AUTOMATIONWORX

User Manual

UM QS EN ILC 150 STARTERKIT

Order No.: 2910295

Installing and Starting Up the
ILC 150 Starter Kit

PHŒNIX CONTACT
INSPIRING INNOVATIONS

AUTOMATIONWORX

User Manual
Installing and Starting Up the ILC 150 Starterkit

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Designation: UM QS EN ILC 150 STARTERKIT

Revision: 02

Order No.:   2910295

This user manual is valid for:

Designation	Order No.
ILC 150 Starterkit	2988955

Please Observe the Following Notes

In order to ensure the safe use of the product described, we recommend that you read this manual carefully. The following notes provide information on how to use this manual.

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Table of Contents

1 General

1.1 Introduction

The ILC 150 Starter Kit is a combination of hardware and software. It contains all the components you need in order to create and start up a basic ILC 150 ETH system.

1.2 Information About This Document

Using an example project, this document helps you to install and parameterize a bus configuration and to program the application program (according to IEC 61131).

It is assumed the user has knowledge and experience in the operation of PCs and Windows® operating systems, and knowledge in IEC 61131.

For more detailed information about the hardware components, please refer to the documentation for the components. The documentation is also included on the CD supplied with the ILC 150 Starter Kit. Moreover, the documentation can be downloaded at
www.download.phoenixcontact.com.

More detailed information about the individual functions of PC WorX can be found in the online help for the program. The entire help function can be called via "Help" in the menu bar. Help for specific functions can be called via F1.

This manual describes the quickest way to start up. Since the INTERBUS devices are read, a complete physical bus configuration is required.

No functions or commands that require communication with the control system can be executed without physical bus configuration. However, complete parameterization is possible in the "offline" state. The application program can also be created and compiled. Should you wish to proceed in this way, please refer to the Quick Start Guide for PC WorX.

1.3 Contents of the ILC 150 Starter Kit

The ILC 150 Starter Kit contains the ILC 150 ETH including an analog input module and an analog output module assembled on a board. The starter kit hardware is completely assembled.

The structure is supplied by an assembled power supply unit. To operate the structure, simply connect the mains cable of the power supply unit to the supply voltage (230 V AC socket) and connect the ILC 150 ETH to your PC via the Ethernet cable provided.

1.4   Components of the ILC 150 Starter Kit

Table 1-1   Components of the ILC 150 Starter Kit

Description	Type	Order No.	Number
Software			
PC WorX programming software See Phoenix Contact "AUTOMATION" catalog	AX SW SUITE DEMO CD	2985660	1
Hardware (Modules)			
Inline Controller	ILC 150 ETH	2985330	1
Inline terminal with one analog output	IB IL AO 1/U/SF-PAC	2861399	1
Inline terminal with two analog inputs	IB IL AI 2/SF-ME	2863944	1
Hardware (accessories, part of the starter kit)			
Ethernet patch cable, crossover, 2 m	FL CAT5 FLEX CONF/	2744843	1
Power supply unit	STEP-PS-100-240AC/24DC/1.5	2938947	1
Switch module	UM 45-IB-DI/SIM8	2962997	1
Standard end clamp, gray	CLIPFIX 35-5	3022276	4
Spring-cage modular terminal block (multi-position), gray	STS 2,5-QUATTRO	3031746	1
Spring-cage modular terminal block (multi-position), blue	STS 2,5-QUATTRO BU	3036288	1
Cover for modular terminal block, gray	D-STS 2,5	3031762	2
Documentation			
User manual	UM QS EN ILC 150 STARTERKIT	2910295	1
Package slip, software registration	PACKB.SOFTWARE REG	9013743	1
CD	CD ILC 150 STARTERKIT	9036973	

1.5 System Requirements

1.5.1 Supported Operating Systems

– Windows® 2000 SP3
– Windows® XP SP2 (recommended)

1.5.2 Hardware Requirements

Table 1-2   Hardware requirements

Hardware Requirements for PC WorX	
CPU	Pentium III 800, 1 GHz (recommended)
Main memory	128 MB (minimum), 256 MB (recommended)
Hard disk space	500 MB free
CD-ROM drive	Yes
Interfaces	1 x Ethernet
Monitor	SVGA, resolution of 800 x 600 pixels (minimum), 1024 x 768 (recommended)
Operating devices	Keyboard, mouse
Web browser	Java Standard Edition SE 6 (or higher) with at least Java Runtime Environment JRE 6 (version 1.6.x or higher)

1.5.3 Programming Software

Table 1-3   Required programming software

Software	Software Version
PC WorX	≥ 5.10 SP 2

1.5.4 Required Firmware Version

Table 1-4   Required firmware version

Device	Firmware Version
ILC 150 ETH	≥ 2.00

If the firmware version on your device is earlier than that specified in Table 1-4, please update your firmware. The latest firmware version can be downloaded at **www.download.phoenixcontact.com**.

2 Installed Hardware and Startup

2.1 Installed Hardware

2.1.1 Structure of the Starter Kit

The structure of the starter kit is illustrated in Figure 2-1.

• The complete starter kit is supplied fully pre-assembled and wired on a board. The starter kit can be used as soon as the mains cable is connected to the 230 V AC supply voltage.

Additional documentation for the starter kit components is included on the CD ILC 150 STARTERKIT provided with the starter kit.

ILC 150 ETH

CLIPFIX 35-5

IB IL AI 2/SF-ME
IB IL AO 1/U/SF-PAC

CLIPFIX 35-5

STEP-PS-100-240AC/24DC/1.5

STS 2,5-QUATTRO BU

D-STS 2,5
STS 2,5-QUATTRO

7533B001
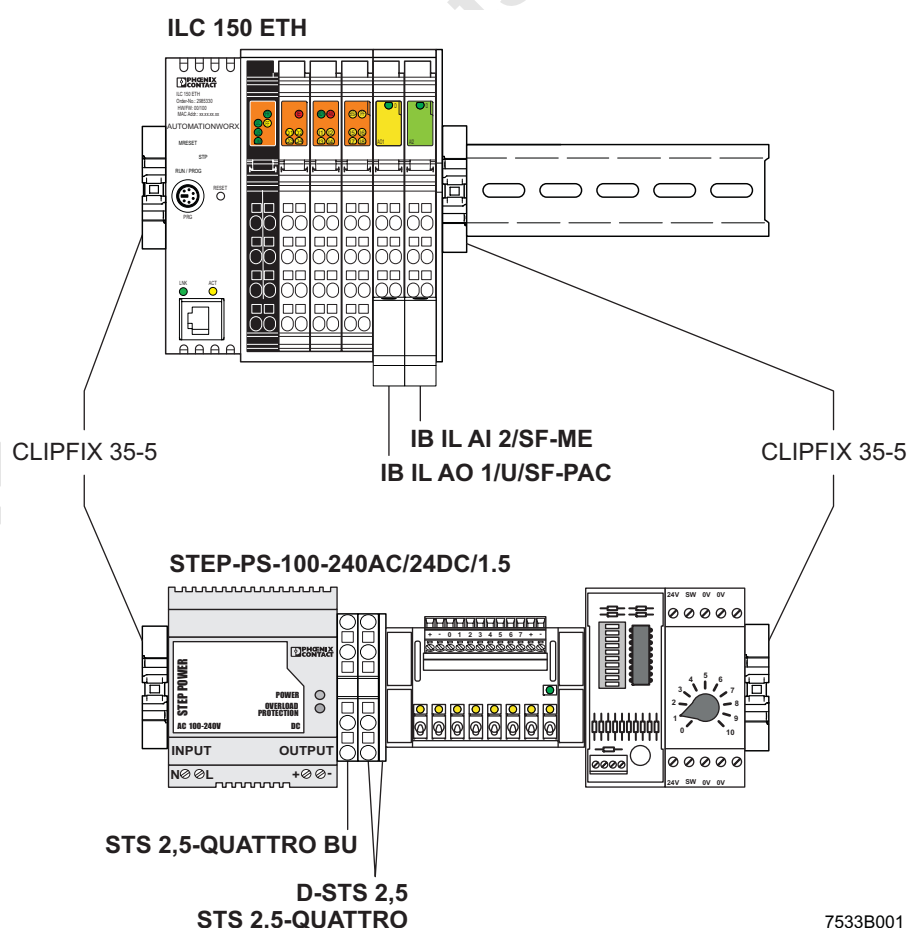
Figure 2-1   ILC 150 Starter Kit: Installed components

2.1.2   Wiring of the Inputs

For the example program in this documentation, the following inputs and outputs are connected:

Table 2-1   Inputs and outputs used in the example

Device	Input/Output	Signal at	Variable
ILC 150 ETH	Input I1 Input I2 Input I3 Input I4 Input I5 Input I6 Input I7 Input I8	Connector 3 terminal point 1.1 Connector 3 terminal point 2.1 Connector 3 terminal point 1.4 Connector 3 terminal point 2.4 Connector 4 terminal point 3.1 Connector 4 terminal point 4.1 Connector 4 terminal point 3.4 Connector 4 terminal point 4.4	ONBOARD_INPUT_BIT0 ONBOARD_INPUT_BIT1 ONBOARD_INPUT_BIT2 ONBOARD_INPUT_BIT3 ONBOARD_INPUT_BIT4 ONBOARD_INPUT_BIT5 ONBOARD_INPUT_BIT6 ONBOARD_INPUT_BIT7
IB IL AO 1/U/SF-PAC	Output O1	Connector 5 terminal point 1.1	Output_Analog
IB IL AI 2/SF-ME	Input I9	Connector 6 terminal point 1.1	Input_Analog

Figure 2-2   ILC 150 Starter Kit: Example wiring for the inputs and outputs and the supply lines

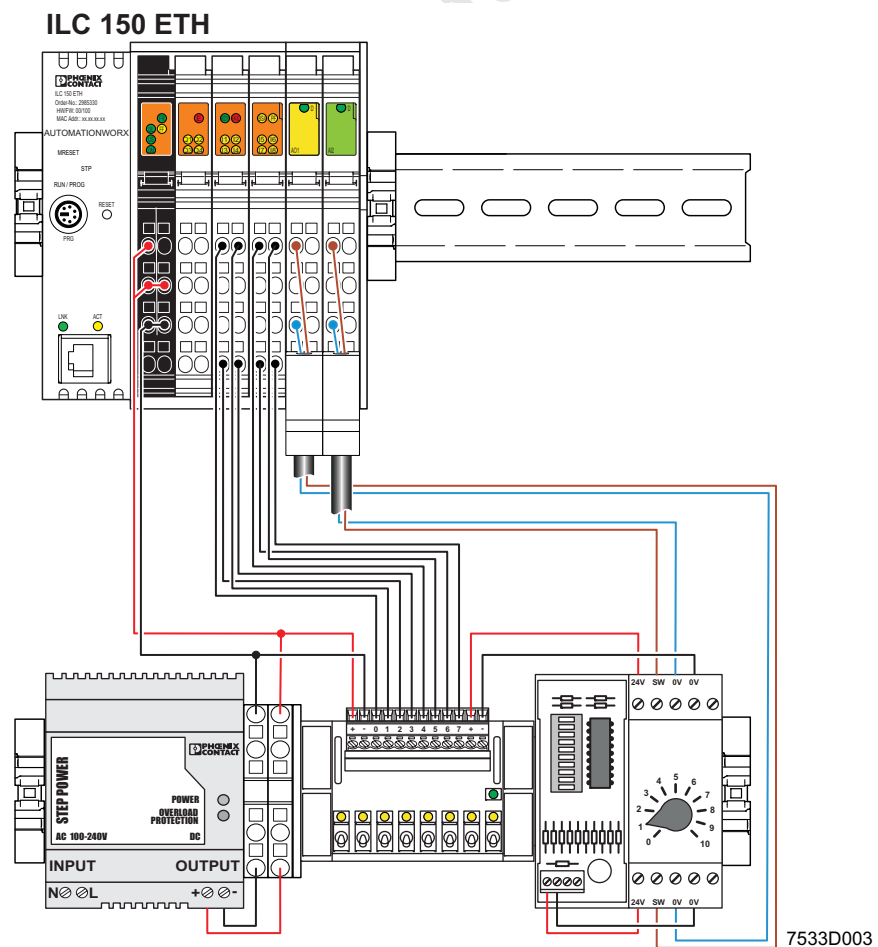### 2.1.3 Establishing the Ethernet Connection
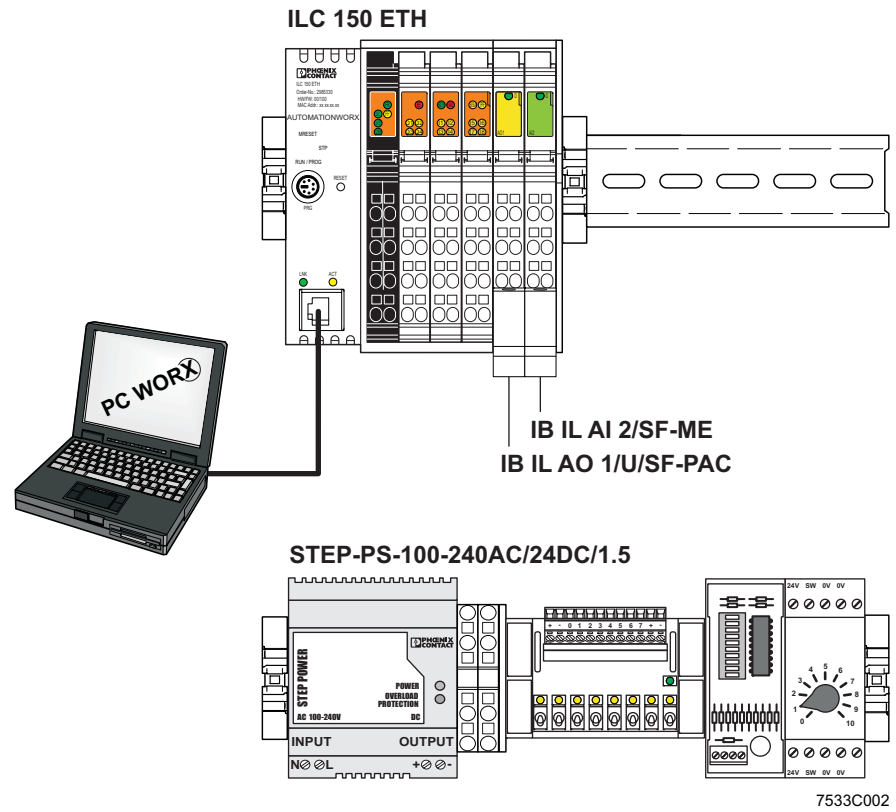
• Connect the Ethernet cable.

Figure 2-3   ILC 150 Starter Kit: Example for Ethernet cabling

2.2 Starting up the ILC 150 Starter Kit

2.2.1 Connecting the Supply Voltage

• Connect the mains cable to the supply voltage (230 V AC).
• Switch on the supply voltage.

2.2.2 Setting up the PC's Network Adapter for the Connection to the ILC 150 ETH

Please note that, by default upon delivery of the ILC 150 Starter Kit, IP address 192.168.0.2 and subnet mask 255.255.255.0 are preset on the ILC 150 ETH.

• Check the settings of your network adapter in the Windows Control Panel.
• Adjust the settings, if necessary, in order for the ILC 150 ETH to be accessible in your network under the preset address.

If you are not able to use the preset IP address of the controller in your network, please read the additional information on adjusting the IP address in Section "Checking/Modifying the IP Settings for the Controller (BootP)" on page 5-5.

Make sure that the PC WorX software is installed and started in order to modify the IP address.

For information on PC WorX installation, please refer to Section 3, "Installing and Enabling the PC WorX Software" from page 3-1. For information on PC WorX operation, please refer to Section 4, "Helpful Information About PC WorX" from page 4-1.

2.2.3 PC WorX Example Project

Please note that, by default upon delivery of the ILC 150 Starter Kit, a PC WorX example project is stored on the controller of the starter kit.

