GO SYSTEMELEKTRONIK

WE MAKE LIQUIDS TRANSPARENT.

Manual
BlueBox R1 and Panel

BlueBox

Version of this manual: 1.2 en

www.go-sys.de

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Manufacturer's declaration
When installing the system, it is necessary to ensure correct electrical connection, protection against moisture and foreign bodies and excessive condensation, and system heating which can arise from both correct and incorrect use. It is the responsibility of the installer to ensure that the correct installation conditions are provided.

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01 Safety Instructions

⚠	**Danger:** Used if non-observance threatens serious injury or death.
⚠	**Warning:** Used if non-observance threatens slight injuries or serious property damage.
⚠	**Caution:** Used if non-observance threatens minor property damage.
⚠	Used for general safety instructions.
⚠	Symbol of safety instruction relating to the use of electricity.

02 Notes on the Commissioning Manuals

At the end of this manual, you will find the commissioning manuals.

- *Manual Commissioning of the BlueBox R1* see Page 45 to 56
- *Manual Commissioning of the BlueBox Panel* see Page 57 to 68

These manuals are each a standalone part of this manual and describe the commissioning of the BlueBox R1 and the BlueBox Panel of GO Systemelektronik.

1 Introduction

BlueBox R1

BlueBox Panel

This manual describes the **BlueBox R1** (Article number 486 00R1-X) and the **BlueBox Panel** (Article number 486 00P0-X) of GO Systemelektronik.

Described Firmware Version: 5.01.40

The operation is carried out at the BlueBox touch screen and with the BlueBox PC Software. The BlueBox PC Software is described in the ***Manual BlueBox PC Software***.

A comprehensive documentation of the BlueBox system can be found on www.go-sys.de/downloads.

The symbol indicates useful additional information.

The symbol indicates an instruction, the non-fulfilment of which may affect the measuring operation.

The symbol indicates a note to avoid an operating error.

Note on Text References

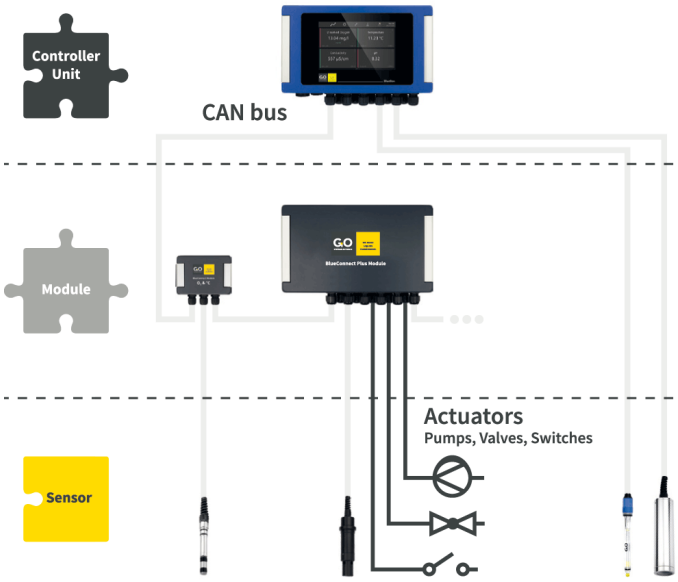
References to passages in this document or to passages in other documents are marked in italics.

- *5.2 Standard Input Displays* e.g. refers to the section 5.2 in this document.
  The short form is *5.2*.
- *Manual BlueBox PC Software* there *5 AMS – Advanced Managing Software* e.g. refers to the chapter 5 in the Manual BlueBox PC Software.

The products of GO Systemelektronik are constantly being developed, therefore deviations between this manual and the delivered product can result. Please understand that no legal claims can be derived from the contents of this manual.

2 Overview

The BlueBox is a modular and expandable basis for a variety of monitoring and control tasks.
It enables the management of extensive sensor and actuator networks.
With the help of the BlueBox as a central interface, the integration and connection of further systems can be realised.
A connection via internet or mobile phone networks expands the possibilities of transmitting measurement data and results and enables remote access and control of the system.



3 Connectable Modules and Sensors

The following modules and sensors can be connected to the BlueBox:

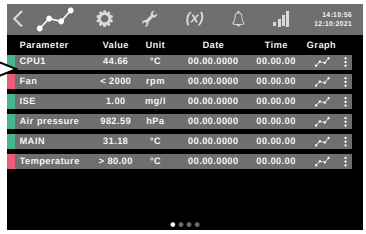
- **External CAN bus modules**
  CAN bus modules of GO Systemelektronik are available in various forms as sensor modules, actuator modules and as active CAN repeaters. The connection is made via the CAN bus clamp sockets on the BlueBox mainboard.
- **Internal CAN bus boards – BlueBox R1 only**
  At the completion of this manual, the following types of design were available:
  BlueConnect Plus board – equippable with up to four BlueConnect sensor and input/output boards
  Spectrometer board – ISA spectrometer sensor unit
  The connection is made via the DAM clamp sockets on the BlueBox R1 mainboard.
- **BlueConnect Modules**
  The versatile BlueConnect Modules of GO Systemelektronik are also CAN bus modules. So they can be connected via the CAN bus clamp sockets on the BlueBox mainboard.
- **Modbus sensors**
  Modbus sensors are connected directly via the RS485 Modbus clamp sockets on the BlueBox mainboard.
- **RS485 devices***
  The connection is made via the RS485 clamp sockets on the BlueBox mainboard.
- **RS232 devices – BlueBox R1 only**
  The connection is made via the CAN bus clamp sockets on the BlueBox R1 mainboard.

> There are many separate instructions on how to connect the BlueBox with several devices. For more information, please contact GO Systemelektronik.

* If an RS485 device (e.g. SPS) is connected here, then it is not possible to connect GO Systemelektronik Modbus Sensors directly.

4 Switching On the BlueBox

1. Switch on the power supply.
2. The BlueBox checks the database and initiates the system.
3. Then the BlueBox initiates the connected sensors and actuators.
4. The Parameter Display in list view in alphabetical order is the factory default start display. see *6 Parameter Display*



Password entry: To perform certain settings, a password consisting of 5 digits must be entered. see *Appendix A – The Configuration Data Sheet* there *1. BlueBox R1* there *BlueBox Password (PIN)*

5 Touch Screen Operation

The touch screen is divided in two sections, the **Main Menu Bar** and the **Function Display**.

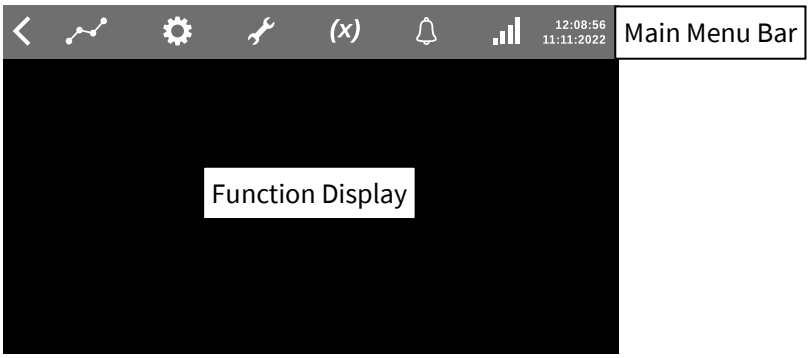
Operating the touch display

tapping

swiping horizontal

swiping vertical

spreading and pinching



5.1 Main Menu Bar

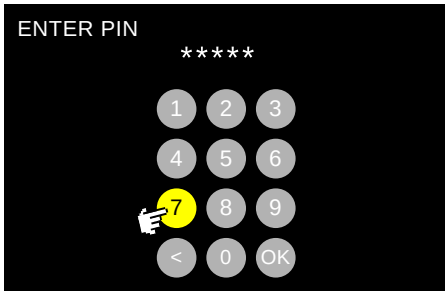
<	Switches back to the previous display.	
	Switches to the Parameter Display.	see *6 Parameter Display*
	Switches to the System Display.	see *7 The System Display*
	Switches to the Service Display.	see *8 Service Display (Maintenance)*
(x)	Switches to the User Variables Display.	see *9 User Variables Display*
	Switches to the Notifications Display. Displays the number of new notifications in a red circle. 3	see *10 Notifications*
	Bar chart for the intensity of an optional LTE and GPS connection – Example 4G: 4G At LTE and GPS: Chart LTE ↻ GPS cycling all 10 seconds	
12:06:28 11:11:2022	Time and date display	

5.2 Standard Input Displays

Standard BlueBox Password (PIN) input display

- Tap in the PIN.
- Tap (<) to delete the last entered digit.
- Tap (OK) to enter the PIN.

You will find the PIN in the enclosed Configuration Data Sheet.

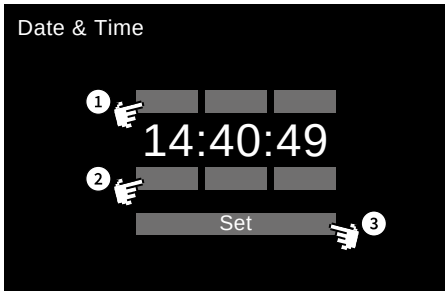


Standard date & time input display

(1) One up

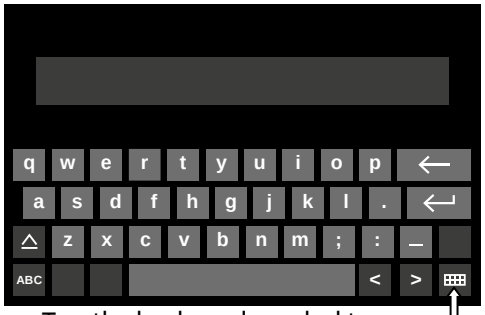
(2) One down

(3) Saves entry



Standard alphanumeric input display

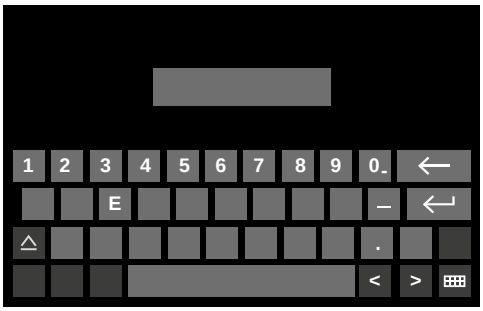
- Tap **ABC** to open the digit view.
  Tap **&123** to open the letter view.
- △ is off △ yellow dot is on
- Letter view - Tap △ to switch between small and capital letters as well as **; : -** and **, _**
- Digit view – Tap △ to change the special character assignment
- Deletes the last entered character. ←
- Saves the entry. ↵
- One character back/forward **< >**



- Tap the keyboard-symbol to return to the previous display without saving an entry.

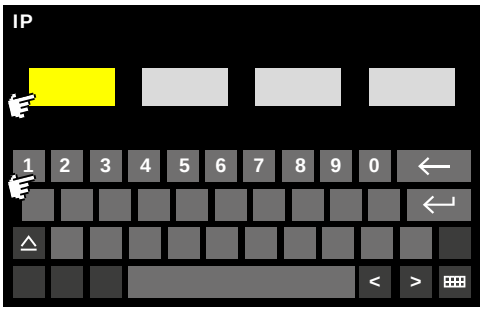
Standard numeric input display

- △ No function here.
- Deletes the last entered character. ←
- Saves the entry. ↵
- One character back/forward **< >**
- Tap the keyboard-symbol ⌨ to return to the previous display without saving an entry.



The standard IP input display

- △ No function here.
- Deletes the last entered character. ←
- Saves the entry. ↵
- One character back/forward **< >**
- Tap the keyboard-symbol ⌨ to return to the previous display without saving an entry.



6 Parameter Display

Parameters of the following can be displayed:

- the connected external sensors/actuators
- the connected internal CAN bus sensors
- the virtual (calculated) sensors
- internal temperature and air pressure sensors (depends on configuration)
- Sensor status messages

There are five View Types of a Parameter Display:

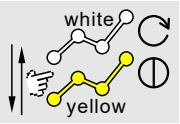
- Sensor List View (max. 9 entries per single list)
- Single Sensor View
- 4 Sensors View (tiles)
- 6 Sensors View (tiles)
- Single Sensor Chart View of selected sensors (max. 30)

The Parameter Display in list view in alphabetical* order of the sensor name is the factory default start display. The displayed sensors and actuators as well as the type and sequence of the Parameter Views are defined via the Parameter Display Functions. see *7.6 Parameter Display Functions*

You can change the current view by swiping the display horizontal.

Appearance order:
by example

List 4 Sensors 6 Sensors Chart



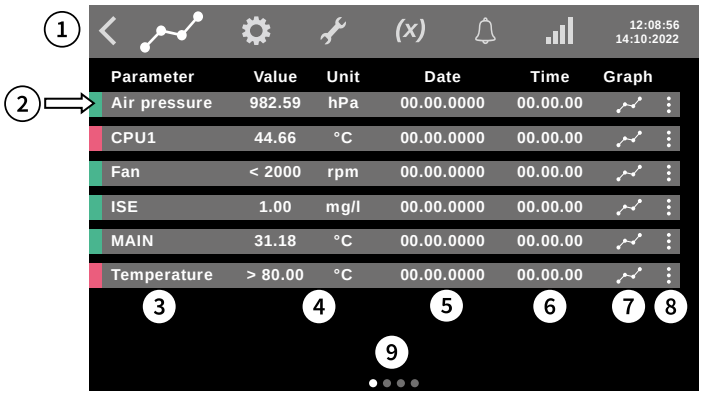
Tap on the Parameter Display Symbol to switch the cycling of the Parameter Views on and off.
The Parameter Display Symbol is also a status indicator.

Cycling ON: white **Cycling OFF: yellow**

Cycling ON means: A Parameter View is displayed for 5 s; thereafter the display switches in a cycling way to the next Parameter View.
Swiping the display horizontal while Cycling ON switches the Cycling OFF.

6.1 Views of the Parameter Display

6.1.1 List View



(1) Main Menu Bar, see *5.1 Main Menu Bar*

(2) Status messages are not displayed, but are marked in colour here. see *Appendix B – Status Messages*
| green ⇨ Status No. 0 | orange ⇨ Status No. 4, 50, 51 | yellow ⇨ Status No. 57 |
| blue ⇨ Status No. 60 | red ⇨ all others |

(3) Sensor name

(4) Measured parameter value with unit

(5) Date of the last measurement

(6) Time of the last measurement

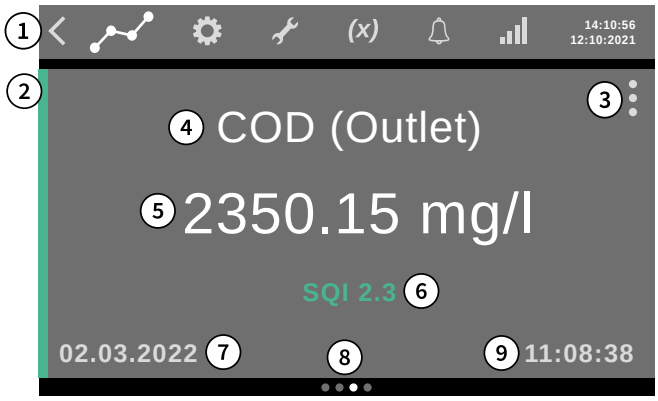
(7) Opens a single parameter chart display with measurement values over the last 24 hours, scaled to min/max of all measurement values. Swiping horizontally shifts the x-axis. Spreading and pinching zooms the chart in and out. Tapping the display switches back to the Parameter Display in List View.

(8) Switches to the Sensor/Actuator Service Selection Display. see 6.2 Sensor Service Selection Display

(9) ○●●● Position of the current Parameter View in the sequence, swipe to change the View.

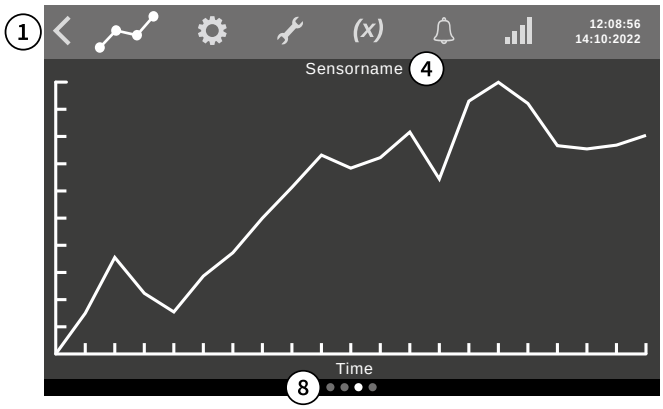
* The sequence is that of the ASCII numeric value, i. e.: Special characters ⇨ numbers ⇨ capital letters ⇨ lower case letters

6.1.2 Single Sensor View



1. Main Menu Bar, see *5.1 Main Menu Bar*
2. Status messages are not displayed, but are marked in colour here. see *Appendix B – Status Messages*
   | green ⇨ Status No. 0 | orange ⇨ Status No. 4, 50, 51 | yellow ⇨ Status No. 57 |
   | blue ⇨ Status No. 60 | red ⇨ all others |
3. Switches to the Sensor/Actuator Service Selection Display.
   see *6.2 Sensor Service Selection Display*
4. Sensor name
5. Measured parameter value with unit Switches to the diagram display.
6. SQI (Sensor Quality Index) in the case of application-specific parameters
7. Date of the last measurement
8. ●●○● Position of the current Parameter View in the sequence, swipe to change the View.
9. Time of the last measurement

6.1.3 Sensor Chart View *



max. 30 Chart Views
at one BlueBox

X-Scale and Y-Scale as defined in *7.6.1 Dashboard Configuration Display* there CONFIG

X-SCALE	0 d	1 h	0 m
Y-AUTOSCALE		OFF	ON

X-SCALE: Scale of passed time as set

Y-AUTOSCALE:

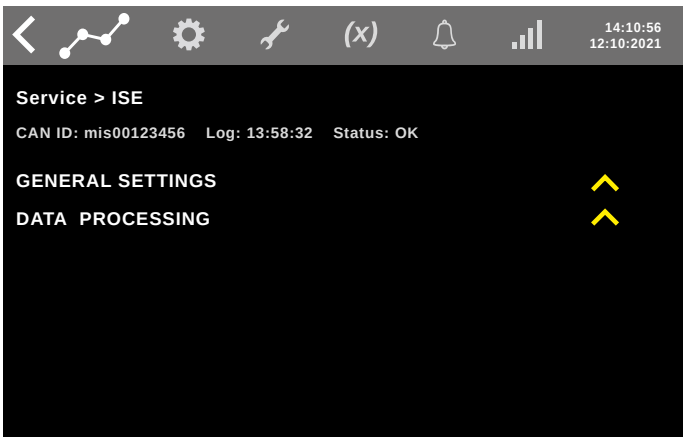
OFF⇦ as defined in *6.2.1 General Settings*
there *Min Value / Max Value*

ON⇨ Min Value / Max Value
= lowest value / highest Value of passed time as set

* Not to be confused with the single parameter chart display, see *6.1.1 List View* there 7.

6.2 Sensor Service Selection Display

Example ISE Sensor



Switches back to the previous Display.

Switches to the corresponding Display.

