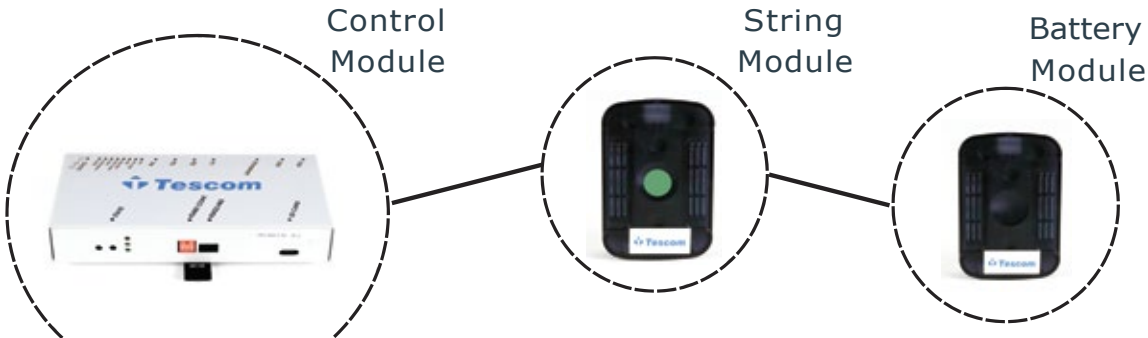
BATTERY MONITORING SYSTEM

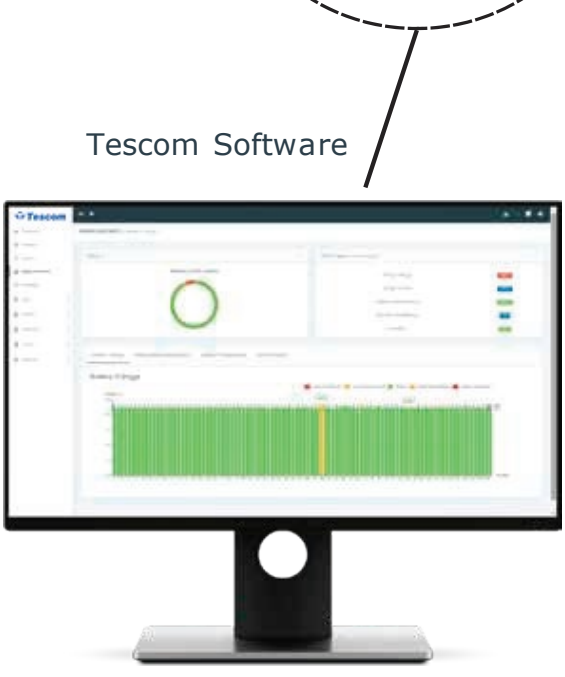
Tescom Battery Monitoring System brings an innovative perspective to battery monitoring solutions.

It is a harsh thing to ensure the providing a "safe working area" for batteries due to their nature. Every system requires another customized solution. With its powerful R&D team and hardworking production team, Tescom presents various solutions.

