alpais
battery monitoring system

ALPAIS

BATTERY MONITORING SYSTEM

BROCHURE

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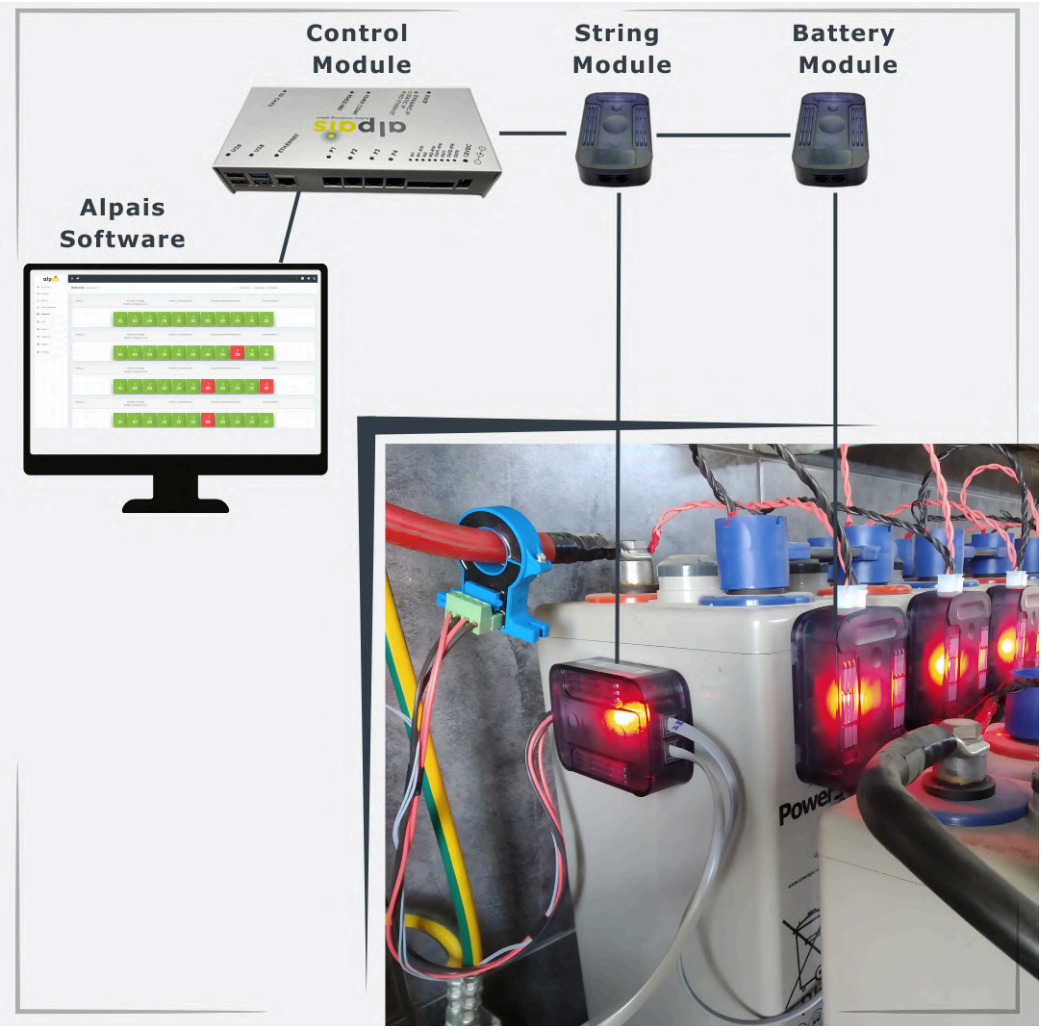
Alpais Battery Monitoring System brings an innovative perspective to battery monitoring solutions.

