v2026-08-05

GENEREX User Manuals

English

BACS HMI Display

Contents

Safety and usage guidelines

1.1 Target audience and staff qualifications

This manual is aimed at two different target groups, whose authorisations must be strictly separated from one another to ensure secure system operation.

Installation and connection: Installation and connection to the power supply (15–30 V DC) and the wiring for RS485 communication must only be carried out by trained or authorised IT / infrastructure staff. This is essential, as incorrect polarity of the screw terminals supplied may result in irreparable hardware damage to the BACS HMI display.

Operation (BACS HMI monitoring): Navigation via the capacitive touchscreen to read out BACS operating data in real time is intended for trained or authorised personnel.

1.2 Basic safety instructions

The BACS HMI display is an electronic display system for critical infrastructure. It is essential to observe the warnings to prevent personal injury and failures in the system monitoring.

Ensure the system is de-energised during installation: Never connect the display whilst it is live. The power supply (e.g. standard 24 V DC) must be disconnected before plugging in the rear terminal block.

Do not open the housing: Opening the display housing without authorisation is strictly prohibited. There are no user-serviceable parts inside the system. Unauthorised tampering will result in the immediate forfeiture of all warranty claims against GENEREX Systems GmbH.

Permissible operating environment: The system is designed for continuous operation in dry, temperature-controlled indoor environments (such as server rooms or control rooms). Never expose the device to direct moisture, as condensation can cause short circuits on the motherboard or the IPS LCD.

1.3 Environmental protection and proper disposal

The BACS HMI display is made from high-quality, recyclable materials and electronic components that are subject to specific recycling regulations.

WEEE Directive

Under no circumstances should this product be disposed of via regular unsorted household or commercial waste at the end of its service life. This strict separation is required by law to ensure that no harmful substances enter the environment.

Return and recycling

At the end of its service life, please take the device to official collection points for electrical and electronic waste. Alternatively, you can contact GENEREX Systems GmbH regarding its return. This ensures that valuable raw materials are extracted professionally and returned to the recycling cycle.

Notation conventions in this manual

In this document, user interface labels are formatted consistently to improve readability. Touch-sensitive screen elements and menu items are always shown in bold and enclosed in square brackets (e.g. **[Update]** or **[X]**).

Installation materials

The BACS HMI display is supplied with the following components:

- 1× BACS HMI display
- 2× connection terminals (screw terminals) for RS485 and power supply

Optional accessories are available depending on the specific order.

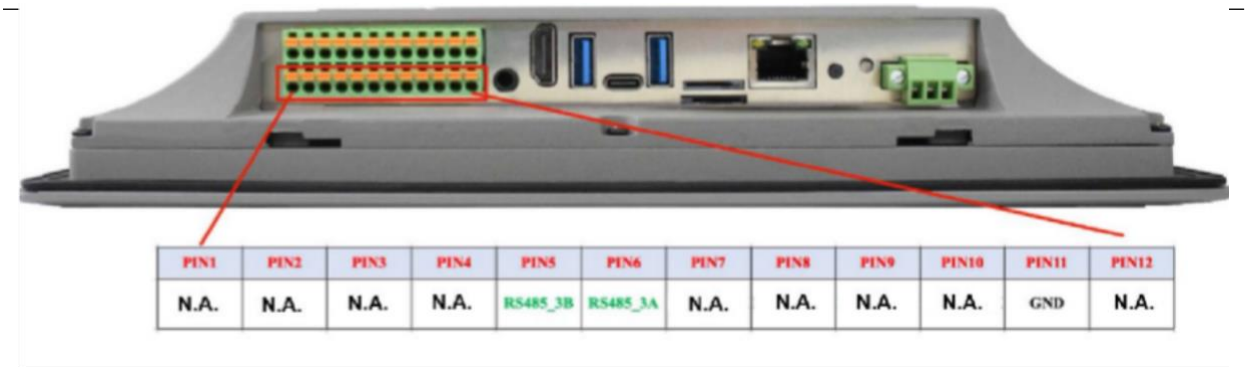
Product specifications and connectivity

Technical specifications (relevant features)