After connecting the voltage to the starter kit you can control the controller inputs/outputs by pressing the switches on the switch module (indicated by the input/output LEDs), as well as modify the bar graph indicator by turning the potentiometer.

For further information on the PC WorX example project, please refer to Section "Example Project "QuickStart_ILC150"" on page 5-16.

2.2.4 Starting the Visualization Application

☞ | **Please note that**
– by default upon delivery of the ILC 150 Starter Kit, a WebVisit example project is stored on the controller of the starter kit.
– the visualization application is only started if the following settings have been made in the Windows® Control Panel.

• Start the Windows® Control Panel.
• Start the Java control panel (version 1.6.x).
• Set the settings for the temporary files such that temporary files are not stored on the computer.

Display the visualization application by entering the controller IP address in the address window of your Java-compatible browser.

• Enter the controller address in the address window of your browser (on the ILC 150 ETH of the starter kit: "http://192.168.0.2", by default).
• Confirm with "Enter".

If all the settings have been made properly, your browser will display the homepage of the visualization application after a short loading time. On this page software switches can be used to call additional pages of the visualization application. The additional pages provide animated LED representations which can be activated/deactivated by pressing the switches of the switch module.

For further information on the WebVisit example project, please refer to Section "Appendix: Visualization With WebVisit"on page A-1.

2.3 Additional Steps

The following sections of this quick start guide contain information for programming the PC WorX example project stored on the controller of the starter kit by default yourself. The appendix provides additional information on the visualization example project which was stored on the controller of the starter kit by default.

3 Installing and Enabling the PC WorX Software

3.1 Installing Software

3.1.1 Prior to Installation

Prior to installation, close all open Windows® applications.

This PC WorX version can be installed parallel to an existing earlier version.

Make sure that you install the PC WorX software from the AX SW SUITE DEMO CD first. Then install Service Pack 2 for the PC WorX software from the CD ILC150 Starterkit CD.

3.1.2 Starting the PC WorX Installation Program

Usually the installation program starts automatically a few seconds after you place the CD-ROM in the CD drive.

- If this is not the case, start the "SETUP.EXE" file from the "[Drive]:\Setup\" directory on the CD-ROM. This file calls the installation wizard, which guides you through the installation process.
- Follow the instructions in the installation program.

The installation program will generate all the directories necessary for operation and will copy the files according your selection in the installation program.

- Following successful installation, restart your PC to activate the changes to the configuration files. To do this, click on "Finish" at the end of the installation process.

3.1.3 Installing Service Pack 2

Once you have installed PC WorX, start the installation of Service Pack 2 for PC WorX.

- Start the installation of Service Pack 2 by clicking on "Install" under "PC WorX Service Pack 2" in the user interface of the CD ILC150 Starterkit CD.
- Follow the instructions in the installation program.

3.1.4 Starting PC WorX

- For installation using the default settings, start PC WorX via "Start... Programs... Phoenix Contact... AUTOMATIONWORX Software Suite 2007 1.30...PC WorX 5.xx".

☞

> When started for the first time, PC WorX runs in demo mode with limited resources.
>
> To enable PC WorX as a basic license for the example project in this starter kit, proceed as described in "Enabling the PC WorX Basic License" on page 3-2.

If you wish to switch from the basic license to the full version, you will need a corresponding license key in order to enable this version. Please contact your nearest Phoenix Contact representative.

3.2 Enabling the PC WorX Basic License

After starting PC WorX, proceed as follows to enable your PC WorX basic license:

- Select the "Register..." command from the "?" menu.
- Enter your registration code.

The registration code for this starter kit version of PC WorX is:
19E80-19A75-E3B30-C895B-8D8CF-04541-B5E

- Confirm your entry with OK.

Registration will come into effect when PC WorX is started again.

4 Helpful Information About PC WorX

4.1 Online Help

More detailed information about the individual functions of PC WorX can be found in the online help for the program. The entire help function can be called via "Help" in the menu bar. Help for specific functions can be called via F1.

4.2 PC WorX User Interface

The user interface consists of the following main components: menu bar, toolbars, main window, and status bar. The contents of the main window depend on the workspace.
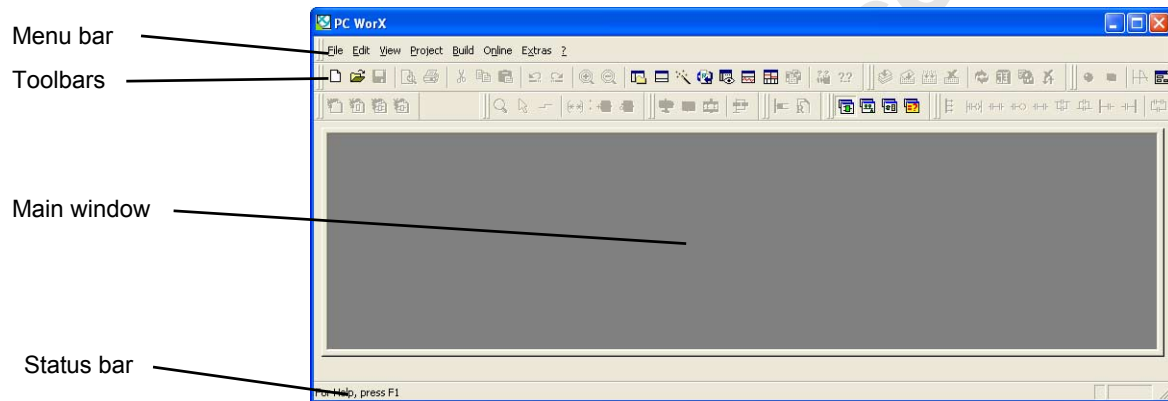

Figure 4-1   User interface

4.3 Toolbars

The program contains several toolbars with different icons, which enable frequently used operations to be executed quickly. Alternatively, these operating steps can be called via menu items or predefined shortcuts.

By default, all the toolbars are shown. To display or hide a specific toolbar, use the "Extras/Options" dialog box.

When the mouse pointer is placed over an icon (without clicking on it), a tool tip appears. The tool tip displays the name of the current icon. In addition, a short function description appears in the status bar. If tool tips are not displayed, this feature can be activated in the "Extras/Options/Toolbars" dialog box.

Icons for Selecting the Workspace

The workspace can be changed via the icons in the toolbar:
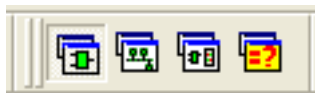
Activate IEC programming workspace.

Activate bus configuration workspace.

Activate process data assignment workspace.

Activate project comparison workspace.

> Which windows will actually be displayed depends on which windows have been toggled on. The last setting for each workspace is saved when the program is closed and restored when it is started again.

Frequently Used Icons for Compiling and Debugging

Online modifications.

Make (compile project; corresponds to "Build/Make" in the menu bar).

Switch debug mode on/off.

Display project control dialog box.

4.4 Workspaces

PC WorX is divided into four workspaces:

– IEC programming

– Bus configuration

– Process data assignment

– Project comparison

The "View" menu or the corresponding icon in the toolbar can be used to switch between the workspaces. Following initial installation the IEC programming workspace is the default setting.

Figure 4-2 to Figure 4-4 show the default workspaces. The windows that you wish to display can be defined at any time for each workspace.
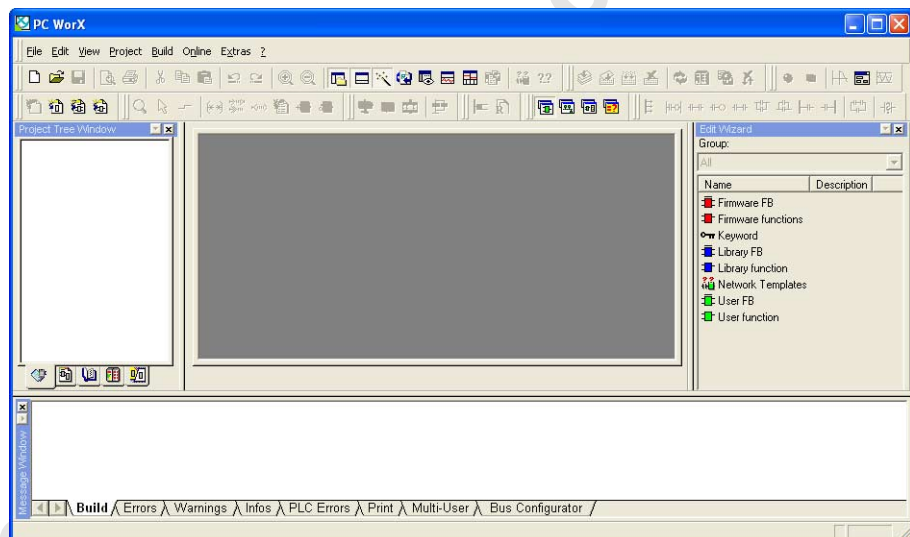
IEC Programming Workspace

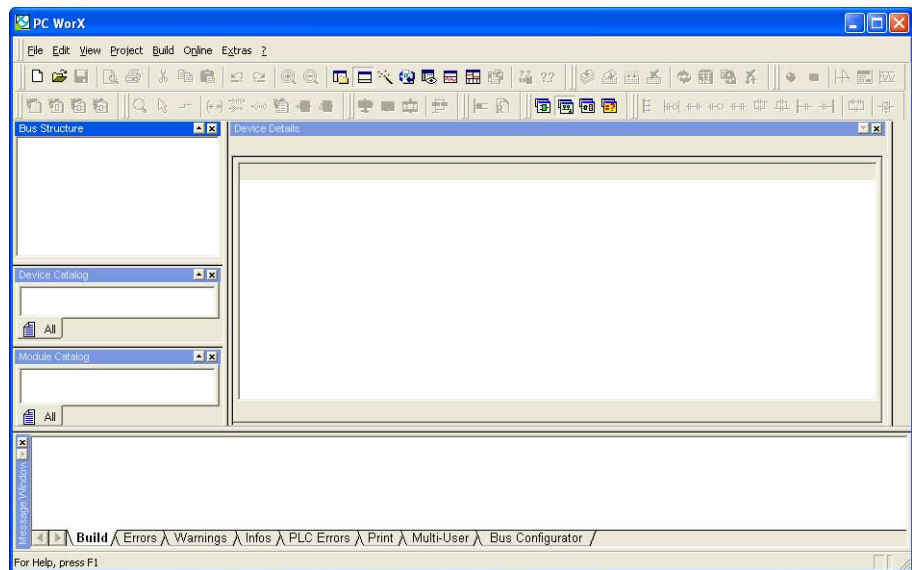Figure 4-2   IEC programming workspace

Bus Configuration Workspace

Figure 4-3   Bus configuration workspace
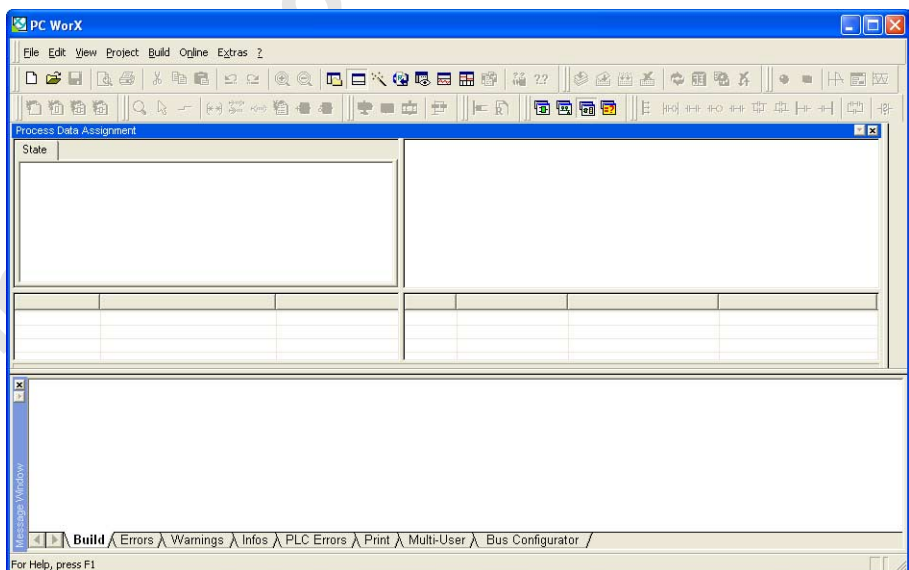
Process Data Assignment Workspace

Figure 4-4   Process data assignment workspace
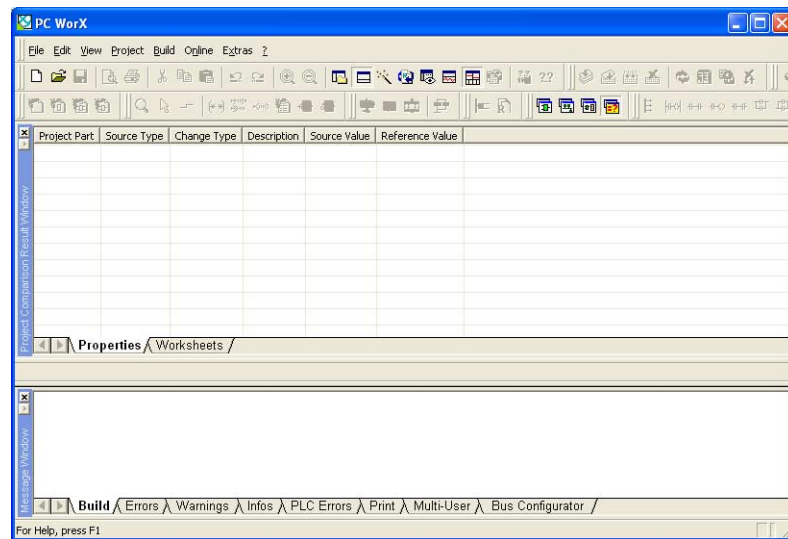
Project Comparison Workspace

Figure 4-5   Project comparison workspace

Toggling windows on/off   Each window can be toggled on/off via the "View" menu by selecting the corresponding menu item.

Docking/undocking windows   For each window, you can specify whether it is to be docked in the other windows or not. There are various options for docking/undocking windows:

1. Permanent docking/undocking:
    In the title bar or the gray frame of the relevant window, right-click with the mouse and activate/deactivate the "Allow Docking" menu item.
    Move an undocked window to the position where it is to be inserted in the desktop.
2. Temporary undocking:
    Double-click on the gray window frame or the title bar of the window. The window is then displayed as a "normal" window. Its size can be modified and it can be moved to any position on the screen. In order to re-dock the window, i.e., to reinsert it in the desktop, double-click on the title bar.

4.5   "Bus Structure" Window

The "Bus Structure" window is used to display and edit the bus topology.

4.5.1   Icons in the "Bus Structure" Window

4.5.1.1   Logical Device Functions

The individual device functions are identified in the "Bus Structure" window with logical icons. The logical icons in the example bus configuration have the following meaning:

Table 4-1   Icons for logical device functions (examples)

Icon	Meaning
R Resource:	**Control system resource** When creating the project using a template, the control system resource is inserted below this icon. When creating the project using the wizard, the control system resource is inserted below this icon.
INTERBUS:	**INTERBUS master** Below this icon, insert the INTERBUS devices that are directly connected to the device that this icon refers to (local bus and remote bus).

4.5.1.2   Validity of Actions

When editing the bus configuration with the mouse, the mouse pointer indicates the validity of your actions.

Table 4-2   Icons when editing the bus configuration

Icon	Meaning
	Insert at the same level
	The device can only be inserted in/moved to the same level as existing devices.
	Insert in the lower level
	The device can only be inserted in/moved to a lower level than existing devices.
	Replace
	The device under the mouse pointer can be replaced by holding down the <Ctrl> key and placing the mouse pointer on the existing device.
	Not permitted
	This icon indicates a mouse pointer position for which actions are not permitted.

4.5.1.3 Display of Status Information

In the "Bus Structure" window some icons, which superimpose other graphics, are used to display important status information.

