Telematics

EP's next generation solution for fleet management 2.0

EP Equipment Online Training

AGENDA

01

EP Equipment

EP EQUIPMENT COMPANY OVERVIEW

+20% 100.000 Units in 2019

Market leader for electric pallet trucks

Li-Ion market leader

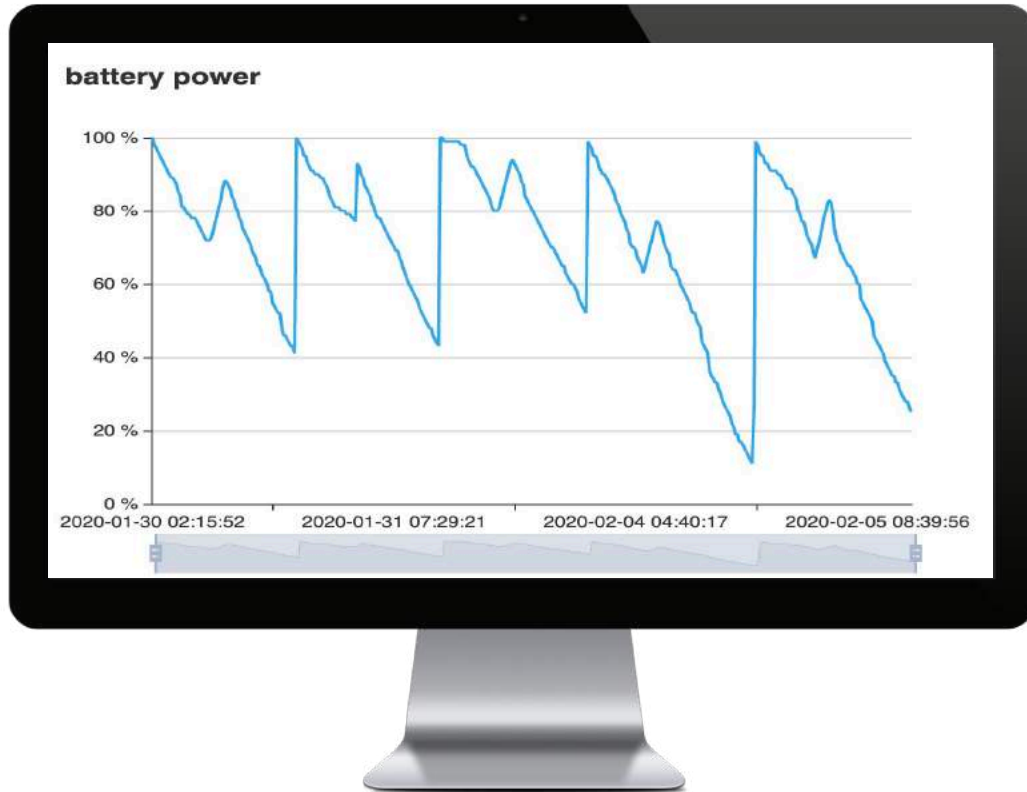International Key Account focus

Customer optimised trucks

Compact trucks

We believe in products that simply work

- Own design
- Focus on li-ion
- Simple after sales
- Change the market

- The EP Telematics proves again this overall concept and thinking

Lithium ion truck sales

battery power

Telematics real time monitoring:

- Telematics equipment fitted under the battery cover
- Fast Charging
- Opportunity charging
- Ideally keep the battery between 35% and 65% (or 25% and 85%)

02
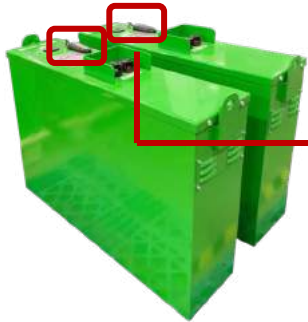
EP Telematics

Let's grow together

What is it?

Who uses it ?

What do I do with it?

What does it do for me?

How does the system technically work?

- **Li-ion batteries & BMS**

- Forklifts with Zapi **controller** (for now)

- CAN + power supply

- GPS

- **4G**

- Website

- PC, Tablet, Mobile

- APP

03

User Benefits

EP

Let's grow together

What value does telematics bring me?

