

7SR11 and 7SR12

Settings and Instruments

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Section 1: Introduction

1.1 Relay Menu And Display

All relay fascias have the same appearance and support the same access keys. The basic menu structure is also the same in all products and consists of four main menus, these being,

Settings Mode - allows the user to view and (if allowed via passwords) change settings in the relay.

Instruments Mode - allows the user to see the conditions that the relay is experiencing i.e. current, voltage etc.

Fault Data Mode - allows the user to see type and data of any fault that the relay has detected.

Control Mode - allows the user to control external plant under the relays control for example the CB

All menus may be viewed without entering a password but actions will not be permitted if the relevant passwords have been set.

The menus can be viewed via the LCD by pressing the access keys as below,

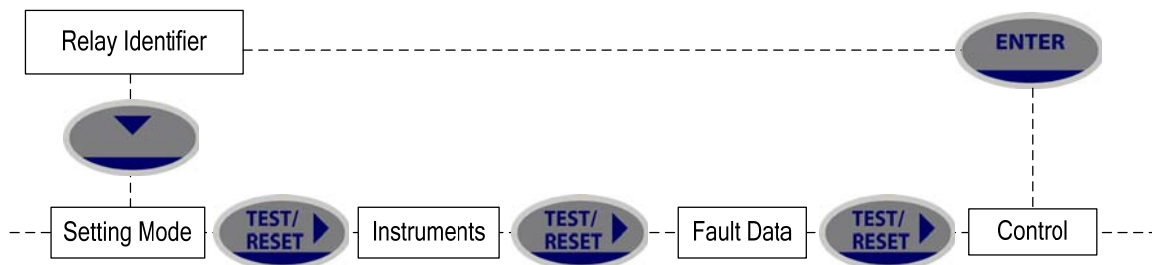


Figure 1.1-1 Menu

Pressing CANCEL returns to the Identifier screen

This document describes the text descriptions as they appear in the menu structure when the relay is using the default files. The user can programme the relay to use alternative text descriptions by installing user language files through the Reydisp Evolution software language configuration tool – see 2.1.5

LCD Contrast

To change the contrast on the LCD insert a flat bladed screwdriver into the screwhead below the contrast symbol, turning the screwhead left (anti-clockwise) lightens the contrast of the LCD and turning it right (clockwise) darkens the display.



Figure 1.1-2 Fascia Contrast symbol

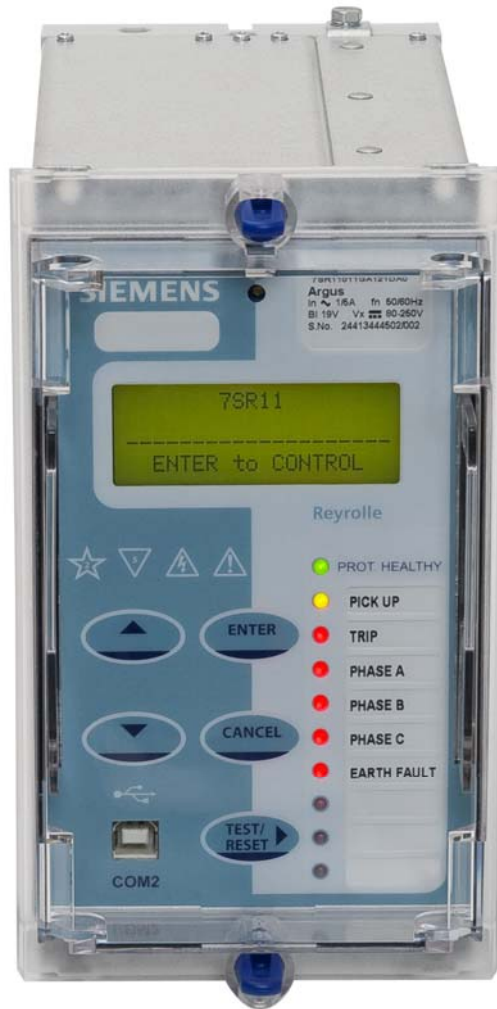


Figure 1.1-3 Fascia of a 7SR11 relay

1.2 Operation Guide

1.2.1 User Interface Operation

The basic menu structure flow diagram is shown in Figure 1.2-1. This diagram shows the main modes of display: Settings Mode, Instrument Mode, Fault Data Mode and Control Mode.

When the relay leaves the factory all data storage areas are cleared, the passwords are set to none and the settings set to default as specified in settings document.