Table 4-3   Icons for displaying status information

Icon	Meaning
⊘	The device is hidden or the bus is deactivated.
✖	Errors have occurred for the device.
⚠	Warnings have occurred for the device.
🖈	The pin indicates a module that is a fixed component of a device. This element cannot be deleted or replaced.

4.5.2   Display in the "Bus Structure" Window

The display in the "Bus Structure" window can be adapted to your requirements.

- Switch to the bus configuration workspace.
- In the context menu, open a device via the "Edit Device Representation..." menu item.

Renumber devices	▶
Copy Device	Ctrl+C
Copy with Subdevices	Ctrl+T
Cut	Ctrl+X
Paste as Child	Ctrl+B
Paste as Sibling	Ctrl+V
Replace	
Blind out Device	Ctrl+Shift+D
Deactivate Bus	
Delete	Delete
Edit Device Representation...	Ctrl+E
Print Bus ...	
Refresh View	F5
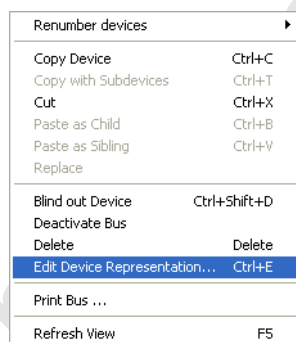
Figure 4-6   "Edit Device Representation..." menu item

- Select the criteria that you would like to see in the display.
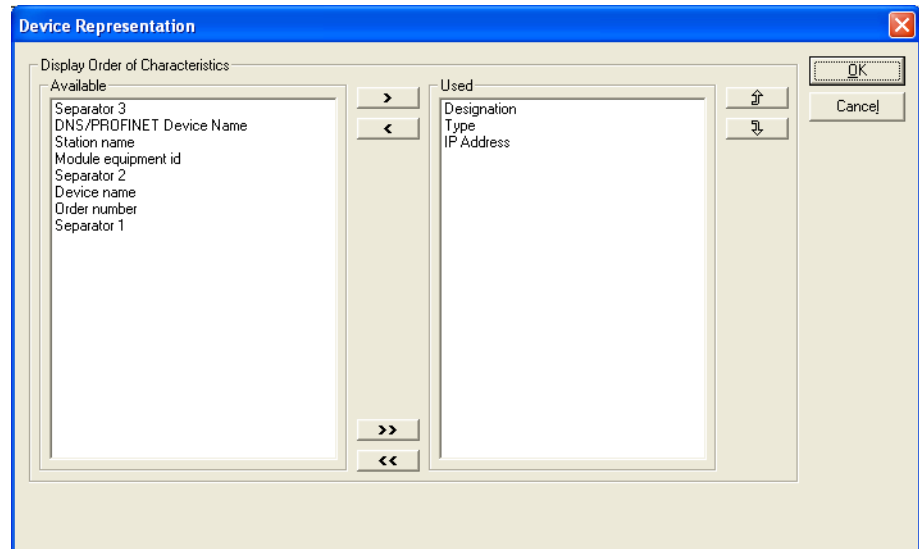
Figure 4-7   Device representations

Examples for different device representations:

Designation and IP address

Designation, IP address, separator, and order number
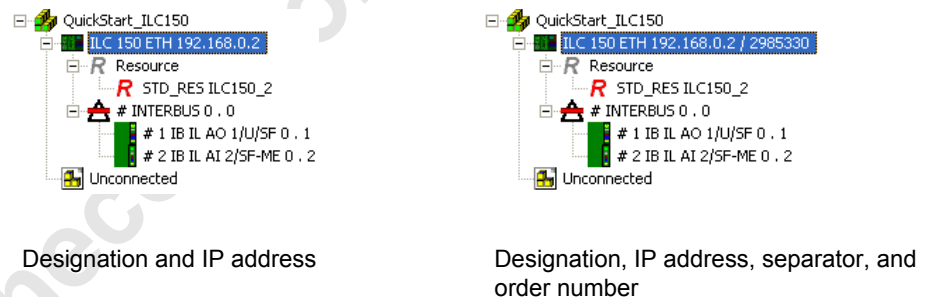
Figure 4-8   Examples for different device representations

The selected representation only affects the representation of a specific device group.

Groups include, for example:
– Control systems
– PROFINET IO devices
– INTERBUS devices

For example, the setting for the Inline Controller does not have any influence on the representation of the Inline modules (see Figure 4-8).

4.6 Compiling and Sending a Project, and Performing a Cold Restart

4.6.1 Compiling a Project

- When compiling a project for the first time, select the "Rebuild Project" command from the "Build" menu. For further compiling processes you can also use the "Make" command (see also "Compiling (Additional Information)" on page 4-12).
- If errors occur when compiling, remove the errors and repeat the compiling process until it is completed successfully. Error messages must be removed. Warning messages do not have to be removed.

☞ If you are compiling the project but have not yet programmed anything, you will receive the "Empty worksheet" warning message. This warning message does not affect the next step and can be ignored.

The results of the compiling process are displayed in the message window together with details of the number of errors and warnings.

4.6.2 Sending a Project

When sending the project to the control system, the desired INTERBUS configuration is transmitted and activated.

- Open the project control dialog box.

☞ If only the "Close" button is enabled in the project control dialog box that opens, there is no valid connection to the ILC 150 ETH. In this case, check the communication path.
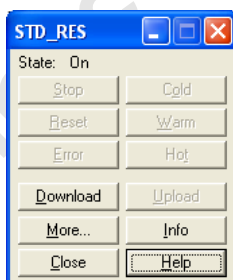
Project control dialog box

Figure 4-9   Project control dialog box

Before sending the project to the controller, the download options can be set.

- Click on "More...".

Download options
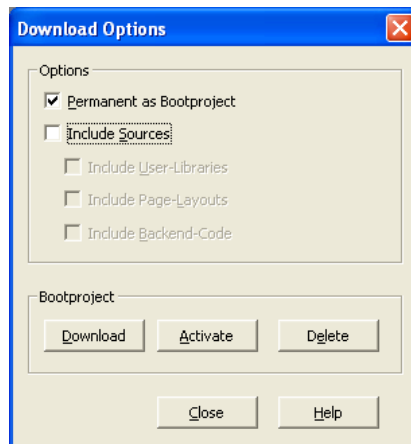
The "Download Options" dialog box opens.

Figure 4-10   "Download Options" dialog box

In the dialog box in Figure 4-10, the following download options can be selected for the project, which is to be transmitted to the controller. In addition, the boot project of the current project can be sent separately or activated/deleted on the controller. The settings selected in this dialog box are used for all transmissions to this specific controller (ILC 150 ETH in the example).

"Options" area

– Permanent as Bootproject	This option can be deactivated to exclude the boot project when sending to the controller.
– Include Sources	This option enables additional options that can be used to select sources, which are included when sending a project.
– Include User Libraries	All included user libraries are included in the packed program source.
– Include Page-Layouts	All page layouts that are used are included in the packed program source.
– Include Backend-Code	All project source data including the compilation is included in the packed program source.

"Bootproject" area

–	"Download" button	The boot project is sent separately to the controller without the complete project.
–	"Activate" button	The boot project saved on the controller is activated. Following activation, the boot project can be executed.
–	"Delete" button	The boot project saved on the controller is deleted.

• Close the "Download Options" dialog box once you have made the necessary settings for your project.
• In the project control dialog box click on "Download".

The project is now in the main memory of the controller.

4.6.3 Performing a Cold Restart

In order to activate the project, it is necessary to perform a cold restart.
• To do so, click on "Cold" in the project control dialog box.

Figure 4-11   Project control dialog box

The ILC 150 ETH has been started up successfully if the green FR LED is on.

4.6.4   Compiling (Additional Information)

There are two options for compiling:

1   Build/Make

2   Build/Rebuild Project

Rebuild Project

Use this command to compile an **entire** project for the first time or after modifying a user library.

"Rebuild Project" compiles and links all worksheets. Errors and warnings that are discovered by the compiler are logged in the message window. After the syntax has been checked successfully, the system automatically generates the IEC code and the special PLC code. Finally, the project can be sent to the controller.

The "Rebuild Project" command should only be used if errors occurred when compiling with "Make" or your project was unpacked without frontend.

Make

The "Make" command is the standard mode for compiling. Use this command after editing and completing your project.

When the "Make" menu item is executed, all **modified** worksheets are compiled/linked and the modified PLC code is generated.

This command can be executed from the menu bar via "Build/Make", with the "Make" icon in the toolbar or using the shortcut <F9>.

Modified worksheets in the project tree are identified by an asterisk that appears after the worksheet name.

Both

After the compiler has been started, the message window appears automatically if it was closed before. This window indicates the steps the compiler is currently executing. In addition, errors, warnings, and additional information about the process are logged here.

Once the compiling process has been completed successfully, i.e., no errors have been reported, the modified project can be sent to the controller.

5   Example Project

> In addition to the example project described in the following section, other example projects are in preparation. In future, they can be downloaded from the Internet at www.download.phoenixcontact.com using the Order No. of the ILC 150 Starter Kit (2988955).

In this section, it is assumed that the following steps have already been completed:

– The hardware is installed (see "Installed Hardware and Startup" on page 2-1).
– The software is installed (see "Installing and Enabling the PC WorX Software" on page 3-1).

5.1   Overview

```
                  ┌─────────┐
                  │  Start  │
                  └─────────┘
                       │
    ┌──────────────────┐          ┌──────────────────┐
    │ Create new project│         │       Read        │
    │                   │         │    INTERBUS       │
    └──────────────────┘          └──────────────────┘
             │                             │
    ┌──────────────────┐          ┌──────────────────┐
    │  Specify project  │         │  Create programm  │
    │   informationen   │         │                   │
    └──────────────────┘          └──────────────────┘
             │                             │
    ┌──────────────────┐          ┌──────────────────┐
    │ Check/modify IP   │         │ Assign process    │
    │ settings          │         │ data              │
    │ for controller    │         │                   │
    └──────────────────┘          └──────────────────┘
             │                             │
    ┌──────────────────┐          ┌──────────────────┐
    │ Assign IP address │         │ Compile and send  │
    │ for               │         │ project,          │
    │ controller /      │         │ and perform cold  │
    │ BootP Server      │         │ restart           │
    └──────────────────┘          └──────────────────┘
                                           │
                                  ┌──────────────────┐
                                  │ Operation/debug   │
                                  │     (end)         │
                                  └──────────────────┘
                                                7533C004
```
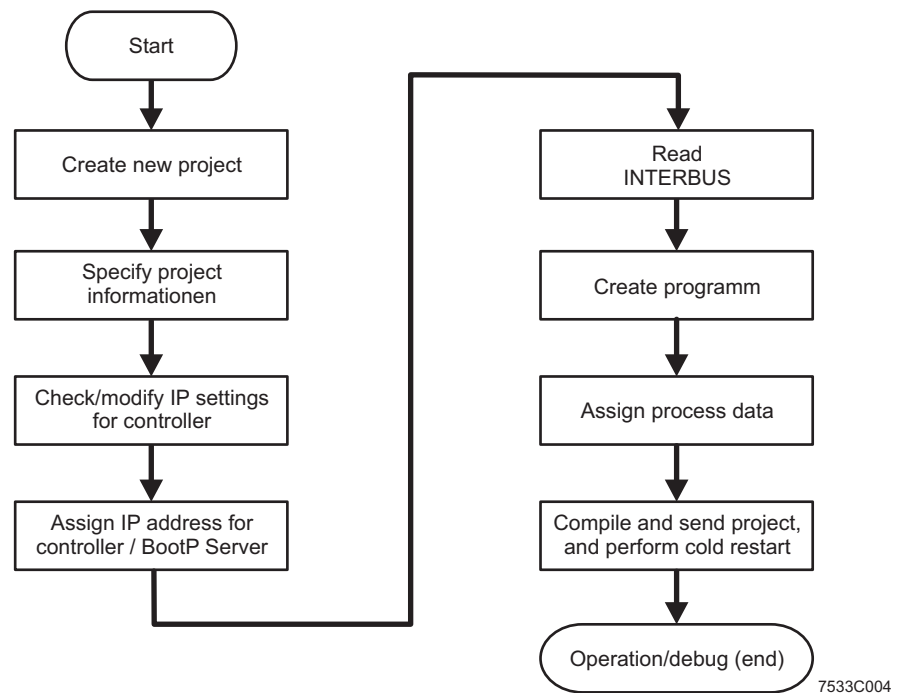
Figure 5-1   Sequence for creating a project

5.2 Creating a New Project

In the following sections the Function Block Diagram (FBD) language is used to develop an example project.

☞
> Please note that
> – this example project is stored on the ILC 150 ETH by default upon delivery of the ILC 150 Starter Kit.
> – this example project is available as "QuickStart_ILC150.zwt" file on the starter kit CD.

📑
> Read the additional descriptions in Section "Example Project "QuickStart_ILC150"" on page 5-16 if you
> – want to use the example project from the CD directly in PC WorX.
> – want to upload the example project from the ILC 150 ETH to the PC in PC WorX.

☞
> If you want to test the following steps yourself, please use the same identifiers and names as used in this user manual in order to obtain the best possible result.

• Select the "New Project..." command from the "File" menu to create a new project using a template.

The tree structure and the selection of the control system are now prepared.

• Select the "ILC 150 ETH Rev. >01/2.00" control system and confirm your selection with "OK".
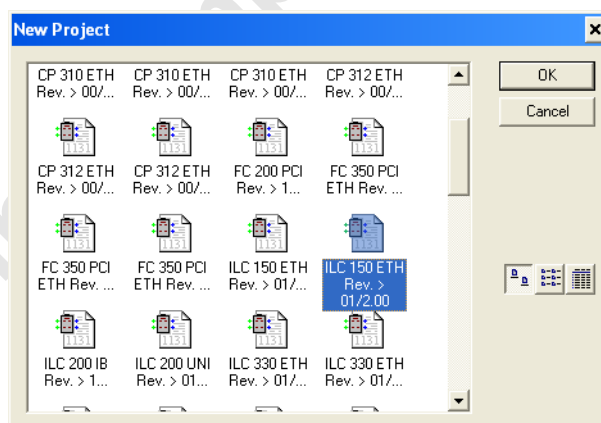
Figure 5-2　　Project templates

• Select the "File... Save Project As/Zip Project As..." command.

- Enter a project name (here: QuickStart_ILC150) and save the project.
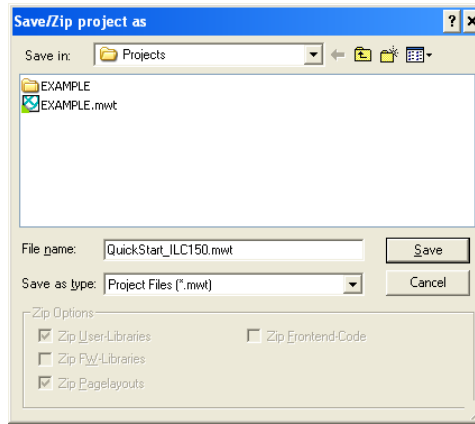
Figure 5-3   "Save/Zip project as" window

5.3   Adapting the Project Information

•   Switch to the bus configuration workspace.

After creating a new project, the project information is displayed in the bus configuration workspace.

