ABB OY DISTRIBUTION SOLUTIONS

Protection and control REX610

Product presentation

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Protection and control REX610

Contents

Introduction

Introduction

All-in-one protection for any basic power distribution application

Protection and control REX610

Freely configurable all-in-one protection relay covering the full range of basic utility and industrial applications

Small number of variants for easy ordering, set up, use and maintenance – and easy to keep in store

Plug-and-play solution with fully modular hardware unlocking all available functionality

Extensive range of default functionality, including communication via Ethernet and serial as default, for easy alteration

IEC 61850-compliant communication and interoperability between substation automation devices

Continuous access to new developments via firmware updates

Extensive life cycle services for safe, reliable and cost-effective protection solutions

Latest addition to ABB's renowned Relion® protection and control family relays

Customer values
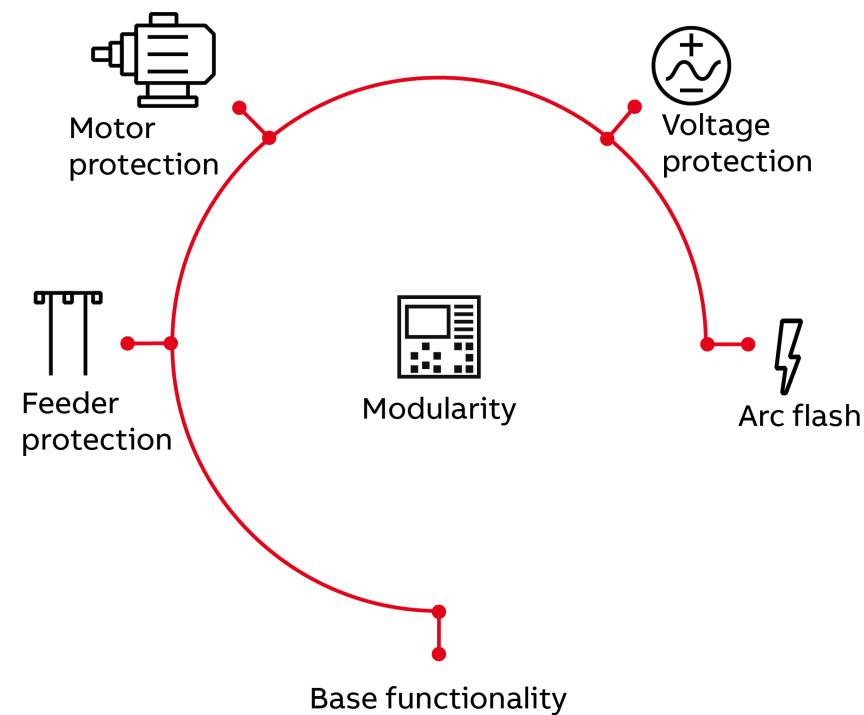
Customer values

One device for all basic applications – and more

Multiapplication coverage with one device for optimal flexibility and cost-effectiveness

- Modular and scalable design for easy and flexible customization according to protection, control and communication requirements

- Extensive range of default functionality for easy alterations – with no additional costs

- Communication available as default in all variants

Latest addition to ABB's renowned Relion® protection and control family relays

- Builds on ABB's strong heritage of freely configurable multifunctional relays

- Features ABB's many proven protection algorithms

Motor protection

Voltage protection

Feeder protection

Modularity

Arc flash

Base functionality

All functionality available by default for your convenience

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Customer values

Simplicity as a hallmark of REX610

Easy ordering, set up, use and maintenance with only a few variants covering all basic applications

Pure plug-and-play solution with installed hardware modules unlocking all available functionality

Easy to keep in store due to small number of variants

Withdrawable plug-in unit for swift replacement, short meantime to repair, and minimized costly downtime

Easy addition, removal and replacement of modules instead of replacing the entire relay

Innovative simplicity – permeating all aspects of REX610

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Customer values

Future-proofed for an evolving grid

Easy and flexible adaptation to changing protection, control and communication requirements with modular and scalable design

Access to an extensive range of default functionality with ABB's relay setting and configuration tool, PCM600

Continuous access to incrementally released new functionality via firmware updates

Modifications possible at any time with fully modular hardware unlocking all available functionality

IEC 61850-compliant communication and interoperability between substation automation devices – today and for years to come as the grid evolves

Easy adaptation to changing requirements – today and for years to come

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Customer values

Extensive life cycle services – full support from start to finish

Extensive life cycle services for safe, reliable and cost-effective protection solutions with predictable maintenance costs for the lifetime of the relay

Web-based data-sharing and backup service with access to firmware updates as an optional add-on – ABB Ability™ Backup Management for electrical systems, Data Care