When the relay is first energised the user is presented with the following, or similar, message: -

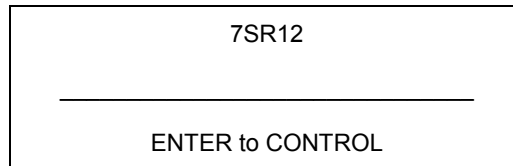


Figure 1.2-1 Relay Identifier Screen

On the factory default setup the relay LCD should display the relay identifier, on each subsequent power-on the screen that was showing before the last power-off will be displayed.

The push-buttons on the fascia are used to display and edit the relay settings via the LCD, to display and activate the control segment of the relay, to display the relays instrumentation and Fault data and to reset the output relays and LED's.

The five push-buttons have the following functions:



READ DOWN



READ UP

Used to navigate the menu structure.



ENTER

The ENTER push-button is used to initiate and accept setting changes.

When a setting is displayed pressing the ENTER key will enter the edit mode, the setting will flash and can now be changed using the ▲ or ▼ buttons. When the required value is displayed the ENTER button is pressed again to accept the change.

When an instrument is displayed pressing ENTER will toggle the instruments favourite screen status.



CANCEL

This push-button is used to return the relay display to its initial status or one level up in the menu structure. Pressed repeatedly will return to the Relay Identifier screen. It is also used to reject any alterations to a setting while in the edit mode.



TEST/RESET

This push-button is used to reset the fault indication on the fascia. When on the Relay Identifier screen it also acts as a lamp test button, when pressed all LEDs will momentarily light up to indicate their correct operation. It also moves the cursor right ► when navigating through menus and settings.

