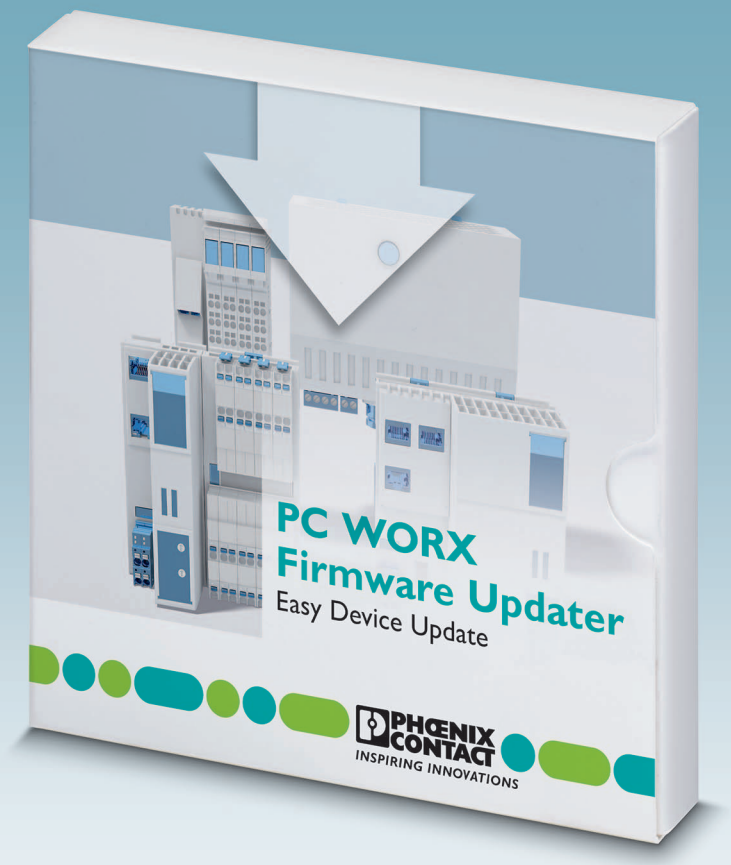

Installation and operation of the PC Worx Firmware Updater software

User manual

PHOENIX CONTACT
INSPIRING INNOVATIONS

User manual

Installation and operation of the PC Worx Firmware Updater software

UM EN PC WORX FIRMWARE UPDATER, Revision 02 2020-10-30

This user manual is valid for:

Designation	Revision	Order No.
PC WORX FIRMWARE UPDATER	2.30	2403718

107352_en_02

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phoenixcontact.com

Table of contents

1 For your safety

Read this user manual carefully and keep it for future reference.

1.1 Identification of warning notes

This symbol indicates hazards that could lead to personal injury.
There are three signal words indicating the severity of a potential injury.

DANGER
Indicates a hazard with a high risk level. If this hazardous situation is not avoided, it will result in death or serious injury.

WARNING
Indicates a hazard with a medium risk level. If this hazardous situation is not avoided, it could result in death or serious injury.

CAUTION
Indicates a hazard with a low risk level. If this hazardous situation is not avoided, it could result in minor or moderate injury.

This symbol together with the **NOTE** signal word warns the reader of actions that might cause property damage or a malfunction.

Here you will find additional information or detailed sources of information.

1.2 Qualification of users

The use of products described in this user manual is oriented exclusively to:

– Electrically skilled persons or persons instructed by them. The users must be familiar with the relevant safety concepts of automation technology as well as applicable standards and other regulations.
– Qualified application programmers and software engineers. The users must be familiar with the relevant safety concepts of automation technology as well as applicable standards and other regulations.

2 General information

2.1 Field of application

The user manual provides support for the installation and operation of the PC Worx Firmware Updater software. You can use the PC Worx Firmware Updater to update the firmware of the devices listed in Section A, “Supported devices” via an Ethernet interface.

2.2 System requirements

Table 2-1 System requirements

Processor	Min. 1.6 GHz (2 GHz recommended)
Main memory	Min. 1 GB (2 GB recommended)
Free memory space on the hard disk	Min. 1 GB (2 GB recommended)
Operating system	Windows® 7 (32-bit/64-bit) Windows® 8/8.1 (32-bit/64-bit) Windows® 10

Deactivate firewall

To ensure that the PC Worx Firmware Updater works correctly, any active firewalls on your PC must be deactivated. Communication protocols (e.g., BootP requests), which are normally blocked by a firewall, are used to search for and identify the devices.

- Make sure that the firewall on your PC is deactivated.

2.3 General description of the PC Worx Firmware Updater

You can use the PC Worx Firmware Updater to update the firmware of the devices listed in Section A, “Supported devices” via an Ethernet interface. You can configure multiple devices for a serial update process. These devices must meet the following requirements:

– The devices are located within a network.
– The devices are the same device type or can at least be updated with the same firmware.

3 Preparatory tasks

3.1 Installation

- To start the installation of the PC Worx Firmware Updater, double-click the “PC WORX Firmware Updater *.exe” file.

The installation wizard starts.

- Follow the instructions in the installation wizard.

The installation wizard will guide you through the necessary installation steps.

- Following successful installation, establish an Ethernet connection between the PC (Ethernet interface) and the device network in which you wish to update devices with a new firmware version.

Make sure that the firewall on your PC is deactivated. An active firewall can adversely affect the functionality of the software.

3.2 Start

- Start the PC Worx Firmware Updater via the Windows® start menu, e.g. in Windows® 10 via “Start, All Apps, Phoenix Contact, PC WORX Firmware Updater 2.x”.

The home page in PC Worx Firmware Updater appears.

