

Quickstart BACS Installation



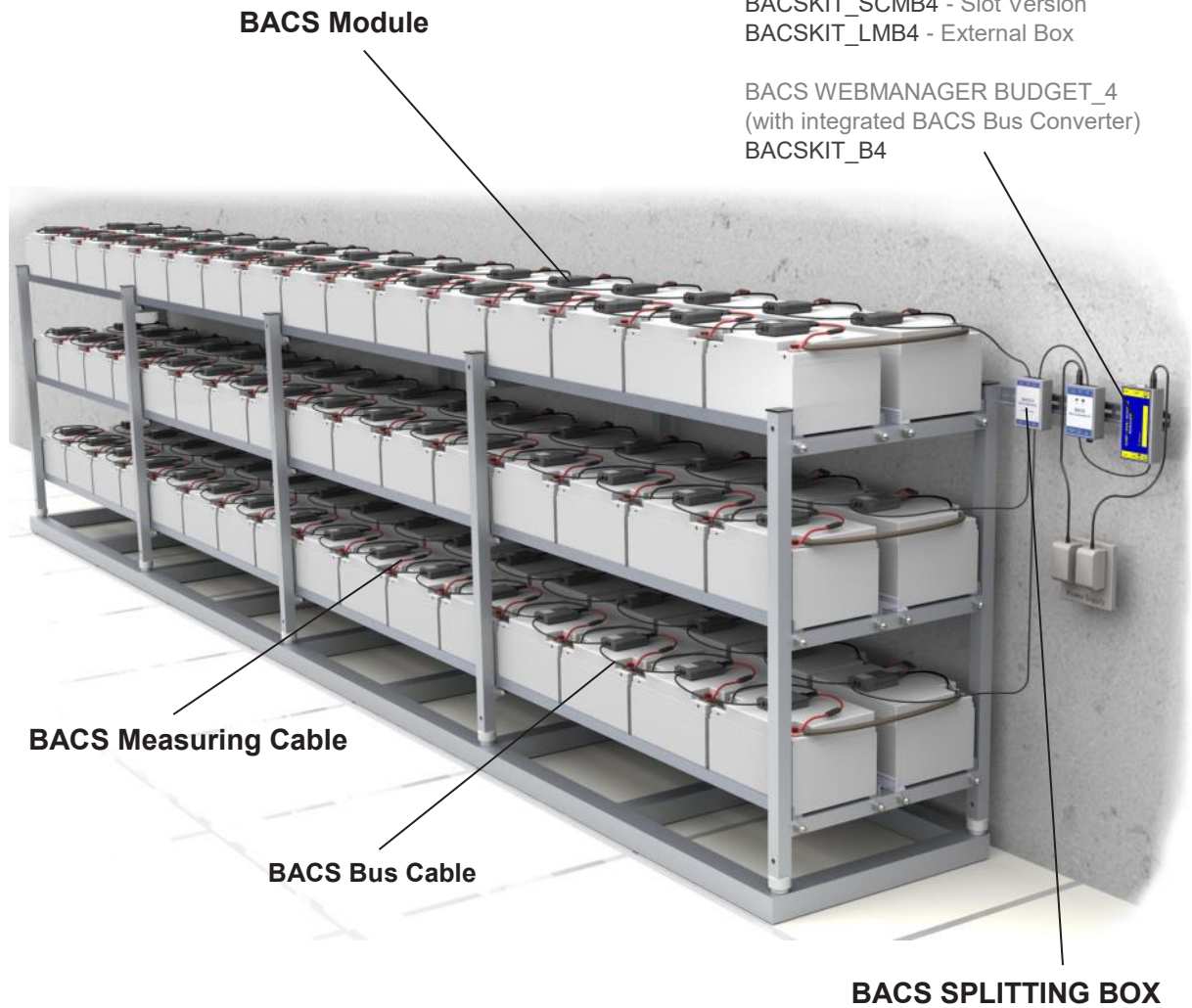
BACS System Hardware Components:

BACS WEBMANAGER

CS141 SNMP Adapter Professional
+ BACS Bus Converter
BACSKIT_BSC4 - Slot Version
BACSKIT_LB4 - External Box

CS141 SNMP Adapter MODBUS/RS485
+ BACS Bus Converter
BACSKIT_SCMB4 - Slot Version
BACSKIT_LMB4 - External Box

BACS WEBMANAGER BUDGET_4
(with integrated BACS Bus Converter)
BACSKIT_B4



BACS Module

BACS Measuring Cable

BACS Bus Cable

BACS SPLITTING BOX

General Safety Precautions - Working with Batteries



Improper use of the products described in this manual may lead to personal injury and/or property damage. GENEREX is not liable for injuries or damages that result from improper handling these products.



Risks associated with improper use include: explosion, fire, and short circuits. **Attention!** Battery terminals are always live, so never place metal objects or tools on top of the batteries. Battery electrolyte solutions are highly corrosive. Should you observe leaks of electrolyte from a battery, be aware that these fluids are harmful to both eyes and skin.

Installation, maintenance, and repair of batteries and battery equipment should be performed only by trained specialists (or personnel authorized by battery manufacturers to perform such services). Persons who have not been trained in battery safety or the proper handling of batteries (or who have not been authorized to work on them) must not handle batteries.

Observe the following regulations (IEEE standards USA only):

- ZVEI publication "Instructions for the Safe Handling of Electrolyte for Lead-acid Accumulators."
- ZVEI publication "Safety Data Sheet on Accumulator Acid (Diluted Sulphuric Acid)."
- VDE 0510 Part 2: 2001-12, in accordance with EN 50272-2:2001: "Safety Requirements for Secondary Batteries and Battery Installations - Part 2: Stationary Batteries".
- IEEE Standard 450-2002: "Recommended Practice for Maintenance, Testing and Replacement of Vented Lead Acid Batteries for Stationary Application."
- IEEE Standard 1188-2005: "Recommended Practice for Maintenance, Testing and Replacement of Valve Regulated Lead Acid Batteries for Stationary Application."
- IEEE Standard 1375-1998: "Guide for Protection of Stationary Battery Systems"









Observe also the following safety rules:

1. **Ensure that all electrical loads and power supplies/charging devices (including separators, fuses, and switches) are switched off. This must be carried out by qualified personnel.**
2. Remove all wrist watches, rings, chains, jewelry and other metal objects before working with batteries.
3. Use insulated tools only.
4. Wear insulating rubber gloves and rubber shoes.
5. Never place tools or metal components on top of the batteries.
6. Make sure that the battery or batteries are not mistakenly grounded. (The consequences of an accidental or incorrect connection can be mitigated reduced by terminating the ground connection.) If the system is grounded, terminate the connection. **Touching a grounded battery by mistake can result in severe electric shock.**
7. Before establishing connections, make sure to verify polarity. (Better one too many times than one too few.)
8. Filled lead-acid batteries contain highly explosive gas (hydrogen/air mixture). **Never smoke, handle open flames or create sparks near the batteries.** Always avoid electrostatic discharge; wear cotton clothing and ground yourself if necessary.
9. Wear the appropriate safety clothing and equipment.



For further information refer to the battery makers instructions for installation, maintenance, and operation of their battery products.

Warning and Safety Indication – BACS Safety Precautions

Attention		
	<u>HIGH VOLTAGE WARNING</u>	Do not open the BACS [®] sensor modules. Do not attach any kind of objects to the battery or the BACS [®] modules itself apart from the connecting cables! The BACS[®] modules and cables could be live!
 Attention!	<u>MAGNETIC EMISSIONS</u>	Do not put any materials or equipment sensitive to magnetic emissions near the BACS [®] WEBMANAGER (For example, monitors, disk drives, memory chips or magnetic tapes.)
 Attention!	<u>INSTALLATION BY QUALIFIED PERSONNEL ONLY! !</u>	The BACS [®] installation should only be installed by qualified personnel. BACS [®] is installed on batteries where high voltages could cause injuries or even death if not handled properly! The BACS [®] connection cables (temperature cable, bus cable, measuring cable) could be live! To avoid short circuits, do not touch, replace, or cut BACS [®] cables, before having disconnected the system from the batteries!
 Danger!	<u>WARNING!</u>	BACS [®] modules must NOT be mounted on a damaged battery! If a battery is damaged and its internal resistance is high, charging current (or current being discharged) may follow the path of least resistance and flow through the BACS [®] module, not the battery. Overheating and destruction of the BACS [®] module can result from this. For this reason, never use batteries that are damaged or show high internal resistances
 Attention!	<u>CHECK MODULES DURING INSTALLATION AND INITIAL CHARGING</u>	The GENEREX service technician should monitor the BACS [®] modules and the initial charge during the installation. Excessive heat created by the BACS [®] may be indication of a damaged battery or incorrectly mounted cables. The installer should not leave the installation site before installation of the BACS [®] system is complete and the battery has had 60 minutes to charge. Once this has taken place, if the BACS [®] system shows stable voltages and normal internal resistance values, it may be considered safe and can be monitored remotely.
 Danger!	<u>Observe battery temperature for up to 12 hours after a discharge period</u>	Observe battery temperature for up to 12 hours after a discharge period! For VRLA batteries, the risk of thermal runaways is greatly elevated during the 12 hours following discharge. Rising temperatures in damaged battery cells and blocs can cause fire. React immediately if battery cell or bloc temperatures rise after a discharge phase.

Safety – BACS® Configuration and Installation

AVOID INSTALLATIONS IN CERTAIN AREAS
Do <u>not</u> install BACS® in the following areas:
<ul style="list-style-type: none">• Wet or dusty places, or rooms that are not protected from water or high humidity• Areas with a constantly high concentration of salted or oxidizing gases• Areas close to sources of extreme heat, open flames, or sparks, or having high variations in temperature• Areas prone to physical vibrations• Areas with high gas concentration or flammable materials

MONITORING SYSTEM - MONITORING AND ALARMS
BACS® is a monitoring system and should be used accordingly. Ensure proper setting of the alarm threshold and proper time frame for reaction to alarms!
<ul style="list-style-type: none">• BACS® is a tool designed to increase the durability of accumulators, but its most important function is to monitor the battery in order to avoid breakdowns. For this reason, it is recommended that situations that trigger alarms be attended to within two hours of alarm notification. BACS® may not be able to eliminate altogether the risk of battery or charger failures, but through its advance warning system and the genuine Equalization process, it gives the user the ability to prevent the issues that can result from such failures• Never mix and match different BACS® C Module versions or BACS® Measuring cable types! (For example: using BACS® C Modules with REV 2 and 3 on the same battery system, using BACS® BC2 and BC5 cables in the same battery system.) This practice can damage modules/cables and lead to inaccurate measurements.

For questions and comments refer to:
www.generex.de or support@generex.de

1. Installation of BACS

1.1 Preparation of the Batteries

In order to ensure optimum support of the BACS Velcro straps, the surface of the accumulators should be dry and free of impurities and grease residues.

Please note that you only use cleaning products recommended by your battery manufacturer.

If you are unsure, only use soapy water for cleaning. After cleaning carefully dry the surface of the accumulator with an antistatic fabric.



1.2 Installation BACS Measuring Cables

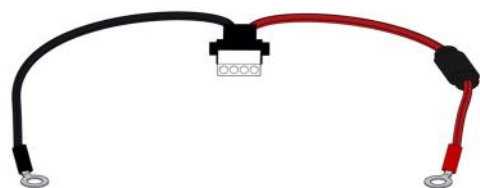
Please follow the installation diagrams on the next pages to mount the cables correctly to the batteries.

The cables should be placed as close as possible to the battery poles, but above the battery connectors.

The measuring cables are color coded:
black: Negative polarity (-) of the battery
red: Positive polarity (+) of the battery

Please refer the operating instructions of your batteries. Use manufacturer's torque values for tightening pole bolts.

Please note that a polarity reversal of the measuring cables can damage the integrated fuse of the cable.



