



trak | monitor 4.0

Digital solutions for your
Battery and fleet management



Power is our passion...

You are looking at the results of 90 years' work. 90 years of passion for innovative solutions for mobile power supplies – 90 years of German engineering skill and the aim of never being satisfied with what we have already achieved.

This is only possible thanks to the employees, who continuously support us along this path. Together with our business partners, we have continued to push the limits forwards and ensure that the impossibilities of yesterday have now become a jointly achieved reality.

Only through our partnership with you, we are able to create the perfect symbiosis of economically optimised solutions and state-of-the-art technological products.

With our structure of nearly 2000 employees at more than 20 locations around the world, we are always close to you and keep our finger on the pulse of pioneering innovations.

Flexibility in the design of your projects and extremely reliable products are our every day aims. With highly available local service we have ensured a thorough understanding of your special challenges for decades.

If you expect more than just a product but a competent partner who is always at your side, HOPPECKE is the right choice for you.



Modern intralogistics in change

Movement of goods in times of industry 4.0

The market for intralogistics is changing rapidly. The constantly increasing Competition presents you with the challenge of finding the best solution for acting reliable and economically at all times. The increase of the production output, improvement of the working speed as well as general cost and resource savings is indispensable for your company. It is correspondingly important to accelerate daily work processes through efficient energy management.

Modern intralogistics tie up resources: The constant threat of downtime through disrupted processes, accidents at work, changing employees or improper handling of the equipment. In addition you have to keep up with the digital change in your industry, so as not to miss the connection.

Applications

- ▶ Industrial trucks
- ▶ Special vehicles
- ▶ Cleaning machines
- ▶ Central charging stations
- ▶ Float operation

Not least because of climate change, companies today must implement environmentally friendly methods and strategies. The increasing use of renewable energies is also constantly driven by new regulations from the European Union. High energy costs and increased environmental awareness together with the importance of emission-free drive systems is also becoming increasingly important.

The traction battery as the main energy source of your vehicle fleet is therefore of crucial importance for economic efficiency and competitiveness of your intralogistic processes.

For a smooth process, especially in 24/7 shift operation, you need to always have sufficient batteries and chargers available. This initial investment is to be achieved by optimizing the life span of the battery and components.

More and more software and electronics are finding their way into modern equipment and machinery and thus ensures more effort for maintenance, repair and management of the batteries.

Shaping the digital change with HOPPECKE

trak | monitor 4.0 – the intelligent battery management system

Digitalisation doesn't stop in front of fleets and logistics. The interconnection of machines and processes and the associated data creates new solutions that will make your business even more efficient. Even now, your company can digitise and monetise existing processes, regardless of the size of your business. It increases your profitability and at the same time your own competitiveness. HOPPECKE offers you the right digital solution.

With trak | monitor 4.0, our new management system for charging stations, batteries and chargers, you have all performance and consumption data at a glance at all times: The System communicates with the chargers and with the HOPPECKE battery controllers. This provides the highest possible transparency so you can make real-time data decisions.

The simple handling with multilingual control elements is intuitively understandable and requires only small training costs. Alarm messages can optionally be sent automatically. The clearly arranged and intuitive evaluation of your data can be done via a personalized dashboard also retrieved from mobile devices .

Regardless of the size of the company, trak | monitor 4.0 is individually adapted to your special requirements and can be expanded at any time: from simple battery monitoring to peak load management.

It is possible to use trak | monitor 4.0 via standardized Interfaces with a higher-level management system and thus to create a cross-location overview of the entire fleet.

trak | monitor 4.0

- ▶ more transparency
- ▶ more efficiency
- ▶ more safety and comfort

HOPPECKE – digital solutions

Measured value from the battery

Measured value from the charger

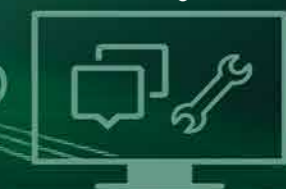
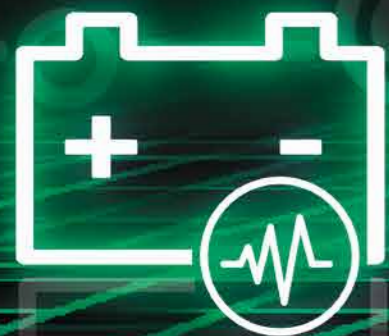
trak | monitor 4.0

