



GENEREX NEWSLETTER 2022



Hot Topics!

- **NEW** Battery Capacity! New feature on BACS
- CS141 HW161, Update + new features
- Cybersecurity - CS141 HW161 at the forefront
- GENEREX back on the road: Upcoming Events 2022



GENEREX News

- **NEW** Call for forecasts: Help us plan and secure your supply!
- An Update to Price List and Quotation validity duration
- Favicons: an example of OEM customization options



UPS and Battery Management

- Network SECURITY
- CS141 / BACS now with RADIUS
- CS141 / BACS now with Remote Syslog
- CS141 / BACS now with IEEE 802.1X
- CS141 BL now discontinued
- An Update on the UNMS Cloud Services



BACS

- YONGYEA - Copycats of BACS ever-present
- 15cm measuring cables available again
- BACS Reseller List, a How-To-Use Guide
- **NEW** Improvements to the BACS Webmanager Housing



SMARTBATTERY / SMARTLOGGER / iBACS

- **NEW** Crococlamps; SMARTLOGGER as "rapid deployment" tool
- SMARTLOGGER 2.0 new APP



Click on the
bullet points
to get there!



A World First!

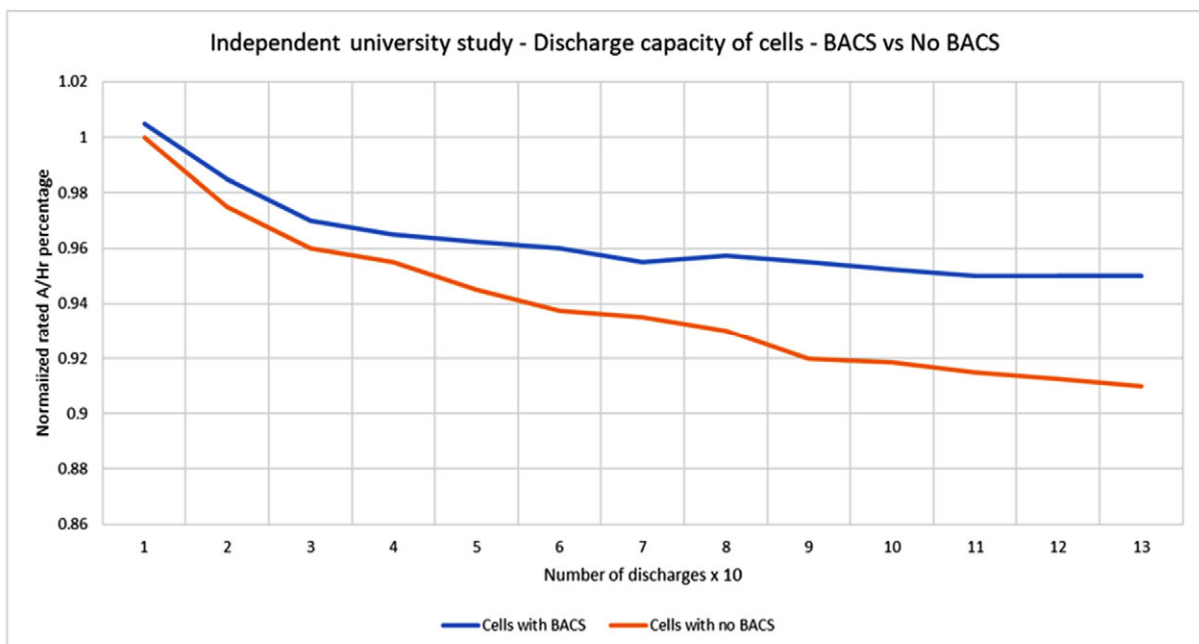
GENEREX BACS is the first battery management system for stationary batteries to provide a capacity display of the batteries/cells

BACS has been the key technology for active management of stationary batteries for more than 18 years. Balancing ensures the stability of lead-acid batteries and NiCd or lithium (LTO/LiFePo) based cells and maintains the "health" of the cells - SOH (State-of-Health) - at the highest level, so long as measured values / alarms are monitored correctly.



The interpretation of the measured values of a battery system is also massively improved by "balancing": Balancing keeps all cells/batteries closely within the "healthy" voltage window and thus allows for a **highly precise impedance measurement**, and - due to the exactly equal voltage values of all batteries during the measurement – it also enables a **comparative relationship between the measured impedance values**.

This has led to BACS verifiably improving both the reliability and longevity of almost any battery-based UPS concept. This makes BACS a **game changer in the industry, and the first choice of most datacenter operators in the western world!**



In addition to facilitating the achievement of a fully charged state and improved impedance readings through balancing, these improvements in **battery capacity (SOC - State-of-Charge)** can now also be measured.

Any user who has ever made a comparison of 2 identical battery systems with/without BACS is able to confirm: **the effective battery capacity is significantly higher with Balancing than with an identical battery system without BACS!**

Not only countless BACS users have noticed this effect, but also independent institutions and universities have been able to prove that a BACS system delivers significantly more battery capacity over time than an identical battery system without BACS.

We have been researching this effect for years and have observed capacity increases of up to 20% in the measurement data. From these findings, we have identified a new approach that many battery system users have been waiting for:

With the introduction of firmware 2.04, a BACS system provides a percentage capacity indication for each battery/cell!

The capacity display determined by BACS is comparable to the results of much more elaborate measuring methods such as "Current Balance". With the "Current Balance" method used so far, current sensors were used to record which currents were drawn and how much was recharged during charging, but losses, temperature effects and missing information about the individual batteries/cells lead to inaccuracies. As a result, after a few discharge cycles all current balance calculations become increasingly inaccurate and the user must be aware and involved to decide when exactly a battery bank with all batteries is considered "full" and "healthy". However, the fully charged state can hardly be determined without the provision of BACS' Balancing, and is thus a considerable source of error in the current balance calculation. To date, the measurement of a battery capacity - regardless of the type of chemistry - is prone to error and is more of an "estimate" that could be more or less accurate, but hardly depended upon.

With the new BACS current sensors on each battery string and active balancing, BACS is able to calculate the percentage of available residual battery capacity at discharge for each individual battery/cell.

Today, we find battery management systems with lithium batteries in the automotive sector that achieve quite good capacity estimates - but at high costs, which make them less than economically viable for every application; especially for stationary battery systems this technology is hardly suitable. **A UPS is not a TESLA car and a discharge in a UPS is the exception rather than the rule** - this makes the determination of the battery capacity in stationary systems difficult because the state-of-health - the undetected failure of a battery/cell - can have a major influence in the calculation, and this cannot be verified due to the lack of discharge options. In a UPS, all

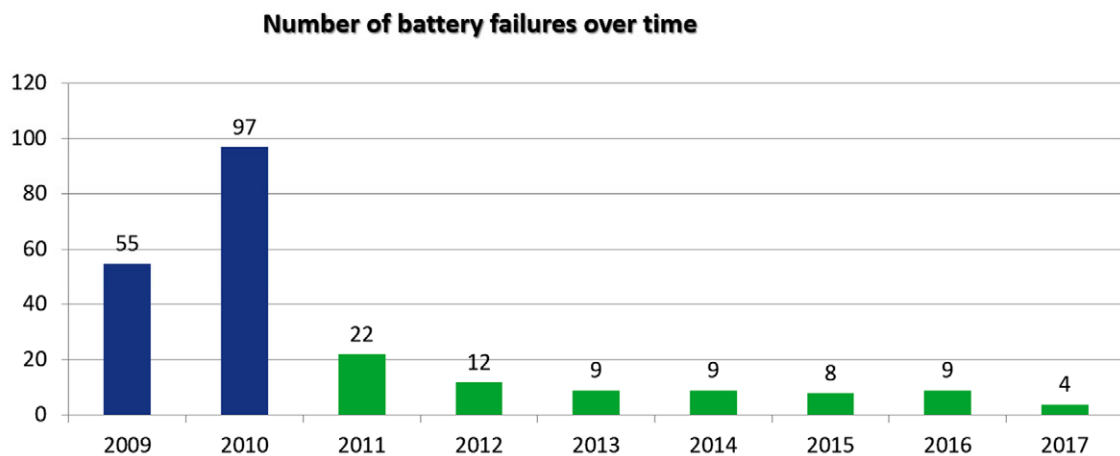
| String 1 LONG 5/2017 | | | | | | |
|---|-----------|------------|----------|------------|----------|--------|
| No. | Volt. [V] | Temp. [°C] | Ri. [mΩ] | Charge [%] | Equalize | Status |
| 1 | 12.52 | 23.8 | 21.25 | 64% | ... | ● |
| 2 | 12.41 | 24.4 | 21.81 | 65% | ... | ● |
| 3 | 12.46 | 24.5 | 20.91 | 67% | ... | ● |
| 4 | 11.77 | 24.4 | 21.94 | 48% | ... | ● |
| 5 | 12.46 | 24.0 | 20.93 | 67% | ... | ● |
| 6 | 12.44 | 24.6 | 21.81 | 66% | ... | ● |
| 7 | 12.42 | 24.5 | 21.72 | 66% | ... | ● |
| 8 | 12.56 | 24.5 | 22.23 | 70% | ... | ● |
| 9 | 12.43 | 24.5 | 22.00 | 66% | ... | ● |
| 10 | 12.48 | 24.0 | 21.34 | 68% | ... | ● |
| 11 | 12.46 | 23.8 | 21.77 | 62% | ... | ● |
| 12 | 12.55 | 24.5 | 21.85 | 70% | ... | ● |
| 13 | 11.08 | 24.5 | 21.63 | 29% | ... | ● |
| 14 | 12.47 | 24.5 | 22.79 | 67% | ... | ● |
| 15 | 12.51 | 24.1 | 21.21 | 68% | ... | ● |
| 16 | 12.56 | 24.5 | 21.43 | 70% | ... | ● |
| 17 | 12.48 | 25.0 | 21.41 | 67% | ... | ● |
| 18 | 12.44 | 25.3 | 21.57 | 66% | ... | ● |
| 19 | 12.55 | 24.6 | 21.67 | 70% | ... | ● |
| 20 | 12.48 | 25.1 | 20.86 | 68% | ... | ● |
| Σ Voltage 247.51 V | | | | | | |
| 12.38 [V] Target Voltage | | | | | | |
| -4.1 [A] DC Current -1.01 [KW] Real Power | | | | | | |
| 0 [A] AC Current | | | | | | |

batteries must always be considered "full" and "healthy", otherwise any calculation of a capacity will run into difficulties.

To date, the UPS display of the "autonomy time" or "battery capacity" is a curve provided by the battery service technician based on battery parameters - which has little to do with the SOC of the batteries in reality if the measured values of the individual batteries are not included. The failure of a battery cannot be detected and therefore cannot be taken into account. It is precisely this circumstance which explains why some UPS users complain that the display of the UPS still shows e.g. 80% when it is discharged, but the UPS switches off because of an undercharge a short time later.

Most UPS users have not noticed this deficiency because discharge simply occurs too infrequently to detect differences. This is true for most users - but not for highly critical datacenters or military installations. Here, the problem of poor UPS capacity indication has been known for a long time, and has led to these users performing regular capacity tests to determine the actual autonomy time/battery capacity and to recheck it regularly.