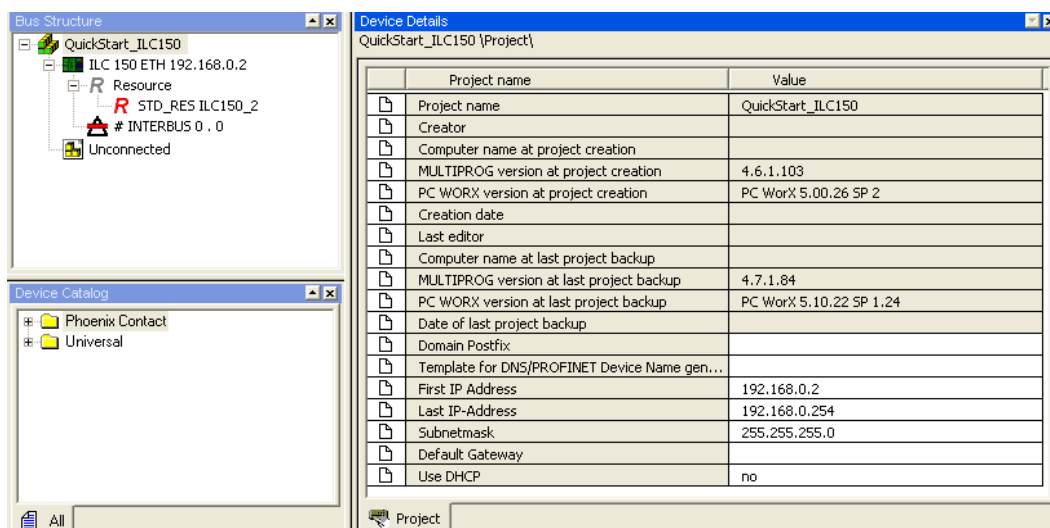•   Adapt the project information to your project.

Figure 5-4   Project information after creating a new project

First and Last IP Address, Subnetmask

During project creation, PC WorX automatically assigns an IP address area for a **local network** (area from 192.168.0.2 to 192.168.0.254). If you would like to use another address area (e.g., a **global network**), adapt the start and end address on the project node (here: Quickstart_ILC150) to your application.

If the IP parameters are modified in the project settings, the IP addresses of the controller may have to be modified manually (see "Checking/Modifying the IP Settings for the Controller (BootP)" on page 5-5).

If you are using the addresses of a local network in your project, also assign a corresponding address (e.g., 192.168.0.225) to the PC on which PC WorX is installed. Otherwise the devices in the local network cannot be accessed.

For information about the IP addresses to be used within your system, please contact your system administrator.

If the start address of the new address area to be entered is higher than the previous end address, please modify the end address first.

If you manually assign IP parameters that are outside the defined area, they will not be accepted.

5.4 Checking/Modifying the IP Settings for the Controller (BootP)

Please note that, by default upon delivery of the ILC 150 Starter Kit,
– IP address 192.168.0.2 and subnet mask 255.255.255.0
– BootP (see note below)

are preset on the ILC 150 ETH.

Initial setting of the IP address of the controller can be performed using a BootP server or manually using the serial interface. During later operation the IP address can be modified using the serial connection or Ethernet and the PC WorX software.

To connect the controller to a PC via the serial interface the PRG CAB MINI DIN connecting cable (RS-232 cable) (Order No.: 2730611) is available as an additional accessory.

PC/network adapter

If your network permits using the preset IP address, the network adapter of your PC must be configured accordingly.

• Check the settings of your network adapter in the Windows Control Panel.
• Adjust these settings, if required, such that the ILC 150 ETH can be addressed in your network under the preset address.

If your network does not permit using the preset IP address, BootP is available on the ILC 150 ETH of the ILC 150 Starter Kit by default, in order to configure the IP address of the ILC 150 ETH for your network.

Bootstrap Protocol (BootP)

In an Ethernet network BootP is used to assign an IP address to a BootP client using a BootP server. In this example (default upon delivery of the ILC 150 Starter Kit) the ILC 150 ETH (BootP client) sends a Boot_Request to the network in the form of a broadcast call. A unique identification is the MAC address of the sender which is transmitted together with the Boot_Request. If the BootP server was activated in PC WorX, PC WorX responds with a Boot_Reply. Using this Boot_Reply PC WorX informs the ILC 150 ETH about its IP address and subnet mask. Please ensure that
– the BootP server knows the MAC address sent by the BootP client.
– an IP address and subnet mask have been specified for the MAC address in PC WorX.

PC WorX acknowledges successful transmission of the IP data to the ILC 150 ETH by means of a corresponding message.

Checking the IP settings

When creating the project the IP settings are made for the controller.
• Adjust these settings, if required.

If you modify any project information which would affect the IP settings of the controller, a warning message appears. However, the settings are not modified automatically. When creating a new project the standard settings can be found under "IP Settings" (see Figure 5-5 on page 5-6).

• Mark the controller node in the bus configuration workspace.
• In the "Device Details" window change to the "IP Settings" tab.
• Check the IP settings and modify, if necessary. Make sure that the IP address of the controller is within the IP address area of the project.
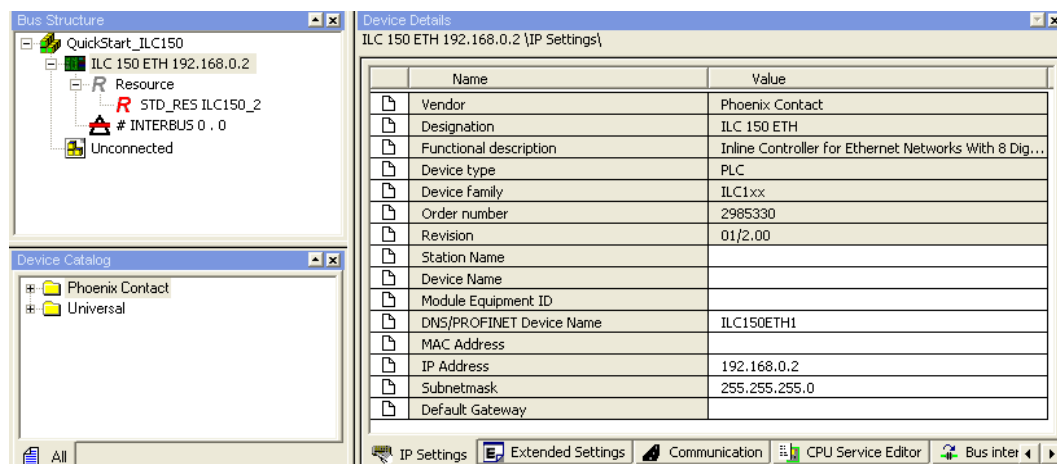
Figure 5-5   IP settings

☞ | The IP address that is assigned here for the controller is also implemented as the IP address for the communication path via TCP/IP.

Using/modifying the IP settings

The following sections inform you about how to proceed in order to establish communication to the ILC 150 ETH in your network if

– you wish to use the preset IP address (see Section 5.4.1).
– you do not wish to use the preset IP address although the controller can be addressed using this IP address (see Section 5.4.2).
– you cannot address the ILC 150 ETH in the network using the preset IP address (see Section 5.4.3).
– BootP is not activated on the ILC 150 ETH (see Section 5.4.4).

5.4.1 Using the Preset IP Address

- Establish an Ethernet connection between the PC and the controller.
- Test the communication path set. For this purpose, change to the "Communication" tab (see Figure 5-6).
- Click on "Test".
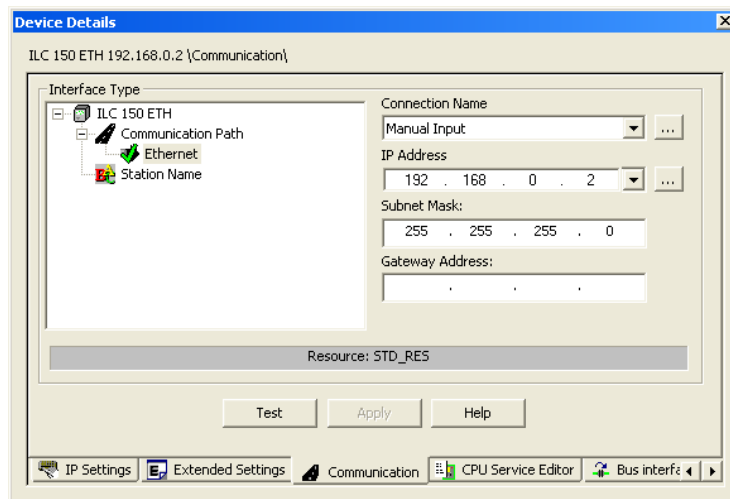
Figure 5-6   Testing the communication path

PC WorX indicates successful testing of the communication path by means of the following message:
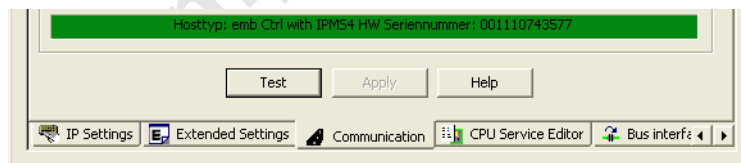
Figure 5-7   Communication path tested successfully

5.4.2 Changing the IP Address Without Using BootP - The Controller can be Addressed Using the Preset IP Address

If communication with the ILC 150 ETH is possible in your network using the preset IP address (see Testing the communication path in Section "Using the Preset IP Address" on page 5-7) but the controller is to be assigned a different IP address, proceed as follows:

• Establish an Ethernet connection between your PC and the controller if it has not yet been established.

• Change to the "Extended Settings" tab.

Select the "Manual definition of the TCP/IP settings" option in the "Network Settings" area.

• Enter the desired IP address and subnet mask
(here: IP Address: 192.168.0.22; Subnet Mask: 255.255.255.0).

• Click on "Send" to transfer the data to the controller.

• Confirm the "Settings Communication Path" dialog box with "OK" (IP address 192.168.0.2 is selected in the example).
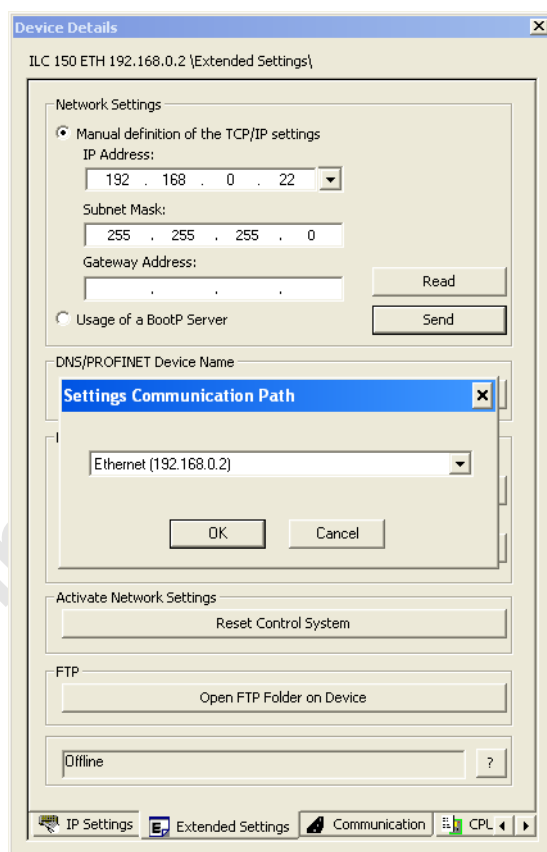
Figure 5-8   Extended Settings - Sending the IP address (192.168.0.22)

In the status window (Offline in Figure 5-8) PC WorX displays the following messages one after the other provided that the IP address was transmitted successfully:

–   Establishing connection...,

–   Online,

–   Service executed successfully,

–   Offline.

To complete IP address assignment, the controller has to be reset in order to activate the new network settings.

•   In the "Activate Network Settings" area click on "Reset Control System" (see Figure 5-8).

•   Confirm the question to really reset the control system with "Yes".

•   Confirm the "Settings Communication Path" dialog box with "OK" (IP address 192.168.0.2 is selected in the example).

In the status window (Offline in Figure 5-8) PC WorX displays the above messages one after the other again provided that the controller was reset successfully.

On the "Communication" tab you can check whether the controller has been successfully assigned the above IP address.

•   Change to the "Communication" tab.

•   Click on "Test" to test the communication path using the IP address assigned above.

PC WorX indicates whether changing the IP address has been successful or not (see Section 5.4.1).

> Please note that BootP is deactivated on the ILC 150 ETH when assigning the controller an IP address as described above.

Activating BootP

After successfully assigning the IP address BootP can be activated on the ILC 150 ETH as described in the following.

•   Mark the "Usage of a BootP Server" option on the "Extended Settings" tab.

•   Confirm the settings by clicking "Send".

•   Confirm the "Settings Communication Path" dialog box with "OK" (IP address 192.168.0.22 is selected in the example).

In the status window (Offline in Figure 5-8) PC WorX displays the above messages one after the other again provided that BootP has been activated successfully on the ILC 150 ETH.

For reading the existing INTERBUS structure, please continue reading Section "Reading INTERBUS" on page 5-13.

5.4.3 Changing the IP Address Using BootP - The Controller Cannot be Addressed Using the Preset IP Address

Use the following way for address assignment via BootP if

– the ILC 150 ETH cannot be addressed in your network using the preset IP address (192.168.0.2; subnet mask: 255.255.255.0).

– the IP address of the controller is unkown.

– the preset IP address is not to be used on the ILC 150 ETH.

– the ILC 150 ETH has not been assigned an IP address so far.

☞ Please note that BootP must be activated on the ILC 150 ETH in order to perform the following steps.

How to activate BootP on the ILC 150 ETH if the controller cannot be addressed using the preset IP address can be found in Section "BootP is Deactivated on the ILC 150 ETH" on page 5-12.

To assign the controller an IP address, proceed as follows.

☞ After assigning the IP parameters, PC WorX automatically creates a link via TCP/IP as a communication path to the ILC 150 ETH.

• Establish an Ethernet connection between your PC and the controller.

• In the menu bar, select the "Extras... BootP/SNMP/TFTP-Configuration..." menu.
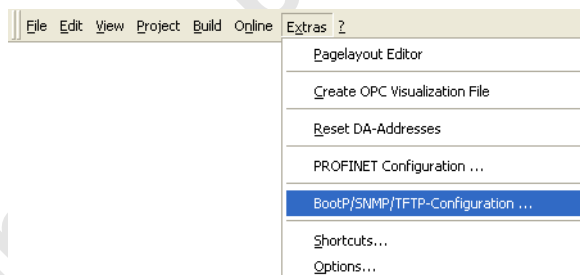
Figure 5-9   Extras / BootP/SNMP/TFTP-Configuration...

• Activate the "BootP Server active" checkbox.

• Switch to the bus configuration workspace.

• Select the "ILC 150 ETH" node.

• Select the "IP Settings" tab in the "Device Details" window.

• Enter the MAC address of the controller. It can be found on a sticker or directly imprinted on the device. The MAC address starts with 00.A0.45.
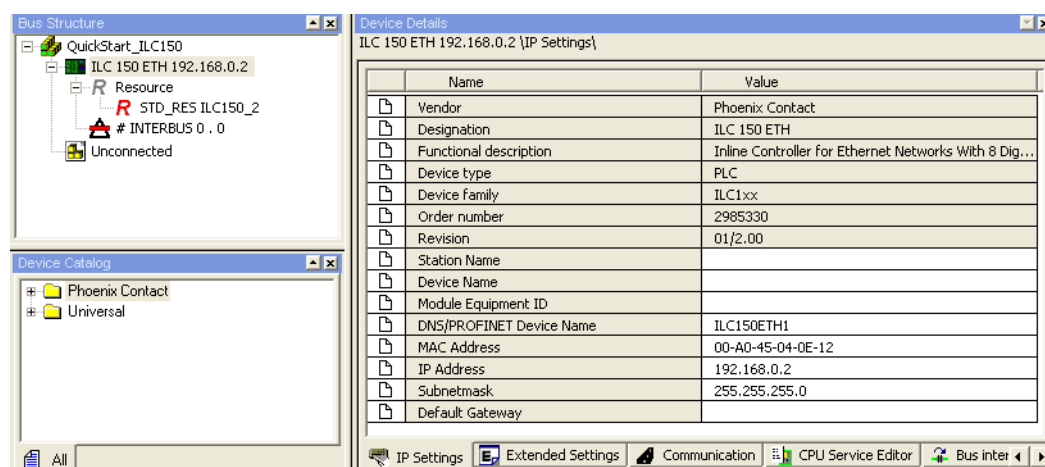
Figure 5-10   Entering the MAC address

- Reset the controller. To do this, switch the supply voltage off and on again.