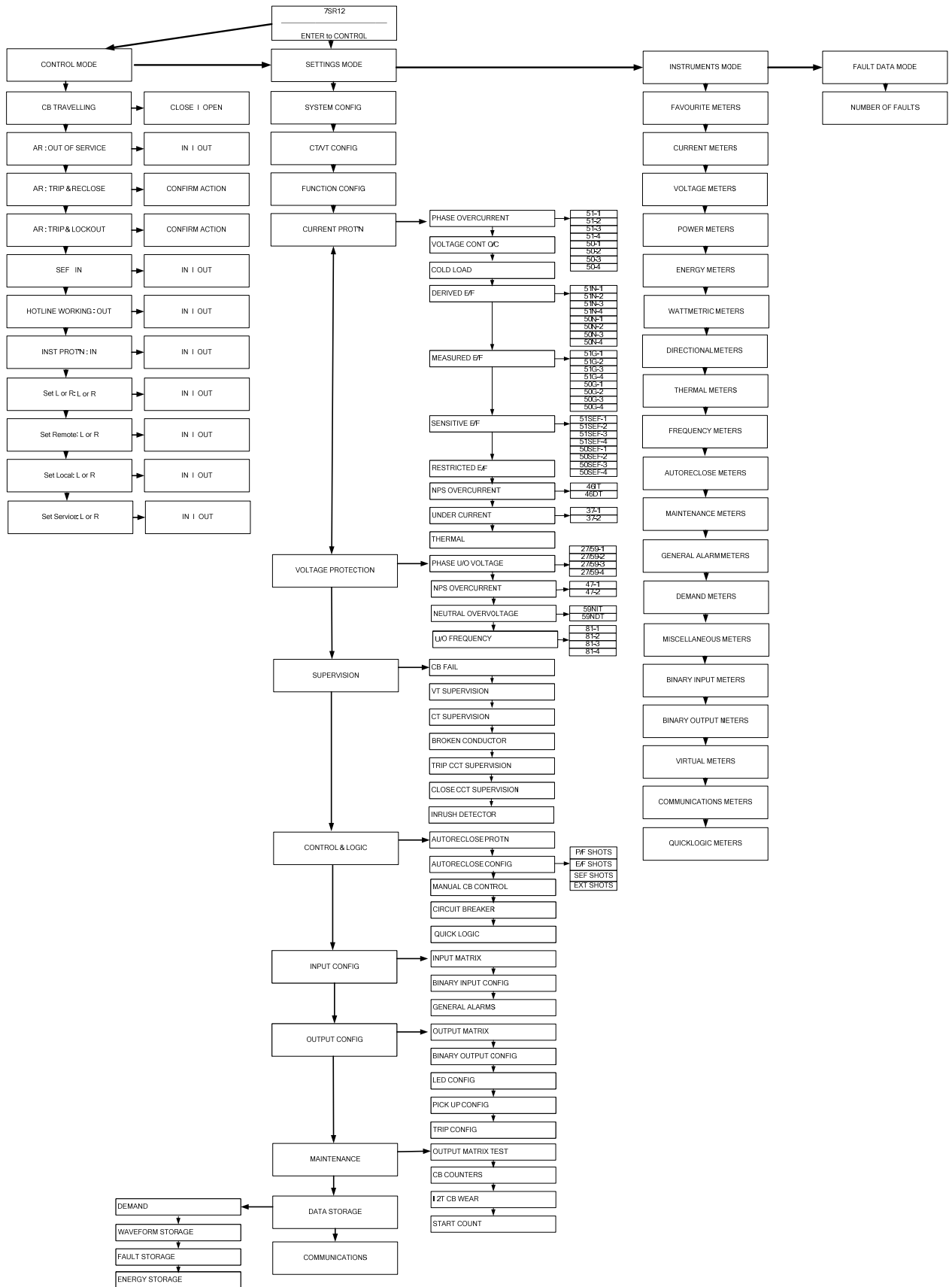


Figure 1.2-2 Menu Structure

1.3 Setting Mode

The Settings Mode is reached by pressing the READ DOWN ▼ button from the relay identifier screen.

Once the Settings Mode title screen has been located pressing the READ DOWN ▼ button takes the user into the Settings mode sub-menus.

Each sub-menu contains the programmable settings of the relay in separate logical groups. The sub menus are accessed by pressing the TEST/RESET ► button. Pressing the ▼ button will scroll through the settings, after the last setting in each sub menu is reached the next sub menu will be displayed. If a particular sub menu is not required to be viewed then pressing ▼ will move directly to the next one in the list.

While a setting is being displayed on the screen the ENTER button can be pressed to edit the setting value. If the relay is setting password protected the user will be asked to enter the password. If an incorrect password is entered editing will not be permitted. All screens can be viewed if the password is not known.

While a setting is being edited flashing characters indicate the edit field. Pressing the ▲ or ▼ buttons will scroll through the valid field values. If these buttons are held on, the rate of scrolling will increase.

Once editing is complete pressing the ENTER button stores the new setting into the non-volatile memory.

The actual setting ranges and default values for each relay model can be found in the appendix to this manual.

1.4 Instruments Mode

The Instrument Mode sub-menu displays key quantities and information to aid with commissioning. The following meters are available and are navigated around by using the ▲, ▼ and TEST/RESET buttons. The text description shown here is the default information. Depending upon the relay model you have, you may not have all of the meters shown.

INSTRUMENT	DESCRIPTION
FAVOURITE METERS →to view	<p>This allows the user to view his previously constructed list of 'favourite meters' by pressing TEST/RESET ► button and the READ DOWN button to scroll though the meters added to this sub-group</p> <p>To construct a sub-group of favourite meters, first go to the desired meter then press ENTER this will cause a message to appear on the LCD 'Add To Favourites YES' pressing ENTER again will add this to the FAVOURITE METERS Sub-menu. To remove a meter from the FAVOURITE METERS sub-menu go to that meter each in the FAVOURITE METERS sub-menu or at its Primary location press ENTER and the message 'Remove From Favourites' will appear press ENTER again and this meter will be removed from the FAVOURITE METERS sub-group</p>
CURRENT METERS →to view	<p>This is the sub-group that includes all the meters that are associated with Current TEST/RESET ► allows access to this sub-group</p>
Primary Current Ia 0.00A Ib 0.00A Ic 0.00A	Displays the 3 phase currents Primary RMS values
Secondary Current Ia 0.00A Ib 0.00A Ic 0.00A	Displays the 3 phase currents Secondary RMS values
Nom Current Ia 0.00xIn----° Ib 0.00xIn ----° Ic 0.00xIn ----°	Displays the 3 Phase currents Nominal RMS values & phase angles with respect to PPS voltage.
Pri Earth Current In 0.00A Ig 0.00A	Displays the 3 Earth currents Primary RMS values
Sec Earth Current In 0.00A Ig 0.00A	Displays the 3 Earth currents Secondary RMS values
Nom Earth Current In 0.00xIn----° Ig 0.00xIn----°	Displays the 3 Earth currents Nominal RMS values & phase angles with respect to PPS voltage.
I Seq Components Izps 0.00xIn--- ° Ips 0.00xIn--- ° Inps 0.00xIn--- °	Displays the Current Sequence components Nominal RMS values & phase angles with respect to PPS voltage.
2nd Harmonic Current Ia 0.00xIn Ib 0.00xIn	Displays the Second Harmonic Current.

