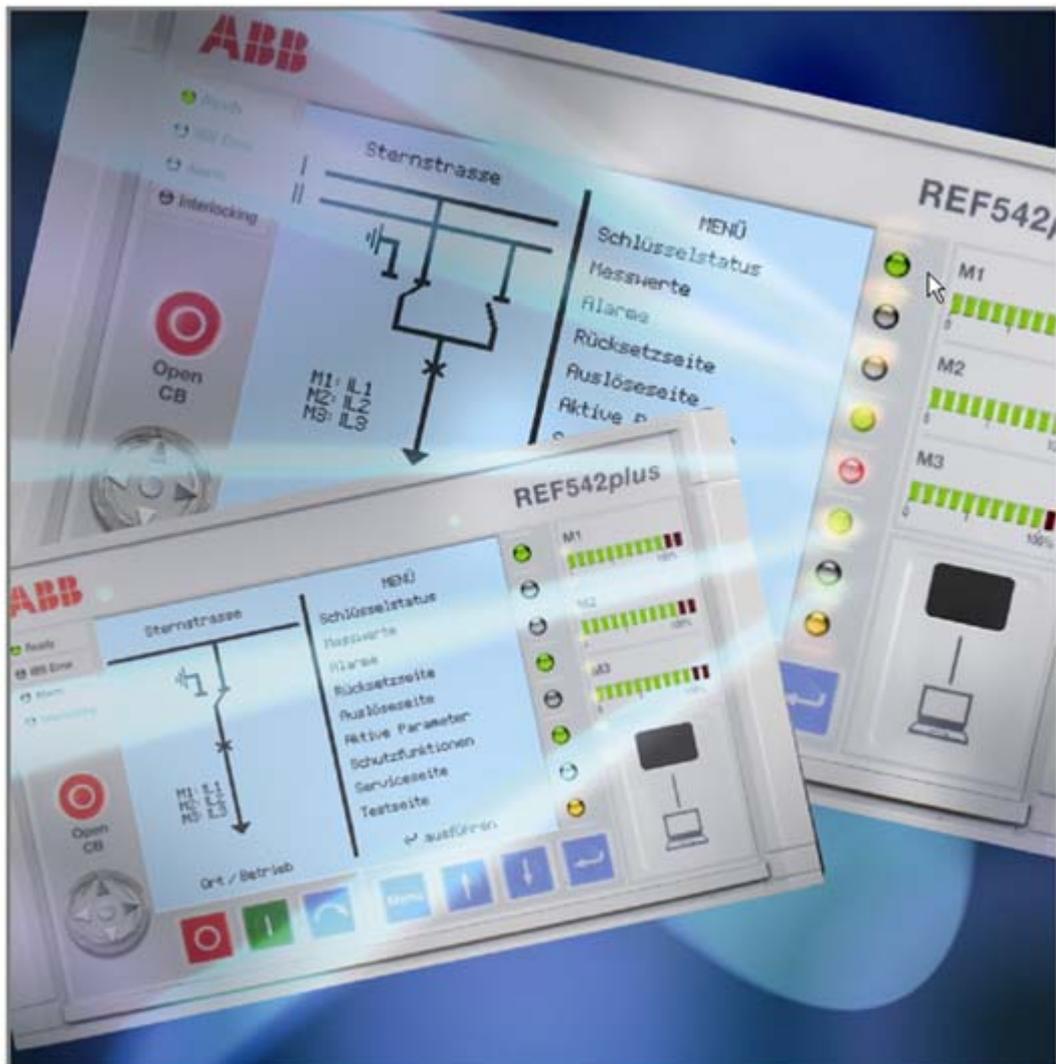


REF 542plus

Remote operations

Operator's manual



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1. Introduction

1.1. This manual

This manual describes how to use the REF 542plus Configuration Tool program for defining the needed actions for the remote operation.

1.2. Use of symbols

This publication includes the following icons that point out safety-related conditions or other important information:



The electrical warning icon indicates the presence of a hazard which could result in electrical shock.



The warning icon indicates the presence of a hazard which could result in personal injury.



The caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which could result in corruption of software or damage to equipment or property.



The information icon alerts the reader to relevant facts and conditions.



The tip icon indicates advice on, for example, how to design your project or how to use a certain function.

Although warning hazards are related to personal injury, it should be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process performance leading to personal injury or death. Therefore, comply fully with all warning and caution notices.

1.3. Intended audience

1.4. Product documentation

Name of the Manual	Document ID
Real Time Clock Synchronization, IRIG-B Input Time Master	1MRS755870
Product Guide	1MRS756269
Configuration Manual	1MRS755871
iButton Programmer User Manual	1MRS755863
Manual Part 3, Installation and Commission	1 VTA100004
Manual Part 4, Communication	1VTA100005
Motor Protection with ATEX Certification, Manual	1MRS755862
SCL Tool Configuration Manual	1MRS756342
Protection Manual	1MRS755860
Technical Reference Manual	1MRS755859
Technical Reference Modbus RTU	1MRS755868
Web Manual, Installation	1MRS755865
Web Manual, Operation	1MRS755864
IEC 61850 PIXIT	1MRS756360
IEC 61850 Conformance Statement	1MRS756361
IEC61850 TISSUES Conformance Statement	1MRS756362
Lifecycle Service Tool	1MRS756725

1.5. Document revisions

Version	IED Revision	Date	History
A	3.0	01.03.2010	1 st release, valid since V4F08x

This manual is applicable to REF 542plus Release 3.0, software version V4F08x and subsequent.

2. Safety information



Dangerous voltages can occur on the connectors even if the auxiliary voltage has been disconnected.

Non-observance can result in death, personal injury or substantial property damage.

Only a competent electrician is allowed to carry out the electrical installation.

National and local electrical safety regulations must always be followed.

The frame of the device has to be carefully earthed.



The device contains components sensitive to electrostatic discharge. Unnecessary touching of the electronic components must therefore be avoided.

3. Project section overview

3.1. Overview

This manual provides thorough information about the new Project section of Configuration Tool. The improvements introduced in this version allow:

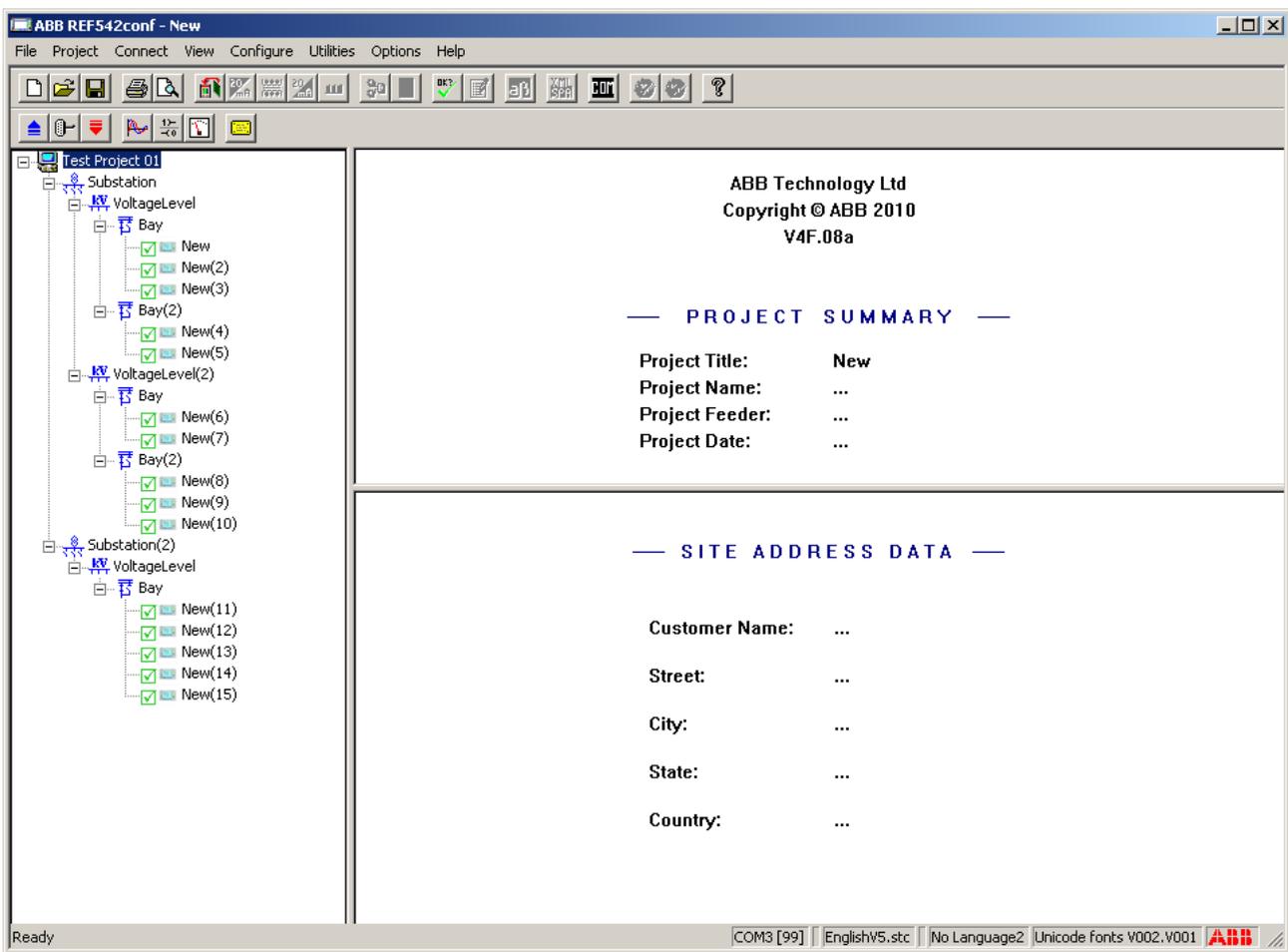
- handling of a network composed of several REF 542plus devices connected to each other via the TCP/IP protocol
- handling a new concept of project, composed of substation nodes, high-voltage level nodes and bay nodes and also of physical devices, that is, the REF 542plus nodes
- comparing the properties of each device
- uploading and downloading the configuration of a group of devices in the batch mode
- downloading the firmware of the mainboard and the COM board of a group of devices in the batch mode
- logging all the previous operations in a text file.

3.2. Project definition

Previously, Configuration Tool (ABB REF542conf) was only able to configure one REF 542plus connected by a serial port RS232. This new version allows configuring a network composed of several REF542plus units connected to each other via TCP/IP.

Projects serve in handling this network. A project is a collection of .REF device configuration files, mapping the real structure of the network. Devices are organized under a hierarchy of nodes: Bay, Voltage Level and Substation, as shown in Figure 3.2.-1. A project is represented with a tree structure by using a Windows Explorer-like representation.

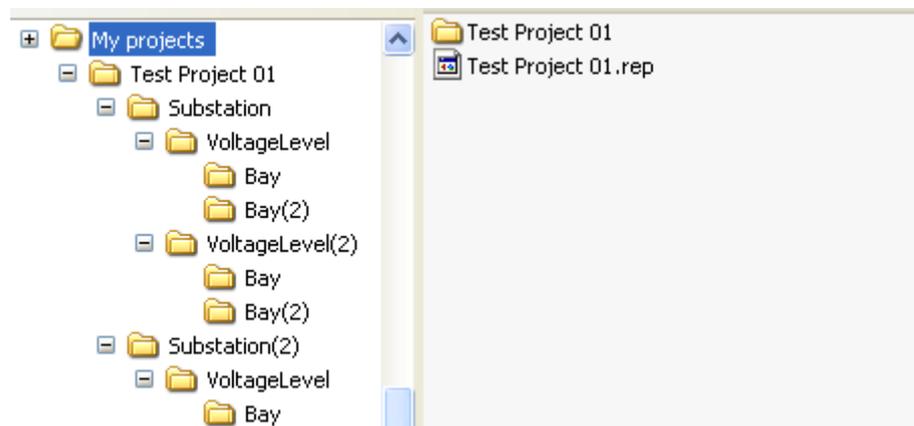
The original ABB REF542conf window has been split into two panes where the left one represents a new project section.



A100658

Fig. 3.2.-1 Main window

A project is composed of a project file with the extension *.rep and a folder with the same name as the project. The folder contains all the device-configuring *.ref files nested in the folder, followed by a tree scheme like in Figure 3.2.-2. Every operation on the project tree also affects the project structure on the file system.



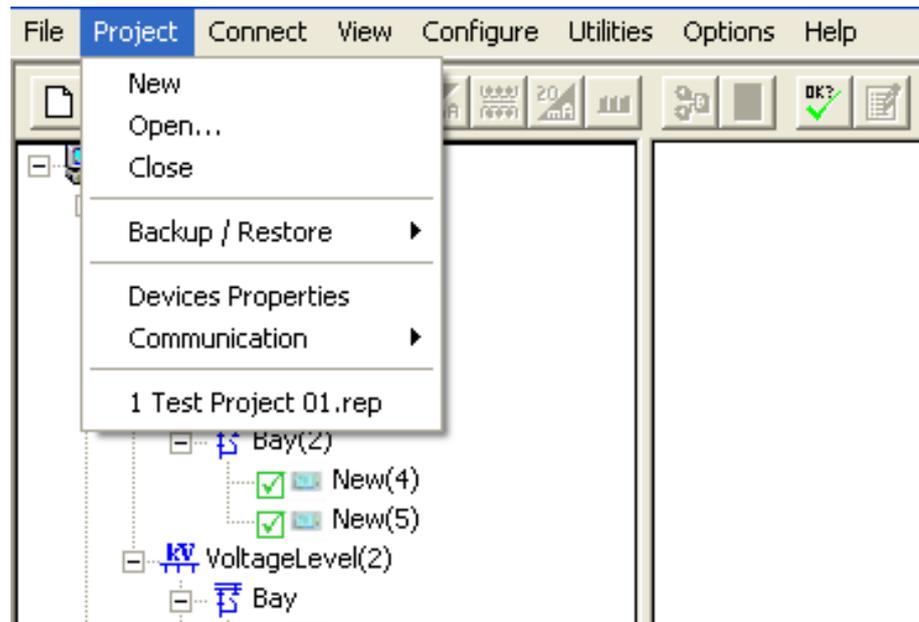
A100694

Fig. 3.2.-2 Project file and its folder structure

Substation and device names must be unique in a project while voltage level and bay names must be unique in their parent node scope.

3.3. Project menu

Projects are handled via a new Project menu.



A100682

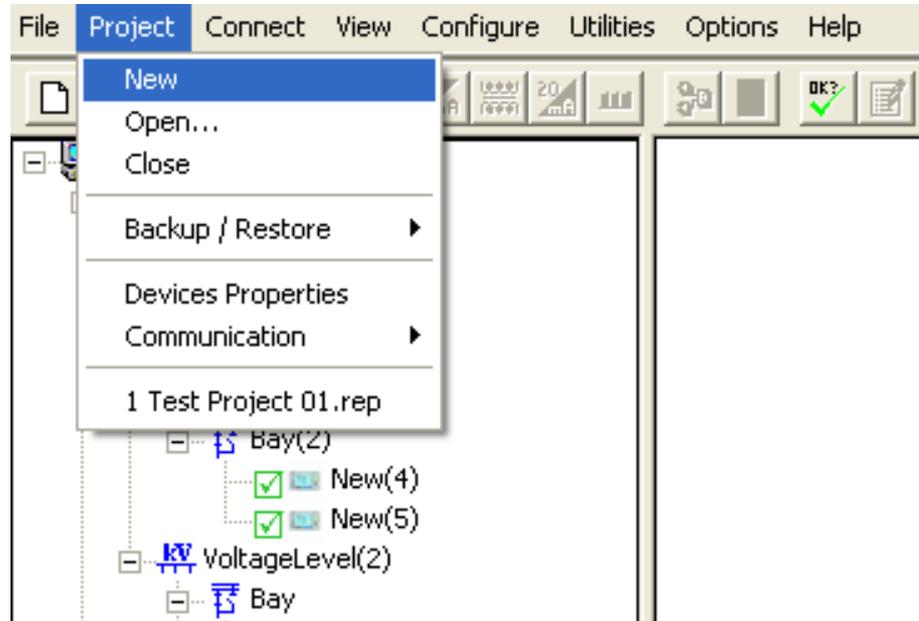
Fig. 3.3.-1 Project menu

This menu allows completing the following functions:

- creating a new project
- opening or closing an existing project
- backing up or restoring a project
- previewing a project archive
- listing the properties of each device in the project
- downloading or uploading the configuration of the devices
- downloading the mainboard or COM Board firmware to the devices

4. Creating new projects

Create a new project by selecting **New** on the **Project** menu.

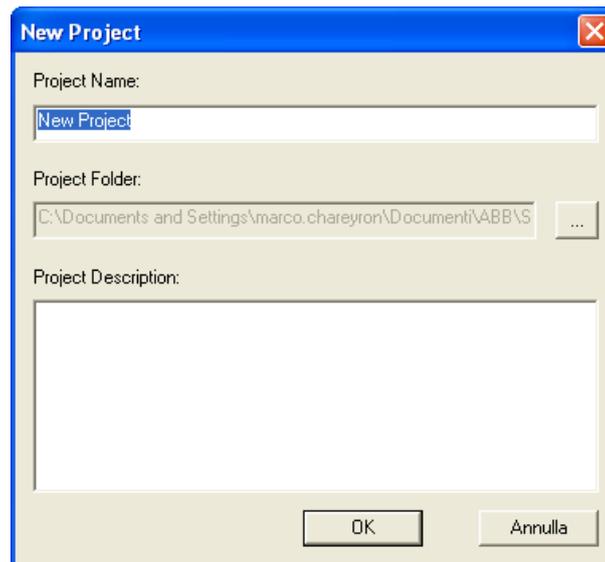


A100684

Fig. 4-1 Project menu items

4.1. Naming new projects

- Type a name for the project in the Project Name box in the New Project dialog window. Project name is mandatory.
- Select a folder where to save the project by clicking the ellipsis button



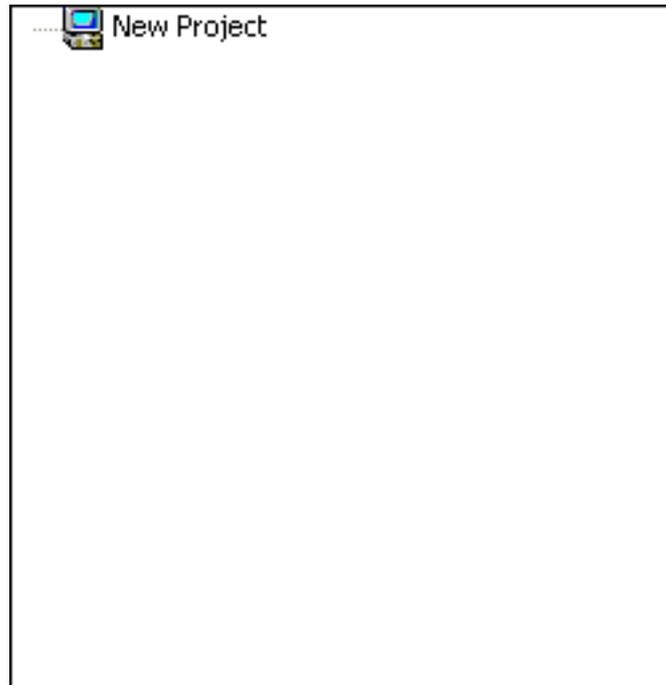
A100660

Fig. 4.1.-1 New Project dialog box

- Add an optional project description in the text field.
- Click **OK** when done or **Cancel** to skip the project creation.

4.2. Adding elements to the project

A new project only contains the main project node.

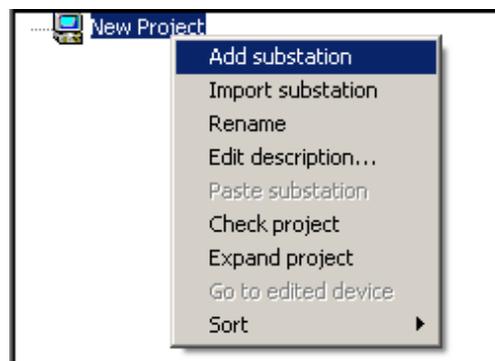


A100686

Fig. 4.2.-1 A new project structure

New elements can be added according to the node hierarchy: project node, substation, voltage level, bay and device.

