

Pro-active protection of your assets: Battery Fleet Management

Dr. Michael Gellert | 07/09/2022

What are battery fleets?

Where do we come across battery fleets?

- Most electrical warehouse equipment is using an exchangeable lead battery
- As multiple vehicles of the same type use the same battery they can share them
- Consequently, there are battery pools where any driver can choose a battery from



What are battery fleets?

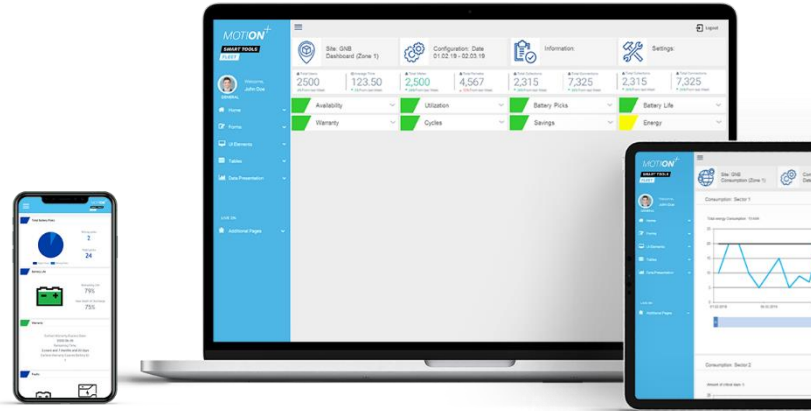
What role do lead-batteries play in here?

- Nowadays it's not about selling just a battery in such an application and forget about it
- Customer requirements are increasing, the need for optimization for such an operation is growing
- Consequently, battery manufacturers and retailers are offering batteries, networked chargers, smart devices and other accessories as a package to meet those needs



Why Battery Fleet Management?

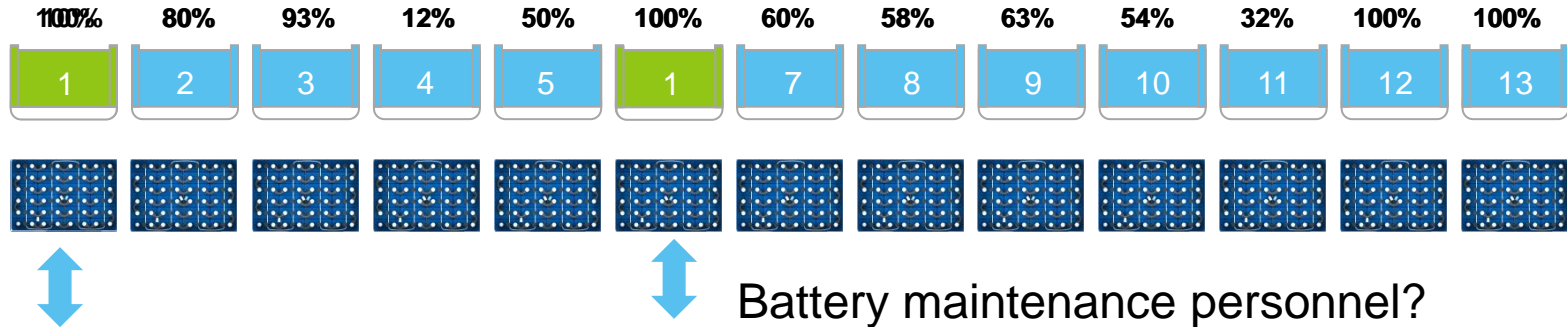
Fleet management is used to avoid downtime of vehicles, and thus production and delivery delays by ensuring maximum availability of a battery fleet



Key problems to solve

What battery to take when changing?

Who to ask to achieve uniform workload distribution across the entire battery stock?



Battery maintenance personnel?
Let the truck operators decide?