Convenient, tailor-made retrofit adapter for smooth replacement of SPACOM with REX610 relays

- Extended switchgear lifetime

- Full availability of life cycle services

- Possibility to adapt the power protection system to meet new requirements

Extensive life cycle services for optimal usability

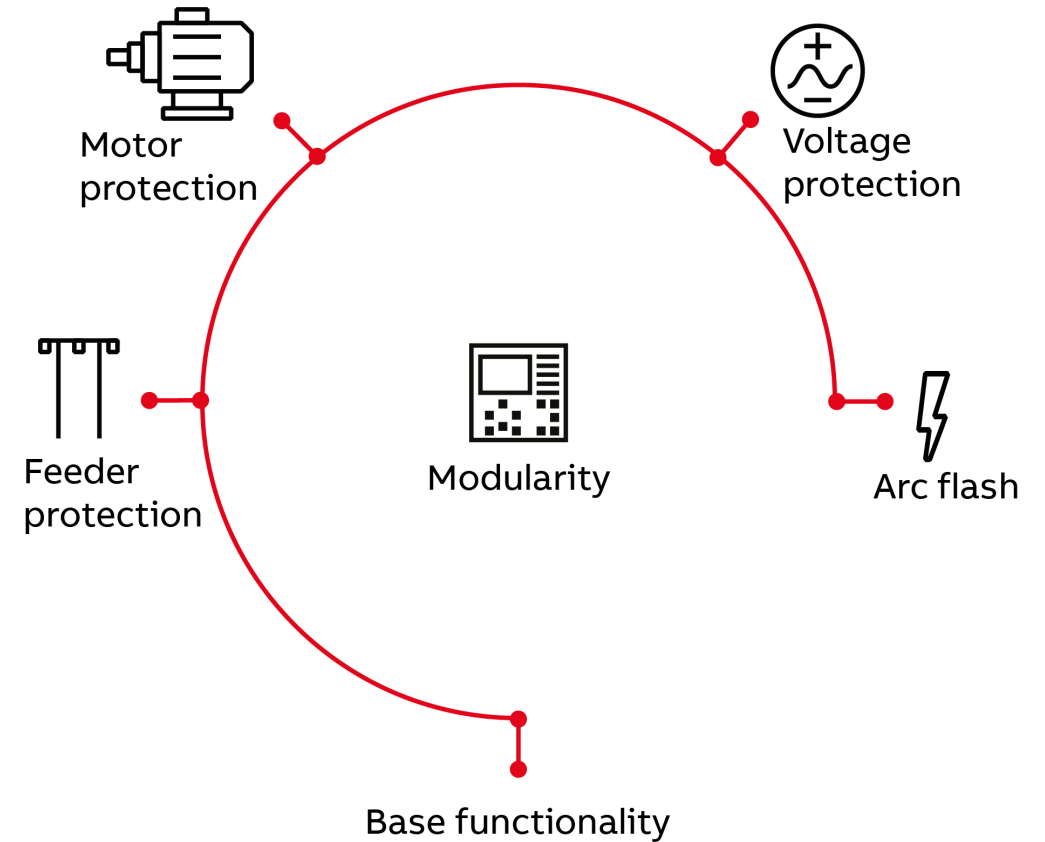# All-in-one coverage

All-in-one coverage

Protection and control for any basic power distribution application (1/4)

Rich in functionality – covering the full range of basic utility and industrial applications requiring:

- Feeder protection
- Voltage protection
- Motor protection

Extensive range of default functionality, including communication, covering:

- Protection
- Control
- Condition monitoring and supervision
- Measurements
- Logging
- Communication

Motor protection

Voltage protection

Feeder protection

Modularity

Arc flash

Base functionality

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All-in-one coverage

Protection and control for any basic power distribution application (2/4)

Base functionality

– Control functionality
  • Circuit-breaker control
  • Disconnector position indication
  • Earthing switch position indication
  • Autoreclosing
  • Synchronism and energizing check
– Condition monitoring and supervision
  • Trip circuit supervision
  • Fuse failure supervision
  • Circuit-breaker condition monitoring
  • Current circuit supervision
  • Runtime counter for machines and devices
– Logging functions
  • Disturbance recorder

Communication

– IEC 61850-8-1 MMS (Manufacturing message specification)
– IEC 61850-8-1 GOOSE (General Object Oriented Substation Event)
– Modbus protocol

Measurements

– Three-phase current measurement
– Residual current measurement
– Sequence current measurement
– Three-phase voltage measurement
– Residual voltage measurement
– Frequency measurement
– Sequence voltage measurement
– Three-phase power and energy measurement

