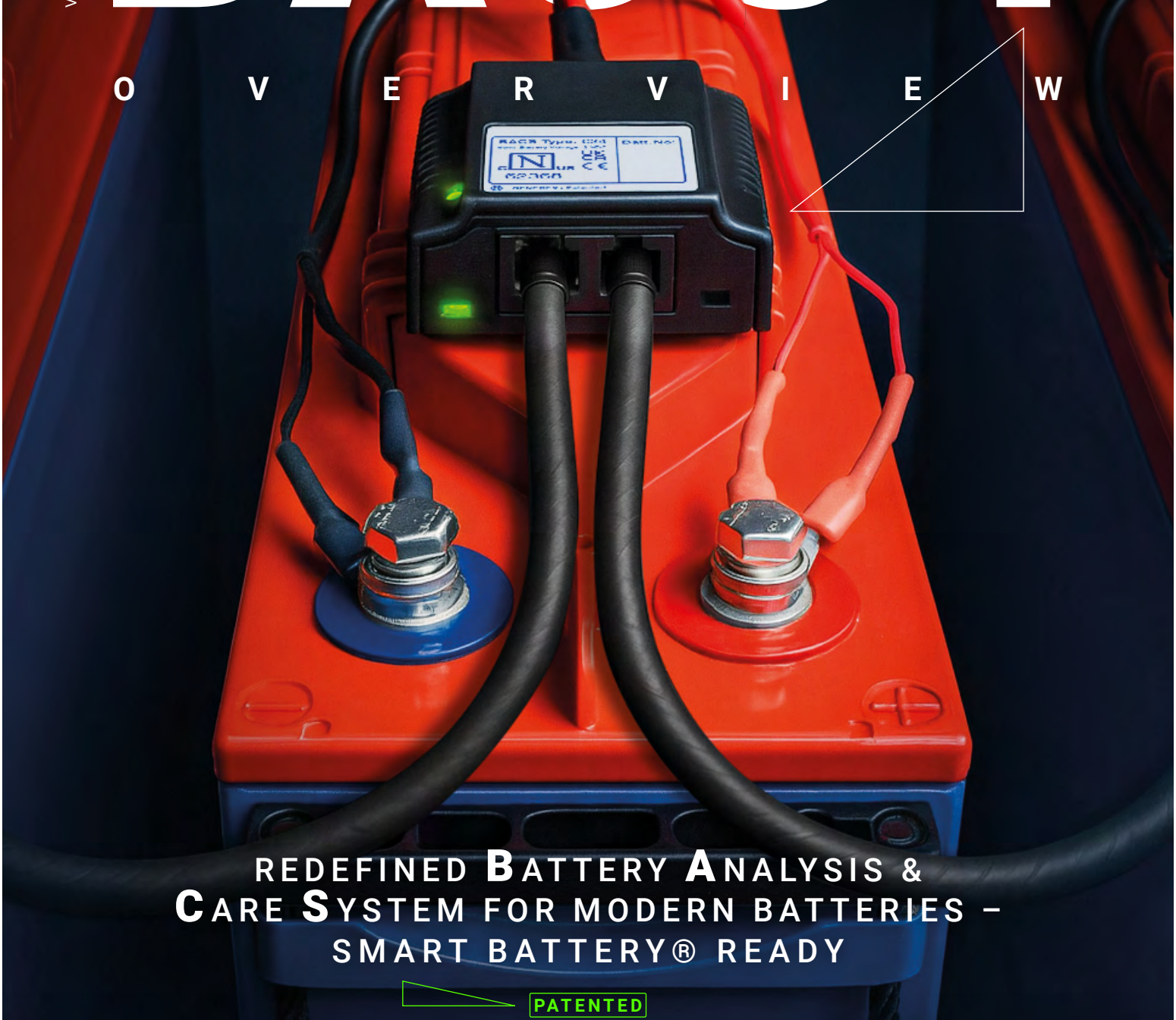
GENEREX

VERSION 2025-11-01

BACS® 4

OVERVIEW



REDEFINED BATTERY ANALYSIS & CARE SYSTEM FOR MODERN BATTERIES – SMART BATTERY® READY

PATENTED

GENEREX SYSTEMS GERMANY ◆ Brunnenkoppel 3 ◆ 22041 Hamburg ◆ Germany ◆ +49 40 22692910 ◆ sales@generex.de ◆ **generex.de**
GENEREX SYSTEMS USA ◆ 109 Magnolia Park Drive ◆ Mooresville ◆ NC 28117 ◆ USA ◆ +1 704 966 1577 ◆ sales@generex.us ◆ **generex.us**
GENEREX SYSTEMS OCEANIA ◆ 3/19 Viewtech Place ◆ Rowville ◆ VIC 3178 ◆ Australia ◆ +61 3 82032570 ◆ info@generex.au ◆ **generex.au**

GENEREX

CONTENTS

Over 4 Million Batteries with BACS®. The Global Standard.

BACS® – Battery Analysis & Care System – with Generation 4, BACS® is the market leader for stationary BMS Systems in the western world. BACS® monitors and controls more than 4 million batteries within the most critical applications in airports, military and data centers.

MADE IN USA EU MADE IN

NOT "JUST" BATTERY MONITORING LIKE ALL OTHER BMS OPTIONS ON THE MARKET – IT MANAGES! HERE ARE THE DIFFERENCES:

Unlike conventional battery monitoring systems, which are also referred to as "BMS," BACS® is **a true Battery Management System** – one of the very few real BMS on the market for stationary batteries, working in a way similar to BMS necessary for Electric Cars and other applications for modern battery technologies and high voltages. Fully developed and manufactured in the EU and USA, BACS® is the preferred choice for critical data centers worldwide. The key differences to Monitoring Systems are:

BACS® increases system capacity by up to 20% and battery lifetime by up to 50%, boosting overall efficiency and reliability.

BACS® is the first BMS to calculate and display the capacity of each individual cell – for all modern batteries as Lithium, VRLA, NiCd etc.

BACS® detects cell failures before they cause system malfunctions and slows down deterioration before it can escalate.

GENEREX

What is a BACS® System?

Hydrogen Sensor

CC Cabinet with Outside-Display

Thermal Runaway battery breaker with GX_R_AUX

BACS® WEBMANAGER AND SPLITTINGBOX

Temperature/Humidity Sensor SMTHCOM, or SENSORMANAGER

Temperature, Humidity and Gas Sensors

Each BACS® Module is connected to the neighbouring module thru an EMI robust BACS® Buscable, the rack level are interconnected through a BACS® SPLITTINGBOX and the controller is the BACS® WEBMANANGER sitting inside a CC Cabinet with/ without Display.

GENEREX

The Future is SMART

HOW SMART CAN A BATTERY BE?

The new BACS®4 module is designed for both retrofitting and integration into a SMART BATTERY (Pat.). These batteries come factory-equipped with measuring cables and integrated BACS® sensor connectors, making later installation of a BACS® or SMART LOGGER module extremely simple. SMART BATTERIES are ideal for datacenters or any application where now or later a battery management system or other electronics is planned – easy to install, cost-efficient,

and ready for:

- **BACS®** (real-time battery management)
- **SMARTLOGGER** (long-term recording)
- **EU Battery Passport** or any compatible 3rd-party device

In addition to the option of integrating a modular system like BACS® or SMART LOGGER, these batteries also provide a secure manual measuring point for service engineers – even when no BMS is initially planned.

GENEREX

BACS® Global Installations

USA

A typical US installation from the 2000s – open racks or cabinets covered by a plexiglas transparent protective cover.

EUROPE

Historical installations – BACS® Generation 2 (2008–2010) at a European Airport, open racks, encapsulated with external temperature sensors.

EUROPE

2V Batteries and 12V Batteries with BACS® Generation 3 (2011–2025).

EUROPE

BACS® installed inside a UPS.

BACS® Generation 3 OEM version in various colors.

GENEREX

Thinks beyond batteries.

For modern unmanned datacenters and drone applications – it's the new standard in the world of high level BMS.

BACS® CONTROLS MORE THAN JUST BATTERIES

BACS® monitors the surrounding environment – not only voltage, impedance and temperature, but also controlling external systems like UPS, transfer switches, generators, voltage leakage, hydrogen or other gas concentrations in the battery room. It also monitors and controls external systems like HVAC air conditioning and cooling systems, ventilation and fire alarm systems. Optionally: Any 3rd party system with a dry contact, SNMP/Modbus/ interface can be additionally monitored by BACS® and can trigger automatic counter reactions in case of alarms.

PROGRAMMABLE LOGIC FOR AUTOMATIC EMERGENCY RESPONSE

Like a programmable logic controller (PLC), BACS® (and the CS141/CS181) can be programmed to manage automatic emergency procedures.

SEAMLESS INTEGRATION INTO EXTERNAL SYSTEMS

PROBLEM

Battery systems often operate in isolation from other safety-critical infrastructure or even in fully unmanned rooms.

SOLUTION

BACS® interfaces with UPSs, inverters, switches, generators, climate conditioning – and even fire alarm systems.

INTEGRATION ADVANTAGE

BACS® connects seamlessly to BACnet, SNMP, MODBUS, MQTT and other fieldbus systems, adapting to modern safety standards of cutting edge monitoring of IT infrastructures.

VOLTAGE BALANCING ISN`T A LUXURY – IT'S THE KEY FOR ANY BMS!

PROBLEM

Battery replacement is the main cost driver in UPS systems. A single battery failure often leads to early full-string replacement – typically after just 50–60 % of the of the battery manufacturer's stated design life.

SOLUTION

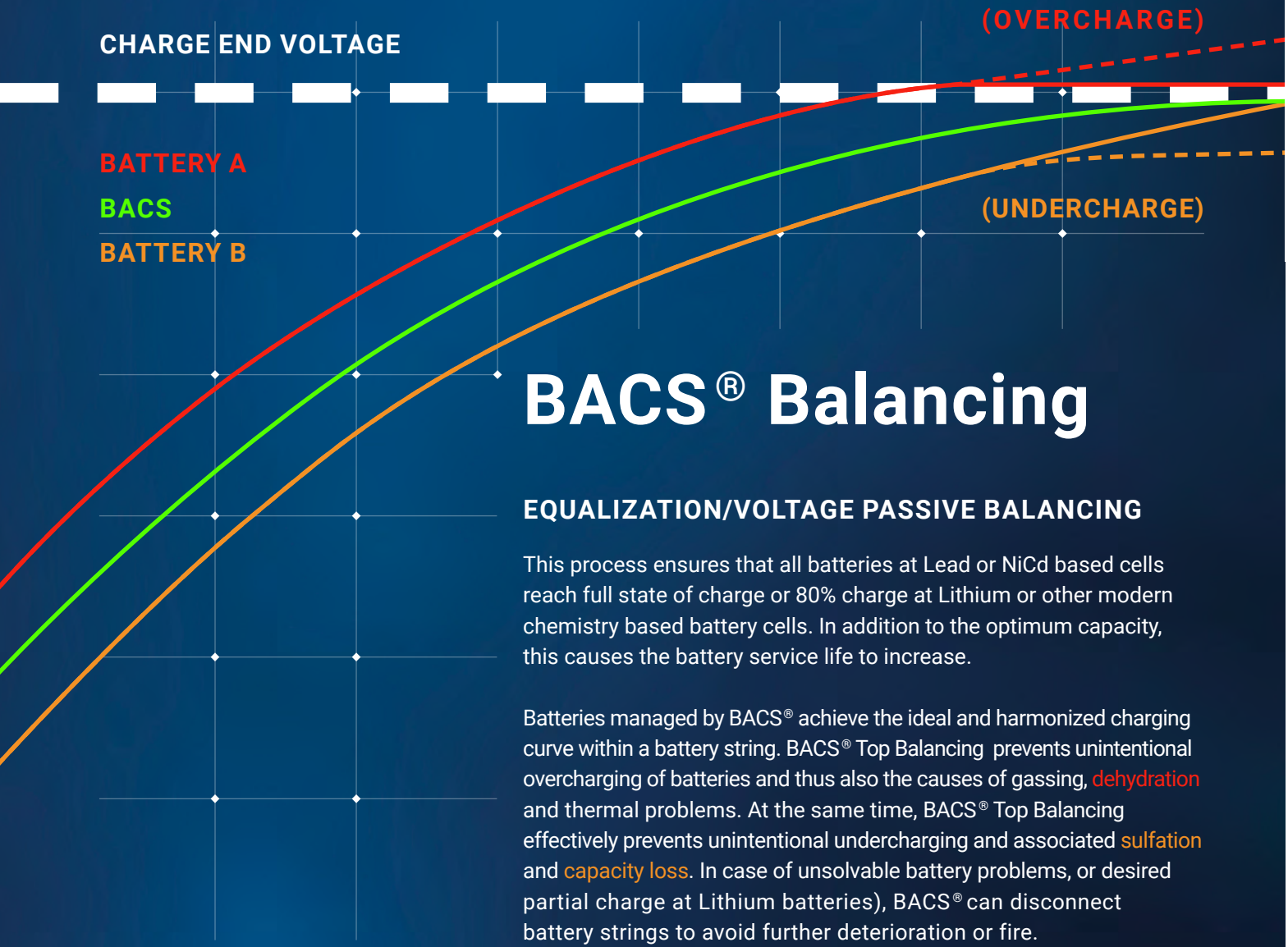
BACS® balances each battery to its optimal voltage level, avoiding over- and undercharging. This eliminates the primary cause of premature battery failure.

ADDED BENEFIT

BACS® users report up to 20 % higher usable capacity – because properly charged batteries deliver full performance in capacity tests.

WHY BACS® IS DIFFERENT

Monitoring systems merely display values. BACS® actively manages battery health automatically by fully charging (at lead acid) automatically or 80% charge at Lithium (optional) - improving safety and lowering total cost of ownership.