Display		
	Size	*10.1” IPS LCD*
	Resolution	*1280 x 800 px*
	Brightness	*500 cd / m²*
	Touch	*Capacitive touchscreen*
Interfaces (active)		
	RS485	*1*
	Baud rate	*38,400 (fixed)*
	Termination	*Integrated*
	Pin assignment	*Pin 5: RS485*
		Pin 6: RS485+
		Pin 11: GND
Power supply		
	Input	*15 C–30 V DC (Standard: 24 V DC)*
	Power consumption	*13.3 W max.*
Housing		*8.4 W standard*
	Dimensions	*275.5 x 193.5 x 460 mm*
	Weight	*1300 g*
	Mounting	*Panel / VESA*
Operating parameters HMI display		
	Operating temperature	*0 °C–80 °C*
	Humidity	*5%–95%, non-condensing*

Specifications and installation

Pin configuration:



PIN1	PIN2	PIN3	PIN4	PIN5	PIN6	PIN7	PIN8	PIN9	PIN10	PIN11	PIN12
N.A.	N.A.	N.A.	N.A.	RS485_3B	RS485_3A	N.A.	N.A.	N.A.	N.A.	GND	N.A.

In the version supplied, pins 5, 6, and 11 are predefined. Other pins cannot be used.

System start-up and user interface

General information

The GENEREX BACS HMI is a self-starting system. As soon as the necessary power supply is available, the display starts up, boots automatically, and requests the required data via the RS485 interface from the connected Web Managers.

Checks to carry out during commissioning:

1. Ensure that the power supply is connected correctly.
2. Check whether the display boots up automatically once power is applied.
3. Finally, check whether the system connects automatically to the available BACS Web Managers via the RS485 interface.

The BACS HMI is a passive offline system for displaying operating data on site. Network integration, e.g. for a remote desktop, is not possible in this operating mode.

Configuration of the BACS interface

The BACS HMI display is pre-configured at the factory for normal operation. To establish communication within the system network, carry out the following steps:

1. Check the hardware: Before starting, check that the necessary pins are correctly connected at the terminal block.
2. Define the number of devices: Open the global settings on the BACS HMI and enter the exact number of BACS devices.

NOTE: Requirements for the BACS Web Manager

The BACS HMI can only detect and display the connected Web Managers if the RS485 interface has been actively configured and enabled on the BACS Web Manager side. For detailed steps on RS485 configuration, please refer to the official BACS
User Manual, available for download at www.generex.de.

Bus termination

Pre-assembled

In pre-assembled cabinets, the bus termination (BACS Web Manager and BACS HMI display) is installed at the factory, and the respective terminating resistor is already in place.

If you are retrofitting the BACS HMI display

Please refer to the official BACS User Manual (available for download at www.generex.de) for detailed instructions.

> ***NOTE: Observe installation and termination requirements***
>
> Install the BACS HMI display at the first position on the bus. The last Web Manager in the bus system must also be terminated.

System start-up and setup

The GENEREX BACS HMI starts up automatically and connects to available Web Managers via the predefined interface. The BACS HMI uses a hardware-defined default configuration.

To set up the system, check the following settings on the BACS Web Manager:

1. *Is the interface enabled?*

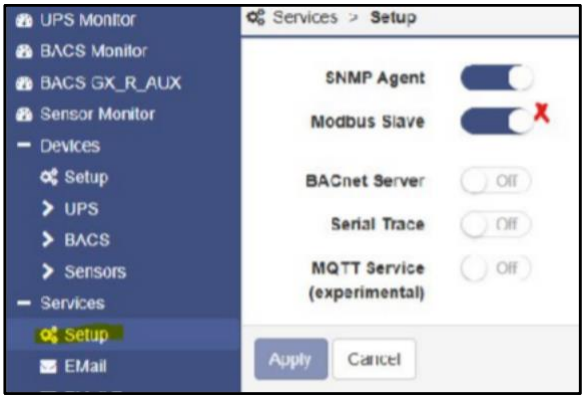
   The BACS Web Manager provides an RS485 interface.

   Instructions: Check the interface setting. It must be enabled.

