

# *SD-TESTBUS2*

## User's Manual

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<b>ABB SACE</b> <b>ABB</b>	SD-TestBus2 v. 2.16	<b>1SDH000602R0002</b>	L2937	EN
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# 1 Introduction

SD-TestBus2 is a software suitably prepared for the testing and setting of the ABB SACE Modbus communication devices, of the relay connected to them and of all their inputs and outputs.

At this revision level SD-TestBus2 will be useful to interface via Modbus, in a simple and fast way, with the following protection units:

- PR112/PD-M e PR113/PD-M
- PR121/P, PR122/P and PR123/P on local bus (see 9.13)
- PR122/P and PR123/P with PR120D-M unit
- PR212/P with PR212/D-M unit
- PR222DS/PD, PR222DS/PD-A
- PR223EF
- PR331/P, PR332/P and PR333/P on local bus (see 9.13)
- PR332/P and PR333/P with PR330D-M unit

The possibility to perform a network scan delimiting the search parameters will help find possible connection or setting errors. The operating testing of a switchboard, fitted with Modbus communication devices, is simplified by SD-TestBus2. The save functionality of the scan just performed is very useful; the file will be afterwards loaded and compared for the real check of the devices into the switchboard.

SD-TestBus2 can also communicate through a Bluetooth adapter with all the ABB SACE SpA devices fitted with the internal wireless communication module PR120BT o with the external wireless communication module BT030, as per table below:

Protection Unit	PR120/D-BT	BT030
PR121/P	NO	YES
PR122/P	YES	YES*
PR123/P	YES	YES*
PR222DS/P	NO	YES
PR222DS/PD	NO	YES
PR223DS	NO	YES
PR232/P	NO	YES
PR331/P	NO	YES
PR332/P	NO	YES
PR333/P	NO	YES

**Table 1. Protection Units suitable for wireless Bluetooth communication**

(\*) if the PR120/D-BT internal module is absent

In wireless mode, the potentials of SD-TestBus2 are exalted by its ease of use in the most demanding environments.

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## 2 Operating instructions

### 2.1 Introduction

In case a previous version of SD-TestBus2 has been installed on the PC, it will be necessary to remove it (the path is: Start → Setting → Control Panel → Add/Remove programs; select the old SD-TestBus2 version and press “Remove”).

### 2.2 SD-TestBus2 Installation

Unzip the archive "SD-TestBusnnn.zip" (nnn stays for the number of the corresponding version) in a temporary directory and launch the “setup.exe” file. Following the screen instructions it proceeds at the guided installation of the program.

**Note:** *with administrative privileges, the installation folder page may ask what type of user can use SD-TestBus2:*

- “Every one”: *everyone is given the possibility to use the software;*
- “Just me”: *the administrator only can use this program.*

### 2.3 USB / Bluetooth adapter installation

For a correct functioning of SD-TestBus2, ABB SACE SpA suggests the installation of a Bluetooth USB adapters compatible with then Widcomm driver, such as those listed below:

- Mitsumi Bluetooth 1.1 Dongle (WidComm stack)
- Racewood Bluetooth Dongle (Extended Systems stack)
- TDK Bluetooth USB 1.1 (WidComm stack)
- SCM Bluetooth ZIO USB (WidComm stack)
- Cambridge Silicon Radio Ltd. (WidComm stack)
- 3COM Bluetooth USB Adapter 3CREB96-EU (3Com stack)
- Acer Bluetooth USB Adapter (WidComm stack)
- Trust Bluetooth 2.0 EDR USB Adapter (WidComm stack)

For a correct use of SD-TestBus2 in wireless mode, the USB/Bluetooth adapter must be configured in such a way that the Bluetooth connection does not requires the PIN code for secure connections. Once the driver and the adapter have been installed, it is necessary to restart the PC. After the restart, right click with the mouse the Bluetooth connection icon and access the "Advanced Configuration" menu.

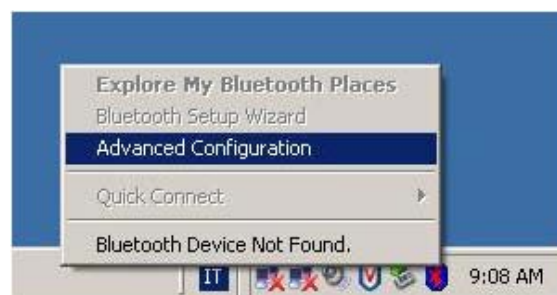



Figure 1. USB/Bluetooth adapter configuration

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Open the "Client application" tab, select "Bluetooth Serial Port" e click "Properties ...".

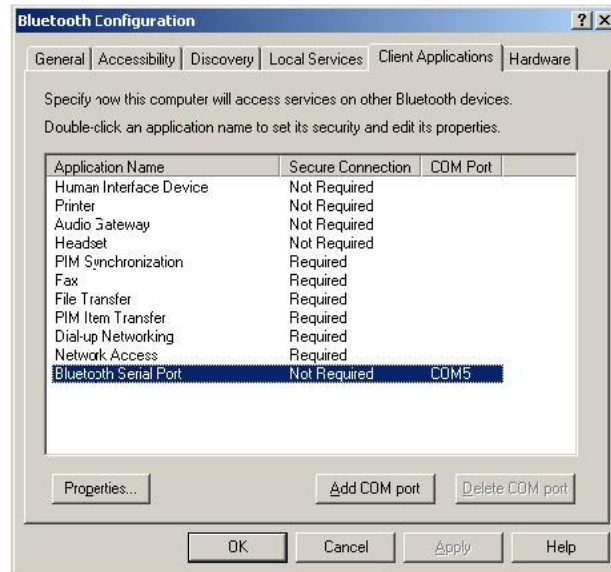


Figure 2. Serial port configuration

Deselect the "Secure connection" option. Click OK to confirm.