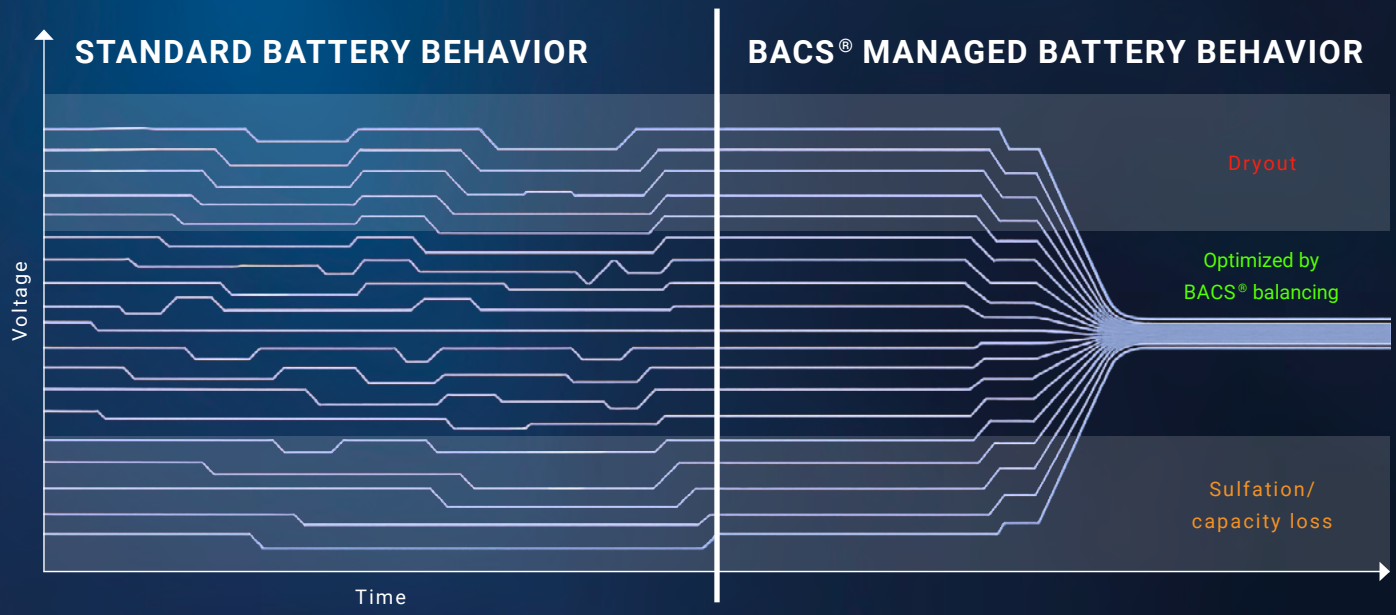


BACS® Balancing

EQUALIZATION/VOLTAGE PASSIVE BALANCING

This process ensures that all batteries at Lead or NiCd based cells reach full state of charge or 80% charge at Lithium or other modern chemistry based battery cells. In addition to the optimum capacity, this causes the battery service life to increase.

Batteries managed by BACS® achieve the ideal and harmonized charging curve within a battery string. BACS® Top Balancing prevents unintentional overcharging of batteries and thus also the causes of gassing, dehydration and thermal problems. At the same time, BACS® Top Balancing effectively prevents unintentional undercharging and associated sulfation and capacity loss. In case of unsolvable battery problems, or desired partial charge at Lithium batteries), BACS® can disconnect battery strings to avoid further deterioration or fire.



GENEREX

BACS® Top Balancing

ONE OF THE MOST IMPORTANT INNOVATIONS IN THE FOURTH GENERATION OF BACS IS THE TOP BALANCING .

This is an optimized form of passive balancing, developed specifically for stationary reserve power systems – systems in which the battery typically remains charged and idle over long periods and is only discharged in emergencies or for testing purposes.

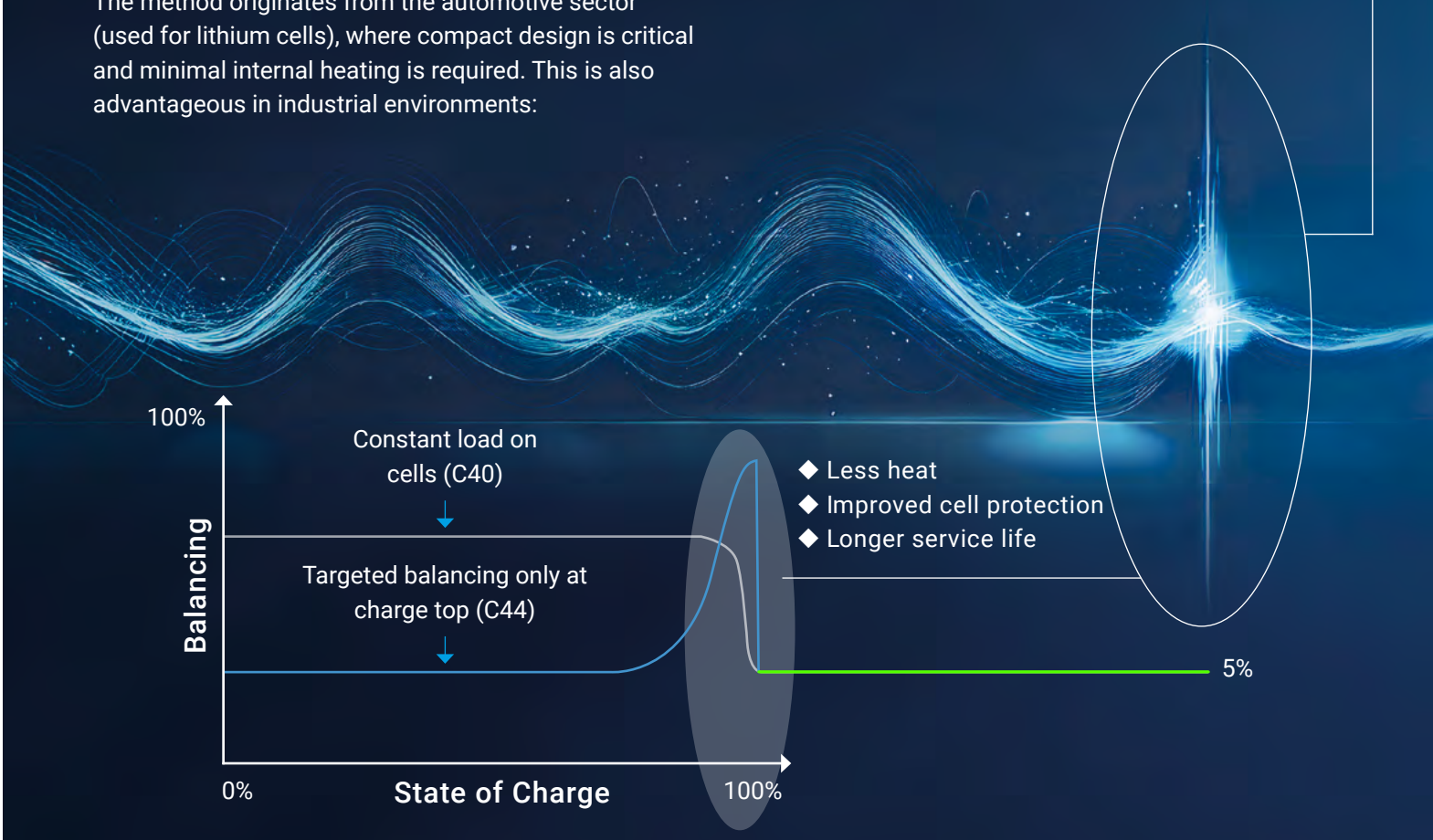
The previous passive balancing method in BACS® 3 was successfully used in the market for over 16 years, but required regulated temperature dissipation through cooling fins. The new Top Balancing builds upon the proven BACS® 3 technology – but is more targeted and energy-efficient:

The resulting heat is dissipated directly through the housing – cooling fins are no longer required. The method originates from the automotive sector (used for lithium cells), where compact design is critical and minimal internal heating is required. This is also advantageous in industrial environments:

Top Balancing ensures safety, efficiency, and extended battery life – while also simplifying the overall system design.

ADVANTAGES FOR STATIONARY BATTERY SYSTEMS:

- Lower continuous load on the cells during the charge phase
- Reduced energy consumption for balancing currents
- No significant heat generation – allowing fully enclosed housing and no heating of the battery and environment
- Top Balancing is a prerequisite for use in SMART BATTERIES



EXTRA CAPACITY

LONGER SERVICE LIFE

MEASUREMENT

Measure capacity – battery by battery.

BACS® IS THE FIRST SYSTEM TO OFFER INDIVIDUAL CAPACITY MEASUREMENT FOR EACH BATTERY OR EACH CELL – AT A FRACTION OF THE COST OF CONVENTIONAL MONITORING SOLUTIONS.

Optimized State of Charge SOC: Thanks to the Top Balancing process, BACS® guarantees up to 100% SOC with optimal protection of the batteries, thus optimizing the performance of your installation.

Increasing the Service Life (State of Health: SOH): The service life of batteries within high-voltage applications is determined by the weakest cell in the battery string and is greatly shortened by incorrect charging behavior. Batteries usually reach only 50-60% of the period specified by manufacturers as ”Design Life”, if installed in a high voltage reserve power system. BACS® keeps each battery at its optimal voltage level. This optimizes the charging process and ensures an optimal health status of each cell block, thus creating the basis for achieving the ”Design Life” specified by the manufacturer in the first place and guaranteeing a secure battery performance 24/7.

String 3						
No.	Volt. [V]	Temp. [°C]	Ri. [mΩ]	Charge [%]	Equalize	Status
61	13.61	27.0	31.05	100%		
62	13.61	27.0	32.88	100%		
63	13.61	26.6	31.97	100%		
64	13.61	27.0	30.71	100%		
65	13.61	26.7	36.33	100%		
66	13.61	27.0	28.44	100%		
∑ Voltage 408.26 V						
Average Charge 100.00 %						
13.61 [V] Target Voltage						
0 [A] DC Current 0.00 [KW] Real Power						
0.1 [A] AC Current						

Screenshot:
Excerpt of BACS® status page with (from left to right) battery number, ideal voltage on all batteries despite different impedance, temperature in Celsius, impedance in mOhm, capacity display in %, balancing power display required to maintain voltage within the ideal range, SOH status shows green as long as no thresholds are exceeded or undercut, total string voltage, average capacity, current target voltage of the charger, current DC charge/discharge current in A and the corresponding value in kW, and current AC component in A.

GENEREX

Proactive Protection. Down to Every Battery Cell.

1. BACS® – PROACTIVE PROTECTION

Not only do damaged batteries have a direct effect on their neighboring batteries – another known phenomenon is that, due to the charging behavior of batteries, new and old batteries cannot be operated together (- without being controlled by a supervision system like in Lithium batteries for automotive applications). Typically, all batteries in a string must be replaced if one older block fails. BACS ® regulates the charging process individually according to the demand and internal resistance of each battery, preventing batteries from affecting or damaging each other during charging. Thanks to this individual treatment, defective/old batteries can be replaced – allowing ”new” and ”old” to be operated together.

STANDARD BATTERY BEHAVIOR

BACS® PROTECTED BATTERIES

2. EARLY DETECTION OF BATTERY FAILURES

Typical problems like sulfation, corrosion, outgassing, dehydration, or thermal runaway can be indicated early by irregularities in the measurement data of the batteries. Warning signs appear in voltage, internal resistance, temperature development, string current, balancing power, Ripple currents and Ripple voltages. With its broad range of measurement values, BACS® offers significantly more possibilities than other BMS systems to detect and visualize these early warning signs.

3. STRATIFICATION – A HIDDEN RISK IN STATIONARY BATTERIES

In batteries at rest, the chemicals tend to separate into layers. The more liquid in the electrolyte, the stronger this effect. As a result, voltages and internal resistance gradually shift – and the batteries drift apart. Since stratification is non-reversible after a certain point, it is recommended to regularly perform full discharge/charge cycles – in other words: to ”use” the batteries – or “overcharge” such batteries at the risk of other side effects.

BACS® slows down stratification considerably. Equalizing (balancing) ensures constant light utilization of the batteries, significantly reducing stratification – even without discharge cycles. This improves SOH (State of Health) and system reliability, without otherwise typically extremely high service costs. The improved SOH results from better battery reactivity: BACS® balancing ensures batteries are ready to deliver power super quickly during an outage – unlike in non-BACS® systems, where stratification increases the risk of undervoltage-related UPS shutdown in the very first milliseconds after a powerfail.

BACS® Active Protection Against Thermal Runaways

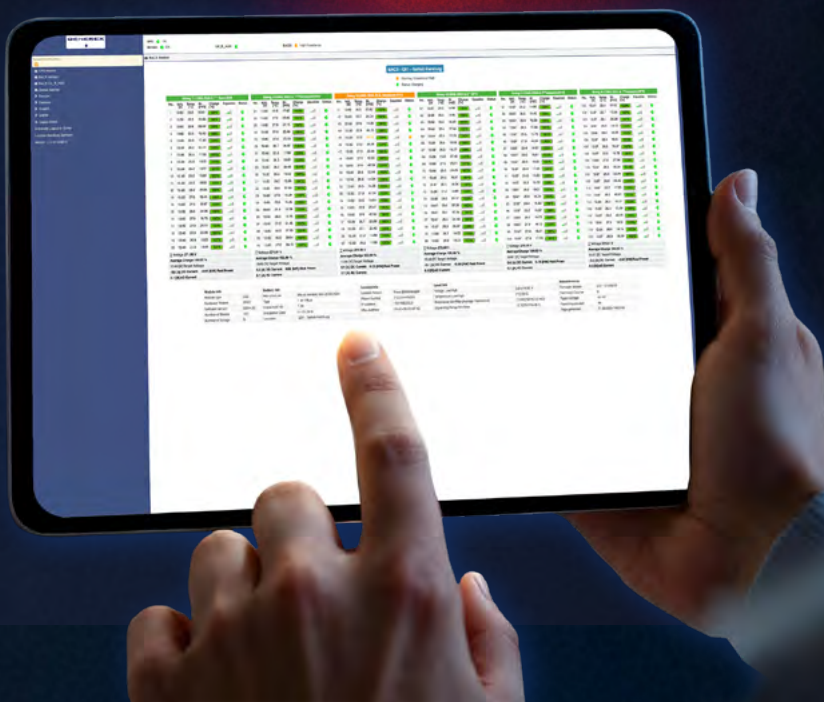
BACS® can detect a thermal runaway risk by monitoring the cell/ block temperatures and the difference in the battery current of the string. If a thermal runaway is detected, the BACS® module can automatically trigger the battery disconnect switch via the GX_R_AUX, thereby isolating the affected battery string. This also disconnects the overheated cells from the charger, allowing them to cool down. An alarm is triggered and the service personal may replace the battery and reconnect the battery string once the problem is solved. This technology has been used successfully in lithium batteries for years.