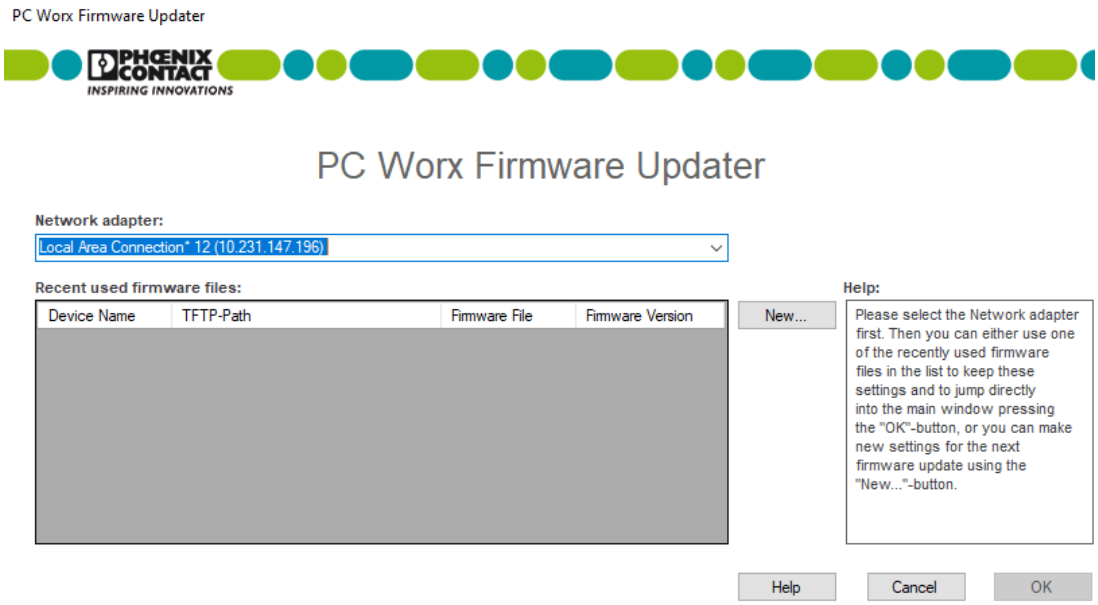

Figure 3-1 Home page

“Network adapter:”

- In the “Network adapter:” drop-down list, select the network adapter that is used to establish the connection to the network which contains the devices that are to be updated.

- Make sure that the IP address of the network adapter is within the network IP address range.

If the IP address is not within the network IP address range, change the IP address and subnet mask of the network adapter. Observe the information provided in the relevant Windows® help.

After changing the network adapter settings, you must restart the PC Worx Firmware Updater.

"Recent used firmware files:"

The “Recent used firmware files:” area displays firmware files that you have recently used for an update.

No firmware files are displayed here if you are starting the PC Worx Firmware Updater for the first time or have not yet performed any firmware updates.

- To make settings for a first or new firmware update, click “New...”.

The “Preferences” dialog opens. For additional information about the “Preferences” dialog, please refer to Section 3.3, “Settings in the “Preferences” dialog”.

If you have already performed firmware updates and wish to use an existing firmware file with the relevant settings, proceed as follows:

- Select the firmware file.
- Click “OK”.

The user interface of the PC Worx Firmware Updater opens. For additional information about the user interface, please refer to Section “PC Worx Firmware UpdaterUser interface” on page 13.

3.3 Settings in the “Preferences” dialog

3.3.1 “Standard settings”

After opening, the “Standard settings” are initially displayed.

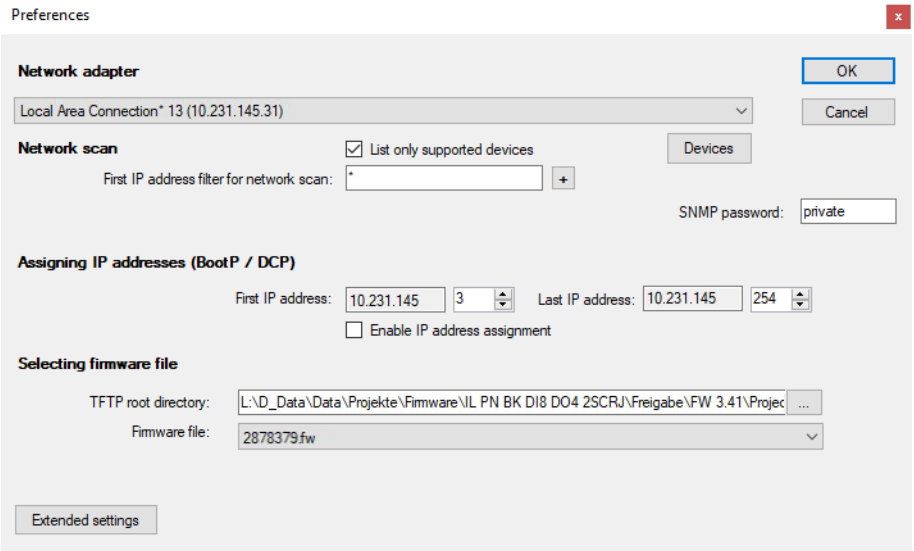

Figure 3-2 “Preferences” dialog with the “Standard settings”

To ensure that the PC Worx Firmware Updater is executed correctly, you must make or check the following settings in the “Preferences” dialog.

“Network adapter”

- In the “Network adapter” drop-down list, select the network adapter that is used to establish the connection to the network which contains the devices that are to be updated.
- Make sure that the IP address of the network adapter is within the network IP address range.

If the IP address is not within the network IP address range, change the IP address and subnet mask of the network adapter. Observe the information provided in the relevant Windows® help.