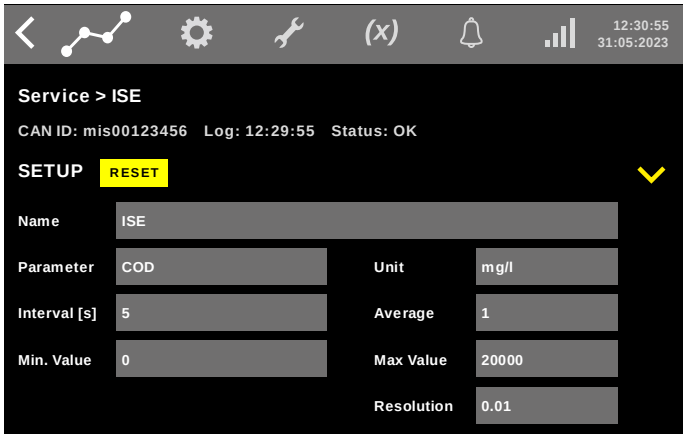
Via this display you can determine the settings of a connected sensor, calibrate it[1], display its measurement value and view the current settings of the sensor. For specific settings of the connected sensor see the sensor description.

CAN ID: CAN ID of the sensor | **Log:** Time of the last measurement | **Status:** Sensor status

[1] if applicable – see *11 Sensor Calibration*

6.2.1 General Settings

Service > ISE
General Settings



Switches back to the previous Display.

Switches back to the Selection Display.

Tap on a yellow or grey rectangle.

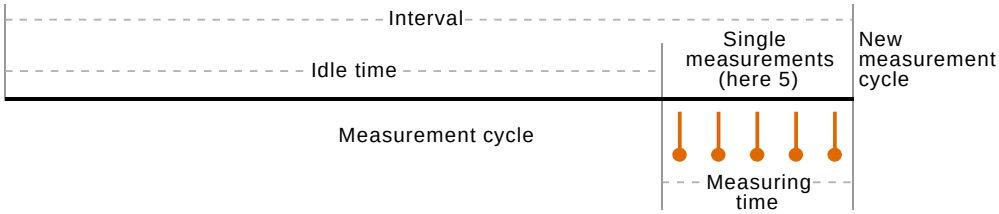
RESET	Resets the general settings of the sensor to the factory settings.
Name	Switches to the input of a sensor name. max. 20 characters Is queried by other BlueBox programs.
Parameter	Switches to the input of the name of the measured parameter. max. 20 characters
Unit	Switches to the input of the unit of the measurement value. More than 7 characters cannot be displayed on the BlueBox display.

Interval and Average

Interval (Measurement Interval): Time in seconds between the end of a measurement and the end of the next measurement.[1] Choose the interval according to the characteristics of the sensor. Each sensor requires a certain minimum period for measuring a value. Please note the data sheet of the sensor.

Average: The measurement value is the arithmetic average of the selected number of single measurements.

Interval [s]	Switches to the input of the measurement interval. see 8.2.2.1.5
Average	The measurement value is the arithmetic average of the selected number of single measurements.



Here the arithmetic average is calculated of 5 single measurements.

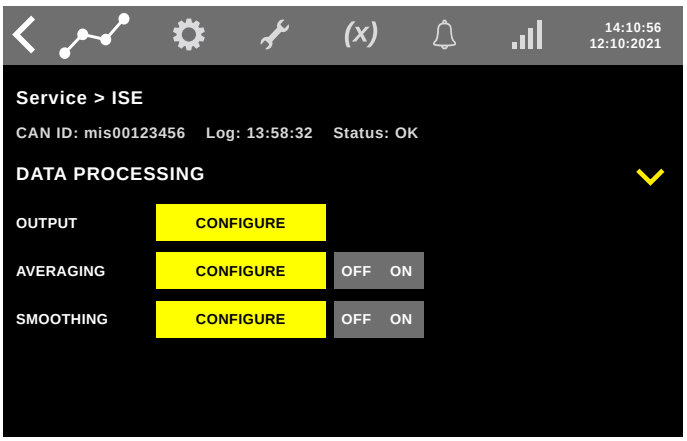
Min Value **Max Value**	Switches to the input of a Measuring range. Min Value: lower limit of the measuring range upper limit. Max Value: upper limit of the measuring range. At underrun and overrun the Sensor Status is set to 50 or 51 (see *Appendix B – Status Messages*). So, it is marked by a < or > in List Views and in orange. The entered Min Value or Max Value is the measurement value.
Resolution	Switches to the input of the measurement resolution. Input 1 corresponds to decimal place = 0 in the Sensor setup of AMS[2], Input 0.1 corresponds to decimal place = 1 in the Sensor setup of AMS[2], etc.

[1] The measurement interval is calculated in advance from the set interval time, the number of individual measurements and the properties of the sensor. This results in a low time drift of the recording times of the measurement values.

[2] The program AMS is part of the BlueBox PC Software.

6.2.2 Data Processing

Service > ISE
Data Processing



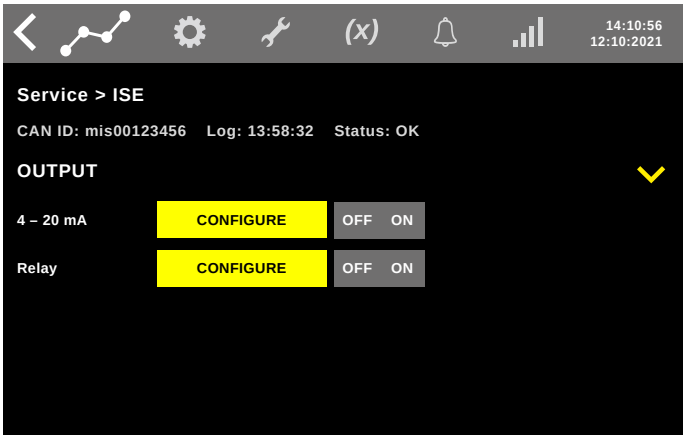
Switches back to the previous Display.

Switches back to the Selection Display.

Tap on CONFIGURE opens the corresponding display.
Tap on OFF ON disables and enables the corresponding function. see next pages

6.2.2.1 Data Processing Output

Service > ISE
Data Processing
Output



Switches back to the previous Display.

Switches back to the Selection Display.

Tap on CONFIGURE opens the corresponding display.
Tap on OFF ON disables and enables the corresponding function. see next pages

Service > ISE
Data Processing
Output 4 – 20 mA

Switches back to the previous Display.

(1) Opens a display for selecting the name of a current output whose current values are controlled by the sensor values.

(2) Opens a display for selecting the serial number of a current output whose current values are controlled by the sensor values.

(3) Sets a sensor measurement value that corresponds to the 4 mA current value.

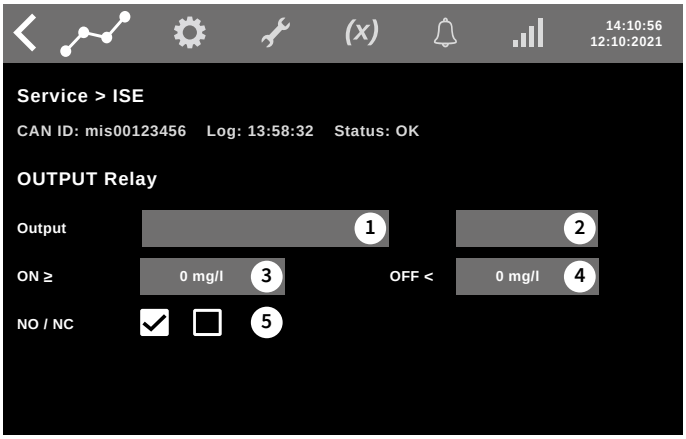
(4) Sets a sensor measurement value that corresponds to the 20 mA current value.

(5) Sets an error output current value in mA.

(6) Sets an offset value in mA for adaption to a control room.

(7) Determines the output scale.
Linear ⇨ linear
logarithm 3 ⇨ logarithmically over 3 decades
logarithm 4 ⇨ logarithmically over 4 decades

Service > ISE
Data Processing
Output Relay



Switches back to the previous Display.

(1) Opens a display for selecting the name of a relay whose switching status is controlled by the sensor values.

(2) Opens a display for selecting the serial number of a relay whose switching status is controlled by the sensor values.

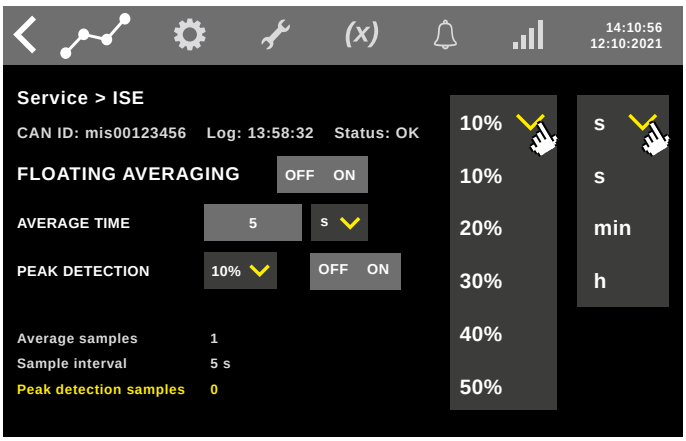
(3) The relay switches at a sensor measurement value ≥ to the value set here.

(4) The relay switches at a sensor measurement value < to the value set here.

(5) Sets the relay contact type to normally open (NO) or normally closed (NC).

6.2.2.2 Data Processing Averaging

Service > ISE
Data Processing
Averaging



Switches back to the previous Display.

Via this display you can determine, how a moving average over the time is calculated and how outliers are suppressed.

If the moving average is enabled, the output sensor measurement value is calculated as a moving average of measured values recorded in the Average Time.
This function is used to smooth measurement series.

FLOATING AVERAGE Tap on OFF ON disables and enables the averaging.

AVERAGE TIME The time unit [s, min, h] is determined by selection in the drop-down list.
The moving average is calculated from the measured values recorded in the Average Time. The number of measured values at a given Average Time depends on the measurement interval (see *6.2.1*). With a double measurement interval (Average Time = 2x measurement interval) two measured values are taken into account, with a triple measurement interval three and so on.
This means, that only an integer multiple of the measurement interval is effective. Other values are taken as the next largest integer multiple of the measurement interval (see 6.2.1). An Average Time of 1xmeasurement interval is ineffective.

PEAK DETECTION Input of the **type of outlier/peak detection**, the unit is determined by selection in the drop-down list.

Type of peak detection

Tap on OFF ON disables and enables the peak detection.

The measurement values are sorted by size.

10% The lower and upper 10 percent by number are removed and the arithmetic mean is calculated.

20% The lower and upper 20 percent by number are removed and the arithmetic mean is calculated.

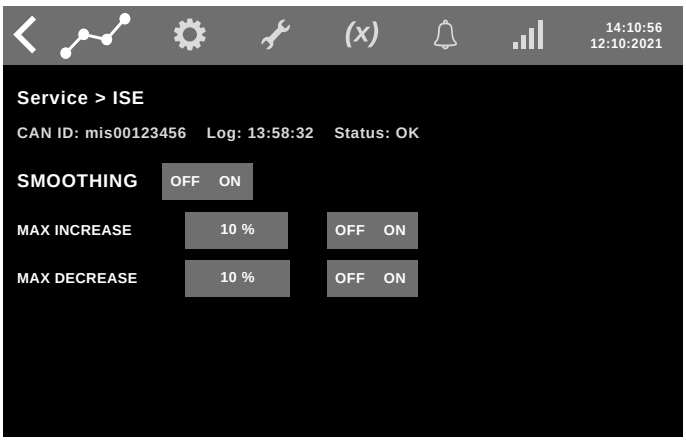
30% The lower and upper 30 percent by number are removed and the arithmetic mean is calculated

40% The lower and upper 40 percent by number are removed and the arithmetic mean is calculated

50% The calculated mean is the median of all n values.

6.2.2.3 Data Processing Smoothing

Service > ISE
Data Processing
Smoothing



Switches back to the previous Display.

Here you can define how the curve of the sensor measurement values is smoothed by a digital filter.

Calculation formula: $Measvalue = Measvalue_{old} \times (1 - maxvalue/100) + (Measvalue_{new} \times maxvalue/100)$

SMOOTHING

Tap on OFF ON disables and enables all smoothing.

MAX INCREASE

Opens the standard numeric input display for the input of a percentage value for the increasing case.
Tap on OFF ON disables and enables the increase smoothing.

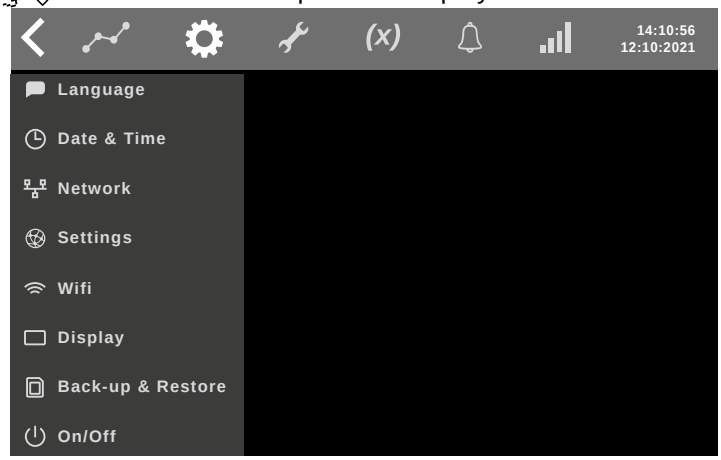
MAX DECREASE

Opens the standard numeric input display for the input of a percentage value for the decreasing case.
Tap on OFF ON disables and enables the decrease smoothing.

7 The System Display

Call-up with ⚙ in the Main Menu Bar. The System Menu with its vertical System Menu bar appears.

Switches back to the previous Display.

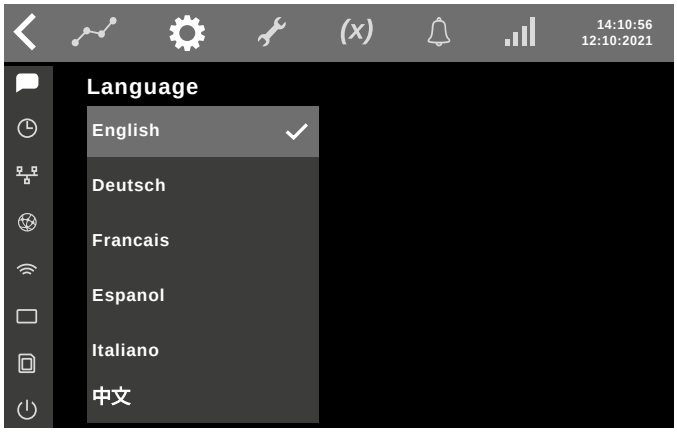


Vertical System Menu bar

Language	Switches to the language setting menu, see *7.1 Language*.
Date & Time	Switches to the Date & Time menu, see *7.2 Date & Time*.
Network	Switches to the Network menu, see *7.3 Network*.
Settings	Modem Setup | Cloud Setup | Connectivity Setup | GPS Setup | CAN bus setup see *7.4 Settings Selection Display*
Wi-Fi	Switches to the Wi-Fi Setup Menu, see *7.5 Wi-Fi Setup*
Display	Switches to the Parameter Display Functions, see *7.6 Parameter Display Functions*
Back-up & Reset	Configuration Back-up Import/Export | Reset to Factory Settings | | Firmware Update | Database Export see *7.7 Back-Up / Reset*
On/Off	Shutdown – Restart – Lock – Unlock see *7.8 Shutdown – Restart – Lock – Unlock*

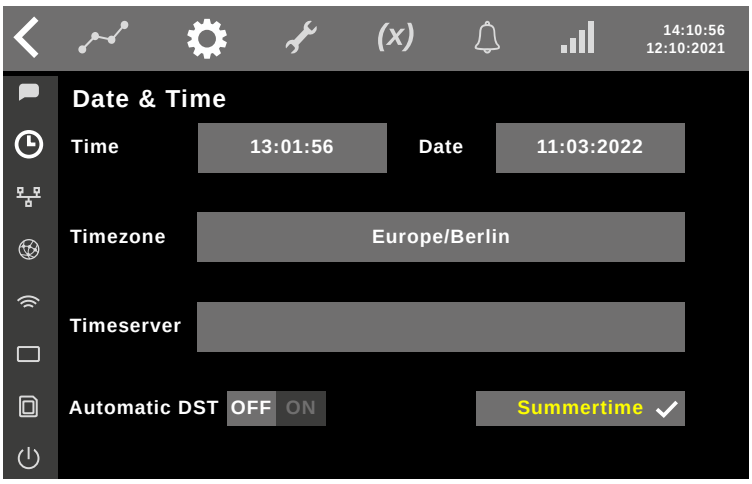
7.1 Language

Here you can select the display language.



The default language is English; German can be selected as an alternative language.
All other languages are not yet realised.

7.2 Date & Time



Time Switches to the standard date/time input display, see *5.2 Standard Input Displays*.

Date Switches to the standard date/time input display, see *5.2 Standard Input Displays*.

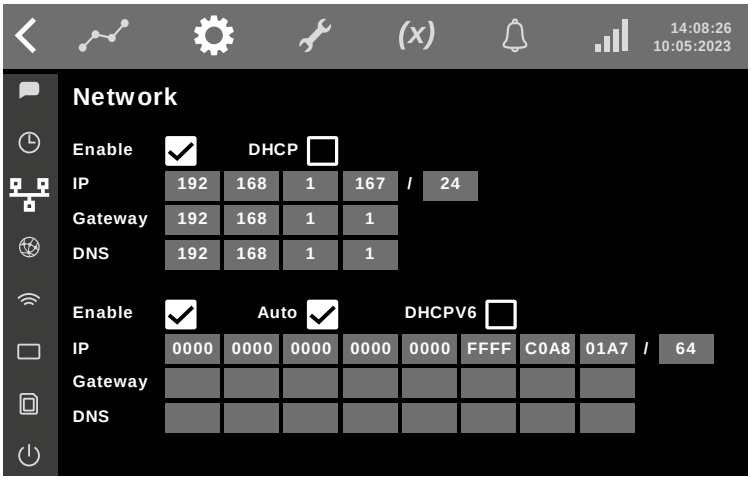
Timezone Switches to the time zone input scroll display.
Scroll by swiping, and then select the appropriate time zone by tapping:
The time zone is set.

Timeserver Switches to the standard alphanumeric input display, see *5.2 Standard Input Displays*.
After setting a URL (web address) or an IP address of a time server, the BlueBox automatically synchronizes its system time with the time server.
GO Systemelektronik provides a time server under the URL "ntp.go-sys" (IP address 212.51.30.18) – the only requirement here is that the BlueBox has Internet access.
Synchronization is performed using the NTP protocol.

Automatic DST Daylight Saving Time ON/OFF

Summertime/Wintertime Status indicator and at DST OFF a toggle switch button.