Figure 3. "Secure connection" removal

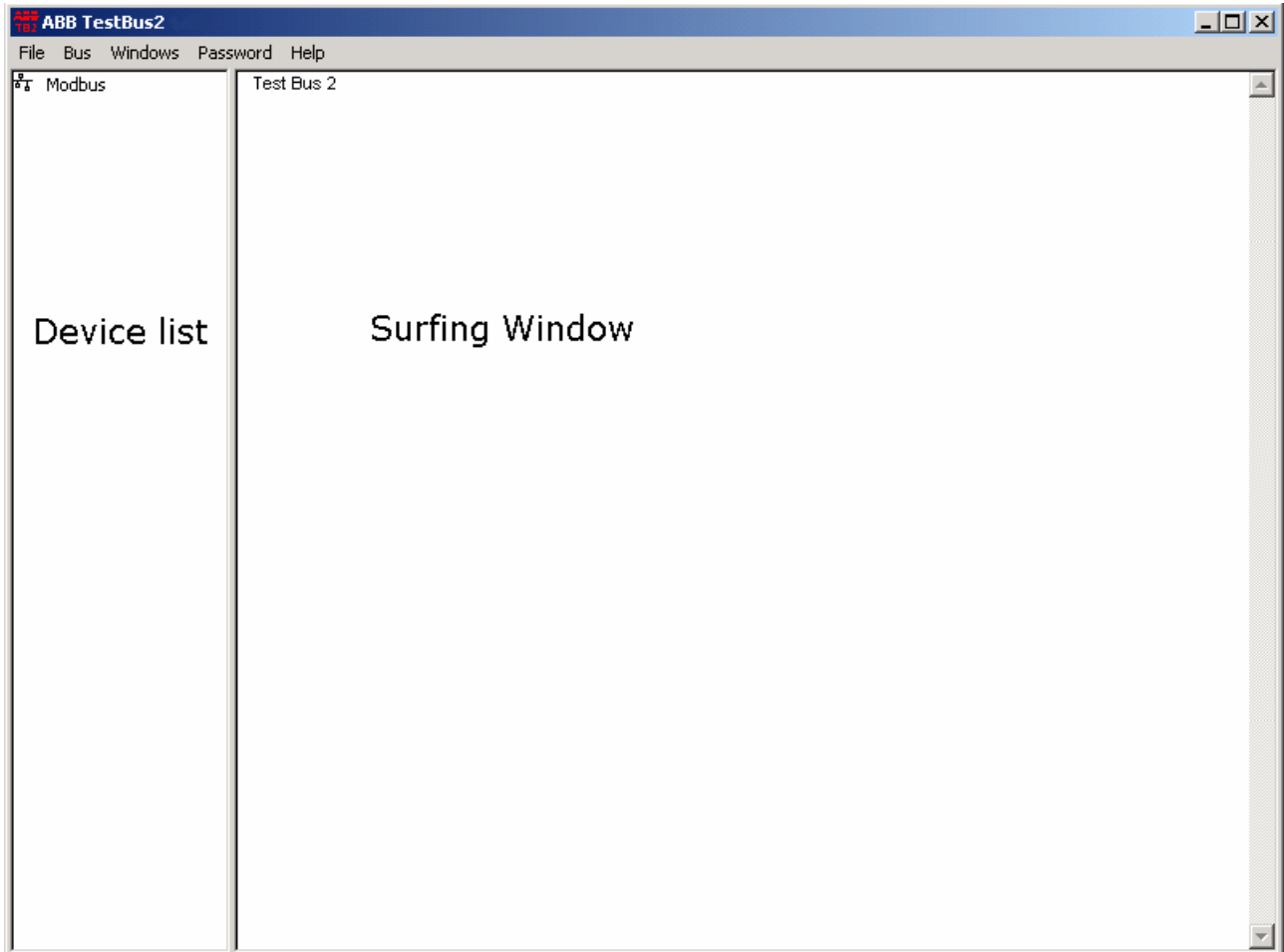
Restart the PC.

## 2.4 Start SD-TestBus2

Once the default installation parameters have been set, it is sufficient to launch the program from the Start Menu pressing the push button "Start" and deselecting the SD-TestBus2 icon, or clicking directly the program icon on the desktop.


### 3 Main window

The main window is split up into 3 areas as shown in the following figure:



#### 3.1 Device list

This area represents, with a tree view, all the devices detected during the bus scanning. The main node is

represented by the  “Modbus” element, while the single devices, are represented as subnodes giving the whole of icons and names that identify the device type and the address they are noticed to. For example, a PR113 relay at address 3 will have the nameplate “PR113 @ 3”.

Each device is associated with an icon that changes cyclically according to the following table:



Default icon



It shows the presence of the device and that the ID supplied (Slave ID) corresponds to that found by SD-TestBus2. The device is connected on **system bus** and it is configured in **remote** mode.

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It shows the presence of the device and that the ID supplied (Slave ID) corresponds to that found by SD-TestBus2. The device is connected through the Bluetooth module.



Indicates the presence of the device and that the ID supplied (Slave ID) corresponds to that found by SD-TestBus2. The device is connected on **system bus** and is configured in **local** mode.



It shows the presence of the device and that the ID supplied (Slave ID) corresponds to that found by SD-TestBus2. The device is connected o the **local bus** (for PR121,PR122, PR123, PR331, PR332 and PR333 only).



The device replied but if is of unknown type or it is not possible to determine the **remote/local** mode.




The device does not reply or its ID does not corresponds to that found by SD-TestBus2.

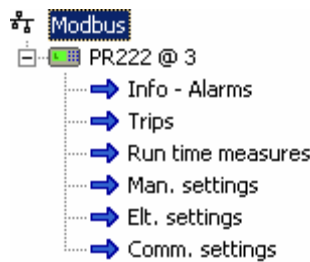


Wink is active.



The device has detected “any alarm” condition.

If the devices found are recognized, a set of pages is shown. Each page contains information and/or commands the device can perform. Each page is marked by an icon  .



**Note:** *in order to make the representation more compact, the pages are “compressed” and are not visualized. To visualize them lick with the mouse on the “+” that appears next to the device icon.*

### 3.2 Surfing pages

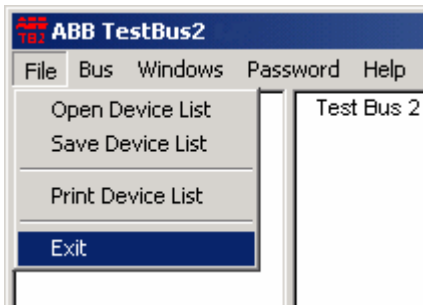
This area is deputed to represent the selected information operating with the mouse in the “nodes” of the device list. Selecting the root node “Modbus” a summary will be visualized with all the found devices and their communication parameters. At the same time, selecting with the mouse a single device it will be visualized a summary on its status and the possible problems found out during the scanning operation. At last, selecting the nodes “page” the information relevant to the status of protections, measure currents, etc., will be visualized.

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### 3.3 Menu bar

This bar contains all the commands that can be carried out by SD-TestBus2. The menu bar is contextual and changes according to the node selected in the device list.

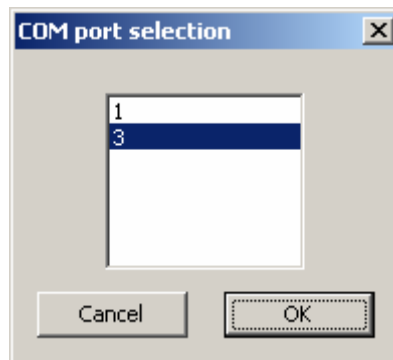
#### 3.3.1 File



##### 3.3.1.1 Open device list

It is possible to mention the result of the scan previously saved selecting “File\Open device list” and choosing the .xml file from the directory.

An example named “scanlist.xml” is available in the SD-TestBus2 installation directory.




Opening the file a dialogue window is showed. It is possible to select the COM port the devices are connected to. If the scan file is generated by the same PC, there is no need to select the COM port: just push “Cancel”.

##### 3.3.1.2 Save device list

It is possible to save the list of the devices found during the scanning in .xml format.

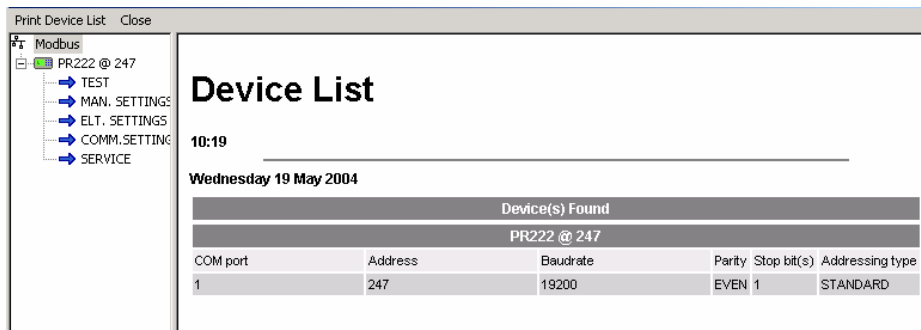
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### 3.3.1.3 Print device list

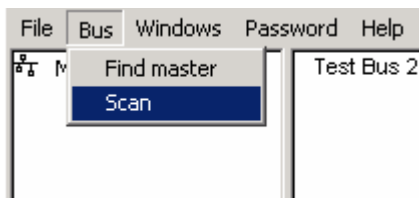
It is possible to print the summary screen that shows the list of all devices found during the bus scanning. To confirm the print command select the menu voice “Print device list”; to go back to the program select “Close”.