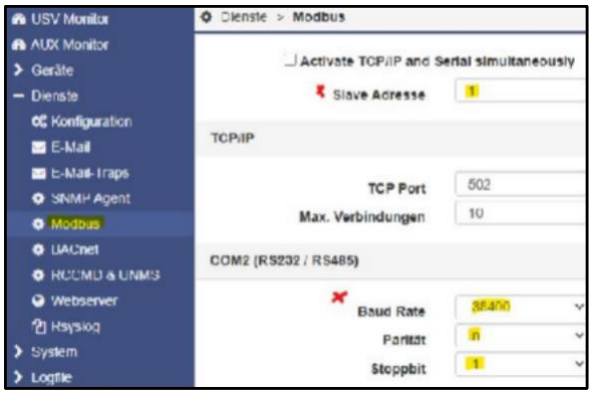
2. *Modbus service set to ON*

   This service prepares the BACS data for the HMI and then sends it via the RS485 interface.

   Instructions: Enable the service; otherwise, no data will be sent.



3. *Modbus settings set to default*



Default Modbus ID
Each BACS Web Manager requires its own unique ID. A BACS HMI display will then show this slave ID as the 'Location'.

Important: If an ID is assigned twice, the BACS HMI will not display the affected devices.

Instructions: Please check that this setting has been configured correctly. Each ID may only be assigned once.

RS232 / 485 settings

Confirm the configuration required by the BACS-HMI at the hardware level.

Baud rate: 38400
Parity: n
Stop bit: 1

NOTE: Why is the interface on the BACS Web Manager not 'pre-activated'?

This is due to the European Union's cybersecurity guidelines. As a fully network-compatible device, a BACS Web Manager can also propagate its data via Modbus IP. Consequently, in accordance with cybersecurity guidelines, the service is usually disabled by default and must be actively enabled by a user.

Display after configuration

The BACS HMI monitor continuously searches for new BACS systems in the background. As soon as the configuration on the BACS Web Manager is complete, the BACS HMI will automatically recognise the relevant Web Manager the next time it runs and automatically display the operational data.

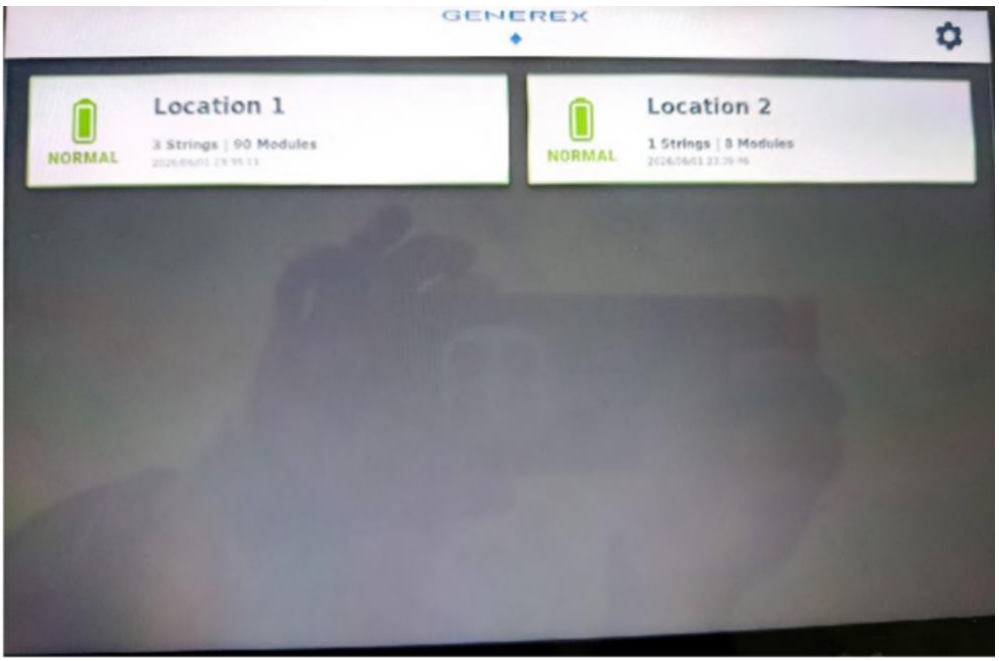
Instructions: Check that all BACS devices have been detected and are displayed.