The controller is assigned the IP address that is specified for the controller in the project. The following message is displayed in the message window on the "Bus Configurator" tab.
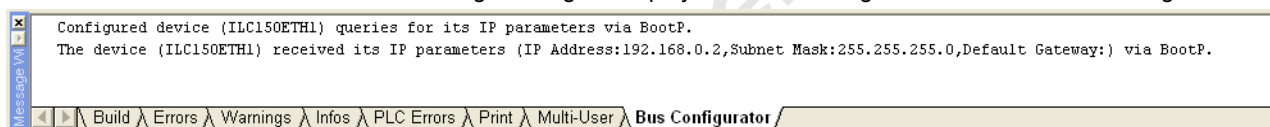
Figure 5-11   Message window following BootP

The IP address is now permanently stored on the controller Flash memory.

For reading the existing INTERBUS structure, please continue reading Section "Reading INTERBUS" on page 5-13.

5.4.4 BootP is Deactivated on the ILC 150 ETH

• Establish an Ethernet connection between your PC and the controller.

There are two possibilities to activate BootP.

The ILC 150 ETH can be addressed in the network

Activate BootP on the "Extended Settings" tab as described in Section 5.4.2, in Paragraph "Activating BootP" on page 5-9.

> Please note that all the data stored on the controller will be lost when resetting the controller voltage as described in the following.
>
> How to save the data on the controller again can be found in sections:
> – 4.6.2 "Sending a Project" (PC WorX project) on page 4-9.
> – A 3 "Reloading the Visualization" (WebVisit project) on page A-4.

The ILC 150 ETH cannot be addressed in the network

Activate BootP by resetting the controller voltage.

• Press the reset button and switch the supply voltage off and on again.

After that you can assign an IP address to the ILC 150 ETH as described in Paragraph "Changing the IP Address Using BootP - The Controller Cannot be Addressed Using the Preset IP Address" on page 5-10.

5.5 Reading INTERBUS

An INTERBUS system that is connected **to an Inline Controller** can be read once the communication path has been established to the Inline Controller.

In the example structure (see Figure 2-1 on page 2-1) two INTERBUS modules are connected to the ILC 150 ETH.

Procedure

• Select the "Connected Bus" command from the "View" menu to read the connected INTERBUS system.
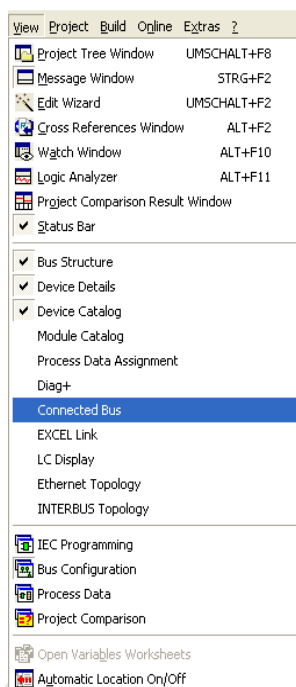
Figure 5-12   "View... Connected Bus" command

• Select the controller in the "Connected Bus" window.
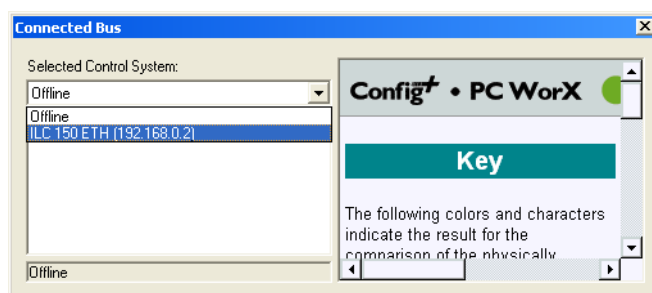
Figure 5-13   Selecting the ILC 150 ETH

This activates the "online" operating state and the controller reads the connected INTERBUS configuration.

ILC 150 Starter Kit

Once the controller has read the connected INTERBUS system, the INTERBUS devices must be imported into the project.

• Select the controller in the "Connected Bus" window.

• Open the context menu and select the "Import to Project... With Device Description" command.
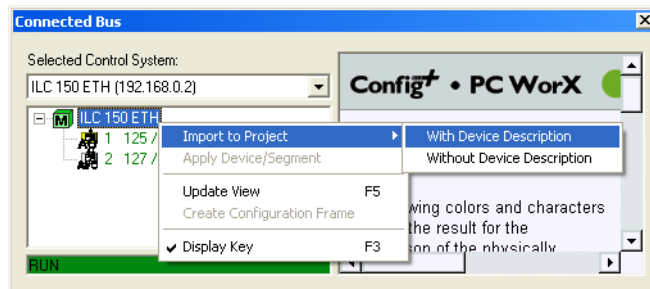
Figure 5-14   Importing devices into the project

The "Select Device" window lists the modules, whose device description corresponds to that of the connected devices.
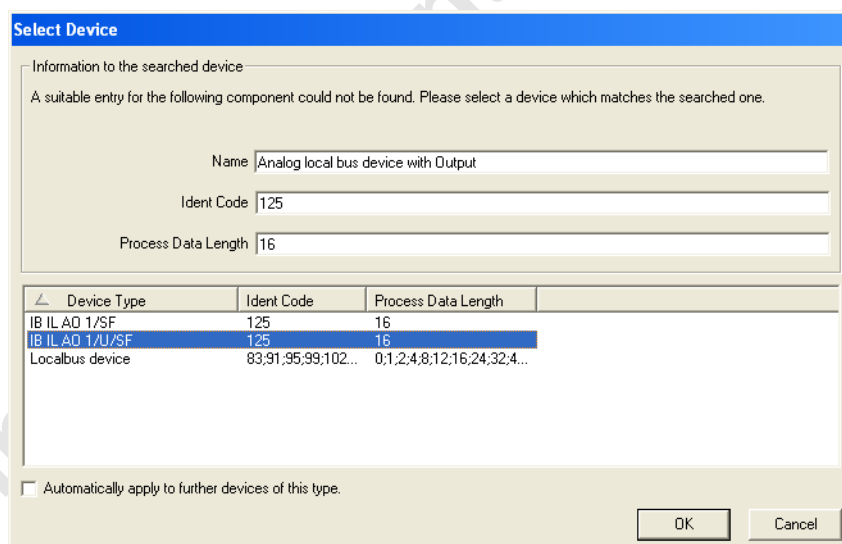
Figure 5-15   "Select Device" window

• Select the device that is actually connected in the INTERBUS system, and repeat this step until all the devices are linked to their device description.
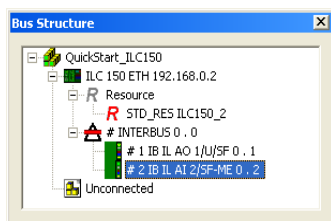
Figure 5-16   Complete bus configuration for the example project

- Disconnect the link by selecting "Offline" as "Selected Control System" in the "Connected Bus" window.
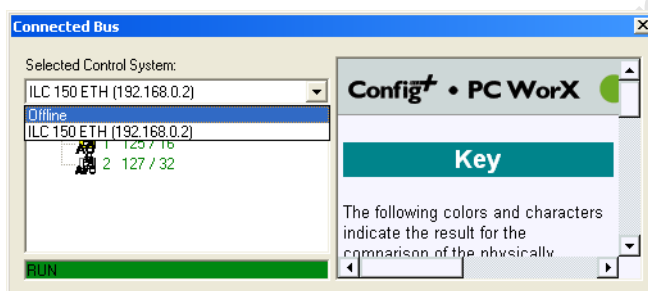
Figure 5-17   "Connected Bus" window: "Selected Control System - Offline"

5.6   Compiling and Sending a Project, and Performing a Cold Restart After Reading the Bus Topology

Now the project contains the full bus configuration. At this point you can compile your project in order to detect any errors that may have occurred.

In order to start up the project, compile it, send it to the control system, and perform a cold restart.

Proceed as described in "Compiling and Sending a Project, and Performing a Cold Restart" on page 4-9.

The ILC 150 ETH Inline Controller and the connected Inline terminals are now started up. The D LEDs on the Inline terminals are permanently on. INTERBUS is running.

5.7 Example Project "QuickStart_ILC150"

Please note that the example project described in the following sections is stored on the ILC 150 ETH of the ILC 150 Starter Kit by default.

In addition, the example project is available in the packed format file "QuickStart_ILC150.zwt" on the CD for the ILC 150 Starter Kit.

Developing the project yourself

When developing the project yourself, please read the following sections first. They provide a description for creating the program which is stored on the ILC 150 ETH of the ILC 150 Starter Kit by default. Please observe that the program code of the FlashLight POE (see Section""FlashLight" POU - Chasing Light" on page 5-27) has to be implemented in your program completely. This part of the program has been programmed in Structured Text (ST). The other parts of the program have been programmed in Function Block Diagram (FBD).

Viewing the example project in PC WorX

If you wish to look at the example project without developing it yourself, you may

– load the "QuickStart_ILC150.zwt" file from the CD for the ILC 150 Starter Kit.

– upload the project from the ILC 150 ETH to your PC.

Loading the Example Project From the CD

• Save the "QuickStart_ILC150.zwt" file on your PC, e.g., under the default path for PC WorX "C:\Program Files\Phoenix Contact\Software Suite...\Projects".

If there already is a "QuickStart_ILC150" project on your PC, rename the project from the CD, e.g., "QuickStart_ILC150_CD.zwt".

• Select the "File" menu item and then "Open Project/Unzip Project...".

• Select the "QuickStart_ILC150.zwt" file from the path under which you saved the file.

• Confirm the prompt asking whether the project should be extracted to the directory containing the zwt file with "Yes" if the file is to be extracted to this directory. Or select a different directory. PC WorX extracts the file automatically.

• If PC WorX prompts you to overwrite layouts (e.g., page layouts, etc.) or bitmaps, confirm this prompt with "No to all".

After PC WorX has extracted the project it is available for viewing/editing. You can, for example, now change to the debug mode in order to view the variable states while pressing the switches of the switch module and/or changing the position of the potentiometer (see Section "Operation and Debug Mode" on page 5-29).

Uploading the Example Project From the ILC 150 ETH

To upload the project from the ILC 150 ETH you must be able to address the controller in your network from PC WorX using an Ethernet connection.

• Proceed as described in Section "Creating a New Project" on page 5-2.

☞ | Because of PC WorX assigning an address area from 192.168.0.2 to 192.168.0.254 when creating a new project, it is possible to address the ILC 150 ETH using the IP address preset in the ILC 150 Starter Kit by default, provided that this is permitted in your network environment.

If the preset IP address of the ILC 150 ETH cannot be used in your network, please proceed as described in Section "Checking/Modifying the IP Settings for the Controller (BootP)" on page 5-5 in order to change the IP address.

If the controller can be addressed in your network from PC WorX using an Ethernet connection, please perform the following steps in PC WorX.

- Call the project control dialog box.
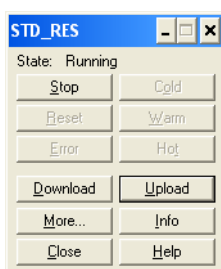
Figure 5-18   Project control dialog box- Uploading a project from the controller

- Click on "Upload".
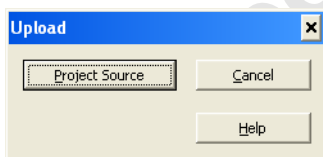
Figure 5-19   Uploading the project source

- Click on "Project Source".
- Extract the "QuickStart_ILC150.mwt" uploaded by the controller on your PC, e.g., under the standard path for PC WorX
  "C:\Program Files\Phoenix Contact\Software Suite...\Projects".

☞ | If there already is a project called QuickStart_ILC150 on your computer, rename the project from the CD, e.g., "QuickStart_ILC150_CD.zwt".

- If PC WorX now prompts to overwrite layouts (e.g., page layout...) or bitmaps, confirm with "No to all".

After PC WorX has extracted the project it is available for viewing/editing. You can, for example, now change to the debug mode in order to view the variable states while pressing the switches of the switch module and/or changing the position of the potentiometer (see Section "Operation and Debug Mode" on page 5-29).

5.8 Programming an Example Program Including Defining Variables

5.8.1 Program Description

A chasing light and the conversion of an analog input value into an analog output value are programmed in the example program for the starter kit.

Chasing light

Outputs 1 to 4 of the controller are controlled in succession. The speed of control varies depending on the position of switches 0, 1, and 2 of the switch module. This is indicated by LEDs Q1 to Q4.

In addition, the switch positions of switches 0 to 7 of the switch module are indicated using LEDs I1 to I8 of inputs 1 to 8 of the controller.

Analog value

An adjustable voltage is supplied at the voltage input for channel 1 of the Inline input terminal. This voltage, which is converted internally, is output at the analog output of the Inline output terminal. The bar graph display is used to visualize the output voltage value.

The entire program is implemented in the "Main", "FlashLight", and "Analog_In_Out" POUs. The **ONBOARD_INPUT_BIT10** and **ONBOARD_INPUT_BIT7** variables (system variables) map the status of the inputs to which the toggle switches are connected. The **Input_Analog** variable (user variable) maps the status of the analog input to which the adjustable voltage is supplied.

The time for controlling the chasing light speed is set within the "Main" POU according to the **ONBOARD_INPUT_BIT0** to **ONBOARD_INPUT_BIT2** input variables. In addition, the **FlashLight** and **Analog_In_Out** user-defined function blocks are called.

The **ONBOARD_OUTPUT_BIT0** to **ONBOARD_OUTPUT_BIT3** output variables are controlled within the "FlashLight" POU.

The analog input variable (**Input_Analog** variable) is converted into the analog output variable (**Output_Analog** variable) within the "Analog_In_Out" POU.

The basic steps for creating this program are described below.

Visualization

Outputs 1 to 4 of the controller are all set to TRUE simultaneously from the visualization. This function is then active once the visualization has been started in your browser and a corresponding button has been clicked. If the button is not clicked, the outputs continue to be controlled by the chasing light.

The **TestOutputs** variable creates the link with the visualization. Depending on the variable status, which is set by the visualization via buttons, outputs 1 to 4 of the controller are set.

5.8.2 Programming

For programming, proceed as follows:

- Switch to the IEC programming workspace.
- Double-click on "Main" in the "Project Tree Window" to activate the IEC programming interface.
- In the "Main" worksheet, click on the empty position where you would like to insert the function block.
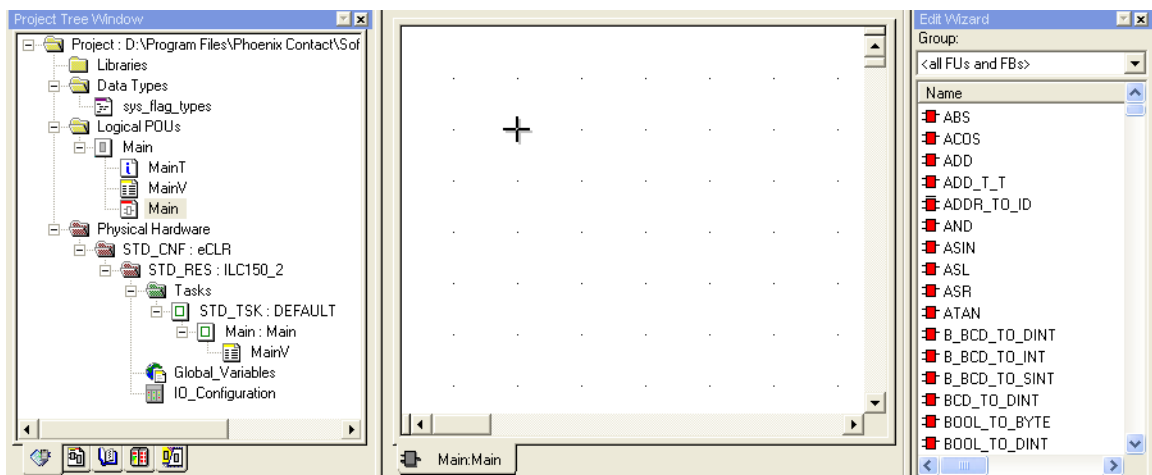
Figure 5-20 IEC programming workspace

5.8.3 Entering a Comment – Title of the POU

- Click on the desired position in the worksheet to set a cursor.