### 3.3.1.4 Exit

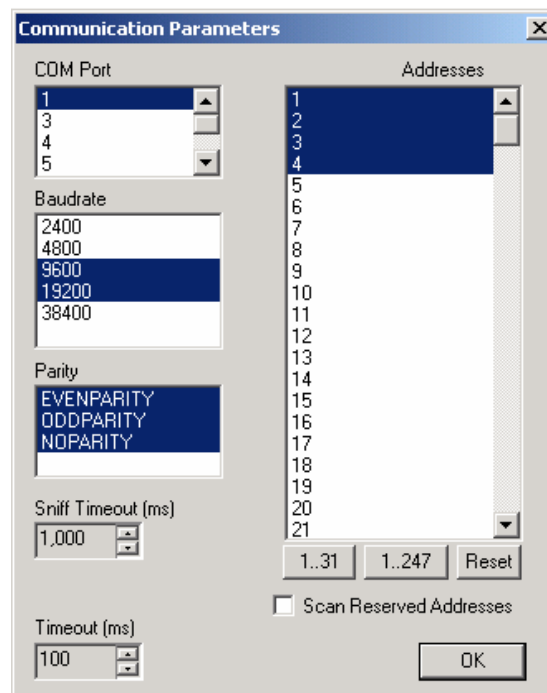
Exit from the program.

### 3.3.2 Bus



#### 3.3.2.1 Find master

It opens a window that allows setting the communication parameters for the detection of **Masters** active on the RS485/RS232 bus.



Acting on the “Sniff timeout” item it is possible to set the time delay SD-TestBus2 will be waiting and listening for intercepting any transmission coming from a mater.

In the “Baudrate” and “Parity” settings it is possible to select the range of scan. The more the selected combinations, the longer the time requested for completion of the scanning operation. To confirm the operation press the push button “OK”, otherwise press.

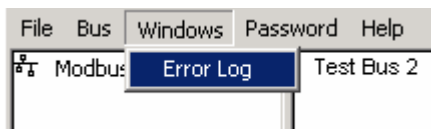
### 3.3.2.2 Scan

It opens the dialogue window similar to the one described on the **Error! Reference source not found.** section. This window allows the scanning parameters of the **Slave** devices on the bus to be selected. Pressing “OK” the scanning starts; by pressing the button “X” the dialogue window will be closed.

### 3.3.2.3 Bluetooth

It activates the Bluetooth antenna for the automatic search of ABB SACE SpA devices fitted with the wireless communication module within a 10m distance.

## 3.3.3 Windows



### 3.3.3.1 Error Log

This command opens a window that contains the errors detected during the communication with the last tested device.

**Note 1:** *in case of communication errors, this window is automatically opened by SD-TestBus2.*

At start up SD-TestBus2 creates a file named “modbus.log”. In this file are reported the last 200 errors occurred in the communication bus. The analysis of this file may be useful to detect problems on the bus.

**Note 2:** *The “modbus.log” file location is in the SD-TestBus2 installation path (for example “C:\Program Files\ABB\SD-TestBus”).*

**Note 3:** *communication errors are often a normal condition: some noise can generate temporary error on the communication bus. Otherwise if you notice slow refresh on SD-TestBus2’s pages and a great log activity probably a serious error has occurred on the bus. If you notice 10 or 15 errors in a time slice of 1 s there is probably a problem on the communication line. The following example shows a broken bus condition:*

```
*****
07/06/2005 - 12:02:56
PR122/P @ 3 time out error
*****

*****
07/06/2005 - 12:02:56
```

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```

PR122/P @ 3 time out error
*****

*****
07/06/2005 - 12:02:56
PR122/P @ 3 time out error
*****

*****
07/06/2005 - 12:02:56
PR122/P @ 3 time out error
*****

*****
07/06/2005 - 12:02:56
PR122/P @ 3 time out error
*****

*****
07/06/2005 - 12:02:56
PR122/P @ 3 time out error
*****

*****
07/06/2005 - 12:02:56
PR122/P @ 3 time out error
*****

*****
07/06/2005 - 12:02:56
PR122/P @ 3 time out error
*****

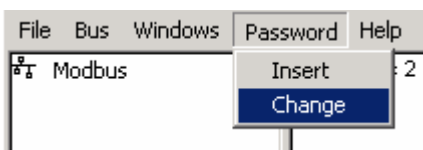
*****
07/06/2005 - 12:02:56
PR122/P @ 3 time out error
*****