After changing the network adapter settings, you must restart the PC Worx Firmware Updater.

“Network scan”

With a network scan, you can restrict the search for devices to a defined IP address range.

- If you wish to restrict the IP address range when searching for devices, under “Network scan” specify an IP address filter in the “First IP address filter for network scan:” input field. For example, specify “192.168.0.*” here to find all devices in the IP address range from 192.168.0.0 to 192.168.0.255.
- If you wish to search for and display all devices in the network adapter IP address range, under “Network scan” enter a placeholder (“*”) in the “First IP address filter for network scan” input field. Any devices that do not yet have an IP address (0.0.0.0) will also be displayed.

Only activate the “List only supported devices” check box if only devices that are supported by the PC Worx Firmware Updater should be displayed.

Another IP address filter, which should additionally be used to search for devices, can be specified via the + button. Please note that you may have to change the IP address of the network adapter in order to enable access to the devices found via the network scan.

“Devices” button

You can display a list of all supported devices by clicking the “Devices” button.

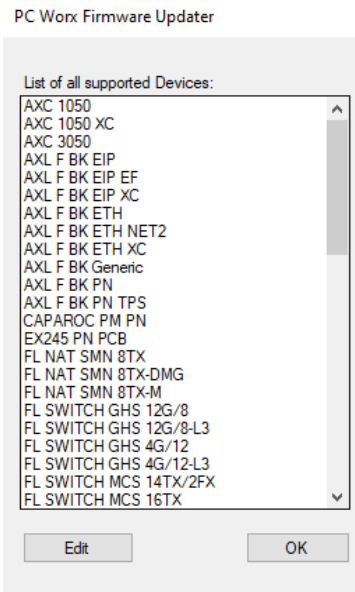

Figure 3-3 List of supported devices

“SNMP password”

The default SNMP password for Phoenix Contact devices is “private”.

- If you have assigned different passwords to your devices, change the SNMP password accordingly.

“Assigning IP addresses (BootP / DCP)”

In the “Assigning IP addresses (BootP / DCP)“ area, you define the IP address range from which the PC Worx Firmware Updater should automatically assign IP addresses via BootP.

- In the “Assigning IP addresses (BootP / DCP)” area, you enter the required IP address range from which the PC Worx Firmware Updater should automatically assign IP addresses via BootP.

IP address assignment via BootP from the range specified here only takes place if the “Enable IP address assignment” check box is activated. If the device already has a valid IP address and the check box is not activated, following a firmware update the
PC Worx Firmware Updater assigns the IP address to the device that was already assigned to the device prior to the firmware update.

“Selecting firmware file”

For a firmware update to be performed, the PC Worx Firmware Updater must know which firmware file is to be used for the update and the location of this file.

- In the “TFTP root directory” field, specify the path under which the new firmware file is stored.

Files with different extensions are usually stored under this path.

- In the “Firmware file” field, select the firmware file with the correct extension.

The correct file extension depends on the device you want to update. The following is a list of devices and corresponding file extensions:

AXC 1050 (XC)	*.fw
AXC 3050	*.ctn
AXL F BK ...	*.fw
SMC EX245 PN PCB	*.fw
ILC 1...	*.fw
ILC 3...	*.ctn
ILB PN 24 DI16 DIO16-EF	*.dat
IL PN BK ...	*.fw
FLM BK PN M12 DI 8 M12-2TX	*.fw
FL NAT ...	*.bin
FL SWITCH ...	*.bin
NFC 4...	*.ctn
RFC 4...	*.ctn
RL PN 24-2 DIO ...	*.fw
TPS-1 EVA BOARD	*.dat

3.3.2 “Extended settings”

When you click the “Extended settings” button in the “Preferences” dialog, the extended settings are displayed in addition to the standard settings.