- Fleet management

- Li-ion battery and truck analytics

- Proactive after-sales service

Lift your business to a new level with more profit

For end user AND for the dealer

Features

Asset Tracking   Uptime Boosting   Battery Monitoring   Predictive Maintenance   Remote Start Stop
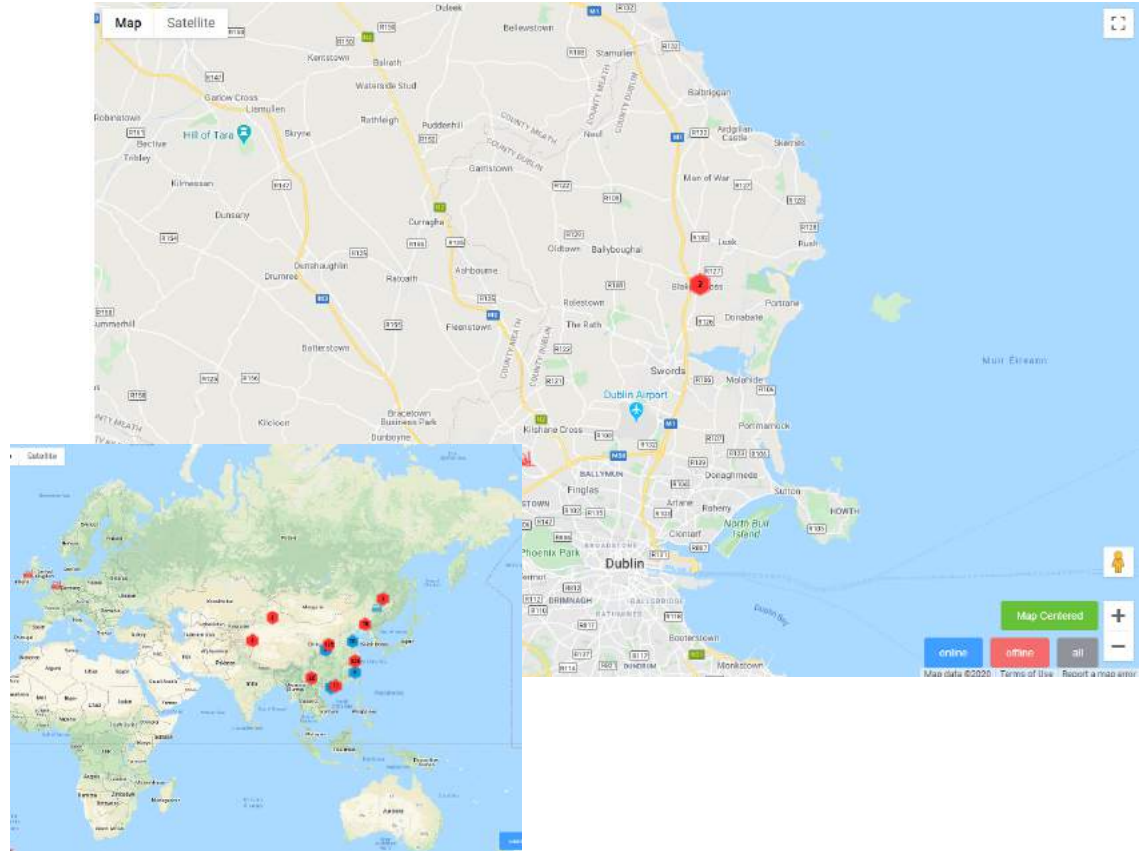
Asset tracking

Asset tracking

- Online
- Base station

Customers can get an own login to see their own trucks
Same online platform

Asset tracking

Asset tracking

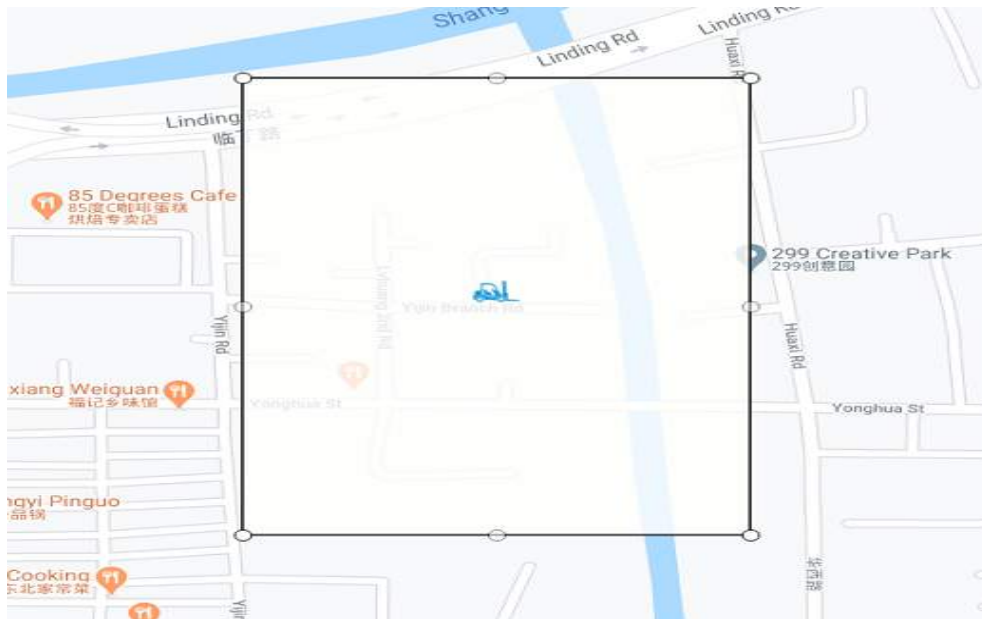- Real time GPS tracking
- Track play back