Screens and filter functions

The BACS HMI offers various filter and convenience functions to sort the measurement data collected in real time on site as required.

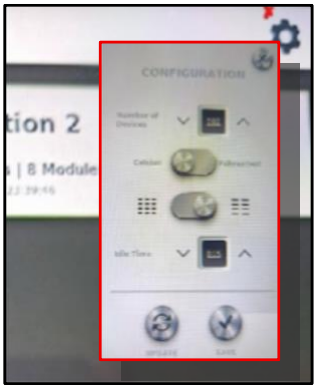
The main screen

The default screen automatically lists all installations that are currently accessible.



The central monitoring screen provides a tactical overview. Tap the relevant tab to open the subordinate detail screens.

The configuration / update screens

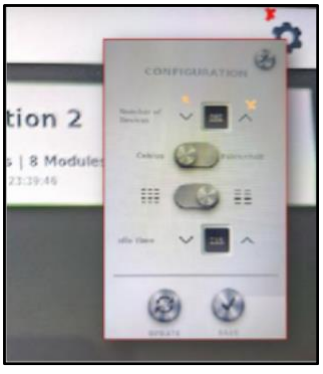


Set global settings for BACS HMI monitoring.

To open the global configuration menu, tap the [**cog**] in the top right-hand corner of the monitoring screen.

<u>The following global settings are available:</u>

Number of devices



This defines the number of BACS Web Managers expected within the RS485 bus system.

The number of devices also defines the sequential device IDs.

For example, if you enter five devices, these must also be configured with the corresponding Modbus IDs 1–5. The BACS HMI will then search directly for five BACS Web Managers (Modbus IDs 1–5) and report if individual Web Managers are not sending data.

Troubleshooting:

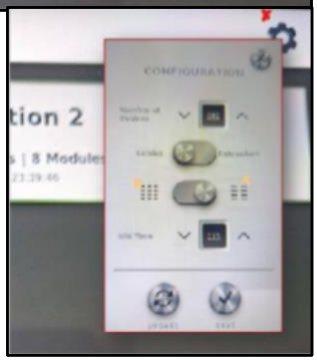
Check that the number of devices set matches the Modbus ID of the respective Web Manager.

Celsius / Fahrenheit

Depending on the location and area of application, either Celsius or Fahrenheit is the official measurement scale. This setting allows you to define which temperature unit is used.

NOTE: The temperature unit selected in the BACS HMI must match the unit set in the BACS Web Manager. If this is not the case, incorrect values will be displayed.

Change columns / object size



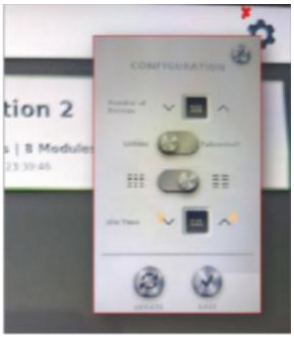
Change the display

The smaller, three-column display shows a smaller image but includes more objects for a comprehensive overview (colour codes); the two-column display features larger text but shows fewer objects at any one time.

Define here what the start-up configuration should be upon restart.

NOTE: This function is redundant. If required, it is possible to switch between two and three columns directly from the detail screens.

Idle time

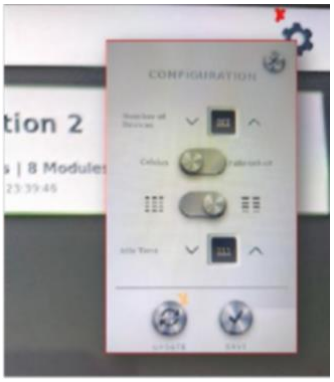


This is the time period before the display switches to sleep mode. By default, the display remains active for 15 minutes and then temporarily switches to standby mode to save power. You can use this setting to increase or decrease the active display time.

Instructions: Select the setting that applies to you from the available options.

1. 15, 30, 60, or 120 minutes until the display goes dark.
2. None: The display remains continuously active.

