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Rexroth IndraWorks HMI 03VRS

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Edition 01

Operating and Programming Guide
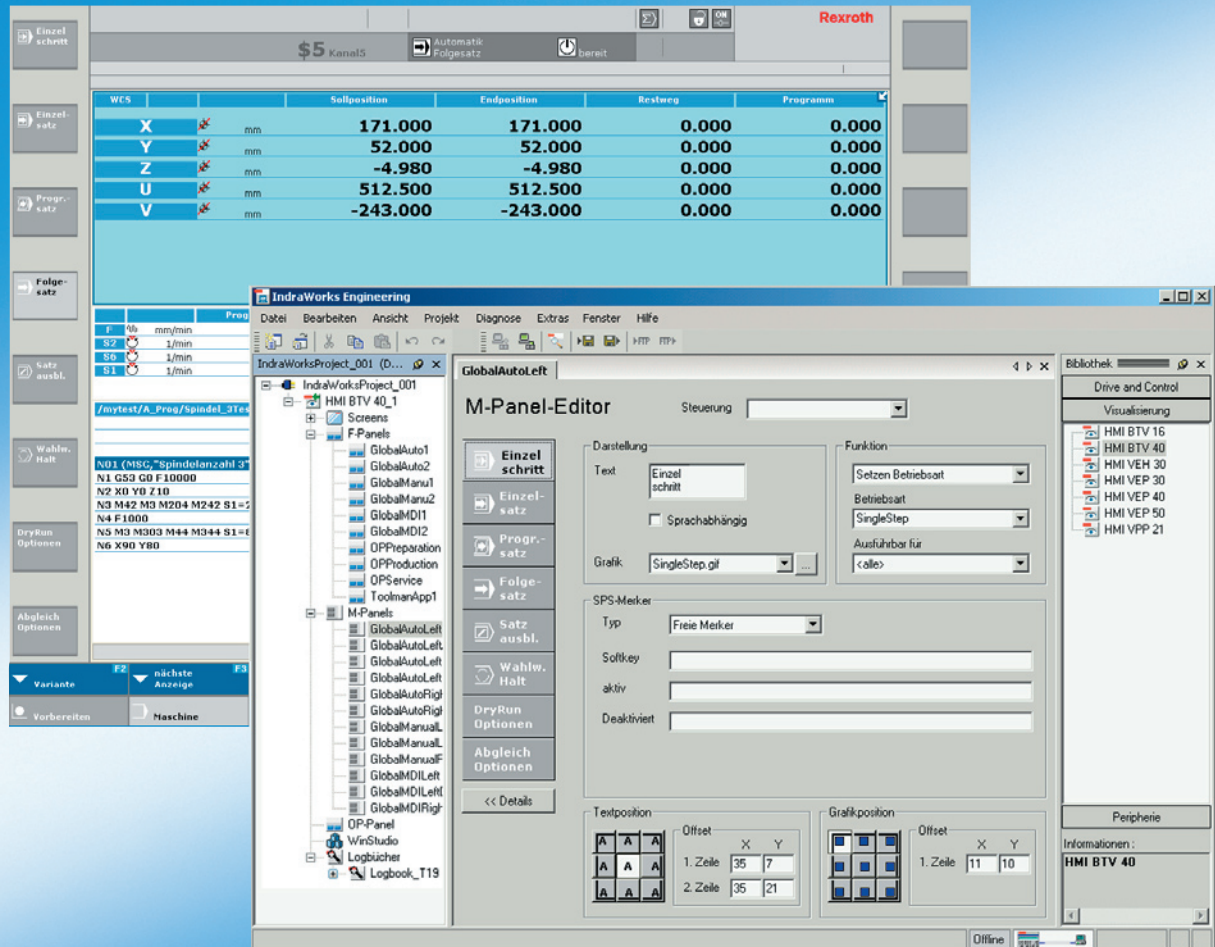
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Contents

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1 Overview

1.1 IndraWorks HMI

The automation platform IndraWorks provides a prepared visualization system which, with the help of integrated tools, can be extended to make a user-specific user interface available.

This documentation is intended for users who need a quick overview of the available IndraWorks HMI user interface and for application engineers who need a technical overview of how to operate, configure and project the various HMI components.

The user interface is based on the operating system Microsoft Windows 2000 or Windows XP and the automation platform IndraWorks.

On delivery, the systems already provide all necessary software components.

IndraWorks HMI is a Windows-based visualization and user interface for the new control systems IndraMotion MLC, IndraMotion MTX and IndraLogic.

1.2 Related Documentation

No.	Title	Document name
/1/	Rexroth IndraWorks; Operating and Programming Guide	In preparation. Preliminarily, in IndraWorks the following Online help files can be called via the help contents under "Working with IndraWorks": - IndraWorks Engineering Desktop - IndraLogic: PLC projecting in IndraWorks - I/O configuration: I/O configuration in IndraWorks
/2/	Rexroth WinStudio; Getting Started Guide	DOK-CONTRL-WIS*PC**V06-KB..-EN-P
/3/	PLC Programming with Rexroth IndraLogic; Operating and Programming Guide	DOK-CONTRL-IL**PRO*V01-AW..-EN-P

Fig. 1-1:   Related documentation

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1.3   User Interface Terms

IndraWorks Engineering	Basic component of the Rexroth automation platform integrating the engineering tools (IndraWorks HMI, IndraLogic, etc.).
IndraWorks Operation	Runtime environment for operating and visualizing PC-based Rexroth controls.
Runtime environment	See: IndraWorks Operation
IndraWorks HMI	IndraWorks user interface, consisting of panels, headers as well as system and user screens.
IndraWorks project	Is created in IndraWorks Engineering and contains all machine or system data that has been projected.
Download	Transfer of all configuration files (runtime project) to the configuration directory of IndraWorks Operation.
Panel	The key bars (F-keys, M-keys, OP-keys) on the screens are called panels.
M-panel	Key bar with machine keys to the left and right of the screen.
F-panel	Key bar with function keys above the OP-panel for calling up a function.
OP-panel	Key bar with operator keys at the bottom of the screen for selecting an operating context.
User screen	Screen created by means of Rexroth WinStudio.
WinStudio	Projecting tool for the creation of user screens.
ProVi message	Diagnostic messages from the control (IndraLogic).

Fig. 1-2:   Basic terms

2   IndraWorks HMI User Interface

2.1   Functional Contents

The IndraWorks HMI version 03VRS provides the following functions:

Diagnosis (ProVi)   Programming of ProVi messages in IndraWorks Engineering (or IndraLogic) and message display in the runtime environment.

Configuration   Configuration of F/M and OP panels and screens with IndraWorks Engineering.

User Screens   Programmable user screens with WinStudio.

M-Key Operation   Operation by means of machine keys (8 keys to the left; 8 keys to the right)

PLC function: In IndraWorks Engineering, the "MKEYS" function block (FB) is provided in the form of a library. This FB must be incorporated in the PLC program. One instance of the FB must be created for each visualization device to be addressed by the PLC.

2.2   Screen Structure
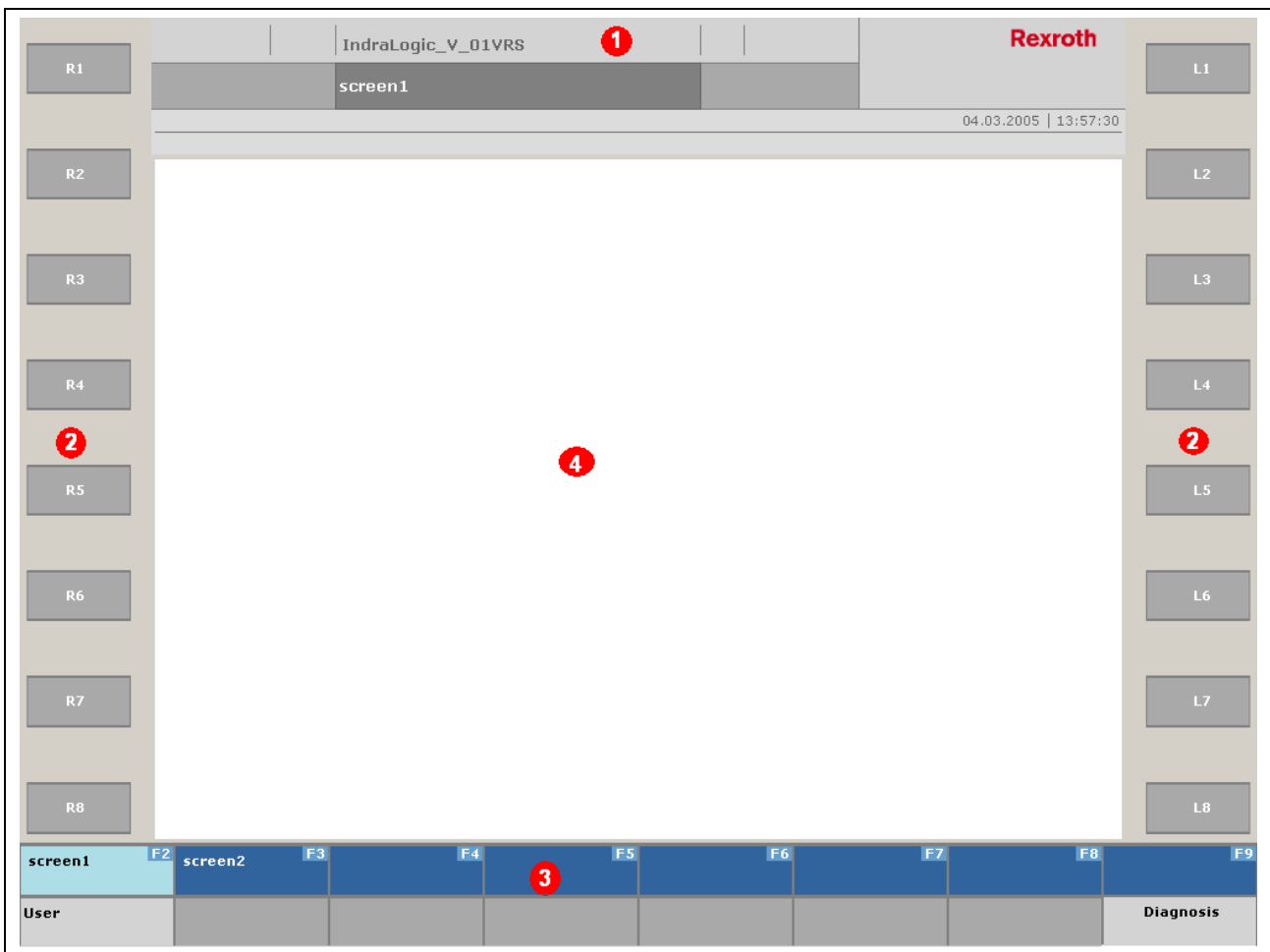
Fig. 2-1:   IndraWorks HMI user interface

Header Display (1)   The header display is identical on all screens. The header display shows the control name, the diagnosis state, ProVi errors and ProVi warnings, date and time as well as the name of the active screen.

M-Panel (2) M-panels are intended for machine operation or for the execution of application-specific functions. The M-panels to the left and right of the screen show the assignment and the state of the M-keys.

OP-Panels and F-Panels (3) OP-panels serve to move among the screens of different operating contexts. Using the function keys, you can move among the screens, show an extended key assignment, or execute other application-specific functions. The currently active operating context and the screen selected are each highlighted in color on the OP-panel and/or F-panel.

Operating Context (4) The operating context displays the various applications.

2.3 M-Key Operation

Visualization Devices with Foil Keys

The devices are operated via the foil keys (M-panels) to the side of the screen. The keys may have the following states:

- Normal
- Pressed
- Activated
- Pressed and activated
- Deactivated

Fig. 2-2: "Normal" M-key

Fig. 2-3: "Pressed" M-key

Fig. 2-4: "Activated" M-key
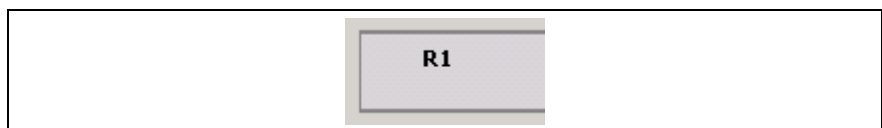
Fig. 2-5: "Pressed and activated" M-key

Fig. 2-6: "Deactivated" M-key

<div style="text-align: right">**Key Layout**
IndraControl VPP 21</div>

The visualization device IndraControl VPP 21 is provided with three foil keys to the left and three foil keys to the right of the screen. The upper and lower keys are intended for navigation; the key in the middle is intended for selection and confirmation.

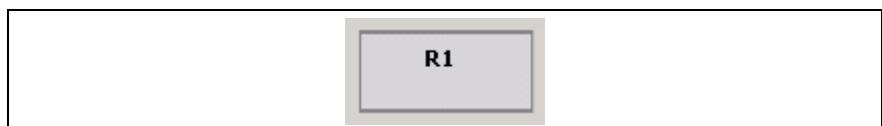The keys are displayed as shown in Fig. 2-2 through Fig. 2-6. The currently selected key is additionally highlighted by red borders.

Fig. 2-7:   Selected M-key

Visualization Devices with Touch Screen

When a visualization device is equipped with a touch screen, the user interface is operated by touching a key icon on the screen.

The M-keys are displayed as shown in Fig. 2-2 through Fig. 2-6.

Note:	For safety reasons, a hardware interlock via keys should be provided for machine operation.

Error Displays on M-Panel Keys

<div style="text-align: right">**Did Not Find PLC Variable**</div>

If a PLC variable which is not contained in the PLC program of the control or in the IndraLogic symbol file (symbol configuration) has been projected for an M-key in the M-panel editor, a warning triangle is shown on the key in question.

Fig. 2-8:   "Did not find PLC variable" error display

<div style="text-align: right">**Key is pressed**</div>

If an M-key is pressed and held (e.g. for moving to a different screen) and a second M-key is pressed at the same time, the user is prompted to release the key. The new assignment will not become active before this key is released.

Fig. 2-9:   "M-key is pressed" error display

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2.4   User Screens

IndraWorks HMI provides the option of integrating as many self-created user screens in the user interface as desired. The projecting tool WinStudio is provided for creating the screens.

User screens are called up via the F-keys, M-keys or OP-keys.
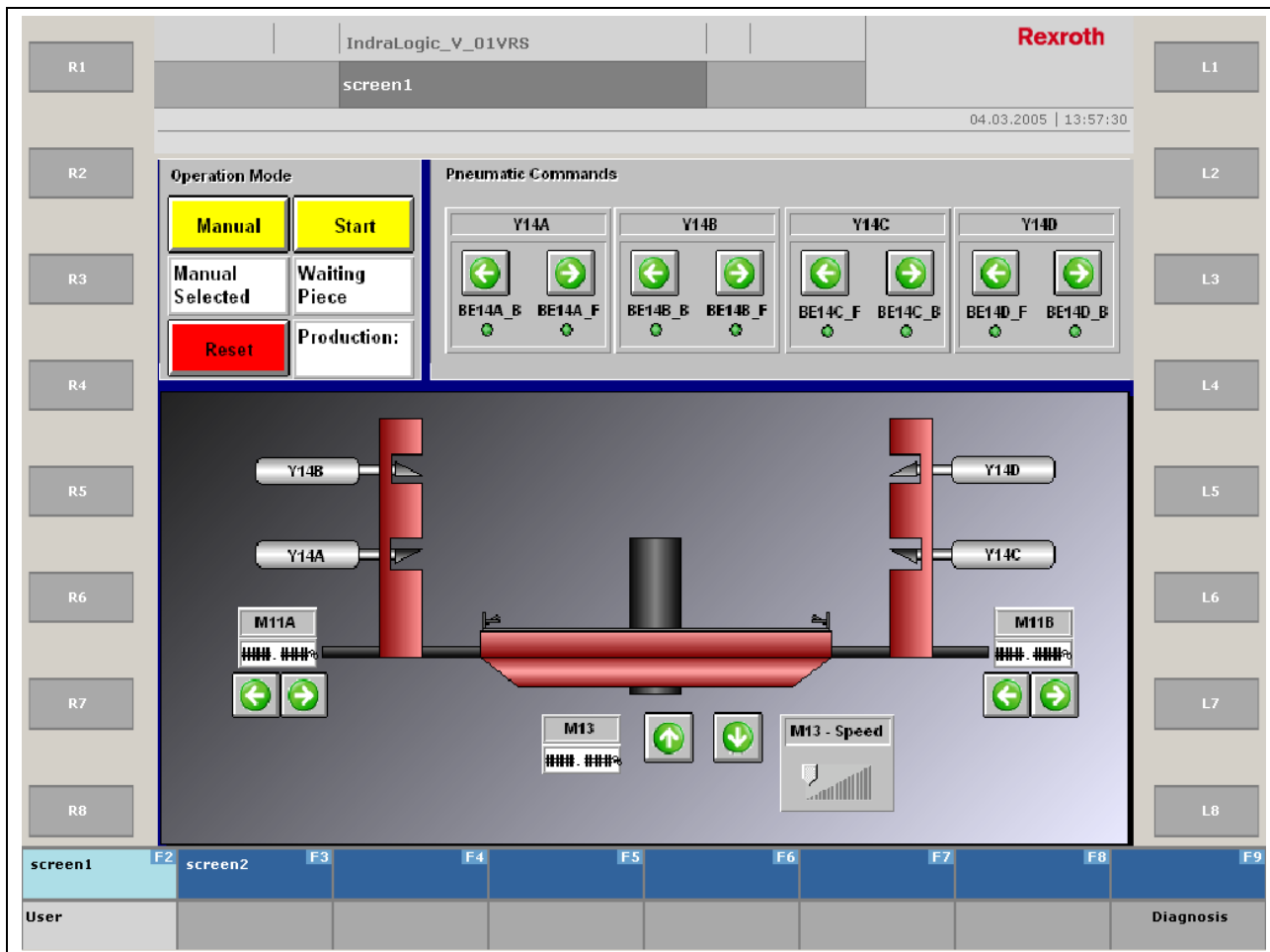
Fig. 2-10:   Example of a user screen in the runtime environment

2.5   Diagnosis Screen

Pressing the OP9 key will activate the diagnosis screen.

Note:	The scope of delivery of IndraWorks HMI depends on the control system installed. While the IndraMotion MTX scope of delivery includes preconfigured screens for operating NC machines, the IndraLogic control only has the OP9 key for calling the diagnosis screen.
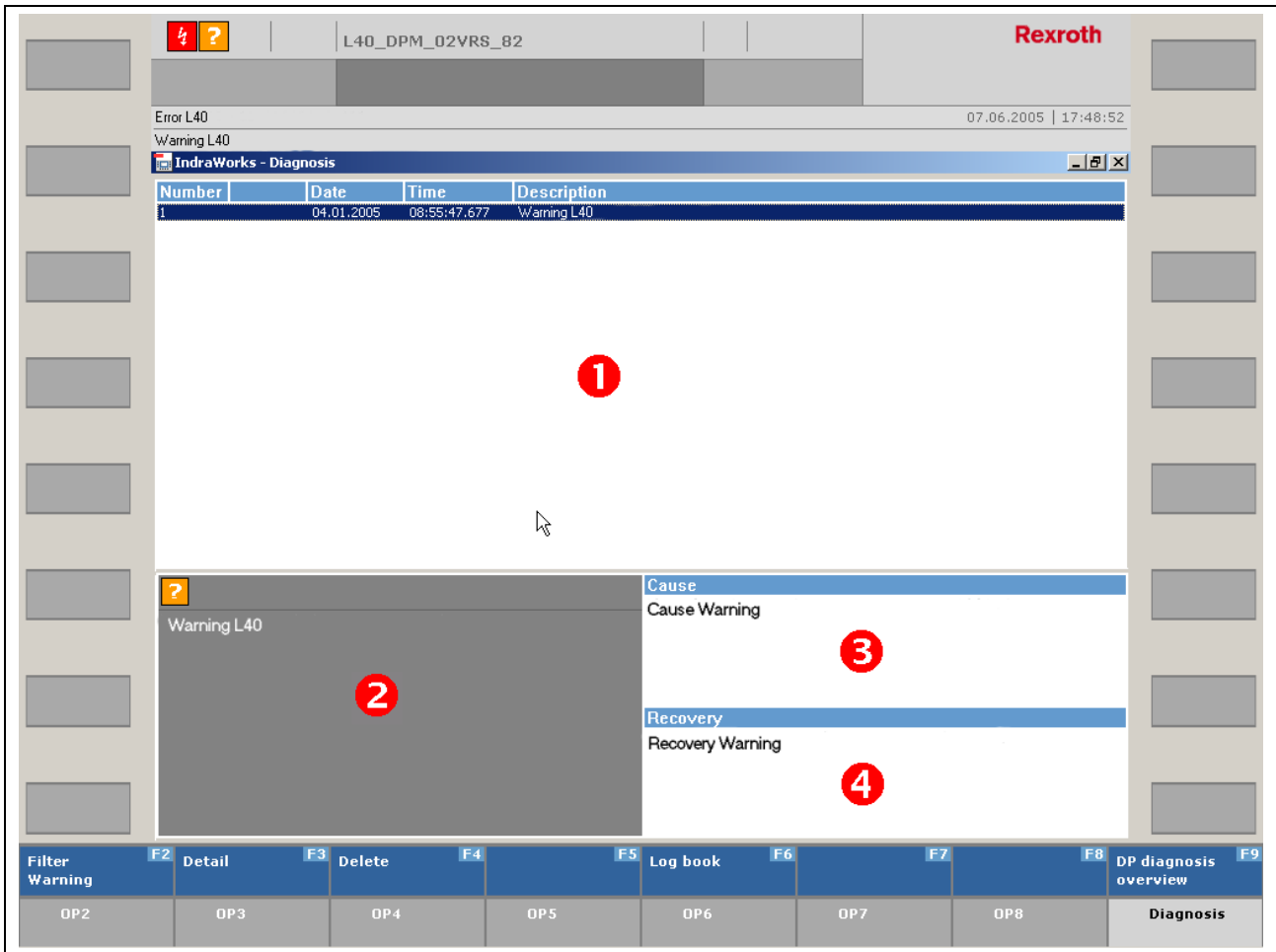
Fig. 2-11:   Basic diagnosis screen

The basic diagnosis screen is divided in four areas:

Message List Box (1)   This area lists all messages of the connected devices which are supporting the diagnosis function. For example, the list includes the number of the message, the channel number of NC messages (MTX), the module number of ProVi messages, the date stamp of occurrence, and the brief description entered by the user.

Brief Info (2)   This area shows the message selected in an abbreviated form. The character of the message (error, warning, message, setup diagnosis, starting condition) is represented by an icon.

Extended info: Cause (3)   This area shows the extended info, where user texts illustrating the cause of the message in more detail are filed.

Extended info: Recovery (4)   This area shows information filed by the user, which serves to eliminate the problem.

The texts are not limited in length. If the text exceeds the text window in size, scroll bars will appear.

Filters

The diagnosis screen provides F-keys for filtering by errors, warnings and messages. A light-blue F-key indicates the active filter:

All <F2>   No filtering. All diagnosis messages are displayed.

Error <F3>   Only messages of the "error" type are displayed.

Warning <F4>   Only messages of the "warning" type are displayed.

Message <F5>   Only messages of the "message" type are displayed.
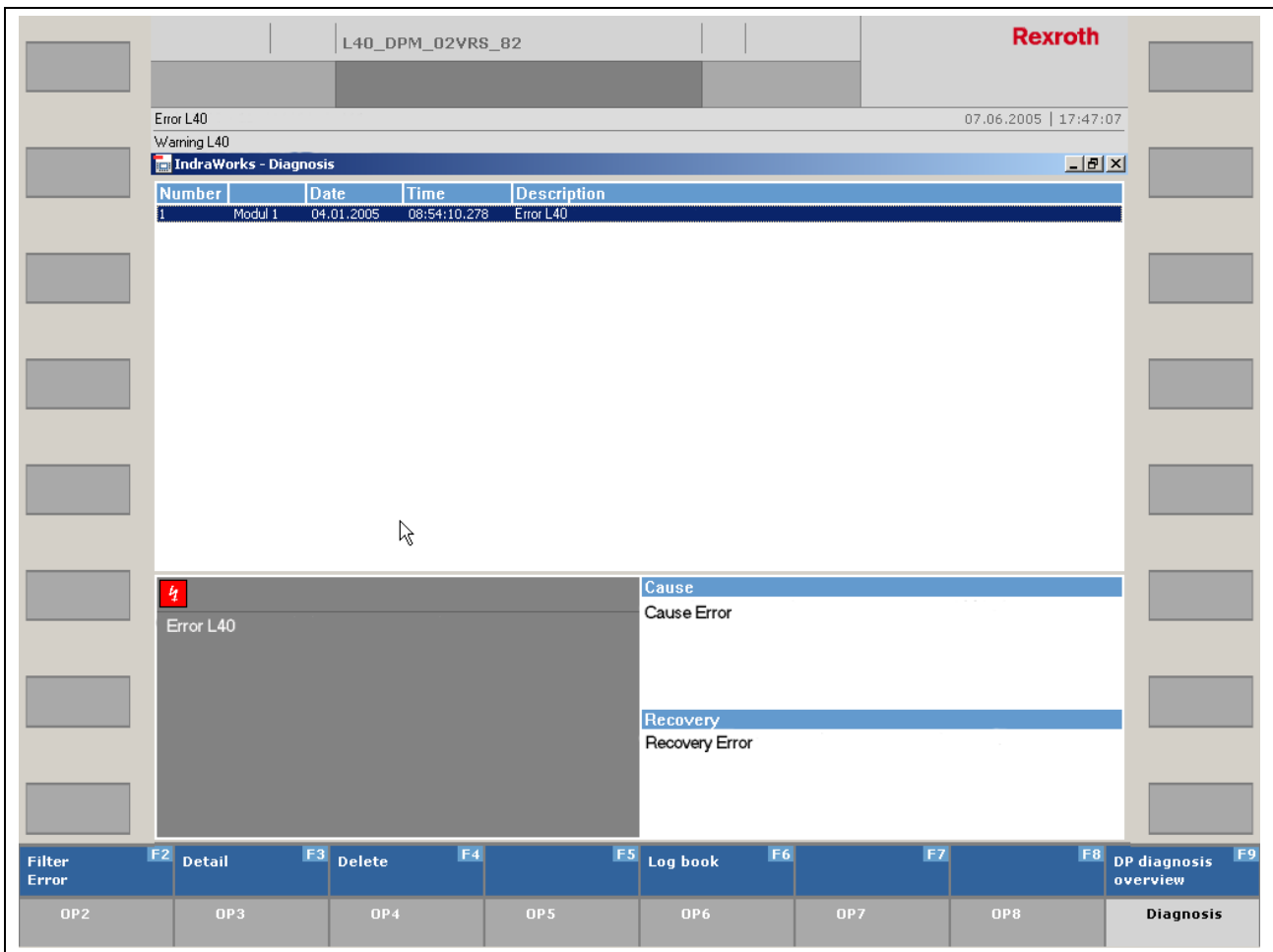
Fig. 2-12:   Diagnosis message filtered by error

Here, the "error" filter is activated, so that only messages having the appropriate error characteristics are displayed.

Detail View

Pressing the F7 key "Detail" toggles the detail and overview views.

