



Series XC50/XC55

LED matrix displays with Ethernet-interface

Operating instructions

1 Contact

www.siebert-group.com

GERMANY

Siebert Industrieelektronik GmbH
Siebertstrasse, D-66571 Eppelborn
P.O. Box 11 30, D-66565 Eppelborn
Phone +49 (0)6806 980-0, Fax +49 (0)6806 980-999
email: info.de@siebert-group.com

AUSTRIA

Siebert Österreich GmbH
Mooslackengasse 17, A-1190 Wien
Phone +43 (0)1 890 63 86-0, Fax +43 (0)1 890 63 86-99
email: info.at@siebert-group.com

FRANCE

Siebert France Sarl
4 rue de l'Abbé Louis Verdet, F-57200 Sarreguemines
P.O. Box 90 334, F-57203 Sarreguemines Cédex
Phone +33 (0)3 87 98 63 68, Fax +33 (0)3 87 98 63 94
email: info.fr@siebert-group.com

ITALY

Siebert Italia Srl
Via Galileo Galilei 2A, I-39100 Bolzano (BZ)
Phone +39 (0)471 053753 Fax +39 (0)471 053754
email info.it@siebert-group.com

THE NETHERLANDS

Siebert Nederland B.V.
Jadedreef 26, NL-7828 BH Emmen
Phone +31 (0)591-633444, Fax +31 (0)591-633125
email: info.nl@siebert-group.com

SWITZERLAND

Siebert AG
Bützbergstrasse 2, CH-4912 Aarwangen
Phone +41 (0)62 922 18 70, Fax +41 (0)62 922 33 37
email: info.ch@siebert-group.com

2 Legal note

© Siebert Industrieelektronik GmbH

This operation manual has been prepared with the utmost care. However, we do not accept any liability for possible errors. We always appreciate your suggestions for improvement, corrections, comments and proposals. Please contact us: editing@siebert-group.com

Siebert[®], LRD[®] and XC-Board[®] are registered trademarks of Siebert Industrieelektronik GmbH. All other product names mentioned herein may be trademarks or registered trademarks of their respective owners.

We reserve the right to make alterations to the technical data and delivery options without notice. - All rights reserved, including the rights of translation. No part of this document may in any form or by any means (print, photocopy, microfilm or any other process) be reproduced or by using electronic systems be processed, copied or distributed without our written permission.

Table of contents

1 Contact	2
2 Legal note	3
3 Safety precautions	8
Important information.....	8
Safety.....	8
Intended use.....	8
Mounting and installation	8
Grounding	9
EMC measures	9
Disposal.....	9
4 Unit description	10
Model designation.....	10
Unit construction.....	10
Central processing unit.....	10
USB interface.....	10
Ethernet interface.....	11
LEDs	11
Button	11
Battery.....	11
Power supply.....	11
Temperature-controlled fan.....	11
Brightness sensor	11
5 Installation instructions	12
Mounting kit.....	12
Requirements to the installation site.....	12
Opening the device	12
Connection to 230 V AC or 115 V AC.....	13
Connection to 24 V DC	13
Connection to the Ethernet.....	14
6 Start-up	15
Start message after switching on.....	15
System requirements	15
Network settings on delivery and network integration	15

Web interface.....	16
7 Network integration of the display	18
Network integration under Windows and with unknown IP-address and network DHCP-Server	18
Network integration under Windows with known IP address.....	18
Network integration under Linux with DHCP server with unknown IP address.....	19
Network integration with unknown IP address via the static service IP address.....	19
Reset name and IP settings to default settings.....	19
8 Operation of the web interface	20
Selection of elements on the website.....	20
Progress bar.....	20
Unsubscribe from the website	20
Displaying incorrect entries.....	20
Tables	20
Standard menus available.....	21
Buttons on the web sites.....	21
Other icons on the websites	22
9 Menu start 'Start'	23
Display information about the system.....	23
Retrieve version numbers	23
10 Menu layout 'Layout – Quick select'	24
Layout Quick select.....	24
Layout Editor	24
11 Menu data 'Data – Input'	25
12 Menu 'Utilities – File manager'	26
13 Menu funktions 'Functions – Brightness'	28
Displays for indoor use	28
Displays for outdoor use	28
14 Menu settings 'Settings – Date and time'	30
Synchronization with an NTP server	30
Manual setting.....	30
Time zone.....	30
15 Menu settings 'Settings – Network'	32
Dynamic setting with DHCP.....	32
Enter fixed IP address	32
16 Menu settings 'Settings – Wireless'	33

Wireless settings.....	33
Access point settings.....	34
17 Menu settings 'Settings – Users'	35
18 Menu settings 'Settings – Updates'	37
19 Menu settings 'Settings – System'	37
20 Data model: Separation of layout and data	38
Definition of the layout.....	38
Send data to the display.....	38
Available design elements.....	38
21 Choose layout 'Quick select'	40
22 Definition of a layout 'Layout Editor'	41
Used symbols.....	42
Select and manage layouts.....	43
Edit layouts.....	43
Save layouts.....	43
Delete layout.....	44
Defining a layout as current layout.....	44
23 Manual data inputh via the web site	45
24 Simplified manual input of data 'Data – Input'	46
25 Complete manual input of data 'Data – Advanced input'	47
26 JSON Protocoll	48
TCP/IP and JSON.....	48
Brief description.....	48
Parallel commanding via web page and JSON.....	48
27 JSON Protocol Quick Start	49
Upper/lower case.....	49
Strings as values in JSON telegrams.....	49
Numbers as values in JSON telegrams.....	49
Boolean values in JSON telegrams.....	49
Control characters.....	50
Telegram ending.....	50
Other characters outside a JSON telegrams.....	50
Usage of the Siebert Terminal Program for the following examples.....	50
Definition of the layout.....	51
Writing data on text field T1.....	51

Writing of data on the numeric field N1	51
Response of the display in case of success.....	51
Response of the display in the case of error	52
28 Valid names in field 'meta'	54
Command setLayout.....	54
Command getLayout	54
Command loadLayout.....	54
Command readLayout.....	54
Command setData	54
Command getData	55
29 Valid name in field 'data' on 'request' : 'setLayout'	56
List with all layout elements.....	56
Common properties of all layout elements with setLayout	56
Additional properties of container elements	57
30 Valid name in field 'data' on 'request' : 'setData'	58
Possible properties of the drawing elements at 'setData'	58
General JSON string	61
JSON string for color name.....	61
JSON format string for Date and time	61
JSON string for file name	61
31 Properties of the drawing elements	62
32 Factory settings	63
33 Network resources	64
34 Update funktions	65
Incremental update	65
Complete update.....	65
35 Technical data	68
Electrical properties.....	68
Construction	68
Ambient conditions	68
Dimensions and weights	69

3 Safety precautions

Important information

Read these operating instructions before starting the unit. They provide you with important information on the use, safety and maintenance of the units. This helps you to protect yourself and prevent damage to the unit. The notes are indicated by a warning triangle and have the following meaning:

**DANGER!**

Disregarding this warning notice leads to death or serious bodily harm.

**WARNING!**

Disregarding the warning notice can lead to death or serious bodily harm.

**ATTENTION!**

Disregarding the warning notice can lead to minor physical injuries or property damage.

The operating instructions are intended for trained professional electricians familiar with the safety standards of electrical technology and industrial electronics.

Store these operating instructions in an appropriate place.

The manufacturer is not liable if the information in these operating instructions is not complied with.

Safety

**DANGER!**

Components inside the units are energized with electricity during operation. For this reason, mounting and maintenance work may only be performed by professionally-trained personnel while observing the corresponding safety regulations.

The repair and replacement of components and modules may only be carried out by the manufacturer for safety reasons and due to the required compliance with the documented unit properties.

The units do not have a power switch. They are operative as soon as the operating voltage is applied.

Intended use

The units are intended for use in industrial environments. They may only be operated within the limit values stipulated by the technical data.

When configuring, installing, maintaining and testing the units, the safety and accident-prevention regulations relevant to use in each individual case must be complied with.

Trouble-free, safe operation of the units requires proper transport, storage, installation, mounting and careful operation and maintenance of the units.

Mounting and installation

The attachment options for the units were conceived in such a way as to ensure safe, reliable mounting.

**WARNING!**

The user must ensure that the attachment hardware, the unit carrier and the anchoring at the unit carrier are sufficient to securely support the unit under the given surrounding conditions.

The units are to be mounted in such a way that they can be opened up while mounted. Sufficient space for the cables must be available in the unit near the cable entries.

Sufficient space is to be kept clear around the units to ensure air circulation and to prevent the build-up of heat resulting from use. The relevant information must be heeded in the case of units ventilated by other means.



ATTENTION!

When the housing fasteners are opened, the front frame of the housing hinges out upward or downward (depending on the unit version) automatically.

Grounding

All devices are equipped with a metal housing. They comply with safety class I and require a protective earth connection. The connecting cable for the operating voltage must contain a protective earth wire of a sufficient cross section (DIN VDE 0106 part 1, DIN VDE 0411 part 1).

EMC measures

The devices comply with the current EU Directive (EMC Directive) and provide the required interference immunity. Observe the following when connecting the operating voltage and data cables:

Use shielded data cables.

The data and operating voltage cables must be laid separately. They may not be laid together with heavy-current cables or other interference-producing cables.

The cable thickness must be properly assessed (DIN VDE 0100 Part 540).

The cable lengths inside the units are to be kept as short as possible to prevent interference. This applies especially to unshielded operating voltage cables. Shielded cables are also to be kept short due to any interference which might be emitted by the shielding.

Neither excessively long cables nor cable loops may be placed inside the units.

Disposal

Units or unit parts which are no longer needed are to be disposed of in accordance with the regulations in effect in your country.

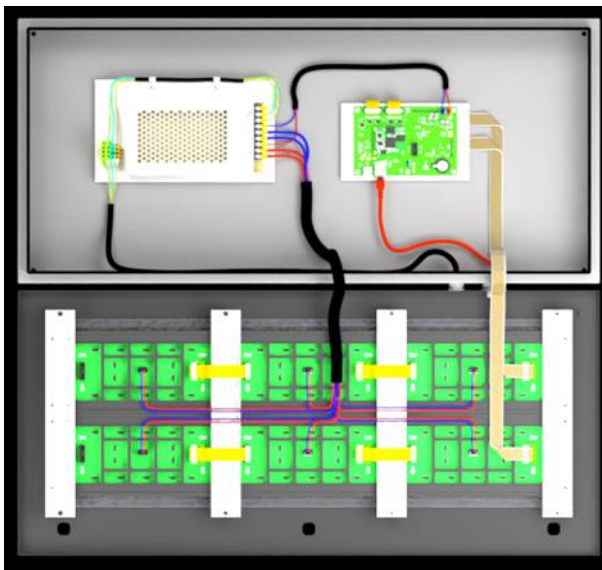
4 Unit description

Model designation

This manual applies for devices of the XC50/XC55 series.

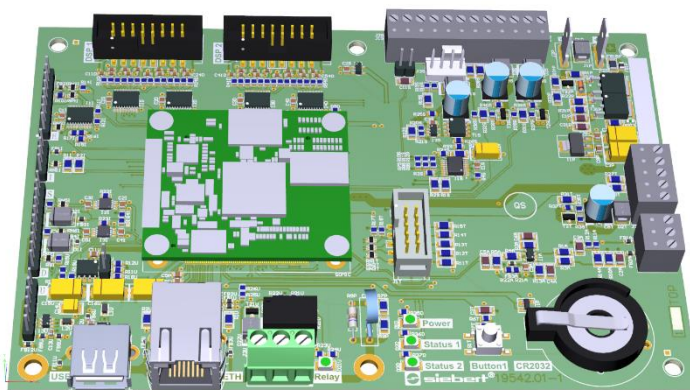
Unit construction

The following figure shows model type XC50-096.032.G1-V4A2-E1 as example for the other model types.



Central processing unit

The following figure shows the Central Processing Unit, located in the lower part of the housing.



- ① ② ③ ④ ⑤
- ① USB port ② Ethernet interface ③ LEDs
④ button ⑤ battery

USB interface

The USB interface is required to perform complete updates.

Ethernet interface

The Ethernet interface is located on the RJ45 socket of the central processing unit. It has the following specifications:

Data rate	10/100 MB/s, auto MDI-X "Auto-crossover"
Galvanic isolation	1,5 kV
Protocols	see chapter factory settings
Operating mode	see chapter factory settings

LEDs

With the LEDs certain operating states are signalled (e.g. during an update).

Button

With the button the display is reset to factory settings.

Battery

The battery (lithium battery, type CR2032) serves for the power reserve of the real-time clock. It is located in a battery holder and is to be replaced after three years.

Power supply

The screw-type terminals for the power supply are located on the power supply unit in the bottom section of the housing.

They have the following designation: L, N and PE.

Temperature-controlled fan

Devices of the XC55 series have a temperature-controlled fan.

Brightness sensor

Devices of the XC55 series have a brightness sensor for the automatic adjustment of the luminosity to the ambient light.

5 Installation instructions

Mounting kit

A parts kit with the components required for assembly is included with all devices.

Requirements to the installation site

The display is designed for wall mounting. The wall surface has to be plane and free of irregularities. The wall must have a sufficient capacity.

Optional pedestal systems, mounting elements for pole mounting or eyelets on the top of the devices for ceiling mounting are available.

Opening the device

To open the device the locks on the front side must be loosened with the supplied key. Then the housing front frame can be folded out.



DANGER!

In the case of devices where the front frame of the housing swings downwards, safety lines are hooked into the device to prevent from falling down.

Once the work has been completed the lines must be reattached.

If the lines are not hooked in properly, the front frame of the housing may drop down suddenly when the device is opened.



DANGER!

In the case of devices where the front frame of the housing folds upwards, gas pressure springs are installed in the device to support this movement and keep the housing frame open.

There is a danger of squashing when the housing front frame is closed, especially if the display lies horizontally..



ATTENTION!

Some displays have internal fans which can start automatically even when the housing is open. Long hair, hanging clothes and jewelry can get caught and dragged into the fans.

Do not wear loose or hanging clothes .or jewelry when working on the device.

Protect long hair with a hair net.