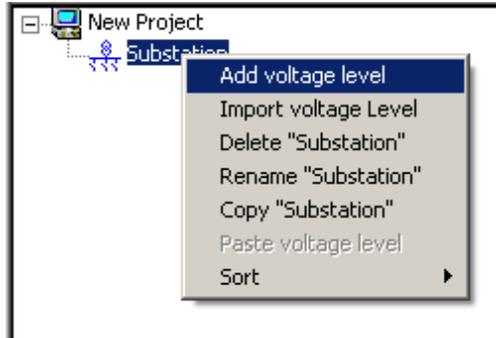
- Add a new substation to the project node by right-clicking the node and selecting **Add substation**.



A100590

Fig. 4.2.-2 New substation node

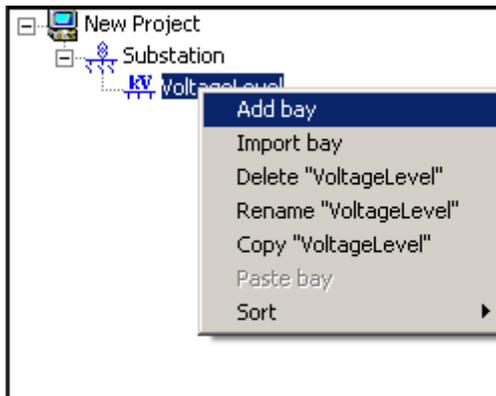
- Add a new voltage level node by right-clicking the Substation node and selecting **Add voltage level**.



A100592

Fig. 4.2.-3 New voltage level node

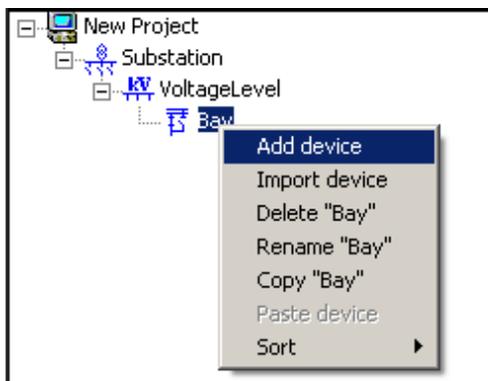
- Add a new bay node by right-clicking the VoltageLevel node and selecting **Add bay**.



A100586

Fig. 4.2.-4 New bay node

- Add a new device by right-clicking the Bay node and selecting **Add device**.



A100588

Fig. 4.2.-5 A new device

The new device is an unconfigured REF 542plus device. Therefore, its icon is a red square with the letter U in the middle.

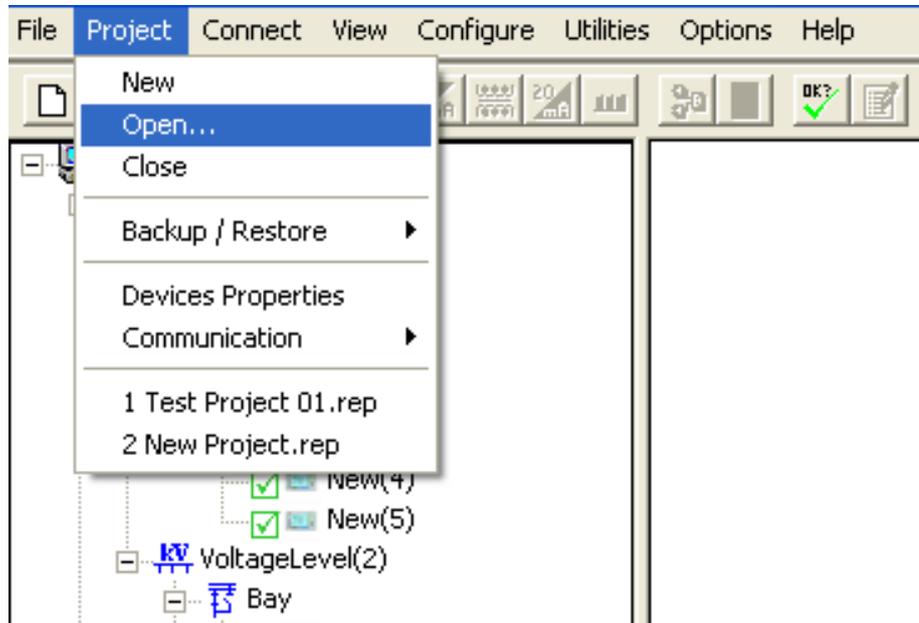


Fig. 4.2.-6 Unconfigured device in error state

A100624

5. Opening and closing projects

- Select **Open** on the **Project** menu to open an existing project.

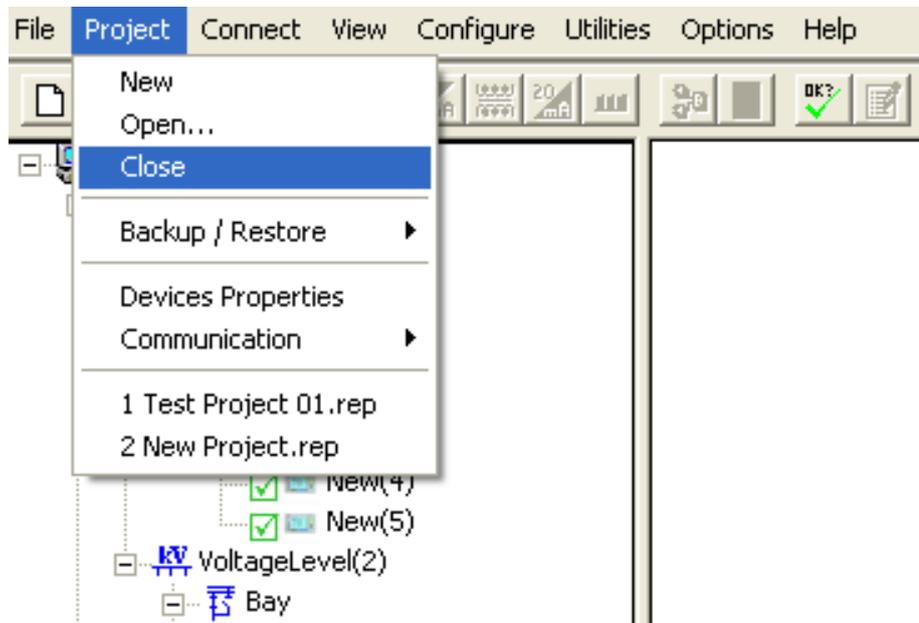


A100688

Fig. 5.-1 Project opening

The selected project is loaded and shown in the project tree section of the main window, see Figure 3.2.-1

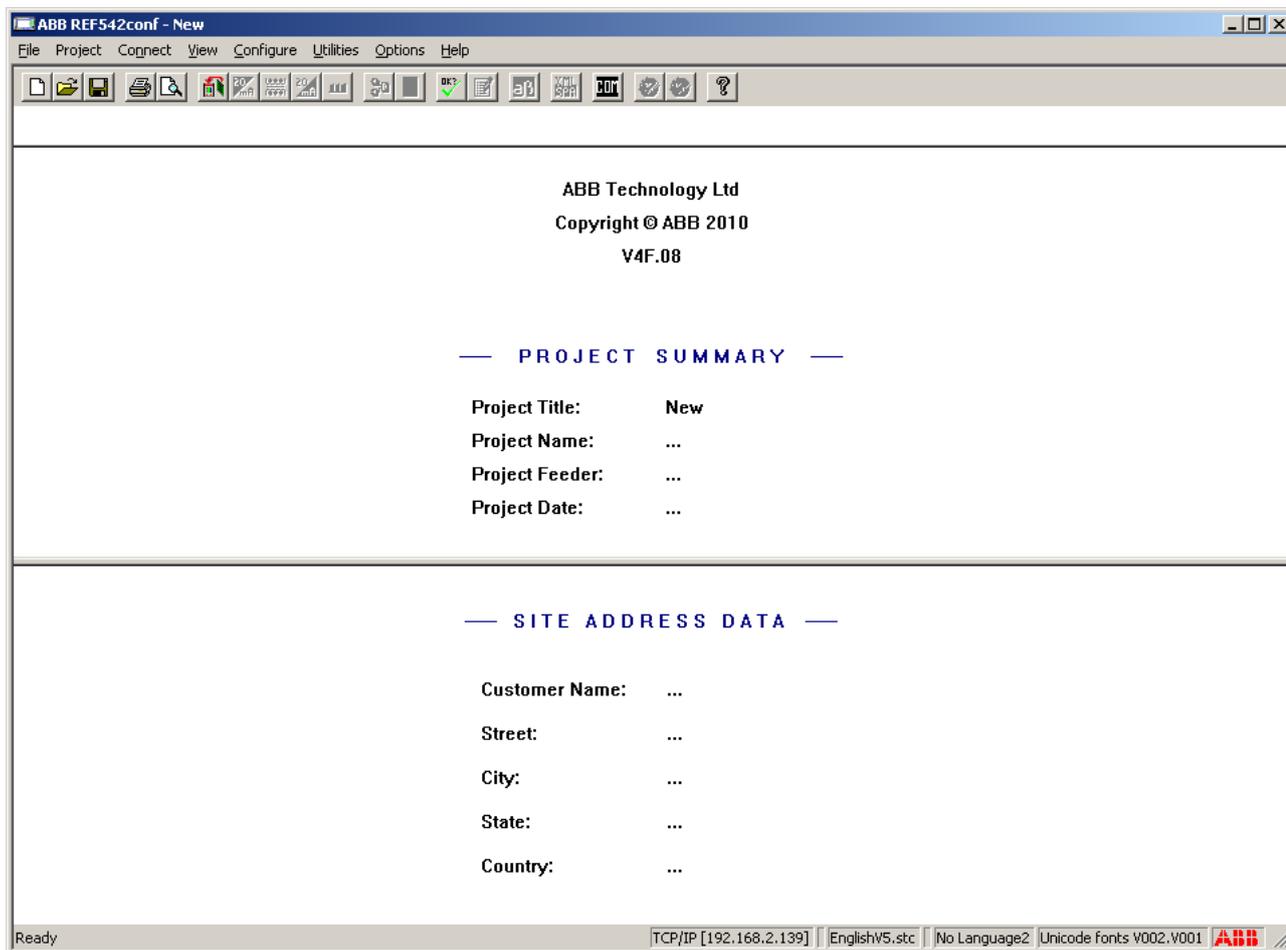
- Close the open project by selecting **Close** on the **Project** menu.



A100678

Fig. 5.-2 Project closing

The ABB REF542conf window returns to the horizontal panes' mode.



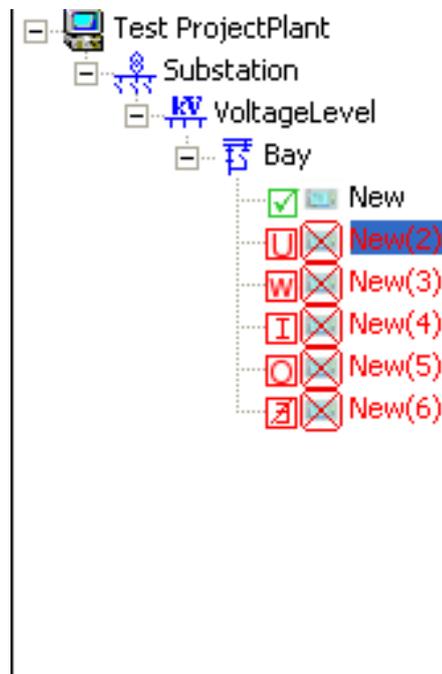
A100664

Fig. 5.-3 ABB REF542conf main window with no projects open

6. Project tree and its operations

A project is represented by a tree structure similar to a Windows Explorer tree. Each node has its own icon. Each device node also has a status icon that depends on the node's condition. There are six possible statuses.

1. Green tick: device OK
2. Red U: configuration file is new (not configured)
3. Red W: configuration file is wrong
4. Red I: configuration file is invalid
5. Red O: configuration file is generated by an old version of Configuration Tool
6. Red backwards E: configuration file does not exist



A100690

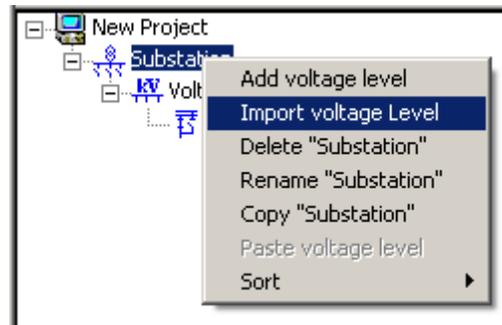
Fig. 6.-1 Possible device icon statuses

It is possible to modify an open project by using the shortcut menu associated with each node. These operations are very similar in all node levels and therefore they are grouped by type.

6.1. Importing nodes

Project nodes, substation nodes, voltage level nodes and bay nodes can all be imported.

- Right-click the parent node and select the option corresponding to the node in question, for example **Import voltage Level**.



A100652

Fig. 6.1.-1 Node import

- In the opening dialog box, select the folder to be imported into the project.



A100650

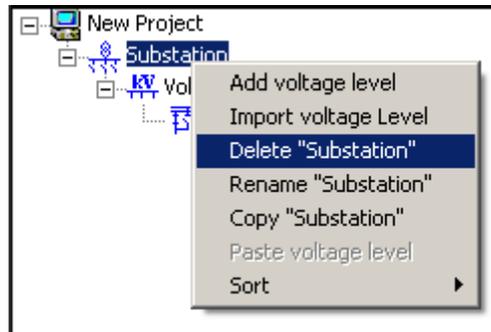
Fig. 6.1.-2 Node importing dialog

The selected folder must be structured similarly to a correct node, that is, in case of a voltage level node, the folder must contain one or more bay folder nodes, and in every bay node must be at least one device. Otherwise, the import fails.

6.2. Deleting nodes

Substation nodes, voltage level nodes, bay nodes and device nodes can be deleted.

- Right-click the parent node and select the option corresponding to the node in question, for example **Delete Substation**.



A100620

Fig. 6.2.-1 Node deletion

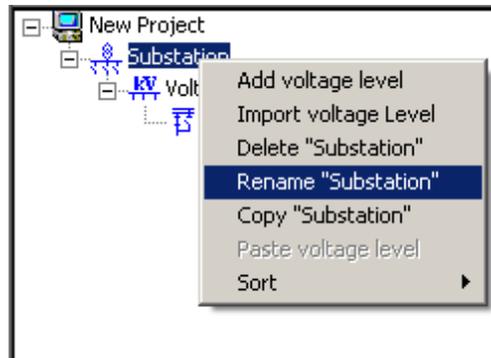
- Click **OK** in the appearing dialog box that prompts for confirmation to delete the node. The selected node is deleted from the project and also from the file system.

6.3.

Renaming nodes

Project nodes, substation nodes, voltage level nodes, bay nodes and device nodes can be renamed.

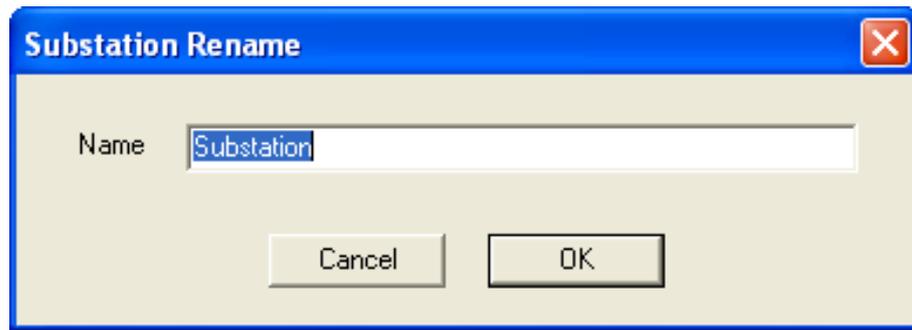
- Right-click the parent node and select the option corresponding to the node in question, for example **Rename Substation**.



A100704

Fig. 6.3.-1 Node renaming

- In the opening dialog box, type the new name and click **OK**.



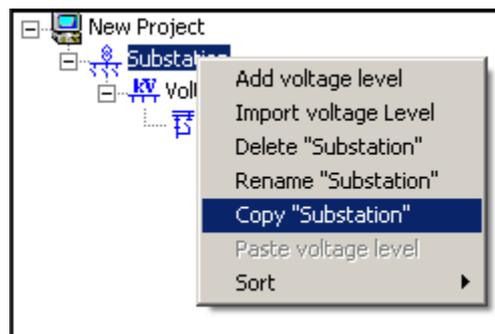
A100702

Fig. 6.3.-2 Node renaming dialog

6.4. Copying nodes

Substation nodes, voltage level nodes, bay nodes and device nodes can be copied.

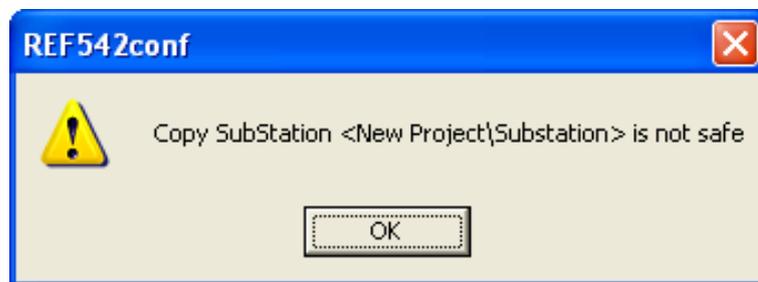
- Right-click the parent node and select the option corresponding to the node in question, for example **Copy Substation**.



A100614

Fig. 6.4.-1 Node copying

The node is copied and ready for pasting. Copying is possible only if the node is safe, that is, if there are no unconfigured devices under the selected node. Otherwise, an error dialog is displayed.



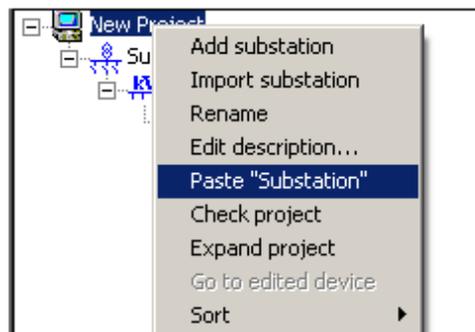
A100616

Fig. 6.4.-2 Error dialog if the copied node is not safe

6.5. Pasting nodes

Project nodes, substation nodes, voltage level nodes and bay nodes can be pasted.

- Right-click the parent node and select the option corresponding to the node in question, for example **Paste Substation**.



A100668

Fig. 6.5.-1 Node pasting

The node is pasted in that position, see 6.5.-2. Pasting is only possible in suitable nodes. For example, a substation node can only be pasted on a project node, a bay node only on a voltage level node and so on.

ABB REF542conf also prevents name overlapping by adding a progressive number in brackets after the node name that must be unique in the project, see 6.5.-2

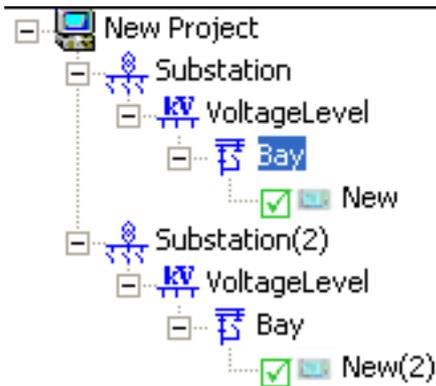


Fig. 6.5.-2 Result of pasting

A100670

6.6. Editing project descriptions

This operation can only be done to a project node.

- Right-click a project node and select **Edit description**.

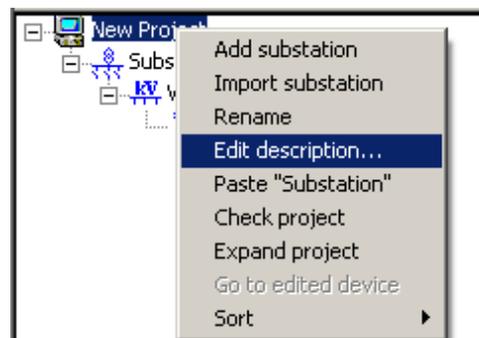
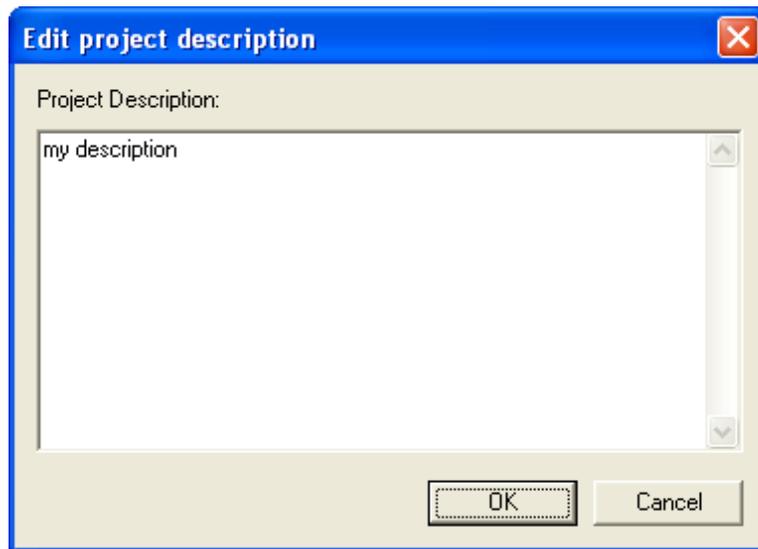


Fig. 6.6.-1 Description editing

A100628

- In the opening dialog, edit the description and click **OK**.