BACS® WARNS ABOUT WEAK BATTERIES

BACS® identifies weak batteries and triggers an alert when impedance or internal resistance values exceed their thresholds. Differences in impedance directly affect performance, safety, and the lifespan of battery packs. Increased internal resistance leads to power loss, overheating, and rapid capacity degradation. Aging, high charge/discharge currents, and deep discharges raise resistance and lead to performance drops or failure.

BACS® continuously tracks and logs internal resistance and charge/discharge values to determine SOH (State of Health) and SOC (State of Charge). When the battery capacity drops below limits, BACS® gives early warnings so that weak batteries can be identified and replaced proactively. This approach prevents problems before they affect surrounding batteries.

Thanks to balancing, even weak batteries can remain in service longer without impacting the overall system. This results in a more stable, long-lasting UPS battery system with significantly lower risk of failure.



GENEREX

Secure Connectivity for Critical Infrastructure.

MULTI-LAYERED CONFIGURABLE ALARM BEHAVIOR

BACS® continuously compares all measured data with predefined alarm thresholds (Freely configurable). In case of problems, an acoustic, visual or network-based alarm can be triggered. BACS ® monitors additional UPS-relevant data on request and can integrate external control systems (temperature, humidity, hydrogen, electrolyte level, AC/DC currents, voltage and current ripple, potential-free contacts, and other sensors).

MODBUS/BACNET/PROFIBUS/ LONBUS/SNMP/MQTT/EMAILTRAPS

BACS® seamlessly integrates into almost all existing building and supports integration via MODBUS, MQTT, BACnet, SNMP and the built-in web server.

CYBERSECURITY

The general requirements for modern networking systems have changed massively in recent years. Battery-based UPS systems are no longer more auxiliary systems, but core infrastructure elements. As a response to these growing demands, the CS141/CS181 – and thus BACS® – has been adapted to the latest network technologies, including numerous new developments in the field of cybersecurity. As the only EU and US made network device we do regular security checks according to UL 2900-1 standards and claim to provide the most secure device on the market.

MQTT – NEW PROTOCOL SUPPORT

Innovative monitoring under the most adverse conditions: monitor your batteries where other systems fail due to restrictive IT policies or unreachable networks. BACS® was developed as a network product to ensure optimal communication within LAN/WAN/VPN structures. Outside of such networks, however, things become difficult – not every customer allows a third-party VPN or remote access for monitoring.

MQTT (Message Queuing Telemetry Transport) is a lightweight communication protocol based on the publish/subscribe model. The CS141/CS181 now supports MQTT, enabling customers to integrate devices into their own MQTT-based monitoring systems, provided that a suitable MQTT broker is available. At this stage, MQTT support in the CS141/CS181 is a new technical feature. Specific use cases and backend integrations at GENEREX are still under definition.

Currently, MQTT support in CS141/CS181/BACS is still a future technical feature. Specific use cases and backend integrations at GENEREX are still under development.

Security. Control. Compatibility. Without Compromise.

RADIUS AND 802.1X EAP

The function of IEEE 802.1X is to provide port-based network access control, allowing only authenticated and authorized devices to connect to a network. Using the Extensible Authentication Protocol (EAP), prevents unauthorized users and devices from accessing enterprise networks.

REMOTE SYSLOG

BACS® and CS141/CS181 transmit all event logs standardized to a central SYSLOG receiver. Log files can be created and issued via the ”Jobs” function and measured values can be defined with variables, meaning that administrators can perform the automatic monitoring of their devices via the SYSLOG alone.

ADVANCED USER MANAGEMENT

The BACS® WEBMANAGER offers freely definable usernames and dynamic user roles, which allows personalized access restrictions and the definition of user groups.

CONTACT-BASED COMMUNICATION FOR BUILDING SERVICES

”No network uplink is the safest uplink” – true to this motto, even in absolute high security areas without a local network, information can be exchanged with a BACS® WEB-MANAGER. Numerous sensors and access points provide the possibility to indicate problems even with simple contact wires. Each alarm point can be configured to operate a contact opener or closer and can be evaluated by a building management system.

MODERN EN-CRYPTION METHODS

The cybersecured and hardened operating system of the CS141/ CS181 and BACS® firmware has numerous possibilities to encrypt the connection between all participants without compromise. Thanks to the regular enhancements of the hardware and software, all future standards and security features are also available for BACS®.

CYBERSECURITY READY

BACS® and CS141/CS181 are the only network devices for reserve power systems which are 100% made in the EU and USA - with constantly monitored security issues and a 3rd party security instance (UL) to check the vulnerability of our systems.The full trust of GENEREX as an independant western maker of network devices and software has established our products in the most critical environments of the western world.

GENEREX

Historical data analysed by BACS® VIEWER – or ”live” data shown by BACS® VIEWER LIVE – both tools give you the peace of mind that your batteries are under control 24/7.

The BACS® Viewer

A Complimentary Tool for Professional Battery Management

THE UNIQUE BACS® VIEWER SOFTWARE CAN DO MORE THAN SIMPLY ”FETCH” DATA FROM THE BACS® WEBMANAGER AND CONVERT IT INTO CSV FORMAT AND CREATE BATTERY REPORTS.

The BACS® VIEWER software is a powerful program designed to and archive battery data of multiple BACS® systems: It integrates additional documents such as drawings, reports, warranty certificates, maintenance schedulesor handouts for technical staff and facilitates the management of many BACS® systems and thus thousands of batteries with one central software. With the BACS® VIEWER software, customer reports can be shared and analysed, maintenance tasks can be scheduled, battery trends can be determined, faulty batteries are detected and status reports are generated automatically. And if all this is not enough – the battery data can be exported into a CSV file, which can then be further processed in Excel or other tools to create customized battery reports for the end user.

Battery chemistry irregularities are harbingers of a problem –
But irregularities in the battery data can be seen in any Battery Monitoring System!

Not anymore when BACS® balancing is active! BACS® ensures that the voltages are consistent, eliminates the “battery gray zone,” and reveals trends that make it possible to predict battery failures.

The CS141/CS181, the industry‘s most successful UPS network card

HIGH-TECH MADE LOCALY

The only network adapter for UPS systems and batteries, engineered and manufactured in Germany and the USA – the most powerful and flexible UPS management card worldwide is the CS141/CS181. This platform also powers the BACS WEBMANAGER – one of the most widely used and proven BMS solutions worldwide.

NETWORK SERVICES / SECURITY

The BACS® system has the full UPS management functionality of a CS141/ CS181 on board and supports a vast array of network protocols like SNMP V1/V2c und V3 , IPv4/IPv6, HTTP/HTTPs, DNS, DHCP, SMTP, X802.1x, MQTT, MODBUS over IP, Modbus RS32 and RS485 and Profibus/ Profinet, BACnet and GENEREX proprietary network protocols like UPSTCP (for UNMS) and RCCMD for network computer shut-down management. An optional a WIFI/ WLAN Adapter over USB is available to work as a 2nd redundant network card or as interface for service engineers. The ”Autostore” USB function allows a service engineers to get easy access to the BACS® battery history files without network access or login procedure – all you need is a USB key!

The BACS® WEBMANAGER provides manifold security features to ensure a maximum of network security. The BACS® WEBMANAGER uses industrial standards to provide HTTPs and SSL encrypted communication with user created certificates. It can be configured to deny outdated or invalid certificates and it provides encrypted SNMP communication (V3), while still supporting less secure systems. Advanced password security and hard-coded user management provides configuration menus according to user level. As a special feature, the BACS® WEBMANAGER provides tools to assist network administrators during network security auditing of a network segment.

GENEREX

Why Battery Management?

Batteries are the weakest link in any UPS or critical power system—subject to aging, temperature, and charging conditions and the interactions between them. Without proactive management, failures may go undetected until it's too late. Modern Battery Monitoring and Management Systems help detect failures early and, in the case of true battery management, actively balance battery voltages to extend lifespan and improve return on investment.

BATTERY MONITORING VS. MANAGEMENT

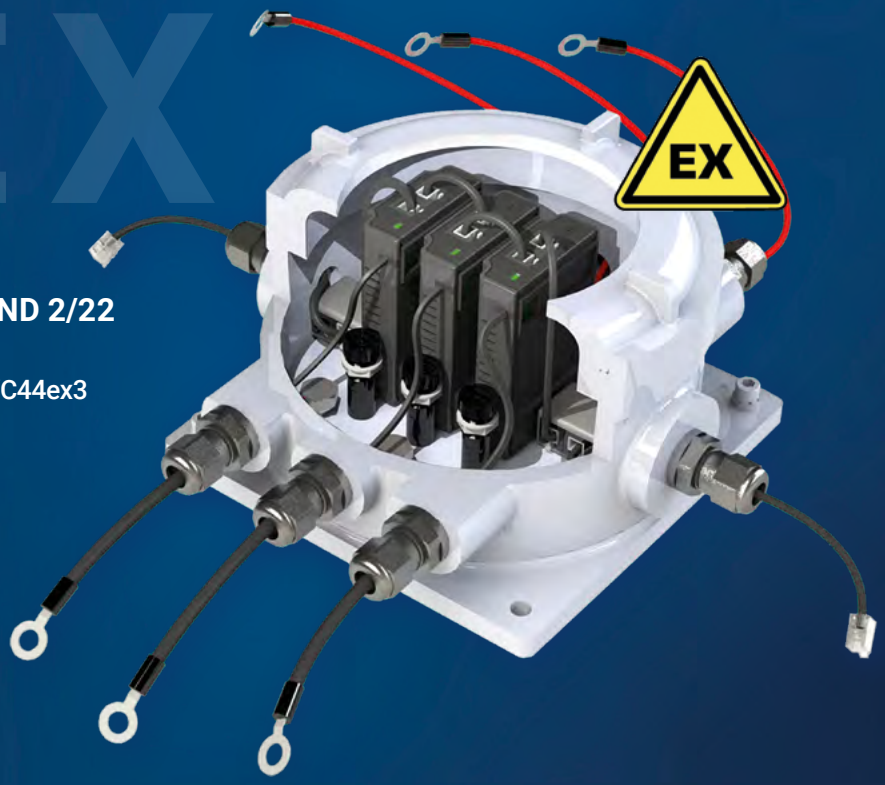
Feature	Battery Monitoring	Battery Management (BACS®)
Battery Service Life Prediction	✗	✓
Maintenance Prediction	✗	✓
UPS/Charger aging monitoring	✗	✓
Thermal Runaway protection	✗	✓
Battery Capacity Display/Test/Comparison	✗	✓
Battery Condition Alerts	✓	✓
Real-time Data Logging	✓	✓
Battery Cell Balancing	✗	Balances every battery in real-time
Charge Optimization	✗	Prevents over-/under-charging
Battery Life Extension	✗	Proven to increase lifespan
ROI Improvement	✗	Lower replacement costs and fewer failures

WHY CHOOSE GENEREX BACS®?

- TRUE BATTERY MANAGEMENT
- EXTENDED BATTERY LIFE
- STRONG LOCAL SUPPORT DURING COMMISSIONING / ANALYSIS
- ENVIRONMENTAL MONITORING
- HIGHEST CYBER-SECURITY COMPLIANCE
- SCALABLE AND FLEXIBLE
- MADE LOCALY AND TRUSTED GLOBALLY
- BEST SUPPORT, NOW WITH AI POWER

BACS® ATEX

ATEX / IECEX CERTIFIED BACS®
FOR EX ENVIRONMENT ZONE 1/21 AND 2/22



BACS® ATEX C20ex3/C24ex3/C30ex3/C40ex3/C44ex3

Certified according to ATEX and IECEx
Protection Type: ATEX
II 2G EX db IIC T5 Gb
II 2D EX tb IIIC T100°C Db

Protection Type IECEx
EX db IIC T5 Gb

Available BACS® Housings for Zone 1/ 2 and 21/22

ATEX-certified housing containing: 3 BACS® C Modules for various voltages and 6 fuses inside the EX-housing. Including 6 * ATEX Halogen-free BC4/5/6 measuring cables, each 1.5m in length and in various ring terminal options. Including 3 * integrated temperature sensors mounted within in the negative leads.

Definition of ATEX Zones

ZONE 0/20

An area in which an explosive atmosphere is present continuously or for long periods of time, consisting of a mixture of air and flammable substances in the form of dust particles, gas, vapor, or mist.