Connection to 230 V AC or 115 V AC



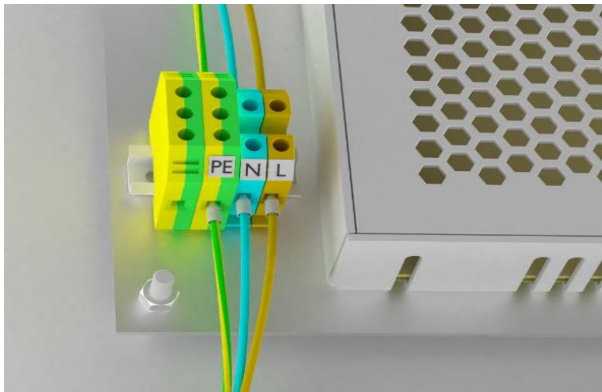
DANGER!

Danger of electric shock. Dangerous voltages are present in the device which can lead to death when handled improperly.

Installation may only be carried out by qualified personnel.

For the power supply, 230 V AC, the devices have an M20 cable gland. The cable bushing in the device is located on the bottom side or top side of the housing depending on the type of mounting.

The power cable must be led through the M20 cable gland into the housing and the individual wires connected to the terminals of the terminal block marked PE, L and N in the housing. Make sure that the power cable is strain-relieved.

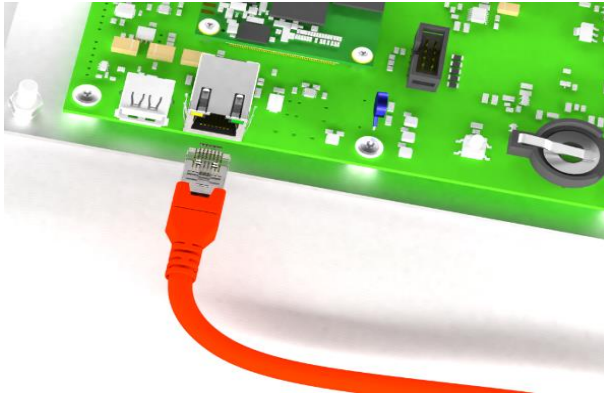


Connection to 24 V DC

The devices are optionally available for operation with 24 V DC.

Connection to the Ethernet

The devices of the XC50/XC55 series are controlled via Ethernet. The RJ45 socket is located on the control computer. Make sure to use Ethernet cables of cat.5 or higher.



The Ethernet cable is led into the device via an M32 cable gland. This allows the use of Ethernet cables with injection-molded connectors up to a diameter of 21 mm due to its split seal set. Depending on the type of mounting the bushing of the housing is located on the bottom or the top side.

For installation, the gasket insert is removed from the M32 fitting and divided into two halves. This allows normal Ethernet cables, including the molded-on connector, to be fed into the housing. The data cable is led through the M32 cable gland into the housing and plugged into the Ethernet socket of the control computer so that the locking device engages on the RJ45 socket.

The diameter of the gasket insert is 7 mm. In order to meet the IP45 protection class, an Ethernet cable with the appropriate diameter must be used.



Tip

If several displays are operated within the same network, the displays should be connected to the network and put into operation one after another.

6 Start-up

Start message after switching on

After connecting the 230 V AC power supply, a start message is displayed and the operating system starts. This process takes about 30 seconds, after that the display is ready for operation.

On delivery the display shows the default layout. After commissioning the display shows the layout last-selected by the user.

System requirements

The operation and configuration of the digital display is done via a web interface which is accessed via a web browser (standard browser, e.g. Microsoft Edge, Mozilla Firefox, Google Chrome or Opera in latest version with activated JavaScript).

Network settings on delivery and network integration

A PC with a network card or an already configured network is required to configure the display. To integrate the display into an existing network the display must be connected with the network. When delivered the device will automatically be assigned an IP address via DHCP. This ensures that connecting the display to your network does not cause any address conflicts.



Tip

Since you cannot find the IP address assigned via DHCP as a normal user, the chapter 'Network-integration of the display' describes various options for addressing the display in the Web browser.



Tip

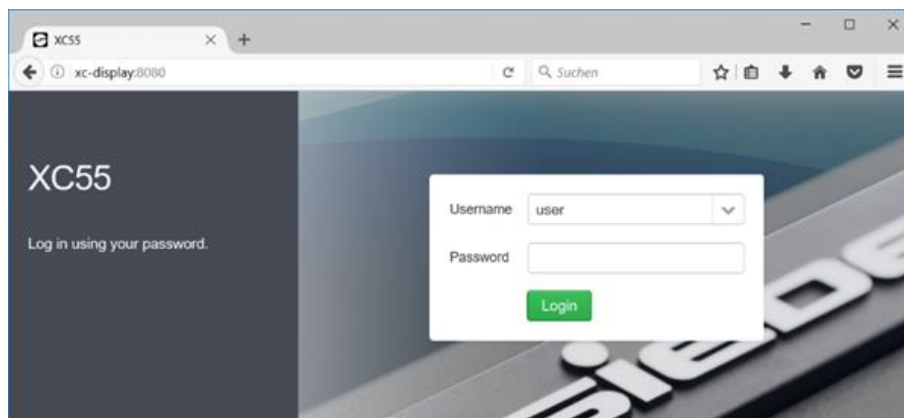
If you operate several displays in a subnet put them into operation one after the other.

Web interface

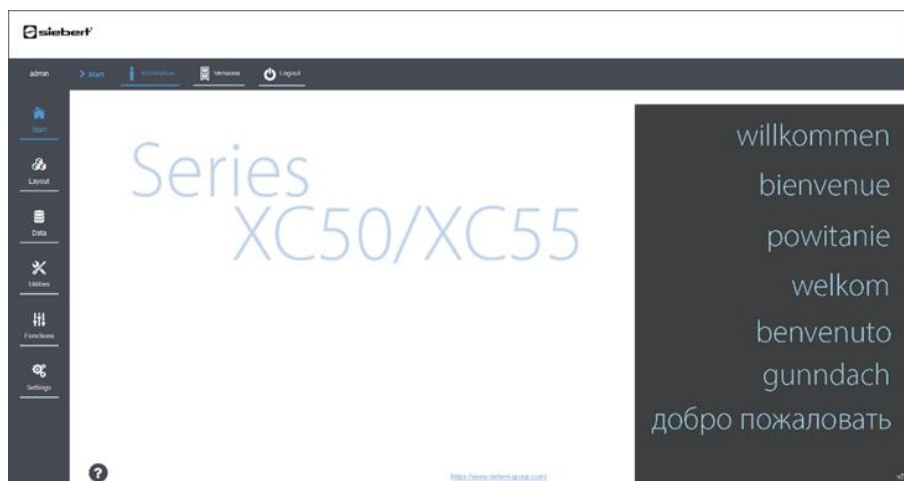
When the Web server is called for the first time after the display has been switched on via the Web browser, the Web interface is initialized.

For security reasons 'Username' and 'Password' will be requested after start. As administrative settings are often necessary after the first login, the login with the account 'admin' is recommended. The default password is 'xc-admin'

It is possible to switch to other accounts with limited functions at any time. Further information on user administration can be found in chapter 'Settings - Users'.



After the initialization phase the start screen opens. The optic depends on the user account with which the user has logged in. The account logged in is displayed in the upper left corner. The following screenshot shows the screen for the account 'admin'.



Tip

With the help button (question mark) in the lower left corner you can open the operating manual in a pdf reader..



Tip

It is recommended to change the standard passwords of the display directly during commissioning..

Passwords that are used multiple times or passwords remaining in their default state security vulnerability and thus target for malware attacks.

You will find the page for setting the passwords under Settings > Users.

The following chapters describe the interface and the functions in detail.

7 Network integration of the display

Due to the multitude of possible network topologies, several methods for network integration are available under Windows 10 and Linux.

These settings can only be made under the user account 'admin'.

Network integration under Windows and with unknown IP-address and network DHCP-Server

As delivered condition, the display logs on to the DHCP server with the name <xc-display> .it is accessible via this name.

To do this enter 'http://xc-display' in the address bar of the web browser. If this does not work use 'http://xc-display.local'.



Tip

With the program 'ping.exe' you can check via the prompt if the name of the display is known. To do this enter the command 'ping xc-display'. If the name is known the corresponding IP address is output.

```
H:\>ping xc-display  
  
Ping wird ausgeführt für xc-display [192.168.15.152] mit 32 Bytes Daten:  
Antwort von 192.168.15.152: Bytes=32 Zeit<1ms TTL=64  
Antwort von 192.168.15.152: Bytes=32 Zeit<1ms TTL=64  
Antwort von 192.168.15.152: Bytes=32 Zeit<1ms TTL=64
```

You can see the IP address assigned by the DHCP server on the web page 'Settings > Network' and change it if necessary.



Tip

You can change the name of the display via the web page 'Settings > Network', for example, to name it after its location.

If you operate multiple displays of the XC50/XC55 series in a network, each display must have a unique name. Double assigned names lead to errors.

Network integration under Windows with known IP address

If the IP address of the display is known, the web site can be accessed via this IP address. This is often the case with 1:1 connections between display and PC without DHCP server. Enter 'http://<IP>/' in your web browser, for example 'http://192.168.1.120/'. The address depends on the respective network configuration.



Tip

Make sure that the IP address of your PC is in the same network as the display to be configured.



Tip

If you want to transfer the data automatically to the display via TCP/IP later on, it may be helpful to use the IP address assigned by the DHCP server as fixed IP address,

Network integration under Linux with DHCP server with unknown IP address

Searching the display with a Linux system enter `smb://<Displayname>` in the address bar of the file manager (not of the web browser). In delivery state `xc-display` is used as `<Displayname>`.

When the display is found an icon appears. After double-clicking on this icon the file 'Quickstart.html' appears. A double click on the icon starts the web browser and establishes a connection to the display.

Network integration with unknown IP address via the static service IP address

This variant works with Windows and Linux.

Another option is to connect the display directly with a PC and to use the service IP address of the device. For this the network settings on the PC must be set to a static IP address in the net '10.20.6.90/8' according to the service IP of the display (see chapter 'Factory settings').

For example, for the PC the address '10.20.6.100' and the Subnet mask '255.0.0.0' can be used.

The fixed service IP address set in the device, under which the display can always be accessed, can be found in the chapter 'Factory settings'



Tip

The service IP address is preset in the display. If this address is already in use in a customer's network the display can not be used. In this case please call our technical support.



Tip

As when operating several displays in the same network, all displays have the same IP address, a specific display must be removed from the network via this address before configuration and put into operation individually.

Reset name and IP settings to default settings

By pressing the button labeled 'Button 1' for at least 8 seconds, the network settings and the user password are reset to factory settings (see chapter 'Factory settings').

The status LEDs flash shortly and the display restarts.

8 Operation of the web interface

All functions and settings of the display can be accessed via the web interface. Due to the variety of browsers and operating systems, the display of the web pages on your system may differ from the screenshots in this manual.



Tip

If menu items or buttons are not visible on your system, changing the zoom factor may help ('Ctrl'-button and button '-' press at the same time).

Selection of elements on the website

The selection is made with a simple click on the left mouse button.

Progress bar


For longer actions, a blue progress bar is displayed on the top of the browser window.

The main menus are arranged on the left edge and the corresponding submenus on the top edge. The menu currently selected is highlighted. The menus that are actually visible depend on the user profile that is active at the moment.

The active user profile is displayed in the upper left.

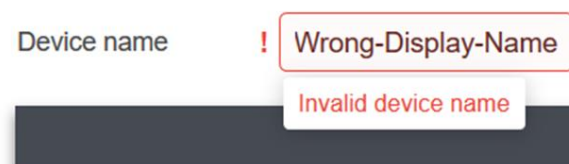
Unsubscribe from the website

With the logout button you can logout from the website after all settings have been made. This is recommended for security reasons, as the operation of the display by unauthorized persons can be prevented.

Icon	Meaning
	Unsubscribe from the website. After logging out the .login screen reappears.

Displaying incorrect entries

If incorrect user entries are detected, a red error message appears. When hovering over the exclamation mark, further information on the error is shown.























Tables

When information is presented in tabular form, the column headers are clickable to change the sort order. If a table is re-sorted in this way, then in the respective column in the right edge a wedge pointing up or down appears, which symbolizes the sort order.

Standard menus available



The following menus are for the 'Admin' user. Depending on the options available and on the user rights assigned not all menus may be visible.

Main menu	Submenu		
 Start	 Information	 Versions	
 Layout	 Quick select	 Editor	
 Data	 Input	 Advanced Input	
 Utilities	 Filemanager		
 Functions	 Brightness		
 Settings	 Date and time	 Network	 Wireless
	 Users	 Updates	 System

For customized displays or after updates further menus may be added.



Buttons on the web sites

The buttons on the websites are an icon and a tooltip. The following buttons are used on many websites of the display.

Icon	Meaning
	Save modified settings.
	Cancel modified settings

In addition there are a number of other buttons which are described together with their respective functions on the individual websites.


Other icons on the websites

Icon	Meaning
	Settings were changed, but not yet saved.
	The settings are write-protected and cannot be changed by the user.

9 Menu start 'Start'

Display information about the system

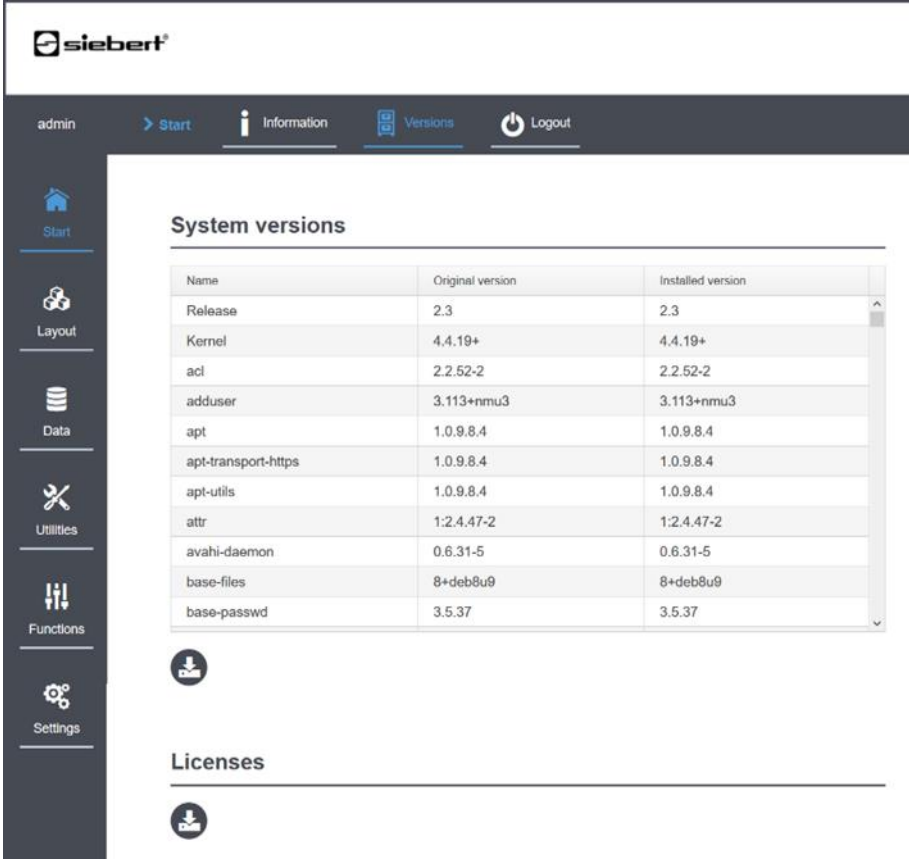
The welcome page is displayed under the point 'Start – Information' of the web interface.