A100680

Fig. 6.6.-2 Edit project description dialog

The description text appears in the project node tooltip.



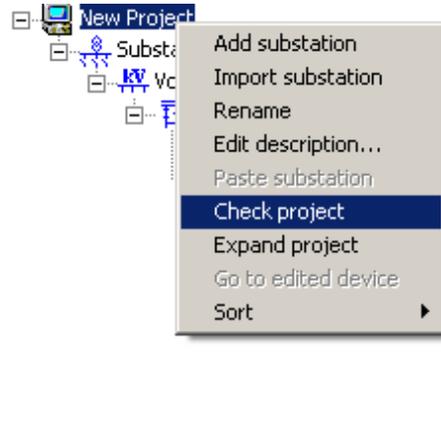
A100722

Fig. 6.6.-3 Project description in the tooltip

6.7. Checking projects

This operation can only be done to a project node.

- Right-click a project node and select **Check project**.



A100610

Fig. 6.7.-1 Project checking

ABB REF542conf performs a verification on the project structure to assure the correctness and consistency.

The verification procedure consists of a sequential procedure checking for the device configuration correctness and for the absence of the IP and COM board address conflicts.

The device configuration check shows the device files that are in the configuration error condition and finds out if the project file is consistent with respect to the file system structure.

If this check is successful, the procedure continues with the check for the IP and COM board address conflicts inside the project.

Definitions of the check project criteria:

- An **Internal IP address** is an IP address assigned to the mainboard or Ethernet board of a device file.
- An **External IP address** is an IP address assigned to any other device or component that communicates with the mainboard or Ethernet board, for example, SPA TCP or MODBUS TCP authorized clients or SNTP servers configured for a device file.
- A **COM board** address is an address assigned to the communication board such as SPA, LON, IEC, MOD-SPA (excluded Ethernet board).

The procedure checks for address conflicts according to the following criteria:

- Internal IP address cannot be used for either another device's internal IP address or for any external IP address. In other words, an IP address assigned to the mainboard and Ethernet board must be unique throughout the whole project.
- External IP address cannot be used as an internal IP address for any device.
- COM board address must be unique only inside the Substation level.

Check functionality is automatically performed just before starting each maintenance operation. If an error is found, it must be corrected. Otherwise, no download maintenance operations can be started.



The COM board address conflicts only block the configuration download. In other cases, they only cause the showing of warnings.

The correction of an IP address conflict or a COM board address conflict is done through the windows that list all the address conflicts and the devices containing the related conflict. By double-clicking each of them it is possible to edit a new value, and a list of the already used addresses can be shown to help the user in the choice.

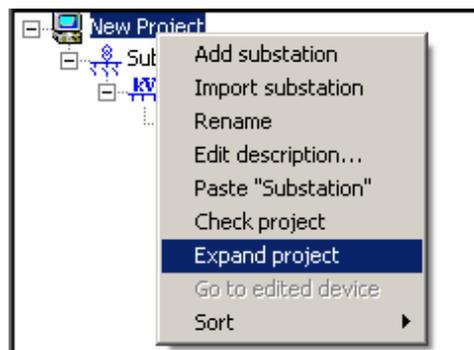
The checking of other possible configuration inconsistencies is delegated to the communication engineer via the "Device Property" dialog that allows grouping the same configuration property for all the devices forming the project.

6.8.

Expanding projects

This operation can only be done to a project node.

- Right-click a project node and select **Expand project**.



A100636

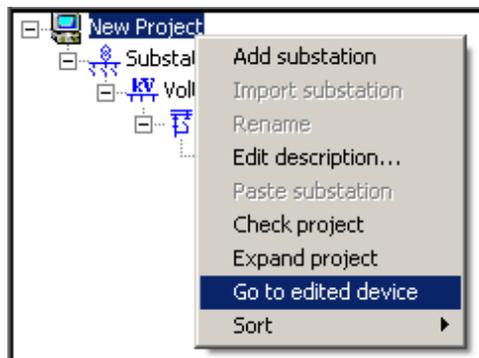
Fig. 6.8.-1 Project expanding in the shortcut menu

Configuration Tool expands the project tree, showing all the nodes in it.

6.9. Going to edited devices

This operation can only be done to a project node.

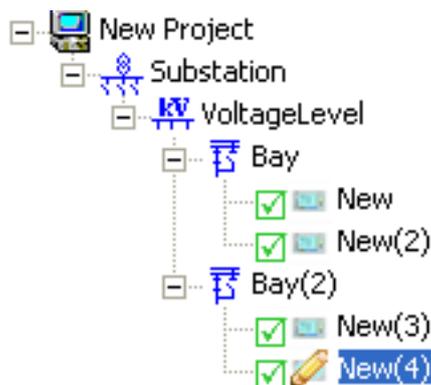
- Right-click a project node and select **Go to edited device**.



A100646

Fig. 6.9.-1 Going to an edited device in the shortcut menu

Configuration Tool expands the project tree, showing the device currently in the edit mode.



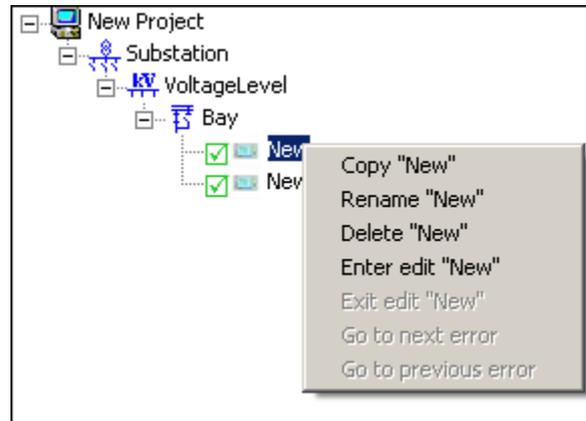
A100648

Fig. 6.9.-2 Device in the edit mode

6.10. Entering and exiting edit

This operation can only be done to a device node.

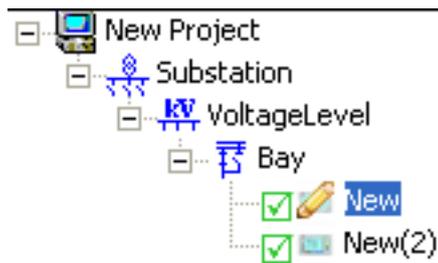
- Right-click a project node and select **Enter edit**.



A100632

Fig. 6.10.-1 Entering edit

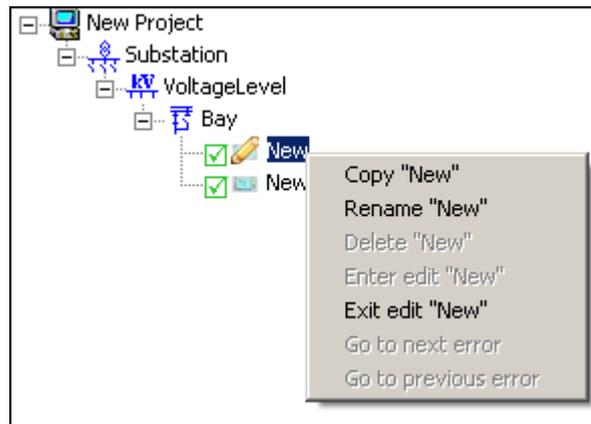
All the configuration menus affect the device currently in the edit mode. The device is marked with a pencil symbol on top of its icon.



A100630

Fig. 6.10.-2 Editing mode for the device "New"

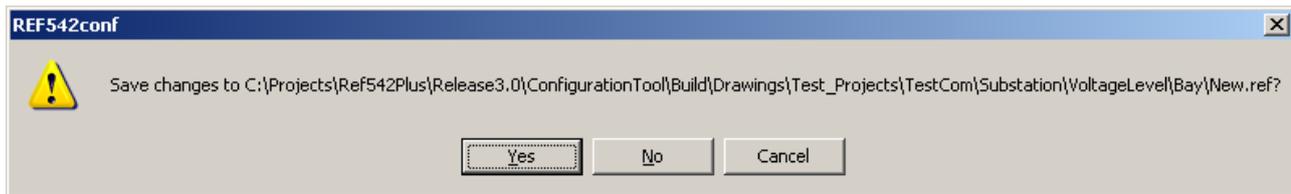
- Right-click the device in the edit mode and select **Exit edit**.



A100634

Fig. 6.10.-3 Exiting edit

ABB REF542conf prevents any further modifications to its properties and prompts for storing the unsaved modifications.



A100710

Fig. 6.10.-4 Exiting the edit mode with unsaved changes

6.11. Going to next and previous errors

This operation can only be done to a device node.

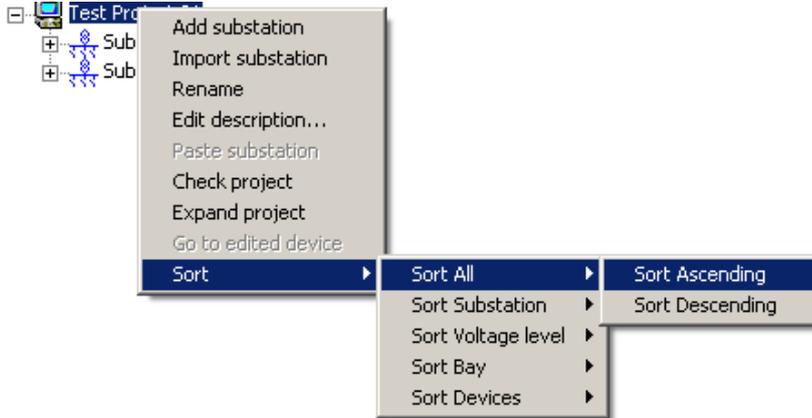
- Right-click a device node and select **Go to next error** or **Go to previous error** to identify a device in the error state and go to it. Configuration Tool selects the next or previous device in the error state. The menu items are only available if devices with errors exist.

6.12. Sorting nodes

Substation nodes, voltage level nodes, bay nodes and device nodes can be sorted in an ascending or descending order.

- Right-click a project node, select **Sort** and then select:

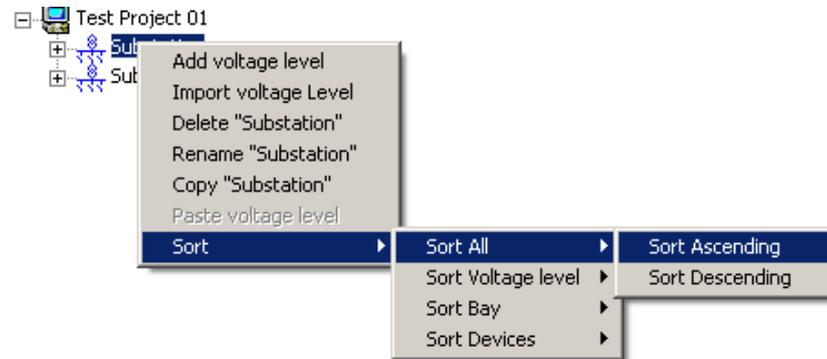
- Sort All to sort all the child nodes of the project node
- Sort Substation to sort only the Substation child nodes of the project node
- Sort Voltage Level to sort only the Voltage level child nodes of the project node
- Sort Bay to sort only the Bay child nodes of the project node
- Sort Devices to sort only the Devices child nodes of the project node



A100800

- Right-click a substation node, select **Sort** and then select:

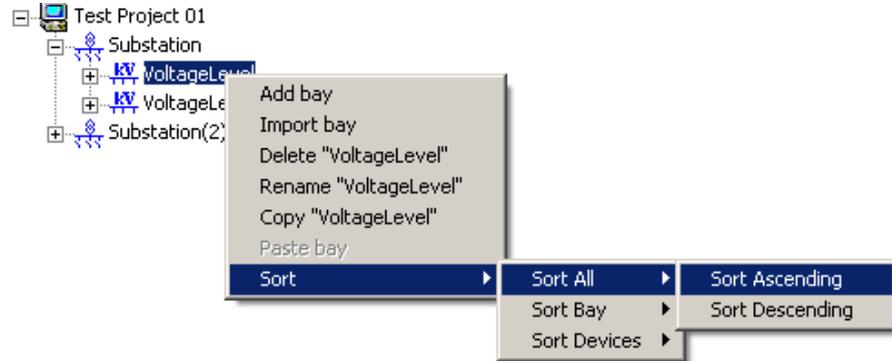
- Sort All to sort all the child nodes of the node
- Sort Voltage Level to sort only the Voltage level child nodes of the node
- Sort Bay to sort only the Bay child nodes of the node
- Sort Devices to sort only the Devices child nodes of the node



A100802

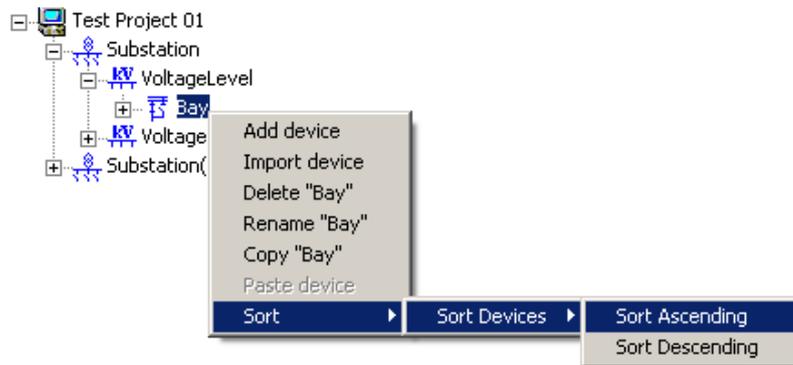
- Right-click a voltage level node, select **Sort** and then select:

- Sort All to sort all the child nodes of the project node
- Sort Bay to sort only the Bay child nodes of the node
- Sort Devices to sort only the Devices child nodes of the node



A100804

- Right-click a bay node, select **Sort** and then select Sort Devices to sort the Devices child nodes of the node.



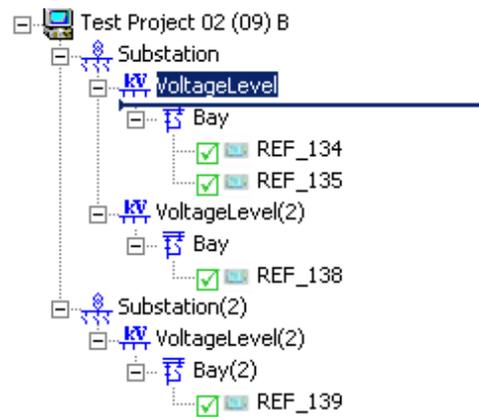
A100806

6.13.

Dragging

The drag-and-drop operation is applicable only to voltage level nodes, bay nodes and device nodes. It is similar to the drag-and-drop operation of files and folders in Windows Explorer.

During dragging, a separator appears under the pointer to indicate where the node is to be moved when the mouse button is released.



A100808

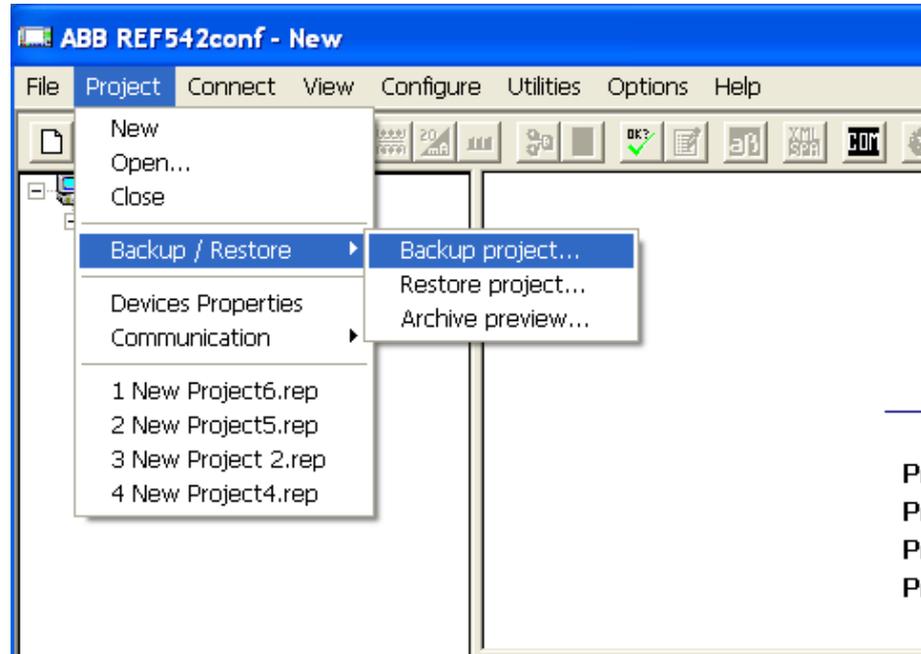
Fig. 6.13.-1 Dragging a voltage level node

- Drag a Voltage level node under a substation type node.
- Drag a Bay node under a voltage level type node.
- Drag a Device node under a bay type node.

7. Project backup and restoration

7.1. Backing up projects

- To create a backup copy of a project, select **Backup / Restore** and then **Backup project** on the **Project** menu.

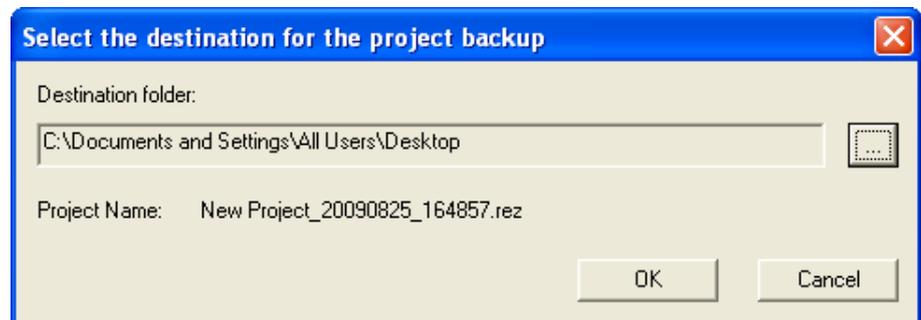


A100608

Fig. 7.1.-1 Project backup in the Project menu

A dialog window opens for selecting the destination folder for the project backup.

- Select a folder where to save the backup by clicking the ellipsis button The name of the backup file is automatically created using the name of the project, date, time of day and the .rez extension.



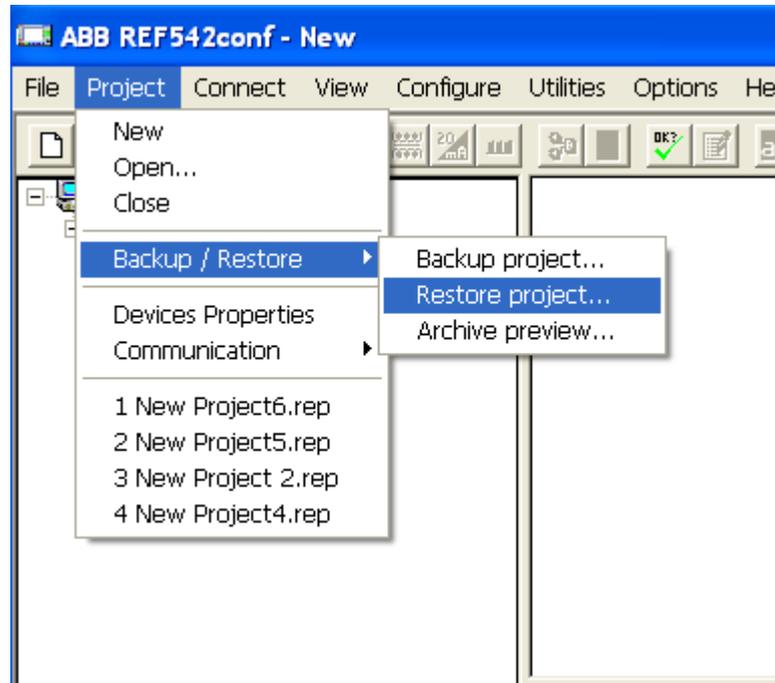
A100640

Fig. 7.1.-2 Backup dialog

7.2.