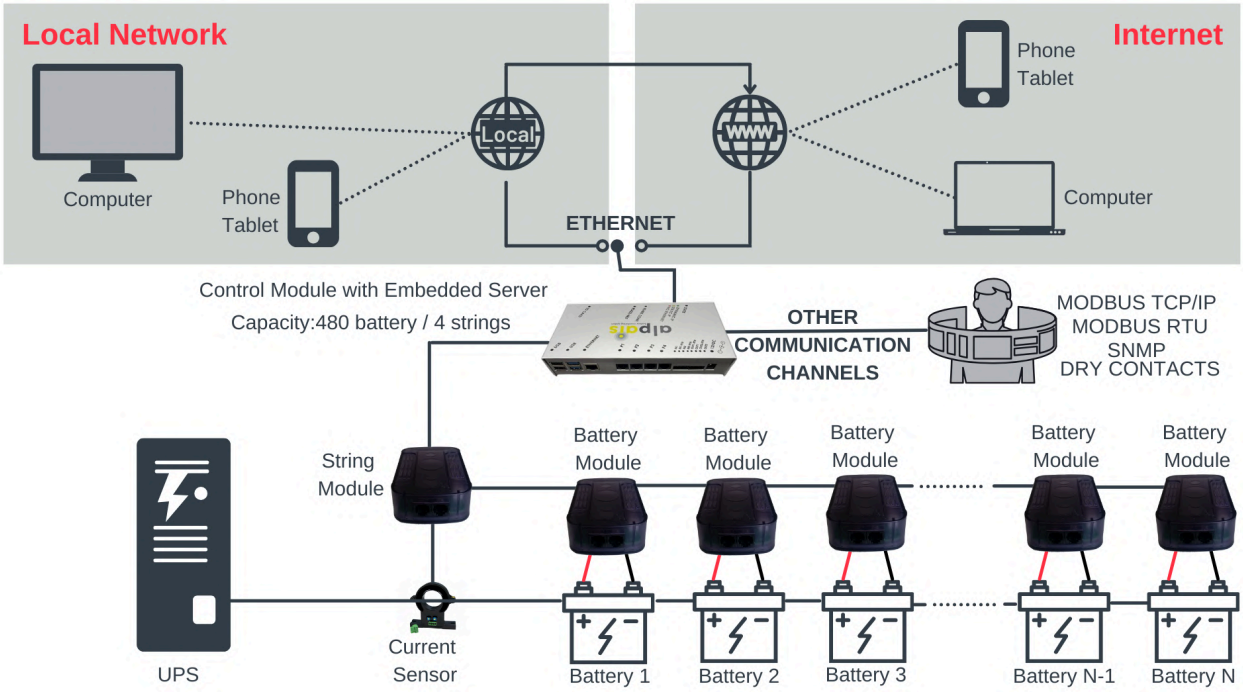
It is a harsh thing to ensure the providing a "safe working area" for batteries due to their nature. Every system requires another customized solution. With its powerful R&D team and hardworking production team, Alpais presents various solutions.

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 comes to battery backup systems it has taken real importance to get the best of it.
Alpais provides full control of the system by doing this it prolongs the lifespan of the whole system.



Alpais 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 Alpais Software

System Components

Control Module

The Control Module is located at the system's center. It is responsible for saving and processing the parameters transmitted from the Battery and String Modules and sending these data to the Alpais Software. The Embedded Server provides easy commissioning. Alpais 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 transmitted to the control unit via Modbus protocol.

String Module

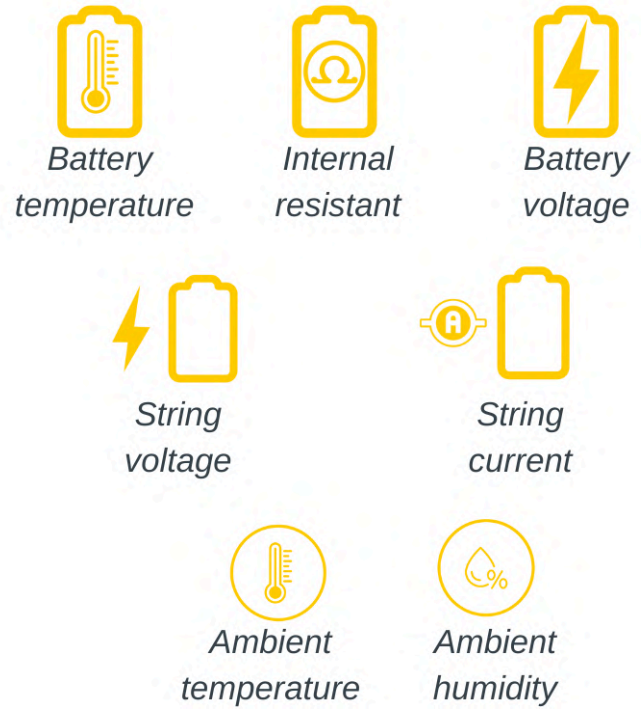
The string current, ambient temperature, and humidity ratio are measured, and the measured parameters are transmitted to the Control Module via Modbus protocol.

