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battery monitoring system

MODULAR BATTERY MONITORING SYSTEM

APPLICATION AREAS OF BATTERIES

Batteries are used in critical areas such as

- Data Centers
- Base Stations
- Hospitals
- Airports
- Industrial Fields

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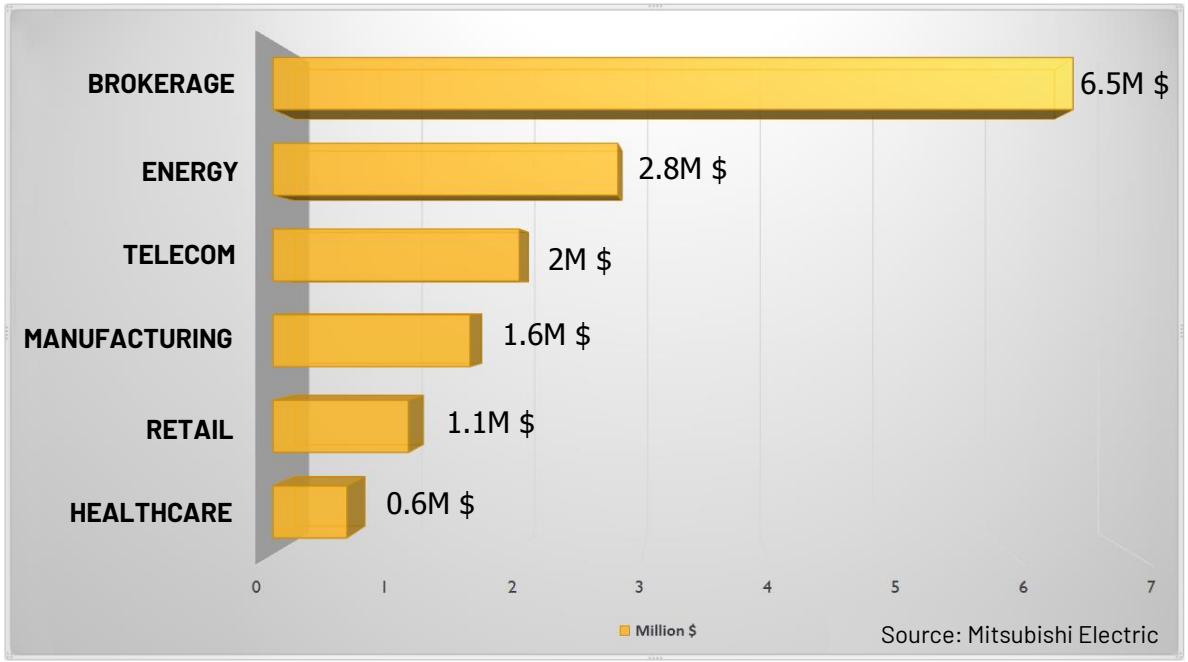
THE COST OF DOWNTIME



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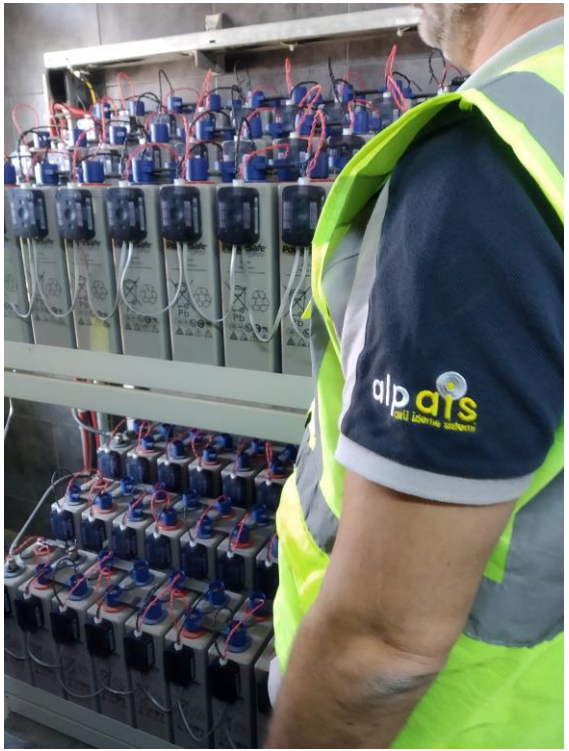
For Fortune 1000 companies:

- Average annual cost of unplanned downtime, $1.25—$2.5 billion
- Average hourly cost of infrastructure failure: $100,000
- Average hourly cost of critical application failure: $500,000—$1 million
- Small to medium-sized businesses may be at most financial risk due to a limited ability to generate revenue during downtime.