Icon	Meaning
	Opening the operating instructions stored on the display in pdf format.

Retrieve version numbers

In the menu item 'Start – Versions' the version numbers of the installed software packages and .the used licenses can be downloaded as a text file.


The main version of the software is displayed in the first line. Software packages whose version number has changed after an update from the basic version are highlighted in color.



The screenshot shows the Siebert web interface. The top navigation bar includes 'admin', 'Start', 'Information', 'Versions', and 'Logout'. The left sidebar contains icons for 'Start', 'Layout', 'Data', 'Utilities', 'Functions', and 'Settings'. The main content area displays the 'System versions' table and a 'Licenses' section.

Name	Original version	Installed version
Release	2.3	2.3
Kernel	4.4.19+	4.4.19+
acl	2.2.52-2	2.2.52-2
adduser	3.113+nmu3	3.113+nmu3
apt	1.0.9.8.4	1.0.9.8.4
apt-transport-https	1.0.9.8.4	1.0.9.8.4
apt-utils	1.0.9.8.4	1.0.9.8.4
attr	1:2.4.47-2	1:2.4.47-2
avahi-daemon	0.6.31-5	0.6.31-5
base-files	8+deb8u9	8+deb8u9
base-passwd	3.5.37	3.5.37

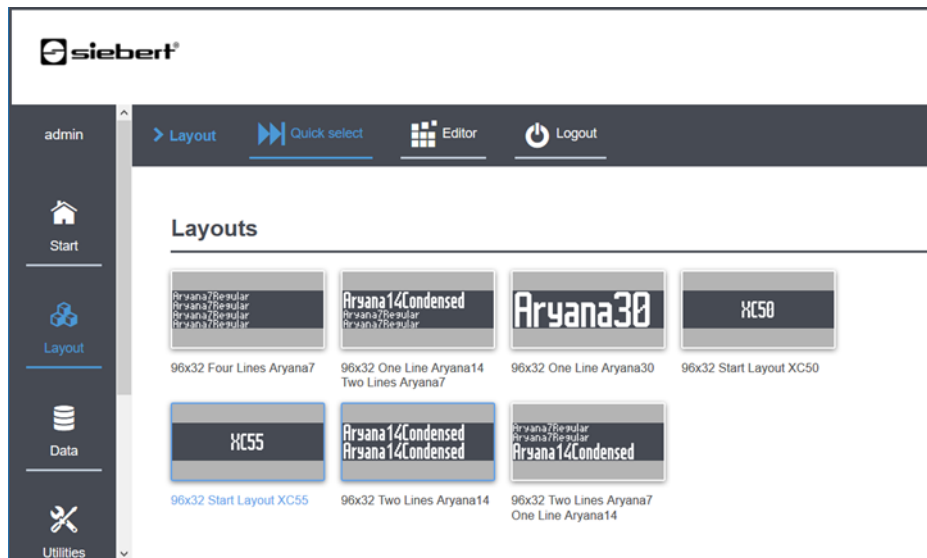
Below the table is a download icon. Below that is the 'Licenses' section with another download icon.

Icon	Meaning
	1) Download of the installed version numbers as text file. 2) Download of the licenses as text file.

10 Menu layout 'Layout – Quick select'

Layout Quick select

Under 'Layout – Quick select' the layout can be selected by a simple click. The active layout is highlighted in color.



Layout Editor

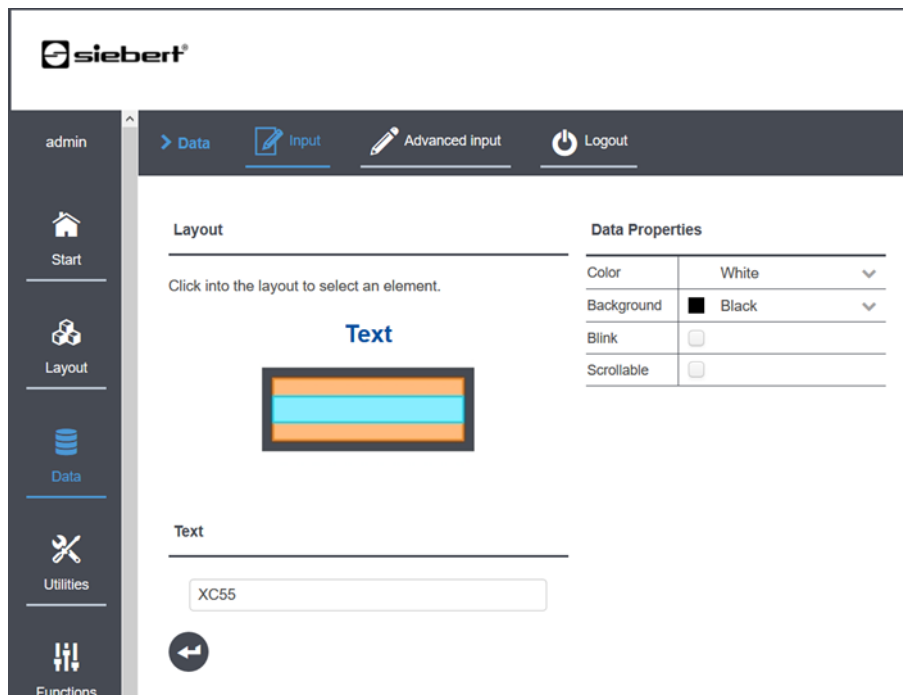
The display is delivered with various layouts. In addition individual layouts can be defined under 'Layout – Editor'.

Further information can be found in chapter 'Operating concept'.

11 Menu data 'Data – Input'

Under 'Data – Input' information to be displayed can be entered manually. Customer-specific extensions can also be found in this menu item.

The properties of the elements of the current layout can be changed as well. In the following screenshot the current layout is a text element. Under 'Data Properties' the following properties can be changed: text color (color), background color (background), blinking (blink) and marquee (scrollable).



Icon

Meaning



The settings made are used.

In menu item 'Data – Advanced Input' further properties of each displayed element can be changed in the current layout.

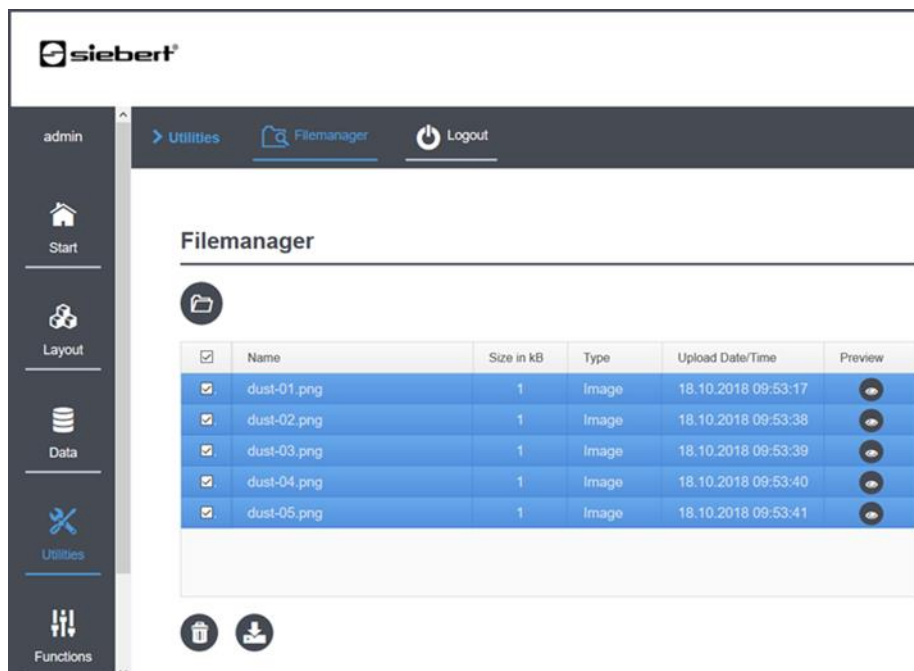
Further information see chapter 'Operating concept'






12 Menu 'Utilities – File manager'





With the file manager data can be downloaded from the display to the PC or data can be uploaded from the PC to the display.

The file manager offers the following options when working with self-created files (for example layouts or bitmap files):

- Self-created files are displayed together with existing files in a table. By clicking on the respective column header the table can be sorted in ascending or descending order.
- Layouts and bitmap files can be previewed with the 'Preview-Button'. Layouts are presented in the same way as they appear when selecting 'Layout – Quick select'.
- Arbitrary elements can be selected and deselected.
- Selected elements can be deleted. Note: deleted elements cannot be restored.
- Selected elements can be saved on your PC as a zip file with the help of the download button. The file name is selectable freely.
- Files, bitmaps or previously saved zip files can be uploaded from the PC to the display.
- Saved layouts can also be uploaded to other displays with the same geometry. This allows a fast and comfortable duplication of the information to be displayed.
- If an imported layout cannot be displayed on the display (for example too big elements for the display), it can be loaded, but it cannot be selected in the menu item 'Layout'. Eventually contained bitmaps can however be used for other layouts.



<input type="checkbox"/>	Name	Size in kB	Type	Upload Date/Time	Preview
<input checked="" type="checkbox"/>	dust-01.png	1	Image	18.10.2018 09:53:17	
<input checked="" type="checkbox"/>	dust-02.png	1	Image	18.10.2018 09:53:38	
<input checked="" type="checkbox"/>	dust-03.png	1	Image	18.10.2018 09:53:39	
<input checked="" type="checkbox"/>	dust-04.png	1	Image	18.10.2018 09:53:40	
<input checked="" type="checkbox"/>	dust-05.png	1	Image	18.10.2018 09:53:41	

Icon	Meaning
	Open the dialog for file selection
	Preview of an uploaded image or layout
	Save selected elements on the PC
	Deleting selected elements from the display.

**Tip**

The size of the layout is defined by the space required by all elements of the layout. You can therefore define a layout on a large display that can also be displayed on a smaller display if all elements are within the pixel area of the smaller display. The area is always counted from the origin, top left, $(x,y) = (0,0)$.

**Tip**

With the possibility to save and reload layouts you can easily transfer a created layout to other displays.

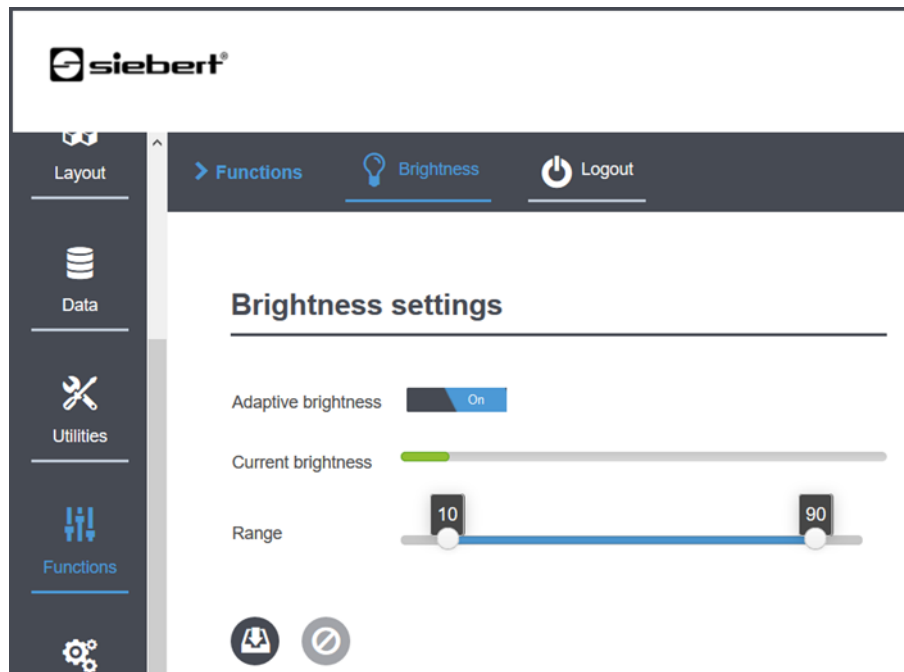
This way you can also perform security backups on your PC.

**Tip**

Please note that for optimal visualization images only contain the colors that the display can display. Especially with images in jpg format there may be differences between their presentation on a PC monitor or on the display.

13 Menu funktions 'Functions – Brightness'

The brightness of the display and the automatic brightness control is defined in this menu item.



There is a fundamental correlation between brightness and energy consumption for all LED displays: the brighter the LED display, the higher the power consumption. On the website this is visualized by the color of the sliders at low brightness the slider glows green (Eco) or blue (Neutral), at high brightness red (Power).



Tip

Select the brightness so that the display is easy to read at the mounting place. If the brightness is too high it will not improve readability, but it will increase power consumption.



Tip

With outdoor displays, use the automatic brightness control 'Adaptive Brightness', to ensure optimum brightness even under changing lighting conditions.

Displays for indoor use

For displays of the XC50 series the desired brightness can be interactively adjusted with the slider 'Current Brightness' in a range between 0% and 100%.