7.3 Network



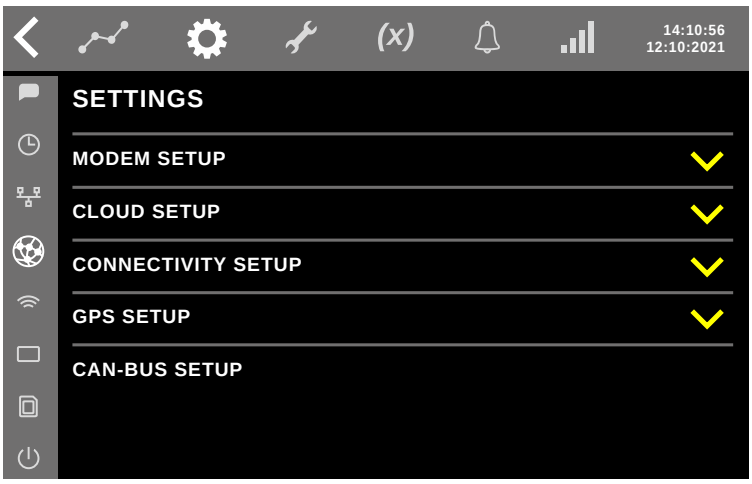
IPv4	**Input of IP addresses see *5.2 Standard Input Displays*.**
Enable	Enables and disables the IPv4 connection. You can use the IPv4 connection with or without the IPv6 connection.
DHCP	The IP address is set via the DHCP protocol when the BlueBox starts. Right of the IPv4 input fields lock symbols appear, with means that no entries are possible.
IP and Netmask IP4 [CDIR*]	Switches to the input of the local IP4 address and netmask which identifies the BlueBox on your local network. Here you can enter the IP4 address in the first four input fields and the netmask in the last input field. The IP address and the netmask are configured at the factory. see *Appendix A – The Configuration Data Sheet* The current setting is displayed.
Gateway	Switches to the input of the IP address of the device, which executes the connection to other networks. If the BlueBox shall communicate via the LAN connection with other networks, enter the IP address of the device that executes the connection (another BlueBox, routers, servers, etc.). The current setting is displayed.
DNS	Switches to the input of a DNS server. If the BlueBox is connected to the Internet via a router or similar and not via an internal modem and if you use names and not IP addresses for Internet addresses, then a DNS server must be entered here in the BlueBox.

* Classless Inter-Domain Routing 24 ≙ 255.255.255.0

IPv6	**Input of IP addresses see *5.2 Standard Input Displays.***
Enable	Enables and disables the IPv6 connection. You can use the IPv6 connection with or without the IPv4 connection.
Auto	Sets the local IPv6 address.
DHCPv6	The IPv6 address is set via the DHCPv6 protocol when the BlueBox starts. Right of the IPv4 input fields lock symbols appear, with means that no entries are possible.
IP and Netmask IP6 [CDIR*]	Switches to the input of the local IP6 address and netmask which identifies the BlueBox on your local network. Here you can enter the IP6 address in the first eight input fields and the netmask in the last input field. The IP address and the netmask are configured at the factory. see *Appendix A – The Configuration Data Sheet* The current setting is displayed.
Gateway	Switches to the input of the IP address of the device, which executes the connection to other networks. If the BlueBox shall communicate via the LAN connection with other networks, enter the IP address of the device that executes the connection (another BlueBox, routers, servers, etc.). The current setting is displayed.
DNS	Switches to the input of a DNS server. If the BlueBox is connected to the Internet via a router or similar and not via an internal modem and if you use names and not IP addresses for Internet addresses, then a DNS server must be entered here in the BlueBox.

* Classless Inter-Domain Routing

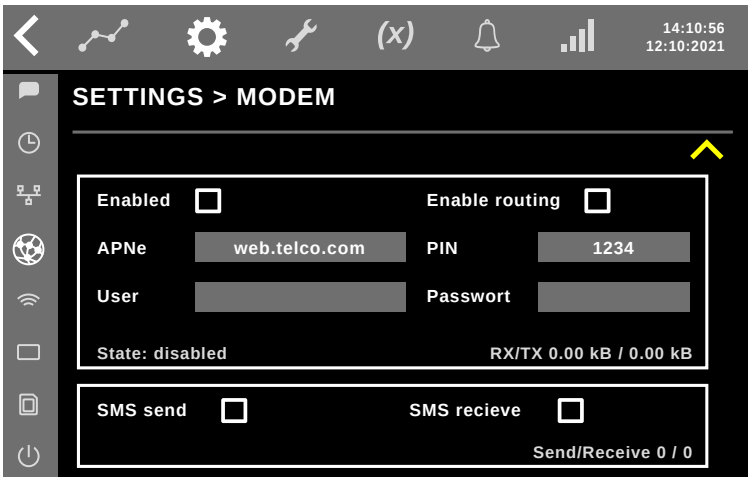
7.4 Settings Selection Display



Switches to the corresponding Display.

The following menus are used for various settings.
Prerequisite is an internet connection via the network cable on the BlueBox or an internet connection via an internal or external* UMTS modem (see *7.4.1 Internet Modem Setup*).

7.4.1 Settings Modem

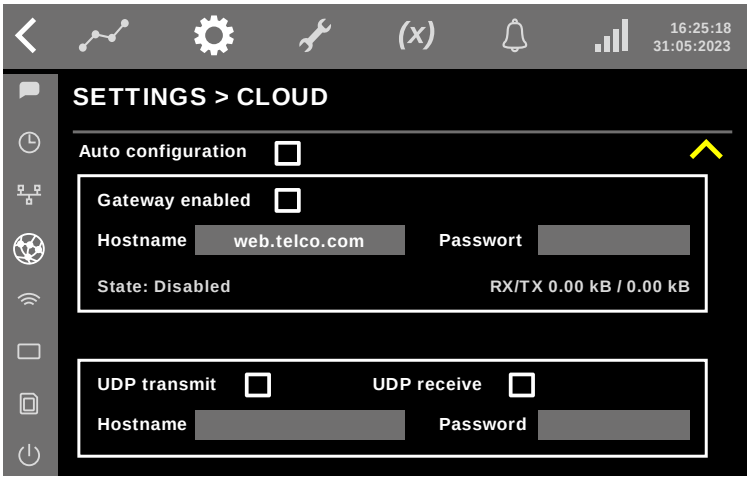


Switches back to the Selection Display.

Enable	Enables and disables the modem connection.
APN	Switches to the input of the **Access Point Name**. The current setting is displayed.
PIN	Switches to the input of the PIN number of a modem. **Note on a possible operation error:** When starting a BlueBox for the first time, the SIM card must be deactivated to avoid a PIN error.
User	Switches to the input of the Username (Login name). The current setting is displayed.
Password	Switches to the input of the Password (Login password)
SMS send	Enables and disables the SMS sending.
SMS receive	Enables and disables the SMS receiving.

* External modems are not supported by GO Systemelektronik.

7.4.2 Settings Cloud



Switches back to the Selection Display.

Auto configuration Enables and disables the auto configuration.

Gateway enabled Enables and disables the auto configuration.
The current setting is displayed.

Hostname Switches to the input of the Hostname.

Password Switches to the input of the Gateway Password.

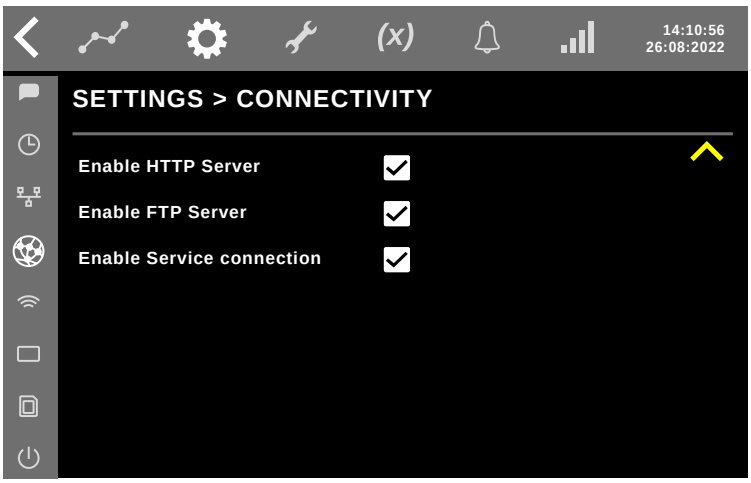
UDP transmit
UDP receive Enables and disables UDP transmitting and receiving.
The UDP* settings are necessary for the transmission of measurement data from and to a PC (e.g. for the online data service BlueGate).

Hostname Here you can enter the IP address of the destination computer in the Internet, to which the measuring data is transmitted. The UDP protocol via port 14112 is used for the transmission. The current IP address is displayed.
If an access to the BlueGate server has been ordered from GO Systemelektronik, the IP address is set to the standard address 212.51.30.18 on delivery of the BlueBox.

Password Switches to the input of the encryption password.
! Only enter the encryption password if GO Systemelektronik requires you to do so.

* UDP = User Datagram Protocol

7.4.3 Settings Connectivity



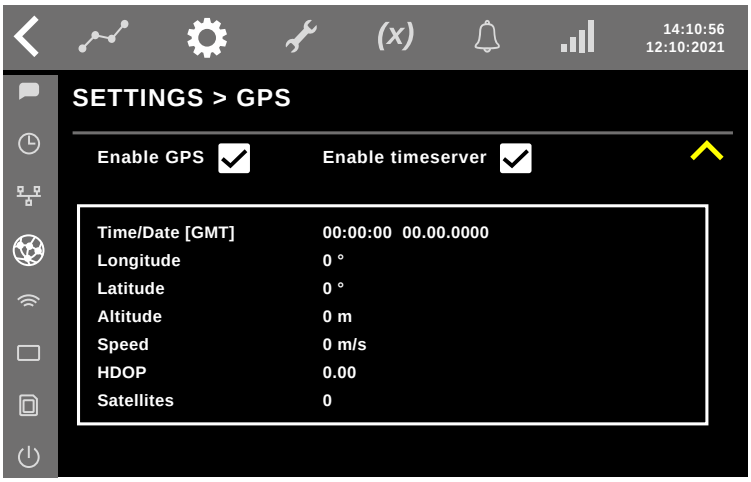
Switches back to the Selection Display.

Enable HTTP Server ☑ Enables and disables the HTTP Server.

Enable FTP Server ☑ Enables and disables the FTP Server.

Enable Service connection ☑ Enables and disables the extended debug functionality.
Default setting: Disabled
Only enable the extended debug functionality if GO Systemelektronik requires you to do so. **Do not forget to switch it back.**

7.4.4 Settings GPS

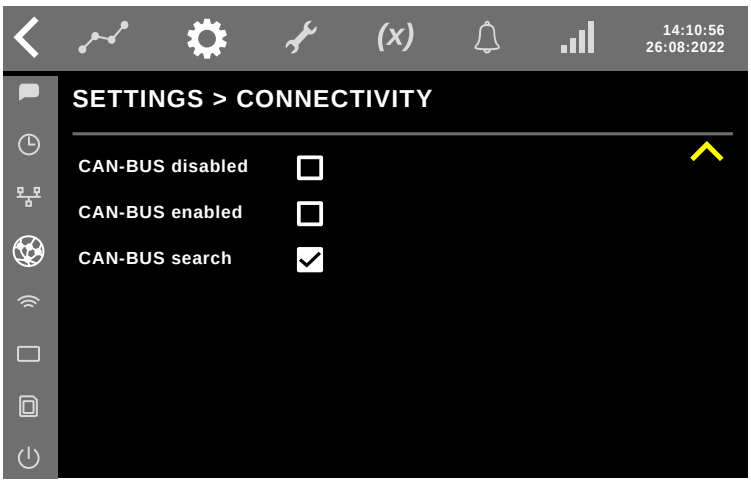


Switches back to the Selection Display.

Enable GPS ☑ Enables and disables the GPS functions.
If enabled, the GPS data is displayed below.

Enable timeserver ☑ The GPS time is used as time signal.

7.4.5 Settings CAN bus



Switches back to the Selection Display.

Radio buttons

CAN-BUS disabled	☑	Enables and disables the CAN bus.
CAN-BUS enabled	☑	Enables the CAN bus.
CAN-BUS search	☑	Searches for connected CAN bus devices.

Background: When the BlueBox boots with <CAN-BUS enabled>, the system first searches for sensors/actuators on CAN bus modules. If nothing is found here, the system stops the boot procedure and an error message occurs. Other sensors (internal sensors and Modbus sensors) are not recognised.

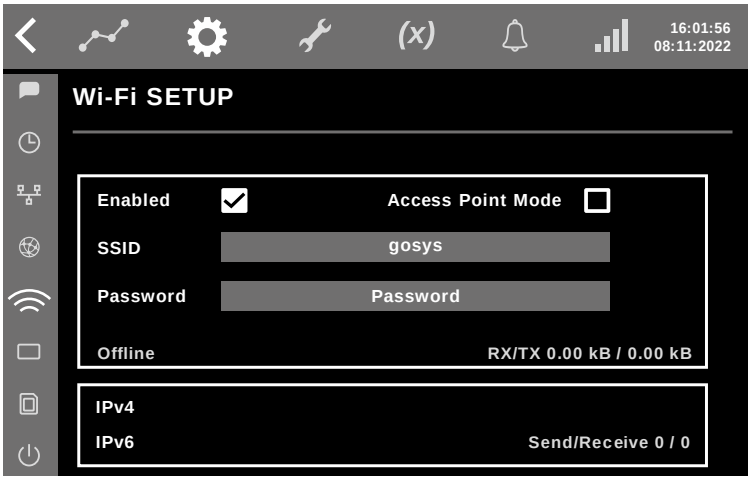
When there are no CAN bus modules at the BlueBox, there are two suitable settings here.

1. <CAN-BUS disabled> Disables the CAN bus, then the search does not take place and other sensors are recognised.
2. <CAN-BUS search> Enables the non-mandatory CAN bus search, then the search continues after no CAN bus module has been detected.

The first setting has the advantage that the BlueBox starts approx. 10 seconds faster.
The second setting has the advantage that CAN bus sensors connected later are recognised immediately.

In case of doubt, choose <CAN-BUS search>.

7.5 Wi-Fi Setup

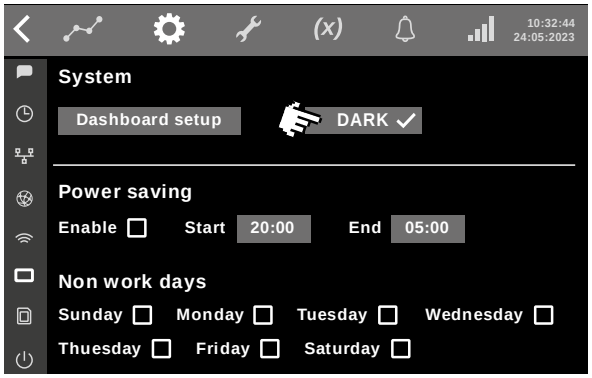


Enabled	Enables and disables the Wi-Fi connection.
Access Point Mode	Enables and disables the Access Point Mode.
SSID	Switches to the entry of the wireless network name. The current setting is displayed.
Password	Switches to the input of the wireless network password. The current setting is displayed. **The password must have at least 8 characters. If not, an error message occurs.**
Offline IPv4 IPv6	Connection status information

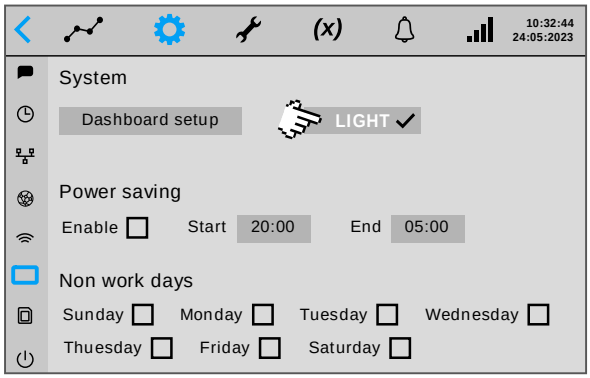
7.6 Parameter Display Functions

see also *6 Parameter Display*

7.6.1 Display Colours and Power Saving



Display Colours Dark



Display Colours Light

Here you can change the display colours with the DARK⇔LIGHT Button, the Button is also a status indicator.
The power saving function enables you, to limit the display operating day time and the display operating days.

7.6.2 Dashboard Setup Display

There are five View Types of a Parameter Display:

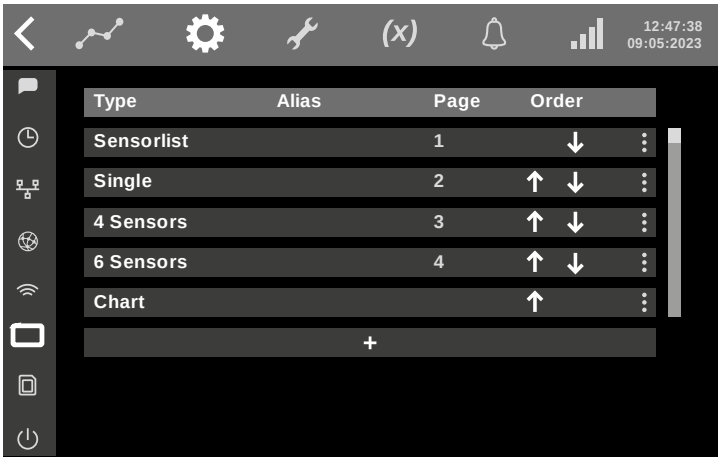
- Sensor list — List View of selected sensors
- Single Sensor — Single Sensor View of a selected sensor
- 4 Sensors (tiles) — 4 Sensors View of selected sensors
- 6 Sensors (tiles) — 6 Sensors View of selected sensors
- Single Sensor Chart — Single Sensor Chart View of a selected sensor[1]

The Parameter Display in list view in alphabetical[2] order is the factory default start display.