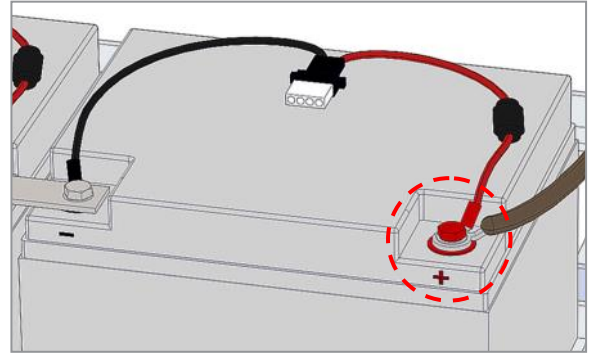
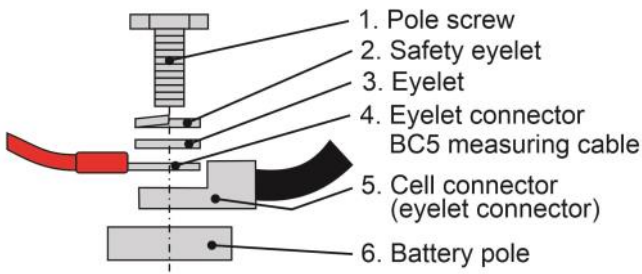
Order No.: **BC5xx**



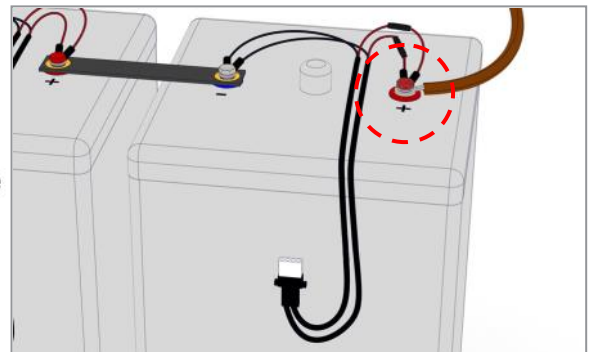
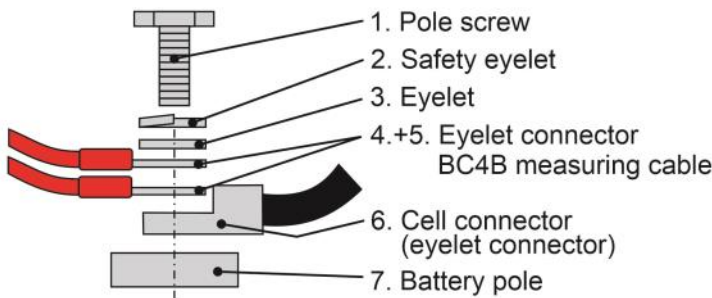
Order No.: **BC4Bxx**

Connecting BACS BCx Measuring Cable to the Battery

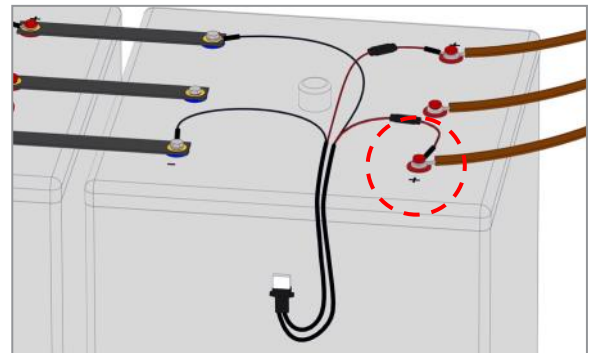
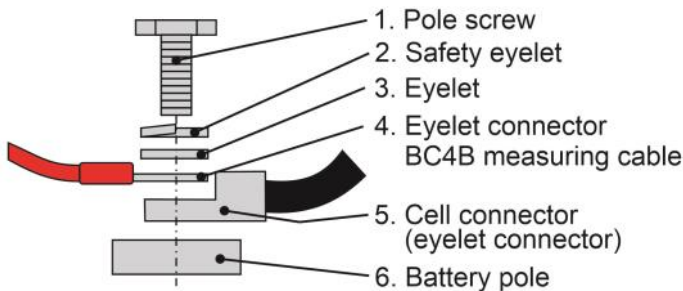
4V – 16V Battery + BC5 - measuring cable



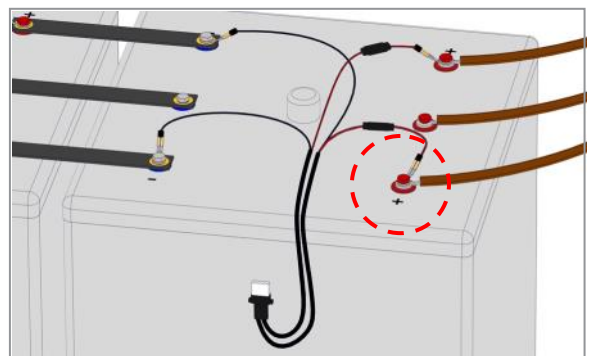
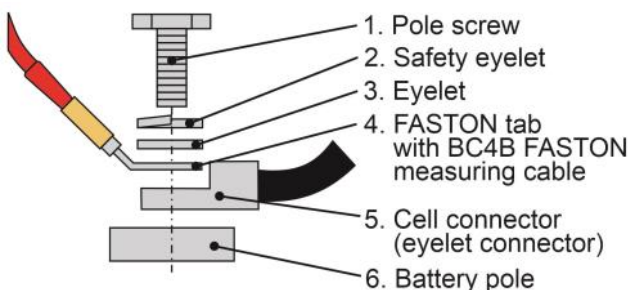
1.2V-2V Batteries with 2 poles + BC4B measuring cable



1.2V-2V Batteries with 4 or more poles + BC4B measuring cable



1.2V-2V Batteries with 4 or more poles + BC4B Faston measuring cable

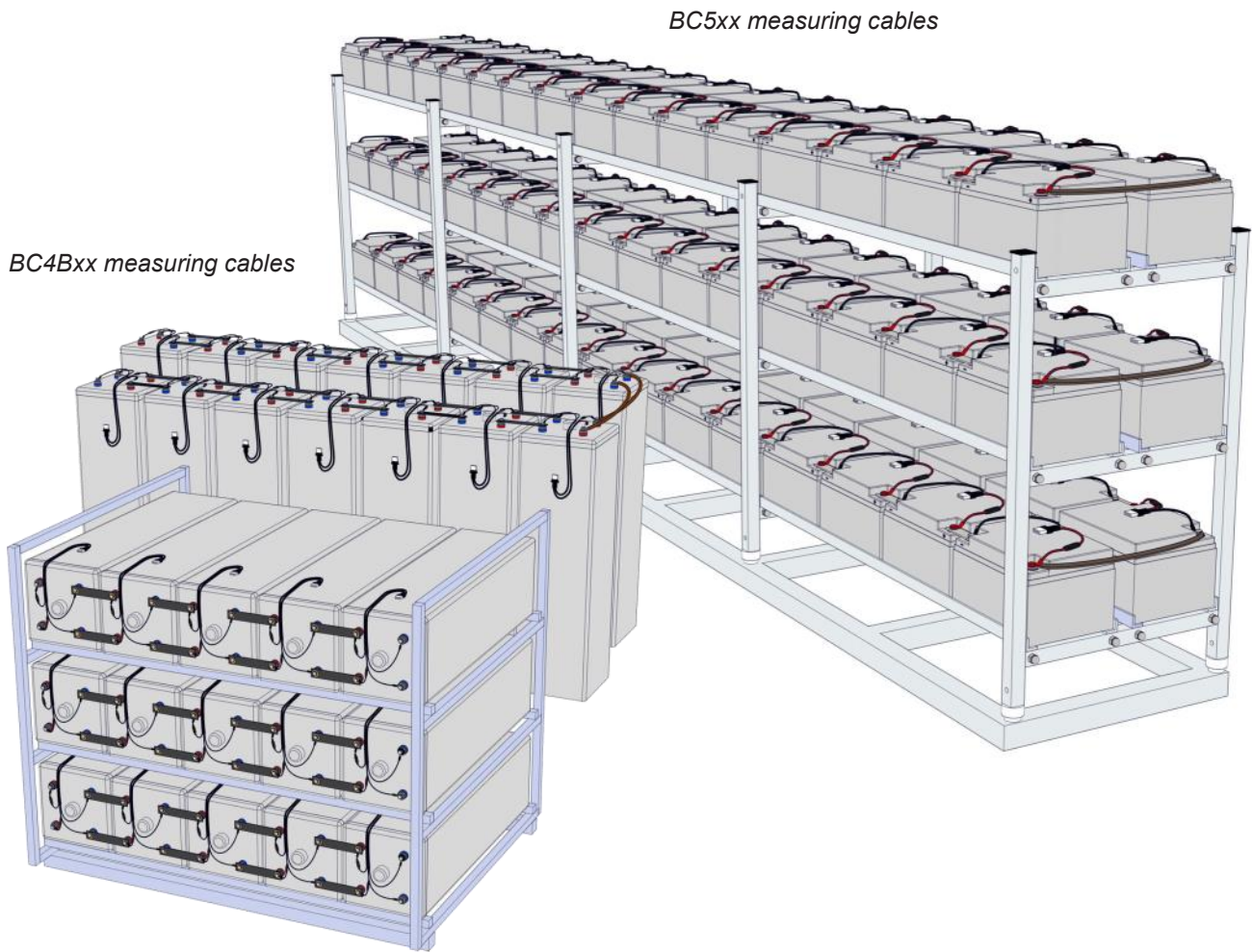


For batteries with four poles, connect the BACS test lead to all poles.

Note: If the battery has more than 4 poles, it is sufficient to connect the BACS cable to four battery poles (Use the same poles at each battery).

Note: Please refer to the battery manufacturers connection guidelines for resistance/impedance measurements. The connection stated in the quick start guide provides a high precision value any will not typically match up to the published battery manufacturing data sheets.

Installation example



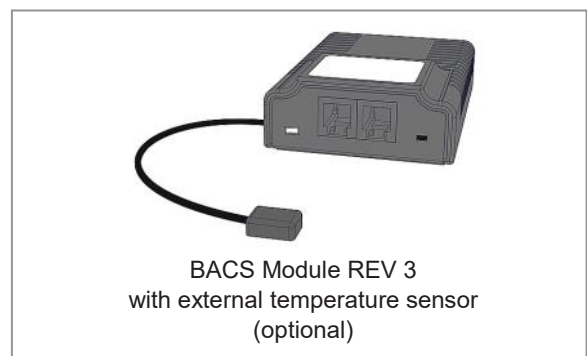
1.3 Installation BACS Modules

This installation guide refers to the modules of the series:

- Order No.: **BACSC20**
- Order No.: **BACSC23**
- Order No.: **BACSC30**
- Order No.: **BACSC40**
- Order No.: **BACSC41**
- Order No.: **BACSC50**

As standards, *BACS modules* are equipped with integrated temperature

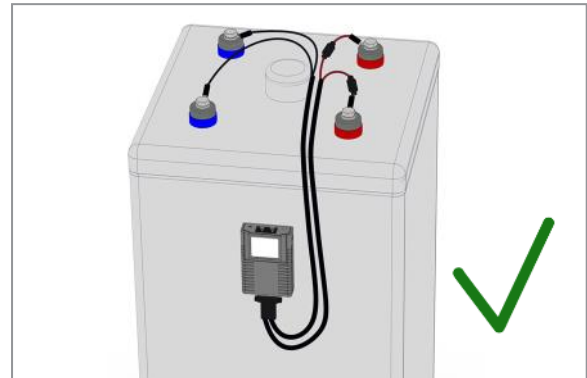
Optional you can get the Module with an external temperature sensor.



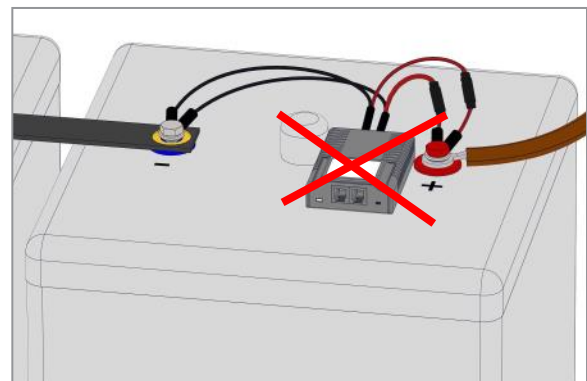
Please read before placing BACS modules!

General instructions

If there is not enough space on the top of the battery, place the *BACS module* at the front panel of the battery.

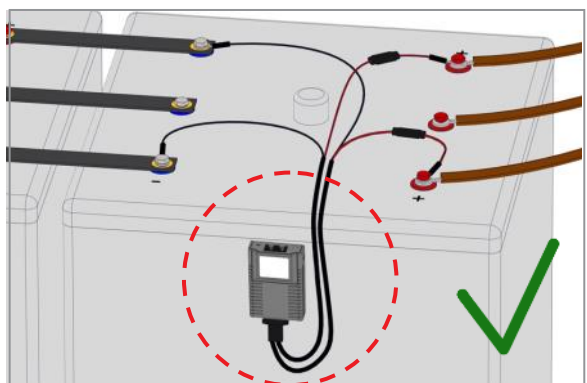


Do not install modules on any cooling ribs, plugs, or vent caps. A blocked vent hole can negatively impact the functionality of the battery.



Wet cells

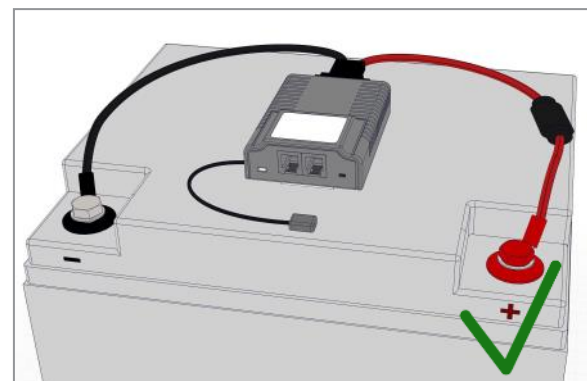
With regards to wet cells and low-maintenance batteries, a distance of at least **10cm (3.94in.)** from the module to the venting nozzle must be maintained! **Important:** It is recommended that the measuring cables run into the modules via a "safety loop" on the front of the cells. Contact with electrolyte / distilled water must be avoided at all costs!



BACS Modules with external temperature sensors

Instead of the internal temperature sensor (standard), there are also BACS REV.3 modules with already pre-assembled external temperature sensor available.

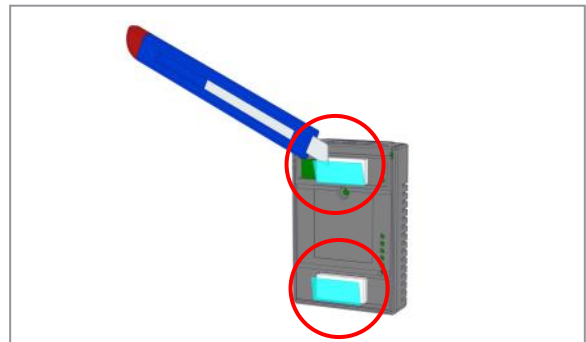
This external temperature sensor is attached at the end of a 23 cm (9.06in.) or 90 cm (35.43in.) long cable.



