X3 web

Configuration and Operation

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Beijer ELECTRONICS

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1. Introduction

1.1. About This Configuration and Operation Guide

This guide contains information on the **software** features of the **X3 web**. It describes configuration as well as operation of the HMI panel.

For more information on the **hardware** features, find the **Hardware and Installation** guide for your specific HMI panel variant at the X3 web documentation page.

1.1.1. Warning, Caution, Note, Important and Tip Icons

This document includes Warning, Caution, Note, Important and Tip icons where appropriate to point out safety-related, or other important information. The icons should be interpreted as follows:

WARNING
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury, and major damage to the product.

CAUTION
Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury, and moderate damage to the product.

NOTE
Points out relevant facts and conditions.

IMPORTANT
Highlights key information.

TIP
Indicates helpful advice, recommendations, or best practices that can improve the user experience or make a task easier, but is not mandatory for completing the task.

1.2. About X3 web

HTML5 web client HMI – X3 web is a Human-Machine Interface (HMI) that uses HTML5 technology, allowing for modern, responsive, and interactive web applications.

The underlying operating system is based on **Yocto Linux**, which is a flexible, customizable, and secure Linux distribution tailored for embedded systems.

The web browser used is **Chromium**, known for its speed, stability, and security features.

This combination ensures a robust and secure foundation for running web applications.

Built-in Security – The integration of Yocto Linux and Chromium provides a strong security framework, protecting the system from vulnerabilities and ensuring safe operation.

1.3. Safety Precautions

Both the installer and users of the HMI panel must read and understand this manual.

1.4. References

For installation instructions, technical specifications, panel cutout and outline dimensions, refer to the Hardware and Installation guide for your HMI panel.

Download software updates from MyBeijerElectronics.

For information about **WebIQ**, visit the WebIQ documentation page.

1.5. Open Source Software Notice

To obtain the source code under GPL, LGPL and other open source licenses that are contained in this product, please contact opensource@beijerelectronics.com. In addition to the source code, all referred license terms, warranty disclaimers and copyright notices may be disclosed upon request.

2. Users and Permissions

The X2 web system image has the following user types available:

- **Administrator**
  Has full access to the Settings Menu, including permission to add and remove Apps.
- **Operator**
  Has limited access to the Settings Menu and can primarily change the web browser URL.
- **Anonymous (not logged in)**
  Can only view and interact with the content on the web browser and adjust the screen's Brightness.
- **Linux Root User**
  Can access the underlying Linux operating system via a Secure Shell (SSH) terminal.

3. Start the HMI Panel

1. Power on the HMI panel.
2. If this is the first time powering on the HMI panel or if a Device Reset has been performed, refer to Initial Device Setup.
3. Otherwise, the **Browser** will appear within 15–20 seconds.
   The X3 web is pre-configured to open a browser page with the Beijer Electronics website. If a custom **URL** is set in the Settings Tab, that page will load instead.

3.1. Initial Device Setup

When powering on the **X3 web HMI panel** for the first time, follow these steps:

1. Accept the **End User License Agreement (EULA)**.
2. Choose a password for the **Linux Root User**. For information on users and permissions, see Users and Permissions.

> **IMPORTANT**
> - The **Linux Root User** is allowed to log into the device's operating system. Be sure to choose a strong password that includes at least one digit and one letter.
> - Remember this password. The only way to change it is through a Device Reset.

3. After setting the Linux Root User password, a dialog will prompt you to change the default **Operator PIN**.
4. At **Login as Operator**, enter the factory default PIN: **1234**.
5. Create your new **Operator PIN**.
6. You will then need to create the **Administrator PIN**.
7. After creating the **Administrator PIN**, enter the new **Operator PIN** twice to confirm the change.

> **TIP**
> The **Administrator** and **Operator** PINs can be changed later. For instructions, see Change the Administrator or Operator PIN.

4. Navigation

The HMI panel is navigated by tapping the screen like a standard tablet or using the **context menu**.

