

Reyrolle 5

Protecting Grids with Confidence ...

Introduction



Reyrolle 5 –

is the next generation of protection relays, from Reyrolle, a global brand with more than 100 years experience of protecting our networks.

“**Reyrolle 5**
Protecting Grids with Confidence”



Reyrolle 5 - Designed for your application

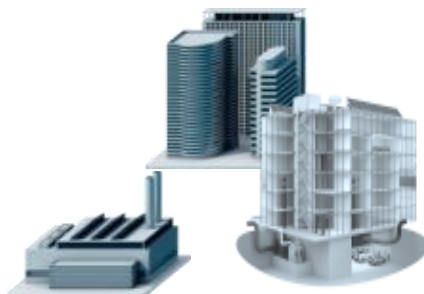
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Generation



Distribution



Industry &
Infrastructure



Reyrolle 5 – The next generation ...



Building on 30 years experience with numerical relays

Easy to use device and settings

Designed for future networks and digital substations



Comprehensive functionality as standard: Wide range of proven protection functions and IEC 61850 Ethernet communications as standard.



Enhanced process data: Comprehensive fault data, event records, waveform data and measurands support effective management of your power network.



Cyber security: The Reyrolle 5 includes cyber security features such as digitally signed firmware and these will be further enhanced with future product releases along with security patches.

Low life cycle cost



Intuitive design: The large LCD, tactile pushbuttons and programmable LEDs provide a user friendly product interface.



Versatile interfaces: The current and voltage transformer inputs, the power supply and the binary inputs cover the full operating range with configurable binary input thresholds.

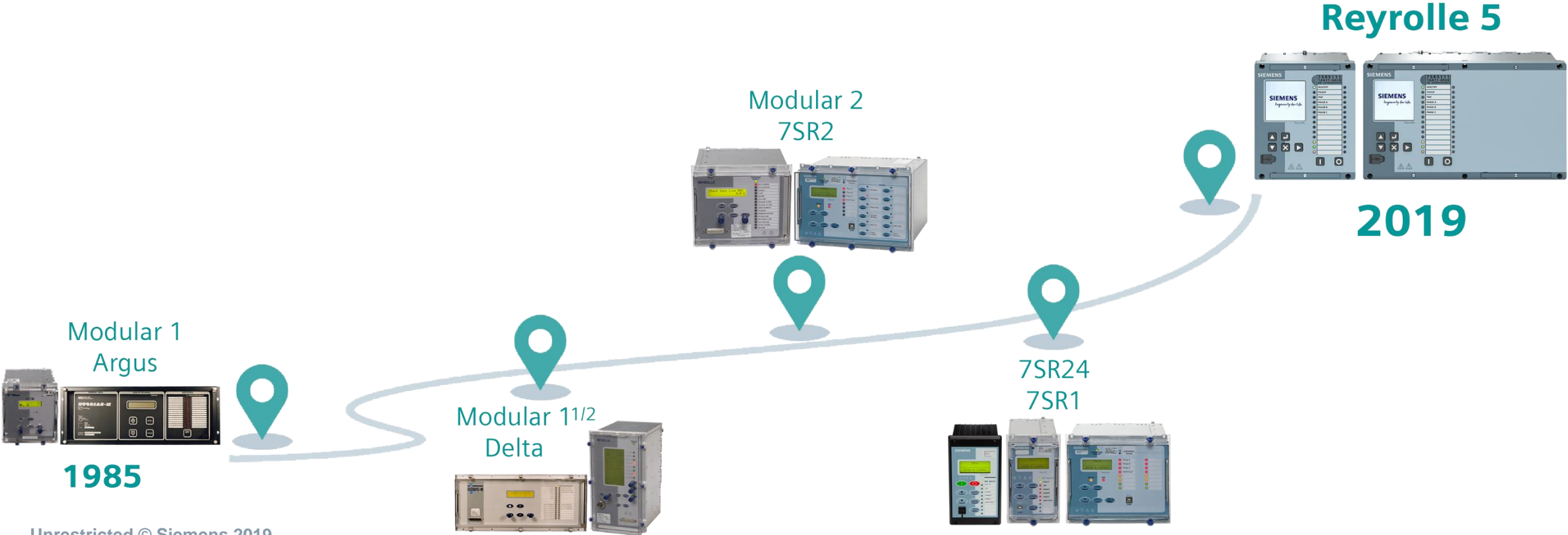


Reliable and efficient lifecycle management: Simple product ordering and firmware upgrade management. Withdrawable construction for easy product replacement.

Five generations of numerical protection



Half a million numerical IED's installed
around the world

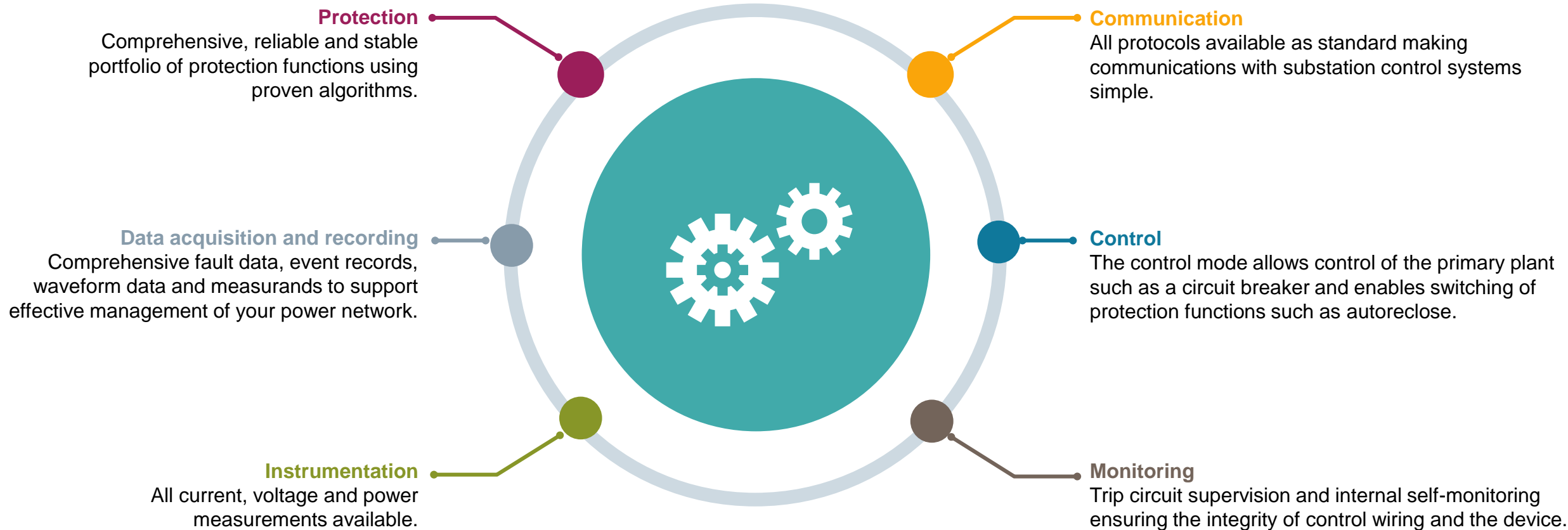


Reyrolle 5

Product details

Designed for future networks and digital substations

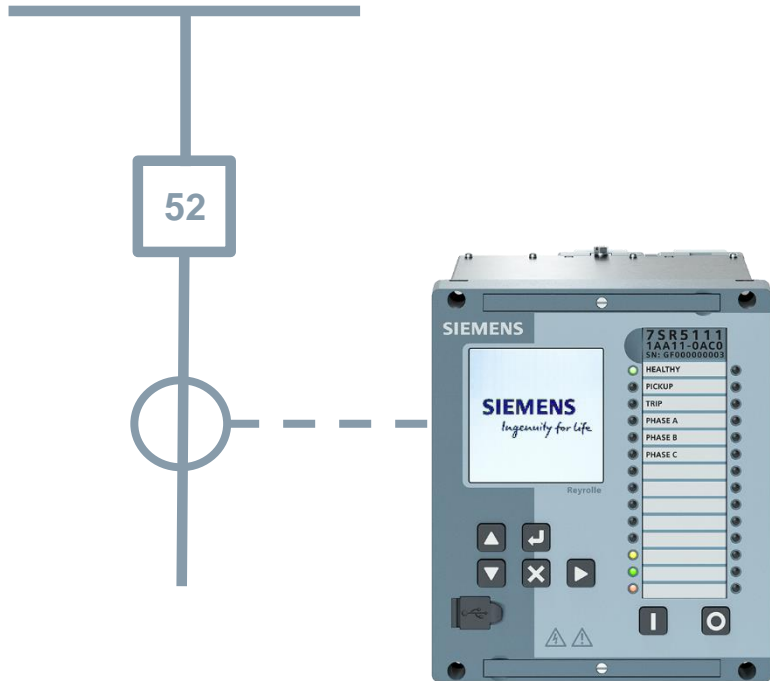
Comprehensive functionality as standard



Designed for future networks and digital substations

Comprehensive functionality as standard

Protection Functions - 7SR5110 Feeder Protection, Non Directional



Protection:

- 37/37G** Undercurrent protection
- 46** Negative sequence overcurrent protection
- 46BC** Broken conductor detection
- 49** Thermal overload protection
- 50/50N/50G** Instantaneous overcurrent
- 50AFD** Arc Flash Detection
- 50GS** Instantaneous sensitive earth fault - measured
- 50SOTF** Switch onto fault
- 51/51N/51G** Time delayed overcurrent
- 51CL** Cold load overcurrent – phase
- 51GS** Time delayed sensitive earth fault – measured
- 87GH** Restricted earth fault protection – high-impedance
- 87NL** Restricted earth fault protection – low impedance

Supervision:

- 50BF** Circuit-breaker failure protection – 3 pole
- 60CTS** CT supervision
- 74CC** Close-circuit supervision
- 74TC** Trip –circuit supervision
- 81HB2** Inrush current detection

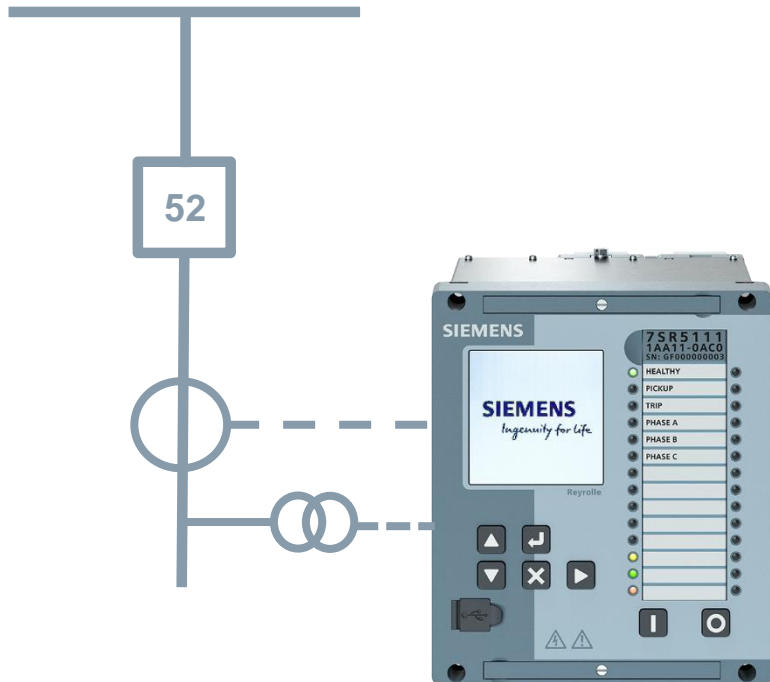
Control & Plant:

- 52** Circuit Breaker control
- 52** CB Counters Trip & Delta Trip
- 52** I2t Counter
- 79** Automatic reclosing
- 86** Lockout

Designed for future networks and digital substations

Comprehensive functionality as standard

Protection Functions - 7SR5111 Feeder Protection, Directional



Protection:

- 21LB** Load blinder
- 27** Undervoltage protection – 3 phase
- 32** Power protection
- 37/37G** Undercurrent protection
- 46** Negative sequence overcurrent protection
- 46BC** Broken conductor detection
- 47** Sequence overvoltage protection
- 49** Thermal overload protection
- 50/50N/50G** Instantaneous overcurrent
- 50AFD** Arc Flash Detection
- 50GS** Instantaneous sensitive earth fault - measured
- 50SOTF** Switch onto fault
- 51/51N/51G** Time delayed overcurrent
- 51CL** Cold load overcurrent – phase
- 51GS** Time delayed sensitive earth fault – measured
- 51V** Voltage dependent overcurrent – phase
- 55** Power factor
- 59/ 59Vx** Overvoltage protection
- 59N** Neutral Voltage protection
- 67/ 67G/ 67GS/67N** Directional – phase/earth fault
- 78VS** Voltage vector shift
- 81** Frequency protection – "f>" or "f<"
- 81R** Frequency protection – "df/dt"
- 87GH** Restricted earth fault protection – high-impedance
- 87NL** Restricted earth fault protection – low impedance

Supervision:

- 50BF** Circuit-breaker failure protection – 3 pole
- 60CTS** CT supervision
- 60VTS** VT Supervision
- 74CC** Close-circuit supervision
- 74TC** Trip –circuit supervision
- 81HB2** Inrush current detection

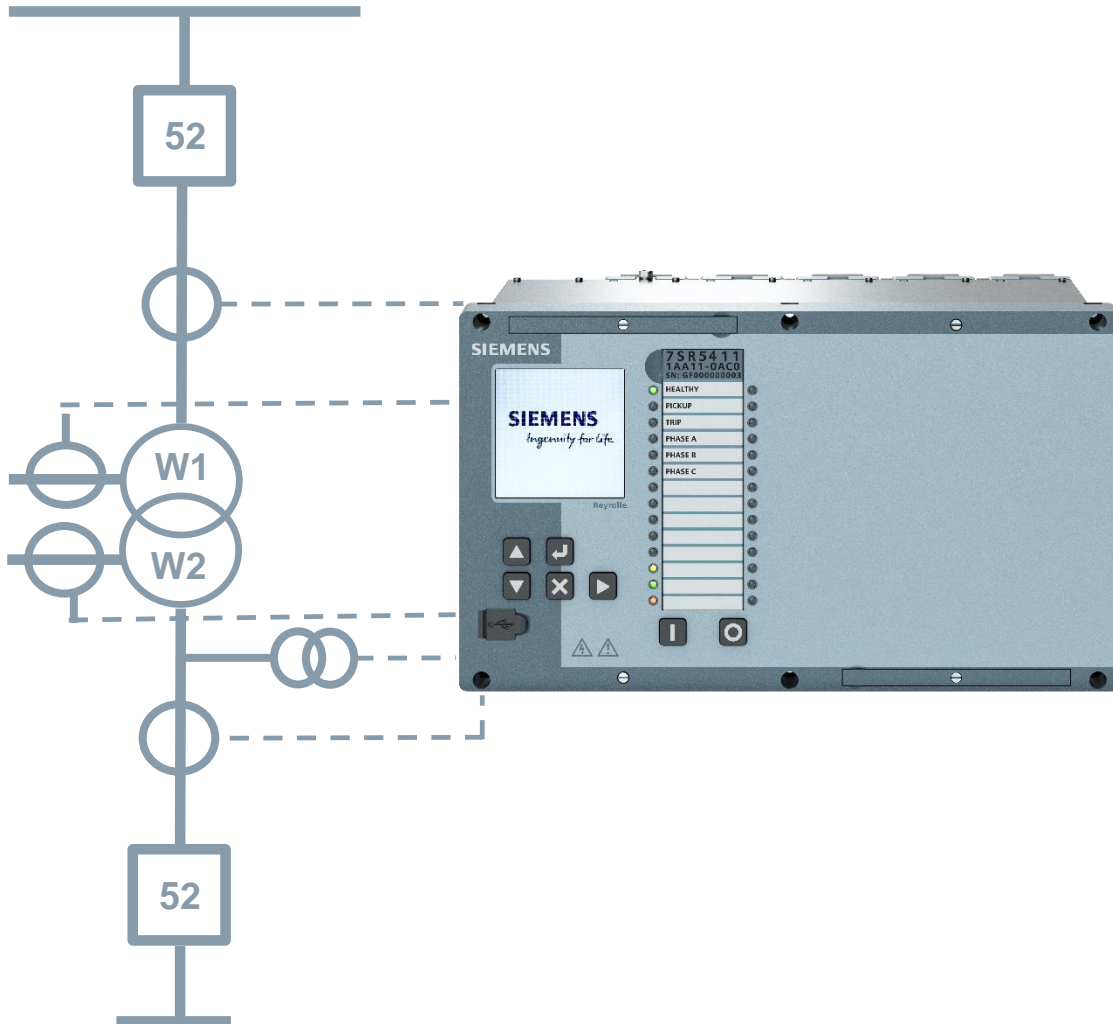
Control & Plant:

- 25** Synchrocheck – synchronizing function
- 52** Circuit Breaker control
- 52** CB Counters Trip & Delta Trip
- 52** I2t Counter
- 79** Automatic reclosing
- 86** Lockout

Designed for future networks and digital substations

Comprehensive functionality as standard

Protection Functions - 7SR542 Transformer Protection, Two Winding



Protection:

- 24** Overexcitation protection
- 27** Undervoltage protection – 3 phase
- 27Vx** Undervoltage protection – Vx
- 37** Undercurrent protection – phase
- 37G** Undercurrent earth fault – measured
- 46** Negative sequence overcurrent protection
- 46BC** Broken conductor detection
- 47** Sequence overvoltage protection
- 49** Thermal overload protection
- 50G** Instantaneous earth fault – measured
- 50** Instantaneous overcurrent – phase
- 50N** Instantaneous earth fault – calculated
- 51** Time delayed overcurrent – phase
- 67/ 67N/ 67G** Directional overcurrent
- 87T-BD** Transformer differential protection – biased
- 50** Instantaneous overcurrent – phase
- 51CL** Time delayed cold load
- 51G** Time delayed earth fault – measured
- 51N** Time delayed earth fault – calculated
- 52** Circuit-breaker control
- 59** Overvoltage protection – 3 phase
- 59N** Neutral voltage displacement
- 59Vx** Overvoltage protection – Vx
- 81** Frequency protection – "f>" or "f<"
- 87GH** Restricted earth fault protection
- 87T-BD HB5** Overfluxing detection
- 87T-HS** Transformer differential protection – highest
- 87NL** Restricted earth fault protection – low impedance

Supervision:

- 50BF** Circuit-breaker failure protection – 3 pole
- 60CTS** CT supervision
- 60VTS** VT Supervision
- 74CC** Close-circuit supervision
- 74TC** Trip –circuit supervision
- 81HB2** Inrush current detection

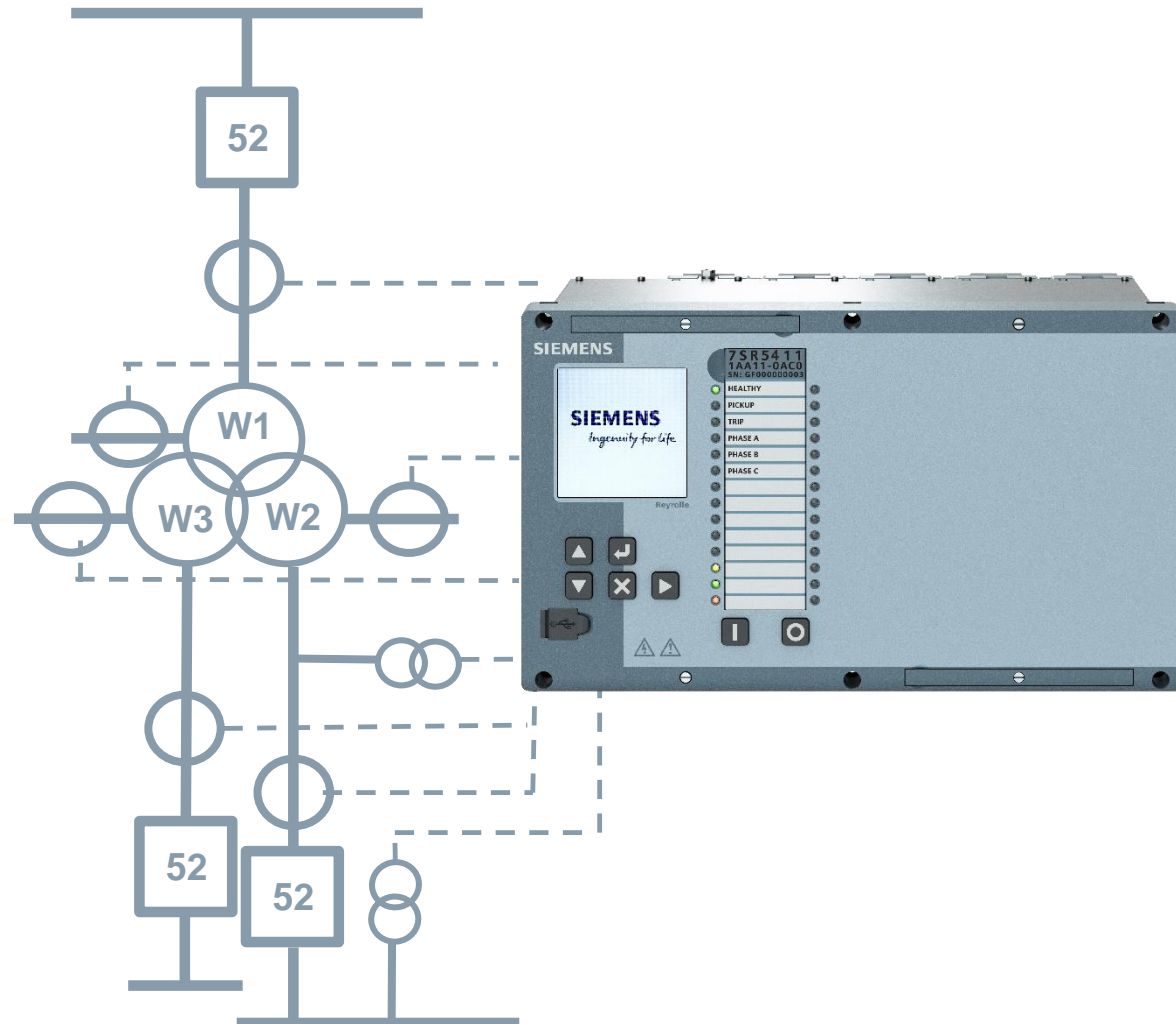
Control & Plant:

- 52** Circuit Breaker control
- 52** CB Counters Trip & Delta Trip
- 52** I2t Counter
- 79** Automatic reclosing
- 86** Lockout

Designed for future networks and digital substations

Comprehensive functionality as standard

Protection Functions - 7SR543 Transformer Protection, Three Winding



Protection:

- 24** Overexcitation protection
- 27** Undervoltage protection – 3 phase
- 27Vx** Undervoltage protection – Vx
- 37** Undercurrent protection – phase
- 37G** Undercurrent earth fault – measured
- 46** Negative sequence overcurrent protection
- 46BC** Broken conductor detection
- 47** Sequence overvoltage protection
- 49** Thermal overload protection
- 50** Instantaneous overcurrent – phase
- 50G** Instantaneous earth fault – measured
- 50N** Instantaneous earth fault – calculated
- 51** Time delayed overcurrent – phase
- 51CL** Time delayed cold load
- 51G** Time delayed earth fault – measured
- 51N** Time delayed earth fault – calculated
- 52** Circuit-breaker control
- 59** Overvoltage protection – 3 phase
- 59N** Neutral voltage displacement
- 59Vx** Overvoltage protection – Vx
- 81** Frequency protection – "f>" or "f<"
- 87T-BD** Transformer differential protection – biased
- 87T-HS** Transformer differential protection – highest
- 87GH** Restricted earth fault protection –
- 87T-BD HB5** Overfluxing detection
- 87NL** Restricted earth fault protection – low impedance

Supervision:







- 50BF** Circuit-breaker failure protection – 3 pole
- 60CTS** CT supervision
- 60VTS** VT Supervision
- 74CC** Close-circuit supervision
- 74TC** Trip –circuit supervision
- 81HB2** Inrush current detection

Control & Plant:

- 52** Circuit Breaker control
- 52** CB Counters Trip & Delta Trip
- 52** I2t Counter
- 79** Automatic reclosing
- 86** Lockout



7SR511 Feeder protection variants

Standard variants






7SR5110-1	<ul style="list-style-type: none"> Housing width 3/8 x 19" (size 6), height 4U 8 binary inputs 6 binary outputs (1 break, 2 c/o, 3 make) 	<ul style="list-style-type: none"> 4 CT's Communication – USB, RS485, 2 x ethernet 	
7SR5110-2	<ul style="list-style-type: none"> Housing width 3/8 x 19" (size 6), height 4U 13 binary inputs 8 binary outputs (1 break, 2 c/o, 5 make) 	<ul style="list-style-type: none"> 4 CT's Communication – USB, RS485, 2 x ethernet 	
7SR5110-4	<ul style="list-style-type: none"> Housing width 3/4 x 19" (size 12), height 4U 23 binary inputs 12 binary outputs (1 break, 2 c/o, 9 make) 	<ul style="list-style-type: none"> 4 CT's Communication – USB, RS485, 2 x ethernet 	
7SR5110-7	<ul style="list-style-type: none"> Housing width 3/4 x 19" (size 12), height 4U 38 binary inputs 18 binary outputs (1 break, 2 c/o, 15 make) 	<ul style="list-style-type: none"> 4 CT's Communication – USB, RS485, 2 x ethernet 	
7SR5111-1	<ul style="list-style-type: none"> Housing width 3/8 x 19" (size 6), height 4U 9 binary inputs 8 binary outputs (1 break, 2 c/o, 5 make) 	<ul style="list-style-type: none"> 4 CT's, 4 x VT's Communication – USB, RS485, 2 x ethernet 	
7SR5111-2	<ul style="list-style-type: none"> Housing width 3/4 x 19" (size 12), height 4U 14 binary inputs 10 binary outputs (1 break, 2 c/o, 7 make) 	<ul style="list-style-type: none"> 4 CT's, 4 x VT's Communication – USB, RS485, 2 x ethernet 	

7SR511 Feeder protection variants



Standard variants			
7SR5111-3	<ul style="list-style-type: none">• Housing width 3/4 x 19" (size 12), height 4U• 19 binary inputs• 12 binary outputs (1 break, 2 c/o, 9 make)	<ul style="list-style-type: none">• 4 CT's, 4 x VT's• Communication – USB, RS485, 2 x ethernet	
7SR5111-7	<ul style="list-style-type: none">• Housing width 3/4 x 19" (size 12), height 4U• 39 binary inputs• 20 binary outputs (1 break, 2 c/o, 17 make)	<ul style="list-style-type: none">• 4 CT's, 4 x VT's• Communication – USB, RS485, 2 x ethernet	

7SR54 Transformer protection variants

Standard variants			
7SR5421-2A	<ul style="list-style-type: none"> Housing width 3/4 x 19" (size 12), height 4U 16 binary inputs 8 binary outputs (1 break, 2 c/o, 5 make) 	<ul style="list-style-type: none"> 8 CT's Communication – USB, RS485, 2 x ethernet 	
7SR5421-1A	<ul style="list-style-type: none"> Housing width 3/4 x 19" (size 12), height 4U 12 binary inputs 8 binary outputs (1 break, 2 c/o, 5 make) 	<ul style="list-style-type: none"> 8 CT's, 4VT's Communication – USB, RS485, 2 x ethernet 	
7SR5421-6A	<ul style="list-style-type: none"> Housing width 3/4 x 19" (size 12), height 4U 37 binary inputs 18 binary outputs (1 break, 2 c/o, 15 make) 	<ul style="list-style-type: none"> 8 CT's, 4VT's Communication – USB, RS485, 2 x ethernet 	
7SR5430-3A	<ul style="list-style-type: none"> Housing width 3/4 x 19" (size 12), height 4U 24 binary inputs 10 binary outputs (1 break, 2 c/o, 7 make) 	<ul style="list-style-type: none"> 12 CT's Communication – USB, RS485, 2 x ethernet 	
7SR5431-5A	<ul style="list-style-type: none"> Housing width 3/4 x 19" (size 12), height 4U 35 binary inputs 16 binary outputs (1 break, 2 c/o, 13 make) 	<ul style="list-style-type: none"> 12 CT's, 4 x VT's Communication – USB, RS485, 2 x ethernet 	

Reyrolle 5

Hardware details

Low life cycle cost

Intuitive design



Graphical display

Large display provides clear viewing of the device menus, instrumentation, user alarms and fault data.

Fascia keys

Tactile push buttons with a responsive clear action inspire user confidence

Programmable LED's

28 programmable tri-colour LED's, Easily exchangeable LED user label behind front access door

Compact dimensions

Two case widths using the standard 4U height.

Environmental

Environmental protection with IP rating of IP54 for mounting in substation locations without the need for additional cover.
Option for IP20 to rear.

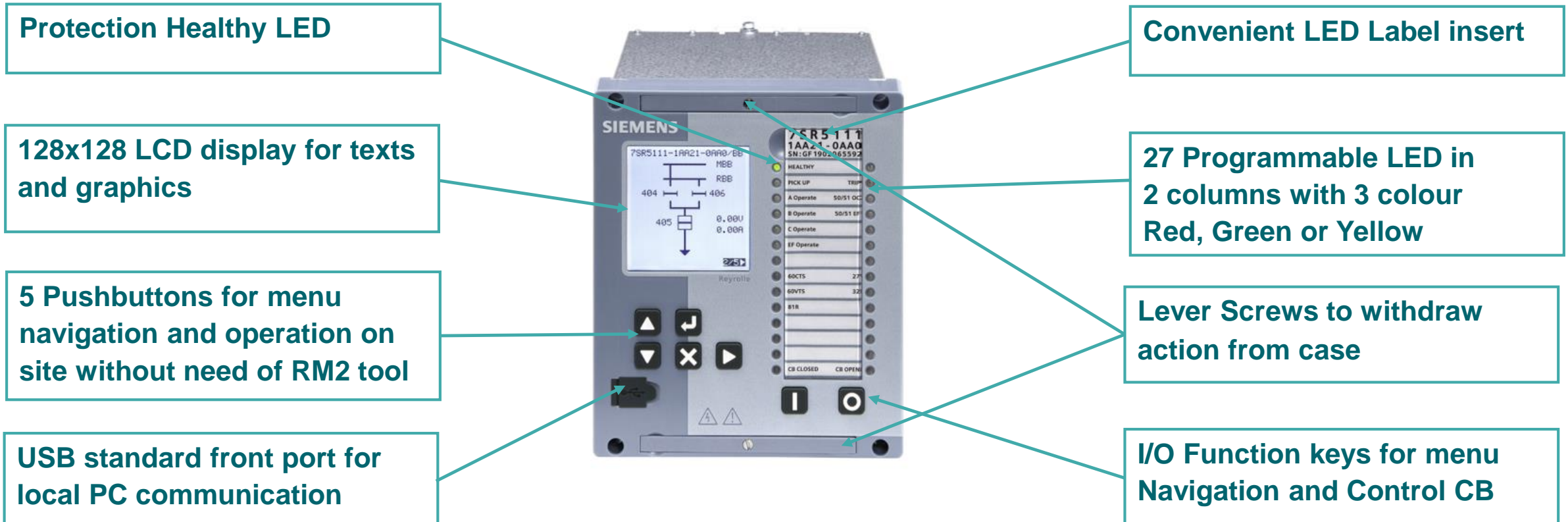
Local control

Open and close control function buttons with select before execute operation and optional ID login security provide a local access point to all controllable features.

Hardware Overview

Front Panel

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Programmable from front fascia with all settings and configuration and compatible with Reydisp Manager 2.0 Software

Low life cycle cost

Intuitive design

Local Interface

Usability

Core messages- Warning Messages

Menu structure - Protection settings change from fascia

Low training requirement

Easily exchanged label – door open label swap

The product platform can include the following variants:

Multi language support capability

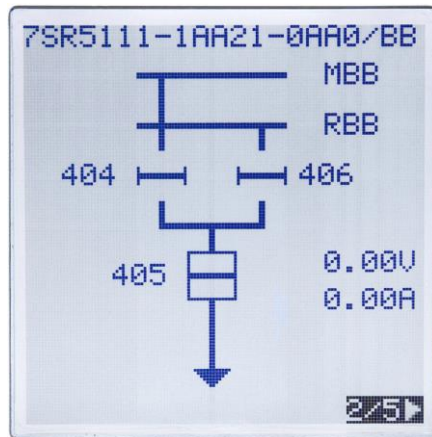
Tactile keys

Open close function keys



Designed for future networks and digital substations

HMI Design - Mimics



128 x 128 LCD with text and graphical display to view device and system information.

Delivered with a single HMI screen (primary metered values) and 5 different pages can be configurable by user with using ReyMimic display editor HMI screens with static, dynamic and controllable graphics.

Mimic diagrams and device instruments can be displayed on the home screen.

A wide range of agreed symbols are used in mimic creator library that can be easily drag and drop to insert screen.

