

This webinar brought to you by the Relion[®] product family

Advanced protection and control IEDs from ABB

Relion. Thinking beyond the box.

Designed to seamlessly consolidate functions, Relion relays are smarter, more flexible and more adaptable. Easy to integrate and with an extensive function library, the Relion family of protection and control delivers advanced functionality and improved performance.



ABB Protective Relay School Webinar Series

Disclaimer

ABB is pleased to provide you with technical information regarding protective relays. The material included is not intended to be a complete presentation of all potential problems and solutions related to this topic. The content is generic and may not be applicable for circumstances or equipment at any specific facility. By participating in ABB's web-based Protective Relay School, you agree that ABB is providing this information to you on an informational basis only and makes no warranties, representations or guarantees as to the efficacy or commercial utility of the information for any specific application or purpose, and ABB is not responsible for any action taken in reliance on the information contained herein. ABB consultants and service representatives are available to study specific operations and make recommendations on improving safety, efficiency and profitability. Contact an ABB sales representative for further information.

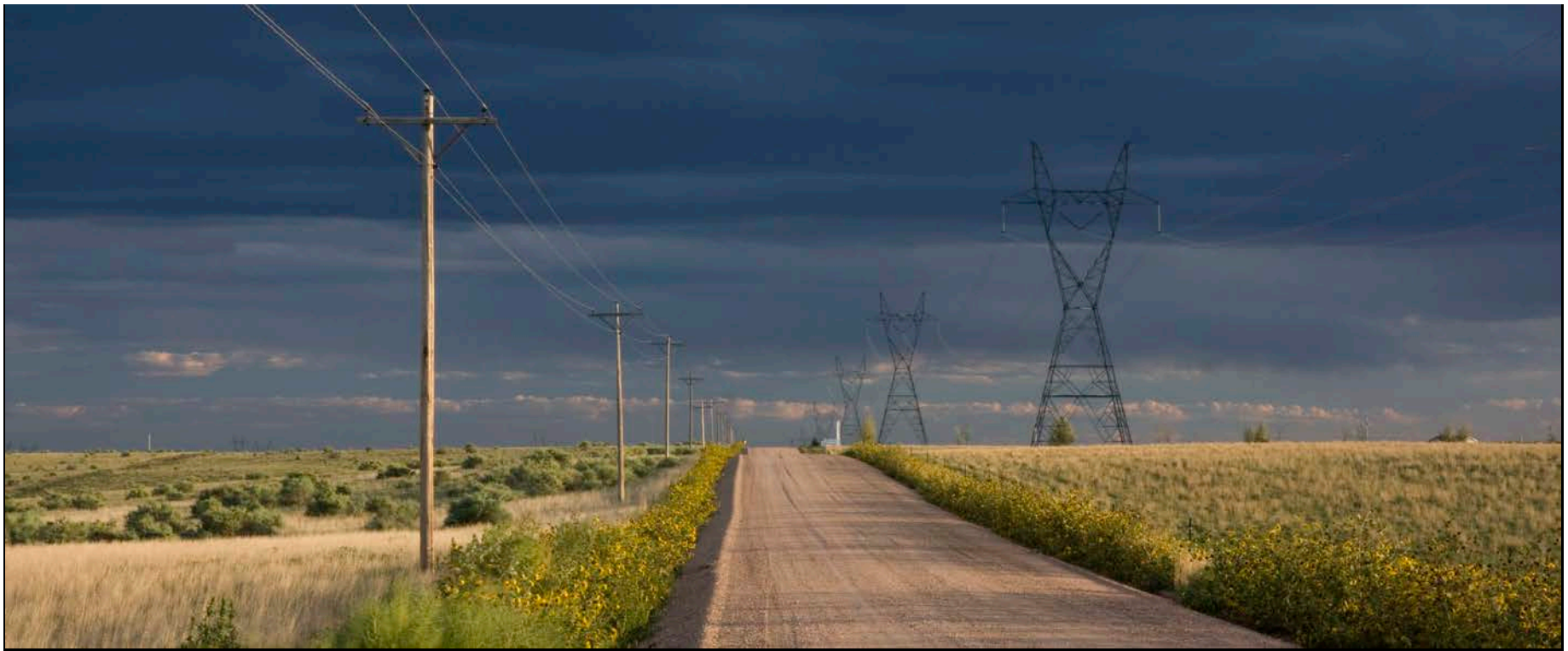


ABB Protective Relay School Webinar Series

RER620 Recloser Control

Presenter



Bob Wilson

Bob graduated from Purdue University and joined Westinghouse Electric Corp. After receiving a Masters degree in Electrical Engineering from Carnegie Mellon University, Bob was a Systems Analysis Engineer responsible for software designed to automate system-wide coordination. He then transferred to Kansas City where he assumed the role of District Engineer and eventually moved to the Houston area where he currently resides.

In his current role as Regional Technical Manager, he supports ABB's Substation Automation and Protection Division, providing technical support to customers throughout the South Central United States. Bob is a senior member of IEEE and has authored and presented several papers in power system protection at a variety of technical conferences throughout the United States. He is a Registered Professional Engineer in the states of Pennsylvania and Texas.

Learning objectives

- In this webinar you'll learn:
 - Overview of the RER620 recloser controller
 - Unique protection elements and their application
 - Overview of WebHMI (web browser interface)
 - Overview of PCM600 configuration/setting tool
 - How to create customized graphics screens
 - How to retrieve COMTRADE waveform files and quickly create condensed color pdf reports
 - How to develop customized logic

Breaker & Recloser...what are the differences?

- BREAKERS...
 - have higher interrupting ratings ...40kA or more
 - don't usually include the relay but require only a simple dry trip contact interface, making it easy to mix and match vendors.
 - are generally larger, heavier and more expensive
- RECLOSERS...
 - include the relay controller with the capability to automatically close the primary contacts multiple times to restore service automatically.
 - are much smaller and lighter allowing them to be pole-mounted
 - are generally limited to about 16kA or less interrupting current
 - are often equipped with magnetic actuators with relay controllers that match the characteristics of the particular *actuator...not a simple a pulse output*

Relion® RER620 recloser controller

The RER620 relay controller is used in ABB's Gridshield Recloser



Relion® 620 protective relay series

RER620 recloser control



- RER620 is a member of ABB's Relion product family and part of its 620 protection and control product series that also includes transformer, feeder and motor protection
- The 620 series IEDs are characterized by their compactness and withdrawable design

Relion 620 series

RER620 drawout chassis and modular construction



Like all members of the Relion 615 and 620 series, the RER620 is both draw-out and draw-in for minimum downtime

Relion[®] RER620

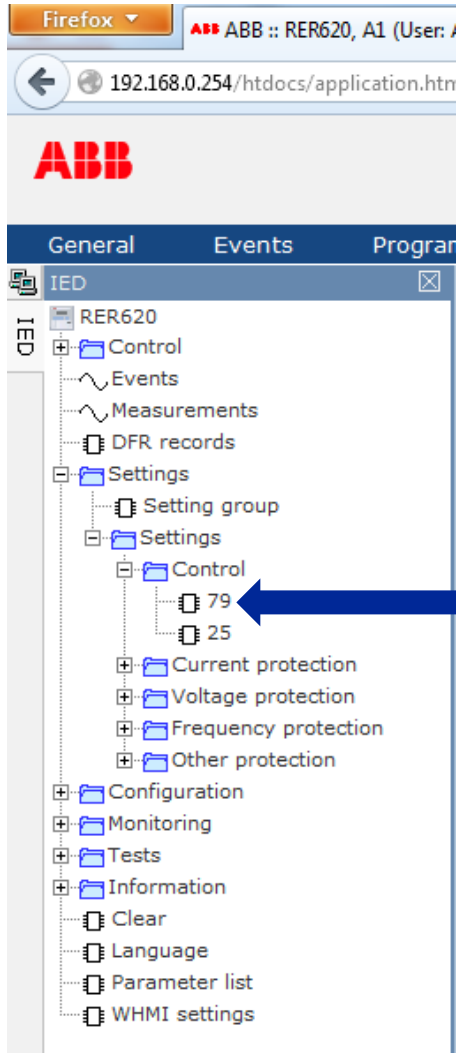
Standard configuration



- One standard configuration with dual directional phase and ground overcurrent and directional ground/earth-fault protection
- Single-phase or Three-Phase operation
- Under/over voltage phase and sequence based voltage protection
- Under/over frequency, load shed & restoration schemes
- High Impedance Detection (HIZ) and open conductor (46PD)
- Highly configurable to meet almost any special application

Relion® RER620

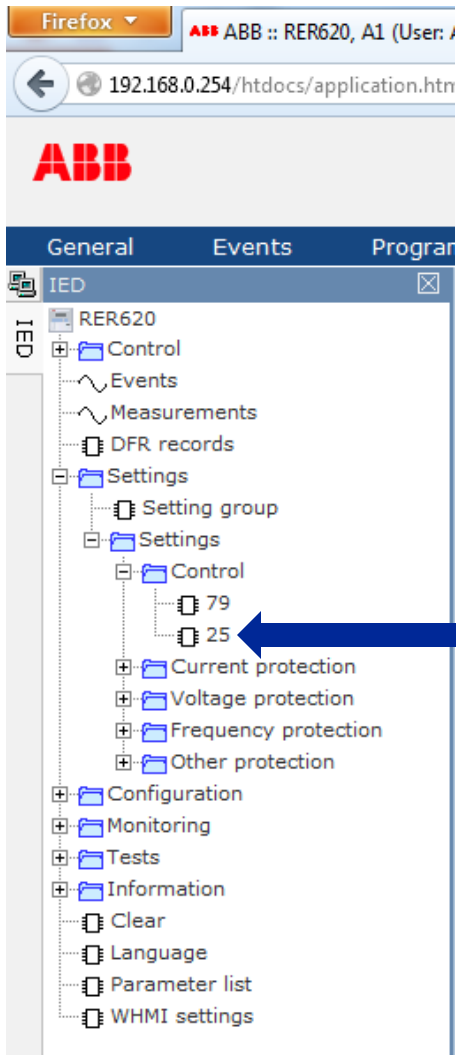
Standard configuration – Auto Recloser



- Clears most transient and semi-transient faults
- 79 function accommodates up to 5 shots
- 3 operating modes
 - OPUP – only picked up phases
 - OOAP – one or all phases
 - APAT – all phases all the time

Relion® RER620

Standard configuration – Synch Check

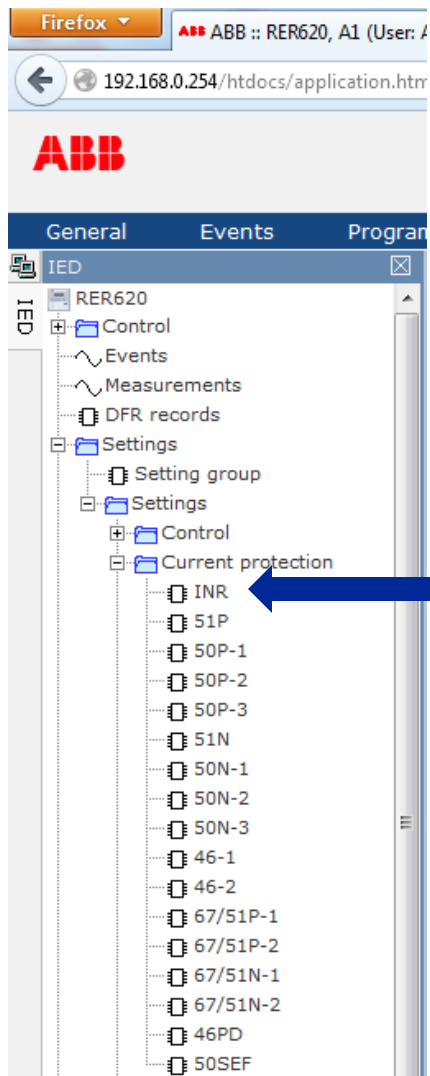


25 synch check function with selectable voltage magnitude and angle difference limits