Local evaluation of the recorded measurement and visualization

Global data analysis

Analysis and visualization

Consulting





Maximum transparency for optimized processes

With **trak | monitor 4.0** all important data is always in focus

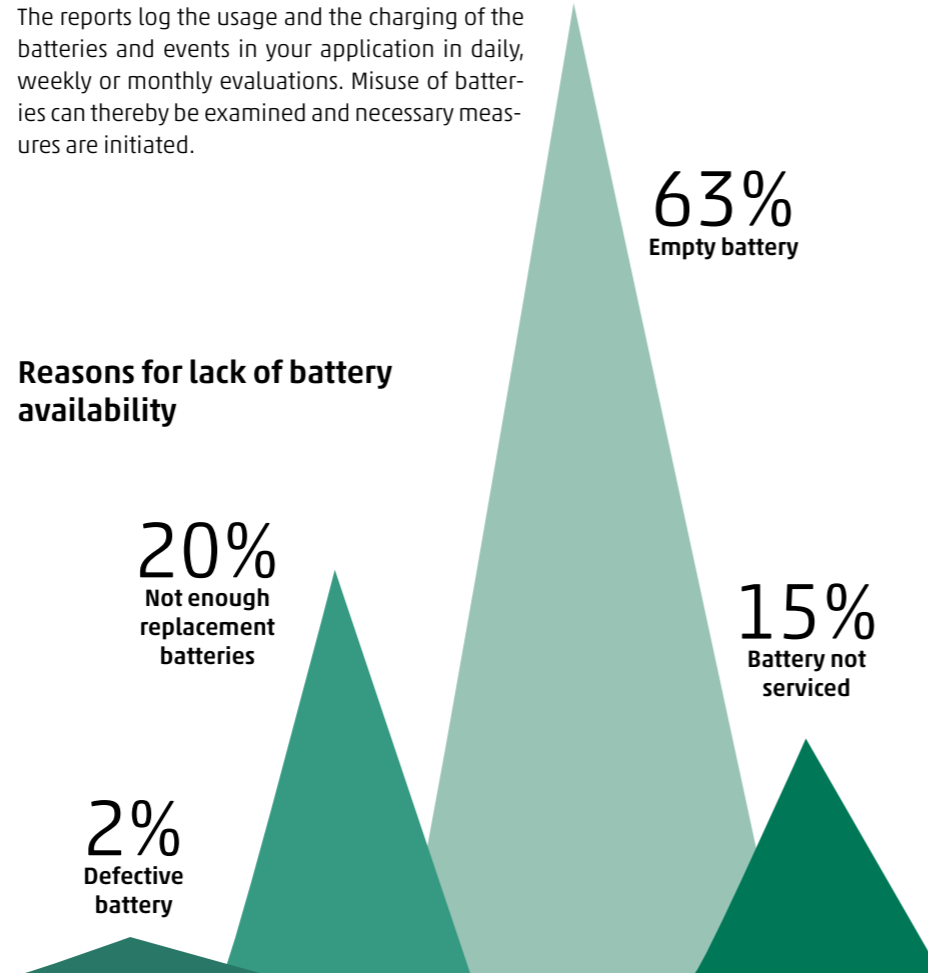
You can't accept standstill in your daily business. Because every minute that your vehicle resides in place costs your company cash money. That makes it important to keep informed over the condition and whereabouts of your batteries.

The reports log the usage and the charging of the batteries and events in your application in daily, weekly or monthly evaluations. Misuse of batteries can thereby be examined and necessary measures are initiated.

A lack of transparency makes it difficult to comply with performance requirements and can also impair the functionality. Are the batteries charged properly? Are there still sufficient batteries available? Is there any service needed at a particular charging station? How is the energy consumption? This information is significantly relevant for fleet managers today.