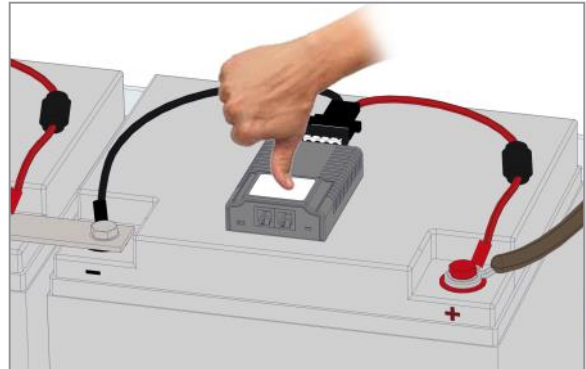
Preparing the BACS Modules

Mounting the modules

1. There are two Velcro or pressure strips on the backside of the *BACS module*. Remove the adhesive film from the Velcro strips.



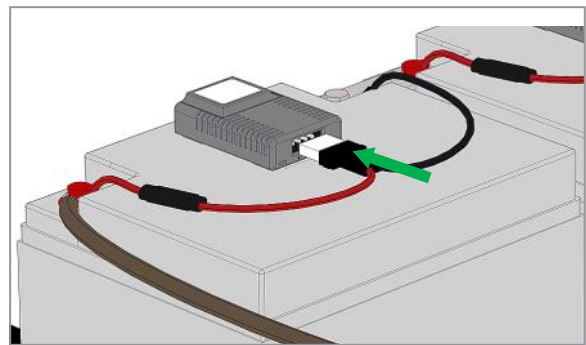
2. Mounting the *BACS module*:
Position the *BACS module*, press it firmly with your thumb under high pressure and hold the pressure for about 5-10 seconds.



Connecting BCx Measuring Cable to the BACS Module

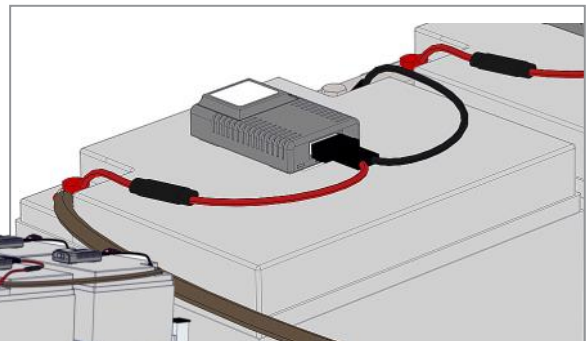
The *BCx measuring cable* is equipped with a mechanical protection against accidental polarity reversal.

Connect plug of the measuring cable to the socket at the back of the module.



Installation example

BACS Modules with connected measuring cables



1.4. Installation BACS Bus Cables



Order No.: **B4BCRJXX**

The *BACS bus cables* are components specially designed for BACS system usage. By using substitute cables, the overall function of the system can not be guaranteed. In order to avoid unnecessary cable length, the bus cables are available in various lengths.

Installation instructions

Cable length

The maximum distance between the last module and the *BACS WEBMANAGER* is **60 m (2364 inches)**. A *splitting box* will not increase distances.

Number of modules per line

A *BACS bus cable* can hold a maximum of 50 connected modules. The modules can be connected to the bus in any order. It is not necessary to connect the modules of the addresses in sequence.

Connection to the BACS WEBMANAGER/BACS Bus Converter

For operation, the nearest module must be connected to the *BACS Bus Converter* or the *BACS WEBMANAGER* via a bus connection.

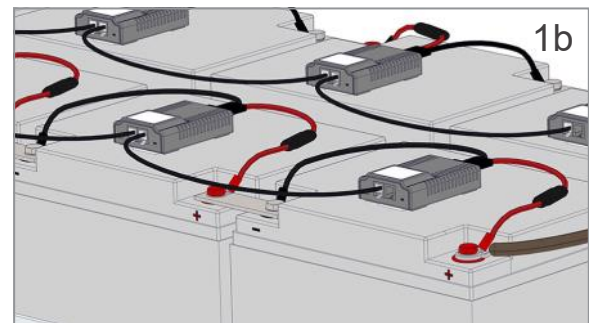
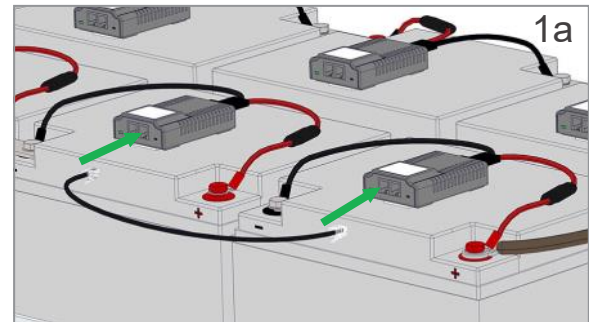
Increasing fail-safety

Basically, the BACS bus benefits from the ring topology with higher reliability of the data lines. However, ring cabling also carries the risk of a poor data signal due to electromagnetic interference: As the number of modules increases, the data lines become more sensitive to electromagnetic interference. If there is increased interference during communication, it is advisable to dispense with ring cabling, as it can take on the function of an antenna despite all the shielding.

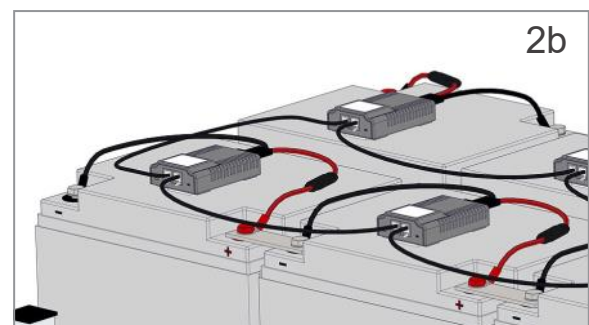
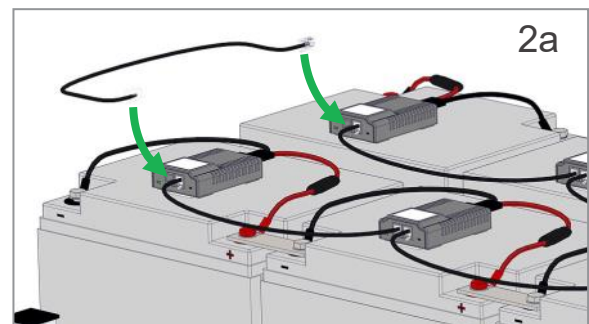
Installation of the BACS Bus Cables

Insert the plugs of the Bus cables into the sockets of the *BACS modules* (see illustration to the right).

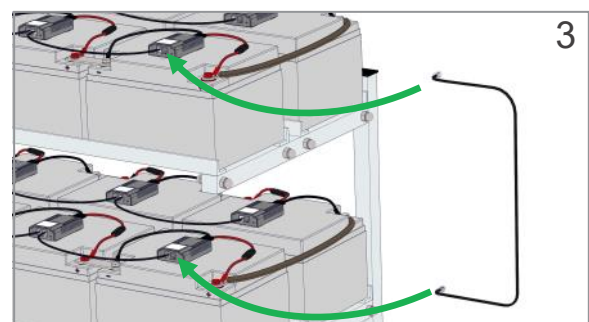
“side by side“:



“behind“:



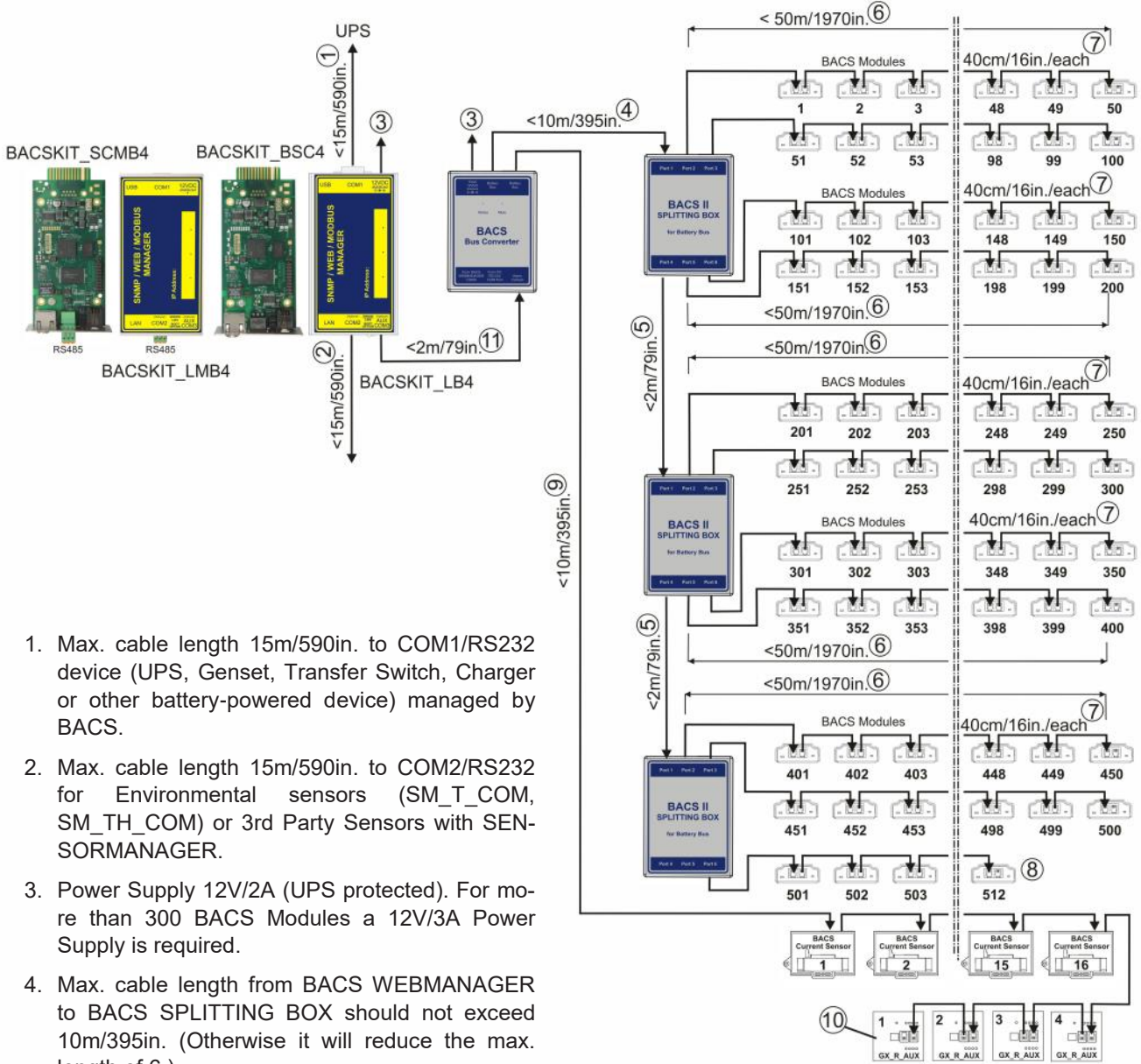
“among each other“:



General BACS BUS Cable length wiring notes

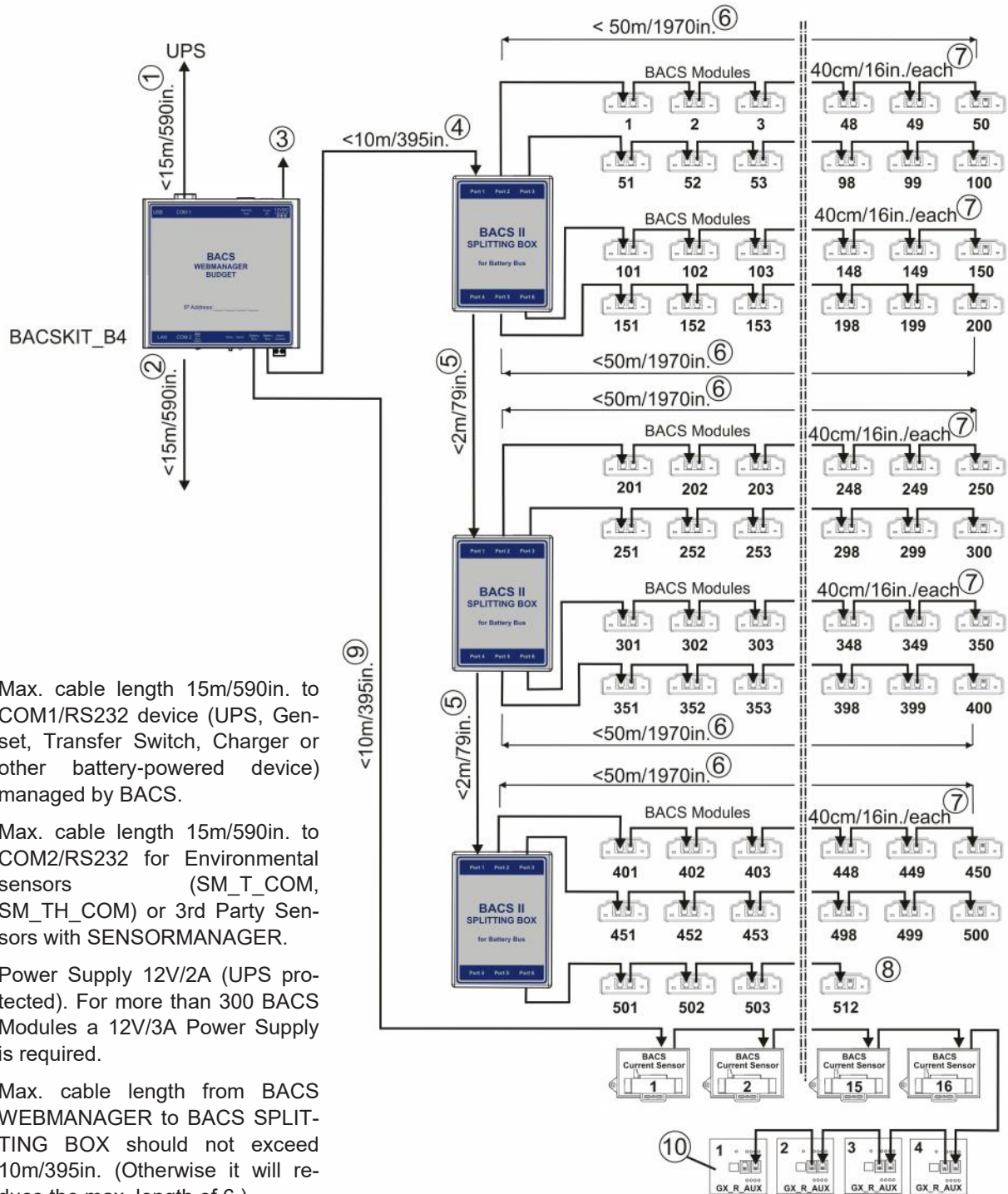
Ensure not to exceed the specified cable lengths. Since the cable lengths can be partially customized, the following diagram is a general aid for calculating the respective cable lengths within your installation.