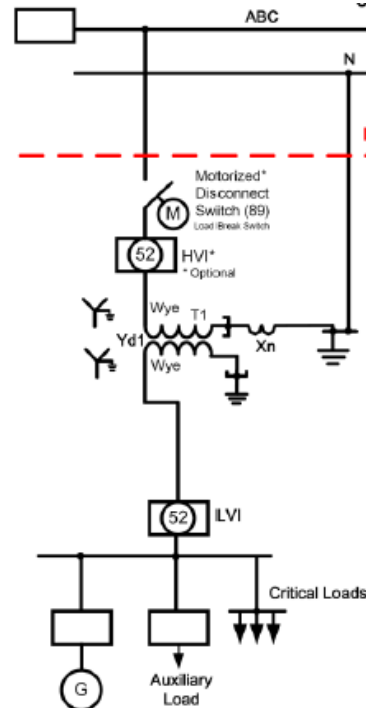
- Off
- Both Dead
- Live Line – Dead Bus
- Dead Line – Live bus
- Dead Bus – Line Any
- Dead Line – Bus Any
- One Live – One Dead
- Not Both Live

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Standard configuration – Inrush Detection

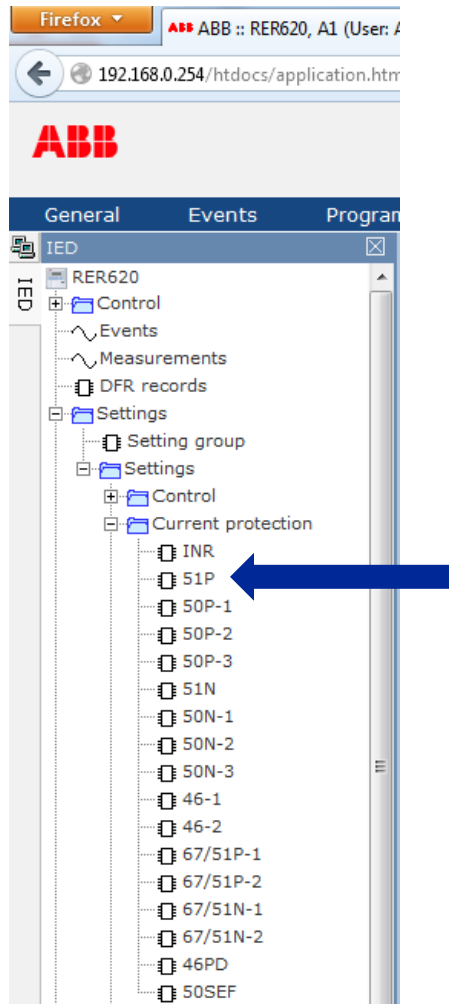


- Second harmonic detector can be used to selectively block overcurrent elements from tripping
- Applicable when large downstream transformers are energized, especially DG applications



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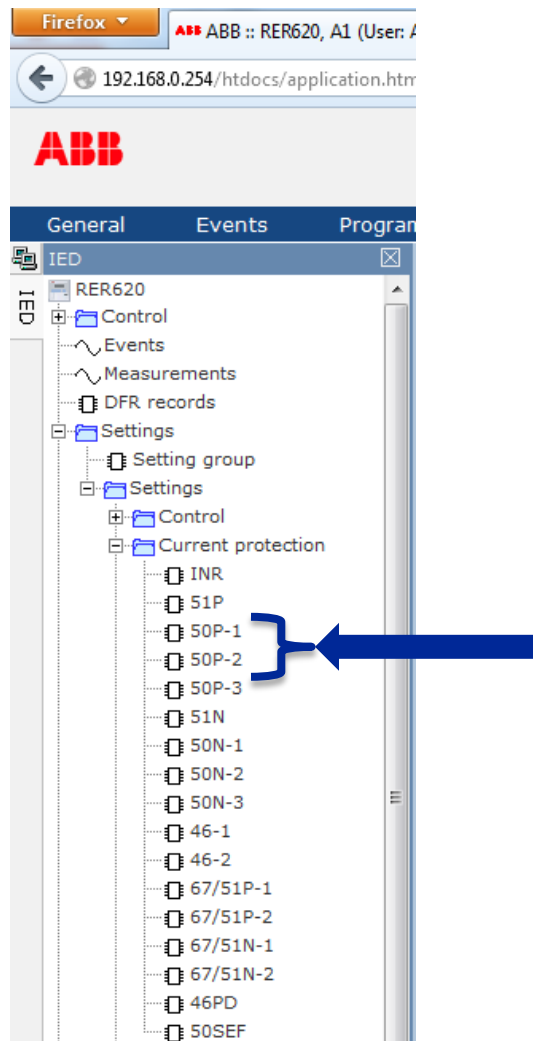
Standard configuration – 51P



- Non directional phase overcurrent protection
- Extensive curve library includes...
 - 8 standard ANSI curve shapes
 - 7 standard IEC curve shapes
 - 39 “Recloser” curve shapes
 - Programmable curve shape

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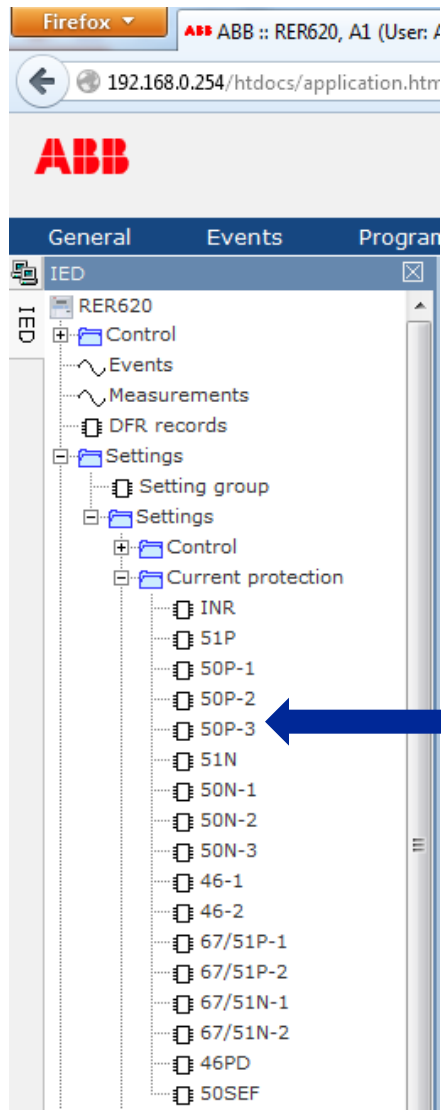
Standard configuration – 50P-1, 50P-2



- Non directional phase high-set overcurrent protection can also be used as additional TOC elements
- Extensive curve library includes...
 - 8 standard ANSI curve shapes
 - 7 standard IEC curve shapes
 - 39 “Recloser” curve shapes
 - Programmable curve shape

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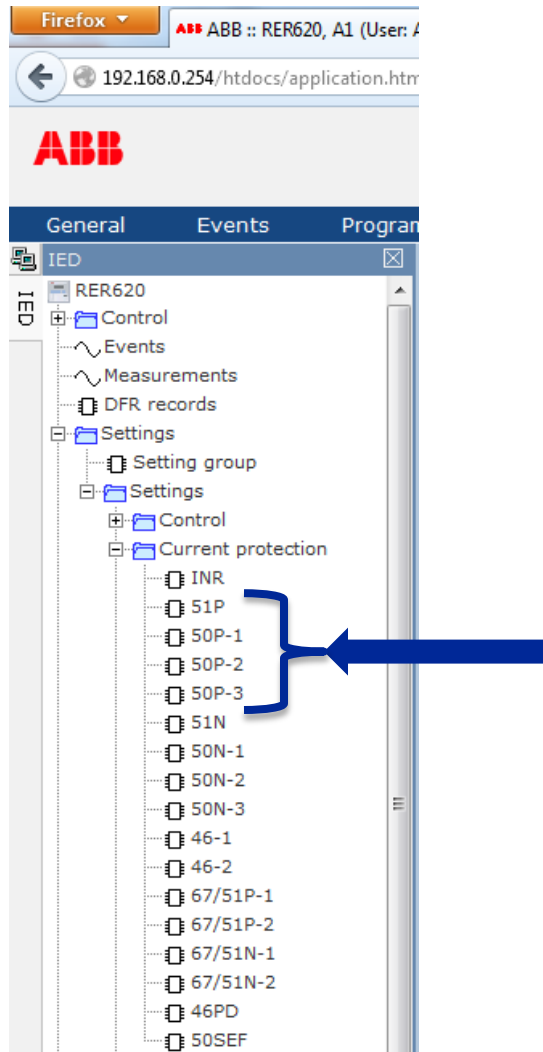
Standard configuration – 50P-3



- Non directional phase high-set overcurrent protection
- 50D element with selectable time delay

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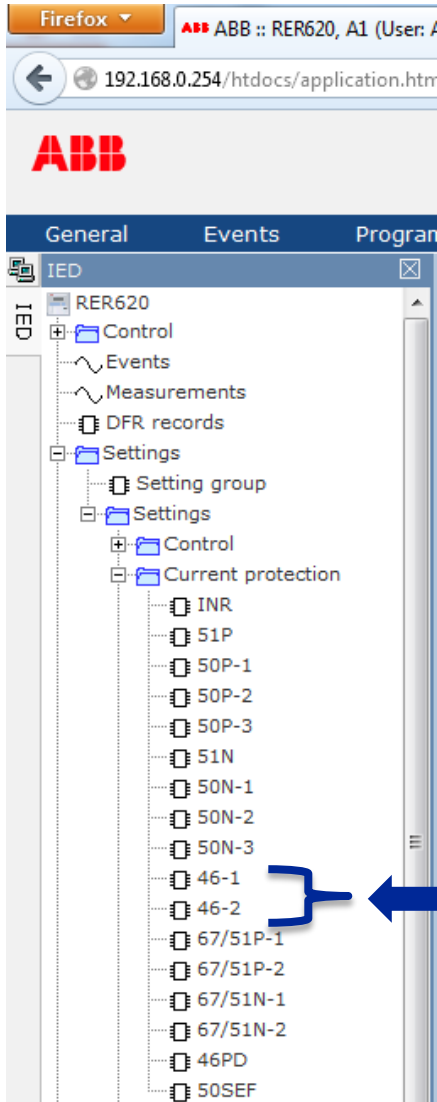
Standard configuration – Ground fault protection



- 51N, 50N-1, 50N-2 and 50N-3 protection elements have similar curve shape possibilities as their phase protection counterparts

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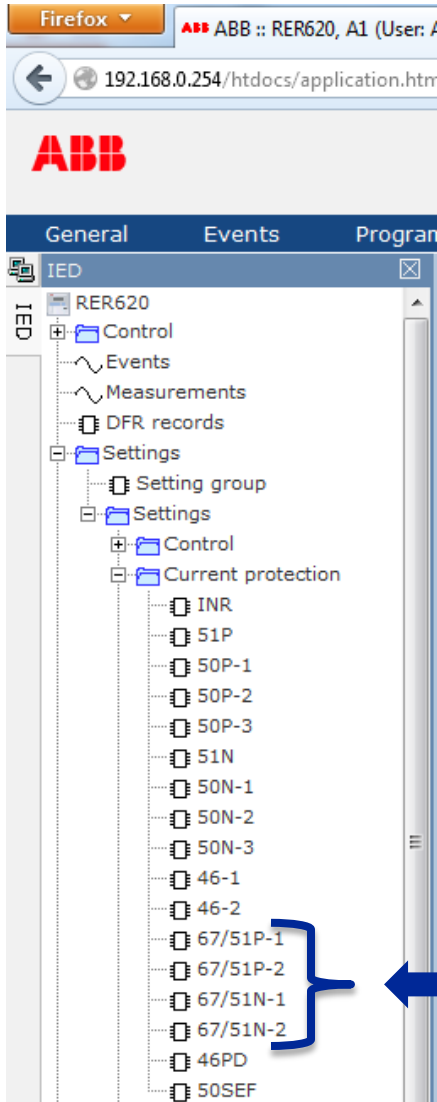
Standard configuration – unbalance current protection