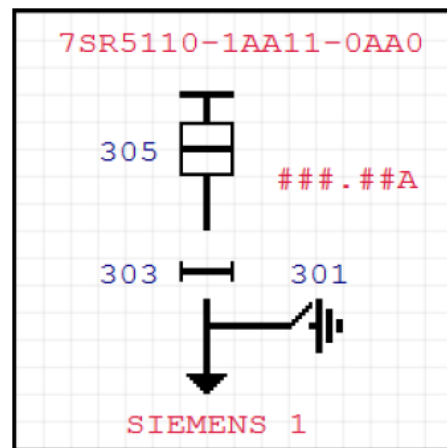
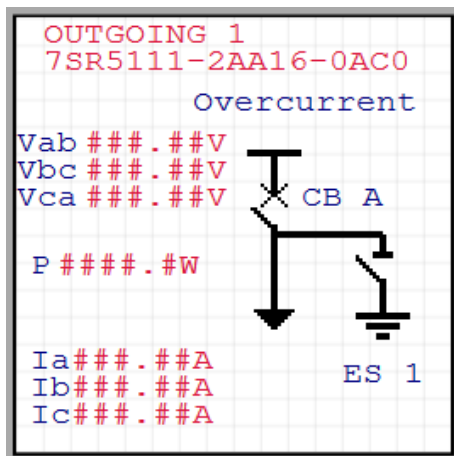
Easy to control any item highlighted on the mimic or listed in the control menu.

CB status are displayed in mimic by the information of binary input status.

LCD contrast can be adjusted by pressing the menu buttons.

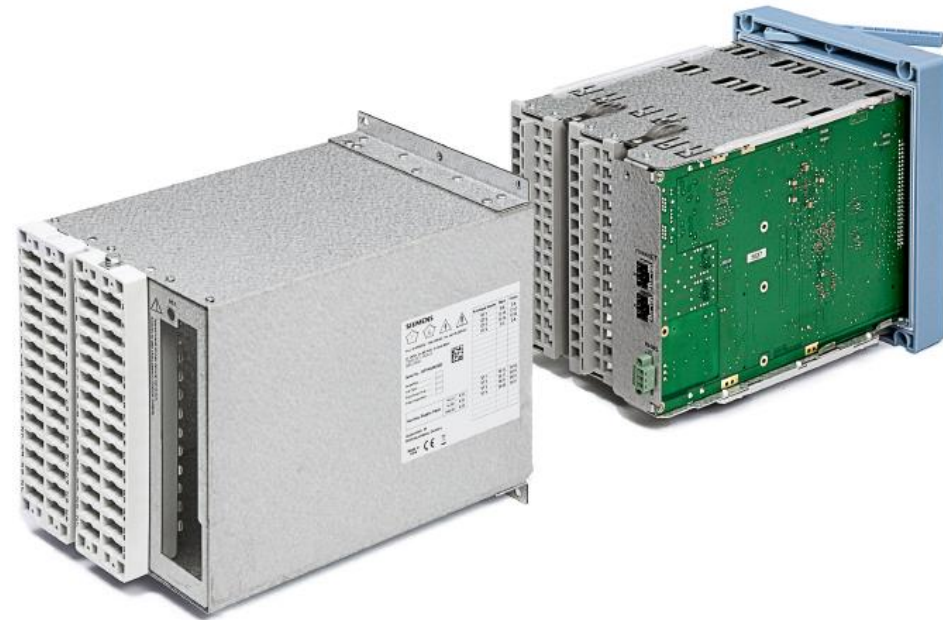
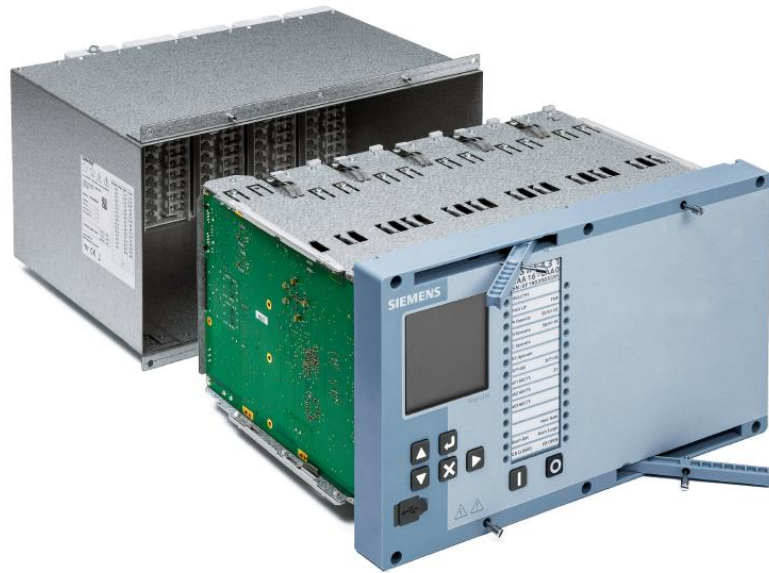
The LCD display automatically switches off when no buttons are pressed for 60 minutes.

Adjustable backlight timer (1 to 60 minutes)



Low life cycle cost Hardware Overview

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Low life cycle cost Hardware Overview

Local Interface

Compact design and low product life-cycle cost

IP54 protection - front

1A / 5A Current Inputs with combined terminals

Withdrawable relay element – top and bottom levers

CT terminals are short-circuited after withdrawn

Selectable BI operating threshold from software (24/110/220V DC)

BI can be configured as inverted for no energized applications.

Fully segregated binary input and binary output wiring

Standard USB front port , RS485 rear port and rear ethernet port (2xRJ45 electrical or 2xLC optic connectors)

Auxiliary Supply Voltage Range: 19.2 to 275 V DC and 80 – 253V AC

24-48-60-110-125-220-250 V DC or 100-110-115-120-200-230 V AC

2 changeover contacts in Binary Outputs (1 make, 1 break)

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Hardware Overview

Back Terminals

Grounding Screw
B28 terminal also should be earthed

Input, Output, Power Supply
CT, VT Modules

M4 Terminals, rear connection
screw type, fixed terminals

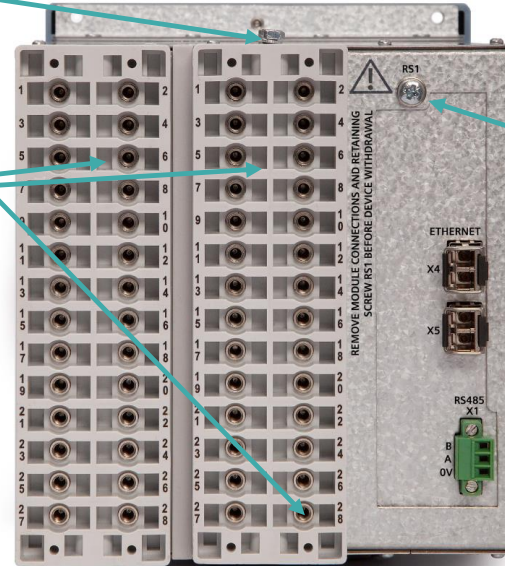
4U High Housing with case6
or case12 width built

Communication Module

Communication Port Screw

(2xRJ45 elec.) or (2xLC optical)
Ethernet Communication Port

RS485 Serial Communication
Port



Reyrolle 5 Process Data

Designed for future networks and digital substations

Enhanced process data



Event log

5,000 events with time stamping to 1ms resolution.

Waveform records

All digital and analogue signals ensure comprehensive fault analysis. Available via IEC61850 file transfer in comtrade format and via local interface.

Fault location

21FL available as standard in devices with current and voltage.

Plant data logs

Allows the user to compile a planned maintenance schedule based on operating history of the circuit breaker.

Metering values

All measured and calculated analogue and digital values can be viewed locally on the fascia or monitored remotely via all communication protocols.

Fault data records

Fault data records provide clear information on the fault type and associated data.

Device Data Data Log

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Event Log Viewer - Event Log - Deneme/New 7SR5431-5AA16-0AA0		
2019/10/31 12:34:07.0000	Raised	SW Forced Restart
	Raised	Re-Start
2019/10/31 12:34:14.0000	Raised	Setting G1 selected
2019/10/31 12:34:15.0000	Raised	Time Sync. Not Received
	Raised	Master Clock Lost
	Raised	Backup Clock Lost
	Raised	Settings changed
	Raised	Clear Event Records
2019/10/31 12:34:15.0005	Raised	LED 9
2019/10/31 12:34:15.0015	Cleared	Backup Clock Lost
2019/10/31 12:34:15.0040	Raised	Local Or Remote Mode
	Raised	Binary Output 3
	Raised	EF In
2019/10/31 12:34:16.0010	Raised	W1 CB Alarm
	Raised	W1 CB Travelling
	Raised	W2 CB Alarm
	Raised	W2 CB Travelling
	Raised	W3 CB Alarm
	Raised	W3 CB Travelling
2019/10/31 12:36:41.0370	Raised	LED 10
	Raised	LED PU 13
	Raised	General Start/Pick-up
	Raised	Start/Pick-up L1
	Raised	Start/Pick-up L2
	Raised	Start/Pick-up L3
2019/10/31 12:36:41.0375	Raised	LED PU 12
	Raised	LED PU 14

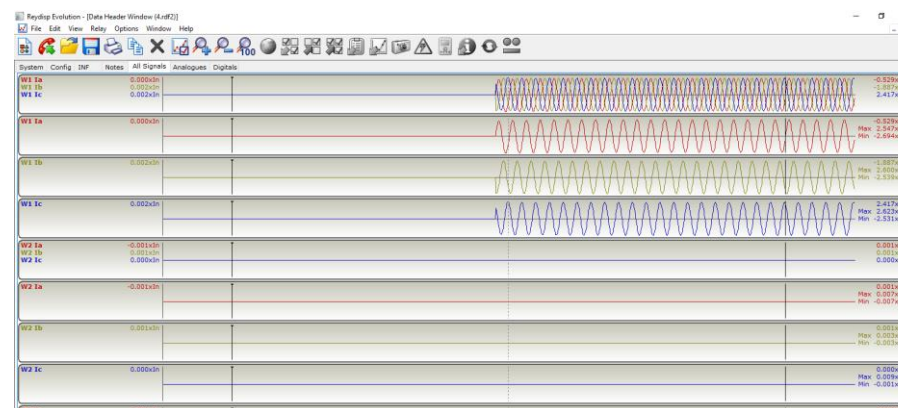
5000 events

Name	Type	Last Modified
Waveform Records		
01/15/00 01:39:48.514000	Waveform Record	15/01/2000 01:39:48
01/15/00 01:39:52.554000	Waveform Record	15/01/2000 01:39:52
Device Event Logs		
Event Log	Device Event Log	10/01/2000 04:17:00
Event Log	Device Event Log	10/01/2000 23:34:30
Event Log	Device Event Log	15/01/2000 01:20:07
Event Log	Device Event Log	15/01/2000 01:20:07
Event Log	Device Event Log	15/01/2000 01:20:07
Event Log	Device Event Log	15/01/2000 01:20:07
Event Log	Device Event Log	15/01/2000 01:20:07
Event Log	Device Event Log	15/01/2000 01:20:07
Device Fault Logs		
Fault Log	Device Fault Record	15/01/2000 01:19:58
Fault Log	Device Fault Record	15/01/2000 01:19:58

20 waveform fault records

Timestamp	Setting Group	Measurements
2019/10/31 14:20:21.520	1	27-1 W1-Ia=0.000kA W1-Ib=0.000kA W1-Ic=0.000kA W2-Ia=0.000kA W2-Ib=0.000kA W2-Ic=0.000kA W3-Ia=0.000kA W3-Ib=0.000kA W3-Ic=0.000kA Ig-1=0.000kA Ig-2=0.000kA Ig-3=0.000kA Va=36.83kV Vb=42.72kV Vc=37.30kV
2019/10/31 14:20:50.320	1	27-1 W1-Ia=0.000kA W1-Ib=0.000kA W1-Ic=0.000kA W2-Ia=0.000kA W2-Ib=0.000kA W2-Ic=0.000kA W3-Ia=0.000kA W3-Ib=0.000kA W3-Ic=0.000kA Ig-1=0.000kA Ig-2=0.000kA Ig-3=0.000kA Va=52.29kV Vb=52.41kV Vc=52.36kV
2019/10/31 14:21:06.660	1	27-1 W1-Ia=0.000kA W1-Ib=0.000kA W1-Ic=0.000kA W2-Ia=0.000kA W2-Ib=0.000kA W2-Ic=0.000kA W3-Ia=0.000kA W3-Ib=0.000kA W3-Ic=0.000kA Ig-1=0.000kA Ig-2=0.000kA Ig-3=0.000kA Va=38.42kV Vb=41.02kV Vc=45.39kV

100 fault records



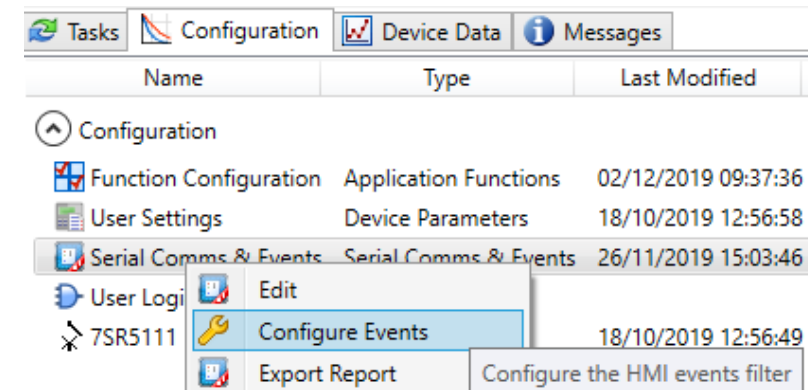
Data records are backed up in non-volatile memory and are permanently stored even in the event of loss of auxiliary supply voltage

Device Data Event Log

Event Log Viewer - Event Log - Deneme/New 7SR5431-5AA16-0AA0			
2019/10/31 12:34:07.0000	Raised Raised	SW Forced Restart Re-Start	
2019/10/31 12:34:14.0000	Raised	Setting G1 selected	
2019/10/31 12:34:15.0000	Raised Raised Raised Raised Raised	Time Sync. Not Received Master Clock Lost Backup Clock Lost Settings changed Clear Event Records	
2019/10/31 12:34:15.0005	Raised	LED 9	
2019/10/31 12:34:15.0015	Cleared	Backup Clock Lost	
2019/10/31 12:34:15.0040	Raised Raised Raised	Local Or Remote Mode Binary Output 3 EF In	
2019/10/31 12:34:16.0010	Raised Raised Raised Raised Raised Raised	W1 CB Alarm W1 CB Travelling W2 CB Alarm W2 CB Travelling W3 CB Alarm W3 CB Travelling	
2019/10/31 12:36:41.0370	Raised Raised Raised Raised Raised Raised	LED 10 LED PU 13 General Start/Pick-up Start/Pick-up L1 Start/Pick-up L2 Start/Pick-up L3	
2019/10/31 12:36:41.0375	Raised Raised	LED PU 12 LED PU 14	

Date Time State Signal

- 5000 events (new record will over-write oldest when full)
- 1ms resolution (time tagging)
- Selectable / filtered events can be viewable on fascia
- The default date is set at 01/01/2000 deliberately to indicate the date has not yet been set after energizing the relay



