



Beijer BoX2 Image Manual

User's Guide
English

User's Guide for Beijer BoX2 Image Manual

Foreword

The information in this document is valid for the latest versions of the devices at the time the document was released.

For information and updates, see <https://www.beijerelectronics.com>.

Order no: MAEN205C

Copyright © 2018-05 Beijer Electronics AB. All rights reserved.

The information in this document is subject to change without notice and is provided as available at the time of printing. Beijer Electronics AB reserves the right to change any information without updating this publication. Beijer Electronics AB assumes no responsibility for any errors that may appear in this document. All examples in this document are only intended to improve understanding of the functionality and handling of the equipment. Beijer Electronics AB cannot assume any liability if these examples are used in real applications.

In view of the wide range of applications for this software, users must acquire sufficient knowledge themselves in order to ensure that it is correctly used in their specific application. Persons responsible for the application and the equipment must themselves ensure that each application is in compliance with all relevant requirements, standards, and legislation in respect to configuration and safety. Beijer Electronics AB will accept no liability for any damage incurred during the installation or use of equipment mentioned in this document. Beijer Electronics AB prohibits all modification, changes, or conversion of the equipment.

Contents

1	Introduction	7
1.1	Safety Precautions	7
1.2	Trademarks	7
1.3	References	8
1.4	Operating Systems	9
2	Image and CODESYS Update	11
2.1	Updating the device using USB or SD-Card	11
2.1.1	Preferred Way	11
2.1.2	Image + New iX Developer Project	12
2.2	Updating the device over Ethernet	12
2.3	iX Developer Project Status after image Update	14
2.4	Updating the CODESYS Runtime using Ethernet	14
3	BoX 2	17
3.1	BoX 2 Series	17
3.1.1	BoX2 series in the Product catalog	17
3.1.2	Configuration file	17
3.1.3	Load the configuration file	20
3.2	Configuration settings	21
3.2.1	Enable Diagnostic page	22
3.3	LED	25

1 Introduction

1.1 Safety Precautions

Both the installer and the owner and/or operator of the Box controller must read and understand the manual.

1.2 Trademarks

Microsoft, Windows, Windows embedded CE6, Windows Embedded Compact 2013, Windows 7, Windows Embedded Standard 7 are registered trademarks or trademarks of Microsoft Corporation in the USA and/or other countries. Any additional trade names given in this documentation are trademarks of their corresponding owners.

1.3 References

Name	Description
MAEN202	Installation Manual BoX2

The installation, technical data as well cutout and outline dimensions of the devices are described in the installation manual for each Box controller. Please refer to the Installation manuals and the iX Developer manual for further information.

Note:

Current documentation and software updates can be found on
<http://www.beijerelectronics.com>

1.4 Operating Systems

image family	Runtime Versions (licenses)	Description
- BoX2 base	Windows CE6	Includes support of most existing features.
- BoX2 Pro - BoX2 Pro SC	Windows Embedded Compact 2013 Runtime (Entry)	
- BoX2 Extreme - BoX2 Extreme SC	Windows Embedded Compact 2013 Runtime (General embedded)	Includes support of most existing features.

2 Image and CODESYS Update

In the Box controller, iX Runtime comes pre-loaded on delivery.

iX Runtime can be updated, either via Ethernet using a PC, or in some cases, using an external storage device.

The Image Loader utility is used to create Image Loader SD-cards and USB-sticks or to transfer a image to an Box controller over Ethernet.

The screenshot shows a software window titled 'Image Loader'. It has two main sections: 'External Memory' and 'Ethernet'.
 The 'External Memory' section contains the text: 'Copies necessary files to a external memory. When ready, insert in panel and cycle power to initiate the update.' Below this is a 'Select drive:' dropdown menu with a downward arrow, followed by a 'Create' button. There is also an unchecked checkbox labeled 'Make Recovery SD Card'. A note below states: 'Note: SD recovery should only be used under special circumstances, see Manual. Updating the EBOOT is normally not needed and special care must be taken when doing this update to ensure that power is uninterrupted.'
 The 'Ethernet' section contains the text: 'Sends the update through Ethernet. Panel will reboot automatically when the transfer is finished.' Below this is a 'Target IP:' label followed by a text input field containing '192.168.99.150' and an 'Update' button.
 At the bottom of the window, there is a progress bar that is currently empty and labeled '0 %'. Below the progress bar, the status 'Ready' is displayed.