Key problems to solve

What is needed for a solution

A fleet management may provide that guidance

- It needs to monitor real-time data, to analyze it and to initiate appropriate guidance or actions
- The status of all batteries needs to be available in one point to compare and find the best available
- The management system needs to tell or visualize the operator which battery to use



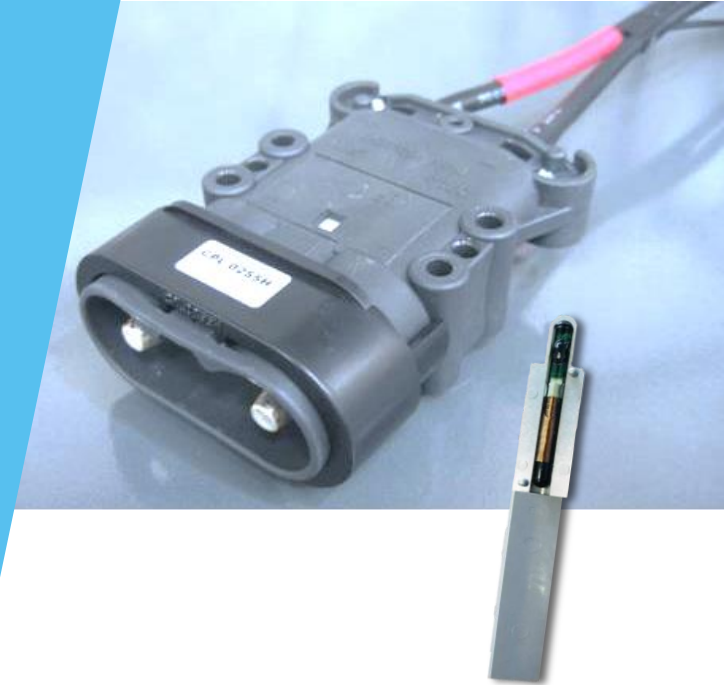
How data is collected

Data collection requires sensors and measuring devices, it's a manufacturer's choice to decide what is important to achieve specific goals and how. This may vary from a full grown cost intensive battery monitoring system with various sensors and wireless communication to a identification tag on the battery and networked chargers

How data is collected

Staying cost effective

- Large warehouses and potentially multiple locations require many industrial trucks and, accordingly, many batteries
- The management system must therefore be able to manage a large battery pool of even thousands of batteries – which will require creative solutions to keep the managing cost per battery low



How data is collected

Staying cost effective

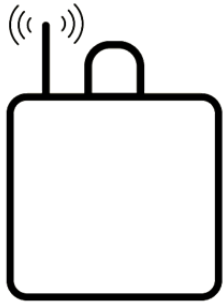
- Battery data may be collected via chargers or monitoring systems
- To identify the battery the attached battery everything from barcode, RFID tag or even monitoring system may be used
- Data is then sent through a wired or wireless network to a central data collection and processing unit or even directly sent to a cloud system



Battery fleet management

Solve the key problem of battery pools

- Wired chargers and a central management system
- Monitoring and enforcement of battery rotation during operation via display, buzzer and signal lamp

A computer monitor displaying a fleet management dashboard. The dashboard has a header with the logo 'MOTION+ SMART TOOLS' and a table with four columns: TRUCK, PICK, QTY, and WRONG PICK. The table contains four rows of data. The second row has a yellow warning icon in the TRUCK column and a yellow triangle warning icon in the WRONG PICK column.

TRUCK	PICK	QTY	WRONG PICK
🚚 CNT-BAL	CBAL-07	5	-
🚚 ORD-PCK	ORD-01	1	ORD-02 ⚠️
PALLET	PALL-01	2	-
🚚 REACH	RCH-01	9	-



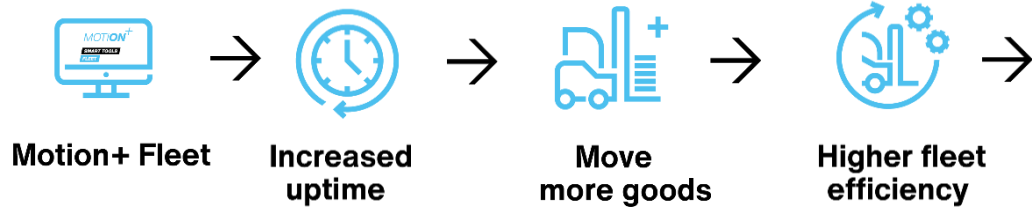
Creating data transparency

The fleet management system has collected a lot of battery and charger data for comparison and guidance. That data can be further used to benefit the operation.