To open the **context menu** (right-click menu), touch and hold the middle or bottom part of the touchscreen for at least 1.5 seconds. A dropdown with navigation commands will appear.

Context menu navigation commands

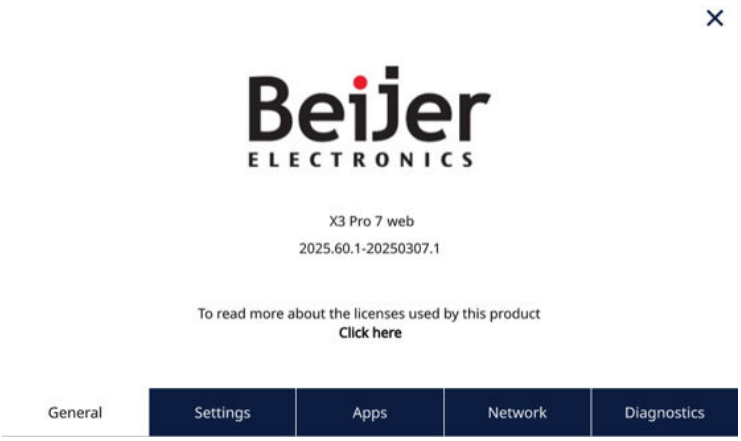
- **Back**
- **Forward**
- **Reload**

You can enable or disable the context menu from the Settings Tab.

5. Settings

The settings in the **X3 web HMI panel** are primarily changed from the Settings Menu. Some additional settings can be changed in the Terminal Settings.

5.1. Settings Menu



The **Settings Menu** is available for **Administrator** and **Operator** users. The **Operator** user has limited configuration options compared to the **Administrator** user, refer to Users and Permissions for more information.

Tabs in the **Settings Menu**:

- General Tab
- Settings Tab
- Apps Tab
- Network Tab
- Diagnostics Tab

To access the **Settings Menu**:

1. Touch and hold the upper area of the display, about one centimeter from the top, for at least 1.5 seconds.

2. After 1.5 seconds, the **Settings** button will appear at the top center of the screen.

3. Tap the button to access the **Settings** menu.
   If you are not logged in, you will be prompted to log in as an **Administrator** or **Operator**.

TIP
To hide the **Settings** button, tap outside of it.

5.1.1. Home

To the left of the **Settings** button is the **Home** button.

Tap the **Home** icon to return to the start page set in **Settings** - **URL**.

5.1.2. Brightness

To the right of the **Settings** button is the **Brightness** button.

Tap the sun icon to adjust the brightness using a slider. No login is required to do this.

5.1.3. General Tab

The **General** tab shows the following information about the HMI panel.

- HMI panel model name.
- Currently installed software version.
- Open source license info.

5.1.4. Settings Tab

The **Settings** tab allows you to configure the following settings:

Setting	Description
URL	Sets the start page. Tap **Open page** to open it in the browser.
Scale fullscreen default	Controls the zoom level and stretching of the web application.  **NOTE** Adjusting this may resolve graphic issues in applications like CODESYS WebVisu.
Brightness	Adjusts the display brightness (scale 0-100).
Screensaver time-out	Sets the time before the screensaver activates (30 sec - 10 min). Tap the **Activate** button to start it immediately.
Calibrate touchscreen	Tap **Calibrate** to recalibrate the touchscreen.  **IMPORTANT** Calibration consists of nine steps where crosshairs must be pressed precisely. Incorrect calibration may make the device difficult to use.