The currently selected message is once again prepared to contain extended information.
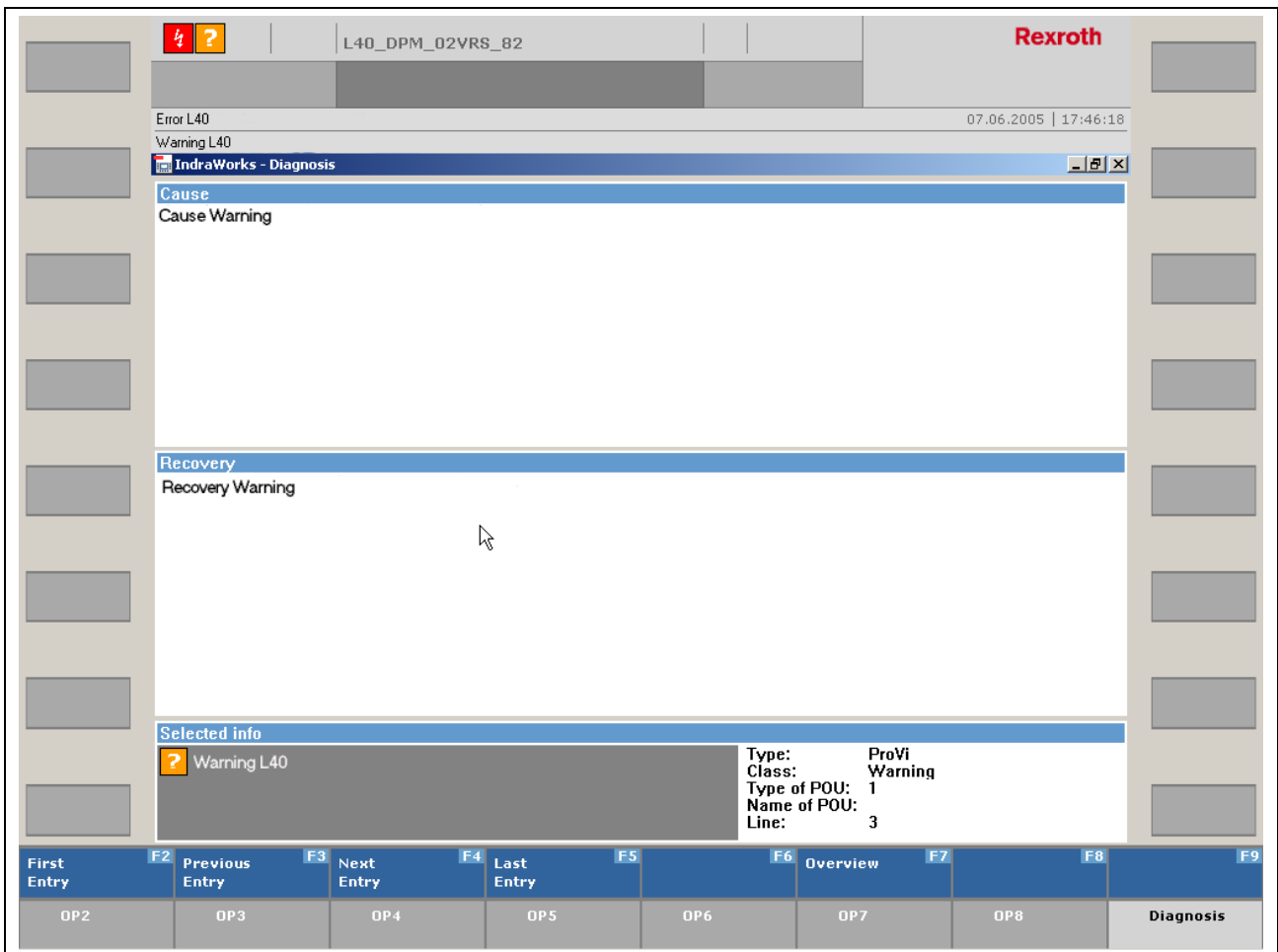
Fig. 2-13:   Diagnosis detail view

The "Cause" and "Recovery" windows are extended versions of the windows already shown in the overview view.

The "Selected info" window displays additional information on the messages. The additional information shown varies according to the type of message (e.g. ProVi).
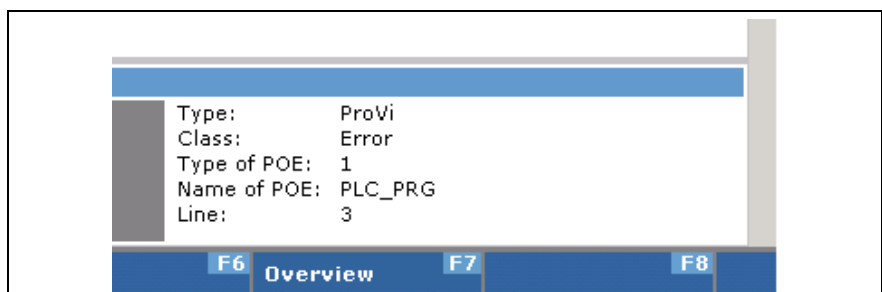
Fig. 2-14:   Additional information on a ProVi message

The additional information describes the type of ProVi message and the origin of the program.

Use the cursor keys or the four navigation keys to scroll through the messages of the filtered overview list.

Press the F7 key to move to the Overview view.
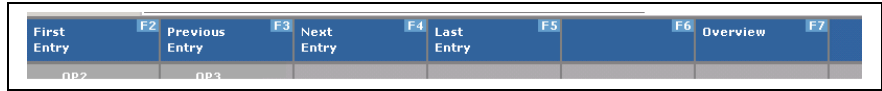
Fig. 2-15:   Navigation keys for the detail view of the diagnosis messages

2.6   Log Book

The log book is embedded in the diagnosis screen. After having called up the diagnosis screen with <OP9>, press the F6 key to toggle the "Diagnosis" and "Log book" screens.

The current state is shown in the F-panel:

- "Log book F6" -> diagnosis is activated. Press <F6> to move to the log book screen.

- "Diagnosis F6" -> the log book is activated. Press <F6> to move to the diagnosis screen.
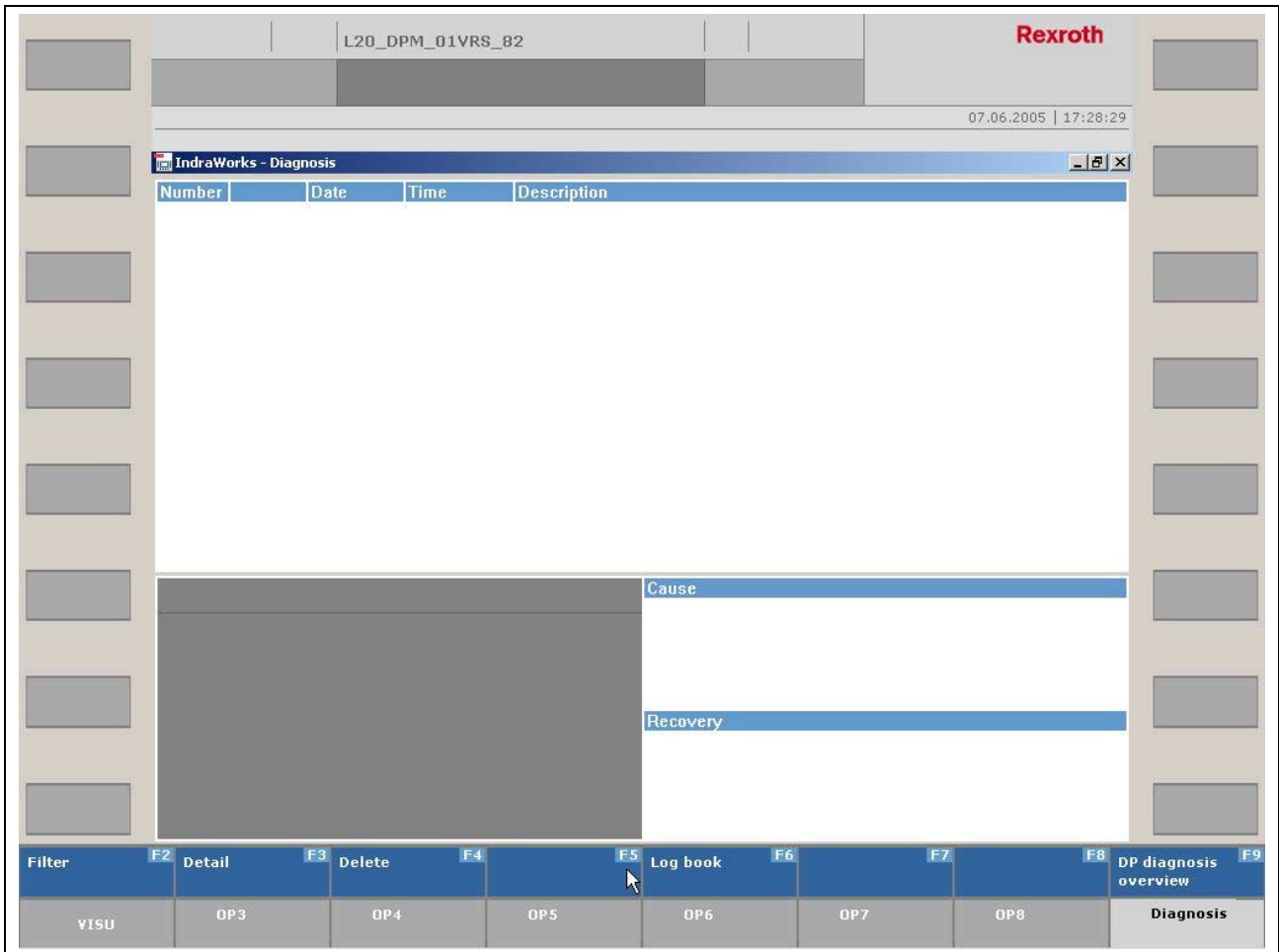
Fig. 2-16:   Basic diagnosis screen

Log Book Selection

Opening the Log Book   If no log book is configured at all, a warning will be displayed.
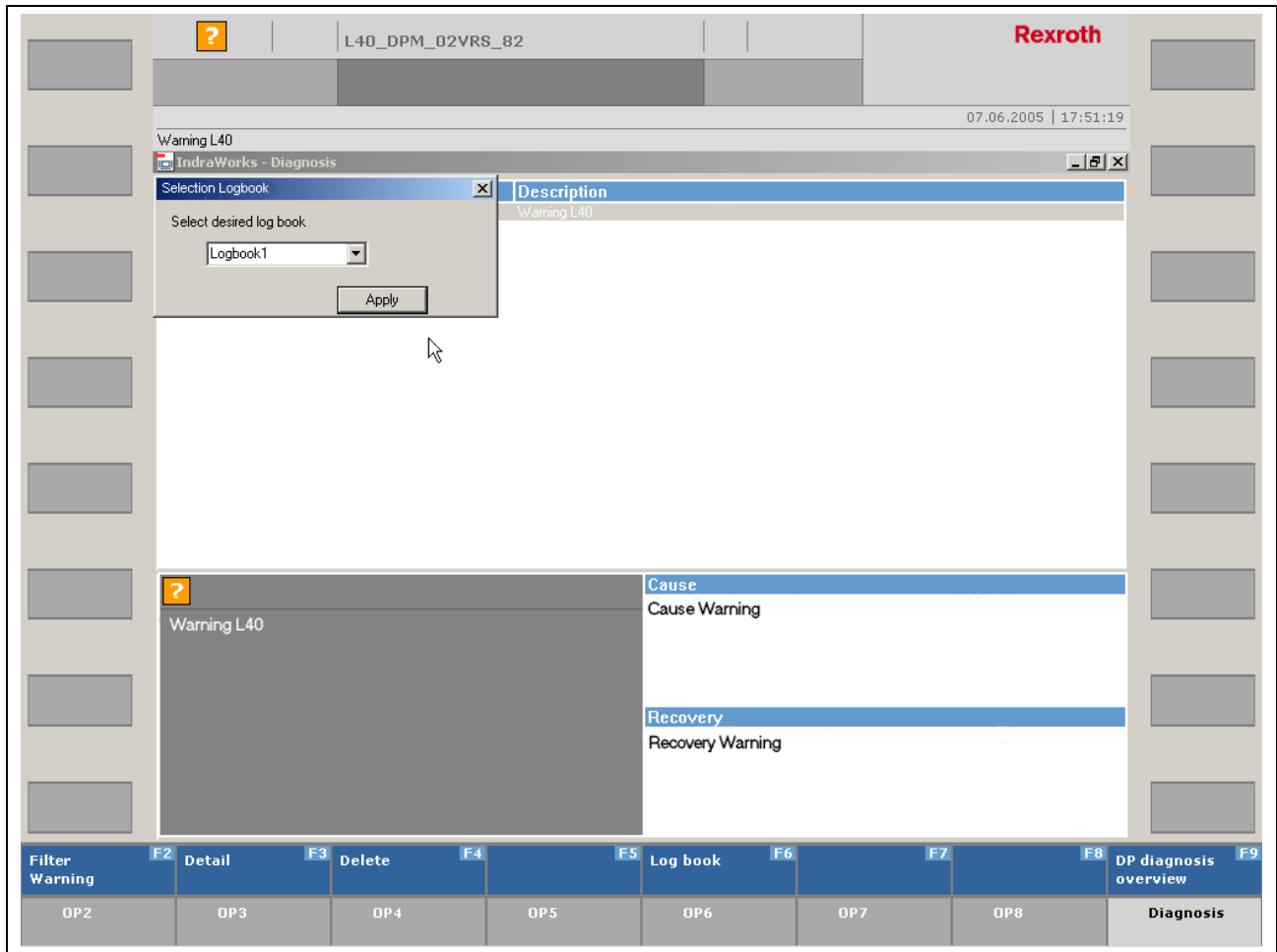
Fig. 2-17:   Log book selection dialog

Log Book Functions   Press the F5 key to move to a different log book and the F6 key to return to the diagnosis screen.
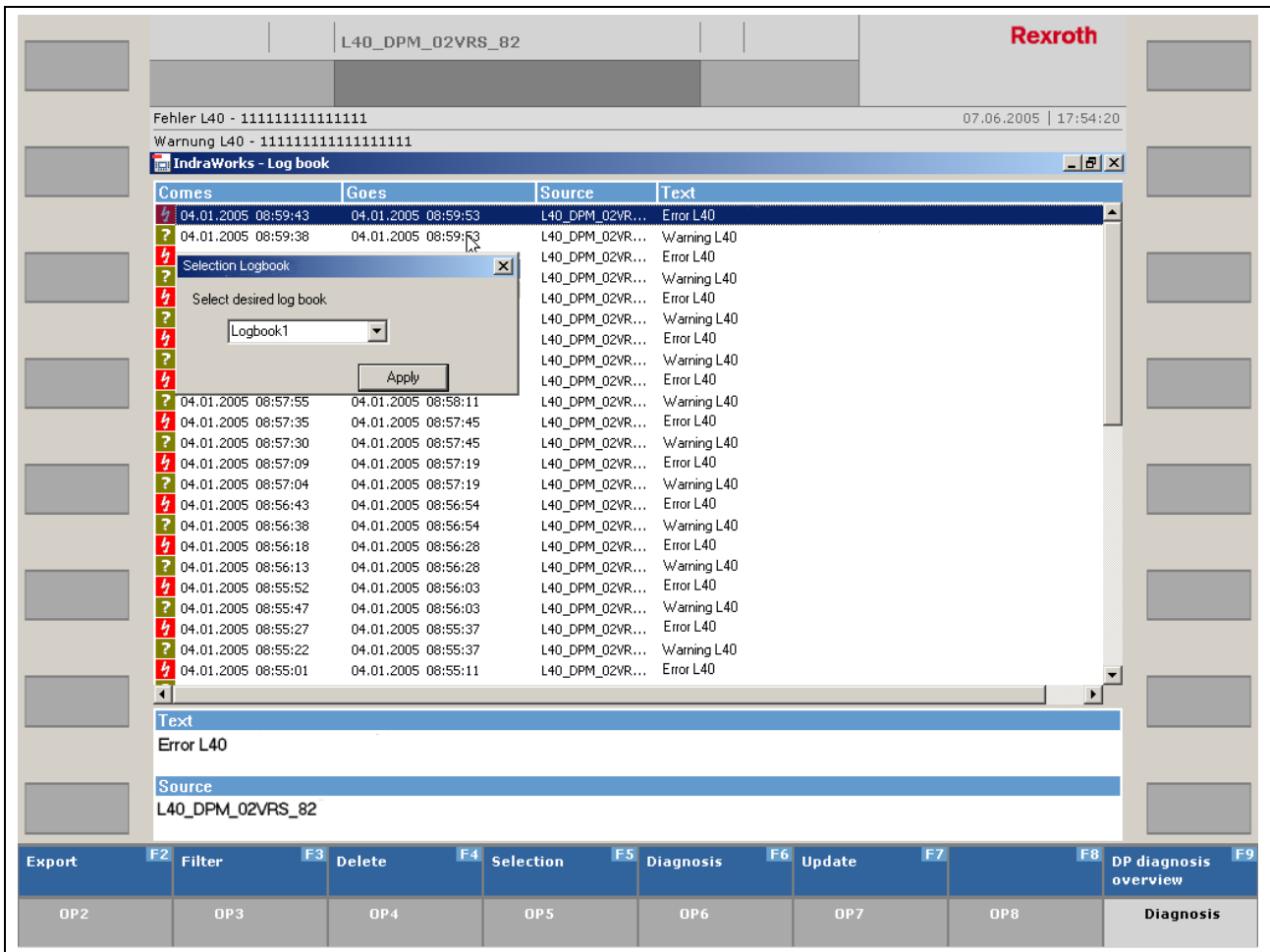
Fig. 2-18:   Selecting a log book

Deleting a Log Book

Press the F4 key "Delete" to activate the delete function. This will delete all messages displayed with the currently set filters. The display will be updated after completed deletion.

Updating the Screen

The log book screen displays the messages statically. Press the F7 key "Update" to update the screen.

Export

Press the F2 key "Export" to show the Export dialog.
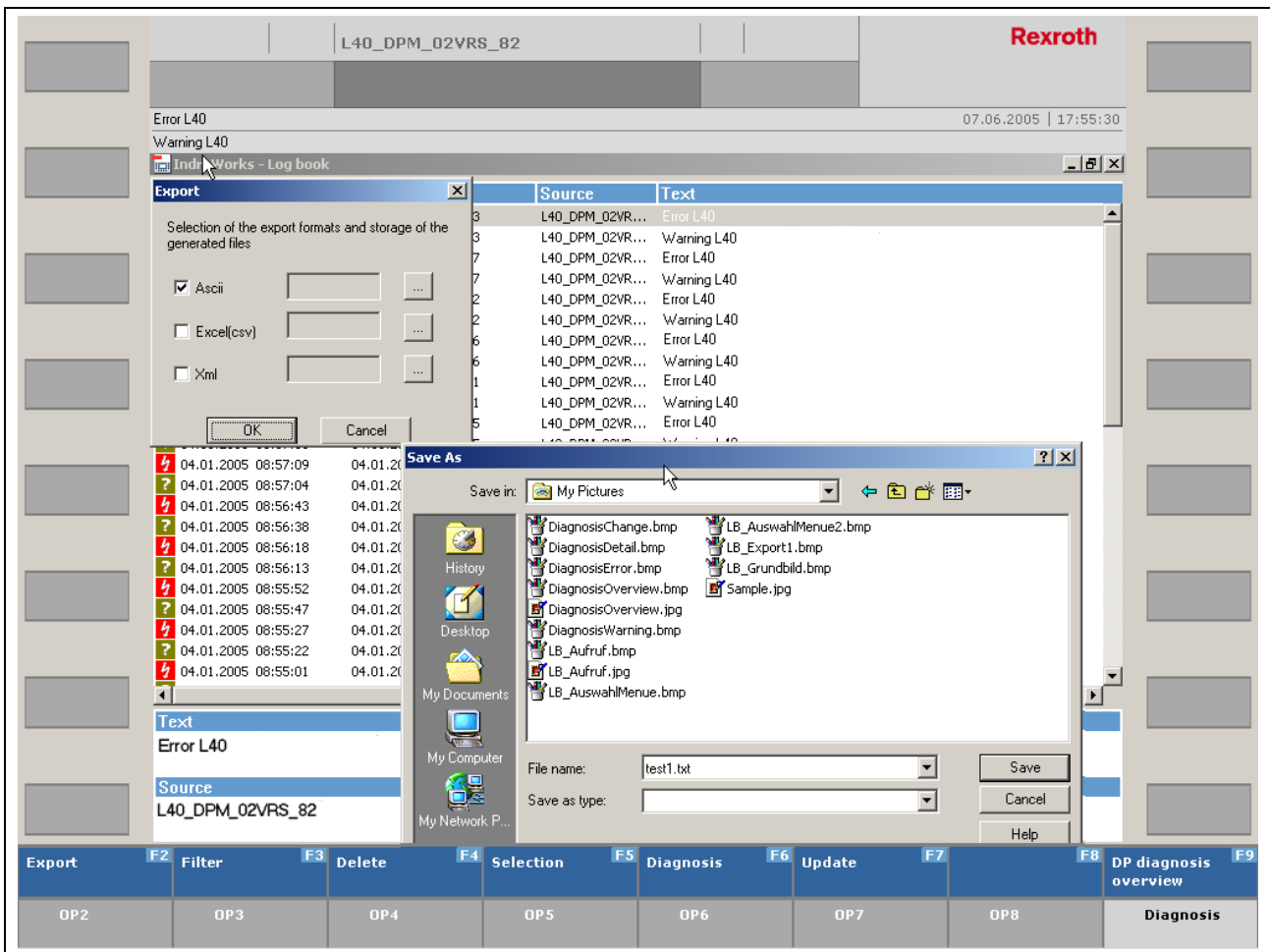
Fig. 2-19:   Export dialog with a selection list of target files

The Export dialog allows selection from the ASCII, CSV and XML formats. Define the path and name of the file to be exported in the input field. Press "OK" to export the file with the currently set filters. ASCII and XML files contain information on the filter settings.

Filter

Press the F3 key "Filter" to display the Filter dialog.
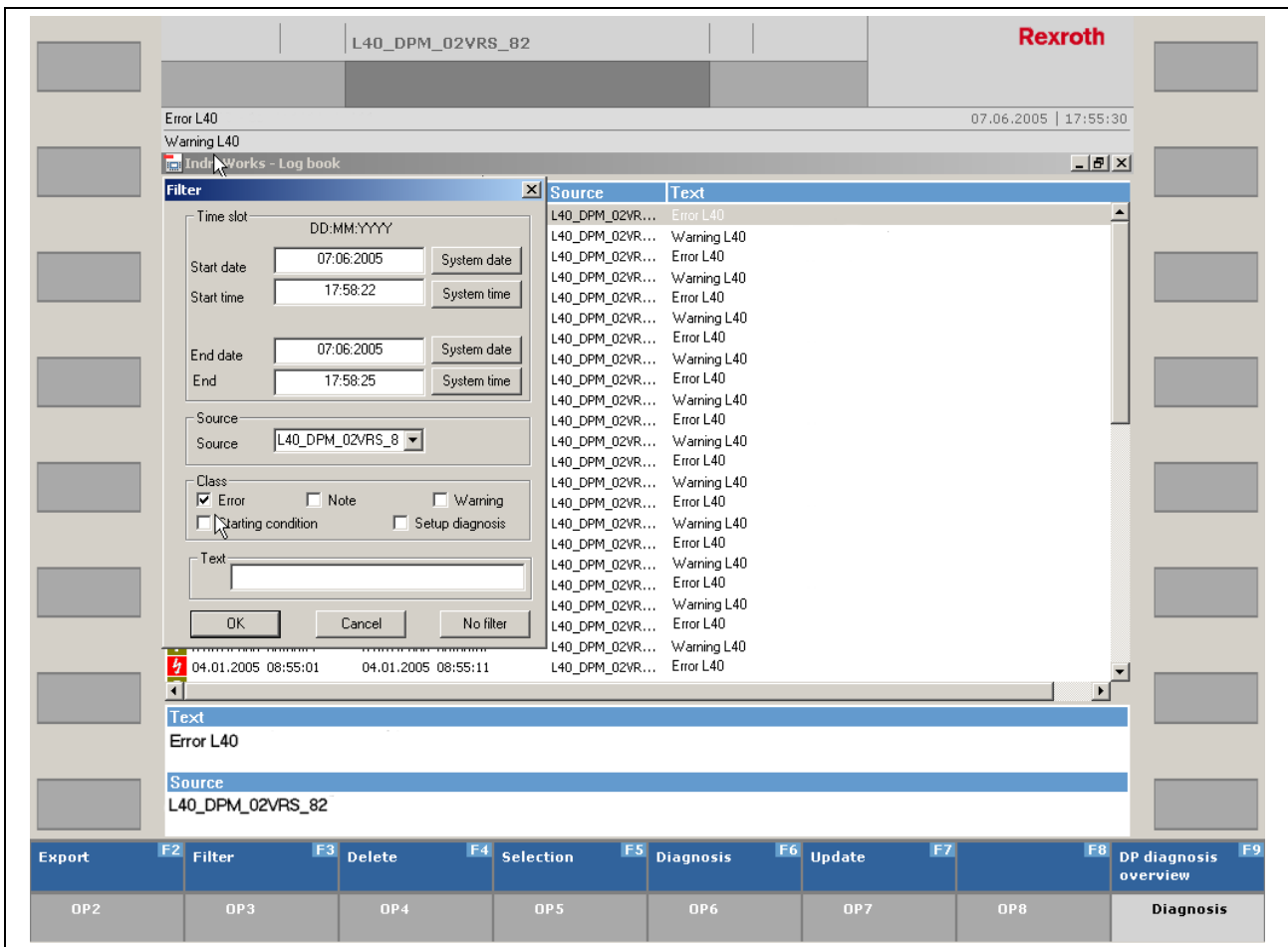
Fig. 2-20:   Example: Filter dialog

The Filter dialog allows to limit the selection list of log book messages.

Enter the start time and end time in the **Time slot** field. This will limit the messages displayed to those within this time period. Using the "System date" and "System time" buttons, you can already assign the current date and time to the input fields.

The **Source** field defines the control whose messages will be considered.

The **Class** field defines the type of messages applied to the log book. The five message classes can be combined as desired.

In the **Text** field, the messages available are searched for a defined text. This will limit the messages displayed to those containing the text defined.

The "No filter" button will reset all entries.

Pressing "OK" will activate the filters.

2.7   Field Bus Diagnosis

The field bus diagnosis screen is embedded in the general diagnosis screen and allows you to view bus states of the Profibus DP connected to the control. Two views are available. The overview view provides a general idea of the field bus currently configured in IndraWorks Engineering. From there, you can select any bus device and then branch to an associated detail view providing extended information.

Press the <F9> key on the diagnosis overview screen to call up the field bus diagnosis screen. You can also branch to the field bus diagnosis screen from the log book, using the same key.
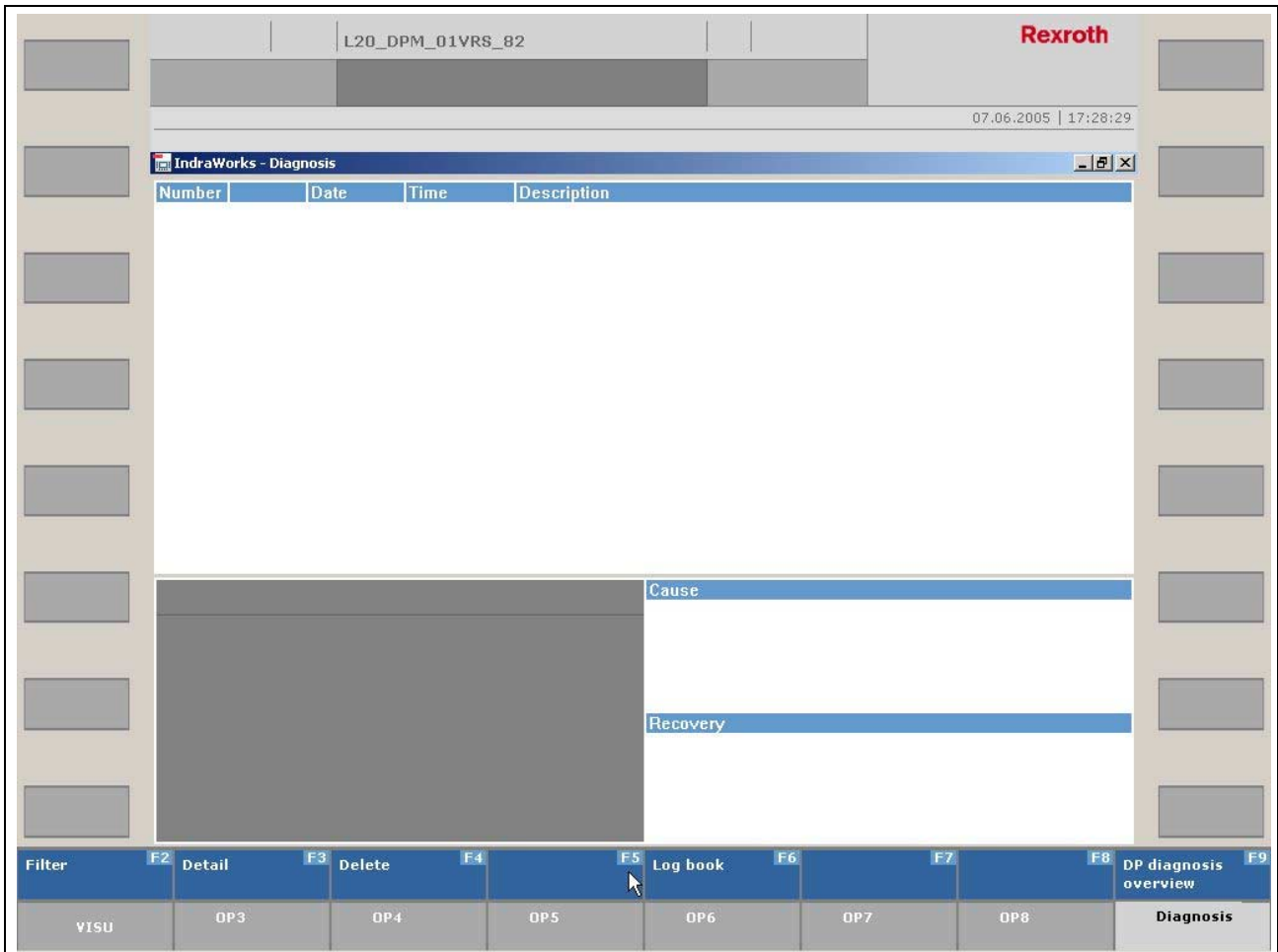
Fig. 2-21:   Basic diagnosis screen

After having called up the field bus diagnosis screen, an overview of the currently configured Profibus DP will be displayed.