Source: APC



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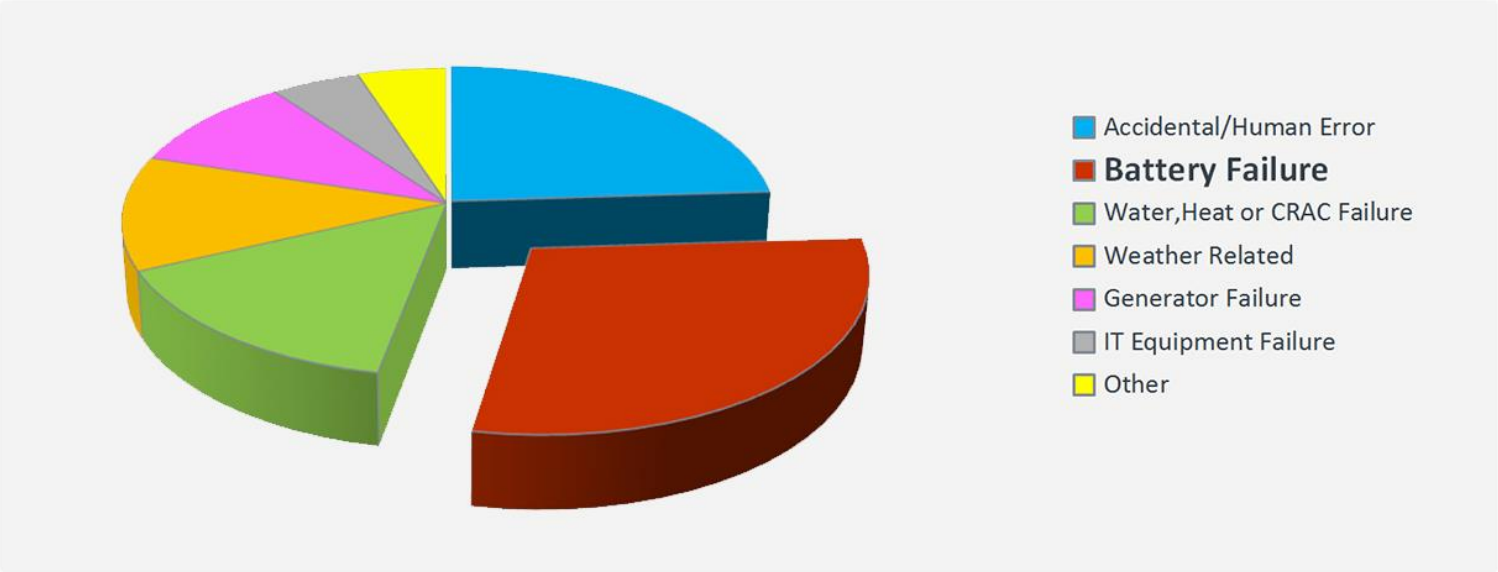
For Fortune 1000 companies:



Source: Uptime Institute

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WHY DOES THE BATTERY FAIL?