Restoring projects

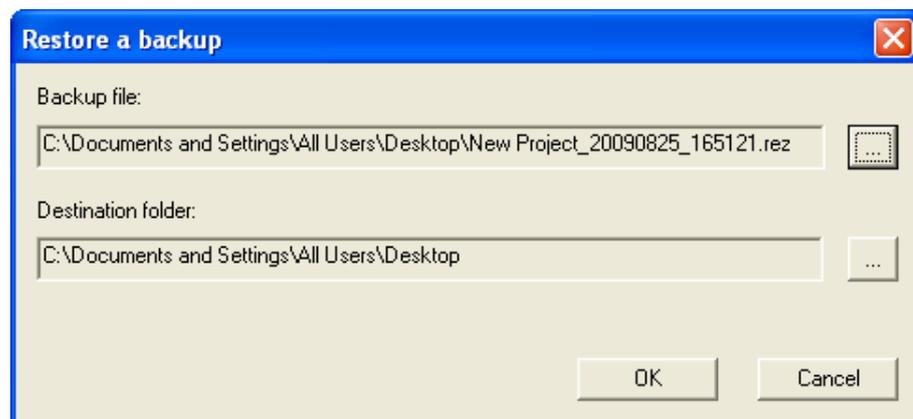
- To restore a project from its backup file, select **Backup / Restore** and then **Restore project** on the **Project** menu.



A100708

Fig. 7.2.-1 Project restore in the Project menu

- In the appearing dialog window, select a backup file by clicking the corresponding ellipsis button A backup file has the file extension .rez.
- Select the destination folder where to restore the backup file by clicking the corresponding ellipsis button



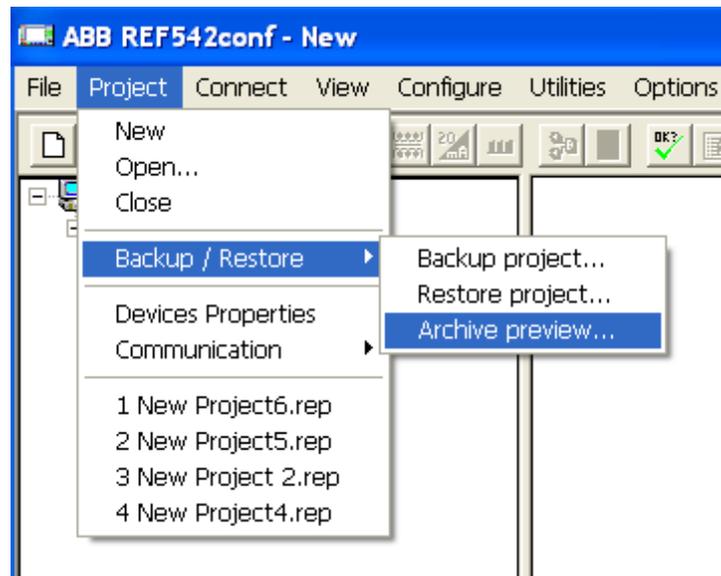
A100644

Fig. 7.2.-2 Dialog for restoring a backup

7.3.

Previewing archives

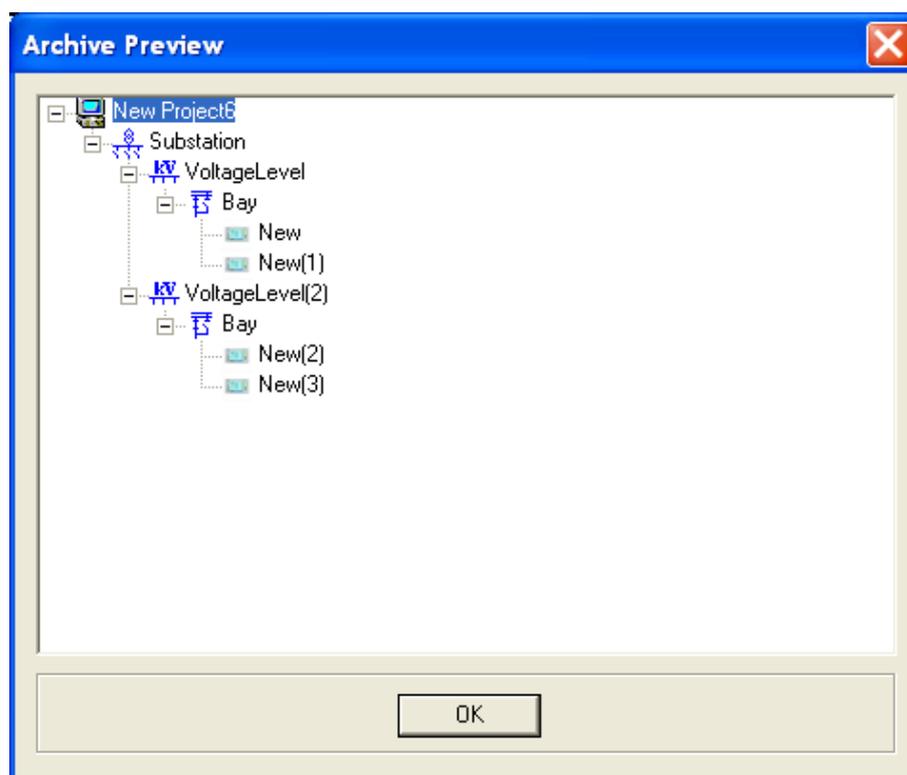
- To have a preview of the structure of a project previously archived in a backup file before restoring it, select **Backup / Restore** and then **Archive preview** on the **Project** menu.



A100672

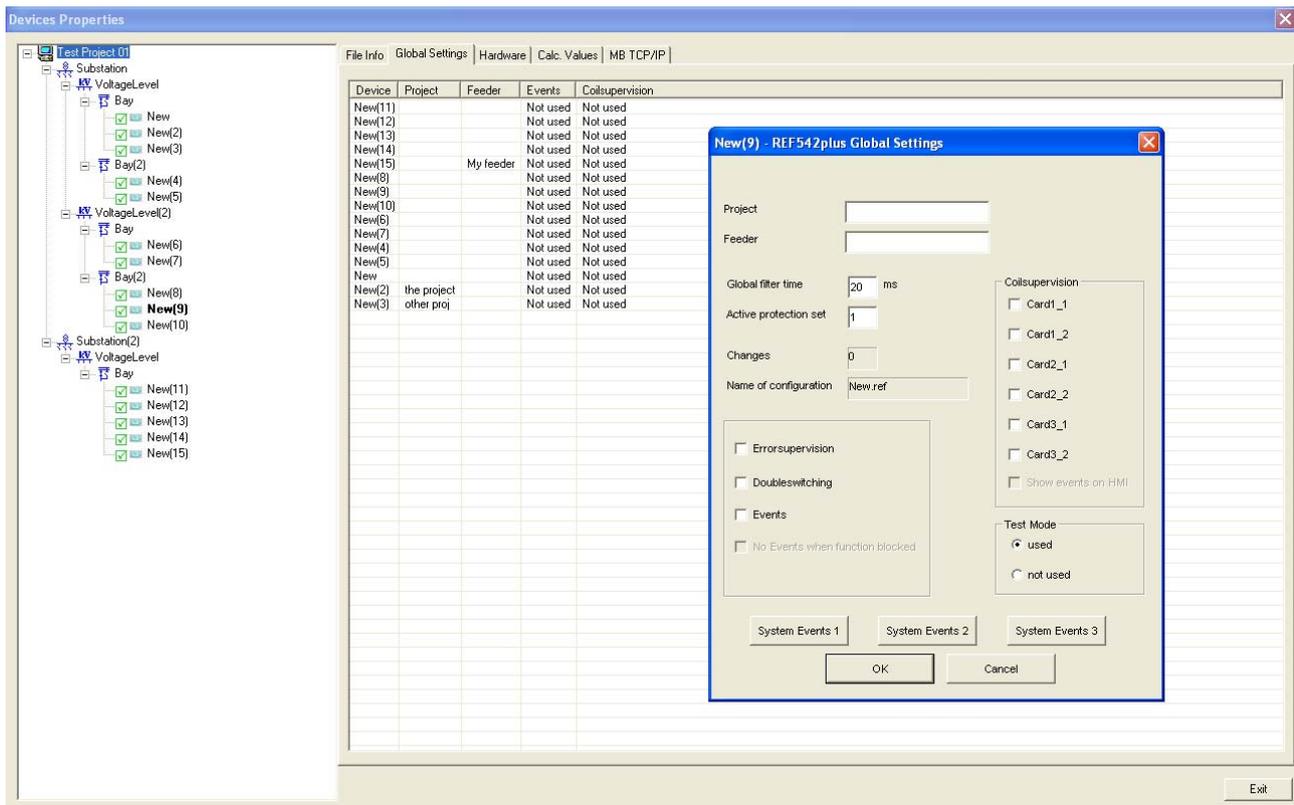
Fig. 7.3.-1 Archive preview in the Project menu

A preview of the selected .rez file is shown in the Archive Preview dialog.



A100642

Fig. 7.3.-2 Dialog for previewing archives



A100626

Fig. 8.-2 Device property value editing

9. Communication

The main purpose of Configuration Tool is to communicate with the devices listed in the project. With the new project section it is possible to do batch communication operations between the PC and the REF 542plus units. The operations are divided into four types.

- **Configuration download:** This allows loading on the selected remote devices the configuration file created in the Configuration Tool project.
- **Configuration upload:** This retrieves the configuration of the selected devices from the REF 542plus units and saves it in the corresponding project in Configuration Tool.
- **Mainboard software download:** This sends to the selected remote devices the mainboard software file selected in Configuration Tool.
- **COM board (LON / IEC) software download:** This sends to the selected remote devices the COM board (of the type LON or IEC) software file selected in Configuration Tool.

Configuration Tool implements these operations with four dialogs, accessible from the **Communication** menu item of the **Project** menu. Due to their similarity, this manual only describes the configuration download dialog. The chapters about the remaining three dialogs only point out the differences compared to the first one.

9.1. Downloading configurations

Application download sends the configuration file to one or more remote devices.

- To download a configuration, select **Communication** and then **Send Configuration** on the **Project** menu.

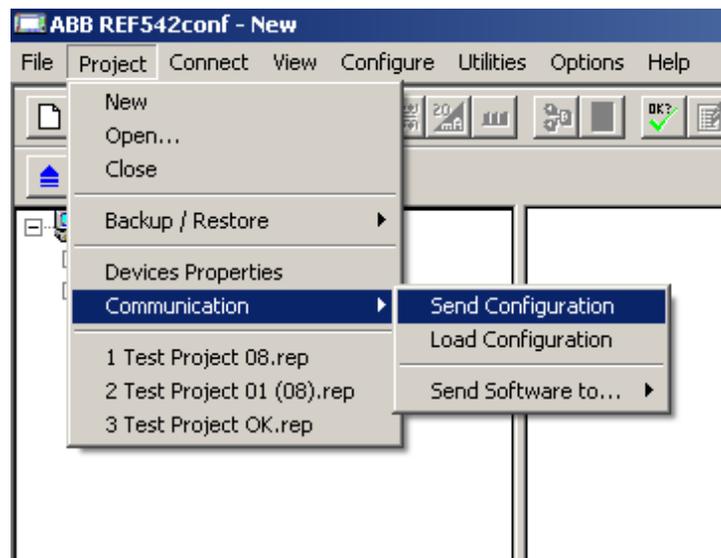
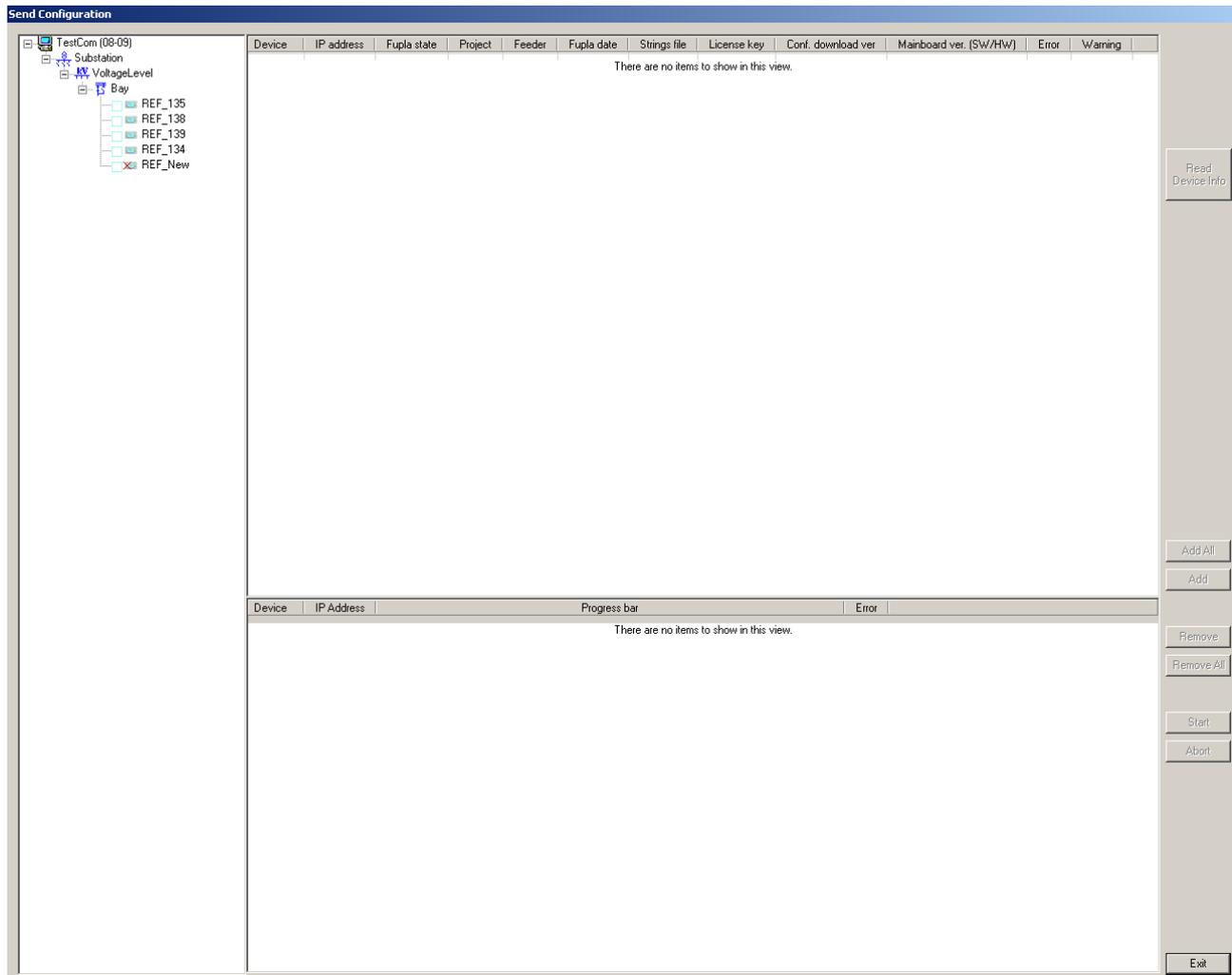


Fig. 9.1.-1 Application download on the Project menu

A100596

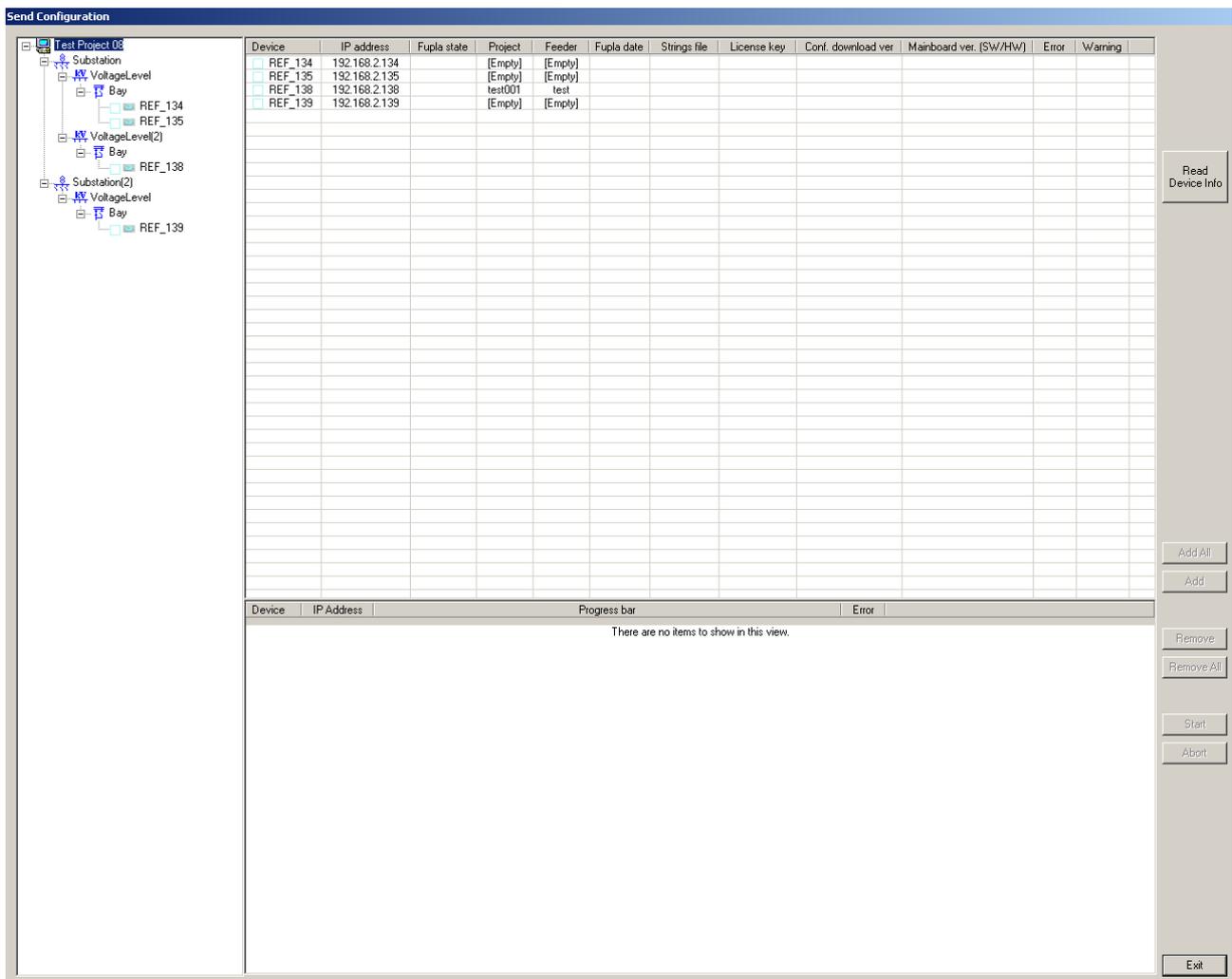
The appearing dialog "Send Configuration" contains the project tree on the left side and two grids, upper and lower, on the right. In the project tree, a device configured with an assigned IP address and the SPA TCP section enabled appears with the default HMI icon, whereas an incorrectly configured device appears with a red X over the HMI icon.



A100598

Fig. 9.1.-2 Application Download dialog

When a node is selected in the project tree, the corresponding configured devices appear in the upper grid with additional information. Also **Read Device Info** becomes available.



A100600

Fig. 9.1.-3 Read Device Info available

Read Device Info allows retrieving remote information from the devices listed in the upper grid. If Configuration Tool successfully communicates with a device, its information is shown in the upper grid, the **Add All** button becomes available and the corresponding node in the project tree takes the transfer icon , see Figure 9.1.-4.

Otherwise an error message is shown in the Error column for each device with problems. The row corresponding to the failed transfer device appears with a red background and the corresponding node in the project tree takes the transfer icon , see Figure 9.1.-5.