INSTRUMENT	DESCRIPTION
Ic 0.00xIn	
Last Trip P/F Ia 0.00A Ib 0.00A Ic 0.00A	Displays the Last Trip Fault Current..
Last Trip E/F In 0.00A Ig 0.00A	Displays the Last Trip Fault Current..
VOLTAGE METERS →to view	This is the sub-group that includes all the meters that are associated with Voltage TEST/RESET ► allows access to this sub-group
Prim Ph-Ph Voltage Vab 0.00kV Vbc 0.00kV Vca 0.00kV	Displays the Phase to Phase Voltage Primary RMS values
Sec Ph-Ph Voltage Vab 0.00V Vbc 0.00V Vca 0.00V	Displays the Phase to Phase Voltage Secondary RMS values & Angles with respect to PPS voltage.
Nominal Ph-Ph Voltage Vab 0.00V ---- Vbc 0.00V ---- Vca 0.00V ----	Displays the Phase to Phase Voltage Nominal RMS values
Prim Ph-N Voltage Va 0.00kV Vb 0.00kV Vc 0.00kV	Displays the Phase to Neutral Voltage Primary RMS values
Sec Ph-N Voltage Va 0.00V Vb 0.00V Vc 0.00V	Displays the Phase to Neutral Voltage Secondary RMS values & Angles with respect to PPS voltage.
Nom Ph-N Voltage Va 0.00V ----° Vb 0.00V ----° Vc 0.00V ----°	Displays the Phase to Neutral Voltage Nominal RMS values
V Seq Components Vzps 0.00V --- Vpps 0.00V --- Vnps 0.00V ---	Displays the Voltage Sequence components Nominal RMS values & phase angles with respect to PPS voltage.
Calc Earth Voltage Pri 0.00V Sec 0.00V ---	Displays the calculated Earth voltage both primary and secondary which also shows the secondary angle
Last Trip Voltage Va 0.00V Vb 0.00V Vc 0.00V	Displays the Phase to Neutral Voltage Nominal RMS values from Last Trip
POWER METERS →to view	This is the sub-group that includes all the meters that are associated with Power TEST/RESET ► allows access to this sub-group
Phase A 0.0MW Phase B 0.0MW Phase C 0.0MW	Displays Real Power

INSTRUMENT	DESCRIPTION
P (3P) 0.0MW	
Phase A 0.0MVA Phase B 0.0MVA Phase C 0.0MVA Q (3P) 0.0MVA	Displays Reactive Power
Phase A 0.0MVA Phase B 0.0MVA Phase C 0.0MVA S (3P) 0.0MVA	Displays Apparent Power
PF A 0.00 PF B 0.00 PF C 0.00 PF (3P) 0.00	Displays Power factor
ENERGY METERS →to view	This is the sub-group that includes all the meters that are associated with Energy TEST/RESET ► allows access to this sub-group
Active Energy Exp 0.00MWh Imp 0.00MWh	Displays both imported and exported Active Energy
Reactive Energy Exp 0.00MVAh Imp 0.00MVAh	Displays both imported and exported Reactive Energy
WATTMETRIC METERS →to view	This is the sub-group that includes all the meters that are associated with Wattmetric TEST/RESET ► allows access to this sub-group
Ires R 0.0xln W Pres 0.0 xln W Ires R Angle 0.0° I0-V0 Angle 0.0°	The Wattmetric component of residual current Wattmetric residual power Compensated residual phase angle Applied residual phase angle
DIRECTIONAL METERS →to view	This is the sub-group that includes all the meters that are associated with Directional elements TEST/RESET ► allows access to this sub-group. Only seen on models that have the 67 option
P/F Dir (67) ----- No Dir, PhA Fwd, PhA Rev, PhB Fwd, PhB Rev, PhC Fwd, PhC Rev	The appropriate values from the selection will be displayed.
Calc E/F Dir (67N) ----- No Dir, E/F Fwd, E/F Rev	The appropriate values from the selection will be displayed.
Meas E/F Dir (67G) ----- No Dir, E/F Fwd, E/F Rev	The appropriate values from the selection will be displayed.

