# PowerShield.

# SENTINEL SYSTEM SPECIFICATION
## Permanent monitoring for lead-acid and Ni-Cad batteries.

The PowerShield Sentinel system provides monitoring for an unlimited number of batteries. A complete solution of hardware and software ensures you get the information you need to confirm your batteries are operating within IEEE/IEC guidelines.

## Sentinel Monitor

The monitor captures, processes and stores data from a range of sensors. This includes monoblock voltage, impedance and temperature, string voltage and current, plus ambient temperature.

| | |
|---|---|
| Power supply [10W]: | 24V DC Model: 11V to 33Vdc, 0.8A max.<br>48V DC Model: 20V to 65Vdc, 0.4A max.<br>72V DC Model: 55V to 140Vdc, 0.15A max.<br>AC Model 110V to 240Vac, 50/60Hz, 0.15A max. |
| Battery inputs<br>Sensor type<br>String voltage | up to 160 (scaleable to 1280)<br>Measurement Module or m-Senzor<br>2V-1000V |
| Current inputs<br>Sensor type<br>Measurement range<br>System accuracy<br>Maximum distance | up to 5 (scaleable to 16)<br>Hall Effect<br>0A – 2000A<br>±1% + sensor accuracy<br>15m / 50ft [1] |
| Temperature inputs (Ambient)<br>Measurement range<br>System accuracy<br>Maximum distance | up to 5 (scaleable to 16)<br>0°C to 80°C/32F to 176F<br>±1°C / 1.8F<br>15m/50ft |
| Digital inputs | 4 |
| Relay outputs<br>Rating<br>Selectable | 4 voltage free<br>1.25A @ 24VDC<br>Any relay configurable to any alarm |
| Memory | 350,000 data points |
| Physical dimensions | Width: 430mm / 17 inches (19" rack compatible)<br>Depth: 270mm / 10.6 inches<br>Height: 45mm / 1.8 inches (1U) |
| Operating temperature<br>Storage temperature | 0°C to 50°C/32F to 122F<br>0°C to 70°C/32F to 158F |
| Service port | RS232 |
| Com port 1<br>(Optional) | Primary monitoring connection with option of:<br>Ethernet – 10Base-T<br>RS232<br>Wi-Fi |
| Com port 2<br>(Optional) | Building management interface with option of:<br>RS485 or RS232 interface<br>Modbus ASCII or Modbus RTU protocol<br>SNMP<br>Modbus TCP |

## m-Senzor
**Dual and Single Input**

| Purpose | Measures individual monoblock voltage, impedance and temperature | | | |
| --- | --- | --- | --- | --- |
| Application | VRLA and vented lead acid, Ni-Cad cells | | | |
| Nominal voltage | Ni-Cad | 2V | 6V | 12V |
| Voltage measurement range | 0.8V-1.9V | 1.6V-2.6V | 4.8V-7.8V | 9.6V-15.6V |
|   Typical Accuracy[2] | ±0.3% | ±0.3% | ±0.2% | ±0.2% |
|   Resolution | 0.001V | 0.001V | 0.005V | 0.005V |
| Impedance measurement range | 0.15-5.00mΩ | 0.15-5.00mΩ | 0.50-20.00mΩ | 1.00-40.00mΩ |
|   Typical Accuracy | ±2.5% ±15uΩ | ±2.5% ±15uΩ | ±2.5% ±25uΩ | ±2.5% ±25uΩ |
|   Resolution | 1uΩ | 1uΩ | 1uΩ | 1uΩ |
| Temperature measurement range | -4°C to 70°C/24.8F to 158F | | | |
|   Measurement location | Negative post of battery (Variable – Pilot to 1 per battery by demand) | | | |
| Maximum input voltage | ±5V | ±6V | ±25V | ±65V |
| Power supply current | 50mA | 30mA | 18mA | 18mA |
| Isolation | 750V DC[4] | | | |
| Power supply | Powered by monoblock being monitored | | | |
| Interface to Sentinel | PowerShield BBUS II (maximum 150m/492ft per BBUS port) | | | |

4V, 8V, 16V m-Senzors also available. Contact PowerShield for full details.



## Measurement Module
**Dual and Single Input**

| Purpose | Measures individual monoblock voltage | | |
| --- | --- | --- | --- |
| Application | VRLA and vented lead acid | | |
| Nominal voltage | 2V | 6V | 12V |
| Measurement range | 1.6V-2.6V | 4.8V-7.8V | 9.6V-15.6V |
| Typical accuracy[2] | ±0.25% | ±0.2% | ±0.2% |
| Maximum input voltage | 6V | 36V | 36V |
| Power supply current | 10mA | 3mA | 3mA |
| Isolation | 600V DC | | |
| Power supply | Powered by monoblocks being monitored | | |
| Interface to Sentinel | PowerShield BBUS (maximum 100m/330ft per BBUS port) | | |



## Link Battery Management Software

Recommended[3] minimum PC system requirements for PowerShield Link software:

| Processor | 1GHz or better x86 or x64 processor |
| --- | --- |
| Operating System | Windows XP Professional or later |
| RAM | 2GB 32 bit or 4MB 64 bit |
| Hard Drive | Single SATA 2 hard drive or better. 160 GB with 20GB available hard disk space |
| Monitor | 1024 x 768 or 1366 x 768 |

[1] Greater distances may be used in a benign electrical environment.
[2] Accuracy is ±0.3% for temperature range of 0°C to 50°C / 32F to 122F.
[3] Recommended for up to 5 Sentinel sites, with single seat operation. Refer to PowerShield for larger configurations
[4] Design rated to 750VDC. UL certified to 600VDC

**www.powershield.com**