Information received from the REF 542plus units is locally stored and shown in the upper grid on request. If **Read Device Info** is clicked when a device already inquired is selected, a dialog asks if Configuration Tool should require again the remote information from the unit or keep the already downloaded information.

Send Configuration

Device	IP address	Fupla state	Project	Feeder	Fupla date	Strings file	License key	Conf. download ver	Mainboard ver. (SW/HW)	Error	Warning
REF_134	192.168.2.134	Running	[Empty]	[Empty]	04.16.10	S5F.08a-eng	DISTANCE	V4F.08	E4F.08-08/6.0	Ok	
REF_135	192.168.2.135	Running	[Empty]	[Empty]	04.16.10	S5F.08a-eng	DISTANCE	E4F.08-05	E4F.08-08/6.0	Ok	
REF_138	192.168.2.138	Running	test001	test	04.19.10	S5F.08a-eng	DISTANCE	V4F.08	E4F.08-08/6.0	Ok	
REF_139	192.168.2.139	Running	[Empty]	[Empty]	04.15.10	S5F.08a-eng	DISTANCE	V4F.08	E4F.08-08/6.0	Ok	

Device IP Address Progress bar Error

There are no items to show in this view.

Read Device Info

Add All

Add

Remove

Remove All

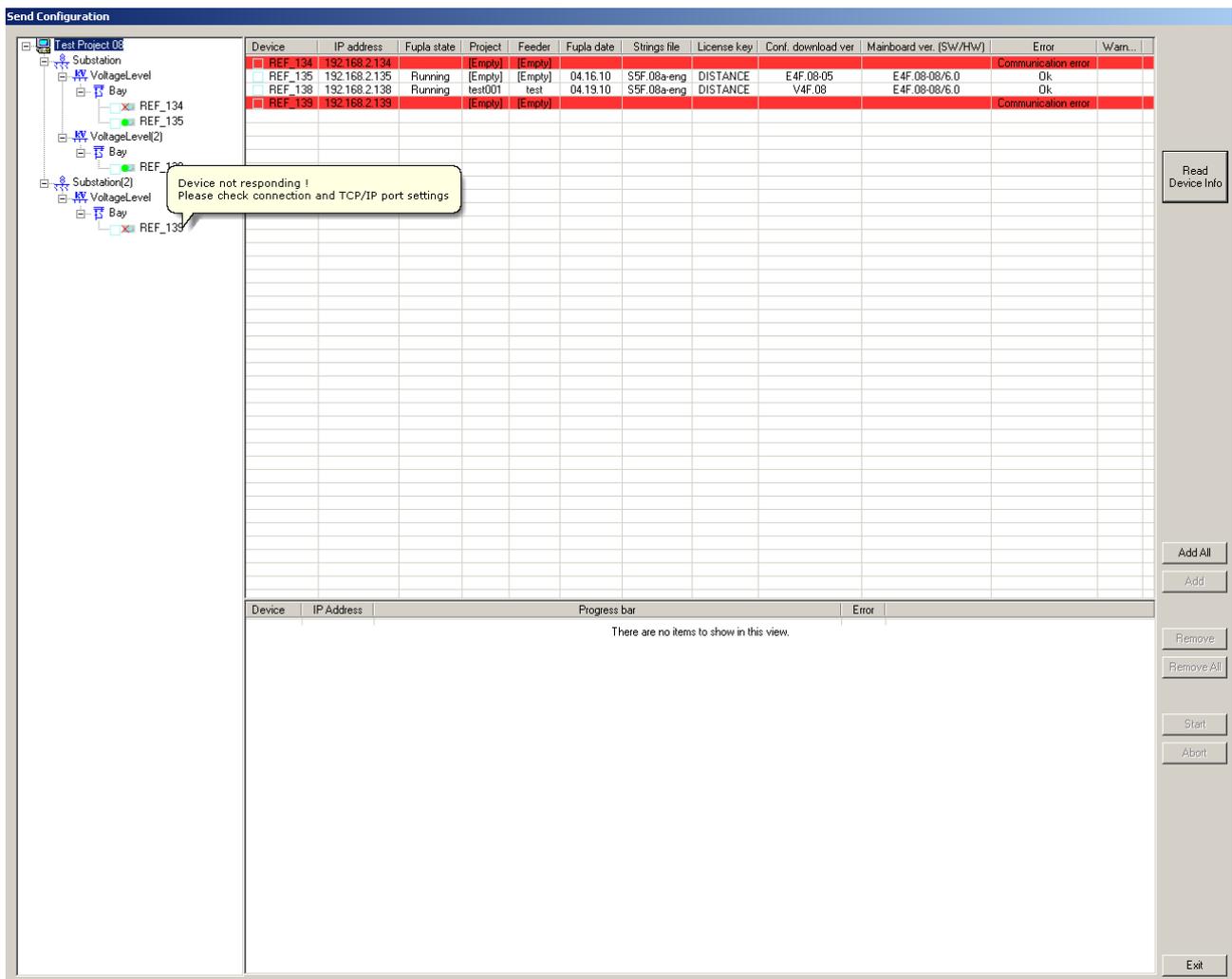
Start

Abort

Exit

A100698

Fig. 9.1.-4 Device information read successfully



A100696

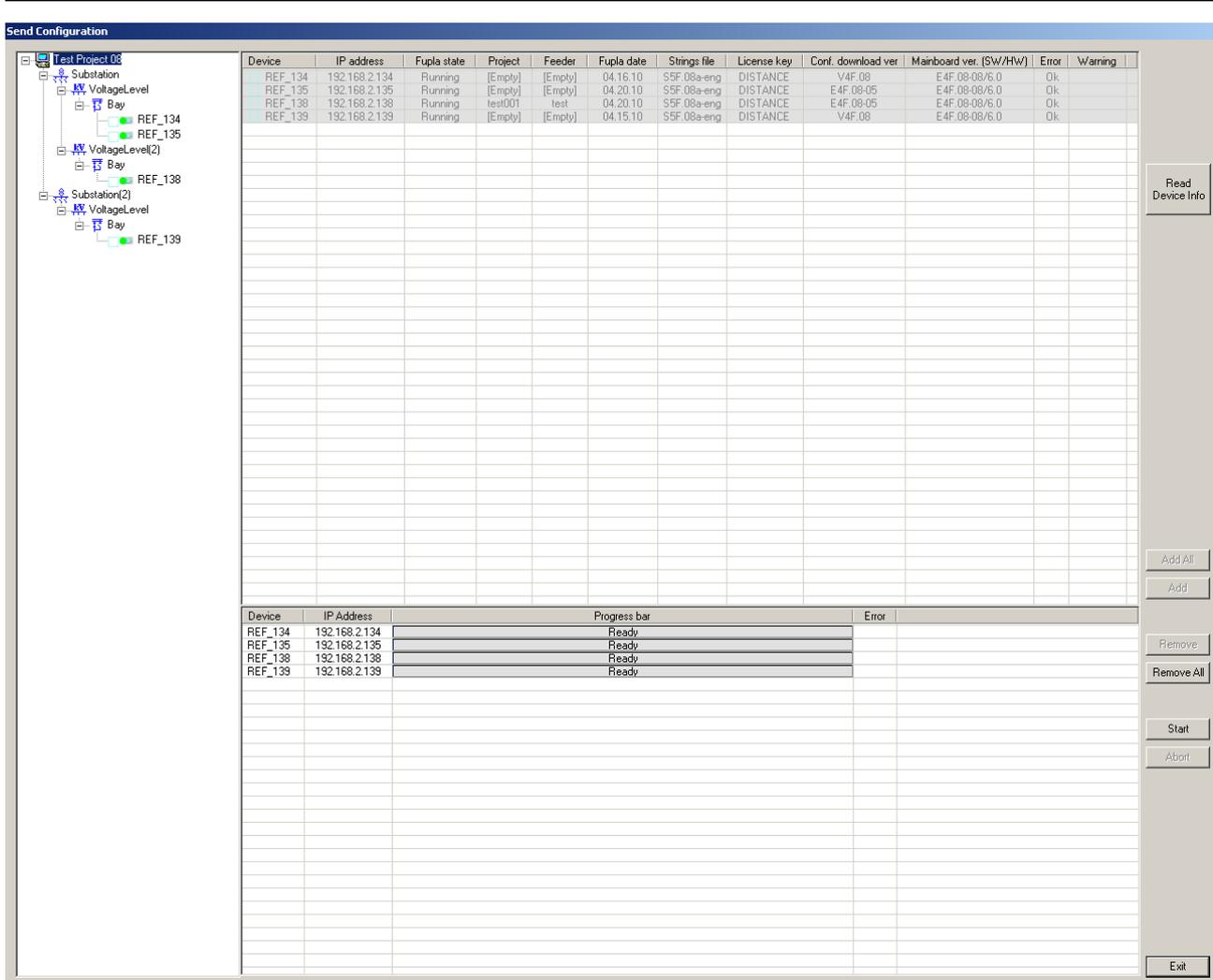
Fig. 9.1.-5 Reading of device information failed

The lower grid contains all the devices to which the configuration is downloaded.

- To add devices to the lower grid, select devices from the upper grid and either click **Add** to add the selected device or click **Add All** to add them all.

Only devices whose information has been retrieved by clicking **Read Device Info** are eligible for application download, that is, added to the lower grid.

- Click **Remove** or **Remove All** to remove some or all of the devices from the lower grid.



A100714

Fig. 9.1.-6 Lower grid with devices ready

- Click **Start**. Downloading begins, and a progress bar shows the progression. The result of a transfer session is shown with an icon for each device on the project tree.

Table 9.1.-1 Device state icons

Icon	Description
<input type="checkbox"/>	Default state: Transfer not done
<input checked="" type="checkbox"/>	Transfer successfully done
<input checked="" type="checkbox"/>	Transfer unsuccessfully done
<input checked="" type="checkbox"/>	Error state: System error

The screenshot shows the 'Send Configuration' window. On the left is a tree view of a project named 'Test Project 08', containing substation, voltage level, and bay components. The main area is a table with columns: Device, IP address, Fupla state, Project, Feeder, Fupla date, Strings file, License key, Conf. download ver, Mainboard ver. (SW/HW), Error, and Warn... The table lists devices REF_134, REF_135, REF_138, and REF_139. Below the table, a progress bar section shows 'Sending WIRE Data... [0%]' for REF_135 and 'Sending FUPLA Data... [100%]' for REF_138. On the right side, there are buttons for 'Read Device Info', 'Add All', 'Add', 'Remove', 'Remove All', 'Start', 'Abort', and 'Exit'.

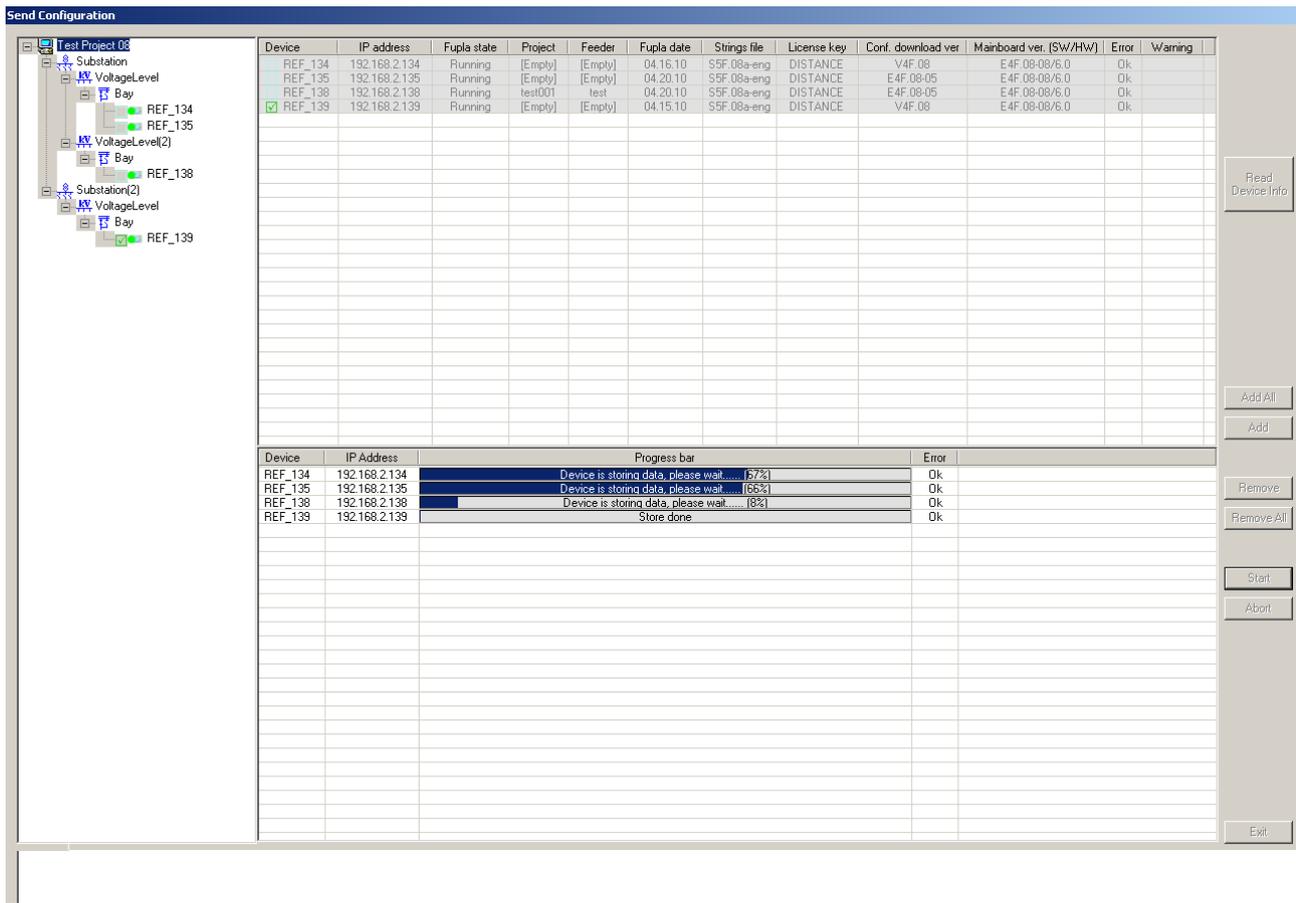
Device	IP address	Fupla state	Project	Feeder	Fupla date	Strings file	License key	Conf. download ver	Mainboard ver. (SW/HW)	Error	Warn...
REF_134	192.168.2.134	Running	[Empty]	[Empty]	04.16.10	S5F_08a-eng	DISTANCE	V4F.08	E4F.08-08/6.0	Ok	
REF_135	192.168.2.135	Running	[Empty]	[Empty]	04.16.10	S5F_08a-eng	DISTANCE	E4F.08-05	E4F.08-08/6.0	Ok	
REF_138	192.168.2.138	Running	test001	test	04.19.10	S5F_08a-eng	DISTANCE	V4F.08	E4F.08-08/6.0	Ok	
REF_139	192.168.2.139	Running	[Empty]	[Empty]	04.15.10	S5F_08a-eng	DISTANCE	V4F.08	E4F.08-08/6.0	Ok	

Device	IP Address	Progress bar	Error
REF_135	192.168.2.135	Sending WIRE Data... [0%]	
REF_138	192.168.2.138	Sending FUPLA Data... [100%]	

A100676

Fig. 9.1.-7 Configuration download in progress

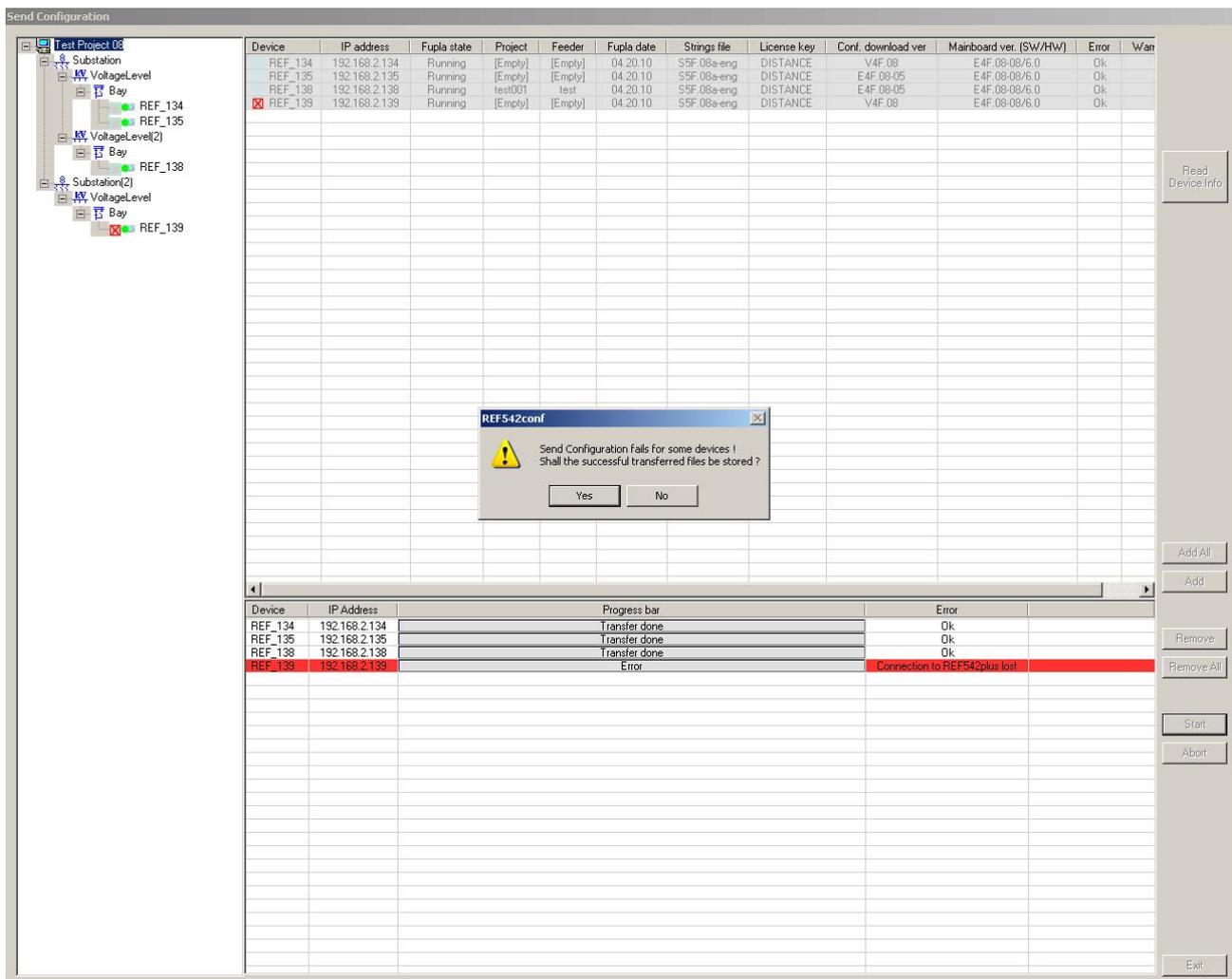
If the downloads are successful, the configuration storing operation starts automatically. New progress bars are shown.