INSTRUMENT	DESCRIPTION
SEF Dir (67SEF) ----- No Dir, SEF Fwd, SEF Rev	The appropriate values from the selection will be displayed.
THERMAL METERS →to view	This is the sub-group that includes all the meters that are associated with Thermal TEST/RESET ► allows access to this sub-group
Thermal Status Phase A 0.0% Phase B 0.0% Phase C 0.0%	Displays the thermal capacity
FREQUENCY METERS →to view	This is the sub-group that includes all the meters that are associated with Thermal TEST/RESET ► allows access to this sub-group
Frequency 0.000Hz	Displays the frequency
AUTORECLOSE METERS →to view	This is the sub-group that includes all the meters that are associated with Autoreclose TEST/RESET ► allows access to this sub-group. Only seen on models that have the 79 option
Autoreclose Status 79 AR State AR Close Shot 0	
MAINTENANCE METERS →to view	This is the sub-group that includes all the meters that are associated with Maintenance TEST/RESET ► allows access to this sub-group
CB Total Trips Count 0 Target 100	Displays the number of CB trips experienced by the CB
CB Delta Trips Count 0 Target 100	Displays the number of CB trips experienced by the CB
CB Count To AR Block Count 0 Target 100	Displays the number of CB trips experienced by the CB. When the target is reached the relay will only do 1 Delayed Trip to Lockout.
CB Freq Ops Count Count 0 Target 10	Displays the number of CB trips experienced by the CB over the last rolling 1 hr period. When the target is reached the relay will only do 1 Delayed Trip to Lockout.
CB Wear Phase A 0.00MA^2s Phase B 0.00MA^2s Phase C 0.00MA^2s	Displays the current measure of circuit breaker wear.
CB Trip Time Time 0.0ms	Displays the circuit breaker trip time to open time. Measured from CB auxiliary contacts.
GENERAL ALARM METERS →to view	This is the sub-group that includes all the meters that are associated with the Binary inputs TEST/RESET ► allows access to this sub-group
General Alarms ALARM 1 Cleared	Displays the state of General Alarm
General Alarms ALARM 2 Cleared	
General Alarms ALARM 3 Cleared	
General Alarms ALARM 4 Cleared	

INSTRUMENT	DESCRIPTION
General Alarms ALARM 5 Cleared	
General Alarms ALARM 6 Cleared	
DEMAND METERS →to view	This is the sub-group that includes all the meters that are associated with DEMAND. TEST/RESET ► allows access to this sub-group
I Phase A Demand Max 0.00A Min 0.00A Mean 0.00A	Displays the Current demand based on Ia.
I Phase B Demand Max 0.00A Min 0.00A Mean 0.00A	Displays the Current demand based on Ib.
I Phase C Demand Max 0.00A Min 0.00A Mean 0.00A	Displays the Current demand based on Ic.
V Phase A Demand Max 0.00V Min 0.00V Mean 0.00V	Displays the Voltage demand based on Va.
V Phase B Demand Max 0.00V Min 0.00V Mean 0.00V	Displays the Voltage demand based on Vb.
V Phase C Demand Max 0.00V Min 0.00V Mean 0.00V	Displays the Voltage demand based on Vc.
V Phase AB Demand Max 0.00V Min 0.00V Mean 0.00V	Displays the Voltage demand based on Vab.
V Phase BC Demand Max 0.00V Min 0.00V Mean 0.00V	Displays the Voltage demand based on Vbc.
V Phase CA Demand Max 0.00V Min 0.00V Mean 0.00V	Displays the Voltage demand based on Vca.
Power P 3P Demand Max 0.00W Min 0.00W Mean 0.00W	Displays the Active Power demand.
Power Q 3P Demand Max 0.00VAr Min 0.00VAr Mean 0.00VAr	Displays the Reactive Power demand.
Power S 3P Demand Max 0.00VA Min 0.00VA Mean 0.00VA	Displays the Apparent Power demand.
Frequency Demand Max 0.000Hz Min 0.000Hz Mean 0.000Hz	Displays the Frequency demand.

