

CheckCon 3

Software for Testing
Power and Voltage Transformers

User Guide

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1 Introduction

What is CheckCon

CheckCon is a software package for the automated testing of current and voltage transformers. CheckCon has been designed for use with the test systems and equipment of ZERA GmbH, Königswinter.

The CheckCon programs support all individual tasks during the test. This includes the generation of test sequences and error classes, running manual and fully automated tests as well as generating reports and performing an evaluation.

About this Guide

Style and Markup

The User Guide at hand addresses all users that are to work with CheckCon. It describes the layout and operation of the program and all its elements.

This documentation uses a number of different styles and markups to highlight or identify specific control elements, identifiers, text entries or key combinations. On the one hand, this indicates the links of the read material to the software programs, and on the other hand it creates an opportunity for quickly identifying a particular option in the text. For that particular reason, elements which a user is most likely to look for by scanning the text are printed in **bold** face font.

The styles and markups are consistently used in following manner:

Mouse

This documentation refers to the mouse by the expressions 'mouse button' and 'mouse wheel' in order to avoid confusion with other input devices or interactive elements. The mouse functions in the manner common for Microsoft Windows:

- 'Click' or 'left click' on a particular object generally refers to one short click on the left mouse button while the mouse pointer is positioned on top of the respective object on the screen. The different designations 'clicking on an item,' 'clicking in an item' or 'clicking an item' merely arise from the visual context and function in an identical manner.
- A 'right click,' while it functions in a manner similar to a left click, is performed with the right mouse button. A 'middle click' is still rather uncommon for PCs. If the mouse exhibits a middle button, a 'middle click' is performed by means of the middle button in a manner similar to the one described above. Depending on the operating system and the model of the mouse, the mouse driver might simulate a non-existent middle button.
- 'Double-click' refers to a fast sequence of two short left clicks on the same object while the mouse remains mostly stationary. The sensitivity with regard to the clicking sequence and the shifting tolerance can generally be adjusted by means of the mouse driver.

Keyboard

While working with the present software program, you will perform entries via the keyboard at different occasions. Throughout this documentation, the term 'key' in the context of data input always refers to a key of your keyboard.

The following differentiations indicate the various types:

- Pressing a key is indicated by means of angle brackets. Example: <a> or <A> refer to the key 'A'. If capitalization is important, it will be explicitly stated in the text.
- Whenever possible, identifiers for individual keys are indicated in the manner they can be found on a standard English keyboard:
<F1>, <F2>, ..., <F12>,
<Alt>, <AltGr>, <Ctrl>,
<Ins>, , <Home>, <End>.
- The following identifiers are used for keys that do not exhibit a label:
<Enter> refers to the return/enter key,
<Backspace> refers to the backspace key,
<Space> refers to the space bar,
<Shift> refers to the shift key,
<Caps Lock> refers to the caps lock key and
<Tab> refers to the tab key. In addition, the cursor keys are indicated by
<Left>, <Right>, <Up>, <Down>, <Pg-up> and <Pg-dn>.
- Keys on the separate keypad are identified by the prefix *Num*:
<Num1>, <Num,>, <Num/>, etc.
- Key combinations, i.e. keys which need to be pressed at the same time, are indicated by means of the sum of the respective keys. Example: 'Press <Alt+X>.' - In order to enter such a combination, press and hold down the first key (in this case <Alt>). While you hold down the first key, press and release the second key (in this example <X>). If the text contains no other instructions, press and quickly release the second key. Subsequently release the first key. Generally such combinations include the keys <Shift>, <Alt> and <Ctrl> as the first key and an additional second key.
- Key combinations with more than two keys are only used in combinations with <Shift>, <Alt> and <Ctrl> as the first key, e.g. <Shift-Ctrl+F2>. The sequence for pressing the first keys is of no importance in that context. Please make sure that all keys are pressed when you press the last key (in this example <F2>). <Ctrl-Shift+F2> is identical to the above example. For that reason, the combination of these keys is indicated by means of a hyphen.
- There are occasions when you need to enter text in the manner indicated in this documentation, e.g. particular names or commands. Such text is indicated in a non-proportional font.
- A non-proportional font is also used for file, directory and path names.

Controls

Typical controls of the display contents are particularly highlighted:

- The names of menus and commands, options, tabs, input boxes, table headers and window ranges are printed in *italics*. Example: 'For detailed settings, click on the tab *Extras*' or 'Select the desired documents in the panel *Contents*.'
- A special notation is used for menus. Accessing a desired command generally involves clicking on a menu name and a submenu. This is represented by the

common abbreviated form 'Menu name > Submenu > Submenu > ... > Command.' Example: 'Click on *Extras* > *Databases* > *Program Databases*' stands for 'From the main menu of the program, click the menu title *Extras* and choose the submenu *Databases*. There, select the command *Program Databases*.'

Unless otherwise indicated, such a menu path always originates from the main menu of the main window. The Windows start menu forms an exception and is represented by '[Start] > Programs > ...' This naturally refers to the button [Start] on the Windows taskbar.

- The names of windows and dialogues, buttons, option buttons and check boxes are indicated in **bold** or *italics*. The names are always printed in bold if they appear in a functional context and require particular highlighting. If the names are only mentioned, they are printed in italics. Example: 'This opens the dialogue **Advanced Settings**.' but 'The control elements function similar to the dialogue *Advanced Settings* (see above).'
- In addition, buttons are indicated by square **[brackets]**. 'Button' generally refers to a control on the screen. If a button is explicitly mentioned in the text, this always implies a left click on that button. Example: 'Confirm your changes with **[OK]**.' This indicates the presence of a button named 'OK' in the respective dialogue. If you click on the button, any changes you might have performed with regard to the settings are accepted and saved.

Button names printed in **bold** face indicate, that the control is labeled with the name, button names in *italics* refer to buttons that are only named as stated in the text. For instance **[Print]** refers to a button that reads 'Print' in letters, *[Print]* instead refers to a button that is named 'Print' and introduced earlier in the text, and does not show its name but most likely a symbol or picture instead.

Links

- References to text passages within this documentation are printed in *italics*. Chapters and sections are divided by means of a hyphen. Example: 'For details about the command Print Preview, please refer to section *Common Functions – Print Preview*.'

2 Installation

CheckCon is installed using the standard software *InstallShield*. The installation must be performed with administrative privileges.

System Requirements

Operating System

CheckCon runs on the Microsoft operating systems Windows 2000 und Windows XP. Up to the current version, CheckCon does not require any service packs or patches. No known conflicts exist with any Windows service pack released prior to this CheckCon version, which are all up to service pack 4 for Windows 2000 and service pack 1 for Windows XP.

Hardware

CheckCon communicates with the devices of the test equipment via serial interfaces of the common type RS232. CheckCon supports up to 8 different devices, each connected to a separate interface (see section 6 *settings* for details).

As a result, the PC must be equipped with a number of RS232 interfaces equal to the maximum number of devices you want to connect.

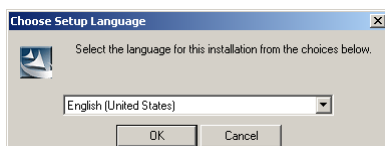
System Performance

CheckCon does not impose any considerable strain to system resources. Any PC capable of running the installed operating system smoothly, will be sufficiently powerful for CheckCon.

First Installation

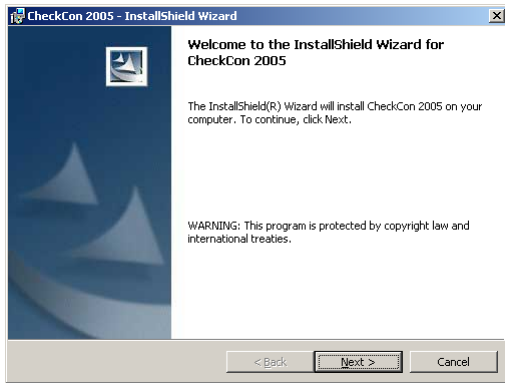
You can simply insert the CheckCon CD and run *Setup.exe* from its root directory. However, it is recommended to first copy the content of the CD to your hard disk into a directory of your choice and run *Setup.exe* from there. This will leave you independent from the setup CD from there on.

If, in order to perform the setup, system files must be installed or updated, you might get asked to reboot the machine. Please do so (by confirming the corresponding dialogue with [Yes]) before continuing with the setup. If the setup does not commence automatically after the reboot, please execute the *Setup.exe* again.

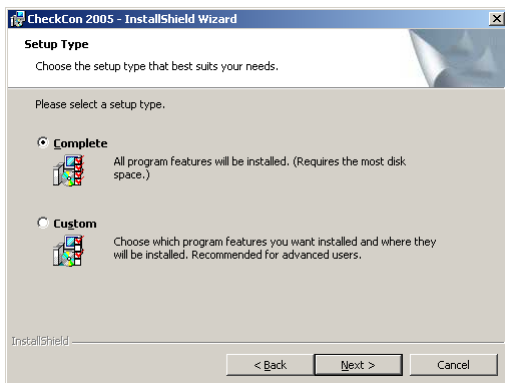


When the setup is ready, you will first be asked to select the setup language.

This selection not only influences the setup language but also determines the installed language version of CheckCon 2005. In the dialogue, just select your language of choice from the drop-down menu, and click **[OK]**.



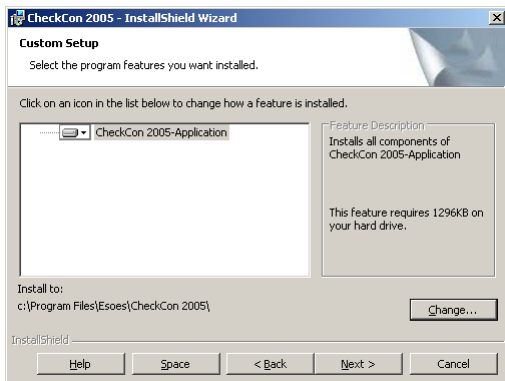
The installation is performed using the Windows standard installer software *InstallShield*. The first screen just tells you about the upcoming setup, please click **[Next>]**.



Choose between a *complete* and a *customized* (user defined) installation and click **[Next>]**. A full setup automatically installs to the directory

```
C:\Program Files\
    Esoes\
        CheckCon 2005
```

If you select the customized setup, the next step allows you to specify an alternative location.

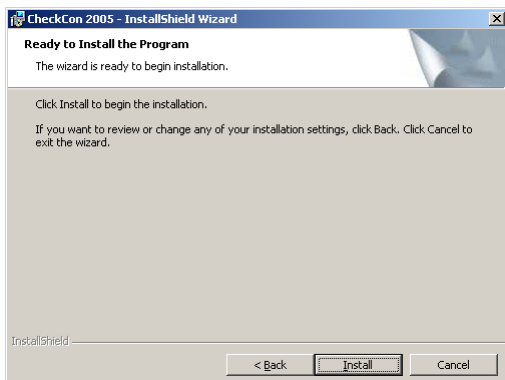


The selected directory defaults to the standard program directory as stated above. You can **[Change]** this selection.

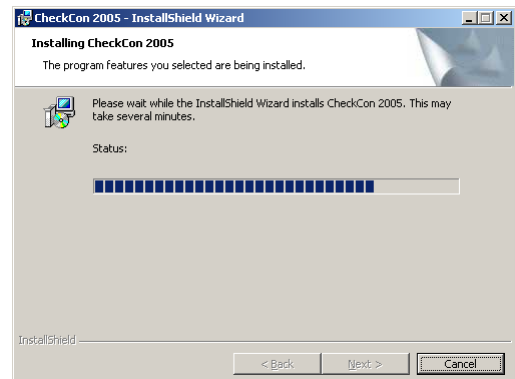
You can not alter the component selection.