Alpais Software

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

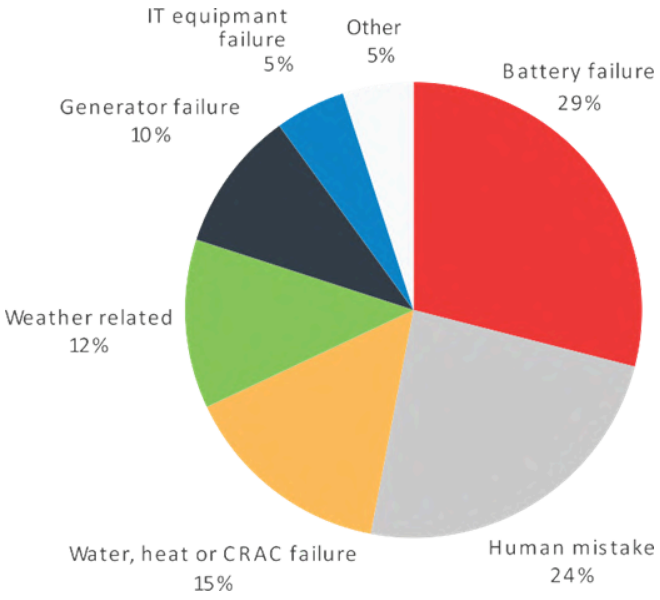
Measured Parameters

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



UPS & Data Center Solution Overview

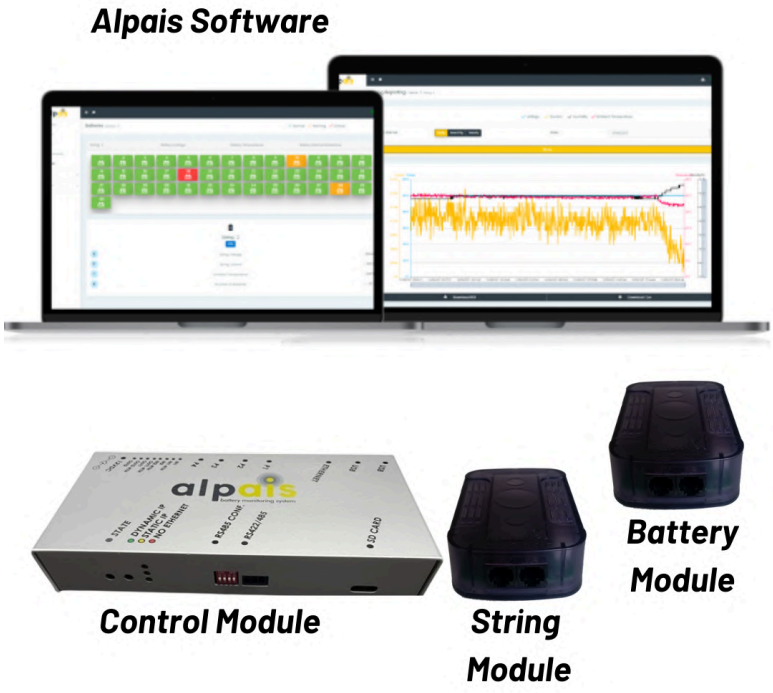
- 29% of the downtime reasons in the data centers are directly related to battery failures.
- Alpais monitors string and ambient parameters along with the individual batteries.
- Alpais's constant measurements and real-time notifications eliminate also human mistakes.
- Thus, the Alpais Battery Monitoring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