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All-in-one coverage

Protection and control for any basic power distribution application (3/4)

Protection functionality

- Three-phase non-directional/directional overcurrent protection
- Non-directional/directional earth-fault protection
- Three-phase thermal protection for feeders, cables and distribution transformers
- Negative-sequence overcurrent protection
- Phase discontinuity protection
- Phase undercurrent protection
- Three-phase under/overvoltage protection
- Residual overvoltage protection
- Multipurpose protection

- Arc Protection
- Frequency protection
- Motor load jam protection
- Loss of load supervision
- Thermal overload protection for motors
- Negative-sequence overcurrent protection for machines
- Negative-sequence overvoltage protection
- Phase reversal protection
- Positive-sequence undervoltage protection
- Motor start-up supervision

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All-in-one coverage

Protection and control for any basic power distribution application (4/4)

Protection-related functionality

– Three-phase inrush detector

– Circuit breaker failure protection

– Master trip

– Emergency start-up

Simplicity as a hallmark of REX610

Simplicity as a hallmark of REX610

A pure plug-and play solution (1/2)

Simplicity – permeating all aspects of REX610

Easy to order, set up, use and maintain with only a few variants covering all basic applications

A pure plug-and-play solution with the modular hardware unlocking all available functionality

- Current transformer (CT) module
- Voltage transformer (VT) module
- Arc module

Easy addition, removal and replacement of modules if protection requirements change instead of replacing the entire relay

Withdrawable plug-in unit ensures swift replacement and short meantime to repair

- Only one plug-in unit variant with universal power supply and binary inputs with software-settable thresholds

Easy to keep in store due to small number of variants

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Simplicity as a hallmark of REX610

A pure plug-and play solution (2/2)

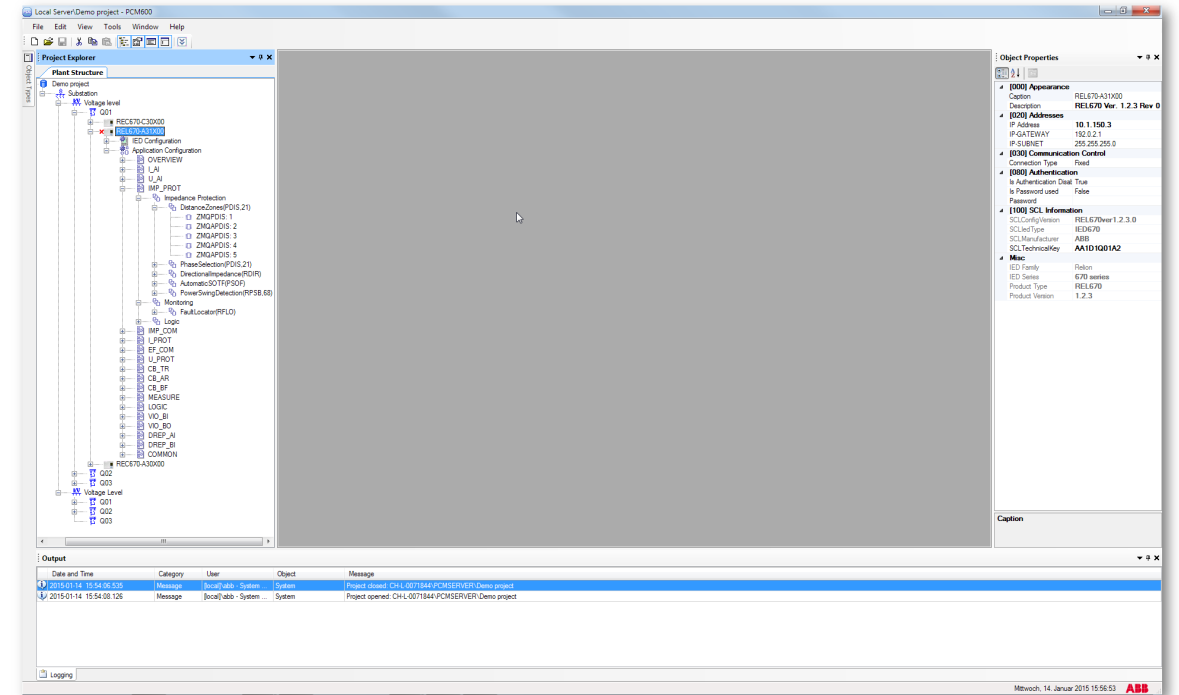Freely configurable binary inputs and outputs and analog inputs