CS141 modular BACS Kit B4



1. Max. cable length 15m/590in. to COM1/RS232 device (UPS, Genset, Transfer Switch, Charger or other battery-powered device) managed by BACS.
2. Max. cable length 15m/590in. to COM2/RS232 for Environmental sensors (SM_T_COM, SM_TH_COM) or 3rd Party Sensors with SENSORMANAGER.
3. Power Supply 12V/2A (UPS protected). For more than 300 BACS Modules a 12V/3A Power Supply is required.
4. Max. cable length from BACS WEBMANAGER to BACS SPLITTING BOX should not exceed 10m/395in. (Otherwise it will reduce the max. length of 6.)
5. The cable length of the connection between the BACS SPLITTING BOX will reduce the max. length of 6.
6. Total Length of a BACS bus must not exceed 60m/2360in.(4.+ 6.), measured from the BACSBUSCONVERTER. Don't connect more than 50 BACS Modules at on BACS bus string.
7. BACS bus cable length between BACS modules for the interconnection, in this example 40cm/16in. Shorter interconnecting cables would increase the distance of 50m/1970in. accordingly, longer interconnecting cables would shorten the distance of 50m/1970in.
8. Max. number of BACS Modules is 512.
9. Max. distance from BACS WEBMANAGER to BACS CURRENT SENSORS should not exceed 10m/395in.
10. Max. distance between the BACS_GX_R_AUX and the dry-contacts should not exceed 50m/1970in. in total.
11. Max. distance from CS141 to BACS Bus Converter should not exceed 2m/79 in.

BACS WEBMANAGER BUDGET



1. Max. cable length 15m/590in. to COM1/RS232 device (UPS, Gen-set, Transfer Switch, Charger or other battery-powered device) managed by BACS.
2. Max. cable length 15m/590in. to COM2/RS232 for Environmental sensors (SM_T_COM, SM_TH_COM) or 3rd Party Sensors with SENSORMANAGER.
3. Power Supply 12V/2A (UPS protected). For more than 300 BACS Modules a 12V/3A Power Supply is required.
4. Max. cable length from BACS WEBMANAGER to BACS SPLITTING BOX should not exceed 10m/395in. (Otherwise it will reduce the max. length of 6.)
5. The cable length of the connection between the BACS SPLITTING BOX will reduce the max. length of 6.
6. Total Length of a BACS bus must not exceed 60m/2360in. (4.+ 6.), measured from the BACSWEBMANAGER. Don't connect more than 50 BACS Modules at on BACS bus string.
7. BACS bus cable length between BACS modules for the interconnection, in this example 40cm/16in. Shorter interconnecting cables would increase the distance of 50m/1970in. accordingly, longer interconnecting cables would shorten the distance of 50m/1970in.
8. Max. number of BACS Modules is 512.
9. Max. distance from BACS WEBMANAGER to BACS CURRENT SENSORS should not exceed 10m/395in.
10. Max. distance between the BACS_GX_R_AUX and the dry-contacts should not exceed 50m/1970in. in total.

1.5. Connection cable between BACS WEBMANAGER & BACS Bus Converter

Available BACS WEBMANAGER

BACS WEBMANAGER BUDGET_4
with integrated BACS Bus Converter
Order No.: **BACSKIT_B4**



SNMP/WEB MANAGER Professional
CS141SC Slot
+ external BACS Bus Converter
Order No.: **BACSKIT_BSC4**



SNMP/WEB MANAGER Professional
CS141L external
+ external BACS Bus Converter
Order No.: **BACSKIT_LB4**



SNMP/WEB MANAGER MODBUS-RS485
CS141SCM Slot
+ external BACS Bus Converter
Order No.: **BACSKIT_SCMB4**



SNMP/WEB MANAGER MODBUS-RS485
CS141LM external
+ external BACS Bus Converter
Order No.: **BACSKIT_LMB4**



The BACS Bus Converter

The *BACS BUS converter* galvanically separates the BACS bus from *BACS WEBMANAGER*. Furthermore it converts BACS bus protocol to RS232 protocol.

In addition, active EMI filtering is performed to protect the current measurement results from interferences.

Order No.: **BUS_CONV_V**

Attention:

If the spring contacts inside of the COM / AUX of the *BACS WEBMANAGER* are mechanically damaged by a wrong cable, addressing and *communication problems occur between the BACS WEBMANAGER* and the connected modules.

Use only the 6-pin original RJ12 cable included with the *BACS WEBMANAGER*.

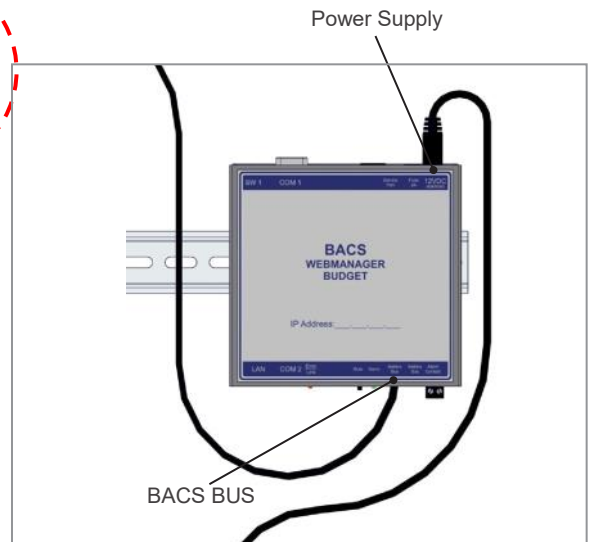
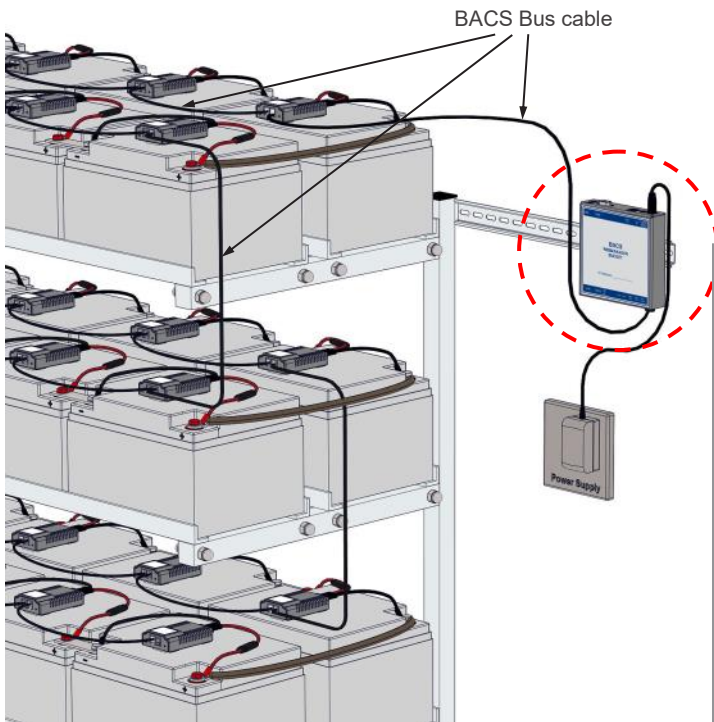
6-pole special cable RJ12
(ca. 1m = 39 in.)



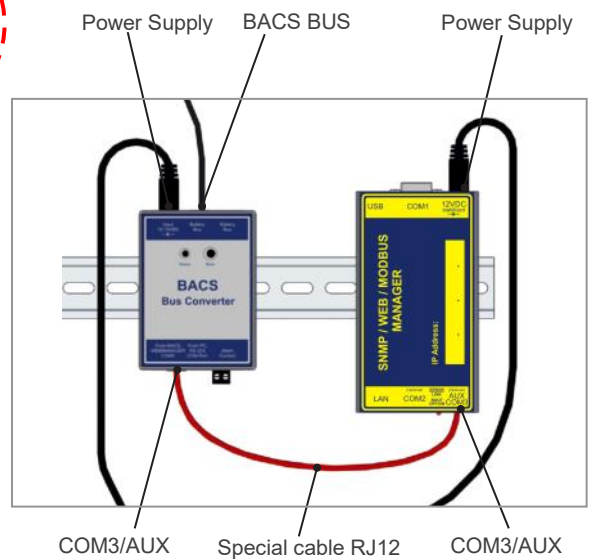
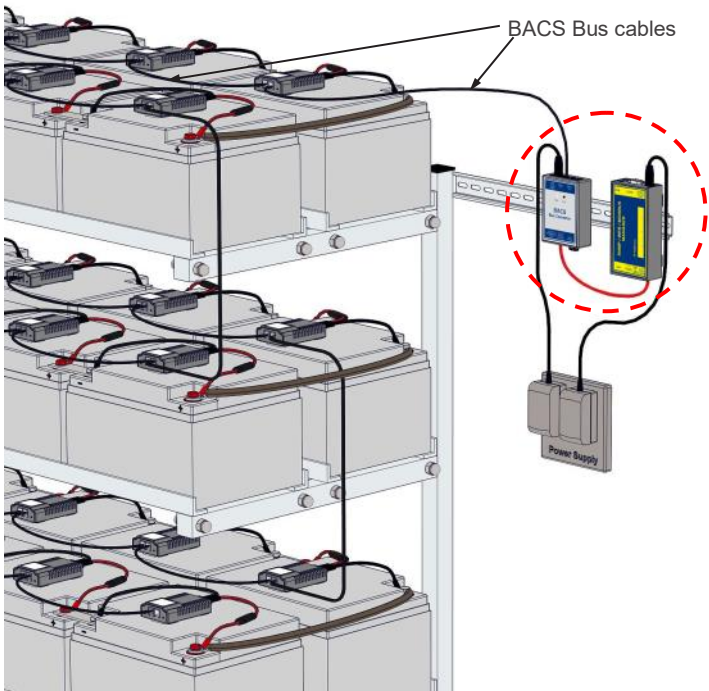
BACS WEBMANAGER BUDGET,
COM3/AUX Port Warning Label

Wiring instruction: BACS WEBMANAGER

BACS WEBMANAGER Budget with integrated BACS Bus Converter

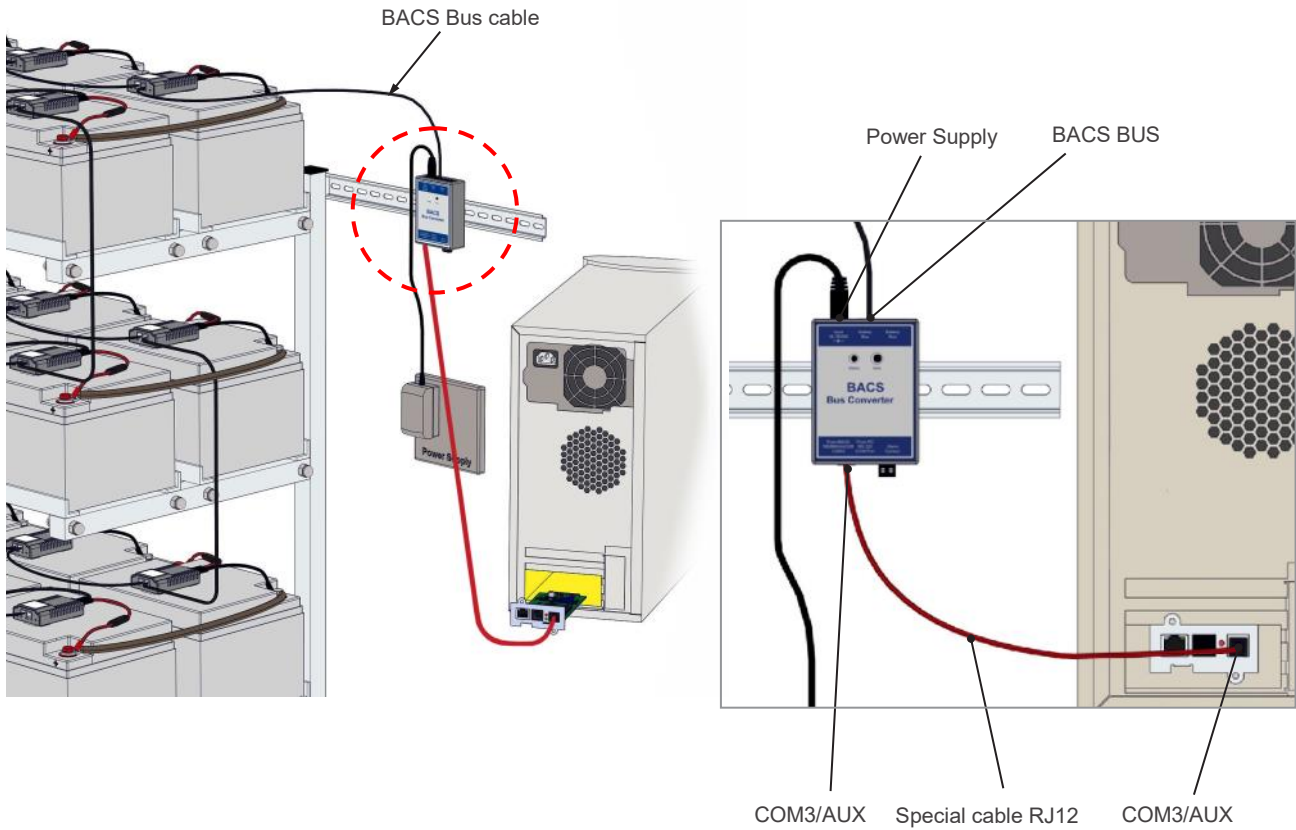


BACS WEBMANAGER BACS Kit Box with external BACS Bus Converter



BACS WEBMANAGER BACS Kit Slot with external BACS Bus Converter

For use in addition to your UPS, inverter, rectifier or other devices with a suitable slot.