The window is subdivided in three areas. The upper area displays the status of the bus master, the name of the control addressed and the ident number.

The central screen area shows the legend of the DP slave states and an overview of the totals of failed slaves and disturbed slaves.

The lower screen area shows the current bus configuration with all slaves. Each slave is represented with the bus address and its current state.
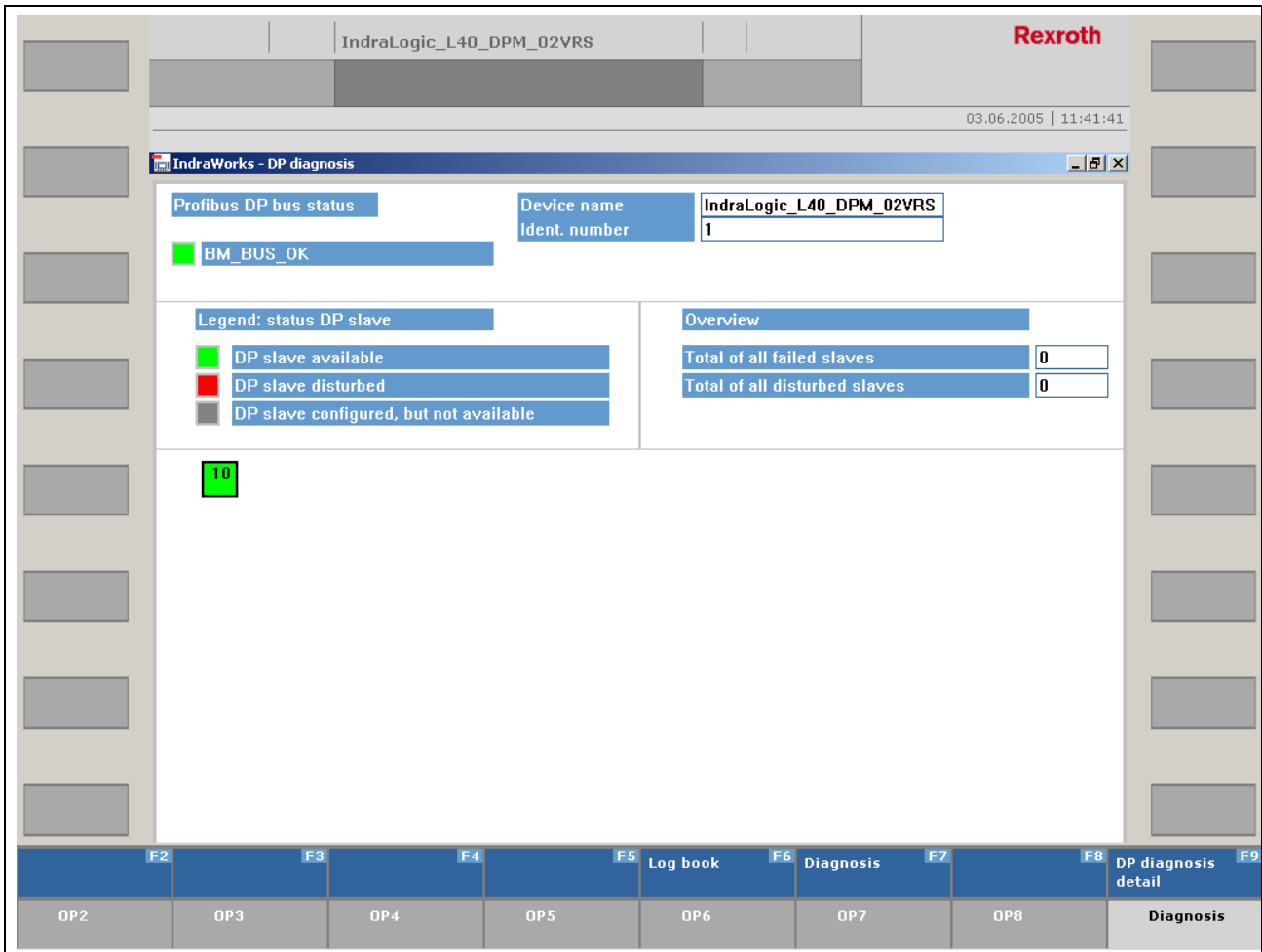
Fig. 2-22:   DP diagnosis overview screen

The detail view provides additional information on each bus device. The detail view is available for each slave. The detail view is displayed for the bus device selected (with black borders). There are three ways of opening the detail view:

• Left-click on the slave desired.

• Use the arrow keys to select the slaves desired and confirm with <ENTER>.

• Use the arrow keys to select the slaves desired and confirm with <F9>.

Press the <F9> key to toggle the overview and detail views.

After you have pressed the <F9> key, the detail view will appear on the central and lower areas of the overview screen. This view provides information on the current state of the bus device, the slave address and the ident number. It also shows the station status, the current error number transferred by the control in the event of an error, and the hexadecimal-encoded channel error text.
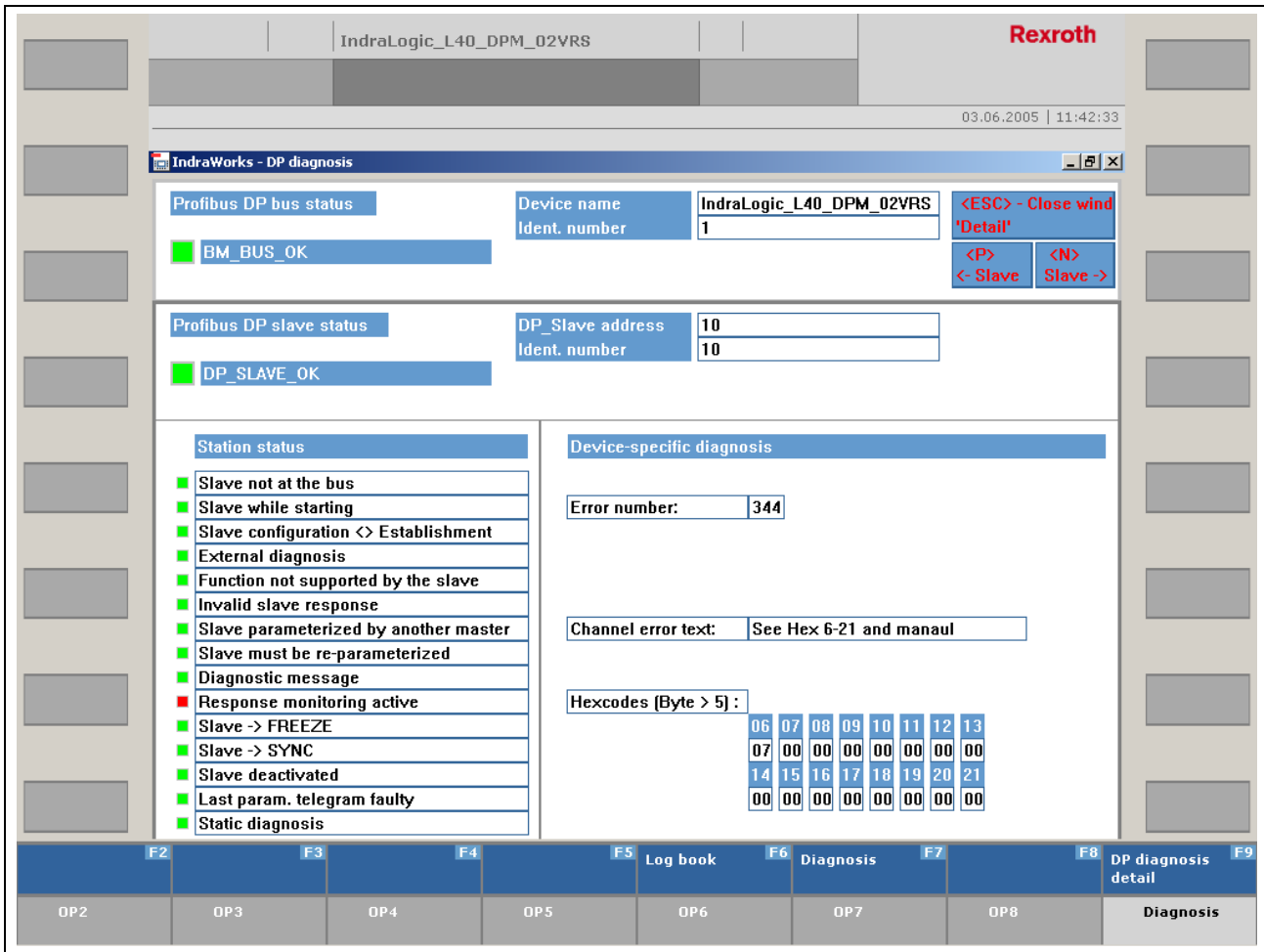
Fig. 2-23:   Detail view of a bus device

Press the <F9> or <ESC> key to move to the detail view. The <F6> and <F7> keys allow branching to the log book or the diagnosis screen respectively.

You do not have to open the overview screen in order to move to the detail view of a different slave. Instead, you can use the <P> key for the previous slave or <N> for the next slave and scroll through the detail views of the bus devices.
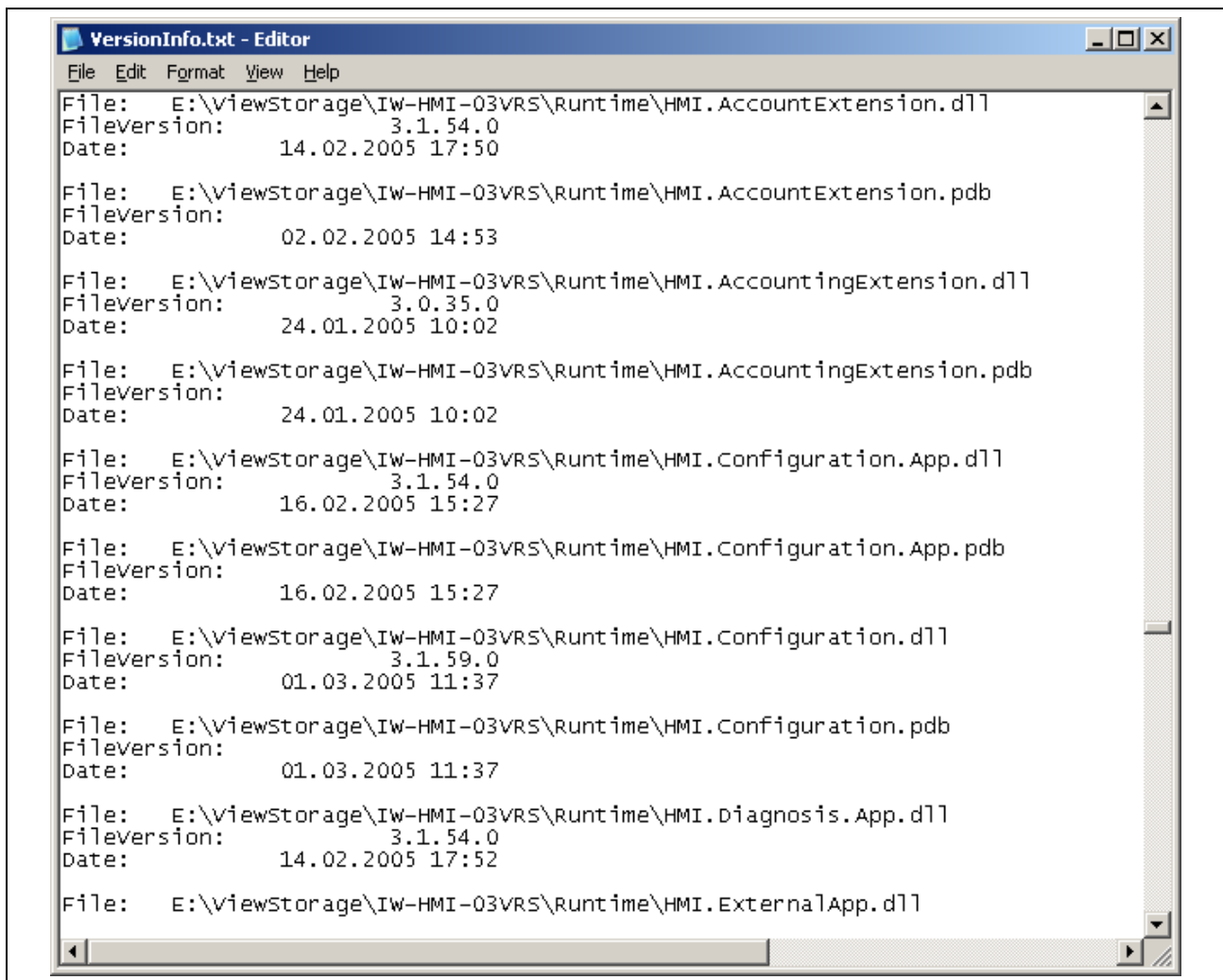
2.8 Version Display

The version dialog displays the IndraWorks HMI version installed. This dialog can be opened by selecting the "Info" menu item from the "Help" menu in the menu bar, both in IndraWorks Engineering and in IndraWorks Operation. Clicking the "Advanced" button will open a list of all components installed. Set the cursor line on the "IW-HMI …" entry to display the exact version name of a component in the "Product details" field.

Fig. 2-24: Version display

Click the "Copy Info" button to automatically create a list of all files installed. This will open the text editor providing information on the hardware used, the operating system and the version data of all IndraWorks components (Fig. 2-25). This process may take several minutes. The file generated can be saved and can, for example, be used for trouble-shooting.

Fig. 2-25:   Detailed information on all files used

Notes

3　User Interface Configuration

3.1　General Information

IndraWorks HMI consists of a number of predefined screens which must be created by the user. F-panels and M-panels can be assigned to each of these screens. The user screens and the assignment of F-keys and M-keys can be configured as desired with IndraWorks Engineering. IndraWorks Operation and IndraWorks Engineering can be installed jointly on one device, but also separately from each other.

After projecting has been completed, the configuration files created are transferred to the destination device where the runtime system (IndraWorks Operation) is installed. The configuration files will be effective when the runtime system is restarted. The projected data can be modified and re-transferred at any time.

The screens and panels are components of a visualization device contained in the IndraWorks project.

Inserting a Visualization Device　　A new visualization device can be inserted in the current IndraWorks project from the device library by drag-and-drop.
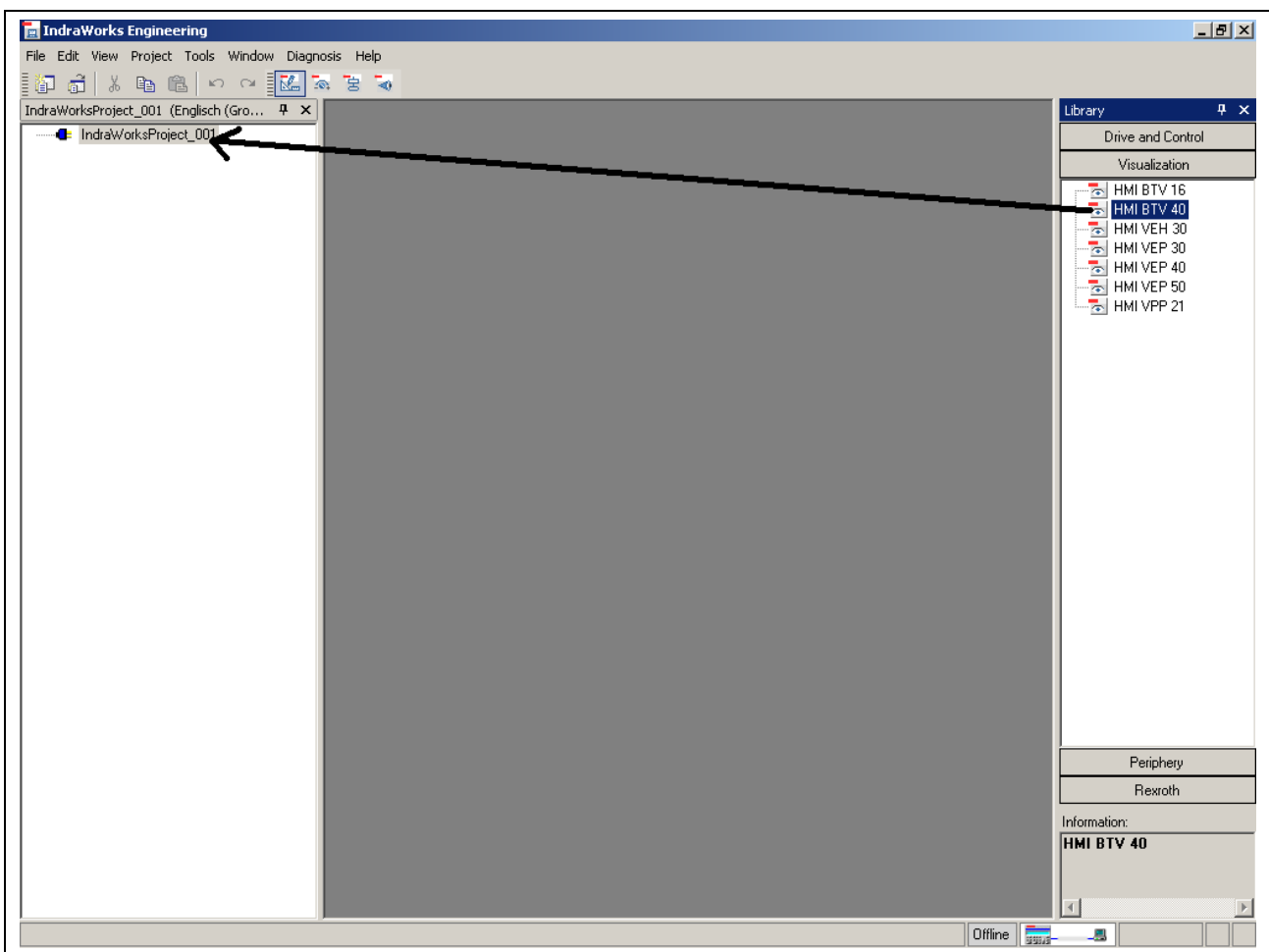
Fig. 3-1:　　Inserting a visualization device

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HMI Wizard

After a device has been inserted in the project folder, the screen will display a wizard providing general information on the device configuration.
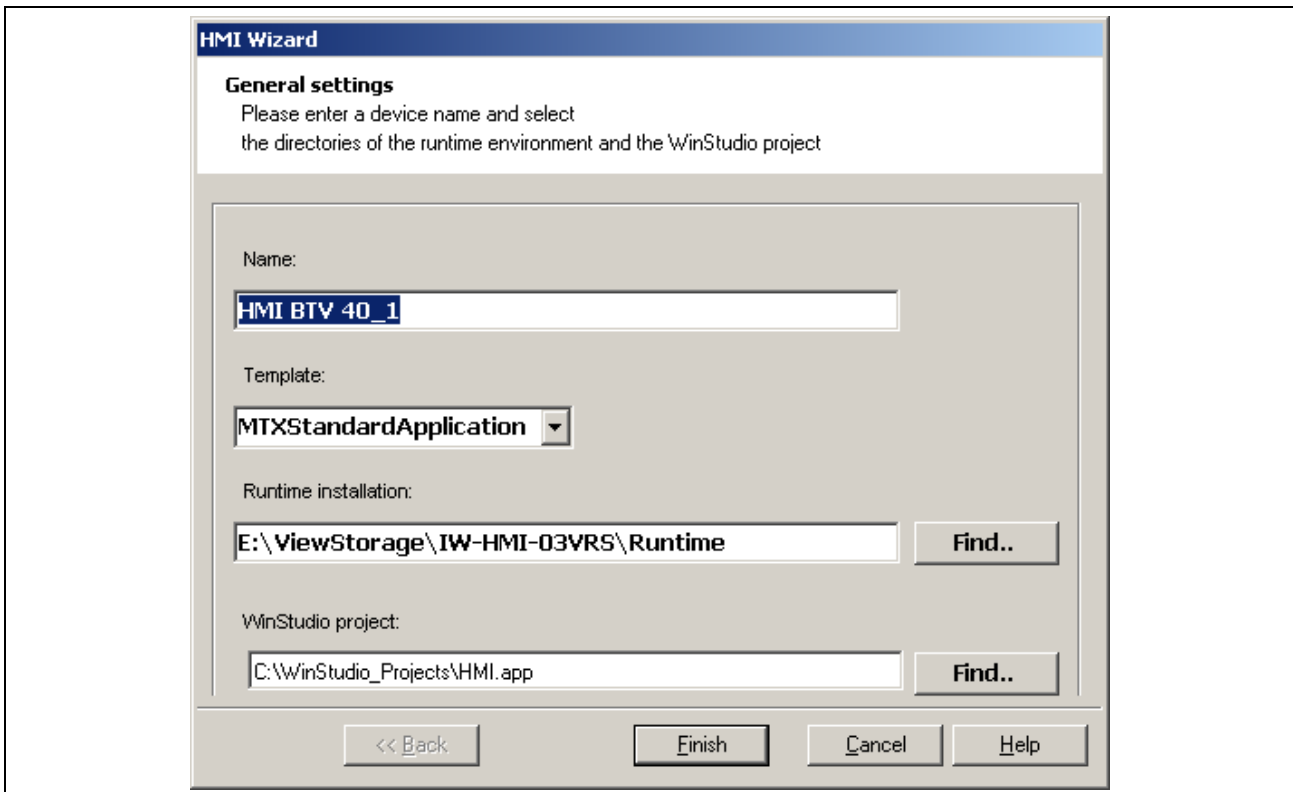
Fig. 3-2: HMI Wizard

The following settings which can be edited if necessary are displayed:

- **Name:** Name of the visualization device which is displayed in the project folder (project explorer).

- **Template:** Configuration template for the visualization device. This list box provides various templates, depending on the systems installed. The templates vary according to the predefined assignment of the screen and panel configuration.

- **Runtime installation:** Directory where the operator desktop is installed. The configuration files are transferred to this directory by means of the "Download" function (see below). If the runtime installation resides on the same PC as IndraWorks Engineering, the path has already been preset. Otherwise, the appropriate path must be entered here. Alternately, you can also select the path with the help of the directory browser which you can call up by clicking the "Find" button.

- **WinStudio project:** When the visualization device is inserted in the IndraWorks project, an empty WinStudio project is created in this directory. This project can be used to create user screens.

The entries the wizard suggests for the runtime and WinStudio directories can also be edited at a later point. This can be achieved by means of the "Properties" dialog which can be opened via the context-sensitive menu of the visualization device.

Context-Sensitive Menu of the Visualization Device

Call up the context-sensitive menu by right-clicking on the HMI node of the project folder.
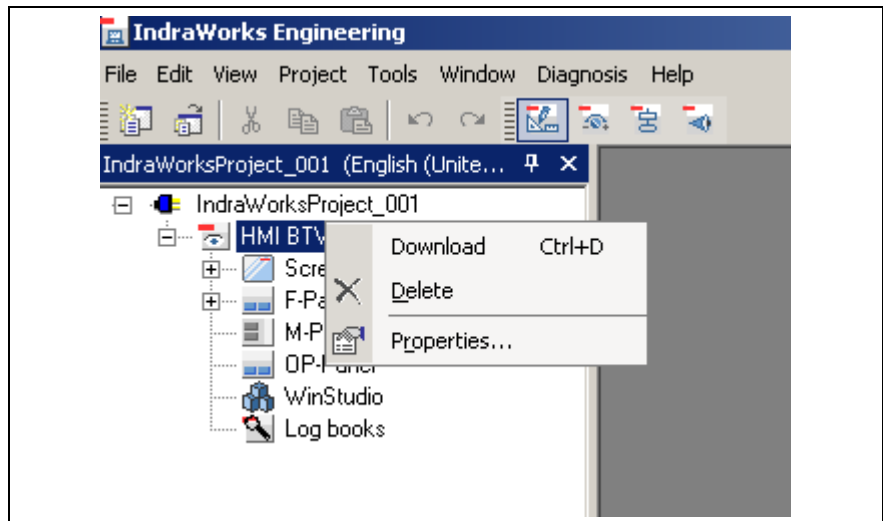
Fig. 3-3: Calling up the context-sensitive menu

The following functions are available:

- **Download**: The data projected is completely copied to the installation directory of the runtime system (IndraWorks Operation) (also see Section "Download").

- **Properties**: This function allows you to edit the properties of the visualization device at a later point.

"Properties" Dialog

The "Properties" dialog provides the following tabs:

General
- Name of the visualization device (cannot be changed at the moment)
- Directory of the runtime installation (see HMI Wizard)
- Directory of the WinStudio project (see HMI Wizard)
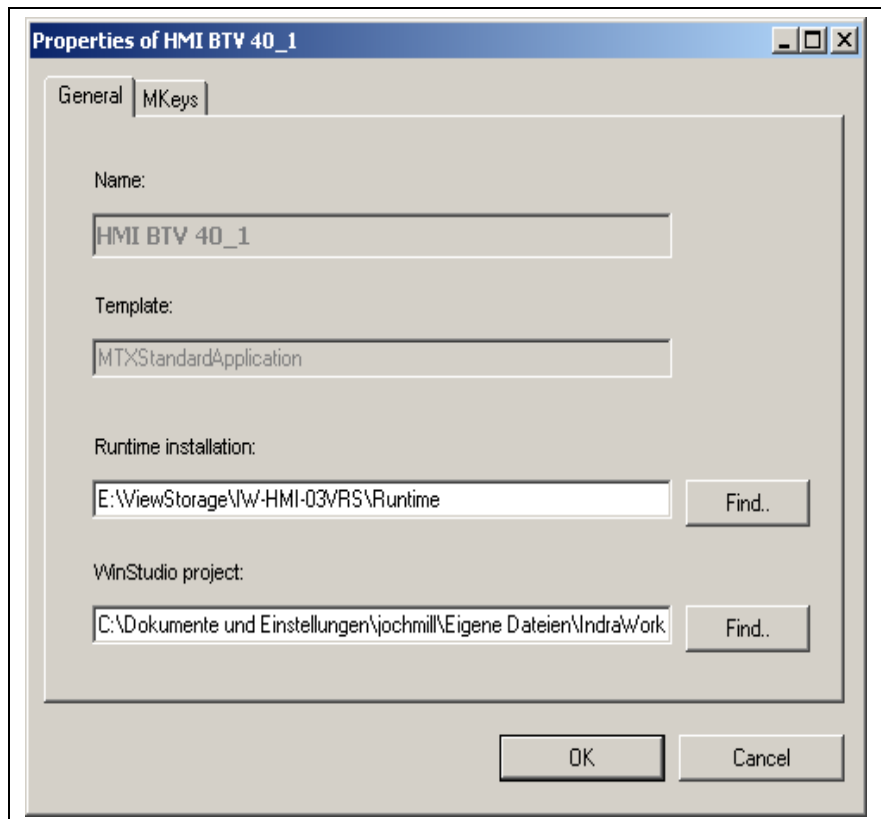
Fig. 3-4: Properties, General tab

M-Keys • FB instance: Name of the function block instance in the PLC program
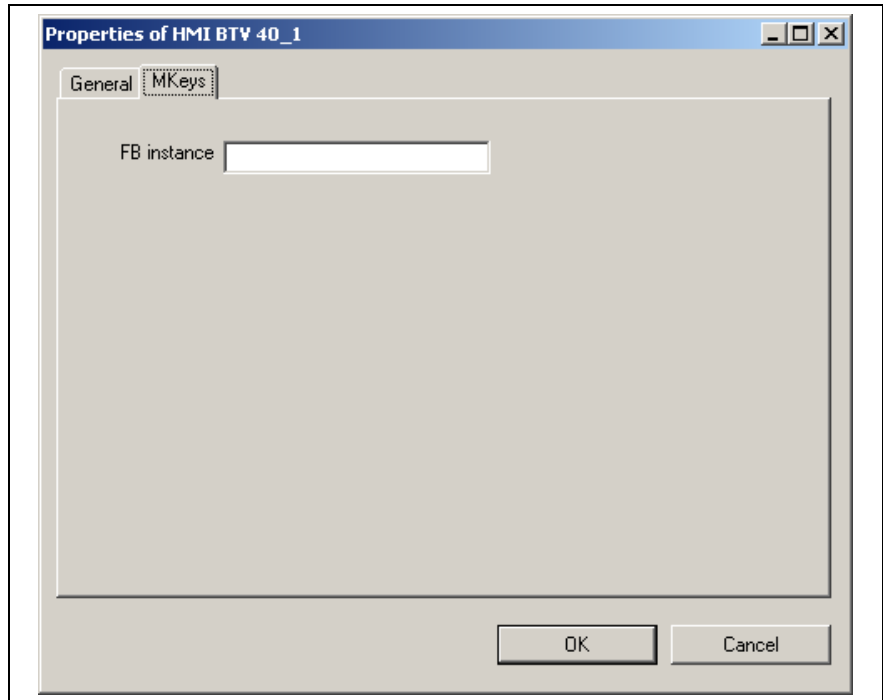
Fig. 3-5:   Properties, M-keys tab

Download

After projecting of the visualization device has been completed, all associated data of the project must be transferred to the destination device. This can be achieved with the "Download" function. The "Download" function can be called up in the context-sensitive menu of the visualization device. During this download, the project data is completely copied to the directory of the "runtime installation" (see properties of the visualization device). Information on the state of the copying process is provided by a progress bar.