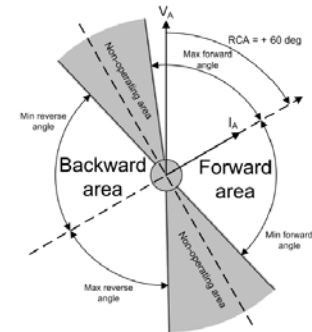
- Two instances of negative sequence (46) protection
- Same curve shape possibilities as the phase and ground overcurrent elements

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Standard configuration – Directional OC protection

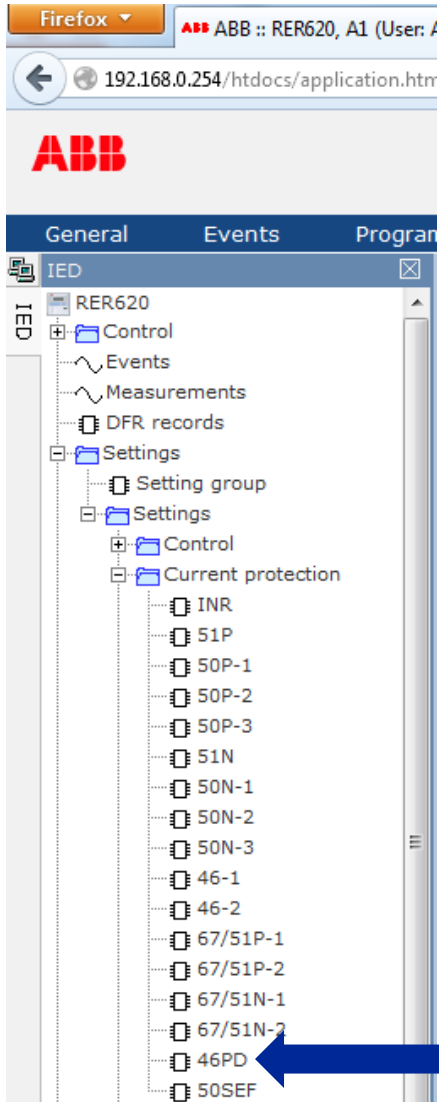


- Two instances directional phase OC elements (67/51P-1 and 67/51P-2)
- Two instances of directional ground OC elements (67/51N-1 and 67/51N-2)
- All elements can selectively take on non-directional characteristics for even more flexibility
- All elements can have any of the same curve shapes available to the non-directional phase and ground elements
- Maximum torque angles are adjustable from 0 to 360 degrees in 1 degree steps

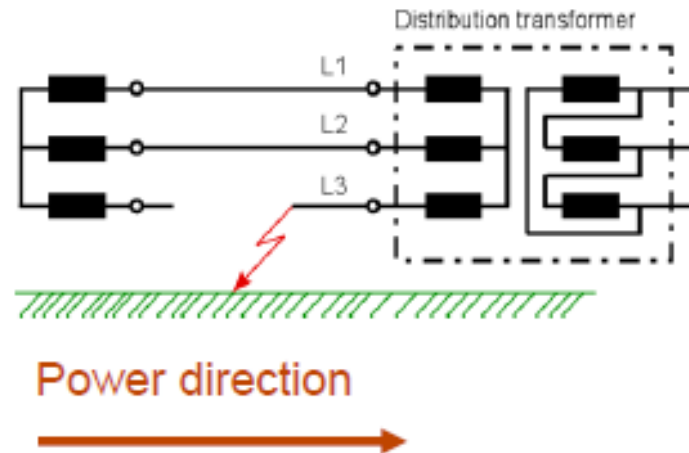


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Standard configuration – 46 phase discontinuity

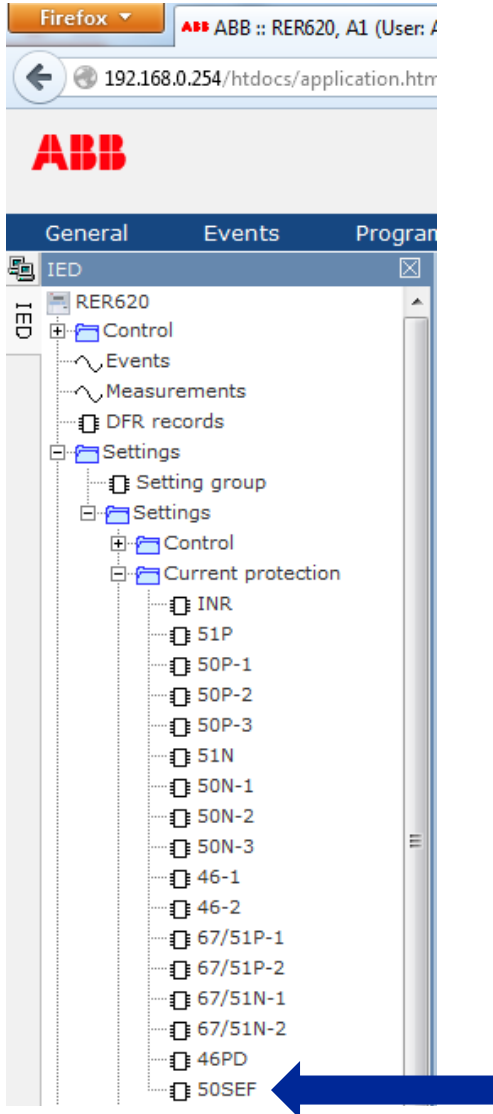


- 46PD function operates on I_2/I_1 for more sensitive detection of open phase conductor events
- More sensitive than I_2 or I_0 alone due to setting limitations associated with natural load unbalances
- Set in percentage of phase current



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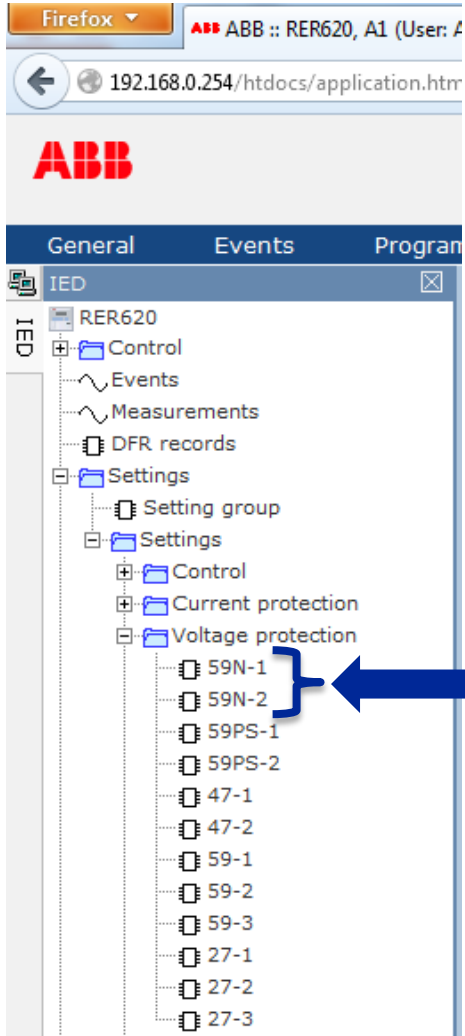
Standard configuration – SEF (Sensitive Earth Fault)



- Overcurrent protection for high-resistance or ungrounded systems where ground fault currents are unusually low
- Can take on any of standard ANSI or IEC curve shapes as well as a programmable curve shape

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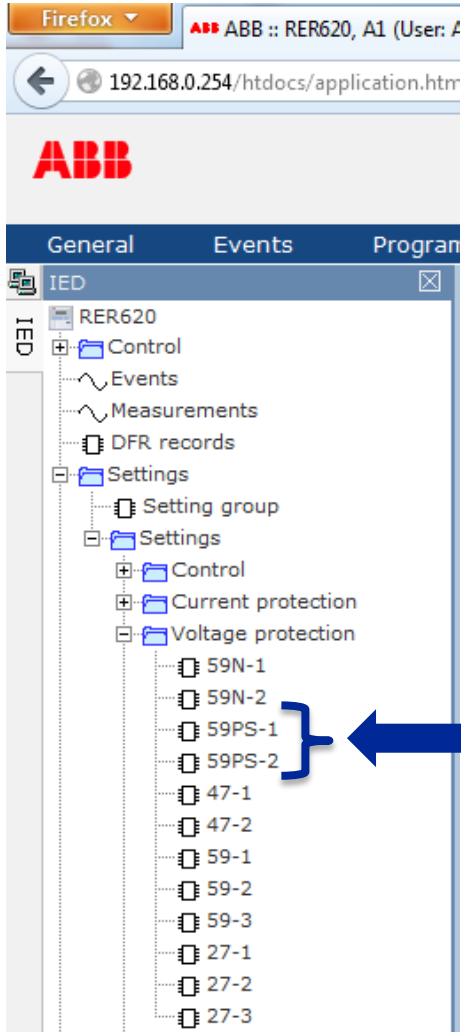
Standard Configuration – 59N Ground OV Protection



- Two instances of ground overvoltage protection
- Definite time characteristics

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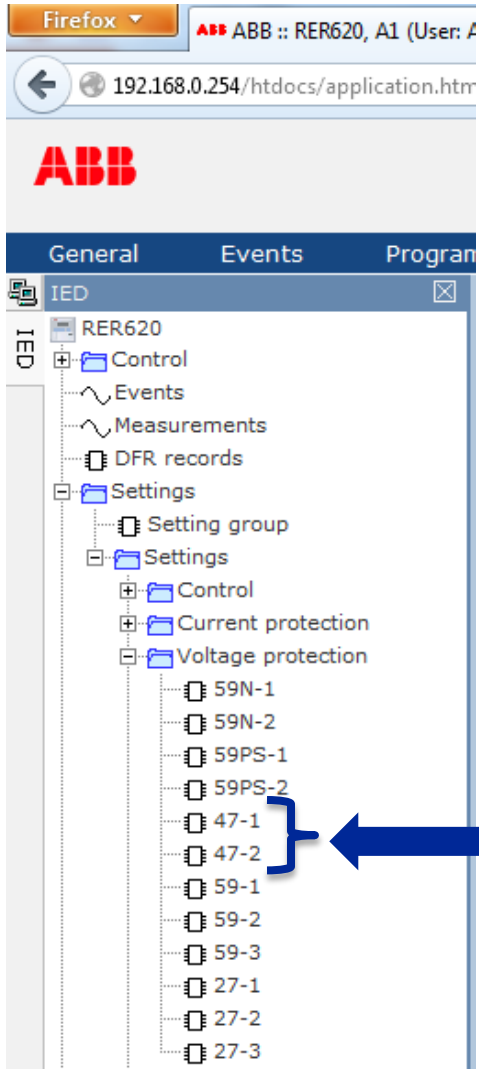
Standard Configuration – 59PS Positive Sequence OV



- Two instances of positive sequence overvoltage protection
- Definite time characteristics