– No need to specify the voltage or current range at the ordering stage

– Minimum number of variants and maximum application flexibility

Front USB (Universal Serial Bus) port for connecting the relay to a PC (Personal Computer)

– Easy retrieval of information, such as disturbance recordings, without any additional software

– Allows powering the relay if the substation is down

Changes to the configuration via ABB's relay setting and configuration tool, PCM600

– Alteration of parameter settings via PCM600 or the human-machine interface (HMI)

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Future-proofed flexibility

Future-proofed flexibility
Supporting the evolving grid (1/2)

Full adaptability to meet requirements today and tomorrow

Modular and scalable design for maximum flexibility

- At the ordering stage
- Before commissioning
- Years after purchase

Access to new functionality via firmware updates for evolving alongside the grid

- The latest versions of ABB's protection algorithms
- New protection functionality, opening up the possibility for new application areas

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Future-proofed flexibility

Supporting the evolving grid (2/2)

Extensive range of default functionality – including communication

– Readily accessible via PCM600

– Easy activation and deactivation of functionality to meet changing protection, communication and network requirements

Fully IEC 61850-compliant for ensured communication and interoperability between substation automation devices

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Lifelong support

Lifelong support

Extensive life cycle services for optimal usability (1/2)

Full support from start to finish

Wide variety of life cycle services to ensure safe, reliable and cost-effective protection solutions with predictable maintenance costs – for the entire lifetime of the relay:

– Training

– Customer support

– Maintenance

– Modernization

ABB Ability™ Backup Management for electrical systems, Data Care – available as an optional add-on

– Web-based data-sharing and backup service

– Secure storing and easy sharing of technical information on your protection relays – online

– Easy access to firmware updates with the relay serial number

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Lifelong support

Extensive life cycle services for optimal usability (2/2)

Convenient retrofit for easy modernization

Tailor-made retrofit adapter to allow smooth replacement of SPACOM with REX610 relays

- Identical cut-out for fast and easy replacement
- Access to the latest protection and control technology
- Possibility to adapt the power protection system to meet new requirements
- Full availability of relay life cycle services
- Extended switchgear lifetime

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Product features

Product features

Local human-machine interface

Easy-to-use local human-machine interface (LHMI) for setting, monitoring and controlling the REX610 relay

– Graphical display to allow multiple language support

– 3 indicator LEDs (light-emitting diode): Ready, Start and Trip

– 10 programmable LEDs and 2 programmable function keys that can be configured using PCM600

– 9 push buttons for:

  • Navigating the menu

  • Giving open and close commands to primary circuit objects, such as circuit breakers (CB)

  • Acknowledging alarms and resetting indications

– Front USB port for connecting the relay to a PC

  • Easy retrieval of information, such as disturbance recordings, without any additional software

  • Allows powering the relay if the substation is down

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Product features

Innovative plug-in unit design

Quick and easy installation, maintenance and testing of the relay with withdrawable plug-in unit design

Swift replacement, short meantime to repair (MTTR) and minimized costly downtime

– Easy addition, removal and replacement of plug-in unit and modules

– Quick access to replacements with the possibility to keep spare units and modules in store due to the small number of variants
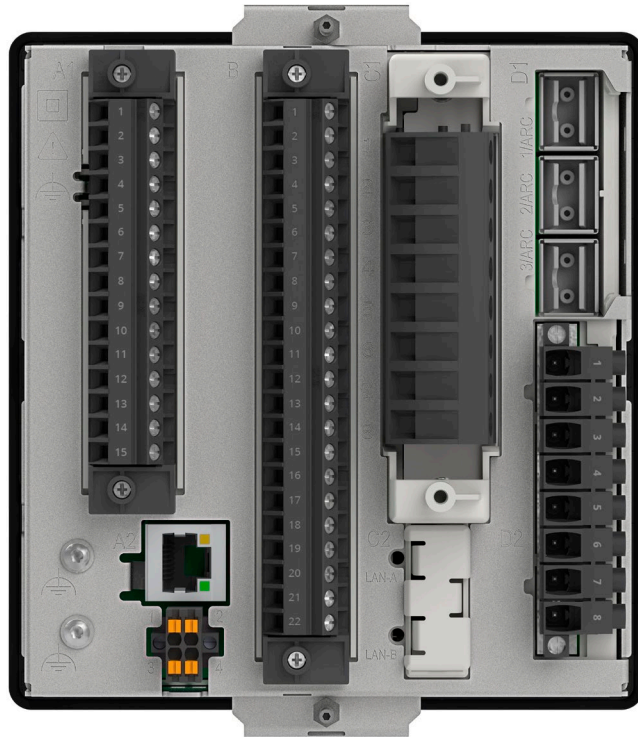
Sealable or lockable pull-out handle to prevent accidental or unauthorized removal of the plug-in unit