- Click on the "Insert Comment" icon in the toolbar.

- In the "Comment" dialog box that opens, enter the desired comment for the "Main" POU.
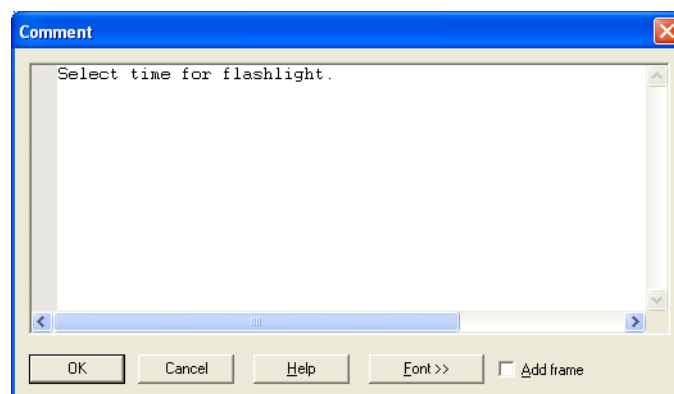
Figure 5-21 "Comment" dialog box

5.8.4 Defining Variables

The onboard inputs and outputs of the ILC 150 ETH are mapped to system variables. The variables for specifying the chasing light speed are defined as user variables.

When specifying the input and output variables please observe the different procedures for system variables and user variables. The following table shows the various settings.

Action	User Variable	System Variable
• To set the scope of validity, open all folders under "Global Variable Groups" and select the following in the "STD_RES" folder:	"Default"	"System Variables"
• At the top of the section, select the scope as:	"Local"	"Global"
• In the "Variable Properties" window, enter or select the name for the corresponding input parameter under "Name".	• Enter the desired name.	• Select the corresponding variable.

5.8.5 Defining User Variables – Assigning the Default Chasing Light Speed

• Click on the desired position in the worksheet to set a cursor.

• In the context menu for the cursor, select the "Variable..." menu item.

• In the "Variable Properties" dialog box, enter the variable name "ActTimeFlashLight". In the "Description" field, enter the descriptive text "Time flashlight".

• Select "TIME" as the data type.

• "VAR" must be set under "Usage".

• Set the scope of validity as "Local" for a user variable. Under "Global Variable Groups", select "Default" in the "STD_RES" folder.
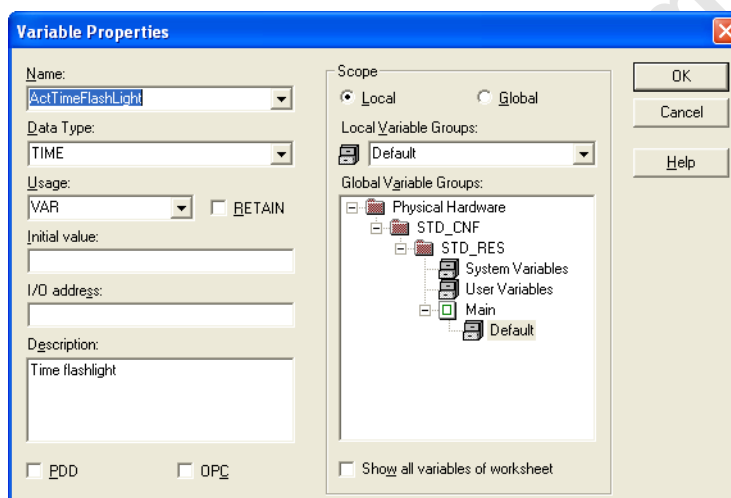
Figure 5-22   Variable Properties (user variables)

☞ Setting the scope of validity is only necessary when defining a variable for the first time. All other variables are also entered in the "Default" group.

5.8.6 Defining System Variables – Selection Block for Inputs

• Select the "SEL_TIME" function block by double-clicking on it in the "Edit Wizard" window.

The function block is inserted in the worksheet.

According to Table 2-1 "Inputs and outputs used in the example" on page 2-2, input I1 of the ILC 150 ETH is to be evaluated for the first input signal. The onboard inputs and outputs of the ILC 150 ETH are mapped to system variables.

• Double-click on the first input parameter of the function block to specify variable properties.

• Open all folders under "Global Variable Groups" and select "System Variables" in the "STD_RES" folder.

• At the top of the section, select "Global" as the scope.

- Select the corresponding variable under "Name". For input I1 of the ILC 150 ETH, the corresponding variable is ONBOARD_INPUT_BIT0.
- Confirm your entries with "OK".
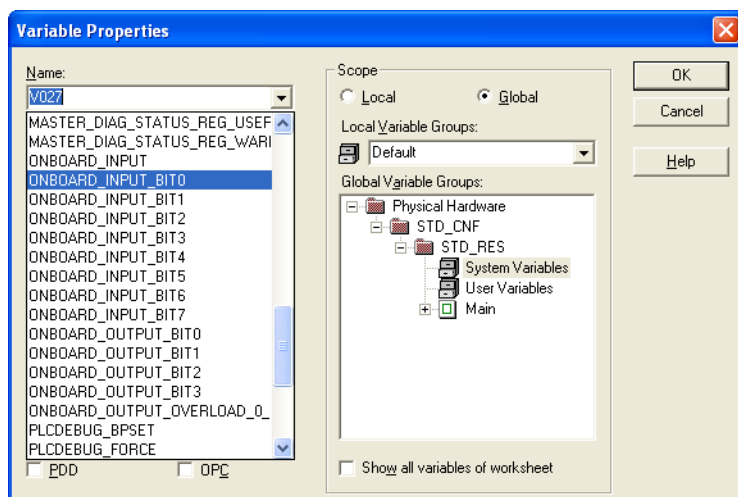
Figure 5-23   Variable Properties (system variables)

Now define all the other variables. All system variables are applied as VAR_EXTERNAL and belong to the BOOL data type.

- Double-click on the second input parameter of the function block to assign the "ActTimeFlashLight" variable.
- Set the scope of validity to "Local".
- Select the "ActTimeFlashLight" variable.
- Confirm your entries with "OK".
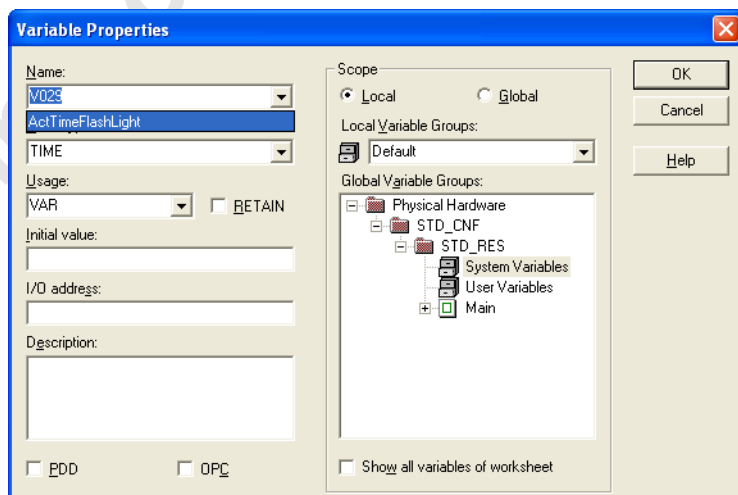
Figure 5-24   Variable Properties

- Double-click on the third input parameter of the function block to assign the "time#350ms" time value.
- Set the scope of validity to "Local".
- Enter "Time#350ms" under "Name".
- Confirm your entries with "OK".
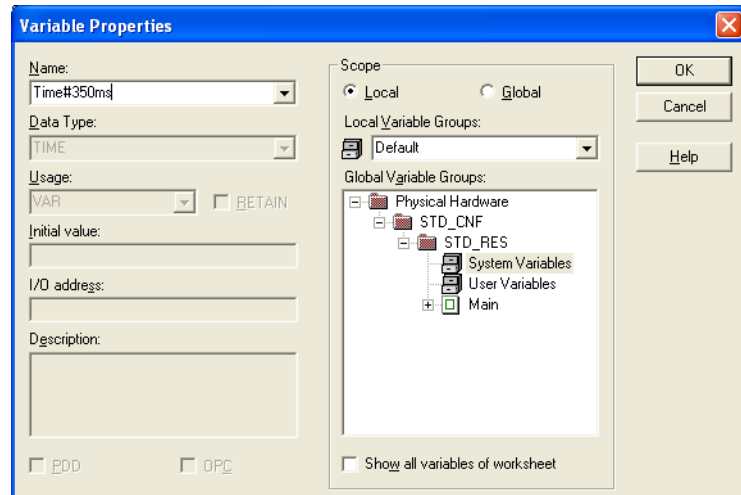
Figure 5-25   Variable Properties

- Repeat this procedure for all variables (in the example for the output of the "SEL_TIME" function block).
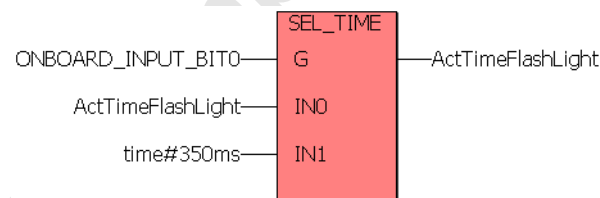
Figure 5-26   Input selection block

The complete program can be found in Section 5.8.8, "Complete Example Program" from page 5-26.

5.8.7 User-Defined Function Blocks

In order to create the **Analog_In_Out** and **FlashLight** user-defined function blocks, proceed as follows.

- In the "Project Tree Window", open the context menu for "Logical POUs".
- Select the "Insert... Function Block" menu item.
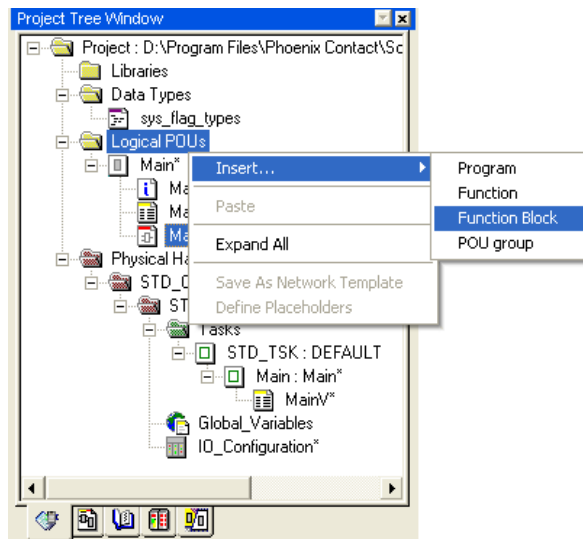
Figure 5-27   Context menu - Insert... Function Block

- In the "Insert" dialog box, enter the name "Analog_In_Out" for the function block to be created.
- Under "Type" select "Function Block" and under "Language" select "FBD".
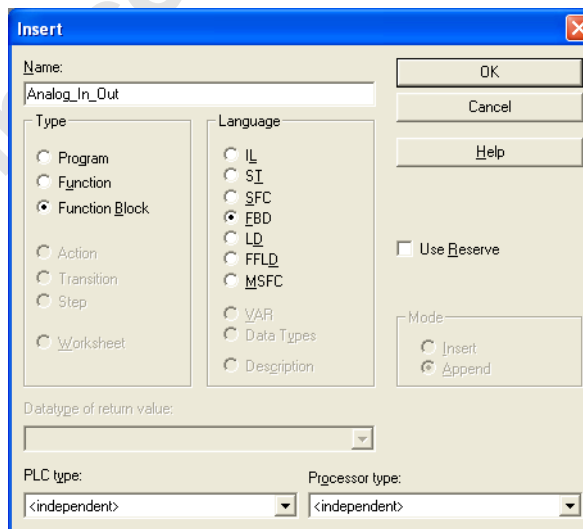
Figure 5-28   "Insert" dialog box - creating a function block

- Confirm your entries with "OK".

- Switch to the "Project Tree Window" in the "Analog_In_Out" worksheet.

- Create the programming for this POU.

- When defining the "Analog_In" and "AnalogOut" variables, please note that "VAR_INPUT" must be selected under "Usage" for "Analog_In" and "VAR_OUTPUT" must be selected for "AnalogOut".

- Once the programming has been created, compile your project.

- Click on the "Make" icon in the toolbar.

- The "Analog_In_Out" function block can be selected in the "Edit Wizard".
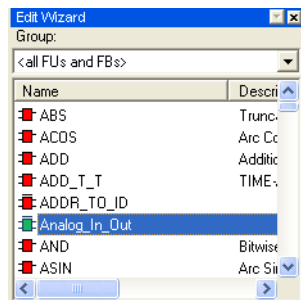
Figure 5-29   Edit Wizard - "Analog_In_Out" function block

- Switch to the "Main" worksheet and insert the user-defined function blocks at the cursor according to the instructions described above.

> The "FlashLight" function block is programmed in ST (structured text). The individual sections of this POU are commented on in the "FlashLight" worksheet. For additional notes about ST, please refer to the online help for the PC WorX software.

5.8.8   Complete Example Program

In order to create the complete example program, proceed as described above.

> For additional information about the PC WorX software, please refer to the online help or the UM QS EN PC WORX Quick Start Guide for the software.

"Main" POU − Requesting Switches 0, 1, and 2 and Calling the User-Defined Function Blocks
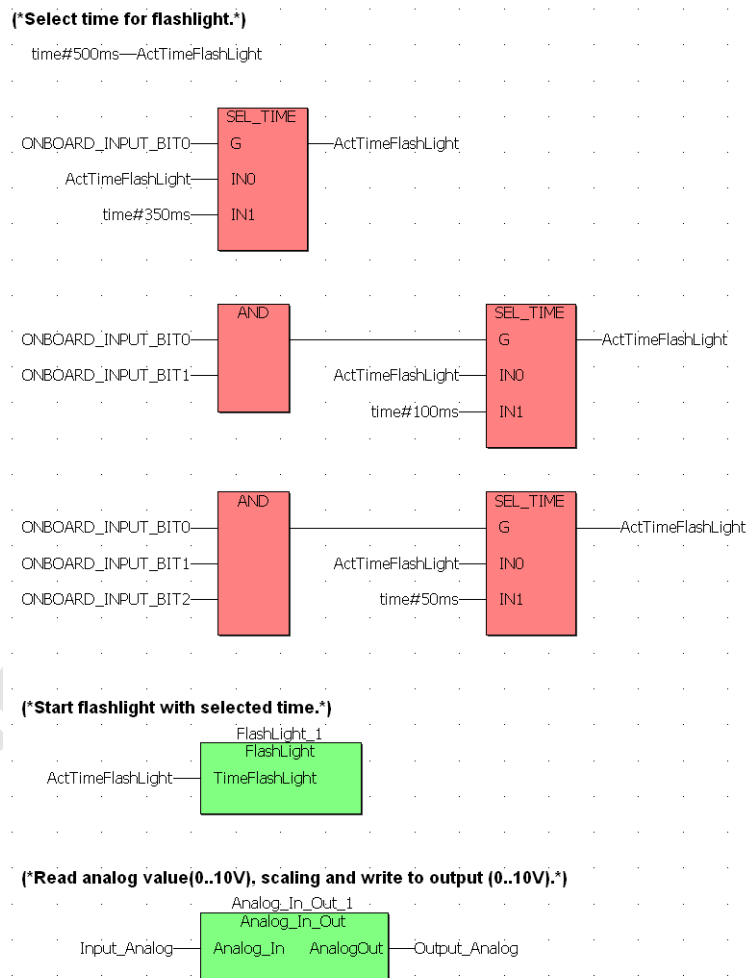
Figure 5-30   "Main" POU (FBD)