Reference: Uptime Institute

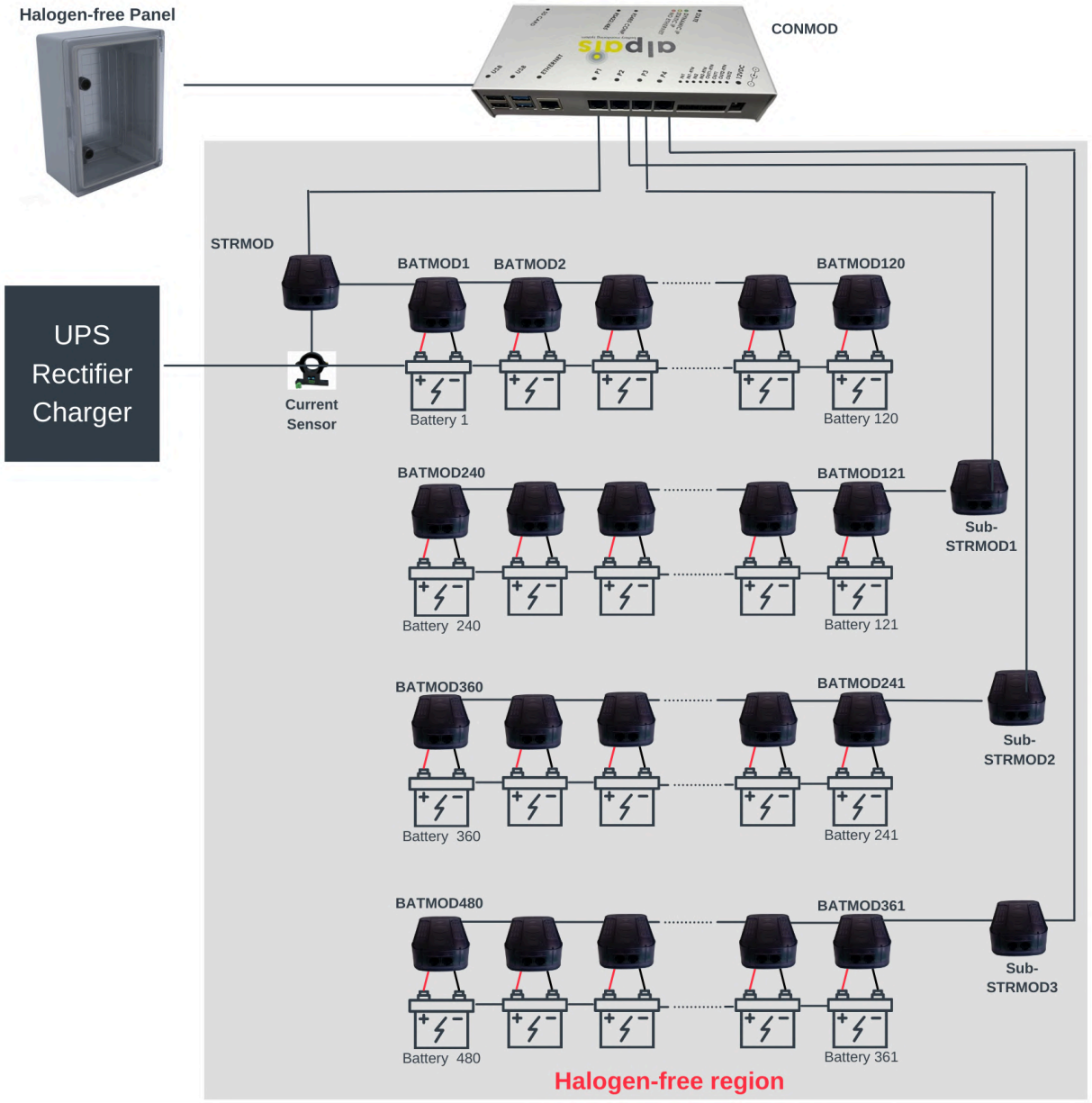
Remarkable Features of UPS & Data Center Solution

- VRLA, VLA, and Ni-Cd battery compatibility
- Immediate detection of the batteries that have manufacturing failures
- 480 - battery 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 performance 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



Industrial Application Solution Overview

In the need for more reliable power backup systems in industrial areas, 1.2V, and 2V cells can be used. Hydrogen gas leaks and the level of electrolytes are assigned to the pain points of the chemical design of NiCd batteries. Due to hazardous environments, the need for extra protection of the battery system will arise. Alpais's solution for industrial areas 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, Alpais is adding a "Halogen-free region" for Industrial Applications. Furthermore, since NiCd battery packs can have many more batteries than lead-acid packs, Alpais 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.