Product features

Hardware

Rear view

Default hardware

- Universal power supply
- 6 binary inputs, 6 binary outputs and 1 internal relay fault output
- RS-485, RJ45 and USB communication ports
- Micro SD (Secure Digital) memory card slot

Optional hardware

- 4 current transformers, either of ring-lug or compression type
- 4 voltage transformers of compression type
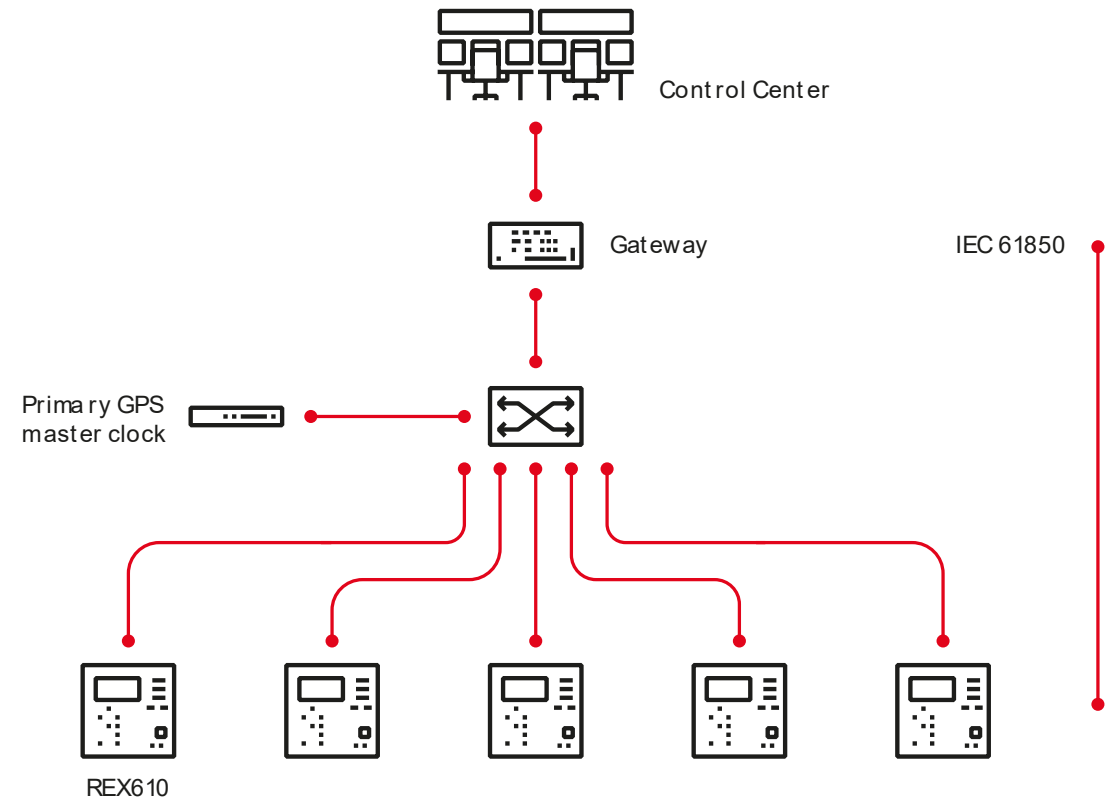- 3 arc sensor inputs

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Product features

Communication capabilities

IEC 61850-compliant communication – both vertical and horizontal – and interoperability between substation automation devices

Support for both binary and analog IEC 61850-8-1 GOOSE messaging

Simultaneous reporting of events to three different clients on the station bus

Support for using Modbus TCP/IP and serial communication in parallel with IEC 61850