Causes of failure	Value monitored with ALPAIS
Aging	Internal Resistance, Ambient Temperature
Internal battery short circuit	Battery Voltage
Inaccurate float charge voltage	Float Charge Voltage
High battery temperature	Battery Temperature
High ambient temperature	Ambient Temperature
Abnormalities in charge / discharge currents	String Current, String Voltage

Source: EATON - The large UPS battery handbook

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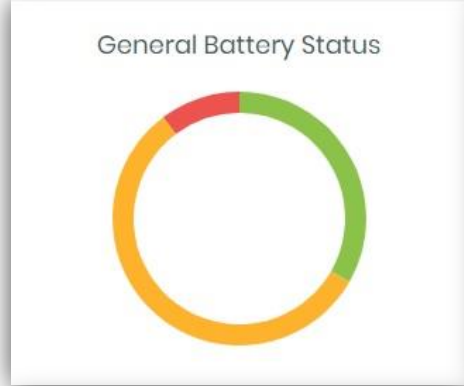
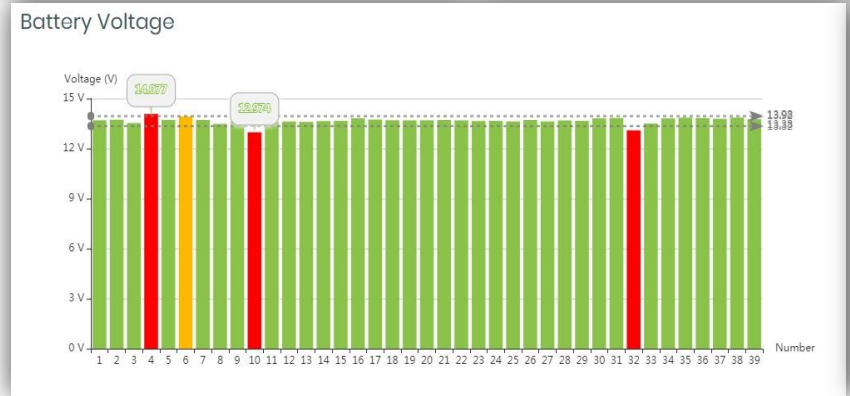
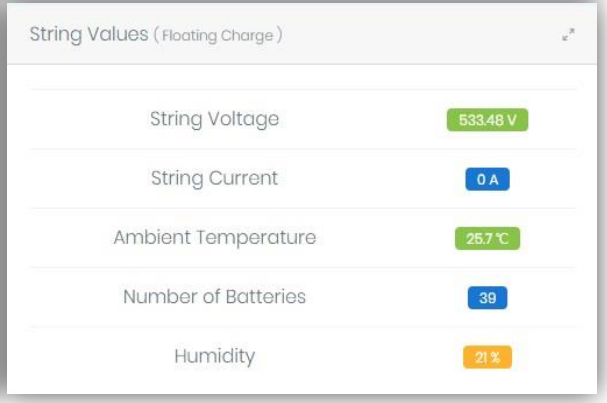
To avoid unexpected consequences of battery systems;
Battery Monitoring System is <u>required!</u>







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BATTERY VOLTAGE

The float charge voltage is critical to battery life. By measuring the battery voltage, short circuit detection, discharge performance and errors can be detected in advance.

STRING VOLTAGE

The string voltage is monitored to verify that the charging system is on and charging properly.

STRING CURRENT

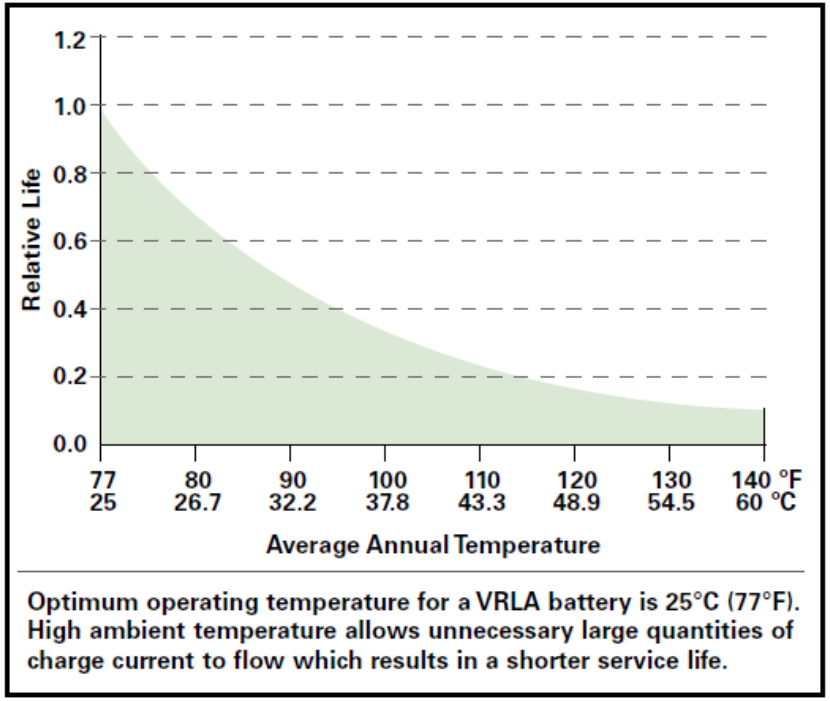
By monitoring the string current, the amount of energy received or given for each string can be measured.

