



Image Manual X2 pro/extreme web

User's Guide for Image Manual X2 pro/extreme web

Foreword

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

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

Order no: MAEN341

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1 Introduction

1.1 Safety precautions

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

1.2 References

Name	Description
MAEN215	Installation Manual X2 control/motion 7 - B2
MAEN221	Installation Manual X2 control/motion 10 - B2
MAEN225B	Installation Manual X2 control/motion 15 - B2
MAEN251B	Installation Manual X2 extreme 7 HP
MAEN256B	Installation Manual X2 extreme 12 HP
MAEN261B	Installation Manual X2 extreme 15 HP

The installation, technical data as well cutout and outline dimensions of the panels are described in the installation manual for each operator panel. Please refer to the Installation manual for further information.

Note:

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

1.3 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 Boot

1. Apply power to the operator panel.
2. Within 15–20 seconds, the **Browser** will appear.

If a start address is defined in the configuration, it will be loaded automatically. otherwise you will be directed to the configuration.

The X2 web is pre-configured from factory with a url to a HTML5 demo page.

2.1 First time boot

When powering up the X2 web device, first time from delivery, a dialog is shown in order to change the default Configtool user password, or PIN. The procedure is as follows:

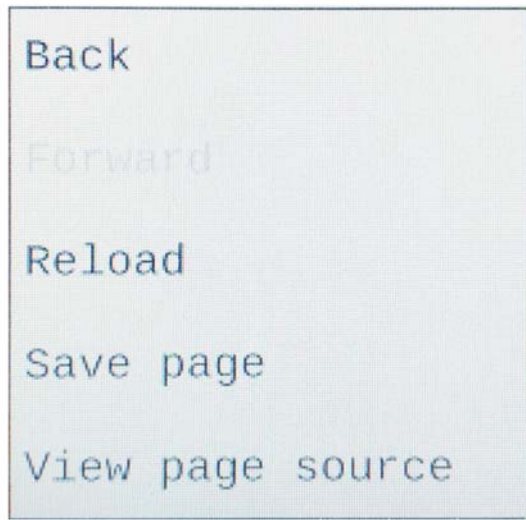
1. At “Login as ConfigTool User”, input the factory default PIN (The default password from factory is 1234).
2. In the subsequent step, it is required to input the “Admin password”. This password is an additional password, similar to the PUK code on a mobile phone SIM card. The Admin password is printed on the flyer, included in the shipment.
3. With correctly stated Admin password, input the new PIN/Configtool User password, two times consecutively.
4. The PIN/Configtool User password is now changed.

3 Navigation

To reach the right click context menu, tap the touch surface and keep it pressed for at least 1.5 seconds. A drop down menu will show with navigation commands.

The following commands is currently implemented:

- Back
- Forward
- Reload



3.1 3.1 Configure context menu

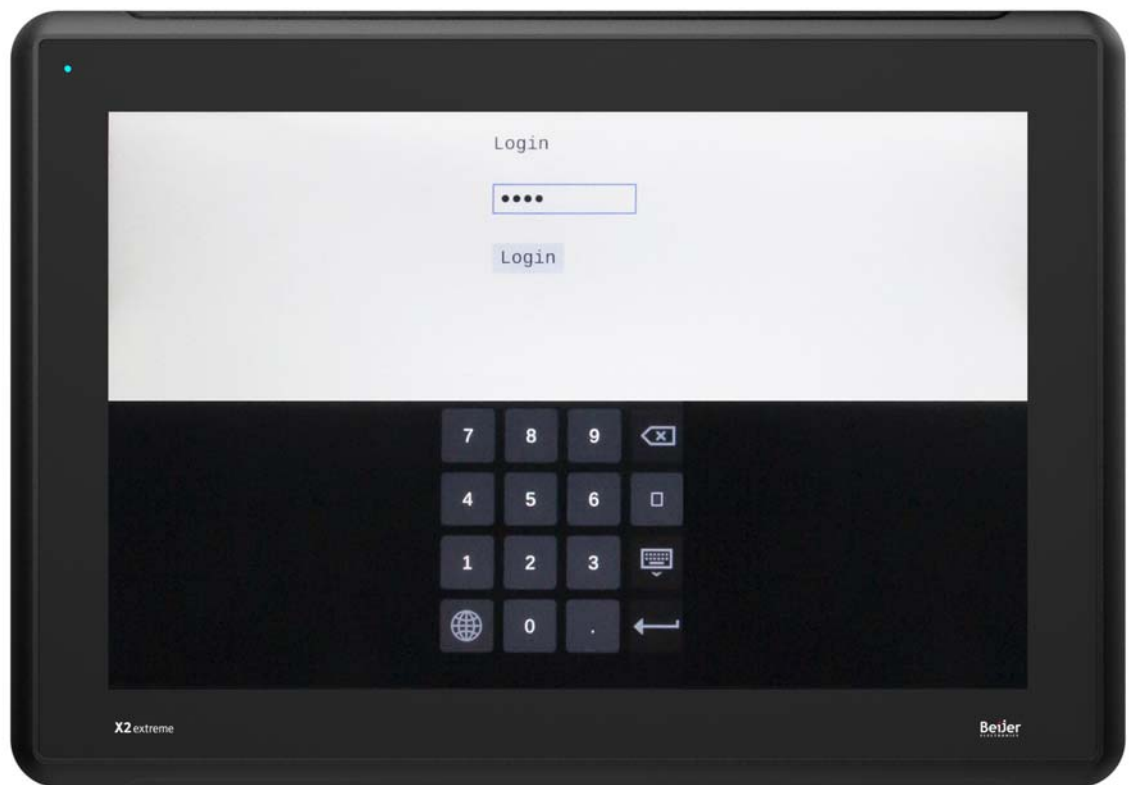
The long-press context menu can be enabled or disabled in the settings by checking or unchecking the 'Disable context menu' checkbox, under the Display tab, inside the settings app.

4 Device settings

If there is no URL address configured in the device, the device settings login page will be shown after boot. To enter the device settings page from the web browser, swipe down from the upper part of the LCD display, in a downward motion (or swipe according to the current swipe gesture configuration).

Perform the following steps to enter the configuration:

1. Apply power to the panel.
2. When the browser appears, swipe down with one finger from the top of the screen.
3. Select user (admin or configtool), enter the PIN code. Default PIN for configtool user is 1234. The admin user PIN code is printed on the flyer, included in the shipment. The default admin password can as well be retrieved from the Beijer Electronics knowledge base online.