INSTRUMENT	DESCRIPTION
MISCELLANEOUS METERS →to view	This is the sub-group that includes indication such as the relays time and date, the amount of fault and waveform records stored in the relay TEST/RESET ► allows access to this sub-group
Power On Count Recs 1 Date 01/01/2000 Time 22:41:44 Waveform Recs 0	This meter displays the date and time and the number of Fault records and Event records stored in the relay
Fault Recs 0 Event Recs 0 Data Log Recs 0 Setting Group 1	
BINARY INPUT METERS →to view	This is the sub-group that includes all the meters that are associated with the Binary inputs TEST/RESET ► allows access to this sub-group
BI 1-6 ----	Displays the state of DC binary inputs 1 to 6 (The number of binary inputs may vary depending on model)
BINARY OUTPUT METERS →to view	This is the sub-group that includes all the meters that are associated with the Binary Outputs TEST/RESET ► allows access to this sub-group
BO 1-8 ----	Displays the state of DC binary Outputs 1 to 8. (The number of binary outputs may vary depending on model)
VIRTUAL METERS →to view	This is the sub-group that shows the state of the virtual status inputs in the relay TEST/RESET ► allows access to this sub-group
V 1-8 ----	Displays the state of Virtual Outputs 1 to 8 (The number of virtual inputs will vary depending on model)
COMMUNICATION METERS →to view	This is the sub-group that includes all the meters that are associated with Communications ports TEST/RESET ► allows access to this sub-group
COM1 COM2	Displays which com ports are currently active
COM1 TRAFFIC Tx1 0 Rx1 0 Rx1 Errors 0	Displays traffic on Com1
COM2 TRAFFIC Tx2 0 Rx2 0 Rx2 Errors 0	Displays traffic on Com2
QUICK LOGIC METERS →to view	This is the sub-group that includes all the meters that are associated with QuickLogic Equations TEST/RESET ► allows access to this sub-group
E 1-4 ----	
E1 Equation EQN =0 TMR 0-0 =0 CNT 0-1 =0	
E2 Equation EQN =0 TMR 0-0 =0 CNT 0-1 =0	

INSTRUMENT			DESCRIPTION
E3 Equation			
EQN		=0	
TMR	0-0	=0	
CNT	0-1	=0	
E4 Equation			
EQN		=0	
TMR	0-0	=0	
CNT	0-1	=0	

1.5 Fault Data Mode

The Fault Data Mode sub menu lists the time and date of the previous ten protection operations. The stored data about each fault can be viewed by pressing the TEST/RESET ► button. Each record contains data on the operated elements, analogue values and LED flag states at the time of the fault. The data is viewed by scrolling down using the ▼ button.

Section 2: Setting & Configuring the Relay Using Reydisp Evolution

To set the relay using a communication port the user will need the following:-

PC with Reydisp Evolution Version 7.1.5.6 or later Installed. (This can be downloaded from our website www.siemens.com/energy and found under the submenu 'Software') This software requires windows 2000-service pack 4 or above, or windows XP with service pack 2 or above and Microsoft.NET framework for tools.

2.1 Physical Connection

The relay can be connected to Reydisp via any of the communication ports on the relay. Suitable communication interface cable and converters are required depending which port is being used.

2.1.1 Front USB connection

To connect your pc locally via the front USB port.