BATTERY TEMPERATURE

The most important advantage of measuring the temperature of each battery is that it can be detected before thermal runaway occur and the necessary operation can be done.

AMBIENT TEMPERATURE

- For the VRLA The optimum temperature is; 20-25°C
- The service life of the batteries is between 20-25 ° C. This is because temperatures outside this range significantly affect the battery corrosion rate. It is important that the ambient humidity is not over 90% in terms of battery life.

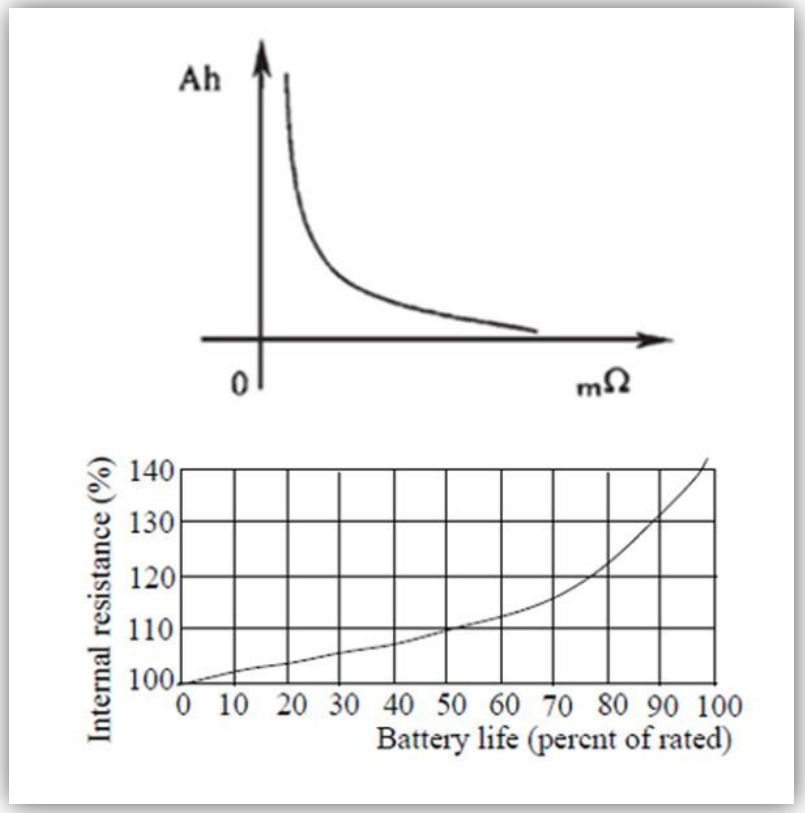


Optimum operating temperature for a VRLA battery is 25°C (77°F). High ambient temperature allows unnecessary large quantities of charge current to flow which results in a shorter service life.

Source: EATON

INTERNAL RESISTANCE

- It shows that there is a correlation coefficient of 0.88 between internal resistance and capacity, so the capacity can be reliably estimated by the internal resistance test.
- The advantage of the internal resistance method is that it has the least effect on the system for the batteries used on the line and can be accurately measured throughout the life of the battery.