Battery fleet management

Major functions in a nutshell

- Battery and charging station management to increase efficiency
- Managing battery and charger status and health
- Managing charging for peak shaving and cost saving



Reduced TCO
Commercial growth
through new investment

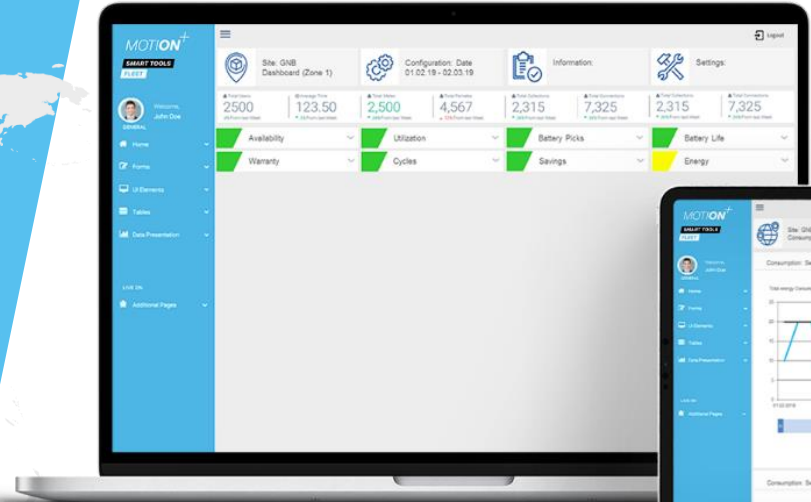
Multi-Site Battery fleet management

Cloud Solutions

Fleet management systems may be connected to a cloud via mobile data uplinks

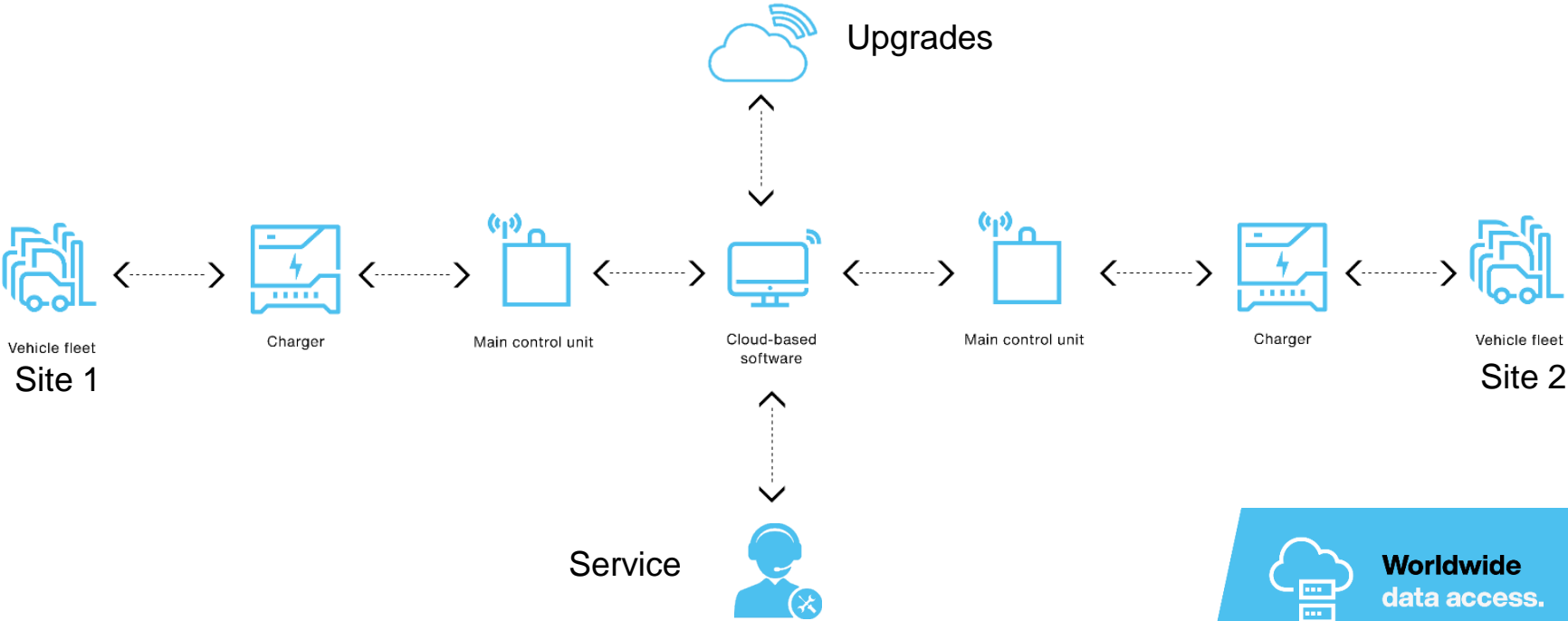
This will enable worldwide access to the fleet via tablet, PC or mobile phone