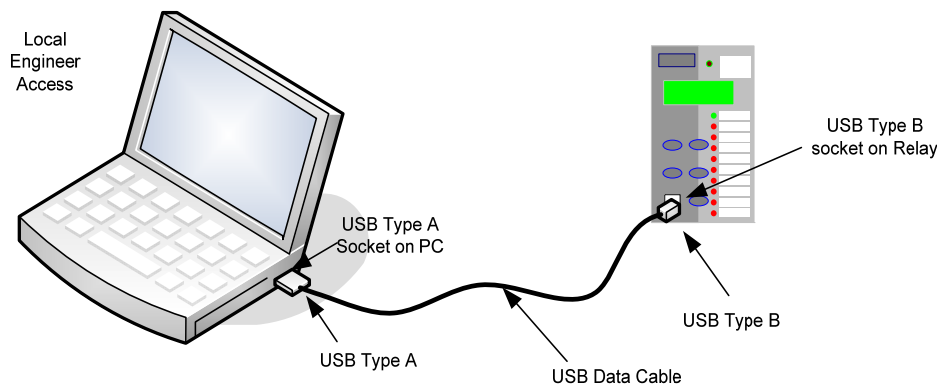


Figure 2.1-1 USB connection to PC

2.1.2 Rear RS485 connection

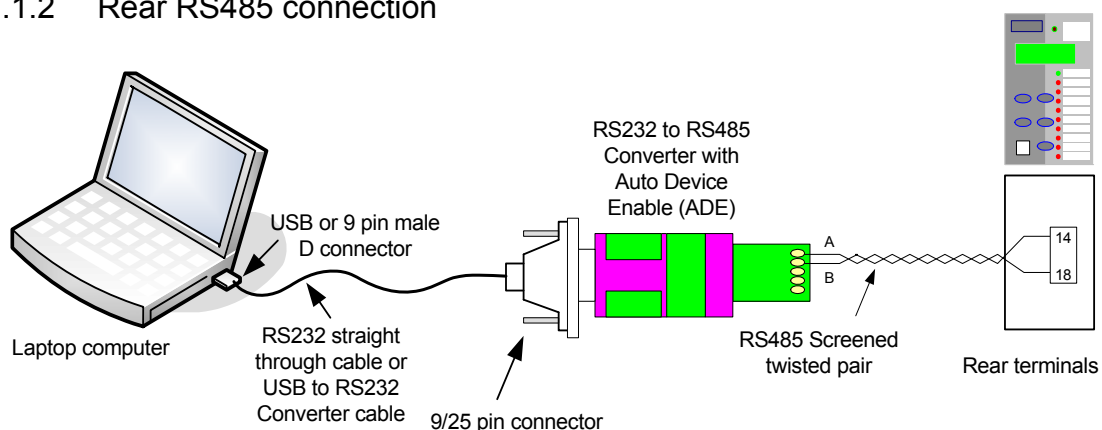


Figure 2.1-2 RS485 connection to PC

2.1.3 Configuring Relay Data Communication

Using the keys on the relay fascia scroll down the settings menus into the 'communications' menu and if necessary change the settings for the communication port you are using on the relay. Reydisp software uses IEC60870-5-103 protocol to communicate.

When connecting the relay to a pc using the front USB port, the Reydisp setting software will automatically detect the relay without making any setting changes in the relay first as long as the USB is selected to IEC60870-5-103.

COM1-RS485 Port and COM2-USB Port

Description	Range	Default	Notes
Station Address <i>IEC 60870-5-103 Station Address</i>	0, 1 ... 65533, 65534	0	Address given to relay to identify that relay from others which may be using the same path for communication as other relays for example in a fibre optic hub
COM1-RS485 Protocol <i>Selects protocol to use for COM1-RS485</i>	OFF, IEC60870-5-103, MODBUS-RTU, DNP3	IEC60870-5-103	IEC60870-5-103
COM1-RS485 Baud Rate <i>Sets the communications baud rate for COM1-RS485</i>	75, 110, 150, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400	19200	19200
COM1-RS485 Parity <i>Selects whether parity information is used</i>	NONE, ODD, EVEN	EVEN	EVEN
COM1-RS485 Mode <i>Selects whether the port is Local or Remote.</i>	Local, Remote, Local Or Remote	Remote	Remote
COM2-USB Protocol <i>Selects protocol to use for COM2-USB</i>			
COM2-USB Mode <i>Selects whether the port is Local or Remote.</i>	Local, Remote, Local Or Remote	Local	Local
DNP3 Unsolicited Events <i>Allows unsolicited event support in the relay. When Enabled, unsolicited event transmission can be controlled by the Master. When Disabled, Master requests are ignored.</i>	Disabled, Enabled	Disabled	Disabled
DNP3 Destination Address <i>The address of the master to which unsolicited events will be sent.</i>	0, 1 ... 65533, 65534	0	This setting is only visible when DNP3 Unsolicited Events is Enabled
DNP3 Application Timeout	5, 6 ... 299, 300	10s	10s

2.1.4 Connecting to the Relay for setting via Reydisp

When Reydisp software is running all available communication ports will automatically be detected. On the start page tool bar open up the sub-menu 'File' and select 'Connect'.

The 'Connection Manager' window will display all available communication ports. With the preferred port highlighted select the 'Properties' option and ensure the baud rate and parity match that selected in the relay settings. Select 'Connect' to initiate the relay-PC connection.