ZONE 1/21

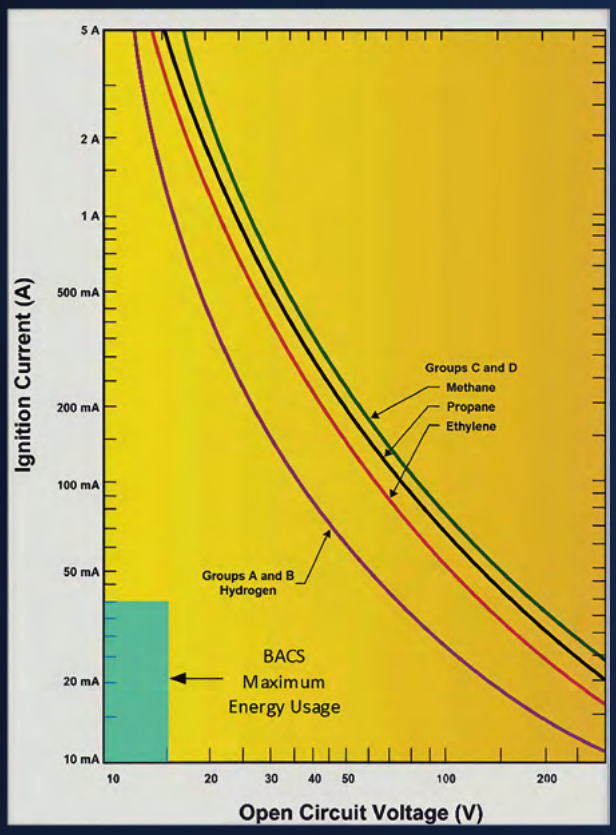
An area in which it is entirely possible that an explosive atmosphere consisting of a mixture of air and flammable substances in the form of dust particles, gas, vapor, or mist could arise for a short time due to production-related reasons during normal operation – for example, when filling and emptying a system.

ZONE 2/22

An area in which it is not expected that an explosive atmosphere consisting of a mixture of air and flammable substances in the form of dust particles, gas, vapor, or mist will occur during normal operation, and if it does, it will only be rare and short-lived.

GENEREX

Intrinsic Safety in Normal Operation



Due to strict safety regulations, the oil and gas industry requires special precautions to prevent sparks or overheating when IT-related systems are operated in hazardous areas with potentially explosive gases. Since some of these systems must remain operational in case of emergency, uninterruptible power supplies (UPS) are often used for backup power.

Therefore, a battery management system used in EX areas (explosion-proof zones) – like the UPS itself – is expected to be certified according to ATEX in order to be operated in such environments. However, such an ATEX certificate becomes unattainable the moment a battery is involved — because a battery, as a potential hydrogen source, must not be used in EX zones. In case of a short circuit, it will inevitably generate a spark or even an arc. This means that even if a battery sensor is ATEX certified, its certification becomes invalid as soon as it is connected to a battery that itself cannot be ATEX-compliant. This contradiction is often not understood by users, who still insist on an ATEX certificate for battery sensors, even though it automatically loses validity when used with batteries.

THE SAFEST BATTERY MANAGEMENT SYSTEM ON THE MARKET

Even though BACS® is the safest battery management system on the market, it does not have ATEX certification and must therefore be enclosed in a specially sealed housing in order to be approved. For this reason, we now offer BACS® in ATEX enclosures.

That's why we take a different approach to the problem: We refer to our BACS® sensor as "intrinsically safe" – because the energy potential required to ignite gas through a spark is physically not present in our system. The amount of electrical power that could be available in the event of a BACS® module failure is insufficient to produce a spark or reach ignition temperatures. This is reliably ensured by the two fuses in the measuring cable – since their introduction in 2010, there has not been a single incident of BACS® module overheating!

The diagram at the top left shows the permissible current and voltage levels for each gas group, above which explosions could occur. Any device operating below this curve is considered "intrinsically safe." BACS® is clearly well below this critical threshold – making it impossible during normal operation to generate an ignition spark that could lead to an explosion.

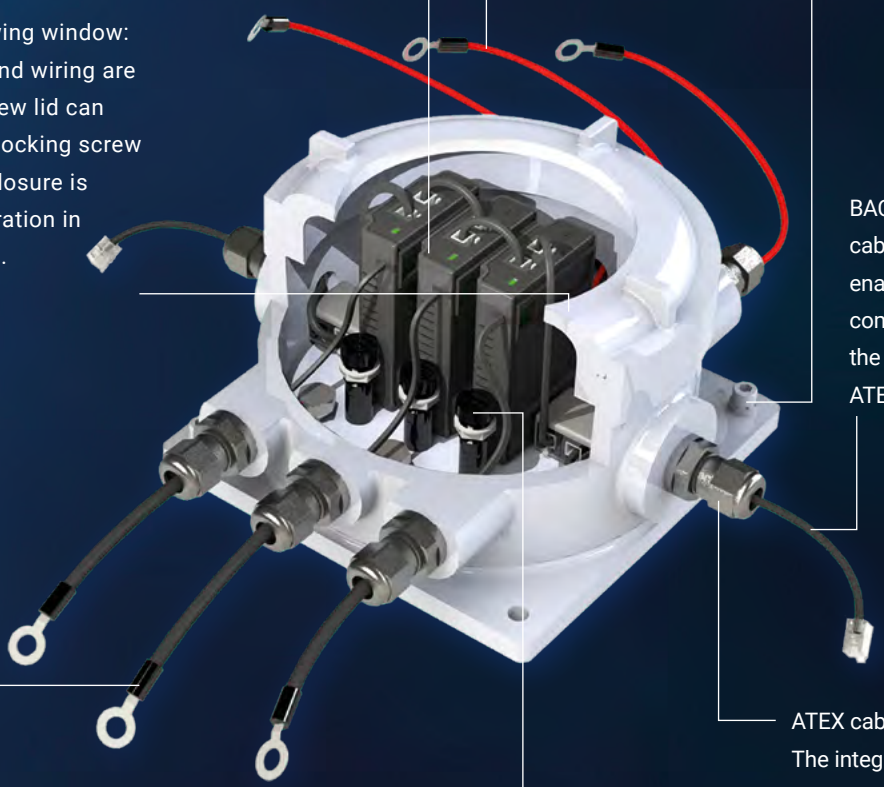
Structure of the BACS® ATEX Housing

BACS® Module: Each C2Xex3xxxx can accommodate up to 3 BACS® modules. Each BACS® module is connected via a BACS® bus cable (as flat ribbon cable), and both the 1st and 3rd module are connected to the next BACS® ATEX housing via the BACS® bus cable and the screw terminal.

Cable to battery positive pole (RED): This connects the first of the three positive battery terminals. The remaining red measuring cables are connected to the positive poles of the second and third batteries.

Mounting holes for stationary installation and grounding: The four mounting holes allow the BACS® module to be securely attached to a battery rack, wall, or another surface and grounded.

Screw lid with viewing window: Once addressing and wiring are completed, the screw lid can be closed and the locking screw tightened. The enclosure is then ready for operation in ATEX Zone 1 and 2.



BACS® bus connection cable: These cables enable BACS® bus communication with the adjacent BACS® ATEX module.

ATEX cable gland with seal: The integrated seal encloses the cable and ensures a gas-tight seal.

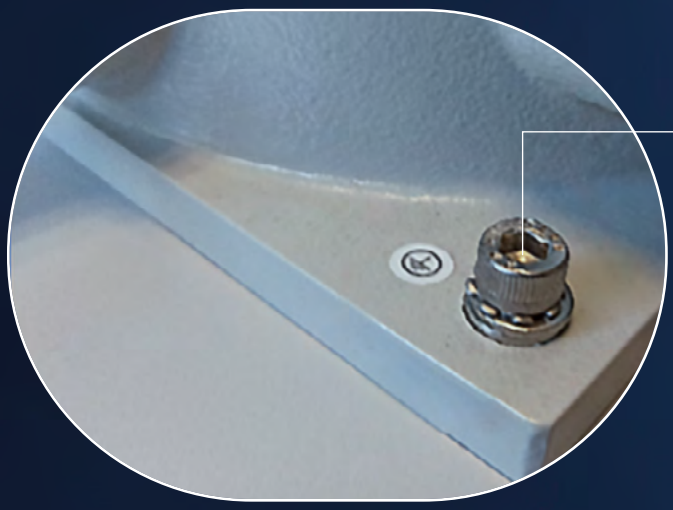
Cable connector for negative pole (black): Connects the first of the three negative battery terminals.

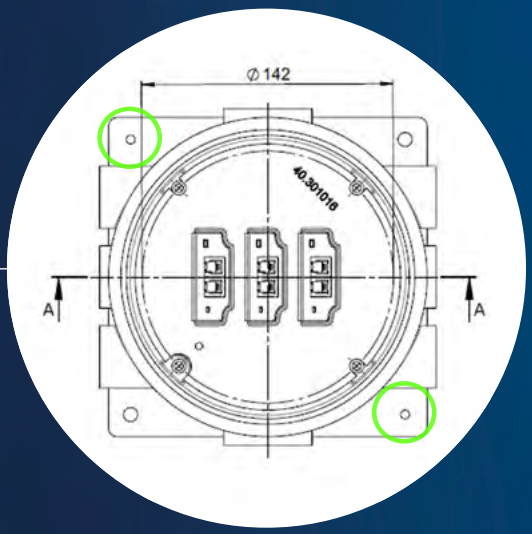
BACS® module fuse: Each BACS® module has two fuses located on the mainboard which can be replaced if necessary.

GENEREX

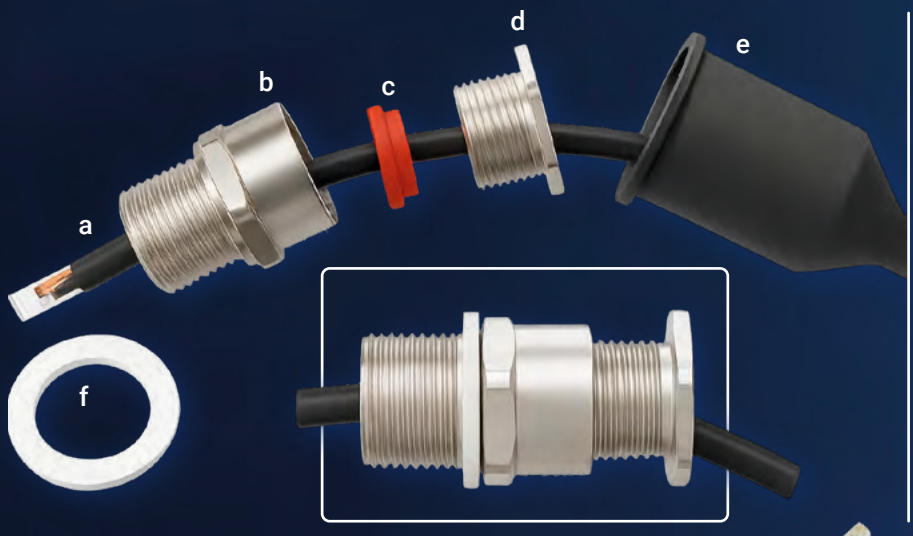
Multiple Grounding Points

Easily accessible grounding points allow extensive grounding to effectively prevent electrostatic discharge.





Sealing according to ATEX / EX-i
Each input and output is individually secured and sealed in accordance with EX-i and ATEX specifications.



Overall Construction of a BACS®Bus Cable which is fed into an ATEX housing. In Zone 1 applications, the entire assembly is additionally encapsulated.

a. RJ12 plug
b. Base screw
c. Sealing ring for tension screw
d. Tension screw for sealing
e. Protective cap (contact protection)
f. Sealing ring for base screw mounting

Factory pre-assembled cables

Pre-assembled cables have the advantage that the seals are already integrated. These cables can be mounted directly onto the housing. The BACS® bus cables for connecting two housings feature pre-installed seals on both ends before the connector.

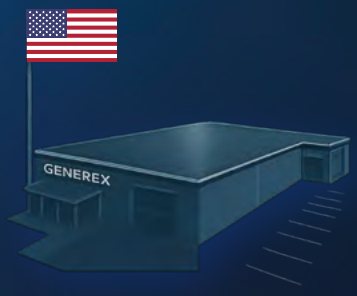
GENEREX

Über uns

LOCALLY MADE, GLOBALLY TRUSTED.
NO. 1 CHOISE WHERE IT MATTERS MOST:

Datacenters · Hospitals · Military · Civil infrastructure · Airports · And more...

30 YEARS Development & support made in Germany.



12 YEARS At the heart of the U.S. market.

More LOCATIONS Poland, Brazil, Australia.

Family-OWNED

Since 1990, the Blettenberger family actively shapes the company with vision, responsibility, and personal commitment.

Stable SUPPLY CHAINS

Proven in crises, resilient and global. Reliable for decades.

True CRAFTSMANSHIP

No robots. No assembly lines. Our experts develop, test, pack, and support – by hand.

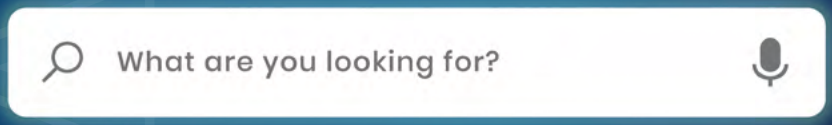
OEM 112

Countries 51

Resellers 300

GENEREX

CONTACT



QUESTIONS?

Contact our sales or consultant team:
sales@generex.de/.us or **support@generex.de/.us**

PREFER SELF-SERVICE?