Die BACS SPLITTING BOX

For battery systems with more than 50 batteries, it is recommended to use a *BACS SPLITTING BOX*.

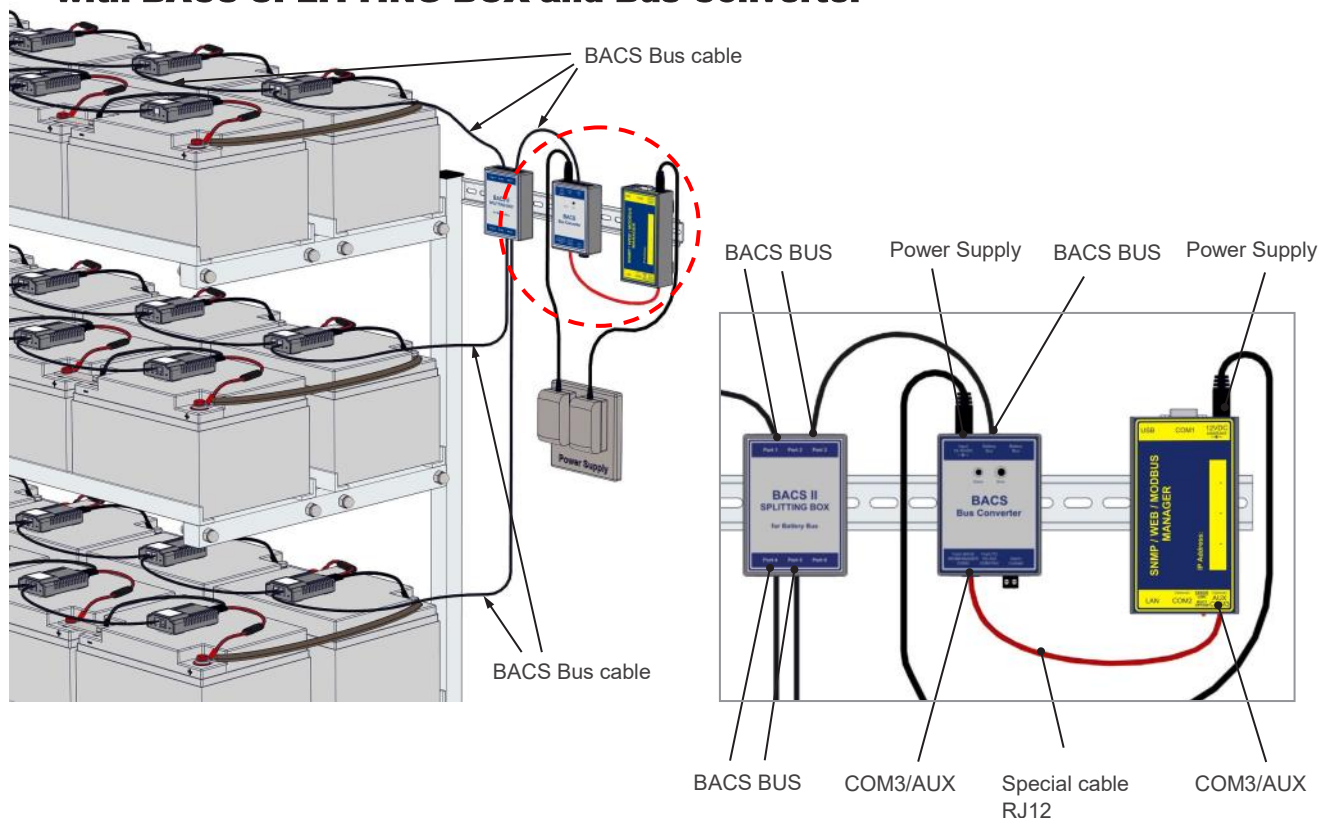
It serves the reduction of total bus cable length and allows an optimized star-shaped bus cabling installation. It is possible to connect more BACS SPLITTING BOX at one BACS System.

Distribute all BACS modules equally to the ports of the SPLITTING BOX. Ensure that each port can manage up to 50 BACS modules.

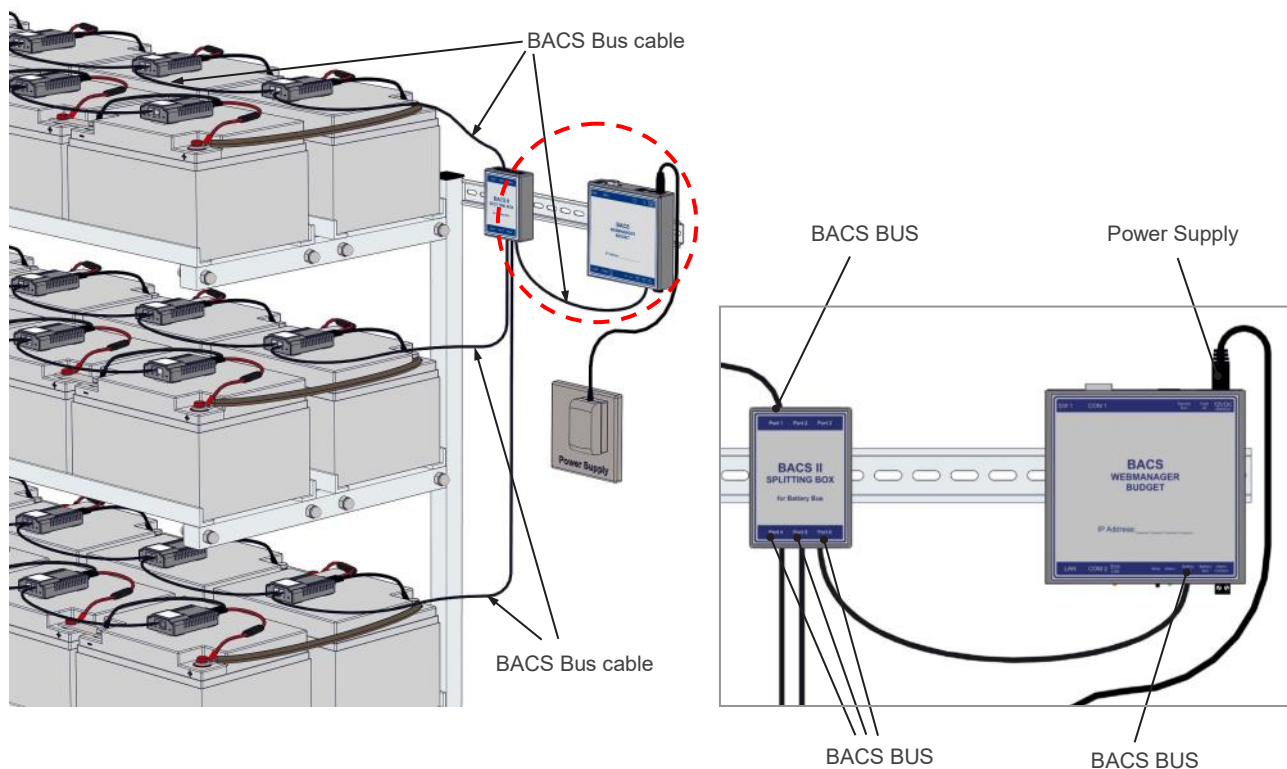


Order No.: BCII_SPLITT

BACS WEBMANAGER BACS Kit Box with BACS SPLITTING BOX and Bus Converter

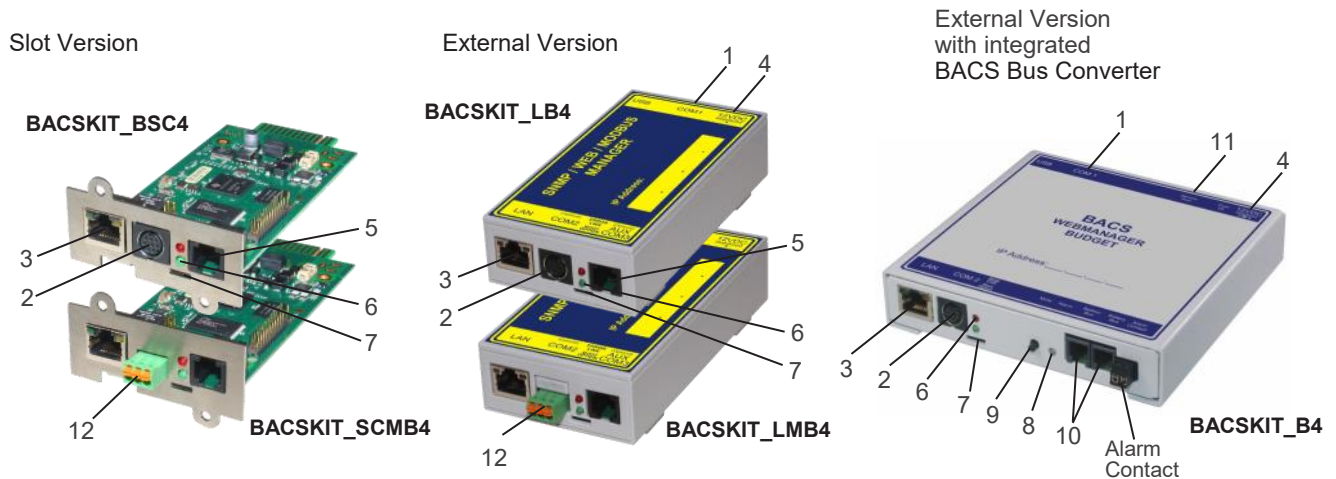


BACS WEBMANAGER Budget with BACS SPLITTING BOX



Installation of the BACS hardware complete
For operational mode, the BACS modules need to be configured!

2. BACS WEBMANAGER Configuration



Description	Function																					
1 COM1 Port	Connection with an UPS or another end device via the original RS232-cable.																					
2 COM2 Port	Connection for optional devices like a modem, multi sensor SENSORMANAGER, temperature sensor, humidity, field busses (MODBUS, RS232, Profibus, LONBus, etc.).																					
3 LAN Port	Ethernet 10/100 Mbit interface with integrated LEDs (green LED: connection to the network established, yellow LED: network-activity).																					
4 DC Input	Power supply 12VDC/1A stabilized through external power supply, DC-connector inside (+) plus, outside (-) minus.																					
5 COM3/AUX	For the connection to the BACS® Bus Converter (at BUDGET 4 internal), max.1m Rj12/6pole cable.																					
6 LEDs (red/green)	<table border="1"> <thead> <tr> <th>Operation Status WEBMANAGER</th> <th>Red LED</th> <th>Green LED</th> </tr> </thead> <tbody> <tr> <td>No Power</td> <td>● OFF</td> <td>● OFF</td> </tr> <tr> <td>Booting</td> <td>● ON</td> <td>● OFF</td> </tr> <tr> <td>Update in progress</td> <td>● ● flashing slowly</td> <td>● OFF</td> </tr> <tr> <td>Update failure</td> <td>● ● flashing fast</td> <td>● OFF</td> </tr> <tr> <td>UPS Communication lost</td> <td>● ON</td> <td>● OFF</td> </tr> <tr> <td>Operating</td> <td>● OFF</td> <td>● ● flashing slowly</td> </tr> </tbody> </table>	Operation Status WEBMANAGER	Red LED	Green LED	No Power	● OFF	● OFF	Booting	● ON	● OFF	Update in progress	● ● flashing slowly	● OFF	Update failure	● ● flashing fast	● OFF	UPS Communication lost	● ON	● OFF	Operating	● OFF	● ● flashing slowly
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	Update failure	● ● flashing fast	● OFF																			
UPS Communication lost	● ON	● OFF																				
Operating	● OFF	● ● flashing slowly																				
7 Slide Switch	<p>Toggles configuration and operation mode</p> <p>Slide Switch middle position: Sets the BACS® WEBMANAGER BUDGET to the configuration mode. After cold boot/reboot the default IP address 10.10.10.10 is active.</p> <p>Slide Switch right position: DHCP is activated and an IP address is set automatically. Check MAC address of your BACS WEBMANAGER to locate according IP Address.</p> <p>Slide Switch left position: Sets operational mode</p> <div style="text-align: right;"> </div>																					
8 Alarm LED	BACS-Alarm LED (green / red / yellow)																					
9 MUTE Button	Button for the acknowledgement and mute of the horn. Alarm LED changes to yellow.																					
10 BACS Bus	2 x Rj10 interface to connect BACS C-Module / SPLITTINGBOX / BACS_CSXXX / GX_R_AUX																					
11 BACS Service Port	For connection to a PC/Laptop RS232-port, for addressing or readout the BACS modules via BACS_Programmer or BACS_Reader Software directly (provided RS232 cable - DSub9 -> Mini-Din8) .																					
12 RS485 Interface	MODBUS variants: BACSKIT_SCMB4 and BACSKIT_LMB4																					