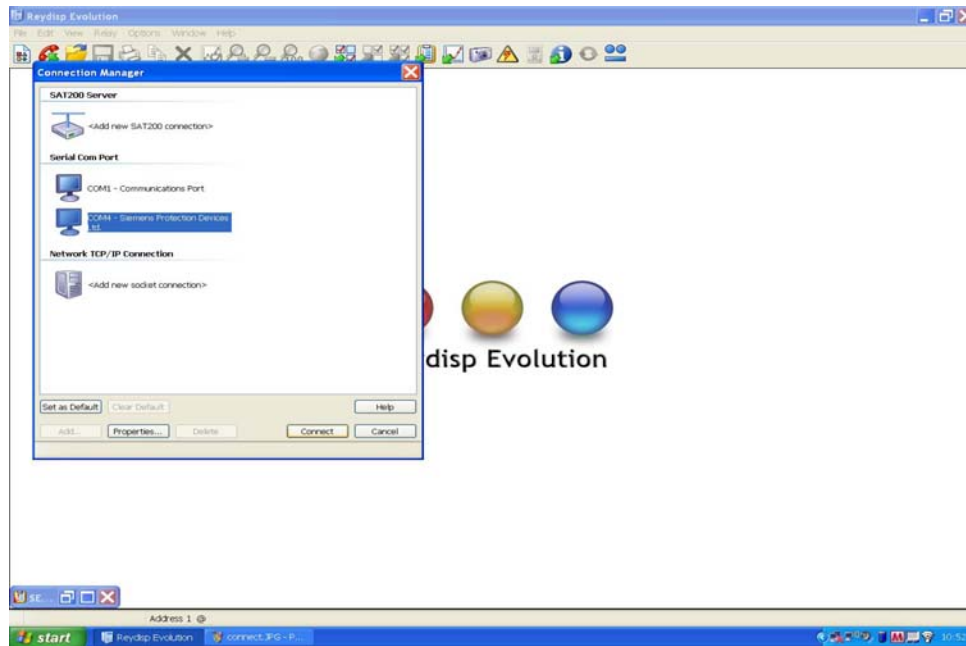


Figure 2.1-3 PC Comm Port Selection

The relay settings can now be configured using the Reydisp software. Please refer to the Reydisp Evolution Manual for further guidance.

2.1.5 Configuring the user texts using Reydisp Language Editor

As default the relay uses the text descriptions in all menus as they appear in this manual. These descriptions can be changed by installing a user language file in the relay, allowing the user to edit all views to meet their needs and provide easier operation.

The Reyrolle Language File Editor tool and its user manual are installed as part of the Reydisp Evolution software package. They can be found in your pc as sub menus of the Reydisp Evolution installation.

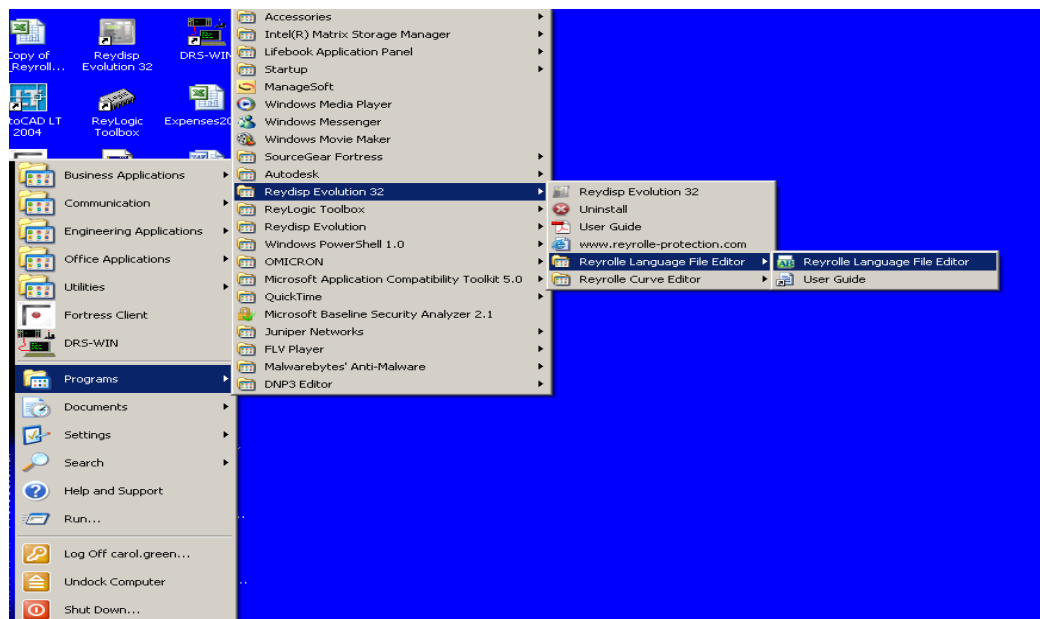


Figure 2.1-4 PC Language File Editor

When the software is opened a 'new project from template' should be used to generate your file. The file will display all default 'Original' text descriptions in one column and the 'Alternative' text in the other column. The descriptions in the 'Alternative' list can be changed and will be used in the relays menu structures. Once the file is complete, a language file can be created and loaded into the relay using the 'send file to relay' function. The communication properties in the software and on the relay must be set. The relay must be restarted after the file is installed.

To activate the language file it must be selected in the relay configuration menu, the 'Original' file is the file labelled 'ENGLISH' and the new file will be displayed using the file name allocated by the user.

Care should be taken to ensure a unique file name is given including a version control reference. The user will be prompted to restart the relay to activate the language file.

Please refer to the Language Editor Manual for further guidance.