In fact, it was precisely through the provision of such regular tests that it has been repeatedly found that the battery capacity improved considerably as soon as BACS was installed. For example, an experienced large user of BACS in the USA reported that after switching to BACS, the number of batteries that needed to be replaced each year was dramatically reduced – and this coincided with an **increased capacity!**



- ✓ Battery management installed 2011 and complete 2012
- ✓ Colocation/Datacenter Provider with 10K – 15K battery assets
- ✓ Quarterly battery maintenance performed in conjunction with BACS for validation of data

With balancing, BACS not only can measure the impedance values of a battery more accurately and thus make them ultimately comparable, but, for the first time, Balancing also allows for a significantly **improved capacity measurement.**

But there are other advantages to visually displaying the battery capacity:

Charging mode: The image to the right shows the capacity display during heavy charging - you can see that Balancing is 100% active and the capacity cannot currently be calculated. The capacity display shows by an arrow pointing upwards that more current is flowing through the bypass than it can dissipate and that Balancing currently has hardly any effect. Only when the battery builds up a resistance because it is approaching the fully charged state will Balancing go below 100% and the capacity calculation can be started.

| String 1 LONG 5/2017 | | | | | | |
|----------------------|-----------|------------|----------|------------|----------|--------|
| No. | Volt. [V] | Temp. [°C] | Ri. [mΩ] | Charge [%] | Equalize | Status |
| 1 | 13.48 | 23.5 | 21.25 | | | |
| 2 | 13.49 | 25.5 | 21.81 | | | |
| 3 | 13.49 | 25.3 | 20.91 | | | |
| 4 | 13.47 | 24.7 | 21.94 | | | |
| 5 | 13.47 | 24.5 | 20.93 | | | |
| 6 | 13.47 | 25.1 | 21.81 | | | |

Trickle charge mode: It may not be clear to every user that voltage behavior during a discharge can differ greatly depending on the battery chemistry. Many users are not aware that a nominal voltage of a lead battery of 12.50 volts - depending on the load - can already represent a massively discharged battery, and that the nominal voltage of a NiCd battery of 1.20 volts says little about the capacity - **although both are the nominal voltages of the battery/cell** - but with different chemistry.

| No. | Volt. [V] | Temp. [°C] | Ri. [mΩ] | Charge [%] | Equalize | Status |
|-----|-----------|------------|----------|------------|----------|--------|
| 1 | 13.59 | 24.5 | 20.94 | | | |
| 2 | 13.59 | 25.5 | 21.67 | | | |
| 3 | 13.59 | 25.5 | 20.65 | | | |
| 4 | 11.41 | 26.0 | 21.70 | | | |

However, if the capacity is displayed with a color or a measured value, even the less experienced user will notice that battery No. 4 with 11.41 volts is a problem because the capacity is displayed in **YELLOW**, indicating a low level. This enables early detection of defective batteries in the system in real-time without additional components and maintenance work!

Discharge mode: Also in case of a discharge, the user will be able to see which cell/block loses capacity faster than others, and check these batteries accordingly later.

| String 1 LONG | | | | | | |
|---------------|-----------|------------|----------|------------|----------|--------|
| No. | Volt. [V] | Temp. [°C] | Ri. [mΩ] | Charge [%] | Equalize | Status |
| 1 | 12.60 | 23.5 | 21.25 | | | |
| 2 | 12.60 | 24.5 | 21.81 | | | |
| 3 | 12.59 | 24.1 | 20.91 | | | |
| 4 | 12.58 | 24.3 | 21.94 | | | |

In the picture on the right you can see that there is a **difference of 5%** in the capacity of battery no. 1 as compared to no. 2, **although both have the same voltage**.

This development is to be observed in order to identify whether the difference increases during discharge.

A little later, battery no. 1 still shows a 3% difference to no. 2, although the voltage at battery no. 1 is now higher than at battery no. 2 => battery no. 1 should be observed.

The optical display of the capacity makes it easier for the user to keep track of a large number of batteries and clearly indicates the vital differences between the batteries at an early stage.

| String 1 LONG | | | | | | |
|---------------|-----------|------------|----------|------------|----------|--------|
| No. | Volt. [V] | Temp. [°C] | Ri. [mΩ] | Charge [%] | Equalize | Status |
| 1 | 12.32 | 23.5 | 21.25 | 57% | ... | ● |
| 2 | 12.26 | 24.0 | 21.81 | 60% | ... | ● |
| 3 | 12.28 | 24.5 | 20.91 | 60% | ... | ● |
| 4 | 12.25 | 24.0 | 21.94 | 60% | ... | ● |
| 11 | 12.20 | 23.5 | 21.77 | 53% | ... | ● |
| 12 | 12.29 | 24.5 | 21.85 | 60% | ... | ● |
| 13 | 10.19 | 24.4 | 21.63 | 4% | ... | ● |
| 14 | 12.18 | 24.5 | 22.79 | 58% | ... | ● |
| 15 | 12.24 | 24.0 | 21.21 | 60% | ... | ● |

With BACS, GENEREX is proud to have the first BMS on the market that can, through Balancing, provide

- Extended service life
- Increase capacity
- Comparability of impedance measurements
- Replacement of old cells/batteries with new cells/batteries without damaging the remaining ones within the string.
- Delay/prevention of spontaneous combustion due to overcharging
- **NEW - a battery capacity indicator**

Now balancing forms the basis for calculating the battery capacity – more dependably and cheaper than was previously possible!

No Battery *Monitoring* System can do this; only a Battery Management System can, by treating each cell or block individually, establish a common voltage base that allows the capacity to be calculated much more accurately than would be possible without balancing.

At GENEREX, we work hard to live up to our reputation as an industry leader and are proud to have been recognized as the unofficial standard within the industry by many users around the world.

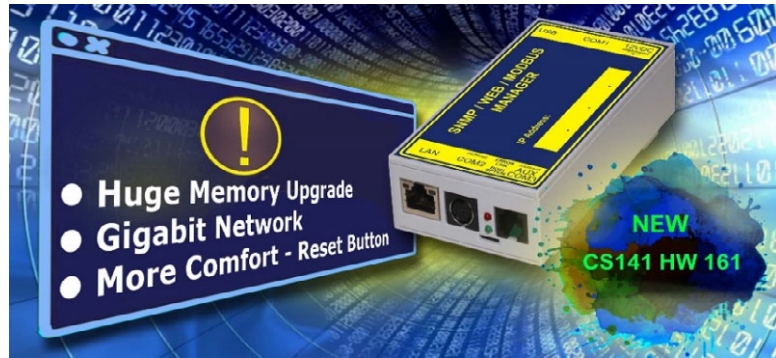
The next generation of our BACS system will support new technology approaches, in addition to well-known standard technologies, and will be able to almost guarantee operational reliability for systems based on lithium LTO/LTE/LiFePo batteries. And this 4th generation will be compatible with the current most successful generation of a BMS on the market!



Announcement

CS141 HW 161 Update

If an IT product does not change to keep up with the times, it will ultimately become a liability. If that product functions as the brain of a complex and vital critical system infrastructure, it must not only change to keep up with the times, it must be pre-emptive in doing so!



We at GENEREX understand this truth, and have invested the resources required in order to provide the most cutting edge, responsive hardware and software solutions on the market in an effort not only to keep our products updated and in accord with current data and technology trends, but also in an effort to provide the best and most functionally secure products possible for our clients.

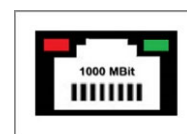
With this in mind, we are pleased to announce that in Summer 2022 we plan to launch the latest hardware iteration of our flagship SNMP card, the **CS141 HW161**. With this hardware upgrade we are specifically targeting the CS141's security infrastructure; The revised hardware is expected to be delivered in the middle of this year and will replace the CS141.

The update itself is based purely upon making the CS141 the most cyber-secure SNMP card on the market. We see cyber security as the next focus point in the natural evolution of the broader product category and industry in Europe, North America and in the expanded global market, in the face of a real or perceived increase of attacks to network infrastructure in critical power installations.

As such, the update will be targeting the Ethernet stack (Gigabit), in addition to a general increase to RAM and ROM as well as improvements to the physical interface, all of which contribute directly to the functional safety and security of the SNMP card, which itself is the brain, the **central interface** and therefore the gateway of the system's management and security

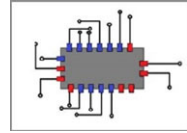
■ Gigabit

In keeping with industry trends, Gigabit supports 1000Mbit transfer speeds – this is gradually becoming an industry “must-have” with many IT Infrastructures requiring it exclusively, and GENEREX is committed to staying at the head of the pack! Not to worry, though – 10/100Mbit is still supported, as well.



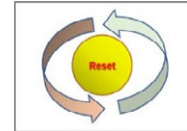
■ Substantial Memory Upgrade

Both as a reaction to current industry needs as well as an investment in requirements yet to come, we're quadrupling the CS141's memory to make sure that regardless of what comes next in cybersecurity, the CS141 will be equipped to handle it. What's more: this additional memory better servers to make the CS141 able to provide larger logfile for the BACS system; **it will be able to store battery data for up to 5 years, locally!**



■ The Reset Button

This feature will appeal particularly to engineers in the field – we've implemented a "reset" button to the face plate of our BSC and SC cards varieties to allow for a quick and easy restart. With this feature, engineers / users will no longer need to remove or unmount the card from the UPS slot in order to reset the CS141.



Our clients need to know that their critical infrastructure is managed competently and securely, and we believe that it is our responsibility to make this as feasible as possible, starting with the specific functionality of our SNMP card hardware and software.

Massive function expansion for the CS141 HW 161 Mini Slot

NEW: Memory Upgrade
More memory to hold log files, system upgrades, processing memory and more!

NEW: Expanded Memory Technology
A new modern memory technology grants low latency processing

NEW: Gigabit LAN
....serving the future
....compatible with the past!

NEW: Jumper Settings Added
The famous CS141 emergency mode jumper is now available!

NEW: Cybersecurity Re-Inforced
The Special „firmed“ software is designed to maximize security for high-secured areas!

NEW: Multi-Function RJ12 Connector
This interface allows multiple connections to BACS, SENSORMANAGER, temperature and humidity sensor intelligent functionality of a CS141 Professional!

NEW: Reset Switch
Just press to reboot the CS141 Hw161 Mini!

NEW: Network Configuration Switch
The network mode sliding selector is now available on the frontside - easier to access without removing the card from the UPS slot!

In addition to adopting all the HW 161 enhancements associated with the CS141 family as a whole, we are equipping the CS141 Mini with an RJ12 connector which allows the CS141 MINI to connect to BACS, SENSORMANAGER, and temperature and humidity sensors via a Type 135 adapter cable.

By doing so, the CS141 Mini becomes the smallest functioning high-performance Webmanager in the world!

The HW 161 upgrade enables the Mini to become a “pre-installed” half of a functioning BACS System – just like its “larger” CS141 device cousins. **However, its “mini” size makes it the ideal candidate for integration into similarly small installation environments, such as Lithium battery packs...and more!**

The CS141HW161 updated cards will follow naturally with the depletion of our current stock of CS141 cards. What’s more, the firmware as accords the otherwise standard CS141 will continue to be maintained and updated in parallel to that of the CS141HW161, without interruption.



Cybersecurity

Editorial: For network infrastructural professionals, “Made in China“ is losing its luster :

Over the past three years there has been growing indicative evidence that many hacker groups are secretly financed or otherwise organized by the Chinese (and in some cases Russian) state apparatus, and as such, more and more consultants from the IT industry are also openly



criticizing the use of network-capable hardware devices from Chinese production in Western networks. Essentially, hardware is able to offer better "hiding places" than might be found in purely software products. Whether in the case of virus scanners or general “watchdog” programs, native or third-party security systems are ultimately well able to monitor software products; this is less true in the case of standalone hardware.

Since hardware is usually "hardened", such security systems are not able to attain access to the inner software. Consequently, background processes cannot be checked for irritating or even harmful secondary functions. If the origin of the device is unknown or the manufacturer cannot be trusted, the "hardening" of an embedded OS, which is actually intended as a security feature, consequently becomes a vulnerability per se with regards to the broader cybersecurity of the system to which it belongs.

