IEC 61850 compliant devices for ZX
All the devices of the Relion ® product family suitable for ZX from the 615 series onwards have full IEC 61850 and GOOSE capability:

615 series
- Control of a circuit-breaker directly at the device
- Practical plug-in design
- Large number of binary inputs and outputs, e.g. for position signals and interlocks
- 11 freely programmable LEDs
- Extensive measurement, monitoring and fault recorder functions
- Memic diagram to indicate the positions of the connected switches
- Optional additional Ethernet interfaces with integrated switch

The 615 series devices are available for:
- Feeder protection
- Line differential protection
- Motor protection
- Transformer differential protection
- Voltage protection

630 series
- Control and graphical display of up to eight objects
- Installation as complete unit or with separate display
- Large number of binary inputs and outputs
- 15 freely programmable LEDs per display page (3 pages)
- Five freely programmable function keys, e.g. for macro operations or starting of automated sequences
- CT plug automatically short-circuits on withdrawable from device
- Extensive measurement, monitoring and fault recorder functions

The 630 series devices are available for:
- Feeder protection including distance protection
- Motor protection
- Transformer differential protection
- Voltage protection

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Just so the supply of electrical power is becoming more and more important is a networked world, demands for the integration of electrical switchgear in network-level monitoring and control systems are constantly growing.

If a smooth bidirectional flow of information is to take place, it is necessary for components to understand each other, even if they come from different manufacturers. The global communications standard IEC 61850 was developed for just that purpose.

It is based on predecessors from the IEC and ANSI worlds, and enables greater compatibility and functionality than all previous standards.

Modern gas-insulated medium voltage switchgear has maintenance-free high voltage technology, plug-in connections, self-checking and monitored operation sequences for remote control. It is thus a matter of course for communication within the switchgear installation and to higher level automation systems to be of the same high quality.

The basis of this communication, built between devices within the switchgear system and ranging upwards to the power network facilities, are devices of various types and devices from different manufacturers that must understand each other.

Features of IEC 61850:

- **Ethernet**
- Consistent object-oriented data model
- Covers all aspects of substation automation such as protection and control functions
- Real-time GOOSE messages (GOOSE stands for Generic Object Oriented Substation Events, i.e. typical events in switchgear systems) for exchange of information on switch positions directly between field devices in the ZX portfolio, for interlock purpose or protection events.

Your benefits from IEC 61850:

- A standard applicable worldwide for all areas of substation automation
- Interoperability of devices, irrespective of manufacturer
- Standardisation and simplification
- Absence of multiple protocols and problems with interlocks by consistent use of Ethernet technology
- Savings throughout the service life of ZX systems from planning to serving.

IEC 61850 in ZX Gas-insulated medium voltage switchgear

GOOSE messages:

GOOSE messages facilitate direct communication between field devices in a ZX switchgear system, enabling them to exchange information via the substation bus. For instance, switch positions or inter-panel interlock configurations, or to implement protection commands such as those for circuit-breaker failure protections.

GOOSE messages are time-critical and have priority over other information transmitted through the bus. For this reason, reliable and deterministic use of GOOSE can only be ensured by devices which have been developed to the IEC 61850 standard and make that communication standard available consistently from the field device upwards, without time-consuming internal or external protocol conversions. The Releyn product family for protection and control makes a range of such devices developed specifically for IEC 61850 available, fulfilling precisely these requirements for modern substation communications.

This product family is used throughout the ZBX portfolio, from the smallest ZBX in block design through ZBH 2 single busbar systems to ZBX double-busbar systems for 66 kV at 16 kA.

Just as important as field devices with complete IEC 61850 capability are the corresponding tools for device programming, substation engineering and monitoring of Ethernet communications.

The RSW00 configuration tool was developed for programming of individual protection devices and for engineering of GOOSE subnets with several voltage levels. Depending on the type of field device, configuration is affected via a signal matrix or a graphical user interface.

Comparison of a local device configuration with the version on the commissioning engineer’s computer is facilitated by clear display of the deviations. Visualization of disturbances recorded in the switchgear installation as in systems with conventional communications.

Quality is provided, together with a host or other functions.

The PCM600 configuration tool was developed both for programming methods. The ITT600 system analysis tool is available to make this information visible.

Graphical display of GOOSE information an a service PC Test set-up: Blocking of double switching operations

Tools for IEC 61850:

- Just as important as field devices with complete IEC 61850 capability are the corresponding tools for device programming, substation engineering and monitoring of Ethernet communications.

- Protection and control devices from the Releyn® 615 and 630 series fulfill the highest GOOSE performance requirements to IEC 61850.

Superior data transmission with GOOSE messaging:

On behalf of ABB AG, KEMA tested the performance of GOOSE communication in comparison with direct signal transmission between two devices through conventional wiring.