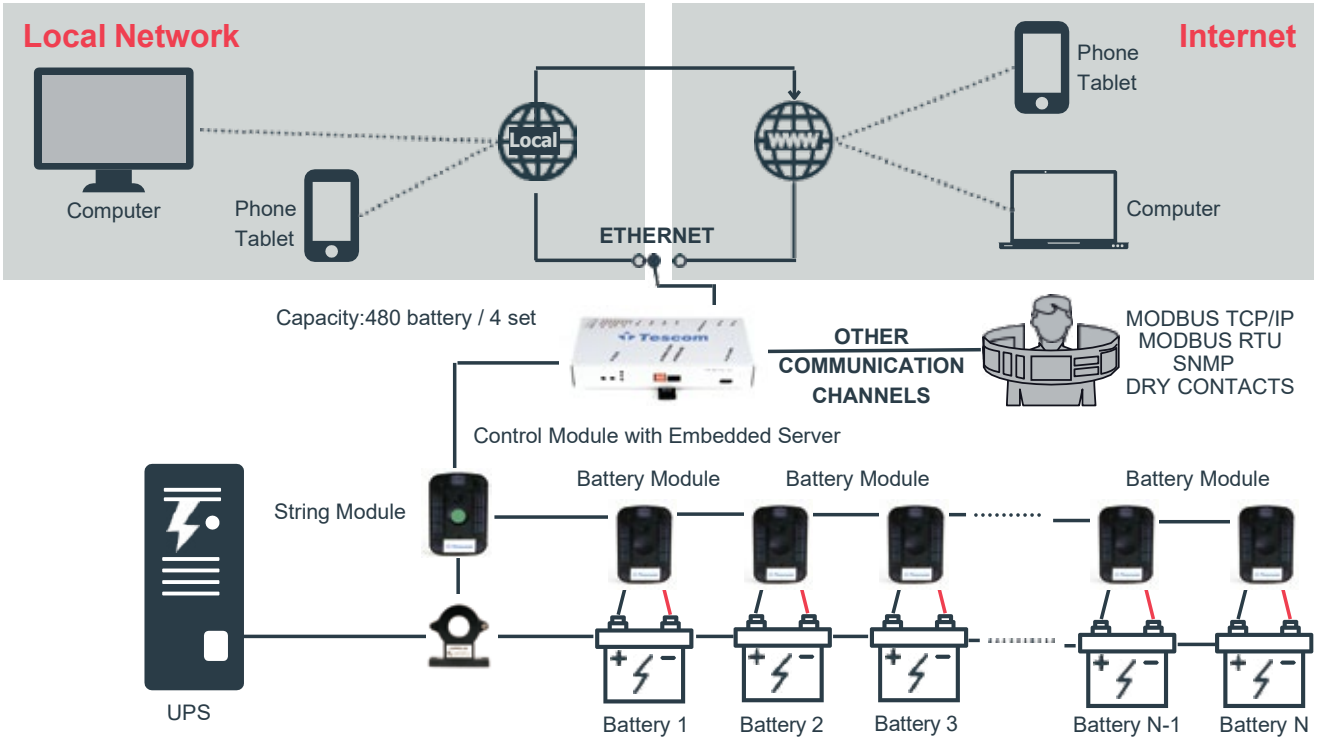
Ensure the maximum efficiency of the battery backup systems.

For those areas that don't have any tolerance for outages, every piece of the system must be high quality and efficient. Today’s world requires more power efficiency due to the environmental crisis. And, when it’s coming to the battery backup systems it has taken real importance to get the best of it.
Tescom provides full control of the system by doing this it prolongs the lifespan of the whole system.





Tescom Battery Monitoring System – Architecture



- ✓ **1 Battery module for each battery**
- ✓ **1 String Module for each string**
- ✓ **1 Control Module for 4 String Modules**
- ✓ **1 String Module can connect 120 battery modules**
- ✓ **Colorful and user-friendly interface of Tescom Software**

System Components

Control Module with an Embedded Server

The Control Module is located at the system's center. It is responsible for saving and processing the parameters transmited from the Battery and String Modules and sending these data to the Tescom Software. The Embedded Server provides easy commissioning. Tescom software is installed in it.

Battery Module

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

String Module

The string current, ambient temperature, and humidity ratio are measured, and the measured parameters are transmited to the Control Module via Modbus protocol.

Tescom Software

Tescom Software can provide real-time monitoring of small to large-scale systems. It is responsible for Email and SMS notifications.

Measured Parameters

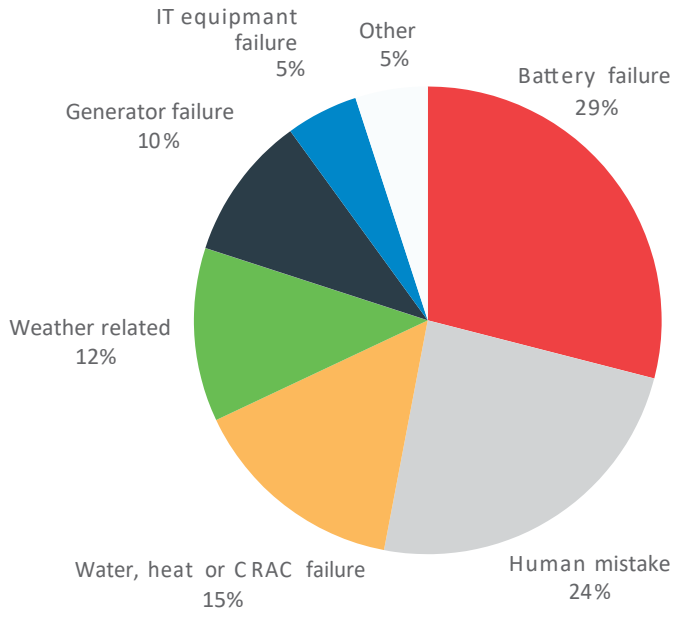
Tescom provides the most important measurement of a battery group, and to ensure the safety of the battery environment provides the ambient measurements.