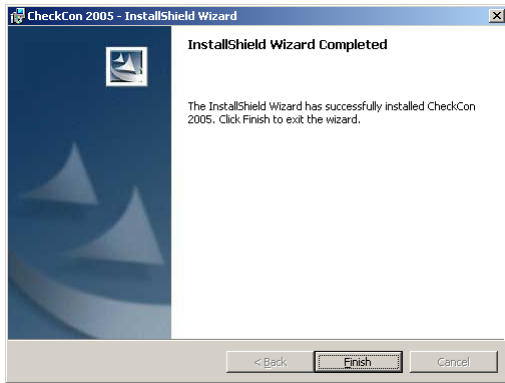
After you specified the correct installation path, click **[Next>]**.

This step is skipped for a *full* installation.



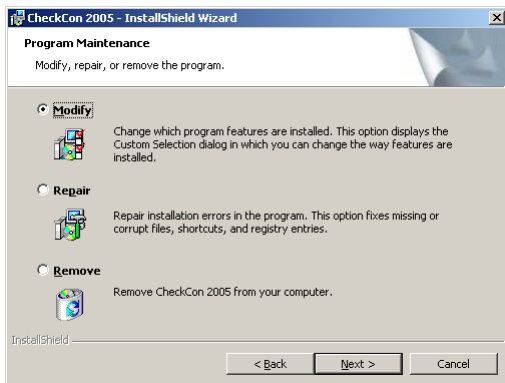
Click **[Install]** to proceed, **[<Back]** to change a setting or **[Cancel]** the setup.





The setup tells you, when CheckCon 2005 has been completely installed. Click **[Finish]** to close and leave the setup program.

Modify, Repair, Uninstall



In order to remove or repair an existing installation, simply rerun the setup. The following options will be available:

Add or remove features leads to the dialog of the customized / user defined setup. Since CheckCon always installs completely without selectable features, this option is useless with CheckCon 2005.

Reinstall or repair replaces all installed files with their originals from the setup medium. This is the thing to try if you suspect that one

of the installed files has been damaged.

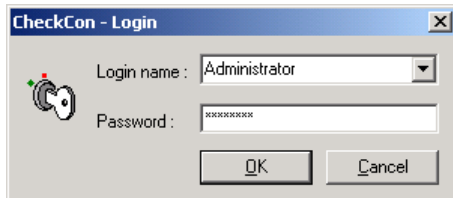
Uninstall completely removes CheckCon from your system. Please always use this way to uninstall CheckCon. Do not manually delete files or folders from your disk, since proper deinstallation will most probably not be possible afterwards.

Select the required option and click **[Next>]**. Proceed as described under *First Installation* above.

3 Common Features

Login

CheckCon includes an internal user base. When you start the application, you are asked to enter your login name and a password.



Enter your CheckCon user name and the corresponding password.

If you don't have a CheckCon user account at your disposal, please check with your CheckCon Administrator.

If you installed CheckCon for the first time, login as *Administrator*. The default password for this account is *CheckCon*. Please change this to something less obvious immediately after first login.

Details about the user management, about linking CheckCon user accounts to Windows user accounts and about auto-login are described in section 4 (*Connection to System Users*).

Commit your login with **[OK]**. If you **[Cancel]**, the login dialog is completely ignored. If you cancel the login at program start, the program will be finished immediately. If you cancel a re-login (see next subsection), you do not switch to the new account but continue to work under the last valid login.

In order to work with CheckCon 2005, there must always be a user logged on to the program. However, no explicit logoff is required, logoff is performed automatically on re-login or on program exit.

The menu item *Login*

Login is also a menu item in CheckCon, allowing fast re-login without the need to logoff or restart the program. This allows for instance to switch between accounts with different permission levels, or to easily share the client machine between several users.

The menu *Login* <Alt+L> has the following items:

Login

Opens the Login dialog as shown above. Allows fast re-login to the running program. Implicitly logs off the previous account.

Stop <Alt+F4>

Exits the program. Implicitly logs off.

Print and print preview

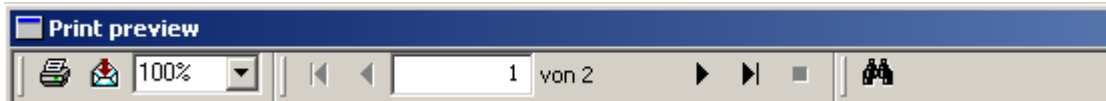
CheckCon is capable of printing specific information in a processed form. The printer set to be the standard printer under Windows, here referred to as *standard printer*, is used for all paper printouts..



The quick printing functions of the program can be accessed via the several *Print...*-buttons on the toolbar, which print the selected report immediately and without further dialogs.



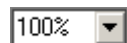
As an alternative to quick printing, at least for protocols, you can a preview. This is a screen representation of the printout to be expected on the selected printer. The print preview is generated by means of the printer driver of the current standard printer. This ensures that the layout displayed on the screen corresponds to the layout of the paper printout.



The print preview window features its own toolbar. It shows the current page number and the total page count. In case of multipage documents, you can switch between pages by means of the arrow icons.

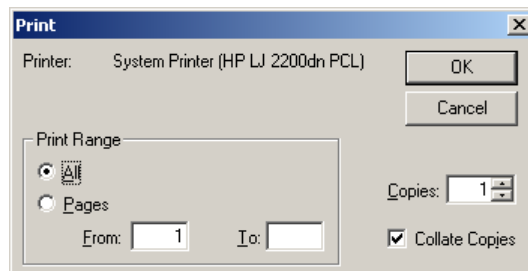
Zoom

With the drop-down box on the left, you can select from several zoom levels.



Print

The document shown on the preview screen will be sent to the device that is specified as default printer under Windows, to be printed with the current settings. When you issue the print from the preview window, another dialog is shown, before actually printing the document.



Here you can specify a page range, the number of copies and the sorting.

Export to file

Instead of printing the document on paper, you can export the document to a file. Click the *Export*-icon to open the export dialog, where you can choose from a wide range of different formats (pdf, csv, xls, several database types, etc.) and one of several export targets (file, email, application, etc.).



Closing the print preview

Simply close the print preview by means of the appropriate Windows control element (X) or press <Alt-F4>.

Working with tables

CheckCon uses tables for the structured display of data. Some allow editing within the table view. Such a table is always connected to a database and usually one line in the table represents one set in the database.

Tables for display purposes

Tables that only serve display purposes work as you know it from Windows: Clicking into a cell marks the whole line. Adding <Ctrl> or <Shift> allows multiple selections. Clicking a column header sorts the table by the entries of that column, additional clicks reverse the sorting order, indicated by the sorting marker.

If need be, the width of a column can be adjusted by dragging and dropping the width control, the separator between two adjacent columns. A double click auto-sizes the column width.

The screenshot shows a table with the following data:

| Description | Test-sequence | Transformer-type | Primary current | Secondary Curr./Volt |
|-------------------|--------------------------------------|--------------------|-----------------|----------------------|
| 2 windings | Class 1 2 ranges+ Intert.+Kneep+S... | Zera test 2 win... | 100,00;99,00 | 5,00;5,00 |
| Faget 0.5 S | Class 0.5S 1 range high ratio | Faget 3000/1 | 3000,00 | 1,00 |
| Faget 3000/1 6... | Class 0.5S 1 range high ratio | Faget 3000/1 ... | 3000,00 | 1,00 |
| Faget 3000/1A | Class 1 1 range high ratio | Faget 3000/1 | 3000,00 | 1,00 |
| MBS 100/5 | Class 1 1 range+ Intert.+Kneep+S... | Zera test | 100,00 | 5,00 |
| Summation | Class 1 summation 2 windings | Summation 2 w... | 5,00;5,00;5,00 | 5,00;5,00;5,00 |

Annotations in the image point to: 'sorting marker' (a small triangle in the 'Description' header), 'column header' (the text in the header row), 'width control' (the vertical line between columns), and 'scroll bar' (the horizontal bar at the bottom).

Tables that allow editing

Tables that allow editing of their content are a bit more complex.

The screenshot shows an editable table with the following data:

| | Test-volt. (%) | Max. deviation (%) | Max. Ratio-error (%) | Max. Phase-displ. (min) |
|---|----------------|--------------------|----------------------|-------------------------|
| | 80,00 | 0,20 | 1,00 | 60,00 |
| | 100,00 | 0,20 | 1,00 | 60,00 |
| | 120,00 | 0,20 | 1,00 | 60,00 |
| | 190,00 | 0,20 | 1,00 | 60,00 |
| * | | | | |

Annotations in the image point to: 'line header' (the empty cell in the first column), 'active line' (the row containing 120,00), 'active cell' (the cell containing 0,20), 'column header' (the text in the header row), 'width control' (the vertical line between columns), 'new line' (the asterisk in the first column), and 'height control' (the vertical line between the first and second columns).

In addition to the column headers these tables feature line headers. Like the width control, line header separators work as height control.

Highlighting

Clicking a column or line header highlights the whole column or line respectively. Clicking into a cell selects the data field for editing. Multiple selections with <Ctrl> and <Shift> is generally possible, but might be disabled in some dialogs partially or completely.

A black arrow in a line header indicates the active line. This is useful for instance when several lines are highlighted but a command is issued that only affects the active line.

Editing cells

Editing of values happens immediately within the table cell. An active cell can be edited, which can happen in one of three different ways in CheckCon 2005:

The simplest case is a checkbox. It works just like any checkbox and can be either checked or unchecked, which is empty.

| |
|--------------|
| Bürde (1/Sn) |
| 2 |
| 4 |
| 8 |

Where there is defined set of choices exceeding *yes* and *no*, the cell usually features a drop-down box to select the value from. The drop-down control (the downward arrow button) will become visible whenever the cell becomes active. You can select an entry from the drop-down list with the mouse, scroll through the list with the cursor keys or simply start typing, which will select the first value alphabetically that matches your input. Available values in a drop-down list might depend on values specified in other cells. In this case, the list does not feature all possible values for the field, but only those that are valid in the given combination.

The third possibility are cells with free text editing. Apart from possible probability checks, these fields accept any input you enter. A single click in such a cell highlights the whole entry. As known from Windows, the entry is replaced with your input as soon as you start typing. If you want to retain the current value for editing instead of replacing it, click a second time into the cell, which will position the cursor within the current entry.

Adding lines

To add a new line to the table, you can enter data into the bottommost line, the one marked with an * in the line header, at any time. As soon as you start entering data into this line, a new bottommost line appears, now bearing the * in its line header, while the incomplete line you just started is indicated by a pen in its line header.

Clearing cells

As a cell is part of a line, cells can only be deleted as a whole line. Individual cells can only be emptied, provided they do not contain mandatory fields.

Deleting lines <Entf>

After highlighting one or more lines, you can delete them by hitting . This empties all related cells and deletes them from the table. A confirmation request prohibits accidental deletion of data.

Please be aware that the key always works on the currently selected elements, which in a bigger dialog may not necessarily be a table element.

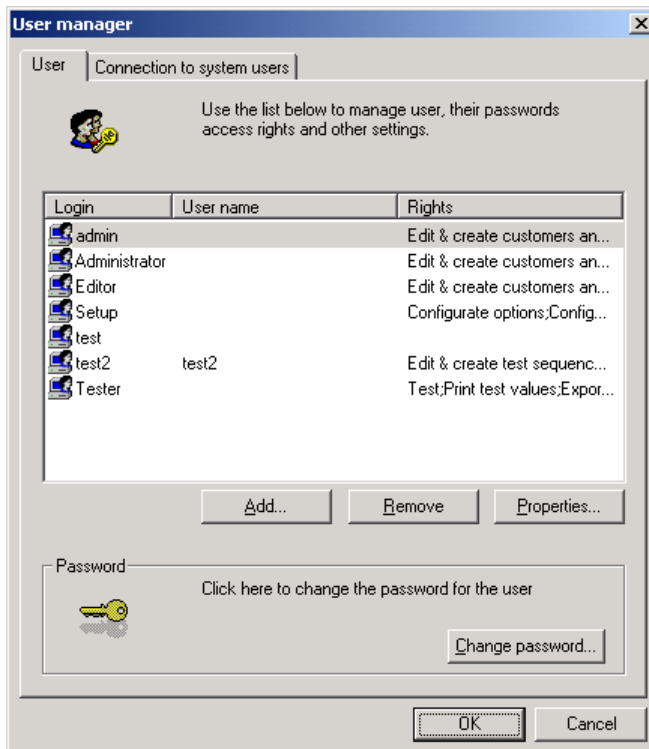
4 User Manager

CheckCon includes and facilitates a separate user management. You can access it via the menu *Extras > User manager*.