Note:

The **Make Recovery SD Card** option should not be used unless otherwise instructed in release notes.

2.1 Updating the device using USB or SD-Card

2.1.1 Preferred Way

Using a USB flash drive or SD-card to update the image in a Box controller is the preferred method of updating the device. This makes it possible to upgrade the device without the use of a PC.

Note:

BoX2 does not support updates from external storage.

2.1.2 Image + New iX Developer Project

It is possible to upgrade both the device and the iX Developer project on a Box controller. This is done in two steps:

1. Create a image USB flash drive or SD-card using the Image Loader utility.
2. Export the iX Developer project from within iX Developer, to that same USB flash drive or SD-card.

2.2 Updating the device over Ethernet

The Image Loader utility can be used to upgrade the device over Ethernet.

Note:

Before trying to update the device over Ethernet, make sure that your PC is on the same IP-subnet as the Box controller. If your device has an IP address of 192.168.1.1, and a netmask of 255.255.255.0, then your PC has to have an IP address in the range of 192.168.1.2 – 192.168.1.254 and a netmask of 255.255.255.0, in order to be able to communicate with the device.

1. Enter the device target IP address in the dialog and click on **Update** to start the update.

The screenshot shows a software window titled 'Image Loader' with two main sections: 'External Memory' and 'Ethernet'. The 'External Memory' section has a 'Select drive:' dropdown menu, a 'Create' button, and a checkbox for 'Make Recovery SD Card'. Below this is a note about SD recovery. The 'Ethernet' section has a 'Target IP:' text box containing '192.168.99.150' and an 'Update' button. At the bottom, there is a progress bar at 0% and a 'Ready' status indicator.

External Memory
Copies necessary files to a external memory. When ready, insert in panel and cycle power to initiate the update.

Select drive: Create

☐ Make Recovery SD Card

Note: SD recovery should only be used under special circumstances, see Manual. Updating the EBOOT is normally not needed and special care must be taken when doing this update to ensure that power is uninterrupted.

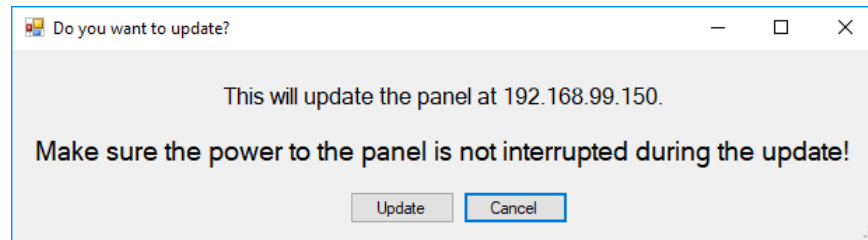
Ethernet
Sends the update through Ethernet. Panel will reboot automatically when the transfer is finished.

Target IP: Update

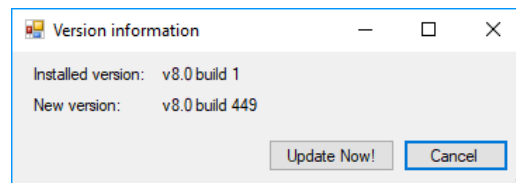
0 %

Ready

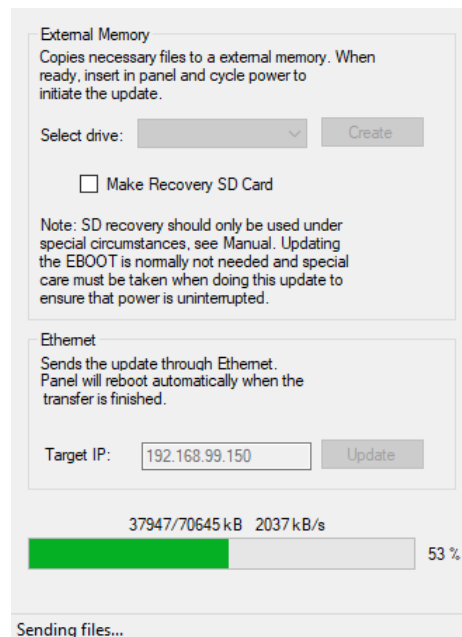
2. Make sure that the IP address of the device matches the actual Box controller that you want to upgrade.