A100720

Fig. 9.1.-8 Storing in progress

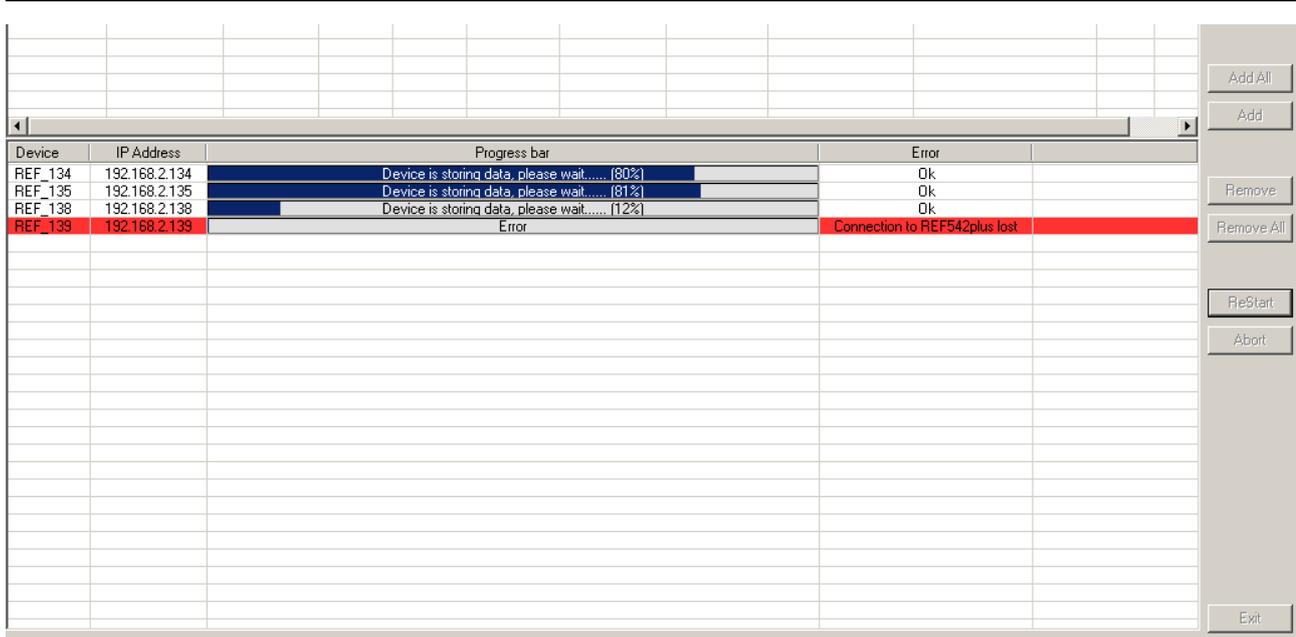
If one or more downloads fail, it is still possible to store the correctly downloaded configurations. A dialog prompting for this appears. The row corresponding to the failed transfer device appears with a red background and the corresponding node in the project tree takes the transfer icon 



A100712

Fig. 9.1.-9 Notification about failed downloads

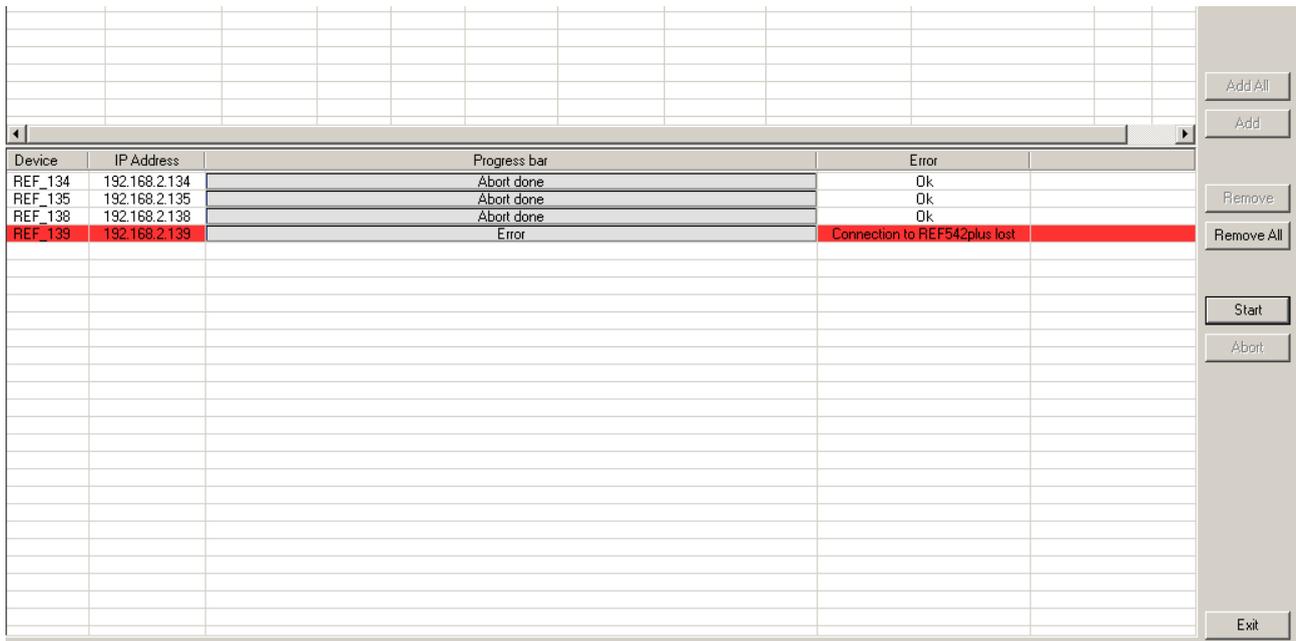
- Click **Yes** to store the correctly downloaded configurations.



A100718

Fig. 9.1.-10 Storing only the device without errors

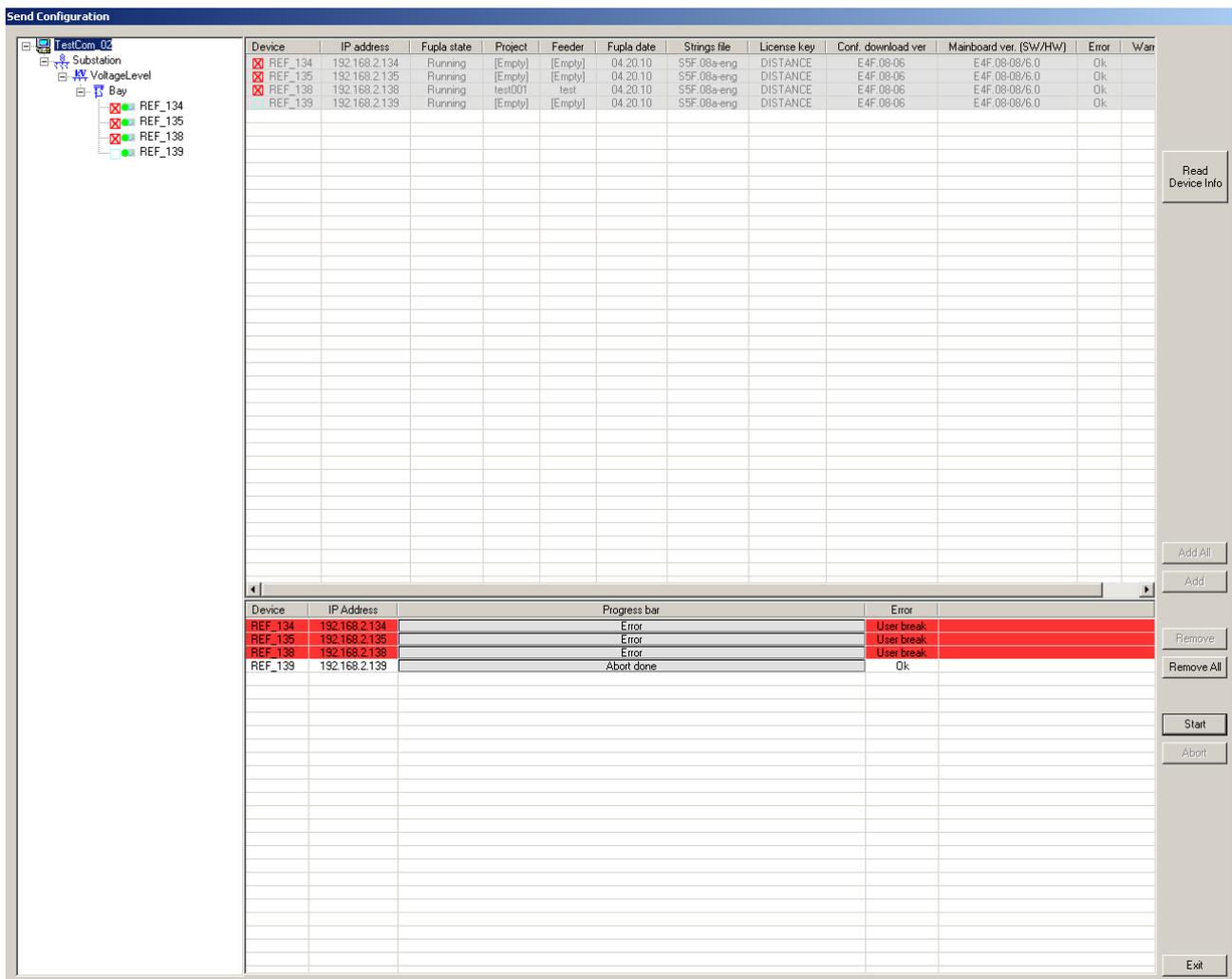
- Click **No** to abort the configuration download for all devices.



A100716

Fig. 9.1.-11 Aborting the download for all devices

- Click **Abort** at any time during the download of a configuration to stop the download in progress, see Figure 9.1.-7. This makes **Start** available again.



A100602

Fig. 9.1.-12 Start available during User break

In case of a download failure, an error message appears in the Error/Warning column. **Start** is now renamed **ReStart**, and retrying of download is allowed. The row corresponding to the failed transfer device appears with a red background and the corresponding node in the project tree takes the transfer icon



Device	IP address	Fupla state	Project	Feeder	Fupla date	Strings file	License key	Conf. download ver	Mainboard ver. (SW/HW)	Error	Warn
REF_134	192.168.2.134	Running	[Empty]	[Empty]	04.20.10	S5F.08a-eng	DISTANCE	V4F.08	E4F.08-08/6.0	Ok	
REF_135	192.168.2.135	Running	[Empty]	[Empty]	04.20.10	S5F.08a-eng	DISTANCE	E4F.08-05	E4F.08-08/6.0	Ok	
REF_138	192.168.2.138	Running	test001	test	04.20.10	S5F.08a-eng	DISTANCE	E4F.08-05	E4F.08-08/6.0	Ok	
REF_139	192.168.2.139	Running	[Empty]	[Empty]	04.20.10	S5F.08a-eng	DISTANCE	V4F.08	E4F.08-08/6.0	Ok	

Device	IP Address	Progress bar	Error
REF_134	192.168.2.134	Store done	Ok
REF_135	192.168.2.135	Store done	Ok
REF_138	192.168.2.138	Store done	Ok
REF_139	192.168.2.139	Error	Connection to REF542plus lost

A100594

Fig. 9.1.-13 ReStart is available and retrying of download allowed



Note that the REF 542plus Configuration Tool is able to send a configuration to the REF 542plus device only if all the following conditions are verified:

1. The version of REF 542plus in general must be compliant with the version of the REF 542plus Configuration Tool.
 - The REF 542plus software version must be equivalent to that of the REF 542plus Configuration Tool; otherwise, the error “Incompatible REF542plus version!” appears.
2. Mainboard communication settings verification.
 - The communication settings version of a REF 542plus device must be compliant with that of the corresponding project REF 542plus configuration file; otherwise, the error “Incompatible REF542plus version!” appears.
 - The REF 542plus device TCP/IP configuration requires a correct ethernet driver initialization (MAC address available); otherwise, the error “REF542plus ethernet driver error. Check the MAC address!” appears.

3. COM board verification

- If the COM board is configured for a device in the project, it must be detected in the corresponding REF 542plus device. Otherwise, the error “COM board configured but not detected by REF542plus!” appears.
- If the COM board is detected in the corresponding REF 542plus device, it must be of the same type than the one configured. Otherwise, the error “COM board detected by REF542plus different from the one configured!” appears.
- If the COMboard is detected and it is of the same type than the one configured, it must be version-compatible in the internal data. Otherwise, the error “Incompatible COM board version!” appears.

4. License key verification

- The license key in the device must be valid and greater than or equal to the license key of the corresponding configuration; otherwise, the error “Missing license rights (%s)!” appears.

5. RHMI version verification (if available)

- HMI hardware version of the device must be valid and equal to that of the corresponding configuration; otherwise, the error “Incompatible HMI hardware version!” appears.

6. Analog input 20mA board version verification (if configured)

- Analog input 20mA board version of the device must be valid and available; otherwise, the error “Analog Input 20mA board not detected!”

7. CAN interface (if configured)

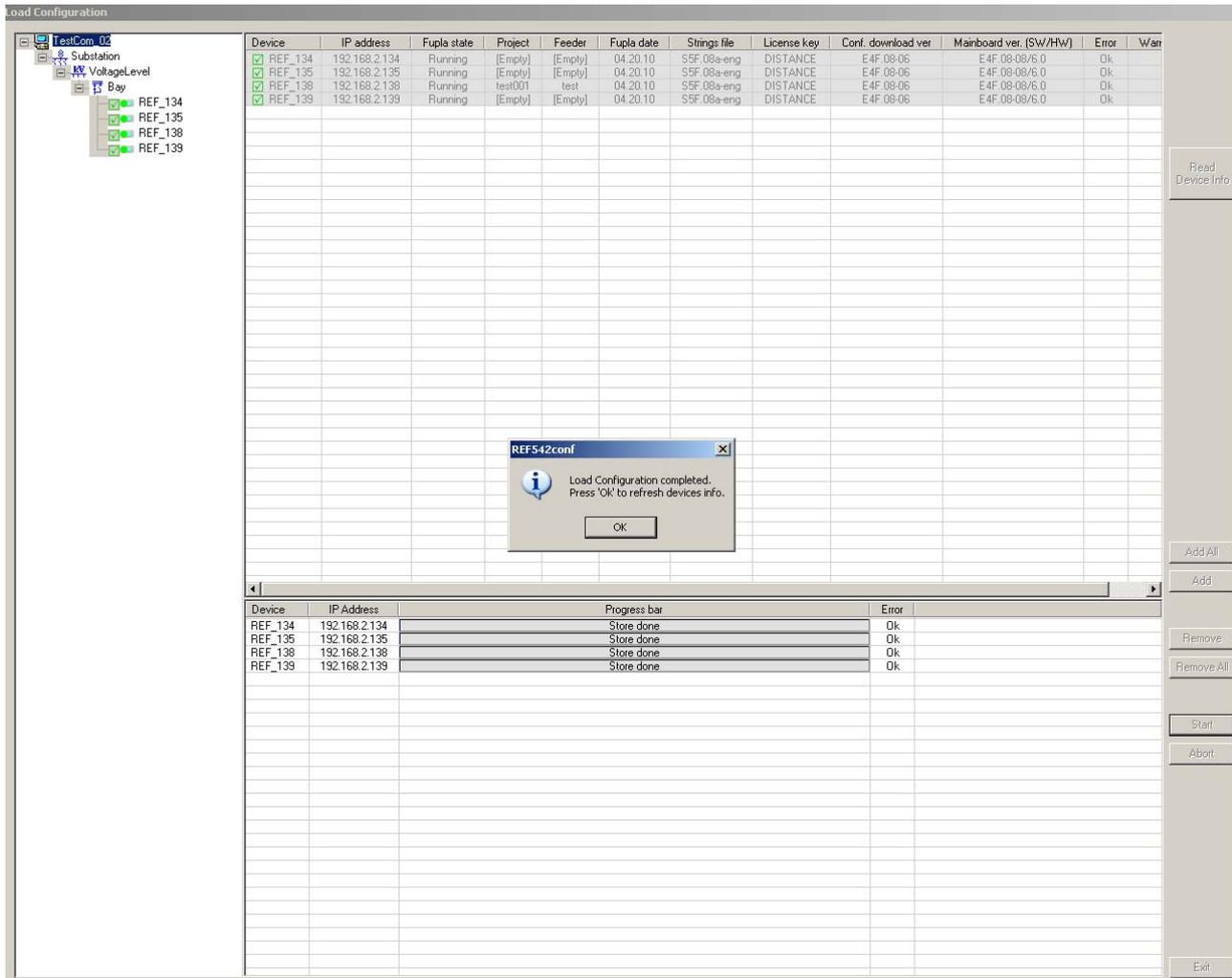
- CAN interface must be valid and available; otherwise, the error “CAN controller not mounted!” appears.

9.2.

Uploading configurations

Configuration upload is identical to configuration download.

- Click **Start** to retrieve the remote configuration from the REF 542plus units and save it in the selected local devices that compose the project. For other parts, dialogs are similar here and in the configuration download.



A100604

Fig. 9.2.-1 Application Upload dialog



Note that the REF 542plus Configuration Tool is able to load configurations from an REF 542plus device only if the following condition is verified:

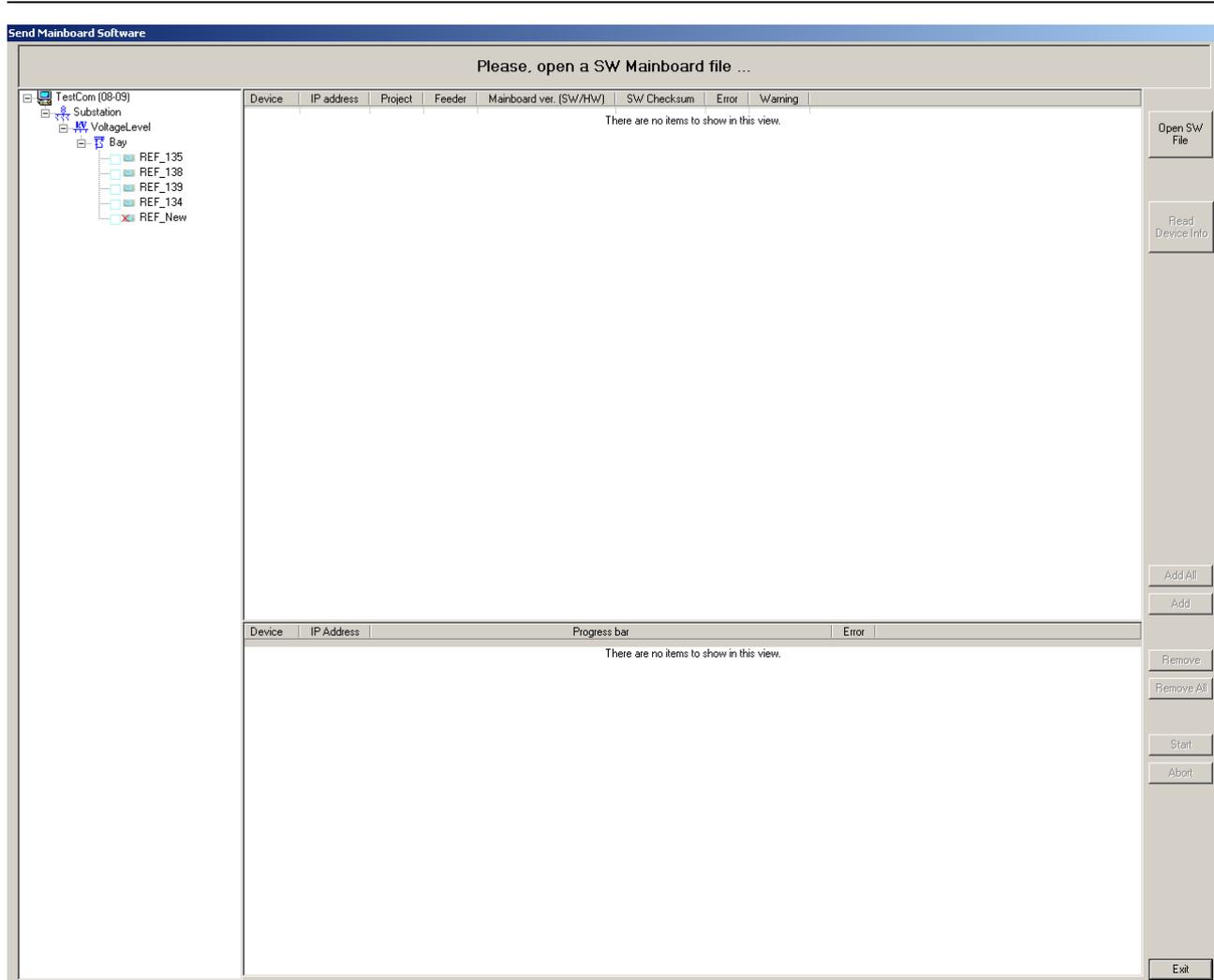
1. The version of REF 542plus in general must be compliant with the version of the REF 542plus Configuration Tool.
 - The REF 542plus software version must be less than or equal to the one of the REF 542plus Configuration Tool. Otherwise, the error “Incompatible REF 542plus version!” appears.

Version comparison is done on the first two digits after the dot, that is, the comparison digits for V4F.08x are 08.

9.3.

Downloading mainboard software

This dialog allows sending a software file to the mainboard of the selected remote devices. The dialog structure is identical to that of the configuration download, except for the addition of a text field at the top of the window and the **Open SW File** button.



A100656

Fig. 9.3.-1 Mainboard firmware download dialog

Open SW file allows choosing a software file with the extension .sre and loading it. Software information is shown in the upper text field, and version and checksum are shown near the file name.

Read Device Info shows information about each device. A warning is shown if the selected mainboard software file is already running in the device.