Control Center

Gateway

IEC 61850

Primary GPS master clock

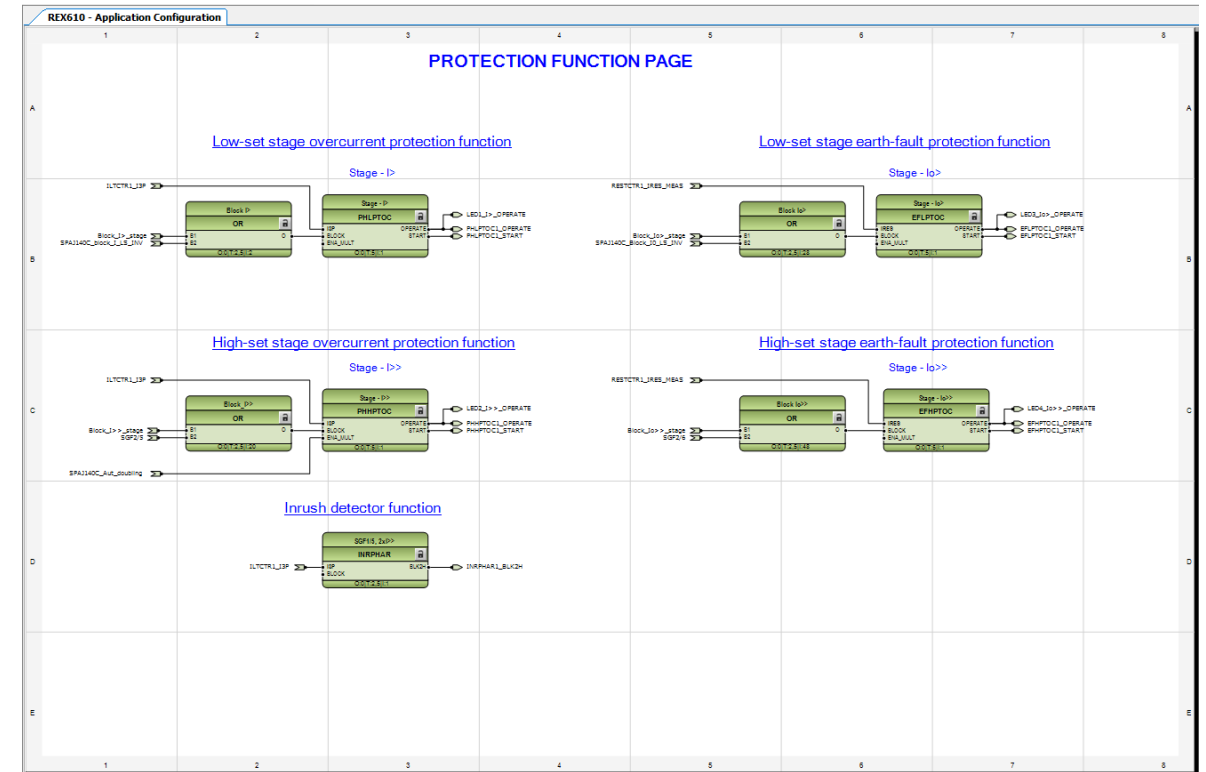REX610

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Product features

Customization of application-specific configurations

PCM600 – for setting and configuring your Relion® relay

Easy tailoring of the configuration to meet application-specific requirements using PCM600 – ABB's IEC 61850-compliant relay setting and configuration tool
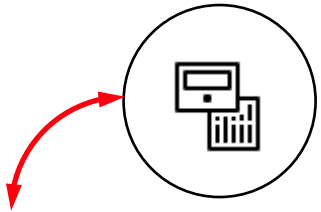
Possibility to create multi-layer logics using the graphical application tool in PCM600 – ACT (Application Configuration Tool)

- Ability to combine protection functionality with logical elements

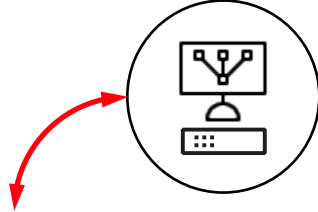- Support for easy documentation of the configuration

Product features
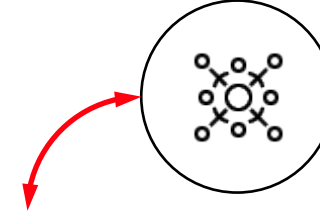
Secure device management

Relay

- Hardened software configuration allowing only necessary services and protocols
- Supervised services, protocols and communication ports
- Role-based access control for individual users

Engineering and operation

- Encrypted communication between the engineering tool and the relay
- Chronological audit trail including security related events
- Easy firmware updates for optional reliability and cyber security
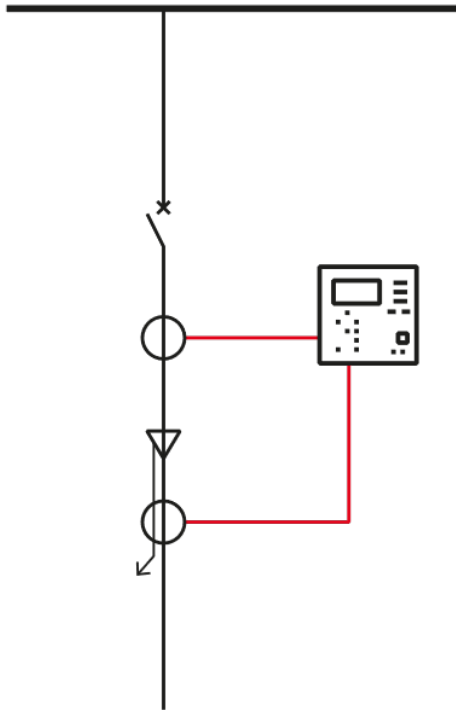
System