Device Data

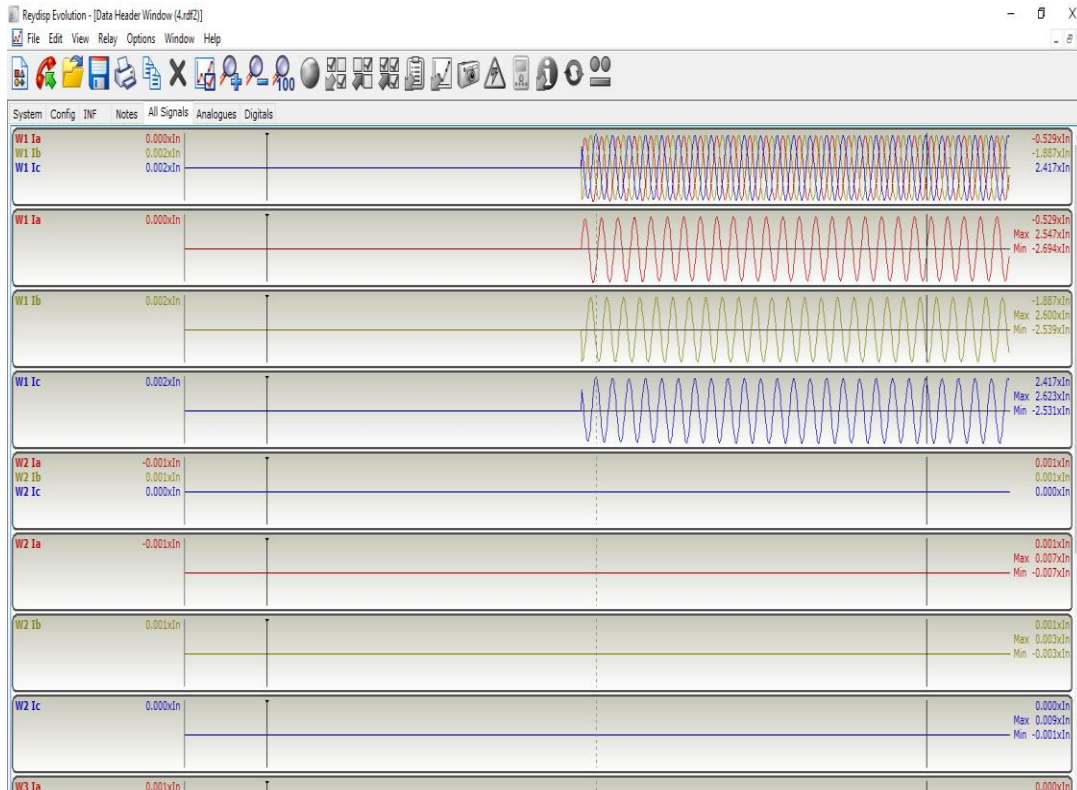
Fault Log

Fault Log Viewer - Fault Log - Deneme/New 7SR5431-5AA16-0AA0		
Timestamp	Setting Group	Measurements
2019/10/31 12:37:51.480	1	51-1 A B C W1-Ia=1.303kA W1-Ib=1.807kA W1-Ic=1.788kA W2-Ia=0.000kA W2-Ib=0.000kA W2-Ic=0.000kA W3-Ia=0.000kA W3-Ib=0.000kA W3-Ic=0.000kA Ig-1=0.000kA Ig-2=0.000kA Ig-3=0.000kA Va=0.000kV Vb=0.000kV Vc=0.000kV
2019/10/31 12:38:50.150	1	51-1 A B C W1-Ia=2.022kA W1-Ib=1.463kA W1-Ic=2.020kA W2-Ia=0.000kA W2-Ib=0.000kA W2-Ic=0.000kA W3-Ia=0.000kA W3-Ib=0.000kA W3-Ic=0.000kA Ig-1=0.000kA Ig-2=0.000kA Ig-3=0.000kA Va=0.000kV Vb=0.000kV Vc=0.000kV
2019/10/31 12:39:41.620	1	51-2 A B C W1-Ia=0.000kA W1-Ib=0.000kA W1-Ic=0.000kA W2-Ia=1.417kA W2-Ib=2.025kA W2-Ic=1.527kA W3-Ia=0.000kA W3-Ib=0.000kA W3-Ic=0.000kA Ig-1=0.000kA Ig-2=0.000kA Ig-3=0.000kA Va=0.000kV Vb=0.000kV Vc=0.000kV

- 100 latest fault
- Time and Date tagged
- Measured Quantities
- Types of Faults
- Records are triggered from operation of an output relay programmed as a **Trip Contact**

Device Data

Waveform Records



- The latest 20 waveform Records stored in time stamped regardless to record duration
- The most recent is waveform 1
- The RAM has a total capacity of 10 seconds of waveform data allocated to records of 10 s, 5 s, 2 s or 1 s selectable duration.
- Files can be transfer as a format Comtrade
- Could be triggered additionally by fascia, BI or protocol
- Pre-trigger function availability to display pre-fault waveforms with post-fault waveforms.
- Trigger protection function trips could be selectable

Pre-trigger Storage	50%
Record Duration	1s

Measurements

Monitoring Functions

Instruments and Meters

- Current
 - Primary phases to earth
 - Secondary phases to earth
 - Relay operate and restraint
 - Phases sequence (PPS, NPS, ZPS)
 - 2nd to 5th Harmonics
 - Differential operate and restraint
- Voltage
 - Primary
 - Secondary
 - Phase sequence (PPS, NPS, ZPS)
- Frequency and fluxing
- Power
- Energy
- Fault location
- Binary input/output and Virtual I/O status
- Time and Date
- Fault data records
- Event records (selectable events viewable on fascia)
- Waveform records

Plant Data

- CB trip counters
- CB trip current counters
- CB I2t summation (wear) counters
- Plant parameters
- Time and Date
- Data logging

Measurements

Demand Data Log

DEMAND/DATA LOG

Setting Name	Value
Data Log Period	5min
Demand Window	24hrs
Demand Window Type	Fixed

The data log monitors average, maximum and minimum demand levels (demand history)

Maximum, minimum and mean values of measured current, voltage and power (where applicable) are recorded and can be viewed in the relay Instruments menu.

Data Log Period: defines the time between each data sample.

Demand Window: the maximum time over which the demand values are measured. A new set of demand values are recorded after expiry of the Demand Window Time.

Fixed: the maximum, minimum and mean values demand statistics are calculated over a fixed window duration. At the end of each window the internal statistics are reset and a new window is started. The first window is started when the setting is entered.

Peak: records the maximum and minimum values since the Demand Data Log feature was last reset.



Rolling: the maximum, minimum and mean values demand statistics are calculated over a moving window duration. The internal statistics are updated when the window advances. The oldest

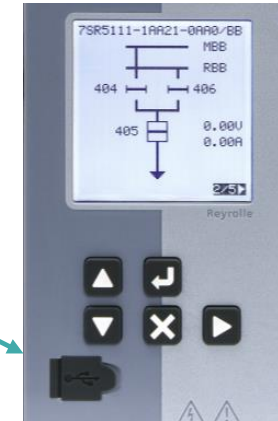
Reyrolle 5

Communication details

Hardware Design Communications

Front USB port for local connection (Standard) with a cover provides environmental protection

- The Relay functions can be set on a PC using Reydisp Manager 2 software via the relay USB port by a standard USB cable
- COM-2 USB port has the IP address 192.168.2.1
- Type-B  plug for device and Type-A  plug for PC connection



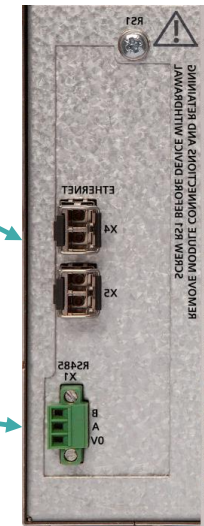
Two rear Ethernet ports (Standard) with Channel 1 and Channel 2

Optionally selectable RJ45 electrical or LC optical duplex connector types (Fibre optic)

- IEC61850, HSR, PRP and RSTP operation.
- Remote access to Reydisp

Rear RS485 serial Communication port (Standard) as COM-1 and terminal number X1

- DNP3.0
- IEC 60870-5-103
- Modbus RTU



Communication

RS485 Data Communication

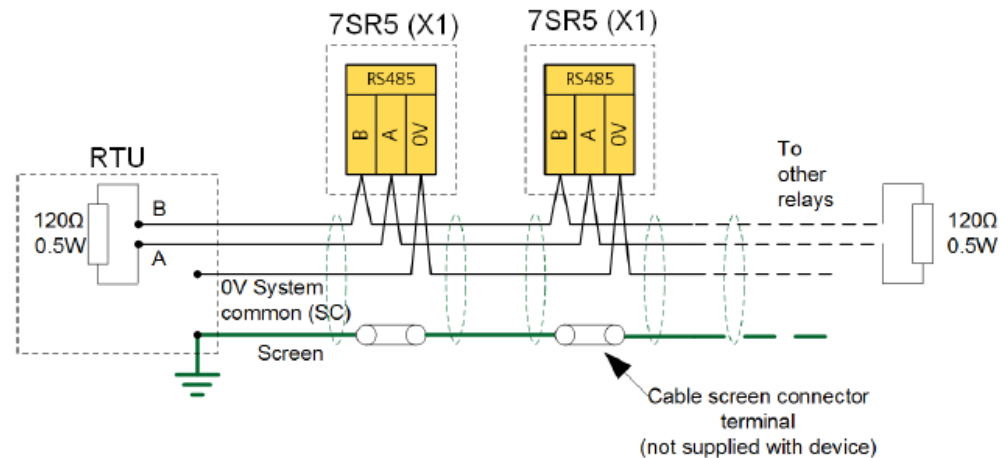
COMMUNICATIONS

Setting Name	Value
COM1-RS485 Protocol	Off
COM1-RS485 Station Address	Off
COM1-RS485 Baud Rate	IEC60870-5-103
COM1-RS485 Parity	MODBUS-RTU
COM1-RS485 Mode	DNP3
COM1-RS485 Mode	Remote
USB Mode	Local
Ethernet Mode	Remote
DNP3 Unsolicited Events	Disabled
DNP3 Destination Address	0
DNP3 Application Timeout	10

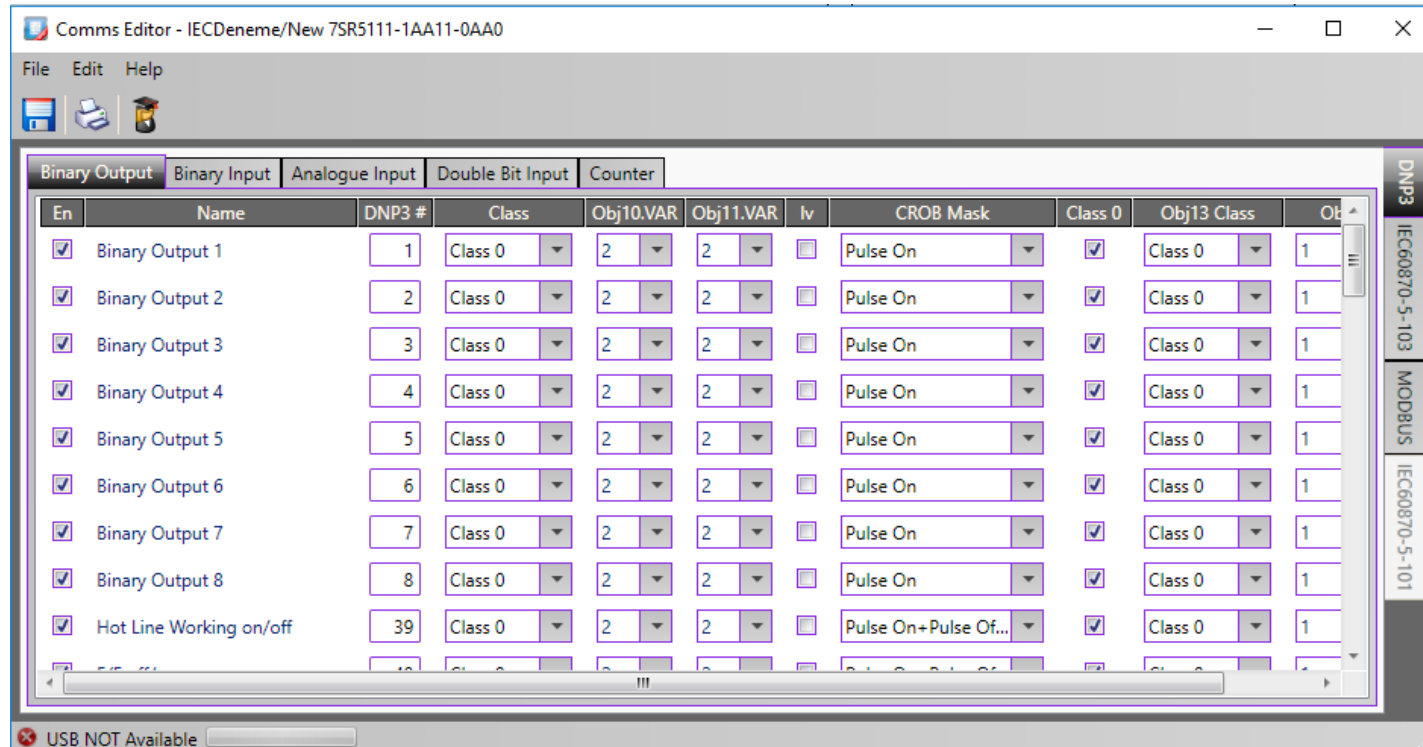
CONFIGURATION > Data Storage

Parameter	Range
COM1-RS485 Protocol	ASCII, IEC 60870-5-103, MODBUS-RTU, DNP3, Off
COM1-RS485 Station address	0 to 254 for IEC 60870-5-103 1 to 247 for Modbus RTU 0 to 65534 for DNP3
COM1-RS485 Baud rate	75, 110, 150, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400
COM1-RS485 Parity	NONE, ODD, EVEN
COM1-RS485 Mode	Local, Remote, Local or Remote

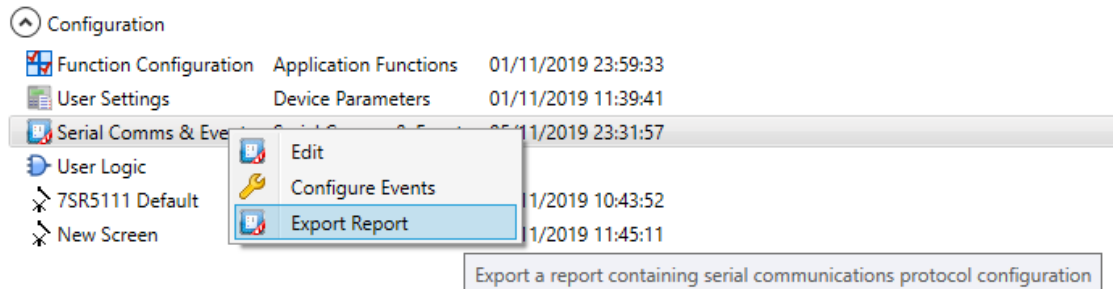
Provides remote communication to user selectable serial protocols DNP3, IEC 60870-5-103 and Modbus RTU



Communication Comms Editor



DNP3, IEC 60870-5-103, and Modbus RTU protocols can be independently mapped by using Comms Editor tool to simplify project engineering.



The complete serial protocol information list containing the DNP3, IEC 60870-5-103, and Modbus RTU data information for the configured device can be generated using the Export Report feature in the Reydisp Manager tool, Serial Comms & Events.

Communication

Ethernet Communication

Ethernet ports can be used for IEC61850 communications to a substation Scada, integrated control system or engineer remote access using Reydisp configuration software

IEC61850 Ethernet supports Edition1 and Edition2 with HSR , PRP and RSTP operation capability for redundancy.

Ethernet modules provided with an integral switch functionality.