The key security dilemma can be found in the details:

Many providers of network products whose products have been "scanned" and deemed harmless are later able to automatically update their firmware via the Internet. As a result, either each firmware version must be completely rechecked again and again, or ultimately one must "blindly" trust that no malware will be reloaded with the firmware update.

To avoid this dilemma, for example, almost all military installations in the “Western” world not only require **full disclosure** of the applicable source code as a prerequisite for security clearance as applies to device operation in high-security facilities, but also the inclusion of proprietary code that makes a device 100% verifiable even after a firmware update. Undeniably, of course, devices such as the CS141/BACS, where GENEREX as the manufacturer offers this insight including "security tags", are preferred as a "secure device" and thus authorized for use in high security areas.

Even in the non-military sector, UPS systems or batteries are from a geo-political point of view increasingly considered "security-critical applications" and have also become attractive targets for hacker attacks: large-scale capping of power supply is a significant attack vector for those looking to massively and sustainably jam societal infrastructure across multiple levels, from civilian life to transportation, business, and government.

The power supplied by a UPS is not itself a "security vulnerability", regardless of the origin of the device. The network uplink, though, often becomes a hidden or unknown weak point within the system as a whole! Safety-critical users therefore prefer clear a proof of origin and safety checks before equipment is put into service.

For the entire duration of its development but especially since 2016 GENEREX has attached great importance and proactive prioritization to the topic of network security with regards to the CS141. Therefore, the varying reports about massive security leaks in processors which would become known in the press as "Meltdown", "Spectre" or 2022's "J4Log", have not posed any sort of problem for the CS141/BACS. Even so, it is clear to us here that one must remain vigilant - therefore the topic "Cybersecurity" remains the top topic for GENEREX also in this year.

Ultimately, „Security“ can only be guaranteed through trusted control of the firmware!



GENEREX, In-Person: Upcoming Event Participation 2022

It's been a weird couple of years now with regards to in-person events. Optimistically, things seem to be changing, and we are now looking forward to participate in several such events. GENEREX and its employees are members of such organizations as 7x24 Exchange, AFCOM, and IEEE, and in this capacity we are

anticipating "getting back out there" to meet our clients, customers and partners at the next possible dates!



**Looking ahead into 2022,
we plan to participate in the following public events:**

IEEE Standards Associations January 24-28

The IEEE Energy Storage Stationary Battery (ESSB) committee holds semi-annual meetings. The conference aims to be the focal point for presentations and discussions about emerging technologies from industry experts, from which participants

are encouraged to break into working groups to write new standards and optimize existing standards concerning the energy storage and stationary battery market. Over the course of the week of January 24nd 2022, GENEREX attended the IEEE ESSB winter meeting held in Gulf Shores, Alabama, for the first time.



We had the opportunity to sit in on several working groups such as IEEE 1491, the Guide for Selection and Use of Battery Monitoring Equipment in Stationary Applications. Daniel Baileys, the CEO for Generex in North America, said, "IEEE standards are well known to the engineering community. They guide our product development on what key metrics we need to use in our product instrumentation. We wanted to take a more hands-on approach, and so we actively participated in several working groups within the ESSB committee."

AFCOM Data Center World March 28-31

GENEREX will be at Data Center World from 28 to 31 March in Austin, Texas. AFCOM offers vendor-neutral training for data centre technical staff as well as IT professionals. Core topics also include data centre sustainability and viable battery technology as pertains to the critical power management industry. Additionally, international fire

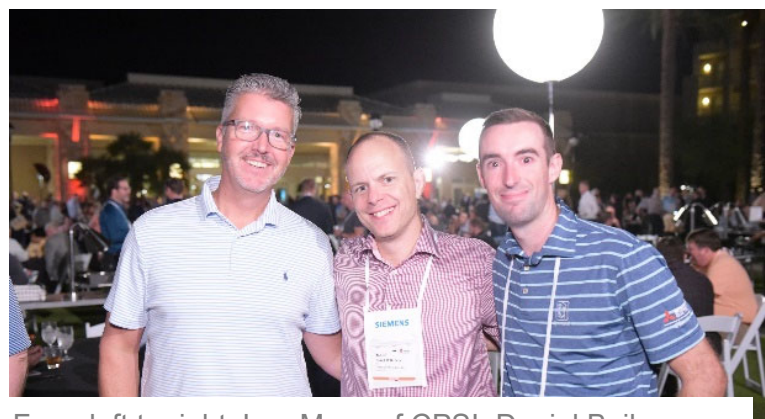
protection requirements and concepts will be presented, and best practices as ought be encouraged in data centre monitoring and management will be discussed. This event is always a good opportunity to acquire industry knowledge, to further educate oneself, or to exchange ideas directly with professional colleagues and customers on the side lines.



7x24 Exchange June 12-15

The 7x24 Exchange provides a platform for continuing education for those who build, operate, and maintain mission-critical facilities. In addition, Generex will be attending the June 2022 Spring Conference located in Orlando, FL. This is another amazing event created to support the data centre community and to provide a special place and time in which to network with these industry professionals.

As always, if you are attending these events, we would love the opportunity to connect face to face! Just give us a shout and we'll make sure and inform you about our location and availability.



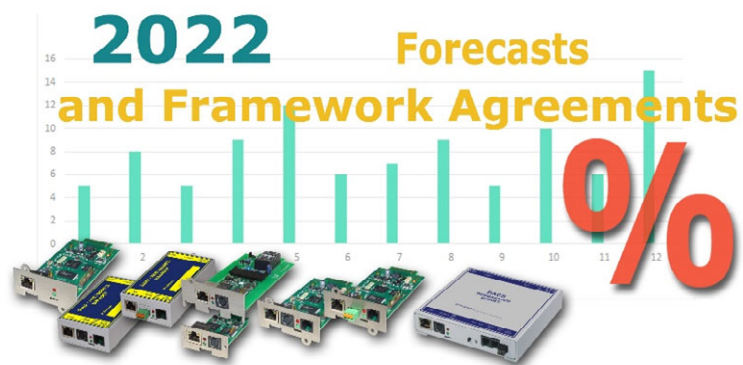
From left to right: Lee Moss of CPSI. Daniel Baileys CEO GENEREX USA, and Dakota Massey from Mitsubishi at the 7X24 Exchange show.



Secure your Supply Forecast and Framework Agreements

It's no secret that the electronics and electronic component industry is in a state of flux.

In parallel to steadily increasing demand for consumer and industrial electronics there has been a growing uncertainty within the industry supplying components for those same goods.



GENEREX has thus far weathered the storm – we are extremely proud to report steady and dependable lead-times throughout this “crisis” period, due in no small part to our strong supplier relationships and competent material planning.

However, you as our valued customer could support us in these ongoing **efforts – and secure lucrative costs savings for your company by doing so!**

We thus hereby repeat our open call to all clients and customers to send us their forecasts and framework agreements for their expected SNMP card, BACS, and BACS peripheral sales for the coming 24-month period!

FORECASTS – Make your estimations work for you!

It is a strange and exciting time for us all. The past two years have proven to be a boom period for GENEREX, where our deeply rooted dependence and reliance on western component manufacturers saw us stand relatively immune to the great shutdown and subsequent component squeeze out of mainland China. Coupled with a general industry boom for critical power management products and services, our most ambitious sales targets were reached early, and we've been hard pressed to keep up supply since. We've been riding the wave!

We'd like to keep riding it; **the availability of key component parts has become even more volatile going into summer 2022**, which means that the importance of our ability to organize our supplier sourcing chain has dramatically increased. To best plan for the next 24 months of BACS and CS141 card production, we ask for your input as business partner. Whatever realistic forecast information which you are able to provide with regards to expected stock requirements and time scales for the coming 24-month period, please do so provide.

A forecast is a non-binding estimation of GENEREX products sold within your portfolio over a given upcoming time period, most appropriately 24 months.

Though there is no contractual “fire” which could be held to a client’s feet in the case that a given estimation proves ultimately inaccurate, such information better informs our ability to gauge our own future production requirements; in this way, it is vital both to our and our clients’ business interests.

What advantage do you gain in giving us your forecast?

Quite simply, your forecast better ensures our ability to supply you! It informs our production estimates, which directly impacts our ability to meet demand. In giving a forecast, you also better improve your own “place in the queue”; **in a given scenario in which two competing clients submit an order for similar quantities which we would otherwise be hard pressed to equally supply in a timely manner, the client who provided forecast information will be the client given preference of supply.**

It is in our interests to support the clients who support us; in other words, in a “first come first serve” scenario, those clients who best provided estimates will be the ones “first served”. You scratch our backs, we scratch yours!

Please direct any forecast information to sales@generex.de (EMEA and South America) and sales@generex.us (USMCA and North America) respectively, with “Forecast” featured within the subject line.

FRAMEWORK AGREEMENT

2023 - Guaranteed delivery capability is the new competitive advantage!

The almost complete collapse of global trade channels due to the corona pandemic in 2020 and 2021 caught many companies cold - no one expected it, and all those companies who have production otherwise anchored in Asia have been massively affected. GENEREX was able to maintain its ability to deliver almost unchanged due in large part to its philosophy of producing only in the EU / USA and selecting suppliers only from within the western world. At the least, this stability has applied to the customers who concluded framework agreements with us during and leading up to this critical period. **Those who have secured their ability to deliver in 2020 through framework agreements are well positioned for 2022!**

But since the war in Ukraine began, European problems are now added and the supply crisis has now reached us after all!

The goods thus proactively secured and now remaining will be divided fairly among all customers, and we can no longer give any short-term delivery guarantees or delivery times for 2022. The “hoarding” of our products may be an option in the short term, but will otherwise create significant distortions in our production planning. The year 2022 is already “closed” from a production planning point of view, anyway - no change / increase is possible anymore because of the enormously long delivery times for all kinds of components, raw materials and the resulting price increases of 30 up to 200% - it has become an unprecedented situation.

We strongly recommend that Customers depending on the timely availability of our products in 2023 take all necessary precautions! We ask these customers not only to send us a - non-binding – forecast, but also to agree on a fixed framework contract with us so that we can order the required components NOW. **Subject to our own supply, the ordered goods from the framework agreement will be accorded a prioritized delivery.**

We look forward to your inquiry and will work with you individually on the best options for securing supply and optimizing prices.

Please contact us with any applicable requests **by 30.04.2022** | James May (j.may@generex.de) for EMEA and South America and Daniel Baileys (d.baileys@generex.us) for USMCA and North America with the subject "**Framework Agreement**".

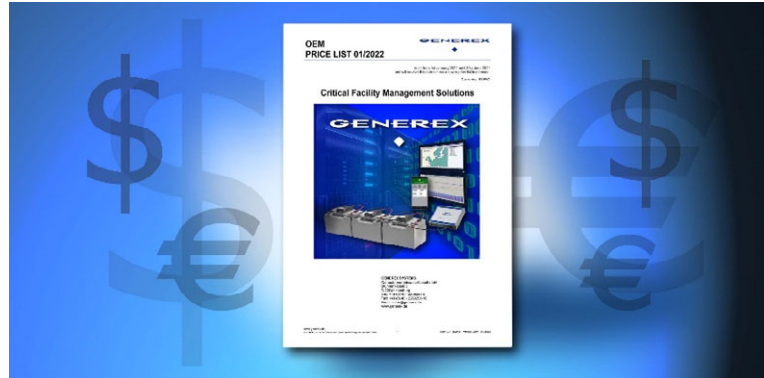


Reduced Quotation and Pricelist Validity

Owing to ongoing instability in the electrical component industry, GENEREX has been forced to conservatively revise its standing quotation and pricelist validity periods.