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BENEFITS OF BATTERY MONITORING SYSTEM

- It ensures planned battery purchases by preventing emergency situations by following the data received from AIS.
- Preventive activities are carried out with the AIS to ensure the continuity of business uptime.
- The remote access feature lets you manage and control your business from anywhere.
- It provides identification and verification of warranty status with recorded data and reporting. The performance of the batteries used is recorded annually.
- Thanks to the temperature sensors, it is possible to detect possible fire risks in advance. Along with the reduction in fire risks, premiums in insurance policies can be beneficial.
- Keeps your personnel away from battery racks / rooms and areas where sensitive operations are performed, ensuring their safety as well as continuing operations without hesitation.

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ALPAIS SYSTEM COMPONENTS

BATTERY MODULE

The voltage, internal resistance, and temperature parameters of VRLA, VLA, or Ni-Cd type batteries are measured, and the measured parameters are transmitted to the control unit via Modbus protocol.

STRING MODULE

The string current, ambient temperature, and humidity ratio are measured, and the measured parameters are transmitted to the control unit via Modbus protocol.

CONTROL MODULE

The control unit is located at the center of the system and is responsible for saving and processing the parameters transmitted from the batteries and string units.

ALPAIS SOFTWARE

An unlimited number of batteries installed either in a single room or in different facilities/countries are monitored extensively through a single control center.

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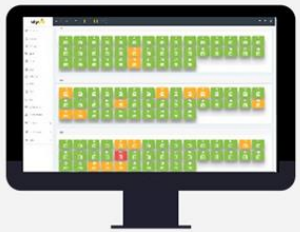
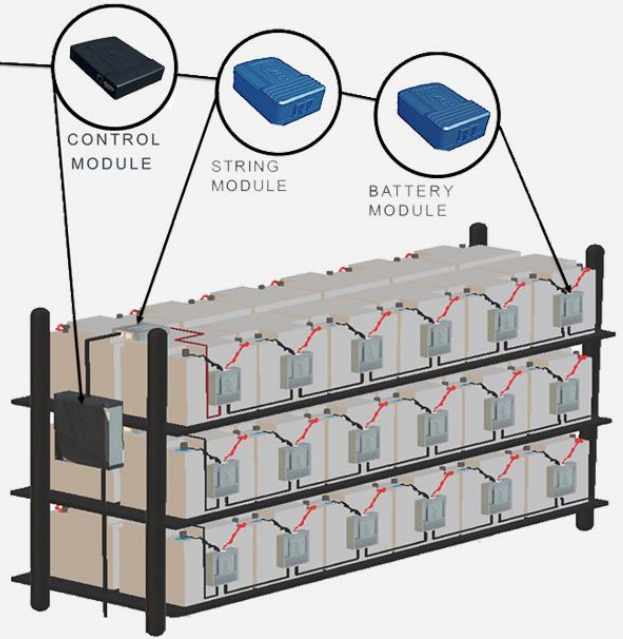
ALPAIS COMPONENTS LOCATION



- Real-Time Battery Statement
- Colourful Interface Notifications
- E-Mail and SMS Notifications
- Multiple Location on One Main Control