Asset tracking

Asset tracking

- Operation zoning

Remote start - stop

- Zoning

- Days rental

- Hours rental

- Reminder,

  automatic expiration or

  manual start-stop

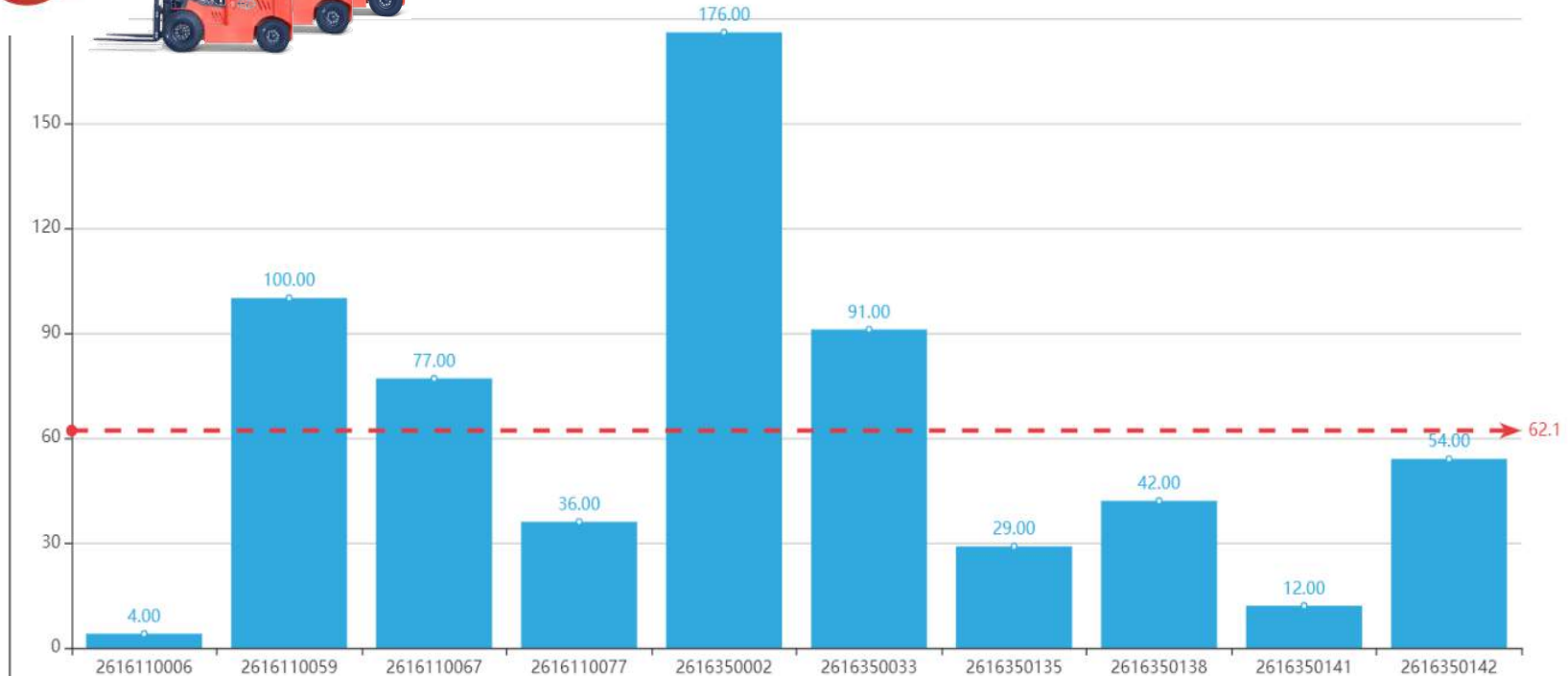# Fleet management

Fleet management

Uptime boosting

- Fleet analysis & truck analysis

- Accumulated operation data over desired time

- Statistical analysis of working hours

- Statistical an analysis of vehicle operation time

- Allocate the fleet to the right location

- Data can be locally exported to excel for further analysis

2020-01-01 ~~ 2020-01-30 Statistics of working hours of selected vehicles
Selected fleet, selected period

2020-01-01 ~~ 2020-01-30 Vehicle 2616350002 statistics of working hours
selected truck, selected period

vehicle 2619180010 online cycle data show
one truck day

vehicle:65501042118779 online cycle data show

dark green means that the vehicle is online for more than half an hour , light green means that the vehicle is online for less than half an hour.

Uptime boosting

- Individual truck use

- Real time, online available

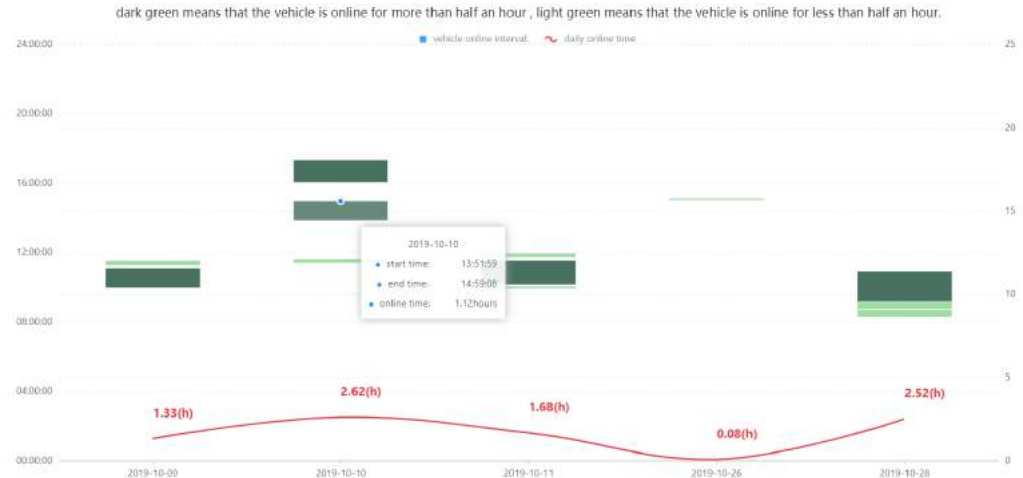- Statistical analysis of working hours over time