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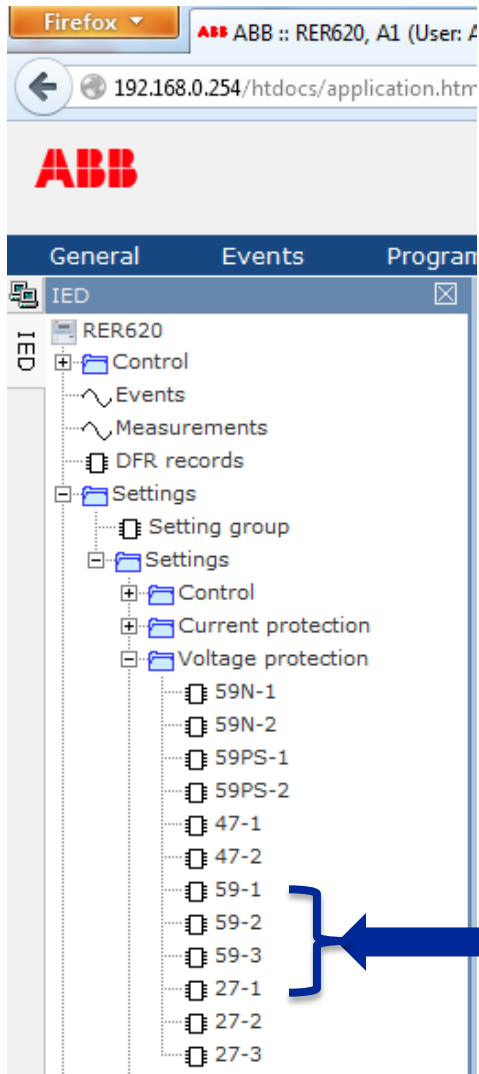
Standard configuration – 47 unbalanced voltage



- Two instances of negative sequence voltage protection
- Definite time characteristics

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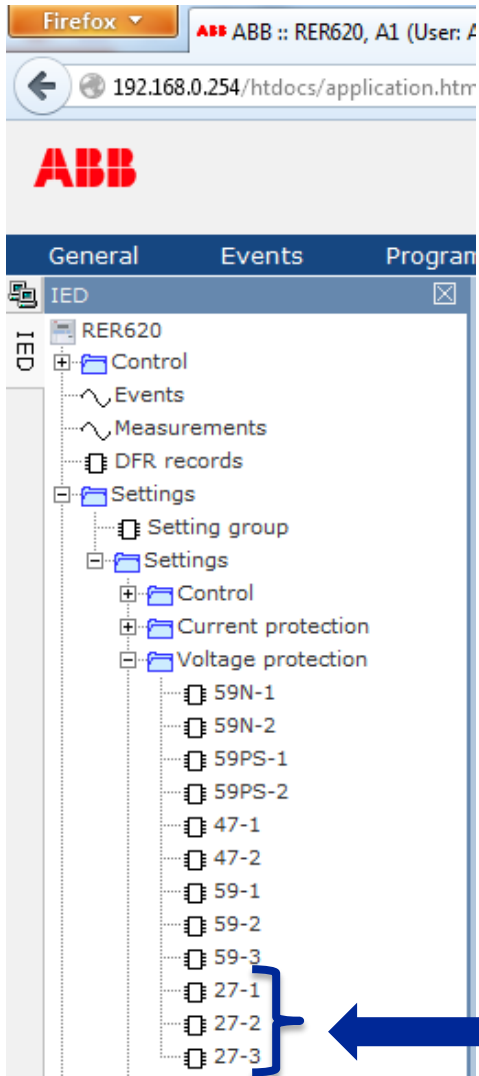
Standard configuration – 59 phase overvoltage



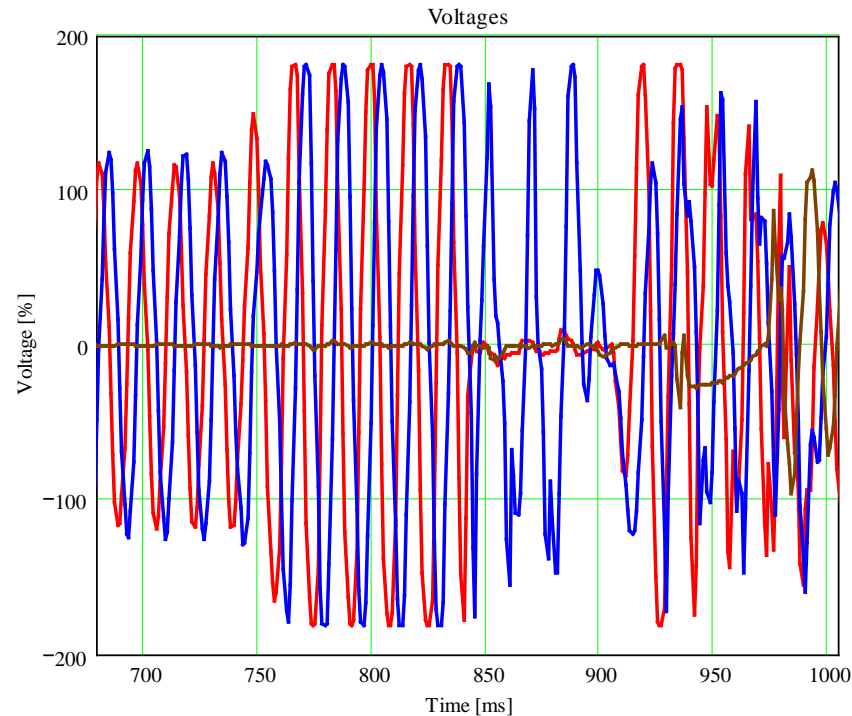
- Three instances of phase overvoltage voltage protection
- Inverse, Definite Time or Programmable curve characteristics

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Standard configuration – 27 phase undervoltage

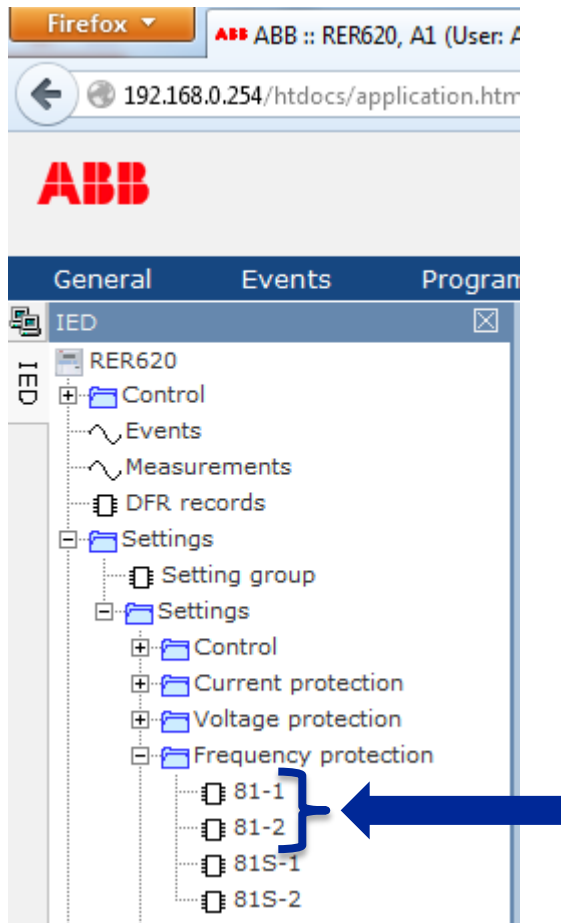


- Three instances of phase undervoltage protection
- Inverse, Definite Time or Programmable curve characteristics

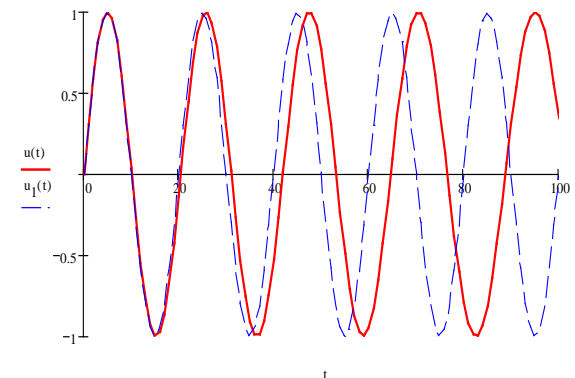


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Standard configuration – 81 frequency protection

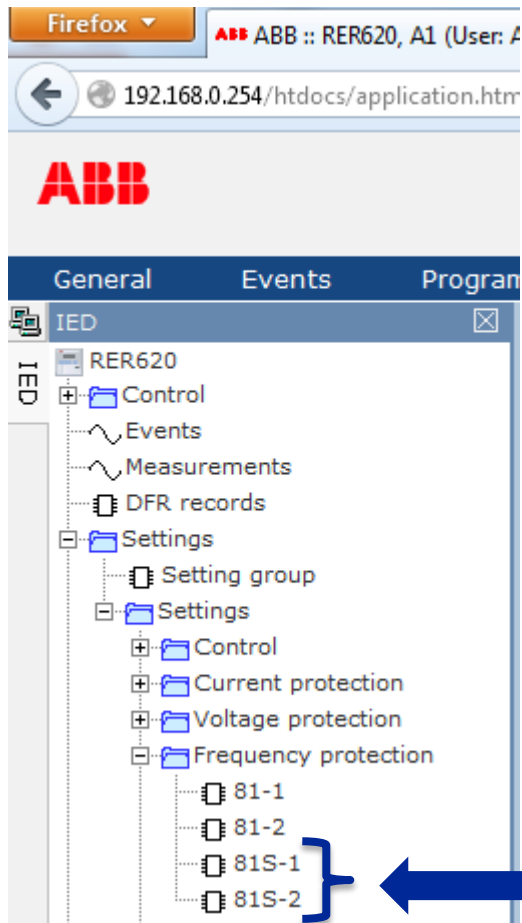


- Two instances of general frequency protection which can take on the following characteristics
 - underfrequency ($<f$)
 - overfrequency ($>f$)
 - df/dt (rate of change of frequency)
 - $<f$ AND df/dt
 - $<f$ OR df/dt
 - $>f$ AND df/dt
 - $>f$ OR df/dt



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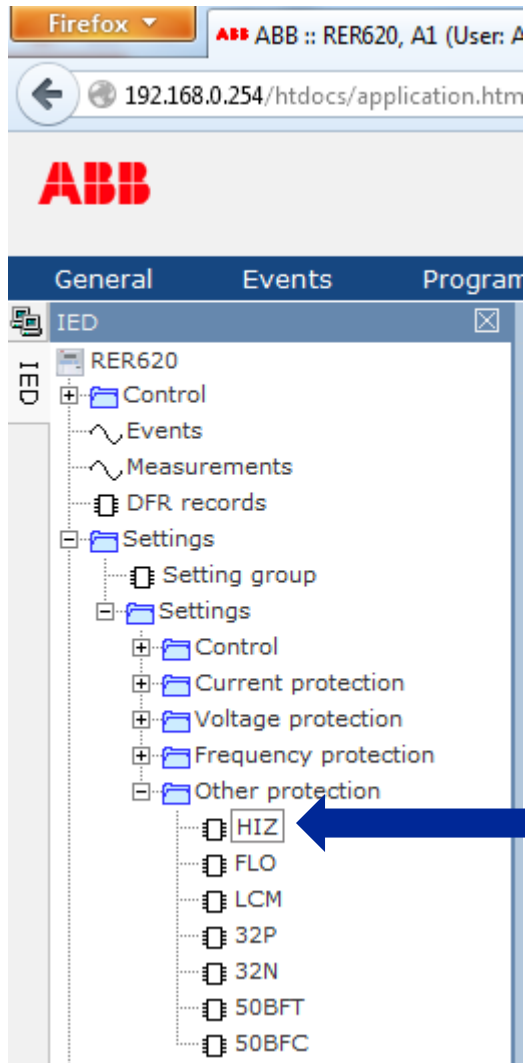
Standard configuration – 81S load shed underfrequency



- Two instances of underfrequency load shedding elements can take on the following characteristics
 - $<f$
 - $<f$ AND df/dt
 - $<f$ OR df/dt