The two main parts of the user management are displayed separately on the two registers *Users*, featuring the list of the CheckCon User accounts, and *Connection to system users* allowing Windows account integration.

Users

Account List



This list contains all user accounts set up for CheckCon. The account *Administrator* is required and predefined. Per default, this user is granted full access to CheckCon. The CheckCon administrator does not necessarily require administrator privileges to the Windows system. However, to avoid access limitations by Windows, a user working as CheckCon administrator requires Windows *change* privileges to the CheckCon program directory, including all subdirectories and files, as well as the CheckCon databases, should they be stored in a different location.

The section *Connection to System Users* below describes a method for associating Windows and CheckCon user accounts and configuring an automatic login.

Strategies for Setting up CheckCon Users

We recommend determining a strategy prior to setting up users under CheckCon. Please also review *Connection to System Users*.

There are generally two strategies for setting up users for programs which (similar to CheckCon) facilitate a user management separate from Windows:

Personalized User Accounts

One strategy consists of setting up a CheckCon user account for each Windows user that is authorized to use CheckCon, ideally under the same name. This provides a simple method for associating Windows and CheckCon users.

As you need to set up an individual CheckCon account for each potential CheckCon user and manage the CheckCon permissions for each of these accounts individu-

ally, this strategy, while being the simplest to the users, will require higher administrative action for a larger user base.

Role-based User Accounts

An other strategy involves initially determining the essential functions or roles of the users operating CheckCon. For the purpose of user management, each role can be expressed as a set of user permissions.

If a number of individuals operating CheckCon hold the same role with regard to CheckCon permissions, then one shared CheckCon account will be sufficient for these individuals to log into CheckCon.

The above picture shows a setup with role based users, *setup*, *editor* and *tester*.

The rights for the roles can be assigned exclusively. For example, the *editor* is allowed to edit all the databases but not authorized to test. The *tester* may only test and print results. The *setup* user may configure program options and access the user management but not the databases. As a result, the respective individual would need to log in as *editor* to configure the test data and as *tester* prior to testing. While this method is more secure, it is also more cumbersome.

To avoid this problem, the appropriate rights can be assigned inclusively. In the example, the *tester* remains restricted to testing and processing results, while the *editor* gets assigned the permissions of the *tester* additionally. The *setup* user can be ignored, as the combined permissions of the exclusive *setup*, *editor* and *tester* result into the role of the administrator.

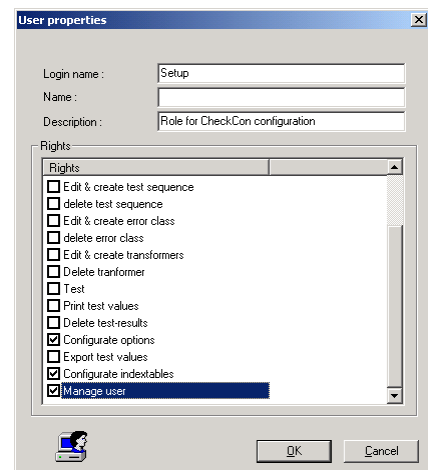
The disadvantage is that several users share the same account, which might compromise individual responsibilities.

Combined strategy

Windows user accounts are usually personalized. For programs like CheckCon, role-based accounts greatly minimize the administrative burden, just like user groups in the Windows user management. By means of the mechanism for connecting CheckCon and Windows user accounts, CheckCon allows you to exploit the benefits of both strategies. For further details, please refer to the section *Connection to System Users* below.

Edit the Account List

In order to edit the account list you must logon with an account that has the *manage user* right. All other users can only change their own password here.



Add account

In the account list, click **[Add]** to open the dialog *New User*.

Assign a **Login name**, the name that needs to be entered as user name at logon.

Name and **Description** serve a proper description of user accounts. They are irrelevant to the system.

Assign a **Password** for user logon. CheckCon passwords need to be at least 6 Characters long. Repeat the password in **Confirm Password** to avoid mistyping.

Please note that any CheckCon account needs a password, even those that are configured for autologin (see *Connection to system users*).

Assign the CheckCon permissions for this user account. The *Rights* list

shows all available user permissions. A checked box indicates that the user has the permission and can perform the corresponding action, an unchecked box indicates that the permission is not granted and the user is prohibited from performing the corresponding action.

When the account configuration is complete, click **[OK]** to save the account into the user database.

Edit existing accounts

Select (highlight) the account you want to edit and click **[Properties]**. You will see all account properties in a nearly dialog identical to the *New User* dialog shown above, only the password boxes are missing. You can change all properties and permissions for the selected user here. Click **[OK]** to apply the changes when you are done. Passwords can not be changed here. Only the user themselves can change their own password (see section *Change password* below for details).

Delete account

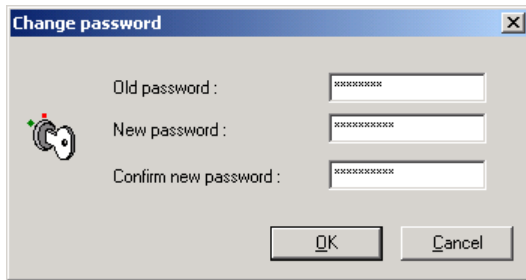
Select (highlight) an account in the account list and click **[Remove]** in order to delete an account.

Change password

Click **[Change Password]** in the user manager to open the corresponding dialog. If the currently logged on user does not have the *user manager* permission,

he can only change the password of the currently logged on account and the *Change password* dialog automatically relates this correctly.

If the currently logged on user does have the *user manager* permission, **[Change Password]** opens the *Change password* dialog not for the currently logged on account, but for the account currently highlighted in the account list.

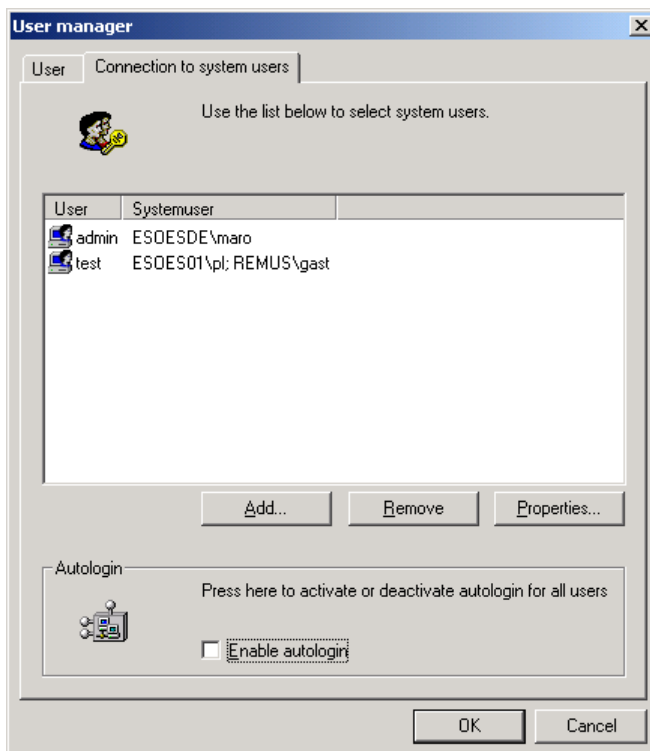


Enter the *old* (=current) *password* of this account for authentication and enter the *new password* twice as a precautionary measure against mistyping.

So in any case, entering the current password is mandatory. If the administrator needs to change the password for an account where the current password is not known,

the only way to do so is to delete the account and create a new one under the same name.

Connection to System Users



In the register *Connection to system users* of the user manager, you can assign one or more Windows accounts to each CheckCon account. You can further decide whether the autologin feature shall be enabled or not. See the next section *Autologin* for details.

The list shows all existing associations between (CheckCon) *users* and (Windows) *system users*.

You can **[Add]** a new association, **[Remove]** an existing one or edit the **[Properties]** of an existing association, analogous to the homonymous buttons on the register *User*. Please see section *Adding a connection to system user accounts* below for further details.

The automatic login feature is the sole purpose of this account association.

If you do not plan to use autologin, spare yourself the trouble of setting up account associations.

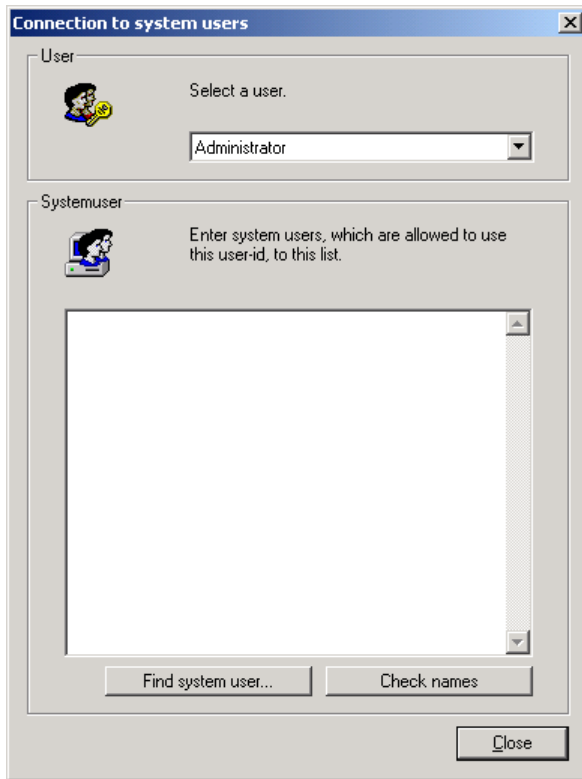
Autologin

Associations between CheckCon and system users allow for an automatic CheckCon login. The autologin is activated in the *Connections to system users* register of the *user manager*.

With the autologin deactivated (default), all users must log in explicitly to CheckCon by means of entering logon credentials in the *Login* dialog. With autologin activated, the system account currently logged in to Windows is looked up in the *Connection to system users* list on each start of CheckCon, and if present there is automatically logged on to CheckCon with the associated CheckCon account.

This enables you to authenticate users by means of a Windows domain and assign the rights within CheckCon by means of the connection to the system users.

Adding a connection to system user accounts



To add a connection, click **[Add]** in the register *Connection to system users* of the user manager. The dialog shown to the left opens.

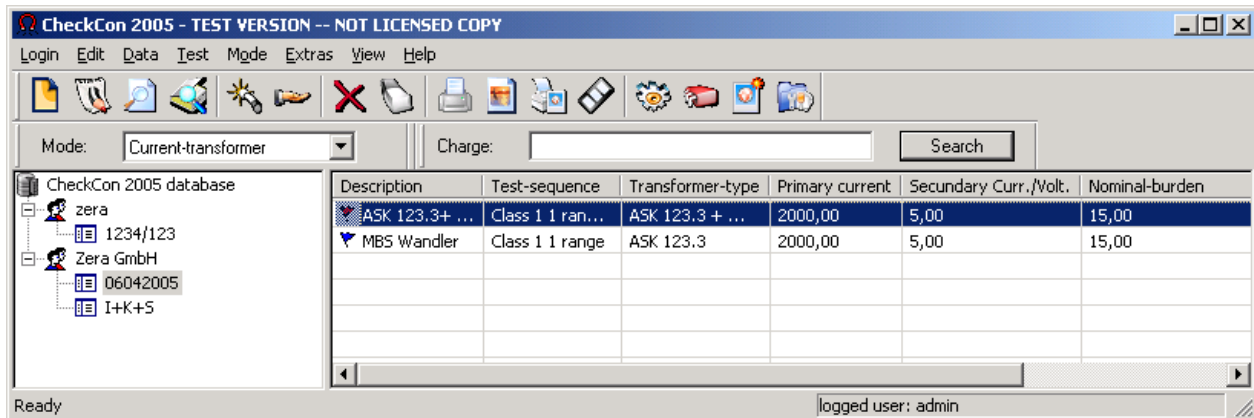
Select the CheckCon account from the drop-down list, to which you want to assign Windows accounts. Only those CheckCon accounts are available here for which no association exists yet.