The displayed sensors and actuators as well as the single view type and the sequence of the view types are defined via the Dashboard Configuration Display. see 7.6.3 below

ⓘ You can reset the parameter display to the factory setting. see *7.7 Back-Up / Reset*

ⓘ You can export the current setting as part of the configuration back-up and then import it again. see *7.7 Back-Up / Reset*

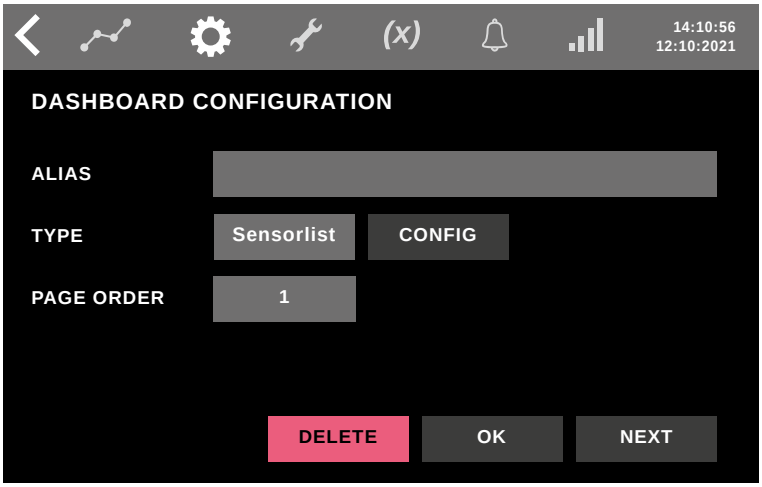


Type	List of the view types of the current Parameter Display
Alias	Alias name of a view type
Page	Position in the appearance order
Order	↑↓ Moves the corresponding view type up or down one column.
⋮	Switches to Dashboard Configuration Display. see 7.6.1 below
+	Switches to the Select Dashboard Type Display. see 7.6.2 below

[1] max. 30 Chart Views at one BlueBox
[2] The sequence is that of the ASCII numeric value, i. e.: Special characters ⇨ numbers ⇨ capital letters ⇨ lower case letters

7.6.3 Dashboard Configuration Display

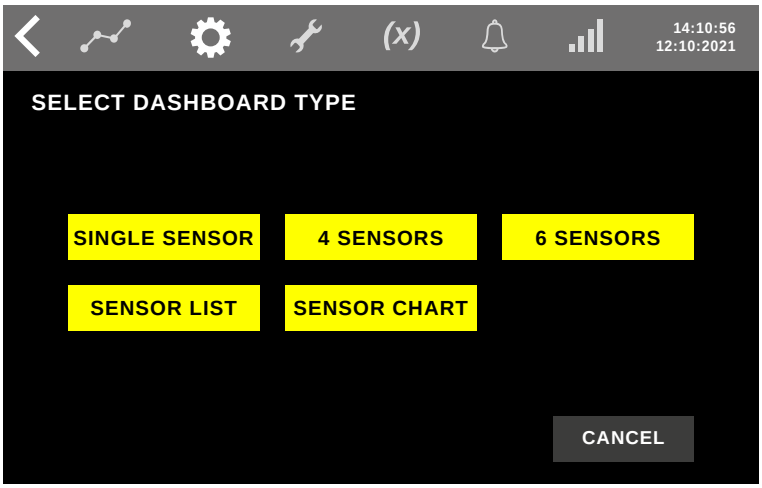
This function display allows you to assign a name to a parameter display, to define the view type, the displayed sensors and the display sequence, as well as to delete the parameter display.



☞ Tap on a red or grey rectangle.

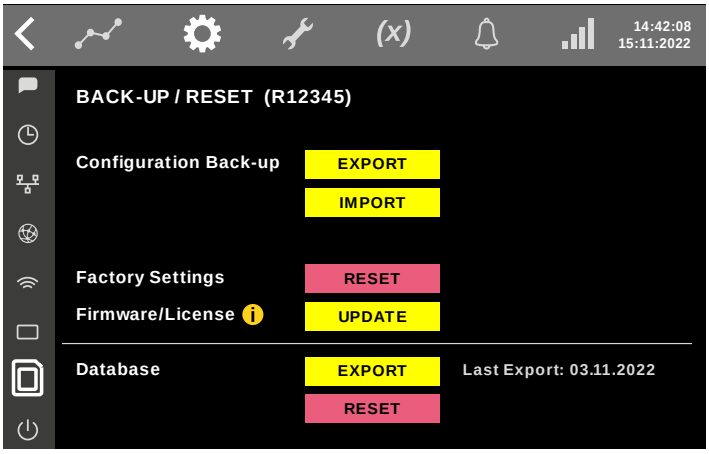
ALIAS	Switches to the input of a name for the view type.
TYPE	Switches to the input of the view type. see 7.6.2 below The button is also a status indicator.
CONFIG	Switches to the settings of the current parameter display.
PAGE ORDER	Switches to the input of the Position in the appearance order.
DELETE	Deletes the Parameter Display after a prompt.
OK	Saves the settings.
NEXT	Switches to the configuration display of the next Parameter Display, if existing.

7.6.4 Select Dashboard Type Display



Here you have 5 yellow buttons for the 5 Parameter Display View Types. Tapping on one of these buttons will define the view type and opens the Sensor Allocation Table Display of the current Parameter Display. Tapping on the CANCEL button switches back to the Parameter Display Functions.

7.7 Back-Up / Reset



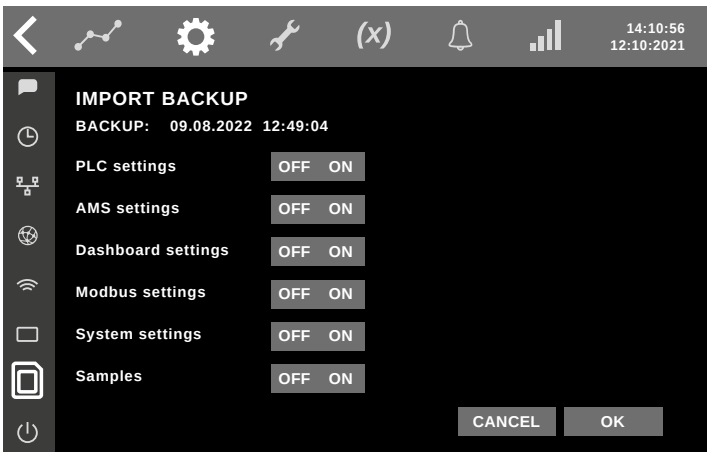
Tap on a yellow or red rectangle.

Configuration Back-up

EXPORT The export function stores all configuration settings (all but measurement data and spectra) into a bsb[1]-file on the first level of a connected USB stick[2].

IMPORT The import function loads the Configuration Back-up from a bsb[1]-file on the first level of a connected USB stick[2].

A selection list with date and time of the bsb-files on the USB stick appears, select a bsb-file. A selection display appears.



Here you can select the types of configuration data that will be imported.

Samples mean the reference measurements of a spectrometer.

Factory Settings

RESET Resets, after a confirmation, the BlueBox to the factory settings.

Firmware/ License

Tap on opens the Firmware Info Display

Via the Firmware Info Display you get information about the current firmware version and the license conditions.

UPDATE opens a function display with buttons:

Check for new Firmware The BlueBox searches in the Internet for a new firmware version.

Check for new License The BlueBox searches in the Internet for a new license.

Precondition is an active Internet connection.

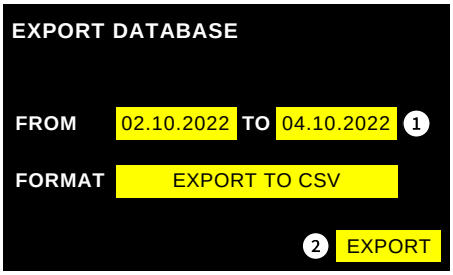
Update from USB flash drive The BlueBox searches on a connected USB stick[2].
For more information contact GO Systemelektronik.

Never interrupt the power supply during the update process.

[1] **B**lueBox **S**ystem **B**ackup
[2] strictly speaking: USB storage device

Database

EXPORT — Opens a function display. The function transfers measurement data and the system log as csv-files to a connected USB stick. ⓘ The USB stick must be formatted in FAT/FAT32.

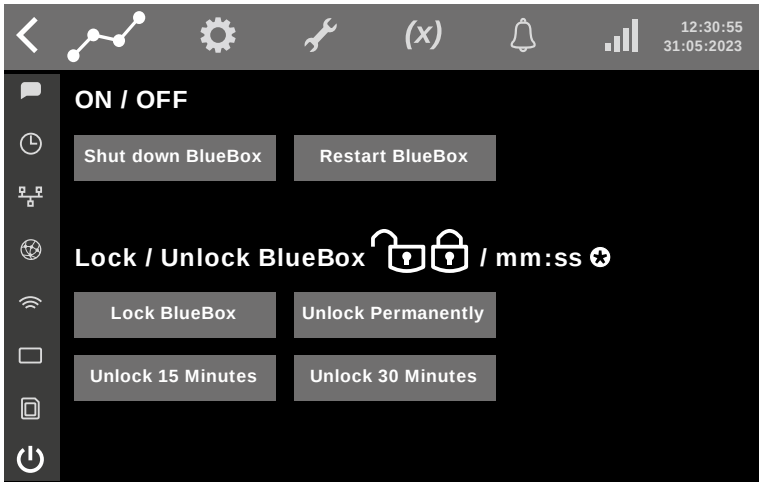


① Select a time range. Data that had been recorded during this period will be exported.

② Starts the Export function. The function creates a folder "database*" on the first level, in this folder there is the data folder with the name of the BlueBox CAN-ID. Thereafter the Ready button appears, tapping on it switches back to the previous display.

RESET — Deletes - after a confirmation - all measurement data on the BlueBox.

7.8 Shutdown – Restart – Lock – Unlock




unlocked


locked

Shut down BlueBox	BlueBox – Shutdown
Restart BlueBox	BlueBox – Shutdown and restart

In the default setting, the BlueBox is locked, i.e. you have to enter the PIN code of the BlueBox to make certain settings. If you have entered the PIN-Code, the BlueBox is unlocked for 15 Seconds.

Lock BlueBox	PIN-Code needed (Default setting after BlueBox start)
Unlock Permanently	PIN-Code not needed — Unlocked Permanently The Button is also a status indicator – "unlocked" is marked yellow. ❗ The BlueBox remains unlocked beyond a restart.
Unlock 15 Minutes	PIN-Code not needed for 15 minutes ⇨ countdown ⊛
Unlock 30 Minutes	PIN-Code not needed for 30 minutes ⇨ countdown ⊛

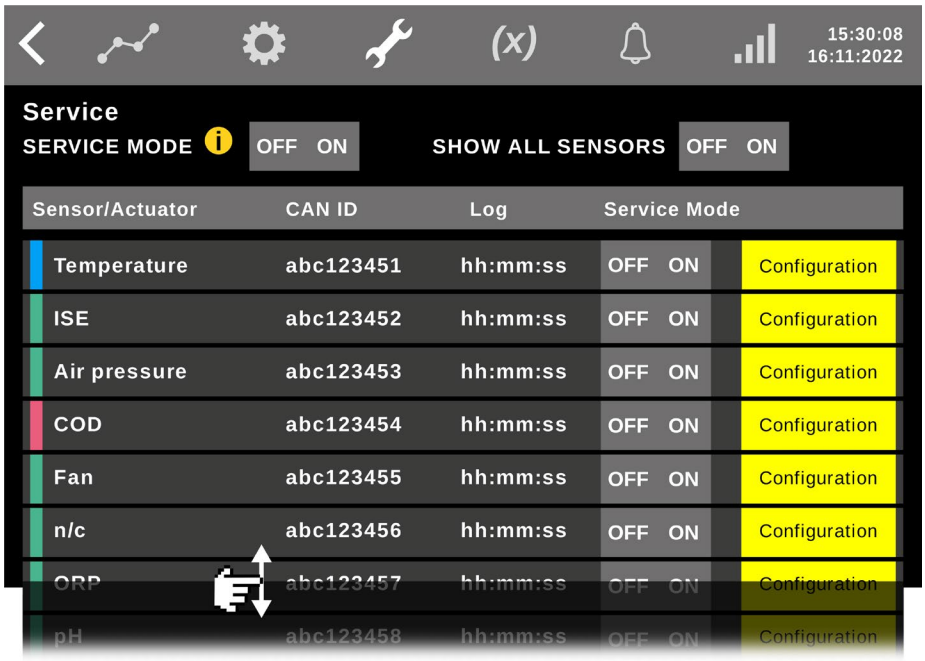
* if not already existing

8 Service Display (Maintenance)

In this display you can handle the service mode. The service mode deactivates automatic cleaning, data output and alarm notifications. Measurement data recorded during Service Mode is marked.
The service mode is useful for system maintenance, it suppresses the recording of measurement-irrelevant maintenance data.

Status messages are not displayed, but are marked in colour here. see *Appendix B – Status Messages*
| green ⇨ Status No. 0 | orange ⇨ Status No. 4, 50, 51 | yellow ⇨ Status No. 57 |
| **blue** ⇨ **Service Mode** | red ⇨ all others |

The Parameter Display in list view in order of the CAN ID.
The CAN ID of a sensor/actuator[1] is uniquely defined (factory preset) for each sensor/actuator. It consists of the CAN ID of the sensor module[2] (see *3 Connectable Modules and Sensors*) plus one digit (sensor number).
CAN ID sensor module[2] = 3 letters + 5 digits, uniquely defined uniquely for each module, factory preset



Opens an info field at the upper right side of the function display.

Info field X **X** closes the Info field.

SERVICE MODE OFF ON Deactivates/Activates the common Service Mode.

SHOW ALL SENSORS OFF ON Deactivates/Activates the listing off not active sensors.
A not active sensor is set to the sensor name ***n/c*** (not connected).
The measurement values of a not active sensor are neither recorded nor saved.

Sensor/Actuator Current sensors and actuators

CAN ID Sensor/Actuator CAN ID:
Sensor-ID = CAN-ID + sensor number (uniquely defined for each sensor, factory preset)

Log Time of the last measurement

Service Mode OFF ON Activates/Deactivates the single Service Mode.

Configuration Opens a selection display for general settings and data processing.
As an example see *6.2 Sensor Service Selection Display*.

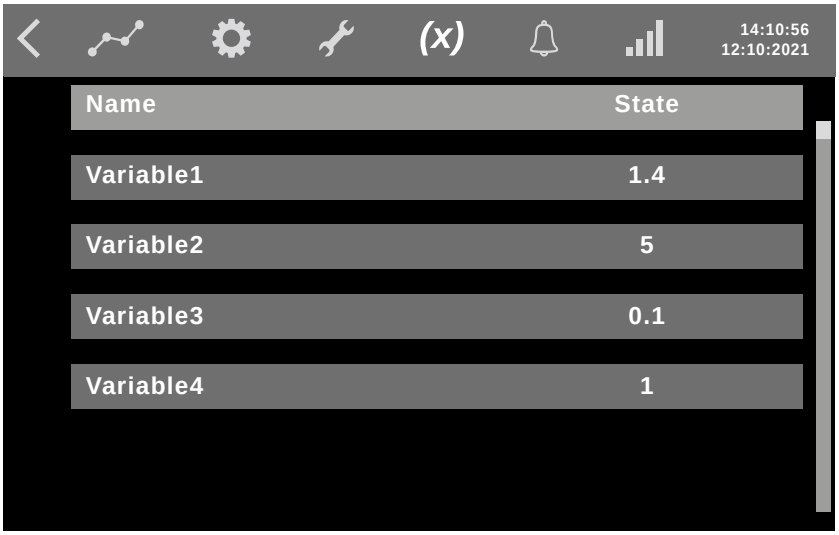
[1] also called Sensor/Actuator identification number
[2] also called DAM ID

9 User Variables Display

At BlueBox adjustable permanently stored variables (user variables) are defined in AMS Formula by a preceding dollar sign (example: $Name) and are changeable on the BlueBox display.
The $ sign is not displayed in the touch screen operation.

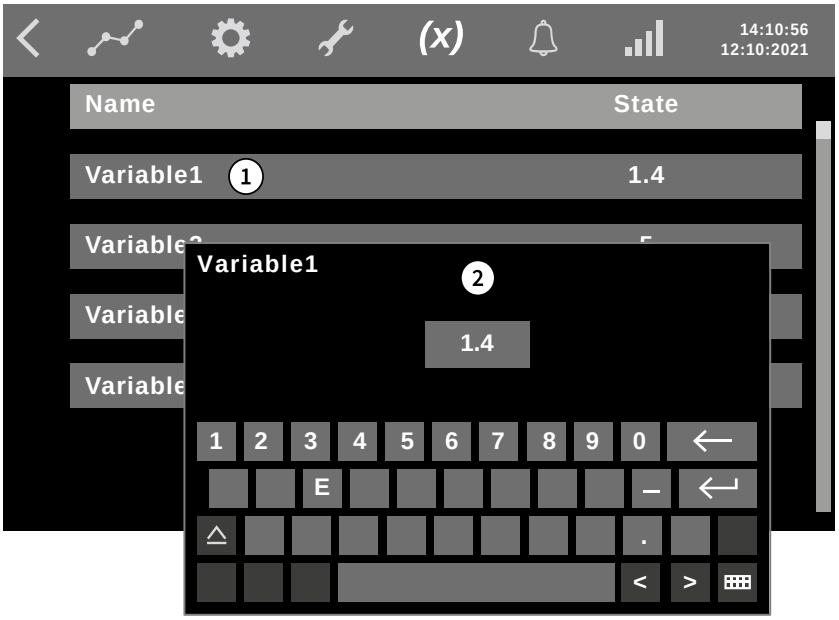
see *Manual PC Software* there *5.5.2 Variables*

Call up the User Variable List on the Display of the BlueBox with tap on the user variable list symbol ***(x)***.
The user variable list appears:



9.1 Changing a User Variable Value

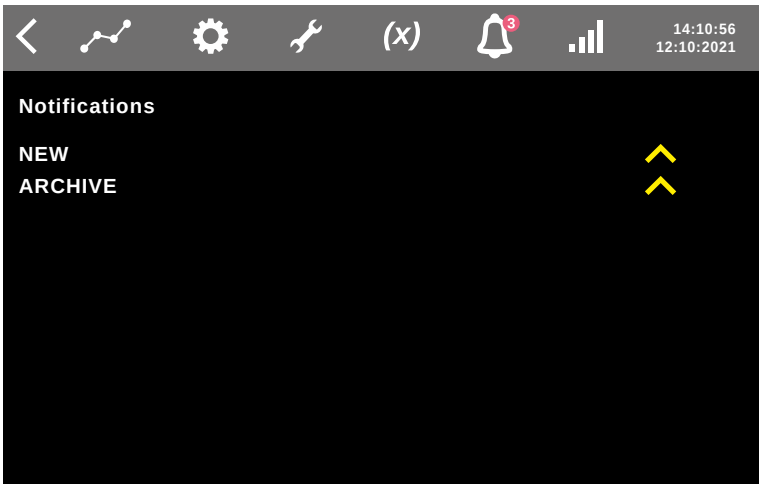
(1) Tap the bar of a user variable. (2) The input display of the selected user variable appears.



- ⇧ no function here
- Deletes the last entered character. ←
- Saves the entry. ↵
- One character back/forward **< >**
- Tap the keyboard-symbol to return to the previous display. ⌨

10 Notifications

3 Displays the number of new notifications.



Switches to the corresponding Display.

NEW	List of new notifications
ARCHIVE	List of old notifications

11 Sensor Calibration

General information on sensor calibration: How a sensor is calibrated depends, of course, on the properties of the respective sensor and the measurement conditions. Calibrating[1] is carried out for sensors on the CAN bus via the display operation on the BlueBox or with the AMS program as part of the BlueBox PC Software[2]. The result is a calibration polynomial of nth degree. The calibration polynomial can also be entered or changed directly with AMS, but usually the calibration polynomial is automatically generated after comparison with calibration measurements at certain measuring points. A calibration measurement value is the moving average of the measurement value from the last 15 seconds[3]. The calibration is stored in the respective sensor module.