Many trucks are not used as intensively as we think

Card Reader

- Optional

- Driver identification

- Driver + truck analysis

Ordinary card = 1 card, 1 truck, 1 truck can connect to unlimited amount of cards, cards cannot be re-programmed
Master card = 1 card, all trucks
Management card = Activate or deactivate the system, activate an ordinary card on the truck
Cards cannot be re-programmed

Card number is added online, then driver data can be filled out by the fleet manager online.
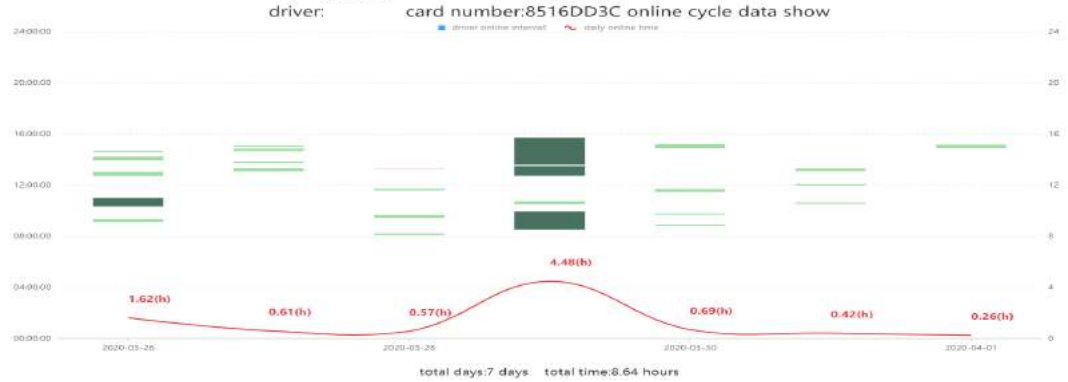Note: For countries with data restrictions, the card number and driver data should be locally stored at the employer so in the cloud we then have no driver ID information, only general non personalised data.

Driver Management

- Usage data

driver: card number:8516DD3C online cycle data show

driver online interval   daily online time

4.48(h)

1.62(h)   0.61(h)   0.57(h)   0.69(h)   0.42(h)   0.26(h)

2020-03-26   2020-03-28   2020-03-30   2020-04-01

total days:7 days   total time:8.64 hours

company	name	sex	employee number	card number	dis	driver status	phone number
	OPERATOR1	male	0	1C12DD3C	67698041006548	offline	
		male	0	6814DD3C	65501042170366	offline	
		male	987654321	8516DD3C	1917154001	offline	66
		male	0	B8F6DC3C	2617322010	offline	
		male	0	D1CBDD3C	2710250147	offline	
	OPERATOR2	male	0	D774DD3C	67698041006548	offline	

Perormance data

- Total visibility into technical truck data
- Current and omnidirectional data
- Speed + Lifting

speed(km/h)