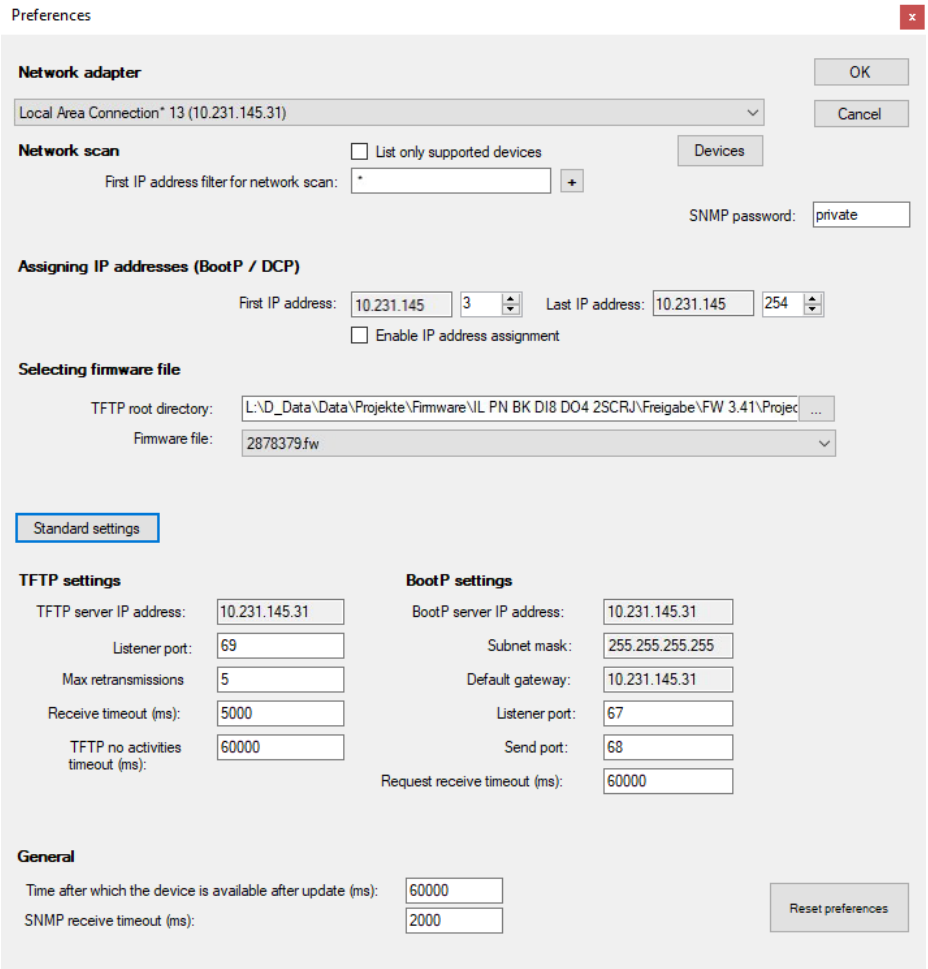

Figure 3-4 “Preferences” dialog with the “Extended settings”

“TFTP settings”

The IP address of the selected network adapter is automatically listed in the “TFTP server IP address” field.

- Enter “69” in the “Listener port” input field.

This setting is required for TFTP.

> The settings for “Max retransmissions”, “Receive timeout (ms)”, and “TFTP no activities timeout (ms)” are required standard settings that may only be changed following consultation with the Phoenix Contact Technical Support team.

"BootP settings"

The settings for “BootP server IP address”, “Subnet mask”, and “Default gateway” are automatically copied from the selected network adapter.

The settings for “Listener port”, “Send port”, and “Request receive timeout (ms)” are required standard settings that may only be changed following consultation with the Phoenix Contact Technical Support team.

“General”

The time set in the “Time after which the device is available after update (ms):” input field extends the overall firmware update. Do not change the preset time, as errors may occur if the specified time is too short.

The “SNMP receive timeout [ms]:” setting is a standard setting that may only be changed following consultation with the Phoenix Contact Technical Support team.

Clicking the “Standard settings” button reduces the view in the “Preferences” dialog to the “Standard settings”.

3.4 Opening the user interface

Opening the PC Worx Firmware Updater user interface

- To open the PC Worx Firmware Updater user interface, click “OK” in the “Preferences” dialog.

You can also go straight to the user interface of the PC Worx Firmware Updater by selecting a firmware file on the home page and clicking "OK" (seeSection “Start” on page 6).

Stopping the active BootP server

The PC Worx Firmware Updater uses its own BootP server for IP address assignment. To ensure that this BootP server works correctly, other active BootP servers must be stopped. If the PC Worx Firmware Updater detects that another BootP server is active on the same PC and corresponding ports are already blocked, an error message is displayed and startup of the PC Worx Firmware Updater is aborted.

- Click the icon in the toolbar (see Section “PC Worx Firmware UpdaterUser interface” on page 13) to check whether additional BootP servers are active.

BootP servers that are already active are indicated via messages in the message window (see Figure 3-2).

- If additional BootP servers are active, deactivate them. Refer to the documentation for the respective software.

Logging the activities

All the activities listed in the log window of the PC Worx Firmware Updater are saved in a log file after exiting the program. You can use the log file as documentation of the changes you made to show your customer or for a service case, for example.

Location: C:\ProgramData\Phoenix Contact\PC WORX Firmware Updater\2.30.xx\LOG

File name: Date_Time.rtf

4 Operation

4.1 PC Worx Firmware UpdaterUser interface

The user interface of the PC Worx Firmware Updater is divided into four areas:

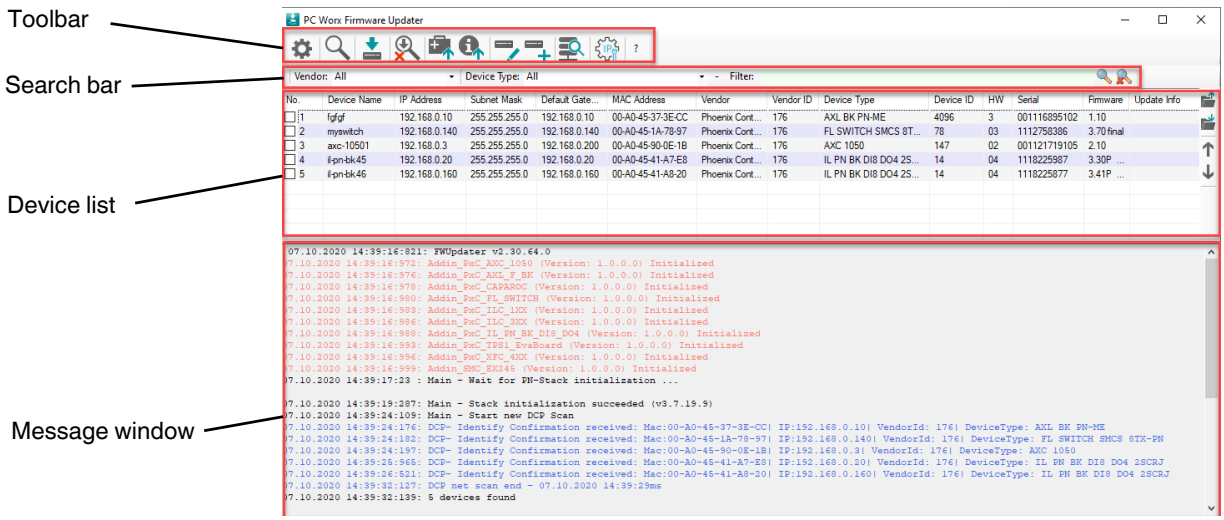

Figure 4-1 PC Worx Firmware UpdaterUser interface

4.1.1 Toolbar

Use this icon to open the “Preferences” dialog (see Section “Settings in the “Preferences” dialog” on page 8). You can change the settings in the “Preferences” dialog at any time.