With **trak | monitor 4.0** the collected data of the chargers and batteries is visible and can be used in reports for easy evaluation.

Reasons for lack of battery availability



Data collection now also directly from the battery via the **trak | collect** via Bluetooth

Identification of problems or required maintenance

Battery condition

Detailed information about temperature, water level etc. of individual batteries.

Analysis of the driving profile

E.g. via a logbook. Full transparency of battery usage and capacity utilization up to charging intervals and downtimes.

Charging station and battery failure

Information on the condition of the individual components including instructions in case of need for action.

Workload of the fleets

Automatic determination of vehicle utilisation and downtimes for optimum efficiency.

Analysis of battery usage

Identification of needs for optimization

Is your system sufficiently dimensioned for the necessary applications? Are there too many or too few batteries in use?

Maintenance of the equipment

Timely recognition of maintenance requirements and optimized charging processes lead to a longer battery life.

Charging station management

Charging history

Reports on individual batteries up to the vehicle fleet are automatically created, stored and processed.

First in /Best out

Display on the charging station shows which battery is currently being charged has the optimum charge level and is ready for use.

Dashboards and reports

Creation of individual reports for efficiency, diagnosis, charging cycles, energy throughput and much more.

More transparency for more profitability.

Use Case | Transparency



The challenge

The company has various supply vehicles in use for aircraft ground services.

- ▶ A huge area has to be covered
- ▶ A wide variety of vehicles are in operation
- ▶ The charging stations are widely scattered
- ▶ Quick check of the batteries without additional roads
- ▶ Particularly important is the availability of the vehicles, since the aircraft have to be supplied in tight time windows

HOPPECKE developed a tailor-made solution for an airport logistics company

More and more electric vehicles are now moving around on international airports. Mobile passenger stairs, container and pallet loaders, as well as various tractors and ladder trolleys now roll battery-operated across the airfield.

The charging stations, which are far apart, are located across the entire area, a central charging station is not available. This makes it difficult to check the individual vehicles and batteries. Nevertheless, regular maintenance and charging is essential for a smooth operation.

HOPPECKE installed the new **trak | monitor 4.0** at a central point, which all vehicles pass at least once a day. As soon as a vehicle with its **trak | collect** battery controller approaches the Bluetooth reception range of the **trak | monitor 4.0** all battery data are read out automatically and sent directly into the cloud or the customer network.

Via a website and a personalized dashboard or optionally via smartphone the customer can receive information about temperature, water level, last charge, possible cell defects, etc. They can then be viewed clearly prepared. An easy-to-understand colour coding (green: everything OK, red: errors) makes any need for action immediately clear.



Innovation for more economic efficiency

Modern battery management with **trak | monitor 4.0**

We make sure that your energy costs do not exceed the limits. With the help of trak | monitor 4.0 you can achieve a consistently high capacity utilisation and thus increase your productivity. Reduced maintenance costs and longer battery life also have a positive effect on your finances.

trak | monitor 4.0 increases the added value of your chargers, battery controllers and energy storage devices. The system thrives on the interaction with other components - even existing ones. Its updateability makes it fit for the future. trak | monitor 4.0 is not static, it grows and adapts flexibly to new requirements at any time.

Less investment and better planning

Less space required

No need for separate charging areas with separate chargers for different battery / vehicle types.

Fewer chargers - chaos charging possible

Different voltages and capacities can be charged with only one charger.

Can be integrated into existing building management systems

Easy integration into common building control systems through standardized interfaces and protocols.

Increased productivity

Thanks to simple and dynamic continuous optimization of the Customer application.

Budget under control

Starting and stopping chargers on demand (peak shaving)

In peak management, so-called peak shaving, charge processes are postponed into low demand periods. This lowers energy costs through cheaper electricity.

Reduced maintenance costs

Excessive or insufficient use of the batteries is avoided. Time and costs for battery service and maintenance are reduced.

Extended battery life

Due to the systematic use and optimal exploitation of the entire battery pools in the charging station.

Minimization of downtimes

Improved planning of the charge times leads to maximum availability of the vehicle pool.