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Standard configuration – HIZ High Impedance Fault



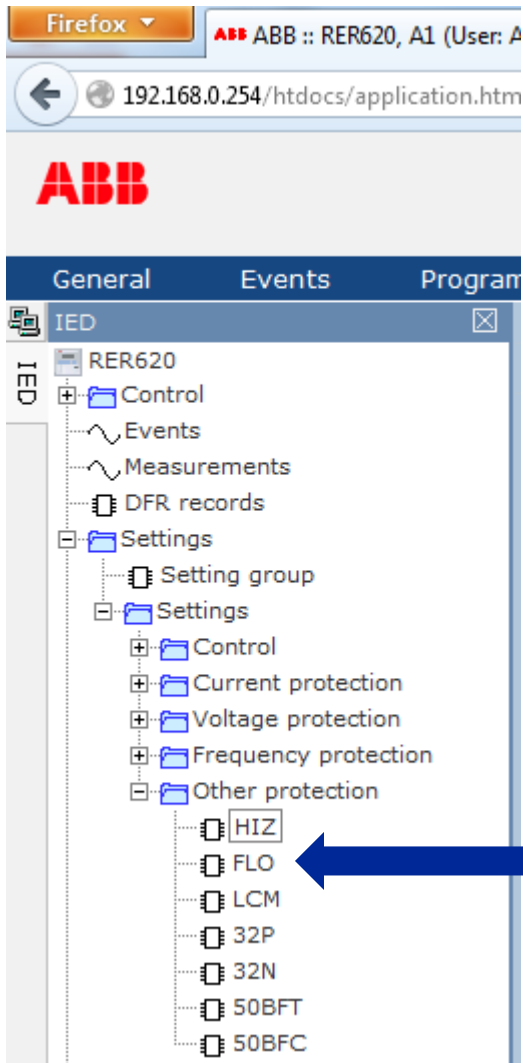
- High impedance fault or downed conductor faults pose a danger to humans and animals
- High impedance faults have been implicated as a root cause in major wildfires
- High impedance faults are impossible to detect by conventional methods
- Ground fault signatures and algorithms resulting from over 7 years of research and testing



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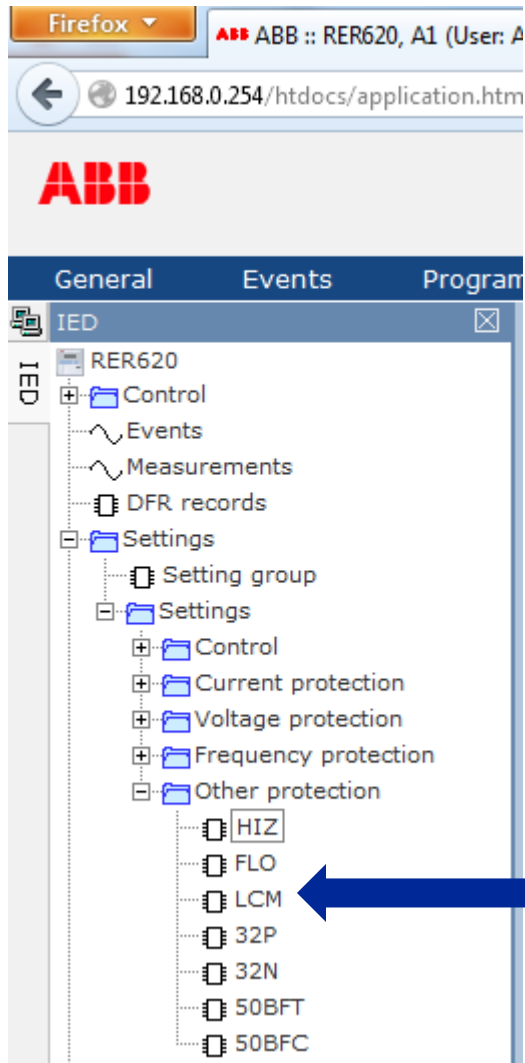
Standard Configuration – Fault Location

- Determines the distance to the fault based on the calculated impedance to the fault



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Standard configuration – Loop control module

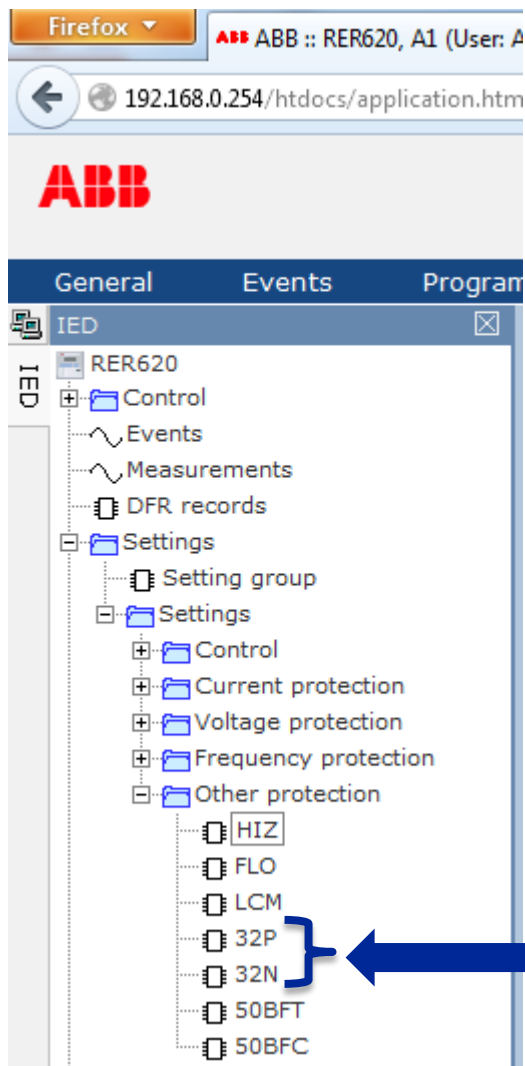


- Built-in loop control logic can open/close reclosers in a loop configuration following a recloser lockout to restore service to the unaffected sections of loop
- Reduces SAIFI
- Requires no communication between reclosers

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Standard configuration - directional phase and ground power

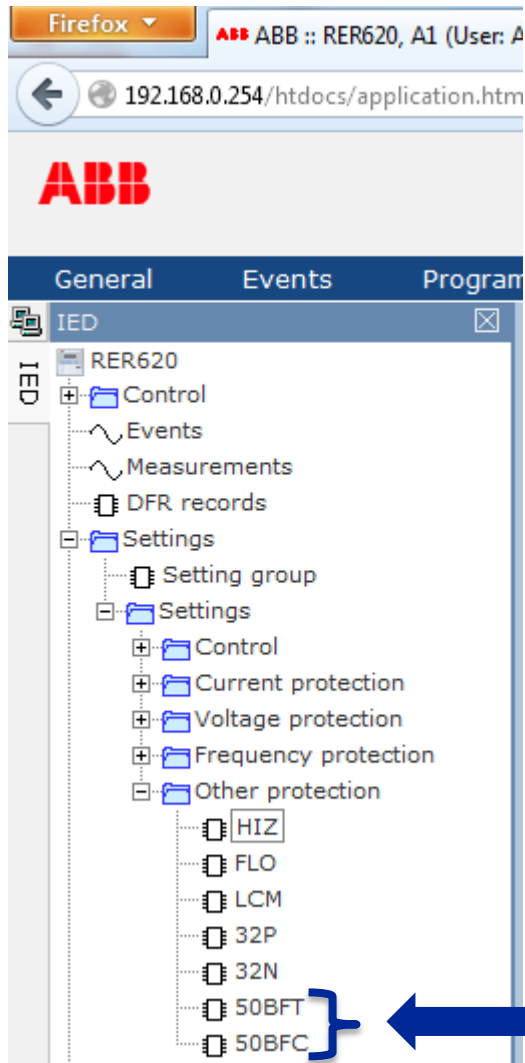
- Used for fast control of other elements
- Maximum torque angle can be set from -179 to 180 degrees, forward or reverse



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Standard configuration – Breaker failure trip & close

- 50BFT – slow/failure to trip
- 50BFC – slow/failure to close

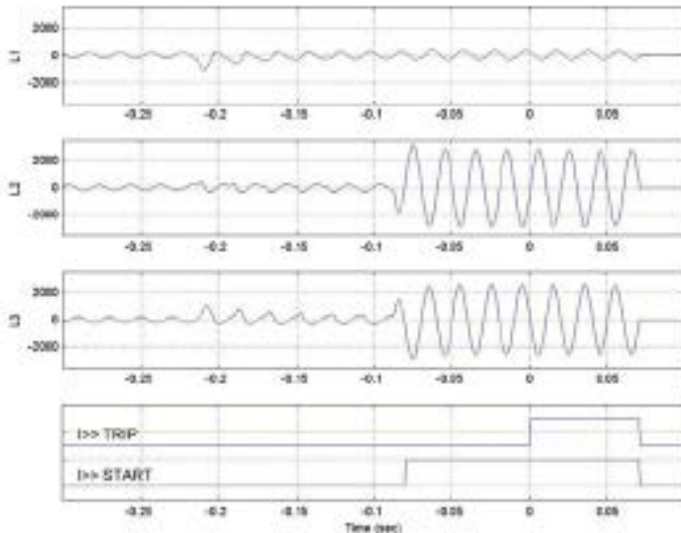


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Standard configuration – Oscillography



- Up to 10 **seconds** of recording times
- Variable pre and post trigger times
- Default storage time is 50 cycles
- Records up to 12 analog channels and 64 binary channels
- Typically storage is 30 events at 50 cycles in length
- Stored in COMTRADE format



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Standard Configuration – Communication Protocols



- Includes popular communication protocols
 - Modbus RTU...*standard*
 - DNP 3.0 Level 2
Plus...*standard*
 - IEC61850...*standard*

Relion® RER620 WebHMI web browser

Change settings, retrieve event records and waveform capture files
without proprietary software

The screenshot shows the ABB Relion RER620 WebHMI web browser interface. The browser window displays the URL `192.168.0.254/htdocs/application.html`. The interface includes a navigation menu on the left with categories like Control, Events, Measurements, DFR records, Settings, Configuration, Monitoring, Tests, Information, Clear, Language, Parameter list, and WHMI settings. The main content area displays 'Device version' and 'Device status' information.

Description	Value
Hardware revision	D
Software version	1.1

Description	Value
Normal	<input checked="" type="radio"/>
Pickup	<input type="radio"/>
Trip	<input type="radio"/>

Relion® RER620

WebHMI web browser

Firefox ABB :: RER620, A1 (User: Administrator, ...)

192.168.2.10/htdocs/application.html

ABB

General Events Programmable LEDs Phasor Diagrams Disturbance records Single Line Diagram

IED RER620

- Control
- Events
- Measurements
- DFR records
- Settings
- Configuration
- Monitoring
- Tests
- Information
- Clear
- Language
- Parameter list
- WHMI settings

Device version

Description	Value
Hardware revision	D
Software version	1.1

Device status

Description	Value
Normal	<input checked="" type="radio"/>
Pickup	<input type="radio"/>
Trip	<input type="radio"/>

Relion® RER620

WebHMI web browser – event records

The screenshot shows the ABB RER620 WebHMI interface in a Firefox browser. The browser address bar shows the URL `192.168.2.10/htdocs/application.html`. The interface features a navigation menu with tabs for General, Events, Programmable LEDs, Phasor Diagrams, Disturbance records, and Single Line Diagram. The 'Events' tab is active, displaying a table of event records. The left sidebar shows a tree view of the system configuration, including settings for protection and monitoring.