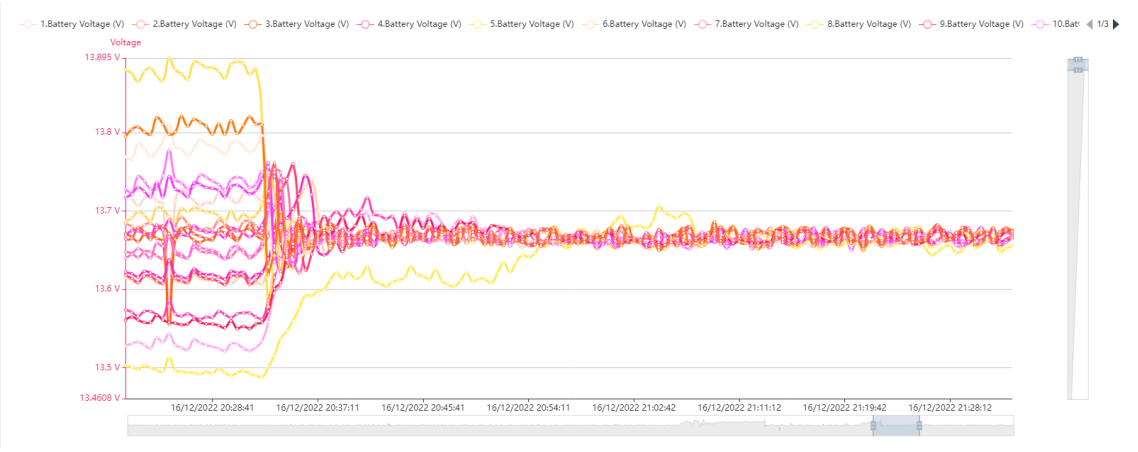


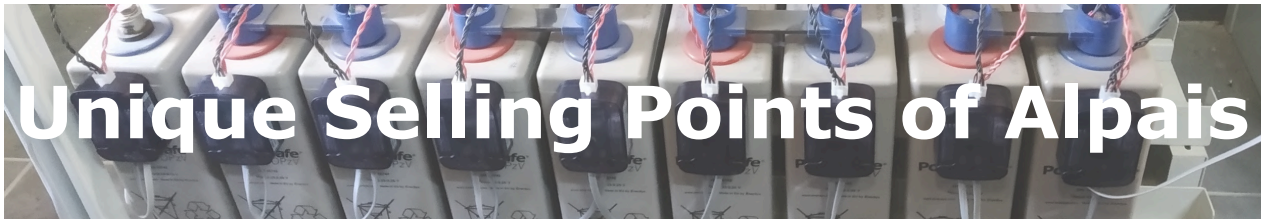
Industrial Application Solution Overview

- 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)

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

Alpais's "Balancing" feature is used to keep the individual 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.





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

- Automatic addressing for Battery Modules.
- 3 LED sources for on-site detection.
- String-based configuration.
- 2 different levels for notifications: 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.

➢ Alpais Battery Monitoring System Technical Specifications

Control Module	
Operating Condition	
Operating Temperature	-10°C ~ +70°C (14°F ~ 158°F)
Storage Temperature	-20°C ~ +70°C (-4°F ~ 158°F)
Relative Humidity Ratio	5% - 90% RH
Atmospheric Pressure	80 – 110 kPa
Power Input	12VDC @1.5-2A
Max. Power Consumption	20 Watt
Communication Interface	
RS-485	Modbus RTU
Ethernet	SNMP, MODBUS TCP/IP (optional)
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 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-DC) 120mA (optionally digital)
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 mm or 40,5 x 145 x 95,5 mm
Enclosure	Metal
Color	Grey

*Optionally, up to 480 cells on 1 string for 1.2V/2V

String Module	
Current Monitoring	
Current Range	0-500A
Resolution	10 mA
Accuracy	1%
Current Sensor	Hall Effect Sensor
Ambient Temperature Monitoring	
Temperature Range	-10°C ~ +100°C (14°F ~ 212°F)
Resolution	0.1°C
Accuracy	±2 °C
String Voltage Monitoring	
Voltage Range	1-2500 VDC
Resolution	10 mV
Accuracy	0.1%
Humidity Monitoring	
Humidity Range	5% - 90% RH
Resolution	1% RH
Accuracy	5%
Protection	
Isolation	2000 V Opto Isolation
Short Circuit Protection	Max. 3.5A (Internal Fuse)
Operating Conditions	
Operating Temperature	-10°C ~ +70°C (14°F ~ 158°F)
Storage Temperature	-20°C ~ +70°C (-4°F ~ 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 Trans.Interface	Serial Modbus Protocol
Physical Characteristics	
Dimensions (H x W x D)	29 x 63 x 91 mm
Enclosure	ABS
Color	Semi-Transparent

Battery Module	
Compatibility	
Battery Type	VRLA, VLA, NiCd
Battery Voltage Monitoring	
1.2 V Type Voltage Range	0.9-3 VDC
2 V Type Voltage Range	1.5-3 VDC
6 V Type Voltage Range	4.5-7.5 VDC
12 V Type Voltage Range	9-15 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	-10°C ~ +100°C (14°F ~ 212°F)
Resolution	0.1°C
Accuracy	±2 °C
State of Health Monitoring (optional)	
State of Health Range	0 – 100 %
Resolution	1 %
Accuracy	±5 %
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	-10°C ~ +70°C (14°F ~ 158°F)
Storage Temperature	-20°C ~ +70°C (-4°F ~ 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
Sleep mode	<10 mA
Communication	
Data Transmission Interface	Serial Modbus Protocol
Features	
Automatical 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)	29 x 63 x 91 mm
Enclosure	ABS
Color	Semi-Transparent

Alpais Software
Minimum system requirements (if it's not Embedded Software)
❖ Core speed of 1.3 GHz or faster ❖ Min 2 core CPU ❖ Min 4 GB RAM ❖ Min 25 GB of free hard disk space

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