X2 extreme 15 web



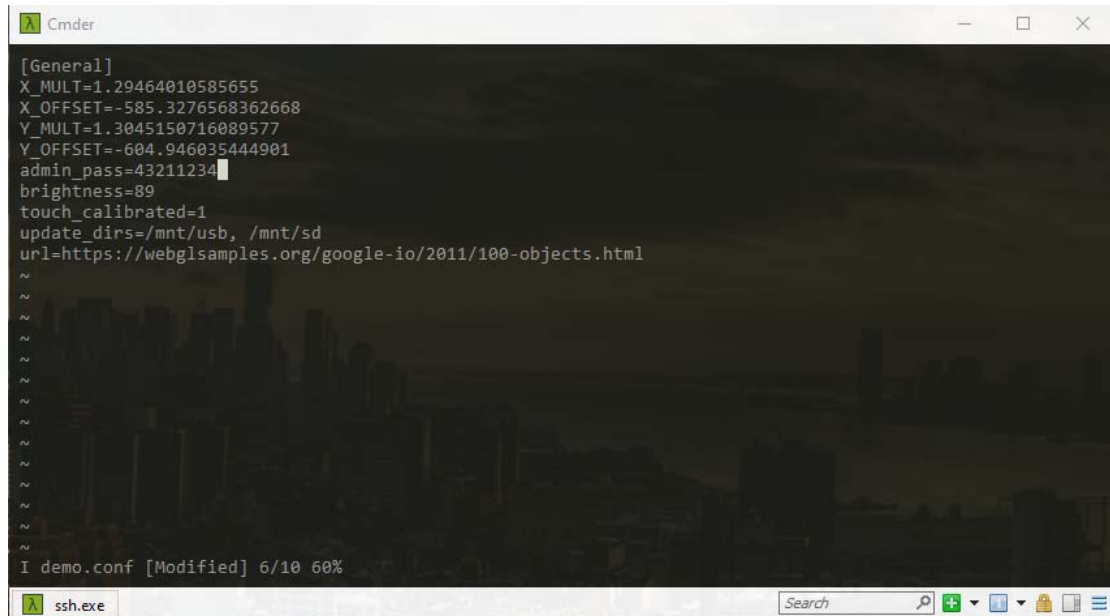
X2 pro 15 web

4.1 Change password (PIN)

To change password, either for admin or configtool user, go to the Change password dialog, from the Display tab.

1. Login to the Device settings as admin user,
2. From the Display tab, click on Change password,
3. Select for which user to change password,
4. Enter the old PIN,
5. Enter the new PIN,
6. Re-enter the new PIN.

After changing the password/PIN, the application will restart.



```

[General]
X_MULT=1.29464010585655
X_OFFSET=-585.3276568362668
Y_MULT=1.3045150716089577
Y_OFFSET=-604.946035444901
admin_pass=43211234
brightness=89
touch_calibrated=1
update_dirs=/mnt/usb, /mnt/sd
url=https://webglsamples.org/google-io/2011/100-objects.html
~
~
~
~
~
~
~
~
~
~
~
~
~
I demo.conf [Modified] 6/10 60%

```

demo.conf

4.2 Change settings from terminal

The X2 web has some additional settings, which of some are only available to be edited from a terminal. The built-in editor in X2 web is *vi*. A basic manual to the various *vi* commands can be found here: <https://cs.stanford.edu/people/miles/vi.html>
The file `/etc/beijer/misc.conf` contains general settings.

Note:

Any changes made to the OS, file system etc. is solely on behalf of the owner. Beijer Electronics AB shall not be held responsible for any damages caused by connecting to the device as a root user.

```

[General]
brightness=100
login_valid_sec=1200
screensaver_timeout=0
update_dirs=/mnt/usb, /mnt/sd
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
I /etc/beijer/misc.conf 6/5 120%

```

misc.conf

Setting parameter	Type, interval	Comment
brightness	Integer [0, 100]	Controls the backlight brightness level. If the screen was mistakenly set to 0, from the config UI, this parameter can be edited from the terminal to solve the problem.
login_valid_sec	Integer [0, N] Rec. [120, N]	Controls the time until the user is automatically logged out from the config UI.
screen-saver_timeout	Integer [0 1, N]	Controls the screen saver timeout. If 0, the screen saver is disabled.
update_dirs	String, comma separated	The paths control which mounted interfaces are allowed for updating the firmware.
drawer_open_direction	string	Controls swiping direction for opening the Config [Down, Right, Left].

```

Cmder
[General]
initscale_workaround=true
url=http://onlinedemo.inductiveautomation.com/data/perspective/client/OnlineDemo/apps/water
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
I web.conf 4/3 133%
ssh.exe

```

web.conf

Setting parameter	Type, interval	Comment
initscale_workaround	Bool [true, false]	Controls whether the workaround for known issues with progressive apps (also WebVisu SP14 zoom issues).
url	String	Address to the web server. Editing this parameter from terminal may be a better option in various deployment scenarios.
disable_context_menu	Bool [true, false]	Enables or disables the long touch menu as referred in section 3.

The file `/etc/beijer/touch.conf` only contains the result from touch calibration. It is recommended to use the built-in touch calibration app instead.