The data can be downloaded only after IndraWorks Operation has been exited on the destination device. If this is not the case, an appropriate message is displayed.
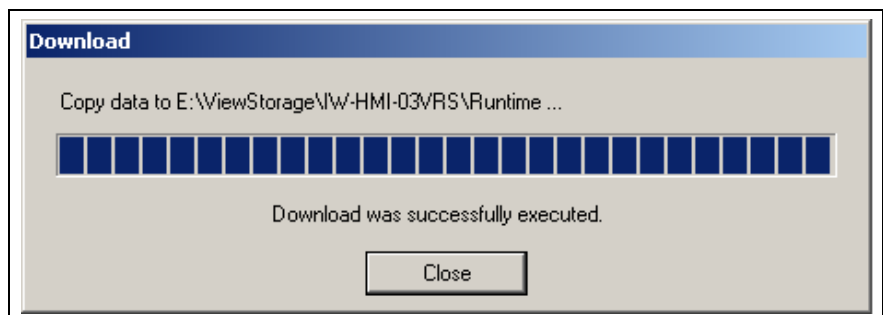
Fig. 3-6:   Downloading the project data of a visualization device

Note: The download of the visualization data does *not* include the download of a PLC program if available.

Download status   Downloading is necessary whenever data of a visualization device has been added, deleted or edited. The data must be downloaded in the following cases:

- when a new visualization device has been created,

- when screens and panels have been changed,

- when language-dependent user texts have been edited,

- when user management data has been edited,

- when WinStudio screens and settings have been changed.

A green arrow in the icon of the visualization device indicates that a download is required:
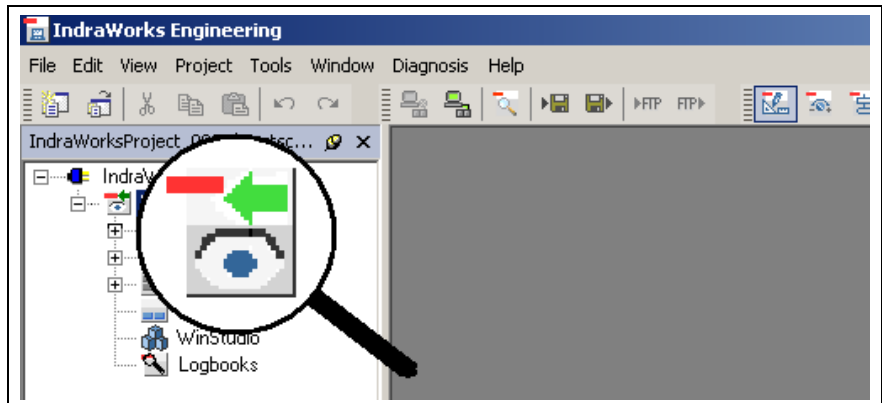
Fig. 3-7:   Indication of a necessary download

Immediately after the download has been completed, the arrow disappears, thus indicating that the project data is equal to the data on the destination device.

Whenever a current project is closed or IndraWorks Engineering is exited, the system is checked for data still to be transferred. If yes, the user is asked whether the data should be downloaded.

Structure of the Visualization Device

In the project folder, the visualization device is subdivided in the following subfolders:

- **Screens**:   Folder for system-specific and projected screens
- **F-panels**:   Folder for system-specific and projected F-panels
- **M-panels**:   Folder for system-specific and projected M-panels
- **OP-panel:**   Configuration of OP-keys and operating contexts
- **WinStudio**: Projecting tool for user screens, started by double-clicking or by pressing <ENTER>
- **Log books:** Folder with all log books projected
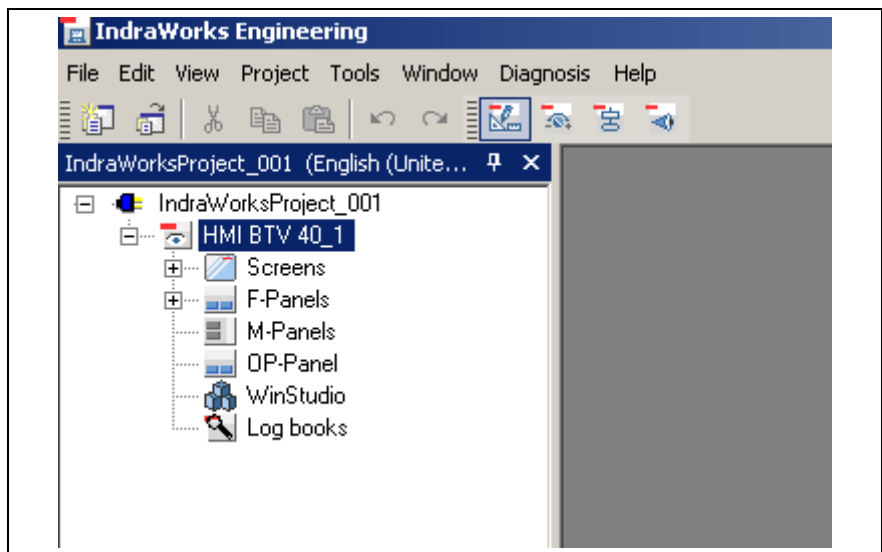
Fig. 3-8:   Subfolders of an HMI project

Adding Panels and Screens   Use the context-sensitive menus of the various subfolders to edit and add screens and/or panels.
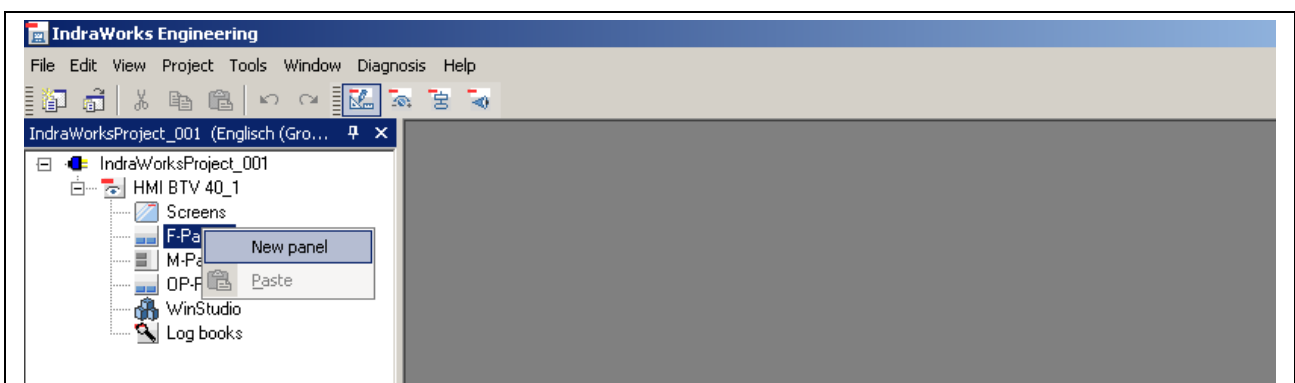
Fig. 3-9:   Creating panels and/or screens

ToolTip   The ToolTip indicates the path and the resource file where the data configured is residing. To show the ToolTip, position the mouse pointer on an element of the project folder.
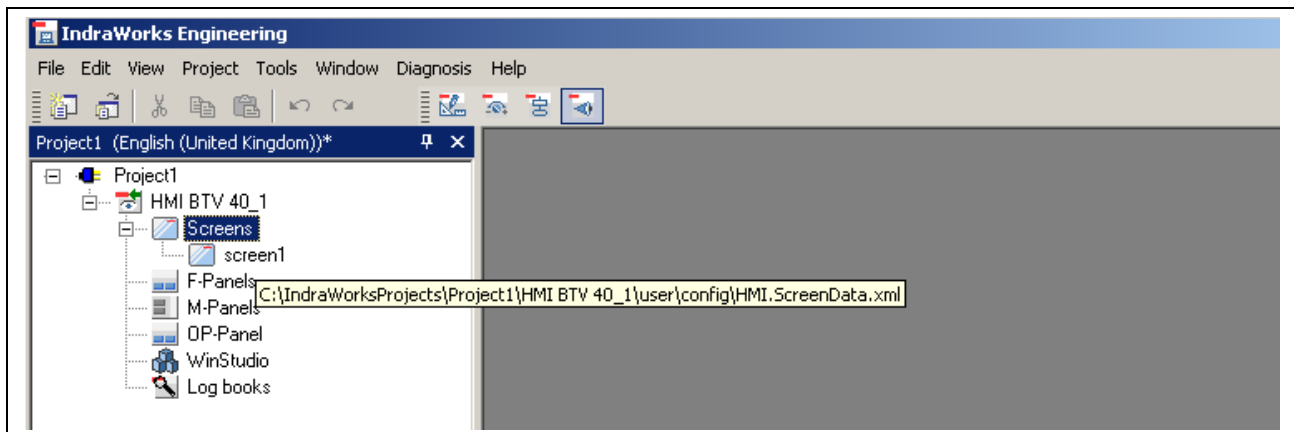
Fig. 3-10:   ToolTip

3.2 Screen Configuration

A screen is defined as a visible application within the IndraWorks runtime environment (e.g. diagnosis and user screens).

Creating a Screen   The configuration of a screen comprises the following steps:

- Generating a screen.
- Selecting an application, e.g. user screen, diagnosis screen, external application.
- In case of user screens: creating screens files by means of WinStudio.
- Selecting or creating and configuring F-keys.
- Selecting or creating and configuring M-keys.
- Entering the screen number.

It is also possible to define a screen as startup screen to be displayed after the runtime environment has been started.

Screen Editor

The screen editor serves to configure all of the parameters of a screen.

Creating a New Screen   Right-click on the "Screens" sub-node to create a new screen.
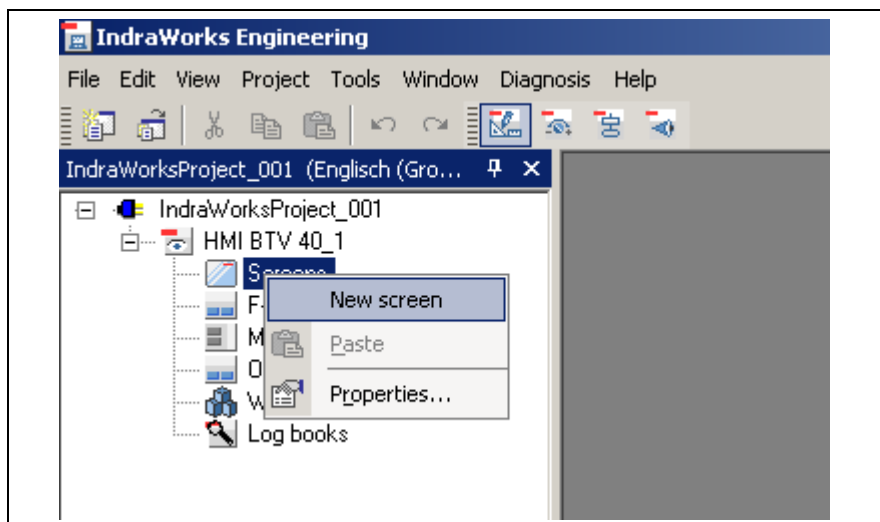
Fig. 3-11:   Creating a new screen entry

After you have selected the "New screen" menu item, an input dialog will open where you can enter any name. This name is intended for identification of the screen for which reason it must be unique. The "File" field shows the file containing the screen information. The file name shown in this field is predefined. Click "OK" to add a new entry to the "Screens" folder.
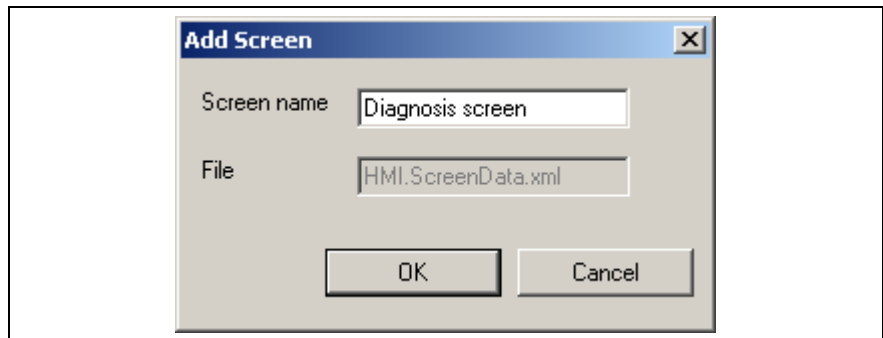
Fig. 3-12:   Dialog for entering a screen name

Editing a Screen   To configure the screen, double-click on a sub-element of the "Screens" folder. The screen editor opens, displaying the current settings. When a new screen is created, the input fields are empty and still need to be assigned appropriately.
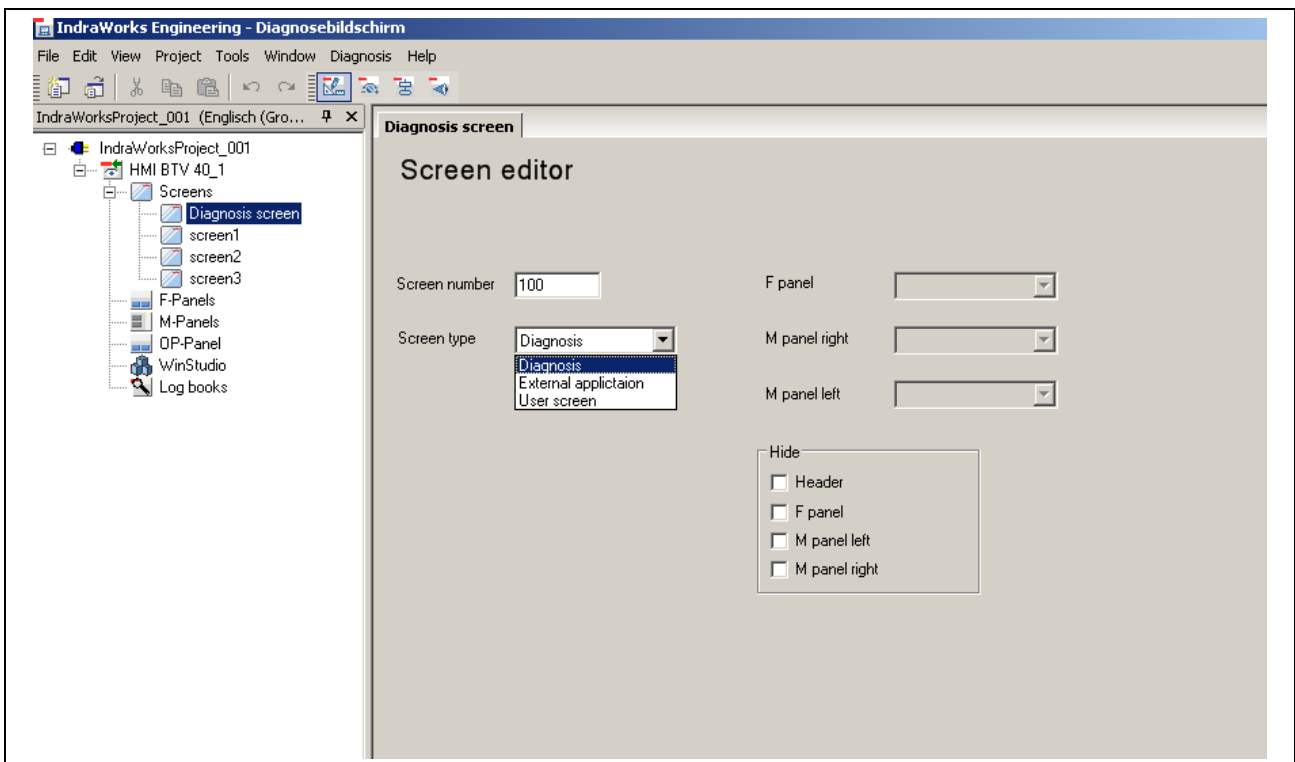
Fig. 3-13:   Screen editor

Screen Number   Unique screen number for interaction with a PLC program. The value is written to a projectable PLC variable when the screen is called up. The PLC can also cause the screen to be changed, if it writes the entered screen number to a projectable PLC variable (also see "Screen Control by the PLC"). The screen number write function is presently only effective for user screens, the diagnosis overview and external applications.

Screen Type   The "Screen type" list box displays all of the applications provided which can be configured and called up. Here, a screen type must be selected. The option of configuring additional F-keys and M-keys is predefined for various screen types. If this is not the case, the corresponding input fields are deactivated. A screen type can also have a parameter which is required for starting the application at runtime. If an application (e. g. user screen) requires such a parameter, an additional input field is displayed, where the parameter in question (e.g. screen name of a WinStudio screen) is entered. The values to be entered for the parameter can be found in the application documentation of the system concerned.

Selecting F-Keys   The "F-panel" input field allows to assign F-keys shown together with the screen at runtime to the screen. These F-keys can be labeled and assigned with functions as desired. These F-keys are configured by means of the F-panel editor (see Section 3.3). If you do not enter any F-panel, the F-key assignment of the screen shown previously remains as it is at runtime.

The list box provides all F-panels which have already been created and listed in the "F-panels" folder. If you wish to create a new F-key assignment, you must enter the name of the new F-panel in the input field. To open a dialog for confirming the creation of the new F-panel, move the focus to a different field (by pressing <TAB> or left-clicking). Thereafter, the new F-panel will appear both in the list box and in the "F-panels" folder. The F-panel editor can be used to assign functions to the F-panel, which is then also available for use by other screens.

Selecting M-Keys   M-keys are configured in analogy to the F-keys. Here as well, existing M-panels can be selected or new M-panels can be created, both for the right-hand and the left-hand edges. New entries are inserted in the "M-panels" folder.

Hide   These screen-specific settings allow you to hide parts of the desktop, so that more space is available for the screen contents. For example, this might become necessary if you wish to call up external applications which possess their own operating elements. This option is effective as soon as the screen is activated at runtime. Please note that toggling the screen takes longer if you use this option.

Screen Control by the PLC

Each visualization device provides the possibility of synchronizing the user interface with the active PLC program. This can be achieved by writing a screen number entered for a screen to a projectable PLC variable as soon as the screen is displayed in the runtime environment. This mechanism can be used to trigger associated actions in the PLC program, if necessary.

Vice versa, it is also possible to trigger a screen change by setting a second PLC variable. Here, the related screen is activated, and the operating context is also changed, if necessary, and the F-panels and M-panels specified are displayed. This function is presently only effective for user screens, the diagnosis overview and external applications.

Configure the screen control by selecting the "Properties" menu item from the context-sensitive menu of the "Screens" folder. This will open the configuration dialog below:

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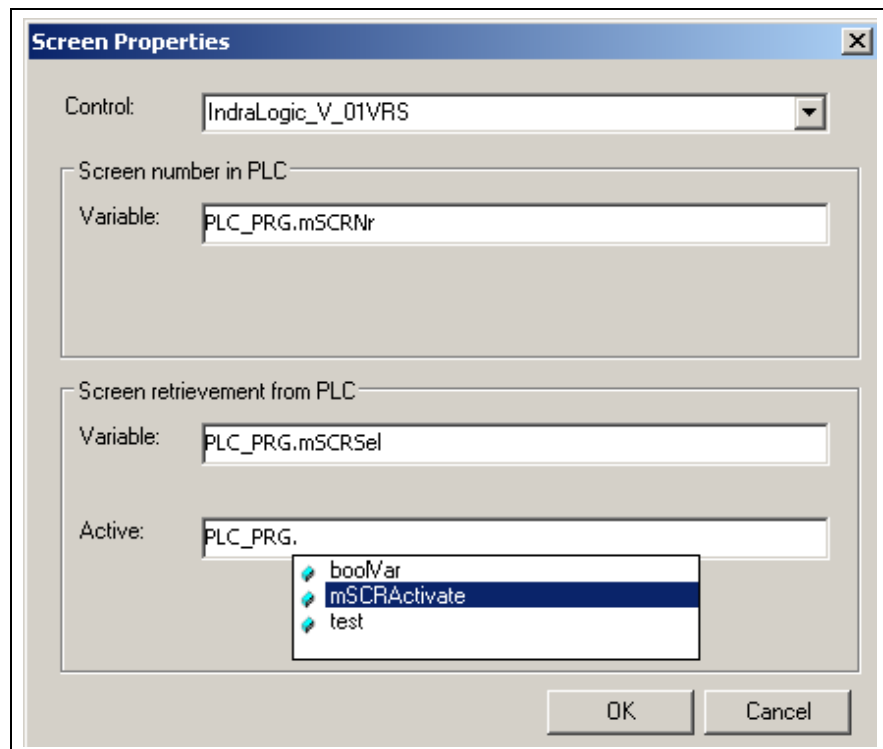
Fig. 3-14:   Screen control configuration

Control   Name of the control containing the program selected for communication with the visualization device.

Screen Number in PLC   PLC variable (including instance path) of the integer type, to which the screen number is written.

Screen Retrievement from PLC   Name of a PLC variable of the integer type, from which the screen number is read from the PLC. A Boolean PLC variable which is read by the visualization device must be entered in the "Active" field. Once this variable assumes the value TRUE, the screen change is triggered. After this variable has been evaluated, the visualization device is reset to the value FALSE.

Startup Screen

The "Startup screen" item allows to define precisely one of the screens configured to be opened immediately without any operator action after IndraWorks Operation has been started. The currently set startup screen is identified by its highlighted icon.

You can change this setting by clicking a different screen entry in the project tree. Then right-click to open the context-sensitive menu and select the "Startup screen" entry. Thereafter, the previous startup screen is reset and the new screen will be selected as the startup screen.
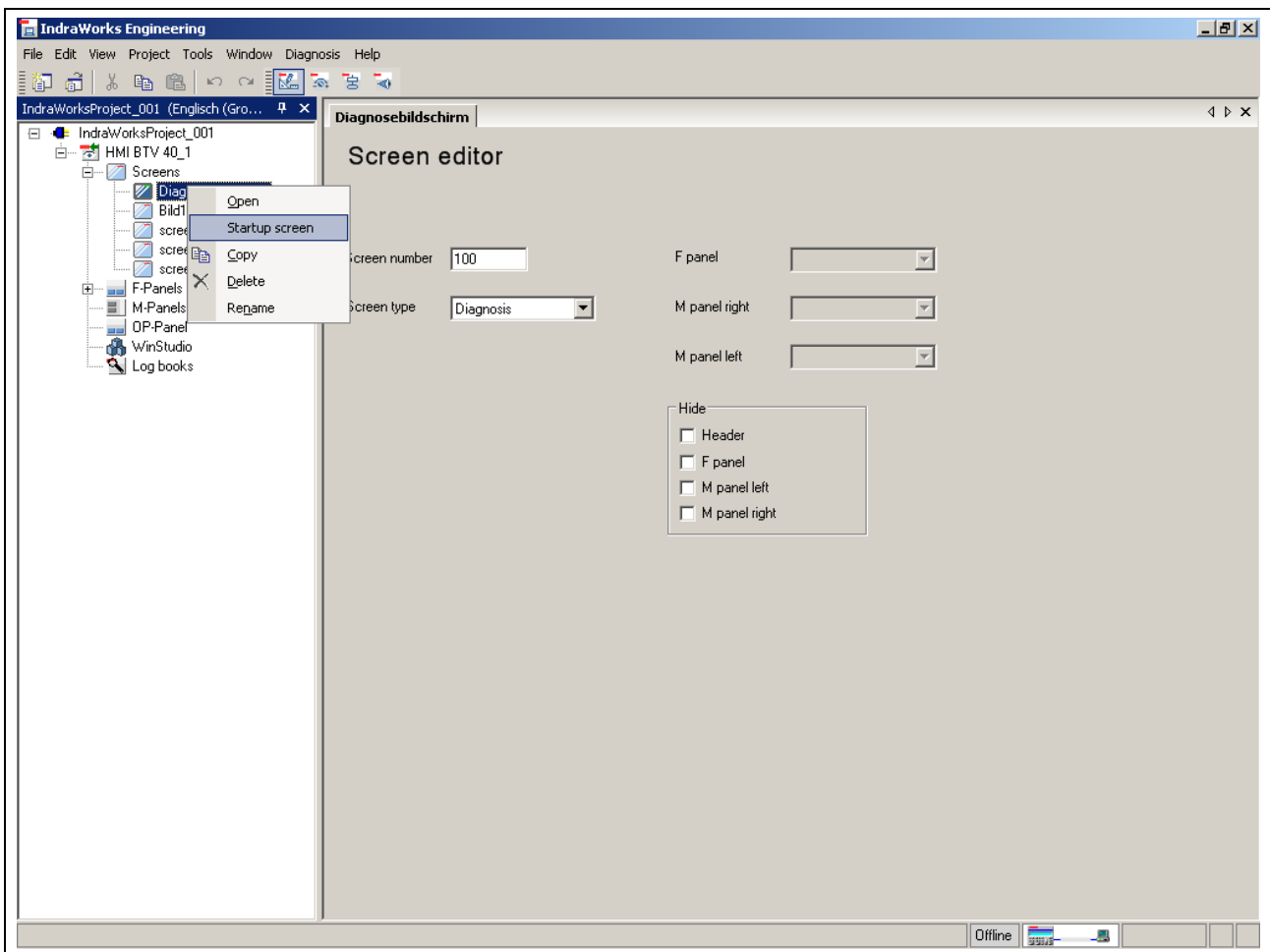
Fig. 3-15:   Defining a startup screen

Saving the Screen

The settings of a screen are saved once the related editor is closed. Current changes are saved after a prompt. If you do not wish to close the editor, you can select the "Save" menu item from the context-sensitive menu of the project folder. This also saves the changes made in all other open editors.

Renaming a Screen

The screen name can be changed subsequently. Select the screen entry from the "Screens" folder and click on it again. The entry changes to the input mode and can be edited.

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Deleting a Screen

After having been selected from the project folder, any screen that is not required can be deleted by pressing the <Del> key or using the context-sensitive menu. This will remove the entry from the folder.

"User Screen" Type (WinStudio)

In addition to the IndraWorks HMI applications available in the basic scope, you can also create your own screens by means of WinStudio. WinStudio allows you to insert and arrange graphical display and control elements as you desire and to link their representation to process variables if necessary. The user screen created will be saved and can be displayed at runtime.

Starting WinStudio

Start WinStudio by double-clicking on the "WinStudio" icon in the project folder. If WinStudio is started for the first time, an empty project will be opened.