For the time being, in an effort to most accurately and proactively react to current trends in supply and demand for such components, we have reduced the validity of our Price Lists from 12 months to 6 months; we hope that market conditions will enable us to return to “status quo” sooner rather than later!

For the same reason, we have limited the validity of our open quotations to two weeks from date of creation, effective as of the release of our January 2022 Price List.



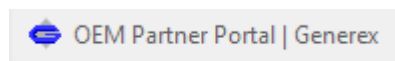


Our Service for OEM Partners - FAVICONS

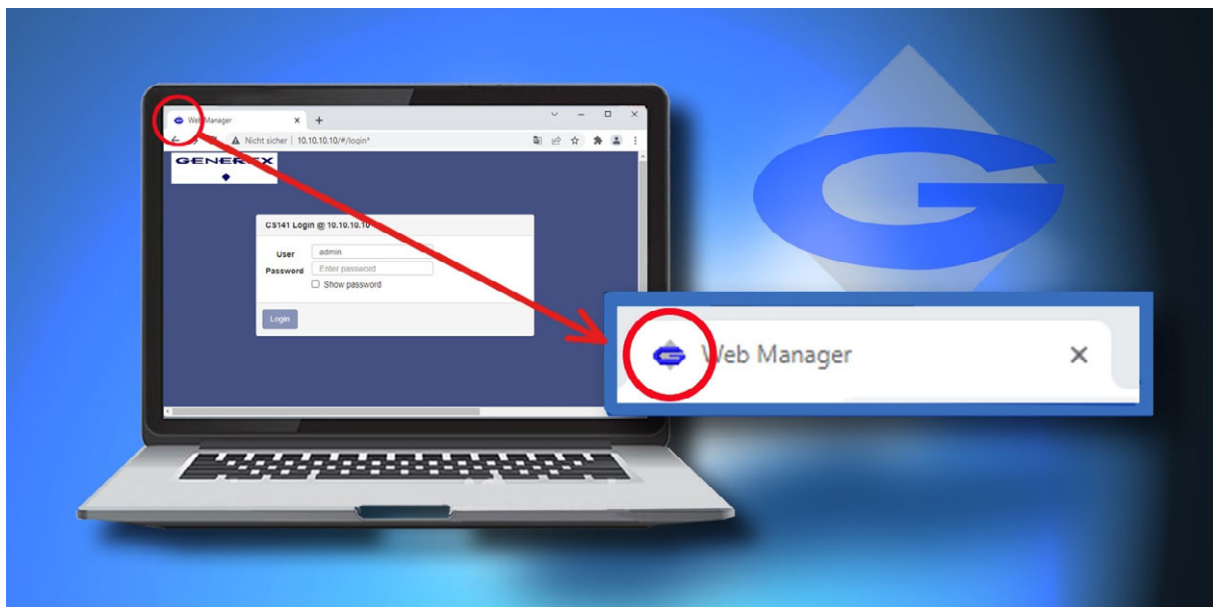
As our OEM customer, you already enjoy access to numerous customization options useful in the adaptation of a GENEREX product into your OEM product line.

As a special service, we will now add your company logo as a standard favicon!

The favicon is a small symbol that serves to make a website uniquely recognizable. It is usually a simplified form of a logo or a graphical symbol, which is displayed next to the page title in the browser tab:



As this example shows with a CS141 / BACS WEBMANAGER, a favicon can be integrated without further ado:



By default we thus will provide an OEM-specific “favicon” to be displayed on your OEM support page and software browser tabs. It’s just one more bit of customizable “flair” which we’d like to make available for you!

If you wish to alter or otherwise designate a different image on behalf of your company as OEM representative, please send any corresponding files or templates to our Marketing colleague:

Mrs. Martina Kohlstruck - m.kohlstruck@generex.de

As of firmware 2.06, we will equip all CS141 and BACS units of our OEM customers with FAVICONS - we look forward to your input should you desire some other specification.



Network SECURITY

The CS141 as a gateway for UPS network devices and data

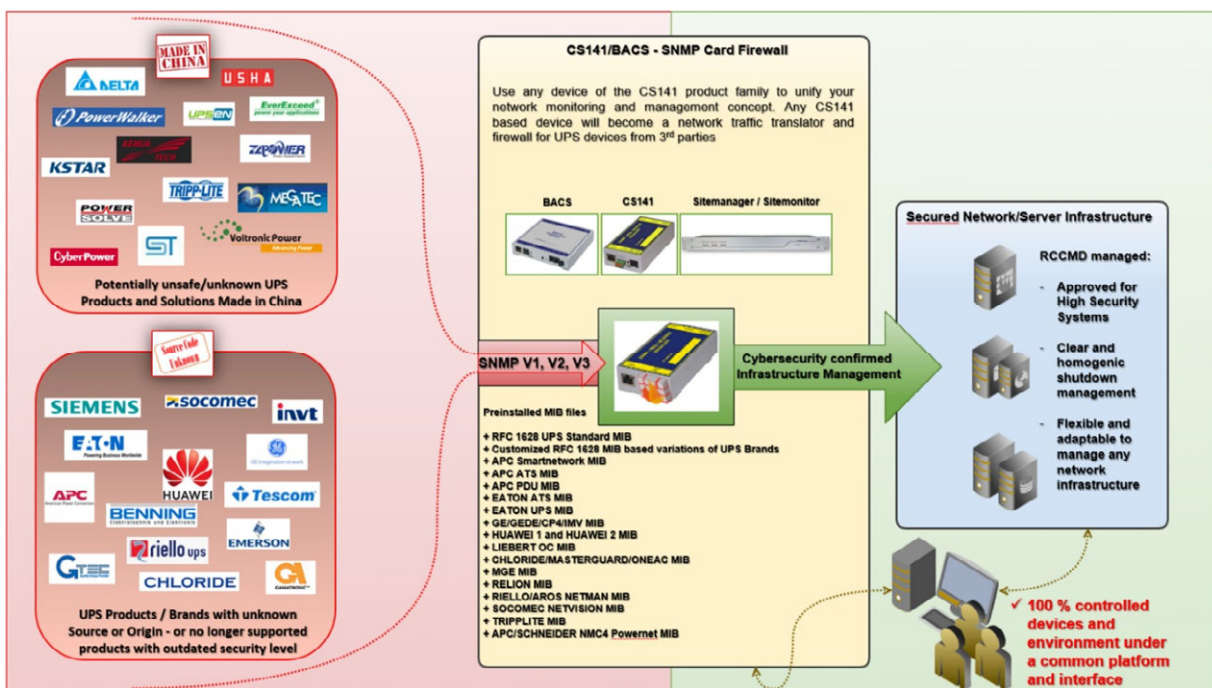
Every time another hacker attack story hits the media, the discussion around how to secure a high-security network against "malware / ransomware" reaches a new fever pitch -- and the resulting discovery always seems to be that under certain conditions, essential elements of an infrastructure are inextricably linked to network access:



How is one supposed to query an integrated UPS SNMP card with firmware from a source that is not 100% verifiable without using the device’s LAN port?

It’s a problem that is becoming increasingly important in the highly sensitive area of power supply: no server system can be expected to succeed without a functioning mains power concept. Experience shows that attacks are increasingly targeting precisely this infrastructure.

Firmware that could otherwise be assumed to negatively influence system integrity and security and which is designated as such by watchdog / government agencies does not give a good feeling of security per se – and such a flaw exists as such with all devices “made in China”. In addition, with an increasing number of different hardware options and configurations, each company wants to offer or pre-install its own biotope of "query and control software",

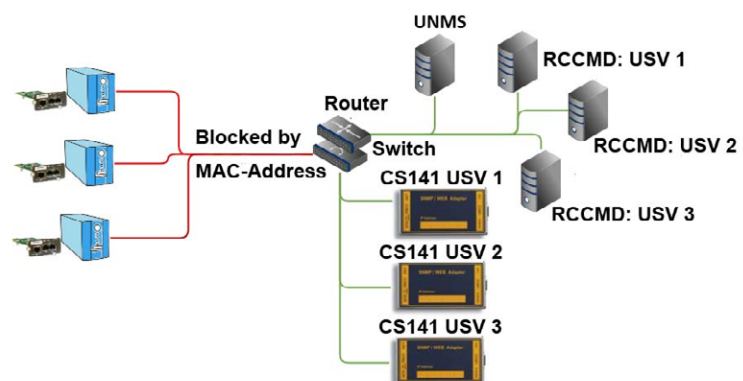


which quickly makes the number of clients and software tools in the network confusing and otherwise overly complex. As a result, numerous individual ports have to be opened in the network, which can in turn serve to open up more gateways for hackers.

A network should therefore only have those ports open that are really needed!

The solution here is to completely separate the heterogeneous hardware landscape from one's own high-security network and prohibit all network connections from unknown or untrusted sources – **or, use the CS141/BACS as a functional Firewall!**

Basically, all safety-critical infrastructures struggle with the same sort of problem: many manufacturers promote their own "complete system solutions" for "their" devices. In the UPS sector, however, certain "universal" standards have become established, such as SNMP RFC 1628, which every UPS



manufacturer should theoretically support. The CS141 has been using this "standardized" interface SNMP RFC 1628 for years to communicate with SNMP cards from other manufacturers. The user only has to select "SNMP-UPS RFC 1628 compliant" as the model in the UPS configuration menu, and the CS141 takes over the SNMP data of the other card and simulates the direct connection via COM/USB.

This SNMP-UPS RFC 1628 communication mode allows the CS141 to be used as a "translator" in all environments where the "other" SNMP card does not meet the requirements of the administrators, or where the integration of this SNMP card into the network is not desired due to security concerns, for example.

In addition, the actual hardware itself is only passively queried, and thus there is no need to appear as a reachable network at all. How dangerous it is to make infrastructure hardware directly available accessible within a network is shown by this current article from March 2022: [TLStorm \(armis.com\)](https://www.armis.com/blog/TLStorm). This article impressively shows why UPS systems in particular have become a central attack vector on an infrastructure.

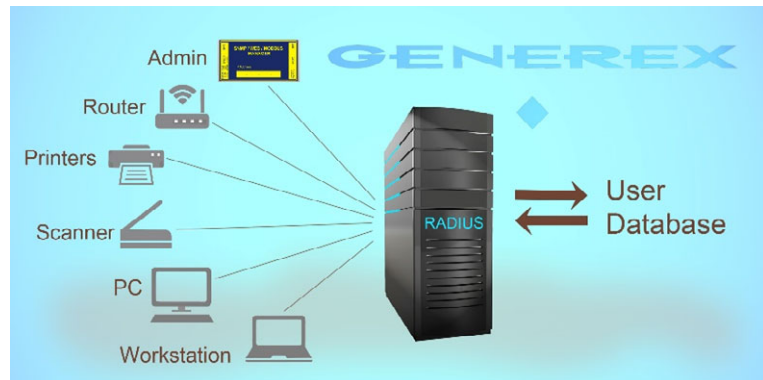
As already described elsewhere in the newsletter, the CS141/BACS is known to belong to safest devices in the UPS market and thus also enjoys the most widespread usage, at least in the western world.

The reason for this strong reputation among end customers is not only the origin of the unit; besides being Made in Germany and Made in the USA, the technical "nitty gritty" details behind the CS141/BACS are the reason. The recently introduced SYSLOG and RADIUS functions in the CS141/BACS, together with the port release via EAP, provides the technical prerequisites for achieving this trust status with end customers **and thus forms the ideal basis for continuing to operate both "insecure" network devices and simply obsolete network devices securely in modern networks.**



What can one do with RADIUS on a CS141/BACS?