3. The dialog shows the current installed device and the new device will be updated to after the upgrade. Click on **Update now!** to confirm the update.



4. The progress bar shows the upgrade status. When the upgrade is done, the device will restart.



Note:

If the Box controller contains a CODESYS Runtime, then the CODESYS Runtime must be downloaded once again to the device after the Box controller has been changed.

2.3 iX Developer Project Status after image Update






On BoX2 base, BoX2 pro, BoX2 pro control, BoX2 extreme and BoX2 extreme control, the iX Developer project is unchanged after a update on the device is performed. If the image upgrade is made over Ethernet, an additional dialog will pop up to confirm an erasing of the current iX Developer project. The default setting is not to erase the iX Developer project.

Note:

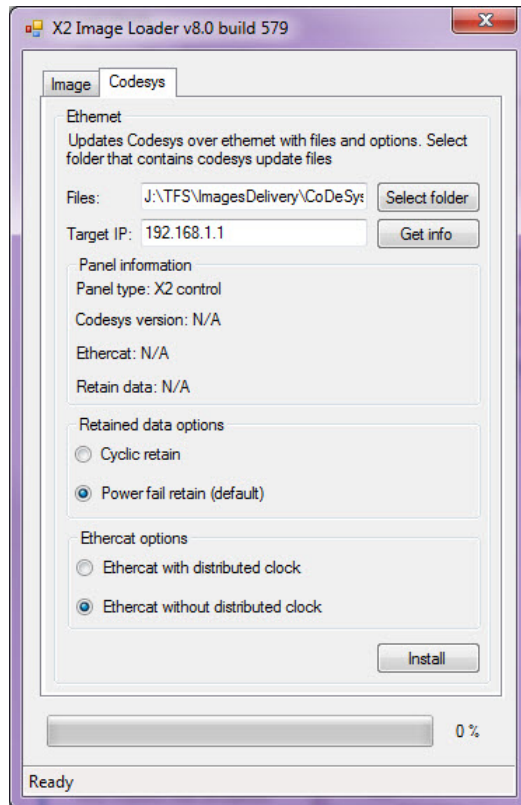
On BoX2 base no dialog will pop up, the iX Developer project will be erased immediately.

2.4 Updating the CODESYS Runtime using Ethernet

To update the CODESYS Runtime, the folder containing the CODESYS .cab-files listed below must be specified in the Image Loader utility. The existing Power Management- and EtherCAT Distributed Clock settings are shown in the Image Loader utility, and can be set before updating the CODESYS Runtime.

temp > CoDeSys v3.5.10.10_5 >				
Name	Date modified	Type	Size	
 CoDeSysControl_SC	2017-04-21 09:59	Cabinet File	9 256 KB	
 CoDeSysControl_SC_NoEcat	2017-04-21 09:59	Cabinet File	9 258 KB	
 CoDeSysControl_SM	2017-04-21 09:59	Cabinet File	9 253 KB	
 UpdateSoftPLCSW	2017-03-20 09:56	Application	24 KB	
 Version	2017-04-21 09:59	Text Document	1 KB	

1. Select the folder that contains the CODESYS files.
2. Select the target IP address for the device.
3. Press the **Get info** button to make sure that communication with the Box controller is working.
4. Select the desired options
5. Press **Install** to perform the update. This button is disabled until communication has been established with the device by previously pressing the **Get info** button.



Note:

Before downloading a new CODESYS Runtime, the image should always first be downloaded to the Box controller again, even if there are no changes to the image. If only the CODESYS Runtime is installed, then this may result in problems connecting to and communicating with other devices.