ALPAIS SOFTWARE



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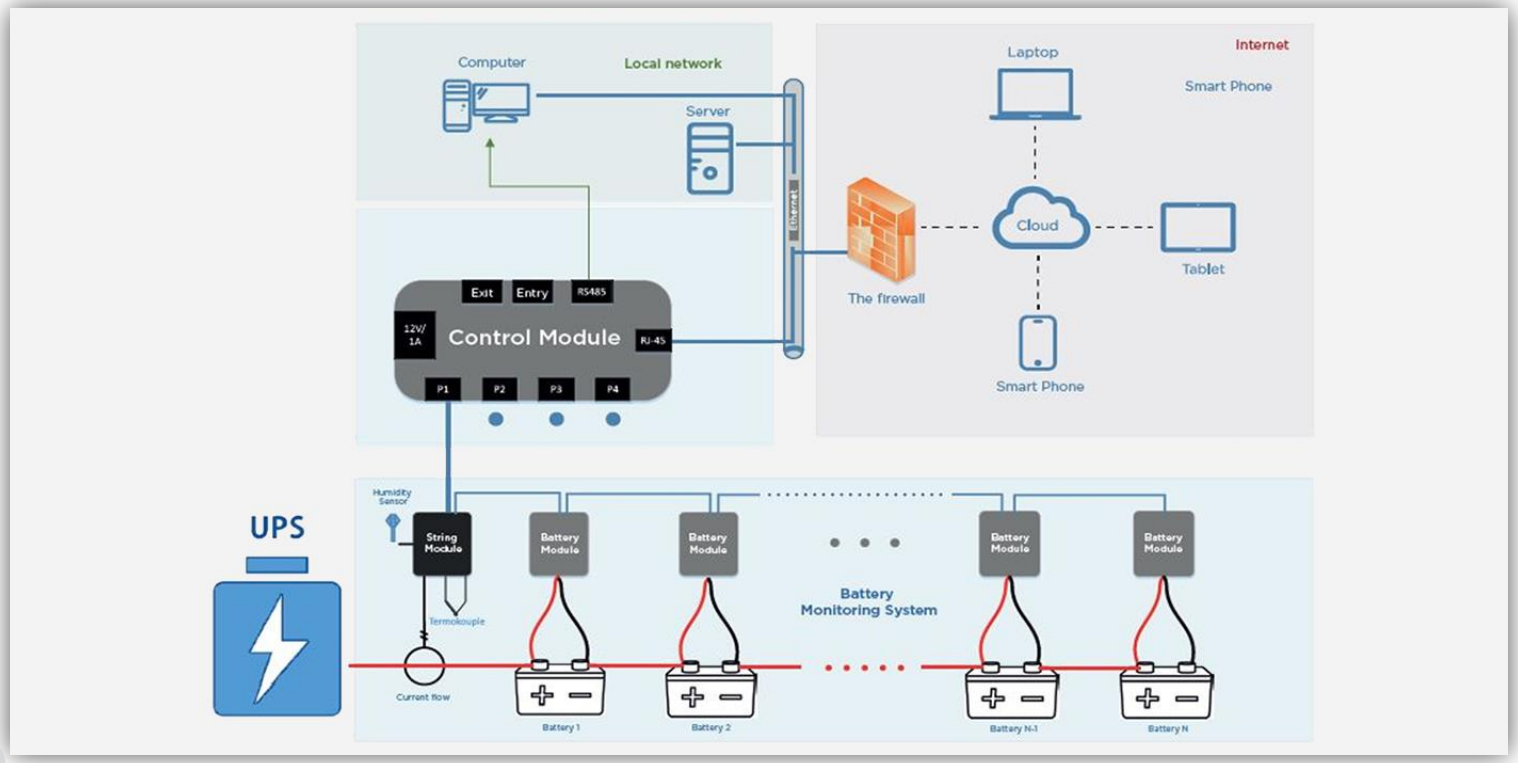
SYSTEM ARCHITECTURE



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WHAT ARE THE DIFFERENCES OF ALPAIS?

- One Battery Module for **each** individual battery.
- **Automatic** software update for each Battery Module.
- **Automatic** addressing for each battery module.
- Battery and string parameters can be **reported daily, monthly or yearly** and exported in CSV format and graphically displayed on the interface in time axis.
- There are three different LED light sources on Battery Modules and String Modules for easy identification of faulty batteries and these LEDs can be **easily seen by the user** thanks to the semi-transparent cover in the module.
- **No extra hardware** required for SMS notification.
- Belonging to the same user is physically located in different systems, it can be monitored from **a single point** without requiring extra hardware and software costs.
- ALPAIS has **Electromagnetic Compatibility (EMC)** and **Low Voltage Directive (LVD)** test reports taken from accredited test laboratories.