Events

Date	Time	Device	Object text	Event
09/14/2014	12:12:51.344	79	SHOT_PTR	3
09/14/2014	12:12:51.323	VA,VB,VC	LOW_ALARM	True
09/14/2014	12:12:51.044	67/51N-2	PICKUP	True
09/14/2014	12:12:51.044	67/51N-1	PICKUP	True
09/14/2014	12:12:51.015	67/51P-2	PICKUP	Phase A
09/14/2014	12:12:51.007	50N-1	PICKUP	True
09/14/2014	12:12:51.007	50P-1	PICKUP	Phase A
09/14/2014	12:12:50.757	52	Phase C	closed
09/14/2014	12:12:50.757	52	Phase B	closed
09/14/2014	12:12:50.757	52	Phase A	closed
09/14/2014	12:12:50.757	52	All phases	closed
09/14/2014	12:12:50.757	MVGAPC1	Q2	True
09/14/2014	12:12:50.757	MVGAPC1	Q1	False
09/14/2014	12:12:50.748	79	SHOT_PTR	2
09/14/2014	12:12:50.732	79-OUT	CLOSE_CB_3P	True
09/14/2014	12:12:50.732	79	INPRO	False
09/14/2014	12:12:50.732	79	INPRO_1	False
09/14/2014	12:12:50.469	79	STATUS	In progress
09/14/2014	12:12:50.457	52	Phase C	open
09/14/2014	12:12:50.457	52	Phase B	open
09/14/2014	12:12:50.457	52	Phase A	open
09/14/2014	12:12:50.457	52	All phases	open

Relion® RER620

WebHMI web browser

Firefox ABB :: RER620, A1 (User: Administrator, ...)

192.168.2.10/htdocs/application.html

ABB

General Events **Programmable LEDs** Phasor Diagrams Disturbance records Single Line Diagram

IED RER620

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Device status

Description	Value
Normal	<input checked="" type="radio"/>
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Trip	<input type="radio"/>

Relion® RER620

WebHMI web browser – view alarm LEDs

The screenshot shows a Firefox browser window displaying the ABB Relion RER620 WebHMI interface. The browser address bar shows the URL `192.168.2.10/htdocs/application.html`. The page features the ABB logo and a navigation menu with tabs for General, Events, Programmable LEDs, Phasor Diagrams, Disturbance records, and Single Line Diagram. The 'Programmable LEDs' tab is active, showing a tree view on the left and a table of LED statuses on the right.

Programmable LEDs

Description	Value
Phase A	<input checked="" type="radio"/>
Phase B	<input type="radio"/>
Phase C	<input type="radio"/>
Ground	<input checked="" type="radio"/>
Current	<input checked="" type="radio"/>
Time	<input type="radio"/>
Instantaneous	<input checked="" type="radio"/>
Yellow Handle	<input type="radio"/>
79 Lockout	<input type="radio"/>
Breaker Failure	<input type="radio"/>
Loss of AC	<input type="radio"/>

Relion® RER620 WebHMI web browser

Firefox ABB :: RER620, A1 (User: Administrator, ...)

192.168.2.10/htdocs/application.html

ABB

General Events Programmable LEDs Phasor Diagrams Disturbance records Single Line Diagram

IED RER620

- IED
 - RER620
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Relion® RER620

WebHMI web browser

Firefox ABB :: RER620, A1 (User: Administrator, ...)

192.168.2.10/htdocs/application.html

ABB

General Events Programmable LEDs **Phasor Diagrams** Disturbance records Single Line Diagram

IED RER620

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Device version

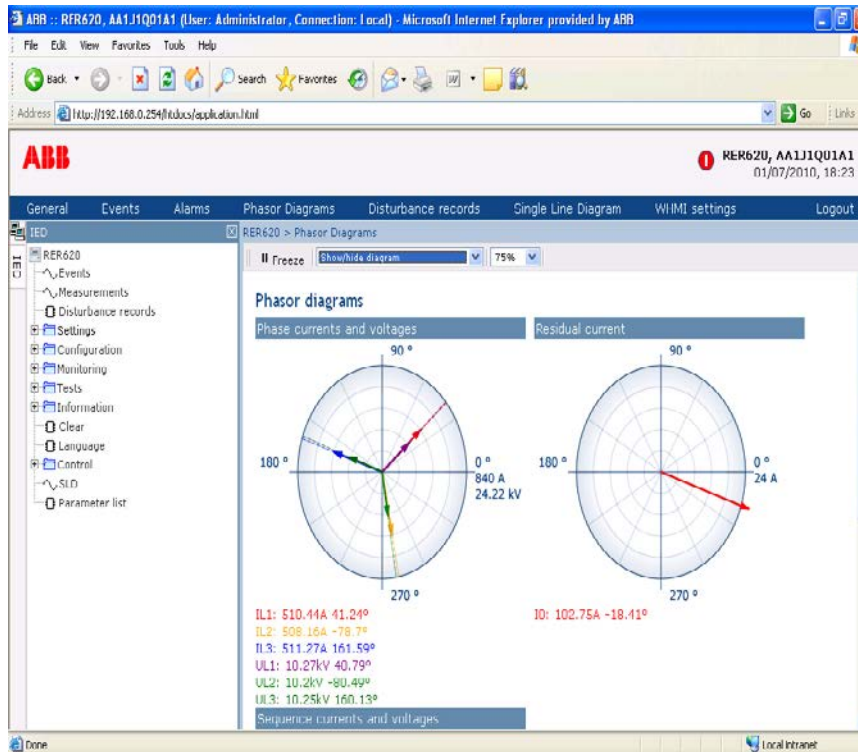
Description	Value
Hardware revision	D
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Device status

Description	Value
Normal	<input checked="" type="radio"/>
Pickup	<input type="radio"/>
Trip	<input type="radio"/>

Relion® RER620

WebHMI web browser real-time phasor plots



- Phasor plots include...
 - Phase currents
 - Phase voltages
 - Sequence currents
 - Sequence voltages

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WebHMI web browser

Firefox ABB :: RER620, A1 (User: Administrator, ...)

192.168.2.10/htdocs/application.html

ABB

General Events Programmable LEDs Phasor Diagrams **Disturbance records** Single Line Diagram

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Trip	<input type="radio"/>

Relion® RER620

WebHMI web browser – retrieve waveform records

The screenshot shows the ABB Relion RER620 WebHMI interface. The browser window title is "ABB :: RER620, A1 (User: Administrator, ...)". The address bar shows "192.168.2.10/htdocs/application.html". The ABB logo is in the top left, and the user is logged in as Administrator. The main content area displays the "Disturbance records" page. The left sidebar shows a tree view of the device configuration. The main content area displays a table of disturbance records.

Selected	Description	Date	Time	Length (ms)	CFG	DAT
<input type="checkbox"/>	020A0026	14/09/2014	12:15:46	833		
<input type="checkbox"/>	020A0025	14/09/2014	12:12:50	833		
<input type="checkbox"/>	020A0024	14/09/2014	12:11:29	833		
<input type="checkbox"/>	020A0023	14/09/2014	12:10:30	833		
<input type="checkbox"/>	020A0022	14/09/2014	12:09:47	833		
<input type="checkbox"/>	020A0021	14/09/2014	12:09:38	833		
<input type="checkbox"/>	020A0020	14/09/2014	12:09:15	833		
<input type="checkbox"/>	020A0019	14/09/2014	12:06:38	833		
<input type="checkbox"/>	020A0018	14/09/2014	12:06:24	833		
<input type="checkbox"/>	020A0017	14/09/2014	12:05:59	833		
<input type="checkbox"/>	020A0016	14/09/2014	12:05:35	833		
<input type="checkbox"/>	020A0015	14/09/2014	11:58:41	833		
<input type="checkbox"/>	020A0014	13/09/2014	17:29:55	833		
<input type="checkbox"/>	020A0013	13/09/2014	17:29:54	833		
<input type="checkbox"/>	020A0012	13/09/2014	17:24:59	833		
<input type="checkbox"/>	020A0011	13/09/2014	17:24:53	833		
<input type="checkbox"/>	020A0010	13/09/2014	17:11:08	833		
<input type="checkbox"/>	020A0009	13/09/2014	17:07:45	833		
<input type="checkbox"/>	020A0008	13/09/2014	16:55:39	833		
<input type="checkbox"/>	020A0007	13/09/2014	16:49:52	833		
<input type="checkbox"/>	020A0006	13/09/2014	16:48:59	833		
<input type="checkbox"/>	020A0005	13/09/2014	16:46:22	833		
<input type="checkbox"/>	020A0004	13/09/2014	16:43:48	833		
<input type="checkbox"/>	020A0003	13/09/2014	16:43:00	833		
<input type="checkbox"/>	020A0002	12/09/2014	18:23:31	833		
<input type="checkbox"/>	020A0001	12/09/2014	18:23:29	833		

Relion® RER620

WebHMI web browser

Firefox ABB :: RER620, A1 (User: Administrator, ...)

192.168.2.10/htdocs/application.html

ABB

General Events Programmable LEDs Phasor Diagrams Disturbance records **Single Line Diagram**

IED RER620

- Control
- Events
- Measurements
- DFR records
- Settings
- Configuration
- Monitoring
- Tests
- Information
 - Clear
 - Language
 - Parameter list
 - WHMI settings

Device version

Description	Value
Hardware revision	D
Software version	1.1

Device status

Description	Value
Normal	<input checked="" type="radio"/>
Pickup	<input type="radio"/>
Trip	<input type="radio"/>

Relion® RER620

WebHMI web browser – view SLD screen

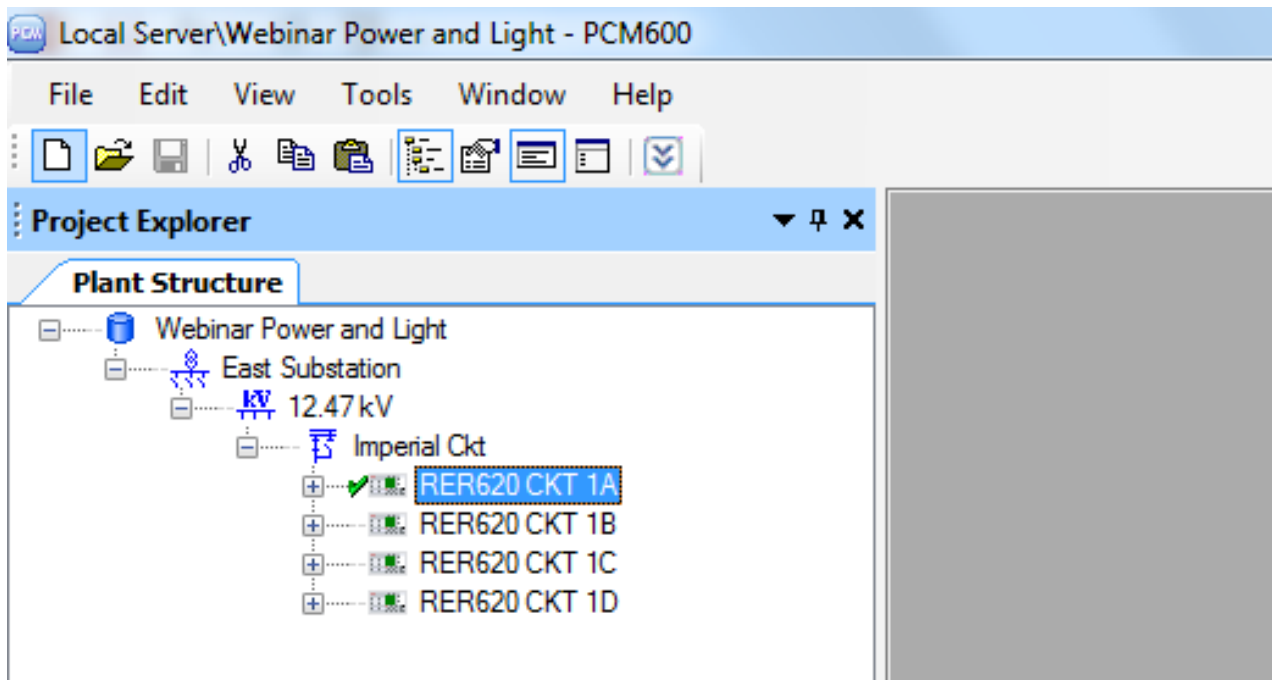
The screenshot displays the ABB Relion RER620 WebHMI interface in a Firefox browser. The browser address bar shows the URL `192.168.2.10/htdocs/application.html`. The interface features a navigation menu with tabs for General, Events, Programmable LEDs, Phasor Diagrams, and Disturbance records. The left sidebar shows a tree view of the system configuration, with the '50N-1' component selected. The main content area displays the 'Single line diagram' screen, which lists the following parameters:

- VA = 7.0kV
- VB = 7.0kV
- VC = 6.7kV
- IA = 120A
- IB = 120A
- IC = 120A
- P = 2485kW
- Q = -54kVAR
- f = (60.00)Hz

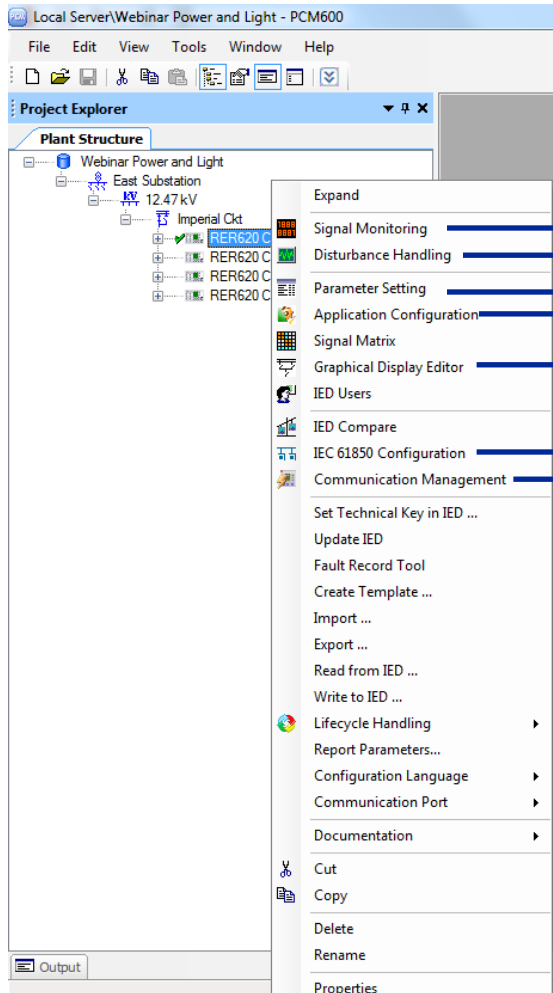
A small black square icon with a vertical line extending downwards is positioned to the right of the current parameters, labeled '3-PH' below it.

Relion® RER620 PCM600 configuration tool

- PCM600 is the common configuration tool for all Relion relays including the RER620
- One database file can contain accommodate many relays



Relion® RER620 PCM600 configuration tool



- PCM600 is used for many things...
- Real-time monitoring of signals
- Retrieving COMTRADE waveform
- Creating condensed color pdf fault report
- Creating parameter setting files
- Creating customized application logic
- Creating customized screen displays
- Creating virtual wires between relays (aka IEC61850 GOOSE signals)
- Creating communication class files

Relion® RER620 PCM600 parameter setting tool

Local Server\Webinar Power and Light - PCM600

File Edit View Tools IED Window Help

Project Explorer

Plant Structure

- Webinar Power and Light
 - East Substation
 - 12.47 kV
 - Imperial Ckt
 - RER620 CKT 1A
 - IED Configuration
 - Application Configuration
 - I/O
 - Protection
 - Settings
 - Current protection
 - INRP HAR1(INR): 1
 - SPHLPTOC1(51P): 1
 - SPHLPTOC2(50P-1): 2
 - SPHHPTOC1(50P-2): 1
 - SPHIPTOC1(50P-3): 1
 - XEFLPTOC2(51N): 2
 - XEFLPTOC3(50N-1): 3
 - XEFHPTOC3(50N-2): 3
 - XEFIPTOC2(50N-3): 2
 - XNSPTOC1(46-1): 1
 - XNSPTOC2(46-2): 2
 - PDNSPTOC1(46PD): 1
 - SDPHLPDOC1(67/51P-1): 1
 - SDPHLPDOC2(67/51P-2): 2
 - XDEFLPDEF1(67/51N-1): 1
 - XDEFLPDEF2(67/51N-2): 2
 - EFLPTOC3(50SEF): 3
 - Voltage protection
 - Other protection
 - Frequency protection
 - Control
 - Measurements

RER620 CKT 1A - Parameter Setting

Group / Parameter Name	IED Value	PC Value	Unit	Min	Max
SPHLPTOC1(51P): 1					
51P					
Operation		disable			
Num of pickup phases		1 out of 3			
Minimum trip time		20	ms	20	60000
Reset delay time		20	ms	0	60000
Measurement mode		DFT			
Curve parameter A		28.2000		0.0086	120.0000
Curve parameter B		0.1217		0.0000	0.7120
Curve parameter C		2.00		0.02	2.00
Curve parameter D		29.10		0.46	30.00
Curve parameter E		1.0		0.0	1.0
Setting Group 1					
Pickup value		1.00	xIn	0.05	5.00
Pickup value mult		2.0		0.8	10.0
Time multiplier		5.00		0.05	15.00
Trip delay time		40	ms	40	200000
Operating curve type		ANSI Ext Inv			
Type of reset curve		Immediate			
Pickup block value		5.00	xIn	1.00	40.00
Pickup block enable		Disable			
Time adder		0.00		0.00	2.00

Relion® RER620 PCM600 disturbance handling tool

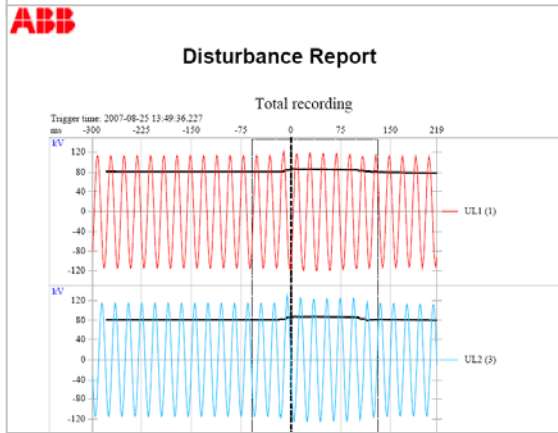
Trig Date Time	Str Name	Obj Name	IED Name	Rec No	Trig Channel	Pre-Trig Time	Post-Fault Time	Recording Time	File
9/12/2014 6:23:29 828 PM	RER620	192.168.2.10				167	666	833	020A0001_2014_9_12_18_23_29_828
9/12/2014 6:23:31 340 PM	RER620	192.168.2.10				167	666	833	020A0002_2014_9_12_18_23_31_340
9/13/2014 4:43:00 505 PM	RER620	192.168.2.10				167	666	833	020A0003_2014_9_13_16_43_0_505
9/13/2014 4:43:48 463 PM	RER620	192.168.2.10				166	667	833	020A0004_2014_9_13_16_43_48_463
9/13/2014 4:46:22 134 PM	RER620	192.168.2.10				167	666	833	020A0005_2014_9_13_16_46_22_134
9/13/2014 4:48:59 126 PM	RER620	192.168.2.10	A1	6	No-value	167	666	833	
9/13/2014 4:49:52 026 PM	RER620	192.168.2.10	A1	7	No-value	167	666	833	
9/13/2014 4:55:39 184 PM	RER620	192.168.2.10	A1	8	No-value	166	667	833	
9/13/2014 5:07:45 293 PM	RER620	192.168.2.10	A1	9	No-value	167	666	833	
9/13/2014 5:11:08 047 PM	RER620	192.168.2.10	A1	10	No-value	167	666	833	
9/13/2014 5:24:53 847 PM	RER620	192.168.2.10	A1	11	No-value	166	667	833	
9/13/2014 5:24:59 797 PM	RER620	192.168.2.10	A1	12	No-value	166	667	833	
9/13/2014 5:29:54 014 PM	RER620	192.168.2.10	A1	13	No-value	167	666	833	
9/13/2014 5:29:55 077 PM	RER620	192.168.2.10	A1	14	No-value	167	666	833	
9/14/2014 11:58:41 214 AM	RER620	192.168.2.10	A1	15	No-value	166	667	833	
9/14/2014 12:05:35 602 PM	RER620	192.168.2.10	A1	16	No-value	167	666	833	
9/14/2014 12:05:59 094 PM	RER620	192.168.2.10	A1	17	No-value	167	666	833	
9/14/2014 12:06:24 123 PM	RER620	192.168.2.10	A1	18	No-value	167	666	833	
9/14/2014 12:06:38 552 PM	RER620	192.168.2.10	A1	19	No-value	167	666	833	
9/14/2014 12:09:15 335 PM	RER620	192.168.2.10	A1	20	No-value	166	667	833	
9/14/2014 12:09:38 727 PM	RER620	192.168.2.10	A1	21	No-value	167	666	833	
9/14/2014 12:09:47 089 PM	RER620	192.168.2.10	A1	22	No-value	166	667	833	
9/14/2014 12:10:30 385 PM	RER620	192.168.2.10	A1	23	No-value	166	667	833	
9/14/2014 12:11:29 106 PM	RER620	192.168.2.10	A1	24	No-value	167	666	833	
9/14/2014 12:12:50 427 PM	RER620	192.168.2.10	A1	25	No-value	167	666	833	
9/14/2014 12:15:46 694 PM	RER620	192.168.2.10	A1	26	No-value	167	666	833	

- Disturbance Fault Records (DFR) are stored in COMTRADE format for viewing by any COMTRADE viewer.
- Selectable record length and pre-trigger time
- *Stores 30 records of 50 cycle length (default size)*

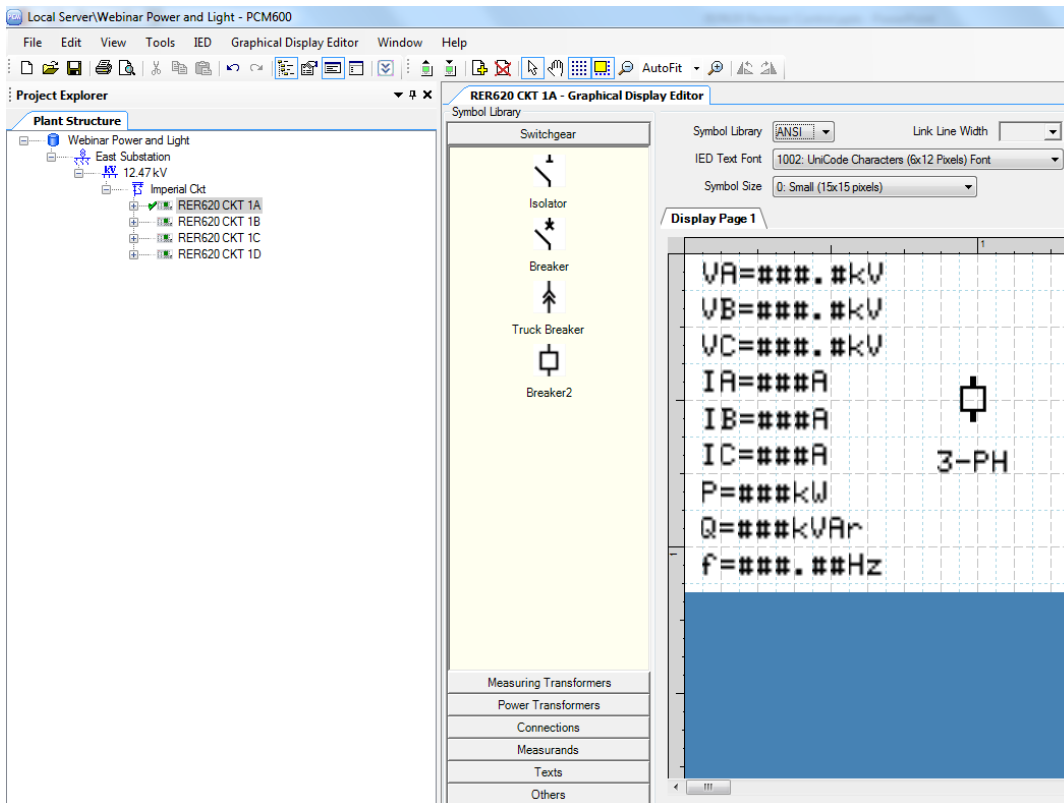
Relion® RER620 PCM600 disturbance handling tool