Fit for the future

Scalable

Easy expansion and integration of additional chargers and batteries into your system.

Adaptable

React quickly to changing requirements: Integration of additional components or third-party products as well as new technologies such as lithium is possible.

Expandable

Possibility of connection to the HOPPECKE Cloud and extension with trak | remote is possible without any problems.

Combinable

Easy connection to existing energy management systems, uninterruptible power supply, solar systems and storage systems.

Future-proof

Ideally equipped for future developments in the energy turnaround and Industry 4.0. updateability allows a fast and flexible reaction to new market requirements.

50%

Up to 50% energy savings through peak shaving management



trak | monitor 4.0 is a safe and sustainable investment in the future.

Use Case | Economics



The challenge

The logistics company has a large fleet with approx. 50 industrial trucks in use and fights with the high energy costs.

- ▶ Up to 30 % of the total energy demand at location are needed for the forklift fleet
- ▶ After the end of the shift, high load peaks often occur: Additional costs due to use of the peak load (kW)
- ▶ Too many forklift trucks charging at the same time
- ▶ Energy costs are exploding
- ▶ Downtimes should be minimized

HOPPECKE developed a tailor-made solution for more effective fleet management for a logistics customer

The customer request is to reduce the current consumption in order to reduce costs sustainably. The load peaks are to be smoothed out, but the full availability of all required vehicles must still be guaranteed at the beginning of the shift.

To achieve this, the charging currents should be adjusted according to the filling level of the battery. Because empty batteries need more electricity to be charged in time, but not fully discharged batteries require less current.

Intelligent sequential charging of the batteries, e.g. at night, ensured for up to 50 % less energy consumption. This was reflected over the year with savings of up to 30,000 € through a more favourable electricity tariff.

This was achieved by integrating trak | monitor 4.0 in combination with stationary energy storage systems of our subsidiary INTILION. These commercially used large-scale storage facilities are used to store energy in low load periods and then allocate it in periods with increased demand. The result was a smooth and thus a more favourable load profile on the side of the energy supplier.

INTILION For more information about our stationary energy storage go to www.intilion.com/en



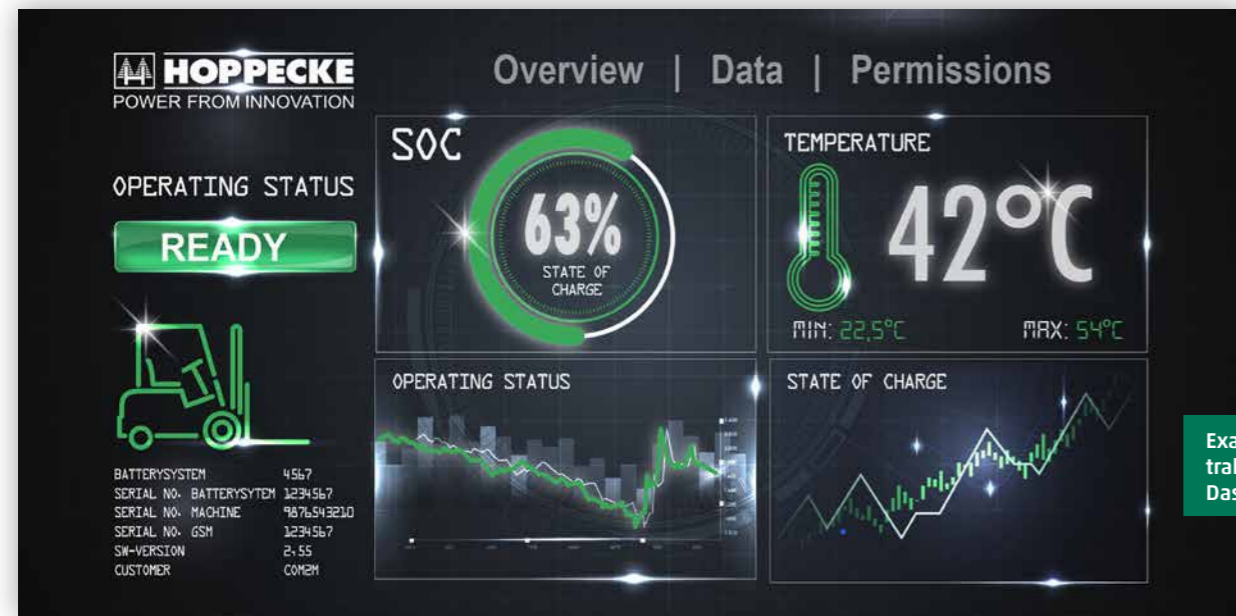
Battery management for more comfort and safety