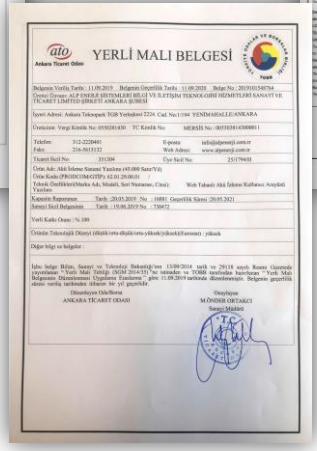
TEST & CERTIFICATES

ISO 9001 CERTIFICATE

EMC TEST REPORT

LVD TEST REPORT

BATTERY MONITORING SYSTEM
DOMESTIC GOODS CERTIFICATE



BATTERY MONITORING SOFTWARE
DOMESTIC GOODS CERTIFICATE

CE CERTIFICATE

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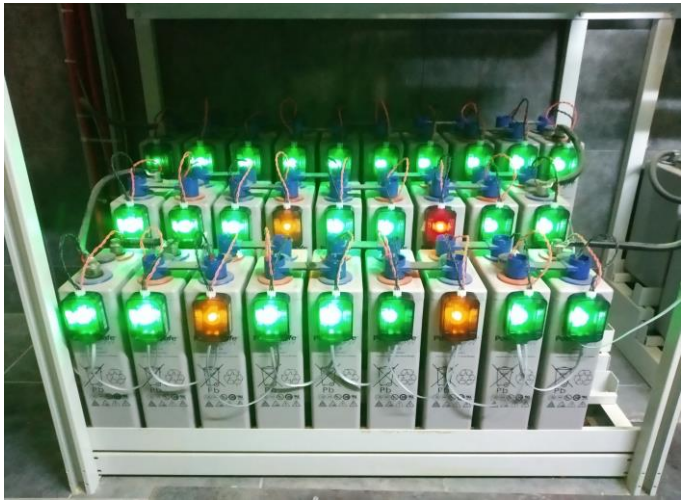
SOME REFERENCES



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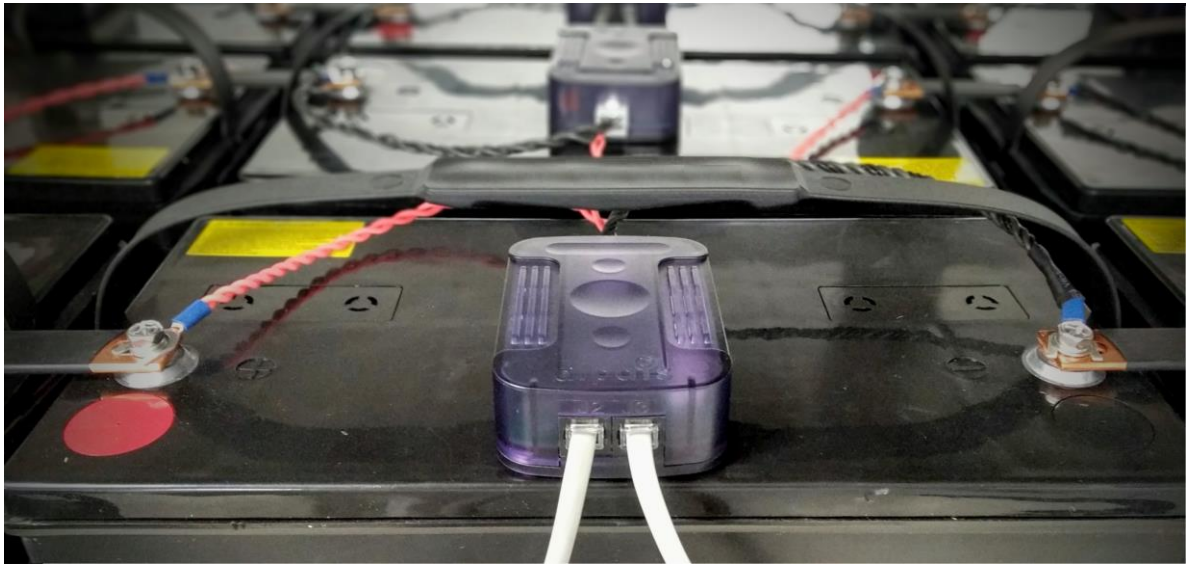
THANK YOU!



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