Setting	Description
Change password	Tap **Change** to change PIN. For detailed instructions, see Change the Administrator or Operator PIN.
Disable context menu	When **On**, the Navigation in the browser is disabled.
Touch mouse emulation	When **On**, touch input is emulated as mouse clicks, disabling scrolling and gestures.
Client certificate	Tap **Change** to add or update client certificate for mTLS.
Certificate Util/Allowlist	Tap **Edit** to control white listed URL's and add server certificates from a USB drive or an SD card. See Certificates and Allowlist for details.
Ping	When **On**, the firewall allows Ping (ICMP) requests.
SSH	When **On**, the firewall allows SSH terminal connections. Tap **Settings** to configure SSH settings.
Date & Time	Tap **Change** to configure time zones, time servers, and manual or automatic time settings.
Docker	When **On**, enables Docker runtime. Tap **Settings** to access the Docker settings.
TLS-certificate setup	Tap **Change** to modify TLS certificates for the device.
Device reset	Tap **Change** to reset the device, erasing all data and restoring factory settings. For more information, refer to Device Reset. **CAUTION** **A device reset cannot be undone!**
HW accelerated graphics	When **On**, enables hardware-accelerated graphics (disabled by default).
Logout timeout	Adjusts the automatic logout time.
Logout	Tap **Logout** to sign out or switch users.
Experimental settings	When **On**, unlocks the following experimental features for **admin** and **configtool** users. • **Rotate browser** Rotates only the browser (not the keyboard or settings menu). Options: Landscape (0°), Portrait (90°), Landscape (180°), Portrait (270°). • **Disable keyboard** When **On**, disables the built-in browser keyboard. • **Multicast DNS** • **Hostname**

5.1.5. Apps Tab

From the **Apps** tab you can Install Apps and Remove Apps.

Apps extend the functionality of the X3 web device beyond its role as a web client. They are packaged as one or more containers that run in the X3 web Docker runtime environment. This makes it easy to run various applications on the X3 web hardware.

NOTE
Docker must be enabled in the Settings Tab before installing or running apps.

5.1.6. Network Tab

From the **Network** tab you can adjust the following network settings for **LAN A** and **LAN B**:

- Method - DHCP (default) or Static
- IP
- Netmask
- Gateway
- DNS 1
- DNS 2

5.1.7. Diagnostics Tab

The **Diagnostics** tab displays the following parameters:

- CPU load
- System uptime
- Memory total
- Memory usage
- SysData usage
- AppData usage

5.2. Terminal Settings

The X3 web HMI panel includes additional settings, some of which can only be modified from the terminal when you Remotely Access the HMI Panel via SSH. This chapter describes these settings.

TIP
The built-in text editor is **vi**. A basic guide to **vi** commands can be found here.

CAUTION
Any modifications to the OS or file system are made at the owner's risk. **Beijer Electronics AB** is not responsible for any damages caused by accessing the device as a **Linux Root User**.

Configuration files

- `/etc/beijer/misc.conf` contains the following settings:

Parameter	Description	Type	Note
brightness	Controls the backlight brightness level. If brightness is mistakenly set to 0 from the UI, this parameter can be adjusted via terminal.	Integer	Range: 0, 100
login_valid_sec	Defines the duration before automatic logout from the configuration UI.	Integer	Range: 0, N Recommended range: 120, N
screensaver_timeout	Sets the screensaver timeout. If `0`, the screensaver is disabled.	Integer	Range: 0|1, N
update_dirs	Specifies allowed mounted interfaces for firmware updates.	Array of strings (comma-separated)	
drawer_open_direction	Defines the swipe direction for opening the configuration menu.	String	Valid directions: Down, Right, Left

- `web.conf` contains the following settings:

Parameter	Description	Type	Note
initscale_workaround	Enables workaround for known issues with progressive web apps (including WebVisu SP14 zoom issues).	Boolean	true, false
url	Defines the web server address. Editing this parameter via terminal may be beneficial in certain deployment scenarios.	String	
disable_context_menu	Enables or disables the Navigation. (context menu)	Boolean	true, false

- `/etc/beijer/touch.conf`: This file stores touch calibration results. It is recommended to use the built-in touch calibration app instead of manually editing this file.

6. Configuration

This section describes how to configure the HMI panel.