4.3 Config tool tabs

4.3.1 General

- Model – Model name of the device model.
- Software Version – Current installed software version.

4.3.2 Display tab

Tab	Description
URL	Start page
Load page	Makes the browser go to the URL.

Default scale fullscreen	Controls the zoomlevel and stretching of the web application. This is workaround for known issues in for instance Codesys WebVisu. If there are issues with the graphics, setting or resetting this parameter may help remedy the problem.
Brightness	Brightness setting for the display (scale 0-100).
Screen timeout	Set time before screen saver activates 30 sek - 10 min.
Activate	Start the screen saver immediately.
Calibrate touchscreen	Will initialize the calibration of the touch. The touch calibration screen enables the function to recalibrate the touch screen. The recalibration consists of nine steps, where a crosshair on the screen is pressed and held. Take care and try to do this as precise as possible, an incorrect calibration makes it hard to use the operator panel.
Change password	Click button to change password/PIN. This method cannot be cancelled, i.e. the change has to be finalized.
Disable context menu	When checked, the long-press context menu in the browser is disabled.
Drawer Open Direction	Controls which direction to swipe to open the settings app, either Left, Right or Down.
Certificate Util/Allowlist	Utility to control white listed URL's as well as adding server certificates from either USB or SD-card.
SSH*	Enable or disable the SSH server. If enabled, the firewall will open port 22 for inbound and outbound traffic.
Docker*	Enable Docker on the X2 web device.
Save button	The URL, your brightness and screen time out.

*) Requires admin user access.

Note:

Depending on the size of the screen, users may have to scroll down to find all setting parameters in the Display tab.

4.3.3 Network

The following parameters can be set:

- IP address
- Subnetmask
- Default gateway
- DNS settings for the Ethernet port on the operator panel
- LAN A / LAN B – One config per port (separate tabs in the top of the UI)
 - Method – DHCP or Static.
 - IP
 - Netmask
 - Gateway
 - DNS 1
 - DNS 2
 - Save – Saves the new settings.

The default setting for LAN A is: IP address 192.168.1.1, Subnet mask 255.255.255.0

4.3.4 Diagnostics

Displays a the following list of parameters for the panel:

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

4.3.5 Licenses

Shows a full table of all the licenses used in the software in terms of

- Package
- Version
- License

5 Image update

The operator panel comes pre-loaded on delivery with an image.

5.1 Updating the panel image using USB

To update the image in an operator panel use a USB flash drive. This makes it possible to upgrade the panel image without the use of a PC.

5.1.1 Image update

It is possible to upgrade the panel image on an operator panel.

1. Download the **system-beijer.raucb** file and store it in the root on a USB memory.
2. Attach the USB memory stick to the device and turn on the power.
3. After booting up, a dialog will show to install the new version. A dialog will notify when the update is finished.
4. Detach the USB memory stick and reboot the device.
5. Check the new version number in the Configuration.

5.1.2 Bootloader update

1. Download the **bootloader-beijer.raucb** file and store it in the root on a USB memory stick.
2. Attach the USB memory stick to the device and turn on the power.
3. After booting up, a dialog will show to install the new version. A dialog will notify when the update is finished.
4. Detach the USB memory stick and reboot the device.
5. Check the new version number in the Configuration.

6 Certificate utility and allowlist

Connecting the X2 web browser to a server over TLS, which lacks a CA root authority signed SSL certificate is prohibited. To bypass X2 web from blocking, either the url can be added to a whitelist or users can install the server certificate on the X2 device as a valid server certificate. If a user connects to a web server, where the server lacks a valid certificate, the user will be notified by a message on the screen, 'Insecure Page'. The notifier will be displayed for 10 seconds.

6.1 6.1 Adding certificate from file

In order to add certificates from a file, the following has to apply:

- The USB thumb drive or SD-card is either vfat or ext3 formatted.
- The USB thumb drive or SD-card contains a certificate folder with *.crt files.