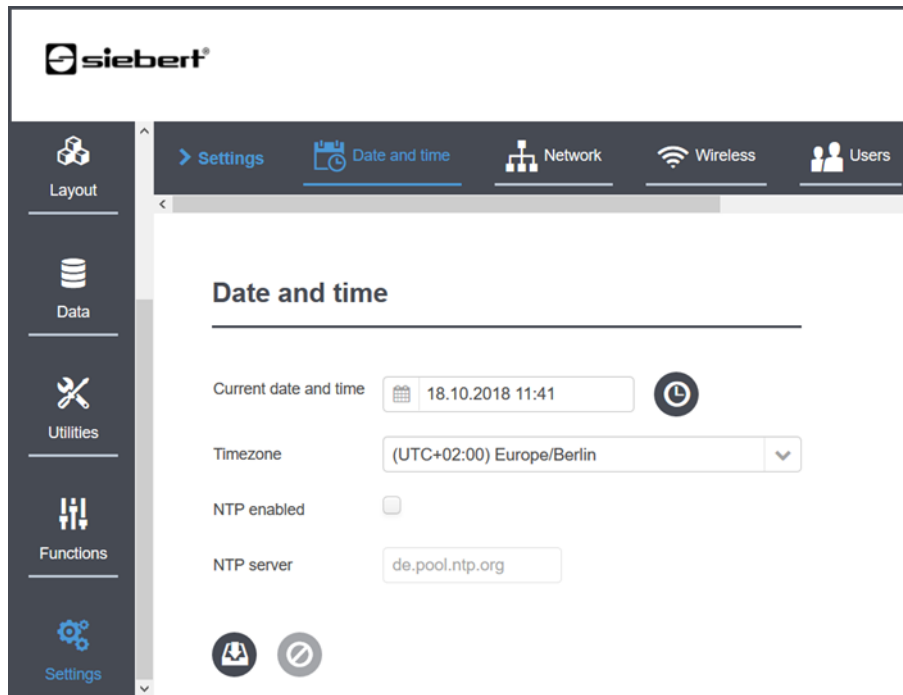
Displays for outdoor use

Displays of the XC55 series are equipped with a brightness sensor on the underside of the display. With the sliding switch 'Adaptive Brightness' the automatic brightness control can be switched on or off. The display automatically adjusts the brightness to the ambient conditions. If the ambient brightness is low, for example in cloudy skies or at night, the display automatically dims to avoid glare effects. When the ambient brightness is high, the display increases its brightness for better readability. With the sliding switch 'Range' the limits for the minimum and the maximum brightness are set independently of each other.

With the automatic function deactivated, the light intensity is set to a fixed value with the .sliding switch.

14 Menu settings 'Settings – Date and time'

The displays of the series XC50/XC55 include a battery-backed real-time clock. To set date and time various options are available.



Synchronization with an NTP server


To synchronize the time settings of the display with an NTP server the NTP client must be activated by ticking 'NTP enabled'. The current time is then colored in gray.

In the text field 'NTP server' the NTP server must be entered. A functioning connection to the NTP server is required for the NTP service.

Manual setting

For a manual setting of the time the checkbox 'NTP enabled' must be deactivated. The text field of the NTP server is now colored gray and the input field 'Current date and time' is activated.

Date and time can be entered either directly in the input field or via a calendar. Alternatively the button 'Set time to browser timer' can be used to adopt the current date and time settings of the connected PC.

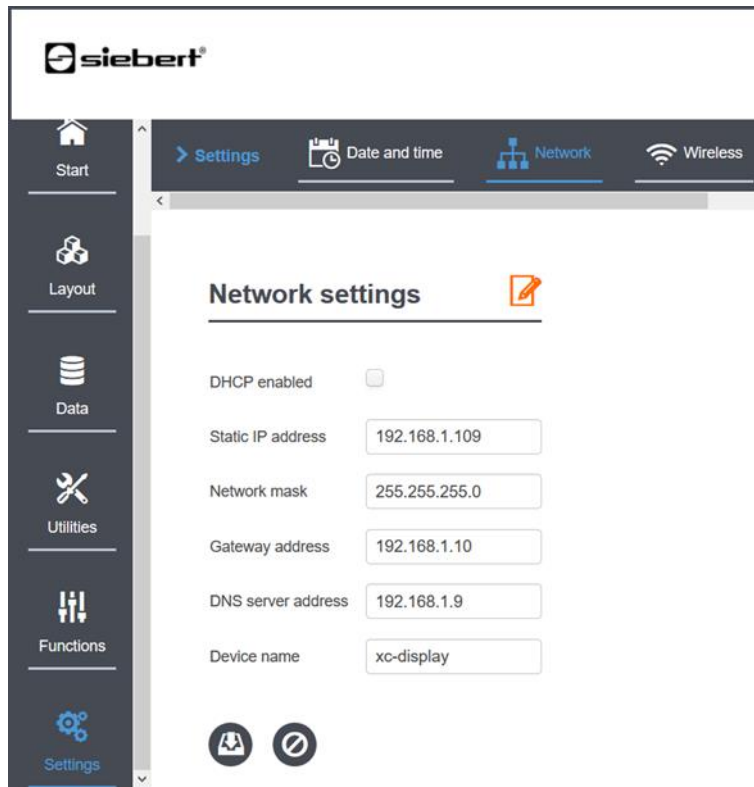
Icon	Meaning
	Adoption of date and time settings from PC

Time zone

In the field 'Timezone' the desired time zone can be entered. This information is required for the automatic summer time changeover. If the entry is incomplete, all entries that match the previous entry are shown in the list box. Due to the large number of entries it may take a few seconds to update the list box.

The difference to the Coordinated Universal time (UTC) is adjusted according to the current date. For example, the difference to UTC in the time zone Europe/Berlin is UTC+01:00 for normal time and UTC+02:00 for summer time.

15 Menu settings 'Settings – Network'



Dynamic setting with DHCP

If the checkbox 'DHCP enabled' is checked, the display automatically obtains its network settings via DHCP. Prerequisite is a DHCP server in the network,

Here, the text fields for IP address, netmask, gateway and DNS server are deactivated.

The device name of the display can be changed in the text field 'Device name'. With this name the display can be found in the network (see chapter "Network-Integration").



Tip

The maximum allowed length of the device name is 15 characters and must not contain any special characters or empty spaces. Names consisting of letters (A-Z, a-z), numbers (0-9) as well as hyphens and underscores (- und _) are ideal. Some networks do not distinguish between upper case and lower case.

Enter fixed IP address

For a static integration into the network the checkbox 'DHCP enabled' must be deactivated, The fields 'Static IP address' and 'Network mask' must be filled with corresponding values. The fields 'Gateway address' and 'DNS Server address' can be filled optionally.

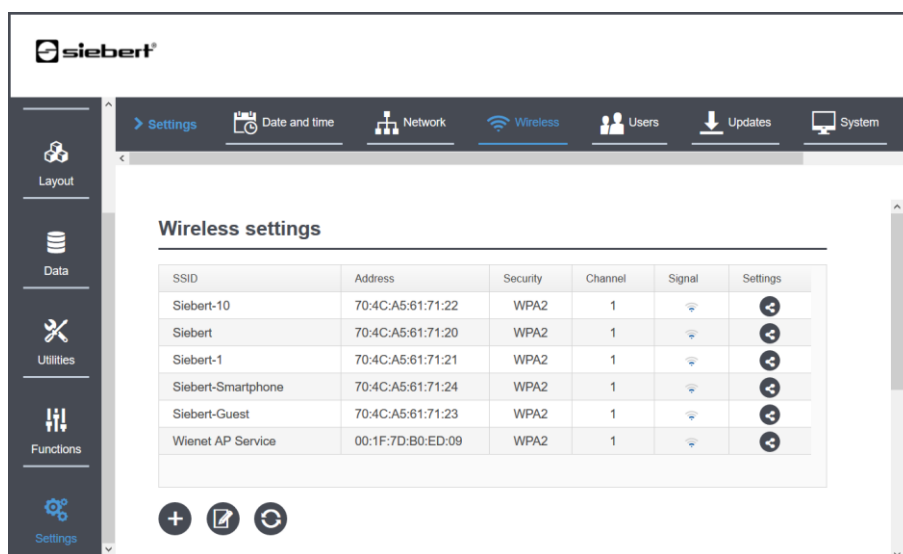
16 Menu settings 'Settings – Wireless'

Display of the XC50/XC55 series can optionally be equipped with WLAN. The WLAN access works parallel to Ethernet access. Thus both can be used at the same time

Displays with WLAN can be integrated into an existing network as client. But they can also be operated as access points, themselves. This feature is particularly advantageous if a display is to be configured for operation into an existing WLAN for the first time or if no WLAN is available.

Wireless settings

The display can be integrated into an existing WLAN via the settings under 'Wireless settings'. All available WLANs are listed in a table.



Icon

Meaning



Connect to the WLAN in this line.

It is necessary to enter the network password. The other settings are taken over automatically.



Connect to an unlisted or hidden network.

For this, SSID, password and security standard of the network must be known.



Individual configuration of a WLAN. This button offers to set the wpa_supplicant of the display (expert mode).



New search for available WLANs.

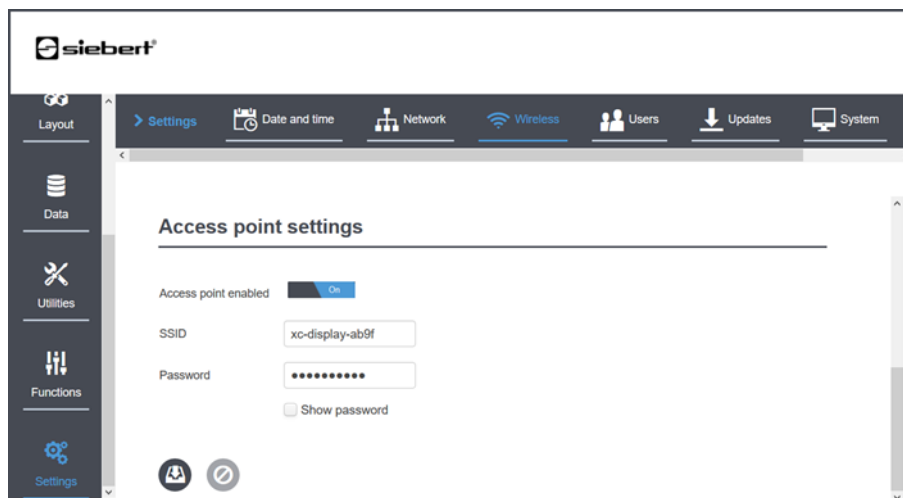
The search may take a few seconds.

Access point settings

With the access point activated, the WLAN of the display is listed in the network settings of the PC. The connection of the PC with the display can be established via this network.

On delivery, the SSID consists of the constant part 'xc-display' followed by the last four characters of the MAC address. This allows multiple WLAN displays to operate WLAN access point at the same time without interfering with each other.

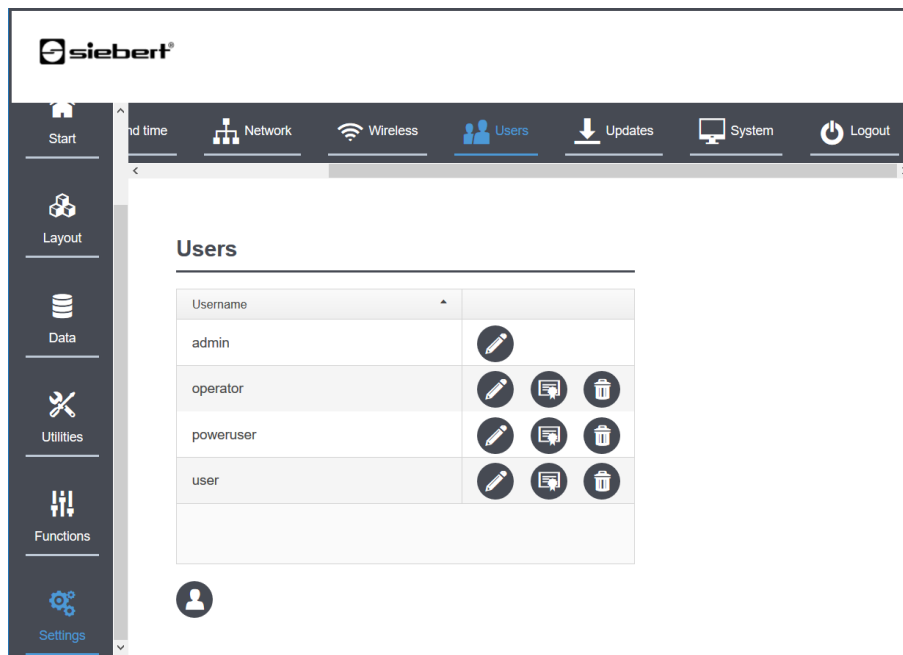
The default password is 'xc-display'. For security reasons the password should be changed during commissioning.







17 Menu settings 'Settings – Users'

For each display XC50/XC55 four different user profiles are defined as standard. The currently active user profile is displayed in the upper left corner of the display.

Each user profile is assigned with a password and access to a certain number of functions. The user settings can be changed on the page 'Settings – Users'. The users are listed in a table.



Icon	Meaning
	Add a new user A new user name and a new password must be specified.
	Change the password of the user.
	Setting of user rights The rights of user 'Admin' cannot be changed.
	Delete user The user 'Admin' cannot be deleted.

On delivery the following passwords are defined:

user	password	changeable
user	xc-user	Yes
poweruser	xc-poweruser	Yes
operator	xc-operator	Yes
admin	xc-admin	yes

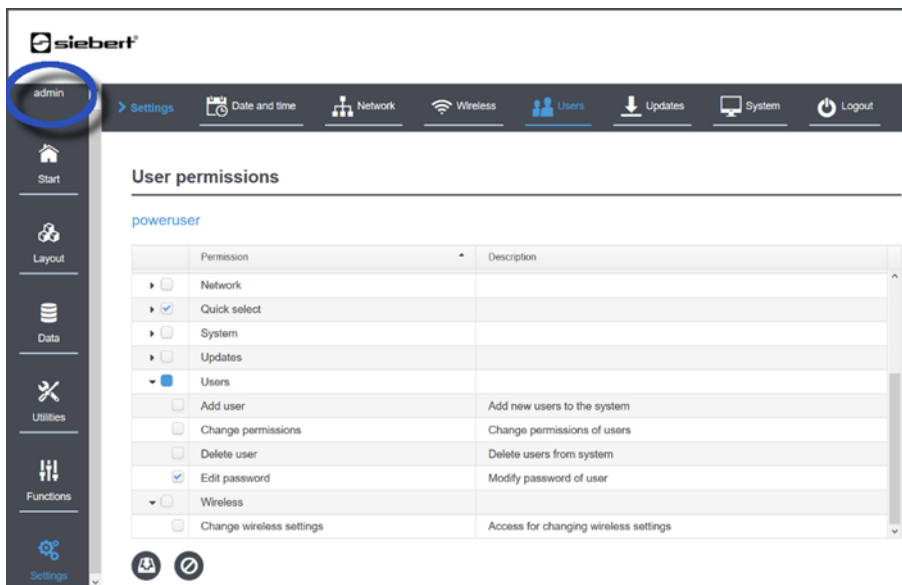
By pressing the button on the control computer (④, figure in chapter "Unit description") for at least 8 seconds, the display is reset to factory settings. Passwords, users and user rights are set to default values. New defined users are deleted.