You can now create your own screens in the WinStudio project. Using the "Insert" menu item, you can create a new user screen in the "Screens" folder.
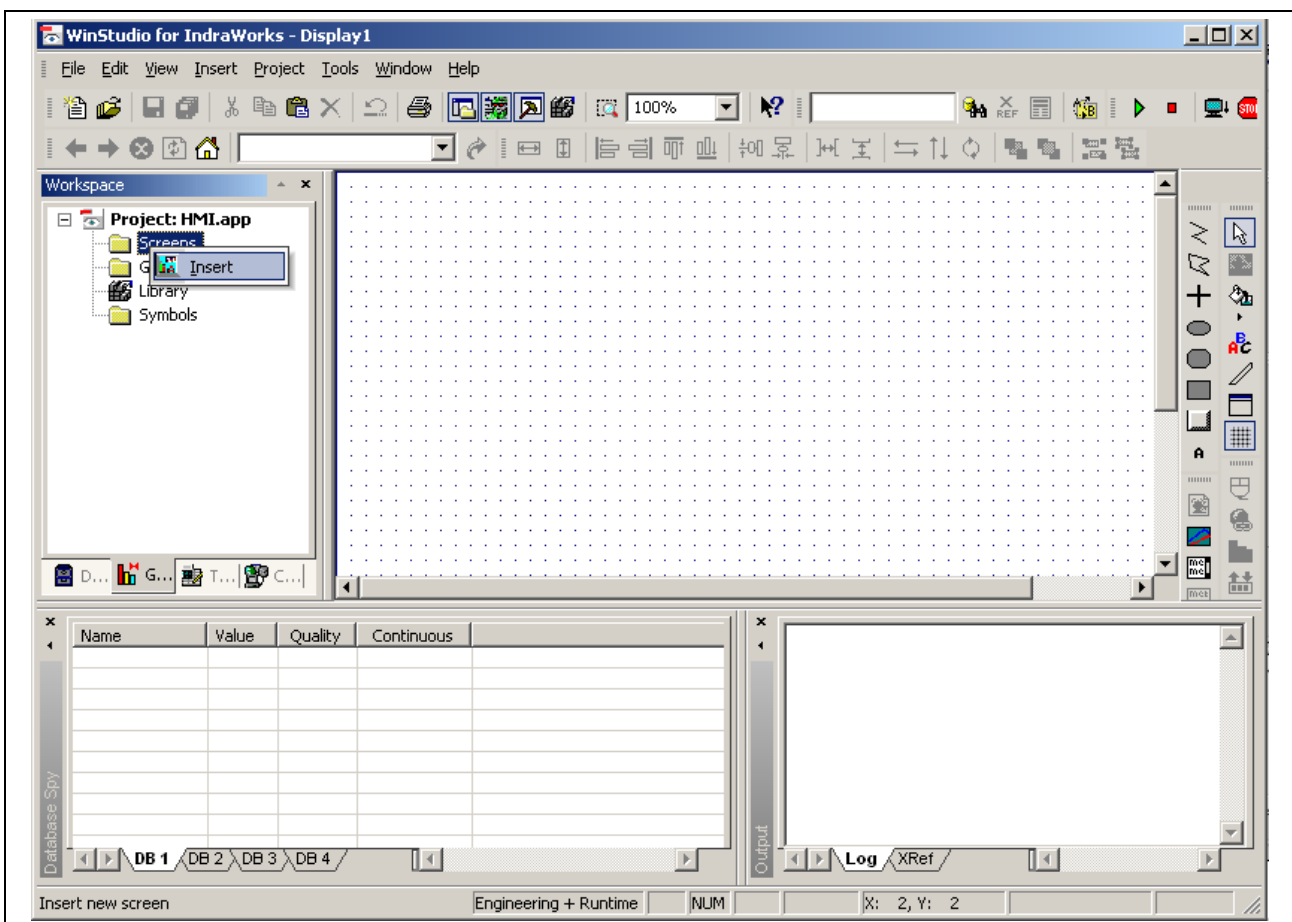
Fig. 3-16:   WinStudio

Screen Attributes

A dialog will be opened where you can define various screen attributes, such as the screen size and the screen location. The appropriate default values for the various systems are already entered in the "Size" field:

- MTX systems: Width: 620   Height: 412

- Other systems: Width: 620   Height: 435

Note: Do not change the settings in the "Size" and "Location" fields, because this would result in faulty screen representations.
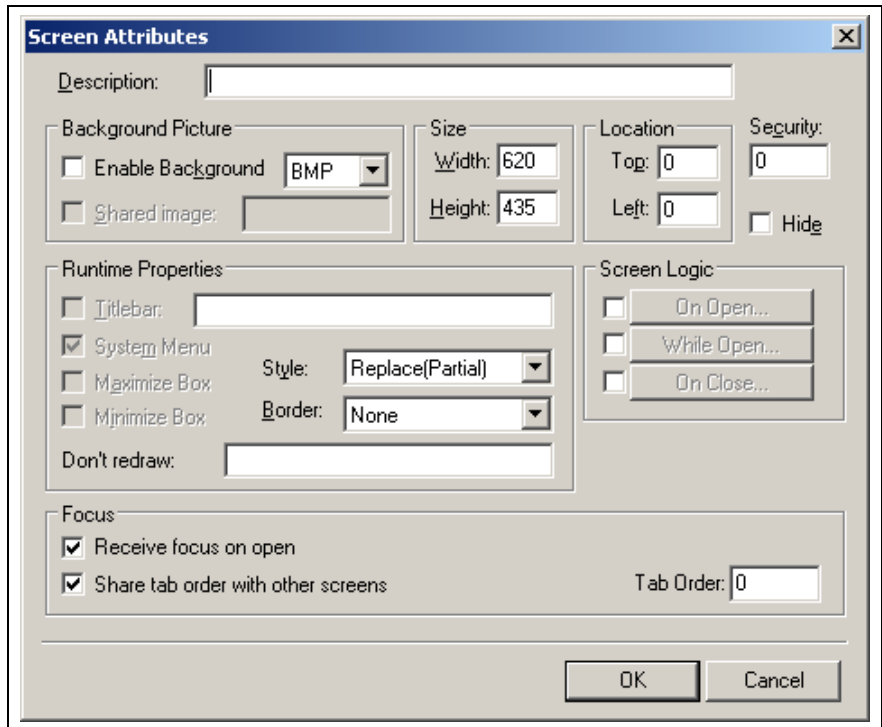
Fig. 3-17:   Attributes of a new user screen

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Editing and Saving a User Screen

Using the tool bar to the right of the screen, you can select display and control elements and insert them in the screen.

To save a user screen, select "Save As…" from the "File" menu in the menu bar. This will display the prompt to enter a file name (= screen name). This file name is also the reference name for configuring the screen call.
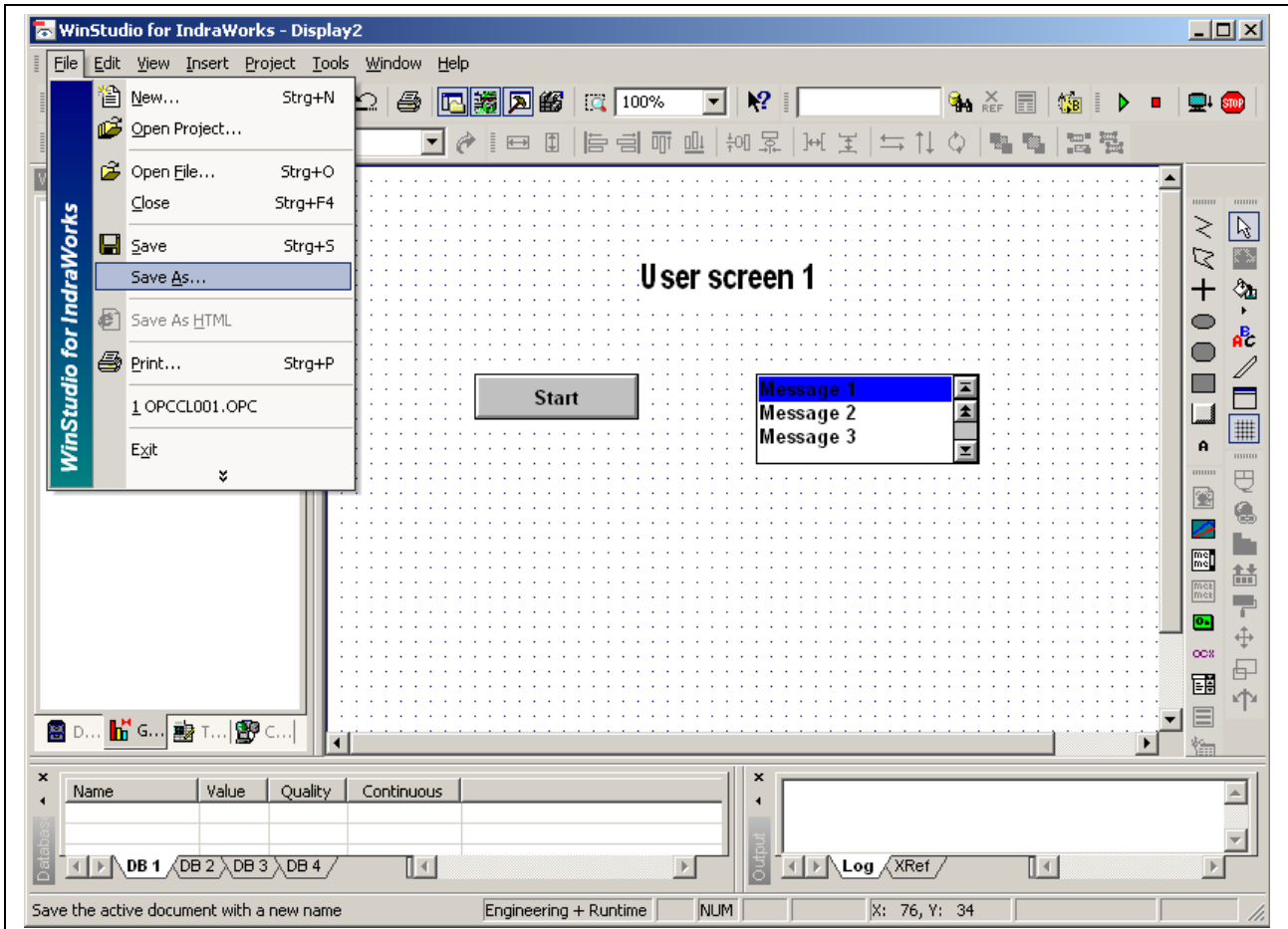
Fig. 3-18:   Saving a user screen

Triggering Actions with F-Keys or M-Keys

If you wish to trigger an action in a user screen with an F-key or an M-key at runtime of IndraWorks Operation, you must assign a command to a control element (e.g. a button). To achieve this, click the "Command" button in the WinStudio tool bar. Then select the "Command" property from the "Properties" dialog of the control element and configure it appropriately. Enter the desired actions in the "Tag / Expression" table (also see WinStudio documentation). In addition, select a key from the "Key" list box and, if necessary, activate the modification keys "Shift", "Ctrl" and "Alt".
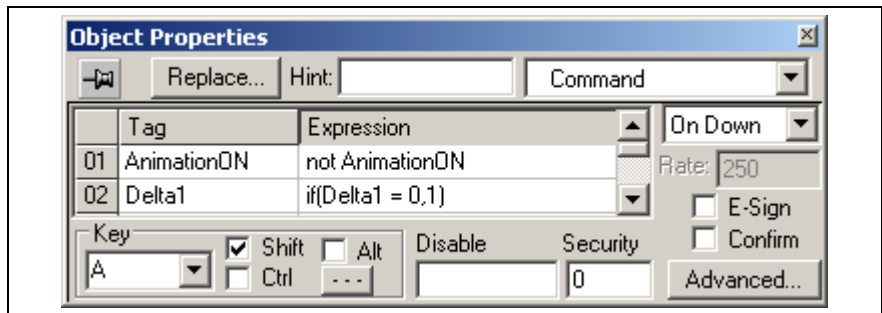
Fig. 3-19:   Configuring a keyboard code

Whenever you now press the key combination selected, the commands projected are executed at runtime.

Alternatively, the pressed key can also be simulated via an F-key or an M-key. To achieve this, select the "Activate keyboard code" function for the key in question from the F- or M-panel editor of the IndraWorks development environment and enter the key desired.
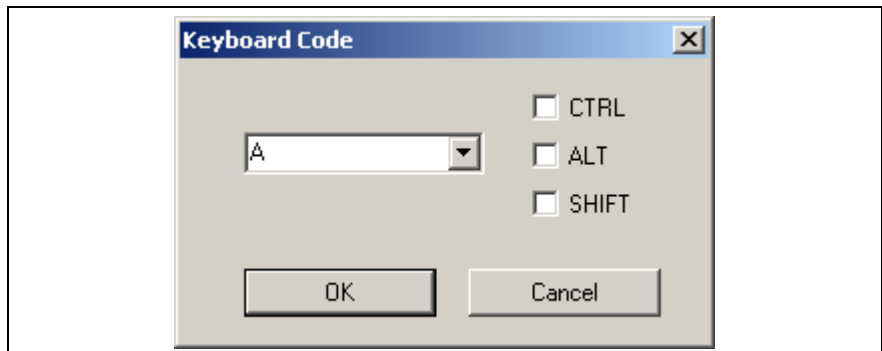
Fig. 3-20:   Activate keyboard code with F-key

Multilinguality

WinStudio user screens can be projected with more languages than one. The "Translation Editor" which can be called up via the "Tools" menu serves to create language-dependent texts.

In the translation editor, the "File", "New" menu function can be used to create a separate text file for each language. This text file is represented as a table with two columns. Enter the original text in the first column and the translated text in the second column. Then save the file as "HMI_XX.tra" with "XX" standing for the country code. For example, English texts are saved as "HMI_en.tra", German texts as "HMI_de.tra", and French texts as "HMI_fr.tra".

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Important WinStudio Settings

If the user screen fails to be displayed at runtime, this is often caused by an error in the presetting of the WinStudio project. In this case, please check whether the following settings under "Project", "Status" are correct:

1. TCP/IP Server: Automatic
2. Viewer: Manual
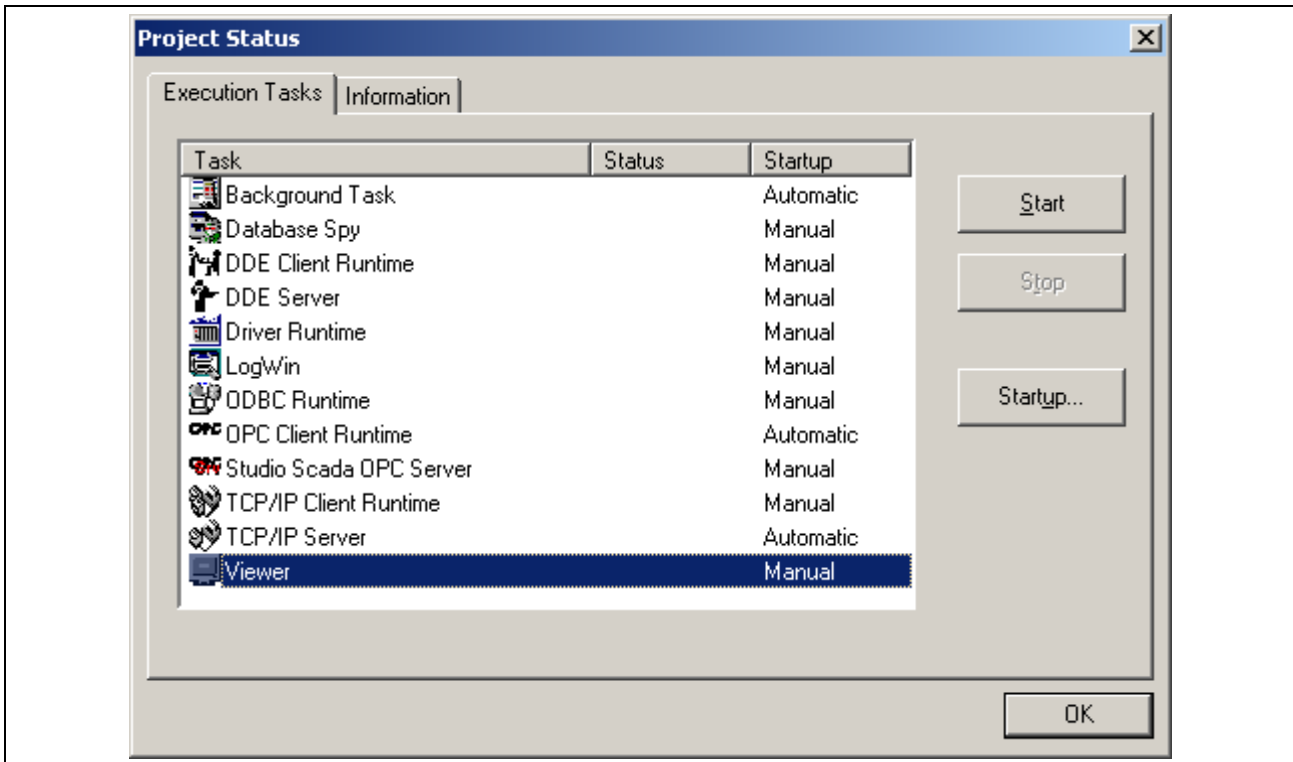
Fig. 3-21:   Project status

User Prompt

WinStudio provides a user management which can be used to protect screens and objects with a password at runtime. This user management can be changed in the "Workspace" window using the "Database" tab. This opens a "Security" folder whose context-sensitive menu provides the "Settings" entry. This opens a dialog where you can change the safety settings. The "Enable Security System" checkbox deactivates and activates the user prompt.
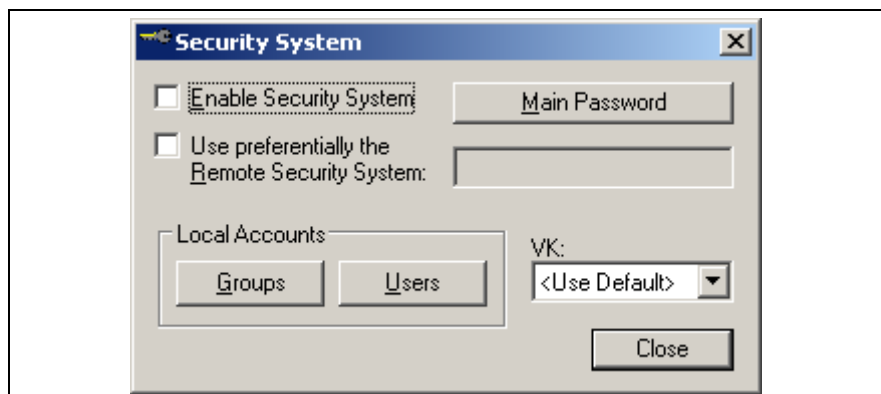
Fig. 3-22:   Deactivating the user prompt

Related Information

WinStudio provides extensive functions for the creation of user screens. The full functional scope is described in the documentation on Rexroth WinStudio /2/.

External Applications

The user desktop provides the option of starting any Windows applications with a graphical user interface and incorporating such applications in the screen management with the help of the F-keys and M-keys. To achieve this, create a screen in the "Screens" folder and select the "External Application" screen type. Next to the "Application" input field in the screen editor, there is a button which opens a dialog (see the figure below). This dialog allows the configuration of parameters for calling up the application.
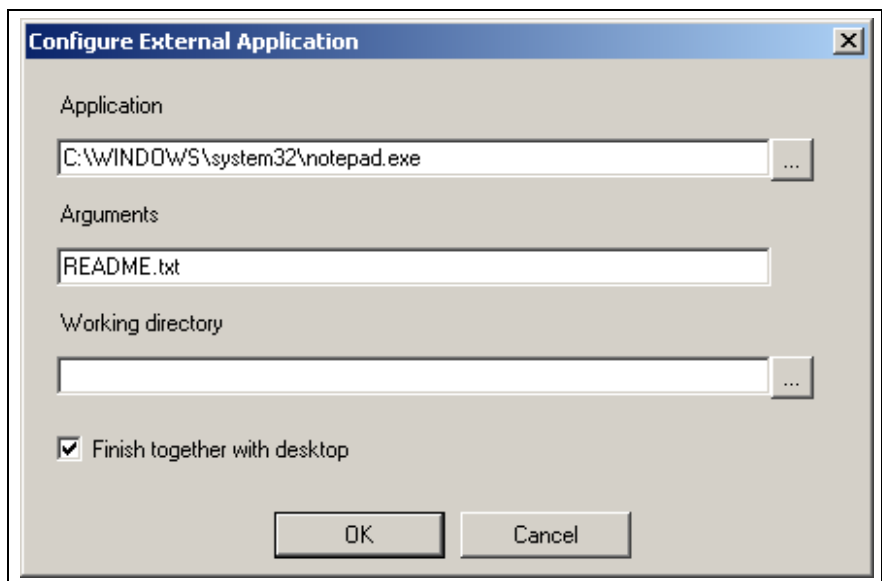
Fig. 3-23:   Configuring the call of an external application

Application   Name of the application including path specification

Arguments   These are parameters which are transferred to the external application when it is started. For example, such a parameter may be the name of a configuration file or a list of program parameters. The format of the arguments list can be found in the documentation on the application to be started.

Working Directory   In order to function properly, some applications require specification of a working directory which is searched for additional program components.

Finish together with desktop   This checkbox defines whether or not the application should be exited automatically when the desktop is exited.

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3.3 F-Key Configuration

General Information

F-keys serve to start or activate applications, to trigger functions, and to change the F-key assignment. Several F-keys are comprised to form an F-panel, with the number of keys per panel depending on the device type in question.

Creating an F-Panel

New F-panels are created either in the screen editor (see "Screen Configuration") or directly in the IndraWorks project explorer by means of the context-sensitive "F-panels" menu.. Click "New panel" to open an input dialog. Enter any name desired in the "Panel name" field. The new panel will be specified by this name in the "F-Panels" folder. The new panel will be saved to a new file the name of which is displayed in the "File" field. The file name is automatically generated from the panel name entered. It is also possible to change the specification and to use any other file name.

Click "OK" to confirm and insert the new entry in the "F-Panels" folder. The new panel can now also be selected from the "F-keys" list box of the screen editor.
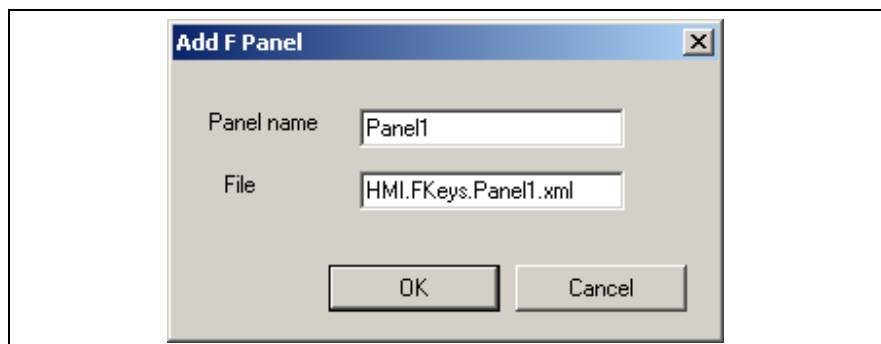
Fig. 3-24:   Input dialog for a new F-panel

F-Panel Editor

Any F-panel can be edited by means of the F-panel editor. To open the F-panel editor, double-click on a sub-element in the "F-Panels" folder. In its upper area, the F-panel editor shows a panel preview (1) displaying the texts and graphics of the various keys. The settings of each key are displayed in the fields below the key preview (2). These fields always display the settings of the key preview selected above.

The configuration of an F-key comprises the representation, i.e. label and display of the graphics, and the function to be triggered when the key is pressed at runtime. In addition, the "Details" button allows to show further setting options for specifically aligning the text and the graphics.
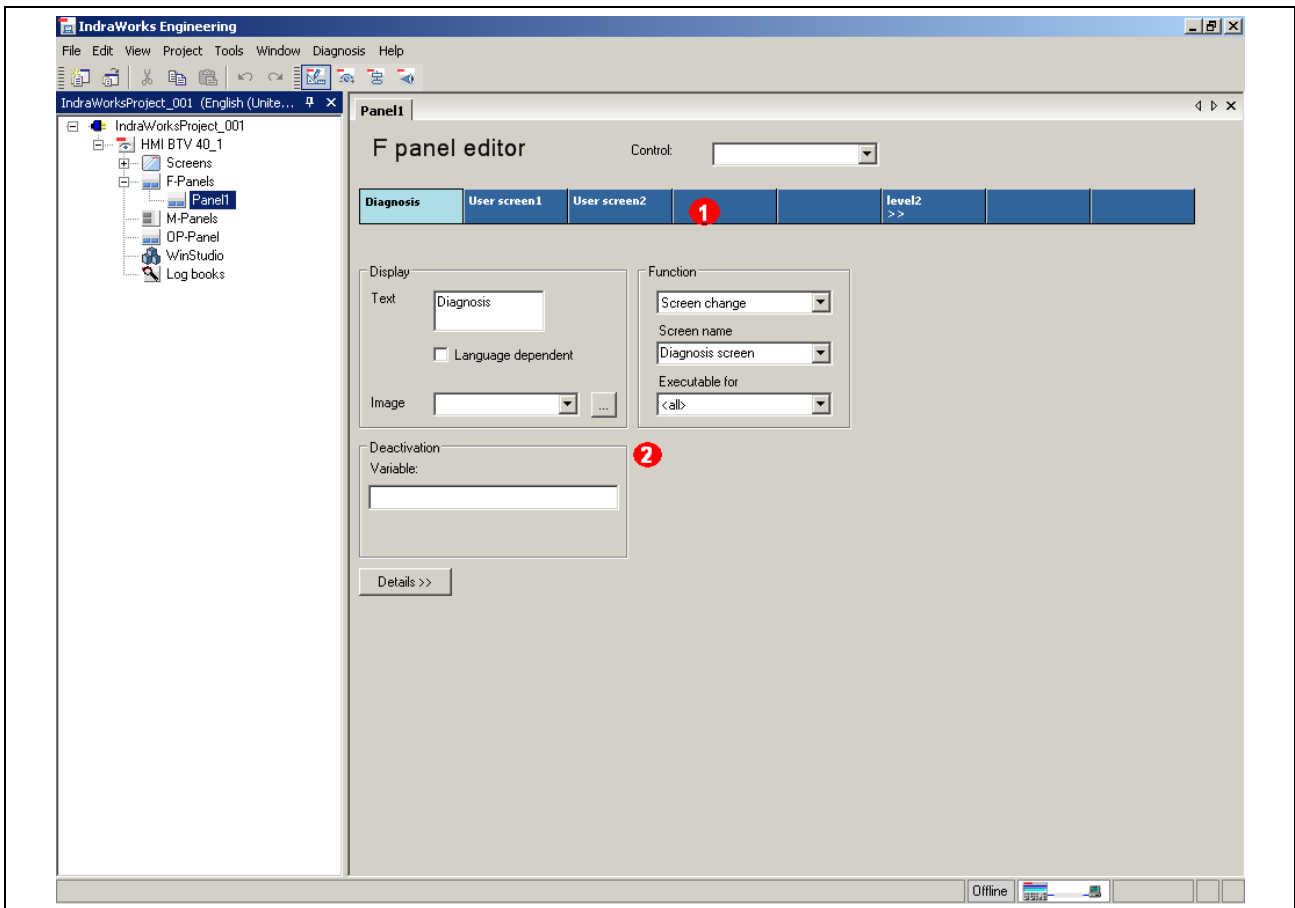
Fig. 3-25:   F-panel editor

Editing the Display   Enter the text to be displayed on the F-key in the "Display" field. The text may comprise two lines. Press the <Enter> key to achieve a line break.

Language-Dependent Text   Check the "Language dependent" checkbox to ensure that the text of a configured key label will be adjusted when the language is changed. For further detailed information, please refer to the section on "Language-Dependent User Texts".

Selecting an Image   Instead of or in addition to a text, it is also possible to assign an image to a key. To achieve this, select an image file from the "Image" list box. This image will be immediately shown in the key preview. The list box contains all image files which are already used in the current project. When a new project is created, this list is empty. New images can be imported to the project by clicking the browser button "…" which will open a file dialog. Select an image file to apply it to the list box. When the changes to the screen configuration are saved, the image file selected is copied to the project directory.

For displaying the image, the following formats are supported:

BMP, ICO, JPG, GIF, TIF, PNG

Please ensure that the size of the image selected does not exceed the size of the F-key. The keys of the various device types differ in size, with the following default values being applicable:

- IndraControl BTV 16: 97 x 29 pixels

- IndraControl BTV 40: 126 x 40 pixels

- IndraControl VPP 21: 126 x 40 pixels

If the maximum size is used, the image is fully visible only if the image is centered in the detail view (see below) or if the offset values are set to 0. It must also be ensured that the color depth of the image does not exceed the screen setting. Otherwise, the image might be falsified.