3 BoX 2

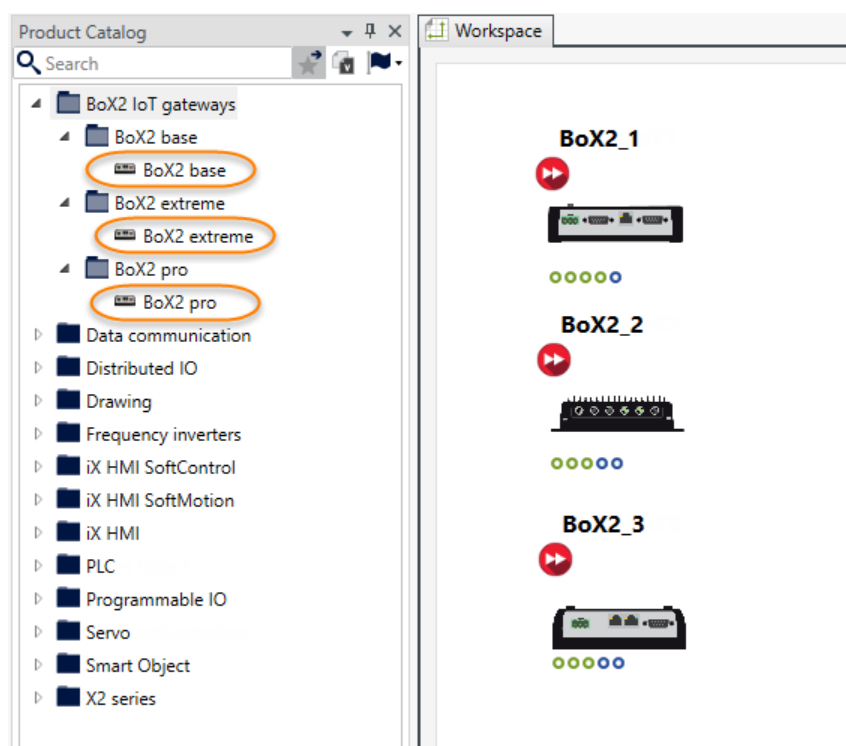
3.1 BoX 2 Series

WARP can generate a configuration file, JSON format, for the BoX2 devices. The property settings of the BoX2 device will be saved to the file. The file should be stored or copied to a USB stick, to configure the BoX2 at the first start-up.

3.1.1 BoX2 series in the Product catalog

The BoX2 devices are available in three different types.

- BoX2 base
- BoX2 extreme
- BoX2 pro

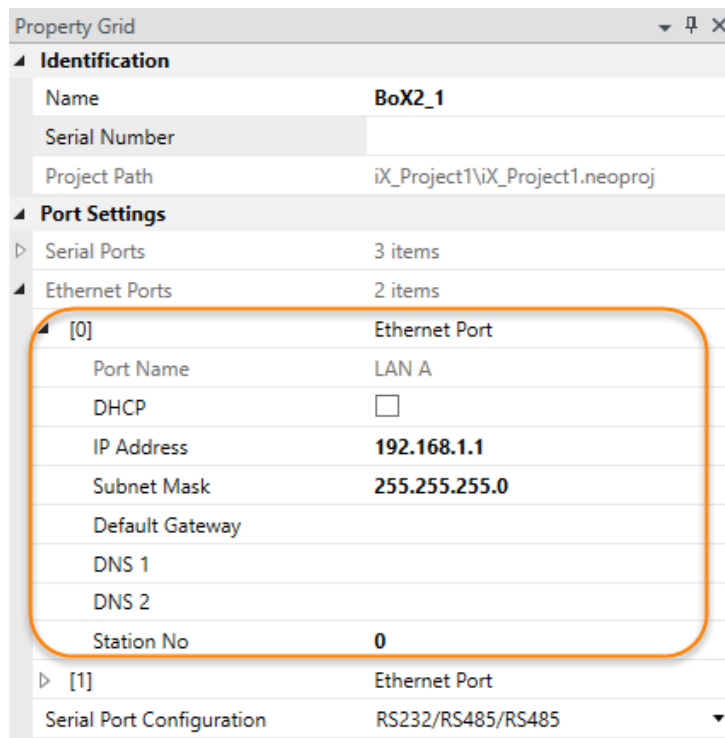
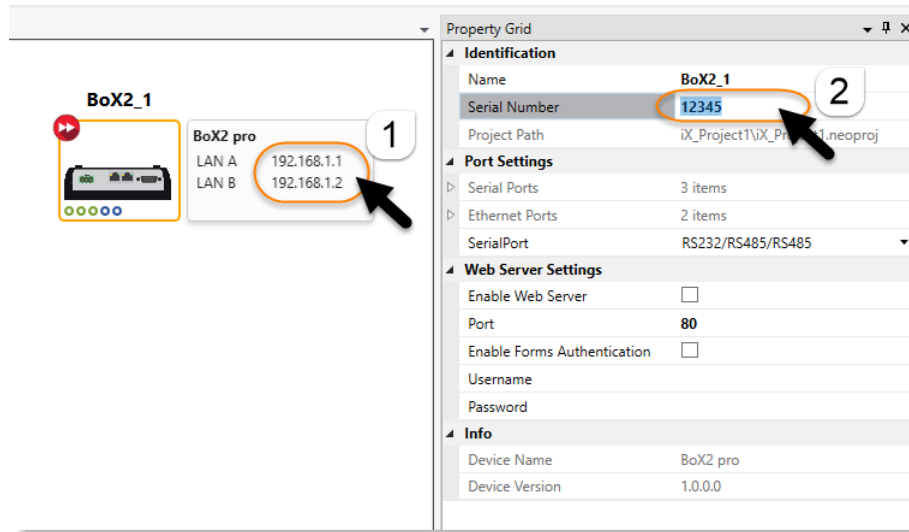