Visit our online Support Portal for quick answers, product documentation, or to submit a request directly:
support.generex.de

GENEREX SYSTEMS GERMANY ◆ Brunnenkoppel 3 ◆ 22041 Hamburg ◆ Germany ◆ +49 40 22692910 ◆ sales@generex.de ◆ **generex.de**
GENEREX SYSTEMS USA ◆ 109 Magnolia Park Drive ◆ Mooresville ◆ NC 28117 ◆ USA ◆ +1 704 966 1577 ◆ sales@generex.us ◆ **generex.us**
GENEREX SYSTEMS OCEANIA ◆ 3/19 Viewtech Place ◆ Rowville ◆ VIC 3178 ◆ Australia ◆ +61 3 82032570 ◆ info@generex.au ◆ **generex.au**

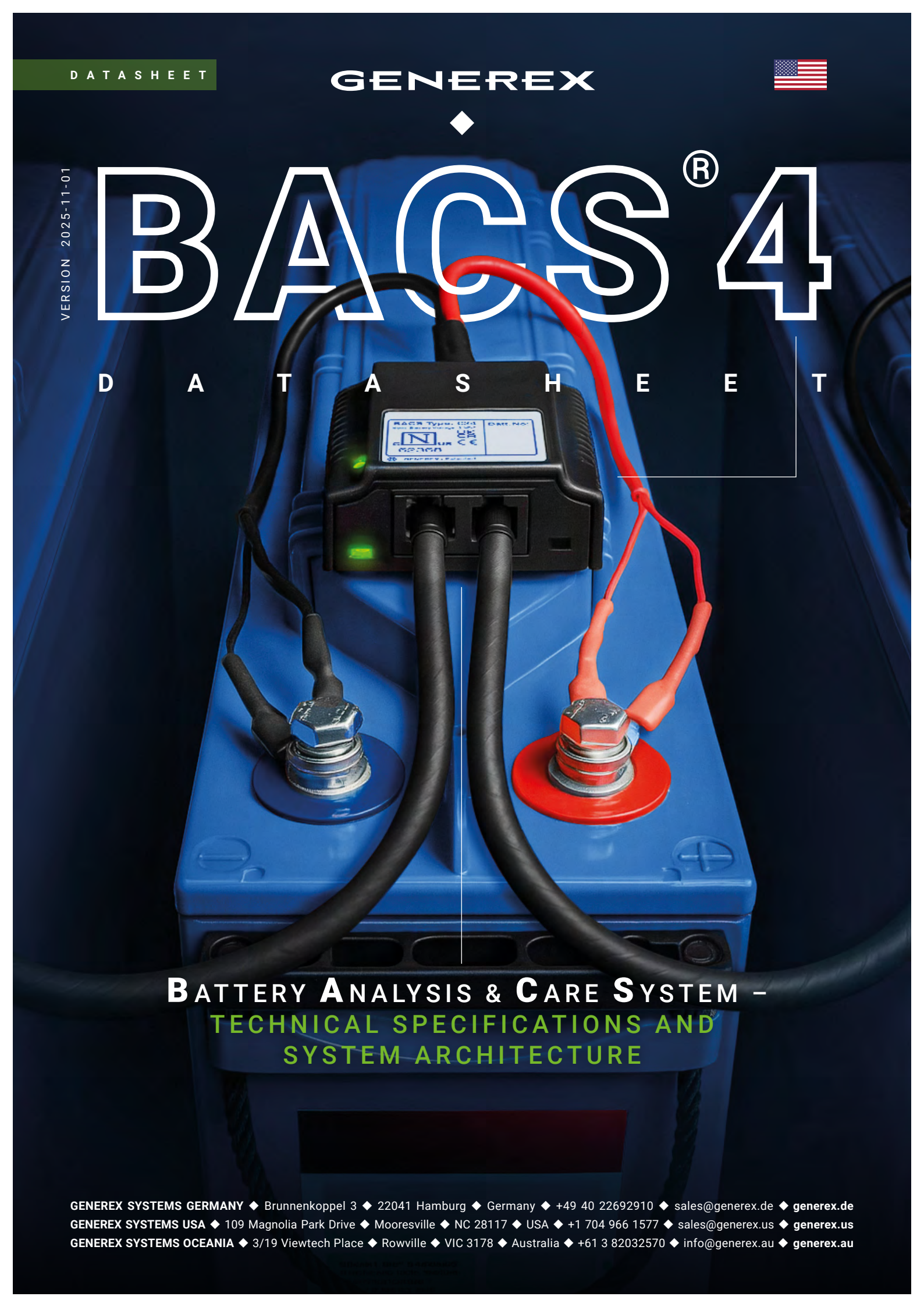
DATASHEET

GENEREX

VERSION 2025-11-01

BACS® 4

DATASHEET



BATTERY ANALYSIS & CARE SYSTEM – TECHNICAL SPECIFICATIONS AND SYSTEM ARCHITECTURE

GENEREX SYSTEMS GERMANY ◆ Brunnenkoppel 3 ◆ 22041 Hamburg ◆ Germany ◆ +49 40 22692910 ◆ sales@generex.de ◆ **generex.de**
GENEREX SYSTEMS USA ◆ 109 Magnolia Park Drive ◆ Mooresville ◆ NC 28117 ◆ USA ◆ +1 704 966 1577 ◆ sales@generex.us ◆ **generex.us**
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GENEREX

CONTENTS

BACS® 4 – New Line

BACS® 4 MODULES – CUTTING-EDGE TECHNOLOGY

BACS® modules Generation 4

Measuring modules with Top-balancing C44/C24. BACS® is a registered and protected trade mark of GENEREX.

POWER CONSUMPTION FROM BATTERY DURING NORMAL OPERATION: 15–20mA (C20/24, C23, C30) 35–40mA (C40/C44, C41).

During "Sleep Mode": less than 1mA

MEASURING PRECISION: Internal resistance: <3% at C44 and C24, <5% at C20, C23, C30, <10% at C40, C4. **VOLTAGE:** < 0,5 %. **TEMPERATURE:** <1°C at C44 and C24, <3°C at C20–C40 with external temperature sensor, <4°C at C20–C41 with internal temperature sensor. **INTERFACES:** 2x RJ10 for BACS® battery bus, Internal RS232 bus interface, 1x button for the addressing, Temperature sensor -35 bis + 85 °C. 2x LED indication (Alarm red/green, Mode red/green horizontally and vertically)

HOUSING: ABS housing (UL certified, flame-retardant)

DIMENSIONS, WEIGHT: 54x54x26mm (WxHxD), 45g

OPERATING CONDITION: Temperature -5–70°C, max. humidity 90%, not condensing. **INT. PROTECTION RATING:** IP 42 coated against dust and condensate. **HIGH VOLTAGE SECURITY TESTED:** Protection against high ohmic battery voltages up to 250 volts/per module (fuse opens).

MTBF (CALCULATED): 87.600 hours (10 years)

BACS® 4 Module C24

(Order No. BACSC24)

REV 4 module for 12V–14V – Any Lead ACID, NiCd, LTO, LiFe, LiFePo battery

OPERATING RANGE: 8V–17V

RI RANGE: 0.5–60mOhm

EQUALIZATION POWER: 150mA

FUSE PROTECTION: 250V DC/AC calibrated

BACS® 4 Module C44

(Order No. BACSC44)

REV 4 module for 1.2V–4V – Any Lead ACID, NiCd, LTO, LiFe, LiFePo battery

VOLTAGE RANGE: 0.7V–6V

RI IMPEDANCE RANGE: 0.02–6mOhm

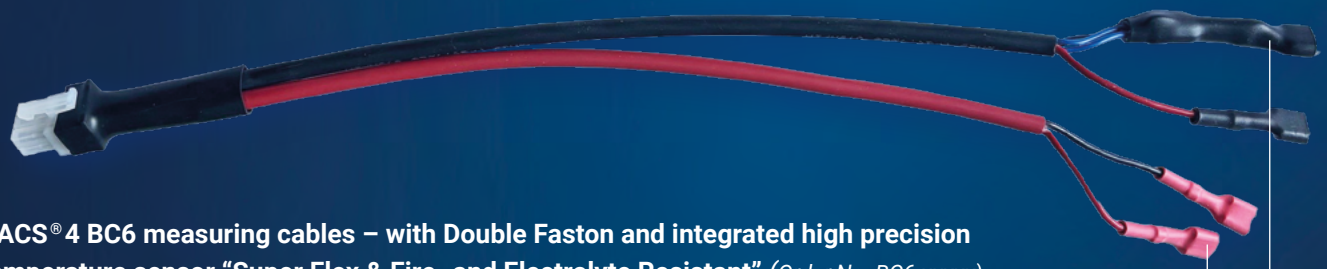
EQUALIZATION POWER: 850mA

FUSE PROTECTION: 250V DC/AC calibrated

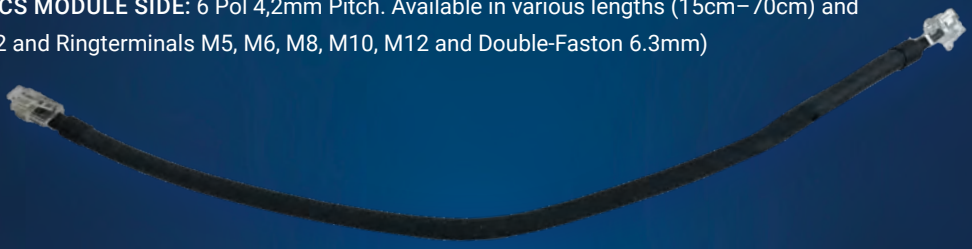
NEW

BACS® 4 – New Line

BACS®4 CABLES – CUTTING-EDGE TECHNOLOGY



BACS®4 BC6 measuring cables – with Double Faston and integrated high precision temperature sensor "Super Flex & Fire- and Electrolyte Resistant" *(Order No. BC6-xxxxx)*
Measuring cables made of halogen-free, fire, flame-retardant, oil, acid, alkaline-resistant material (TPE), for all BACS® modules Generation C24 and C44 for high precision measuring.
CABLE DIAMETER: Bare Copper, Measuring Wires 2 x 0.75mm2/AWG 20. **TEMPERATURE WIRES:** 2 x 0.315mm2/AWG24.
OUTER DIAMETER: Red 4.8mm; Black 5mm. **RESISTANCE :** At 20°C max. 26 mΩ/m.
Nominal Voltage: 300V/500V, Insulation Voltage: 2000V. **TEMPERATURE RANGE:** -15 °C – +70 °C.
CABLE COATING: FR-PE halogen-free acc. VDE0281 part 14 (UL listing in preparation). ROHS, REACH conform.
CONNECTORS BACS MODULE SIDE: 6 Pol 4,2mm Pitch. Available in various lengths (15cm–70cm) and terminals (M5–M12 and Ringterminals M5, M6, M8, M10, M12 and Double-Faston 6.3mm)



BACS®Bus cables – compatible with BACS®3 and BACS®4 *(Order No. B4BCRJx)*
High-quality and robust BACS® bus communication cable for both BACS® 3 and BACS® 4 modules, GX_R_AUX, BACS_CSHxxx current sensors and Splitting Boxes. Available in various lengths, EMI-resistant, acid- and alkaline-resistant.
CABLE COATING: Halogen-free in accordance with VDE0281 part 14 and fire-resistant. **CONNECTORS:** RJ 10, Twisted Pair
CABLE LENGTH: Various lengths available. See the latest BACS® price list for details

The measuring cables BC6 are also available as ring lug cables in various sizes.

BC6 with Double-Faston and integrated high precision temperature sensor.

Temperature sensor inside the cable

S H E E T

GENEREX

BACS® 3 – Classic Line

BACS®3 MODULES – TRUSTED TECHNOLOGY, PROVEN SUPPORT

With BACS® 4, GENEREX has introduced a new line of battery management systems. At the same time, the proven BACS®3 modules remain fully supported for ongoing and future projects – cost-efficient, reliable, and backed by GENEREX support. As BACS®3 and BACS ®4 cannot be combined due to different architectures, every new project requires a clear choice: the classic, cost-efficient BACS®3 or the new, feature-rich BACS®4.

BACS® modules Generation 3

Measuring modules with passive balancing/equalization C20, C30, C40 and C41. BACS® is a registered and protected trade mark. **POWER CONSUMPTION FROM BATTERY AT NORMAL OPERATION:** 15–20mA (C20, C23, C30) 35–40mA (C40, C41) **"SLEEP MODE":** < 1mA. **MEASURING PRECISION:** < 10 % at C40, < 5% at C20/30. **VOLTAGE:** < 0,5 %. **TEMPERATURE:** < 15 %. **INTERFACES:** 2 x RJ10 for BACS® battery bus Internal RS232 bus, interface, 1x button for the addressing temperature sensor -35 bis + 85 °C, Optical display LED (alarms red/green, mode red/green). **HOUSING:** ABS housing (UL certified, flame-retardant, cooling fins). **DIMENSIONS, WEIGHT:** 55 x 80 x 24mm = 2,17 x 3,15 x 0,94in. (B x H x T), 45g. **OPERATING CONDITION:** Temperature 0–60°C, max. humidity 90%. **INT. PROTECTION RATING:** IP 42 coated against dust and condensate. **HIGH VOLTAGES SECURITY TESTED:** Protection against high ohmic battery voltages up to 150 volts/per module (fuse opens). At higher voltages, the fuse opens, but BACS® module is damaged. All REV 3.1 modules are designed for fault voltages up to 1000 volts. **MTBF (CALCULATED):** 87.600 hours (10 years).