*****
07/06/2005 - 12:02:56
PR122/P @ 3 time out error
*****

*****
07/06/2005 - 12:02:56
PR122/P @ 3 time out error
*****

*****
07/06/2005 - 12:02:57
PR122/P @ 3 time out error
*****
    
```

### 3.3.4 Password



#### 3.3.4.1 Insert

Inserting a specific password the user’s authorizations change. At present in SD-TestBus2 two use levels are provided:

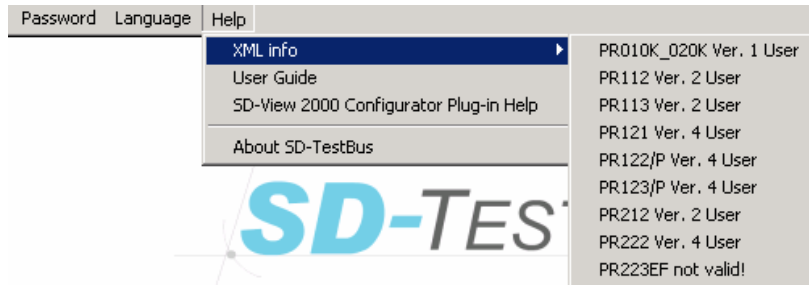
Protection level	Description
None	It allows to scan the bus in search of devices, to visualize some pages but not to send commands (open/close) or to set the protection parameters.
User	It allows to scan the bus in search of devices, to visualize some pages, to send commands (open/close) and to set the protection parameters.

**Note:** at the first installation of SD-TestBus2, the default *user password* is set to 0001.

### 3.3.4.2 Change

It allows changing the current password with another one at pleasure.

### 3.3.5 Help



**ABB**  
**ABB SACE S.p.A.**

#### 3.3.5.1 XML info

It is possible to access the information about the device describers and their version. The device describers represent the database used by SD-TestBus2 to identify and manage the devices connected to the bus.

**WARNING:** any modification of the device describers is strictly forbidden, since it may seriously compromise SD-TestBus2.

#### 3.3.5.2 Guide

It opens this guide.

#### 3.3.5.3 About SD-TestBus2

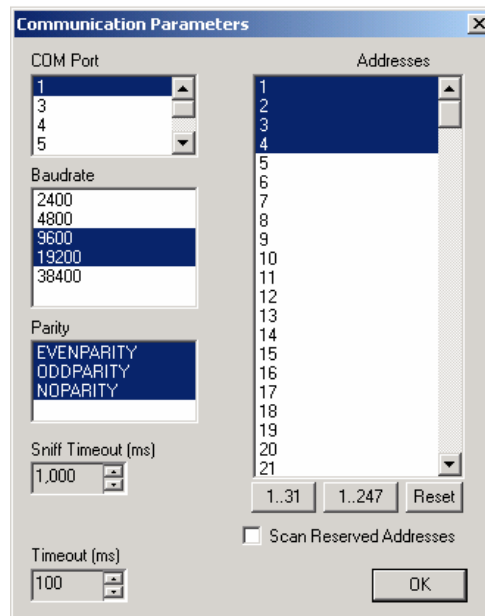
It opens a window containing the information on the version of SD-TestBus2.

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## 4 Bus scanning

This function allows identifying the devices (slave) connected to the bus, pointing out the characteristic communication parameters. According to the device type, more pages will be available for protection parameters setting and for command sending.

From the menu “Bus” select the “Scan” function; a dialogue window will open up allowing choosing scanning parameters.



The “Baudrate” parameter allows selecting the communication speed between the device and SD-TestBus2.

The “Parity” parameter allows selecting the type of error check that is carried out on each transmitted character. The possible options are:

- “Evenparity”: check of “even” parity;
- “Oddparity”: check of “odd” parity;
- “Noparity”: no parity check.


In the box on the left it is possible to select with the mouse an addresses range within which to perform the scanning. By ticking off the “Scan Reserved Addresses” option, it will be carried out the device scanning in the addresses 248-255.

The “Timeout” parameter shows the maximum time expressed in milliseconds, the program will be waiting for receiving a reply from the device under scanning. If the selected time is too short there is a possibility of not being able to detect the presence of devices on the bus.

The 100 ms value is an excellent compromise between the scanning velocity and the waiting time.

Acting on the “COM Port” box, it is possible to select the port within which to perform the scanning.

**Note 1:** *if some program is using one or more serial ports (e.g. SD-View2000) these ones will not be visualized.*

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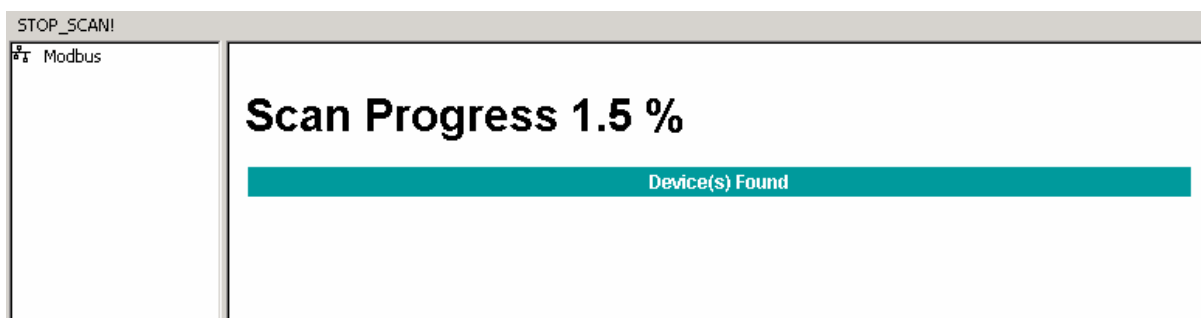
**Note 2:** *it is possible to launch a number of SD-TestBus2 instances equal to the serial ports available on one's own PC.*

At last in the boxes “Baudrate” ad “Parity” it is possible to select the wished scanning intervals likewise the box “Addresses”.

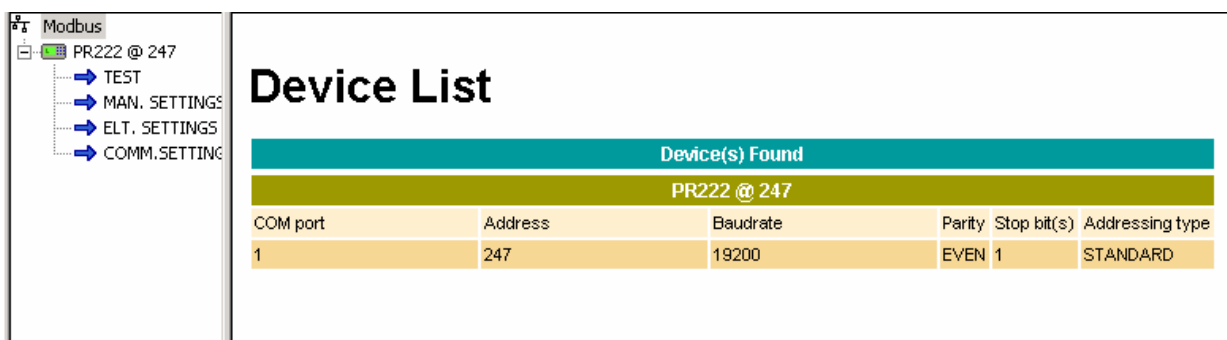
**Note 3:** *the larger is the selected parameters set, the greater is the number of the combinations to test; as a result, the time to complete the scanning will be longer.*

To confirm press “OK”; to exit press the “X” push button.



During the scanning the progress percentage is visualized in the box on the right.  
To end immediately the operation select the item “STOP\_SCAN!” in the menu bar.



If some devices are found, they will be visualized both in the device list and in the box of surfing pages where the main communication parameters will be summarized.




At the end of the operation (each 5s) SD-TestBus2 checks the presence of the devices detected. In the box “device list” all the devices found are visualized by a tree diagram.

The device’s icon, may change from  , showing the right reply of the device, to  signaling a device’s or serial connection’s anomaly.

In the case the device is in **local** mode (the device can not perform commando), the icon will have the padlock

shape .

**Note 5:** *SD-TestBus2 will signal also the possible presence of not ABB SACE SpA devices.*

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The screenshot shows the SD-TestBus2 software interface. The menu bar includes 'File', 'Bus', 'Windows', 'Password', and 'Help'. The left sidebar shows a tree view with 'Modbus' and a sub-entry 'Device Unknown @ 3'. The main window is titled 'Device List' and contains the following information:

Device(s) Found					
Device Unknown @ 3					
COM port	Address	Baudrate	Parity	Stop bit(s)	Addressing type
1	3	19200	EVEN	1	Unknown

**Warning(s):**

- On or more devices are of not known type. Maybe not ABB.

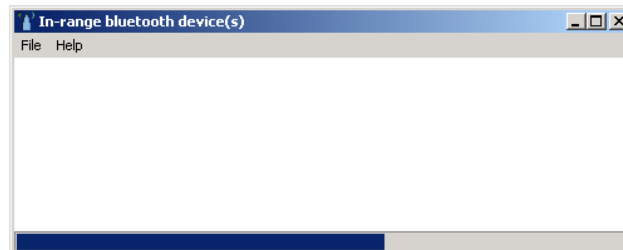
At the end of the scanning SD-TestBus2 will visualize possible Warning or Errors found (for example in case there are two devices with different baud rate)

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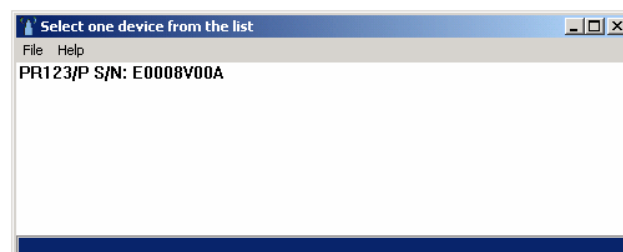
## 5 Bluetooth

This function allows identifying ABB SACE SpA devices fitted with the internal wireless Bluetooth communication module BT030 or with the external one PR120D-M.

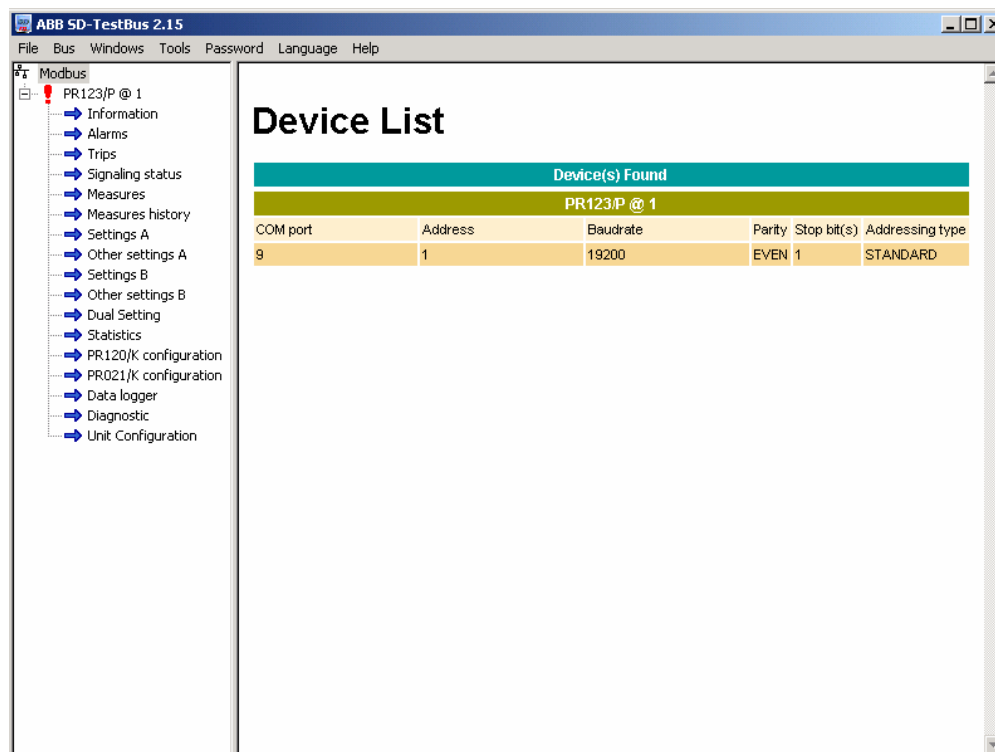
From the "Bus" menu select the "Bluetooth" function to activate the adapter. On the screen a pop-up window will show the search progress.



At the end of the search, the description and serial number of the detected devices will be shown.



With a double click it is possible to access the information of one of the devices detected during the wireless scan.

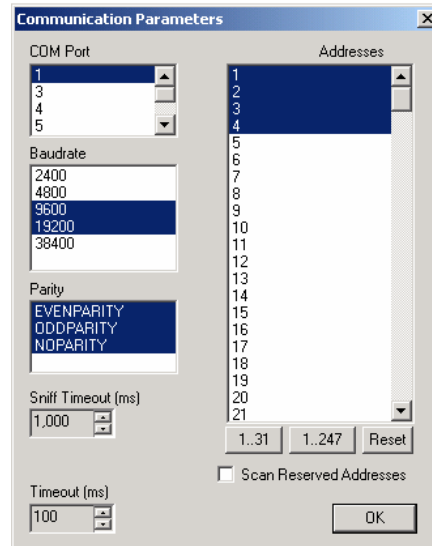