- More time for analyzing complicated disturbances instead of data processing
- Fast corrective actions enabled by
 - Easily creating a concise color pdf file containing a summary of the phasor plots and protective elements that asserted during the fault



Relion® RER620 PCM600 graphic editor tool



- Single Line Diagram (SLD) screen is configurable
- Combines graphics and text

- One of three display screens (Menu, Metering, **SLD**)
- Build a screen that shows what you want to see

Relion® RER620

PCM600 communications management tool

Local Server\Webinar Power and Light - PCM600

File Edit View Tools CMT Window Help

Signal Type: DNP Analog Input Object

Project Explorer

Plant Structure

- Webinar Power and Light
 - East Substation
 - Imperial Ckt
 - RER620 CKT 1A
 - RER620 CKT 1B
 - RER620 CKT 1C
 - RER620 CKT 1D

RER620 CKT 1A - Communication Management

Master 1

ZBAT1(ZBAT1): 1.UPS Hw Version

Name

- ZBAT1(ZBAT1): 1.UPS Hw Version
- ZBAT1(ZBAT1): 1.UPS Fw Version
- ZBAT1(ZBAT1): 1.UPS Bootldr Version
- ZBAT1(ZBAT1): 1.TST_VOLT
- ZBAT1(ZBAT1): 1.Temperature
- ZBAT1(ZBAT1): 1.Internal rail 60V
- ZBAT1(ZBAT1): 1.Internal rail 12V
- ZBAT1(ZBAT1): 1.Boost Voltage
- ZBAT1(ZBAT1): 1.Bat Execution Result
- ZBAT1(ZBAT1): 1.Aux Voltage
- ZBAT1(ZBAT1): 1.Aux Protection
- ZBAT1(ZBAT1): 1.Aux Load I
- ZBAT1(ZBAT1): 1.AC Input V
- VSMSQI2(V1,V2,V0(2)): 2.Zro-SeqB+kV
- VSMSQI2(V1,V2,V0(2)): 2.U2_DB
- VSMSQI2(V1,V2,V0(2)): 2.U1_DB
- VSMSQI2(V1,V2,V0(2)): 2.U0_DB
- VSMSQI2(V1,V2,V0(2)): 2.Ps-SeqB+kV
- VSMSQI2(V1,V2,V0(2)): 2.Ng-SeqB+kV
- VSMSQI1(V1,V2,V0): 1.Zro-Seq+kV
- VSMSQI1(V1,V2,V0): 1.U2_DB
- VSMSQI1(V1,V2,V0): 1.U1_DB
- VSMSQI1(V1,V2,V0): 1.U0_DB

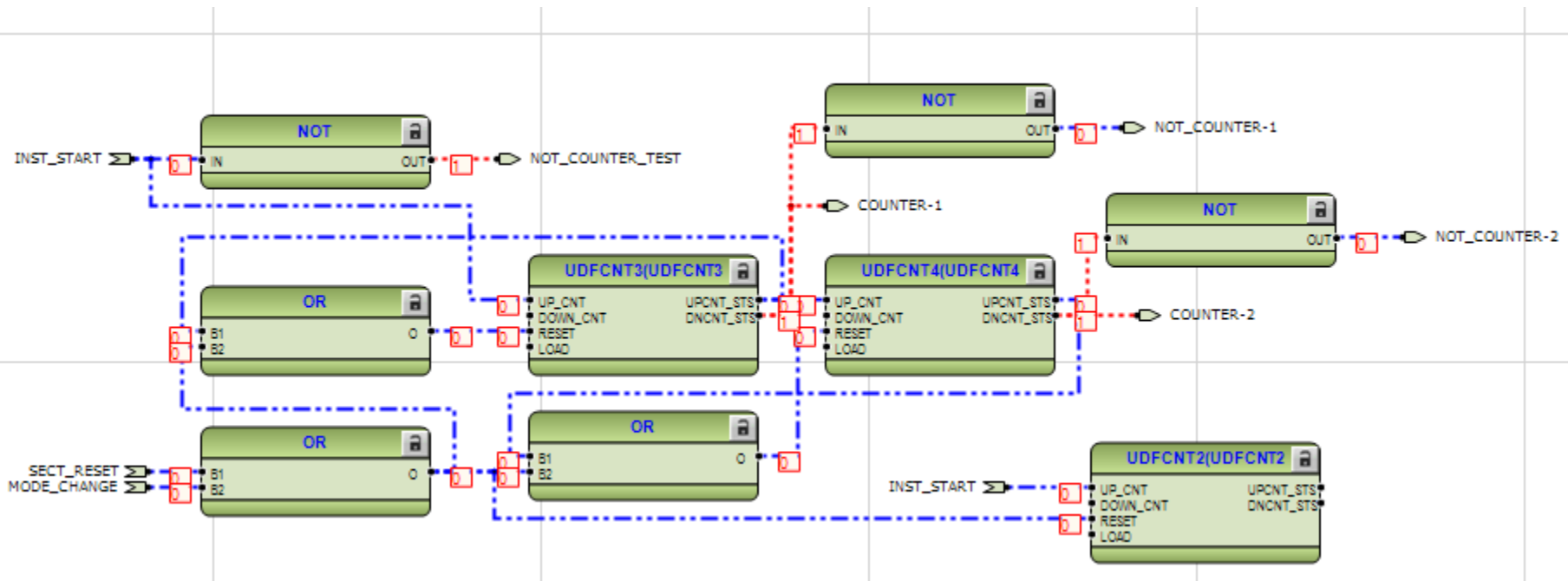
Master 1

Index	Name	Class	Description
0	CMMXU1(IA,IB,IC): 1.IL1-A	0,2	Three-phase current measurement, Measured current amplitude phase A
1	CMMXU1(IA,IB,IC): 1.IL2-A	0,2	Three-phase current measurement, Measured current amplitude phase B
2	CMMXU1(IA,IB,IC): 1.IL3-A	0,2	Three-phase current measurement, Measured current amplitude phase C
3	RESCMMXU1(I): 1.Io-A	0,2	Residual current measurement, Measured residual current
4	VMMXU1(VA,VB,VC): 1.U_INST_A	0,2	Three-phase voltage measurement, UL1 Amplitude, magnitude of instantaneous ...
5	VMMXU2(VA,VB,VC(2)): 2.U_INST_A	0,2	Three-phase voltage measurement, UL1 Amplitude, magnitude of instantaneous ...
6	VMMXU1(VA,VB,VC): 1.U_INST_B	0,2	Three-phase voltage measurement, UL2 Amplitude, magnitude of instantaneous ...
7	VMMXU2(VA,VB,VC(2)): 2.U_INST_B	0,2	Three-phase voltage measurement, UL2 Amplitude, magnitude of instantaneous ...
8	VMMXU1(VA,VB,VC): 1.U_INST_C	0,2	Three-phase voltage measurement, UL3 Amplitude, magnitude of instantaneous ...
9	VMMXU2(VA,VB,VC(2)): 2.U_INST_C	0,2	Three-phase voltage measurement, UL3 Amplitude, magnitude of instantaneous ...
10	ZBAT1(ZBAT1): 1.Battery V	0	UPS Status, Battery V
11	ZBAT1(ZBAT1): 1.Battery charge I	0	UPS Status, Battery charge I
12	FLTMSTA(FLTMSTA): 1.Current IL1	0,2	Fault record, Phase A current
13	FLTMSTA(FLTMSTA): 1.Current IL2	0,2	Fault record, Phase B current
14	FLTMSTA(FLTMSTA): 1.Current IL3	0,2	Fault record, Phase C current
15	FLTMSTA(FLTMSTA): 1.Fault number	0,2	Fault record, Fault record number
17	FLTMSTA(FLTMSTA): 1.Current Io	0,2	Fault record, Residual current

Relion® RER620

PCM600 applications configuration tool

- Insert a variety of logic blocks, gates, timers, counters etc. to configure customized logic applications
- Debugging tool allows real-time monitoring of signals between logic blocks to aid in building logic



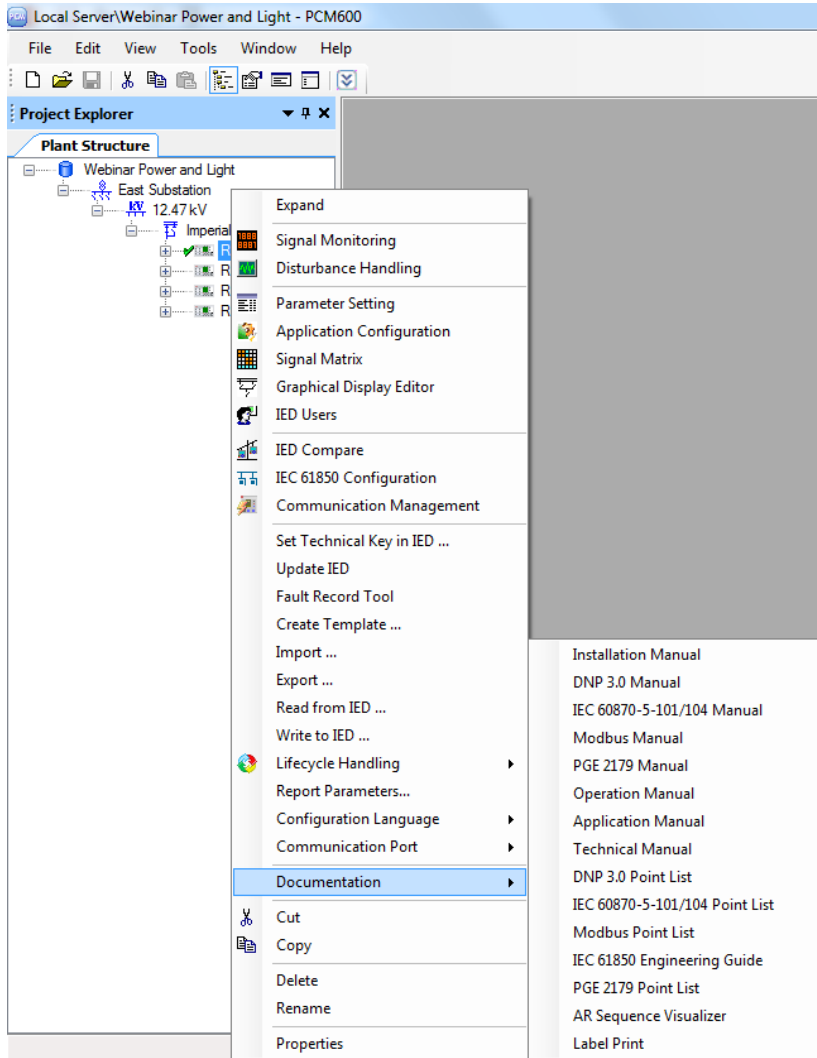
Relion® RER620

Example of customized configuration



Relion® RER620

PCM600 – documentation - embedded manuals



- All manuals are embedded in PCM600 in pdf format

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