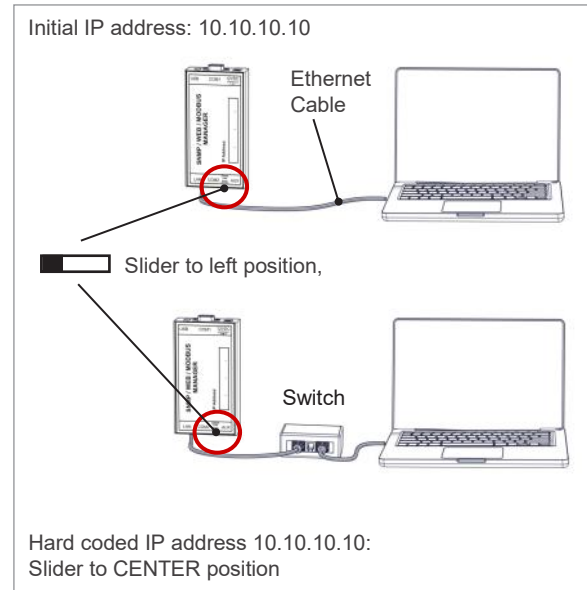
2.1. Installation / network integration of a BACS Webmanager

Initial configuration

On delivery, the IP address is 10.10.10.10 and the Webmanager is in manual mode. As soon as you assign an IP address, the *Webmanager* will take over the new settings without reboot:

1. Leave the „*sliding switch in the left position*“.
2. Connect the *Webmanager* to the „*LAN port*“ of your workstation via, either directly or via a switch.

When the IP address is wrong, it is possible to fall back to the hard coded IP address 10.10.10.10 by setting the sliding switch to center position and rebooting the device.



Connecting the UPS

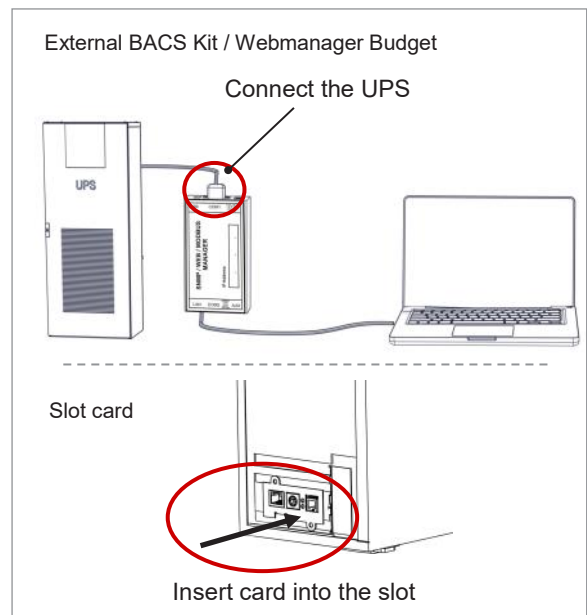
... when using an external CS141 or a BACS WEBMANAGER BUDGET

If necessary, connect the UPS with the original serial UPS cable to the "COM1 port" of the web manager.

Connecting the *BACS WEBMANAGER* directly with a UPS system is an additional feature. BACS will run without it, too.

... when using a BACS WEBMANAGER Slot card version

Insert the *Webmanager* directly into the „*according card slot*“ of the UPS. You do not need to depower the UPS.



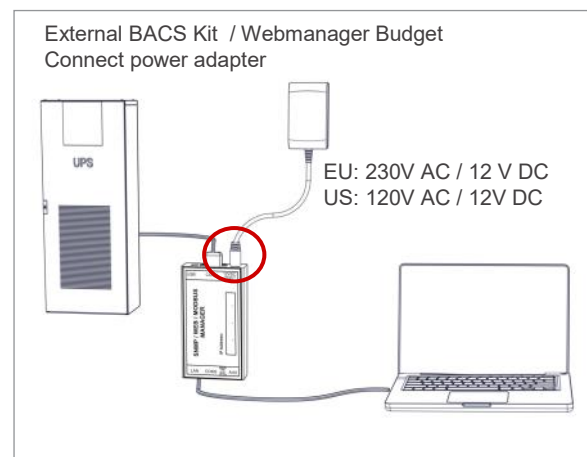
Powering up the manager

... when using an external Webmanager

Connect the power adapter coming with the *Webmanager* device. As soon as power is available, the *Webmanager* will start booting

... when using a slot card version

The *CS141* slot card will be powered by the internal connectors of the slot provided by your UP. As soon as you plug in the slot card, it will power up and start booting.



2.2 Preparing the Computer

Add a route on your computer

1. Run the command prompt with the option "run as administrator" from the Windows context menu.
2. Enter the following command:
route add 10.10.10.10 <local IP address>
(Example: "route add 10.10.10.10 192.168.1.54")
3. Windows will confirm your command with „OK“



Access the web interface

1. Open your local web browser

2a. Direct access for initial configuration

Enter the start IP as target: „[http\(s\)://10.10.10.10](https://10.10.10.10)“

2b. If in DHCP-Mode: The Netfinder

Netfinder is a tool that can display the IP and MAC addresses of web managers connected to your network. It helps if your IP addresses are assigned using DHCP.

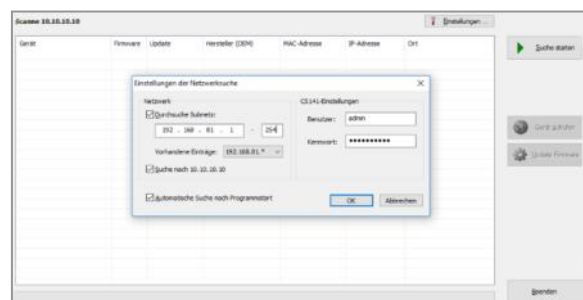
find the tool in the download area at

www.generex.de

3. Login

Use the initial login data :

User: **admin**
Password: **cs141-snmp**



2.4 For UPS user: The setup wizard

Please note: If only BACS is in use, click cancel and proceed with configuration step 3

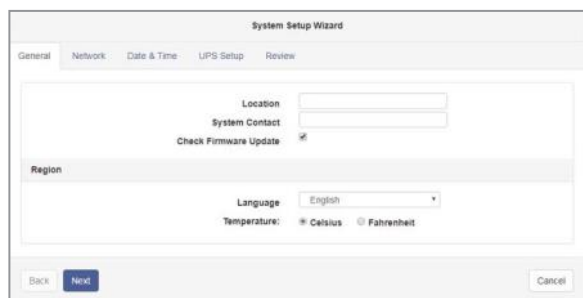
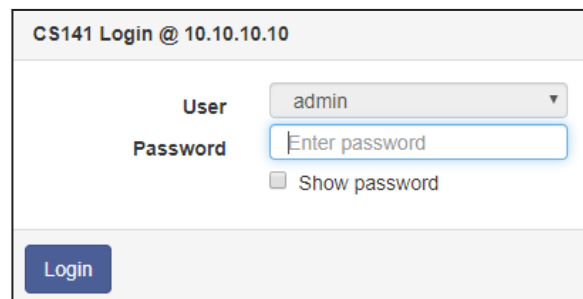
The web manager starts with the configuration help, the "System Setup Wizard".

This guides you through the most important installation points.

Tip:

If the wizard does not start automatically, click on

- "systems"
- "magician"



3. Basic configuration

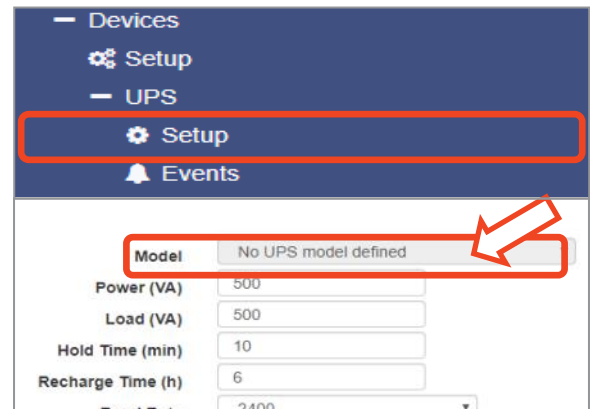
Select your language

1. On the drop-down menu, select
 - „**System**“
 - „**General**“
2. Select your preferred system „**language**“.
3. With „**Apply**“, settings will be saved.



Choose your UPS

1. Choose in the menu
 - „**Devices**“
 - „**UPS**“
 - „**Setup**“
2. At „**Model**“, select the UPS you want to connect to the *Webmanager*. Setting up a UPS is not necessary: If you want to use BACS only, select "No UPS model defined".
- 3.
4. Press „**Apply**“ to save your settings.



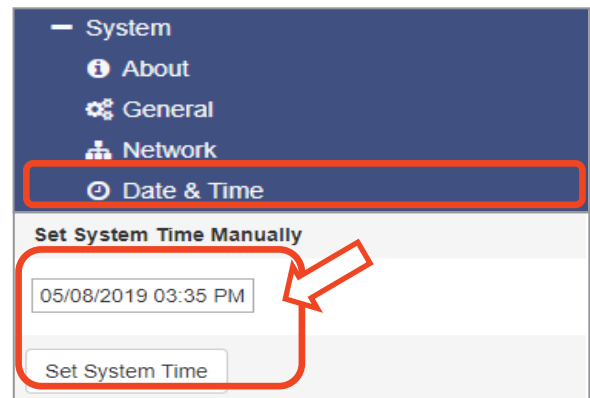
Configure the local system time

The time is important for accurate event logging.

1. Under „**System**“ go to „**Date & Time**“
2. For the quick configuration, just press:
 - „**Set System Time**“

Note:

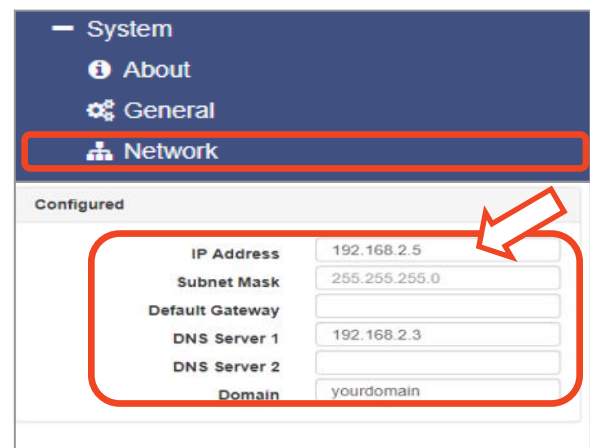
The *Webmanager* provides a preset of time servers - feel free to customize them to fit to your network.



Enter a valid IP address

When dealing with large network infrastructures, a static IP address is recommended.

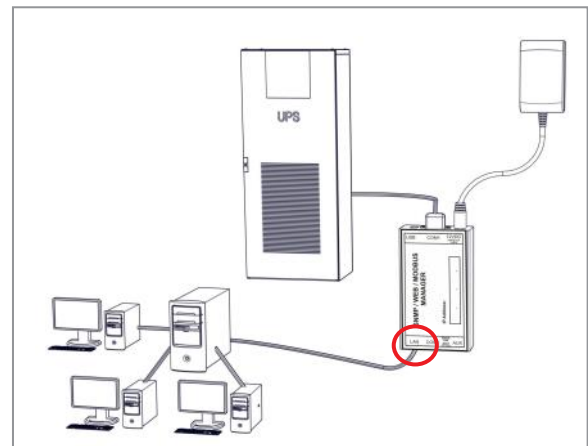
1. Under „**System**“, select „**Network**“
2. Enter valid IP address data:
 - „**IP-Address**“
 - „**Subnet Mask**“
 - „**Default Gateway**“
 - „**DNS Server**“
3. Press „**Apply**“ to save your settings.



Connect the Webmanager with your network

Since the web manager automatically takes over the new IP settings on the fly as soon as you enter a valid IP address, a restart is not required. After configuration work, connect the web manager to the target network.

Connect the „LAN port“ of your *Webmanager* with the according network node.