6.1. Install Apps

Apps are distributed as `.bapp` files. Download the `.bapp` files from MyBeijerElectronics. Each `.bapp` file contains all necessary data for installation on an X3 web panel, including manifest information, an app icon, and other relevant data.

Prerequisites

- Computer with internet access
- USB drive or SD card with the standard **FAT32** file system.
- HMI panel

Instructions

1. Go to the **App** section in SmartStore and download the desired app.
2. Copy the `.bapp` file to the **root directory** of the USB drive or SD card.

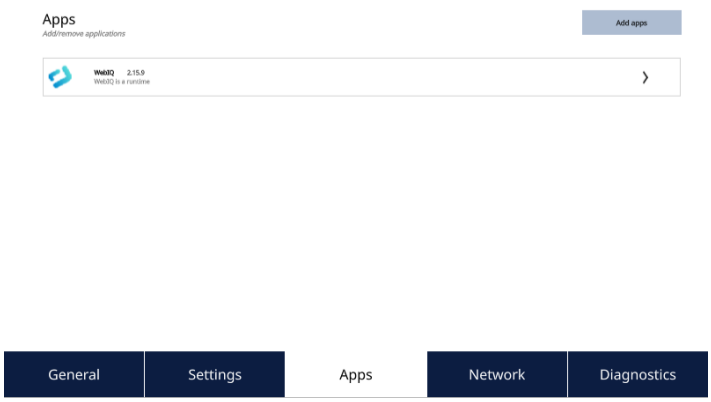
TIP

For instance, if a USB drive is assigned the letter `E:` and the application to be installed is the WebIQ app named `webiq_2.16.0.bapp`, the path should be `E:\webiq_2.16.0.bapp`.

IMPORTANT

For X3 web firmware versions older than **2025.60.1**, applications must be placed in a subdirectory named `papps` within the root directory of the USB drive or SD card.

3. On the HMI panel, open the Settings Menu, logged in as **Administrator**.
4. In the Settings Tab, ensure that **Docker** is enabled.
5. Go to the Apps Tab.
6. Connect the USB drive or SD card to the HMI panel.
7. Tap **Add apps** to open the **Install apps** dialog.
8. Tap **Install** next to the app you want to install.
9. After installation, close the **Install apps** dialog.
10. The installed app will now appear in the Apps Tab.



11. If the installed app is **WebIQ**, continue to Set Up and Run WebIQ Project on the HMI Panel.

6.2. Remove Apps

To remove an app from the HMI panel:

1. Open the Settings Menu, logged in as **admin**.
2. Go to the Apps Tab.
3. On the app you want to remove, tap the > button to open its detailes.
4. Tap **Uninstall**.
5. Tap **Yes** to confirm and complete the removal.

6.3. Set Up and Run WebIQ Project on the HMI Panel

6.3.1. Install WebIQ

1. Install **WebIQ** by following the steps in Install Apps.
2. Open the Settings Menu and go to the Settings Tab.
3. Ensure that **Docker** is enabled.
4. Change the **URL** to:

   ```
   localhost:10123
   ```

5. Tap **Open page**. The welcome screen for **WebIQ Runtime Manager** will appear.
6. Log in with your WebIQ credentials or create a new user.
7. If you are running WebIQ Runtime Manager for the first time:
   a. Open the **License Activation** tab.
   b. Enter the license key.
   c. Tap **Confirm**.

6.3.2. Upload WebIQ Project

1. Copy your WebIQ project **ZIP file** to a **USB drive**, then connect it to the X3 HMI panel.

> **TIP**
> For details on exporting a project as a ZIP file from **WebIQ Designer**, see the WebIQ documentation.

2. In **WebIQ Runtime Manager**, open the **HMI Projects** tab and tap **Upload**.
3. Locate your WebIQ project on the USB drive, and click **Open**.

> **NOTE**
> The project must be in a ZIP file format.