## 6 Find master

This function allows discovering the presence of possible master present on the bus, showing the characteristic communication parameters.

From the "Bus" menu select the voice "Find master". A dialogue window opens allowing choosing various parameters to perform the scanning.



The parameter "Sniff Timeout" shows the maximum time expressed in milliseconds, the program will be waiting for intercepting the transmission of a master on the bus. If the selected time is too short there is a possibility of not being able to detect device's presence on the bus. The value of 1000 ms is an excellent compromise between the scanning velocity and the waiting time.

Acting in the box "COM Port" it is possible to select the port within which to perform the scanning.

**Note 1:** *if some program is using one or more serial ports (e.g. SD-View 2000), these ones will not be visualized.*

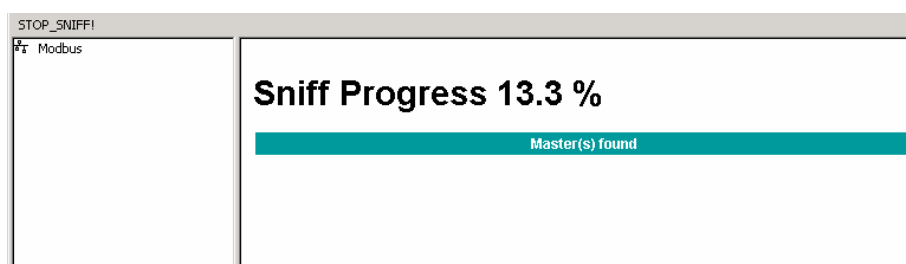
In the boxes "Baudrate" and "Parity" it is possible the selection of the wished scanning intervals.

**Note 2:** *the larger is the selected parameters set, the greater is the number of the combinations to test; as a result the scanning time will be longer.*

To confirm press OK; to exit press the 'X' push button.

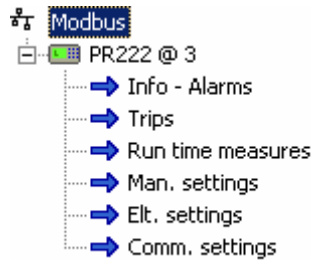
During the scanning the progress percentage is visualized in the box on the right.

To end immediately the operation select the item "STOP\_SNIFF" in the menu bar.



## 7 Interaction with the single device

To interact with a single device select the “pages” (e.g. "TEST", "SETTINGS"...) that appear below each node in the box “device list”:



**Note 1:** a changeable number of pages may be present according to the device type.

### 7.1 Information

In this section it is possible to read general information about the device (SW release, circuit breaker and alarms status) and send commands (Wink, closing and opening command, Trip reset, etc.).

PR222 @ 1 - Info - Alarms			
Present Parameter		Alarms	
CB Type	T4	L Prealarm	NO
Nominal current	300 A	L	NO
Date of Test	10.11.2069	S	NO
SW version	02.03	G	NO
Device version	warning!hex: FFFF	Trip Command Fail	NO
Product Execution	LSIG	Reports	
Process Statistics		CB Status	OPEN
CB Number of Operation(s)	0	CB tripped	NO
		PR010T Connected	NO
		AUX-E Status	NOT PRESENT
		MOE-E Status	NOT PRESENT

PR222 @ 1 - COMMANDS				
CB Open	CB Close	CB Reset	Trip Reset	Wink

**Note 2:** for sending the command it is necessary to be an “authorized” user. The default password is 0001. For more details see section **Error! Reference source not found.**

**Note 3:** the commands in the page will be visualized in gray color if the device under test is in the local operation modality



; it will not be possible to press the push buttons.

### 7.2 Alarms

All the alarms made available by the device are shown in this page: the “any alarm” status is shown with the



icon into the tree view.

PR122P @ 1 - Alarms			
Protection Alarms		Other Alarms	
L Pre-Alarm	NO	Harm. Dist. > 2.1	NO
L Timing	NO	CW Pre-Alarm	NO
S Timing	NO	CW Alarm	NO
S2 Timing	NO	LC1 Alarm	NO
G Timing	NO	LC2 Alarm	NO
G Alarm (Blocked Trip)	NO	Frequency Error	NO
G Ext. Timing	NO	Iw Warning	NO
G Ext. Alarm (Blocked Trip)	NO	Power Factor Error	NO
Advanced Alarms		Phase Cycle Error	NO
T Pre-alarm	NO	Date Error	NO
T Alarm	NO	Configuration Error	NO
T Alarm (Blocked Trip)	NO	CB Status Error	NO
D Timing	NO	Connection Alarms	
U Timing	NO	Rogowski L1	OK
U Alarm (Blocked Trip)	NO	Rogowski L2	OK
UV Timing	NO	Rogowski L3	OK
UV Alarm (Blocked Trip)	NO	Rogowski NE	OK
OV Timing	NO	GT Ext Sensor	OK
OV Alarm (Blocked Trip)	NO	TC Status	OK
RV Timing	NO	Rating Plug Status	OK
RV Alarm (Blocked Trip)	NO	Key Plug Status	OK
RP Timing	NO	Temperature Sensor Status	OK
RP Alarm (Blocked Trip)	NO		
UF Timing	NO		
UF Alarm (Blocked Trip)	NO		
OF Timing	NO		
OF Alarm (Blocked Trip)	NO		

The “any alarm” status is produced by any of the alarms reported in this page: for example alarm condition could be done by protection timing or by connection errors.

### 7.3 Trips

If the alarm condition has reached a timeout (i.e. L timing) the relay sends a trip command to the circuit breaker and then enters into the “tripped” status. In this page it is possible to catch information about the cause of the trip and the protection’s name that has timed out.

Depending on the type of relay, it is possible to read information about previous trips (called Trip history).

PR122P @ 1 - Trips								
Trip History								
Trip Type	N. of Trip	Date	Time	RMS L1	RMS L2	RMS L3	RMS Ne	Contact wear
HW Trip	45	09.06.2005	17:44:16.311	...	...	...	...	13.0507 %
HW Trip	44	09.09.2005	17:11:21.616	...	...	...	...	13.0476 %
HW Trip	43	09.09.2005	17:11:04.987	...	...	...	...	13.0446 %
HW Trip	42	08.06.2005	16:56:13.614	...	2596 A	...	...	13.0415 %
HW Trip	41	08.06.2005	16:54:57.803	...	...	...	...	13.0338 %
HW Trip	40	08.06.2005	16:54:50.087	...	...	...	...	13.0307 %
HW Trip	39	08.06.2005	16:54:31.599	...	...	...	...	13.0276 %
I	38	08.06.2005	16:06:59.641	...	...	...	9014 A	13.0246 %
I	37	08.06.2005	16:06:45.175	...	...	...	8345 A	12.6092 %
I	36	08.06.2005	16:06:42.052	...	...	9036 A	...	12.1553 %
I	35	08.06.2005	16:06:37.695	...	9040 A	...	...	11.7984 %
I	34	08.06.2005	16:06:14.235	8085 A	...	...	...	11.4476 %
I	33	08.06.2005	16:05:24.557	...	...	...	9011 A	11.0169 %
I	32	08.06.2005	16:05:04.515	...	...	...	9007 A	10.5861 %
I	31	08.06.2005	16:04:35.063	...	8655 A	...	...	10.1476 %
I	30	08.06.2005	16:04:22.642	8571 A	8819 A	8430 A	9000 A	9.8738 %
I	29	08.06.2005	16:03:18.618	...	...	9033 A	...	9.5692 %
I	28	08.06.2005	16:03:11.042	9007 A	...	...	...	9.203 %
I	27	08.06.2005	16:03:05.491	8664 A	...	...	...	8.7569 %
I	26	08.06.2005	16:01:28.613	8593 A	8452 A	6208 A	...	8.483 %


### 7.4 Measures History

In this table are shown the measures of current, voltages and power recorded by the relay. It is possible to define the time interval between two measures (for ex. 5 min).

Measures History												
MARKER	Historical Code	Time from the last store [min]	Date	Hour	Minute	Average Total Active Power [kW]	Max Total Active Power [kW]	Max current phase	RMS max current [A]	Max Voltage Phase	Max value	Min Voltage Phase