average speed
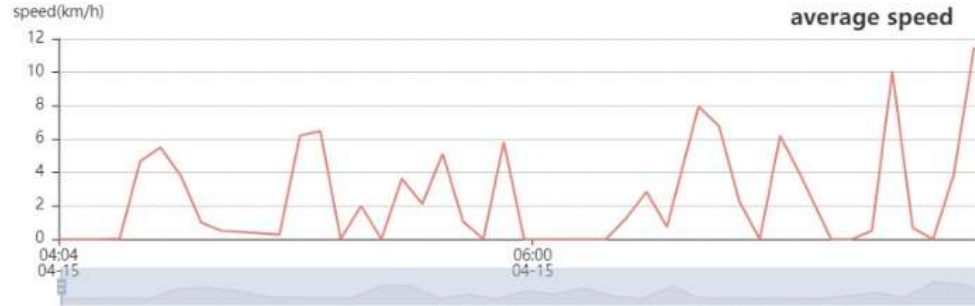
Uptime boosting

- Voltage

- SOC charge and discharging current

Here we do something unique

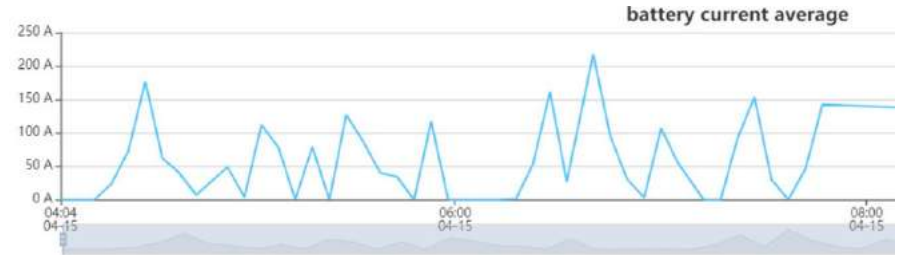**With li-ion we change the way we look at batteries**
Change the way we look at battery size
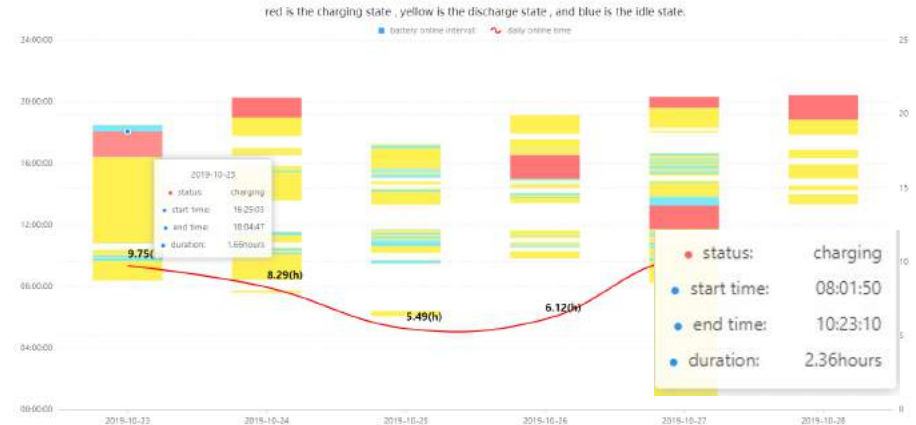Change the way to look at when to charge, where to charge

Change in the optimum truck and battery configuration

Change in the design the optimum fleet
Even different design of the warehouse

battery current average

battery:65860042004029 working status data show

red is the charging state , yellow is the discharge state , and blue is the idle state.

Uptime boosting

- Find out the truck behavior during the day
- When can be charged
- Optimise battery capacity, smaller size can do
- Optimise use of li-ion battery
- Longest battery life time

2020-02-06 10:41:45
percentage of electricity:79%

Maintenance
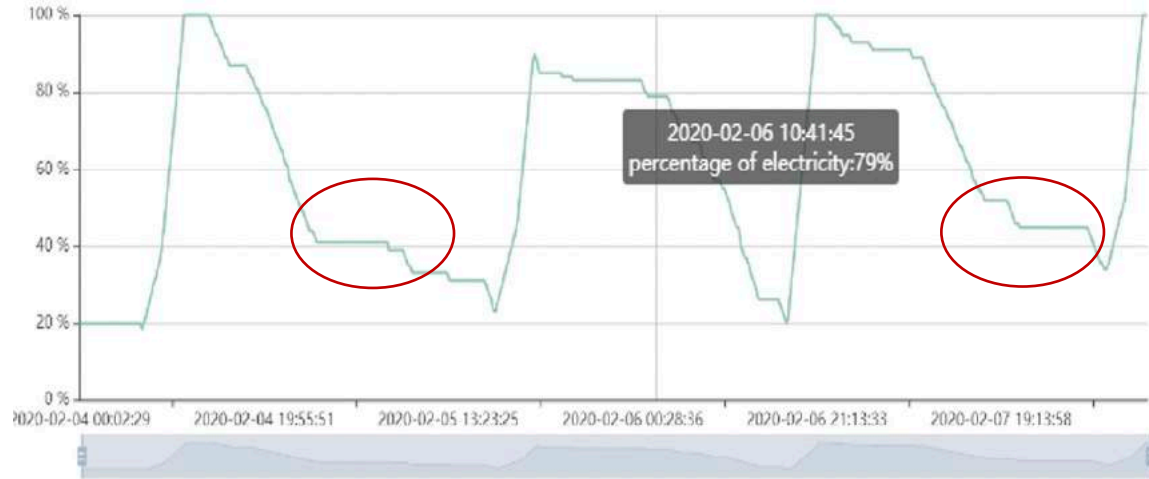
Remote battery diagnose

- State of charge and discharge
- Voltage
- Temperature
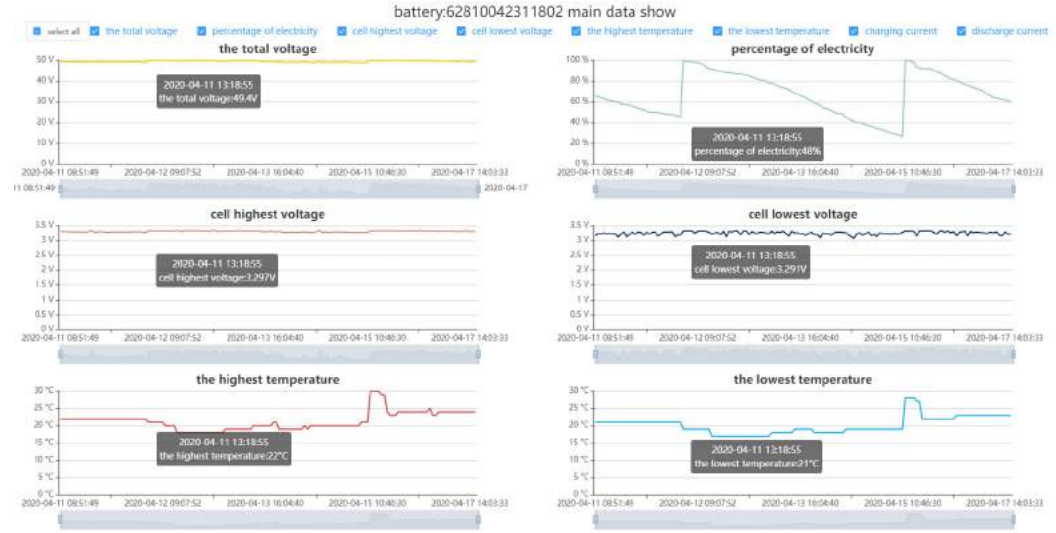
Remote truck diagnose