With **trak | monitor 4.0** now and in the future

With trak | monitor 4.0, battery usage can be significantly simplified. The clearly laid out dashboards and portals support you for example on the battery change - safely and quickly.

Do you have sufficient batteries and chargers, to ensure the operation of your forklift fleet? Also this question can be answered within seconds.

With the optional connection to the HOPPECKE Cloud trak | monitor 4.0 will be the digital heart of all HOPPECKE Motive Power products and operating or billing models such as the ecomizer or optimizer. Only HOPPECKE offers you the combination of batteries, chargers, energy storage devices and a software that can handle all those systems reliably through controlling them in a future-proof manner. With trak | monitor 4.0 you not only do battery management, but also site management.



Example of a trak | monitor 4.0 Dashboard

More comfort

Easier fleet management

Manage up to 200 chargers and 10 battery pools.

Intuitive operation

Simple and multilingual instructions for industrial truck operators.

"fire and forget"

Each battery can be connected to every HOPPECKE charger.

Convenient retrieval of the reports

Optionally on PC or Smartphone.

More safety

Automated messages

Timely detection of faults with notification to the responsible person.

Detailed information about incorrect or false withdrawals

The screen displays the battery to be removed, tracking of individual shifts and vehicle indicate any training needs of the employees.

"Best-Charged" function

Always remove the optimum battery from the charging station.

Extended functions through connection to the HOPPECKE cloud

Predictive maintenance

The HOPPECKE service technician is available on site before a fault becomes critical and failures threaten.

Data security

Leverage market leaders in cloud architecture. Secure in the sense of cyber security. Protection against data loss by using redundant and distributed servers.

Consulting

Regular professional advice based on the cumulative Data. Identification of optimization and savings potentials.

Cloud access

Location-independent access to all data via dashboards. Either on a smartphone or PC. Automated messages for alarms and threshold violations.

Optimizer

Design, commissioning, support and optimization of the installation by HOPPECKE - 24/7.

Ecomizer

Individual fleet solutions, including provision of assets. HOPPECKE always guarantees optimum battery and energy availability. You only pay for the energy actually consumed

Use Case | Comfort & safety



The challenge

The company would like to coordinate the batteries of its various locations in a uniform manner and achieve a significant reduction of errors in battery handling.

- ▶ Check the entire battery fleet simultaneously
- ▶ Fast reaction time in case of an emergency
- ▶ The operational readiness must be guaranteed
- ▶ Determine training requirements of the employees
- ▶ Clear indication of mishandling

HOPPECKE developed a tailor-made solution for the vehicle pool of a drugstore chain store.

The logistics department of a leading drugstore chain wanted a location-independent overview of the entire battery fleet. In addition to fast reaction times in the event of deviations and automatic reporting to various terminals, the customer was interested in preventive error avoidance and the general assurance of operational readiness.

All of the customer's forklifts have a remaining driving time display that provides information about the remaining energy. Initial evaluations showed an incorrectly set display, which led to a deep discharge of the batteries. Subsequent adjustment and the installation of an acoustic warning signal specially developed for the customer finally saved the fleet from premature battery failure.

The optional cloud connection of trak | monitor 4.0 allows for locally independent access. This was followed by an automatic readout of all battery and charger data, including reports on the status of chargers, batteries and truck fleets.

In case of errors or events requiring action, the customer receives automatically generated messages on the terminal of his choice. These reports also include the identification of training needs for truck operators to extend battery life and trends in the usage of the batteries for any additional requirements.

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