Using the DHCP mode

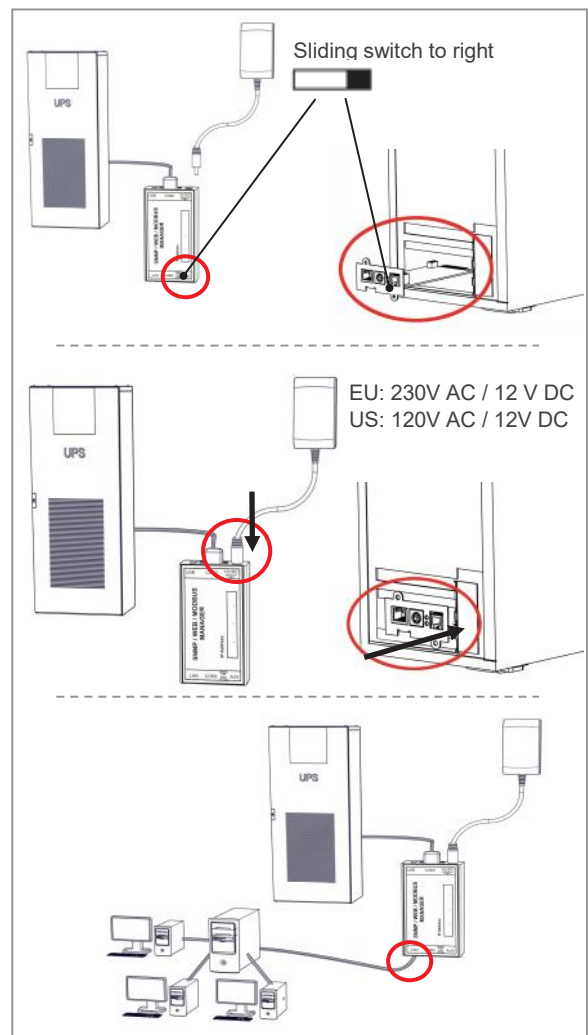
1. Remove power adapter from the external web manager. Since The slot card is a hot plug system, simply remove it from the UPS slot.
2. Put the „sliding switch to the right“ position.
3. Connect the power supply or insert the slot card into the according slot of the UPS
4. Connect the *Webmanager* to your local network.

The UPS will continue running as expected. Removing the power supply from the external *CS141* or removing the slot card does not affect the UPS! After reboot, the *Webmanager* can be reached by entering the IP address as configured at the DHCP server.

Note:

The recommended setting is using a static IP address:

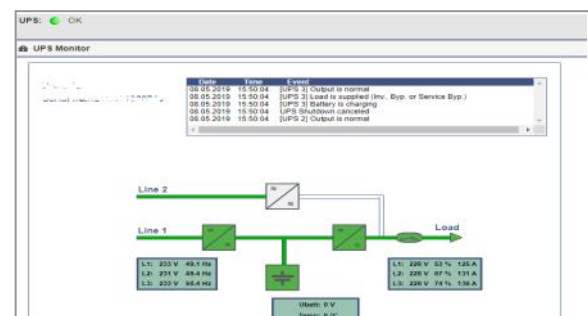
If the DHCP server is not reachable, the *Webmanager* will boot and start with a manually configured IP address. Furthermore, some options like RCCMD requires a static IP address and the DHCP server may change it dynamically.



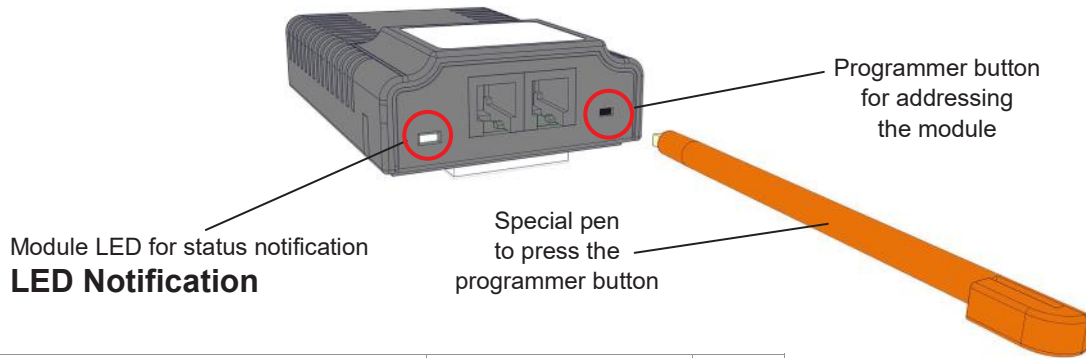
Login and check settings

Log on to the web manager again:

The upper area should show an „OK“. At the UPS monitor, *UPS operational state data* will be displayed.



4. BACS Module Configuration



Operation state module:	LED notification:	
Not addressed (default delivery status)	flashing red	●●
Programming modus active	fast flashing red	●●
Programmed & communication active	solid green	●
Programmed & no active communication	flashing green	●●
Threshold High/Low	solid red	●
Search mode	alternating red / green	●●

BACS Modules are available in following conditions:

1. Default delivery status - not addressed

Status notification of the module LED:

- slowly flashing red = **Standard address = 0**

BEFORE starting the addressing, **ALL** modules have to be in this condition!

If this is not the case, all modules have to be reset back into the status of delivery.

2. Pre-Programmed by the supplier

optional service - Order No. „BACS_PGM”

Status notification of the module LED:

- Slowly flashing green = no BACS communication or
- solid green light! = normal operation

Note: With pre-addressed modules, you do not need to address them yourself!

„Sleep Mode“ - Information:

Status notification of the module LED:

- no activity

Modules > Rev 3.xx are in «sleep mode» when they are connected to the measuring cable. They wake up *automatically*, if the *BACS WEBMANAGER*, *BACS Programmer* or *BACS Reader* sends request. To wake up the modules, it's necessary to activate bus communication via connected *BACS WEBMANAGER*, *BACS Programmer* or *BACS Reader*.

Note:

1. The quick installation guide describes the integrated BACS programmer.
2. For a windows-based legacy tool set, refer the download section of www.generex.de.
3. The legacy tool set (BACS programmer, BACS Reader and BACS Viewer) provides advanced functions for your BACS system.

4.1 Setup Battery Information

1. Under „BACS“, select menu item „Setup“.
2. At battery, enter the basic battery data.

Configuration example:

Your UPS uses 40 batteries provided by 2 strings

Please Enter at "Number of batteries" 40 and at "number of battery strings" 2.

UPS with center tap or positive and negative strands

The charge voltages between positive and negative strand can differ. In this case, equalizing / balancing is only ensured while the strings independently control the circuits of the batteries.

If the battery system of your UPS uses a center tap using a configuration like that, you need to setup your BACS system according to it.

To handle different power circuits your BACS configuration needs for each power circuit an independent string.

Configuration examples:

2 parallel strings (2 x positive / 2 x negative)

Number of configured BACS strings: 4

3 parallel strings (3 x positive / 3 x negative)

Number of configured BACS strings: 6

Modules per line:

Status display and log file

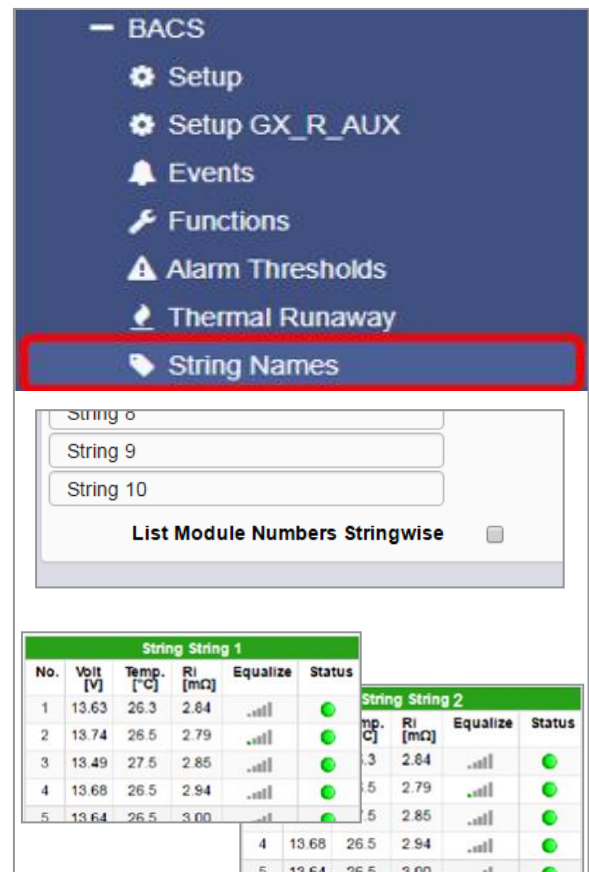
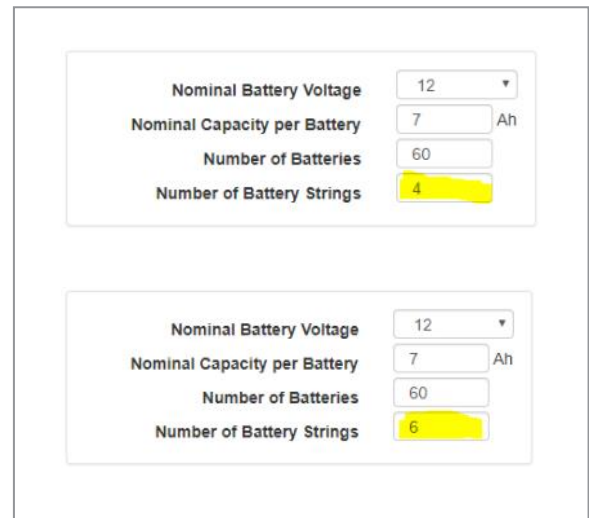
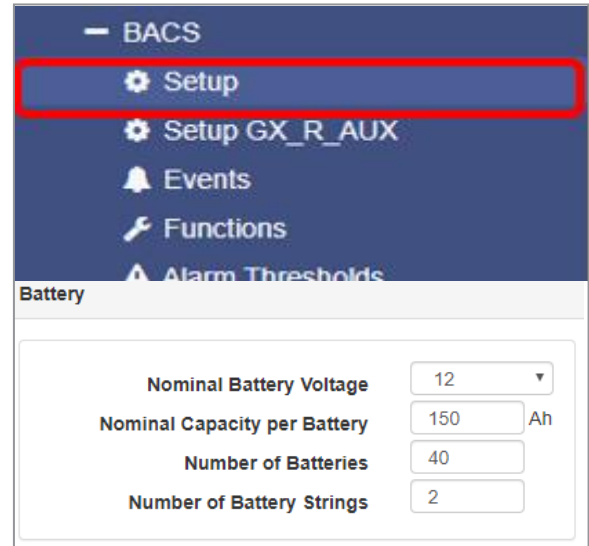
By selecting "**List Module Number Stringwise**", BACS web interface will display battery addresses 1 - 20 at String 1 and at String 2.

In addition, the batteries per string are logged with a prefix in the BACS log file:

4S2 = module 4 in strand 2

This facilitates the identification of a BACS module.

If you are unsure how many strings to enter, please ask your UPS manufacturer for further informations about your UPS system.



4.2 The integrated BACS Programmer

The BACS Programmer Tool is an essential part of the *BACS WEBMANAGER*.

1. Under „**Devices**“, open the „**BACS**“ submenu.
2. Select the menu item „**Programmer**“.
3. By pushing „**Enable Input Capability**“, BACS configuration capability will be enabled:

Mit dieser Funktion schalten Sie folgende Funktionen zur BACS-Konfiguration frei:

Audible Confirmation:

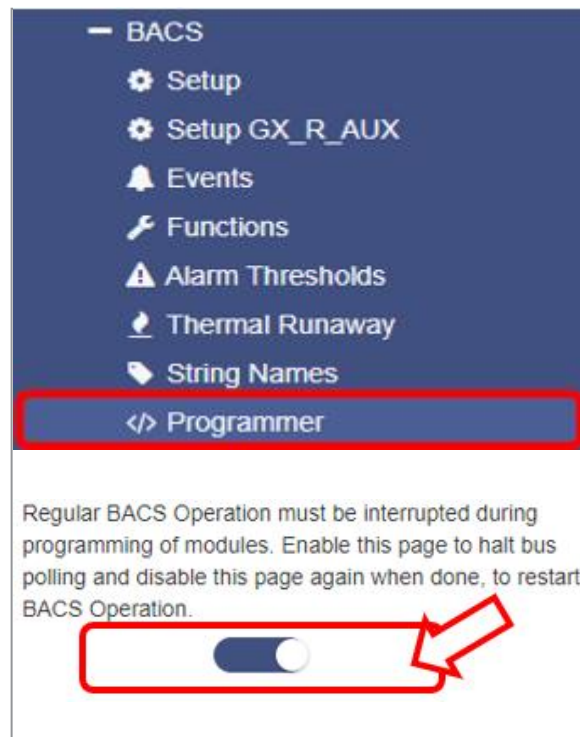
A signal tone confirms the BACS module button.

Automatic/Manual Mode:

Address your BACS-Modules.

BACS Address Search Tool:

Find BACS modules by address.



4.2.1 Addressing BACS Modules via Automatic Mode

Automatic mode allows automatic addressing of modules. After each successful addressing, an address is automatically incremented to prevent duplicate addressing. If the *WEBMANAGER* should provide audible feedback for each registered module, enable „**Automatic Mode**“.

„**Start Address**“ defines the first address to be used, „**End Address**“ the last address to be assigned.

Addressing example 1:

Start address is 1 and ends at address 35:
The BACS-Programmer will set up exactly 35 modules, starting at number 1.

Addressing example 2:

Start address is 76 and ends at address 89:
The BACS-Programmer will set up exactly 14 modules and assigns the dedicated address range from 76 up to 89.

Press „**Start**“ to begin.



Addressing BACS Modules

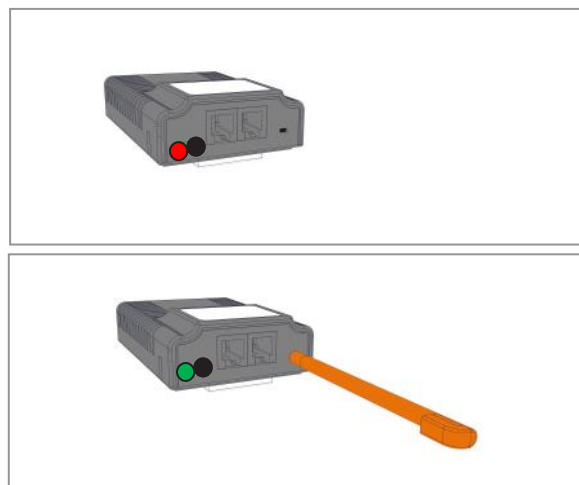
Pressing „**Start**“ in the Programmer increases the frequency of the red flashing lights on the *BACS modules*. The modules are ready for registration

Press the button on the *BACS module* briefly with the BACS PEN. The module signals the successful addressing with a green light signal. Repeat until all modules flash green.