BACS®3 Module C20 *(Order No. BACSC20)*
REV 4 module for 12V – 7–600Ah lead, NiCad, NiMH, Lithium batteries (UL certified)
VOLTAGE RANGE: 9.7V–17V. **RI RANGE:** 0.5–60mOhm.
EQUALIZATION POWER: 0.15A

BACS®3 Module C30 *(Order No. BACSC30)*
REV 3 module for 6V – 7–900Ah lead, NiCad, NiMH, Lithium batteries (UL certified)
VOLTAGE RANGE: 4.8V–8.0V. **RI RANGE:** 0.5–60mOhm.
EQUALIZATION POWER: 0.3A

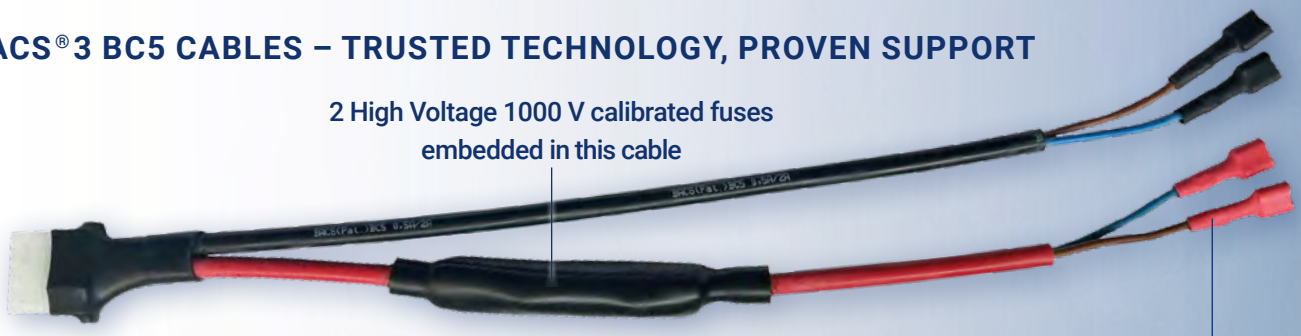
BACS®3 Module C41 *(Order No. BACSC41)*
REV 3 module for 4V – 7–900Ah lead, NiCad, NiMH, Lithium batteries (UL certified) *(Auld)*
VOLTAGE RANGE: 2.4V–5.0V. **RI RANGE:** 0.5–30mOhm.
EQUALIZATION POWER: 0.3A

GENEREX

D A T A

BACS® 3 – Classic Line

BACS®3 BC5 CABLES – TRUSTED TECHNOLOGY, PROVEN SUPPORT



BACS®3 BC5 measuring cables – made of UL-certified material for BACS®3 sensors type C20 REV. 3, C23 REV. 3, C30 REV. 3 and C41 Rev. 3. Unique high voltage precision fuses (UL listed) for system protection and precise measurements *(Order No. BC5-xxxxxA/B)*

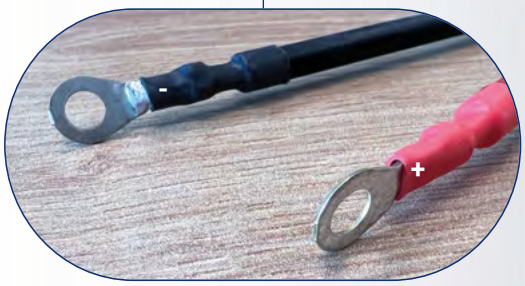
CABLE CROSS SECTION: 2 x 0,75mm² | **nominal voltage:** U_0/U 300V/300V

FUSES: 1000V/2A and 1000V/500mA

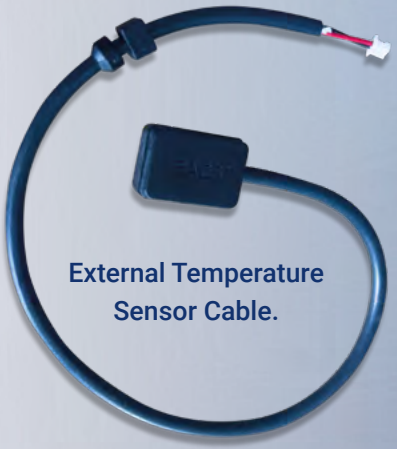
TEMPERATURE RANGE: -25°C–70°C

CABLE COATING: halogen-free in accordance with VDE0281 part 14

BC5 with Double-Faston.



The measuring cables BC5 and BC4 are also available as ring lug cables in various sizes.

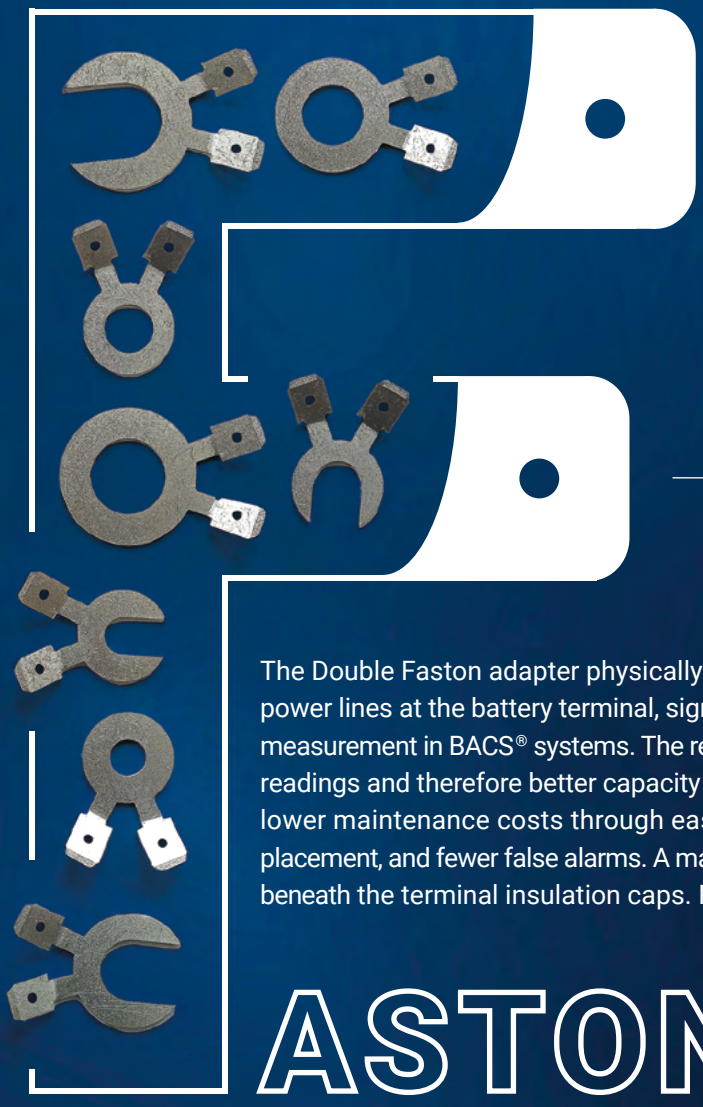


External Temperature Sensor Cable.

DOUBLE FASTON – EIGHT CONNECTOR SIZES FOR SMART BATTERY MONITORING

DOUBLE FASTON

- More Accurate Impedance Measurement Through Separation of Voltage and Current Paths
- Install Quickly and Safely Without Interrupting Battery Operation
- Compatible with Existing BACS® Systems and Smart Battery Installations
- Improved Safety Through Maintained Contact Protection
- Proven Success in the U.S. for Over a Decade
- Designed for the EU metric and US imperial system



The Double Faston adapter physically separates measurement and power lines at the battery terminal, significantly improving impedance measurement in BACS® systems. The result: more accurate impedance readings and therefore better capacity calculation, faster installation, lower maintenance costs through easier module and cable replacement, and fewer false alarms. A manual test point is also available beneath the terminal insulation caps. Recommended for BACS® 4.

– MANUAL MEASUREMENT POINT FOR BATTERY SERVICING –
– REDUCED MAINTENANCE COSTS –
– NO FALSE ALARMS –

DOUBLE FASTON – EIGHT CONNECTOR SIZES FOR SMART BATTERY MONITORING

Zinc/Copper for optimal measurement accuracy and maximum conductivity with minimal resistance.

Custom design with extended Faston necks to ensure enough length for connecting the insulated BACS® Double Faston cables, even with large terminal bolts.

Full touch protection once measurement cables are connected.

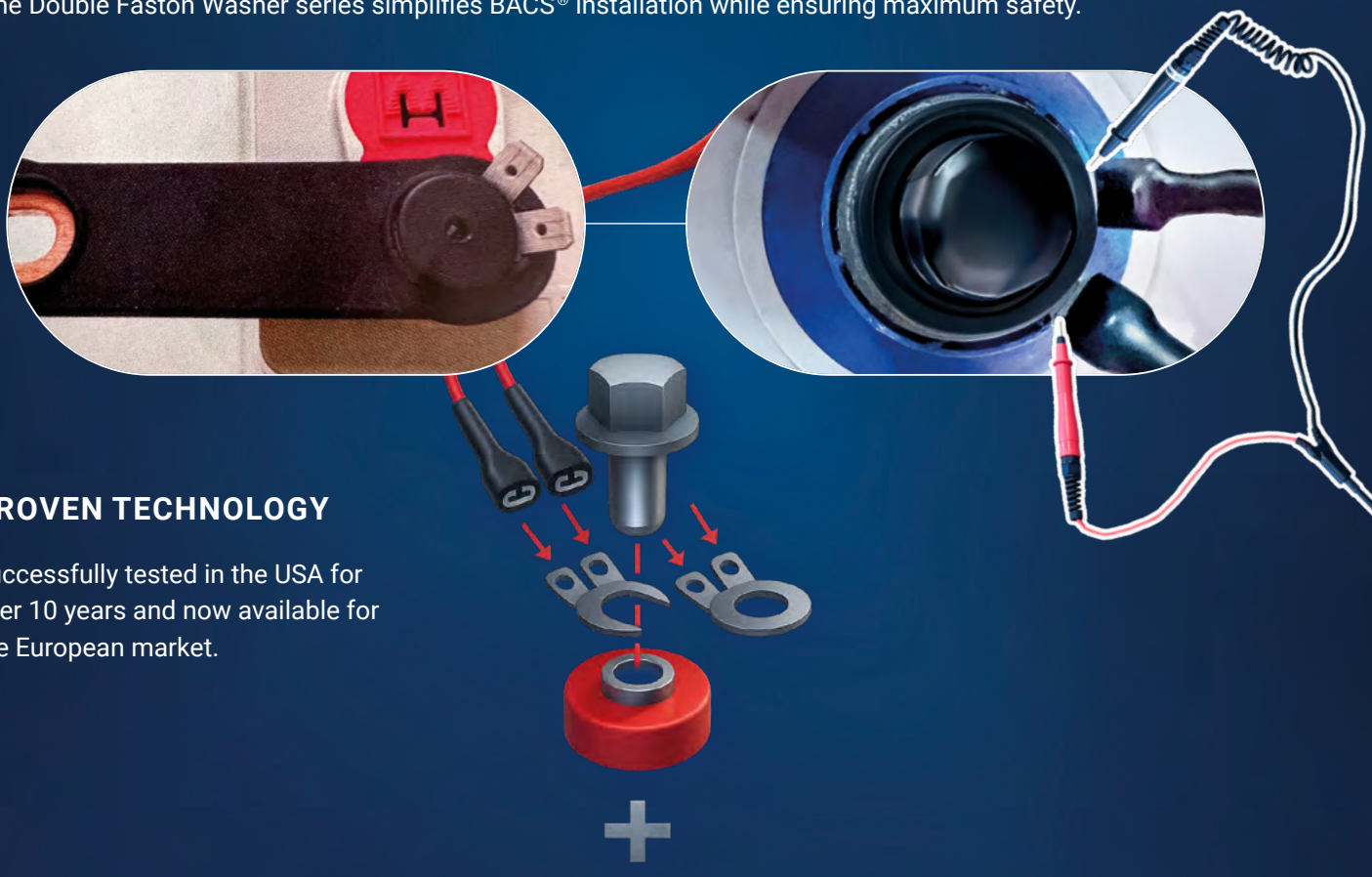
Slightly flexible to allow continued use of existing terminal covers.

With locking mechanisms for 100% secure connection.

Earthquake-proof connection and long-term stability.

NEW STANDARD IN EUROPE!

Fully encapsulated battery installations make a BMS installation difficult, unless special monitoring screws are supplied. Using the new Double Faston Washers the standard battery screws do not have to be replaced; simply place a Washer underneath , as shown below - high precision + measuring point at lower costs!
The Double Faston Washer series simplifies BACS® installation while ensuring maximum safety.



PROVEN TECHNOLOGY

Successfully tested in the USA for over 10 years and now available for the European market.

BACS® – WEBMANAGER

EXTERNAL VERSIONS AND INTERNAL UPS SLOTCARD VERSIONS FOR HIGHEST INTEGRATION INTO UPS AND CHARGER APPLICATIONS.

BACS®
WEBMANAGER
Variations

BACSKITB4-6:
Standard External Device
with RS232 interface

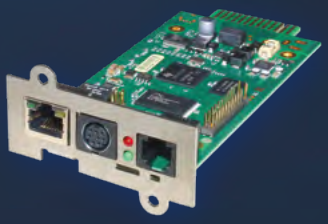
BACSKM4-6 : Standard External Device with R485 interface for integrated displays or 3rd party management devices.

BACS®
KIT EXTERNAL
BOX

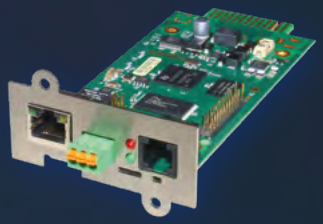
CS141L-6: Standard UPS external Device with RS232 interface

CS141LM-6: Standard UPS External Device with RS485 interface for integrated displays or 3rd party management devices.