For further information see 'Factory settings'.

For all users (except user 'Admin') the rights can be defined individually in a foldout tree-view.

In the following screen shot the user 'Admin' is logged in (user name on the upper left). The user 'Admin' can change the user rights of all users. In this example the rights of the user 'poweruser' are defined.

The user 'poweruser' can change his own password. He does not have the right to add or delete a .new user or to change his own user rights.



The screenshot shows the Siebert control computer settings interface. The user 'admin' is logged in, as indicated by the 'admin' label in the top left corner. The 'Users' menu item is selected in the top navigation bar. The main content area displays the 'User permissions' for the user 'poweruser'. A table lists various permissions with checkboxes and descriptions.

Permission	Description
<input type="checkbox"/> Network	
<input checked="" type="checkbox"/> Quick select	
<input type="checkbox"/> System	
<input type="checkbox"/> Updates	
<input checked="" type="checkbox"/> Users	
<input type="checkbox"/> Add user	Add new users to the system
<input type="checkbox"/> Change permissions	Change permissions of users
<input type="checkbox"/> Delete user	Delete users from system
<input checked="" type="checkbox"/> Edit password	Modify password of user
<input type="checkbox"/> Wireless	
<input type="checkbox"/> Change wireless settings	Access for changing wireless settings

18 Menu settings 'Settings – Updates'

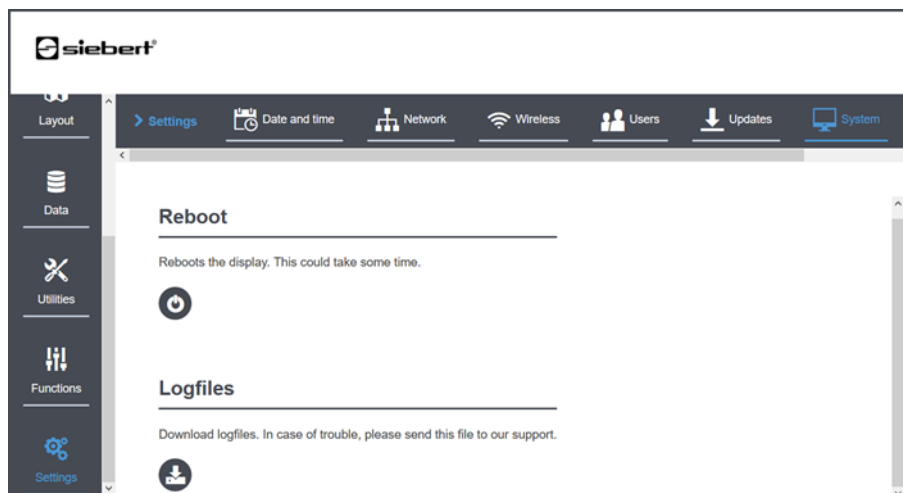
Under 'Settings – Updates' individual parts of the firmware can be updated.

For more information how to make updates see: Update functions.

19 Menu settings 'Settings – System'

Press the 'Reboot' button to reset the display.

With the button 'Download logfiles' a packed file, containing logfiles and other system settings, can be downloaded from the display.



20 Data model: Separation of layout and data

The displays of the XC50/XC55 series provide an LED matrix for displaying a wide variety of information. An object-oriented approach is consistently followed, which distinguished between the fixed layout of the display and the variable data.

Definition of the layout

In this step you define a layout once for this surface, with which you determine which information is to be displayed at which position and in which form on the display surface according to your application. There are several choices:

1. Standard application

The selection of a predefined layout in Layout > Quick Select. Some layouts are predefined here for typical applications as p. e. 'Displaying multiple text lines'.

2. Expert mode

If your requirements go beyond this you have the possibility to interactively create your own layout with the layout editor under Layout > Editor. This layout is stored on the display under a name of your choice and can be modified later if required.

3. Automatic configuration

Use JSON commands to command a layout. The setup of JSON commands is described in chapter 'Data format'.

Send data to the display

The application data is sent to the display and displayed. Danach werden die Anwendungsdaten zur Anzeige gesendet und dargestellt. Here you have the following choice:

1. Automatic configuration

The application data is sent via the network in JSON format. This is typical for displays in industrial environments, e.g. for displaying process information.










2. Manual control via the web site

The application data is entered manually via the web page of the application. This is often used for call systems where the information to be displayed rarely changes. An employee can enter the desired information by hand when required.

Available design elements

With the available design elements simple layouts such as a display with several text lines can be defined just as well as complex layouts with a background image on which text fields, numeric fields and further bitmaps or data and time can be placed at different places.

The following design elements are available. Each element has attributes that define its design and characteristics. All attributes are specified in the description of the data model. With manual data entry the attributes of each element can be set on the web page, with automatic data entry the attributes are set by JSON commands, see 'JSON Protocol'.

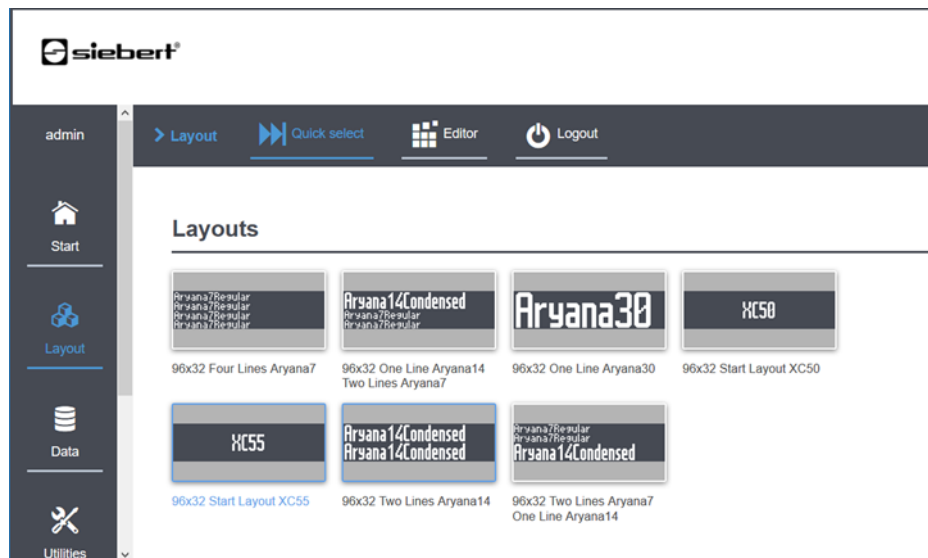
Element	Function
 Container	Element for grouping all subordinate elements
 Text	Text field
 Numeric	Numeric field In contrast to a text field which can also display numbers, the 'Numeric Element' has a large number of functions which are useful when displaying numbers, e.g. the definition of a decimal point, leading zeros and automatic change of color if a threshold value is exceeded or falls below a limit value.
 Bargraph	Bargraph field
 Clock	Field for displaying time and date Various formats can be defined.
 Rectangle	Rectangular field With this you can create light fields or backgrounds for other elements.
 Circle	Round light field With this field a circular area can be displayed as a light field.
 Bitmap	Field for displaying graphics in bmp or png format
 Multimage	Field for displaying multiple graphics in bmp or png format By entering the allocated number the corresponding graphic can be called. .

21 Choose layout 'Quick select'

On delivery the predefined layouts for typical applications are available for selection on page Layout > Quick select.

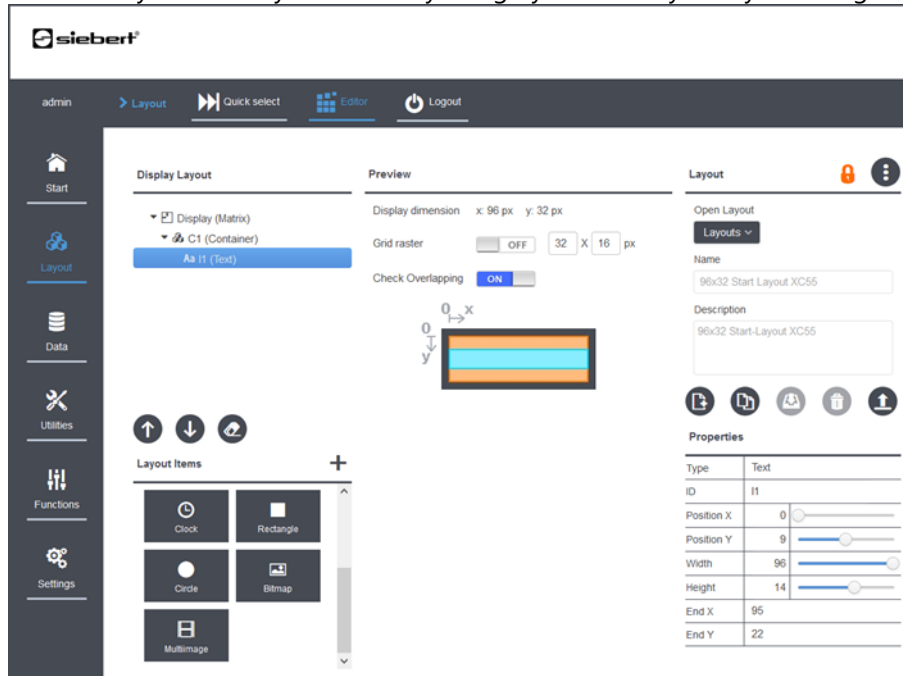
If self-designed layouts are available they are also shown here.

By a simple click on one of the layouts this layout is loaded into the display. Thus the layout becomes the active layout. The corresponding icon is highlighted in light blue.



22 Definition of a layout 'Layout Editor'

With the layout editor you can freely design your own layout by selecting and placing layout elements.














The work surface is divided into the following areas:

Element	Function
Display Layout	<p>Displaying elements in a tree structure</p> <p>Since elements can overlap each other, in this tree structure also the elements can be reached that are hidden in the background in the preview.</p>
Preview	<p>Schematic view of the selected layouts</p> <p>The drawing elements are shown as colored rectangles. With a left click you can select an element for editing. For this the following colors are used::</p> <p>blue Inactive design element</p> <p>turquoise Active drawing element, the properties of this element can be edited in the field 'Properties'.</p> <p>red When 'Check Overlapping' is on overlapping elements are marked red.</p> <p>orange Container to sum up several design elements</p>
Layout	Load, save, delete, etc. of the defined layouts
Properties	Define name, ID, size and position of the actual drawing element
Layout Items	<p>Summary over all possible drawing elements</p> <p>By clicking on an element it is added to the 'Display Layout' area and placed at its starting position in the 'Preview' area.</p> <p>(For more information see chapter 'Available drawing elements')</p>

Used symbols

The following symbols are used to define user-defined layouts. A tooltip is assigned to all buttons which is displayed when the mouse scrolls over it

Icon	Function
	The layout belongs to the predefined layouts which are write-protected. Copy the layout to continue working with the copy.
	Changes have been made in the layout that have not yet been stored.
	Expand or minimize the workspace.
	Create new layout: Create a new layout Here a freely selectable name and an explanatory description can be defined. This description is also displayed as tooltip in layout > Quick Select.
	Copy layout: Duplicates an existing layout Afterwards you can work on the copy
	Save layout: Saving the edited layout
	Delete Layout: Delete the current layout in the layout area.
	Set layout: Das Layout is displayed on the display. This is only possible if the layout has been saved before.
	Move layout item up: The selected element is moved up in the hierarchy of the display layout. This changes the order in which the elements are displayed. This is relevant for elements that partially overlap.
	Move layout item down: The selected element is moved down in the hierarchy of the display layout. This changes the order in which the elements are displayed. This is relevant for elements that partially overlap.
	Delete Layout Item: Delete the selected drawing element in the display layout area. .

Select and manage layouts

The various layouts are managed in the 'Layout' box.

Here you can define a new layout or select from predefined layouts or from your own layouts for editing.

When a new layout is created, a name is automatically assigned. The name can be changed afterwards. In the field description you can enter a short description of your layout which is displayed as tooltip on the Quick – Select page.



Tip

By duplication one of the supplied read-only standard layouts you get a new editable layout as basis for your application with a click on the mouse.

Edit layouts

The current layout is displayed schematically in the preview field. Each drawing element is symbolized by a rectangle that shows the size and the position of the element. You can select a specific element by clicking on it to edit it. The currently active element is drawn in turquoise color.

The properties which are relevant for this element are displayed in the field „Properties“:

- 1 ID: this defines a name that can be used by the element to be addressed via JSON.
The name must be unique within the hierarchy level of the layout. . Elements which are defined in different containers may have the same names.
- 2 Position X, position Y: the upper left corner in pixels as a reference point for the position of the element.
- 3 Width, height: the width and the height in pixels for the element.

It is not possible to define a drawing element outside the display area of the display.

Drawing elements may overlap. Elements that are defined first in the hierarchy are also drawn first. . This means that in case of an overlap they are completely or partially in the background. The position of an element in the hierarchy can be changed by using the 'up' and 'down' buttons. In case of an overlapping the visible areas also change.

A bitmap as background image must be the first element in the hierarchy.

Overlapping elements are displayed in red in the preview and tree view. This can be switched off with the check overlapping slide switch.

As a positioning aid a grid with adjustable grid size can be displayed using the slide switch 'Grid raster'.

A selected drawing element can be removed from the drawing element with the delete button (eraser) situated below the display layout area. When deleting containers, their content is also deleted.

Save layouts

With the Safe button the layout is permanently saved on the display, If the active layout has been edited the display is also updated when the layout is saved. . The display shows the default values of the drawing elements. These can afterwards be changed .either manually via the data website or automatically via JSON commands.

Delete layout

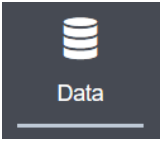
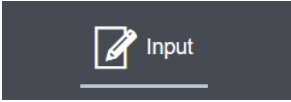
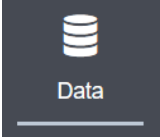
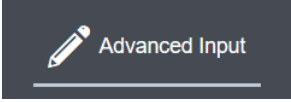
You can delete the selected layout with the delete button below the 'Layout' area after confirming a confirmation prompt. The deletion of a layout cannot be undone.

