Pivotal TECHNOLOGIES

pBDL Battery Data Logging System

Real Time Battery Data Logging for Mission Critical Environments

Multiple Alarm Transmission Paths – Email/SMS/SNMP/GPRS

Rich web based user interface supported by in-built web server

Data Visualization through real time, data driven dashboards for web and mobile devices

High Resolution automated graphing and reporting on all Battery measurements

Advanced Analytics, Search and Reporting capabilities on Captured Data & Event History

Nationwide Network of Authorised Dealers, Installers & Technicians

100% Researched, Designed and Manufactured in Australia

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Safeguarding Mission-Critical Environment

A mission-critical environment cannot tolerate system failures such as power outages. Consequently, it is vital that the onset of failure is identified and resolved at the earliest possible instance. To this end, comprehensive system and environmental monitoring is a central facet of a safeguarded mission-critical environment.

Battery backups are commonly employed in cases where failure resilience is a design requirement. This may range from small desktop UPS to complex, highly redundant failure protection architectures of the type found in critical infrastructure. Batteries may provide a source of backup power or serve as a stopgap to manage changeover to a long-term failure management framework.

Improved System Monitoring

As the cornerstone of a failure management system, a battery backup network must always be ready to serve in its full capacity during the service lifecycle. Comprehensive and accurate battery monitoring allows operators to ensure this is the case at any given time and allows issues to be identified and resolved as early as possible.

Monitoring via UPS allows an operator to gauge the health of a battery network, but generally does not enable assessment of individual components or identify imbalances. A dedicated battery monitoring system allows operators to measure the health of battery networks at the level of individual cells, enabling issues to be isolated and rectified without necessarily taking the system offline.

Financial Benefits

Battery monitoring systems deliver cost savings that justify the case for implementation:

- Increase the interval between maintenance and periodic discharge tests via constant monitoring.
- Preventative maintenance cost and outage windows reduced as issues can be isolated at the cell level.
- Reduce the need for on-site presence by enabling 24/7 remote monitoring.
- Enhance & extend the service life of individual batteries through ongoing verification of cell health.
- Replacement quantity and purchase timing is managed more effectively on the basis of historical data.

Battery Monitoring with Pivotal Technologies EMSpro Platform

Pivotal Technologies' PBDL is a universal battery data logging system designed to monitor the state and conditions of SLA/VRLA (or wet cell) stand-by batteries operating in mission critical systems. PBDL enables operators to realise the real-time condition and performance of their battery system for the entirety of the system lifecycle.