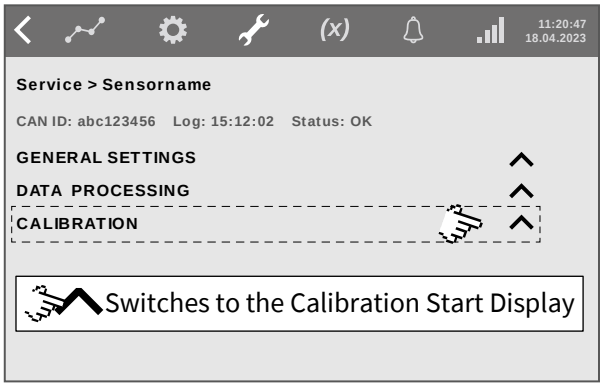
[1] Strictly speaking, the sensor is already pre-calibrated at the sensor module.
[2] For sensors on BlueConnect Modules with Modbus connection, calibration is also possible with the Modbus Tool.exe program.
[3] Strictly speaking, these are the last 15 measurement values, but since all connected sensors (strictly speaking all but the ISA spectrometer) are automatically set to a measurement interval of one second during calibration, it's the moving average of the last 15 seconds.

A supplement to the sensor calibration is the creation of a table with measurement values and reference values. see *11.3 Reference Values Measurement*

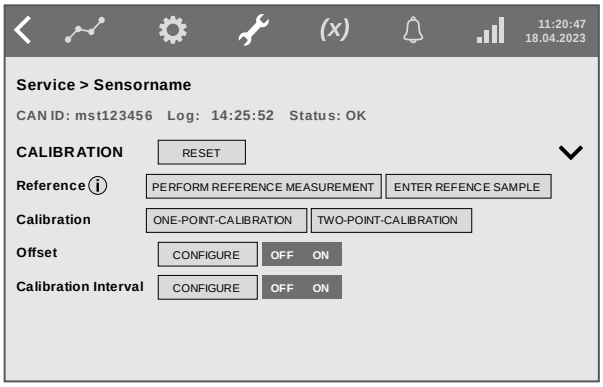
There are four kinds of calibration sequences: the **Standard One-Point/Two-Point/Multi-Point Calibration**, the **pH Calibration**, the **Oxygen Calibration** and the **Spectrometer Calibration**[1].
Depending on the type of sensor, one or more of these calibrations are offered.

Call-up Standard One-Point/Two-Point Calibration

Configuration 8 Service Display (Maintenance) at the row of the sensor.[2]



Sensor Service Selection Display



Calibration Start Display

It is also possible to call-up the calibration displays via the Parameter Display. see *6 Parameter Display*

ONE-POINT-CALIBRATION
TWO-POINT-CALIBRATION
Leads to a guided calibration sequence with one or two calibration points.

Offset CONFIGURE Switches to the entry of an Offset value.
The entered value is added to the measurement value.

Calibration Interval CONFIGURE Switches to the Input of a calibration interval in days. When this interval is exceeded, the Sensor Status is set to 57[3] and an entry is set in the List of new Notifications[4].

Disables and Enables the Offset and the Calibration Interval function.
The button is also a status indicator. OFF ON

[1] The Spectrometer Calibration is described in the *Manual ISA and Process Spectrometer Commissioning – Maintenance –Service*.
[2] It is also possible to call-up the calibration displays via the Parameter Display. see *6 Parameter Display*
[3] see *Appendix B – Status Messages*
[4] *see 10 Notifications*

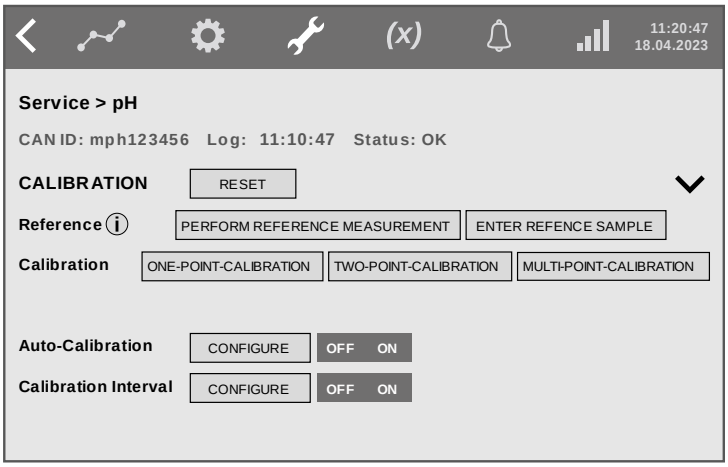
11.1 Calibrating a pH Sensor

Example two-point calibration electrochemical pH sensor

The pH sensor is an electrochemical sensor. To function properly, electrochemical sensors have to be recalibrated in regular intervals. This is best done weekly, but at least monthly.
As a reference you need two calibration fluids (buffers) with different pH values, e.g. pH 4 and pH 7.
Temperature compensation is done automatically when a temperature sensor is connected and the parameter unit is C° and the sensor name starts with "temperatur" (not case sensitive).[1]
The BlueBox calculates the calibration curve.
The calibration fluids (buffers) are available as accessories under the article no. 418 400X from GO.
In addition, you need clean tap water for rinsing of the electrodes between the calibration steps.

11.1.1 Calibration pH Start Display

Service > Calibration



Switches back to the Selection Display.

Switches back to the Selection Display.

Tap on a yellow or grey rectangle.

CAN ID: CAN ID of the sensor | **Log:** Time of the last **recorded**[2] measurement | **Status:** Sensor status

RESET Switches to the selection between two standard calibrations.

CALIBRATION RESET mV
mV calibration
Measurement value in mV
Offset = 0 | Slope = 1
Switches back to the Calibration menu pH sensor.

CALIBRATION RESET default pH
default pH calibration
Measurement value in pH
7 pH ≙ 0 mV | Slope = -59.16 mV/pH unit
Switches back to the Calibration menu pH sensor.

SET CALIBRTION TO **mV** or **DEFAULT pH** with tap on YES YES NO

Reference PERFORM REFERENCE MEASUREMENT ENTER REFERENCE SAMPLE
see *11.3 Reference Value Measurement*

Calibration Leads to a guided calibration sequence with one, two or three calibration points.
In the example at the next page, the 2-point calibration is carried out.
So tap on TWO-POINT-CALIBRATION

Offset CONFIGURE Switches to the entry of an Offset value.
The entered value is added to the measurement value.

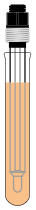
Calibration Interval CONFIGURE Switches to the Input of a calibration interval in days. When this interval is exceeded, the Sensor Status is set to 57[3] and an entry is set in the List of new Notifications[4].

Disables and Enables the Offset and the Calibration Interval function. OFF ON
The button is also a status indicator.

[1] Search sequence by Sensor ID, first before then after the Sensor ID of the pH sensor.
[2] During a guided calibration, measurement data is only recorded for calibration purposes and is not stored.
[3] see *Appendix B – Status Messages*
[4] *see 10 Notifications*

11.1.2 Guided Two-Point Calibration

Here, as an example, is the guided Two-Point calibration of a pH sensor.
Before immersing the pH sensor in a buffer solution, rinse the electrode in clean tap water.



During a buffer measurement almost the entire glass shaft of the sensor must be in the buffer solution.

Tap on TWO-POINT-CALIBRATION

Step 1 Checklist Here you have an optional selection of buffer solutions:

GO Systemelektronik OFF ON Technical buffer solutions of GO Systemelektronik

NIST / DIN OFF ON Laboratory buffer solutions / Calibration according to NIST/DIN NEXT

Step 2 Information Service Mode NEXT

Rinse the electrode in clean tap water before immersing the pH sensor in buffer solution 1.

Step 3 Measurement in Buffer Solution 1
The current raw value and the temperature of the buffer solution 1 are displayed.
You have to wait until the measurement value is stable. NEXT

Step 4 Input Reference Value Buffer Solution 1 Enter the pH value of buffer 1 as first Reference Value.
When buffer solutions are selected in Step 1, the reference value input is determined automatically.
NEXT

Rinse the electrode in clean tap water before immersing the pH sensor in buffer solution 2.

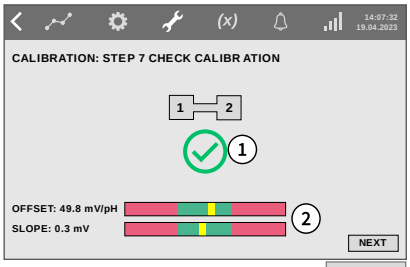
Step 5 Measurement in Buffer Solution 2
The current raw value and the temperature of the buffer solution 2 are displayed.
You have to wait until the measurement value is stable. NEXT

Step 6 Input Reference Value Buffer Solution 2 Enter the pH value of buffer 2 as second Reference Value.
When buffer solutions are selected in Step 1, the reference value input is determined automatically. NEXT

Step 7 Check Calibration

(1) If there is a ⊗, the calibration is not successful.
If there is a ✓, the calibration is successful.

(2) The result of the calibration is displayed in values and graphically.
The yellow pointers must be in the green area.
If during the calibration procedure the permissible range of values has been exceeded, this is displayed with “inf” or “-inf”.
If undefined values were entered during the calibration procedure, this is displayed with “nan”.



NEXT

Step 8 Check Calibration The current measurement value is displayed.

The calibration is completed.

End Service Mode? NO YES

11.2 Calibrating a Galvanic Oxygen Sensor

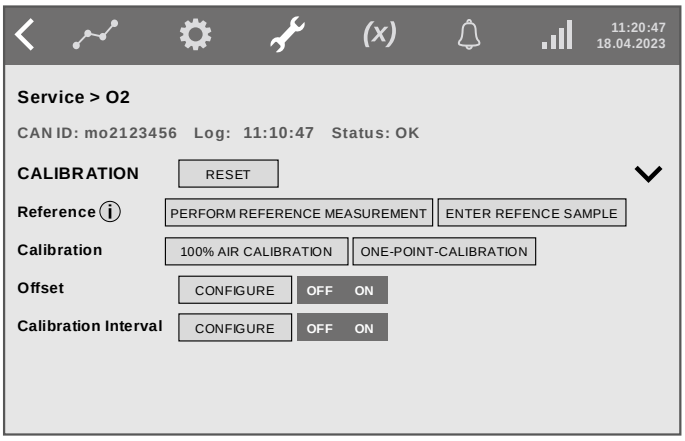
The galvanic oxygen sensor is an electrochemical sensor. To function properly, electrochemical sensors have to be recalibrated at regular intervals. This is best done weekly, but at least monthly.

There are three ways of calibrating a galvanic oxygen sensor.

1. **Saturation calibration – Calibration in air**
2. **Reference calibration – Calibration with a reference measuring instrument**

11.2.1 Calibration O2 Start Display

Service > Calibration



Switches back to the Selection Display.

Switches back to the Selection Display.

Tap on a yellow or grey rectangle.

CAN ID: CAN ID of the sensor | **Log:** Time of the last **recorded**[1] measurement | **Status:** Sensor status

Reference PERFORM REFERENCE MEASUREMENT | ENTER REFERENCE SAMPLE

11.3 Reference Value Measurement

Calibration 100% AIR CALIBRATION — Leads to a guided 100 % Saturation Calibration in Air[2].

ONE-POINT-CALIBRATION — Leads to a guided One-Point Calibration with a reference measuring instrument.

Offset CONFIGURE — Switches to the entry of an Offset value. The entered value is added to the measurement value.

Calibration Interval CONFIGURE — Switches to the Input of a calibration interval in days. When this interval is exceeded, the Sensor Status is set to 57. see *Appendix B – Status Messages.*

Disables and Enables the Offset and the Calibration Interval function. The button is also a status indicator. OFF ON

[1] During a guided calibration, measurement data is only recorded for calibration purposes and is not stored.

[2] The galvanic cell for oxygen measurement is located at the bottom of the sensor body, the temperature sensor is near the center. Therefore, a saturation calibration in the air can only be carried out when the entire sensor body has reached the temperature of the ambient air. The larger the difference in temperature between the measuring medium and the ambient air, the greater the time required for a temperature adjustment (30 minutes or more, if applicable). The temperature adjustment can be accelerated by immersing the sensor in water, which has approximately the temperature of the ambient air, before per forming the saturation calibration.
Moreover, abrupt temperature changes (e.g., by direct exposure to the sun) must be avoided.

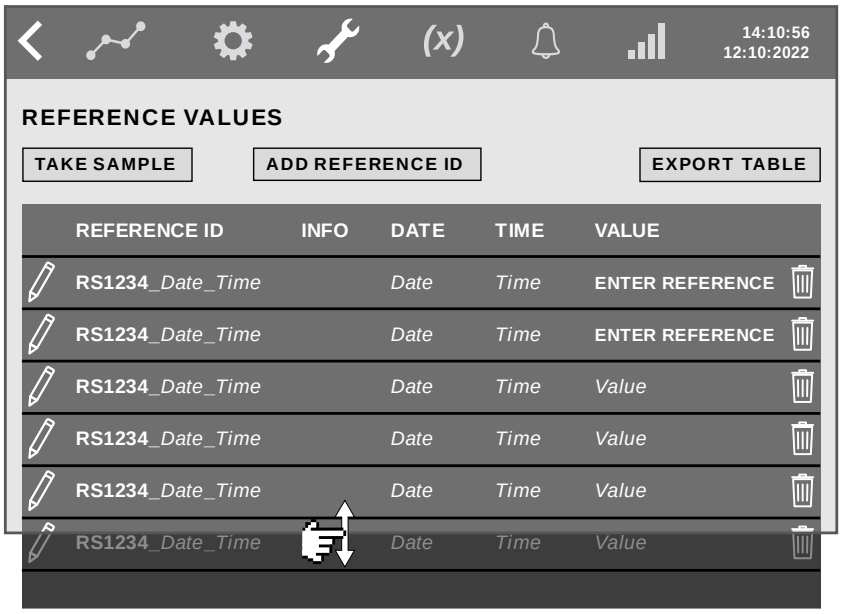
11.3 Reference Value Measurement

For a parameter calibration, it may be necessary to take reference values from chemical laboratory analyses and the respective associated measurement values for the parameter to be measured. A measurement value plus the corresponding reference value is called reference value pair. This pairs are stored in the Reference Values List. For more information contact GO Systemelektronik.

PERFORM REFERENCE MEASUREMENT Sensor Calibration Start Display

The Display of the Reference Values List appears.

Switches back to the Calibration Display.



TAKE SAMPLE Performs a Reference Measurement.

ADD REFERENCE ID Switches to the input of a Reference ID.

EXPORT TABLE Exports the Reference Values Table as csv file and as json file to a connected USB stick.

Switches to the Reference Value Display of the corresponding Reference Value.

ENTER REFERENCE Switches to the input of a Reference Value.

Deletes the corresponding Reference Value.

12 The Blue Box Web Interface

Enter the IP address of the BlueBox into the URL address bar of your browser.

Example[1]: http://192.168.1.167 or https://192.168.1.167

The https address is preferable, as here the password is transmitted in encrypted form; however, your browser will prompt you to release the access.

The login field of the BlueBox Web Interface opens. The standard username is ***bluebox***. Your password is the network password of the BlueBox, see *Appendix A – The Configuration Data Sheet* there *2. Network* there *Password*. After the login the sensor table appears:

BlueBox live data

Sensor	Date / Time	Value	
Air Pressure	9.5.2023 16:13:32	1011.46 hPa	
Redox	9.5.2023 16:12:40	93 mV	
Temperature	9.5.2023 16:12:14	18.7 °C	

If there is a GPS function, Latitude and Longitude are displayed in the fourth and fifth column.

The sensor table is in alphabetical[2] order of the sensor names. The sensor table shows the connected sensors, the time of the last recording of a measurement value and the measurement value.

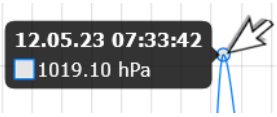
The BlueBox transmits the time as Coordinated Universal Time (UTC). Your browser converts UTC to the browser's time zone.

Intensity	.....	0	

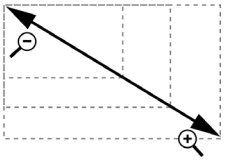
Connected sensors that have not yet recorded a measurement value are marked in red.

Click on opens the diagram display of the measurement values. Here you can select the sensor and the time range of the display.

The Cursor on a measurement point opens an info tag.



You can zoom the view in and out by drawing a rectangle to the right or to the left with the mouse while pushing the left mouse button.



[1] 192.168.1.167 is the default IP address at delivery

[2] The sequence is that of the ASCII numeric value, i. e. special characters ⇨ numbers ⇨ capital letters ⇨ lower case letters

Appendix A – The Configuration Data Sheet

The configuration data sheet contains the necessary settings to run the BlueBox.

Example BlueBox R1:

Configuration Data Sheet

Product: BlueBox

Page: 1/1

Date: 2022-07-04

1. BlueBox R1:

Serial Number	R11234
Display PIN	xxx
Storage Device	8 GB

2. Network:

IP Address	192.168.1.167
Netmask [CDIR]	24
Gateway	0.0.0.0
Port	14111
Login Name	bluebox
Password	xxx

3. Hardware

LAN MAC-Address	xx-xx-xx-xx-xx-xx
WLAN MAC-Address	xx-xx-xx-xx-xx-xx

4. BlueBox BlueGate Settings:

Host	bluegate.go-sys.de
Password BlueGate	xxx

5. BlueBox PC Software - BlueGate Settings:

Host	datagateway.go-sys.de
Username	xxx
Password Windows	xxx

This document contains confidential information.

© GO Systemelektronik GmbH

Faluner Weg 1 D 24109 Kiel Telephone: +49 431 58080-0 Fax: +49 431 58080-11 Internet: www.go-sys.de

1. BlueBox R1:

Serial Number	R11234
BlueBox Password (PIN)	xxx
Storage Device	8 GB

Serial Number

Serial number of the BlueBox
With this serial number the BlueBox is identified by the BlueBox PC Software.
⇨ set at the factory, not changeable

BlueBox Password (PIN)

Password of the BlueBox
Is required to change the BlueBox system settings.
⇨ set at the factory, not changeable

Storage Device

Size of the internal BlueBox memory, here 8 GB
⇨ set at the factory, changeable by replacing

2. Network:

IP Address	192.168.1.167
Netmask [CDIR]	24
Gateway	0.0.0.0
Port	14111
Login Name	bluebox
Password	xxxxx

IP Address IP address of the BlueBox
At this address, the BlueBox is addressed on the network.
⇨ set at the factory, changeable

Netmask [CDIR] Netmask of the BlueBox
⇨ set at the factory, changeable

Gateway Standard gateway of the BlueBox
⇨ set at the factory, changeable

Port Default gateway of the Blue Box
⇨ set at the factory, not changeable

Login Name User name for a modem connection
⇨ set at the factory, not changeable

Password Network password of the BlueBox
Is needed to access the BlueBox via the AMS software.
⇨ set at the factory, not changeable

3. Hardware:

LAN MAC-Address	xx-xx-xx-xx-xx-xx
WLAN MAC-Address	xx-xx-xx-xx-xx-xx

LAN MAC-Address ⇨ set at the factory, not changeable

WLAN MAC-Address ⇨ set at the factory, not changeable

4. BlueBox BlueGate Settings:

IP Address	bluegate.go-sys.de[1]
Password BlueGate	xxxxx

IP Address IP address of an Internet Gateway
⇨ can be configured at the factory, changeable [2]

Password BlueGate Password of an Internet Gateway
⇨ can be configured at the factory, changeable

5. BlueBox PC Software – BlueGate Settings:

Host	datagateway.go-sys.de[1]
Username	xxxxx
Password Windows	xxxxx

If the BlueBox is accessed via a gateway (e.g. with an UMTS connection), you have to enter these access data in the BlueBox SQL Software.