- Chronological audit trail including security related events

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Application examples

Application examples
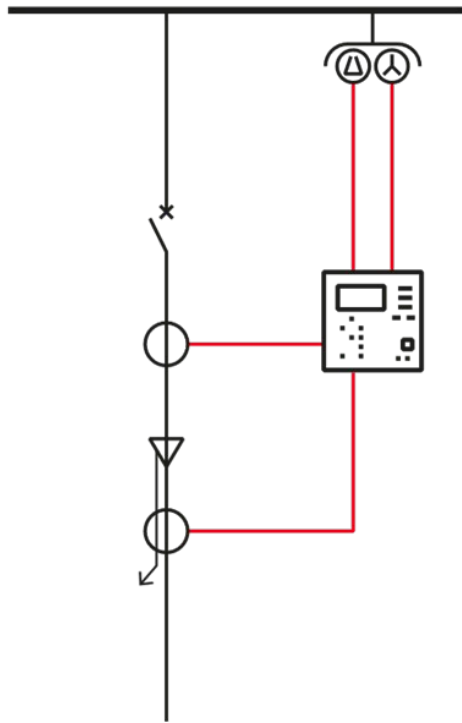
Feeder protection

CT module installed

Available protection functionality

- Non-directional overcurrent and earth-fault protection
- Negative-sequence overcurrent protection
- Inrush detector
- Thermal protection
- Phase discontinuity protection
- Undercurrent protection
- Circuit beaker protection
- Arc protection

- Emergency start-up
- Motor load jam protection
- Loss-of-load supervision
- Negative-sequence overcurrent protection for machines
- Thermal overload protection for motors
- Phase reversal protection
- Motor start-up supervision

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Application examples

Feeder and voltage protection
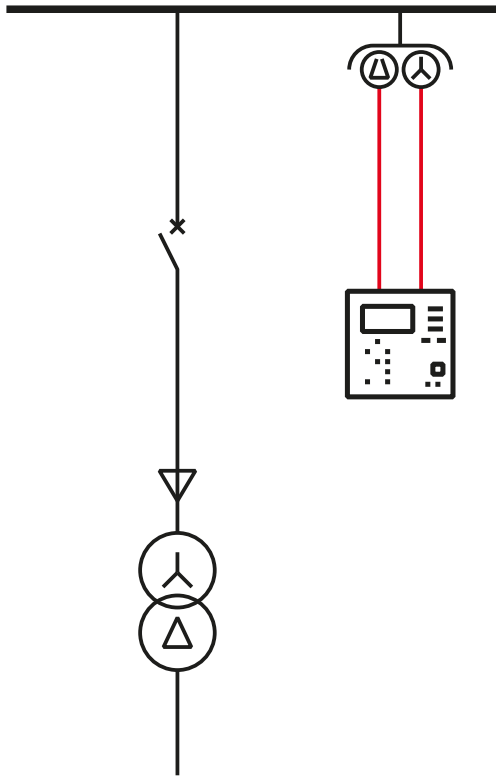
CT and VT modules installed

Available protection functionality

- Non-directional and directional overcurrent and earth-fault protection
- Negative-sequence overcurrent protection
- Phase undervoltage and overvoltage protection
- Residual overvoltage protection
- Inrush detector
- Thermal protection
- Phase discontinuity protection
- Undercurrent protection
- Circuit beaker protection
- Arc protection

- Emergency start-up
- Motor load jam protection
- Loss-of-load supervision
- Negative-sequence overcurrent protection for machines
- Thermal overload protection for motors
- Negative-sequence overvoltage protection
- Phase reversal protection
- Motor start-up supervision
- Positive-sequence undervoltage protection
- Frequency protection

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Application examples

Voltage protection

VT module installed

Available protection functionality

- Phase undervoltage and overvoltage protection
- Residual overvoltage protection
- Arc protection
- Negative-sequence overvoltage protection
- Positive-sequence undervoltage protection
- Frequency protection

Ordering and modification

Ordering and modification

Ordering options

Simple ordering of REX610

Only hardware options in the order code – with hardware modules unlocking all available functionality

- No exact configuration, rated voltages or thresholds, for instance, required at the ordering stage – with easy alteration anytime using PCM600

Possibility to order and add additional modules throughout the relay life cycle

- Possibility to keep REX610 and modules in store for flexible adaptation to changing project requirements