2 optical LC

X4 - Channel 1

X5 - Channel 2



2 electrical (RJ45)

X2 - Channel 1

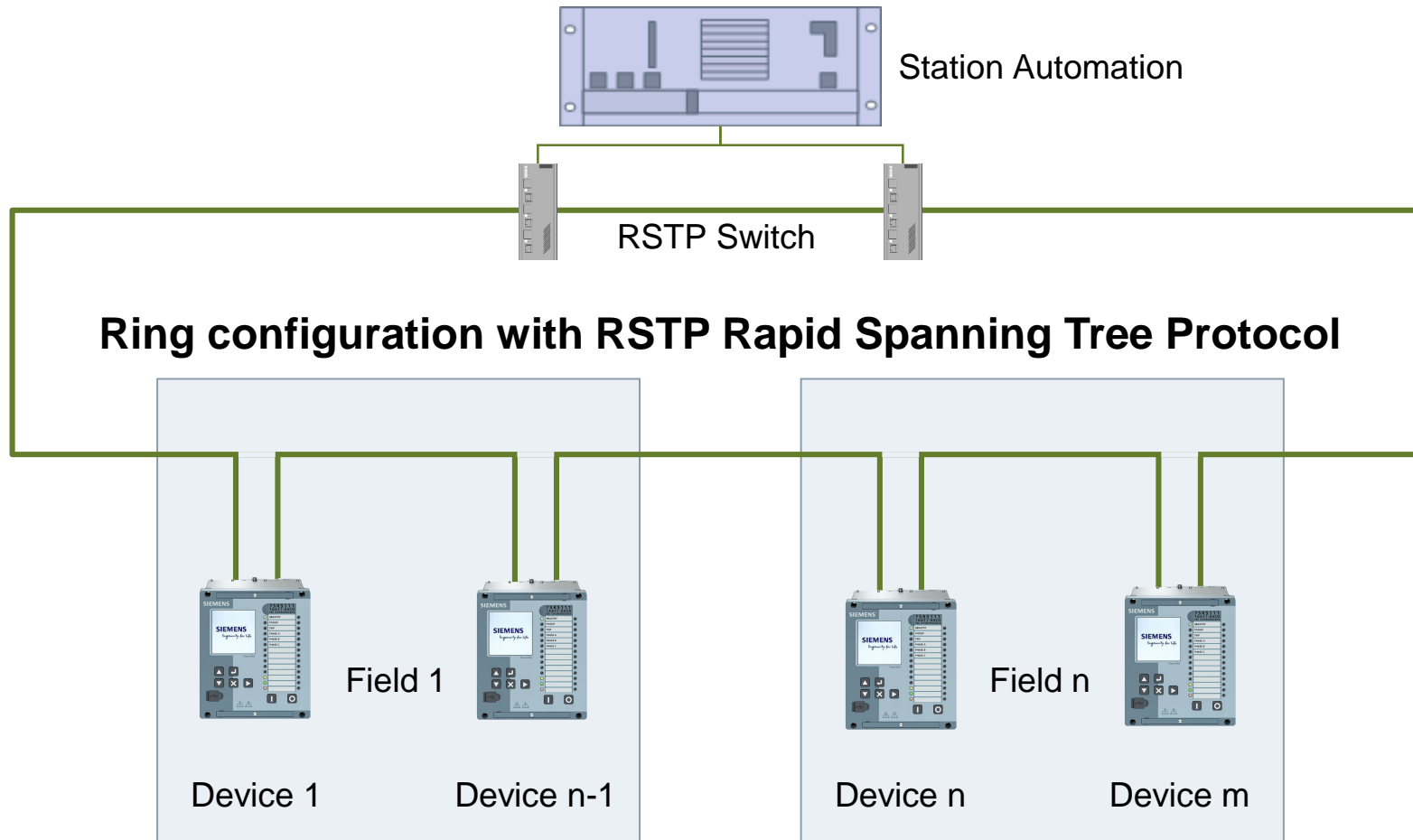
X3 - Channel 2

Functions:

- Object Modelling
- GOOSE Messaging
- Buffered and Unbuffered Reporting
- SNTP Time Synchronising
- Disturbance Record File Transfer
- Edition 1 or Edition 2 selection
- Redundancy
- 5 Clients Supported

Communication

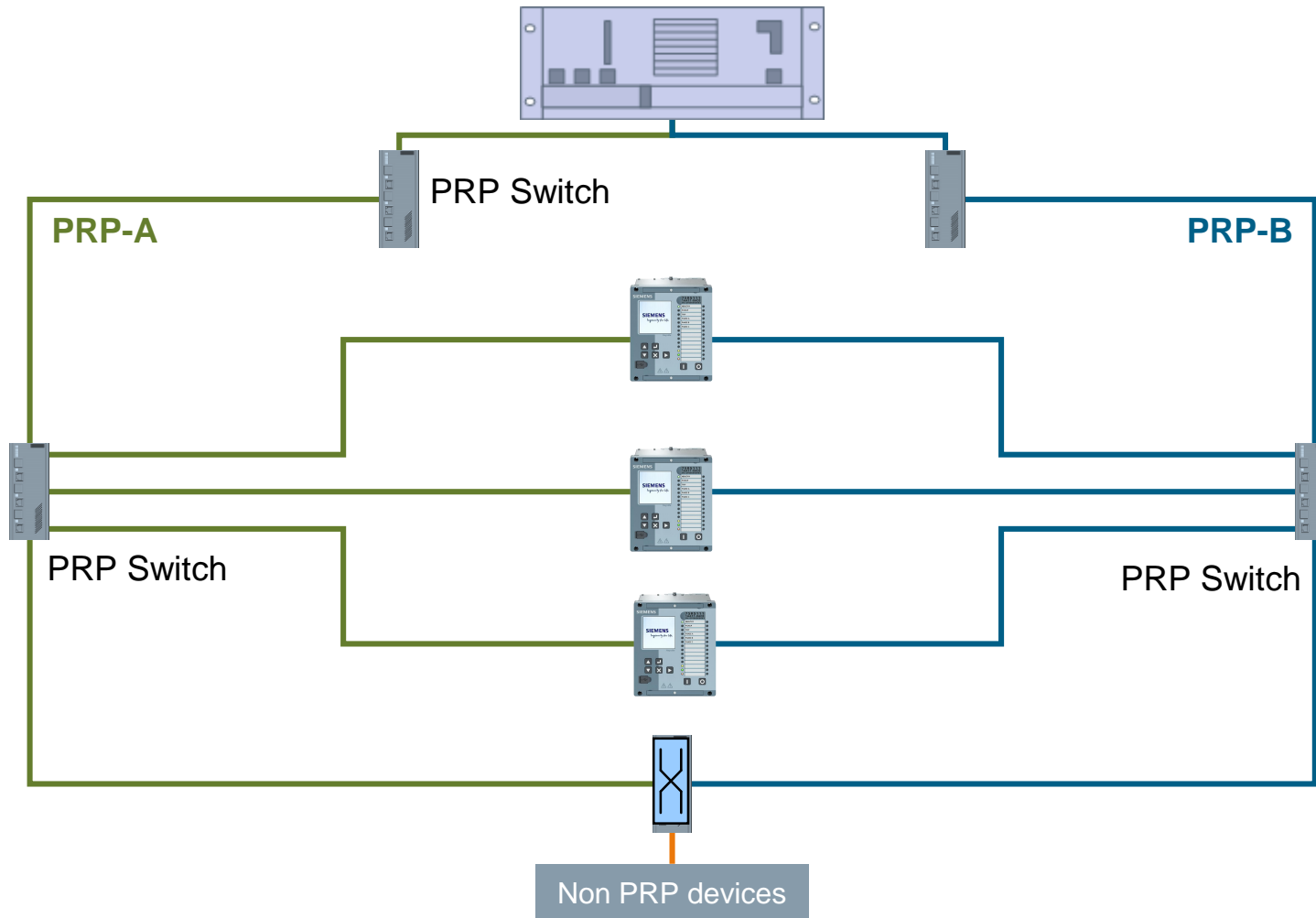
IEC 61850 RSTP Configuration



- RSTP is a redundancy protocol that reroutes the data to another path after the failure of a network path.
- 2 external RSTP-Switches
- Reyrolle devices with integrated RSTP switch
- Rings with up to 30 devices
- Several rings can be connected to external switches
- Setting of RSTP parameters necessary
- IEEE 802.1D-200
 - Well established technology
 - Field proven interoperability

Communication

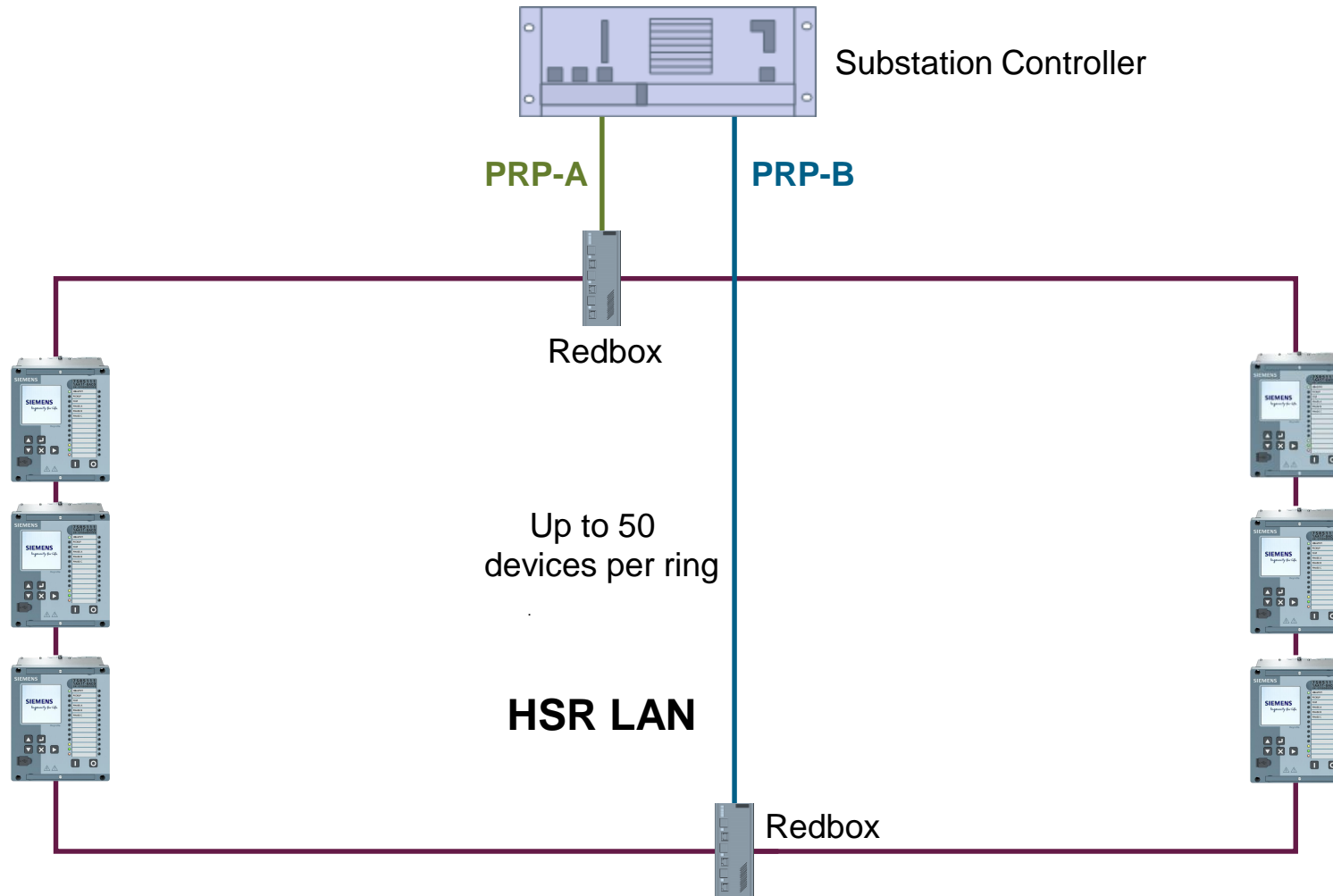
IEC 61850 PRP Configuration



- Two separate independent parallel networks
- PRP offers a switchover without any interruptions with high availability
- The receiver takes the information that arrives first and discards second as a redundant.
- Device are connected to network PRP-A and PRP-B
- Devices send via both active links
- RedBox for connection of non PRP devices
- Seamless
- IEC 62439-3.4

Communication

IEC 61850 HSR Configuration

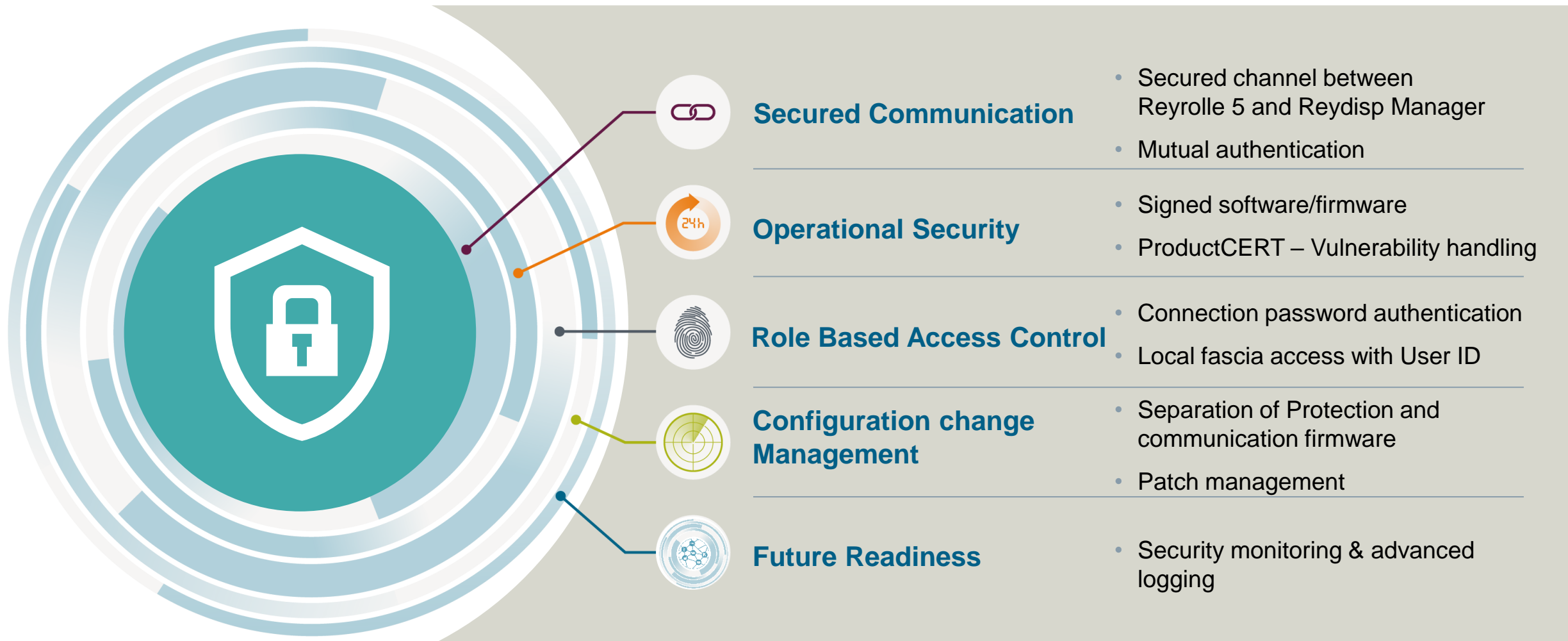


- In ring-shaped network structure
- 2 Redboxes
- Reyrolle devices with integrated HSR switch
- The indication is sent twice in both directions of the ring.
- Rings with up to 50 devices
- Redboxes distributed in the ring
- Seamless
- IEC 62439-3.5

Reyrolle 5 Cyber Security

Designed for future networks and digital substations

Cyber security



Designed for future networks and digital substations

Passwords



Setting Confirmation ID

A password required for **settings changes** at the device fascia Setting ID can be set in Reydisp Manager. The Setting ID will timeout 60 minutes after the last key press.

Control Confirmation ID

A password required to carry out **control operations** from the device fascia Control ID can be set in Reydisp Manager. The Setting ID will timeout 60 minutes after the last key press.

Security Log Confirmation ID

A password required to view **security logs** from the device fascia Security Log ID can be set in Reydisp Manager. The Setting ID will timeout 60 minutes after the last key press.