Defining a layout as current layout

With the button Set Layout the selected layout becomes the current layout. Alternatively the layout can be selected via the website Layout -> Quick select.

23 Manual data input via the web site

The displays of the series XC50/XC55 provide two web pages for manual data input. Access to these pages is determined by the current user profile. The following rights are preset on delivery:

Web site	User profile	Function
 	All	Simplified input of data Certain attributes can be selected for drawing elements.
 	Power user Operator Admin	Complete input of data All possible attributes can be selected for drawing elements,






Tip

These pages are used to enter data in the active layout.

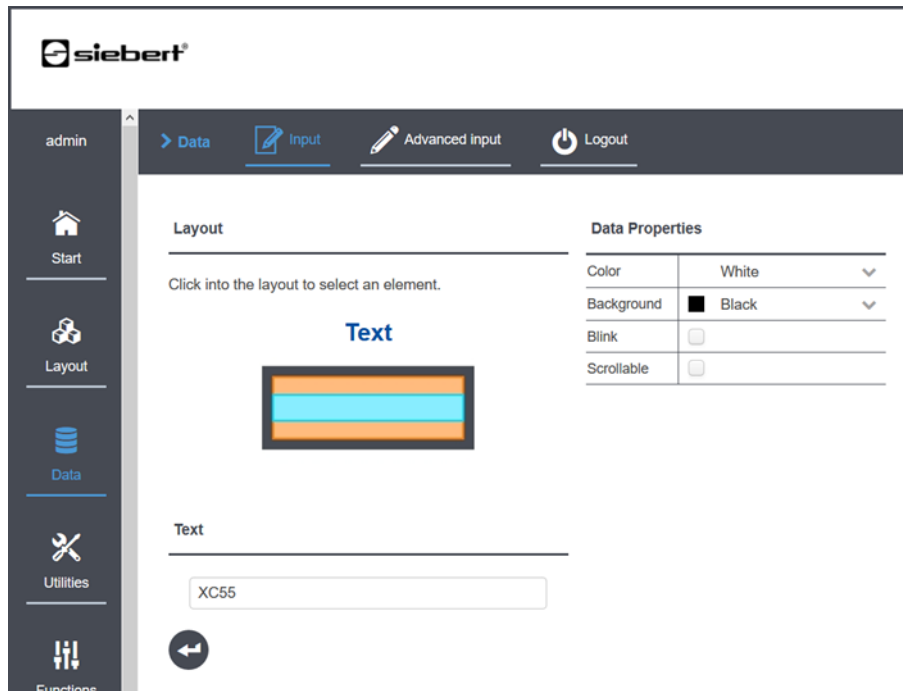
The layout itself, for example the position or size of text fields, cannot be changed. Changes to the layout can be made using the 'Layout Editor'.

The following icons are used:

Icon	Function
	Store and apply data: Transfer of set attributes to the display. Note: Data is stored on the display. They will then be displayed automatically after the next restart,
	Apply data: Transfer of set attributes to the display. Note: The data is displayed, but not saved on the display. So a defined start text remains unchanged.
	Store data: Saving attributes on the display with self-defined layouts. When activating the layout the self-defined layouts are automatically loaded along. With predefined layout the attributes can be changed, and displayed on the display, but it cannot be stored.

24 Simplified manual input of data 'Data – Input'

The page 'Data > Input' allows the manual input of data in the active layout. Additionally certain inputs can be changed.

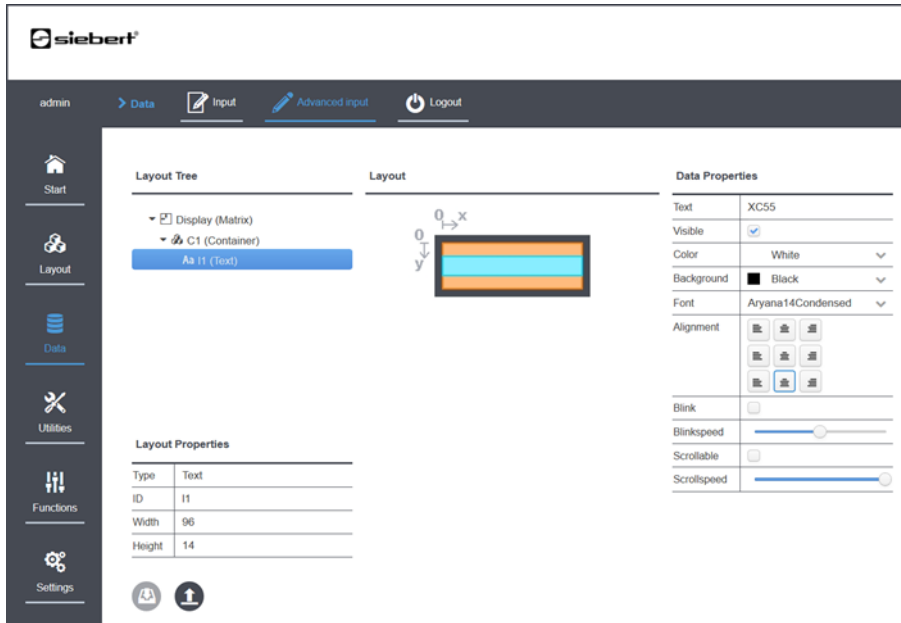


The box 'Layout' shows the schematic structure of the active layout. It is selected by a simple click left on one of the drawing elements. In the box 'Data Properties' the selected settings can be changed.

The possible settings 'Attribute' depend on the type of element. For example, it doesn't make sense to enter a text with a bitmap.

25 Complete manual input of data 'Data – Advanced input'

The page 'Data > Advanced Input' allows the manual input of data in the active layout. All attributes defined for a specific drawing element can be edited.



The screenshot shows the Siebert software interface. The top navigation bar includes 'admin', 'Data', 'Input', 'Advanced input', and 'Logout'. The left sidebar contains icons for 'Start', 'Layout', 'Data', 'Utilities', 'Functions', and 'Settings'. The main workspace is divided into three panels: 'Layout Tree', 'Layout', and 'Data Properties'.

The 'Layout Tree' panel shows a hierarchical structure: 'Display (Matrix)' > 'C1 (Container)' > 'Aa (1) (Text)'. The 'Layout' panel shows a schematic of the selected text element with a coordinate system (0, x, y) and a blue rectangular area.

The 'Data Properties' panel contains the following settings:

Text	XC55
Visible	<input checked="" type="checkbox"/>
Color	White
Background	Black
Font	Aryana14Condensed
Alignment	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Blink	<input type="checkbox"/>
Blinkspeed	<input type="range"/>
Scrollable	<input type="checkbox"/>
Scrollspeed	<input type="range"/>

The 'Layout Properties' panel shows the following details:

Type	Text
ID	11
Width	96
Height	14

The boxes 'Layout Tree' and 'Layout' show the schematic structure of the active layout. It is selected by a simple click left on one of the drawing elements.

In the box 'Data Properties' the selected settings of the element can be changed. The possible settings depend on the type of element.



Tip

Duplicate a predefined layout if you want to use this layout with changed attributes, for example a different color.

26 JSON Protocol

Besides the manual operation of the display via the website there is the possibility to send the layout and the data to the display automatically via the network.

TCP/IP and JSON

TCP/IP is used as transport protocol. In the TCP/IP packets the desired information is transmitted with the widely-used JSON (JavaScript Object Notation) format.

JSON defines a simple, text-based, language-independent syntax for data exchange, which is fully defined in the ECMA-404 specification. The specification is published on the website www.json.org.

Brief description

Each JSON-telegram consists of multiple name:value pairs which are grouped in curly brackets. Each value itself can again consist of a name:value pair in curly brackets, etc.. Square brackets are used to group several JSOB objects, so-called JSON arrays. With this simple structure any complex data structures can be described.

JSON itself only defines the syntax, not the value of the name:value pairs.

The combinations allowed for the displays of the XC50/XC55 series are described in the following chapters. All JSON telegrams which are used with the displays of the XC50/XC55 series have the following structure:

```
{"meta":{...}, "data":{...}}
```

With the two fields:

1. "meta" for the metadata required for the correct interpretation of the payload
2. "data" for payload

Parallel commanding via web page and JSON

The display can be operated via the web page or the JSON Protocol.

So it is no problem to interactively define the layout in the layout editor of the web site once, and then automatically send the data to the display via JSON during operation.

It is also possible to operate a field via the web site and in parallel to output JSON data in another field. . Furthermore, the display can be controlled from several sources.



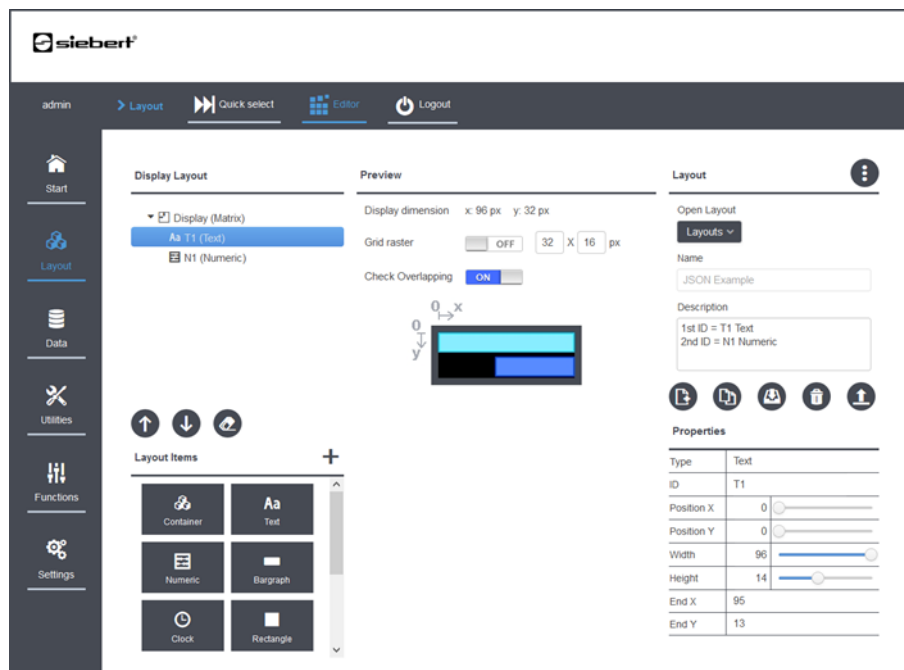
Tip

During the training it is helpful to manually send short JSON commands to the display via the terminal program to become familiar with the possibilities of display and protocol. A suitable terminal program is the Siebert Terminal-Program. On <https://www.siebert-group.com/de/product-software-industry-downloads.php> this is available free of charge.

27 JSON Protocol Quick Start

The following simple example shows exemplarily the JSON telegrams which are needed for the definition of a layout and for the writing of data. The complete definition of the protocol is described in the following chapters.

For this example a display of the XC55 series with 96x32 pixels is assumed on which a text field with ID = T1, and a numeric field with ID = N1 are to be displayed. In the layout editor the layout looks like this:



Upper/lower case

For all JSON commands it is important to always use the correct upper and lower case.

Strings as values in JSON telegrams

Strings are always written in quotation marks, p.e.: {"text":"Siebert GmbH"}

Numbers as values in JSON telegrams

Numbers are written without quotation marks. For decimal numbers the dot "." is used as delimiter, p.e.: {"value":123.4}.

Boolean values in JSON telegrams

Boolean values are specified only with the two keywords "true" and "false" without quotation marks, p.e. {"visible":true}.

Control characters

Besides the JSON telegrams there are two control characters defined that can be sent at any point in the data stream:

Byte	ASCII name	Function
0x04	EOT, End of Text	The current content of the input buffer is analyzed even if no complete JSON telegram was received. The display tries to make the best of the data received so far and replies with a JSON message.
0x18	CAN, Cancel	The content of the input buffer is deleted without comment. This allows to reset the JSON interface to a defined initial state in the case of a completely wrong telegram. With this control characters no respond is sent from the display.

Telegram ending

JSON telegrams do not need a special telegram ending. A telegram is clearly defined by the string of opening and closing curly brackets. Possible control characters CR (0x0D) or LF (0x0A) at the telegram ending are ignored.

Other characters outside a JSON telegrams

All other characters are invalid and lead to error messages.



Tip

In many terminal programs, characters at the beginning of the line must be deleted by backspace before a new JSON telegram is entered.

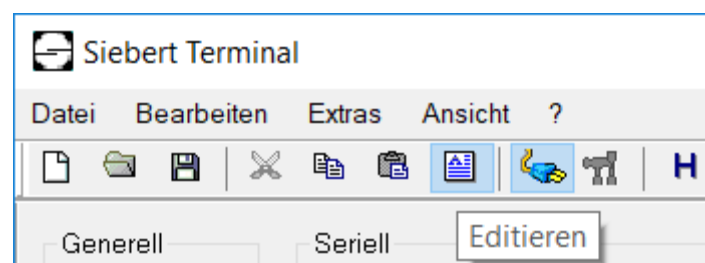
Usage of the Siebert Terminal Program for the following examples

In the following, complete JSON telegrams which can be sent to the display are set in font Courier New. You can enter these examples e.g. in the Siebert Terminal Program and send them to the display.



Tip

Activate the edit mode in the Siebert Terminal to type in the JSON examples.



Definition of the layout

First the position and the IDs of the two elements are defined. The text element gets the ID T1 and the numeric element gets the ID N1. Both fields are 16 pixel high.

```
{
  "meta":{"request":"setLayout"},
  "data":{"elements"
    [
      {"type":"SText",    "id":"T1",    "x": 0, "y": 0, "w":96, "h":16 },
      {"type":"SNumeric", "id":"N1",    "x": 48, "y": 16, "w":48, "h":16 }
    ]}
}
```



Tip

Since no data has not yet been defined for the new layout the display remains dark after loading a new layout.