4. Enter a **Project Name**. This name will be part of the project's URL.
5. Tap **OK**. The uploaded project will appear in the **HMI Projects** list.

6.3.3. Run WebIQ Project

1. In **WebIQ Runtime Manager**, open the **HMI Projects** tab.
2. Tap the **...** button next to the project and select **Start** to run it. A play icon will appear under **Status**.
3. Open the Settings Menu logged in as **admin** or **configtool** user.
4. In the Settings Tab, change the **URL** to:

   `localhost:10123/<projectname>`

   *Replace `<projectname>` with the **Project Name** entered in Step 4 in Upload WebIQ Project.*
5. Tap **Open page** to run the project.

6.4. Change the Administrator or Operator PIN

To change the **Administrator** or **Operator** PIN:

1. Open the Settings Menu, logged in as **Administrator**.
2. In the Settings Tab, locate the **Change password** setting and tap **Change**.
3. The application will restart.
4. After the restart, select the **Operator** or **Administrator** user and follow the on-screen instructions.

PIN requirements:

- The new PIN must be at least **four characters long**.
- There is **no maximum** PIN length.

6.5. Remotely Access the HMI Panel via SSH

This section explains how to remotely access an **X3 HMI panel** using **Secure Shell (SSH)**. SSH is a secure protocol that enables remote login and management over an unsecured network. It allows you to update and troubleshoot the HMI panel without needing physical access.

Prerequisites

- **Network connectivity** - Ensure the HMI panel is connected to a network with a valid IP address.
- **Computer with SSH Client** - Windows, Linux or MacOS computer with a suitable SSH client installed, for example PuTTY or OpenSSH (included with Windows 10 and newer).

Instructions

1. On the HMI panel, open the Settings Menu, logged in as **Administrator**.
2. Go to the Network Tab, find the HMI panel's IP address, and write it down.
3. Go to the Settings Tab. Scroll down to the **SSH** setting and set it to **On**.
4. Tap **Save**.
5. On the computer, open a terminal window. On Windows, you can use **Command Prompt** or **PowerShell**.
6. Enter the following command:

   ```
   ssh root@<ip address>
   ```

   Replace `<ip address>` with the panel's IP address from Step 2.
7. When prompted, enter the **Linux Root User** password, configured during the Initial Device Setup, and press **Enter**.

You are now connected to the HMI panel via SSH.

SSH resources

- Tutorial: SSH in Windows Terminal

6.6. Web Browser Startup Delay

This section describes the process of adding and removing a delay to the startup process of the web browser.

6.6.1. Add a Startup Delay

A startup delay is added as an extra step in the **systemd** web browser service.

Instructions

1. Connect a computer to the HMI panel using the instructions in Remotely Access the HMI Panel via SSH.
2. Run the following command to create a directory for the web browser service:

   ```
   mkdir -p /etc/systemd/system/webbrowser.service.d
   ```

3. Create a configuration file named **delay.conf** in the newly created directory with the following content:

   ```
   [Service]
   ExecStartPre=sleep 5
   ```

   The `sleep 5` command introduces a 5-second delay. Adjust the number to change the delay duration (e.g., `sleep 20` for a 20-second delay).
   To create this file using a single command, run:

```
echo -e "[Service]\nExecStartPre=sleep 5" > /etc/systemd/system/
webbrowser.service.d/delay.conf
```

4. Reload the **systemd** service to apply the changes:

```
systemctl daemon-reload
```

5. Restart the system.

6.6.2. Remove the Startup Delay

Instructions

1. Connect a computer to the HMI panel using the instructions in Remotely Access the HMI Panel via SSH.
2. Delete the **delay.conf** file created in Add a Startup Delay:

```
cd /etc/systemd/system/webbrowser.service.d
rm delay.conf
```

3. Reload the **systemd** service:

```
systemctl daemon-reload
```

4. Restart the system.

6.7. Certificates and Allowlist

Connecting the X3 web browser to a server over TLS without a CA root authority-signed SSL certificate is not allowed. To avoid blocking the connection, you can either:

- **Add the server certificate to the HMI panel as a trusted certificate** — See Add a Certificate to the HMI Panel.
- **Add the URL to the allowlist** — See Add the Current URL to the Allowlist.