Attach the USB thumb driver or SD-card to the X2 web device and go to the Certificate Util/Allowlist dialog. All certificates found on the drive will be listed in the upper list. Select which certificate to be added, followed by clicking on the Add button. If the operation succeeded, the browser will restart. If the operation failed, users will be notified.

6.2 Add current URL to the allow list

To add the current url address to the allow list, simply check the 'Add current URL to allowlist' checkbox, followed by clicking the Add button. White listed url domain addresses are listed in the lower listbox. Existing, whitelisted, urls can be removed by selecting it and clicking the Remove button.

7 SSH and SSH Key handling

By default, X2 web provides root access via SSH, using a unique root password, included in the shipping as well as printed on a label, on the backside of the X2 web device.

The SSH server can be disabled or enabled from the Display tab, provided being logged in as admin user.

7.1 7.1 SSH key handling

There are at least two methods to conveniently add a public SSH key to the device. Either using the `ssh-copy-id` command from a Linux command line, or via the built-in dialog in the Device setting.

To install a SSH public key on the device, copy the designated public key to a folder, labelled 'ssh-keys', and attach it to the device. The 'ssh-keys' folder has to be on the root of the USB drive. Next open the SSH Key Handling dialog, select the key from the upper listbox (example: `usb/keys/id_ed25519.pub`), and add it to the Authorized keys list.

From the Authorized keys list, it is also possible to remove keys by selecting which to be removed and subsequently click on the Remove button.

8 Container runtime

X2 web supports Docker which can be enabled or disabled from the device settings, provided being logged in as admin user. Currently, Beijer Electronics does not provide any prebuild container images. The X2 web only supports container apps targeting Linux on ARM v7 (Arm32).

**Warning:**

Container apps are often running as root user, which must be considered from a cyber security viewpoint.

DISCLAIMER! Docker runtime on X2 web is provided as is. Beijer Electronics do not support operational capabilities or functionality of third-party containers, unless explicitly stated. Beijer Electronics do not provide any tooling, SDK or build environment in order to compile code and containers for the X2 web platform.

8.1 Accessing Docker

The Docker runtime is accessible from remote PC, connected via SSH, for example `docker -H ssh://<ip> <docker command>`.

The Docker CLI is also available if logged in to the device over SSH.

8.2 Storage

X2 web docker storage is utilizing appdata, which is always enabled and always persistent.

8.2.1 Volumes

X2 web has three different volumes, the static, appdata, and more dynamically, SD-card or USB.

Example 1. Mounting volumes to appdata:

```
$ docker run -v appdata:/data <image name>
```

Example 2. Mounting to attached USB memory:

```
$ docker run -v usb:/data <image name>
```

Please note, if the USB memory is not attached, the volume will not be mounted.

Example 3. Mounting to SD-card:

```
$ docker run -v sd:/data <image name>
```

9 Firewall

The firewall in X2 web is always active and cannot be turned off. However, the firewall can be configured and customized over SSH terminal. X2 web is using **iptables** as firewall solution. For configuring the firewall, please refer to iptables documentation.

9.1 Docker integration

The iptables is working together with docker by means of opening and closing ports, depending on port mapping of docker container apps.

9.2 SSH port 22

When SSH is enabled from the device settings, X2 web will automatically open port 22 in the firewall. When SSH is disabled, the port will close.

10 Configuring touch to act as mouse

In some HMI use cases, letting the touch act as mouse inputs work as a better and more robust solution. However, when configuring touch as mouse, some functionality will no longer be accessible, such as slide gestures when scrolling etc. To configure the touch to act as mouse input, X2 web provides a bash script which can be invoked over SSH.

Example 1. Enable mouse emulation.

```
$ ssh root@<ip address> /usr/bin/touch_mouse_emulation enable
```

Example 2. Disable mouse emulation, i.e., default touch.

```
$ ssh root@<ip address> /usr/bin/touch_mouse_emulation disable
```



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