Writing data on text field T1

This command writes the text "Siebert GmbH" on the text field T1 in white color. The text is always written in quotation marks:

```
{
  "meta":{"request":"setData"},
  "data":{"T1":{"text":"Siebert GmbH", "color":"white"}}
}
```

Writing of data on the numeric field N1

This command writes the number 123,4 on the numeric field N1 in green color. Note that in JSON the decimal character is written as dot "." and that numbers are written without quotation marks:

```
{
  "meta":{"request":"setData"},
  "data":{"N1":{"value":123.4, "color":"green"}}
}
```

Response of the display in case of success

The display responds to every valid JSON telegram with a confirmation. In the event of success the most important information is sent back and then output in format:

```
{
  "meta": {
    "source": "display",
    "version": 1,
    "method": "setData",
    "success": true
  },
  "data": {}
}
```

Response of the display in the case of error

If an error occurred during receipt or processing of the data a corresponding response is sent. In the 'data' area further information about the error follows. An error in the nesting structure of the curly brackets could, for example, look as follows:

```
{
  "meta": {
    "source": "display",
    "version": 1,
    "success": false
  },
  "data": {
    "errorcode": 2,
    "message": "ValueError: ValueError('Expecting object: line 3 column 83
      (char 87)',)",
    "errorname": "MALFORMED"
  }
}
```

If the display does not respond to a JSON telegram that an incorrect telegram structure or an invalid character is responsible. In this case, by sending the control character 0x04, EOT, the processing of the faulty telegram can be stopped and an error message can be forced.



Tip

In the Siebert Terminal-Program the control character can be entered by '@04' in edit mode:

```
{ .."meta":{"request":"setData"}, .."data":{"N1":{"value":123.4, .."color":"green"}}}<CR><LF>
@04<CR><LF>
{<LF>
  ...."meta":{<LF>
  ..... "source": "display", <LF>
  ..... "version": 1, <LF>
  ..... "success": false<LF>
  ..... }, <LF>
  ..... "data": {<LF>
  ..... "errorcode": 2, <LF>
  ..... "message": "ValueError: ValueError('Expecting object: line 1 column 83 (char 82)',)", <LF>
  ..... "errorname": "MALFORMED"<LF>
  ..... }<LF>
  }<LF>
}<CR>
```

28 Valid names in field 'meta'

In the field 'meta' the following name:value pairs are allowed:

Name	optional	Value range	Description
request	no	setLayout	Define layout completely via JSON
		getLayout	Read back current layout
		loadLayout	Load existing layout on the display
		readLayout	Ask for name of active layout
		setData	Write data on the display
		getData	Read out actual data from the display
source	yes (default: „user“)	user	Send data to the display
		display	Data is sent from the display, p.e. as answer to a previous request
tag	Yes	any string	Day for assigning the protocol answer
version	yes (default: 1)		

Command setLayout

JSON command to set a new layout. This defines the form in which the data will be displayed later.

Find an example in chapter Quick Start.

Command getLayout

JSON command to read back the actual layout definition from the display. In this place the data area only includes the empty element.

```
{"meta":{"request":"getLayout"},"data":{}}
```

Command loadLayout

JSON command to select and activate an existing layout by its name. The layout name corresponds exactly to the name displayed on the Quick select web page. P.e. you can load the start layout of a display XC55 via JSON with the following command:

```
{"meta":{"request":"loadLayout", "version":1},
  "data":{"name":"128x32 Start Layout XC55"}}
```

Command readLayout

JSON-command to query the name of the active layout. In this case the data area only included the empty element.

If the layout was selected via the web site Layout -> Quick Select or the web site Layout -> Editor, then the corresponding layout name is displayed. If the layout was defined via JSON beforehand then "-dynamic-set-" is displayed as name..

```
{"meta":{"request":"readLayout", "version":1},"data":{}}
```

Command setData

JSON command to send data to the layout. This fills the layout with content.

Find an example in chapter Quick Start.

Command `getData`

JSON command to query the current content of data on the display.

Since the display can receive data via JSON as well as via the web page it is possible that the values read back differ from the written values.

In the "data" area specify the ID of the desired element with which you have defined this element in the layout editor or with the `setLayout` command. By a name extension separated by a dot you can specify more precisely whether only the value of a particular attribute or the values of all attributes of the addressed element are output.

P.e. for a text element with the extension ".text" the text currently displayed on the display is delivered.

```
{"meta":{"request":"getData", "version":1}, "data":{"id":"T1.text"}}
```

The extension ".*" returns all attributes defined for the element.

```
{"meta":{"request":"getData", "version":1}, "data":{"id":"T1.*"}}
```



Tip

With the ".*" extension all attributes of the called drawing element are displayed.

29 Valid name in field 'data' on 'request' : 'setLayout'

With the following name:value pairs in the data area a layout is defined via JSON. This layout can then be filled with data, both via JSON telegrams and via the 'Data' website.

List with all layout elements

Name	optional	Value range	Description
elements	no	Array [...]	Contains all defined elements For each element a list {...} with the properties of this element is defined.

```
{"meta":{"request":"setLayout", "version":1},
  "data":{"elements":[ {...}, {...}, ... ]}}
```

Common properties of all layout elements with setLayout

Each individual layout element is defined via the following name-value pairs.

Name	optional	Value range	Description
type	no	"SText" "SNumeric" "SBargraph" "SClock" "SRectangle" "SBitmap" "SMultimage" "SCircle" "SContainer"	Type of the element to be defined The elements are the same as those in the layout editor.
id	No	String	Unique name of the element
x	No	Integer	x-coordinate of the upper left corner of the element in pixels
y	No	Integer	y-coordinate of the upper left corner of the element in pixels
w	No	Integer	Width of the element in pixels
h	no	Integer	Height of the element in pixels

The x- and y- coordinates refer to the upper left corner of the reference element.

For layouts without containers it is also the upper left corner of the LED matrix. .For elements defined within a container the reference point is the upper left corner of the container.

Example:

Definition of a display containing a Clock- and a Bitmap element.

Note the square brackets with 'elements'


```
{
  "meta":{"request":"setLayout"},
  "data":{"elements":
    [
      {"type":"SBitmap", "id":"B1", "x": 0, "y": 0, "w":32, "h":32 },
      {"type":"SClock", "id":"C1", "x": 40, "y": 16, "w":48, "h":16 }
    ]}
}
```

Additional properties of container elements

The container element has an additional attribute: al list with the IDs of all elements which are defined in this container:

Name	Description
SContainer	Elements: A JSON array of all drawing elements contained in this container.

30 Valid name in field 'data' on 'request' : 'setData'

At 'request:setData' in the 'data' area the information which fills the before defined layout with user data follows. Data can be defined either for one element only or for all elements together.

Each element is addressed by its unique ID, which was assigned when the layout was designed. This ID is also displayed on the web page Data -> Manual input for data input.

P.e. the field element from type text has the name 'Text-1' in the following example. The element is then called by this name.

Layout Properties

Type	Text
ID	T1
Width	96
Height	14

The value is either a JSON object with named properties, or a single value if only the standard property of the field is to be changed.

Example:

Changing the properties of the Clock element C1 and the bitmap element B1 from the previous layout definition in a single JSON telegram:

```
{
  "meta":{"request":"setData"},
  "data":{"B1":{ . . . }, "C1":{ . . . } }
}
```

Possible properties of the drawing elements at 'setData'

To set the properties of the various drawing elements there are the corresponding keywords. The same keywords are used in the web interface when entering data.



Tip

Because the different drawing elements have different properties only the parameters that make sense for the respective element can be commanded.



Tip

The keywords must be used exactly as defined here, in particular the upper/lower case must be observed.

Property	Description	Value range / format
alignment	Text alignment	String: left, right, center
background	Background color	JSON string (see chapter 'Color name')
blink	Activate flashing and set flashing speed. The speed is defined in steps from 1 (slow) to 9 (fast)	{ "enabled": false, "speed": 5 }
color	Text color	JSON string (see chapter 'color name')
decimalPlaces	Number of decimal digits in a numeric field	Number
filename	File name	JSON string (see chapter 'File name')
filenames	Array with multiple field names	JSON array of strings
font	Name character set	{ "name": "Aryana14Condensed" }
format	Format for displaying date and time	JSON string (see chapter 'format time')
index	Selection of a certain picture via its index with multimages	Index = 0 means no picture is selected
leadingZerosEnabled	Output of leading zeros in a numeric fields	Boolean value: true / false
limits	Definition of the threshold values of a numeric field, but for which an automatic color change has to take place	{ "enabled": false, "lowerLimit": 10, "upperLimit": 90 "lowerColor": {"value": "red"}, "upperColor": {"value": "red"}, }
scroll	Activating marquee and setting ticker speed	{ "enabled": true, "speed": 10 }
suffix	Dimension symbol that is displayed after a numeric value	Any text, p.e. 't' for tons or 'pcs/h' for pieces per hour
text	The text that the element is to display in double quotation marks. Special characters are entered in accordance with the JSON convention.	JSON string

value	Numeric value	Numeric value after JSON, Decimal digits are allowed
visible	Visibility of the element	Boolean value: true / false

General JSON string

A general JSON string is always written in double apostrophes and encoded in Unicode (utf8).

Special characters in the string can always be specified in the form `\uXXXX`. If the character is not defined in the character set a blank character is displayed as a place holder.

For example, a text containing quotation marks can be commanded with Unicode `\u0022` as follows:

```
{
  "meta":{"request":"setData"},
  "data":{"T1":{"text":"Er sagte \u0022Hallo\u0022."}}
}
```

JSON string for color name

Colors are defined by their clear names. The following colors are allowed:

"red", "green", "blue", "orange", "yellow", "black", "white", "cyan"

JSON format string for Date and time

The format string for date and time follows the usual Linux Conventions.



Tip

On the web site Data -> Manual input you can interactively define the format of clock elements by a timebuilder and databuilder. The resulting format string is displayed on the website and can be copied.

In the Aryana character sets `\u2236` is defined as a colon for time.

JSON string for file name

The file names under Windows without path specification are valid.

31 Properties of the drawing elements

For each defined drawing element the allowed properties are specified below

With the "getData" command these properties can also be queried via JSON.

Element	Attribute
SText	visible, color, background, scroll, blink, text, font, alignment
SNumeric	visible, color, background, blink, value, font, alignment, suffix, decimalPlaces, leadingZerosEnabled, limits
SBargraph	visible, color, blink, value, min, max, limits
SClock	visible, color, background, blink, format, alignment
SRectangle	visible, color, blink
SCircle	visible, color, blink
SBitmap	visible, blink, filename
SMultimage	visible, blink, index, filenames
SContainer	visible

32 Factory settings

The displays are delivered with the following settings. By pressing the button (④ figure in chapter "Unit description") of the control computer for at least 8 seconds you can reset the display to its factory settings. The status LEDs then flash shortly and the display restarts.

Properties	Value	Changeable
Password for users	see user administration	Yes
IP address	DHCP	Yes
Name of device	xc-display	Yes
Service IP address	10.20.6.90	No
Service net mask	255.0.0.0	No

User-defined layouts and data are preserved.

33 Network resources

The displays require the following network protocols and port numbers for proper function.

Port	TCP/UDP	Protocol	Use
22	TCP/UDP	ssh	sftp, scp
80	TCP	http	Forwarding
123	UDP	ntp	NTP client
137	TCP	nbns	Windows release
138	UDP	nbns	Windows release
139	UDP	nbns	Windows release
445	TCP	cifs	Windows release
1900	UDP	ssdp	Bonjour
5350	UDP	nat-pmp-status	Bonjour
5351	UDP	nat-pmp	Bonjour
5353	UDP	mdns	Bonjour
8080	TCP	http	Web interface
9000	TCP	raw	Payload



Tip

In case of network problems first check your firewall settings and router settings.

34 Update funktions

The displays of the XC50/XC55 series offer two types of updates to update the firmware: incremental update and full update.

With the update function you can make on-site improvements without having to send the display back to the manufacturer.

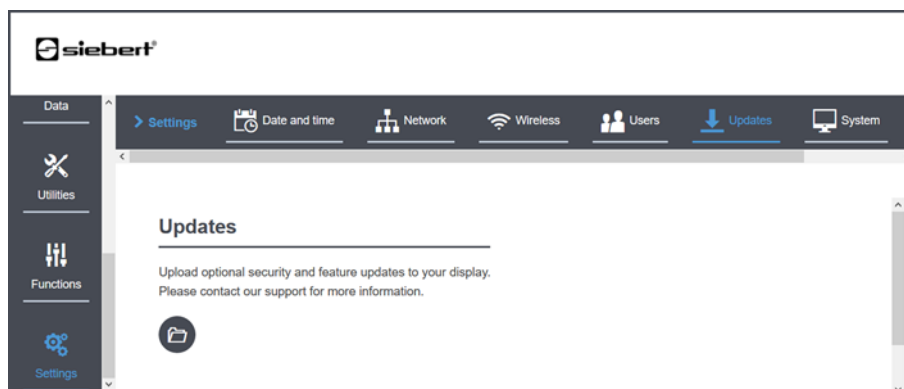
Always contact Siebert Support before making an update.

Incremental update

For a package-based update select Settings > Updates on the display.

The file with the update image '<ImageName>.xcs' can be obtained from Siebert Support p.e. per email. First save this file in any file location on your computer. Then you can select this file on the web page Settings > Updates with the Button "Open".

This loads the file to the display and checks it. If a valid update package has been loaded you can install it by pressing the "Start Update" button.



Complete update

A complete update is always performed via the USB interface. Please observe the following notes:

1. The update is always performed via an USB stick and can be carried out during operation.
2. You obtain an USB stick with the image by post.
3. You use your own USB stick with at least 1 GB and the file system FAT32 and save the image '<ImageName>.xcs' in the main directory on it.
4. The USB stick can simply be plugged into the USB socket (① image page 9) during operation. The display recognizes the stick and starts the update. The display does not have to be switched off and then on again.
5. The complete update takes up to four minutes.
6. The USB- stick has to be formatted in format FAT32 with at least 1 GB of free and must not be write-protected.
7. The display must not be switched off and the USB stick must not be removed during update.
8. During a complete update user settings may be lost.
9. During the update the display shows the following states by means of various blinking patterns of the LEDs (③).

