

RELEASE NOTE 1MRG040289 | 2021-08-12

Release of Relion® 670 series Version 2.2

The evolution of Relion 670 series continues with this update. The designation of this update is revision 2.2.5

Release authorized by:

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Introduction



We are pleased to announce an update of the Relion 670 series version 2.2, our flagship protection and control IEDs. With this update, we bring several new features and enhancements.

The update covers customized and pre-configured IEDs covering all application areas within the products REB/REC/RED/REG/REL/RER/RES and RET670. The Relion 670 series covers a complete set of applications from generator protection, transformer protection and control to busbar protection, line protection, phasor monitoring and bay control. With the introduction of version 2.2 of the 670 series, we further expand the application areas especially for digital substations, enhancing the system functionality and flexibility.

New features and benefits



The following new features and their benefits are introduced in this update:

Application related

- The existing high-speed line distance protection functions ZMFPDIS/ZMFCPDIS are now enhanced further to handle parallel line applications. This is based on exchanging measured neutral current from the parallel line to compensate the effect of line's mutual inductance. With this enhancement, distance protection's effective zone reach is not impacted by mutual coupling between parallel lines.
- In addition to the above enhancement, the functions are further improved to handle earth-faults in solidly grounded networks with no zero-sequence current source behind the relay location.
- A new distance to fault location SMTRFLO based on double end measurement is now available in RED670. This function provides accurate distance to fault location by using a novel approach that is not impacted by the dynamic change in source impedances and remote infeed. The function requires the use of line data communication module (LDCM) supporting 2Mbps for exchanging data between line ends. The function calculation principle can be set to single end measurement mode thereby making this new fault locator very versatile.
- A new fault component monitoring function FLTMMXU is now included in this release. The peak and RMS current and voltage values at the time of a triggering fault is captured and reported to clients over IEC 61850 communication. This allows the user to have a fast overview and evaluation of the network performance.
- The existing current and voltage harmonic monitoring functions CHMMHAI and VHMMHAI have been enhanced to monitor up to the 9th harmonic and DC content with polarity of the monitored signal. This brings value in power quality monitoring applications especially in inverter based renewable applications.

- Several math and logic functions are added to the existing library which help users to develop advanced application logics. The entire list can be found in the product documentation like product guide and technical manuals.
- A simplified binary release overcurrent protection BRPTOC is introduced. The function supports several input measuring modes like DFT, Peak values, Peak-to-Peak values and can be used where applications require an instantaneous overcurrent operation with a short time delay or as a release criterion for other protection functions.
- In protection functions, OC4PTOC, PH4SPTOC, D2PTOC, EF4PTOC, EF2PTOC, SCCFPVOC and CVGAPC, the internal harmonic blocking detection reset the START signal and thereby reset the trip timers. In this release, the behavior of internal harmonic blocking detection has been modified to only freeze the trip timer. This enhancement eliminates the risk of temporary resetting of START signal and trip timer in case of evolving/simultaneous fault.
- The two-step overvoltage protection O2RWPTOV and two step undervoltage U2RWPTUV available in RER670 now have separate stage wise start and trip outputs. This enables users to freely assign stage wise output signal for protection applications. Also, a new *Inverse curve Type C* is made available for U2RWPTUV.
- The transformer tank protection TPPIOC in Railway protection RER670 has been enhanced to cover a higher setting range.
- To enable selectivity in protection schemes during earth-fault, the directionality can now be set per stage in the two-step residual overcurrent protection EF2PTOC in RER670.
- The fault locator RWRFL0 in RER670 is now improved with the following:
 - An additional application in railway electrification systems “BTCatenary”. This allows the fault locator to be used in single phase traction systems.
 - Distance to fault data as BCD outputs. This allows transmission of distance to fault information to a higher level system as BCD coded data.
- The GOOSEINTRCV function is updated and can now receive transformer tap position from publishing YLTC logical nodes via GOOSE. With this feature, IEDs that require transformer tap positions where it is physically not wired can obtain via GOOSE communication.
- The interface between 670 series scheme communication functions and protection signaling equipment are modeled according to IEC 61850 Ed2.