- Tuck data: We have all the truck data from the controller

- Temperature data of motors, controller and battery
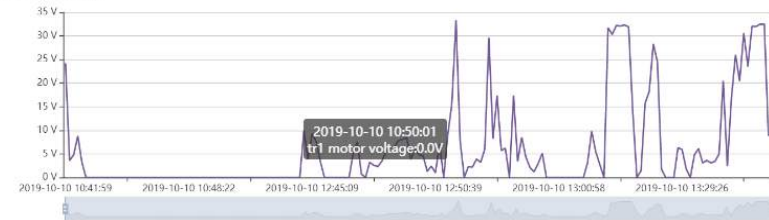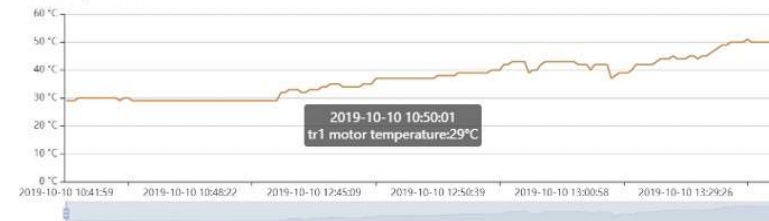
Maintenance

Remote diagnose

- Error code

- Explanation

- Solution
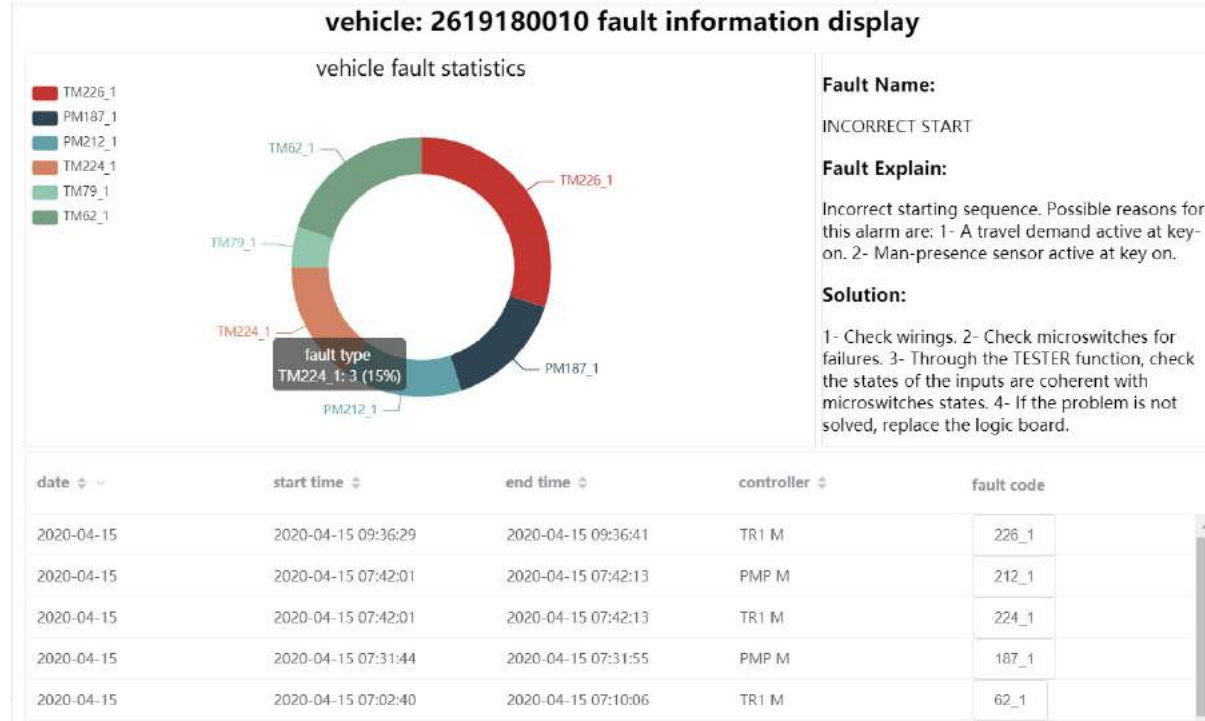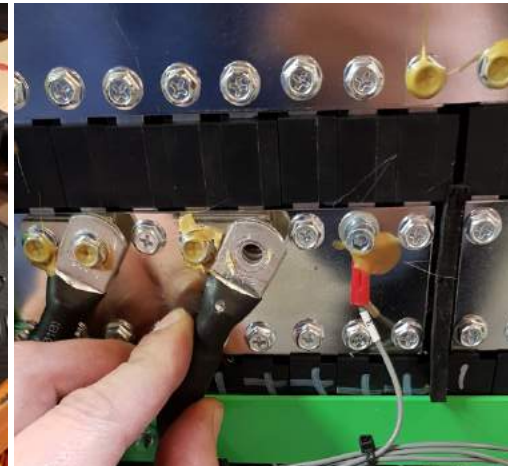
We can fix it