The test programme was based on IEC 61850-5 and was performed with gas-insulated switchgear of type ZX and the REM615 and REM630 protection devices from the Releyn® product range.

The results of the KEMA test at a glance:

- Data transmission with GOOSE is between 12 ms and 15 ms faster than with conventional wiring.
- In the event of an interruption to GOOSE communication, the system reacts as specified and blocks the set protection functions.
- In order to prevent double switching operations function as specified.

The Releyn devices comply with class P1, message types 1A, “Trip” to IEC 61850-5 for message transmission time less than 10 ms.

With the use of GOOSE messages for panel to panel communication, information, for example on switch positions, is no longer available as a binary signal at a loop line terminal strip in the switchgear installation as in systems with conventional communications, but only as a data package on the substation bus which cannot be checked using classical measuring methods. The ITT600 system analysis tool is available to make this information visible.

ITT600 permits scanning of all the IEC 61850 devices in the network and also provides for the monitoring of all GOOSE messages between the individual devices using a special GOOSE Explorer. It is an indispensable tool, especially during commissioning and for troubleshooting.

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Test set-up: Blocking of double switching operations

Your benefits from GOOSE in ZX switchgear systems:

- Superior data transmission speed
- Less wiring and greater clarity
- Simple modification without additional wiring work
- Addition of functions to existing systems
- More inputs and outputs available at the protection devices
- Permanent monitoring of the signal communications link
- Protection and control devices from the Releyn 615 and 630 series fulfill the highest GOOSE performance requirements to IEC 61850.
Gas-insulated medium voltage switchgear

Features of IEC 61850:
- Interoperability of devices, irrespective of manufacturer
- Standardization and simplification
- Voidance of multiple protocols and problems with interoperability
- Savings throughout the service life of ZX systems: from initial installation to the end of its life expectancy.

Tools for IEC 61850:
- Ethernet communication on substation level
- Consistent object-oriented data model
- Covers all aspects of substation automation such as protection, rear interlock and interruption of communication
- GOOSE messages facilitate direct communication between field devices in a ZX switchgear system, enabling them to exchange information via the substation bus. For example, on switch positions or inter-panel interlock configurations, or to implement protection commands such as those for circuit-breaker failure protections.
- GOOSE messages are time-critical and have priority over other information transmitted through the bus. For this reason, reliable and deterministic use of GOOSE can only be ensured by devices which have been developed to the IEC 61850 standard and make real-time communication possible.
- GOOSE messages: messages for panel to panel communications, information, for example on switch positions, is no longer available as a binary signal at a loop back terminal strip in the switchgear installation as in systems with conventional communications, but only as a data package on the substation bus which cannot be checked using classical measuring and Commissioning tools.
- GOOSE Explorer: an indispensable tool, especially during commissioning and for troubleshooting.

Superior data transmission with GOOSE messaging:
- On behalf of ABB AG, KEMA tested the performance of GOOSE communications in comparison with direct signal transmission between two devices through conventional wiring. The test programme was based on IEC 62271-3 and was performed with gas-insulated switchgear, of type ZX and the R6015 and R6203 protection devices from the Relion® product range.
- KEMA tested the GOOSE performance requirements to IEC 61850 standard and made that communication standard be ensured by devices which have been developed to the IEC 61850 standard and make real-time communication possible.
- The results of the KEMA test at a glance:
- GOOSE communications, but only as a data package on the substation bus which cannot be checked using classical measuring and Commissioning tools.
- GOOSE messages: messages for panel to panel communications, information, for example on switch positions, is no longer available as a binary signal at a loop back terminal strip in the switchgear installation as in systems with conventional communications, but only as a data package on the substation bus which cannot be checked using classical measuring and Commissioning tools.

Your benefits from GOOSE in ZX switchgear systems:
- Superior data transmission speed
- Less wiring and greater clarity
- Simple modification without additional wiring work
- Addition of functions to existing systems
- More inputs and outputs available at the protection devices
- Permanent monitoring of the signal communications link
- Protection and control devices from the Relion® 615 and 630 series fulfill the highest GOOSE performance requirements to IEC 61850

Just as the supply of electrical power is becoming more and more important is a networked world, demands for the integration of electrical switchgear in network-level monitoring and control systems are constantly growing.

If a smooth bidirectional flow of information is to take place, it is necessary for components to understand each other, even if they come from different manufacturers.

IEC 61850 in ZX
Gas-insulated medium voltage switchgear
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If a smooth bidirectional flow of information is to take place, it is necessary for components to understand each other, even if they come from different manufacturers. The global communications standard IEC 61850 was developed for just that purpose.