[1] default address of GO Systemelektronik
[2] changeable only at the default address

Appendix B – Status Messages

Status no.	Description	Colour
0	Sensor sends data.	green
1	Sensor sends no data.	red
2	A new sensor is recognized. (temporary at sensor initialization)	red
3	Sensor-ID assigning. (temporary at sensor initialization)	red
4	Measurement value is unreliable. (currently only for spectrometers)	orange
30	Formula error	red
31	Unknown sensor is used in the formula.	red
33	Default calculation time in for and while loops is exceeded.	red
50	Minimal measurement value underrun *	orange
51	Maximal measurement value overrun *	orange
52	Internal communication error	red
53	Underrun of the lower limit of the AD converter	red
54	Overrun of the upper limit of the AD converter	red
55	General device error	red
57	Calibration interval exceeded	yellow
60	Sensor service mode	blue

The entries in this column can be queried using AMS Formula.

In the Parameter Display (see *6 The Parameter Display*) and the Service Display List (see *8 Service Display*) the status messages are not displayed, but are marked in colour:

| green ⇨ Status No. 0 | orange ⇨ Status No. 4, 50, 51 | yellow ⇨ Status No. 57 |
| blue ⇨ Status No. 60 | red ⇨ all others |

* At underrun: the measurement value in the Parameter Display is marked by a **<**
At overrun: the measurement value in the Parameter Display is marked by a **>**

Manual
Commissioning of the BlueBox R1

Creation date: 9.6.2023 Version: 1.2 en

This manual is a standalone part of the *Manual BlueBox R1 and Panel* and describes the commissioning of the **BlueBox R1** of GO Systemelektronik.

A comprehensive documentation of the BlueBox system can be found on www.go-sys.de/downloads.

The products of GO Systemelektronik are constantly being developed, therefore deviations between this manual and the delivered product can result. Please understand that no legal claims can be derived from the contents of this manual.

Notes on Text References

References to passages in this document or to passages in other documents are marked in italics.
References with no document name refer to the *Manual BlueBox R1 and Panel*, of which this manual is a part.

- *7.1 Language* e.g. refers to the section 7.1 in this document. The short form is *7.1*.
- *Manual BlueBox PC Software* there *5 AMS – Advanced Managing Software* e.g. refers to the chapter 5 in the Manual BlueBox PC Software.

Table of Contents

R1Com 1 Meaning of the Safety Instructions

⚠	**Danger:** Used if non-observance threatens serious injury or death.
⚠	**Warning:** Used if non-observance threatens slight injuries or serious property damage.
⚠	**Caution:** Used if non-observance threatens minor property damage.
⚠	Used for general safety instructions.
⚠	Symbol of safety instruction relating to the use of electricity.

R1Com 2 Connecting the Power Supply

For connecting the power to the BlueBox R1 you need an external 24 VDC power supply.
see *R1Com 5.1 Technical Data BlueBox R1* there *Voltage supply* and *Power consumption BlueBox R1*

Connect the power supply to slot X06 at the BlueBox R1 mainboard.
see *R1Com 5.2.3 Mainboard PIN Assignment and Termination*

⚠	The BlueBox should only be installed by a qualified person using suitable tools. Incorrect installation can result in serious malfunction and could damage the instrument.

Please note that the power supply unit is placed close to the BlueBox because the voltage is declining with the length of the connecting cable.

⚠	Please ensure that, depending on the installation location, an appropriate power cable is used. In outdoor areas, a suitable cable must be kept that is approved for the place of use.

R1Com 3 Notes on Operation

⚠	Improper handling of electrical devices endangers man and property. Commissioning of the BlueBox should only performed by skilful, trained personnel using appropriate tools. Incorrect installation could cause serious faults and errors that may damage the device.

Keep this manual handy for future reference. Never deliver the BlueBox to other persons without this manual. The manufacturer is not liable for improper or unintended usage.

This device is designed in accordance with the Low Voltage Directive and the safety regulations for electronic measurement devices.

The trouble-free operation and reliability can only be assured if you pay attention to the generally applicable safety measures and special safety instructions in this manual.

- Before the connection of the Blue Box to the power supply make sure that the labelled BlueBox operating voltage matches the supply voltage.
- The correct functioning and operational safety of the device can only be ensured, if the ambient conditions that are specified in section *R1Com 5.1 Technical Data BlueBox R1* are complianced.
- If the device is transported from a cold to a warm environment condensation may result in a failure of the function. In this case, wait until the device temperature is at the level of the ambient temperature before a new start-up.
- Maintenance and repair work may only be performed by a specialist who is authorized by GO Systemelektronik.

If it is to be assumed that the device can no longer be operated safely, it must be put out of operation and secured with identification markings against further commissioning.

The safety may be compromised by the device if, for example, the device:

- has visible damages,
- no longer works as required,
- has been stored in improper conditions for a longer time,
- was exposed to improper transport conditions.

In cases of doubt give notice to GO Systemelektronik GmbH. If necessary, send the device to GO Systemelektronik for reparation respectively maintenance.

Earth the BlueBox. This is the only way to ensure trouble-free measurement operation.

R1Com 4 LAN Connection

To retrieve the data and communicate directly with the BlueBox, the BlueBox PC Software must be installed on your local computer (see *Manual BlueBox PC Software*).

The MDI crossover supported connection to a network is made by a RJ-45-connector at the bottom of the BlueBox (see also *R1Com 5.2.1 Housing Connections*).

Please ensure that the RJ-45-plug snaps into the socket with a click.

R1Com 5 Device Description

R1Com 5.1 Technical Data BlueBox R1

Article No. 486 00R1

Computer:	ARM Cortex-A53; 4x 1200 MHz	
	Operation system: Embedded Linux®	
	Main memory 1 GB minimum	
Storage media:	8 GB Flash minimum	
Display:	Touch screen 7″; 1280 x 800 Pixel; colour 24 bit	
	Viewing angle horizontal/vertical 85°	
Mechanical data:	Housing dimensions:	303 mm x 200[1] mm x 93 mm (L x W x H)
	Weight:	approx. 3.3 kg
	IP class (housing):	IP65
	Material:	Die-cast aluminium housing, powder coated
	Colour:	RAL 5010
Voltage supply:	Nominal voltage: 24 VDC (18 V – 28 V) [2]	Fuse protection 1.1 A Polyswitch (The CAN bus has its own fuse protection.)
Power consumption BlueBox R1:		typical 7 W
Power supply for modules via BlueBox R1 CAN bus interface:	The power supply of the BlueBox R1 CAN bus interface can be loaded with a maximum of 45 W (24 VDC; Polyswitch fuse). [3]	
Interfaces:	Housing:	1x USB
		1x Ethernet 10 Mbit/s | 100 Mbit/s (MDI crossover)
	Mainboard:	1x CAN – Fuse protection output current 1.85 A Polyswitch, recovers automatically
		1x CAN (internal DAM)
		1x RS232
		1x RS485 (half-duplex) – with 12 VDC 6 W sensor power supply

Modem and Wi-Fi optional

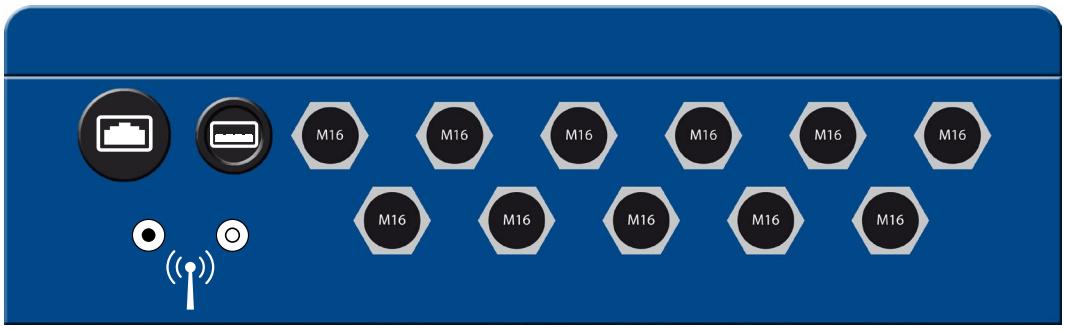
Ambient conditions:	Ambient temperature:	Storage: -10 °C to +50 °C
		Operation: -20 °C to +45 °C
		avoid direct sunlight
	Relative humidity:	≤ 90 % (annual average)

To protect the device and to ensure the proper functioning of the device, the specified ambient conditions must be strictly adhered to!

[1] with PG glands
[2] The connected CAN-bus modules receive their power from the BlueBox. Some modules have a constricted input range, so there is an input voltage tolerance of ± 10 %.
[3] CAN bus modules can also be supplied directly via a power supply unit.

R1Com 5.2 Connections BlueBox R1

R1Com 5.2.1 Housing Connections



Earth the BlueBox. This is the only way to ensure trouble-free measuring operation.
The earth connection is located on the left side of the housing.

LAN connection, see *04 LAN Connection*

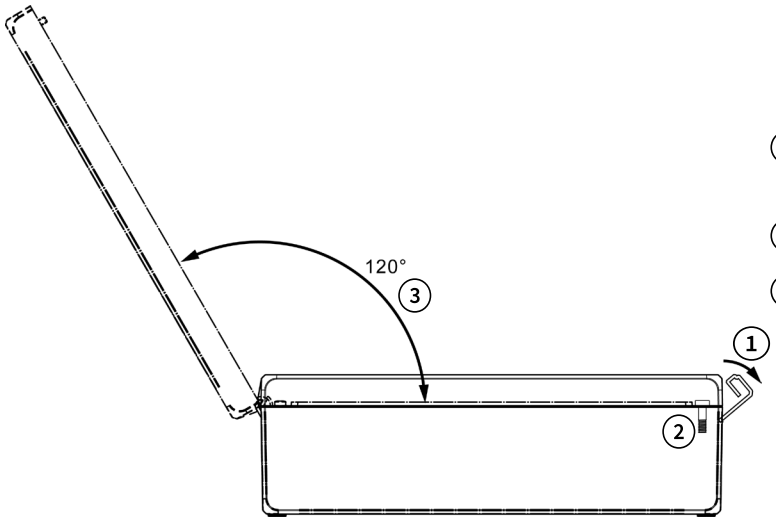
USB Connection
Please note:
The USB port at the BlueBox is designed for data export and for firmware and license update.

Antenna connections
Wi-Fi Panel plug
LTE Panel socket

In case of doubt, differentiate the antenna connectors as follows:
Panel plug = Wi-Fi Panel socket = LTE

PG glands M16
Via these glands the cables are laid to the connections on the mainboard.
Ensure proper fitting.

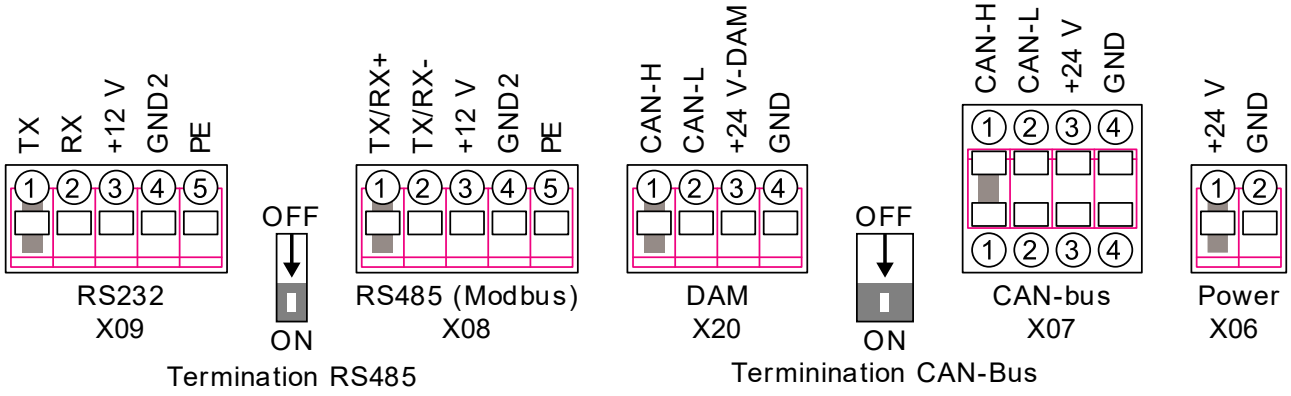
R1Com 5.2.2 Opening the Housing



1. Turn the housing bracket to the right.
   If necessary, use a suitable tool.
2. Loosen the two cover screws (Torx T20).
3. Open the housing cover to the left.

R1Com 5.2.3 Mainboard PIN Assignment and Termination

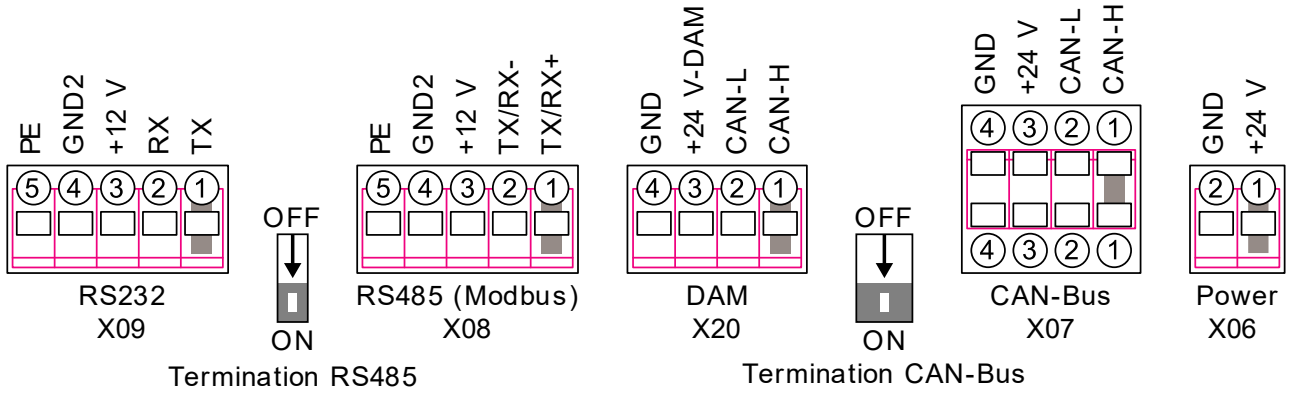
First generation mainboard



> ⓘ The difference between the first- and second-generation mainboards is that the assignment of all slots has been "rotated".
> **You can see the difference in the assignment by looking at the mainboard labelling.**

> ⚠ **Caution:** Reverse polarity can destroy the device.

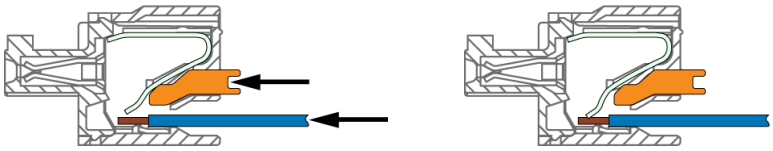
Second generation mainboard



> **Note on RS232 X09 and RS485 X08:**
> Only one of the two connections can be active, toggling is done via the AMS program. see *Manual BlueBox PC Software* there *5.3.3.2 Custom Protocol Setup*

> **Note DAM X20:**
> Internal DAM connection to an internal BlueConnect Plus board or an internal spectrometer.

Functionality of the cable clamp



R1Com 5.3 Connectable Modules and Sensors

The following modules and sensors can be connected to the BlueBox:

- **CAN bus modules**
  CAN bus modules of GO Systemelektronik are available in various forms as sensor modules, actuator modules and as active CAN repeaters. The connection to the BlueBox is made via the CAN bus clamp sockets at slot X07 on the BlueBox mainboard (see *R1Com 5.2.3 Mainboard PIN Assignment and Termination*).

- **Internal CAN bus boards**
  At the completion of this manual, the following types of design were available:
  BlueConnect Plus board – equippable with up to four BlueConnect sensor and input/output boards
  Spectrometer board – ISA/BlueScan spectrometer sensor unit
  The connection to the BlueBox is made via the DAM clamp sockets at slot X20 on the BlueBox mainboard (see R1Com 5.2.3 Mainboard PIN Assignment and Termination).

- **BlueConnect Modules**
  The versatile BlueConnect Modules of GO Systemelektronik are also CAN bus modules. So they can be connected via the CAN bus clamp sockets at slot X07 (see *R1Com 5.2.3 Mainboard PIN Assignment and Termination*).

- **Modbus sensors**
  Modbus sensors are connected directly via the RS485 Modbus clamp sockets at slot X08 on the BlueBox mainboard (see *R1Com 5.2.3 Mainboard PIN Assignment and Termination*).

- **RS485 devices***
  The connection to the BlueBox is made via the CAN bus clamp sockets at slot X08 on the BlueBox mainboard (see *R1Com 5.2.3 Mainboard PIN Assignment and Termination*).

- **RS232 devices**
  The connection to the BlueBox is made via the CAN bus clamp sockets at slot X09 on the BlueBox mainboard (see *R1Com 5.2.3 Mainboard PIN Assignment and Termination*).

> There are many separate instructions on how to connect the BlueBox with several devices.
> For more information, please contact GO Systemelektronik.

* If an RS485 device (e.g. SPS) is connected here, then it is not possible to also connect GO Systemelektronik Modbus Sensors.

R1Com 6 Commissioning Procedure

Earth the BlueBox. This is the only way to ensure trouble-free measurement operation.

Caution: The BlueBox must be installed in such a way that they are not exposed to direct sunlight, rain or snow. Direct sunlight can lead to extreme temperatures, which significantly reduces the service life of electronic components. The manufacturer is not liable for improper or non-application use.

Caution: Handle the touch display with care. Do not remove the protective foil from the touch display until all work has been completed.

Warning: Before the connection of the Blue Box to the power supply make sure that the labelled BlueBox operating voltage matches the supply voltage.

Manuals, data sheets etc. of the BlueBox System can be found on:
www.go-sys.de/downloads/

A great advantage of the BlueBox is their design flexibility. Therefore construction of installation will vary by application. A description of the structure and assembly of the BlueBox can only serve as an example.

Precondition:

- Carefully unpack the BlueBox.
- Familiarise yourself with the structure of the BlueBox, see in particular:
  - *R1Com 5.1 Technical Data BlueBox R1*
  - *R1Com 5.2 Connections BlueBox R1*

R1Com 6.1 Housing Mounting

Despite the construction of the BlueBox in IP class IP65 you have to install the device in a rain- and sun-protected site.

If this is not possible, the BlueBox must be mounted in an additional housing.

Be careful when choosing the location of the BlueBox, the location has to achieve the following properties:

- rain-and sun-protected location
- convenient location for a mobile network coverage,
  if the Blue Box is used with an optional LTE modem
- if possible, a vertical surface.

1. Open the housing.
   see *R1Com 5.2.2 Opening the Housing*
2. At each corner of the housing, you see the holes for the mounting screws.
   see *R1Com 7 Housing Mounting Holes*
3. Choose suitable mounting screws and dowels, which are suitable for the material of the mounting surface and fix the housing.