This enables multi-site management, proactive service and remote guidance



Multi-Site Battery fleet management

Cost effective connectivity



 **Worldwide data access.**

Using and analysing data

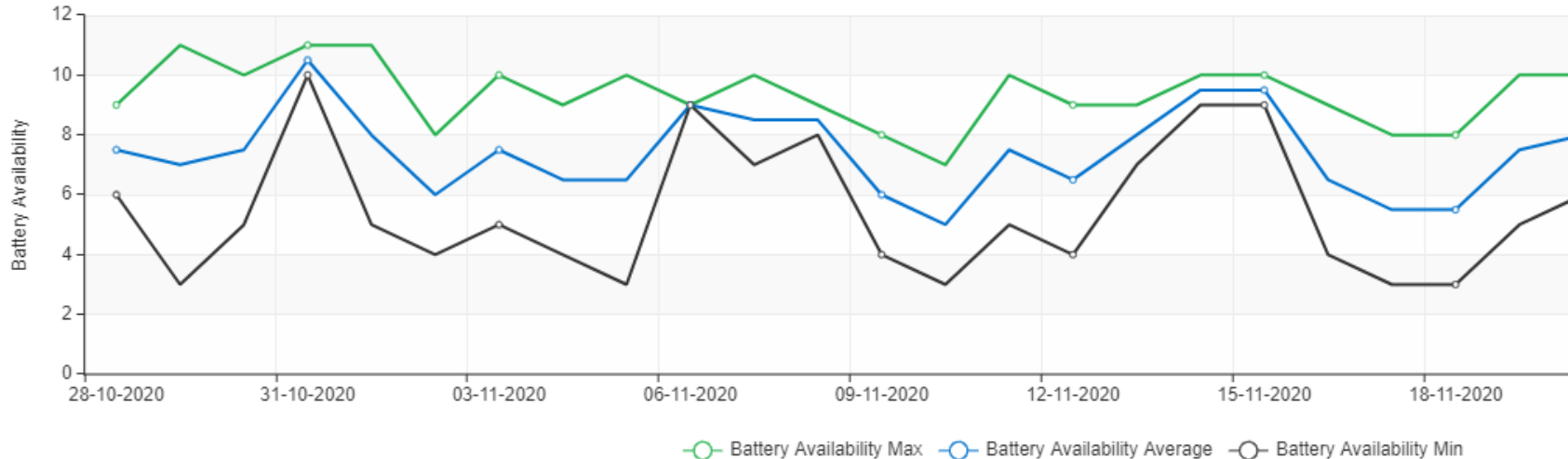
Load level analysis

Do you have enough batteries to fulfil the needs or are there even to many batteries?