It is based on predecessors from the IEC and ANSI worlds, and also adapt better communications functionality to all previous standards.

Modern gas-insulated medium voltage switchgear has maintenance-free high voltage technology, plug-in connections requiring no work and monitored operating mechanisms for remote control. It is thus a matter of course for communications within the switchgear installation and to higher level automation systems to be of the same high quality.

The basis of this communication, built between devices within the switchgear system and ranging upwards to the power network facilities, is based on predecessors from the IEC and ANSI worlds, and also adapts better communications functionality to all previous standards.

The GOOSE message: GOOSE messages facilitate direct communication between field devices in a ZX switchgear system, enabling them to exchange information via the substation bus. For instance, switch positions or inter-panel interlock configurations, or to implement protection commands such as those for circuit-breaker failure protection.

GOOSE messages are time-critical and have priority over other information transmitted through the bus. For this reason, reliable and deterministic use of GOOSE can only be ensured by devices which have been developed to the IEC 61850 standard and make that communication standard available consistently from the field device upwards, without time-consuming internal or external protocol conversions. The Relion® product family for protection and control makes a range of such devices developed specifically for IEC 61850 available, fulfilling precisely those requirements for modern communication automation.

This product family is used throughout the ZX portfolio, from the smallest Z21 in block design through Z21-2 single busbar systems to Z20 double-busbar systems for 11kV at 96 (34) kV.

Your benefits from GOOSE in ZX switchgear systems:
- Simpler installation and commissioning
- Interlocks to prevent double switching operations function as specified
- Fewer inputs and outputs available at the protection devices
- Permanent monitoring of the signal communications line
- Protection and control devices from the Relion® 615 and 630 series fulfill the highest GOOSE performance requirements to IEC 61850

Superior data transmission with GOOSE messaging:
- On behalf of ABB AG, KEMA tested the performance of GOOSE communications in comparison with direct signal transmission between two devices through conventional wiring. The test programme was based on IEC 62271-3 and was performed with gas-insulated switchgear of type ZX and the REM615 and REM630 protection devices from the Relion® product range.

The results of the KEMA test at a glance:
- Data transmission with GOOSE is between 12 ms and 16 ms faster than with conventional wiring.
- In the event of an interruption to GOOSE communication, the system reacts as specified and blocks the set protection functions.
- Interlocks to prevent double switching operations function as specified.

The Relion® devices comply with class P1, message type 1A. 1A” to IEC 61850 for message transmission time less than 10 ms.

GOOSE: Gas insulated medium voltage switchgear

Gas-insulated medium voltage switchgear
IEC 61850 in ZX

Gas-insulated medium voltage switchgear

IEC 61850 compliant devices for ZX
All the devices of the Relion® product family suitable for ZX from the 615 series onwards have full IEC 61850 and GOOSE capability:

615 series
- Control of a circuit-breaker directly at the device
- Practical plug-in design
- Large number of binary inputs and outputs, e.g. for position signals and interlocks
- 11 freely programmable LEDs
- Extensive measurement, monitoring and fault recorder functions
- Mirage diagram to indicate the positions of the connected switches
- Optional additional Ethernet interfaces with integrated switch

630 series
- Control and graphical display of up to eight objects
- Installation as complete unit or with separate display
- Large number of binary inputs and outputs
- 12 freely programmable LEDs per display page (3 pages)
- Five freely programmable function keys, e.g. for macro operations or starting of automated sequences
- CT plug automatically short-circuits on withdrawable from device
- Extensive measurement, monitoring and fault recorder functions

The 630 series devices are available for:
- Feeder protection
- Line differential protection
- Motor protection
- Transformer differential protection

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IEC 61850 compliant devices for ZX

All devices of the Relion ® product family suitable for ZX

615 series

- Control of a circuit-breaker directly at the device
- Practical plug-in design
- Large number of binary inputs and outputs, e.g. for position signals and interlocks
- 11 freely programmable LEDs
- Extensive measurement, monitoring and fault recorder functions
- Mimic diagram to indicate the positions of the connected switches
- Optional additional Ethernet interfaces with integrated switch

615 series devices are available for:
- Feeder protection
- Line differential protection
- Motor protection
- Transformer differential protection
- Voltage protection

620 series

The protection and control devices of the 620 series provide the following functions:

- Control and graphical display of up to eight objects
- Installation as complete unit or with separate display
- Large number of binary inputs and outputs
- 15 freely programmable LEDs per display page (3 pages)
- Five freely programmable function keys, e.g. for macro operations or starting of automated sequences
- CT plug automatically short-circuits on withdrawable from device
- Extensive measurement, monitoring and fault recorder functions

The 620 series devices are available for:
- Feeder protection including distance protection
- Motor protection
- Transformer differential protection
- Transformer protection