RADIUS (Remote Authentication Dial-In User Service) is widely used in modern IT. This service makes it relatively easy to authenticate and authorize users wishing to log into a network from a location outside the network itself. As such, RADIUS can also be used, for example, if you want to bill certain services according to usage time (accounting), or manage company WLAN access in a quick and efficient manner.



For the CS141/BACS, RADIUS primarily plays a role in dynamic password management or direct network access based on LAN access.

A CS141/BACS offers central user management via dynamic password management and displays exactly the menus that an administrator has intended for the user.

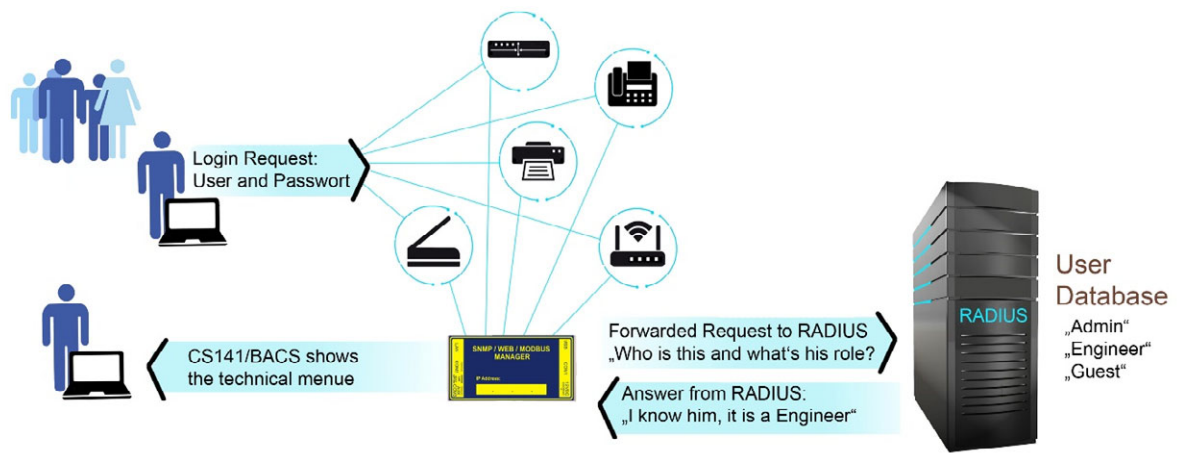
RADIUS with CS141/BACS – What are the basics?

Normally, a given device has its own administrative access in the network. There are no limits to access options -- depending on the device, distinct user credentials can be created for technicians, administrators, OPS, and so on.

With a larger team of technicians, 3 users can mean up to 80 individual user names/password combinations that have to be maintained manually, even with 20 devices. If 2 colleagues leave the team and a new colleague comes in, this can quickly cascade into:

- 20 Logins with the administrator account
- 40 Users to delete (on account of the two departing colleagues)
- 20 Users created with password, etc. (1 new colleague)
- Additional time and effort required for the login and navigation as necessary for the new user dichotomy.

Such efforts can keep an administrator busy for quite a while - and that's not even many users, compared to what might be required for larger IT infrastructures! One can quickly imagine that this micromanagement will not work with a medium-sized corporation with 800 - 1200 employees, access controls, external consultants and consulting firms, etc...



How can RADIUS improve such a scenario?

In a well-configured RADIUS environment, with the exception of a local administrator, the end device no longer needs to facilitate its own users in its own localized database; instead, it utilizes an authentication service to which it can in principle delegate login functionality.

Depending on the device, it is a question of whether someone is allowed to log on via WLAN, for example, and then gain access to certain network resources, or if the user wishes to log directly onto a device, the device then requests authorization from the RADIUS server.

This makes things manageable for both the administrator and the user:

Depending on the level of autonomy or categorization of services the administrator may only have a single list which is automatically distributed to the corresponding user groups. Accordingly, the centralized administration of users and passwords facilitates the simplified care of the active users in a network. For the technician or office worker, they would only need their personal username and password; their access level and associated network resources are aligned over the RADIUS server automatically as accords with the distinct login credentials.

The CS141/BACS device is able to be fully integrated within a RADIUS Server-driven infrastructure

The CS141/BACS fully supports the central management of a username and password authentication system as well as the assignment of a specific menu share via RADIUS with its share level based upon a defined user role or set of user roles. As a result, administrators are able to individually adapt access to the CS141/BACS as an integrated cog within their network.



What is „Syslog“ and why does one especially need „Remote Syslog“ with their CS141/BACS?

It is not possible or feasible to "start from scratch" every time a given network product becomes otherwise obsolete or reaches EOL status ("End-Of-Life"). As such, over time every network grows into a heterogeneous structure in which different hardware manufacturers have inherently instilled upon it their



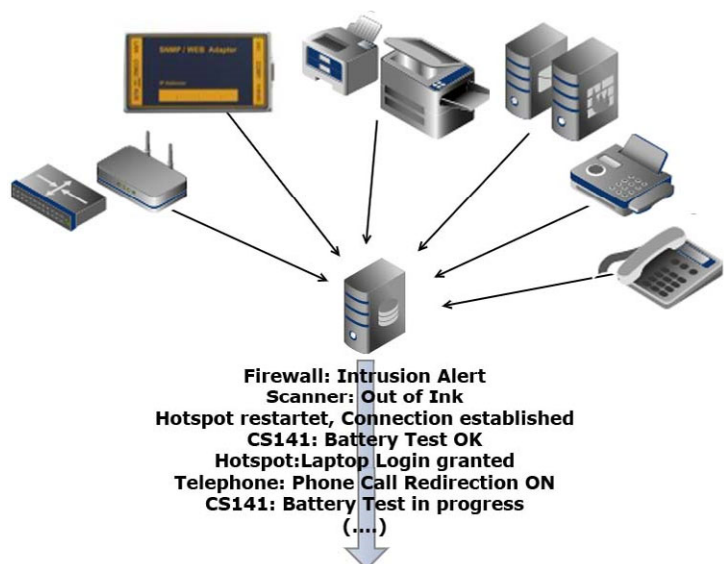
very own operating concepts. In the event of a network error in such a heterogeneous network, the responsible administrator is left with little choice: if they're unlucky, they will need to "surf" each individual device with software from the manufacturer in order to download the necessary log files (event logs) and transfer them into a uniform format so that the process can be automated - or "read" each entry in the log file themselves and draw the right conclusions, accordingly. **This is far from what might be called "user-friendliness" and is completely unsuitable for practice in large networks – and yet, that's precisely the practice for many such administrators in the field of UPS network devices.**

Many of the primarily Chinese suppliers of UPS network cards certainly offer "download management tools" that can take over the "collection work" at this point, but only support their own products and rarely allow the data to be transferred to another format for evaluation. Automation is not possible with such devices and is only acceptable for small networks.

Was does Remote SYSLOG do for CS141/BACS?

Essentially the idea is that everything a given device might write to its own log file, **also be sent as a standardized message to a central database.** The centralized data collection then contains all sorts of information, such as

- Timestamp, Device name / IP / DNS-Name, Specific Problem / Issue, ...



A typical example from the UPS industry would be the question of fill level warnings for printers and scanners, on the basis of which the company's internal controlling process can determine savings potentials for consumables such as paper and printer cartridges: Thanks to Remote Syslog, the information required for this is conveniently available in a database; all that is needed is to know the appropriate search term. Without Remote Syslog, each printer would have to be read out individually and the data compiled manually.

In the industrial infrastructure sector, the same technology can be applied to any number of network devices to transmit log files to a central database. This enables fully automated evaluation by internal statistics and maintenance programs without requiring third-party software within the server environment.

Exactly this optimization of networks is now delivered by the CS141/BACS with Remote Syslog:

Each CS141/BACS with firmware version 2.04 or higher can send its local logfiles directly to a SYSLOG receiver and thus enable a **centrally manageable overview of the health status of ALL UPS or BACS systems located in the network.**

How is Remote SYSLOG configured to work with CS141/BACS?

With Firmware 2.04 one can find the new menu „RSYSLOG“ in the „SERVICE“ Configuration:

The input of IP address / host name and TCP port of the responsible SYSLOG server are sufficient to automatically write all EVENTS of the CS141/HW161 into this file.

Even measured values can be transferred into the SYSLOG; for this the CS141/BACS offers to design the logfile individually. This possibility allows the user to have everything entered into this central SYSLOG file in freely selectable intervals.

Services > Rsyslog

Remote syslog server IP

Remote syslog server port

Accept only TLS connections

Reject expired TLS certificates

Apply Cancel

No certificate found. Please upload rsyslog certificate.

Drop rsyslog.pem File here
or click to select

PEM file <no file selected>

The order of the items in rsyslog.pem is important!

```
-----BEGIN RSA PRIVATE KEY-----  
[rsyslog private key]  
-----END RSA PRIVATE KEY-----  
  
-----BEGIN CERTIFICATE-----  
[rsyslog certificate]  
-----END CERTIFICATE-----
```


Remote Syslog gives the user the freedom to manage everything centrally with minimal effort without costly software - even without in-depth knowledge of the end devices!

Example for the creation of a data record into the logfile of the CS141/BACS for automatic transfer into the SYSLOG:

- Select an Event, e.g. with the CS141/BACS one can find under the UPS-Menu for example the option „*UPSMan started*“:
- Here one might add the job "Log" and select as text a unique term or code which can in turn be searched for later in the syslog database. In this example we have chosen the name "SL_Datapoint".
- Next, one selects which measured values the CS141/BACS ought to send with this SL_Datapoint SYSLOG message - here the "Output frequency L1 in Hz".
- The job SL_Datapoint is triggered as soon as the CS141/BACS has completed its boot process. In order to guarantee now that the measured values are present, one must define a transmission delay (e.g. of 60 seconds) after completion of the boot process and a repetition every 24 hours (86000 seconds) via the timing function.
- On the SYSLOG server side, one now only needs to search in the search program for the term "SL_Datapoint" review all sent measured values, renewed every 24 hours. The basis for further statistic evaluations is thus firmly established and the user does not need to worry about the peculiarities of the end device.

The screenshot shows a configuration window titled "Add Job to Event UPSMAN started". It contains a "Job" dropdown menu set to "Log". Below it is a "Parameter" section with a "Text" field containing "SL_Datapoint:". An "Insert" button is next to the text field. A dropdown menu is open below the "Text" field, showing a list of variables: "Input voltage L1 in V", "Input current L1 in A", "Output frequency L1 in Hz", and "Output voltage L1 in V". The "Output frequency L1 in Hz" option is highlighted in blue.

The screenshot shows a "Timing" configuration window. It has four radio button options: "Immediately, once", "After [] seconds", "After [60] seconds, repeat all [86000] seconds", and "At [] seconds remaining time". The third option, "After 60 seconds, repeat all 86000 seconds", is selected with a blue radio button.



Security – Standard IEEE 802.1X

The CS141 establishes new security standards

Break-ins into semi-open or not fully closed networks have always been one of the biggest problems for system administrators: As soon as a user is allowed to log on to a network with their given device, they establish basic access to the infrastructure points whose IP addresses are known. **Thus, it follows logically that first line of defense for such break-ins the exercise of discernment as to which network-enabled device ought to be allowed access to the network, regardless of its user.**

It's of course understandable that a company wants to deny unchecked private devices access to its own protected intranet. However, this becomes more and more difficult to enforce as the number of employees and computers in the company increases. **The simplest solution here is to simply “lock out” unauthorized hardware from the system via IEEE 802.1X:** a device that does not meet the access criteria is not assigned a port, and without an open port there is no way to penetrate a network.

