the Frequency measurement FMMXU avoids unnecessary reporting during momentary vector shift situations.
- Improvement on GOOSE receiving. In a system where one relay is receiving GOOSE communication from multiple senders, it is possible that a communication break in one sender might impact handling of received values from other senders.
- Improvement on line differential protection communication for LD frame sending to remove occasionally happened excess delay in it.

Firmware update release 4.0.6:

Control

- Improvement to the synchrocheck function for preventing unexpected short-period reset of SYNC_OK output. The reset could have been seen in vector shift situations earlier.
- Improvement to the synchrocheck function for preventing unexpected short-period reset of SYNC_OK output. The reset could have been seen in very rare situations earlier even when the synchronism conditions were fulfilled and voltages were aligned on both sides of the breaker.

Firmware update release 4.0.5:

Control

- Manual control of function block OLATCC1 is now enabled for “Operator” user of the relay.

HMI

- Enhanced programmable LED response for ensuring update of the programmable LEDs on the LHM during open/close command.
- The Local HMI object control selection behavior improved while user log in and log out.

Measurement

- The updating of the minimum demand value calculation is improved for function block PEMMXU when the measurement is under minimum power limit.
- Unnecessary warning is not any more generated by the self-supervision of the RTD measurements in REM615 motor protection relay.

Communication

- The relay is able to start up normally even if vertical communication data sets are empty or not available at all.
- ARP table size increased to hold more client IPs.

IEC 61850:

- Improved GOOSE sending performance at high application load, e.g. when using complex configurations.
- The performance enhancement for system communication (MMS) event sending during extremely high event load situations.

IEC 103:

- Improvement in Rated primary value (RPV) and rated secondary value (RSV) of the IEC 103 for preventing that the U0 value is constantly zero in IEC 103 disturbance recording.
- Improvement in the time stamp of the disturbance recording for preventing that minutes in the IEC 103 disturbance record might occasionally be incorrect
- The transmission handling of the disturbance recorder has been improved for IEC 103 protocol when uploading with very fast reading cycles.
- CRC check sum calculation improved for retransmitted variable-length messages with certain masters in IEC 103 protocol.

Modbus:

- Improved refreshing logic of current measurement value for Modbus protocol.

DNP 3.0:

- The DNP3.0 Rx buffering has been improved to prevent a situation where the DNP3.0 response sequence numbers are occasionally lagging behind the requested sequence numbers.

Supervision

- Audit trail handling is improved during restart situation.
- Self-supervision coverage of the RAM memory has been improved.
- Improved failure tolerance of the file system for preventing a possible file opening failure, resulting "CRC error" indication on the Local HMI, after restarting of the relay.
- Self-supervision improved to prevent the unnecessary error message "57 Light sensor error" when ARCSARC functionality is not supported.
- The internal diagnostic logging of the line differential communication in RED615 relay has been enhanced.

Tools for updating the IED

Tools needed to update to SW version 4.0.8:

- PCM600 2.6 or later
- 615 Series Connectivity package 5.0.4 or later
- Relay Update file version 4.0.8
 - Example: REF**615**_IEC_Config_**A**_Version_**4.0.8**_2RCA029677J.bin
 - F refer to: Feeder protection and control REF615
 - 615 refer to: 615 product series
 - IEC refer to: International Standard
 - A refer to: Standard Configuration A
 - 4.0.8 refer to: Update file version 4.0.8

Update Procedure

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 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.