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Function   Each F-key can be related to a function. To achieve this, the first selection field provides a list of predefined basic functions. Default functions are "Screen change" and "Panel change". Other installed systems provide additional functions.

In the "Screen name" field, the "Screen change" function provides all screens from the "Screens" folder that have already been configured. These are user-defined screen IDs which are used to file specific screen information (screen type, F-panels, M-panels, screen number). If this function is executed at runtime, the screen selected and the associated panels are displayed. To call the filed screen information, double-click on the appropriate screen entry in the "Screens" folder.

The "Panel change" function only causes a change in the F-key assignment. This function can be used to select a different F-panel that has been created beforehand.

Executable for   The "Executable for" field serves to set the authorization for executing the function selected. There are the following predefined user roles: "Observer", "Operator", "Creator", or "Engineer". If one of these roles is selected, the current user will be checked at runtime of the user desktop. If there is no authorization, a login dialog will be displayed if necessary, where a different user can log in. To configure users in the user management of IndraWorks Engineering, select the "Configure user management" menu item from the "Project" menu. New users can be created and assigned to groups. Each group can assume exactly one of the four roles.

The setting always relates to the function and not to the key, i.e. if the same function is additionally configured for a different F-key, M-key or OP-key, the same "Executable for" setting will be applicable.

Deactivation   If you enter a Boolean PLC variable in this input field, the related F-key will be disabled or enabled at runtime, depending on the value of the variable. The key is operable only if the value is TRUE. Otherwise, the key labeling is gray and the function cannot be executed. The "Control" list box establishes the relation to the control. The control can be set separately for the F-panel.

Detailed Settings   Apart from the basic "Display" and "Function" settings, it is also possible to adjust the texts and images such that they differ from the preset positions and alignments. Using the "Details" button, you can show or hide further settings.
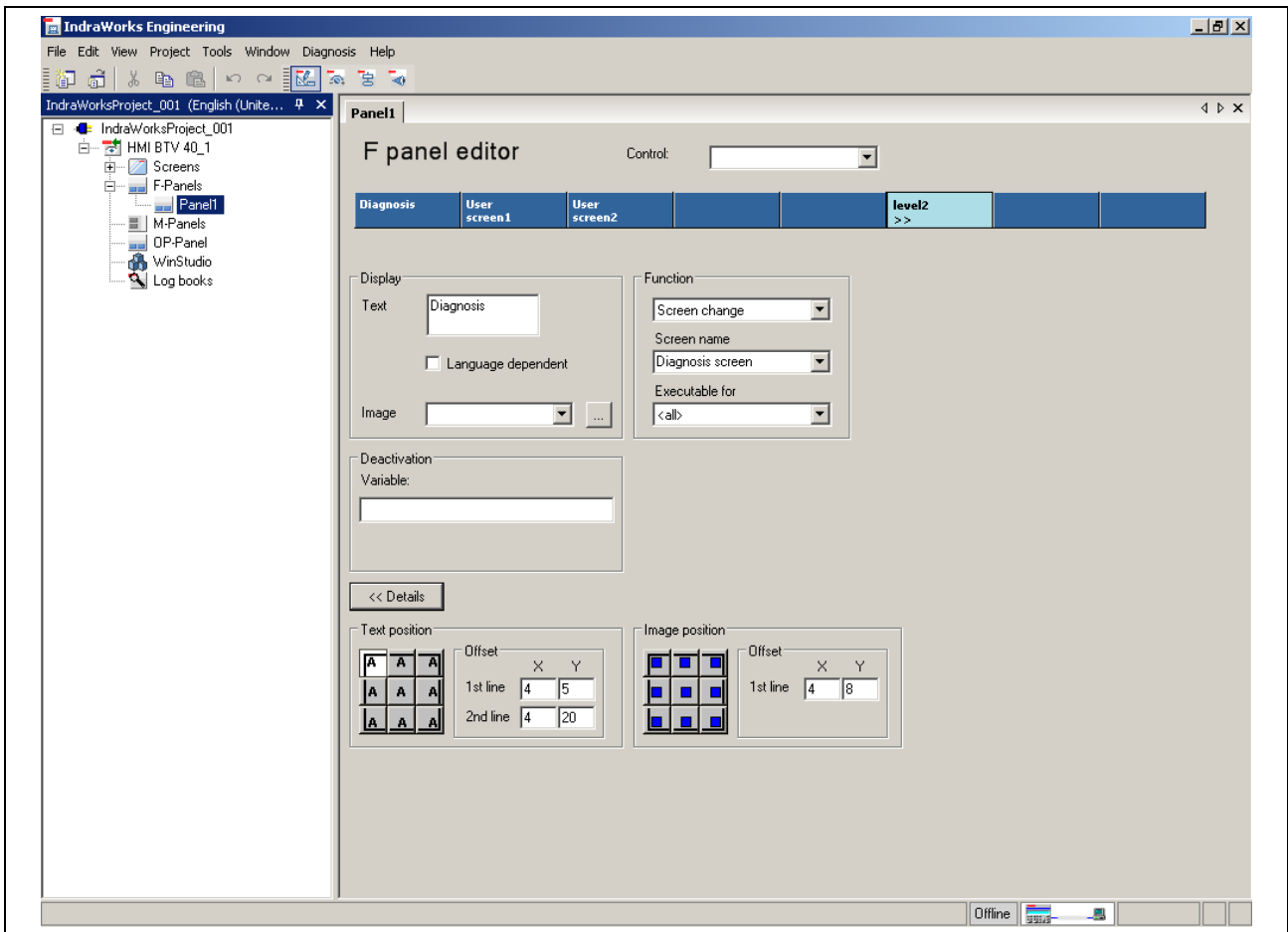
Fig. 3-26:   Detailed settings of an F-key

Copying, Deleting, Pasting an F-Key

The configuration of an individual F-key can be copied and pasted to a different F-key. Right-click on the key to be copied and select "Copy". Then select a different key (which might also belong to a different panel). Assign the configuration by selecting the "Paste" function from the context-sensitive menu. All settings, i.e. labeling and function of the F-key, will be overwritten by the copied key. Select the "Delete" menu item to remove all settings. You can also call up all actions by pressing the <CTRL>+<C>, <CTRL>+<V>, <CTRL>+<X> and <DEL> keys.

Renaming an F-Panel

The name of the F-panel can be changed subsequently. To do this, select the F-panel from the project explorer and click on it again. The entry changes to the input mode and can be edited. The file name specified on creation of the panel remains as it is.

Note: If you have already assigned the panel to a screen, you must also edit this setting for the screens concerned.

Deleting an F-Panel

After having been selected from the project explorer, any F-panel that is not required can be deleted by pressing the <Del> key or using the context-sensitive menu. The entry will be removed from the folder and the related file will be deleted. Any screens using the F-panel deleted must be adjusted accordingly.

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3.4   Configuration of OP-Keys and Operating Contexts

General Information

The OP-keys at the bottom of the screen can be used to start applications (screen change) and to change what is called operating contexts. In the basic IndraWorks HMI setting, the only key already assigned is the OP9 key which calls the diagnose. The function of this and the other OP-keys can be configured by means of the OP-panel editor.

A special function of OP-keys is the activation of operating contexts. Exactly one operating context can be assigned to one OP-key. Such an operating context comprises applications (e.g. screens) that are logically related to each other. When an operating context is activated for the first time, the set startup screen is opened. Then you can use the F-key or M-keys to start further applications. To view already open applications one after the other, click on the OP-keys repeatedly.

OP-Panel Editor

Fig. 3-27:   OP-panel editor

Editing the Display   Enter the text to be displayed on the OP-key in the "Display" field. The text may comprise two lines. Press the <Enter> key to achieve a line break.

Language-Dependent Text   Check the "Language dependent" checkbox to ensure that the text of a configured key label will be adjusted when the language is changed. For further detailed information, please refer to the section on "Language-Dependent User Texts".

Selecting an Image   Instead of or in addition to a text, it is also possible to assign an image to a key. To achieve this, select an image file from the "Image" list box. This image will be immediately shown in the key preview. The list box contains all image files which are already used in the current project. When a new project is created, this list is empty. New images can be imported to the project by clicking the browser button "…" which will open a file dialog. Select an image file to apply it to the list box. When the changes to the screen configuration are saved, the image file selected is copied to the project directory.

Function   A function can be assigned to an OP-key in the same manner as to an F-key (see "F-Panel Editor"); the available functions, however, are different. The "Screen change" and "Activate operating context" functions are available for OP-keys. To configure an existing operating context or create a new operating context, click the "...“ button which will open the operating context editor (see "Configuring Operating Contexts)"

Detailed Settings   As with the F-Panel Editor, the OP-panel settings for the position and alignment of texts and images can be changed and adjusted as desired. To show and hide these texts and images as required, click on the "Details" button.
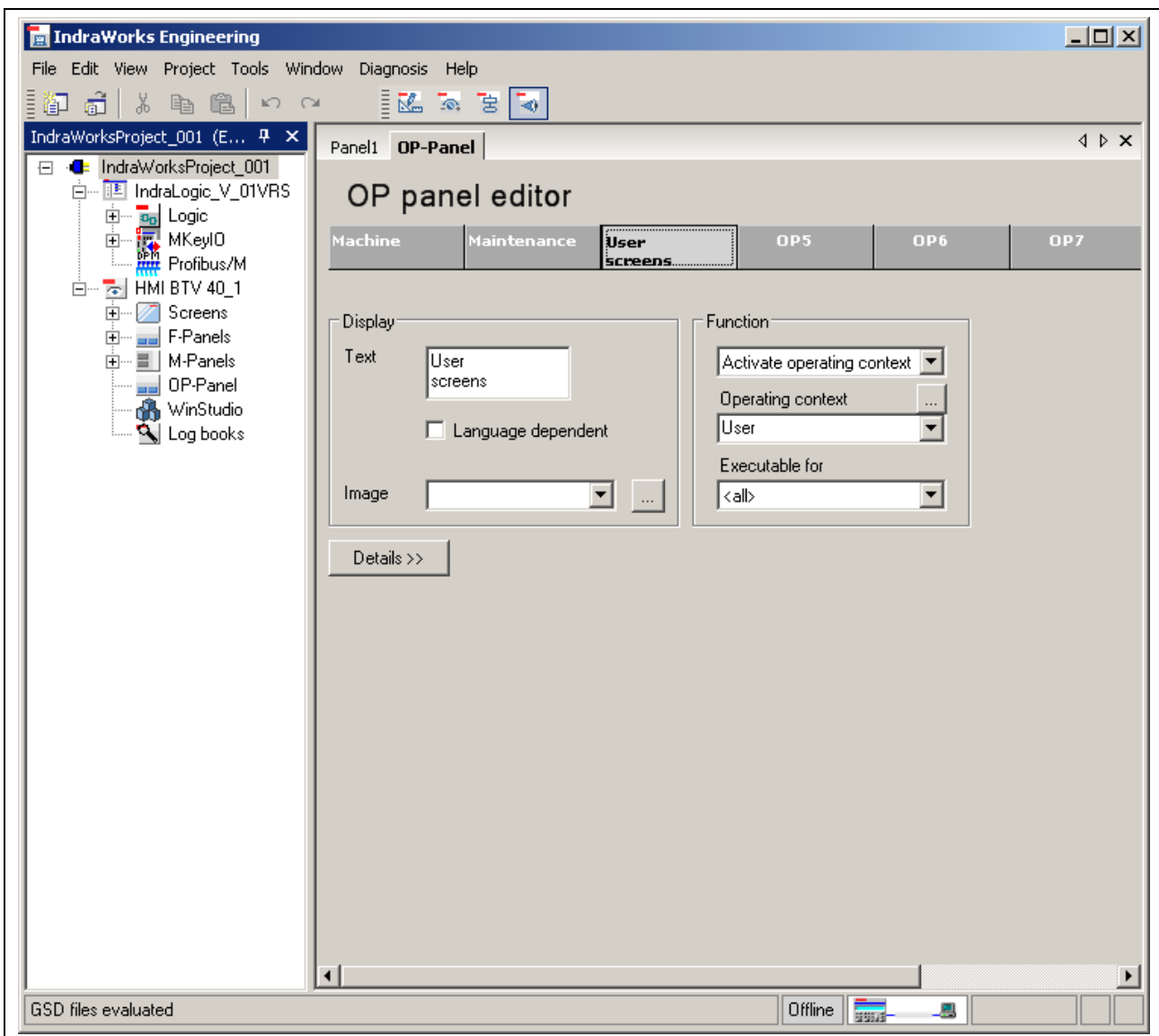
Copying, Deleting, Pasting an OP-Key   The configuration of an individual OP-key can be copied and pasted to a different OP-key. Right-click on the key to be copied and select "Copy". Then select a different key (which might also belong to a different panel). Assign the configuration by selecting the "Paste" function from the context-sensitive menu. All settings, i.e. labeling and function of the OP-key, will be overwritten by the copied key. Select the "Delete" menu item to remove all settings. You can also call up all actions by pressing the <CTRL>+<C>, <CTRL>+<V>, <CTRL>+<X> and <DEL> keys.

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Configuring Operating Contexts

An operating context that is assigned to an OP-key can be selected from the "Function" field of the OP-panel editor, after the "Activate operating context" function has been selected. If configured already, operating contexts can be selected from the list box. To configure an existing operating context or create a new operating context, click the "..." button which will open the operating context editor.
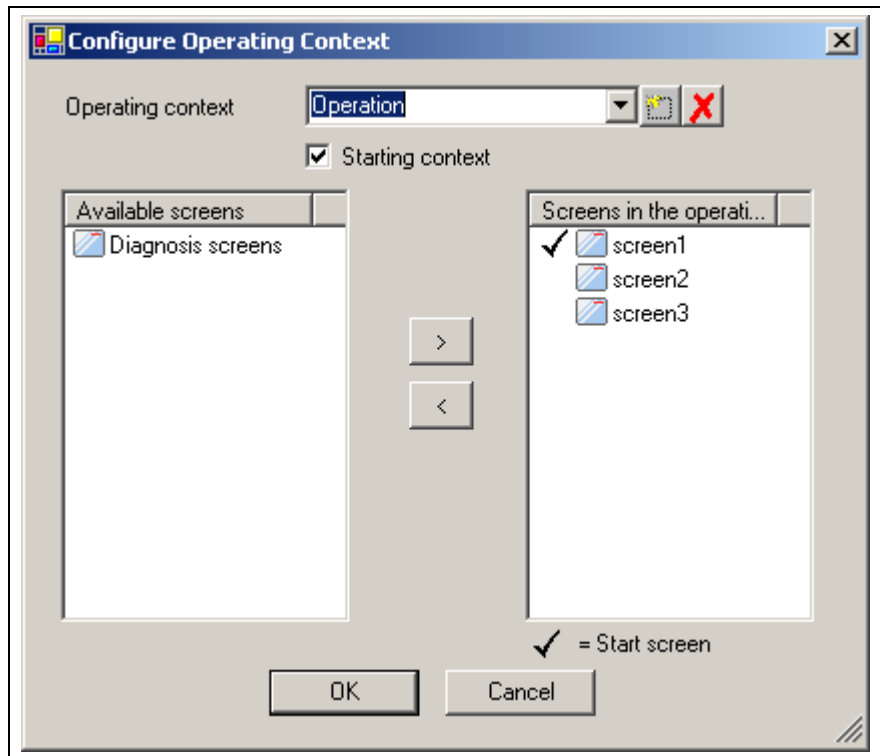
Fig. 3-28:   Operating context editor

Adding an Operating Context

To create a new operating context, enter the name desired in the "Operating context" list box. Click the button to the right to apply the entry to the list.

Configuring the Operating Context

The operating context editor contains a list which includes all screens which are not assigned to an operating context yet. If no operating context has been configured yet, this list contains all entries which can also be found in the "Screens" folder in the project explorer. To add the screens selected to the currently selected operating context, select the appropriate entries from this list and click the ">" button. The screens added are removed from the list of available screens and are not available to the other operating contexts any longer. Analogously, you can select entries from the list of screens in the operating context and remove them from the operating context by clicking the "<" button.

Removing an Operating Context

Any operating context that is not needed any longer can be removed by clicking the "x" button. All screens that were contained in this operating context will be added to the list of "Available screens".

Setting the Starting Context

One of the operating contexts can be selected to be automatically activated on start of the user desktop. Check the "Starting context" checkbox to configure the current operating context as starting context. Only one of the operating contexts can be configured as the starting context at a time. Any starting context previously activated will be deselected.

Setting the Start Screen   Each operating context can be provided with a start screen which is displayed when the operating context in question is activated for the first time. Whenever this operating context is activated again after the operating context has been changed, the previously opened screen will be used as the start screen. To select a screen as the start screen, double-click on the appropriate screen entry in the operating context. The currently set start screen is identified by its colored and highlighted icon.

Note: The combination of "Starting context" and "Start screen" defines the screen which will be activated immediately after IndraWorks Operation has been started.

3.5   M-Key Configuration

General Information

M-keys serve to trigger functions on the user interface or to set PLC flags in a control. M-keys (panels) can be shown to the left or right of the screen. The M-panel editor allows to configure and label the M-keys. Moreover, you can configure the function assignment and the link to the PLC flag by selecting the control and the instance of the "MKey" function block and entering the individual PLC flags.

FB Instance   To link the M-keys to the PLC, you must create an instance of the MKEYS or MKEYS_SINGLESEL function block in the PLC program (see "Programming the M-Keys in the PLC"). Enter the name of this instance as a property of the M-panel. To do this, call up the appropriate dialog by selecting the "Properties" menu item from the "M-Panels" folder (by right-clicking).
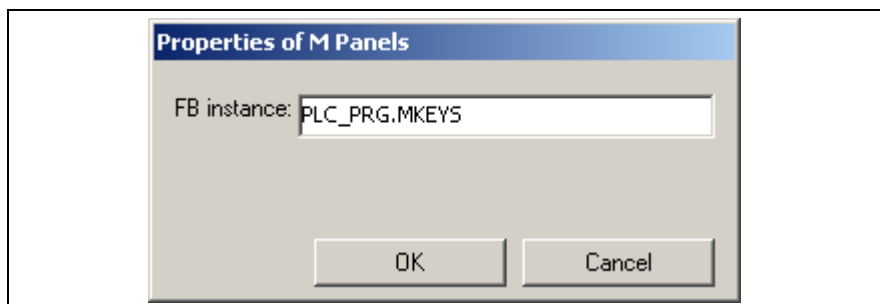
Fig. 3-29:   M-panel properties with instance name of the FB

Note: M-keys can be parameterized such that they are effective in various controls. The same instance name is used for every control.

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Creating an M-Panel

To generate new M-panels, select the "New panel" menu item from the context-sensitive menu of the "M-Panels" folder (to be opened by right-clicking on this folder). A dialog will open where you can enter a panel name to be used as a reference name when this panel is assigned to a screen. A file name is generated automatically from this name. The file name is used to save the data of the M-panel for communication with the PLC. The visual data of an M-panel, i.e. texts and images, are saved separately. Information on filing of this data is displayed in the "Reference panel" field. If necessary, the "Edit" button allows the specifications to be changed. For example, specifications must be changed if you wish to insert a new M-panel in an already existing file instead of in a new file. In this case, you can select a file from the list instead of selecting the file name specified.

The "Properties" function in the context-sensitive menu allows to change the settings for an already existing M-panel subsequently.
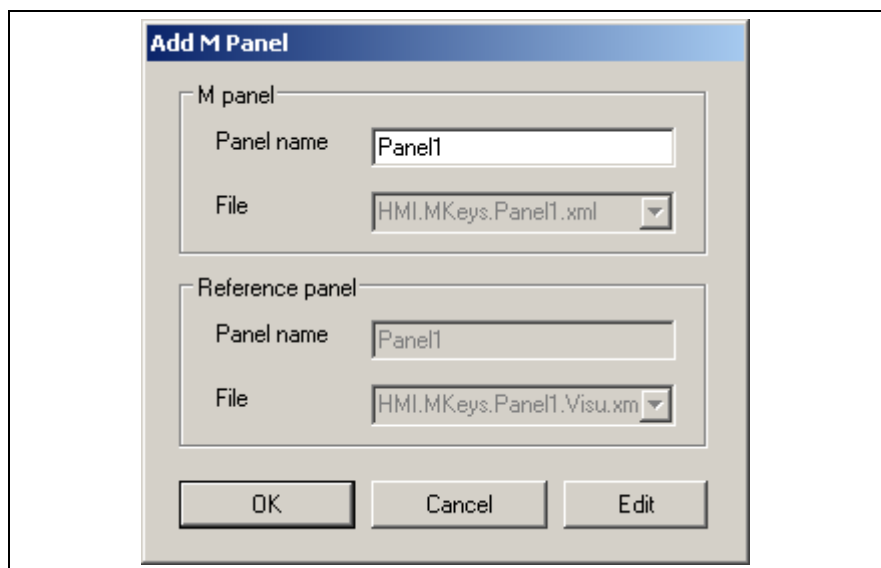
Fig. 3-30:   Dialog for creating an M-panel

M-Panel Editor

Any M-panel can be edited by means of the M-panel editor. To open the M-panel editor, double-click on an entry in the "M-Panels" folder. To its left, the M-panel editor provides a preview bar (2) which displays the assignment of the current panel. To show the settings of a key, click on appropriate key preview. These settings are grouped in the "Display" (3), "Function" (4) and "PLC flag" (5) fields. In addition, it is also possible to selectively set the position of texts and images ("Details" button).
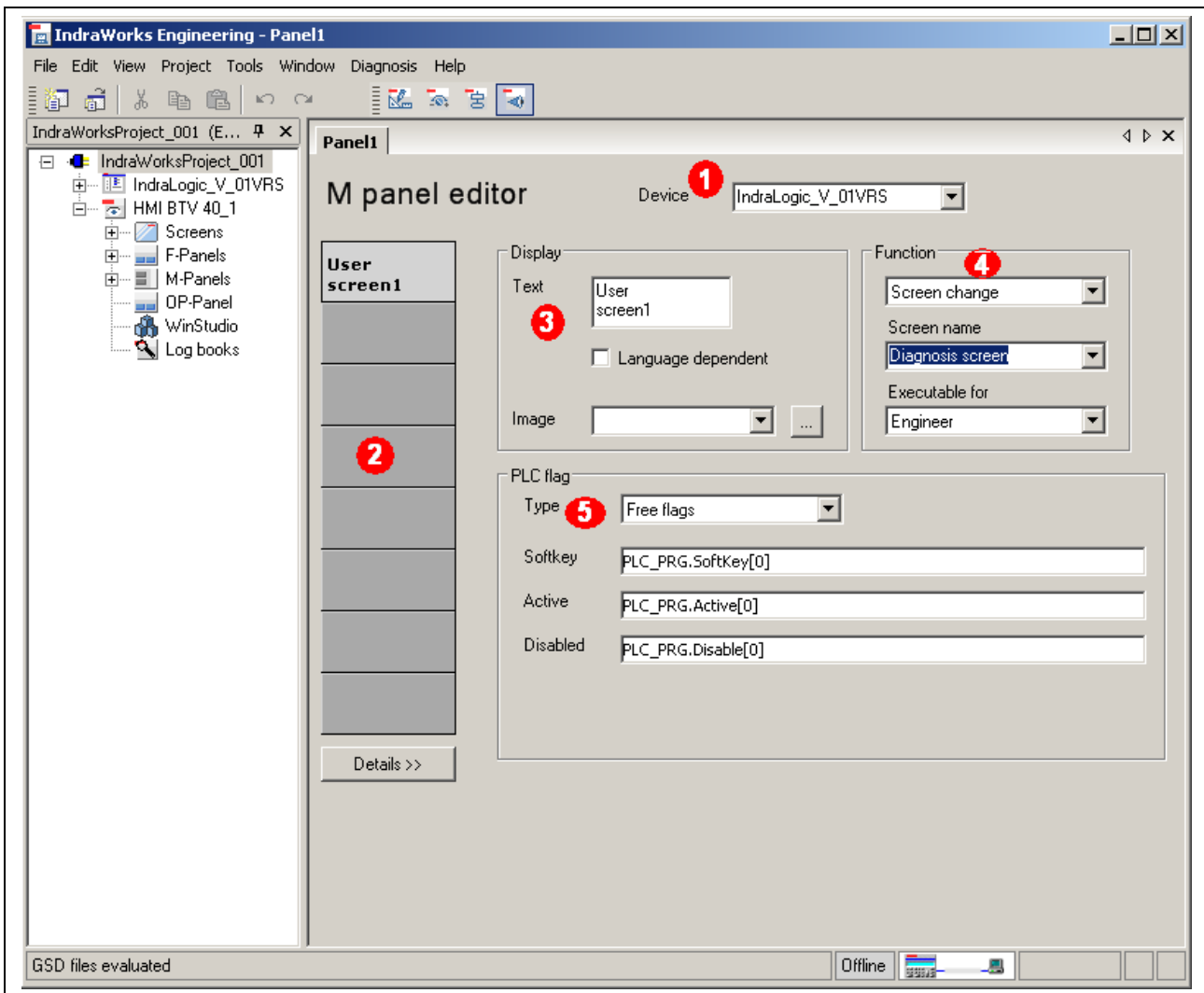
Fig. 3-31:   M-panel editor

Device (1)   Enter the name of the control device where the PLC program for the M-keys is implemented in this input field. If one or more control devices are already existing, then these are available in the list box of this input field.

Preview Bar (2)   The preview bar shows the assignment of the current M-panel.

Display (3)   These settings serve to label the M-key selected with a text or an image. For more detailed information on the input fields, please refer to "F-Key Configuration".

Function (4)   As is the case with F-keys, M-keys can also be used to call up screens and functions and to change the M-key assignment. M-keys are configured in the same way as F-keys.

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PLC flag (5) The PLC flag" field serves to link an M-key to the appropriate PLC flags which have the following functions:

- Softkey: Flag which is set to TRUE when the M-key is pressed and to FALSE when the M-key is released.

- Active: This flag is set by the PLC program as an acknowledgement of the key depression.

- Disabled: To disable an M-key function, the "disabled" flag must be entered and set to TRUE by the PLC program.

Each flag must be entered with its complete instance path (e.g. <program name>.<flag name>).

Detailed Settings If you wish to select an alignment of texts and images that differs from the presetting, you can show and hide additional configuration settings by clicking on the "Details" button. For more detailed information, please refer to "F-Key Configuration".

Copying, Deleting, Pasting an M-Key The configuration of an individual M-key can be copied and pasted to a different M-key. For more detailed information, please also refer to "F-Key Configuration".

Renaming an M-Panel

The name of an M-panel can be changed subsequently. To do this, select the panel and click on it again. The entry changes to the input mode and can be edited. The file name specified on creation of the panel remains as it is. You can also use the "Properties" dialog which you can select from the context-sensitive menu (to be opened by right-clicking). In the "Properties" dialog, you can also change the M-panel name and the name of the file to which the M-panel data is saved.

Deleting an M-Panel

After having been selected from the project explorer, any M-panel that is not required can be deleted by pressing the <Del> key or using the context-sensitive menu. The entry will be removed from the folder and the related file will be deleted. Any screens using the M-panel deleted must be adjusted accordingly.

Programming the M-Keys in the PLC

On installation of the particular IndraLogic target (target system), the library HMI_MKeys.lib is made available. This library contains two function blocks (FB) for implementing the M-key functionality. Use one of the two FBs, depending on the type of visualization device:

- MKEYS Function Block: device with keypad.
- MKEYS_SINGLESEL Function Block: device with touch screen.

The PLC program requires one instance for each visualization device.

Adding a Library   As a first step, the library HMI_MKeys.lib must be added to the PLC application program. To achieve this, a Library Manager is required (see IndraLogic documentation and/or help).