Use this icon to start searching for devices (“Network Scan”). When searching for devices, the settings from the “Preferences” dialog are taken into consideration. Before starting a search, observe the following notes:

– A network adapter must be selected in the “Preferences” dialog.
– Following a search, devices without an IP address (0.0.0.0) are only displayed if a placeholder “*” is entered in the “First IP address filter for network scan” input field in the “Network scan” area of the “Preferences” dialog.
– All device types are only then displayed if the “List only supported devices” check box is **deactivated** in the “Network scan” area of the “Preferences” dialog. If the check box is activated, only devices for which the PC Worx Firmware Updater supports a firmware update are displayed.

During the search, all icons except for the icon to cancel the search are grayed out and cannot be used. All icons can be used again once the search has been completed. The search results are displayed in the device list.

Edit the device list following a search and before the firmware update. Please refer to “Device list” on page 17.

Use this icon to start the firmware update for the devices selected in the device list. Please refer to “Device list” on page 17. The firmware update can take several minutes.

- Before proceeding further, wait until the devices in the device list are displayed with either a green background (firmware update completed successfully) or red background (errors during firmware update).

Errors during firmware update

If the firmware update could not be performed without errors, proceed as follows:

- Check whether the selected firmware file matches the respective device.
- Check the path details for the respective firmware file.

Other external factors can cause errors during an update, e.g., power supply failure or interrupted network connection during the firmware update. If a firmware update is interrupted, the device may no longer respond after a network scan and may no longer be found. In this case, try to manually get the device listed in the device list again (see corresponding icon) and update it as per the instructions.

The firmware update has been completed once the devices in the device list appear on a green background.

- Check the displayed firmware version in the “Firmware” column in the device list.

Use this icon to cancel the firmware update.

> If you cancel the firmware update before the firmware has finished installing, this can result in the device/devices no longer being accessible.
> - If the device/devices is/are no longer accessible, add the device/devices manually via the corresponding icon.
>
> For information on this, refer to the description of the corresponding icon .

Use this icon to read device information (identification and maintenance data, also referred to as I&M data) for the selected devices that support PROFINET. This data is only displayed if it is stored on the devices and the firewall is deactivated.

Use this icon to read the hardware and firmware versions as well as the description for the individually selected devices via the SNMP protocol.

Use this icon to change important device parameters for the selected device. Click the icon to open the “Device Info Settings” dialog for a single selected device (see Figure 4-2). In the “Device Info Settings” dialog, you can change the device name, IP address, subnet mask, and default gateway address of the device.

The “Factory Reset” button resets the device to the delivery state. IP addresses that you previously assigned will be deleted and the IP address that was set by default upon delivery will be assigned.

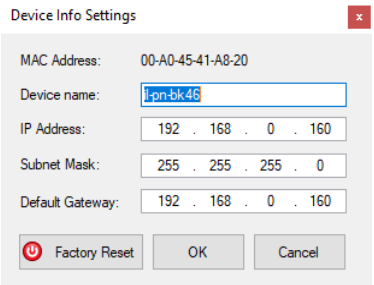

Figure 4-2 “Device Info Settings” dialog

Use this icon to manually add devices to the device list. Manually adding devices to the device list is useful if a device “gets lost”, i.e., it is not listed in the device list following a search. For example, a device is not listed in the device list following a search if an update could not be performed without errors and the device has entered an undefined state as a result. One possible cause of errors during an update is an interrupted network connection during the firmware update, for example.

Background: When a device is starting, the device checks whether firmware is correctly installed. If no firmware is installed and there is no installable firmware file on the device memory, the device sends BootP requests.

In the BootP request, the device requests an IP address and then requests a firmware file. This mechanism utilizes the function of the “Add Device” dialog.

Clicking the icon opens the “Add Device” dialog.

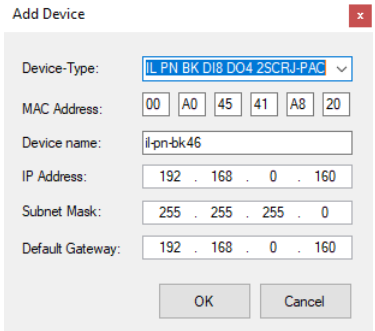

Figure 4-3 “Add Device” dialog

The following parameters must be selected or entered in the “Add Device” dialog:

– “Device Type”
– “MAC Address”
  The MAC address can be read from the device or taken from a previous error message that may be present (see message history in the message window).
– “Device name”
– “IP Address” (desired IP address)
– “Subnet Mask”
– “Default Gateway” (default gateway address)

- Click “OK” to add the device to the device list.

The PC Worx Firmware Updater window opens in which a message is displayed that indicates how to proceed to update the firmware of the manually added device.

Figure 4-4 “PC Worx Firmware Updater” window

To start the firmware update for the manually added device, proceed as follows:

- Select the newly inserted device by activating the corresponding check box in the “No.” column in the device list.
- Click on the icon to start the firmware update.
- Perform a voltage reset on the device, e.g., by switching the power supply for this device off and on again (unplug connector for power supply at the device, wait five seconds, and insert connector again).

Following the device boot process, the device requests an IP address (BootP request). The BootP server of the PC Worx Firmware Updater sees this request and supplies an IP address to the device and performs the firmware update in full.

When the search is repeated, the device is found again and can be used.