Enter the Windows accounts to be associated into the field *system users*, each on a separate line. You can also query your Windows user base by **[Find system user]**. Depending on your system and installation you will be able to browse the user base, for instance by means of active directory, and select the Windows account rather than typing it.

If you want your CheckCon accounts to define roles rather than individual user accounts, you can assign several Windows accounts to one CheckCon account.

After you entered all Windows accounts, it is a good idea to **[Check names]** before you go on. If Windows can not resolve any of the entries into valid accounts, you will see an error message. The list will be checked top down and the first irresolvable entry produces the error message. So after correcting the entry, continue to [Check Names] until no error message pops up.

5 The main window



The CheckCon main program window is divided into a menu bar with command menus, a toolbar with short-cut icons, a navigation tree in the left pane and a detailed view in the right pane as well as a status bar. This common layout is completed with a modus selector and a search option. Please note that the mode, search and toolbar are freely moveable and might on your system be arranged different from the layout shown in the picture above. In addition, display of each as well as of the status bar can be toggled on/off with the respective commands in the *View* menu.

Navigation tree

The CheckCon database forms the topmost level in the navigation tree. The next level downward consists of the customers. Below each customer lie the orders of this customer. To each order, any number of charges can be defined.

Detail pane

Select any item in the navigation pane to see a detail view of its contents and/or properties in the detail pane.

Modus bar

In the modus bar you select the CheckCon mode. You can alter between *Current-transformer* and *Voltage-transformer*. Since management of the two types is quite different for each, the complete program adjusts to this setting. Only the customer database remains identical in both modes.

The same setting can be performed in the *Mode* menu.

The display of the mode bar can be toggled on/off in the *View* menu.

Search bar

The search bar allows searching for a charge in the complete customer database. Just enter what you know from the charge description into the field *Charge* and **[Search]**.

Searching starts at the current position in the detail pane, provided the detail pane shows charges. Otherwise it starts at the current position in the navigation pane. If a charge is found, it is shown highlighted in the detail pane while the related order

is shown and highlighted in the navigation tree. If the search reaches the end of the customer list (as shown in the navigation tree) it continues the search from the beginning. If a charge is found and displayed and you want the search to continue to find more hits, just click **[Search]** again.

The display of the search bar can be toggled on/off in the *View* menu.


Tool bar and status bar

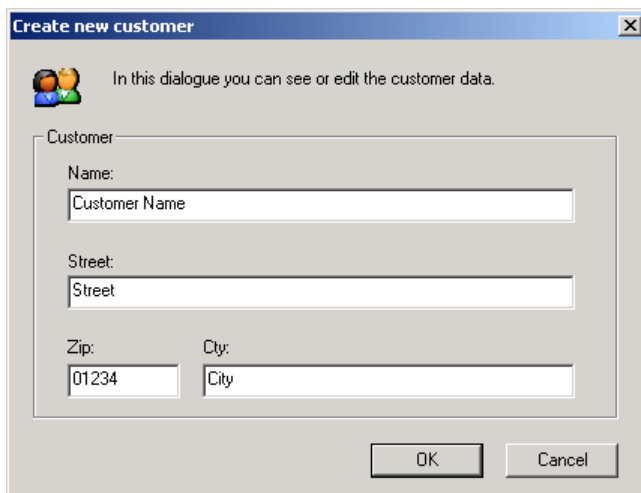
The icons on the tool bar represent short-cuts to the most commonly used features of CheckCon. Throughout this documentation wherever a function is described to which a short-cut icon exists on the tool bar, the icon is shown to the right of the description text.

The status bar shows the current program *mode* on the left and the currently logged in account on the right.


The display of the tool bar and of the status bar can be individually toggled on/off in the *View* menu.


Add, edit and delete customers

To **add** a new customer to CheckCon, highlight the database in the navigation tree and select *Edit > New*. 




Enter the customer's name, street, zip-code and city. After you confirm with **[OK]**, you will find the new entry in the navigation tree.

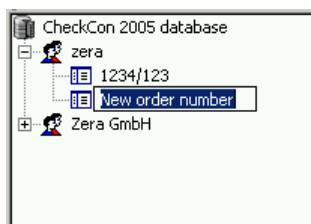
To **edit** existing customer data, highlight the corresponding entry in the navigation tree and select *Edit > Edit*. Alter data as desired and confirm with **[OK]**. 


To **delete** an existing customer, highlight the corresponding entry in the navigation tree and select *Edit > Delete* or hit . Confirm with **[OK]** to delete the customer 

entry from the database.

There are two ways to just **view** customer data. When you highlight a customer in the navigation tree or detail pane, you can select *Edit > Display* from the menu. Alternatively, CheckCon displays the data when you perform a double-click on a customer name in the detail pane. 

Add, edit and delete orders



To create a new order number under a given customer, select the customer in the navigation tree and select *Edit > New*. CheckCon will present you an editable entry *New order number*, just like with a *New folder* in the Windows explorer. Enter the order number, which automatically overwrites the default entry *New order number* and conclude with <Enter>. 

To edit an order number, highlight the order number in the navigation pane and select *Edit > Edit* from the menu. The order number will become editable again. The same can be achieved when performing a single click on an already highlighted order number. (Pause a second between the first click for highlighting and the second for editing the entry, as two clicks in rapid order will be interpreted as double-click, which will not do the same). Change the order number as needed and conclude with <Enter>.



To delete an order number, highlight the corresponding entry in the navigation tree and select *Edit > Delete* or hit . Confirm with **[OK]** to delete the order number from the database.



Add, edit and delete charges

To create a new charge under a given order number, select the order number in the navigation tree and select *Edit > New*.



Enter a name for the new charge.

Select the type of the transformers in this charge. You can either select the type directly from the drop-down box, or open the complete list by clicking **[>>]**, the latter allowing you to [Search] for a type, which becomes useful as the list of transformer types grows.

Select the test sequence for this charge. Again, you can either select the type directly

from the drop-down box, or open the complete list by clicking **[>>]**. There is no search feature for test sequences, since the list is not expected to grow to a size that would require a search.

To edit a charge, highlight the charge in the navigation pane and select *Edit > Edit* from the menu. Change the data as needed and confirm with **[OK]**.



To delete a charge highlight the corresponding entry in the detail table and select *Edit > Delete* or hit . Confirm with **[OK]** to delete the charge from the database.



There are two ways to just **view** charge data. When you highlight a charge in the detail pane, you can select *Edit > Display* from the menu. Alternatively, CheckCon displays the data when you perform a double-click on a charge in the detail pane.

Delete transformers from a charge

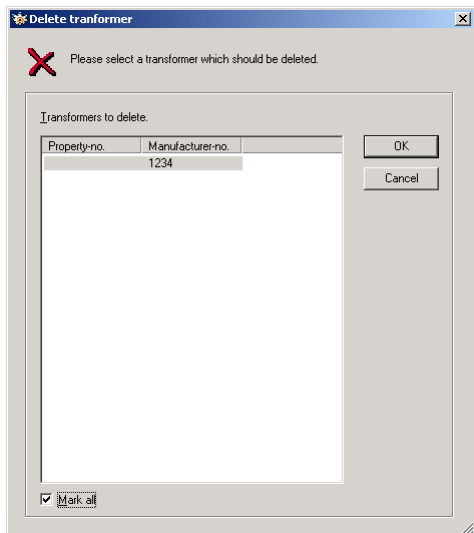
Highlight a tested (red flagged) charge in the detail pane and select *Edit > Delete test results* from the menu.



A red flag marks a tested charge, a blue flag indicates that the charge is still to be tested.

Doing so opens a dialog (shown below) in which you can select specific transformers for deletion.

| Description | Test-sequence | Transforme |
|-------------------|------------------------|------------|
| ▼ MBS transformer | Class 1 1 range+ In... | ASK 123.3 |
| ♥ Rogowski 80A | Class 1 1 range | rogowski |

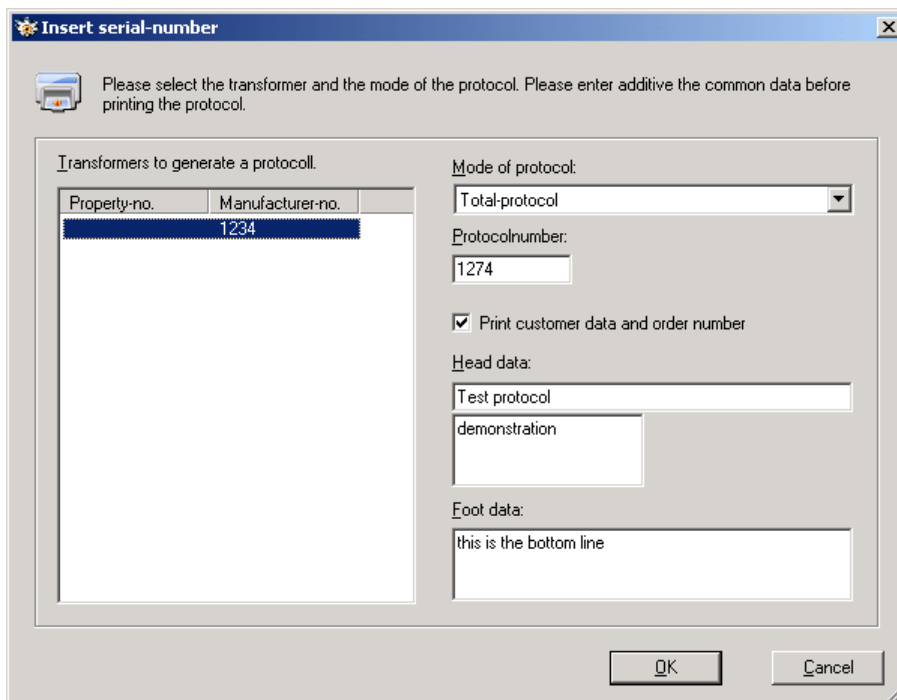


Highlight any selection of transformers in the list for deletion. Use <Shift> and <Ctrl> for multiple selections as used from Windows. If you want to highlight all, check the box **Mark all** (uncheck to remove all highlighting).

Click **[OK]** to remove all selected transformers from the charge.

Printing

You can print a test protocol for any transformer of an already tested charge. Select *Edit > Print protocol* from the menu.



Highlight any selection of transformers in the list on the left for the protocol. Use <Shift> and <Ctrl> for multiple selections as used from Windows

Select the **Mode of protocol**, choose between *single protocol*, *total protocol* and *total protocol (short)*.

The *single protocol* is designed for a single transformer, so in order to generate a single pro-

col, only one transformer may be highlighted in the list.