Valid	Power Up	0	28/07/2005	15	14	...	...	---	...	U12	...	U12
Valid	Power Up	0	28/07/2005	14	55	...	...	---	...	U12	...	U12
Valid	Power Up	0	28/07/2005	14	54	...	...	---	...	U12	...	U12
Valid	Power Up	0	28/07/2005	14	54	...	...	---	...	U12	...	U12
Valid	Power Up	0	28/07/2005	14	54	...	...	---	...	U12	...	U12
Valid	Power Up	0	28/07/2005	14	53	...	...	---	...	U12	...	U12
Valid	Power Up	0	28/07/2005	14	53	...	...	---	...	U12	...	U12
Valid	Normal	16	28/07/2005	14	46	...	...	---	7476	U12	...	U12
Valid	Normal	16	28/07/2005	13	46	...	...	Phase L2	7	U12	...	U12
Valid	Normal	16	28/07/2005	12	46	...	...	---	7492	U12	...	U12
Valid	Normal	16	28/07/2005	11	46	...	...	---	8796	U12	...	U12
Valid	Power Up	0	28/07/2005	10	47	...	...	---	...	U12	...	U12
Valid	Power Up	0	28/07/2005	10	43	...	...	---	...	U12	...	U12
Valid	Power Up	0	27/07/2005	14	42	...	...	---	...	U12	...	U12
Valid	Power Up	0	27/07/2005	14	25	...	...	---	...	U12	...	U12
Valid	Power Up	0	27/07/2005	12	18	...	...	---	...	U12	...	U12
Valid	Power Up	0	27/07/2005	12	15	...	...	---	...	U12	...	U12
Valid	Power Up	0	27/07/2005	10	19	...	...	---	...	U12	...	U12
Valid	Power Up	0	27/07/2005	9	34	...	...	---	...	U12	...	U12
Valid	Power Up	0	27/07/2005	9	33	...	...	---	...	U12	...	U12
Valid	Power Up	0	27/07/2005	9	32	...	...	---	...	U12	...	U12
Valid	Power Up	0	27/07/2005	9	32	...	...	---	...	U12	...	U12
Valid	Power Up	0	27/07/2005	9	32	...	...	---	...	U12	...	U12
Valid	Power Up	0	27/07/2005	9	29	...	...	---	...	U12	...	U12
Valid	Power Up	0	27/07/2005	9	20	...	...	---	...	U12	...	U12

PR122P @ 3 - COMMANDS

Measure History Reset

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### 7.5 Run time measures

In this page are shown all the measures made by the relay at run time.

PR123/P @ 247 - Run time measures			
<b>Currents</b>		<b>Apparent Powers</b>	
RMS max current	...	S Total	---
Max current phase	---	<b>Power Factor</b>	
L1 phase	...	Total	---
L2 phase	...	<b>Frequency</b>	
L3 phase	...	Measured Frequency	---
Neutral	...	<b>Peak Factors</b>	
Ground	...	Phase 1	---
<b>Voltages</b>		Phase 2	---
U1	...	Phase 3	---
U2	...	Neutral	---
U3	...	<b>Energies</b>	
U0 Residual	...	Active Total	2 kWh
U12	...	Reactive Total	- 7 kVARh
U23	...	Apparent Total	145 kVAh
U31	...	Active Positive	47 kWh
<b>Active Powers</b>		Active Negative	- 45 kWh
P Total	---	Reactive Positive	41 kVARh
<b>Reactive Powers</b>		Reactive Negative	- 48 kVARh
Q Total	---		

It is possible to see the run time currents, voltages, power and energies depending on the installed relay.

### 7.6 Settings

The protection settings can be visualized and set up in this page. The information are arranged in a table form; each row contains the name of the item, its current value and a list box menu showing the value whole that the item may assume. Choose the wanted value from the menu. More selections about different items are possible; the new values are transferred to device only after pressing the push button "Submit".


PR222 @ 1 - Eit. settings			
<b>Protection L</b>		<b>Protection I</b>	
Trip Threshold	1.00 In	1.00	Protection Status
Trip time	6.0 s	6.0	ENABLED
L pre-alarm status	DISABLED	DISABLED	ENABLED
<b>Protection S</b>		<b>Protection G</b>	
Protection Status	ENABLED	ENABLED	ENABLED
Curve type	DEFINITE TIME	DEFINITE TIME	Trip Threshold
Trip Threshold	2.0 In	2.0	0.50 In
Trip time	0.25 s	0.25	0.20 s
Submit		Reset	
PR222 @ 1 - DRAW CURVE			
CURRENT/TIME CURVE			

During the transfer of the data to the device, for each item modified will be visualized the indication "old\_value-> new\_value" (e.g. "10 ---> 12") to indicate that the writing operation is under execution. When the writing is completed the indication will change in "new\_value".

For sending the data it is necessary to be an "authorized" user. The default password is **0001**. For more details see section **Error! Reference source not found.**

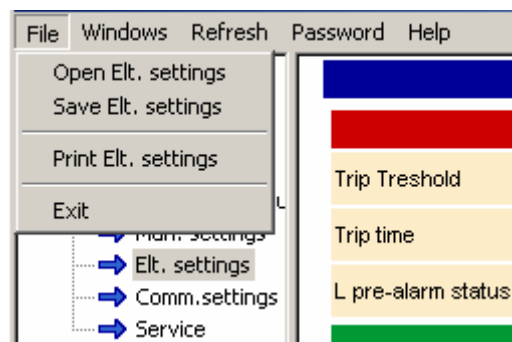
**WARNING:** the sending to the device of some value arrangements (e.g. not congruent protection threshold) may cause an error message. In this case the page will be refreshed with the relay current value.



**Note 1:** when the device under test is in the local operating modality , all the writing commands are disabled.

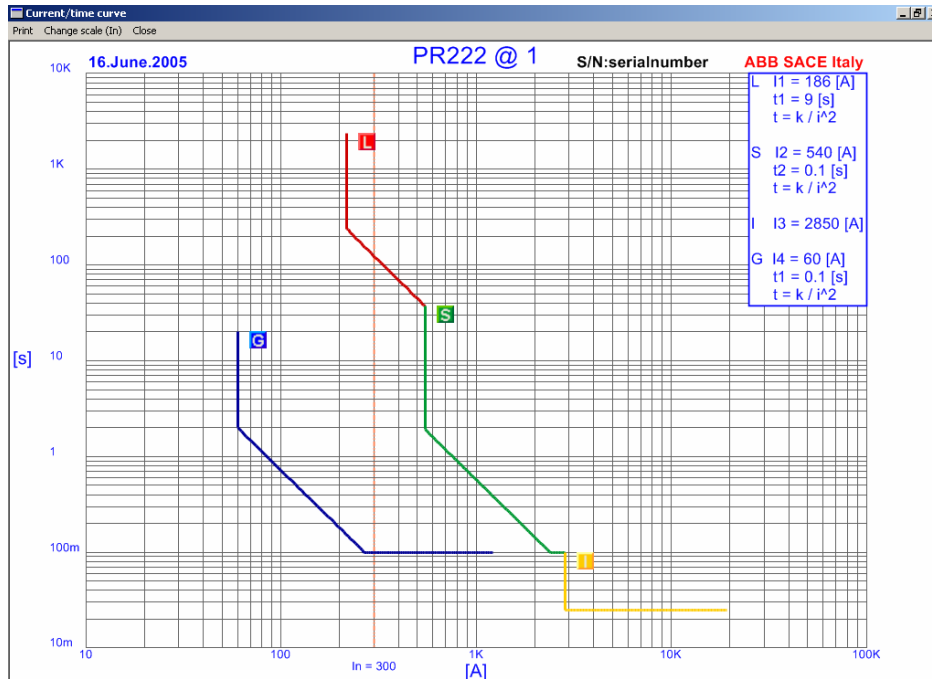
**Note 2:** to cancel the modifications in the selections it is sufficient to press the pushbutton "Reset".

**Note 3:** according to the type of selected voice, TEST, SETTINGS, etc. it is possible to print a test report and to save/load the relay settings in the menu "File".



### 7.6.1 Current time curve

With some relays it is possible to have a graphical representation of the protection set (L, S, I and G protections). To open this window you have to push the button named “Curve current / time”.



On the menu bar is made possible to print the current view, to change the current scale (Ampere or In) and to close the window.

*Note 1:* the I<sub>1</sub> current threshold is drawn at about 117% (IEC) or 105% (UL) of its nominal value. This is done according to the respective standards.

*Note 2:* it is possible to change the protection set without close the window. At the end of the programming session, the window is automatically refreshed with the new parameters. If there is a communication problem or an incoherent parameter set a “?” icon is shown.

### 7.7 Communication settings (only for PR222DS/PD and PR223EF)

This page is visualized only if the device found on the bus belongs is a PR222DS/PD or PR223EF. Here is some information about the configuration of the communication unit.

PR222 @ 1 - Comm.settings		
Communication Parameters		
Address	1	<input type="text" value="1"/>
Addressing	Standard	<input type="text" value="Standard"/>
Baudrate	9600	<input type="text" value="9600"/>
Parity	Even	<input type="text" value="Even"/>
<input type="button" value="Submit"/>		<input type="button" value="Reset"/>

The item “Address” shows the logical address of the device on the bus, and may be changed by the list box menu on the right. Admissible values are from 1 to 247.

The item “Addressing” shows the access modality of SD-TestBus2 to different records of the device. The two possibilities are:

- “Standard”: in this modality the records are mapped according to the standard Modbus;
- “ABB”: in this modality the records are mapped according to the standard owner ABB.

**Note 1:** *the selection of the addressing modality does not compromise the functionality of the device and of SD-TestBus2, however is good manner that all the devices on the bus will have the same addressing type.*

The voice “Baudrate” allows selecting the communication speed between the device and SD-TestBus2. The two choices are 19200 and 9600 characters per second.

The voice “Parity” allows to select the type of error check that is carried out on each transmitted character. The possible options are:

- “Even”: check of even parity;
- “Odd”: check of odd parity;
- “None”: no check of parity.

**WARNING:** Even though SD-TestBus2 allows managing more devices with different communication parameters, it is highly advisable to maintain the same addressing, baud rate and parity for all devices on the same bus. Before changing the logical address of the device (“Address”), verify that this is not already in use by another device. Otherwise the communication with both devices will be lost.

**Note 2:** *when one or more communication parameters are modified, SD-TestBus2 “follows” these changes resetting the serial port. The communication with the device is not lost so the user is not forced to do a new scanning operation.*

## 7.8 Statistics

In this table are shown the number of operations, subdivided by typology.

PR123/P @ 3 - Statistics	
CB Operations statistics	
N° total operations	54
N° manual operations	34
N° protection trips	571
N° prot trip fails	13
N° trip tests	0

**Note:** *the manual operations item is updated when the CB changes its status from CLOSE to OPEN.*

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## 7.9 Signaling Status

In this page are shown the status of the contacts installed on the relay:

- PR010/K, PR020/K, PR021/K external contacts module;
- PR120/K internal contacts module (see 7.10);
- Input status on PR120/K.

It is possible to reset contacts status by pushing the button “Signaling reset”.


PR122/P @ 3 - Signaling status			
PR020k contacts		P1 P4 contacts	
relay 1	Open	contact P1	Open
relay 2	Open	contact P2	Open
relay 3	Open	contact P3	Open
relay 4	Open	contact P4	Open
relay 6	Open	<b>Signaling module input</b> Input status      Not Active	
relay 7	Open		
relay 8	Open		
PR122/P @ 3 - Actions			
<input type="button" value="Signaling reset"/>			

## 7.10 PR120/K Configuration

In this page is possible to setup the behavior of the PR120/K module. This optional module has 4 programmable contacts (outputs) and one input named “Signaling module input”. For each contact there are four items to be selected.

1. The “Contact status” item can assume two values:
  - “NO”: contact is normally open;
  - “NC”: contact is normally close;
2. “Contact Latch” establish the behavior of the contact:
  - “Not latched”: the output stays active when the programmed event is set. When the event is no more verified the corresponding contact return to its inactive status;
  - “Latched”: the output stay active when the programmed event is set for the first time. When the event is no more verified the corresponding contact **does not return** to its inactive status
3. “Function”: it is possible to select a simple event function from the menu showed. If needed, it is possible to set up a custom event by pressing the “Custom” button.
4. “Delay”: defines the delay between the event changing status (to verified) and the corresponding contact response.

P1 contact		
Contact Status	NO	<input type="button" value="NO"/>
Contact Latch	Not Latched	<input type="button" value="Not Latched"/>
Function	Custom: 0x610	<input type="button" value="Custom..."/> <input type="button" value="Custom"/>
Delay [s]	0.0	<input type="button" value="0"/> <input type="button" value="0"/>

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## 7.11 Data logger

The Emax series PR122 and PR123 has the ability to record the current and voltage signals of the plant.

PR123/P @ 3 - Data logger				
Parameters			Status	
Frequency	4800 Hz	4800 Hz ▾	Waiting trigger   Waiting	
Status	Enabled	Enabled ▾	Triggered   ---	
Trigger type	Custom: 0x810A	Custom... ▾ Custom	Stopped   ---	
Stop delay	0.00 s	0.00 ▾	Time Stamp	
			Date	31.12.1999
			Hour	0
			Minute	0
			Second	0
			Millisecond	0

PR123/P @ 3 - Commands		
<input type="button" value="Trigger Restart"/>	<input type="button" value="Data logger Stop"/>	<input type="button" value="Download"/>

In this page it is possible to set the sampling frequency, to set a custom event and to set the delay between the trig event and the end of the recordings.

**Note 1:** *the total time capacity of the data logger depends on the selected sampling rate. It can vary between 3s (sampling frequency equal to 4800Hz) and 27s (sampling frequency set to 600Hz). It is important to choose the proper sampling frequency: too low sampling frequency may affect signal's representation. This is caused by noise and plant harmonics at frequencies above 50 or 60 Hz. For further information please refer to the Emax PR122 or PR123 user manual.*

**Note 2:** *the data logger can be set to be "free running" or "triggered on event". In the first case the user have to stop manually the recording of the data logger. In the second, a stop command is sent by the relay when a particular event (i.e. any trip or any alarm or a custom event) occurs. The trip event has the priority: when this event occurs the relay stops the data logger (even if it is in "free running").*

To start an acquisition push the "Trigger restart" button. You can notice a "Waiting trigger" item on the top of the "Status" box. **Warning:** the "Trigger restart" command has to be sent only if the data logger is "enabled".

To stop the data logger acquisition, push the "Data logger stop" button.

To download the content of the data logger to a file push the "Download" button.