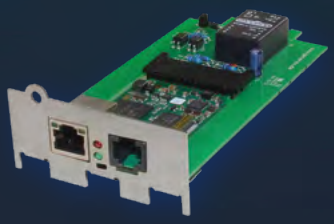
BACS® KIT SLOT VERSION



CS141SC-6:
Standard UPS Slot Device
with RS232 interface



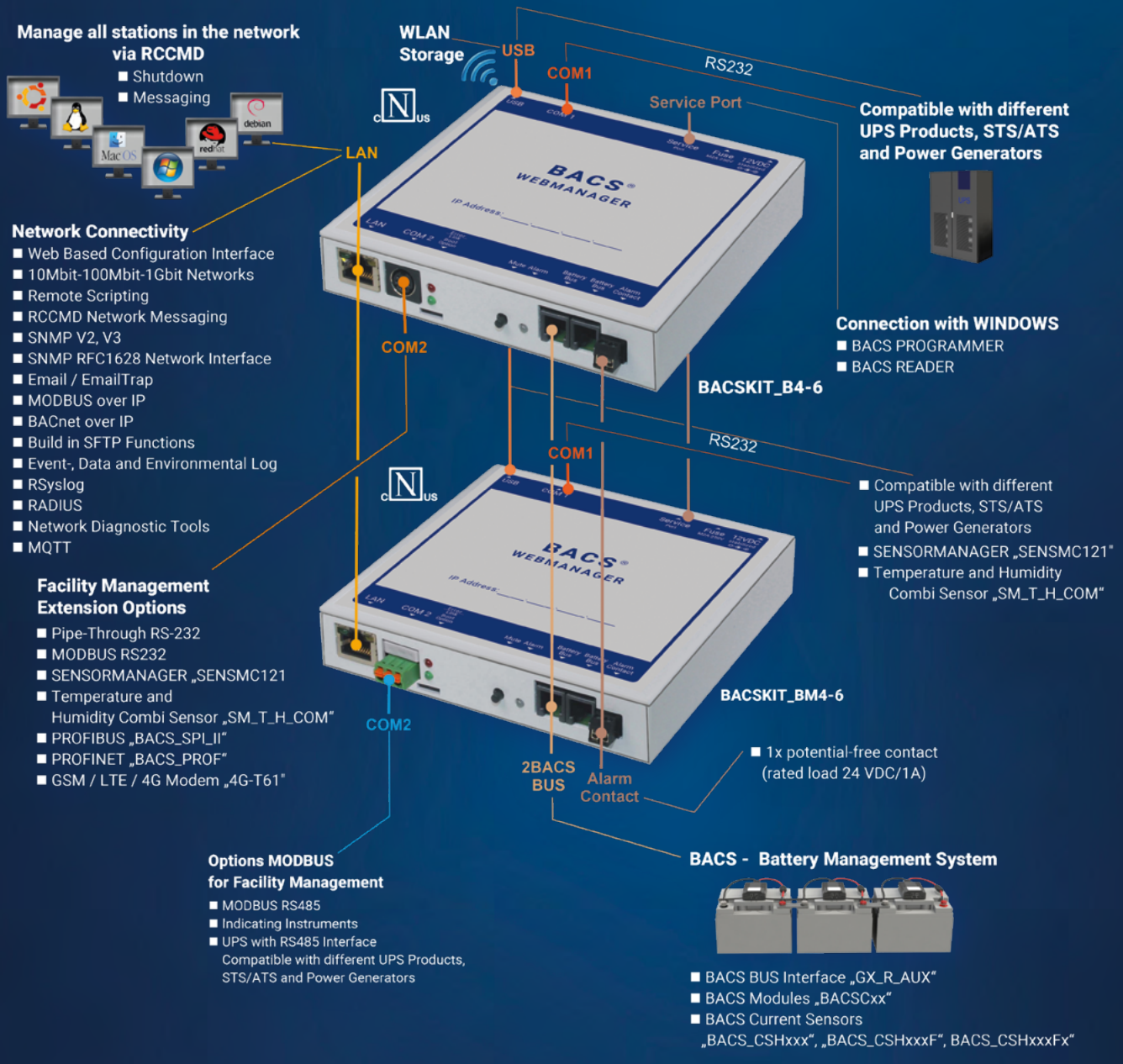
CS141SCM-6: Standard UPS Slot Device with RS485 interface for integrated displays or 3rd party sensors



CS141R-6 – OEM UPS Slot Device with RS232 interface

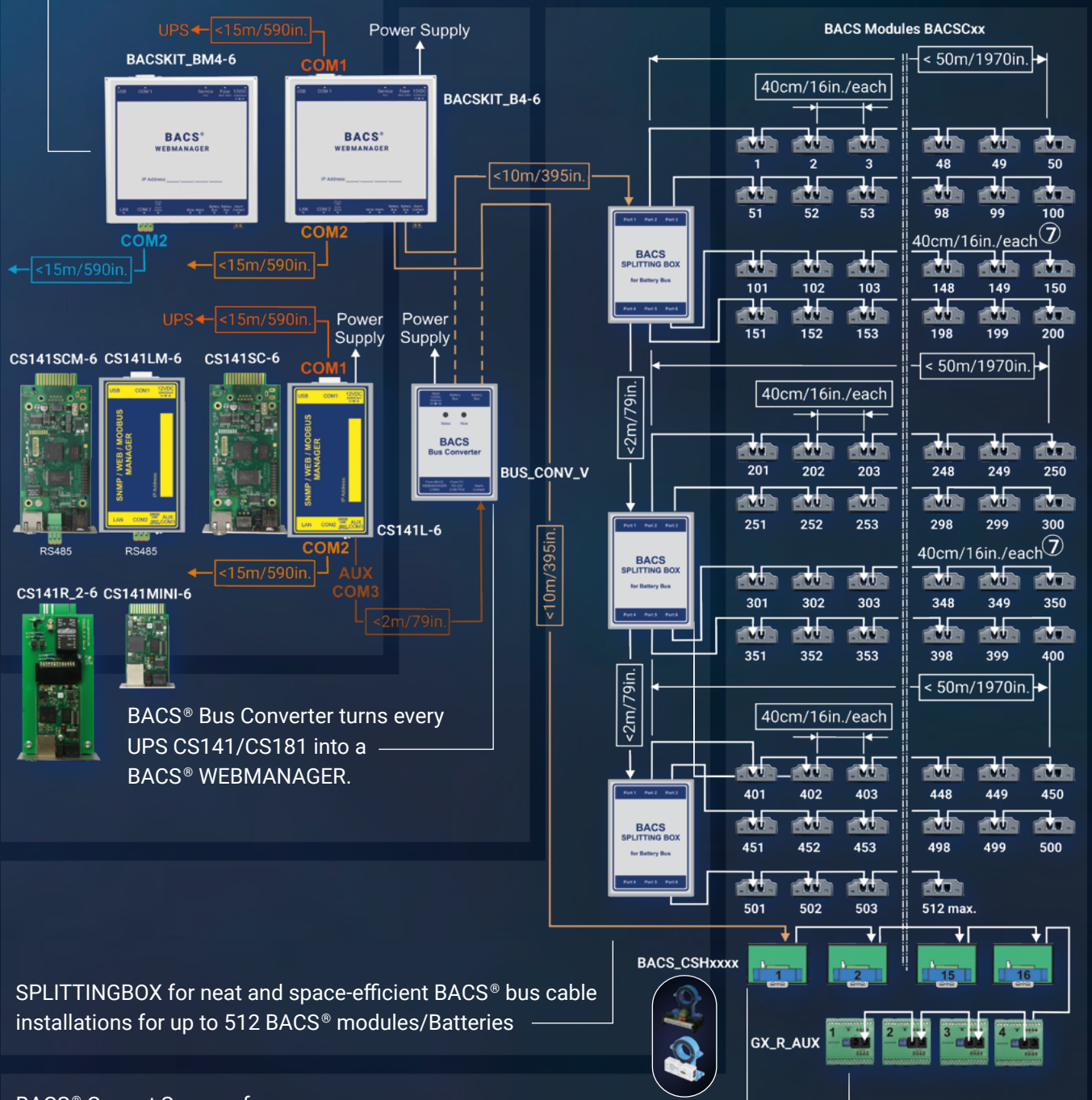
CS141-6 MINI – Our smallest UPS Slot Device and the smallest BACS Webmanager in our portfolio – with RS232 interface – high tech with smallest footprint!

FUNCTION OVERVIEW: BACS® WEBMANAGER



BACS® Components

BACS® WEBMANAGER in various versions, for inside UPS/Transferswitch usage (Slotcards) and External.



SPLITTINGBOX for neat and space-efficient BACS® bus cable installations for up to 512 BACS® modules/Batteries

BACS® Current Sensors for measuring Battery Capacity, Battery DC Voltage, Current DC and AC Ripple.

GX_R_AUX relay devices. For the remote control and monitoring of 3rd party dry contacts or relays, switches etc. Up to 4 input alarm contacts and 4 alarm relays per device, up to 16 devices per BACS® WEBMANAGER

BACS® WEBMANAGER/CS141/CS181 SERIES – GENERAL TECHNICAL DATA

	CS141L-6 Professional External *(all UPS vendors)*	**CS141SC-6 Professional Slot** *(all UPS vendors with SC slot format)*
POWER CONSUMPTION	12V (min. 9V, max. 30V DC), 150mA	12V (min. 9V, max. 30V DC), 150mA
SIZE (W x L x H), WEIGHT	69 x 126 x 35mm, 210 g	60 x 120 x 29mm, 66 g
NETWORK / LAN	HW161/HW181 : 10/100/1000Mbit auto sense	HW161/HW181 : 10/100/1000Mbit auto sense
RS-232 INTERFACE	2	2
RS-485 INTERFACE	–	–
RESET – BUTTON	–	1
USB INTERFACE	1	–
AUX INTERFACE	1	1
MODBUS OVER IP	Standard	Standard
BACNET OVER IP	Standard	Standard
REMOTE SYSLOG	Standard	Standard
RADIUS SERVER SUPPORT	Standard	Standard
MQTT	Standard	Standard
STATUS LED'S	normal green, boot/error red	normal green, boot/error red
USER MANUAL	German, English	German, English
MIB FILE AVAILABLE	RFC 1628 and private extentions	RFC 1628 and private extensions
OPERATING TEMPERATURE	0–45 °C	0–70 °C
STORAGE TEMPERATURE	0–70 °C	0–70 °C
MAX. OPERATING AMBIENT TEMPERATURE	45 °C	55 °C
CPU	HW161 : ARM Cortex A8 800Mhz HW181 : NXP ARM Cortex A55 800Mhz	HW161 : ARM Cortex A8 800Mhz HW181 : NXP ARM Cortex A55 800Mhz
FLASH MEMORY	HW161 : 8 GB	HW161 : 8 GB
RAM	HW161 : 512 MB	HW161 : 512 MB
HUMIDITY	20–95%, not condensing	20–95%, not condensing
CLASSIFIED FOR	CE, UL/NEMKO/UL2900-1 Cybersecurity	CE, UL/NEMKO/UL2900-1 Cybersecurity
MTBF (EN/IEC 61709)	849.192 hours (96,9 years)	874080 hours (99,8 years)
PRODUCT WARRANTY	2 Years	2 Years

BACS® GENERAL STORAGE DATA

TEMPERATURE RANGE	-55°C–70°C
HUMIDITY RANGE	0 %–90 % in non condesning environments
STORAGE ALTITUDE RANGE	0m–4000 m
STORAGE MAINTENANCE	The BACS® WEBMANAGER, measuring cables and the BACS® modules do not need any maintenance work during storage or in operation. There is no internal battery used that needs maintenance or replacement

BACS ® WEBMANAGER – TECHNICAL DATA INDENTICAL TO CS141 + EXTRAS

BACS® WEBMANAGER BUDGET – 12V

(Order No. BACSKIT_B4-6 | MODBUS RS485)

COM2 = Multipurpose, service port for Windows BACS®
READER and PROGRAMMER software
2 x battery bus converter outputs internal
1 x potential-free alarm contact
(2 pole screw wire size 1,0 mm², rated load 24 VDC/1A)
DIMENSION: 130 x125 x 30mm = 5,12 x 4,92 x 1,18 in. (W x L x H)
WEIGHT: Aluminium 360g/ABS housing 238g

BACS® WEBMANAGER BUDGET – 18V–72V

(Order No. BACSK4-6_18 | MODBUS RS485)

COM2 = Multipurpose, service port for Windows BACS®
READER and PROGRAMMER software
2 x battery bus converter outputs internal
1 x potential-free alarm contact
(2 pole screw wire size 1,0 mm², rated load 24 VDC/1A)
DIMENSION: 130 x125 x 30mm = 5,12 x 4,92 x 1,18 in. (W x L x H)
WEIGHT: Aluminium 360g/ABS housing 238g

BACS® WEBMANAGER BUDGET – 90V–375V

(Order No. BACSK4-6_90 | MODBUS RS485)

COM2 = Multipurpose, service port for Windows BACS®
READER and PROGRAMMER software
2 x battery bus converter outputs internal
1 x potential-free alarm contact
(2 pole screw wire size 1,0mm², rated load 24 VDC/1A)
DIMENSION: 130 x125 x 30mm = 5,12 x 4,92 x 1,18 in. (W x L x H)
WEIGHT: Aluminium 360g/ABS housing 238g
NUMBER OF MODULES: The power supply provides 1960mA are for up to 392 BACS® C modules and other BACS® components.

GENEREX

BACS® ALL-IN-ONE Solution

THE SITEMANAGER 7

PROCESSOR AND MEMORY	ARM Cortex A8 800MHz CPU, 30 MB storage for battery history
POWER CONSUMPTION	Non-volatile memory for alarm notification after power loss
INTERFACE	40 watts max.
INPUTS	Adapter for RS232 support 8 digital inputs (NC/NO configurable) 8 analog inputs (0–10V, 4–0mA, 0–20mA configurable via jumpers) 2 x RJ10 for BACS® battery bus
OUTPUTS	8 relay outputs (changer, max. 230V/4A AC/DC)
NETWORK	10/100/1000Mbit LAN
SUPPORTED PROTOCOLS	Email, HTTP/HTTPs, SNMP, SNTP, MODBUS Over IP, BACnet, UPSTCP, DHCP, DNS, sFTP, MQTT
FRONT DISPLAY	LED alarm display, LED operating status display
DIMENSIONS	483 x 162 x 44mm, (483 x 212 x 44mm incl. SM_LOOM) 19,00 x 6,38 x 1,73in, (19,02 x 8,35 x 1,73 in incl. SM_LOOM)
WEIGHT	2262 g
OPERATING CONDITION	Temperature 0–70°C, max. humidity 20–95%, not condensing
NETWORK MANAGEMENT	UNMS Network Management software
NETWORK ADAPTER	
ADDITIONAL SENSORS	Smoke/fire alarms, motion detectors, door contacts etc., connection of any other alarm contact indicator, which output signal is between 0–10V, 4–20mA or rather 0–20mA (configurable via jumpers)
ACTUATORS	flash light, alarm buzzer, relay-switches, external switches, etc.

SITEMANAGER 7 – Our all-in-one BACS WEBMANAGER with UPS interface, dry contact management, SENSORMANAGER built in for the management of all kinds or environmental sensors on the market!