REX610 order code

#	Description	
1-6	**Product**	
	Relay	REX610
7-8	**Front language**	
	English, Global	1G
9	**Current inputs**	
	4 current - compression type	A
	4 current - ring lug type	M
	No current inputs	N
10	**Voltage inputs**	
	4 voltage	B
	No voltage inputs	N
11	**Communication**	
	Serial RS 485 and Ethernet 100Base TX (RJ45)	A
12	**Arc protection**	
	Arc protection with 3 sensors	A
	No arc protection	N
13-15	**Reserved for future use**	
	Reserved for future use	NNN
16	**Hardware version**	
	Hardware version A	A

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Ordering and modification

Relion® BIO-Tester 610-611-615-620

Easy simulation and testing

Specifically developed for testing the binary inputs and outputs of 610, 611, 615 and 620 protection relays

Fast and easy simulation throughout the relay's entire life cycle – from design and commissioning, through periodic maintenance, to modifications and replacement

- Simulation during the engineering of the application configuration, including troubleshooting

- Testing the operation of inputs and outputs during routine maintenance and testing

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Summary

Summary

Multiapplication coverage and simplicity for the evolving grid (1/2)

REX610 – for any basic power distribution application

Multiapplication coverage with one device for optimal flexibility and cost-effectiveness

Easy and flexible customization and adaptation to changing protection, control and communication requirements with modular and scalable design

Easy ordering, set up, use and maintenance with only a few variants covering all basic applications

Plug-and-play solution with installed hardware modules unlocking all available functionality

Extensive range of default functionality, including communication, for easy alterations with no additional costs

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Summary

Multiapplication coverage and simplicity for the evolving grid (2/2)

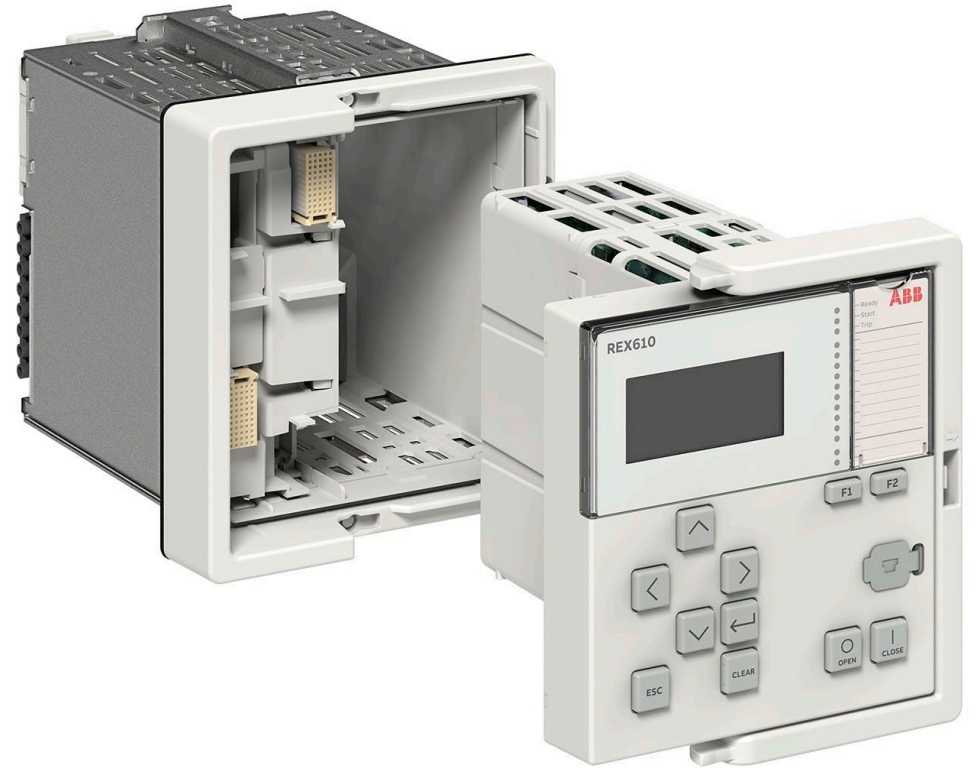Continuous access to incrementally released new functionality via firmware updates

Easy to keep in store due to small number of variants

Withdrawable plug-in unit for swift replacement, short meantime to repair, and minimized costly downtime

Possibility of replacing one or several modules instead of replacing the entire relay

IEC 61850-compliant communication and interoperability between substation automation devices

Convenient, tailor-made retrofit adapter to allow smooth replacement of SPACOM with REX610 relays