


## Battery management system

The PowerShield8 system provides monitoring for an unlimited number of batteries, with hardware options targeting both large and small battery systems. A complete solution of hardware and software ensures you get the information you need to confirm your backup batteries are operating within IEEE/IEC guidelines.

### System specifications

	Controller LX	Controller MX		Controller LX	Controller MX
<b>Capability</b>	up to 512 blocks up to 8 strings*	up to 200 blocks up to 4 strings*	<b>Interfaces</b>	Link Battery Management Software Controller Web Interface	
				16 x 2 character LCD & keypad	–
<b>Battery system information</b>	Block: Voltage, Ripple Voltage, Ohmic, Temperature String: Voltage, Current, Ripple Current Environment: Ambient Temperature, Humidity		<b>Communication ports</b>	2 x 1000Base-T Ethernet 2 x Expansion ports - RS485 (optional)	1 x 1000 Base-T Ethernet 1 x USB 1 x Expansion ports - RS485 (optional)
<b>Battery types</b>	Lead Acid (2V, 4V, 6V, 8V, 12V & 16V) Ni-Cd (1.2V, 3.6V)		<b>Protocols</b>	ModbusTCP, SNMP and HTTP ModbusRTU when RS485 card is fitted	
<b>Battery charging regime</b>	Float and Intermittent		<b>Relay outputs</b>	4	1
<b>Thermal runaway management</b>	String breaker or charger step down signalling		<b>Digital inputs</b>	up to 10 2 via Controller, up to 8 via Hubs	up to 4 via Hubs*
<b>Environment</b>	Operating temperature: 0 to 50°C / 32 – 122°F Storage temperature: -10 to 70°C / 14 – 158°F 10 to 90% RH non condensing Altitude: 2000m max., Indoor use only.		<b>Certifications</b>		

### Controller

	Controller LX	Controller MX		Controller LX	Controller MX
<b>Service port</b>	Front Ethernet port (1000Base-T)	USB 2.0 (Type B)	<b>Dimensions</b>	1U High 19" rack mount	
<b>Port 1</b>	Back Ethernet port (1000Base-T)		<b>Width</b>	430mm / 16.9 inches	250mm / 9.84 inches
<b>Port 2</b>	Expansion port - optional RS485		<b>Depth</b>	265mm / 10.4 inches	155mm / 6.1 inches
<b>Port 3</b>	Expansion port - optional RS485	–	<b>Height</b>	45mm / 1.8 inches	36mm / 1.4 inches
<b>Display</b>	16 x 2 character LCD	–	<b>Power supply</b>	AC Model: 90 – 260V 50/60Hz 24V DC Model: 18 – 30V 48V DC Model: 35 – 60V 110V DC Model: 80 – 150V	AC Model: 90 – 260V 50/60Hz 48 DC Model: 18 – 60V 110 DC Model: 80 – 150V
<b>Front</b>	USB data storage	SD Card data storage	<b>Power consumption</b>	5W + 1.2W per Hub	1.5W + 1.2W per Hub
<b>Relay outputs</b>	4 SPDT	1 SPDT	<b>Digital inputs</b>	2 (Voltage free / Dry contact)	–
<b>Rating Selectable</b>	1A (Q 30VDC, resistive* Any relay configurable to any alarm		<b>Memory</b>	2GB RAM 4GB Flash	512MB RAM 4GB Flash
<b>Configuration interface</b>	Web browser				
<b>Minimum version</b>	Chrome 50, Firefox 45, Safari 6.1, Internet Explorer 10, Edge 12				

\*Contact PowerShield for further details.

# Link battery management software

## Minimum PC system requirements<sup>1</sup>

<b>Processor</b>	Intel i3-6100 or faster	<b>RAM</b>	8GB
<b>Operating system</b>	Windows 10 Windows Server 2012, 2012 R2, 2016	<b>Storage</b>	20GB available hard disk space
		<b>Monitor</b>	1024 x 768 or 1366 x 768

<sup>1</sup> Recommended for up to 5 Controller connections, with single seat operation. Refer to PowerShield for larger configurations.

## mSensor

### Dual and Single Input

<b>Battery type</b>	Lead Acid (2V, 4V, 6V, 8V, 12V & 16V) Ni-Cd (1.2V, 3.6V)			
<b>Nominal voltage<sup>1</sup></b>	NiCad <sup>2</sup>	2V	6V	12V
<b>Operating range</b>	0.8V-1.9V	1.6V-2.6V	4.8V-7.8V	9.6V-15.6V
<b>Maximum input voltage</b>	±5V	±6V	±25V	±65V
<b>DC resolution / accuracy</b>	1mV / ±0.3%	1mV / ±0.3%	5mV / ±0.2%	5mV / ±0.2%
<b>AC resolution</b>	1mV	1mV	1mV	1mV
<b>Ohmic measurement range</b>	0.10-5mΩ	0.10-5mΩ	0.50-20mΩ	1.00-40.00mΩ
<b>Resolution / accuracy</b>	1uΩ / ±2.5% + ±15uΩ	1uΩ / ±2.5% + ±15uΩ	1uΩ / ±2.5% + ±25uΩ	1uΩ / ±2.5% + ±25uΩ
<b>Temperature<sup>3</sup></b>				
<b>Range</b>	-10 to 70°C / 14 to 158°F			
<b>Resolution / accuracy</b>	0.1°C / ±1°C			
<b>Power supply current<sup>4</sup></b>	50mA	30mA	18mA	18mA

<sup>1</sup> Most common models, other models available on request      <sup>3</sup> Operating temperature -10 to 50°C / 14 to 122°F      Design rated to 750VDC. UL certified to 600Vdc  
<sup>2</sup> Ni-Cd single 1V mSensor cannot perform ohmic measurement      <sup>4</sup> Power by block being monitored

The mSensor communicates via Modbus, meaning it can be easily integrated with other Modbus based site management systems. Contact PowerShield for further details.

## Hub

<b>Powered</b>	24Vdc supplied by Controller	<b>Power consumption</b>	1.2W
<b>Digital inputs</b>	1, voltage free	<b>Relay outputs</b>	1
<b>DC current<sup>1</sup></b>	0 - 2000A (Hall Effect sensor)	<b>Temperature</b>	-10 to 80°C / 14 to 176°F
<b>Typical resolution</b>	0.05A	<b>Resolution</b>	0.1°C / 0.18°F
<b>Accuracy</b>	±1% + CT accuracy	<b>Accuracy</b>	±1°C / 1.8°F
<b>Ripple current (AC)<sup>1</sup></b>	True RMS	<b>Relative humidity</b>	0 - 100%
<b>Typical resolution</b>	0.5A	<b>Resolution</b>	1.0%
<b>Accuracy</b>	±1% + CT accuracy	<b>Accuracy</b>	20% - 80% ±3% at 25°C / 77°F
<b>Frequency range</b>	10 – 1000Hz		

<sup>1</sup> Resolution dependent on CT model used, typical values are based on 400A CT      \*Contact PowerShield for further details.

## Installation Dimensions

Dimension	Maximum		Factory sizes	
	Metres	Feet	Metres	Feet
<b>A</b>	75	246	-	-
<b>B</b>	50	164	3, 5, 10, 15	10, 16, 33, 49
<b>C</b>	25	82	-	-
<b>D</b>	15	49	3	10
<b>E</b>	-	-	0.2, 0.4, 0.7, 1.0	8, 16, 28, 39 inches