Internal Resistance | Battery Temperature | Battery Voltage | String Voltage | String Current | Ambient Temperature | Ambient Humidity

Solution Overview

UPS & Data Center Solution

29% of the downtime reasons in the Data Centers are directly related to battery failures.
Tescom monitors string and ambient parameters along with the individual batteries.
Tescom's constant measurements and real-time notifications eliminate also human mistakes.
Thus, the Tescom Battery Management System helps avoid, approximately 70% of the downtime reasons.



Reference: Uptime Institute

Remarkable Features of UPS & Data Center Solution

- ✓ VRLA, VLA, and Ni-Cd battery compatibility
- ✓ Immediate detection of the batteries that have manufacturing failures
- ✓ 480 - batterry on 4 strings
- ✓ Multiple locations on 1 single screen
- ✓ Multiple users with different authorization levels
- ✓ Automatically addressing for Battery Modules
- ✓ SNMP, Modbus, Dry Contacts
- ✓ 2 different levels of notifications
- ✓ Graphical tools to determine the battery perfo mance trends in time,
- ✓ Email, SMS, and buzz notifications
- ✓ 3 LED sources on modules for on-site detection
- ✓ Reporting in PDF and CSV format
- ✓ Daily, monthly, or yearly reports
- ✓ Recording of constant measurement and alarm logs
- ✓ More than 10 years of historical data