- Analysis of the **availability** of charged and ready batteries
- Adjustment of the fleet to increase **efficiency**
- Monitoring of **load fluctuations**



Optimize
processes



Status Monitoring

Ensuring smooth operation



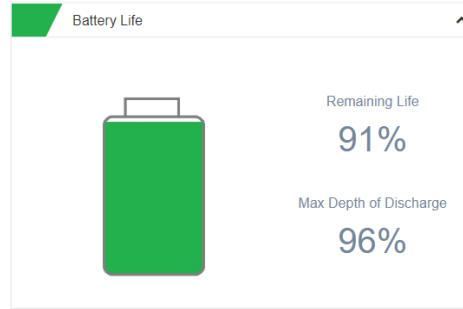
Monitor
your batteries
and chargers

Warranties



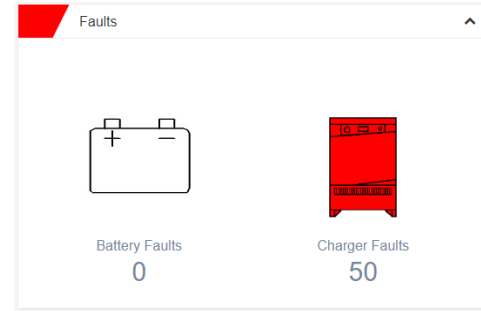
Extend the warranty in good time and receive a replacement if the worst comes to the worst

Lifetime



Provide for replacement in good time and proactively ensure operation

Errors and Problems



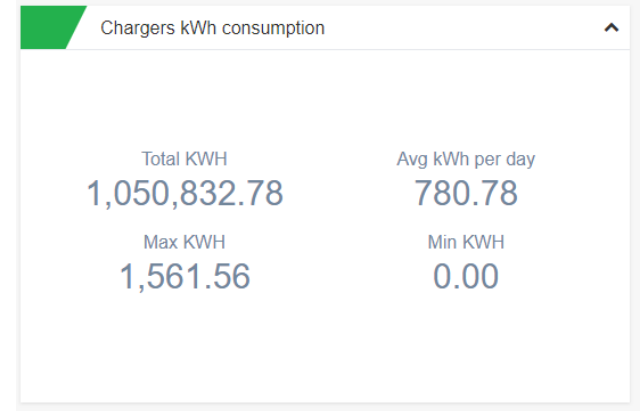
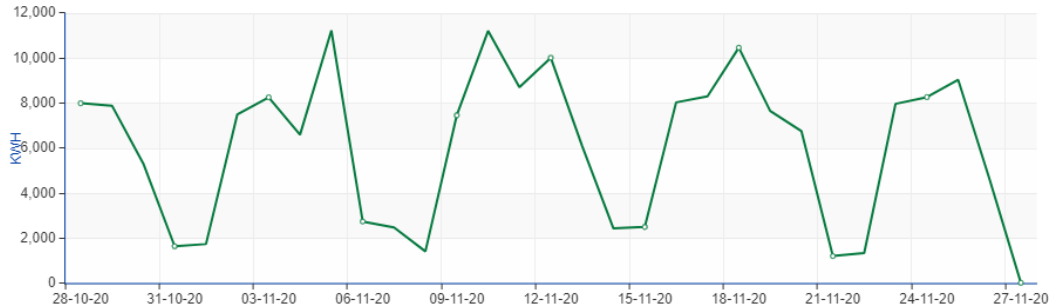
Identify and eliminate problems quickly

Energy Management

How much energy do I actually consume and when?