3.1.2 Configuration file

To create the BoX2 configuration file, do the following:

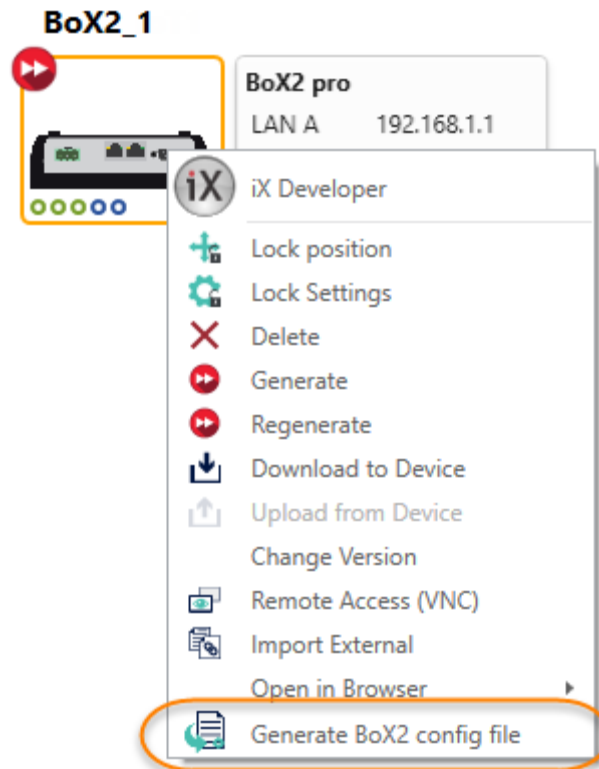
1. Add a BoX2 pro device to the workspace.

2. Set properties in property grid.
 - The IP addresses of the LAN A / LAN B.
 - The Serial number of the BoX2 hardware device. See the label of the unit.

