

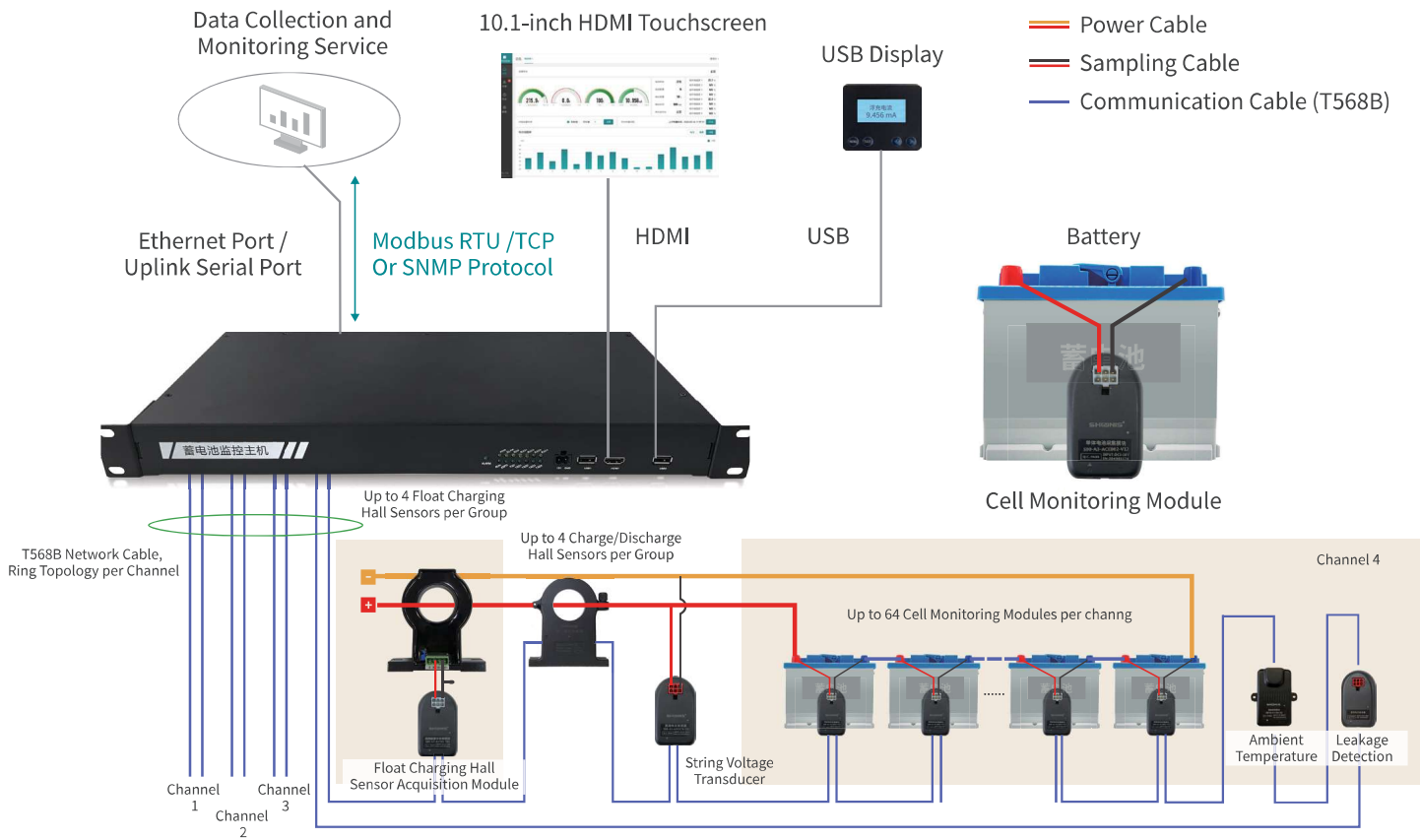
Battery Online Monitoring Solution

The Zenvex Battery Monitoring System focuses on key parameters including string voltage, charge/discharge current, float charging current, individual cell voltage, temperature, internal resistance, battery SOC/SOH, and ambient temperature.

It provides early warning for a wide range of potential battery faults or risks, such as overvoltage or undervoltage of individual cells or battery strings, excessive internal resistance, overtemperature, overcharge, overdischarge, overcurrent, thermal runaway, and open circuit conditions. The system enables refined maintenance of battery strings, ensuring maximum safety and reliability.



System Architecture Diagram



Solution Equipment Overview

Product	Function Overview	Function Details	Configuration Notes
 Battery Monitoring Controller	Data aggregation, storage, calculation, and northbound data upload	Optional: single or dual power supply Each controller supports monitoring 1–6 battery strings, up to 600 cells Built-in Web service, supports local configuration and remote control With automatic power-off feature, ensures safety in case of module failure Provides two RJ45 ports for each string, supports ring topology communication Supports auto addressing for sub-devices	Each controller supports up to 600 cells grouped into 1–6 battery strings
 Cell Monitoring Module	Monitors single-cell voltage, internal resistance, temperature, and battery SOC	Voltage range: 2V / 12V Proprietary bus communication, each channel supports daisy-chaining up to 64 modules. Supports auto addressing Supports pre-warning for open-circuit faults	1 unit per battery cell
 Charge/Discharge Current Sensor	Monitors battery charge and discharge current	Current range: 300ADC / 600ADC / 1000ADC Proprietary bus daisy-chain communication Supports auto addressing	Up to 4 units per battery string
 String Voltage Transducer	Monitors battery string voltage	Voltage range options: 0–60VDC / 0–300VDC / 0–700VDC Proprietary bus daisy-chain communication Supports auto addressing	1 unit per battery string
 Float Current Hall Sensor + Acquisition Module	Monitors float charge current and ambient temperature	Hall aperture: 20 / 40mm Float current range: $\pm 2000\text{mA}$ Proprietary bus daisy-chain communication Thermal runaway pre-warning monitoring One temperature sensor included per set Supports auto addressing	Up to 4 sets per battery string, with 1 Hall sensor and 1 acquisition module in each set
 Environmental Temperature Sensor Module	Monitors ambient temperature of the battery string	Temperature range: -10°C to $+99.9^{\circ}\text{C}$ Proprietary bus daisy-chain communication Supports auto addressing	Up to 4 units per battery string
 10.1" HDMI Touchscreen	Local display for data, alarms, history, and configuration	Supports HDMI high-definition digital interface Supports wall-mounted/embedded/desktop installation Equipped with a 2MP camera Metal casing, durable and weather-resistant	Configurable per requirement, 1 unit per controller
 USB Display Screen	Local data display and setup	Supports easy magnetic mounting	Configurable per requirement, 1 unit per controller

System Highlights



Multi-Level Protection

- Circuit protection guards against abnormal electrical conditions.
- Self-diagnostics enable real-time fault detection.
- Automatic shutdown prevents damage when faults occur.
- Sleep mode reduces power use and extends battery life during inactivity.



Advanced Fault Detection

Provides early warnings for a wide range of potential issues, including overvoltage, undervoltage, excessive internal resistance, thermal abnormalities, overcharge/discharge, thermal runaway, and open-circuit faults at both cell and string levels.



Auto Addressing

Supports automatic addressing of sub-devices—including Hall current sensors, DC voltage transmitters, temperature sensors and cell monitoring modules—without manual configuration, significantly improving installation efficiency.



Modular & Reliable

Each cell module operates independently. A dual-port serial communication interface enables ring topology wiring, ensuring that communication remains uninterrupted even if a single link fails.