LED 1	LED 2	Meaning
short – short – pause	off	The file with the update on the USB stick is valid and is loaded into the memory. (Duration up to 2 minutes)
Single short flash		Display restarts
Constant even flashing	off	The update is being installed (figure page 9) Duration up to 3 minutes
Single short flash		Display restarts
On	Off	The update was carried out successfully. The USB stick can now be removed. The display can remain switched on.
off	Off	Normal operation mode

35 Technical data

Electrical properties

Power supply	Series XC50	115/230 (85...264) V AC, 50/60 Hz ± 20 %
	Series XC55	230 V AC, 50/60 Hz ± 15 % or 115 V AC, 50/60 Hz ± 15 %

Power consumption

Series XC50 – one-sided displays		Series XC50 – double-sided displays		Series XC55	
XC50-064.016.G1-xxxx	21	XC50-064.016.G2-xxxx	35	XC55-064.016.G1-xxxx	55
XC50-096.016.G1-xxxx	28	XC50-096.016.G2-xxxx	50	XC55-096.016.G1-xxxx	73
XC50-128.016.G1-xxxx	35	XC50-128.016.G2-xxxx	64	XC55-128.016.G1-xxxx	92
XC50-192.016.G1-xxxx	50	XC50-192.016.G2-xxxx	92	XC55-192.016.G1-xxxx	130
XC50-256.016.G1-xxxx	64	XC50-256.016.G2-xxxx	120	XC55-256.016.G1-xxxx	187
XC50-064.032.G1-xxxx	35	XC50-064.032.G2-xxxx	64	XC55-064.032.G1-xxxx	92
XC50-096.032.G1-xxxx	50	XC50-096.032.G2-xxxx	92	XC55-096.032.G1-xxxx	130
XC50-128.032.G1-xxxx	64	XC50-128.032.G2-xxxx	120	XC55-128.032.G1-xxxx	187
XC50-192.032.G1-xxxx	92	XC50-192.032.G2-xxxx	180	XC55-192.032.G1-xxxx	292
XC50-256.032.G1-xxxx	120	XC50-256.032.G2-xxxx	235	XC55-256.032.G1-xxxx	367
XC50-128.048.G1-xxxx	92	XC50-128.048.G2-xxxx	180	XC55-128.048.G1-xxxx	265
XC50-192.048.G1-xxxx	135	XC50-192.048.G2-xxxx	265	XC55-192.048.G1-xxxx	445
XC50-256.048.G1-xxxx	180	XC50-256.048.G2-xxxx	350	XC55-256.048.G1-xxxx	560
XC50-128.064.G1-xxxx	120	XC50-128.064.G2-xxxx	235	XC55-128.064.G1-xxxx	340
XC50-192.064.G1-xxxx	180	XC50-192.064.G2-xxxx	350	XC55-192.064.G1-xxxx	560
XC50-256.064.G1-xxxx	240	XC50-256.064.G2-xxxx	460	XC55-256.064.G1-xxxx	710

The performance data are approximate values in watts.

Construction

Housing	Series XC50	Steel sheet powder-coated, optional stainless steel 1.4301 (V2A) or 1.4571 (V4A) brushed or powder-coated
	Series XC55	Steel sheet electrolytically galvanized, two-layer powder-coated, optional stainless steel 1.4301 (V2A) or 1.4571 (V4A) powder-coated
Housing color	Anthracite grey/light grey (RAL 7016/RAL 7035), optional other RAL colors	
Protection type	IP54, series XC50 optional IP65	

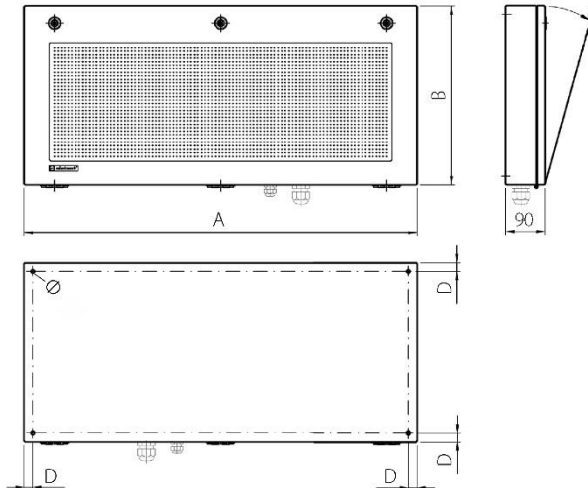
Ambient conditions

Operating temperature	Series XC50	0...50 °C ¹⁾ (unit versions XC50-xxx.048.G2-... and XC50-xxx.064.G2-... : 0...40 °C)
	Series XC55	-25...50 °C
Relative humidity	< 90 %, non-condensing	
Storage temperature	-25...70 °C	

Dimensions and weights

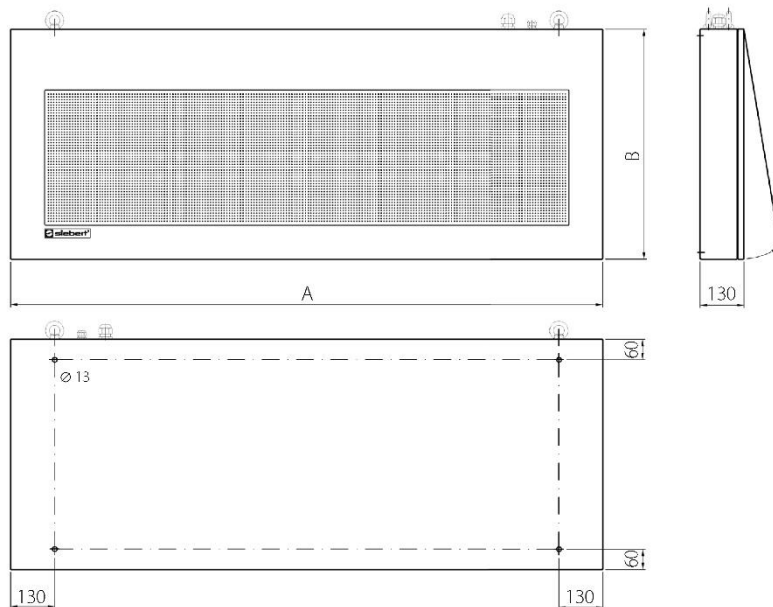
Series XC50 – One-sided displays

The following figure shows unit version XC50-096.032.G1-xxAx representing the other unit versions in the following table. All dimensions are in mm. The weights given are approximate values in kg.



	A	B	D	Ø	Weight
XC50-064.016.G1-xxAx	640	280	16	7	9
XC50-096.016.G1-xxAx	900	280	16	7	12
XC50-128.016.G1-xxAx	1150	280	20	9	16
XC50-192.016.G1-xxAx	1660	280	20	9	24
XC50-256.016.G1-xxAx	2180	280	25	11	32
XC50-064.032.G1-xxAx	640	410	16	7	13
XC50-096.032.G1-xxAx	900	410	20	9	17
XC50-128.032.G1-xxAx	1150	410	20	9	22
XC50-192.032.G1-xxAx	1660	410	25	11	32
XC50-256.032.G1-xxAx	2180	410	25	11	42
XC50-128.048.G1-xxAx	1150	540	25	11	28
XC50-128.064.G1-xxAx	1150	670	25	11	34

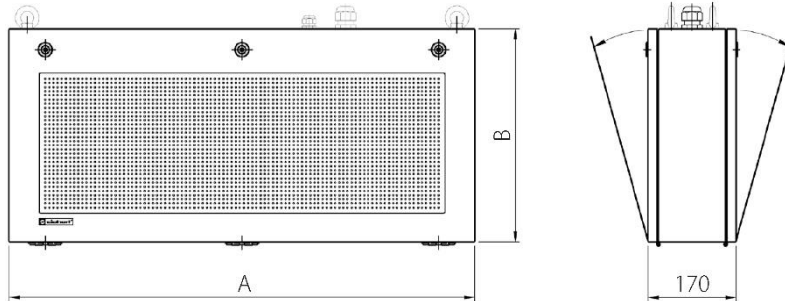
The following figure shows unit version XC50-192.048.G1-xxEx representing the other unit versions in the following table. All dimensions are in mm. The weights given are approximate values in kg.



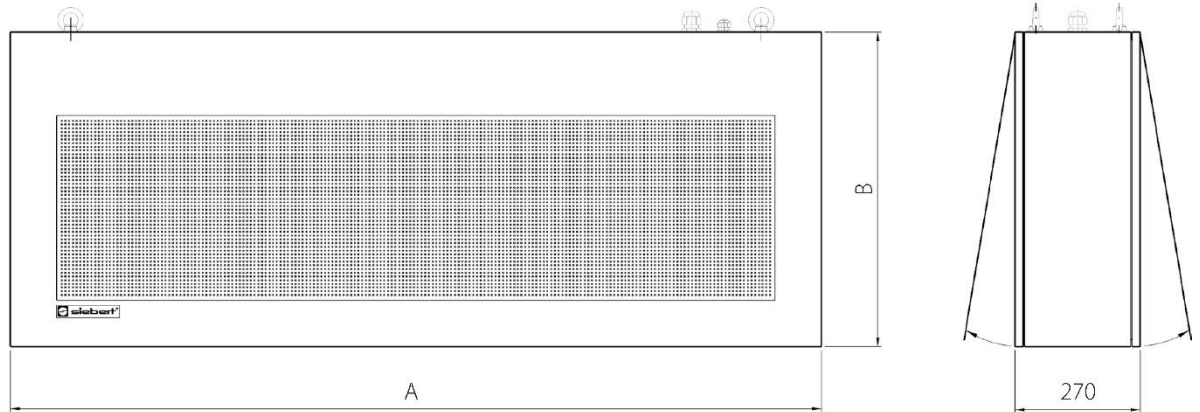
	A	B	Weight
XC50-192.048.G1-xxEx	1750	680	73
XC50-256.048.G1-xxEx	2260	680	96
XC50-192.064.G1-xxEx	1750	810	89
XC50-256.064.G1-xxEx	2260	810	115

Series XC50 – Double-sided displays

The following figure shows unit version XC50-096.032.G2-xxDx representing the other unit versions in the following table. All dimensions are in mm. The weights given are approximate values in kg.



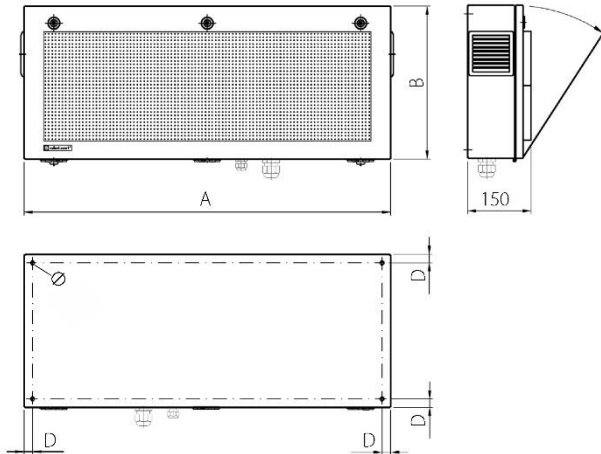
	A	B	Weight
XC50-064.016.G2-xxD-	640	280	14
XC50-096.016.G2-xxD-	900	280	18
XC50-128.016.G2-xxD-	1150	280	24
XC50-192.016.G2-xxD-	1660	280	36
XC50-256.016.G2-xxD-	2180	280	48
XC50-064.032.G2-xxD-	640	410	20
XC50-096.032.G2-xxD-	900	410	26
XC50-128.032.G2-xxD-	1150	410	33
XC50-192.032.G2-xxD-	1660	410	48
XC50-256.032.G2-xxD-	2180	410	63
XC50-128.048.G2-xxD-	1150	540	42
XC50-128.064.G2-xxD-	1150	670	51



	A	B	Weight
XC50-192.048.G2-xxDx	1750	680	110
XC50-256.048.G2-xxDx	2260	680	144
XC50-192.064.G2-xxDx	1750	810	134
XC50-256.064.G2-xxDx	2260	810	173

Series XC55

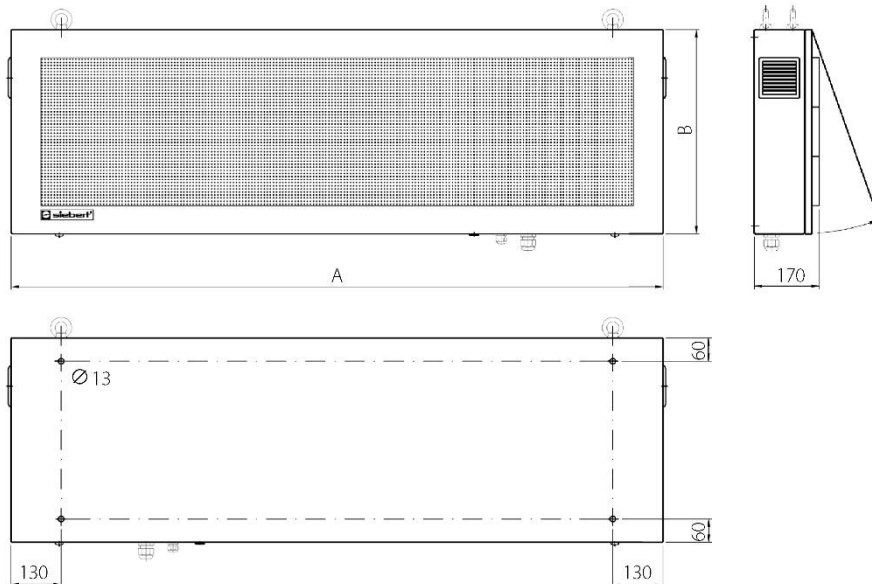
The following figure shows unit version XC55-096.032.G1-xxAx representing the other unit versions in the following table. All dimensions are in mm. The weights given are approximate values in kg.



	A	B	D	Ø	Weight
XC55-064.016.G1-xxAx	600	235	16	7	9
XC55-096.016.G1-xxAx	860	235	16	7	12
XC55-128.016.G1-xxAx	1110	235	20	9	16
XC55-192.016.G1-xxAx	1620	235	20	9	24
XC55-256.016.G1-xxAx	2140	235	25	11	32
XC55-064.032.G1-xxAx	600	360	16	7	13
XC55-096.032.G1-xxAx	860	360	20	9	17
XC55-128.032.G1-xxAx	1110	360	20	9	22
XC55-192.032.G1-xxAx	1620	360	25	11	32
XC55-256.032.G1-xxAx	2140	360	25	11	42
XC55-128.048.G1-xxAx	1110	490	25	11	28
XC55-128.064.G1-xxAx	1110	620	25	11	34

Series XC55

The following figure shows unit version XC55-192.048.G1-xxEx representing the other unit versions in the following table. All dimensions are in mm. The weights given are approximate values in kg.



	A	B	Weight
XC55-192.048.G1-xxEx	1690	530	58
XC55-256.048.G1-xxEx	2200	530	75
XC55-192.064.G1-xxEx	1690	660	72
XC55-256.064.G1-xxEx	2200	660	93