MKEYS Function Block

The MKEYS FB supports control and visualization devices with foil keys, e.g. BTV16 or BTV40. The inputs of the keys must be assigned to the inputs R1–R8 and L1–L8. The "Enable" input can be used to activate (= TRUE) or deactivate (= FALSE) the FB.
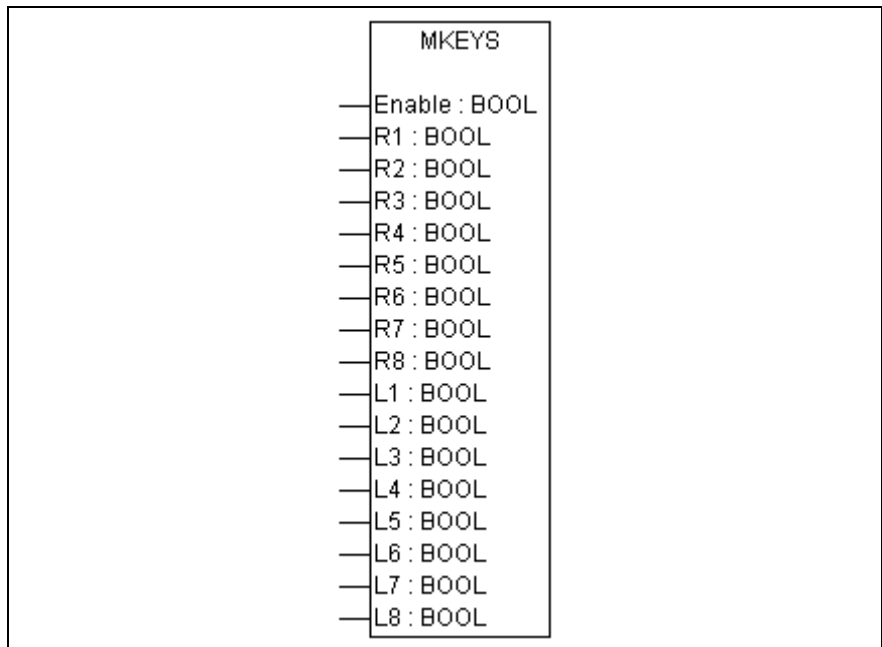
Fig. 3-32:   MKEYS FB

MKEYS_SINGLESEL Function Block

The MKEYS_SINGLESEL FB supports an IndraControl VPP 21 device and operator panels with touch screen. One key each may be active on the left and the right sides. The activated key is represented by red borders. All other keys are disabled. The selection can be changed either by clicking on an M-key (mouse or touch) or by means of optional HW keys which are applied to the "SelUp" and "SelDn" inputs respectively. Operation of the keys selected requires two hardware keys (inputs R1 and L1).

```
        MKEYS_SINGLESEL

  ──│Enable : BOOL
  ──│SelUp : BOOL
  ──│SelDn : BOOL
  ──│R1 : BOOL
  ──│L1 : BOOL
```

Fig. 3-33:   MKEYS_SINGLESEL FB

3.6   Language-Dependent User Texts

In version IW-HMI-02VRS and higher versions, user texts can be configured to be language-dependent.

In case of F-keys, M-keys and OP-keys, this is achieved by checking the "Language-dependent" checkbox in the appropriate editor.

Fig. 3-34:   Projecting a language-dependent key label

If the checkbox is checked, the country code of the language currently selected is displayed below the "Text" field. The text shown is now assigned to this language and can be overwrit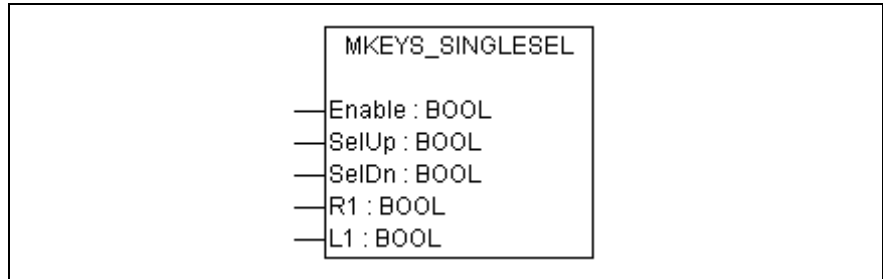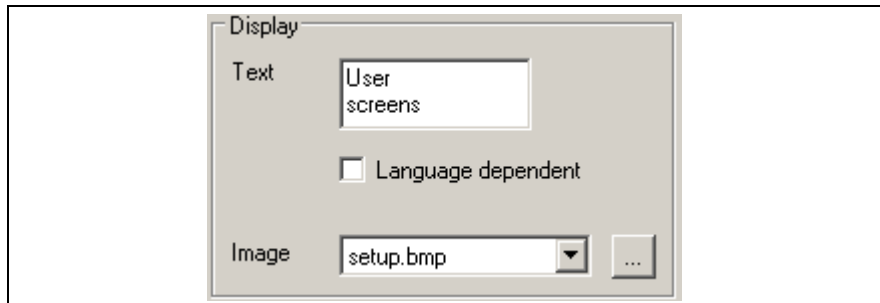ten, if necessary. To enter texts in other languages, select the "Select project language" menu item from the "Language" option in the "Project" menu in the IndraWorks menu bar. After the language has been changed, all texts are immediately displayed in this language. If no text has been entered in the language selected yet, the text previously displayed initially remains as it is, but can be overwritten later. The text entered here relates to the language displayed.

Texts from Resource Files   Depending on the control system forming the basis of the IndraWorks HMI application installed, the preset assignments of the F-keys, M-keys and OP-keys differ from each other. If available in several languages, the related panel labels are saved to what is called resource files. It is not possible to edit these texts; the input field is disabled. However, the language-dependent function can be deactivated so that you can enter your own text. If you check the "Language-dependent" checkbox again, you can enter a language-dependent text, which is now taken from the user text file instead of from the original resource file.

Fig. 3-35:   Selecting the project language
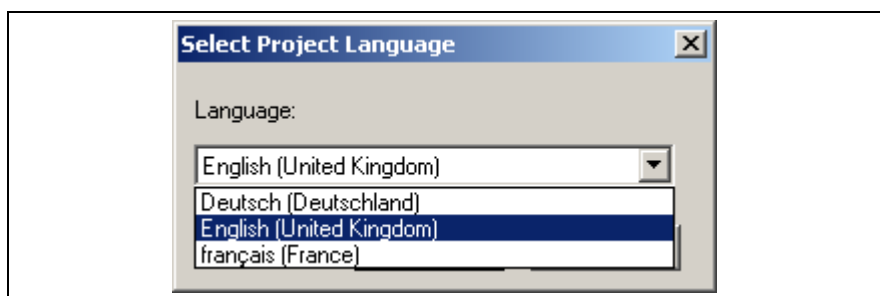
Adding Languages   To add further languages, select the "Manage project languages" menu item from the "Language" option in the IndraWorks "Project" menu.

It is also possible to export, translate externally and import language-dependent texts. For a description of these functions, please refer to the IndraWorks documentation (in preparation).

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3.7   Log Book Configuration

General Information

The IndraWorks project allows configuration of several log books. Different messages can be recorded in each of these log books.

Creating a New Log Book

To generate a new log book, select the "New log book" menu item from the context-sensitive menu of the "Log books" folder (to be opened by right-clicking on this folder).
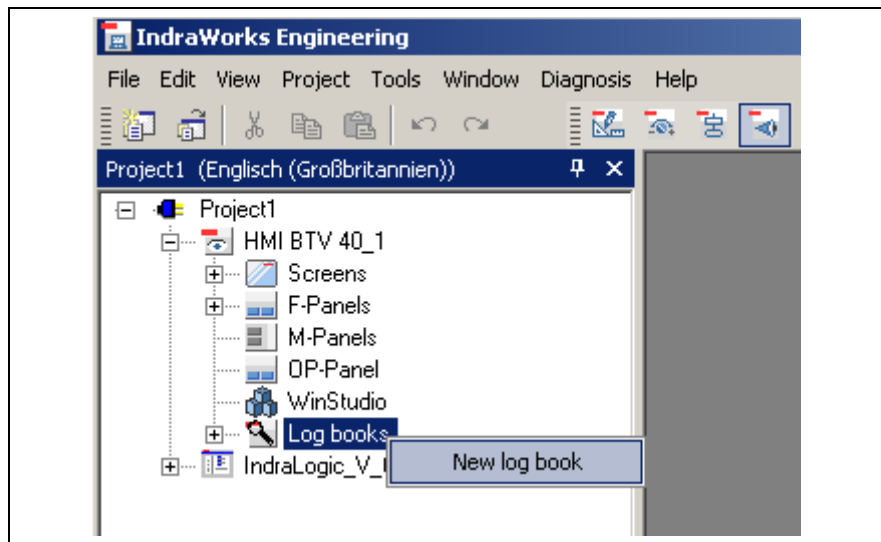

Fig. 3-36:   Creating a new log book

Note: Initially, each log book is created with the default name "Log book". This name can be changed. To do this, select the entry and click on it again. The entry changes to the input mode and can be edited. You can also use the "Rename" function which you can select from the context-sensitive menu (to be opened by right-clicking).

Log Book Configuration

Double-click on the log book to open the log book configuration screen.
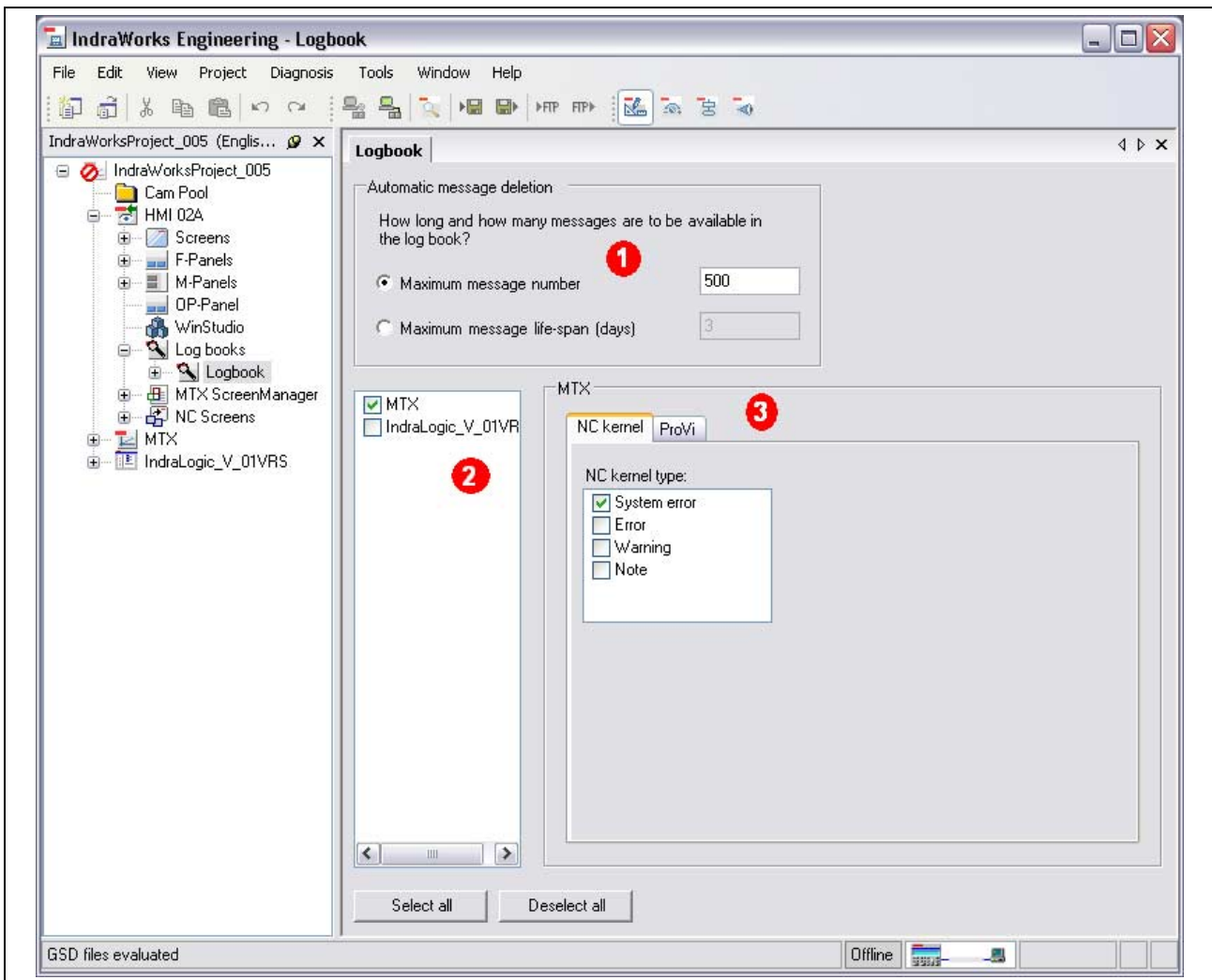
Fig. 3-37:   Log book configuration screen

Automatic message deletion (1)   Old messages are automatically deleted from the log book. The messages to be deleted can be defined either by specifying a number of messages or a maximum message lifespan.

- Depending on the number of messages:
  If you enter more messages in the log book than are specified here, the oldest messages are deleted. However, it is not only one message that is deleted; instead, the 50 oldest messages are always deleted.

- Depending on the message lifespan:
  All messages that are older than the lifespan configured are deleted. This check is done only once a day.

The default setting is the maximum number of 500 messages.

Note: Only one option can be selected for automatic message deletion. It is not possible to combine the number and lifespan of the messages.

Assigning Controls (2) The configuration screen shows all controls in the current IndraWorks project, which can record log book messages. Use this field to activate the controls which you wish to record the messages. The controls activated are also shown as sub-nodes of the log book in the project explorer.

A control can also record in more log books than one. For example, errors can be recorded in one log book and warnings in another one.

Tip:	Click the "Select all" or "Deselect all" button to select or deselect all controls respectively.

Defining Message Types (3) The messages to be recorded can be set separately for each control.

The configuration screen provides a tab for each diagnosis type which is supported by the control. This tab can be used to configure the messages to be recorded. The editable fields of the various message types vary depending on the control type.

Saving Data Save the log book configuration by selecting the "Save" item from the "File" menu or by exiting IndraWorks.

3.8 Data Filing

File Locations, Directory Structures

When you create a new visualization device, a directory with the device name is created within the IndraWorks project.

All data configured are residing in the <device name>\user\config folder or within this folder.
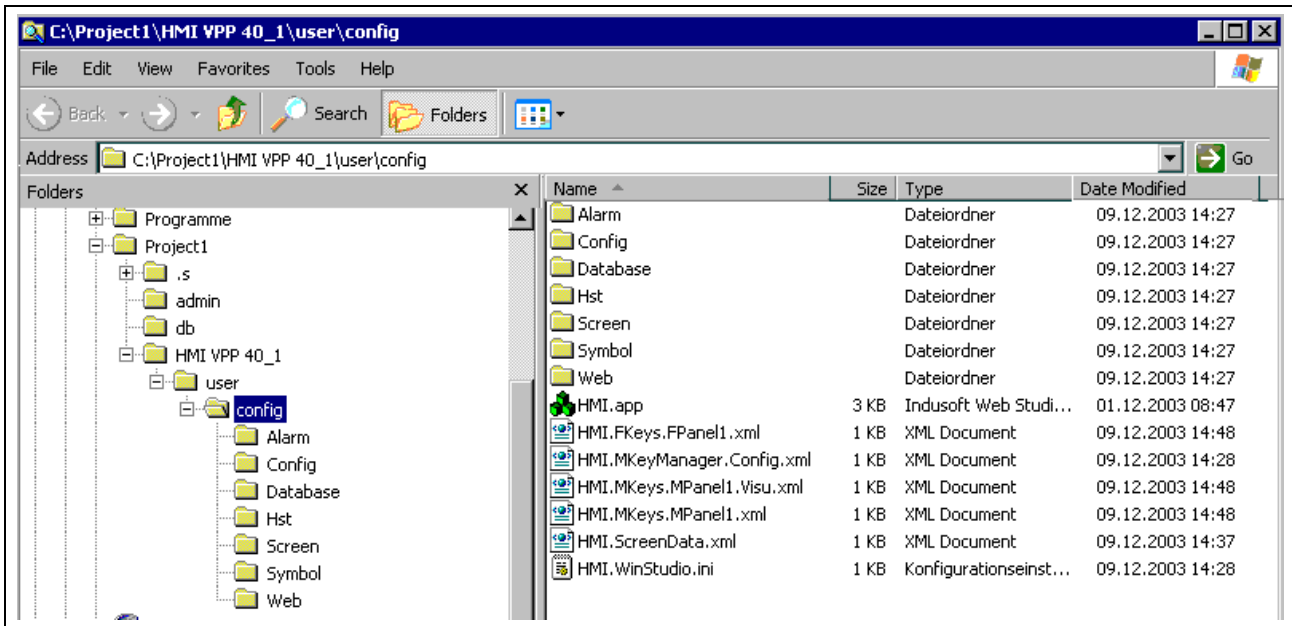
Fig. 3-38:   Directory structure

Files Generated for Screens and Panels

When screens and panels are projected, the following configuration files are generated:

Projecting	Configuration files
Screens	..\user\config\HMI.ScreenData.xml
F-panels	..\user\config\HMI.Fkeys.<panel name>.xml
M-panels	..\user\config\HMI.Mkeys.<panel name>.xml
OP-panel	..\config\DDP.PanelService.OPKeyPanelConfig.xml

Fig. 3-39:   Configuration files

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Extending the Screen Catalog

Several screen types represent a screen catalog. Three screen types are delivered in version IndraWorks HMI 03VRS and higher versions.

- Diagnosis
- User screens (WinStudio)
- External application

Fig. 3-40:   Screen types

To extend the screen catalog, generate an additional XML file having the structure described below. The file name must start with HMI.ScreenTypes (e.g. HMI.ScreenTypes.User.xml). The file must be residing in the ..runtime\config directory.

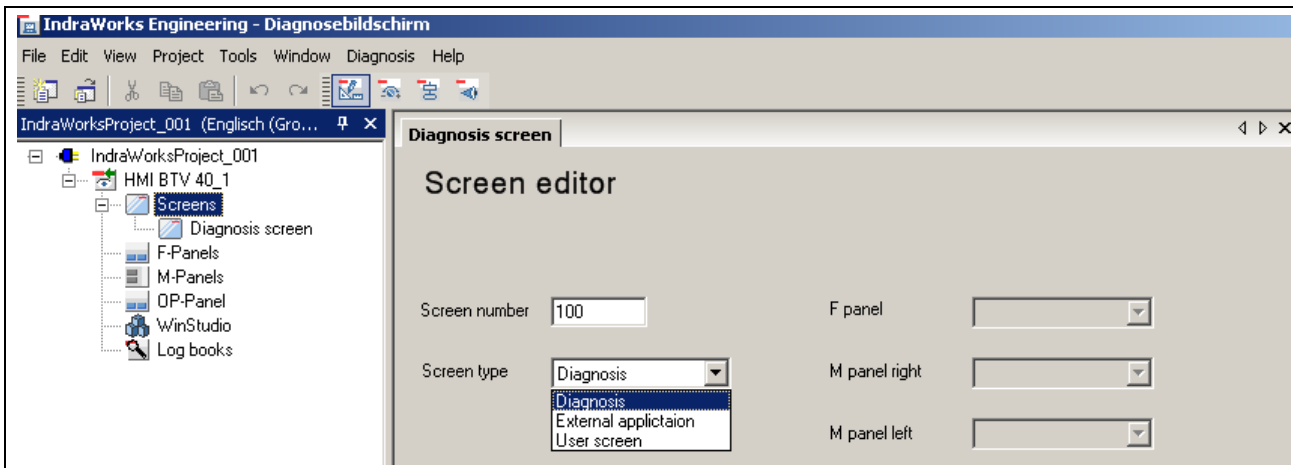Fig. 3-41:   Structure of the HMI.ScreenTypes.XML file

ScreenType AppID	Identification of the screen (ID).
Name	Name appearing in the list box of the screen editor.
Token	Language-dependent name (function not available at present).
Assembly	Assembly name of the application to which the screen call is applied.
Type	Assembly type.
ActionGUID	ActionGUID which must be logged in by the application and which is used for the configuration for call-up.
FKeys	Define whether it should be possible to configure F-panels for this screen. "Enable" permits projecting; "Disable" does not permit any entry.
MKeysLeft	See FKeys.
MKeysRight	See FKeys.

Extending the Function Catalog

Several functions represent a function catalog. The following function types are delivered in version IndraWorks HMI 02VRS and higher versions.

- Screen change
- Panel change
- Activate keyboard code
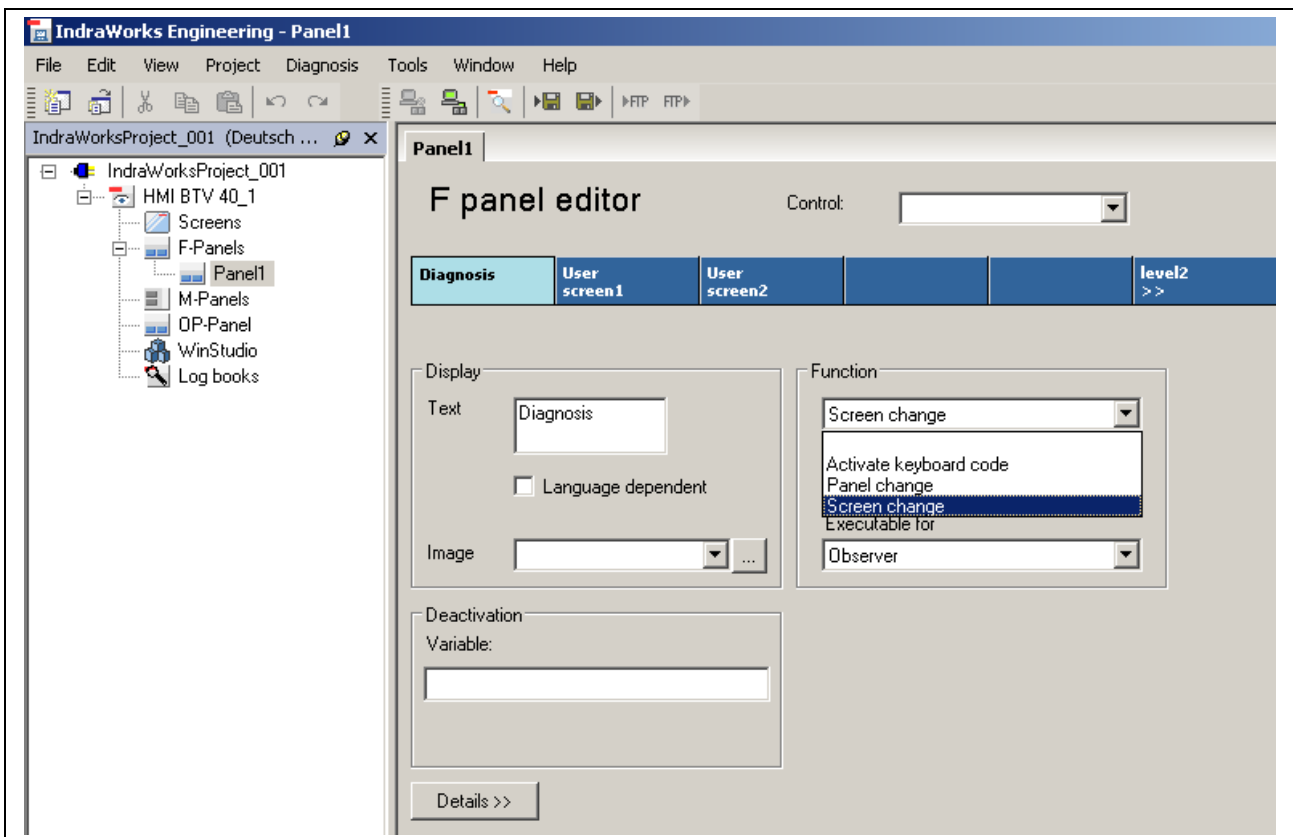- Activate operating context

Fig. 3-42:   Function types

To extend the function catalog, generate an additional XML file having the structure described below. The file name must start with HMI.FunctionTypes (e.g. HMI.FunctionTypes.User.xml). The file must be residing in the ..runtime\config directory.

```xml
<?xml version="1.0" encoding="UTF-8" ?>
- <FunctionTypeCollection Name="HmiFunctionTypes">
  - <FunctionType FunctionID="ChangeScreen" Assembly="HMI.Configuration.App" Type="HMI.Configuration.App.ScreenManager">
    - <Configuration FunctionName="TChangeScreen" ParameterName="TScreenName">
        <ResourceDescription Assembly="HMI.Configuration" Type="HMI.Configuration.HmiPackageResource" />
        <Context OPKeys="Enabled" FKeys="Enabled" MKeys="Enabled" />
        <Value Assembly="HMI.Configuration" Type="HMI.Configuration.ScreenList" />
      </Configuration>
    </FunctionType>
  + <FunctionType FunctionID="ChangePanel" Assembly="HMI.Configuration.App" Type="HMI.Configuration.App.ScreenManager">
  + <FunctionType FunctionID="ChangeMKeyPanel" Assembly="HMI.Configuration.App"
      Type="HMI.Configuration.App.ScreenManager">
  + <FunctionType FunctionID="WinStudioKeyCode" Assembly="HMI.Screen.App" Type="HMI.Screen.App.HmiScreenApp"
      ActionGUID="{85B6A5F0-0B80-48a9-9D10-BF8EB4C3D0A2}">
  - <FunctionType FunctionID="ActivateOPContext" Assembly="HMI.Configuration.App"
      Type="HMI.Configuration.App.ScreenManager">
    - <Configuration FunctionName="TActivateOPContext" ParameterName="TContext">
        <ResourceDescription Assembly="HMI.Configuration" Type="HMI.Configuration.HmiPackageResource" />
        <Context OPKeys="Enabled" />
        <Value Assembly="HMI.Configuration" Type="HMI.Configuration.ContextList" />
        <ConfigurationDialog Assembly="HMI.Configuration" Type="HMI.Configuration.ContextDialog" />
      </Configuration>
    </FunctionType>
</FunctionTypeCollection>
```

Fig. 3-43:   Structure of the HMI.FunctionTypes.XML file

FunctionType AppID	Identification of the function (ID).
Name	Name appearing in the list box of the F/M-panel editors.
ParameterName	Name of the parameter appearing when the function is selected.
ActionGUID	ActionGUID which must be logged in by the application and which is used for the configuration for call-up.
Type	Assembly type.
Assembly	Assembly name of the application to which the screen call is applied.
FKeys	Enable: The function may be projected to an F-key.
	Disable: The function cannot be projected to an F-key.
MKeys	Enable: The function may be projected to an M-key.
	Disable: The function cannot be projected to an M-key.

3.9   Configuration of the Header Display

IndraWorks HMI provides a pre-configured header display. The layout is defined in the IndraWorks\Config\HMI.Header.xml file.

The default setting contains the following display elements:

- Device name of the control

- Diagnosis status

- Last ProVi error and last ProVi warning

- Proprietary name ("Rexroth") as bitmap

- Date and time

- Title of the screen activated

```xml
<?xml version="1.0" encoding="utf-8" ?>
- <Header>
    <Control Left="0" Top="0" Width="585" Height="37" BackColor="#D3D3D3" />
    <Control Left="0" Top="37" Width="585" Height="1" BackColor="#808080" />
    <Control Left="98" Top="6" Width="1" Height="25" BackColor="#808080" />
    <Control Left="10" Top="6" Width="77" Height="25" Assembly="HMI.Header" Type="HMI.Header.HeaderDiagnosisControl" />
    <Control Left="152" Top="6" Width="1" Height="25" BackColor="#808080" />
    <Control Left="156" Top="6" Width="295" Height="25" Assembly="HMI.Header" Type="HMI.Header.HeaderDeviceControl" />
    <Control Left="454" Top="6" Width="1" Height="25" BackColor="#808080" />
    <Control Left="490" Top="6" Width="1" Height="25" BackColor="#808080" />
    <Control Left="500" Top="6" Width="77" Height="25" Assembly="HMI.Header" Type="HMI.Header.HeaderConnectionControl" />
    <Control Left="585" Top="0" Width="1" Height="75" BackColor="#808080" />
    <Control Left="0" Top="38" Width="585" Height="37" BackColor="#A9A9A9" />
    <Control Left="0" Top="75" Width="806" Height="1" BackColor="#808080" />
    <Control Left="152" Top="37" Width="303" Height="39" BackColor="#666666" />
    <Control Left="153" Top="38" Width="301" Height="37" BackColor="#808080" ForeColor="white" Type="Title" />
    <Control Left="0" Top="76" Width="806" Height="37" BackColor="#DCDCDC" />
    <Control Left="3" Top="94" Width="800" Height="1" BackColor="#808080" />
    <Control Left="1" Top="76" Width="670" Height="18" Assembly="HMI.Header" Type="HMI.Header.HeaderProViErrorControl" />
    <Control Left="1" Top="95" Width="805" Height="18" Assembly="HMI.Header" Type="HMI.Header.HeaderProViWarningControl" />
    <Control Left="669" Top="76" Width="70" Height="18" BackColor="#DCDCDC" ForeColor="#666666" Type="Date" />
    <Control Left="747" Top="76" Width="58" Height="18" BackColor="#DCDCDC" ForeColor="#666666" Type="Time" />
    <Control Left="742" Top="79" Width="1" Height="12" BackColor="#666666" />
    <Control Left="710" Top="8" Width="74" Height="17" Image="Config\HMI.Logo.bmp" />
</Header>
```

Fig. 3-44:   Structure of the HMI.Header.xml file

Each entry of the "Control" type defines a rectangle in the header display. The properties of this rectangle can be defined by the attributes described below.