R1Com 6.2 Set Up Operational Readiness

1. Open the housing. see *R1Com 5.2.2 Opening the Housing*

2. **Optional** – Insert your SIM card into the SIM card slot.
   ! Ensure that the SIM card is not activated.

3. Terminate CAN bus and RS485 (Modbus) according to your requirements.

4. Pass the cables of the units to be connected through the PG cable glands to the respective cable clamps.

5. Assign the cable clamps according to your requirements and plug the cable clamps back into the corresponding slots.

6. Assign the antenna connections according to your requirements.

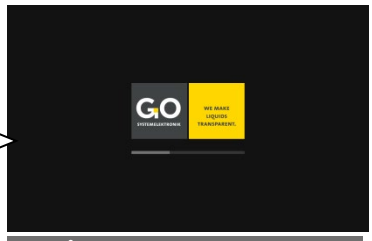
7. Tighten the PG cable glands.

8. Earth the BlueBox.

9. Remove the protective foil from the touch display.

10. Switch on the power supply of the BlueBox, the BlueBox will start up.
    see *R1Com 6.3 Switching On the BlueBox and Initial Operation*

R1Com 6.3 Switching On the BlueBox and Initial Operation



1. Switch on the power supply.
2. The BlueBox checks the database and initiates the system.
3. Then the BlueBox initiates the connected sensors and actuators.
4. The Parameter Display in list view in alphabetical order is the factory default start display. see *6 Parameter Display*

Password entry: To perform certain settings, a password consisting of 5 digits must be entered. see *Appendix A – The Configuration Data Sheet* there *1. BlueBox RP* there *BlueBox Password (PIN)*

Note: In the default setting, the BlueBox is locked, i.e. you have to enter the PIN code of the BlueBox to perform certain settings. When setting up the BlueBox, it might be more convenient if the BlueBox is temporarily unlocked, see *7.8 Shutdown - Restart - Lock - Unlock*. **Do not forget to switch it back.**

If no CAN bus module is connected, the BlueBox boots up with an error message:

NO SENSOR FOUND

After approx. 15 seconds another error message appears:

CAN-BUS ERROR

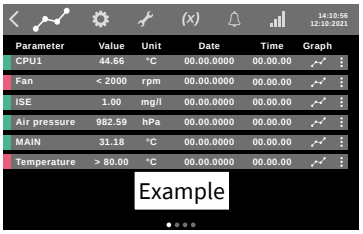
INFO: IF NO CAN-BUS SENSOR CONNECTED, DISABLE THE CAN-BUS

In this case you have to disable the CAN bus:

SYSTEM > SETTINGS > CAN-BUS SETUP

see also *7.4.5 Settings CAN bus*

Precondition: The BlueBox has booted up without an error message and the Parameter Display in list view is shown.

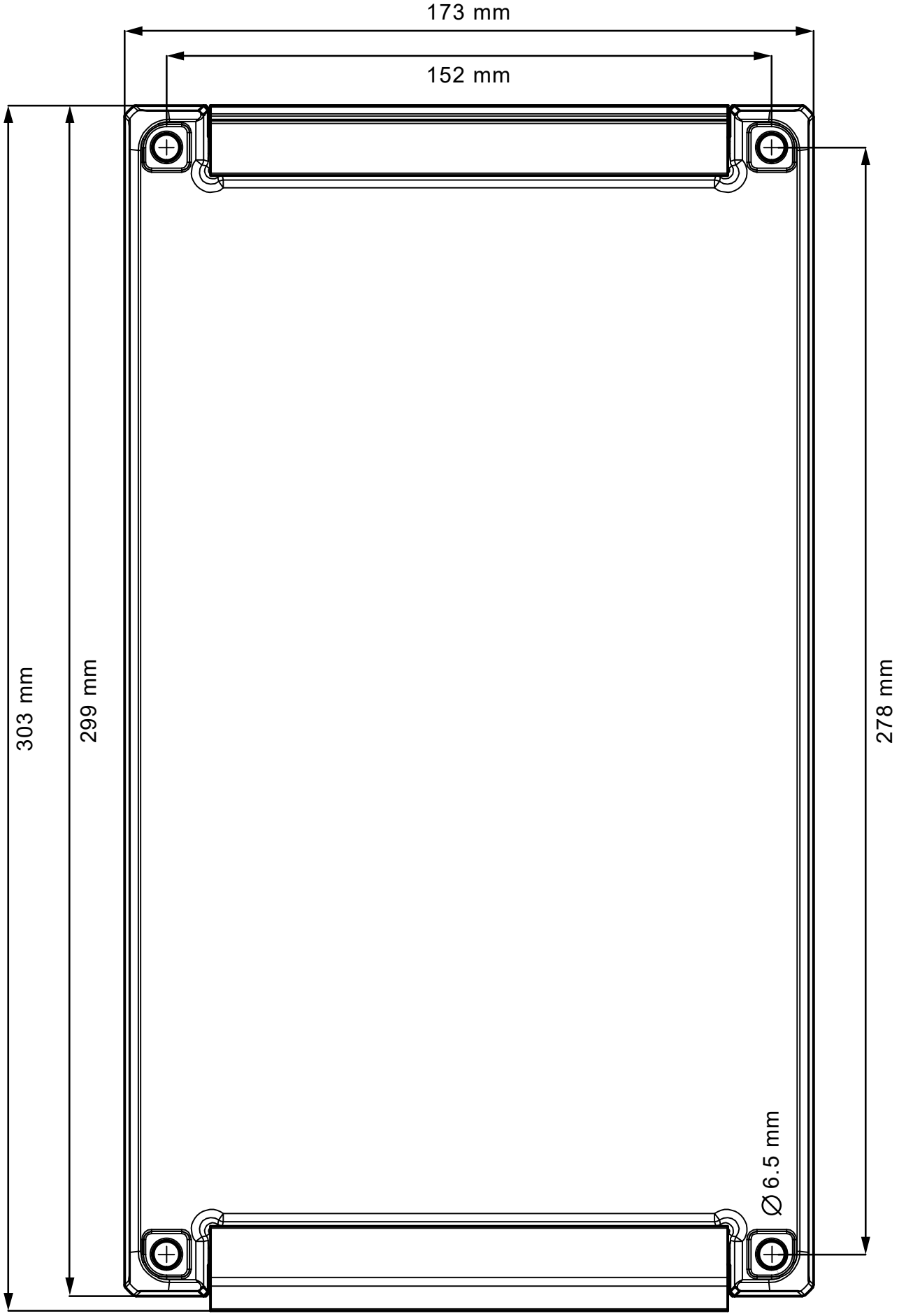


Precondition: The optional SIM card is not activated.

Procedure

1. Language setting — see *7.1 Language*
   The default language is English; German can be selected as an alternative language.
2. Date and Time setting — see *7.2 Date & Time*
3. Network settings — see *7.3 Network*
4. Modem settings (optional) — see *7.4.1 Settings Modem*

R1Com 7 Housing Mounting Holes



R1Com 8 EU Declaration of Conformity

EU-Konformitätserklärung
EU Declaration of Conformity

Hersteller:
Manufacturer:

GO Systemelektronik GmbH
Faluner Weg 1
24109 Kiel Germany

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.
The sole responsibility for issuing this EU declaration of conformity is carried by the manufacturer.

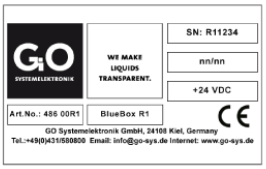
Gegenstand dieser Erklärung:
Subject to this declaration:

BlueBox R1

Artikelnummer:
Article No.:

486 00R1

Typenschild des Produktes:
Type plate of the product:



Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsvorschriften der Union.
The subject matter described above fulfills the relevant harmonization rules of the Union.

Zugrunde liegende harmonisierte Normen:
Underlying harmonized standards:

1. DIN EN 61000-6-3:2011 Störaussendung *Interference emission*
2. DIN EN 61000-6-1:2007 Störfestigkeit *Interference resistance*

(Falls zutreffend) **Gemäß den Bestimmungen der Richtlinie/den Dokumenten:**
(If applicable) ***Following the provision of directive/the documents:***

1. DIN EN 60950:2006 Niederspannungsrichtlinie *Low voltage directive*
2. Fertigungs- und Prüfanweisung BlueBox R1 *Manufacturing and test instruction BlueBox R1*
3. Bedienungsanleitung BlueBox R1 *Manual BlueBox R1*

Kiel, 31.08.2022
Ort, Datum der Ausstellung
Place, date of issue

Dr. Thorsten Knutz
Geschäftsführer *Managing director*

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www.go-sys.de info@go-sys.de **Seite *Page* 1 / 1**

Manual
Commissioning of the BlueBox Panel

Creation date: 9.6.2023 Version: 1.2 en

This manual is a standalone part of the *Manual BlueBox R1 and Panel* and describes the commissioning of the **BlueBox Panel** of GO Systemelektronik.

A comprehensive documentation of the BlueBox system can be found on www.go-sys.de/downloads.

The products of GO Systemelektronik are constantly being developed, therefore deviations between this manual and the delivered product can result. Please understand that no legal claims can be derived from the contents of this manual.

Notes on Text References

References to passages in this document or to passages in other documents are marked in italics.

References with no document name refer to the *Manual BlueBox R1 and Panel*, of which this manual is a part.

- *7.1 Language* e.g. refers to the section 7.1 in this document. The short form is *7.1*.
- *Manual BlueBox PC Software* there *5 AMS – Advanced Managing Software* e.g. refers to the chapter 5 in the Manual BlueBox PC Software.

Table of Contents

PCom 1 Meaning of the Safety Instructions

⚠	**Danger:** Used if non-observance threatens serious injury or death.
⚠	**Warning:** Used if non-observance threatens slight injuries or serious property damage.
⚠	**Caution:** Used if non-observance threatens minor property damage.
⚠	Used for general safety instructions.
⚠	Symbol of safety instruction relating to the use of electricity.

PCom 2 Connecting the Power Supply

For connecting the power to the BlueBox Panel you need an external 24 VDC power supply.
see *PCom 5.1 Technical Data BlueBox Panel* there *Voltage supply* and *Power consumption BlueBox Panel*

Connect the power supply to slot X3 at the BlueBox Panel mainboard.
see *PCom 5.3 Connections and Termination BlueBox Panel*

⚠	The BlueBox should only be installed by a qualified person using suitable tools. Incorrect installation can result in serious malfunction and could damage the instrument.

Please note that the power supply unit is placed close to the BlueBox because the voltage is declining with the length of the connecting cable.

⚠	Please ensure that, depending on the installation location, an appropriate power cable is used. In outdoor areas, a suitable cable must be kept that is approved for the place of use.

PCom3 Notes on Operation

	Improper handling of electrical devices endangers man and property. Commissioning of the BlueBox should only performed by skilful, trained personnel using appropriate tools. Incorrect installation could cause serious faults and errors that may damage the device.

Keep this manual handy for future reference. Never deliver the BlueBox to other persons without this manual. The manufacturer is not liable for improper or unintended usage.

This device is designed in accordance with the Low Voltage Directive and the safety regulations for electronic measurement devices.

The trouble-free operation and reliability can only be assured if you pay attention to the generally applicable safety measures and special safety instructions in this manual.

- Before the connection of the Blue Box to the power supply make sure that the labelled BlueBox operating voltage matches the supply voltage.
- The correct functioning and operational safety of the device can only be ensured, if the ambient conditions that are specified in section *PCom 5.1 Technical Data BlueBox Panel* are complianced.
- If the device is transported from a cold to a warm environment condensation may result in a failure of the function. In this case, wait until the device temperature is at the level of the ambient temperature before a new start-up.
- Maintenance and repair work may only be performed by a specialist who is authorized by GO Systemelektronik.

If it is to be assumed that the device can no longer be operated safely, it must be put out of operation and secured with identification markings against further commissioning.

The safety may be compromised by the device if, for example, the device:

- has visible damages,
- no longer works as required,
- has been stored in improper conditions for a longer time,
- was exposed to improper transport conditions.

In cases of doubt give notice to GO Systemelektronik GmbH. If necessary, send the device to GO Systemelektronik for reparation respectively maintenance.

Earth the BlueBox. This is the only way to ensure trouble-free measurement operation.

PCom 4 LAN Connection

To retrieve the data and communicate directly with the BlueBox, the BlueBox PC Software must be installed on your local computer (see *Manual BlueBox PC Software*).

The MDI crossover supported connection to a network is made by a RJ-45-connector at the bottom of the BlueBox (see also *PCom 5.3 Connections and Termination BlueBox Panel*).

Please ensure that the RJ-45-plug snaps into the socket with a click.

PCom 5 Device Description

PCom 5.1 Technical Data BlueBox Panel

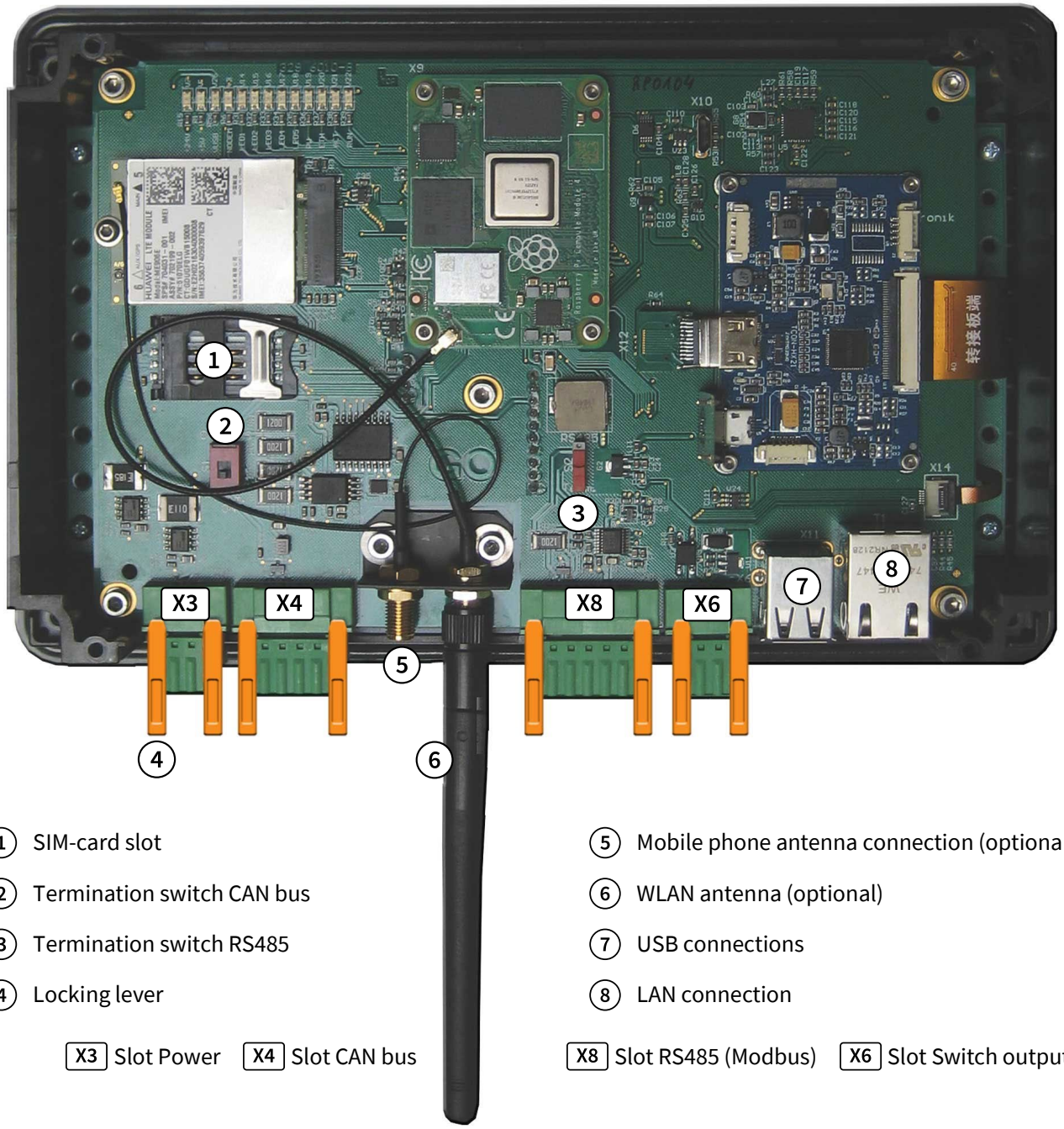
Article No. 486 00P0

Computer:	ARM Cortex-A72; 4x 1500 MHz	
	Operation system: Embedded Linux®	
	Main memory 1 GB minimum	
Storage media:	8 GB Flash minimum	
Display:	Touch screen 7″; 1280 x 800 Pixel; colour 24 bit	
	Viewing angle horizontal/vertical 85°	
Mechanical data:	Dimensions:	226 mm x 146 mm x 52,5 mm (L x W x H)
	Weight:	approx. 1 kg
	IP class (installed):	IP65
	Material:	PVC and tin-plated steel sheet
	Colour:	black
Voltage supply:	Nominal voltage: 24 VDC (18 V – 28 V) [1]	Fuse protection 1.1 A Polyswitch (The CAN bus has its own fuse protection.)
Power consumption BlueBox Panel:		typical 7 W
Power supply for modules via BlueBox Panel CAN bus interface:	The power supply of the BlueBox Panel CAN bus interface can be loaded with a maximum of 45 W (24 VDC; Polyswitch fuse). [2]	
Interfaces:	2x USB	
	1x Ethernet 10 Mbit/s | 100 Mbit/s | 1000 Mbit/s (MDI crossover)	
	1x CAN – Fuse protection output current 1.85 A Polyswitch, recovers automatically	
	1x RS485 (half-duplex) – with 12 VDC 6 W sensor power supply	
	1x 24 V switch output	
Modem (optional)	**WiFi (optional)**	
Ambient conditions:	Ambient temperature:	Storage: -10 °C to +50 °C
		Operation: -20 °C to +45 °C
		avoid direct sunlight
	Relative humidity:	≤ 90 % (annual average)

To protect the device and to ensure the proper functioning of the device, the specified ambient conditions must be strictly adhered to!

[1] The connected CAN-bus modules receive their power from the BlueBox. Some modules have a constricted input range, so there is an input voltage tolerance of ± 10 %.
[2] CAN bus modules can also be supplied directly via a power supply unit.