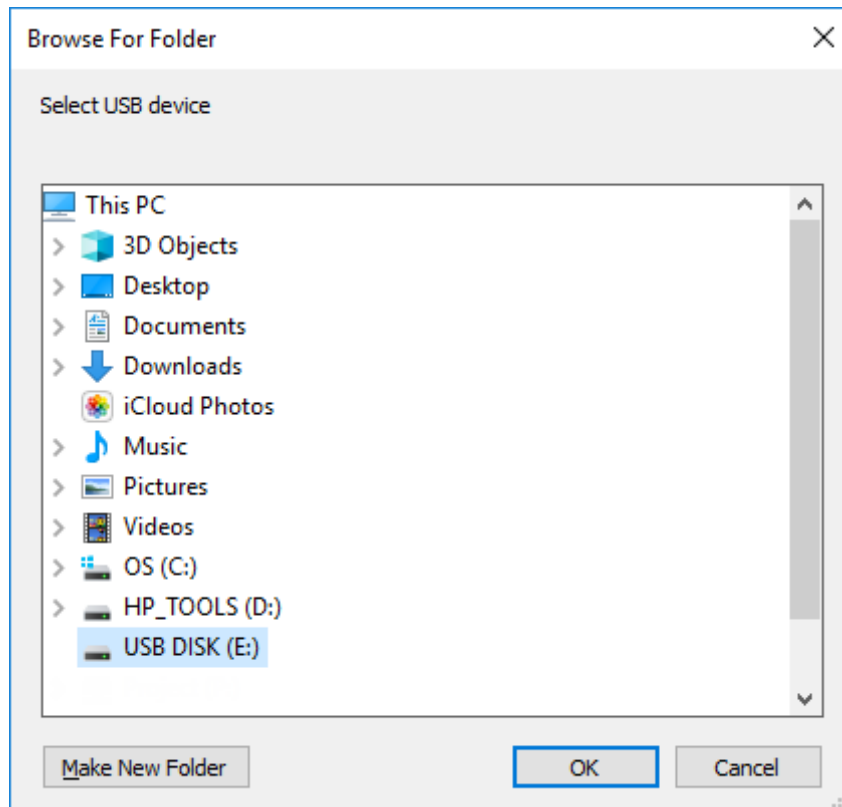


3. Right-click on the BoX2 device to open the context menu.

4. Select *Generate BoX2 config file* to open the file browser.



- From the browser, choose to save the file to any location, disk or USB stick.



Note:

In the example above, the device serial number was set to *12345*. The file name will then automatically be set to: *BoX2ConfigSet_12345.json*
 For a device without a serial number, the file should be named *BoX2ConfigSet.json*. this is then a generic configuration file usable on any BoX2 device.

Note:

The configuration files should be placed in the root folder of a USB stick. If saving in *C:\root directory* or in a not removable device, warnings will show.

3.1.3 Load the configuration file

A BoX2 device will load a configuration file only when a USB stick is connected to the device. The device does not need to be rebooted. Configuration files will be loaded in the following priority if several config files are in root folder:

- Device with a serial number matching a configuration file. The configuration file with a serial number (in this example, *BoX2ConfigSet_12345.json*) is loaded.
- Device with a serial number not matching any configuration. Then the file without a serial number (In this example, *BoX2ConfigSet.json*) is loaded.

Once the configuration file has been loaded, the LED light will flash in red once.

3.2 Configuration settings

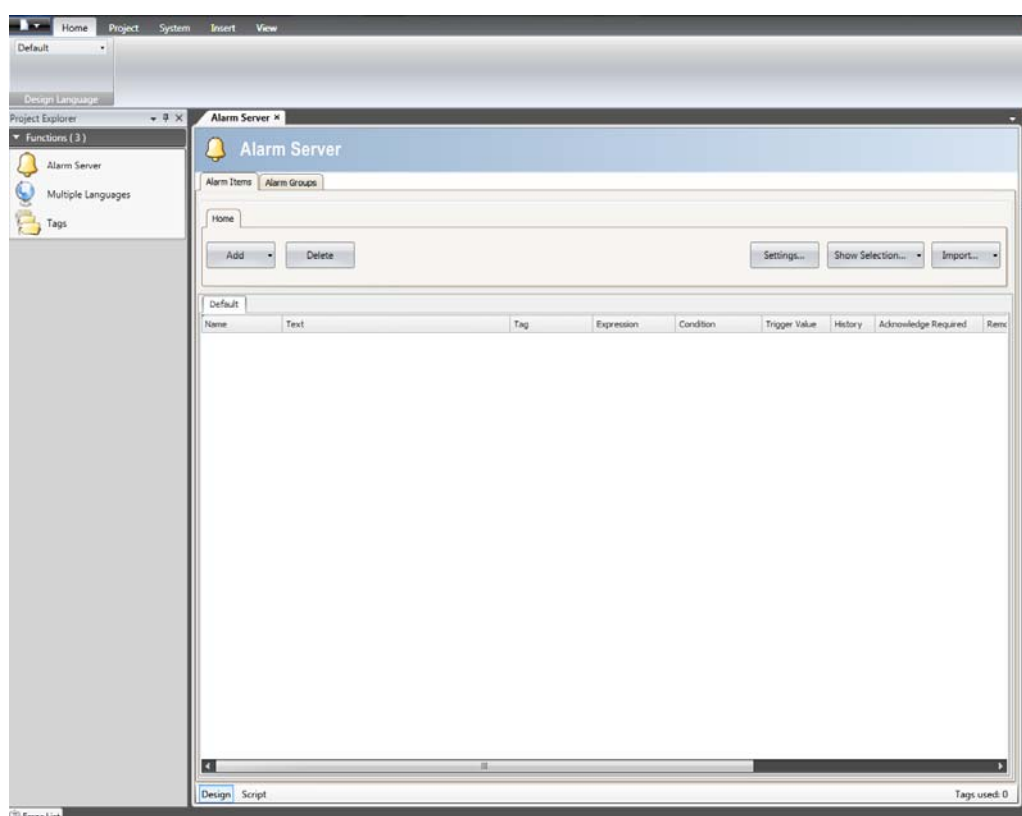
BoX2 is available from version 1.12 of WARP in the BoX2 series, and supports iX Developer 2.40.