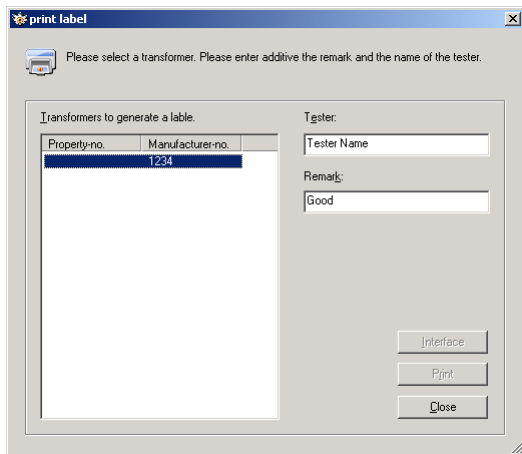
Enter a **Protocol number**, **Header data** und **Footer data** as desired. Chose whether to **Print customer data and order number** on the protocol and confirm with **[OK]** to start printing.

The same dialog opens for *Edit > protocol preview*. The difference is that after **[OK]** the protocol is shown in a preview window on screen instead of sent directly to the printer. You can then print the protocol from the preview window.



Owners of a label printer can print (adhesive) labels for the tested transformers by *Edit > print label*. The label printer must be connected to the machine and the system port specified in *Extras > Adjustments*, register *Interface settings*.





Highlight a transformer in the list of the left. Add information about the tester and a remark if desired.

[Print] the labels for the selected transformer.

[Interface] allows you to directly monitor the communication between CheckCon and the label printer for diagnostic purposes. See section 13

Finally, you can print an overview over all charges for a given (highlighted) order number by selecting *Edit > print charge overview* from the menu.

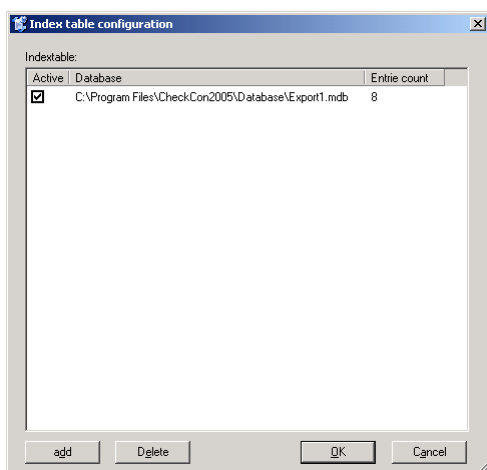


Exporting results

You can export the test results for any tested transformer. Click *Extras > Export results* in the menu. This opens a standard *Save as...* dialog, in which you must specify the export file (.mdb). If you select an existing file it will be overwritten with the current data.

This new export file is added to the list of index tables (see below). CheckCon will ask you whether you want to delete the exported results from the program database. Since the results are now stored in the export database and still available via the index table system, you can delete the results from the program database to keep it small and fast. Since results can not be appended to existing export databases, you should only export the results of completed test sets for which no new results will need to be added.

Index table configuration



The index table configuration, *Extras > index table configuration*, allows you to manage all exported results, provided they are available as Access (.mdb) database files.

It features a list of all available export database files. If an existing database file is not listed here, you can **[Add]** it, which opens a standard *Open file* dialog.

If an entry points to a database which is no longer needed, highlight it in the list and **[Delete]** it.

The column **entry count** shows the number of results contained in each database file.

Check a database **Active** to have it included in the search when searching for transformers (see next section). Click **[OK]** to apply changes to the *active* selection.

Searching transformers



Select *Data > Search transformer* from the menu, to open the search dialog.

Please enter the research criteria to search one ore more transformers. You could print the transformer informations.

Research criteria

Customer name: *
 Test-sequence: *
 Property-number: *
 Order number: *
 Error-class: *
 Serial no: *
 Charge: *
 Transformer-type: *
 Testdate: 01.06.2005
 Manu: *
 Certific. no: *
 Consider results of the indextables

Search

Transformers

| Property no | Manufacturer-no | Manu | Certification no | Charge | Customer name | Order no | Database |
|-------------|-----------------|------|------------------|-----------|---------------|----------|-----------------|
| 1 | 11 | | 3.2005 | Rog. zera | Zera GmbH | 1234/1.. | Programdatabase |
| 10 | | | | MBS... | Zera GmbH | I+K+S | Programdatabase |
| 100 | | | | 2 win... | Zera GmbH | I+K+S | Programdatabase |
| 101 | | | | Sum... | Zera GmbH | I+K+S | Programdatabase |
| 102 | | | | Sum... | Zera GmbH | I+K+S | Programdatabase |
| | 1234 | | | ASK ... | Zera GmbH | 06042... | Programdatabase |

Go to... Print preview statistics Print statistics Print... Close

Enter any search criteria in the appropriate fields in the upper area.

Check **Consider results of the index tables** when you want to extend the search to the index tables, which means all index tables that are marked *Active* in the index table configuration (see above).

Start the **[Search]**.

All results that match the search criteria are shown in the lower area on the window. The right-most column of the result list shows whether the transformer was found in the program database or in the index tables.

When you highlight a result from the program database and press **[Go to...]** you switch back to the CheckCon main window with the corresponding charge displayed in the detail pane.

[Print statistics] and **[Print preview statistics]** print respectively preview a statistics sheet about all listed results, **[Print]** prints the results for the highlighted transformer. The print and preview dialogs are described in the section *Printing* above.

Current transformer

Adjustments Please enter the common data for the current-transformer.

Interturn-insulation-test

| | | |
|-----------------------|-------------------|---------------|
| Increase-rate (% /s): | decrease-rate (%) | Length(sec.): |
| 10,00 | 50,00 | 60 |

Demagnetization

| | |
|-----------------------|-----------------------|
| Increase-rate (% /s): | decrease-rate (% /s): |
| 10,00 | 1,00 |

Accuracy-test

| | | |
|-----------------------|-----------------------|--------------|
| Increase-rate (% /s): | decrease-rate (% /s): | with/without |
| 100,00 | 100,00 | No |

Check test point

| | | |
|--------------|-----------------|---------------------|
| Test-current | Ratio error (%) | Phase-displ. (min): |
| 7,00 | 6,00 | 8,00 |

Security factor / Kneepointvoltage

| | |
|-----------------------|-----------------------|
| Increase-rate (% /s): | decrease-rate (% /s): |
| 100,00 | 100,00 |

OK Abbrechen

For the **Interturn insulation test**, **Demagnetization**, **Accuracy test** und **Secondary current factor**, please specify the *increase rate* and the *decrease rate* in [%/s]. For the *interturn insulation test* the test length is required additionally.

If the *Accuracy test* shall be performed taking the correction values into account, select **Yes** in the drop down box **with correction**. Configuration of correction values is described in section 7 (*Corection Values*).

In the area **Check test point** specify the *test current* and *ratio error* in % and *phase displacement* in minutes. If you enter 0 (zero) a test current percentage, check test point will not be executed.

Voltage transformer

Adjustments

Please enter the common data for the voltage-transformer.

Insulation-test

| | | |
|-----------------------|-----------------------|---------------|
| Increase-rate (% /s): | decrease-rate (% /s): | Length(sec.): |
| 10,00 | 50,00 | 60 |

Accuracy-test

| | | |
|-----------------------|-----------------------|-----------------------|
| Increase-rate (% /s): | decrease-rate (% /s): | with/without correct: |
| 20,00 | 100,00 | No |

Check test point

| | | |
|-------------------|------------------|----------------------|
| Test voltage (%): | Ratio error (%): | Phase-displ. (min.): |
| 0,00 | 5,00 | 200,00 |

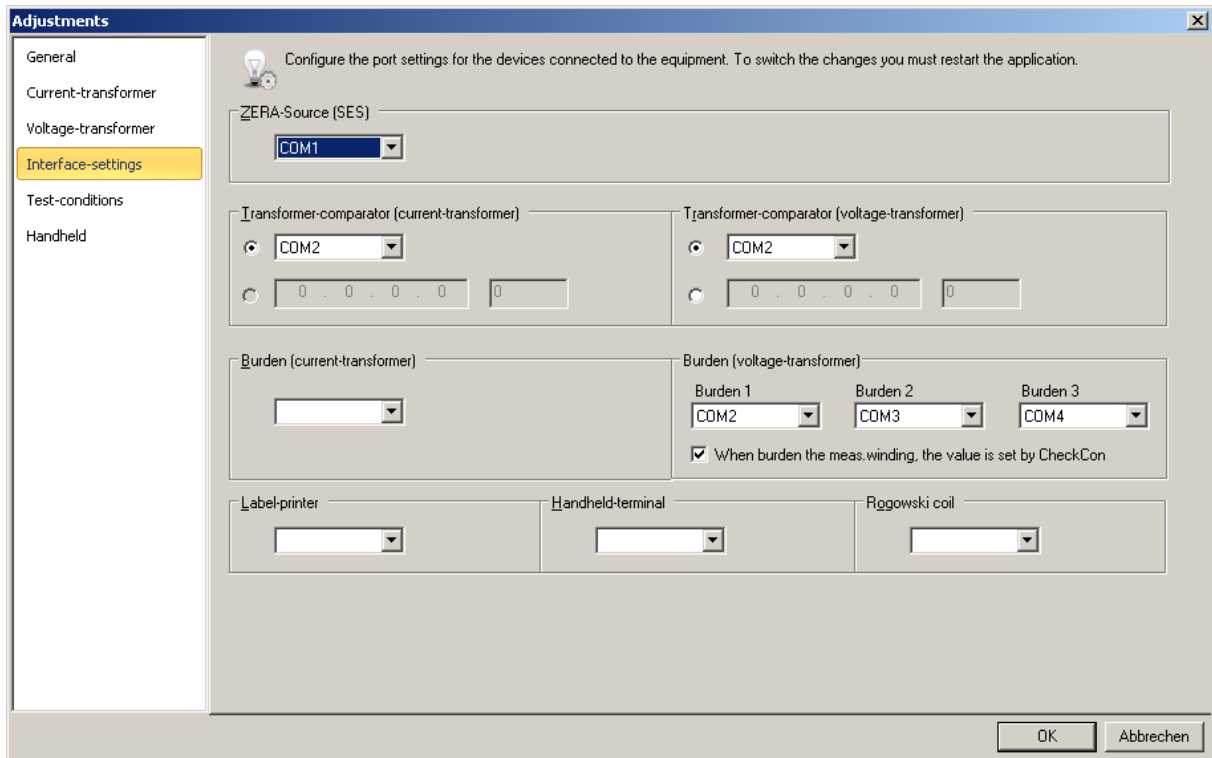
OK Abbrechen

For the **Insulation test** and **Accuracy test**, please specify the *increase rate* and the *decrease rate* in [%/s]. For the *insulation test* the test length is required additionally.

If the *Accuracy test* shall be performed taking the correction values into account, select **Yes** in the drop down box **with correction**. Configuration of correction values is described in section 7 (*Correction Values*).

In the area **Check test point** specify the *test current* and *ratio error* in % and *phase displacement* in minutes. If you enter 0 (zero) a test current percentage, check test point will not be executed.