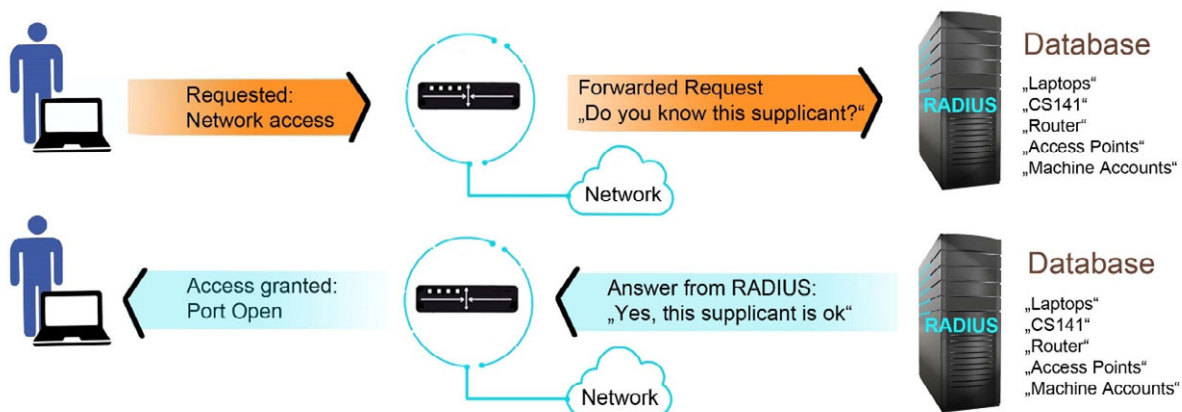
The principle of IEEE 802.1X is relatively simple to explain

On the one hand, we have a so-called supplicant who wants to log on to a network. As soon as the connection is established, it asks for an IP address from the network:

With an active IEEE 802.1X, however, this is not possible "without further ado". In its function as an "authenticator", the router first clarifies whether the requesting device is allowed to access the network at all: A supplicant needs permission from the responsible server to enter the network.

Only if the server agrees, a port is opened for the client, through which it can then enter the network.

In this way, one ensures in the first instance from a central location - in this case a RADIUS server - that only devices that are also authorized by the administrator have access to a LAN.



With firmware 2.04, every CS141 / BACS offers IEEE 802.1X function automatically, so that IT decision makers can identify and discerningly allow "known trusted UPS network devices" in their networks!



End of the Line: CS141BL discontinued

Effective with the launch of our July 2022 Price List, the CS141BL “Budget External Adapter” will no longer be offered as an option within the CS141 family of SNMP Card products.

Essentially, where previously we were able to offer a relatively weighty discount based upon minor differences in hardware / component allocation (hence the “reduced” functionality / features otherwise found on the “BL” version), we’re no longer able to do so.



Since the electrical component market has found its pricing as applies to such minor components “equalized” over the course of the past two years, the “BL” version – as a “budget” item – can no longer compensate its reduced functionality through cost savings, meaning that the pricing gap between it and the “full” CS141L version has all but become inconsequential. As such, we no longer find it appropriate to market the item.

Henceforth, we recommend that our CS141BL clients make the switch over to the CS141L “Full”-version SNMP Adapter. Filling the identical functional role as the now-discontinued Budget version, the CS141L offers increased functionality at a still-reasonable price.



Remains Available: CS141 L



Production discontinued: CS141 BL

And there are further options to reduce the small price difference to the CS141BL - with our “quantity discount” structure, the savvy purchaser is still able to marshal savings of their own creation through increased single-order volume amounts.

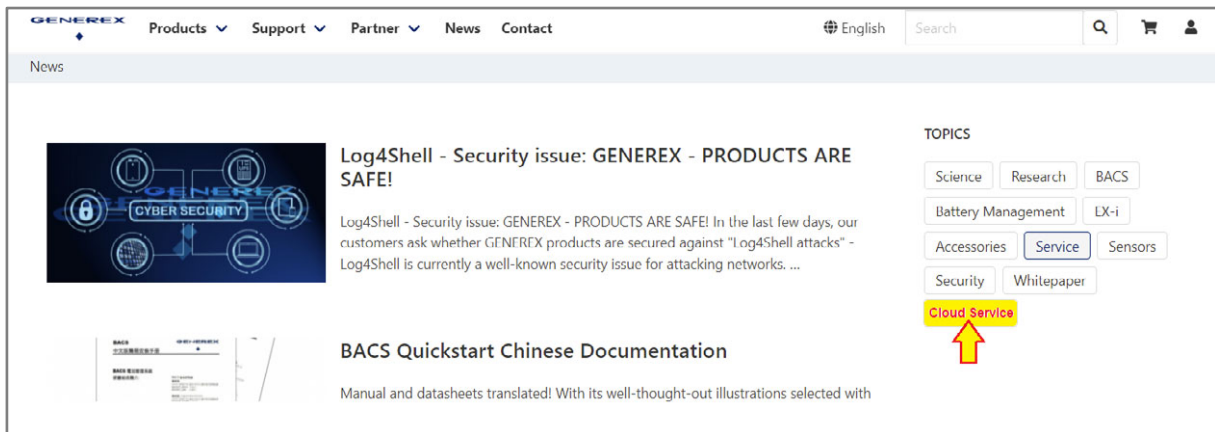


Service

THE UNMS CLOUD Service is making progress ...

Since the announcement in our last newsletter, a lot has happened with our UNMS Cloud Service. Reason enough that we would like to keep you up to date from now on:

Visit our website for the latest NEWS - Link - Under Cloud Services you will find the current development status on this new service in our portfolio:



How the UNMS Cloud Service Email-Trap services work:

A UPS, CS141/BACS or SITEMANAGER System offers a wide range of information about the devices and environments to which it belongs:

- UPS and ambient readings
 - Alarm states
 - Battery test run, discharge, threshold warning
 - Battery failure and many other system messages and measurements
 - Battery Error
- => All measurements of the UPS, batteries, and sensors are sent regularly via encrypted data package over Email to the UNMS Cloud Server

If the customer has a maintenance contract with one of our partners, their environment can be easily and safely monitored using UNMS. In case of a problem, the customer can be informed or maintenance can be scheduled. This mode of operation requires a UNMS with email traps installed to inform the actions of one of our partners.

OR

If the end customer prefers to manage their UPS and environment themselves, they can use the UNMS CLOUD APP service. The picture on the right shows the application as an Apple iOS app on an iPhone





Be Aware!

Another BACS Copycat out of Asia

Every year, competing products out of the BMS industry – especially those from Asia – discover that our BACS system is considered by and large as the “unofficial standard” for Western critical infrastructure projects and installations. We think this is great! And yes, we are of course tickled pink that technicians and industry experts all over the world think of GENEREX first when they hear the word "BACS": **Battery Analysis & Care System**

However, feedback from within the industry has shown that others are also trying to piggyback off of BACS’ established name and reputation! Apparently, some competing sales teams have come up with the half-baked idea of name-dropping “BACS” as if it were a general industry-term for quality – it’s apparently enough to engender some sort of “Aha!” effect for prospective client. While such a tactic is slightly flattering (something about “imitation is the best form of...”), we of course denounce such behavior -- see for example our previous Newsletter edition, in which we discuss the CYBERPOWER copy. Today we want to introduce another offender, one who actually takes the charade one step further by actually using the printed name “BACS” to foist its own system onto the prospective user.

YONGYEA BMS System, out of Taiwan

This particular plagiarist organizes the distribution of his product, which actually originates from China, via a Taiwanese company headquarters:



GENEREX has a partner in Taiwan – a single partner! We’ve been exclusively serving the Taiwanese market for many years at the side of our trusted partner, JTI (JT Information Co. Ltd). Thanks to JTI’s long-standing competence and reliability in local sales, the name BACS is now very well known in this beautiful country as a guarantee for quality and safety as accords to the mark: "Made in Germany".

GENEREX has a partner in Taiwan – a single partner! We’ve been exclusively serving the Taiwanese market for many years at the side of our trusted partner, JTI (JT Information Co. Ltd). Thanks to JTI’s long-standing competence and reliability in local sales, the name BACS is now very well known in this beautiful country as a guarantee for quality and safety as accords to the mark: "Made in Germany".

YONGYEA is absolutely not a certified GENEREX Partner!

And yet, we have to assume that YONGYEA seeks to create exactly this impression with this "small addition" of the name "BACS". On



the YONGYEA website, "imported products from European production" is often used as a quality feature, which in this case is definitely a lie. In German usage this is called "Trittbrettfahrer" ... they’re freeloading off of the hard work and established reputation of others! Hopefully their clients are discerning.

If in doubt if the offered BACS product is an original GENEREX BACS, our support team will help to clarify and answer your questions via email: support@generex.de / support@generex.us !



Back in Stock

The “short” 15cm BACS BC5 cable

In response to customer requests the BC5 measuring cables are now available with a 15cm length, again.

On the majority of otherwise “standard” installations the 15cm long BACS cables were installed far less often than their longer-length cousins, up until the past year or so.

More recently, however, an increasing proportion of installations featuring front-terminal batteries can be found in which the BACS module is mounted on the front side instead of along the top – hot tip: the battery name plate serves as a great surface for the Velcro adhesive!

Since shorter cables are actually an advantage with this sort of an installation method, and since several clients have requested we do so, we are reintroducing the 15cm variation with the next price list, to be released in 06/2022.

Note on the above installation example: We only tolerate this type of mounting for the BC5 measuring cables for 6, 12, and 16-volt VRLA batteries, as there is no danger of such battery types otherwise releasing battery electrolyte, which could then enter the housing of the BACS module via the bus cables.

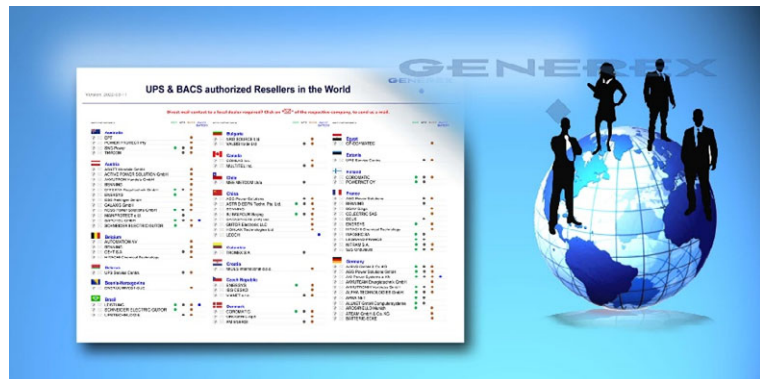




The Reseller List – A Quick Guide

Curious Visitors to our website and prospective customers alike will have come across our Reseller List during their investigations.

GENEREX distributes its products exclusively in accordance with its "B2B distribution model". As such, end



customers and service companies are advised and possibly supplied by us based upon their given relationship with any one of our official local sales and distribution partners.

In accordance to this philosophy, over the past 30 years GENEREX has built up a worldwide partner network of more than 300 "resellers" and 100 OEM/ODM customers, all the while strictly adhering to its "no end-customers" policy, choosing instead to devote energy and intellectual capital into supporting and encouraging the operations of these partners in the field!

For end customer enquiries, we generally refer interested parties to our reseller list from which they can choose the given sales partner at their own discretion. We are of course willing to provide helpful suggestions if required, should the prospective customer have specific needs which otherwise match the traits of a specific partner.