Update



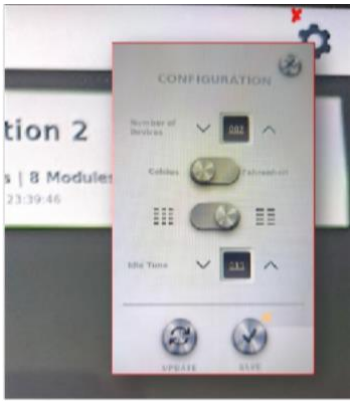
This opens the update dialogue, which allows you to install precompiled update packages from a USB stick.

Instructions:

1. Insert a USB stick containing the update into a USB port on the BACS HMI.
2. Tap [**Update**]. The display will update and then restart.

Save

This applies the settings immediately without restarting.



Instructions:

1. Tap [**Save**] to save your settings.

NOTE:

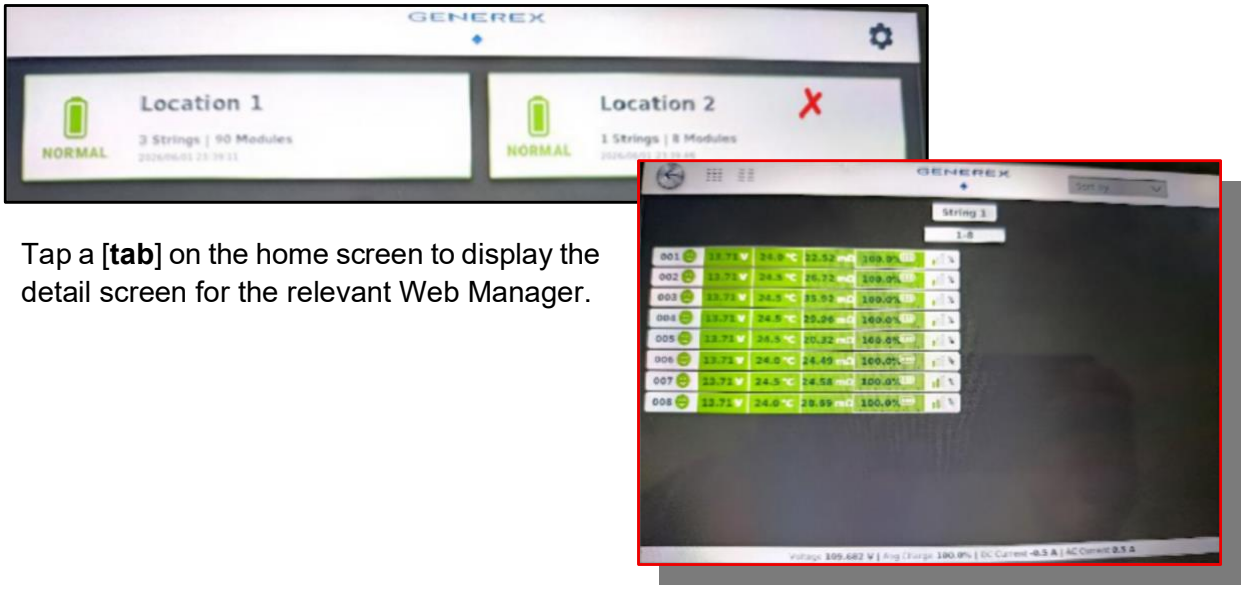
This function does not reconfigure any BACS Web Managers; it simply adapts the display in the BACS HMI to your requirements.

Close / Cancel

Press ‘X’ to close the configuration dialogue box, and the BACS HMI will return to normal operation.

Instructions: Click [**X**] to discard your settings.