Focus on li-ion fork lift trucks

EP
Let's grow together

Focus

- Our system is now focussed on our max range li-ion trucks

- Use the system to optimise the use and boost the sale of li-ion batteries

- If you have wishes to the EP system, feel free to provide input

- If you have wihes beyond the sope of the EP system, benefit from the great 3rd party systems on the market

Ideal for mixed fleets
- 3rd party suppliers can connect to every truck
- More easy to mix different brands of fork lifts
- The customer has full overview of his whole fleet
- Own interface and direct control
- More reporting features
- More truck features (access, daily checks, impact sensors, indoor tracking, …)
- For larger accounts, need to break them away from being tied in
  with their existing supplier. Contact:
  (Fleet IQ is worldwide active)

Simon Manasseh
Head of Country

Phone: 01460 259 101
Mobile: 07808 243 771
Email: simon@ciiquk.com

COLLECTIVE
INTELLIGENCE
GROUP

For the driver
For use on any vehicle
Developed by the customer

EP Li-ion fork lift trucks
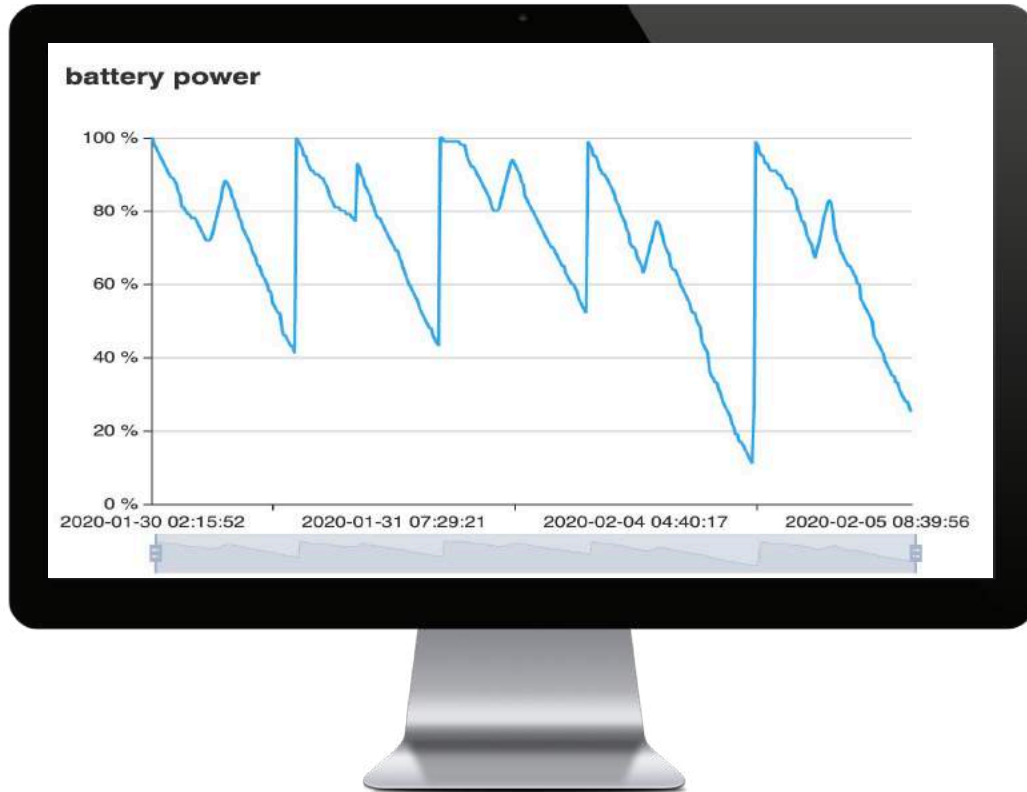
EP Li-ion fork lift trucks

- Order your demo and stock trucks now with the Telematics system
- Use the battery analysis to show the customers the benefits of li-ion
- Increase awareness and interest for the EP Equipment thinking

For more information see our sales training sessions on li-ion technology and on the individual trucks. PDF available on request.
For after sales support we offer tools and training.

Asset Tracking   Uptime Boosting   Battery Monitoring   Predictive Maintenance   Remote Start Stop

- System: Eur 599
- RFID Reader: Eur 170

End user price. For stock trucks same price
For Europe now including 5 years 4G data and online access

APP

- Replace Zapi handheld or PC Cable
- First test units in Europe from 07.2020

APP

CONTROLLER LIST

BLE Connect State: BLE Device Is Connected.