Reset Password

This function is accessible at the relay fascia only. The reset is applied to the connection password and the maintenance password

Setting Confirmation ID	Not Set
Control Confirmation ID	Not Set

Set Setting Confirmation ID

Apply

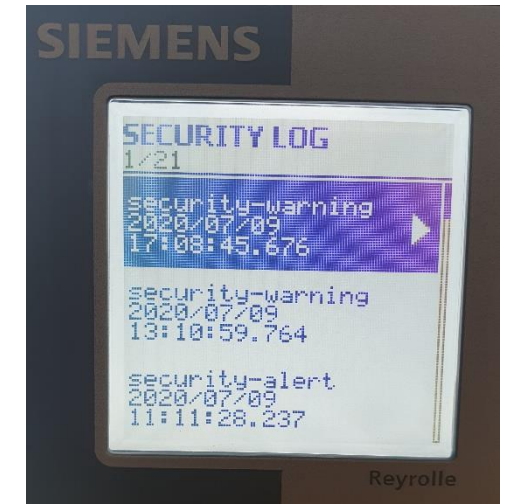
Cancel

Setting Confirmation ID

Control Confirmation ID

Set

Clear

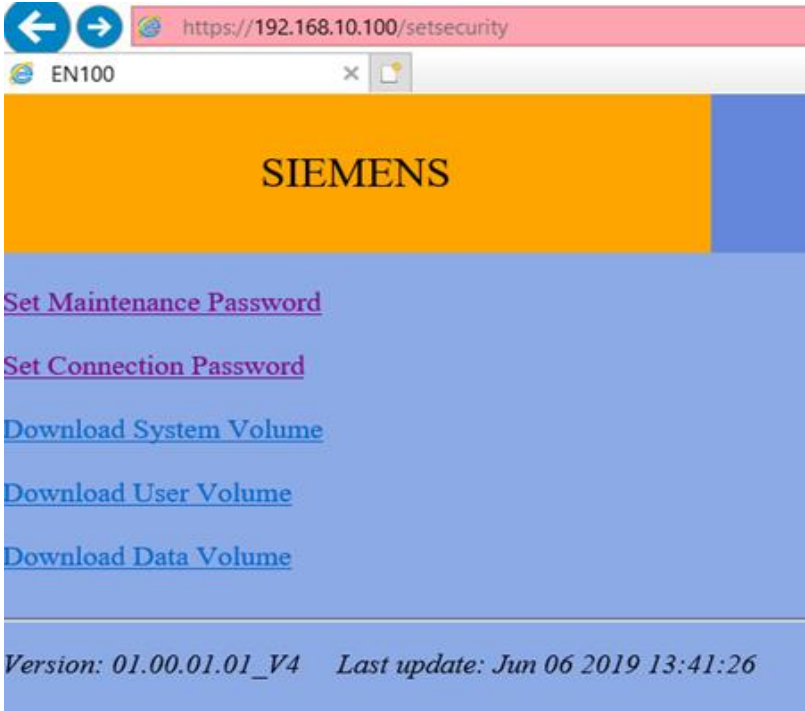


Designed for future networks and digital substations

Passwords



Password	Description
Maintenance	Password for: <ul style="list-style-type: none">• EN100 firmware upgrade via Ethernet or USB• Firmware upgrade via Ethernet or USB• Setup secure engineering access – Download password-reset file
Connection	Password for EN100 connection with Reydisp via Ethernet or USB

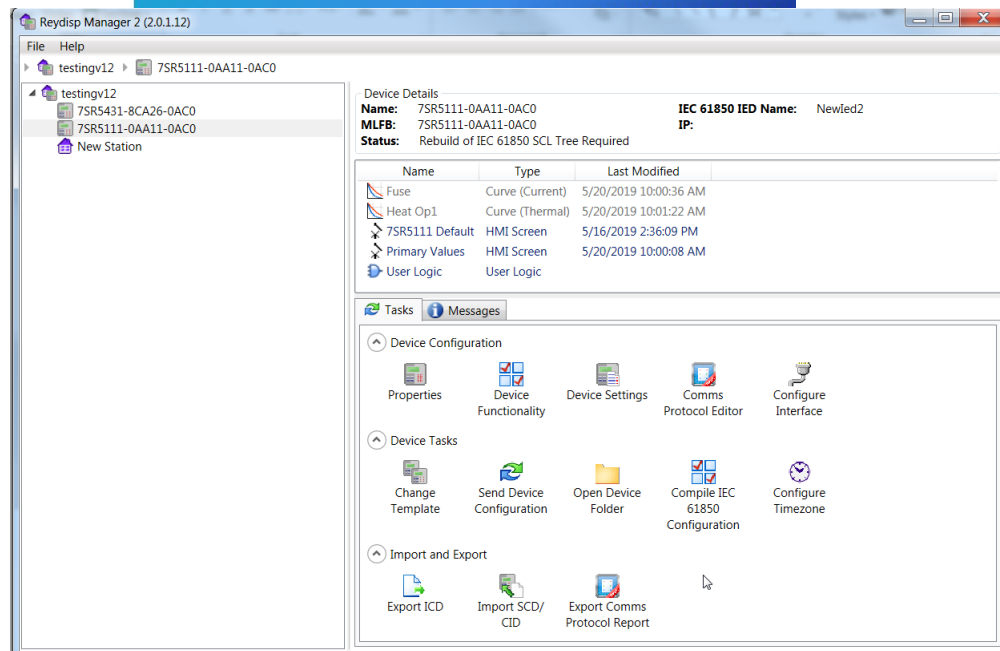
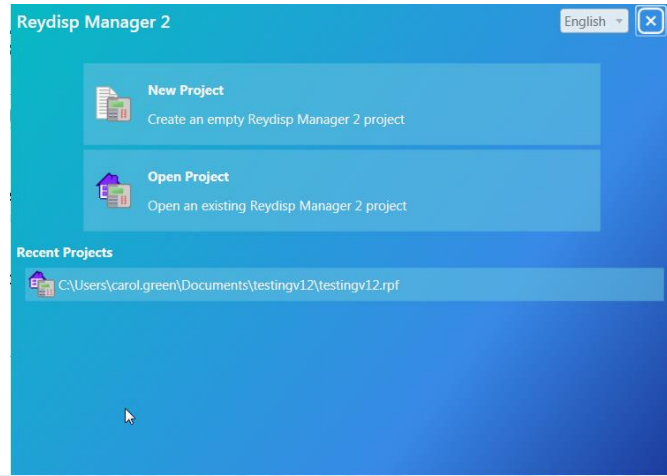


Reyrolle 5 Reydisp Manager 2

Efficient Engineering Reydisp Manager 2.0



Improved engineering workflow,
intuitive feel, file management



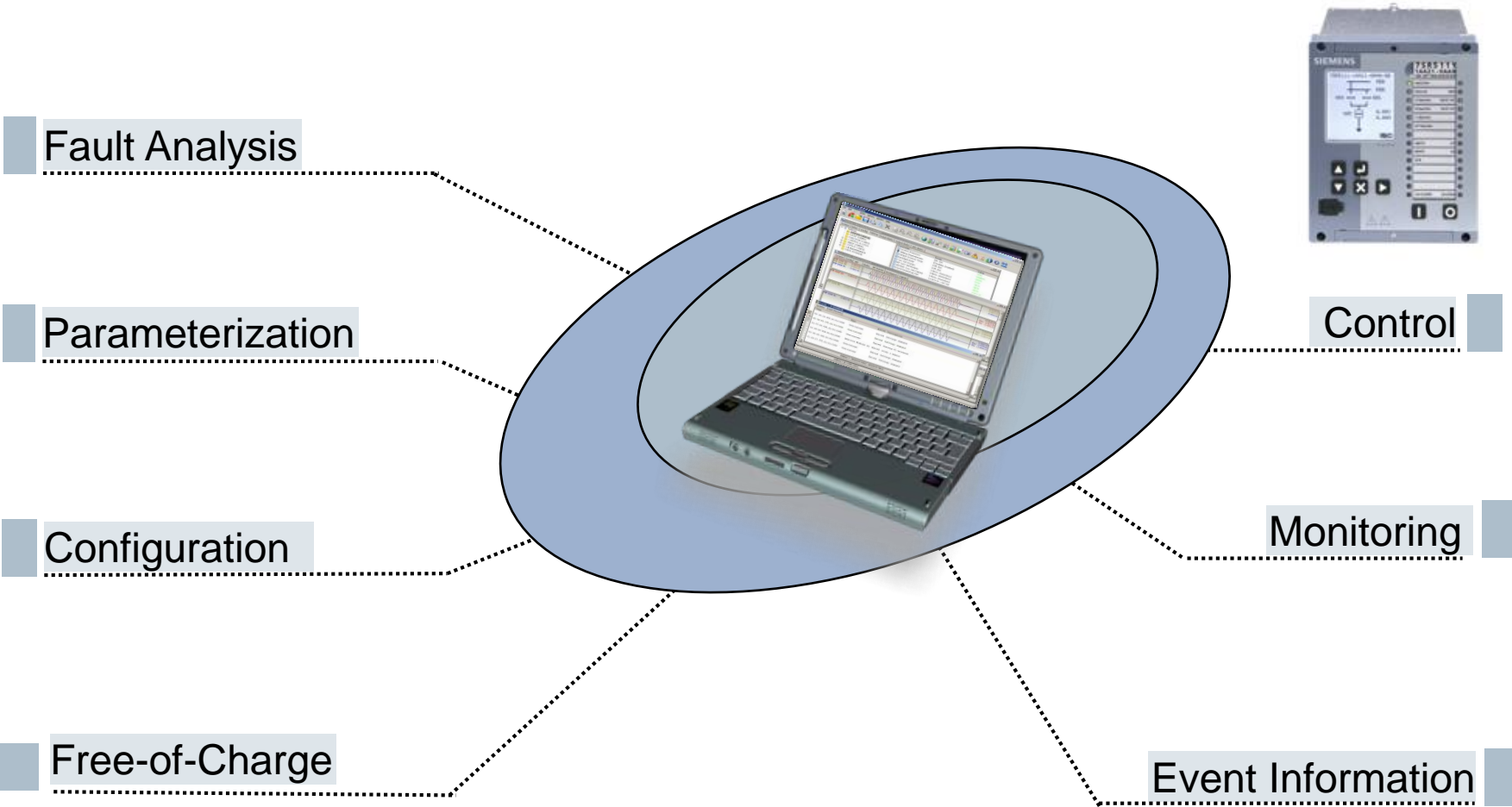
Reydisp Manager 2

Reydisp Manager 2 (RM2) is a pc based engineering tool used for the setting, configuration and commissioning all Reyrolle 5 relays.

Available to download free of charge from our web site this easy to use software ensures an efficient work flow.

Function management

Efficient Engineering Reydisp Manager 2.0



Reydisp Manager 2

Overview of Functions

Reydisp Manager 2 is for setting, configuration, and commissioning all Reyrolle 5 relays.
Simple parameterization and shorter commissioning times
Free to download from site and easy to make a configuration and all settings
Cyber-security functionality
Configurable 28 virtual inputs/outputs for any functions.

- Protection setting parameterization both offline and online
- Device configuration
- Viewing of device instrumentation
- Logic editing
- Creation of user curves
- Serial protocol point editing
- Mimic design and configuration
- Real time indications on all event, waveform records
- Indication of all element operate states.

- Relay Input and Output matrix display
- Manage, print and export of all files
- Comtrade files to be viewable
- Communications editor
- Curve editor (User defined curves for overcurrent protection)
- Language File editor (Multi-language support capability)
- Mimic Creator (User defined single lines and mimic diagrams)
- User triggering of protection, control and supervision functions.
- Communication settings and IEC61850 configuration

Reydisp Manager 2

Overview of Tool



Tasks

Device Data

Messages

Name	Type	Last Modified
Waveform Records		
01/17/00 00:58:51.424000	Waveform Record	17/01/2000 00:58:51
01/17/00 00:58:57.874000	Waveform Record	17/01/2000 00:58:57
01/17/00 00:59:01.054000	Waveform Record	17/01/2000 00:59:01
01/17/00 00:59:15.494000	Waveform Record	17/01/2000 00:59:15
01/17/00 00:59:18.314000	Waveform Record	17/01/2000 00:59:18
01/17/00 00:59:20.894000	Waveform Record	17/01/2000 00:59:20
01/17/00 00:59:23.904000	Waveform Record	17/01/2000 00:59:23
01/17/00 00:59:26.994000	Waveform Record	17/01/2000 00:59:26
01/17/00 00:59:29.144000	Waveform Record	17/01/2000 00:59:29
01/17/00 00:59:33.384000	Waveform Record	17/01/2000 00:59:33
01/17/00 00:59:36.754000	Waveform Record	17/01/2000 00:59:36
01/17/00 00:59:43.854000	Waveform Record	17/01/2000 00:59:43
01/17/00 00:59:46.704000	Waveform Record	17/01/2000 00:59:46
01/17/00 01:00:06.954000	Waveform Record	17/01/2000 01:00:06
01/17/00 01:00:09.384000	Waveform Record	17/01/2000 01:00:09
01/17/00 01:00:11.694000	Waveform Record	17/01/2000 01:00:11
01/17/00 01:00:13.854000	Waveform Record	17/01/2000 01:00:13
01/17/00 01:00:16.034000	Waveform Record	1
01/17/00 01:00:18.004000	Waveform Record	1
01/17/00 01:00:19.854000	Waveform Record	1
01/17/00 01:00:22.554000	Waveform Record	1
Device Event Logs		
Event Log	Device Event Log	1
Device Fault Logs		
Fault Log	Device Fault Record	1

Clear Completed

Clear Top Flag

Preparing Settings

Applying Settings

Sending configuration to device

Preparing Settings

Hebburn - Reydisp Manager 2

File Tools Help

Hebburn > New 7SR5430-3AA16-0AA0

Hebburn

- New 7SR5111-1AA11-0AA0
- New 7SR5430-3AA16-0AA0
- New 7SR5111-0AA11-0AA0
- New 7SR5111-1AA21-0AA0

Device Details

- Name: New 7SR5430-3AA16-0AA0
- MLFB: 7SR5430-3AA16-0AA0
- Status: IEC 61850 Compile Required
- IEC 61850 IED Name: Newled2

Device View

Configuration

- Function Configuration
 - Application Functions
- User Settings
 - Device Parameters
- Serial Comms & Events
 - Serial Comms & Events
- User Logic
 - Graphical Logic
- 7SR5430 Default
 - HMI Screen

Task Screen

- Device Configuration
 - Properties
 - Ethernet Interface
 - Ethernet Timezone
- Device Tasks
 - Send Device Configuration
 - Get Device Data
 - Get Device Configuration
 - Open Device Folder
 - Set Device Date & Time
 - Compile IEC 61850 Configuration
 - Install Device Firmware
 - Change Template
- Import and Export
 - Export ICD
 - Import SCD/CID
 - Export IEC 61850 MICS

Device Templates

Project Tree

Device Configuration Screen

Task Screen

Device Data

Information Messages

Reydisp Manager 2

Device Configuration



Device Functionality - Hebburn/...

67 Directional

Functions	Include	CT Inputs	
		W1	CT4
67	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	
67G	<input checked="" type="checkbox"/>		<input checked="" type="radio"/>
67GS	<input checked="" type="checkbox"/>		<input checked="" type="radio"/>
67N	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	

50 Overcurrent

Functions	Include	CT Inputs	
		W1	CT4
50-1	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	
50-2	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	
50-3	<input type="checkbox"/>		
50-4	<input type="checkbox"/>		

50G Earth Fault

Functions	Include	CT Inputs	
		W1	CT4
50G-1	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	

Apply Cancel

Tasks Configuration Device Data Messages

Name	Type	Last Modified
Configuration		
Function Configuration	Application Functions	02/12/2019 09:37:36
User Settings	Device Parameters	18/10/2019 12:56:58
Serial Comms & Events	Serial Comms & Events	03/12/2019 12:05:08
User Logic	Graphical Logic	
7SR5111 Default	HMI Screen	18/10/2019 12:56:49

- Configuration file includes:
- User Setting File
 - Logic File
 - HMI Scree
 - Serial comms and event file

Function configuration

50N Earth Fault

Functions	Include	CT Inputs					
		W1		W2		W3	
		CT1,CT2,CT3	CT4	CT5,CT6,CT7	CT8	CT9,CT10,CT11	CT12
50N-1	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>		<input type="radio"/>		<input type="radio"/>	
50N-2	<input checked="" type="checkbox"/>	<input type="radio"/>		<input checked="" type="radio"/>		<input type="radio"/>	
50N-3	<input checked="" type="checkbox"/>	<input type="radio"/>		<input type="radio"/>		<input checked="" type="radio"/>	

To adjusting a functional scope and to create a functional configuration suitable for users application in the offline configuration of device. The user can change these by adding or deleting function groups and function elements.