BoX2 does not have any displays. BoX2 is a series of IoT gateways with the possibility to add optional smart functions:

- Share data between PLCs of different makes.
- Create IoT solutions to store and access data in the cloud (not BoX2 base).
- Present data on mobile devices via HTML5 screens and dashboards.
- Integrate local CODESYS control.
- Add smart functions such as local data base storage, alarm servers, recipes, reporting, C# scripting, etc.

Note:

It is not possible to convert a Display panel project to a BoX2 project.



Excluded functions for BoX2:

- Security
- Audit trail
- Text Libraries
- VNC (Remote access)
- Zoom in/out
- Recipe

Unavailable ribbon items:

- Clipboard
- Screen
- Objects
- Font
- Format
- Tag/Security
- Name

Unavailable system tags:

- RemoteAlarmServerConnectionErrorsTagInfo
- NumberOfDisabledAlarmsTagInfo
- CurrentScreenNameTagInfo
- ScreenUpdateTimeTagInfo
- CurrentScreenIDTagInfo
- NewScreenIDTagInfo
- LatestLoadedRecipeNameTagInfo
- PowerLedBlueIntensityTagInfo
- PowerLedRedIntensityTagInfo
- PowerLedGreenIntensityTagInfo
- PowerLedBlinkFrequencyTagInfo
- MaxScreenCacheMemoryLoadPercentTagInfo
- CurrentUserTagInfo
- BacklightBrightnessLevelTagInfo

3.2.1 Enable Diagnostic page

The diagnostics page shows diagnostic values from the BoX2 device. The diagnostic values include internal temperature, available RAM, used storage, connection and database errors and other system related markers. The diagnostic page can be viewed after the project is loaded to the Box device.

1. Open **Web server** configuration from **System** ribbon tab. Set values needed, in WARP, to access web server and enable web server for the project.

Note:

The URL for the diagnostics page should include the assigned port number.

The screenshot shows a 'Web Server Settings' dialog box. On the left is a tab labeled 'Web Server Settings'. The main area is titled 'Settings' and contains several configuration options:

- Enable Web Server:** A checkbox that is checked.
- Port:** A text input field containing the value '80'.
- Enable forms authentication:** A checkbox that is checked.
- User Name:** A text input field containing the value 'webuser'.
- Password:** A text input field containing the value 'fGsgj#h36jfdp'.
- Password strength:** A text input field containing the value 'very strong'.

At the bottom of the dialog are two buttons: 'OK' and 'Cancel'.