This list can be found under the following > [LINK](#) <

This List is organized by country, featuring a direct display of our current Reseller and OEM Partners in their respective countries; also featured is a color-coded indication as to the product / expertise offered by each given partner – whether they are primarily BACS resellers or whether they perhaps specialize in UPS product sales; whether they are an OEM or not, and whether they have expertise in our SMARTBATTERY family of products. Each partner featured on the list has proven their expertise, either directly through undergoing a product / installation training in cooperation with our own sales and support team, or through having proven their expertise over multiple successful installations. The information available over the Reseller List can be broken down as follows, using Norway as an example country:

www mail company

OEM UPS BACS SMART BATTERY

| Country | Company | OEM | UPS | BACS | SMART BATTERY |
|---------|--------------------------|-----|-----|------|---------------|
| Norway | ELTEK Norway | ● | | | ● |
| | GRUENCO AB | ● | ● | | ● |
| | MAKKER AS | | | | ● |
| | COROMATIC | ● | ● | | ● |
| | NTC SERVICES | | | | ● |
| | SCHNEIDER ELECTRIC GUTOR | ● | | | ● |

- **www** – indicated by an interactive “globe” icon, the website of the respective partner can be accessed by clicking on the icon. Depending on the size of the organization it could prove difficult to find the right “connection”; to aid in this, we’ve also provided the “mail” symbol, as follows:
- **mail** – indicated by an interactive “envelope” icon, clicking the corresponding icon will send a message to our sales department indicating interest in the respective reselling partner – both our US and Germany sales departments are included. We’ll then follow up with the Reseller or OEM in question with the corresponding details and request.
- **company** – here you’ll find the trade name of the company indicated.
- **OEM** – represented by an accompanying green “dot”, these companies are OEM Partners with GENEREX. An OEM Partner might opt to sell an individualized, “own brand” version of the GENEREX product in question.
- **UPS** – represented by an accompanying grey “dot”, these companies have expertise in UPS and UPS accessories, such as our CS141 family of SNMP/MODBUS BACNET cards.
- **BACS** – represented by a brown “dot”, these companies have received the training and expertise required in order to be ordained “Authorized BACS Resellers”. The prospective client can be assured that such partners are able to not only sell the BACS product, but also to install, maintain and otherwise respond to any deeper informational requests.
- **SMARTBATTERY** – represented by a blue “dot”, these companies are considered experts and sales partners with regards to our SMARTBATTEY family of products, including the SMARTLOGGER.



Announcement: Improvements to the BACS Webmanager

Starting this April 2022 all of our BACS Webmanagers will be sporting a new look! In keeping with our philosophy of innovation in the provision of functional, utilitarian solutions, we've "upgraded" our BACS Webmanager in the following ways:



- ABS Plastic Housing, instead of metal:

ABS (Acrylonitrile butadiene styrene) is a flame-retardant, light-weight and easily recyclable plastic material already commonly featured in the battery room due to its strong resistance to corrosive materials and otherwise excellent performance under heat – stress conditions.

- Integrated DIN Rail:

This is a "cutting out the middle man" improvement. Instead of having to order mounting kits (**Part no. BACS_MNT_II** in our catalogue) separate to the Webmanager in case of implementation into a DIN installation, with this improvement each and every Webmanager delivered come pre-integrated with DIN mountings as an otherwise unobtrusive part of the housing, itself.





NEW

**The Rapid-Deployment SMARTLOGGER:
Now with Croco-clamps!**

Since its launch the SMARTLOGGER has been a hit, functioning as an easy-to-use and quick-to-install Battery Monitoring System. Especially amongst battery engineers and service personnel the “SM” has met with aplomb and appreciation: with a “kit” featuring a set number of SM modules and a smartphone featuring the dedicated “iBACS SMARTBATTERY” APP, an engineer can **monitor and otherwise less “awkwardly” evaluate any number of individual sites and battery installations!**



As of our most recently published Price List (January 2022) we’ve introduced a new variation to the SMARTLOGGER featuring “Croco Clamps” in an effort to make this “rapid-deployment” functionality even more accessible.

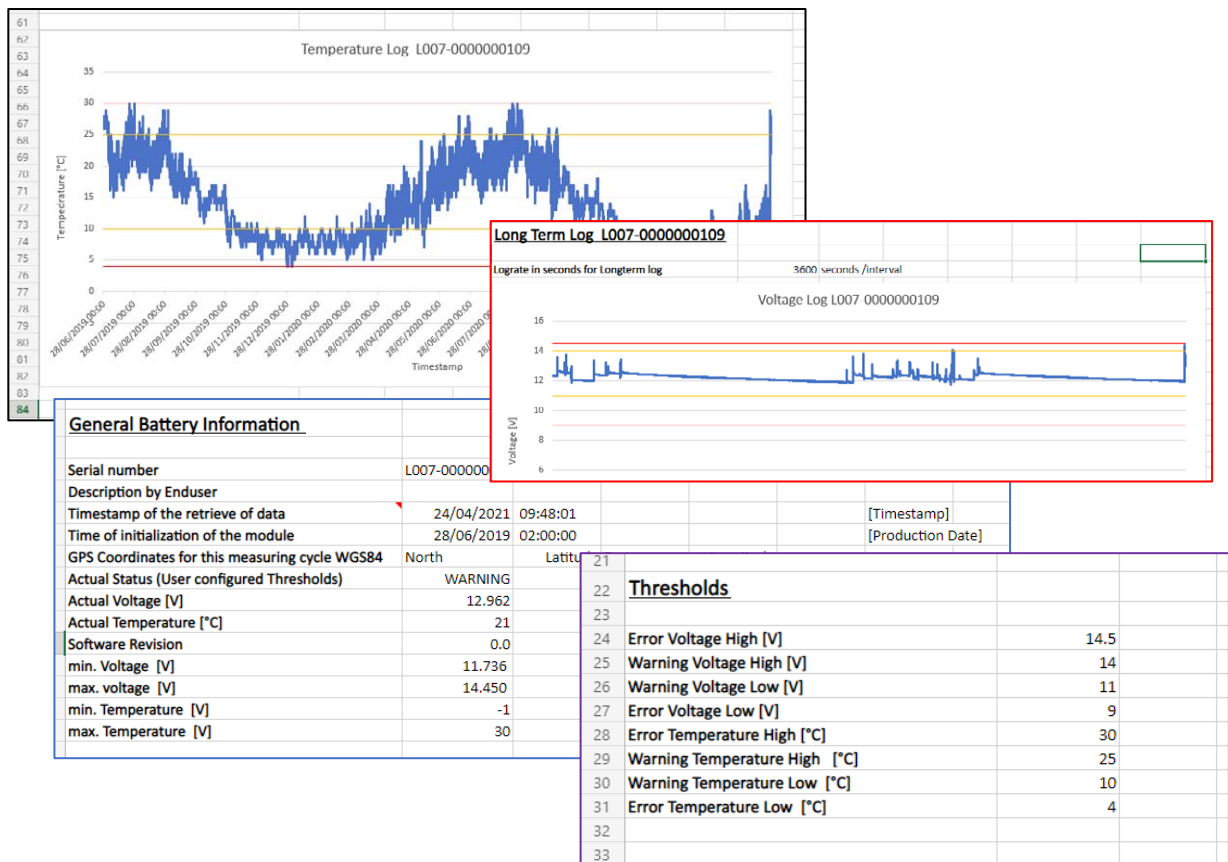
- Simply attach the SMARTLOGGER module to the battery via the easy-to-use clamps
- Initialize the connection through use of the APP and your Smartphone’s NFC connection
- Collect data / run a capacity test as required, and then delete the local SMARTLOGGER memory cache



Since it is possible to reset the local memory of the SMARTLOGGER, it can be reused again and again.

The analysis functions of the iBACS/SMARTBATTERY APP have also been improved:

With version 2.0, the measurement data can be converted into battery-specific diagrams and graphics directly after discharge using EXCEL



NEW: iBACS/SMARTBATTERY APP with freely definable thresholds!

There have been several requests from technicians on site whether it would not be possible to set threshold values for the most important data, as this would facilitate automatic data collection and evaluation. For example, a battery can be defined as "empty" at 11.5 volts, overriding our default of 9.9 volts. The temperature range can also be set individual.

This function will be retrofitted at the request of our customers and will be delivered with the next hardware version of the SMARTLOGGER from Q4 2022.

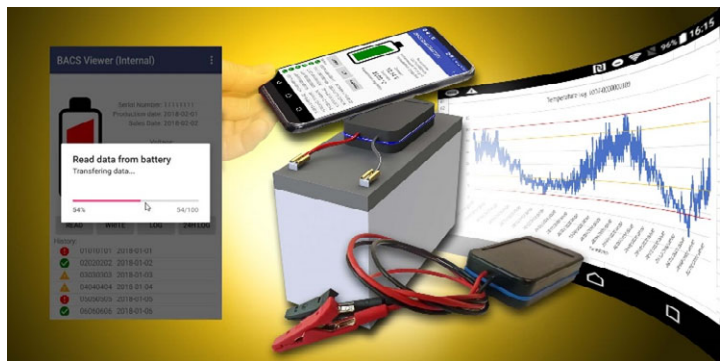


SMARTLOGGER Rev. 2.0

The ideal complement to the Battery Service Technician

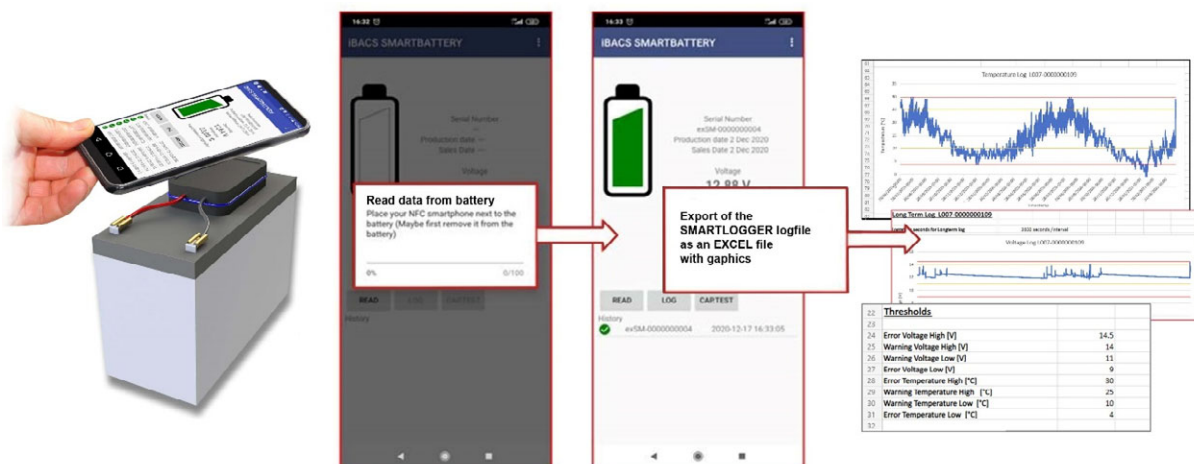
The SMARTLOGGER has made turned a lot of heads since its launch last year!

Our patent-pending, low-cost, easy-to-install and intuitively evaluable battery monitoring concept convinced many customers from the very first minute - not least because it is the first functional "black box" for the operation of batteries over their entire service life and at the same time a perfect tool for the battery service technician!



Announcement: SMARTLOGGER 2 and SMARTLOGGER APP 2.0

- Offline Battery Monitoring and "Black Box" functionality for batteries
- Configurable logging rate and thresholds
- Easy transfer: Use Mail, WhatsApp or other methods to share your battery data
- Battery Diagrams included in Android Display – and exported to EXCEL format



The "black box" (recording function for up to 10 years) is particularly interesting for manufacturers of stationary batteries, and is therefore also used as an integrated version in the SMARTBATTERY.

The SMARTLOGGER is also designed for temporary use on site and offers the advantage to collect and evaluate measurement data with little effort. The integrated version of the SMARTBATTERY additionally offers the possibility to retrofit a full-fledged BACS via the iBACS interface by slot insertion.