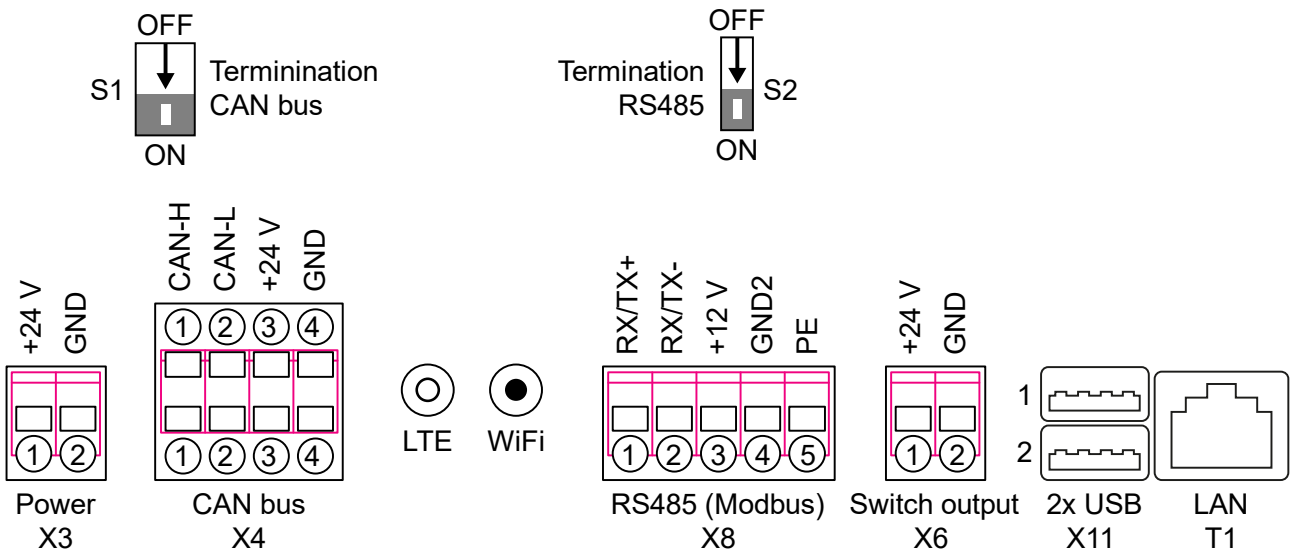
PCom 5.2 Overview Mainboard

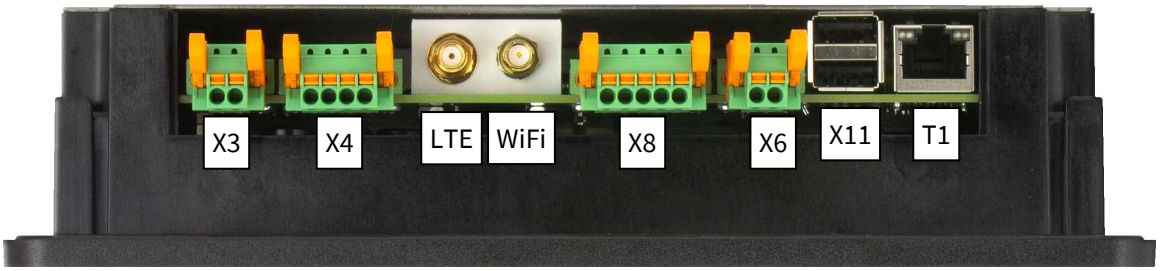


1. SIM-card slot
2. Termination switch CAN bus
3. Termination switch RS485
4. Locking lever
5. Mobile phone antenna connection (optional)
6. WLAN antenna (optional)
7. USB connections
8. LAN connection

X3 Slot Power X4 Slot CAN bus X8 Slot RS485 (Modbus) X6 Slot Switch output

PCom 5.3 Connections and Termination BlueBox Panel





At the slots X3, X4, X8 and X6 are cable clamps with locking lever.

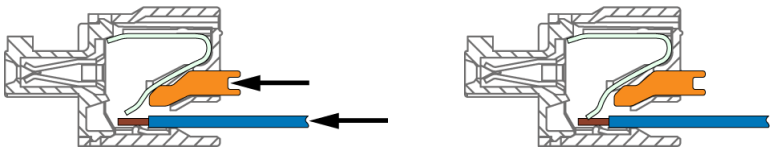
- The cable clamps are removed by pushing the locking lever carefully downwards and then pulling the cable clamps out.
- Reinsertion is done in reverse order.

① Type plate

② Earthing connection

③ Sticker with assignment

Functionality of the cable clamps



PCom 5.4 Connectable Modules and Sensors

The following **external** modules and sensors can be connected to the BlueBox:

- **CAN bus modules**
  CAN bus modules of GO Systemelektronik are available in various forms as sensor modules, actuator modules and as active CAN repeaters. The connection to the BlueBox is made via the CAN bus clamp sockets at slot X4 on the BlueBox mainboard (see *PCom 5.3 Connections and Termination BlueBox Panel*).
- **BlueConnect Modules**
  The versatile BlueConnect Modules of GO Systemelektronik are also CAN bus modules. So they can be connected via the CAN bus clamp sockets at slot X4 (see *PCom 5.3 Connections and Termination BlueBox Panel*).
- **Modbus sensors**
  Modbus sensors are connected direct via the RS485 Modbus clamp sockets at slot X8 on the BlueBox mainboard (see *PCom 5.3 Connections and Termination BlueBox Panel*).
- **RS485 devices***
  The connection to the BlueBox is made via the CAN bus clamp sockets at slot X8 on the BlueBox mainboard (see *PCom 5.3 Connections and Termination BlueBox Panel*).

> There are many separate instructions on how to connect the BlueBox with several devices. For more information, please contact GO Systemelektronik.

* If an RS485 device (e.g. SPS) is connected here, then it is not possible to also connect GO Systemelektronik Modbus Sensors.

PCom 6 Commissioning Procedure

Earth the BlueBox. This is the only way to ensure trouble-free measurement operation.

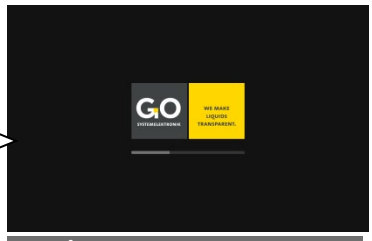
Caution: Handle the touch display with care. Do not remove the protective foil from the touch display until all work has been completed.

Warning: Before the connection of the Blue Box to the power supply make sure that the labelled BlueBox operating voltage matches the supply voltage.

PCom 6.1 Hardware

1. Carefully unpack the BlueBox.
2. Familiarise yourself with the structure of the BlueBox, see in particular:
   - *PCom 5.1 Technical Data BlueBox Panel*
   - *PCom 5.2 Overview Mainboard*
   - *PCom 5.3 Connections and Termination BlueBox Panel*
   - *PCom 8 Setup and Mounting*
3. Place the BlueBox with the display side on a suitable soft surface.
4. Remove the four screws holding the back cover and remove the back cover.
5. Terminate CAN bus and RS485 (Modbus) according to your requirements.
6. **Optional** – Insert your SIM card into the SIM card slot.
   Ensure that the SIM card is not activated.
7. Release the cable clamps by carefully pushing down the locking lever and pull out the cable clamps.
8. Insert the BlueBox into the fitting opening and place the four corner clamps on the guides and fix the corner clamps with the corner clamp fixing screws.
9. Assign the LTE, WiFi, USB and LAN connections according to your requirements.
10. Assign the cable clamps according to your requirements and plug the cable clamps back into the corresponding slots. Fix the cable clamps by carefully pushing the locking lever upwards.
11. Earth the BlueBox.
12. Switch on the power supply of the BlueBox, the BlueBox will start up.
    see *PCom 6.2 Switching On the BlueBox*
13. Remove the protective foil from the touch display.

PCom 6.2 Switching On the BlueBox and Initial Operation



1. Switch on the power supply.
2. The BlueBox checks the database and initiates the system.
3. Then the BlueBox initiates the connected sensors and actuators.
4. The Parameter Display in list view in alphabetical order is the factory default start display. see *6 Parameter Display*

Password entry: To perform certain settings, a password consisting of 5 digits must be entered. see *Appendix A – The Configuration Data Sheet* there *1. BlueBox RP* there *BlueBox Password (PIN)*

Note: In the default setting, the BlueBox is locked, i.e. you have to enter the PIN code of the BlueBox to perform certain settings. When setting up the BlueBox, it might be more convenient if the BlueBox is temporarily unlocked, see *7.8 Shutdown - Restart - Lock - Unlock*. **Do not forget to switch it back.**

If no CAN bus module is connected, the BlueBox boots up with an error message:

NO SENSOR FOUND

After approx. 15 seconds another error message appears:

CAN-BUS ERROR

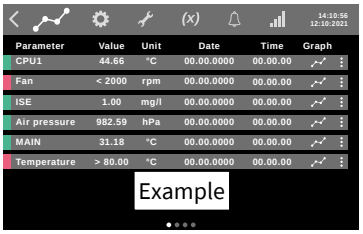
INFO: IF NO CAN-BUS SENSOR CONNECTED, DISABLE THE CAN-BUS

In this case you have to disable the CAN bus:

SYSTEM > SETTINGS > CAN-BUS SETUP

see also *7.4.5 Settings CAN bus*

Precondition: The BlueBox has booted up without an error message and the Parameter Display in list view is shown.



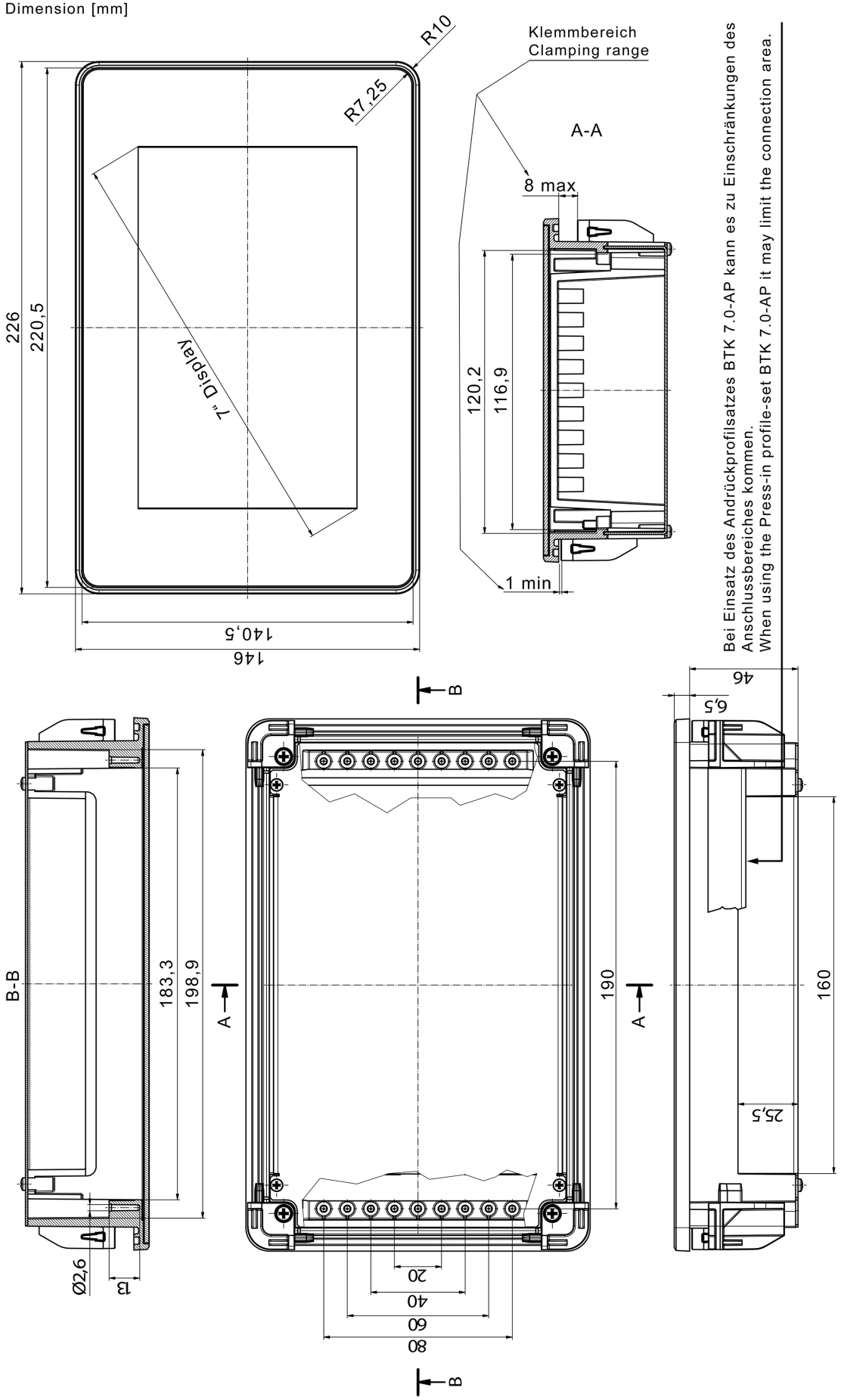
Precondition: The optional SIM card is not activated.

Procedure

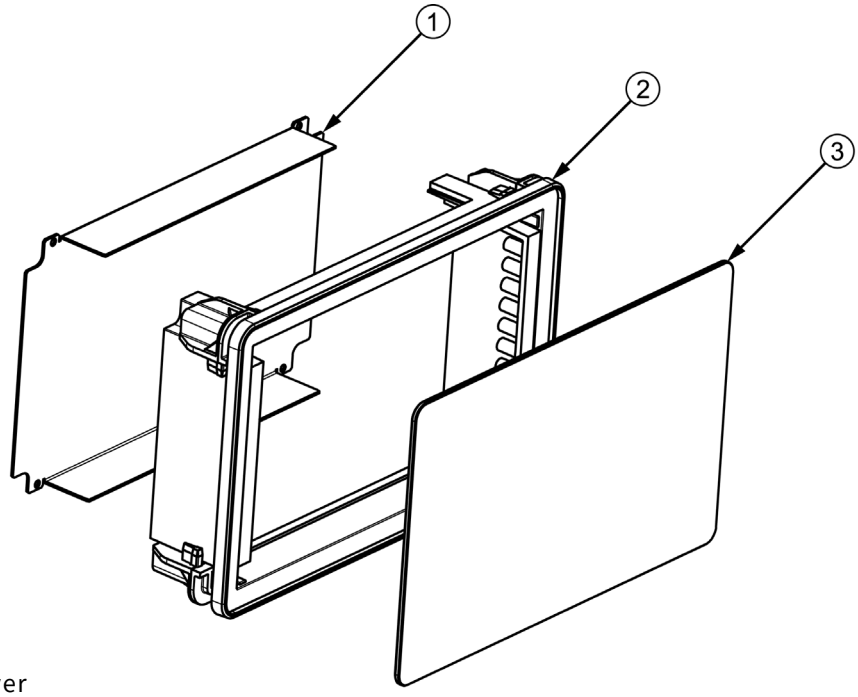
5. Language setting — see *7.1 Language*
   The default language is English; German can be selected as an alternative language.
6. Date and Time setting — see *7.2 Date & Time*
7. Network settings — see *7.3 Network*
8. Modem settings (optional) — see *7.4.1 Settings Modem*

PCom 7 Dimensions

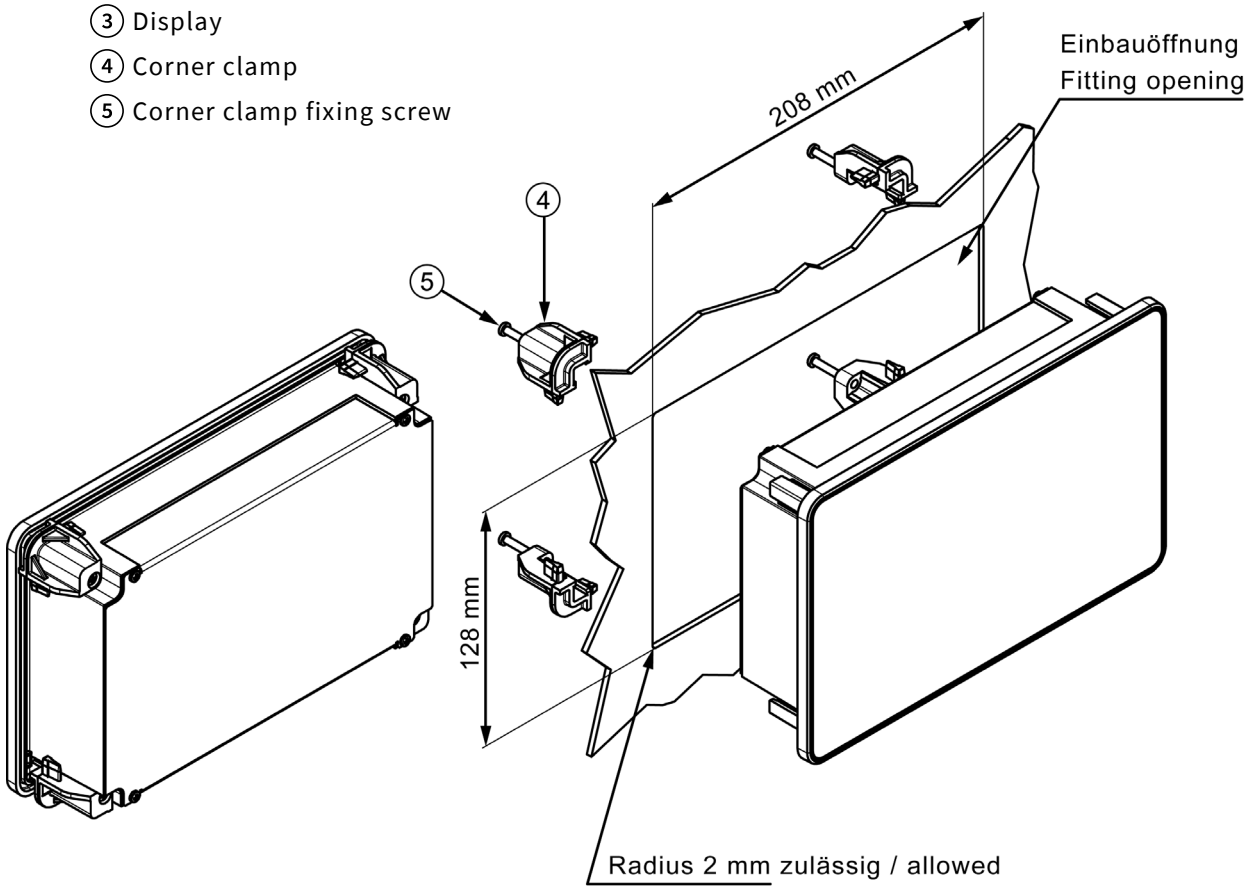
Dimension [mm]



PCom 8 Setup and Mounting



1 Back cover
2 Housing frame
3 Display
4 Corner clamp
5 Corner clamp fixing screw



PCom 9 EU Declaration of Conformity

EU-Konformitätserklärung
EU Declaration of Conformity

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Manufacturer:

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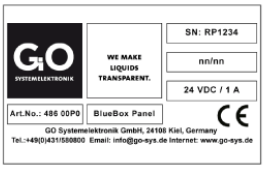
Gegenstand dieser Erklärung:
Subject to this declaration:

BlueBox Panel

Artikelnummer:
Article No.:

486 00P0

Typenschild des Produktes:
Type plate of the product:



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(Falls zutreffend) **Gemäß den Bestimmungen der Richtlinie/den Dokumenten:**
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Kiel, 31.08.2022
Ort, Datum der Ausstellung
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GO Systemelektronik GmbH Faluner Weg 1 24109 Kiel Germany Tel.: +49 431 58080-0 Fax: -58080-11
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