Reydisp Manager 2

Settings Menu Overview

SIEMENS
Ingenuity for life

- PROTECTION
 - 21LB
 - 27
 - 27Vx
 - 32
 - 37
 - 46
 - 46BC
 - 47
 - 49
 - 50
 - 50G
 - 50GS
 - 50N
 - 50AFD
 - 50SOTF
 - 51
 - 51G
 - 51GS
 - 51N
 - 55
 - 59
 - 59Vx
 - 59N
 - 67
 - 78VS
 - 81
 - 81R
 - 87GH

Settings Input Matrix Output Matrix

- CONFIGURATION
 - DEVICE
 - CT/VT
 - BINARY INPUTS
 - BINARY OUTPUTS
 - DATA STORAGE
 - COMMUNICATIONS
 - QUICK LOGIC
- FUNCTIONS
 - FUNCTION CONFIG
 - PROTECTION
 - SUPERVISION
 - CONTROL

- BINARY INPUTS
 - INPUT MATRIX
 - BINARY INPUT CONFIG
 - FUNCTION KEY CONFIG
 - GENERAL ALARMS

- BINARY OUTPUTS
 - OUTPUT MATRIX
 - BINARY OUTPUT CONFIG
 - LED CONFIG
 - GENERAL PICKUP
 - TRIP CONFIG

- DATA STORAGE
 - DEMAND/DATA LOG
 - WAVEFORM STORAGE
 - FAULT STORAGE
 - ENERGY STORAGE
 - FAULT LOCATOR

- SUPERVISION
 - 50BF
 - 60CTS
 - 60VTS
 - 74CCS
 - 74TCS
 - 81HB2

- CONTROL
 - 52
 - CB-1
 - CB-1 COUNTERS
 - CB-1 I²T WEAR
 - 79

FUNCTION KEY CONFIG

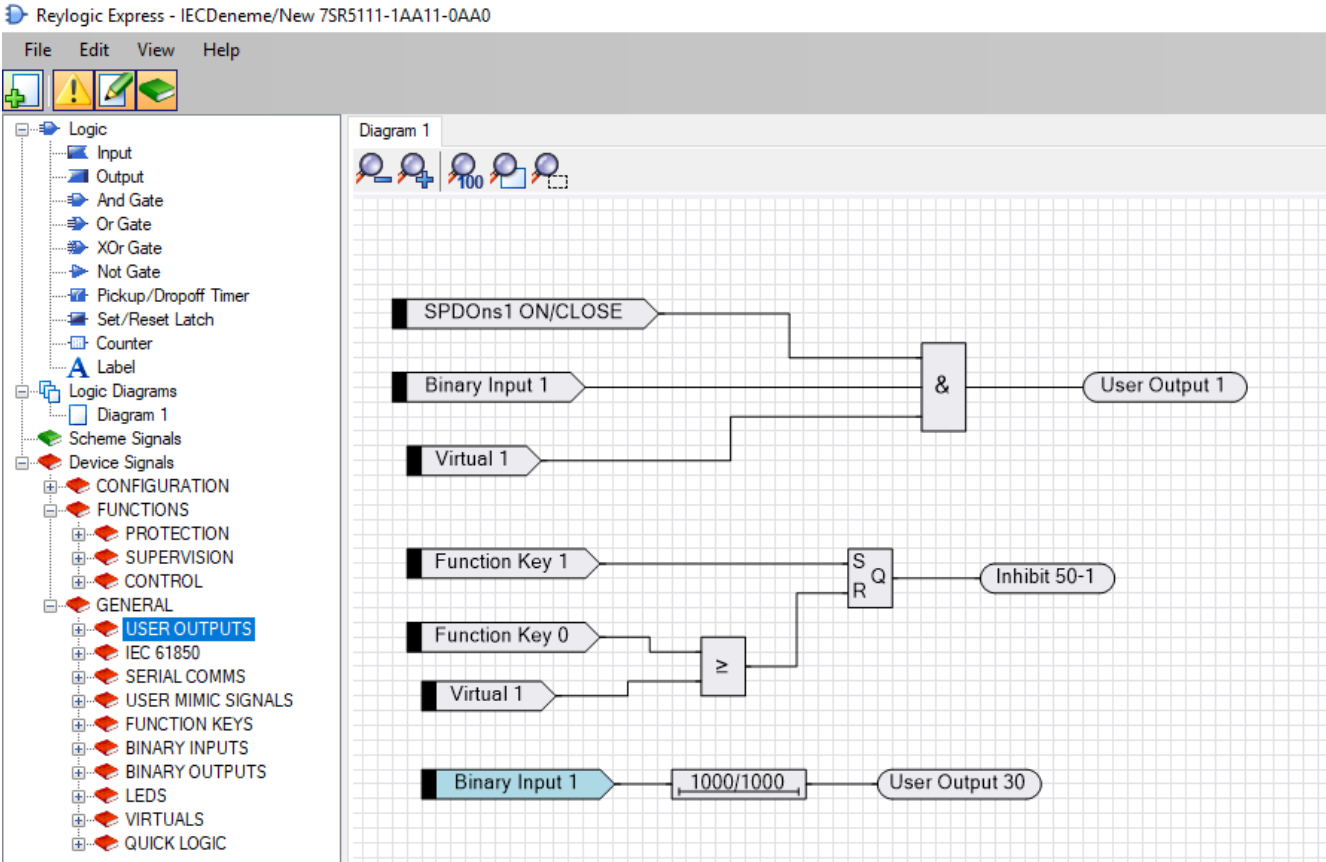
Setting Name	Value
Function Key 1 Text	CLOSE CB
Function Key 0 Text	OPEN CB
Close CB	<none>
Open CB	<none>
Enabled In Remote	<none>

BINARY OUTPUT CONFIG

Setting Name	Value
Hand Reset Outputs	<none>
Min Operate Time 1	0.10s
Min Operate Time 2	0.10s
Pickup Outputs	<none>
Pulsed Outputs	<none>

Reydisp Manager 2

Reylogic Express



Reylogic Express is a tool to create custom logic diagrams for the device by using predefined gates and device signals.

The user can map binary inputs and protection operated outputs to function inhibits, logic inputs, LEDs and/or binary outputs.

The user can also enter up to 32 equations defining scheme logic using standard functions e.g. timers, AND/OR gates, inverters and counters.

Each protection element output can be used for alarm & indication and/or tripping

Binary Input 1	External Input	User Output 1	External Output
New Input1	Internal Input	New Output2	Internal Output
&	And Gate	≥	Or Gate
=1	XOr Gate	S R Q	Set/Reset Latch
C R Q	Counter	1000/1000	Pickup/Dropoff Timer
⌐	Not Gate		

Description	Diagram	Symbol
Missing connections	Diagram 2	Function Key 1
Invalid Logic Scheme		

Logic Validation Scheme Warnings and Errors

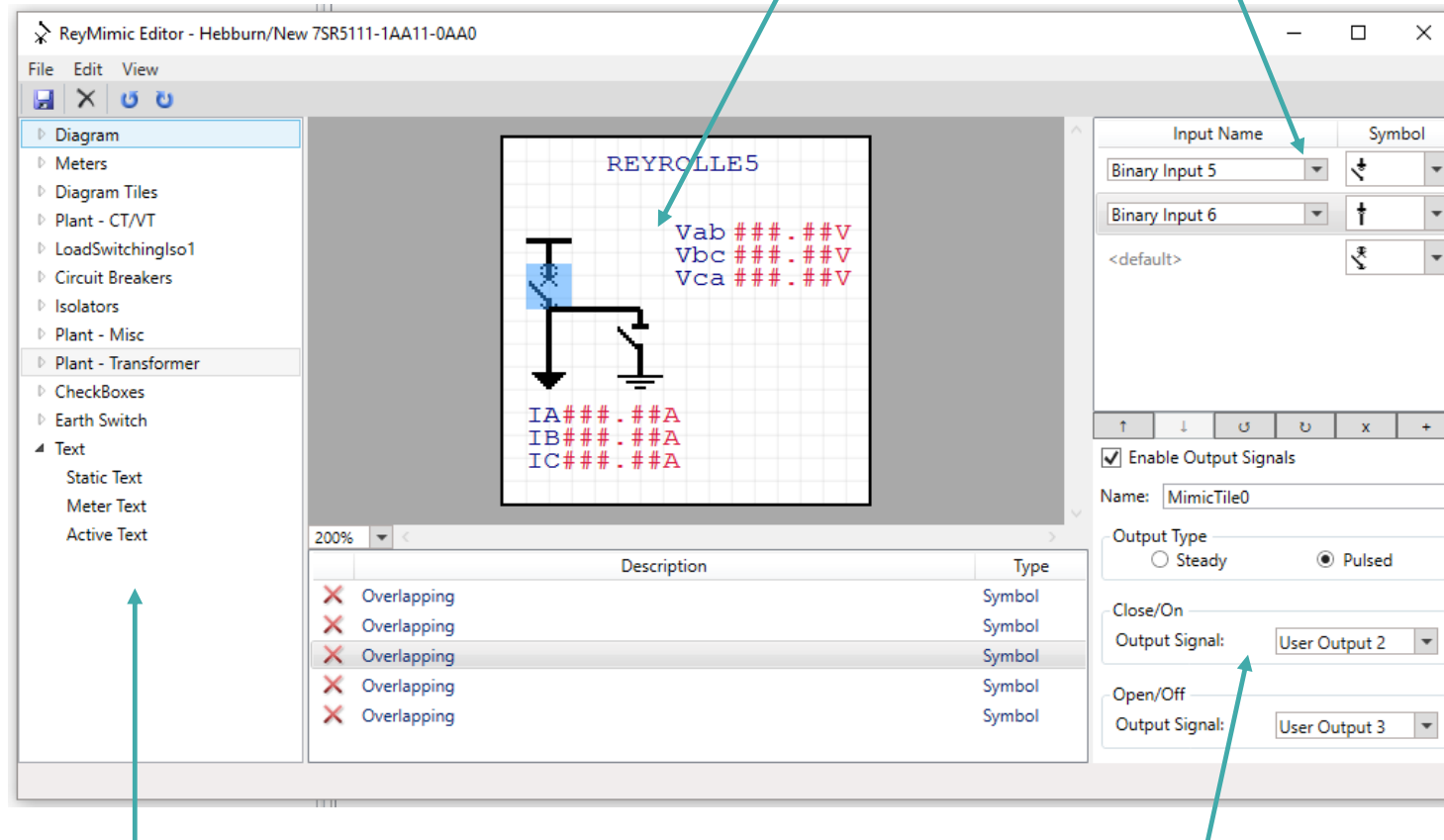
Reydisp Manager 2

ReyMimic editor

SIEMENS
Ingenuity for life

Main Diagram Page

Signal Catalog



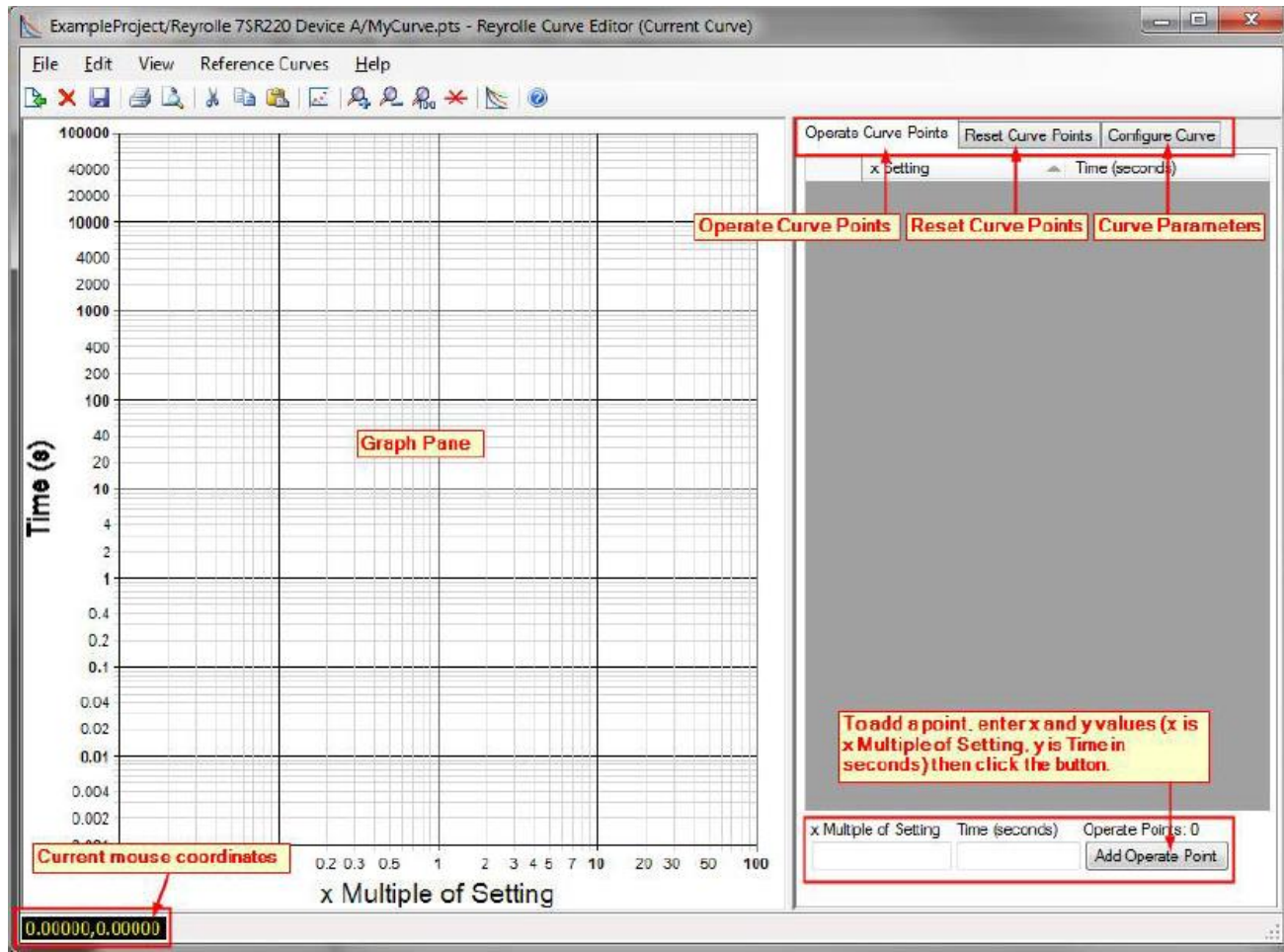
Tree Structure Library

Output Command Signals

5 different display pages can be configurable by user with using ReyMimic display editor. A wide range of agreed symbols are used in mimic creator library that can be easily drag and drop to insert screen. Easy to control any item highlighted on the mimic or listed in the control menu. CB status are displayed in mimic by the information of binary input status. Metered values or configurable text messages are also available for dragging to screen. Enable output signals for control operation

Reydisp Manager 2

Curve editor

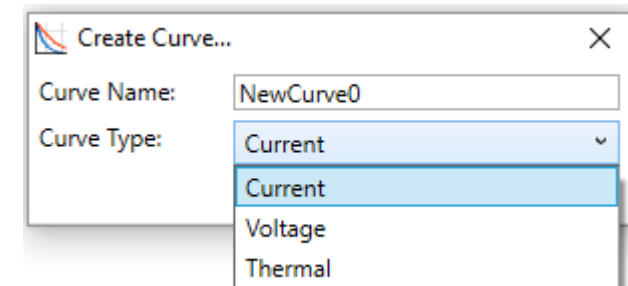


This editor allows the user to create custom time graded curves to have more flexibility with coordination cases additional to predefined IEC or ANSI curves.

The user defined curves are created and saved in the device configuration.

Curves can be copied and pasted between device configurations.

Current, voltage and thermal curve types are supported.



Reydisp Manager 2

Inputs Matrix

INPUT MATRIX

List View	Matrix View
Setting Name	Value
Reset Energy Meters	<none>
Inhibit 60VTS	<none>
Ext Trig 60VTS	<none>
Ext Reset 60VTS	<none>
Inhibit 27-1	BI1
Inhibit 27Vx-1	<none>
Inhibit 32-1	<none>
Inhibit 37-1	<none>
Inhibit 37G-1	<none>
Inhibit 46DT-1	<none>
Inhibit 46BC-1	<none>
Inhibit 47-1	<none>

7SR5111-1AA11-0AA0

Mapping Filters

Signal Filter

Filter by: CB

INPUT MATRIX

List View Matrix View

Signals View

Binary Input View

Virtuals View

Show All

Show Mapped

Show All

Name	BI1	BI2	BI3	BI4	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11
CB Closed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CB Open	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Close CB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Block Close CB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Open CB	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Block Open CB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reset CB Total Trip	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reset CB Delta Trip	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reset CB Trip Time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50BF CB Faulty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reset CB I^2t Wear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trigger CB I^2t Wear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Signal List

Binary Inputs

Virtual I/O

Binary Inputs, Virtual I/O's, Function Keys, General Alarm signals are mapped in Input Matrix

The user can choose to view all parameter settings for a particular element or function by using the Filter by option. In the above example the filter has been applied to the Output Matrix for all parameters containing CB.