## 7.12 Local/remote modality management



For safety reasons, when the device is in **local** modality, SD-TestBus2 does not allow the command sending. It is necessary, therefore, to interact with the frontal panel of the device and to set the **remote** operation modality. Within 5 seconds, SD-TestBus2 will find the setting change and automatically will allow to the user to send the commands or to set the protection parameters.

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## 8 SD-View2000 Configurator Plug-in

**SD-View 2000 Plug-in** for SD-TestBus2 is an application that allows to use the information got from **SD-TestBus2**'s Modbus scan process for configuring **SD-View 2000**. This will reduce the configuration time and make the engineering process easier, more consistent and less error-prone.

Usually, the configuration engineer is required to use SD-View 2000 Configurator for configuring SD-View 2000. This is the main and most flexible procedure, but it requires to manually set the configuration.


The plug-in can be seen as a simplified version of SD-View 2000 Configurator, where most of the configuration data is taken from SD-TestBus2.

**SD-View 2000 Configurator Plug-in** for **SD-TestBus2** can be used even when a previous **SD-View 2000** version exists.

The plug-in is able to determine whether the information found by **SD-TestBus2** are in conflict with what previously configured in **SD-View 2000**. If this is the case, the user will be alerted.

The plug-in is based on **SD-View 2000 Configurator** and it requires **SD-View 2000** to be installed on the same computer where **SD-TestBus2** is running. For further information read "Getting started with SD-View2000" (doc. 1SDH000513R0002).

## 9 Summary of last scanning

To have a summary of the last scanning carried out, select the node  "Modbus" in the device list.

## 10 FAQs

### 10.1 The program does not start and gives a message "No available COM port found!"

At start SD-TestBus2 is looking for the serial ports supplied from the PC in use. On some portable PC of last generation it is possible that the COM ports are emulated. It is necessary to set them in a proper way so that SD-TestBus2 may use them rightly. Besides, verify that the serial ports are not already in use in another software, for example SD-View 2000.

### 10.2 The scanning operation does not find any device

Check that the relay is correctly powered. Make sure that the serial cable and the converter RS-232/ RS-485 is correctly supplied. Besides, check that the polarity of the two cables of the bus 485 is right. In case, act on parameter "Timeout" to increase the waiting time during the scanning. In case, mark the item "Search in the reserved addresses" to find devices with not configured communication.

### 10.3 The scanning operation finds unknown devices with consecutive addresses

Make sure that the polarity of the bus 485 cables is right and that at rest the line is correctly polarized. Go to "Bus\Find master" to check the presence of a master (e.g. SD-View 2000) which is transmitting on the bus.

### 10.4 During the scanning one or more unknown devices are found even if in the switchboard there are SACE devices.

Verify that the devices do not communicate on the bus at the same address. In case, dissect the bus and set one at a time the devices with different addresses.

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**10.5 I have found some PR010K /PR020K /PR021K unit.**

**Attention**, the wirings are wrong. These units have not to be visible to SD-TestBus2.

**10.6 SD-TestBus2 has found a device but it does not show the pages.**

Make sure that on the left of the icon there is the signal “+”. On the contrary, select the device and in the surfing window check the item “Problem”. They may be several reasons:

- Unknown device, SD-TestBus2 does not support this device or two or more devices communicate on the same address;
- Describer not valid, the file xml has been corrupt. It is necessary to install again SD-TestBus2.

**10.7 SD-TestBus2 has found the device but loses the communication**

Make sure that the line RS-232 and the bus 485 are not too much disturbed (interferences with supply cables, mobile phones, etc.)

**10.8 I try to send a command but SD-TestBus2 ask me a password**

To send a command it is necessary to be authorized users.


**10.9 I try to send a command but the push buttons do not work**

Make sure that the device is in **remote** modality (alternation icons  and  ). On the contrary, set the remote operation node on the relay panel.

**10.10 I try to carry out a command but an error window opens with the message “Modbus device return an exception code...”**

It means that the device has received the command but is not in condition to perform it.

**10.11 During the surfing of pages, a page in evidence appears with some error messages.**


Occasionally some communication errors caused by noise may occur (timeout error, CRC error, etc.). To avoid that this window appears continually, minimize it pressing the push button .

**10.12 SD-TestBus2 show always the same serial number.**

Every relay has its own serial number that is read (once) during scan operation. If the relay under test is changed (e.g. by bus switch) with another one (of the same type) with the same slave address, the serial number will not be refreshed. New devices connected to the bus have to be detected always with a bus scan.


**10.13 Local bus connection.**

The PR12X and PR33X relays have built in a **point-to-point** bus for Modbus communication. It means that, without the PR120/D-M module, it is made possible to wire the **W3** and **W4** contacts and communicate with an RS-485 converter. **The bus parameters are fixed: address 3, baud rate 19200, even parity and 1 stop bit.**

When local bus is used for connection, SD-TestBus2 shows the  icon on the tree list view. **It is not possible to connect more than one device on the local bus: it can cause conflicts and communication problems.**

**10.14 The signaling module doesn't work**

It is possible that the contact activation delay is greater than the event duration when the contact behavior is set to “Not Latched”. If possible try to decrease the delay or set the contact to “Latched”.

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