Tescom Software

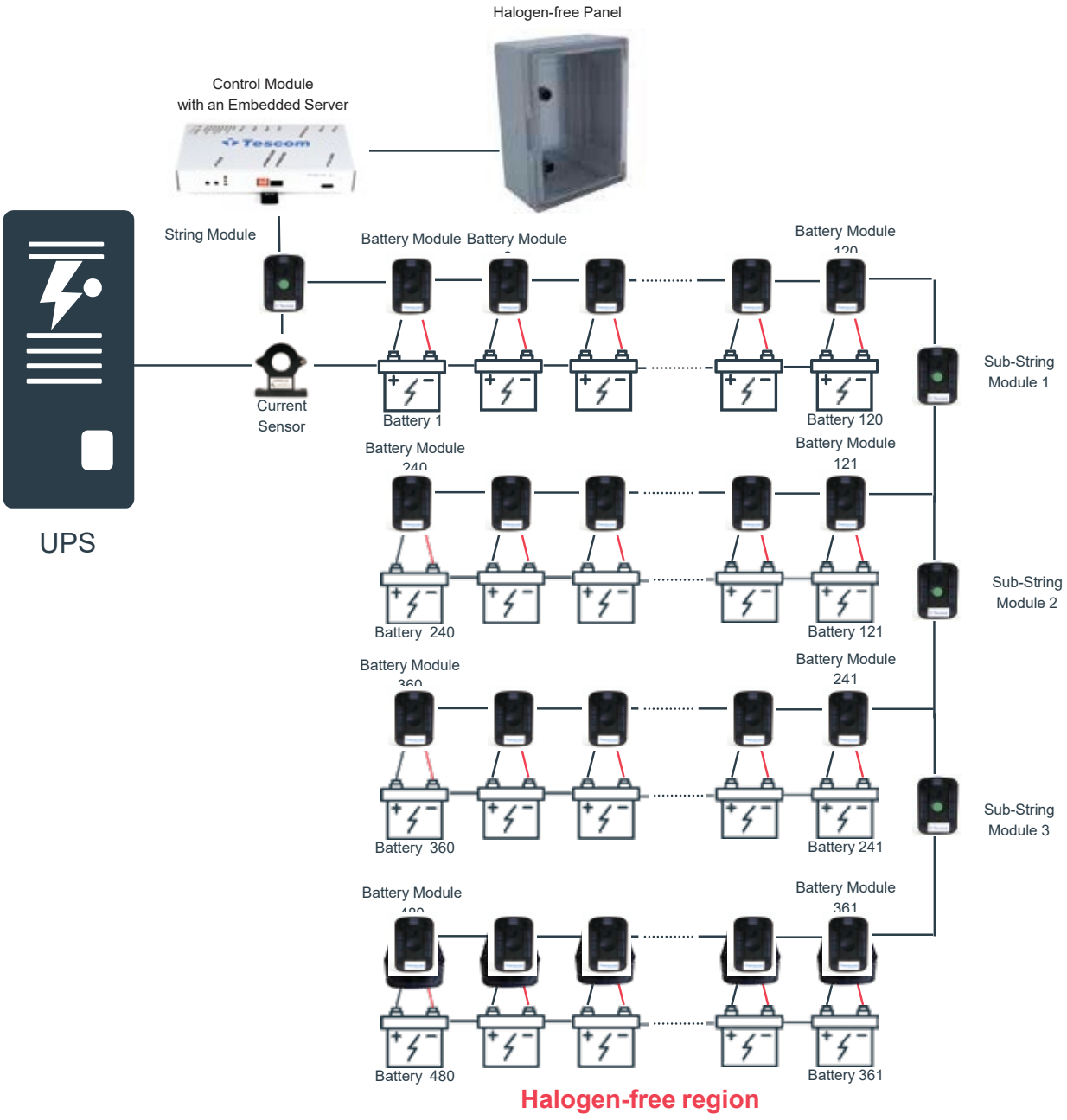
Control Module

String Module

Battery Module

Ni-Cd Solution For Industrial Applications

In the need for more reliable power backup systems in industrial areas, NiCd batteries can be used.
Hydrogen gas leaks and the level of electrolytes are assigned to the pain points of the chemical design of Ni-Cd batteries.
Due to hazardous environments, the need for extra protection of the battery system will arise.
Tescom's Ni-Cd Solution is specially designed to cover protection for a better environment for the batteries thus ensuring reliable power.
With constant monitoring of the most important parameters, Tescom is adding a “Halogen-free region” for Industrial Applica- tions. Furthermore, since Ni-Cd battery packs can have many more batteries than lead-acid packs, Tescom solves this issue with its “Sub-String Modules”. Sub-String Modules are responsible for lengthening the communication line in the battery packs which consist of more than 120 batteries.



Remarkable Features of Industrial Application Solution

- Up to 480 Ni-Cd batteries can be monitored with 1 BMS
- Halogen-free measurement and data cables
- Halogen-free Control Module Panel
- Halogen-free Battery and String Modules
- Hydrogen Gas Sensor (Optional)
- Low-Electrolyte Level Sensor (Optional)
- Ground Fault Detector (Optional)
- Display Screen (Optional)

Tescom is suitable for all kin ds of battery applications. With its innovative design perspective for both hardware and software parts, Tescom offers the best solution for the user's requirements. Here is a list of Unique Selling Points of Tescom;

- Automatic addressing for Battery Modules.
- 3 LED sources for on-site detection.
- String-based configuration.
- 2 different levels for notification: warning & critical
- Every measurement is individual.
- 1,2V, 2V, 6V, and 12V solutions.
- Flexible and scalable setup based on each system.
- Collects the data in 30-second intervals.
- Remote access from anywhere via smartphone, or tablet.
- 10 years of historical data.
- Supports SNMP, Modbus RTU, Modbus TCP/IP, etc.
- Dry contacts can be utilized for 3rd party systems.
- E-mail and SMS notifications for multiple users.
- PDF or Excel reports in daily, monthly, and yearly intervals.
- Charge/discharge records per string.