"FlashLight" POU − Chasing Light

```
1    (* Start flashlight with selected time *)
2
3    TON_1(IN:=start,PT:=TimeFlashLight);
4    start:=true;                        (* start timer *)
5
6    If (TON_1.Q) then                   (* timer lapsed *)
7      start:=false;
8      ONBOARD_OUTPUT_BIT0:=false;       (* delete outputs *)
9      ONBOARD_OUTPUT_BIT1:=false;
10     ONBOARD_OUTPUT_BIT2:=false;
11     ONBOARD_OUTPUT_BIT3:=false;
12
13     case control of                   (* set outputs *)
14       0: ONBOARD_OUTPUT_BIT0:=true;
15          control:=1;
16       1: ONBOARD_OUTPUT_BIT1:=true;
17          control:=2;
18       2: ONBOARD_OUTPUT_BIT3:=true;
19          control:=3;
20       3: ONBOARD_OUTPUT_BIT2:=true;
21          control:=0;
22     end_case;
23   end_if;
24
25
26   (* only for test outputs via WebVisit *)
27   If TestOutputs then
28     ONBOARD_OUTPUT_BIT0:=true;
29     ONBOARD_OUTPUT_BIT1:=true;
30     ONBOARD_OUTPUT_BIT2:=true;
31     ONBOARD_OUTPUT_BIT3:=true;
32   end_if;
```

Figure 5-31   "FlashLight" POU (ST)

"Analog_In_Out" POU − Analog Value Conversion
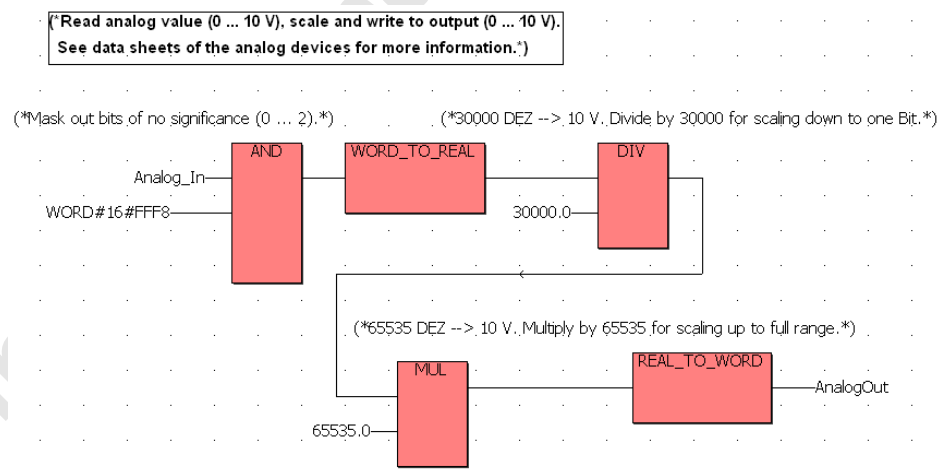
Figure 5-32   "Analog_In_Out" POU (FBD)

5.9   Compiling After Creating the Program

At this point you can compile your project in order to detect any errors that may have occurred.

• Select the "Build/Make" command.

5.10 Assigning Process Data

Process data and control variables are assigned in the process data assignment workspace.

Link the process data of all devices to variables.

- Make sure you are in the process data assignment workspace.
- Select the control system in the top right window. The standard configuration is then displayed in the top left window, "Symbols/Variables".
- In the top left window, "Symbols/Variables", select the "STD_RES : ILC150_2" resource.
- In the top right window, select the device for which you would like to link the process data to variables (here: IB IL AO 1/U/SF).
- Select the process data item to be linked (here: 1.1).
- The "Input_Analog" and "Output_Analog" variables are defined when the program is created. Using drag & drop, link the selected variable to one of the variables displayed on the left-hand side (here: Output_Analog).

In the bottom left window, the assignment between variables and process data is displayed.
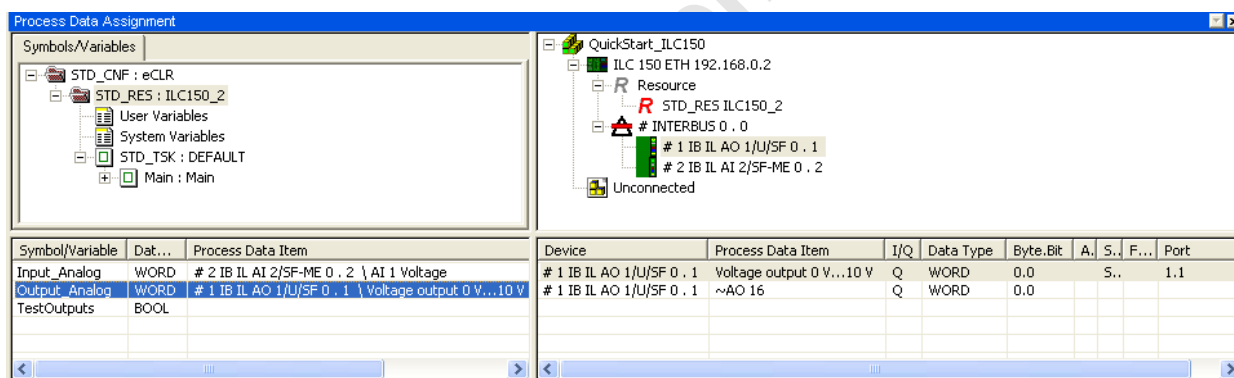
Figure 5-33   Assignment of process data item 1.1 of the "Output_Analog" variable

- Repeat this procedure for all inputs to be evaluated and for all outputs to be controlled.

> System variables (e.g., ONBOARD_INPUT_BIT10) are not displayed in this process data view.

5.11 Compiling and Sending a Project (Including Program), and Performing a Cold Restart

Now the project has been completed. In order to start up the project, compile it, send it to the control system, and perform a cold restart.

- Proceed as described in "Compiling and Sending a Project, and Performing a Cold Restart" on page 4-9.

The project has been successfully started.

5.12   Operation and Debug Mode

The toggle switch can now be pressed and the response at the output checked. The method of operation of the program can be monitored in PC WorX by switching to debug mode.

- Activate debug mode.

- Switch to the IEC programming workspace.

The status of all global variables in the program is displayed under "MainV" in the "Project Tree Window".
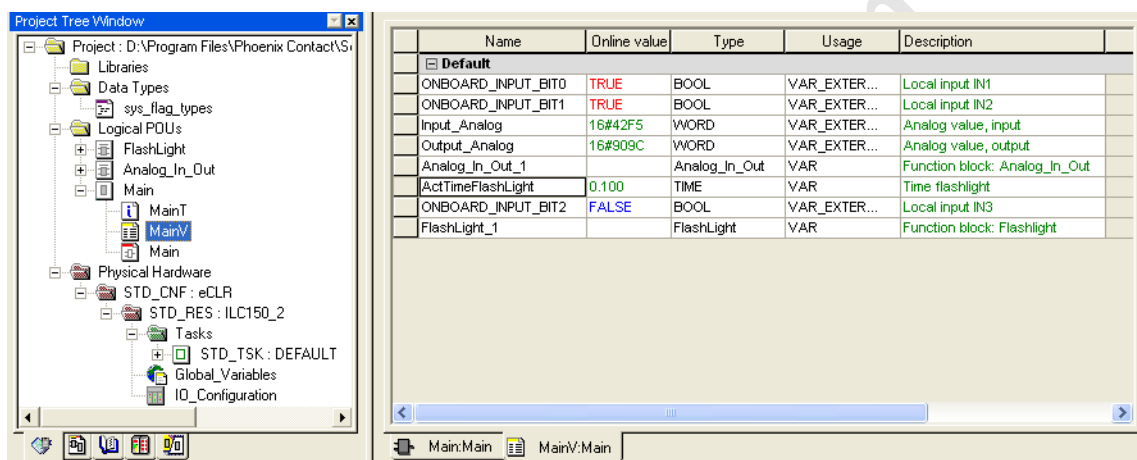
Figure 5-34   Variables in debug mode: Global variables

The following states are illustrated in Figure 5-34:

Variable	Online Value	Description
ONBOARD_INPUT_BIT0	TRUE	Switch 0 ON
ONBOARD_INPUT_BIT1	TRUE	Switch 1 ON
ONBOARD_INPUT_BIT2	FALSE	Switch 2 OFF
ActTimeFlashLight	0.100	Chasing light speed is 100 ms
Input_Analog	16#42F5	Analog input value
Output_Analog	16#909C	Analog output value

The program status of a POU is displayed by opening the program worksheet (in Figure 5-35: under "Main" in the "Project Tree Window" or under "Main:Main" on the tab in the worksheet).
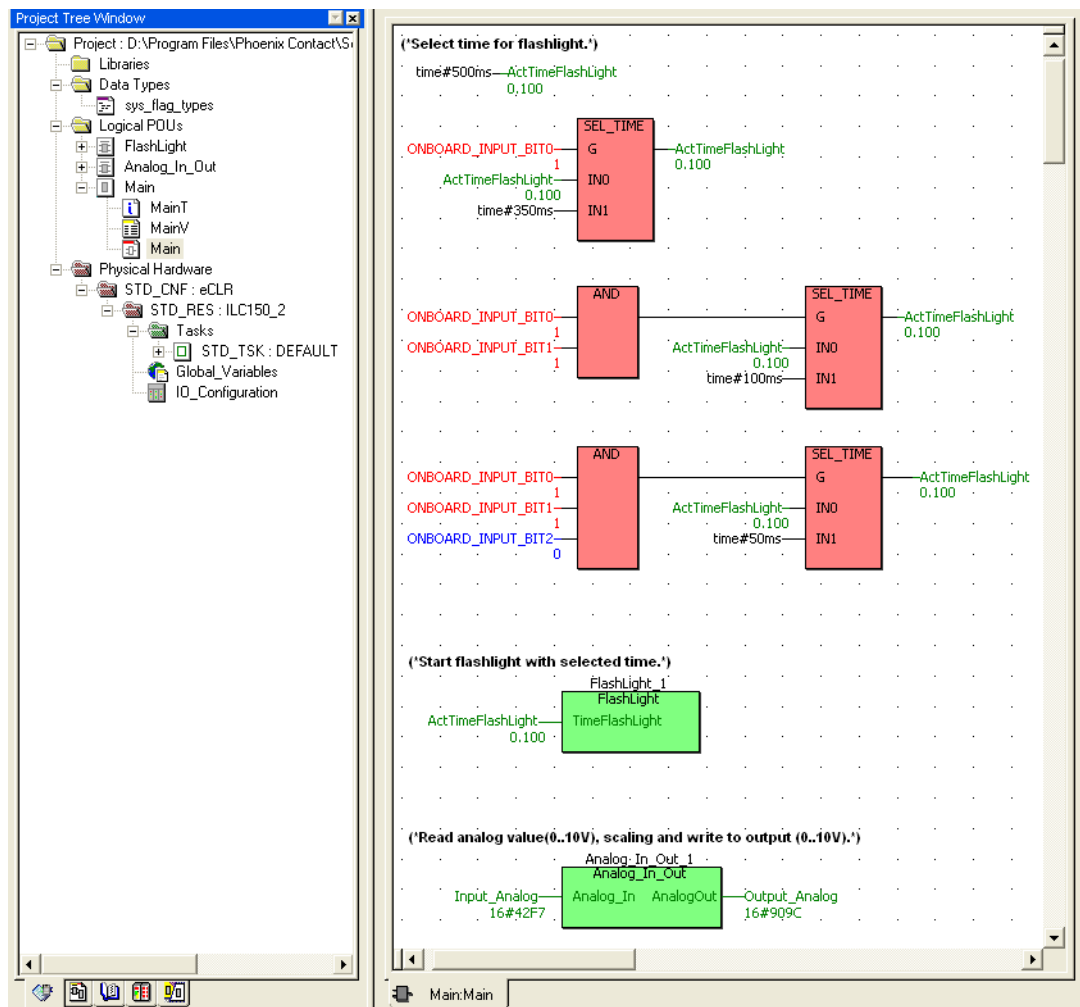
Figure 5-35   Variables in debug mode: Program variables

The status of all global variables is displayed under "Global Variables" in the "Project Tree Window".

Figure 5-36   Variables in debug mode: Global variables

• Switch to the window that provides the best display of the required information.

ILC 150 Starter Kit

6 Additional Functions of PC WorX

6.1 Diagnostics With Diag+

Diag+ is a diagnostics tool for the seamless diagnostics of INTERBUS.

When installing PC WorX, Diag+ is installed automatically and is integrated in PC WorX. It can be called from PC WorX via the "View... Diag+" menu.

However, Diag+ can be started separately via "Start... Programs... Phoenix Contact... AUTOMATIONWORX Software Suite... Diag+ 2.xx".

☞ | An online connection to the controller is required in order to use Diag+.
For the following description, the IB IL AI 2/SF-ME Inline terminal has been removed from the starter kit bus configuration in order to prompt an error.

• Start Diag+ via "View... Diag+".
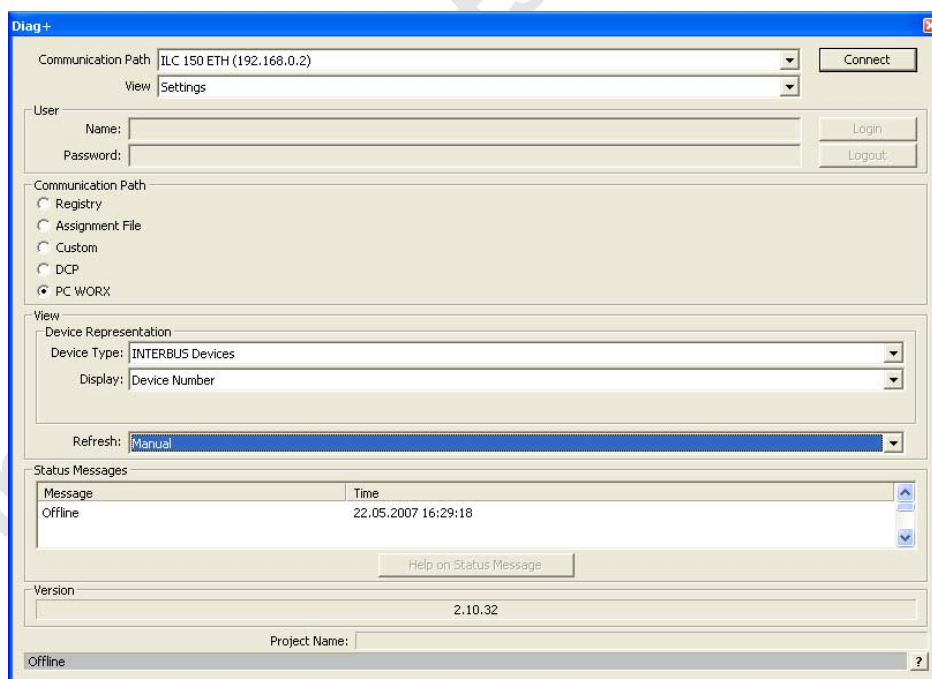
Figure 6-1   Diag+ start screen

• The ILC 150 ETH (192.168.0.2) Inline Controller is set under "Communication Path". A connection can be established with this device.
• Click on "Connect" to activate the communication path.
• At the top of the section under "View", select which general information is to be represented (View: Settings/INTERBUS Diagnostic).

ILC 150 Starter Kit

View: Settings

• At the bottom of the section under "View", select which information is to be represented for the devices.

Figure 6-2   Example for Device Representation view

View: INTERBUS Diagnostic

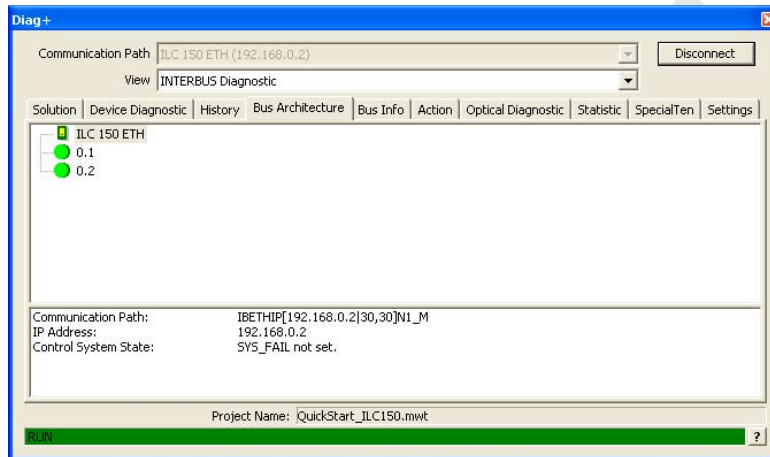Various information can be called via the different tabs.