With the icon, you assign a new IP address from the BootP address range to the selected devices. The BootP address range is specified in the “Preferences” dialog under “Assigning IP-addresses (BootP / DCP)”. The default gateway and subnet mask are copied from the BootP settings. If the selected device already has an address from the BootP address range, nothing will change.

This function can also be used for new devices that are fresh from the factory, whose IP address, subnet mask, and default gateway are set to 0.0.0.0.

4.1.2 Search bar

If you sort and/or filter the devices according to specific criteria, you can select the devices for a firmware update more quickly in the device list.

You can search for specific devices by selecting the corresponding manufacturer name and device type in the “Vendor” and “Device Type” drop-down lists in the search bar. The displayed device list is filtered accordingly.

Another way to search for specific devices is to use the text search function in the search bar. Open the input field for the text search function via the icon next to the “Device Type” drop-down list.

You can use the text search function to enter and combine various filter criteria. Click on the magnifying glass icon next to the input field for the text search function to activate the filter. To clear the filter and display all devices again, click on the magnifying glass icon with a cross . The tool tip for the text search function input field also provides an example of an entry. Make sure you use the correct notation for the search terms in the text search. Use the text in the device list column heading in combination with free text as search terms. The free text must relate to the contents of the device list.

Example A:

To search for a device for which you only know the last digits of a MAC address, enter the following filter: “MAC Address=*A7-E8”. In this case, the list of devices found only contains those devices where the last digits of the MAC address match the filter.

Example B:

To search for devices from the Inline device range with firmware Version 3.x, enter the following filter: Device Type=IL* && Firmware=3.x*

The displayed list of devices found is then filtered accordingly.

4.1.3 Device list

The device list displays the devices that were found in the network.

- In the “No.” column, activate the check boxes of the devices for which the firmware updates are to be performed.

You can select multiple devices for one firmware update. However, all the devices must be the same device type or can at least be updated with the same firmware. The firmware that will be loaded on the devices can be defined in the “Preferences” dialog (see Section “Operation” on page 13).

The firmware of multiple selected devices is updated one device at a time from top to bottom in the device list. First, update the devices that are at the very bottom of a network hierarchy. In order to do this, you may need to adapt the order of the devices in the device list.

- If necessary, change the order of the devices in the device list by selecting the devices with the mouse (activating the respective check boxes) and using the up ↑ or down ↓ arrow to move the devices.

The devices in the device list can be sorted according to various criteria, e.g., by the “Device ID”. In this case, all devices with an identical device ID are displayed one after the other in groups. You can use all column names as a criterion for sorting.

To edit the IP address (“IP Address”), subnet mask (“Subnet Mask”) or standard gateway (“Default Gateway”) of a listed device, double-click the relevant list box.

4.1.4 Message window

The message window logs and displays the executed service sequences, corresponding (feedback) messages, and error outputs. If required, they can be exported to other applications using the clipboard. Please also refer to Section 4.2.2.

4.2 Additional functions

4.2.1 Export and import of device lists

Device lists that have been generated by a search can be exported as a *.csv file and processed further in Excel, for example.

Use this icon to export the device list.

Use this icon to import a *.csv file in the software.

In this way, for example, you can save a specific, filtered view of the devices to be updated, edit it in Excel, and then import it again.

Before importing, export a device list that you can use as an example for editing and subsequent import. This is because the file that you import must be the same format as an exported file.

Please note:
Device settings modified in a *.csv file are not automatically transferred to the devices when the file is imported.

Manually transfer the modified settings for each device using the icon, see Section 4.1.1 on page 14.

Please note:
You cannot import the *.csv files that you exported using version 2.3 of the PC Worx Firmware Updater into one of the previous versions.

4.2.2 Copying and clearing the message log

In certain applications, e.g., forwarding information to the Phoenix Contact Technical Support team, it may be useful or necessary to save all messages from the message window as a message log. In the message window, save the message log to the clipboard via the context menu (right mouse button). You can then paste the log from the clipboard into other applications.

You can also clear the message log in the message window via the context menu (right mouse button).

For information on the log file of the PC Worx Firmware Updater, see “Logging the activities” on page 12.