If a user tries to connect to a web server with an invalid certificate, a notification saying **Insecure Page** will appear on the screen for 10 seconds.

6.7.1. Add a Certificate to the HMI Panel

To add a server certificate to the HMI panel as a trusted certificate:

Prerequisites

- HMI panel
- USB drive or SD card formatted as **FAT32**.

Instructions

1. On the USB drive or SD card, create a folder named `certificates` in the root directory.
2. Add the `.crt` files to the `certificates` folder.
3. Connect the USB drive or SD card to the **X3 web HMI panel**.
4. On the HMI panel, open the Settings Menu, logged in as **admin**.
5. In the Settings Tab, find the **Certificate Util/Allowlist** section. All certificates on the USB drive or SD card will be listed in the upper list.

6. Select the certificate to add, then click **Add**.

If the operation succeeds, the browser will restart.

6.7.2. Add the Current URL to the Allowlist

To add the current URL address to the allowlist:

1. Open the Settings Menu, logged in as **admin**.
2. In the Settings Tab, find the **Certificate Util/Allowlist** section.
3. Check the **Add current URL to allowlist** checkbox, then tap **Add**.

> **NOTE**
> White-listed URL domain addresses will appear in the lower list. To remove a URL, select it and click the **Remove** button.

6.8. Update the System Image

The HMI panel is pre-loaded with the most recent **system image** available upon delivery. To update the system image, follow the steps below.

> **NOTE**
> Updating the image does not delete any user settings or installed applications. All existing configurations and apps will be preserved.

Prerequisites

- HMI panel
- USB drive or SD card formatted as **FAT32**.

> **NOTE**
> The USB drive or SD card must have a partition smaller than 32 GB and be formatted as FAT32. If the device is larger than 32 GB, create a partition under 32 GB first, then format it as FAT32.

Instructions

1. Download the X3 web image from MyBeijerElectronics.
2. Extract the package.
3. Place the `system-beijer.raucb` file in the root folder of the USB drive or SD card.
4. Connect the USB drive or SD card to the HMI panel. A dialog will appear to install the new version.
5. A notification will appear once the update is complete.
6. Eject the USB drive or SD card and reboot the device.
7. Verify the new version number in the General Tab in the Settings Menu.

ALTERNATIVE

When you Remotely Access the HMI Panel via SSH you can also update the system image via USB drive, SD card, or file transfer and manual installation by using the following command:

```
rauc install system-beijer.raucb
```

7. Device Reset

Resetting the device restores the operating system to a factory-like state, while retaining the most recently installed system image. This process will remove all configuration changes, including settings parameters, Docker containers, SSH keys, and more. Additionally, the root user password will be reset and must be reconfigured upon reboot. For instructions on setting up the root password, see Initial Device Setup.

For security reasons, the reset will only proceed if the device's serial number is provided. The serial number can be found on a label located on the back of the HMI panel.

You can reset the device in two ways:

- Reset the Device From the Settings Menu
- Reset the Device During Boot Up

> **CAUTION**
> **A device reset cannot be undone!**

7.1. Reset the Device From the Settings Menu

1. Open the Settings Menu, logged in as **Administrator**.
2. In the Settings Tab, find the **Device reset** section and tap **Change**.
3. Reset the device through the **Device reset** dialog.

7.2. Reset the Device During Boot Up

If you do not know the **Administrator** PIN, you can perform a device reset during boot up:

1. Power off the HMI panel, wait 10 seconds, then power it on.
2. When the spinning wheel appears, **touch and hold** the screen until the **Device reset** dialog appears.
3. Reset the device through the **Device reset** dialog.

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