Figure 6-3   INTERBUS Diagnostic: Bus Architecture (no error)

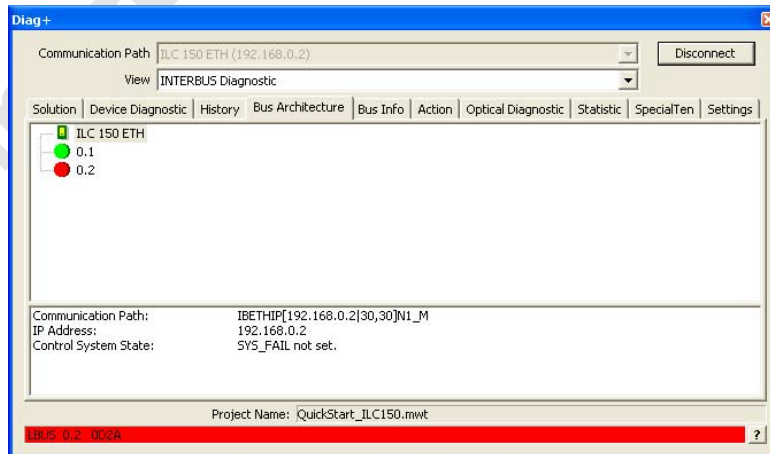An error is simulated, the IB IL AI 2/SF-ME Inline terminal is disconnected.

Figure 6-4   INTERBUS Diagnostic: Bus Architecture (error)

• Switch to the "Solution" tab.

Here, information is provided about how to remove the error.
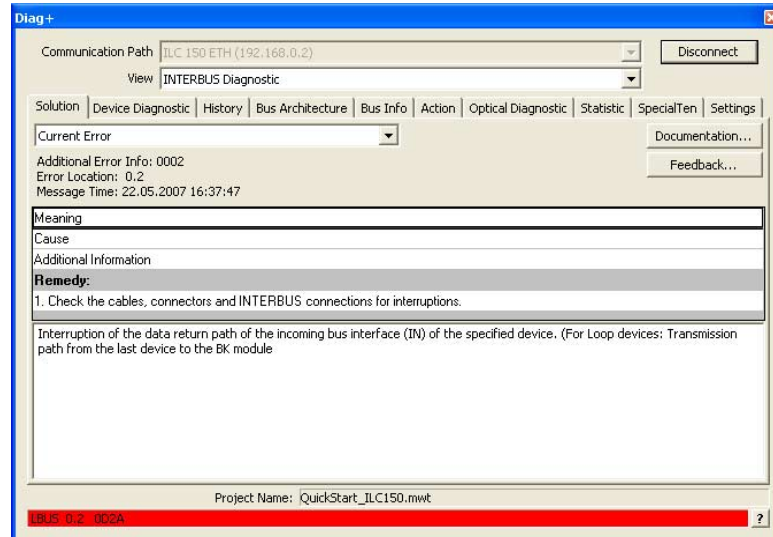
Figure 6-5   INTERBUS Diagnostic: Solution

• Remove the error (here: insert Inline terminal again).

If the bus is not restarted automatically, the "Action" tab can be used, for example, to acknowledge errors, reset the controller, and start the bus.

A Appendix: Visualization With WebVisit

A 1 General

The WebVisit software is used to visualize the global variables of the Inline Controller used under PC WorX. WebVisit is a software tool used to generate web pages. The software runtime component is a web server, which is stored on the controller. The variable values are actually visualized via a Java-compatible standard browser.

☞ Please note that, for visualization purposes, you will require a web browser with Java Standard Edition SE 6 (or later) with at least Java Runtime Environment JRE 6 (version 1.6.x or later).

Variables in PC WorX

To visualize variables from your PC WorX project in WebVisit activate the "PDD" checkbox in PC WorX.

– In the "Variable Properties" window (Figure A-1)
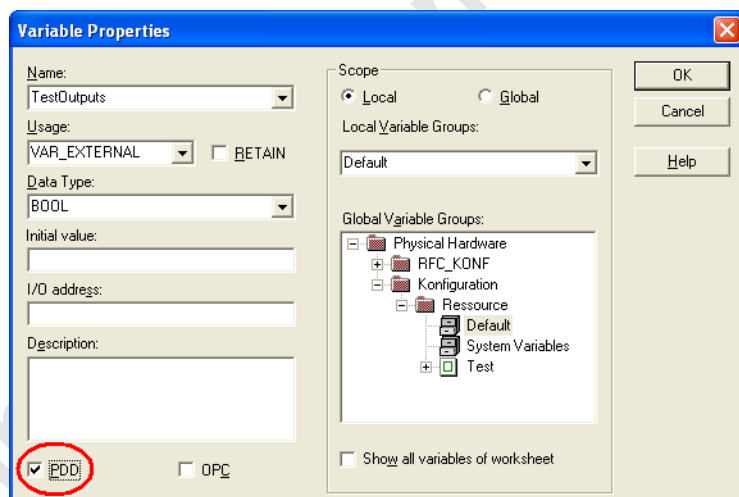– In the variables worksheet (Figure A-2)

Figure A-1   Defining variables for WebVisit

Figure A-2   Activating "PDD" in the variables worksheet (Global_Variables)

When compiling the project, a file called "pdd.csv" is generated, which is used by WebVisit for the visualization.

In WebVisit, enter the PC WorX project used (recommended) or the corresponding pdd.csv file. For standard installation:

– The project is located in directory
   C:\Program Files\Phoenix Contact\Software Suite...\Projects

And

– The corresponding pdd.csv file is located in directory **C:\Program Files\Phoenix Contact\Software Suite...\Projects\xxx\C\STD_CNF\R\STD_RES**
   (xxx = project name, in the example: QuickStart_ILC150)

> For information about using WebVisit, please refer to the corresponding documentation.

A 2   Starting the Visualization

> Please note that the visualization is started only with the following setting in the Windows® control panel.
>
> • Start the Java control panel from the Windows® control panel.
> • Select in the temporary files settings that temporary files are not stored.

By default upon delivery, a WebVisit example project is stored on the starter kit controller. This visualization can be viewed by entering the IP address of the controller in the address window of your Java-compatible browser (in the example: "http://192.168.0.2").
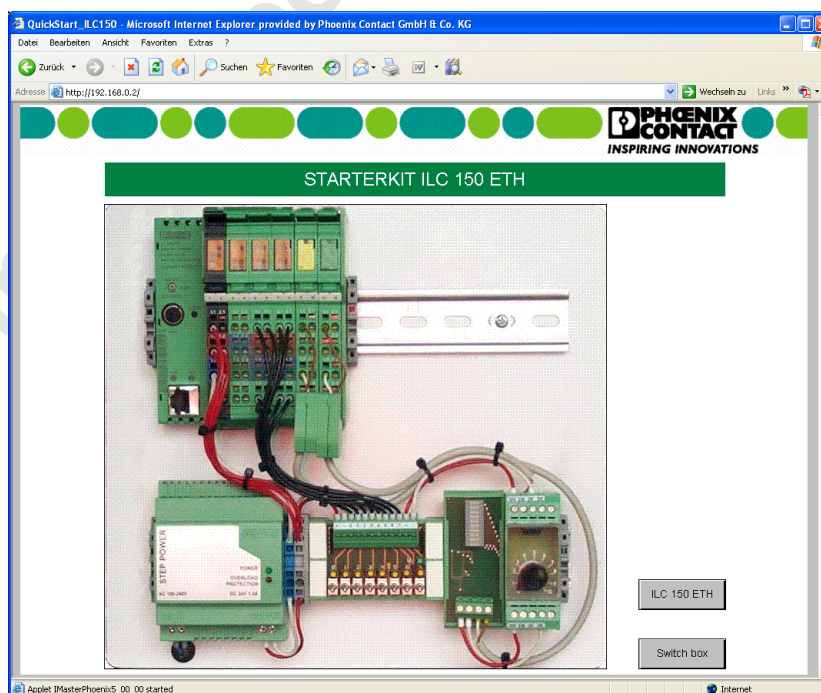

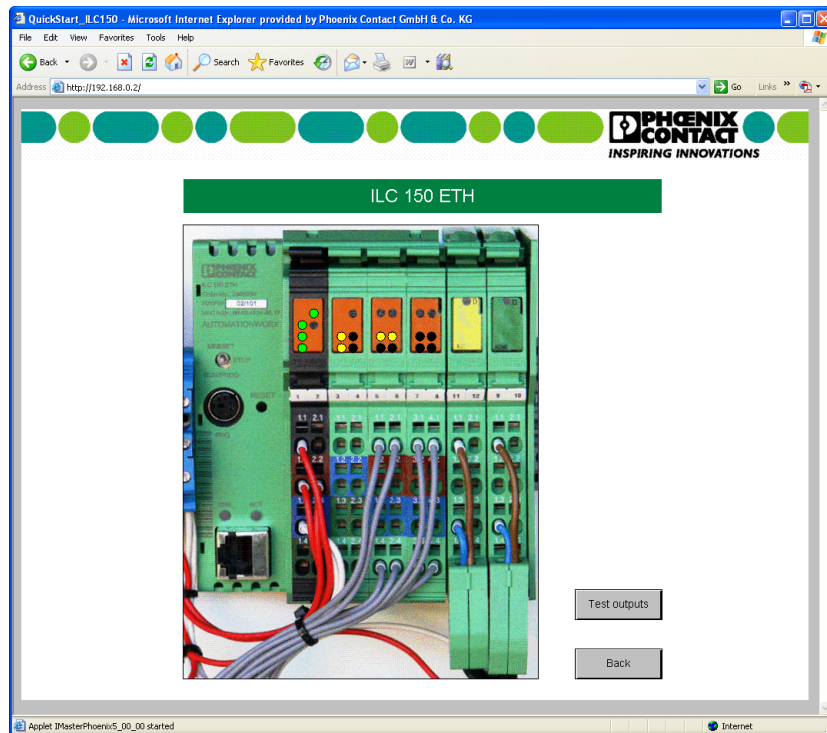Figure A-3   Visualization – Start Page

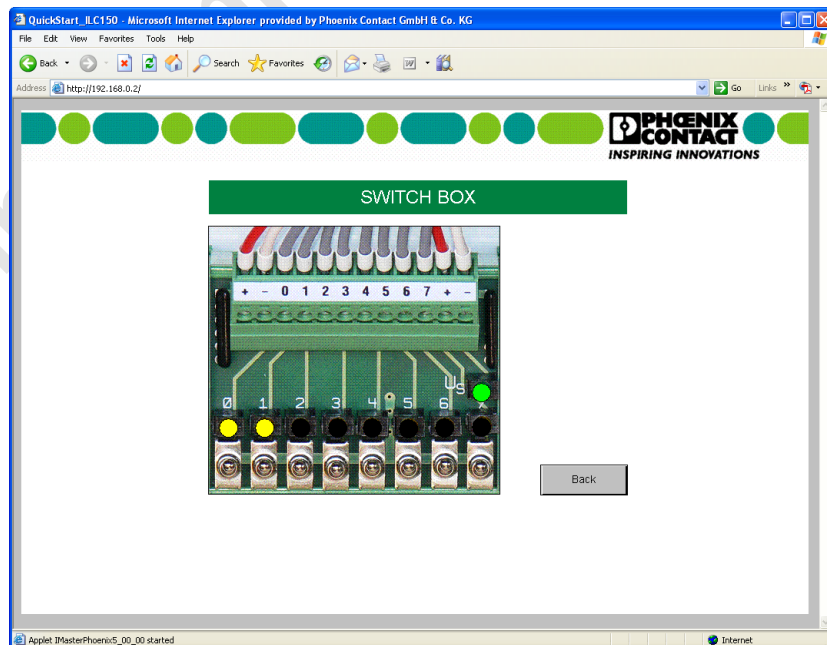Figure A-4   Representation of the controller LEDs

Figure A-5   Representation of the switch LEDs

A 3 Reloading the Visualization

If you want to reload the visualization project on the controller, proceed as follows. This method can also be used to load a modified WebVisit project on the controller.

- Save the packed WebVisit project (web server project) from the "CD ILC150 Starterkit" onto your hard disk (file: QuickStart_ILC150.exe).
- Extract the file to the project directory of your WebVisit installation (standard installation path: C:\Program Files\WebVisit\Projects).
- Start WebVisit.
- Open the project ("QuickStart_ILC150.prj file) in WebVisit via the "File/Open project..." menu item.

Figure A-6   Opening the WebVisit project

☞ | If when opening the WebVisit project an error message is displayed indicating that WebVisit cannot open the "pdd.csv" file, proceed as follows.

- Confirm the error message with "OK".
- Open the "Project-Teq Configurations" dialog box via the "Project/Project configurations..." menu item.
- Confirm any further error messages with "OK".
- In the dialog box set the path under which you have saved the PC WorX example project for the "QuickStart_ILC150.mwt" starter kit on your PC.
- Confirm your entries with "OK".

• Load the project on the controller via the "Project/Download project..." menu item.
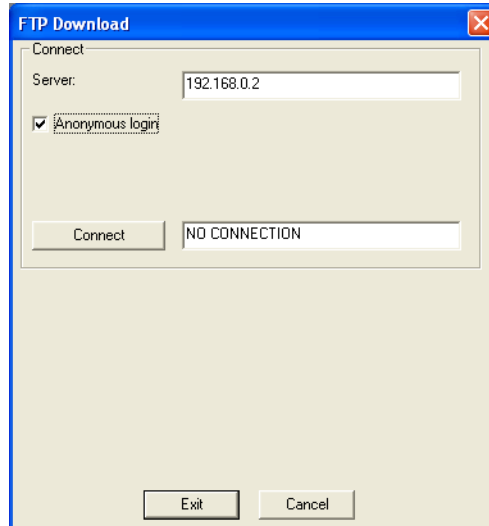
Figure A-7   WebVisit FTP download to the controller

• In the "Connect" area, set the IP address of the controller under "Server" ("192.168.0.2" in the example).
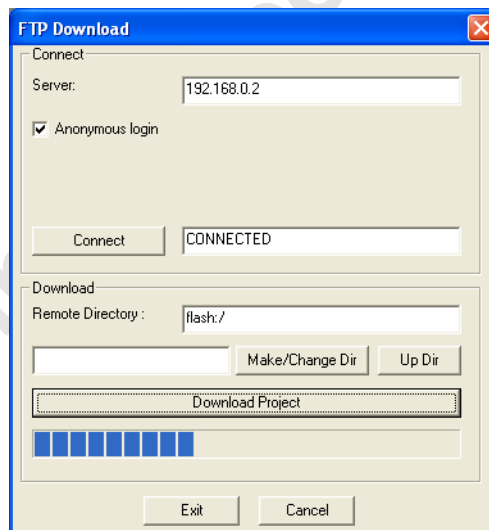• Click on "Connect".

Figure A-8   Loading the WebVisit project on the controller

• Click on "Download Project" once the connection to the controller has been established (display: CONNECTED).
• The progress bar shows the transmission status.
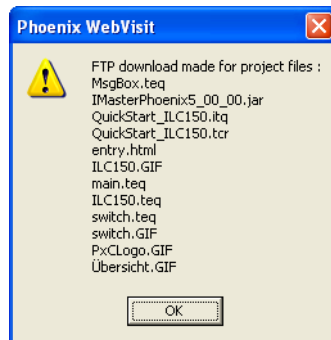• Confirm the message that appears once transmission is complete with "OK".

Figure A-9   Download completed

The visualization project has been transmitted to the controller. The visualization can now be displayed again via your browser (see "Starting the Visualization" on page A-2).