Firmware update release 1.0.7 for REX640 control and protection

Scope

This update Release Note 1.0.7 concerns REX640 protection relays and LHMIs delivered from the factory earlier than 10th of February 2021.

To verify whether the update applies to the protection relay and the LHMI version at hand, there are three things to check:

1. Product Connectivity Level shall be one (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.

    REX640B10Nx + xxxx + COMx + PSMx + BIOx + **PCL1**

2. Relay Firmware version is 1.0, 1.0.1, 1.0.2, 1.0.3, 1.0.4, 1.0.5 or 1.0.6. This can be checked from LHMI or from WHMI

3. LHMI application version is dated **<u>earlier than</u>** 19-09-10-16:34. This can be checked from LHMI only.

Below figures show how to locate the above-mentioned information from the LHMI Device Information page and from the WHMI Product Identifiers page. The LHMI Device Information page can be accessed by tapping the menu bar on upper part of the LHMI screen and locating the Device Information button from the lower left-hand corner of the screen. The relay Firmware version is referred as "SW version" and the LHMI application version is referred as "HMI version". The "PCL" part of the composition code is pointed out as well.
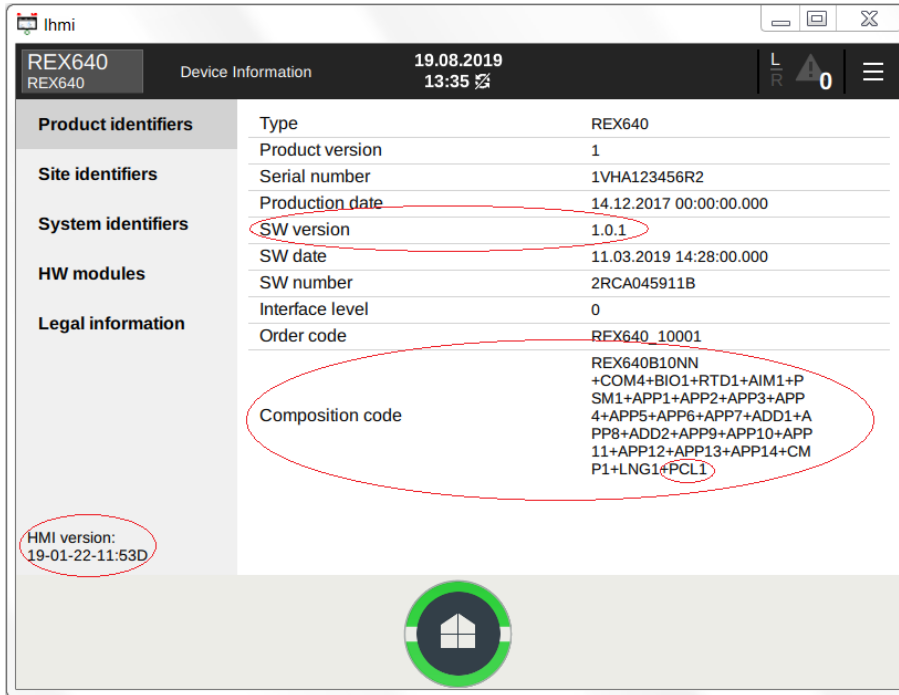
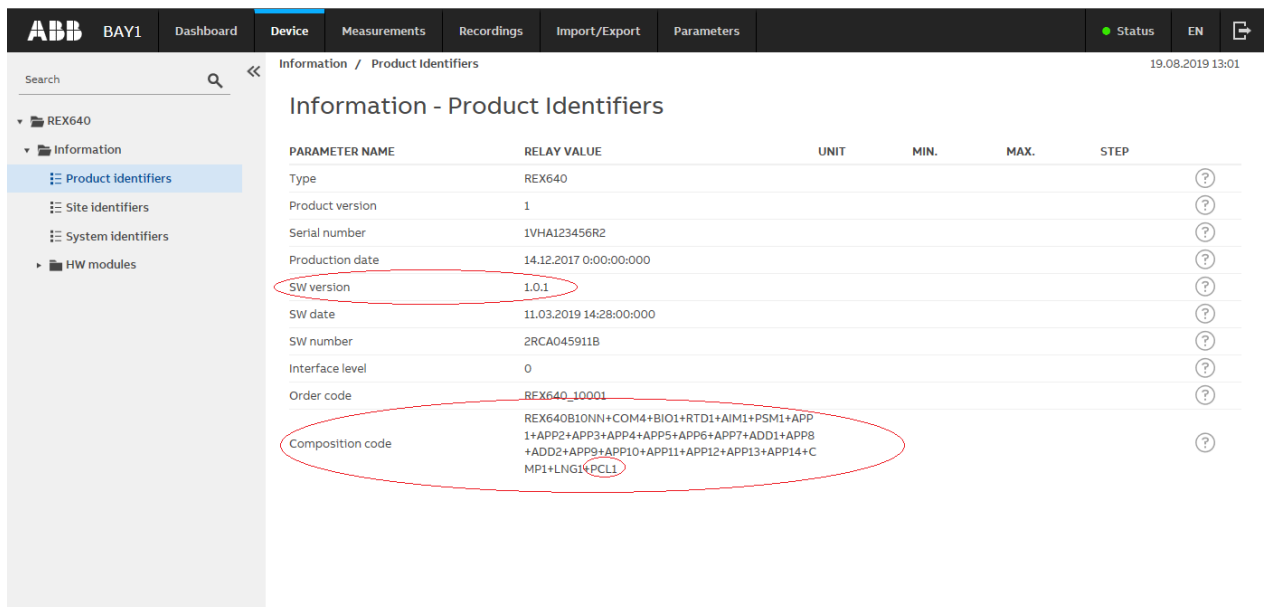Fig 1. LHMI Device Information page