Presenting the Best Solution to Cover Your Requirements - Voltage Balancing as an Option

Tescom's "Balancing" feature is used to keep the in dividual battery voltage at the desired charge voltage level for each string. In this way, the system ensures that all battery voltages in the string are close to equal. The bad effects of the batteries on eliminating the overcharging and inability to fully charge the batteries are prevented. This ensures that the string life is extended and its capacity is increased.

TECHNICAL DATASHEET

Control Module	
Operating Condition	
Operating Temperature	0-50°C (32-122°F)
Storage Temperature	-10-70°C (14-158°F)
Relative Humidity Ratio	5% - 90% RH
Atmospheric Pressure	80 – 110 kPa
Power Input	12VDC @1.5A
Max. Power Consumption	20 Watt
Communication Interface	
RS-485	Modbus RTU
Ethernet	SNMP, Modbus TCP/IP
Features	
Number of String	4 Strings can be monitored
Number of String Module	1 String Module at each String
Number of Battery Module	120 Battery Module at one string, 480 Battery Modules in total
Battery Nominal Voltage	1,2V – 12V Batteries
String Voltage	1,2V – 2500VDC
Input/ Output	
Relay Output	2 x Dry Contact Output, 400V (AC-
Digital Input	2 x 12-24VDC
Electrical Isolation	2000 V
Physical Characteristics	
Dimensions (H x W x D)	40,5 x 200 x 95,5
Enclosure	Metal
Color	Grey

String Module	
Current Monitoring	
Current Range	0-500A
Resolution	10 mA
Accuracy	1%
Current Sensor	Hall Effect Sensor
Ambient Temperature Monitoring	
Temperature Range	0-50°C (32-122°F)
Resolution	0.1°C
Accuracy	±2 °C
String Voltage Monitoring	
Voltage Range	1-2500 VDC
Resolution	10 mV
Accuracy	0.1%
Humidity Monitoring	
Resolution	1% RH
Accuracy	5%
Protection	
Isolation	2000 V Opto Isolation
Short Circuit Protection	Max. 3.5A (Internal Fuse)
Operating Conditions	
Operating Temperature	0-50°C (32-122°F)
Storage Temperature	-10-70°C (14-158°F)
Relative Humidity Ratio	5%-90% RH
Atmospheric Pressure	80-110kPa
Power	
Power Consumption	1.2 Watt
Operating Current	
Nominal Operation	100 mA
Communication	
Data Transmission Interface	Serial Modbus Protocol
Physical Characteristics	
Dimensions (H x W x D)	(91 x 63 x 29 mm)
Enclosure	ABS
Color	Semi-Transparent Grey

Battery Module	
Compatibility	
Battery Module Types	2V, 6V, 12V, 1.2V
Battery Voltage Monitoring	
Battery Module 2V	1.5-3 VDC
Battery Module 6V	4.5-7.5 VDC
Battery Module 12V	9-15 VDC
Battery Module 1.2V	0.9-3 VDC
Resolution	1 mV
Accuracy	0.05 % ± 6 mV
Internal Resistance Monitoring	
Resistance Range	0.1 – 64m ohms
Resolution	1µOhm
Accuracy	±2 %
Temperature Monitoring	
Temperature Range	0-50°C (32-122°F)
Resolution	0.1°C
Accuracy	±2 °C
Protection	
Isolation	2000 V Opto Isolation
Short Circuit Protection	Max. 3.5A (Internal Fuse)
Reverse Polarity Protection	Provides protection at rated voltage against reverse connection
Operating Conditions	
Operating Temperature	0-50°C (32-122°F)
Storage Temperature	-10-70°C (14-158°F)
Relative Humidity Ratio	5%-90% RH
Atmospheric Pressure	80-110kPa
Power	
Power Consumption	50mA @2V Battery 10mA @12V Battery
Operating Current	
Nominal Operation	10mA – 50mA
Internal Resistance Measurement During Test	0.167 A/dk
Low power mode	<2 mA
Communication	
Data Transmission Interface	Serial Modbus Protocol
Features	
Auto Addressing	Automatically obtain address during installation or replacement
Voltage Balancing Accuracy (optional)	Voltage balancing feature on string ±0.05 V
Physical Characteristics	
Dimensions (H x W x D)	(91 x 63 x 29 mm)
Enclosure	ABS
Color	Semi-Transparent Grey

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