Users of the external SMARTLOGGER can collect and examine the battery data "offline" and contactless without interfering with the battery operation, e.g. to check the usage behaviour or to identify causes of battery problems. Warranty services or recourse claims would no longer be questionable, but can be clarified transparently with the customer.

2023 will see the arrival of the successor to SMARTLOGGER - SMARTLOGGER 2 with three new additional functions!

These new functions are especially aimed at battery service technicians and those who use the SMARTLOGGER for quick, temporary service on site.

No. 1: Freely definable threshold values for voltage and temperature

The firmware of the SMARTLOGGER in conjunction with the new APP has been expanded to include the option of defining individual threshold values for a battery.

Usage Example:

An enormous amount of effort is often put into testing or otherwise measuring the capacity of the batteries. Sometimes even a load generator has to be connected to simulate the "standard" load which in the process actually consumes the current instead of the actual load; we've also seen the use of a transfer switch which switches the load via a 2nd UPS for the duration of the test. Service technicians must also record the measured values of the individual batteries as quickly as possible on-site during the discharge test for later evaluation - **precisely this requirement is personnel-intensive, and it can be difficult to justify from a costs perspective.**

A UPS system can easily have 200 or more batteries - the reliable collection of all data within the necessarily short time window is often not only an error-prone and difficult to perform process, but also a costly one due to the high demand for trained personnel - and in the end there are often only vague answers to important core questions such as:

- How long can the batteries supply the terminals with this load?
- Were there any batteries that were exhausted / failed earlier during the discharge?

The effort traditionally required for a capacity test is enormous - and usually delivers questionable results due to the lack of a possibility to measure IN REAL TIME.

With the SMARTLOGGER 2 - with the option of CROCO clips for temporary mounting - this is simplified and measurement data acquisition massively improved:

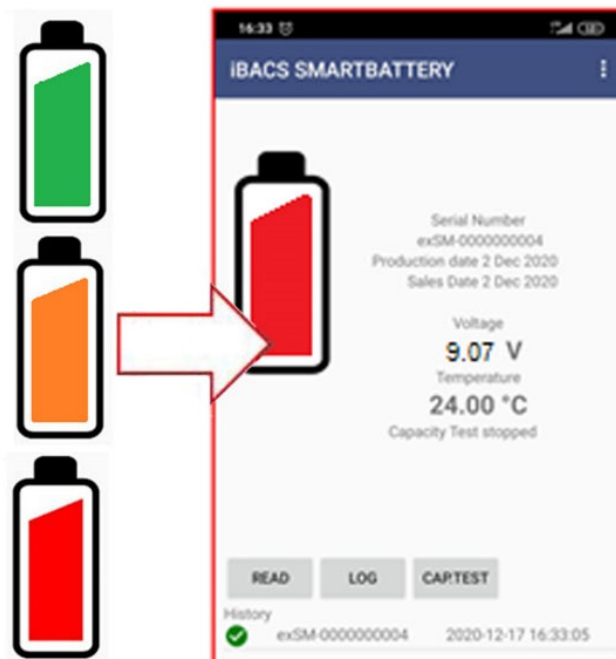
A capacity test can be carried out faster, easier and, above all, more reliably with the SMARTLOGGER 2, as it can simply be clamped to the poles of the batteries with its crocodile clips during control operation. Before a capacity test, the service technician determines for each battery which voltage or temperature should be considered "OK" for this discharge.



To do this, the limit values are set in the SMARTLOGGER APP 2.0 and the NFC (**Near Field Communication**) chip of the mobile phone is "placed" once over each battery to transfer the limit values. This process only takes 1-2 seconds and then the capacity test can begin.

If these threshold values are exceeded during the test, the APP will visually indicate the exceedance for the respective battery: YELLOW for a warning that the threshold has been exceeded slightly or only briefly. RED is displayed if the set threshold value has been exceeded massively or for a longer period of time.

The SMARTLOGGER APP shows each limit value exceeded in colour directly after the end of the test and offers the download of the log file for analysis in order to graphically display the duration of the exceedance. The SMARTLOGGER provides the measured values for voltage and temperatures for each battery at the same time, **so that the discharge measured values of all batteries can be recorded and compared at the same time, representative of every second.** No battery technician can compete by measuring these values in the usual, "manual" way...



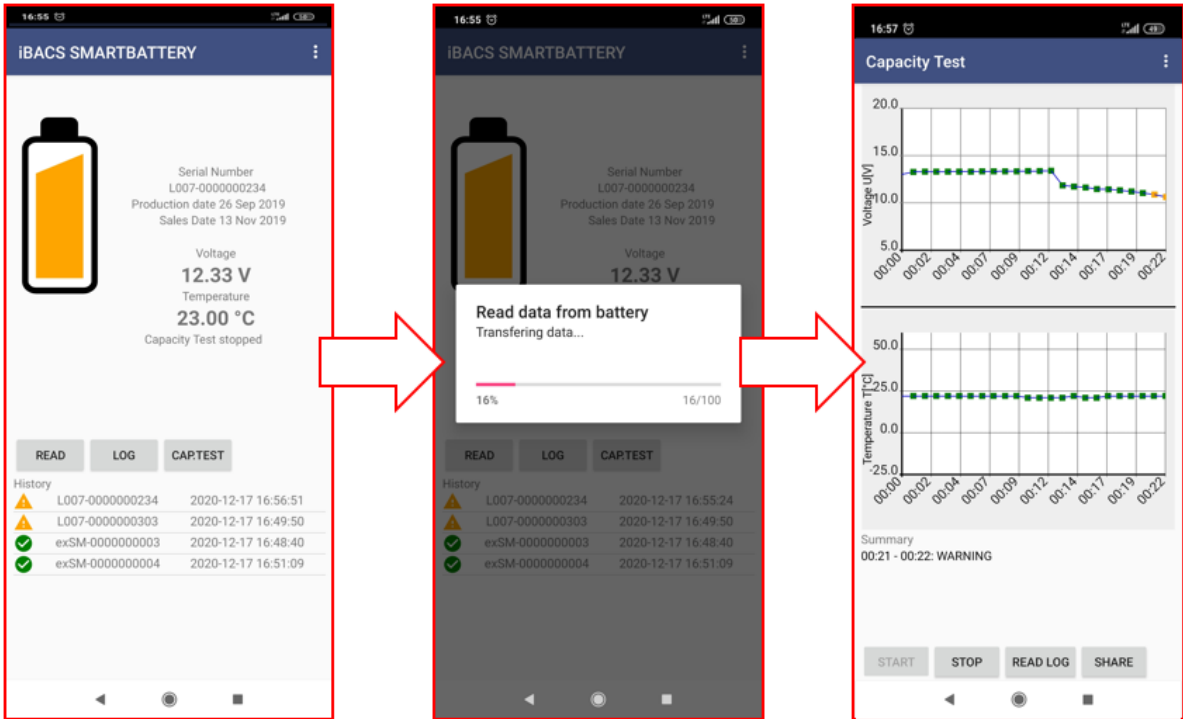
2. Improved Capacity Measurement

Capacity measurement was already introduced in the first version of SMARTLOGGER, but it has for some reason been often overlooked.

Because of the precise timestamp data associated with the given voltage measurement values, a capacity measurement can be very accurately undertaken if the load is known. This makes it possible to calculate the individual "performance" - i.e. the ampere hours delivered during a discharge - of a given battery. **By comparing the nominal ampere hours of the battery and the ampere hours actually delivered, conclusions can be drawn about the state of health (SOH) of the battery - and it can be checked whether the battery has lost capacity (SOC) over time due to normal ageing - compared to the other batteries.**

In addition, the capacity measurement can lead to a significantly more precise bridging time for the user (UPS) if the manufacturer uses the data of the individual SMARTBATTERY via iBACS for the calculation.

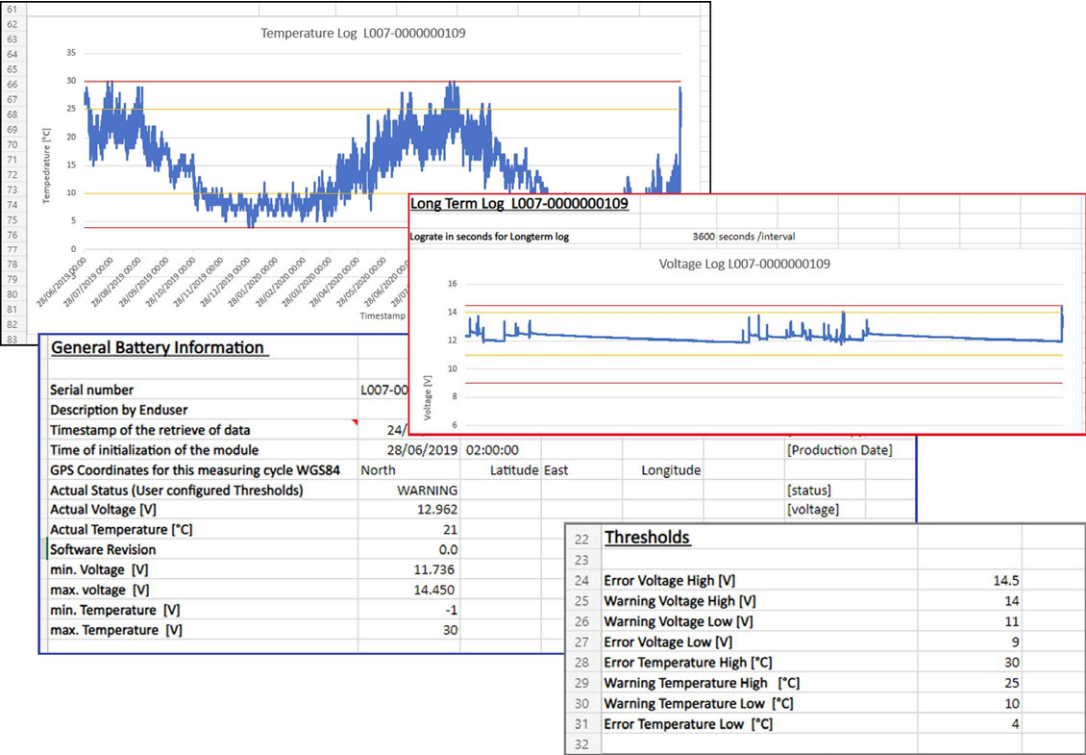
A new feature of the SMARTLOGGER 2.0 and the SMARTLOGGER APP 2.0 is the user defined recording speed.



3. Export of the SMARTLOGGER logfile as an EXCEL file with graphics

Many technicians report having been pleased with the intuitively understandable diagrams featured in the iBACS/SMARTBATTERY APP, and that they can easily export the measurement data via the "SHARE" button. Until now, only a data sheet with raw data was transmitted with "SHARE"; this raw data had to be compiled by the recipient.

New with the SMARTLOGGER APP 2.0 is that a software tool is delivered which automatically translates these data and prepares them directly with EXCEL as understandable and useful diagrams, which look like the following pictures:



Clearly visible on the graphs: The measured voltage values and temperatures of a SMARTLOGGER, as compared with the permissible warning thresholds (in orange) and alarm thresholds (in red).

The new iBACS/SMARTBATTERY APP 2.0 can be used for both first and second generation SMARTLOGGERS. You can find it in the GOOGLE PLAY STORE from May 2022!

As of the release of the iBACS/SMARTBATTERY APP 2.0, there is also a very special service for our OEM customers included:

You already own a SMARTLOGGER module of the first generation and would like to be able to use the new functions? **Then use our UPDATE service!**

Send us your 1st generation SMARTLOGGER for an upgrade; we will do a technical check, install the new firmware and reset the unit to factory default - "as new" - with the new features of SMARTLOGGER 2.0.