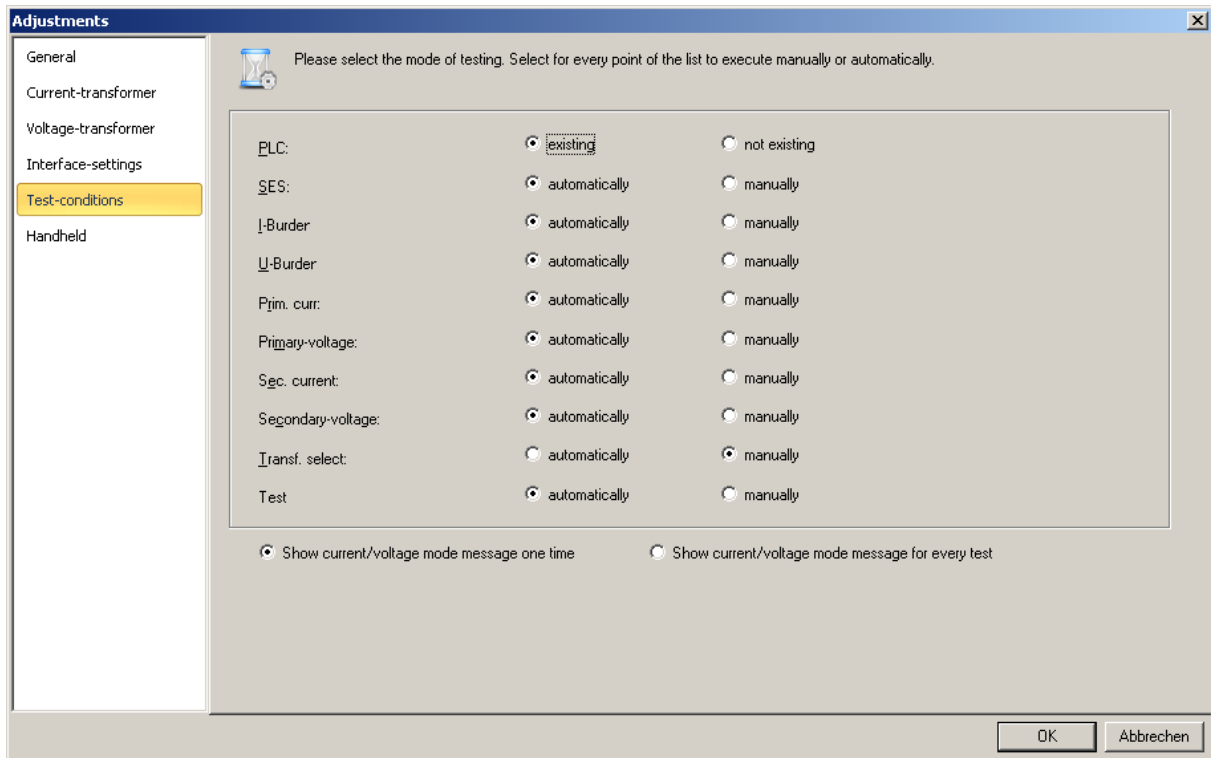
Interface settings



Assign the appropriate interface port to each connected device. Since each interface port can only feature a single device, a given port can not be assigned more than once. Leave the drop-down box empty for devices that are not connected to your machine.

Any changes on this register require a restart of CheckCon in order to take effect.

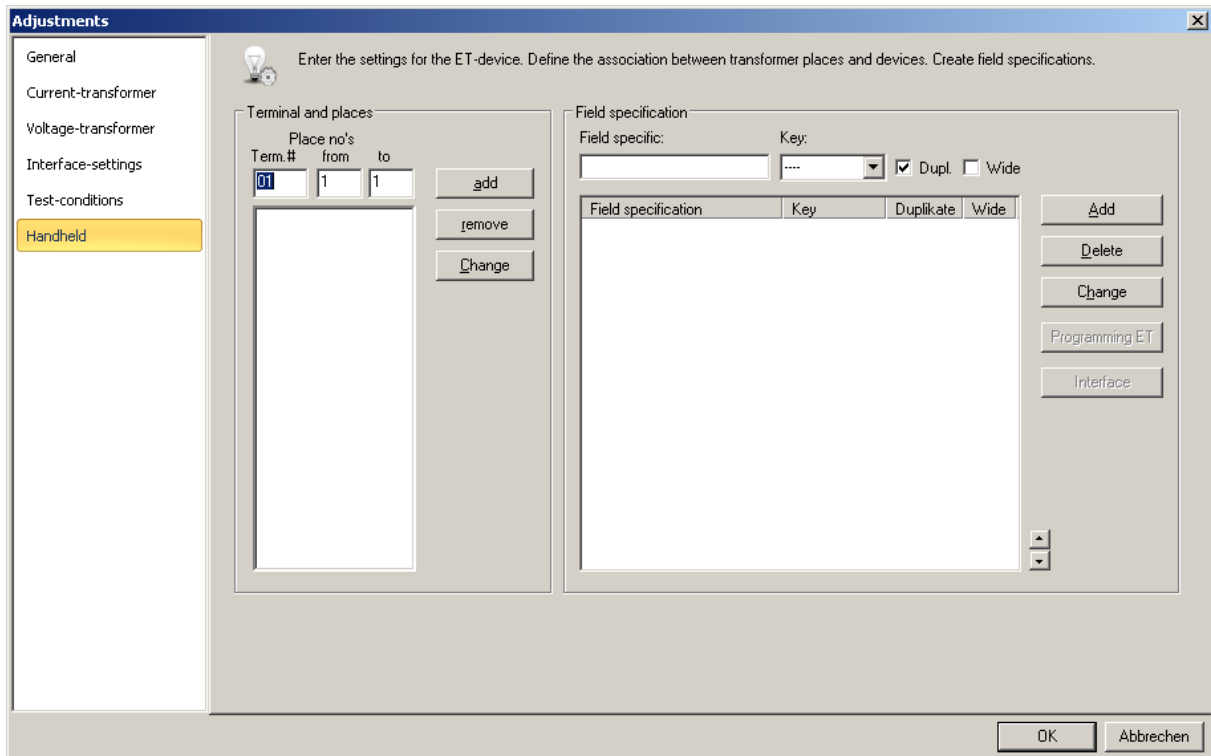
Test conditions



Apart from the SES, automatic testing is only possible if your testing equipment features a PLC. Please specify whether a PLC exists or not.

Then, for each device, select whether the test will be performed manually or automatically. A manual test requires the tester to perform the necessary operation manually during the test, CheckCon will announce the necessary steps during the course of the test.

Handheld



Handheld or *terminal* refers to the mobile hand-held combination of keypad and barcode scanner, which allows the user to collect the required data in place going from one testing place to another. After data collection is completed, the handheld is put into a docking station to allow data transfer to CheckCon.

Since a single terminal covers only a limited number of testing places (usually 10), you might have more than one in use, each with its own corresponding docking station. In the area *terminals and places* you assign each terminal to the testing places it covers. The first column shows the terminal number, column 2 and 3 define the corresponding range of testing places.

To allow for proper data collection and exchange, the handhelds must be properly programmed before you can use them.

In the area **Field specifications** all required specifications must be declared. A specification consists of a **Key** and a **Field specification**.

The keys correspond to the transformer registers. To assign a specification to a register, select the corresponding key from the list and enter a unique specification.

To **add** a new specification, select the key corresponding to the desired register from the drop-down box **Key**: (the drop down box features all customary keys as default) and enter the desired **Field specification** in the input field left to it.

Usually, the values for the specifications may not exceed a length of 10 characters. If the expected values for the new specification might exceed 10 characters, please check them as **Wide**, which will allow the specification to store values of up to 20 characters length. The terminal shows those values split up on two lines.

CheckCon can check whether a given specification assumes identical values on different transformers. For most specifications, those **duplicates** are noncritical or even required (many transformers will show the same year of construction, for in-

stance), so *duplicates* are allowed per default. If you want CheckCon to prevent a specification from assuming an identical value on different transformers (id numbers, for example), remove the check mark from the checkbox **Dupl.**

Finally, click **[add]**, to add the new specification to the list.

When you highlight a specification, the current values are copied into the input fields above the list. Now, you can

- click **[Delete]** to delete the specification.
- edit the values and click **[Change]** to alter the specification.
- edit the values and click **[Add]** to create a new specification, useful for creating several similar specifications.
- reposition the specification in the list by means of the up and down arrow buttons down right beside the list field.

The specification **Property number, Manufacturer number** and **Manufacturing year** should be defined in any case, and always in this order. They are needed to properly identify the transformer in the automatic test.

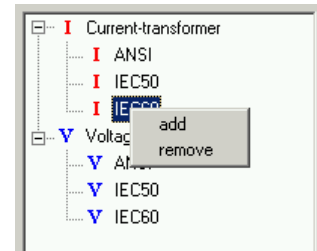
The [Program]-button is only active if you use a terminal and have it connected. It allows you to **[Program]** all specifications into the terminal, so the corresponding data can be collected with the handheld. During the programming of the handheld, you can monitor the data transfer on the **[Interface]** for diagnostic purpose. See section *13 Interface* for details.

7 Device configuration

Open *Extras > Device Configuration*.

The four registers all work in the same way. The left side features a navigation pane with two separate trees, one for current transformers, and one for voltage transformers. The trees might contain entries, in which case each entry resembles a certain configuration. The right pane shows the detail data for the entry currently highlighted in the tree.

Right-clicking an entry in the tree opens a context menu allowing to **add** a new entry to the tree, or to **remove** the currently highlighted one.







Each dialog features two buttons [**Save to file**] and [**Load from file**], which allow you to export the currently highlighted entry to an external file, or import from such a file respectively. You can use this feature, for instance, to transfer existing configurations from one machine to another.

The external file is in XML format.

Burden

Device configuration

-  Burden
-  Standard transformer
-  Correction values
-  Current ranges (V107)

Please select on the left side a burden and enter the relevant data on the right side.

- [-] I Current-transformer
 - I ANSI
 - I IEC50
 - I IEC60
- [-] U Voltage-transformer
 - U ANSI
 - U IEC50
 - U IEC60

| | A | Cos β |
|----|--------|-------------|
| | 0,00 | 0,00 |
| | 2,50 | 0,90 |
| | 5,00 | 0,90 |
| | 12,50 | 0,90 |
| | 22,50 | 0,90 |
| | 25,00 | 0,50 |
| | 45,00 | 0,90 |
| | 50,00 | 0,50 |
| | 90,00 | 0,90 |
| | 100,00 | 0,50 |
| | 200,00 | 0,50 |
| >> | 0,00 | 0,00 |

| | Secondary current |
|----|-------------------|
| | 1,00 |
| | 2,00 |
| | 5,00 |
| >> | 0,00 |

Here you configure all burdens connected to the testing equipment.

If the burden supports so, try to **[Read from burden]** to determine the correct configurations automatically.





When reading from the burden, **[Interface]** allows you to monitor this communication.

If you need to fill the table manually, do as follows:

From the context menu of the navigation pane **add** a new configuration and give it a name. Add all value pairs of VA and Cos β for this configuration into the upper table. The lower table contains all valid settings for secondary current or secondary voltage, where for the secondary voltage you can additionally define whether to divide it by 3 (**/3**) or by the root of 3 (**/√3**).

Current range

Device configuration

-  Burden
-  Standard transformer
-  Correction values
-  Current ranges (V107)

Select a current-range on the left side and enter the corresponding values on the right.

| | Primary [A] | Secondary [A] | Output-voltage [%] |
|----|-------------|---------------|--------------------|
| >> | 0,00 | 0 | 0 |

Define the current range for current and voltage transformers.


Specify the primary voltage or current and add the value or percentage for the output.


Standard transformer

Device configuration

 Burden

 Standard transformer

 Correction values

 Current ranges (V107)

Select a standard transformer type on the left side and enter the corresponding values on the right.





| | | | |
|------------------------------|-------------|---------------|--|
| [-] I Current-transformer | Primary [A] | Secondary [A] | |
| [-] I Standard I-Transformer | 1,00 | 5,00 | |
| [-] U Voltage-transformer | 1,00 | 1,00 | |
| U EVT Standard coil | 5,00 | 1,00 | |
| U NW neu | 5,00 | 5,00 | |
| U Standard U-Transformer | 10,00 | 1,00 | |
| | 10,00 | 5,00 | |
| | 15,00 | 1,00 | |
| | 15,00 | 5,00 | |
| | 20,00 | 1,00 | |
| | 20,00 | 5,00 | |
| | 25,00 | 5,00 | |
| | 25,00 | 1,00 | |
| | 25,00 | 50,00 | |
| | 40,00 | 5,00 | |
| | 50,00 | 5,00 | |
| | 50,00 | 1,00 | |
| | 80,00 | 1,00 | |
| | 80,00 | 5,00 | |
| | 100,00 | 5,00 | |
| | 100,00 | 1,00 | |
| | 200,00 | 5,00 | |
| | 200,00 | 1,00 | |
| | 250,00 | 5,00 | |
| | 250,00 | 1,00 | |
| | 300,00 | 1,00 | |
| | 300,00 | 5,00 | |
| | 400,00 | 5,00 | |

For voltage transformers you specify primary and secondary voltage and determine for both whether the values are to be divided by 3 (**/3**) or by the root of 3 (**/√3**).