System and cyber-security related

- Rapid Spanning Tree Protocol (RSTP) according IEEE 802.1D is now available as a communication redundancy method in addition to the existing PRP and HSR. The RSTP offers a cost-effective station communication redundancy. The IED supports multiple redundancy methods and can be ordered. All communication redundancy protocols require 2 SFP communication ports and is configured using Ethernet Configuration Tool (ECT) in PCM600.
- The built-in disturbance recorder in the 670 series IED has been extended to support IEC 60255-24 (COMTRADE-2013) format. For backward compatibility purposes, a setting is available to record disturbances in earlier COMTRADE-1999 or the new COMTRADE-2013 format.

COMTRADE-2013 format provides several benefits like higher signal resolution, indication of time quality at recording and a single file (extension .CFF) containing all parts of the recording. PCM600 2.10 with PCM600 2.10 Hotfix 20210804 and SDM600 version 1.2 FP2 HF5 handle upload and analysis of both COMTRADE-1999 and COMTRADE-2013 formats as supported by 670 series.

- The LPHD PhyNam (Physical Name) is now modeled to include several attributes for the device name plate. These attributes can be configured with accurate data of the installed IED. When using a higher-level asset management system, Utilities can benefit by having high quality data on these IEDs which can further help to monitor and manage the installed assets.
- The transmission delay of line data communication can now be monitored on the LHMI and PCM600 signal monitoring tool. This helps in quick monitoring of the communication setup especially for line differential protection applications.
- OpenSSL updated to version 1.1.1j (<http://www.openssl.org>).

Hardware and product packaging related

- Two new transformer module (TRM) variants are introduced:
 - 9IM 1A + 3U 110/220V, 50/60Hz, article number 1MRK002247-BL
 - 6IM 1A + 6U 110/220V, 50/60Hz, article number 1MRK002247-AZ

All current inputs in the above new TRMs are of measurement type and this combination is often required for PMU applications. These TRMs are available as options in REC670 and RES670 products.

- With this release, it will now be possible to have a maximum of 6 Milliamp-Input-Modules (MIM) depending on the IED size and the total amount of ordered hardware. This increase from the present maximum 4 MIM modules, supports applications where larger amount of transducer inputs are connected to the IED for monitoring purposes.
- Additional instances of Transformer energization control XENCPOW and Transformer tank overcurrent protection TPPIOC are now available in RER670. Please refer to the RER670 product guide for ordering information.
- Additional instances of Underfrequency protection SAPTUF are now available in customized variants of 670 series products. This meets application requirements where up to 10 under-frequency stages are required.
- The number of LON/SPA communication function block EVENT has been increased from 14 to 24 in RER670 which makes it possible to send more data to higher level system.

PCM600 and IED connectivity package for 670 series products version 2.2

PCM600 version 2.10 together with PCM600 2.10 Hotfix 20210804 or later and 670 series connectivity package version 3.4.1 will be required.

The version 3.4.1 of the IED Connectivity package for Relion 670 series supports 670 series version 2.2 products as well as earlier versions of the 670 series.

For further details about the connectivity package and its installation, please refer to the release note 1MRG040290.

Documentation and marketing material

The product guides, technical manuals, technical summary sheets and brochures are available via <http://hitachi-powergrids.com/protection-control>.

Ordering and delivery

All new orders on the Relion 670 series version 2.2 products will be delivered with this latest version. Existing orders will be processed with the version/revision as acknowledged at order. If existing order needs be upgraded to this latest version, a request shall be made to **SA-T sales**.

For current delivery time, please get in touch with our sales contact at Hitachi ABB Power Grids, Grid Automation Products.

Kind regards,

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