Left	Position of the left edge.
Top	Position of the upper edge.
Width	Width of the rectangle.
Height	Height of the rectangle.
BackColor	Background color (optional).
ForeColor	Foreground color (optional), which is only relevant for the date, time and title types.
Image	Screen file including the path after the IndraWorks directory.
Assembly	Module consisting of a code and metadata, which can be used to represent a UserControl (e.g. ActiveX Control) in the header display.
Type	"Date", "Time", "Title", or class name incl. name space of a UserControl.
ProgID	ProgID of an ActiveX Control.
CLSID	CLSID of an ActiveX Control.

3.10 Requirements for Communication of User Screens with the PLC

General Information

User screens created with WinStudio permit to display and manipulate the values of PLC variables and to use these values for dynamically changing display elements. Communication is achieved via an OPC server and the OPC client of WinStudio. If configuration is correct, PLC variables can be easily selected from a browser dialog in WinStudio. The sections below describe the necessary settings which must be checked in the event of an error.

Configuring the OPC Server

The OPC server is the data interface to the PLC. The OPC server must be configured depending on the OPC server selected.

The description below relates to a selected "IndraLogic.OPC.02" OPC server. "OPC.IwSCP.1" does not need the configuration described here. The OPC server IndraLogic.OPC.02 can be configured by means of a dialog which can be called via the Windows Start menu under "Programs, Rexroth, Communication, OPC Configurator". After having been opened, the Configurator shows the existing PLC connections. If no PLC connection is shown, the user screens cannot communicate with the PLC, so that a new connection must first be configured. To achieve this, select "Add PLC" from the "Edit" menu. Thereafter, a new PLC entry appears in the "Connection" subfolder of the Server display.
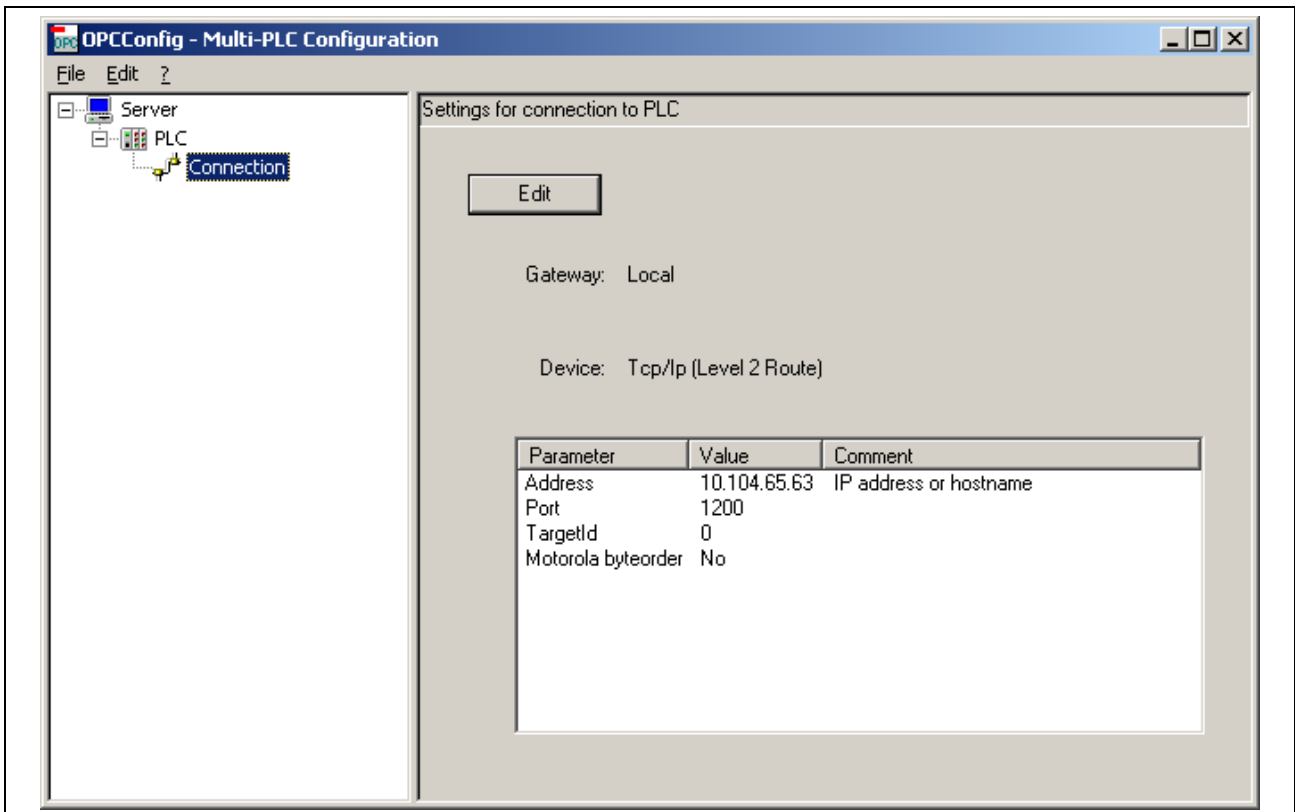
Fig. 3-45:   OPC Configurator

Click on the "Connection" entry to show the current settings. If new entries are created, these settings are blank. To configure these settings, click on the "Edit" button. This will open the "Communication Parameters" dialog from which you can select an existing channel. For more information on the "communication parameters" topic, please refer to the IndraLogic help or the IndraLogic manual.
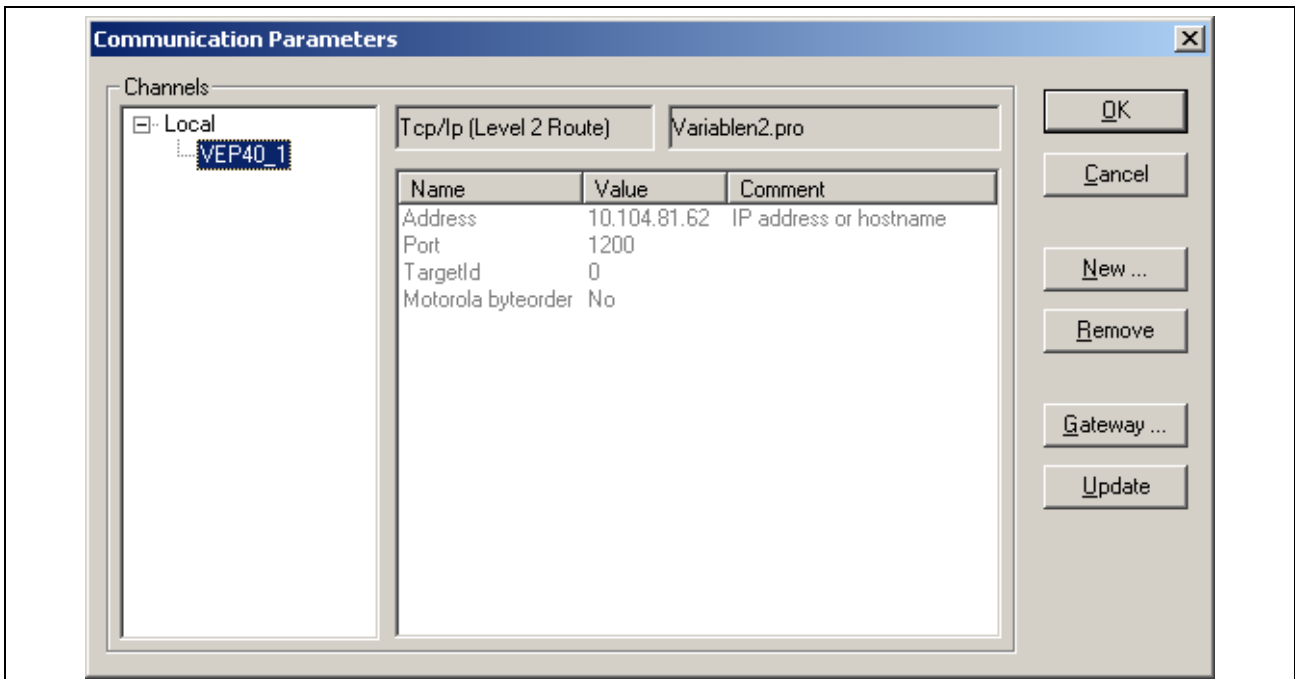

Fig. 3-46:   Communication parameters

Generating Symbol Files

To allow display and selection of all PLC variables of a project in WinStudio, the appropriate checkbox for the generation of symbol files (symbol configuration) must be activated. This checkbox is provided in the "Options" menu item of the IndraLogic "Project" menu.
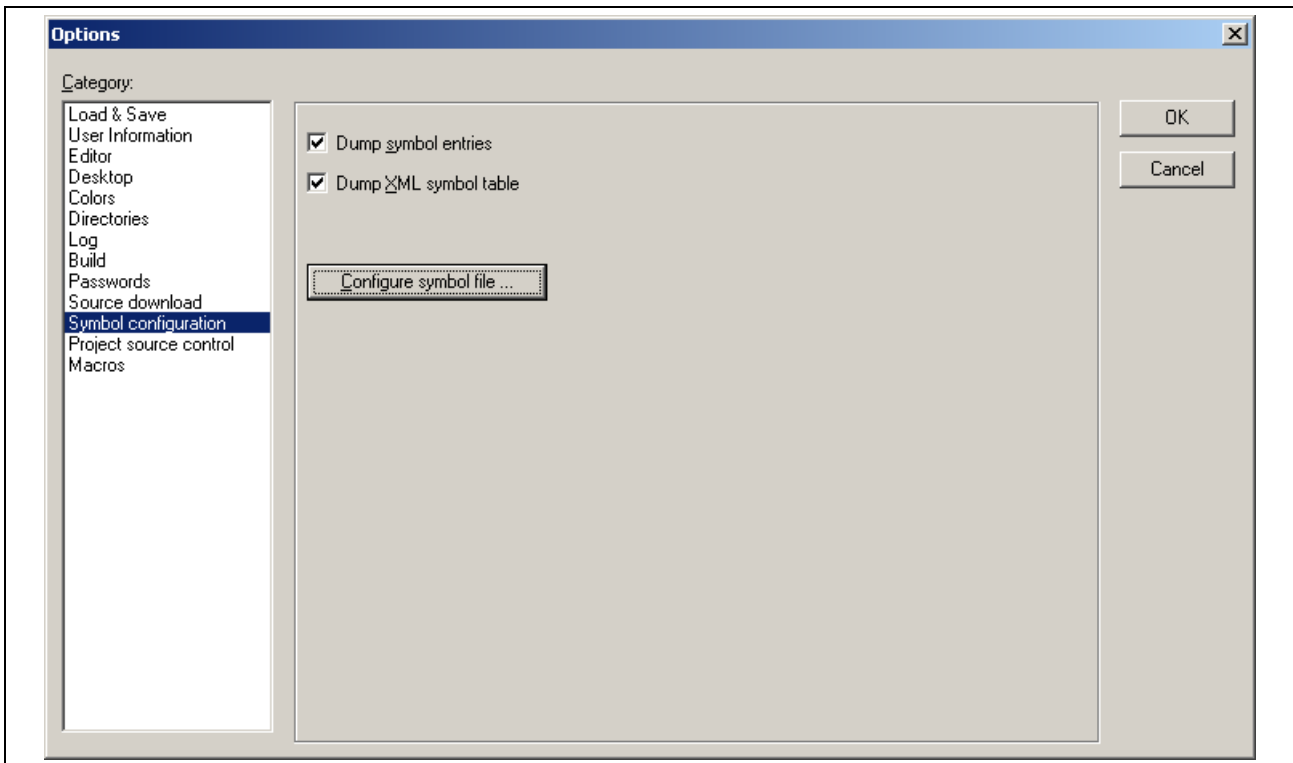

Fig. 3-47:   IndraLogic Project–Options

In the project options, the "Dump symbol entries" checkbox must be activated under "Symbol configuration". Then all variables to be selectable from the browser dialog of WinStudio must be selected. To achieve this, click on the "Configure symbol file" button. A further dialog lists the various components of the project. The "Export variables of object" option can be activated and deactivated for each single component. The option must be activated for the variables desired. The symbol files are available after the project has been rebuilt. For more information on the "symbol file" topic, please refer to the IndraLogic help or the IndraLogic manual.
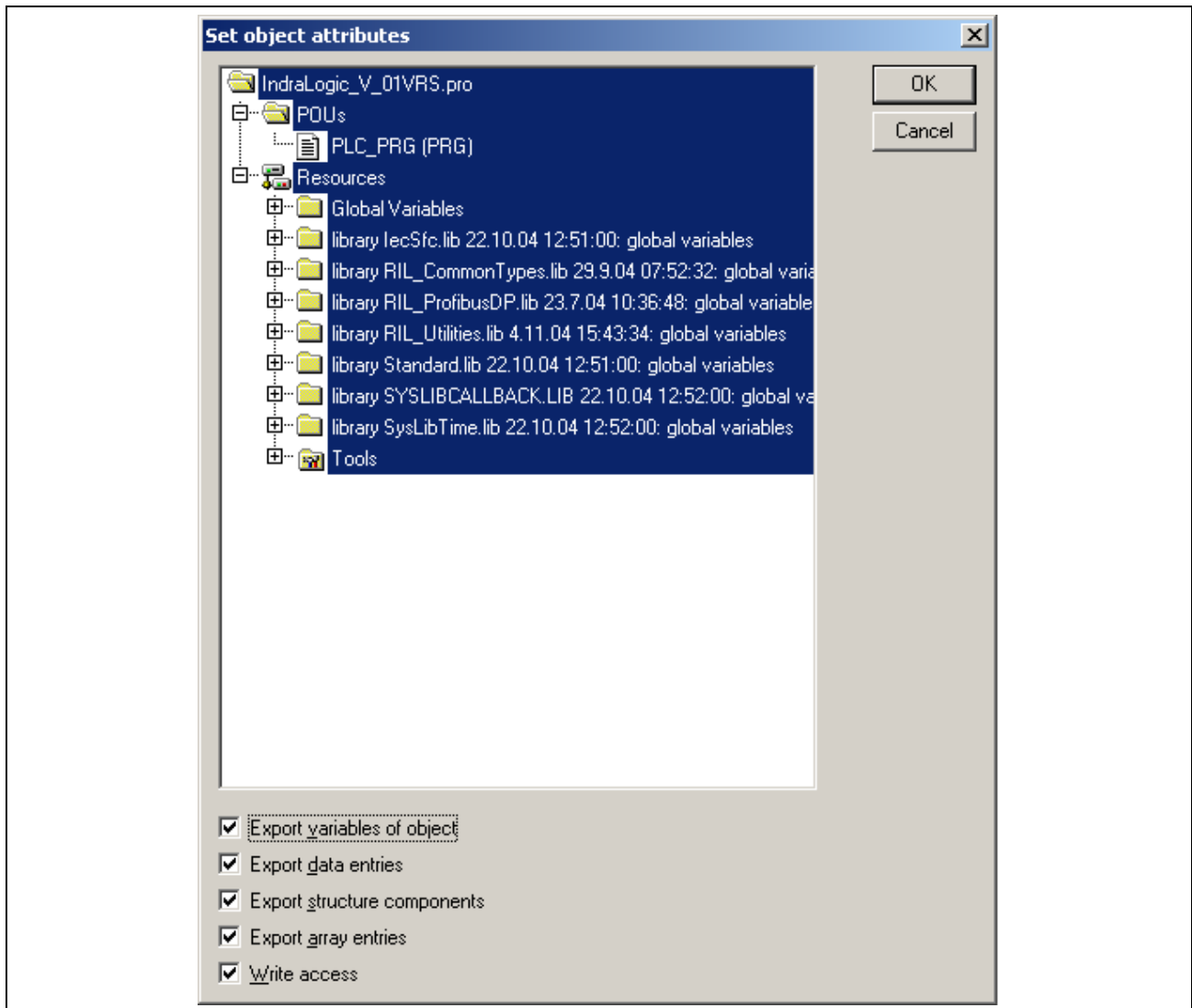
Fig. 3-48:   IndraLogic symbol file configuration

Configuring the OPC Client

To permit communication with the PLC by means of the OPC server described above, an appropriate OPC client must be configured in WinStudio. Configuration is implemented in the workspace window under "Communication". A new OPC configuration can be generated by selecting the "Paste" item of the context-sensitive menu of the "OPC" folder. This defines the variables and the OPC server used.
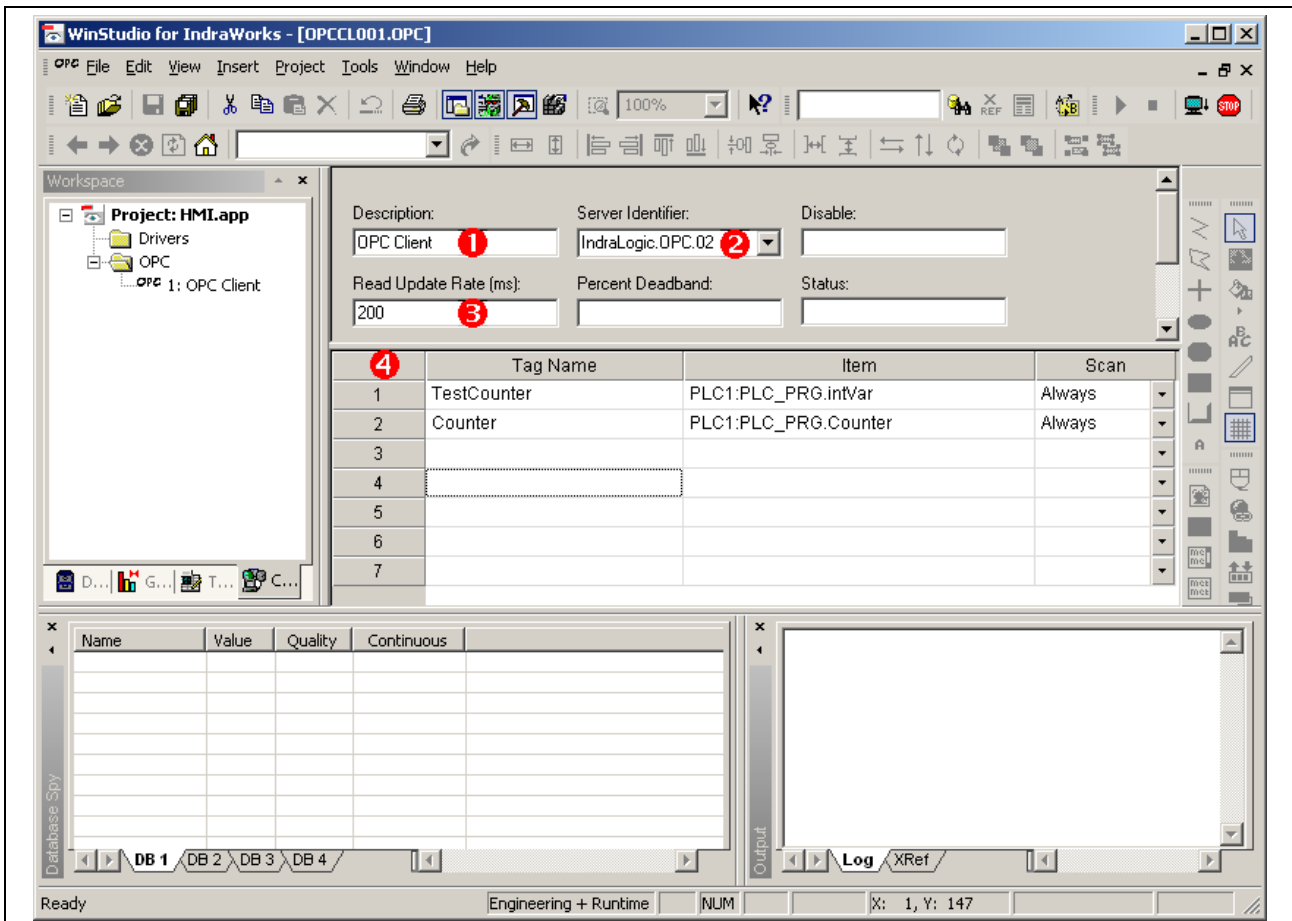

Fig. 3-49:   Configuration of the WinStudio OPC client

The configuration dialog requires the following settings:

Description (1)   Text describing the OPC configuration

Server Identifier (2)   List of all OPC servers that are supported.

For communication with the IndraLogic OPC server, the "IndraLogic.OPC.02" entry must be selected.

Read Update Rate (3)   Time interval for updating the variables.

User-Defined Tags (4)   The lower part of the dialog contains a table containing the user-defined variables. Any variable name can be entered in the "Tag Name" column. In WinStudio, this name is used to access a PLC variable. If this variable does not exist yet, a dialog is opened which can be used to select the variable type. The "Item" column contains the associated PLC variable which can be easily selected with the browser dialog. This browser can be opened by means of the context-sensitive menu of the "Item" field.
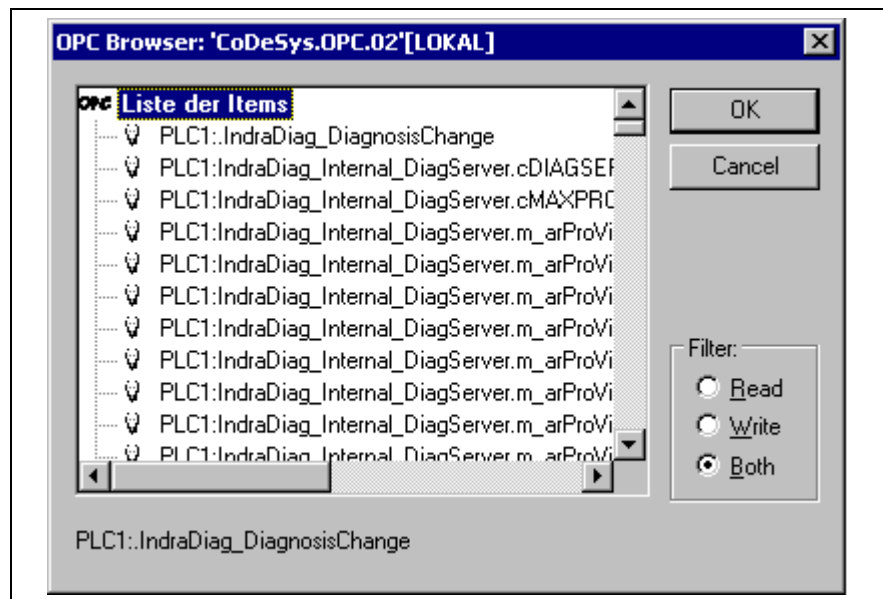
Fig. 3-50:   OPC browser for PLC variables

Select a variable and confirm it with "OK" to apply it to the table.

Using the "Scan" column, you can define whether the variable in question should be read always or only whenever the appropriate user screen is activated.

Notes

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6 Service & Support

6.1 Helpdesk

Unser Kundendienst-Helpdesk im Hauptwerk Lohr am Main steht Ihnen mit Rat und Tat zur Seite. Sie erreichen uns

Our service helpdesk at our headquarters in Lohr am Main, Germany can assist you in all kinds of inquiries. Contact us

-	telefonisch - by phone: über Service Call Entry Center - via Service Call Entry Center	**+49 (0) 9352 40 50 60** Mo-Fr 07:00-18:00 Mo-Fr 7:00 am - 6:00 pm
-	per Fax - by fax:	**+49 (0) 9352 40 49 41**
-	per e-Mail - by e-mail:	**service.svc@boschrexroth.de**

6.2 Service-Hotline

Außerhalb der Helpdesk-Zeiten ist der Service direkt ansprechbar unter

After helpdesk hours, contact our service department directly at

+49 (0) 171 333 88 26

oder - or   **+49 (0) 172 660 04 06**

6.3 Internet

Unter **www.boschrexroth.com** finden Sie ergänzende Hinweise zu Service, Reparatur und Training sowie die **aktuellen** Adressen *) unserer auf den folgenden Seiten aufgeführten Vertriebs- und Servicebüros.

At **www.boschrexroth.com** you may find additional notes about service, repairs and training in the Internet, as well as the **actual** addresses *) of our sales- and service facilities figuring on the following pages.

☐ Verkaufsniederlassungen
☐ Niederlassungen mit Kundendienst

☐ sales agencies
☐ offices providing service

Außerhalb Deutschlands nehmen Sie bitte zuerst Kontakt mit unserem für Sie nächstgelegenen Ansprechpartner auf.

Please contact our sales / service office in your area first.

*) Die Angaben in der vorliegenden Dokumentation können seit Drucklegung überholt sein.

*) Data in the present documentation may have become obsolete since printing.

6.4 Vor der Kontaktaufnahme... - Before contacting us...

Wir können Ihnen schnell und effizient helfen wenn Sie folgende Informationen bereithalten:

1. detaillierte Beschreibung der Störung und der Umstände.
2. Angaben auf dem Typenschild der betreffenden Produkte, insbesondere Typenschlüssel und Seriennummern.
3. Tel.-/Faxnummern und e-Mail-Adresse, unter denen Sie für Rückfragen zu erreichen sind.

For quick and efficient help, please have the following information ready:

1. Detailed description of the failure and circumstances.
2. Information on the type plate of the affected products, especially type codes and serial numbers.
3. Your phone/fax numbers and e-mail address, so we can contact you in case of questions.

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6.5   Kundenbetreuungsstellen - Sales & Service Facilities

Deutschland – Germany

Vertriebsgebiet Mitte Germany Centre	**SERVICE AUTOMATION**	**SERVICE AUTOMATION**	**SERVICE AUTOMATION**

Bosch Rexroth
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Bgm.-Dr.-Nebel-Str. 2 / Postf. 1357
97816 Lohr am Main   / 97803 Lohr
Kompetenz-Zentrum Europa
 	
Tel.:   +49 (0)9352 40-0
Fax: +49 (0)9352 40-4885
	CALL ENTRY CENTER
	Helpdesk
	MO – FR
	  von 07:00 - 18:00 Uhr
	  from 7 am – 6 pm
	
	Tel. +49 (0) 9352 40 50 60
	Fax +49 (0) 9352 40 49 41
	<u>service.svc@boschrexroth.de</u>
		HOTLINE 24 / 7 / 365
		
		außerhalb der Helpdesk-Zeit
		out of helpdesk hours
		
		Tel.: +49 (0)172 660 04 06
		oder / or
		Tel.: +49 (0)171 333 88 26
			ERSATZTEILE / SPARES
			  verlängerte Ansprechzeit
			  - extended office time -
			♦ nur an Werktagen
			  - only on working days -
			♦ von 07:00 - 18:00 Uhr
			  - from 7 am - 6 pm -
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vom Ausland: (0) nach Landeskennziffer weglassen,   Italien: 0 nach Landeskennziffer mitwählen
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Bosch Rexroth Sp.zo.o. Biuro Poznan ul. Dabrowskiego 81/85 60-529 Poznan Tel.: +48 061 847 64 62 /-63 Fax: +48 061 847 64 02	Bosch Rexroth Sp.zo.o. ul. Staszica 1 05-800 Pruszków Tel.: +48 (0) 22 738 18 00 – service: +48 (0) 22 738 18 46 Fax: +48 (0) 22 758 87 35 – service: +48 (0) 22 738 18 42	East Electric S.R.L. Bdul Basarabia no.250, sector 3 73429 Bucuresti Tel./Fax:: +40 (0)21 255 35 07 +40 (0)21 255 77 13 Fax: +40 (0)21 725 61 21 eastel@rdsnet.ro	Bosch Rexroth Sp.zo.o. Str. Drobety nr. 4-10, app. 14 70258 Bucuresti, Sector 2 Tel.: +40 (0)1 210 48 25 +40 (0)1 210 29 50 Fax: +40 (0)1 210 29 52
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