- Viewing load peaks and total energy consumption of charging stations.
- Simple and precise control as a basis for cost optimisation with the energy provider (night tariffs, etc.)
- Control of the chargers via the timer or peak power function



Battery fleet management

Fleet Management Cloud Capabilities



Proactive service

Repair and replace batteries before they fail - the system automatically calculates remaining run times based on temperatures, amp hour usage and load



Remote guidance & assist

Never wait for a service technician again - Access data remotely upon request and ensure or optimise operation



Automatic updates

The software can be automatically updated via the internet and thus also upgraded with the latest features

Battery fleet management

Fleet Management Cloud Capabilities

- **Individual alarm messages**
 - Automatic sending of error messages or optimisation potential by e-mail to site managers
- **Maximization of availability**
 - Automated preventive maintenance on demand to maintain productivity

Dear Max Mustermann

There have been errors or warnings related to the following charger:

Site Name: Musterman GmbH

Site Location: Frankfurt

Zone Name: Mustermann 02

Sector Name: Container

Charger Name: Ladeg.4

Charger Type: 8dV200A

Error Description: ChargerID:4with new Charger Error: CHARGER OVERHEATING(F04)

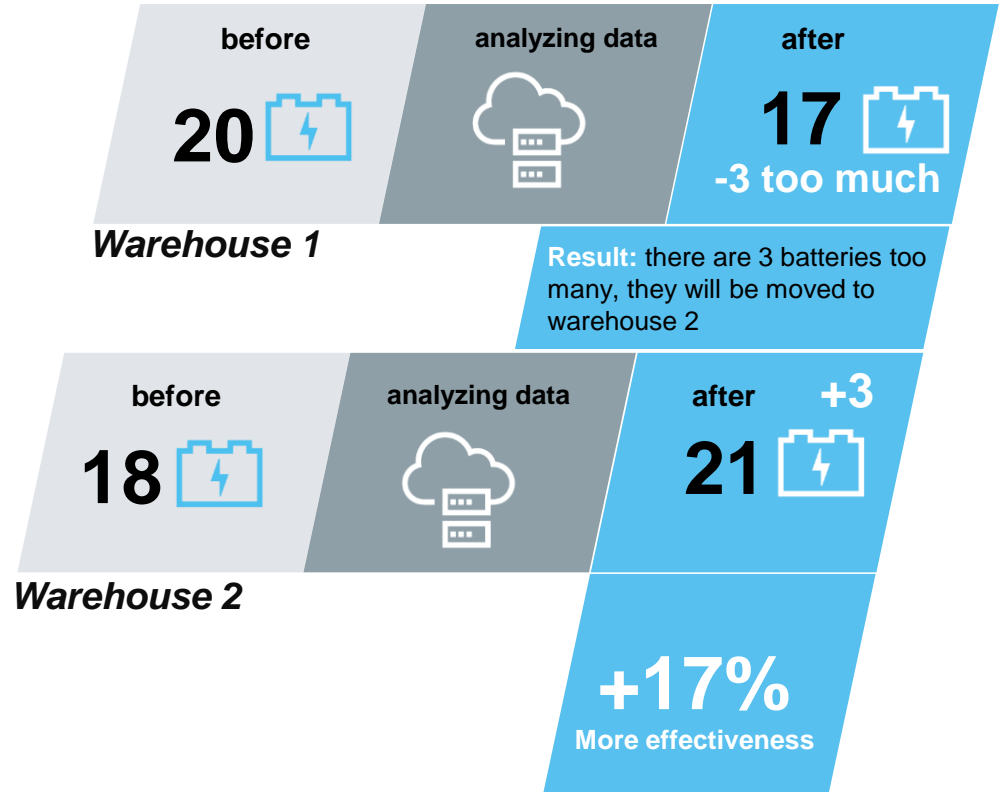
Error Date: 2021-12-15T15:12:19Z

Regards,

Battery fleet management

Fleet Management Cloud Capabilities

- **Multi-site management**
 - Manage all locations centrally
 - Easily identify synergies and optimise locations



Summary

Battery fleet management

Fleet management Systems

- manage battery fleets effectively and thus helps to increase efficiency and lifetime
- provide data transparency and consequent analysis for better planning
- are able to manage the energy consumption of a charging station and reduce energy costs
- pro-actively prevent or detect issues of the operation to avoid downtimes

Fleet management systems lower the TCO of battery fleets and attached operations



Reduced TCO
Commercial growth
through new investment

Thank you

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