For current transformers you only specify primary and secondary currents.

Correction values

Device configuration

-  Burden
-  Standard transformer
-  Correction values
-  Current ranges (V107)

Select a correction value on the left side and enter the corresponding values on the right.

| | Primary [V] | Secondary [V] | Load point [%] | Ratio error | Phase displacem... |
|----|-------------|---------------|----------------|-------------|--------------------|
| >> | 0,00 | 0,00 | 0 | 0,00 | 0,00 |

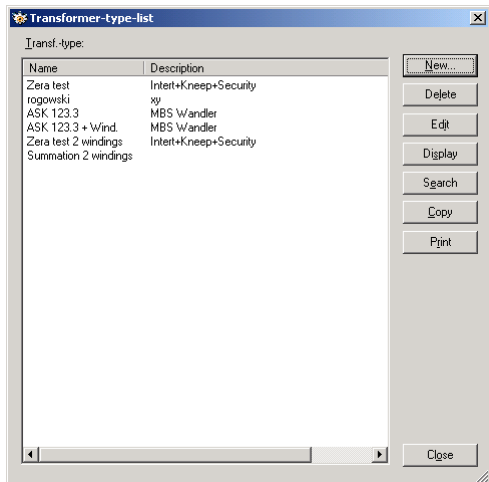
| | | | | | |
|------------------------------|--|--|--|--|--|
| [-] I Current-transformer | | | | | |
| [-] I Standard I-Transformer | | | | | |
| [-] U Voltage-transformer | | | | | |
| [-] U EVT Standard coil | | | | | |
| [-] U Normalwandler1 | | | | | |
| [-] U NW neu | | | | | |
| [-] U Standard U-Transformer | | | | | |

Specify the correction values for the transformers. For each pair of primary and secondary quantities, specify correction values for current, ratio error and phase displacement.

The correction values are used in the accuracy test, if this is activated in the corresponding settings (see section 6, subsections *voltage transformer* and *current transformer*).

8 Transformer type and windings

Manage transformer types and their respective windings with the transformer type list at *Data > transformer type*.



Add new transformers by **[New]** (from scratch) or by **[Copy]** (using the currently highlighted transformer as template).

Both options open a property dialog for the transformer (see below), in which you can specify all detail data.

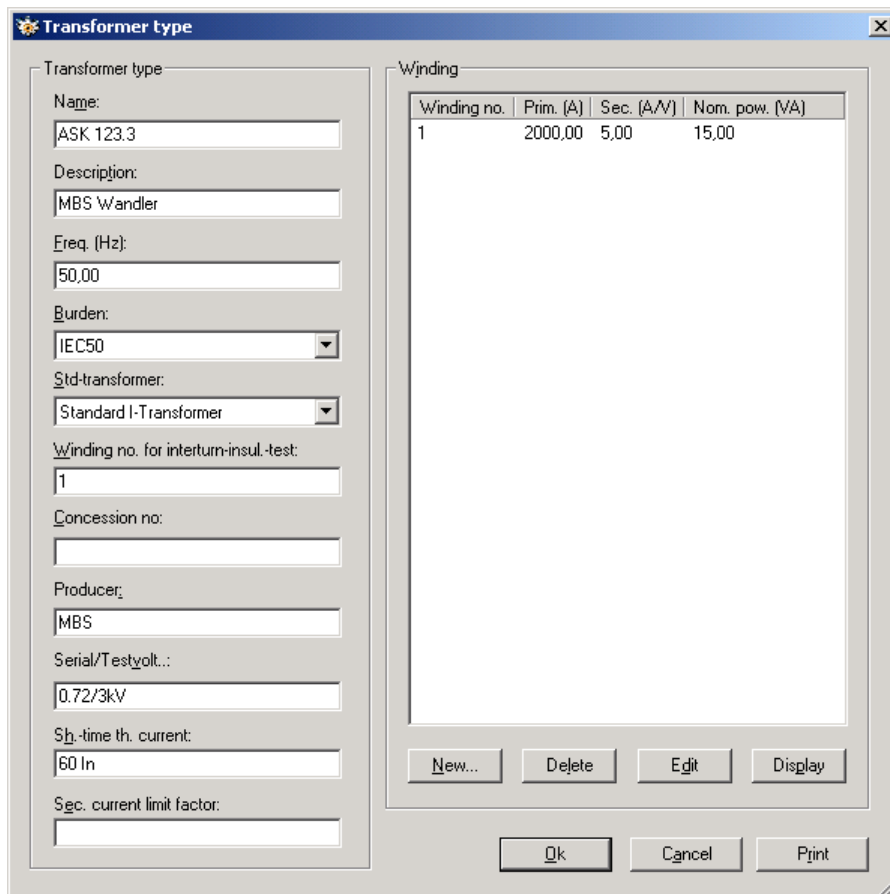
You can **[Delete]** the currently highlighted transformer or **[View]** its detail data. You can only **[Edit]** a transformer, when it is not included in any charge at that time.

For larger lists, instead of scrolling, you might want to **[Search]** for a transformer by its name.

Finally, you can **[Print]** an overview over all

transformers contained in the list.

[New], **[Edit]** and **[Display]** open the following dialog:



The area **Transformer type** contains the general data of this transformer.

The **Winding** list allows you to specify the windings of this transformer. The buttons **[New]**, **[Delete]**, **[Edit]** and **[Display]** work identically to the other dialogs and

allow you to add or remove a winding number and to edit or view the details respectively.

The detail data of the windings is presented in a separate mask, as shown to the right.

Enter general winding data in the upper fields of the dialog. Select an **error class** for that winding. Please refer to section *10 Error Classes* for details about error classes. Instead of typing the name of the error class, click [>>] to select one from the list.

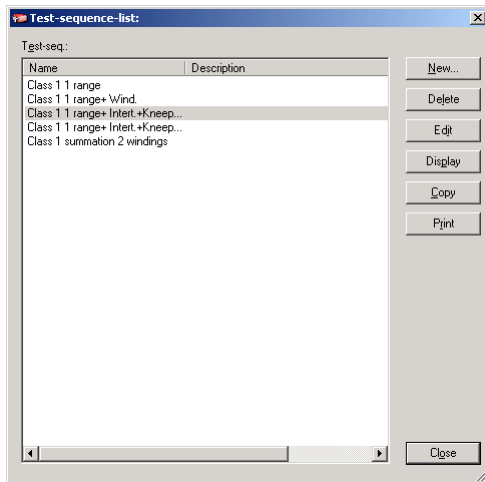
For each winding please check **Single winding summary transformer** or **Rogowski coil** where appropriate.

The screenshot shows a 'Winding' dialog box with the following fields and controls:

- Core:** 1
- Winding no.:** 2
- Term. 1:** K1
- Term. 2:** K3
- Primary current (A):** 2000
- Sec. current (A):** 5
- Rated burden:** (dropdown menu)
- Security fact:** (empty field)
- Intern. resist. (Ohm):** 0,00
- Knee point volt. (V):** 0,00
- Errorclass:** Class 1
- Single winding summary transf:**
- Rogowski coil:**
- Buttons:** Ok, Cancel

9 Test Sequence

Manage the test sequences in the test sequence list at *Data > Test sequences*.



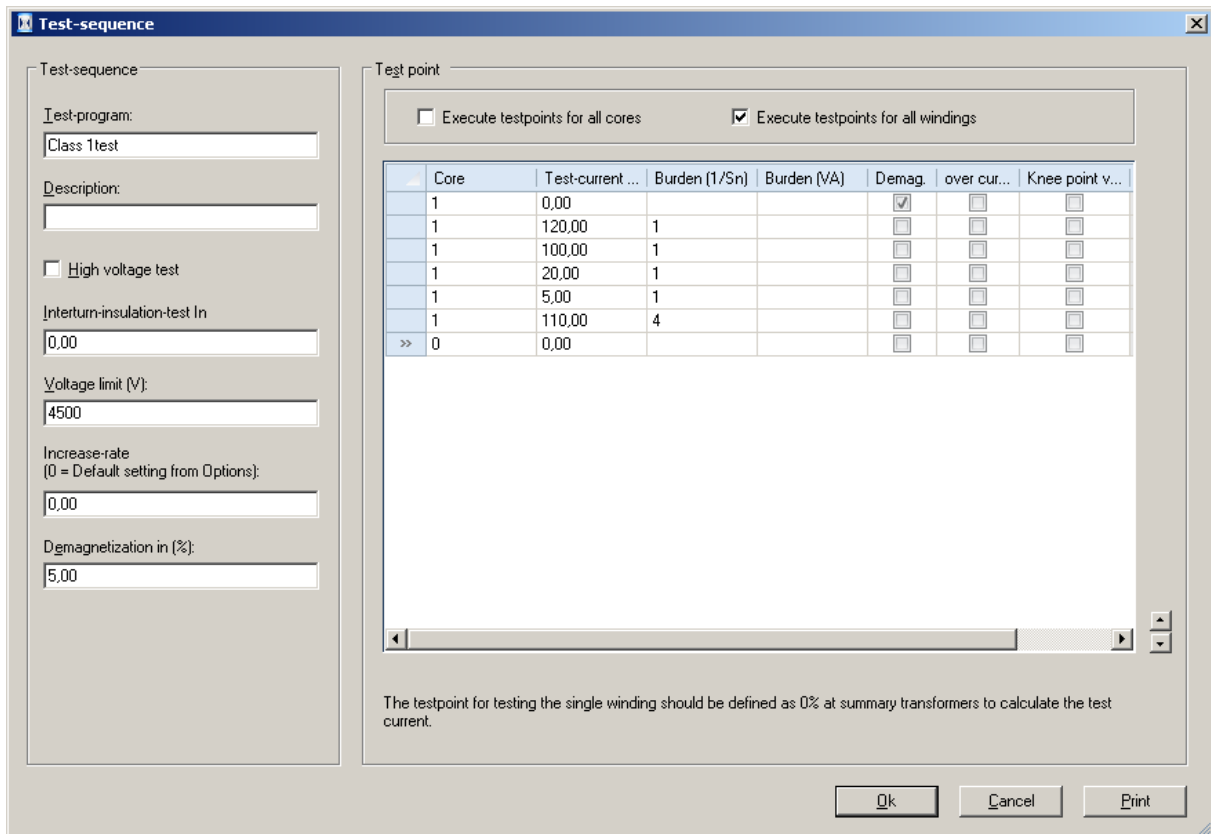
Add a new test sequence by **[New]** (from scratch) or by **[Copy]** (using the currently highlighted sequence as template).

Both options open a property dialog for the test sequence (see below), in which you can specify all detail data.

You can **[Delete]** the currently highlighted test sequence or **[View]** its detail data. You can only **[Edit]** a test sequence, when it is not included in any charge at that time.

Finally, you can **[Print]** an overview over all test sequences contained in the list.

[New], **[Edit]** and **[Display]** open the following dialog:



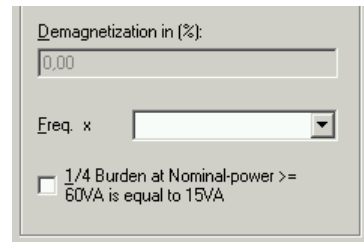
In the area **Test sequence** please enter a name for the new test sequence in the field **Test program** and add a **Description** if desired.

If you checked *High Voltage Test* capability for your test equipment in the settings (see section 6 *Settings General*), here you can activate the **High voltage test** for this test sequence.