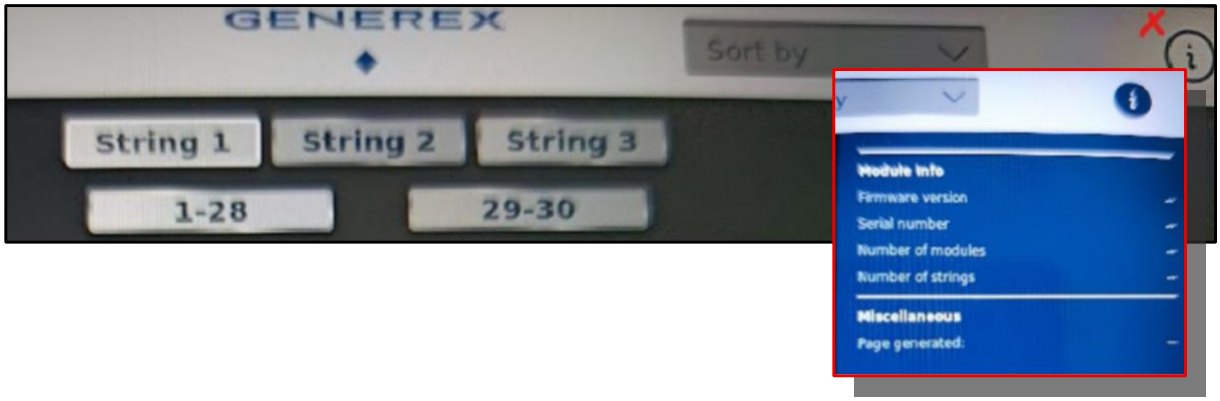
Detail screens—Web Manager view



Tap a [**tab**] on the home screen to display the detail screen for the relevant Web Manager.

Obtain information about the system

As soon as you open the details screen for your BACS system, you will see a small ‘i’ in the top right-hand corner, which displays detailed information about the relevant Web Manager. The following information is available on the Web Manager:



- Firmware version
- Serial number
- Number of modules / batteries
- Number of battery strings
- Current timestamp for this information page

Instructions: Tap the **[i]** icon to view this data for the relevant system.

NOTE: The Modbus ID = Location ID

The BACS HMI sorts the Location IDs based on the Modbus ID, regardless of their layout in the room or CC cabinet! When commissioning multiple BACS Web Managers, affix a location label that is clearly visible on each Web Manager. This ensures quick identification during routine maintenance.

Display in the event of a fault

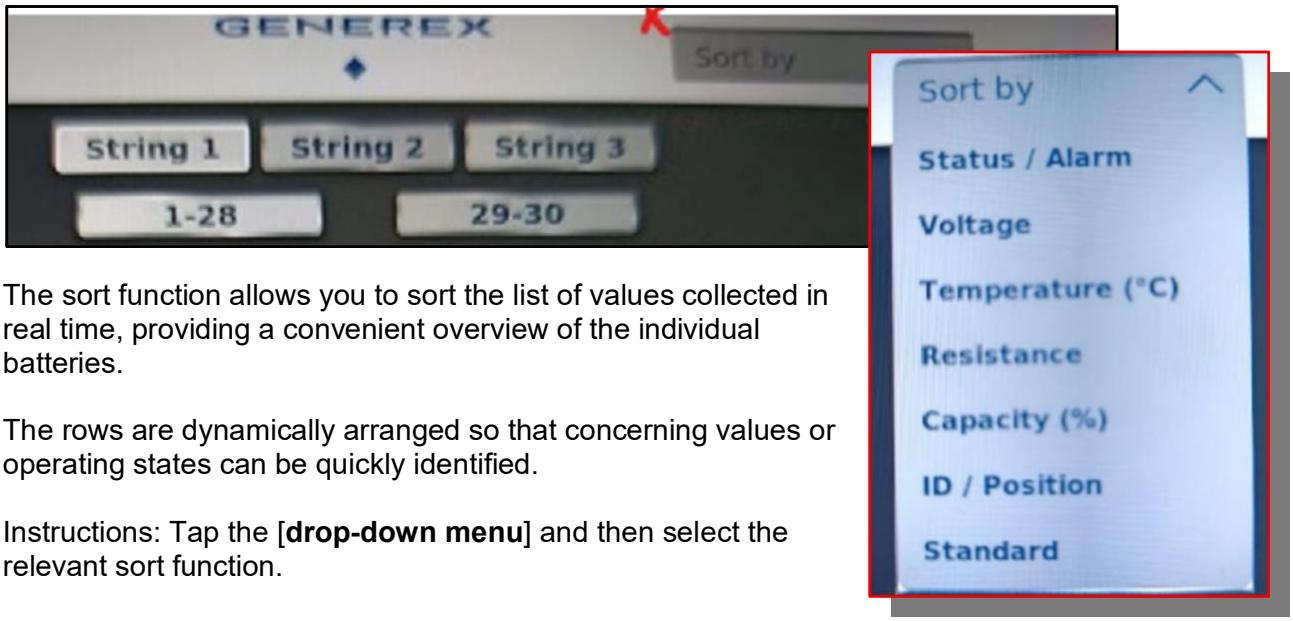
In the event of a fault, the relevant location is highlighted using the traffic light system, and a warning is displayed indicating that action is required.