TR1 NAME:DA2M2B C EEP1.45
VOLTAGE:72V
CURRENT:320A
TYPE:TraR

TR2 NAME:DA2S2B C EEP1.45
VOLTAGE:72V
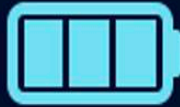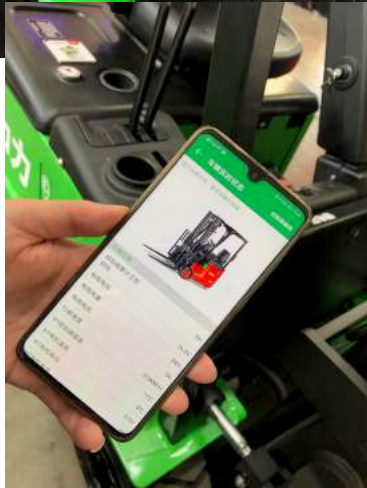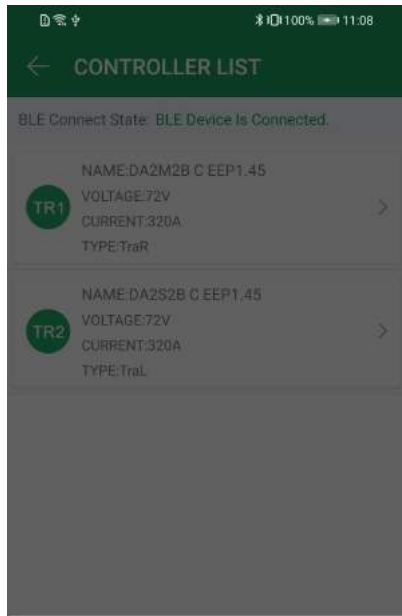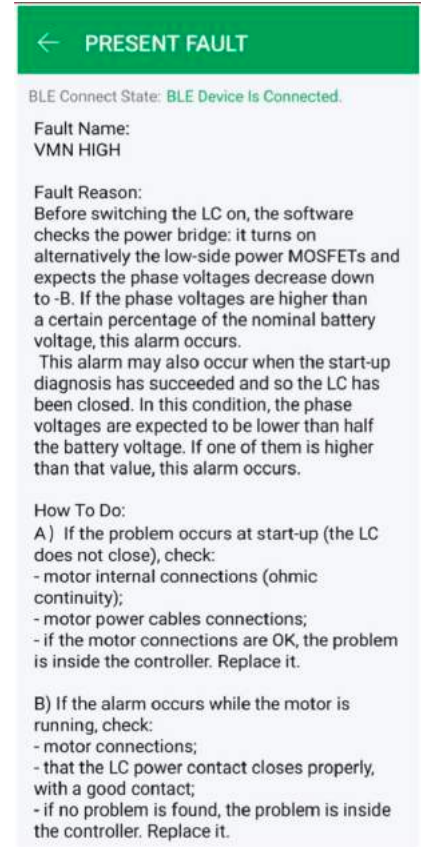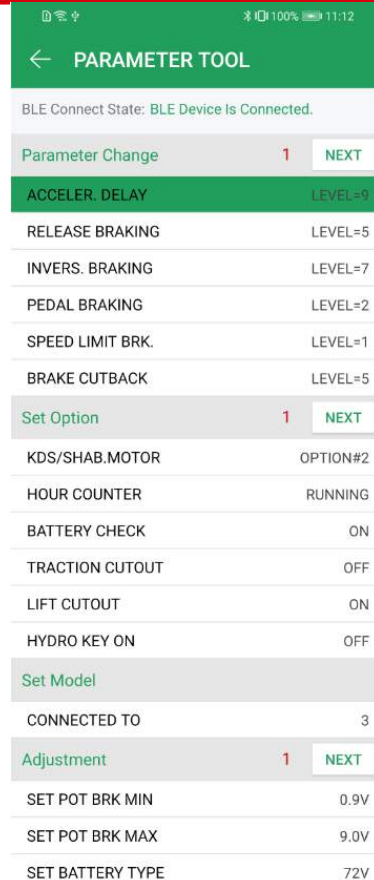CURRENT:320A
TYPE:TraL

Please Select What You Want To Do With th...

1. Parameter Tool

2. Tester

3. Program VACC

4. Present Fault

PARAMETER TOOL

BLE Connect State: BLE Device Is Connected.

Parameter Change	1	NEXT
ACCELER. DELAY		LEVEL=9
RELEASE BRAKING		LEVEL=5
INVERS. BRAKING		LEVEL=7
PEDAL BRAKING		LEVEL=2
SPEED LIMIT BRK.		LEVEL=1
BRAKE CUTBACK		LEVEL=5
Set Option	1	NEXT
KDS/SHAB.MOTOR		OPTION#2
HOUR COUNTER		RUNNING
BATTERY CHECK		ON
TRACTION CUTOUT		OFF
LIFT CUTOUT		ON
HYDRO KEY ON		OFF
Set Model		
CONNECTED TO		3
Adjustment	1	NEXT
SET POT BRK MIN		0.9V
SET POT BRK MAX		9.0V
SET BATTERY TYPE		72V

PRESENT FAULT

BLE Connect State: BLE Device Is Connected.

Fault Name:
VMN HIGH

Fault Reason:
Before switching the LC on, the software checks the power bridge: it turns on alternatively the low-side power MOSFETs and expects the phase voltages decrease down to -B. If the phase voltages are higher than a certain percentage of the nominal battery voltage, this alarm occurs.
This alarm may also occur when the start-up diagnosis has succeeded and so the LC has been closed. In this condition, the phase voltages are expected to be lower than half the battery voltage. If one of them is higher than that value, this alarm occurs.

How To Do:
A）If the problem occurs at start-up (the LC does not close), check:
- motor internal connections (ohmic continuity);
- motor power cables connections;
- if the motor connections are OK, the problem is inside the controller. Replace it.

B) If the alarm occurs while the motor is running, check:
- motor connections;
- that the LC power contact closes properly, with a good contact;
- if no problem is found, the problem is inside the controller. Replace it.