BACS® Accessories

BACS® BUS CONVERTER 5 *(Order No. BUS_CONV_V)*
Conversion and galvanic separation of the BACS® battery bus to the BACS®. Real-time clock (RTC) timer for the BACS® WEBMANAGER. **NUMBER OF MODULES:** Standard Power supply grants power for up to 360 BACS® C modules. For up to 512 Modules and sensors, a larger power supply is available. **INTERFACE:** 2 x RJ10 for BACS battery bus 1xRJ12 for COM3 BACS® WEBMANGER 1xMiniDin8/RS232 interface for Service Tools. 1 x 2, 1mm DC connector socket for power supply via external power supply. 1x potential-free alarm contact (2 pole screw terminals for 1,0 mm²/ 24 VDC/1A) **DISPLAY:** Optical display (LED). **ALARM:** Internal alarm buzzer with mute button **Housing:** Polystyrene. **DIMENSION:** 91,5 x 67 x 25 (W x H x D). **WEIGHT:** 120g

BACS® SPLITTING BOX *(Order No. BCII_SPLITT)*
Passive splitter for BACS® communication cables, designed to optimize the overall cable lengths. In addition to the extension of the 2 BACS® bus inputs. **POWER SUPPLY:** Passive element, no additional power supply required. **INTERFACE:** 5* RJ10 for cables 1x RJ10 input connector for BACS® bus data input. **HOUSING:** Polystyrene. **DIMENSION:** 91,5 x 67 x 25 (B x H x T)

BACS® bus interface GX_R_AUX *(Order No. GX_R_AUX)*
Input alarms and Output relay management. A typical application is the control of a battery breaker in case of a “thermal runaway” alarm in the battery system. Applies to US Norm International Fire Code IFC 608.3 for isolating UPS batteries in case of a thermal runaway. In case of a high battery temperature and increasing voltages during float charge, the GX_R_AUX may open the battery breaker to stop a further increase in the battery temperature. Individual programming of the relays through a web interface. **INPUTS:** 4 digital inputs (configurable NO/NC). **OUTPUTS:** 4 Relay potential-free outputs (NO/NC)/50VAC–2A, 30VDC–1A. **POWER SUPPLY:** Powered by BACS® bus, no external power supply. **POWER CONSUMPTION:** 170mA. **Housing:** Polyamide, pluggable system DIN rail. **DIMENSION:** 75 x 75 x 45mm = 2,95 x 2,95 x 1,77 in. (LxWxH). **WEIGHT:** 170g.

BACS® DC current sensor 50/200/500/1000/2000 Ampere
(Ord. No: BACS_CSH50, BACS_CSH200, BACS_CSH500, BACS_CSH1000, BACS_CSH2000)
DC-current sensor for measuring battery string discharge and charging process +/-50A, +/-200A, +/-500A, +/-1000A, +/-2000A DC transducer diameter hole: 20mm [0,82in] (BACS_CSH50)/40 mm [1.57in] (BACS_CSH2000). **POWER SUPPLY:** Intern powered by BACS® bus. **POWER CONSUMPTION:** 90mA. **INTERFACES:** 2 x RJ10 for BACS bus cable, pluggable system. **HOUSING:** DIN Rail. **DIMENSION** (LxWxH)**:** 110 x 82 x 125 mm = 4,33 x 3,22 x 4,92 in (LxWxH). **WEIGHT:** 450g.

BACS® DC current sensor 50/200/500/1000/2000 Ampere
(Ord. No: BACS_CSH50F, BACS_CSH200D/F, BACS_CSH500D/F, BACS_CSH1000D/F, BACS_CSH2000D/F)
Identical to BACSCSHxx, but with optional DIN RAIL and freeform mountable.
POWER SUPPLY: Intern powered by BACS® bus. **POWER CONSUMPTION:** 90mA.
INTERFACES: 2 x RJ10 for BACS® bus cable, pluggable system. **HOUSING:** Freeform, DIN, Rail.
DIMENSION (LxWxH): 82*82*100mm. **WEIGHT:** 400g.

BACS® Control Cabinets

TECHNICAL DATA AND DIMENSIONS

Control cabinet for BACS® systems. Plug & play, with an AC input plug (Euro) ready to install. With optical and audible display on the outside door, protection class IP 54 with the application of the included bottom plate (Note: US versions differ in dimensions and weight).

BACS® CONTROL CABINET Type 1 *(Order No. BACS_CC1)*

CONTROLLER:	1	BACS® WEBMANAGER BUDGET
POWER:	1	12V Power supply (100–240V, 50/60Hz)
LAN:	1	CAT 6 Ethernet socket
CONTACTS:	1	Alarm contact (potential-free), 230VC/30VDC/8A
FRONT DOOR:	1	POWER LED
FRONT DOOR:	1	BACS® ALARM LED
SPARE PARTS:	6	Spare bus communication cable
DIMENSION:	WHD	400 x 500 x 210 mm = 15,75 x 19,69 x 8,27 in.
WEIGHT:	kg	16,10

BACS® CONTROL CABINET Type 2 *(Order No. BACS_CC2)*

CONTROLLER:	2	BACS® WEBMANAGER BUDGET
POWER:	2	12V Power supply (100–240V, 50/60Hz)
ETHERNET SWITCH:	1	unmanaged (for CC2–CC8)
LAN:	2	CAT 6 Ethernet socket
CONTACTS:	2	Alarm contact (potential-free), 230VC/30VDC/8A
FRONT DOOR:	2	POWER LED
FRONT DOOR:	2	BACS® ALARM LED
SPARE PARTS:	8	Spare bus communication cable
DIMENSION:	WHD	500 x 500 x 210 mm = 19,69 x 19,69 x 8,27 in.
WEIGHT:	kg	20,20

BACS® CONTROL CABINET Type 3,4,5,6,7,8 *(Order No. see pricelist)*

CONTROLLER:	3–8	BACS® WEBMANAGER BUDGET
POWER:	3–8	12V Power supply (100–240V, 50/60Hz)
LAN:	3–8	CAT 6 Ethernet socket
CONTACTS:	3–8	Alarm contact (potential-free), 230VC/30VDC/8A
FRONT DOOR:	3–8	POWER LED
FRONT DOOR:	3–8	BACS® ALARM LED
WEIGHT:	kg	22,70kg/22,90kg/27kg/26kg/30kg/31kg

BACS® CONTROL CABINETS ARE ALSO AVAILABLE WITH BUILT IN PC WITH HDMI DISPLAY AND WITH RS485 DISPLAYS FOR INSTALLATIONS WITHOUT NETWORK

BACS® CONTROL CABINET with PC

(*All Cabinets are also available with a fully featured Touch Panel Computer*)

RAM:	1*204-pin SODIMM DDR3L 1333MHz/up to 8GB
CPU:	Intel Bay Trial J1900 Quad Core 2GHz
TOUCH PANEL:	15” XGA TFT multi-point capacitive touch screen
USB:	4* USB Ports and 1 covered USB Service Port
COM:	6 COMPorts
LAN:	2 GLAN P
WIRELESS:	1x Mini-PCIe slot, extensible 3G, Wifi wireless card
POWER CONSUMPTION (MAX):	38,6 Watt max
INPUT VOLTAGE:	DC 12V, support reverse polartity protection
GRAPHIC:	VGA/HDMI
SOFTWARE:	Windows 10 Professional English Language BACS® Tools Software packet pre-installed
OPERATING CONDITION:	-30~80°C (-22~176°F)
RELATIVE HUMIDITY:	5~95% (Non condensation)
EMC:	CD/FCC Class A
NOTES:	The Operating system is a fully featured Windows 10 operating system and needs additional configuration. Not pre-configured – you need to configure it before first use.

Preliminary – BACS® CC Cabinets with low cost RS485 Display

For installations without network connection (high security or remote locations) – showing BACS® “LIFE” Data for up to 4 BACS® WEBMANAGERs on one Screen.

GENEREX

BACS® ATEX

GENERAL HOUSING DATA

TBE 160 TW BACS housing for ATEX Environment	
NAME	TBE 160 TW
IECEX & ATEX ZONE	Zone 1/2 Gas and 21/22 Dust
IP PROTECTION CLASS	IP 66
MATERIAL	Aluminium, lacquered
CERT. ACCORDING ATEX	18ATEX0119X
CERT. ACCORDING IECEX	DEL 18.0075S
DIMENSIONS	300 x 300 x 140mm
OPERATING TEMPERATURE	0°–50°C max
WEIGHT	3.9 KG

MODULES C20

ATEX ZONE 1,2/21,22 HOUSING WITH M5 TERMINAL
Zone 1, 21: Order No. C20ex3_Z1_M5
Zone 2, 22: Order No. C20ex3_Z2_M5
ATEX ZONE 1,2/21,22 HOUSING WITH M6 TERMINAL
Zone 1, 21: Order No. C20ex3_Z1_M6
Zone 2, 22: Order No. C20ex3_Z2_M6
ATEX ZONE 1,2/21,22 HOUSING WITH M8 TERMINAL
Zone 1, 21: Order No. C20ex3_Z1_M8
Zone 2, 22: Order No. C20ex3_Z2_M8
ATEX ZONE 1,2/21,22 HOUSING WITH M10 TERMINAL
Zone 1, 21: Order No. C20ex3_Z1_M10Z1
Zone 2, 22: Order No. C20ex3_Z2_M10Z1
ATEX ZONE 1/21 HOUSING WITH M12 TERMINAL
Zone 1, 21: Order No. C20ex3_Z1_M122
Zone 2, 22: Order No. C20ex3_Z2_M122

MODULES C30

ATEX ZONE 1,2/21,22HOUSING WITH M5 TERMINAL
Zone 1, Z21: Order No. C30ex3_Z1_M5
Zone 2, Z22: Order No. C30ex3_Z2_M5
ATEX ZONE 1,2/21,22 HOUSING WITH M6 TERMINAL
Zone 1, Z21 Order No. C30ex3_Z1_M6
Zone 2, Z22 Order No. C30ex3_Z2_M6
ATEX ZONE 1,2/21,22 HOUSING WITH M8 TERMINAL
Zone 1, Z21 Order No. C30ex3_Z1_M8
Zone 2, Z22 Order No. C30ex3_Z2_M8
ATEX ZONE 1,2/21,22HOUSING WITH M10 TERMINAL
Zone 1, Z21 Order No. C30ex3_Z1_M10
Zone 2, Z22 Order No. C30ex3_Z2_M10
ATEX ZONE 1,2/21,22HOUSING WITH M12 TERMINAL
Zone 1, Z21 Order No. C30ex3_Z1_M12
Zone 2, Z22 Order No. C30ex3_Z2_M12

ATEX

MODULES C24

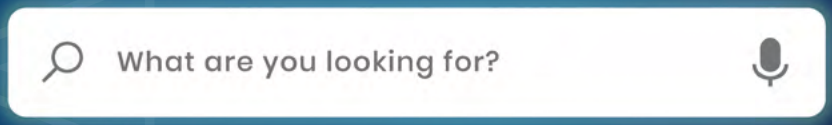
ATEX ZONE 1,2/21,22HOUSING WITH M5 TERMINAL
Z1, Z21 Order No. C24ex3_Z1_M5
Z2, Z22 Order No. C24ex3_Z2_M5
ATEX ZONE 1,2/21,22 HOUSING WITH M6 TERMINAL
Zone 1, Z21 Order No. C24ex3_Z1_M6
Zone 2, Z22 Order No. C24ex3_Z2_M6
ATEX ZONE 1,2/21,22 HOUSING WITH M8 TERMINAL
Zone 1, Z21 Order No. C24ex3_Z1_M8
Zone 2, Z22 Order No. C24ex3_Z2_M8
ATEX ZONE 1,2/21,22HOUSING WITH M10 TERMINAL
Zone 1, Z21 Order No. C24ex3_Z1_M10
Zone 2, Z22 Order No. C24ex3_Z2_M10
ATEX ZONE 1,2/21,22HOUSING WITH M12 TERMINAL
Zone 1, Z21 Order No. C24ex3_Z1_M12
Zone 2, Z22 Order No. C24ex3_Z2_M12

MODULES C44

ATEX ZONE 1,2/21,22HOUSING WITH M5 TERMINAL
Z1, Z21 Order No. C44ex3_Z1_M5
Z2, Z22 Order No. C44ex3_Z2_M5
ATEX ZONE 1,2/21,22 HOUSING WITH M6 TERMINAL
Zone 1, Z21 Order No. C44ex3_Z1_M6
Zone 2, Z22 Order No. C44ex3_Z2_M6
ATEX ZONE 1,2/21,22 HOUSING WITH M8 TERMINAL
Zone 1, Z21 Order No. C44ex3_Z1_M8
Zone 2, Z22 Order No. C44ex3_Z2_M8
ATEX ZONE 1,2/21,22HOUSING WITH M10 TERMINAL
Zone 1, Z21 Order No. C44ex3_Z1_M10
Zone 2, Z22 Order No. C44ex3_Z2_M10
ATEX ZONE 1,2/21,22HOUSING WITH M12 TERMINAL
Zone 1, Z21 Order No. C44ex3_Z1_M12
Zone 2, Z22 Order No. C44ex3_Z2_M12

GENEREX

CONTACT



QUESTIONS?

Contact our sales or consultant team:
sales@generex.de/.us or **support@generex.de/.us**

PREFER SELF-SERVICE?

Visit our online Support Portal for quick answers, product documentation, or to submit a request directly:
support.generex.de

GENEREX SYSTEMS GERMANY ◆ Brunnenkoppel 3 ◆ 22041 Hamburg ◆ Germany ◆ +49 40 22692910 ◆ sales@generex.de ◆ **generex.de**
GENEREX SYSTEMS USA ◆ 109 Magnolia Park Drive ◆ Mooresville ◆ NC 28117 ◆ USA ◆ +1 704 966 1577 ◆ sales@generex.us ◆ **generex.us**
GENEREX SYSTEMS OCEANIA ◆ 3/19 Viewtech Place ◆ Rowville ◆ VIC 3178 ◆ Australia ◆ +61 3 82032570 ◆ info@generex.au ◆ **generex.au**