A Supported devices

Description	Type	Order No.
Bus coupler		
Axioline F, bus coupler, EtherNet/IP™, RJ45 jack, transmission speed in local bus: 100 Mbps, degree of protection: IP20, incl. bus base module and Axioline F connector	AXL F BK EIP	2688394
Axioline F, bus coupler, EtherNet/IP™, RJ45 jack, extended function, transmission speed in local bus: 100 Mbps, degree of protection: IP20, incl. bus base module and Axioline F connector	AXL F BK EIP EF	2702782
Axioline F, bus coupler, version for extreme conditions, degree of protection: IP20, including bus base module and Axioline F connector	AXL F BK EIP XC	1167192
Axioline F, bus coupler, Modbus/TCP (UDP), RJ45 jack, transmission speed in the local bus: 100 Mbps, degree of protection: IP20, including bus base module and Axioline F connector	AXL F BK ETH	2688459
Axioline F XC, bus coupler, Modbus/TCP (UDP), RJ45 jack, version for extreme conditions, transmission speed in the local bus: 100 Mbps, degree of protection: IP20, including bus base module and Axioline F connector	AXL F BK ETH XC	2701949
Axioline F, bus coupler, Ethernet (2 networks), RJ45 jack, transmission speed in local bus: 100 Mbps, degree of protection: IP20, incl. bus base module and Axioline F connector	AXL F BK ETH NET2	2702177
Axioline F, bus coupler, PROFINET, RJ45 jack, transmission speed in the local bus: 100 Mbps, degree of protection: IP20, including bus base module and Axioline F connector	AXL F BK PN	2701815
Axioline F, bus coupler, PROFINET, RJ45 jack, transmission speed in the local bus: 100 Mbps, degree of protection: IP20, including bus base module and Axioline F connector	AXL F BK PN TPS	2403869
Axioline F XC, bus coupler, PROFINET, RJ45 jack, version for extreme conditions, transmission speed in the local bus: 100 Mbps, degree of protection: IP20, including bus base module and Axioline F connector	AXL F BK PN XC	2701222
Axioline F, bus coupler, Ethernet (IEC 61850, MMS, GOOSE), RJ45 jack, transmission speed in local bus: 100 Mbps, degree of protection: IP20, incl. bus base module and Axioline F connector	AXL F BK SAS	2701457
The PROFINET bus coupler opens up a local bus for up to 16 devices. Additional functions: 100 Mbps, auto negotiation, auto crossover, SNMP, TFTP, LLDP, 8 digital inputs, channel-specific diagnostics, short-circuit/overload protection, M12 fast connection technology	FLM BK PN M12 DI 8 M12-2TX	2736741
PROFINET bus coupler, 8 inputs, 24 V DC, 4 outputs, 24 V DC, 500 mA, complete with I/O connectors	IL PN BK DI8 DO4 2SCRJ-PAC	2878379
PROFINET bus coupler, 8 inputs, 24 V DC, 4 outputs, 24 V DC, 500 mA, complete with I/O connectors	IL PN BK DI8 DO4 2TX-PAC	2703994
PROFINET bus coupler, 8 inputs 24 V DC, 4 outputs 24 V DC, without I/O connectors	IL PN BK DI8 DO4 2TX/NC	2692649

Description	Type	Order No.
Inline, bus coupler, PROFINET, RJ45 jack, auto negotiation, transmission speed in the local bus: 500 kbps / 2 Mbps, degree of protection: IP20	IL PN BK-PAC	2403696
I/O modules		
Inline, Block IO, PROFINET, RJ45 jack, digital inputs: 32 (16 fixed, 16 freely selectable), 24 V DC, connection technology: 3-conductor, digital outputs: 16, 24 V DC, 500 mA, connection technology: 2-conductor, PROFINET, IRT, MRP, Fast Startup, IP20 degree of protection, including inline connectors	ILB PN 24 DI16 DIO16-EF	2702289
Digital I/O device for PROFINET; FO connections according to SC-RJ standard, 2-port switch, 100Base-FX, Fast Startup, SNMPv2, TFTP, LLDP, PDev, eight inputs or outputs (24 V DC, max. 0.5 A), push-pull connection technology, robust metal housing, IP67 degree of protection	RL PN 24-2 DIO 8/8 2SCRJ	2773513
Digital I/O device for PROFINET; 100Base-TX, Fast Startup, SNMPv2, TFTP, LLDP, PDev, eight inputs (24 V DC), eight configurable inputs or outputs (24 V DC, max. 0.5 A), VARIOSUB push-pull connection technology, robust metal housing, IP67 degree of protection	RL PN 24-2 DIO 16/8 2TX	2773652
Controllers		
Axiocontrol for the direct control of Axioline I/Os. With 2 Ethernet interfaces and programming options in accordance with IEC 61131-3. Complete with connector and marking field.	AXC 1050	2700988
Axiocontrol for the direct control of Axioline I/Os. With 2 Ethernet interfaces, expanded temperature range and programming options in accordance with IEC 61131-3. Complete with connector and marking field.	AXC 1050 XC	2701295
Axiocontrol for the direct control of Axioline F I/Os. With 3 Ethernet interfaces for the additional connection of distributed I/Os via PROFINET, Modbus/TCP or TCP/IP. Programming in accordance with IEC 61131-3. Including connector and marking field.	AXC 3050	2700989
The Inline controller offers the option of communicating via PROFINET and Modbus/TCP. Programming is carried out using PC Worx Express or PC Worx (IEC 61131-3).	ILC 131 ETH	2700973
Inline controller for use under harsh ambient conditions, with Ethernet interface for coupling to other controllers and systems, with programming options according to IEC 61131-3, complete with connector and marking field.	ILC 131 ETH/XC	2701034
The Inline controller offers the option of communicating via PROFINET and Modbus/TCP. Programming is carried out using PC Worx Express or PC Worx (IEC 61131-3).	ILC 151 ETH	2700974
Inline controller for use under harsh ambient conditions, with Ethernet interface for coupling to other controllers and systems, with programming options according to IEC 61131-3, complete with connector and marking field.	ILC 151 ETH/XC	2701141
Inline controller with Ethernet interface and GSM modem for coupling to other controllers and systems, with programming options according to IEC 61131-3, complete with connector and marking field.	ILC 151 GSM/GPRS	2700977

Description	Type	Order No.
The Inline controller offers the option of communicating via PROFINET and Modbus/TCP. Programming is carried out using PC Worx Express or PC Worx (IEC 61131-3).	ILC 171 ETH 2TX	2700975
The Inline controller offers the option of communicating via PROFINET and Modbus/TCP. Programming is carried out using PC Worx Express or PC Worx (IEC 61131-3).	ILC 191 ETH 2TX	2700976
Inline controller with integrated pulse/direction/PWM interface, RS-485/422, analog inputs (0...10 V), and analog outputs (0...10 V), with programming options in accordance with IEC 61131-3	ILC 191 ME/AN	2700074
Inline controller with integrated pulse/direction/PWM interface, RS-485/422, fast counters, and incremental encoder inputs, with programming options in accordance with IEC 61131-3	ILC 191 ME/INC	2700075
Inline controller with PROFINET interfaces for coupling to other controllers and systems, with programming options according to IEC 61131-3, complete with connector and marking field.	ILC 330 PN	2988191
Inline controller with PROFINET interface for coupling to other controllers and systems, with programming options according to IEC 61131-3, complete with connector and marking field.	ILC 350 PN	2876928
Inline controller with PROFINET interfaces for coupling to other controllers and systems, with programming options according to IEC 61131-3, complete with connector and marking field.	ILC 370 PN 2TX-IB	2876915
Remote field controller with 3x10/100 Ethernet, INTERBUS Master, PROFINET controller, PROFINET device, IP20 degree of protection, plug-in configuration memory	NFC 470	2916613
Remote field controller with 3x10/100 Ethernet, INTERBUS Master, PROFINET controller, PROFINET device, IP20 degree of protection, plug-in configuration memory	RFC 470 PN 3TX	2916600