The BACS HMI uses colour coding to display the value in question. Using the module ID, you can identify the battery directly that needs close examination.

IMPORTANT: BACS WEB MANAGER must be configured.

The alarm thresholds are only displayed here. They are defined via the web interface of the relevant BACS WEB MANAGER.

The sort function



The sort function allows you to sort the list of values collected in real time, providing a convenient overview of the individual batteries.

The rows are dynamically arranged so that concerning values or operating states can be quickly identified.

Instructions: Tap the [**drop-down menu**] and then select the relevant sort function.

Below is a description of the sorting functions.

Status / Alarm

This sorts according to the traffic light system within the system.

Red: Immediate action is required, or there is a verified fault or a hazardous situation. On-site intervention is necessary in accordance with the operating guide.

Yellow: Immediate action is required, or a verified warning has been issued. A more detailed investigation is recommended, as the thresholds configured in the BACS system have been exceeded. Technicians should refer to their operating guide to determine how seriously the warning should be taken.

Green: No action required, or no incident detected. The values are within the normal range configured by the BACS user. Carry out regular maintenance and documentation work.

Voltage

This sorts the batteries and modules by voltage.

Even if all voltage readings are within the normal range, this can help determine whether a battery may need to be examined more closely in the near future.

Temperature (°C) / (°F)

This sorts the batteries and modules by current temperature readings.

When batteries are under stress, they heat up. This setting allows you to monitor current temperature readings in real time and flag batteries for closer inspection.

Resistance

This sorts the batteries and modules by their current internal resistance values.

The internal resistance provides information about a battery's current condition and its overall performance. If there are significant differences between individual batteries, investigate the cause to determine what further action to take.

Capacity (%)

This sorts the batteries and modules according to their current capacity values.

Please note that BACS is an active battery management system that takes into account the individual charging behaviour of each battery. If a battery has a lower capacity than the others, check whether there might be a fault.

ID / Position

This sorts the batteries by BACS module ID and makes it easier to locate the battery on site.

Default

This resets all filters and sort functions in the BACS HMI. The BACS HMI displays the default settings for the BACS system.

The HMI display shows the following information from left to right: module ID, pictogram for intuitive understanding, voltage in volts, temperature in °C / °F, battery resistance, charge level in per cent, and BACS module activity / balancing in per cent.

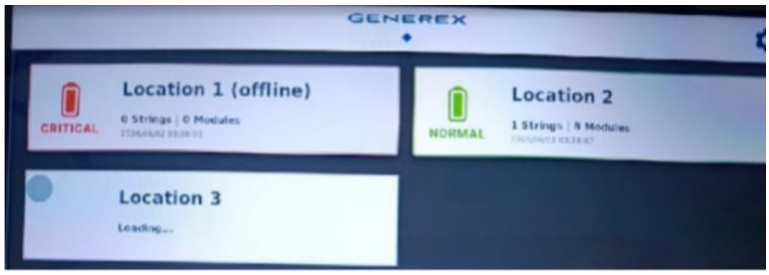
Error message: Device Loading / Offline—Location Not Reachable

As soon as you have integrated a new device, the BACS HMI will attempt to connect to it. The BACS HMI distinguishes between different system states during real-time search and display.

1. Devices found and integrated

The number of strings and modules is displayed.

2. Loading / Offline



Offline

The device has not responded to repeated requests. The BACS HMI will continue to attempt to locate the device at regular intervals and will document in real time that a connection is not possible in the current operating state.

Reasons for this may include the following:

1. Incorrect Modbus setting;
2. Duplicate Modbus ID assigned;
3. Incorrect configuration or cabling;
4. The Web Manager is currently booting up and cannot respond to the request.