Add the values for **Interturn insulation test**, **Voltage limit** and **Increase rate**.

In the *current transformer* mode of CheckCon (as shown above) a value for **Demagnetization** is required.

In the *voltage transformer* mode instead you need to specify, or rather select the **frequency**. Additionally, you can select **1/4 Burden at nominal power >= 60VA equals 15 VA** to cap the maximum burden power . The different section of the dialog is shown to the right.



In the detail pane of the dialog, the area **test point**, individual test points can be specified. The columns of the table have the following meanings:

Winding no: The winding number to be tested in this test point

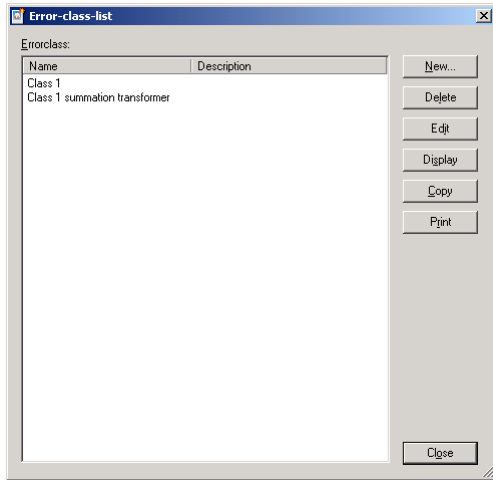
Demag(netization), Security current and **Kneepointvoltage:** You can select only one of the three options. **Security current** and **Kneepointvoltage** are only available if configured for your test equipment in the *settings* (see section 6 *Settings – General* for details).

If none of the boxes for *Demag*, *Security current* and *Kneepointvoltage* is checked, you must provide values for **test voltage (%)** or **test current (%)** (depending on mode) and **burden**. The burden can either be specified as **Burden (1/Sn)** (third column) or as **Burden (VA)** (fourth column). Specifying both is not possible, if you enter values in both fields, *Burden (1/Sn)* takes precedence.

If the test sequence is completely defined, click **[OK]** to save it and close the dialog. You can also **[Print]** out any complete test sequence including all detail data or **[Cancel]** at any time.

10 Error Classes

The list of error classes is available via *Data > Error class* from the menu. This list allows you to manage the error classes.



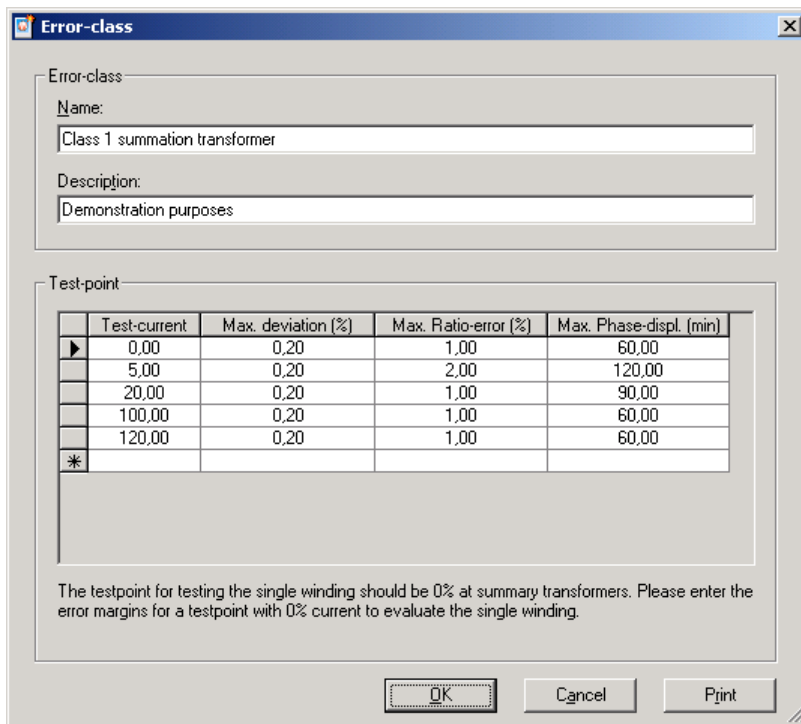
To add a new error class, either create a **[New]** one, starting empty, or **[Copy]** the currently highlighted class as template for the new one. Copying only asks for a name and creates an otherwise identical class. **[Edit]** the new class to adjust the detail data.

You can **[Delete]** the highlighted class, removing it from the database.

You can **[Display]** the detail data at any time, **[Edit]** only when they are not assigned to any transformer at that time. In order to edit an error class currently assigned to transformers, you would first need to delete any such transformer.

You can **[Print]** an overview over all error classes including all details.

[New], **[Edit]** and **[Display]** open the following detail data dialog:



In the area *Error class*, enter a **Name** and **Description** for the error class.

Define the individual test points in the table *test point*. Enter **test current (%)** or **test voltage (%)** (depending on mode). Add **maximum deviation (%)**, **maximum ration error (%)** and **maximum phase displacement (minutes)**.

You can **[Cancel]** at any time and **[Print]** out the error class with its current detail data. Confirm by **[OK]** when you are done to save the changes.

11 Automatic test

Automatic test

Testing charge

Name: MBS Wandler Details >>

Transf.-type: ASK 123.3 Details >>

Test-seq.: Class 1 1 range high ratio Details >>

Test-mode

Accuracy-test

Action: All test-point will be tested ...

Test-data

Current (%): 100,18

Ratio-error (%): 0,030

Phase-displ. (min): -11,61

Prop.no. (place): 1 (1)

Winding (T1,T2): 1 (1 . 2)

Prim. current (A/%): 2000,00 / 20,0

Sec. current (A): 5,00

Burd. (VA): 15,00

Test mode: Difference

Failure:

Interface Zoom Start Stop Close

To start the automatic test, highlight a charge in the detail pane of the main CheckCon window and select *Test > Automatic Test*.

The dialog shown above opens, which serves to start and stop as well as monitor a running test. It shows the charge *name*, the *transformer type* and the name of the *test sequence* in the upper area for reference. Click the corresponding **[Details >>]** to display full details.

Test mode shows, which test is currently performed and the current test **action**.

Current test parameters for **current/voltage**, **ratio error** and **phase displacement** are shown in the area **test data**. Values that are out of their valid range are shown in red. To monitor the test data from a distance, you can **[Zoom]** these three parameters into a magnified display.

Right beside the *test data* detail data for the current test place are displayed.

[Start] the test when ready. **[Interface]** allows you to monitor the raw communication between CheckCon and the individual devices in a separate window, see section 13 *Interface monitoring* for details. You can **[Stop]** a running test at any time.

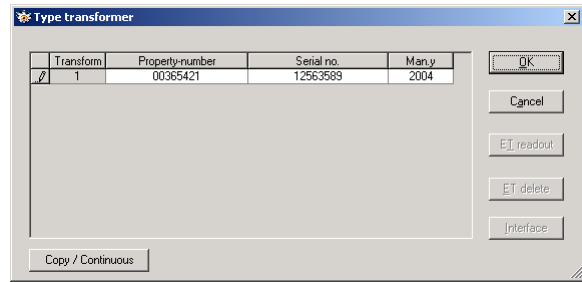
Should any disturbance occur, an error message will be shown in the field **Failure**.

When you are done, just **[Close]** the window.

When you **[Start]** the test, CheckCon asks for the *property number*, *manufacturer number* and *manufacturing year* of the currently tested transformers. You can either

input the data manually into the table or read it from a handheld, if connected, by **[ET readout]**.

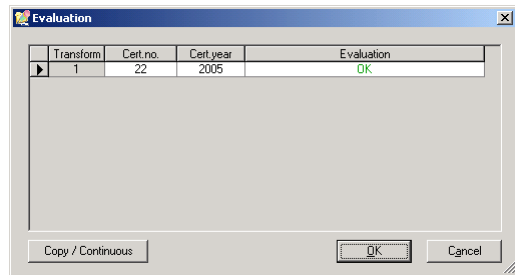
You can erase the transformer data in the handheld by **[ET delete]**. As usual, **[Interface]** allows monitoring the raw communication between CheckCon and the device, here the terminal.



When you need to input the data manually, **[Copy / Continuous]** allows you to copy the data of the currently highlighted line into all subsequent lines, while incrementing the values of *property number* and *manufacturer number* by 1.


When all detail data are entered, click **[OK]** to confirm and to start the test.

After the end of the test, another dialog shows you the evaluation of the just finished test. Please check the *Certification number* and the *Certification year*. You can correct the values, where necessary. This dialog also features the **[Copy / Continuous]** button, which works as described above.



After you confirm the results with **[OK]**, the results are saved into the database and the test is started anew for the next set of transformers.

12 Manual test

CheckCon allows to manually performing a partial test. Manual tests do not create regular test results, nothing will be stored in the result database. To start a manual test, select *Test > Manual Test* from the menu. 

Test mode shows, which test is currently performed or about to be performed and the current test **action**. The drop-down box **Mode** on the top of the test detail data allows you to select the test mode prior to starting. In addition to the **Mode**, please specify all detail data as required for the selected test.

In the fields **Transformer/Terminals** you specify in detail, which terminals at which transformer are to be tested. Terminals here refers to the transformer terminals, the electric connectors of the transformer, not the handheld device.

Please note that only those fields are available, that will be evaluated for the test type you chose in **Mode**. Also, some combinations may not be valid, for instance the specified test currents must be supported by the selected burden.

[Start] the test when ready.

Current test parameters for **current/voltage**, **ratio error** and **phase displacement** are shown in the area **test data**. Values that are out of their valid range are shown in red. To monitor the test data from a distance, you can **[Zoom]** these three parameters into a magnified display.

[Interface] allows you to monitor the raw communication between CheckCon and the individual devices in a separate window, see section *13 Interface monitoring* for

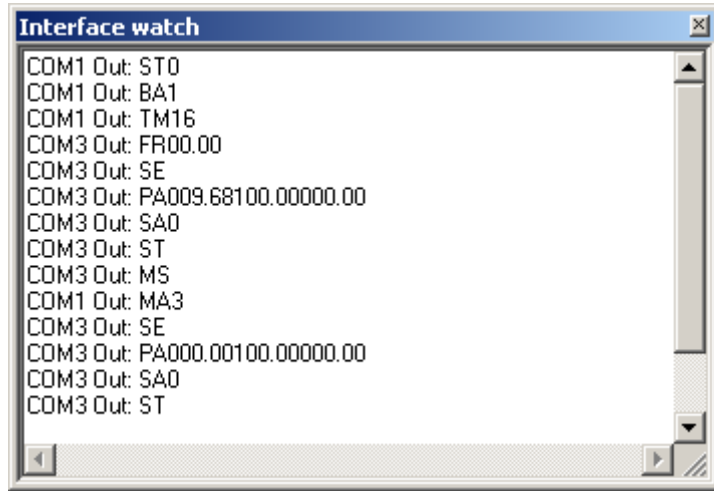
details. The manual test does not halt by itself, you can **[Stop]** a running test at any time.

Should any disturbance occur, an error message will be shown in the field **Failure**.

When you are done, just **[Close]** the window.

During the test you can **[Save the current test point]** at any time. This will export the parameters of the current test point into a file `ManTestLog.txt`, located in the CheckCon program directory.

13 Interface monitoring



Whenever CheckCon communicates with one of the connected devices, the corresponding dialog allows you to monitor that communication by means of an **[Interface]** button.

This opens a separate window which shows all commands and data exchanged between CheckCon and the device in real-time.

Data that go from CheckCon to the device carry the prefix **COMx Out**, where x is the number of the interface port the device is actually connected to. Data that go from the device to CheckCon have the prefix **COMx In**.

If you want to delete the content of the window in between monitoring, right-click into the window and issue the **Delete** command.