Description	Type	Order No.
Switches		
Smart Managed Narrow NAT switch with eight 10/100 Mbps RJ45 ports and 1:1 NAT router function	FL NAT SMN 8TX	2989365
Smart Managed Narrow NAT switch with eight 10/100 Mbps RJ45 ports and 1:1 NAT router function	FL NAT SMN 8TX-DMG	2989352
Smart Managed Narrow NAT switch with eight 10/100 Mbps RJ45 ports and 1:1 NAT router function	FL NAT SMN 8TX-M	2702443
Ethernet Gigabit Modular switch with four 1000 Mbps combo ports and 4 10/100 Mbps RJ45 slots, can be extended by an extension station to up to 24 ports	FL SWITCH GHS 4G/12	2700271
Ethernet Gigabit Modular switch with four 1000 Mbps combo ports and 12 10/100 Mbps RJ45 slots, can be extended by an extension station to up to 24 ports, with integrated routing function	FL SWITCH GHS 4G/12-L3	2700786
Ethernet Gigabit Modular switch with eight 10/100/1000 Mbps RJ45 ports and four 1000 Mbps SFP ports, can be extended by an extension station to up to 28 ports	FL SWITCH GHS 12G/8	2989200
Ethernet Gigabit Modular switch with eight 10/100/1000 Mbps RJ45 slots and four 1000 Mbps SFP ports, can be extended by an extension station to up to 28 ports, with integrated routing function	FL SWITCH GHS 12G/8-L3	2700787
Ethernet Managed Compact switch with 14 10/100 Mbps RJ45 ports and two 100 Mbps FX-SC multi-mode ports	FL SWITCH MCS 14TX/2FX	2832713
Ethernet Managed Compact switch with 16 10/100 Mbps RJ45 ports	FL SWITCH MCS 16TX	2832700
Modular switch system, head station, can be extended to up to 24 Ethernet ports	FL SWITCH MM HS	2832328
Modular switch system, head station, can be extended to up to 24 ports, with GL approval	FL SWITCH MM HS/M	2832522
Ethernet Smart Managed Compact switch with four 10/100 Mbps RJ45 ports, PROFINET mode preset	FL SWITCH SMCS 4TX-PN	2989093
Ethernet Smart Managed Compact switch with six 10/100/1000 Mbps RJ45 ports and two 1000 Mbps SFP slots	FL SWITCH SMCS 6GT/2SFP	2891479
Ethernet Smart Managed Compact switch with six 10/100 Mbps RJ45 ports and two 1000 Mbps SFP slots	FL SWITCH SMCS 6TX/2SFP	2989323
Ethernet Smart Managed Compact switch with eight 10/100/1000 Mbps RJ45 ports	FL SWITCH SMCS 8GT	2891123
Ethernet Smart Managed Compact switch with eight 10/100 Mbps RJ45 ports	FL SWITCH SMCS 8TX	2989226
Ethernet Smart Managed Compact switch with eight 10/100 Mbps RJ45 ports, PROFINET mode preset	FL SWITCH SMCS 8TX-PN	2989103
Ethernet Smart Managed Compact switch with 14 10/100 Mbps RJ45 ports and two 100 Mbps FX-SC multimode ports	FL SWITCH SMCS 14TX/2FX	2700997
Ethernet Smart Managed Compact switch with 14 10/100 Mbps RJ45 ports and two 100 Mbps FX-SC singlemode ports	FL SWITCH SMCS 14TX/2FX-SM	2701466
Ethernet Smart Managed Compact switch with 16 10/100 Mbps RJ45 ports	FL SWITCH SMCS 16TX	2700996

Description	Type	Order No.
Smart Managed Narrow switch (SMN) with six 10/100 Mbps RJ45 ports and two 100 Mbps multimode SC format fiber optic ports	FL SWITCH SMN 6TX/2FX	2989543
Smart Managed Narrow switch (SMN) with six 10/100 Mbps RJ45 ports and two 100 Mbps singlemode SC format fiber optic ports	FL SWITCH SMN 6TX/2FX SM	2989556
Smart Managed Narrow switch with six 10/100 Mbps RJ45 ports and two 100 Mbps POF SC-RJ ports, PROFINET mode preset	FL SWITCH SMN 6TX/2POF-PN	2700290
Smart Managed Narrow switch (SMN) with eight 10/100 Mbps RJ45 ports, PROFINET mode preset	FL SWITCH SMN 8TX-PN	2989501
Additional products		
Power module, assembly type: DIN rail: 35 mm, pluggable onto CAPAROC CR... busbar, color: light gray RAL 7035	CAPAROC PM PN	1110986
Customer-specific product	SMC EX245 PN PCB	2692283
Demo board for the PROFINET TPS-1 protocol chip	TPS-1 EVA BOARD	2700881

B Appendix for document lists

B 1 List of figures

Section 3

Section 4

Please observe the following notes

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