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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HMI

- LHMI performance improvement.
  Earlier LHMI might have acted slow under some heavy configurations.

Supervision

- Fixing performance issue leading to reccurring IRF116 at certain HSR and PRP network systems.
  At some HSR and PRP network systems it has been possible to experience recurring IRF116 (WD2) COM card error leading to relay self-recovery reboot.
  (Impacted FW 1.0.5 & 1.0.6.)

Communication

- Enhcanced SFP module handling and reporting.
  (SFP Module related to Line Differential and Line Distance applications.)

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

Firmware update release 1.0.6 for relay

Cyber Security

- Cyber Security improvements to the "Ripple20" vulnerability in TCP/IP communication stack for normal product usage conditions. Following vulnerabilities has 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

- 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.

- Enhancing relay restart process from Supply voltage breaks.
  In case of Supply voltage break, on rare occasions, relay was restarting to fault (EEPROM error on slot A2) and indicating "Card error, slot A2" at Event list.

HMI

- Improvements in WebHMI to better support Google Chrome 83 & 84 new security features. previously issues was seen at least with relay settings import and login.

Engineering

- Improving Special Character < > & handling at User Defined Names (UDN) and alarm texts. Which earlier may have caused relay program error and preventing successful relay restart.

Firmware update release 1.0.5 for relay

HMI

- Enhancing LHMI "testing and commissioning / Secondary injection Monitoring" page function "ON/OFF" restoration while switching from Test mode to Normal mode. When returning to normal mode operation without turning temporarily deactivated function(s) back to "ON" under test mode, some function(s) have remained "OFF" instead restoring automatically its original "ON"-state.

- Removing unnecessary repetitive "Viewed Security Event logs Succesfully" Syslog messages seen at Report Summary page when using WHMI.

Measurement

- CMSWI / VMSWI switching of the source fixed for TR2PTDF, TR3PTDF, MPDIF, COLPTOC, SRCPTOC, HAEFPTOC and PHVPTOV. Earlier these functions did not take the new switched source correctly into use.

Time synchronization

- Improving SNTP Time synchronization server switch from primary to secondary server.

Firmware update release 1.0.4 for relay

Protection

- Improvement of line differential protection stability.

Firmware update release 1.0.3 for relay and LHMI application version dated 19-09-10-16:34

Measurement

- Calculated residual voltage scaling on SMV stream receiver side has been corrected.

- Calculated residual voltage scaling on measurement list on LHMI/WHMI as well as for MMS reporting has been corrected.

HMI

- "Clear LEDs" function button behaviour on the ready-made virtual alarm LED page in LHMI is improved.

- Improved information on the "Fault Records" page on LHMI in case ANSI naming convention is in use.

Firmware update release 1.0.2 for relay and LHMI application version dated 19-06-13-16:05

Protection

- Improvement of stability during post-fault oscilations in multifrequency admitance-based earthfault protection (MFADPSDE) operating in "Intermittent EF"-mode.

Measurement

- Improvement in current measurement summation function (CMSUM) output values in case currents measured with sensors (Rogowski coils) are summated with conventional CT measurements, or with IEC 61850-9-2 LE based measurements.

Communication

- Improvement in updating capacitor bank unbalance protection CUBPTOC and HCUPTOC functions measurement values reported to the communication link.

Supervision and Monitored values

- Improvement of alarm handling during relay switch-off and switch-on process. "Power down detected" event is not anymore generating persisting alarm which could be cleared only after a five-minute delay.

HMI

- A new feature for restoring relay configuration using back-up from the LHMI is now supported. 640 LHMI restores the relay backup file after the existing LHMI and the new replacement relay pairing has been successfully completed. Following conditions must be additionally fulfilled:
  - Replacement relay's serial number is different than in the original relay
  - The replacement relay contains all the same options as the original relay. The replacement relay may contain additional options.
  - User has accepted to run the restore operation
The back-up file is automatically written to the LHMI memory 24 hours after the latest change in the relay's configuration or setting parameter files.

- Improvement LHMI Home-button alarm indication in case virtual alarm LEDs are used instead of event-based alarm list.

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 during periodical testing or during a maintenance break.

REX640 relays and LHMIs dispatched later than 10th of February 2021 includes the stated relay firmware update 1.0.7.

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.