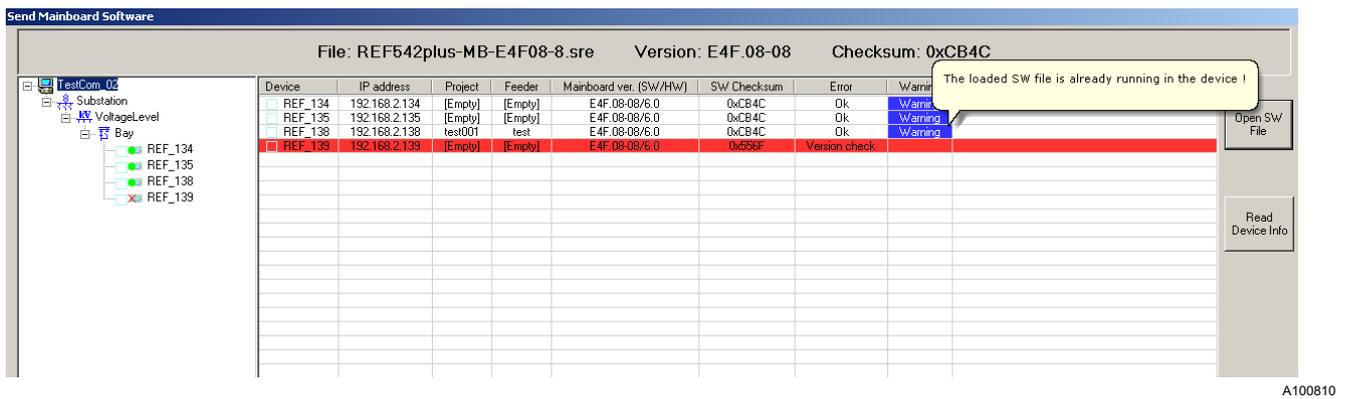


Fig. 9.3.-2 Result of device information reading with software file information at the top

- Click **Start** to download the software file to the mainboard of the remote devices listed in the lower grid. Except for this function, the dialogs are similar to those of the configuration download.



Restrictions: The REF 542plus Configuration Tool is able to send software to the REF 542plus devices only if all the conditions are verified.

1. REF 542plus Mainboard software and hardware minimum requirements
 - The minimum version of the mainboard software running on the device must be V4F.08.
 - The minimum version of the mainboard hardware of the device must be 6.0.
 - The minimum version of the mainboard bootloader running on the device must be 4.2.

Only the devices without errors can be moved in the lower grid to start the download process.

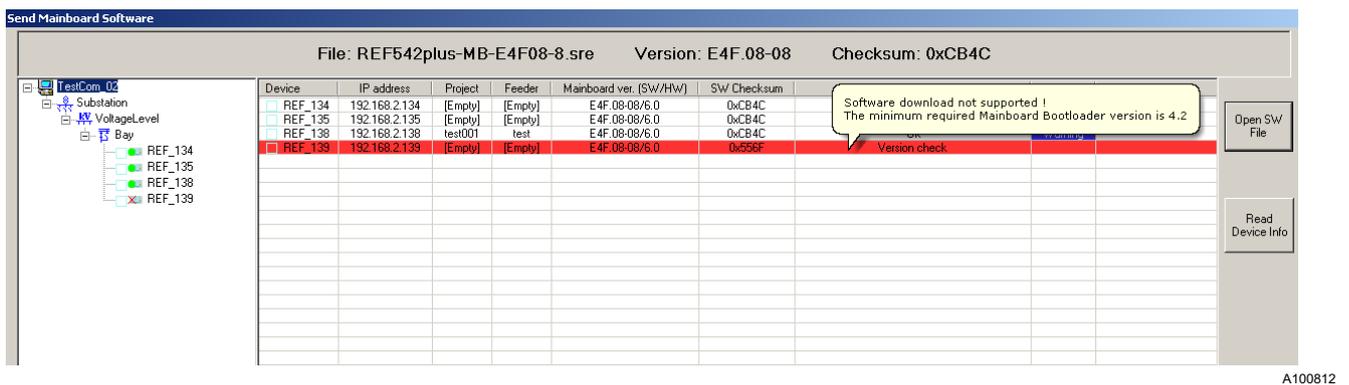


Fig. 9.3.-3 Version check after device info reading

9.4. Downloading COM board software

COM board software download allows loading a software file to the COM board of the selected remote devices. The dialog structure is identical to that of the configuration download, except for the addition of a text field at the top of the window and the **Open SW File** button. It allows choosing a software file with the extension .sss and loading it. Software information is shown in the upper text field.

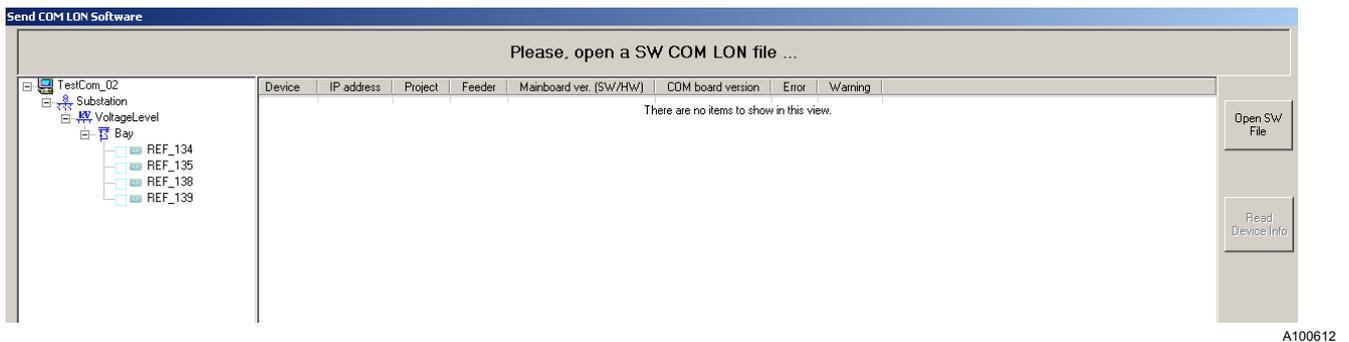


Fig. 9.4.-1 COM board LON software download dialog

- Click **Start** to download the firmware file to the COM board of the remote devices listed in the lower grid. Except for this function, the dialogs are similar to those of the configuration download.



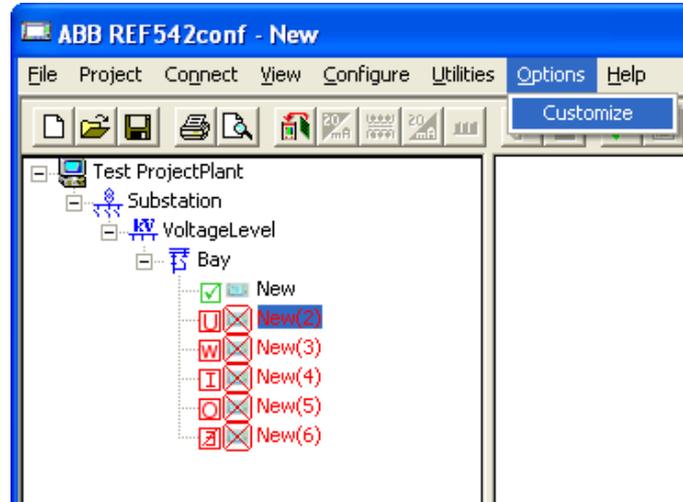
Restrictions: The REF 542plus Configuration Tool is able to send software to the COM board of an REF 542plus device only if all the conditions are verified.

1. REF 542plus mainboard software and hardware requirements
 - The minimum version of the mainboard software running on the device must be V4F.08.
 - The minimum version of the mainboard hardware of the device must be 6.0.
2. COM board verification
 - Sending software operation requires that an appropriate type of the COM board is installed and detected
 - Sending software to COM IEC requires the IEC COM board type
 - Sending software to COM LON requires the LON COM board type
 - The COM board must be of the same type than the one configured. Otherwise, the error “COM BOARD software cannot be downloaded. Different COM board detected by REF 542plus” appears.

10. Logging

ABB REF542conf allows logging all the main events generated by project section operations in a text file. Logging is off by default.

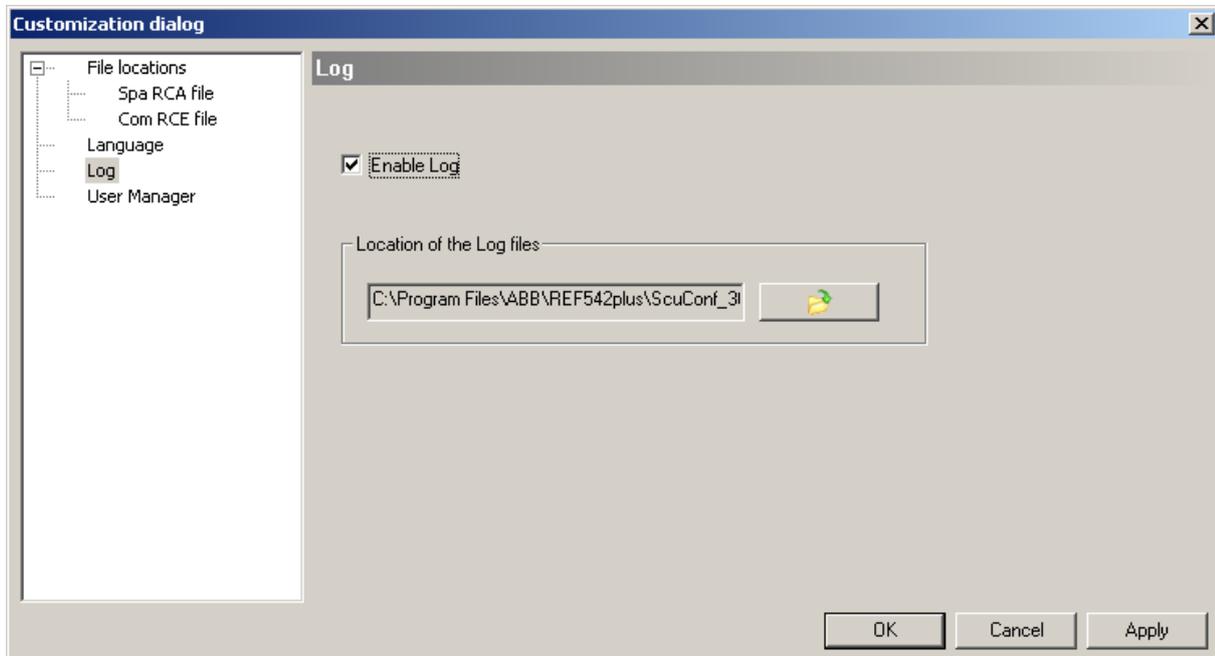
- To activate logging, select **Customize** on the **Options** menu.



A100618

Fig. 10-1 Customizing

- Select "Log" from the tree structure on the left of the customization dialog. On the right side it is possible to enable logging and choose a destination folder for the log text file.



A100654

Fig. 10-2 Logging parameter configuration dialog

The log is archived in a text file named using the ABB REF542conf executable name, the word "Log" plus the current date. When logging is enabled, a new log file is created every day. Operations are logged in a single text row in the file like in this example:

REF542confLog_2009-08-25.txt

2009-08-25 11:29:02 – [MAIN]: Beginning REF542conf.

2009-08-25 11:38:00 – [PROJECT]: Opened a project: New Project.

2009-08-25 11:38:55 – [DEVICE]: Opened a device: New.

2009-08-25 11:38:55 – [DEVICE]: Entering edit mode for device: New.

2009-08-25 11:43:17 – [DEVICE]: Exiting edit mode for device: New.

Each logged event contains the date with units in day and hour, the section inside square brackets and the event message.

A section represents a specific area of ABB REF542conf that groups similar functionalities. The logged sections are as follows:

- Main
- Project
- Device
- Backup/Restore
- Drawing
- Device properties
- Application download
- Application upload
- Mainboard FW
- COM FW
- User management

11. User profile management

This version of Configuration Tool has the optional functionality of setting Access Control List in order to access Configuration Tool in a secure way.

Access Control List is stored on the local disk or in a remote folder of the LAN as a hidden user file. It consists of user profiles defined by:

- User ID
- Password
- Authorization level

User profile management enabled means that it is possible to access Configuration Tool only after having been granted authorization in the authentication login phase.

Further, some or all Configuration Tool functionalities can be accessed according to the user authorization level.

There are four authorization levels to ensure minimum user rights needed:

- User
- Programmer
- Engineer
- Administrator

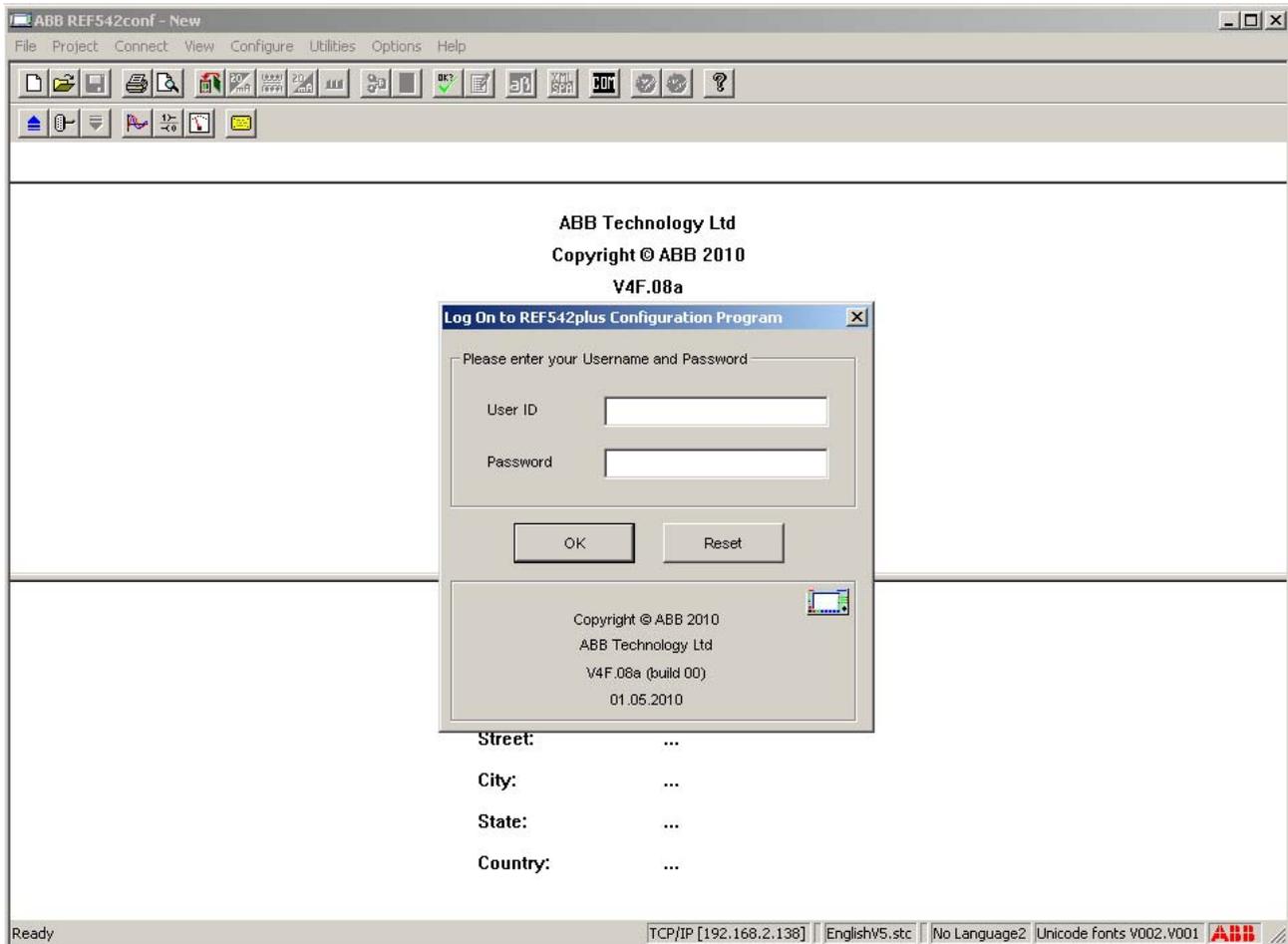
The authorization levels and corresponding allowed operations are listed in the table:

User	Level	Operations
User	L1	<ul style="list-style-type: none"> • Load in read/only the Project • Device properties view • Read device info • Upload application file (*.ref) • Saving disabled
Programmer	L2	<ul style="list-style-type: none"> • L1 operations • Download application file (*.ref) • Download FW mainboard • Download FW COM board • Parameter setting (like operation tool)
Engineer	L3	<ul style="list-style-type: none"> • L2 operations • Full access of functionality
Administrator	L4	<ul style="list-style-type: none"> • L3 operations • Manage user levels (assign/remove password, etc.) • Import / export encrypted authorized user file

By default, user profile management is disabled.

11.1. Logging in

If the user profile management is enabled, Configuration Tool requires the credentials through a login window.



A100734

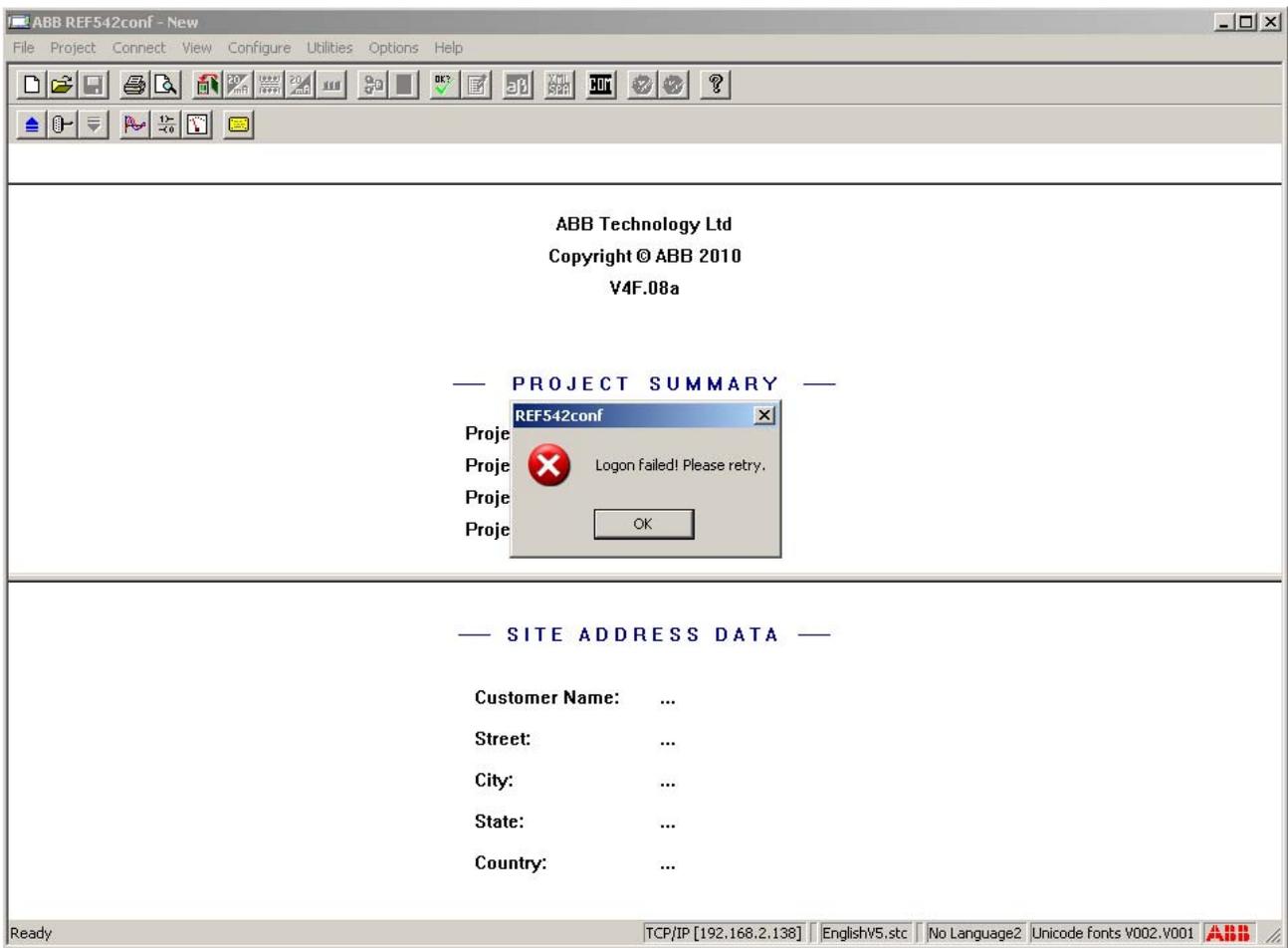
Fig. 11.1.-1 Login

- Click **OK** to confirm the credentials and wait for the verification response of the system.
- Click **Reset** to reset the User ID and password fields.