Attention:

In automatic addressing mode, all LEDs must flash rapidly in red. If this does not happen, there is a problem with the modules.

If it happens, set the "**Set all address to 0**" checkbox at the programmer. You can also press and hold the button on the relevant BACS module for about 10 seconds to reset the module to the delivery state (With C20 HW 3.x, FW 3.4.1 and C30 & C40 HW 3.x from FW 3.4.2, this BACS module function is no longer available). After that restart registration process.



Final Conditions of Module Addressing

The automate addressing progress bar:

With each module registration, the *BACS Programmer* will count 1 up until the indicated number of modules are registered.



All indicated module addresses are used

The *BACS WEBMANAGER* terminates the registration process and reports a successful registration.



The last module has been registered

If you specified more modules than are actually installed, you can stop the progress manually. Click on the „**Stop**“ button.



Please note:

In both cases the status LED of the modules must be green or flash green.



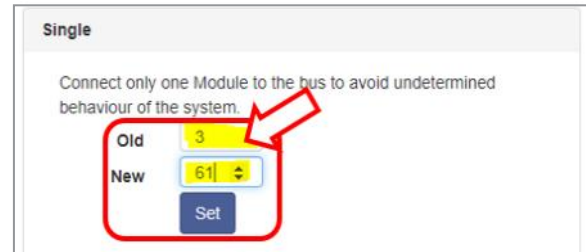
4.2.2 Addressing BACS Modules via Manual Mode

This function allows precise configuration of BACS module to provide the replacement of broken modules as well as adding one single module to the existing configuration.

Please Ensure only one module is connected to your Manager.

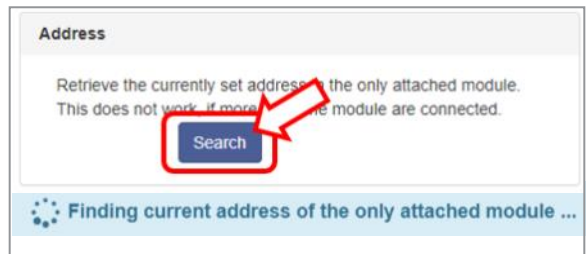
Entering address

Under „*Old*“, enter the current module address. „*New*“ allows you to assign a new address to selected module. „*Set*“ transfers the new address to the selected BACS module.



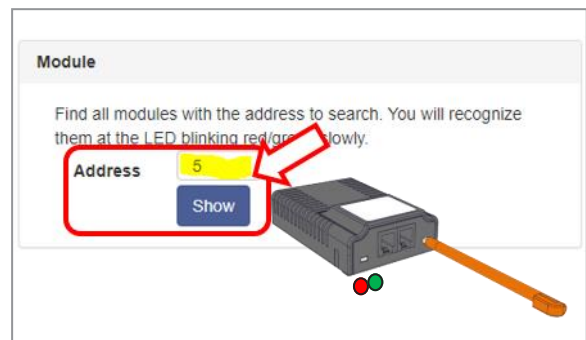
BACS address searching tool

With this function, the BACS *WEBMANAGER* displays the address of an unknown BACS module. Connect one single module to the manager and press start.



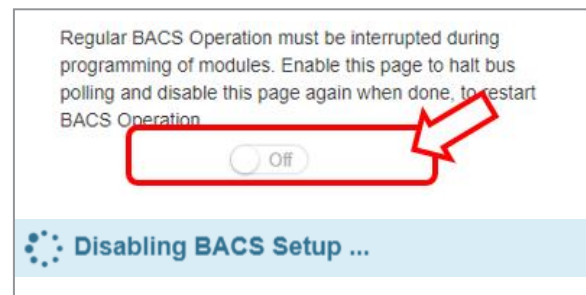
Finding a BACS module on site

If you are looking for a single address on site, enter the „*module ID*“ and click on „*Show*“. The module will start blinking red and green until you press the trigger button of the module itself.



Closing the BACS programmer tool

„*Off*“ will close the BACS programmer and the BACS *WEBMANAGER* will enable normal operational mode and reboot your BACS System.



Configuration tip for large installations:

For larger systems, you may not be able to address all available modules at once, but they are needed the same time. In automatic mode, you can first address modules 1 - 32 and later modules 33 - 64. With this function, for example, you can comfortably prepare a module replacement at address range 145 - 197. If there is an addressing error, the *WEBMANAGER* displays an error message and you can correct the affected modules individually by using manual mode.

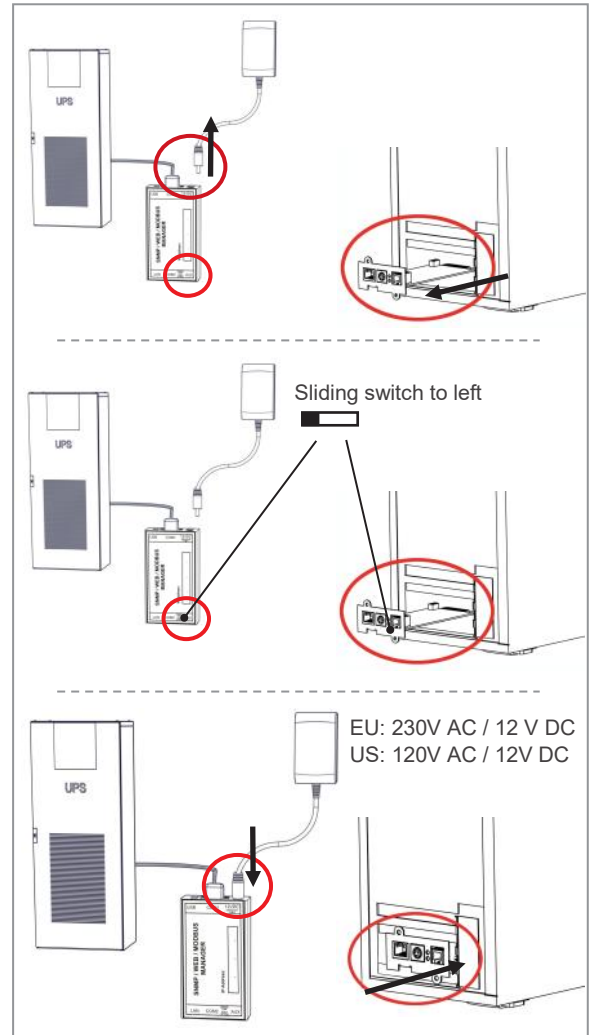
5. Activating the Operating Mode

This step is only necessary if you are running the *webmanager* in configuration mode. If the sliding switch is in the correct position you may just need to check if the IP address is correct and the *BACS webmanager* shows login dialog as expected.

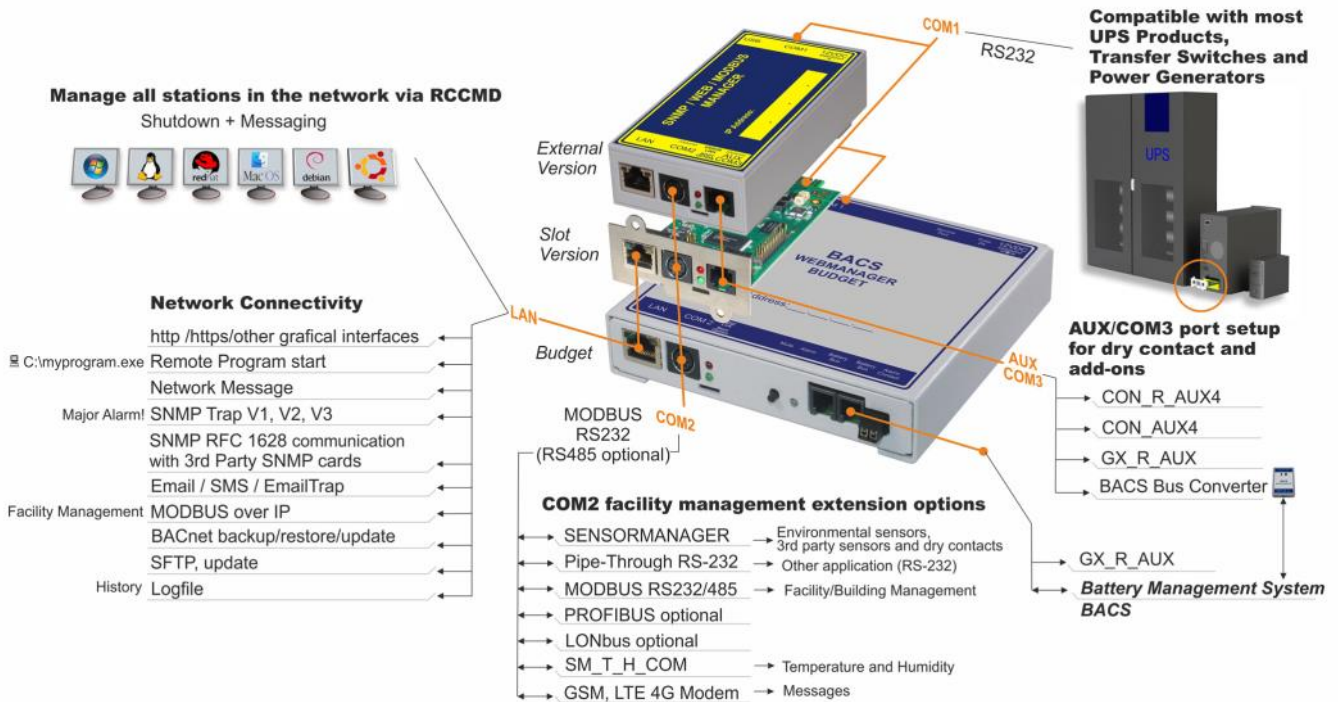
1. Remove the power supply from the *WEBMANAGER*. For the slot versions, pull the card out of the slot of your UPS.
2. To switch the *WEBMANAGER* to operating mode, „left position“: **manual IP**
„right position“: **IP via DHCP**
3. Connect the *WEBMANAGER* to the power supply. After the boot process, the adapter is accessible on the configured IP address.

After about 2 minutes, the boot process is complete and the web manager can be reached via the configured IP address.

Note: If you are running your adapter in DHCP mode, this step is omitted.



Connection Diagram for the WEBMANAGER



6. First BACS startup sequence

BACS Monitor displays the system status according to your configuration.

Indicated colours after startup:

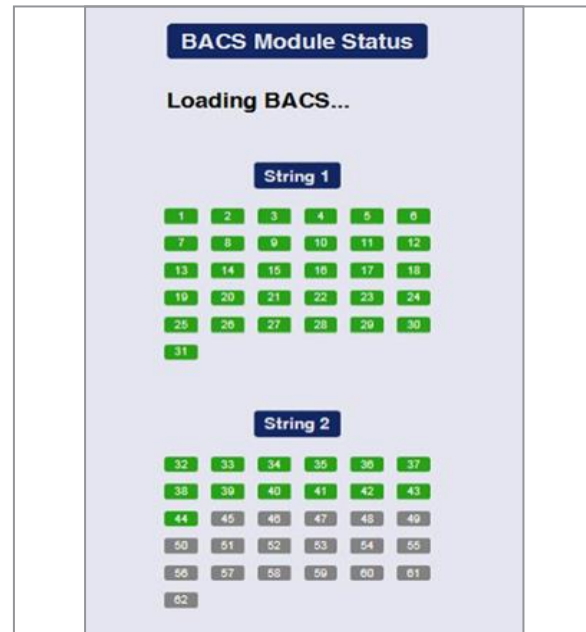
- BACS module initialized and ready for operation
- BACS module not available
- BACS module not queried or initialized

After successful initialization, the BACS status page will be displayed with the voltage and temperature of the batteries, the equalization power and the status of the LEDs.

After approximately 15 minutes, the first measurement of the impedance is performed.

Wait until the first RI measurement has been carried out before continuing with chapter

BACS Module & Alarm Threshold Setting



BACS Module Status										
● BACS Status: Charging										
String String 1						String String 2				
No.	Volt [V]	Temp. [°C]	Ri [mΩ]	Equalize	Status	No.	Volt [V]	Temp. [°C]	Ri [mΩ]	Status
1	13.62	26.3	2.82		●	21	13.50	29.0	2.75	●
2	13.77	26.3	2.77		●	22	13.51	28.6	2.94	●
3	13.49	27.5	2.85		●	23	13.46	28.0	2.75	●
4	13.67	26.8	2.92		●	24	13.63	28.0	2.85	●
5	13.62	26.5	2.98		●	25	13.83	25.5	2.58	●

Module info		Battery info		Miscellaneous	
Module type	C20	Manufacturer	Oerlikon CP 80	Voltage Low/High	9.9 V/14.7 V
Hardware Version	03.02	Type	12 year battery	Temperature Low/High	5°C/35°C
Software Version	03.02.00	Capacity(C10)	150 Ah	Resistance Min/Max	1.1 mΩ/3.6 mΩ
Number of Blocks	40	Installation Date	01.01.2008	Equalizing Range Min/Max	12.495 V/14.7 V
Number of Strings	2	Phone Number		Firmware Version	CS141-SNMP V1.52.3 170306
Contact Person		Location	Testlab 2	Discharge Counter	0

BACS system status: 2 strings and 40 modules.

For more information and operating instructions, please refer the BACS User Manual.