Instructions

Check the following one by one:

1. Cabling / Connections
2. BACS HMI configuration: number of BACS devices
3. Configuration of the BACS Web Manager
    a. Interface and service settings
    b. Modbus settings
    c. Modbus ID

Loading

The requested device has not yet responded on the expected Modbus ID 3 (Location 3). The BACS HMI has sent at least one request, but further connection attempts are pending. Once the device responds, the display will be updated in real time.

Action required

1. Please allow the BACS HMI time to receive further feedback.
2. Restart the Web Manager if necessary.
3. Restart the BACS HMI if necessary

Cleaning and maintenance of the BACS HMI display

To ensure longevity and reliable operation of the capacitive touchscreen, the guidelines below must be followed during maintenance.

Cleaning whilst the power is off

Before cleaning, disconnect the BACS HMI display from the power supply or put the system into an inactive state. This prevents accidental system inputs on the touchscreen whilst wiping and also rules out electrical hazards caused by any moisture that may penetrate the device.

Permitted cleaning materials

For gentle cleaning of the display and housing surfaces, use only a soft, dry, or slightly damp microfibre cloth. This effectively prevents the build-up of micro-scratches.

Avoidance of solvent-based chemicals

The use of glass cleaners, alcohol, abrasive cleaners, and aggressive, solvent-based chemicals is strictly prohibited. These substances harm the screen’s special anti-reflective and touch coating, which gradually leads to irreparable damage to the material and a total loss of multi-touch sensitivity.

Avoiding direct contact with liquids

Under no circumstances should you spray water or cleaning agents directly onto the device. Liquids can seep into the interior of the casing via the edges of the display and cause short circuits in the sensitive measurement electronics. If necessary, always apply moisture to the cleaning cloth first.

FAQs

Is it possible to operate in parallel with other controllers / RTUs via RS485?

This is not possible for technical reasons.

What is possible?

The BACS Web Manager provides its Modbus data via both RS485 and Modbus IP. Please note that this may result in fragmentation, as the parallel operation of RS485 and Modbus IP requires additional system resources that must be managed.

How do I download BACS data via the BACS HMI?

The BACS HMI monitor is a passive offline monitoring system that displays data in real time. It is not possible to download data. If you wish to download BACS operational data, there are two options:

1. Log in and download manually.

You can view all log files via the web interface. The BACS Web Manager offers various options for downloading the data directly.

2. Via USB mass storage (HW161 onwards).

From hardware revision HW 161 onwards, it is possible to enable the USB mass storage function on the Web Manager. As soon as you plug a USB stick into the Web Manager's USB port, it is automatically formatted and all available log files are then transferred to the USB stick. You do not need to log in to the device to do this. Further information on this function can be found in the CS141 / BACS User Manual.

About the BACS Viewer software

The freeware tool BACS Viewer allows you to download and sort data on a project-by-project basis. It also offers powerful tools for in-depth analysis and the automatic generation of reports. You can find the software in the download section of our website at www.generex.de.

Can I commission additional BACS HMI interfaces?

No, this is not currently planned. The BACS HMI is designed for a specific purpose and runs on a proprietary operating system with a predefined user interface, which does not provide for any further options beyond its dedicated function.

Can I view the BACS HMI as a remote desktop?

No, the BACS HMI is intended solely as an offline system for local visual feedback and a quick overview of battery readings. Full networking is not planned. The BACS HMI LAN interface is therefore disabled at the hardware level.

The same applies to updates.

You can open the update menu via the global settings and then install a suitable update package using a local USB stick. Updates via remote connections or LAN are not possible.

Updates are available on our website under Product Support at www.generex.de.

The BACS HMI is displaying unusual temperature readings, but everything else is normal.

Check the settings on the BACS HMI. If the battery temperature is displayed as 77 °C but the BACS Web Manager indicates that the battery is fine, this is usually because you have set the wrong temperature unit in the global settings. Check whether the BACS Web Manager and the BACS HMI are using the same temperature scales.

Do I always need a laptop for more in-depth problem analysis?

Strictly speaking, yes. The BACS HMI is not a substitute for in-depth fault analysis with failure prediction; it is merely a general additional display for a quick check in real time. You can immediately see if something is wrong and, using the colour code, schedule a maintenance window for a more detailed analysis. However, the display does not replace access to the log files on site.

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