To quit the login dialog and exit immediately from the application, click the **Close** button of the window or press ALT+F4.

If a wrong ID or password is entered, an error message appears.



A100736

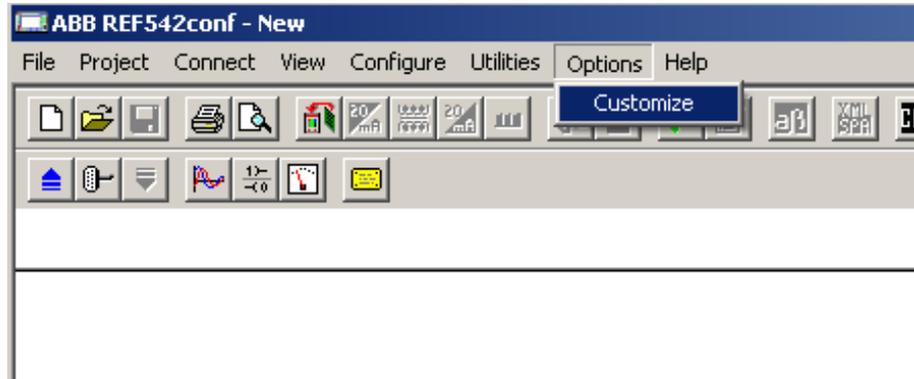
Fig. 11.1.-2 Login failure

If user profile management is disabled, at startup no credentials are requested.

11.2.

Configuring user access control list

- To configure the list of users allowed to access Configuration Tool or make other user profile operations, access the user management configuration page by clicking **Customize** on the **Options** menu.



A100738

Fig. 11.2.-1 User manager access

- Select "User Manager" in the tree structure on the left.



A100746

Fig. 11.2.-2 User manager in the tree structure

A login dialog appears for an authentication to access the user management.



A100740

Fig. 11.2.-3 Login dialog

- Click **OK** to confirm the credentials and wait for the verification response of the system.
- Click **Reset** to reset the User ID and Password fields.



The Administrator authorization level is required to access this page and manage user profiles. If the user access list has not been created before, the only account that can be entered in the user management configuration page is the "Super User" account.

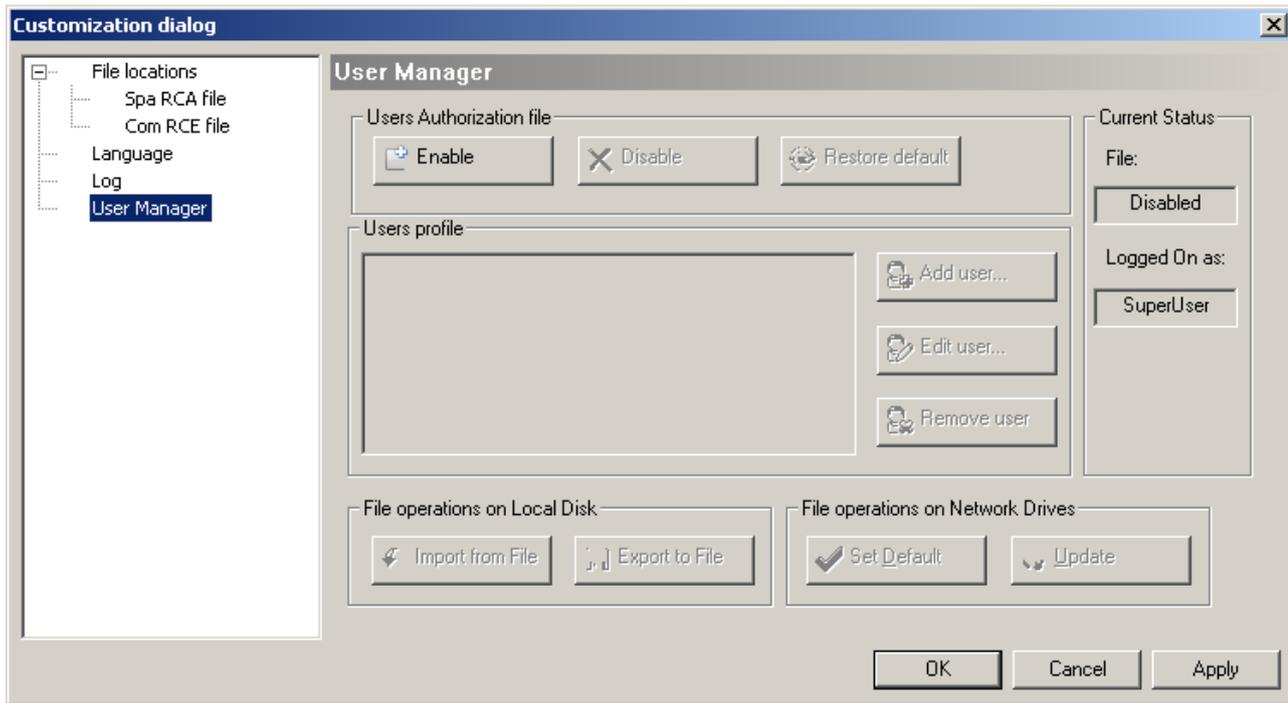
An error message appears if a different user profile is used.



A100742

Fig. 11.2.-4 Incorrect user rights error

After a successful login authentication, the User Manager panel is shown.



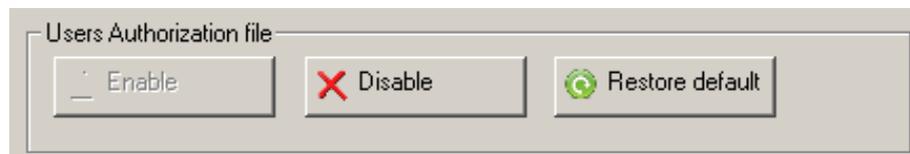
A100744

Fig. 11.2.-5 User manager panel

User Manager consists of five main sections:

- User Authorization file
- Current Status
- Users profile
- File operations on Local Disk
- File operations on Network Drives

11.2.1. Users Authorization file



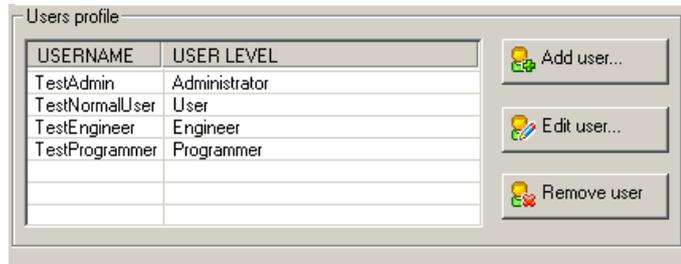
A100724

Fig. 11.2.1.-1 Users Authorization file

- **Enable** sets Configuration Tool to operate with user access control.
- **Disable** sets Configuration Tool to operate without user access control by disabling the user profile management.
- **Restore default** sets Configuration tool to operate with the user access control list stored in the default folder in the local disk.

11.2.2. Users profile

This section allows managing user profiles by adding a new user profile or editing or removing existing profiles in the list.



A100748

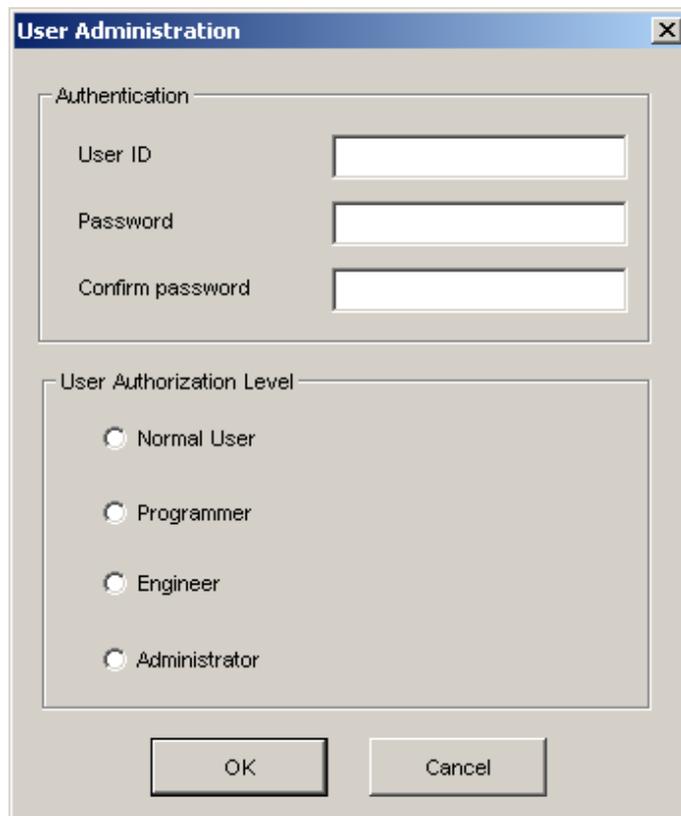
Fig. 11.2.2.-1 User profiles

- **Add user** adds a new user to the user list.



The maximum number of users is 100.

A dialog window with the main user profile fields appears.



A100750

Fig. 11.2.2.-2 User adding dialog

- "User ID" is the username. It is case-sensitive and cannot be longer than 15 characters.
- "Password" is case-sensitive and cannot be longer than 15 characters.
- "User Authorization Level" must be selected to complete the user profile before closing the dialog.

User authorization level is a mandatory selection. There can be more than one user for each level.



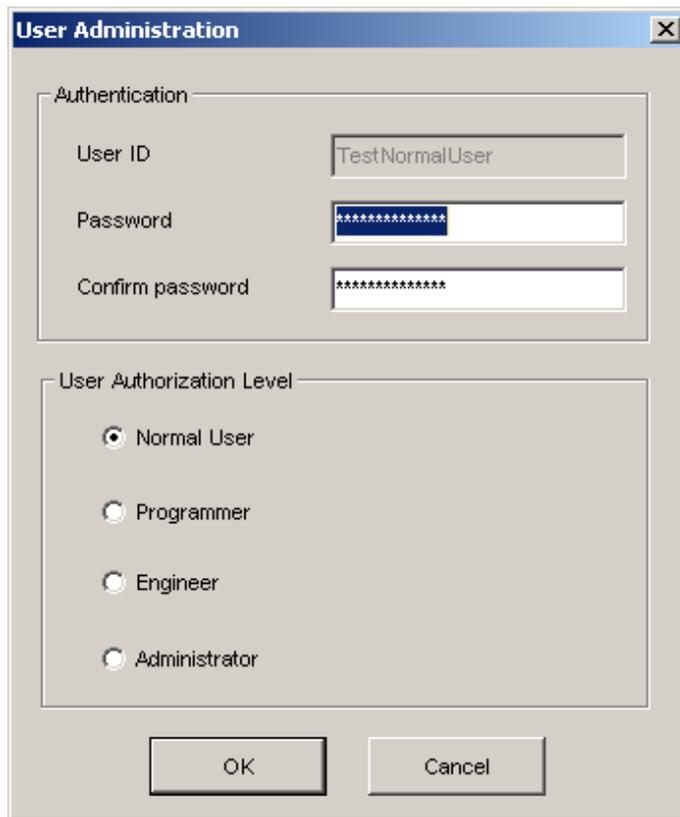
The first user profile must be defined as "Administrator."

- **Edit** edits the data of the selected user from the user list.



The edit mode can also be accessed by double-clicking a user ID on the list.

A dialog window for editing appears.



A100752

Fig. 11.2.2.-3 User editing dialog



User ID cannot be changed here. For a different user ID, the old user profile must be deleted and a new profile added with the new user ID.

- **Remove** removes the selected user from the list.

A confirmation message appears, where clicking **Yes** removes the user.



A100754

Fig. 11.2.2.-4 User removing confirmation



All kinds of user profiles can be removed. However, an Administrator profile cannot be removed with Configuration Tool if it is the only Administrator profile in the list. An Administrator profile cannot be removed last but there must be other user profiles left.

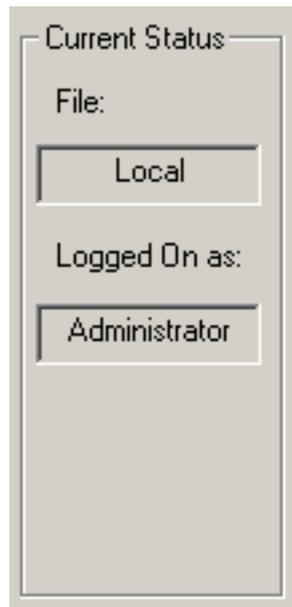
11.2.3.

Current status

The Current status section contains information about the location of a user account file and the profile of the user logged in.

The location of a user account file can be local or remote, depending on if a file is used from the local computer or from a network storage.

The current profile can always be either Administrator or Super User.



A100726

Fig. 11.2.3.-1 Current status section

11.2.4. File operations on Local Disk



A100730

Fig. 11.2.4.-1 File operations on local disk

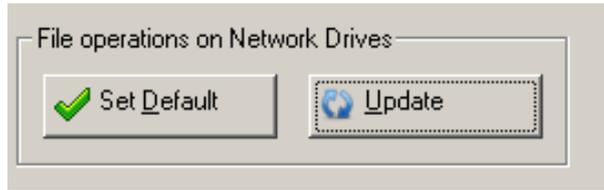
- **Import from File** allows importing a user account file from local disk.
- **Export to File** allows exporting user account settings to an external visible file.



For both operations the path file established as default is used. All the user management operations only affect the default user file.

11.2.5. File operations on Network Drives

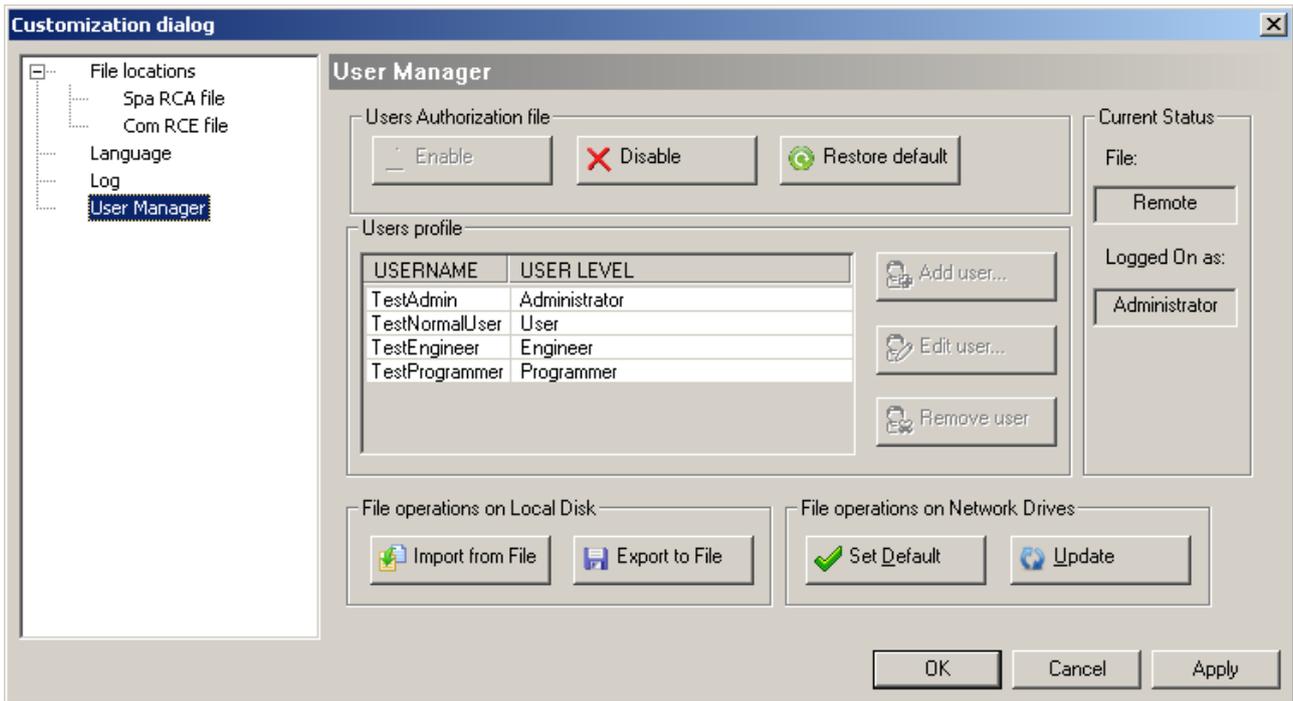
- **Set Default** is used for selecting a user file located in a remote folder and setting it as the default user account setting file. After this, the content of the local file is updated with the content of the selected remote user file.
- **Update** allows refreshing the user list if the network file is updated by another administrator.



A100732

Fig. 11.2.5.-1 File operations on network drives

File operations can be done remotely.



A100700

Fig. 11.2.5.-2 Example of remote operations

12. Configuration detection differences

During maintenance, it must be known if the configuration file stored in the PC file system and opened in Configuration Tool is the same as the one running in the device.

To provide this information, the functionality to detect every real change done by the user (that is, parameters, FUPLA logic, settings and so on) has been improved.

The difference detection is based on the date of configuration modification and on the configuration revision. Only in case both are the same in the PC configuration file and in the device, the two configurations can be considered equal.

The date of configuration modification is updated by the configuration tool when saving or downloading a modified configuration.

The revision consists of a major and a minor number ("m.n," default "1.0").

- The major number is increased by the configuration tool when saving or downloading a modified and already downloaded configuration. After a revision upgrading, the minor number is reset to "0."
- The minor number is increased by the device after every parameter update.

The configuration modification date and state ("downloaded," "not downloaded" or "modified") and the revision are shown in the Configuration Tool main window.

The configuration modification date and the revision are shown in the HMI versions page.

The revision parameter can also be changed in the "Global Setting" dialog.



If the configuration file includes the "Parameter Set Selector" function, also a change on the parameter set causes an upgrade of the revision number, that is, the minor number.

For example, a change from SET1 to SET2 or from SET2 to SET1 makes a configuration difference also if they are equal.

13. Appendix A: Project organization and maintenance guideline

This chapter provides advice on how to keep the project files safely organized.

A project consists of a project file with the extension *.rep and a folder with the same name as the project. The folder contains all the device-configuring *.ref files nested in the folder, followed by a tree scheme like in Figure 3.2.-2.

It is recommended to define a meaningful name for the release folder where to store all the project files, project folders and project archive relevant to the actual release. For example, a folder called "Release 3.0" contains all the projects with the version V4F.08x, while a folder called "Release 3.0 SP1" contains all the projects with the version V4F.09x.

It is strongly recommended to keep the project files synchronized with the configuration files running on the REF 542plus devices.

MAINBOARD SOFTWARE UPGRADE PROCEDURE

The recommended procedure to do in case a new release or a new service pack with a changed version number has been delivered is to remotely upgrade the maintenance software for the REF 542plus mainboard.

For example, a project is to be updated from "Release 3.0" to "Release 3.0 SP1" and the mainboard version from V4F.08 to V4F.09.

1. Ensure the synchronization between the release 3.0 project configuration files and the remote configuration files currently running on the REF 542plus devices.
2. If the project is already synchronized, go to step 3; otherwise:
 - 2.1. Open Release 3.0 Conf Tool (V4F.08)
 - 2.2. Open "Project" from the "Release 3.0" folder
 - 2.3. Upload all the remote configuration files currently running on devices
 - 2.4. If there are no errors, archive "Project" in the "Release 3.0" folder
3. Create, if it does not already exist, a new folder "Release 3.0 SP1" and store the "Project" archive to the new "Release 3.0 SP1" folder.
4. Move the configuration files to the "Release 3.0 SP1" folder with the configuration tool
 - 4.1. Open Release 3.0 SP1 Conf Tool (V4F.09)
 - 4.2. Open "Project" from the "Release 3.0 SP1" folder
 - 4.3. Do the porting: "Enter Edit" to each Config file node of the project, change at least the language and click "Save."
5. Send the software and configuration to the mainboard
 - 5.1. Open the communication dialog to send the software to the mainboard
 - 5.2. Open the communication dialog to send the configuration to the mainboard



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