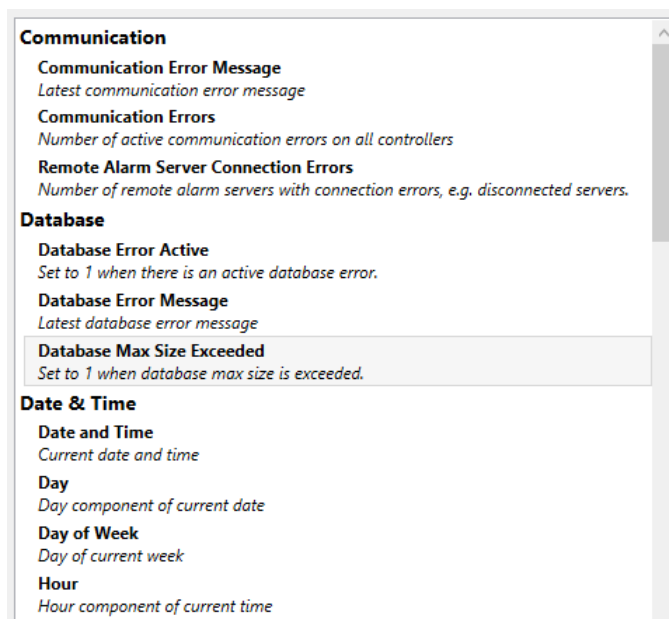
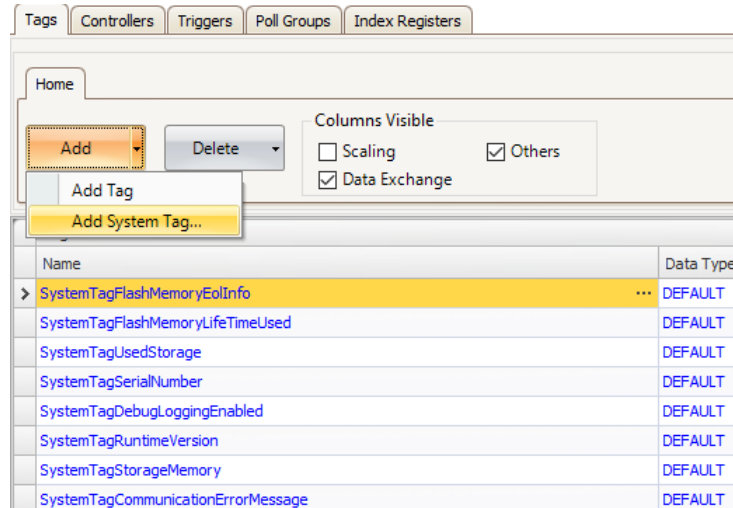
2. Add system tags, used on the page, manually to the project. If the system tag is missing, '-' will be displayed on the page.

Note:

The following system tags are available:

- Communication Errors (count) (*SystemTagCommunicationErrorMessage*)
 - Communication Error Message (*SystemTagCommunicationErrorMessage*)
 - Database Error Active (*SystemTagStorageErrorActive*)
 - Database Error Message (*SystemTagStorageErrorMessage*)
 - Database Max Size Exceeded (*SystemTagStorageMaxSizeExceeded*)
 - Current Date and Time (*SystemTagDateTime*)
 - Debug Logging Enabled (*SystemTagDebugLoggingEnabled*)
-

3. Select **Functions - Tags - Add - Add System Tag...**. Select and add needed tags in System tags dialog.



4. Deploy by either upload files via FTP or copy into the ProjectFiles folder. Diagnostics page files are installed with iX Developer installation and reside in 'iX Developer 2.40\Bin\DiagnosticsPage'.
 - a. Enable FTP server for the project.
 - b. Download the project to the image through **Project - Download**.
 - c. Connect to the Box controller. Use FTP settings specified in the project with the help of any FTP client.
 - d. Create a new folder 'diagnostics' in the 'Website' folder and copy diagnostics page files into it.

Use the URL: `http://<image_ip_address><:port>/diagnostics/index.html` to access the page. The port is taken from the project web server configuration. If Forms authentication is enabled for the web server, user is first taken through authentication process. The page is updated asynchronously every 2 seconds with the latest data.

3.3 LED

Box2 has three LED lights; Red, Purple and Blue.

Red

State	Description
Constant on	The light signals that the boot process is working. For example, when updating image.
Every 2 seconds on/off	Update mode.
Fast flashing	Image/Codesys update requires image reboot. Remove any USB / SD card and reboot image.

Purple

State	Description
Constant on	Booting up.
Every 0.5 seconds on/off	The unit is on standby and no iX project is running.

Blue

State	Description
Every 0.5 seconds on/off	The iX project is running.



Head office

Beijer Electronics AB

Box 426

201 24 Malmö, Sweden

www.beijerelectronics.com / +46 40 358600