Reydisp Manager 2

Input Matrix



BINARY INPUT CONFIG

Setting Name	Value
Inverted Inputs	BI2
BI Operate Voltage	Range 1: 24/48/60V
BI 1 Pickup Delay	0.020s
BI 1 Dropoff Delay	0s
BI 2 Pickup Delay	0.020s
BI 2 Dropoff Delay	0s
BI 3 Pickup Delay	0.020s

FUNCTION KEY CONFIG

Setting Name	Value
Function Key 1 Text	CLOSE CB
Function Key 0 Text	OPEN CB
Close CB	<none>
Open CB	<none>
Enabled In Remote	<none>

GENERAL ALARMS

Setting Name	Value
General Alarm-1	FUSE TRIP
General Alarm-2	TEMP ALARM
General Alarm-3	ALARM 3
General Alarm-4	ALARM 4
General Alarm-5	ALARM 5
General Alarm-6	ALARM 6

- inverted operation i.e. the input is energized when no supply is applied.
- DC operate voltage is selectable and applied to all binary inputs.
- The inputs have a default pickup delay setting of 20ms which provides security against operation in the presence of AC voltage across the input terminals

- General Alarm is user defined text and signal information for mapping any binary inputs
- Function Key Config for control or user logic mapping

Reydisp Manager 2

Output Matrix

11-1AA11-0AA0

Filter by: 50

OUTPUT MATRIX

List View Matrix View

Signals View Binary Output View Leds View Virtuals View

Show All Show Mapped Show Mapped Show All

Name	BO3	L1	L2	L4	L5	L6	V1	V2	V3	V4	V5
50-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50G-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50GS-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50N-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50AFD PhA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50AFD PhB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50AFD PhC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50GAFD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50SOTF-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50GSOTF-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50BF Delay 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50BF Delay 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50BF PhA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50BF PhB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Binary Outputs, Virtual I/O's, LEDs are mapped in Output Matrix with filter options



BINARY OUTPUTS

- OUTPUT MATRIX
- BINARY OUTPUT CONFIG
- LED CONFIG
- GENERAL PICKUP
- TRIP CONFIG

TRIP CONFIG

Setting Name	Value
Trip Contacts	BO1
Trip Triggered	L3

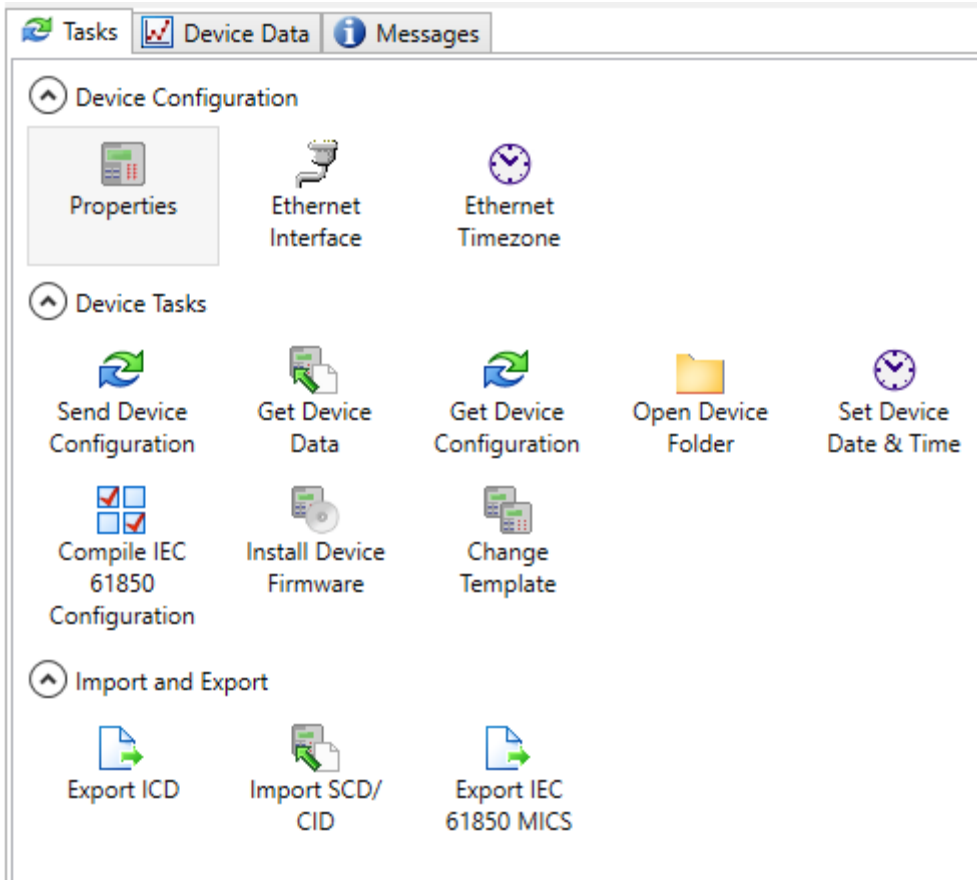
OUTPUT MATRIX

List View Matrix View

Setting Name	Value
51-1	<none>
51G-1	<input type="checkbox"/> BO1
51GS-1	<input type="checkbox"/> BO2
51N-1	<input type="checkbox"/> BO3
55-1	<input type="checkbox"/> BO4
59-1	<input type="checkbox"/> BO5
59 PhA	<input type="checkbox"/> BO6
59 PhB	<input type="checkbox"/> BO7
59 PhC	<input type="checkbox"/> BO8
59Vx-1	<input type="checkbox"/> L1
59NDT-1	<input type="checkbox"/> L2
59NIT-1	<input type="checkbox"/> L3
60CTS-I	<input type="checkbox"/> L4
60CTS-I PhA	<input type="checkbox"/> L5
60CTS-I PhB	<input type="checkbox"/> L6
60CTS-I PhC	<input type="checkbox"/> L7
60CTS-V	<input type="checkbox"/> L8
78VS-1	<input type="checkbox"/> L9
81-1	<input type="checkbox"/> L10
	<input type="checkbox"/> L11
	<none>
	<none>
	<none>
	<none>

Reydisp Manager 2

Tasks



Properties: Allows viewing and editing of the device properties including template version, serial number, name, IEC 61850 edition, and IP address.

Ethernet Interface: for configuring Ethernet communication setting (IP address, redundancy, etc.)

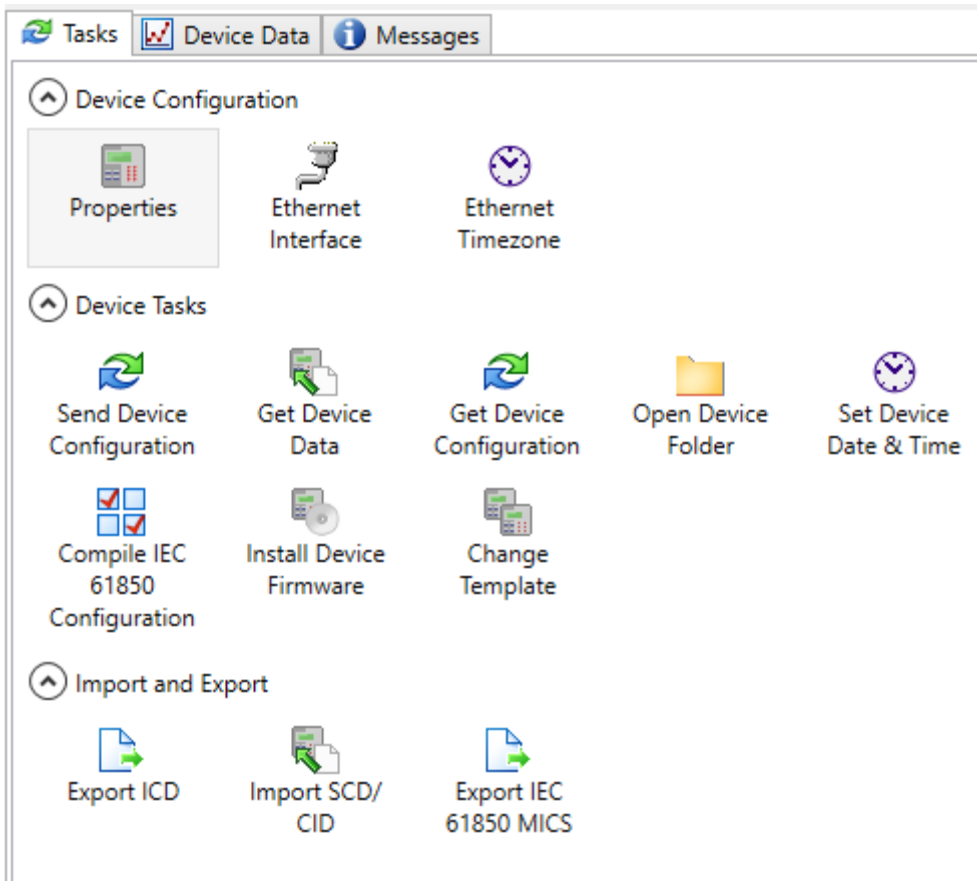
Ethernet Timezone: configuration of ethernet communication time settings.

Export ICD: device ICD file can be exported for use in another vendor's IEC 61850 configuration tool.

Import SCD/CID: Another vendor's tool is used to configure the station (SCD file).

Export IEC 61850 MICS: provides the user with the Model Implementation Conformance Statement directly from device configuration to provide a specific user specific data.

Reydisp Manager 2 Tasks



Send Device Configuration: sending offline settings to relay by online connection. After this initialization, the device is restarted.

Get Device Data: The stored data in the 7SR5 device such as available Waveform records, fault records and event log can be retrieved to PC. These retrieved data will be stored under Device Data tab with date&time format.

Get Device Configuration: To retrieve device configuration and settings

Open Device Folder: Shortcut to reach device folder that saved on your PC

Set Device Date&Time: Configuring device's date and time settings by using PC with PC time or manual a different time

Compile IEC61850 Configuration: updating any change in IEC61850 configuration

Install Device Firmware: update the firmware in 7SR5 to match the firmware in the Reydisp Manager template using the device task function.

Change Template: this function is to adapt an existing device than to start with a new different variant MLFB device and configure it.

Reydisp Manager 2 Tasks

Edit Time Zone

Time zone offset to UTC (hh:mm): +00:00

☒ No summer time switchover

Summer time offset to UTC (hh:mm): +01:00

Start of Summer Time:

Week: Last

Day: Sunday

Month: March

Switchover Time: 02:00

End of Summer Time:

Week: Last

Day: Sunday

Month: October

Switchover Time: 03:00

Apply Cancel

Ethernet Timezones

Allows the time zone to be set for the device Ethernet port and allows the daylight saving times to be set by using Ethernet communication.

By default, the relay is set to GMT, with no daylight saving offset specified

The Ethernet interface uses the UTC time format and a parameter for configuring the applicable rules for the local time.

Offset and daylight saving time are provided in Reydisp Manager.

Reyrolle 5 Conclusion

Low life cycle cost

Versatile interfaces



Current Analogue Access

Suitable for both 1A & 5A inputs with accuracy to provide sensitive earth fault.

Local Access

High speed front USB communication port for device configuration. In addition the Function settings can be viewed and edited from the fascia menus.

Voltage Analogue Inputs

Facilitating voltage derived and directional protection and measurements

Remote Access Communications

Ethernet IEC 61850 and Serial RS485 communications supplied as standard in all models and capable of operating simultaneously.

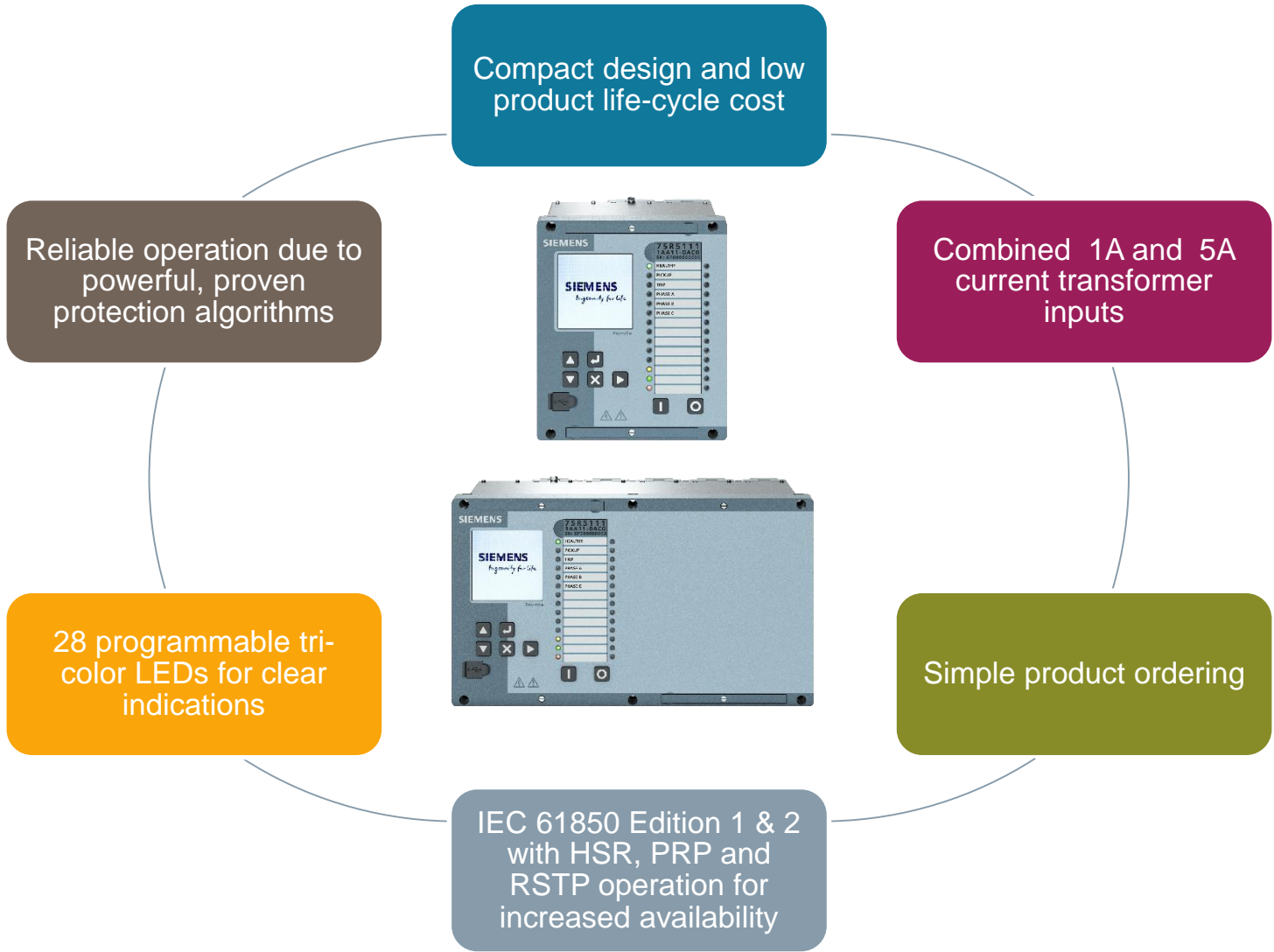
Universal Power Supply

One solution that simplifies the order process.

Binary Inputs and Outputs

Binary input threshold is configurable in software making the order process even easier.

Reyrolle 5 Benefits



Low life cycle cost

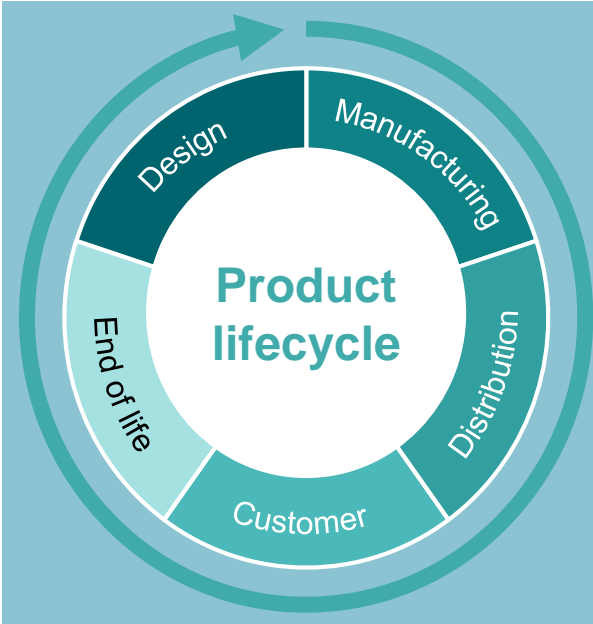
Reliable and efficient lifecycle

Manufacturing

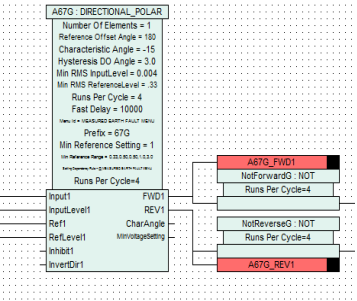
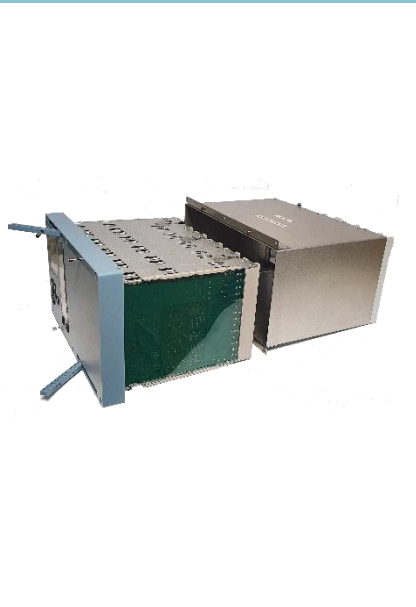
Easy Ordering

Reliable operation

Software Design



- ✓ 1A and 5A Inputs
- ✓ Universal Power Supply
- ✓ Software configurable BI threshold
- ✓ Single Comprehensive Function Pack



$$t_{op} = \left[\frac{A}{\left(\frac{I}{I_s} \right)^p - 1} + B \right] \cdot T_m$$



Designed for manufacture. We use the latest techniques in assembly and test.

Ordering variations are kept to a minimum

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