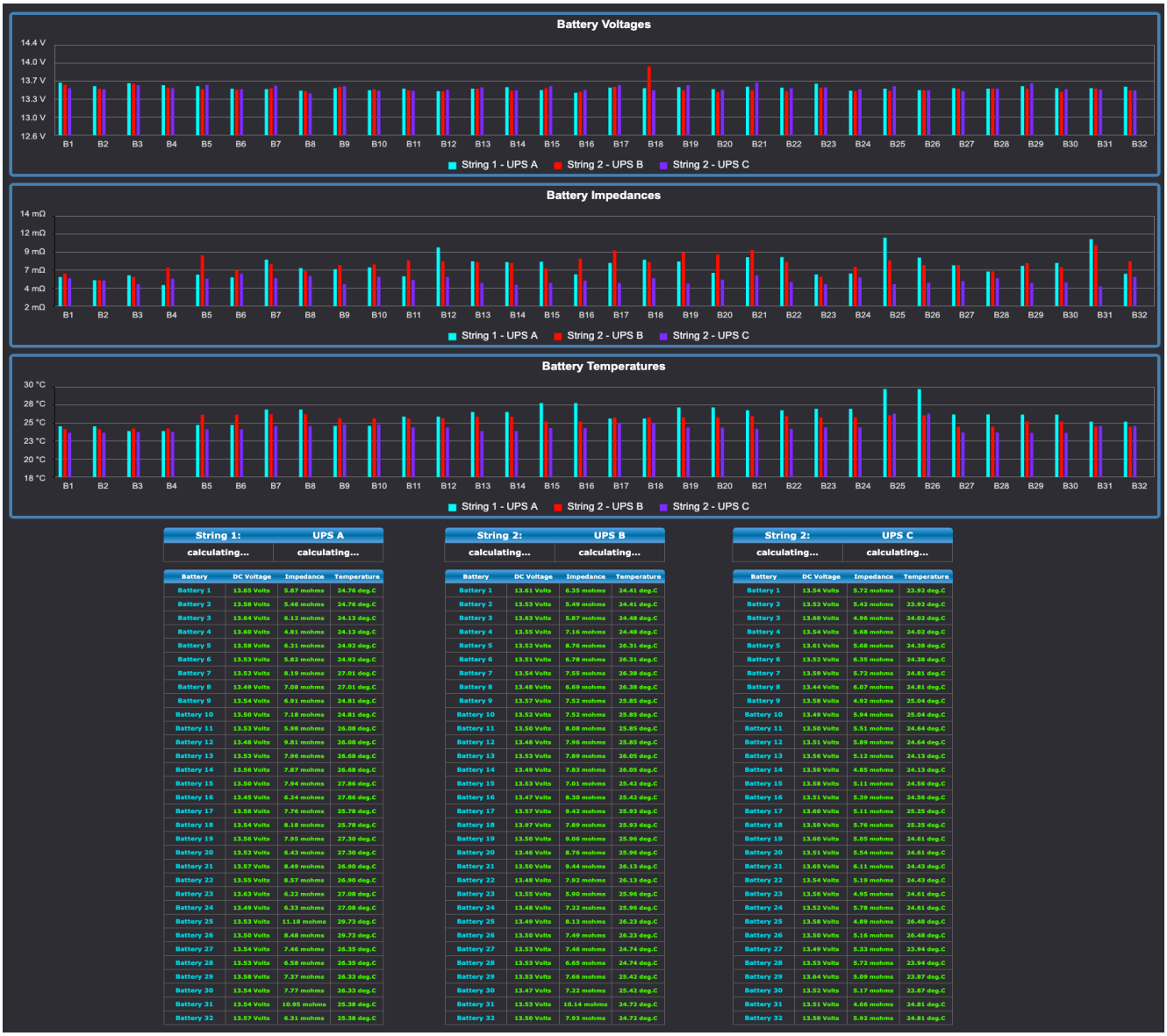
The PBDL system is modular and highly scalable allowing it to be tailored to wide range of requirements. It is suited to both retrofit and new installations. It is based on the widely used Modbus Client-Server protocol.

PBDL employs Pivotal Technologies' flagship EMSpro head-end for real-time monitoring, system alerts, analytics and reporting. The EMSpro system is web-based and fully user-configurable allowing for complete access and control whether on-site or remotely. The EMSpro platform is itself modular, scalable and interoperable with existing systems, and this capability may be further leveraged beyond the use of PBDL itself.

- Stand-alone microprocessor based panel with real time operating system
- Modular architecture allowing for logical expansion through hardware and 3rd party devices
- Web Based User interface which is cross browser compliant
- Real time monitoring implementation for all battery parameters such as voltage, impedance and temperature
- High resolution plotting of all monitored points with advanced graph and reporting capabilities
- Alarm processing with highly configurable user parameters based on logical operators
- Encrypted contact ID over GPRS for 24hr remote monitoring centre support
- Advanced search, automated reports and export features for battery measurement parameters
- User configurable Macros to manage maintenance windows around alarm escalations
- Highly configurable Analytic reports to manage battery profiling and graphing
- DGLux5 integration for the implementation of HTML5 front end graphics for the visualization of your data centre

pBDL Features

- Measures battery voltage, impedance and temperature
- Supports wide range of battery models from 2V -20V
- String voltage measurements from 2V - 1000V
- String current measurements from 0A - 1000A
- Scalable design - up to 400 batteries and 8 Strings per system
- Small size, low cost, low power
- Sensors powered from monitored batteries
- Isolated communications network for safety
- Embedded console/terminal menu for sensor configuration



String 1:	UPS A
calculating...	calculating...

Battery	DC Voltage	Impedance	Temperature
Battery 1	13.65 Volts	5.87 mohms	24.76 deg.C
Battery 2	13.58 Volts	5.46 mohms	24.76 deg.C
Battery 3	13.64 Volts	6.12 mohms	24.13 deg.C
Battery 4	13.60 Volts	4.81 mohms	24.13 deg.C
Battery 5	13.58 Volts	6.21 mohms	24.92 deg.C
Battery 6	13.53 Volts	5.82 mohms	24.92 deg.C
Battery 7	13.52 Volts	8.19 mohms	27.01 deg.C
Battery 8	13.49 Volts	7.08 mohms	27.01 deg.C
Battery 9	13.54 Volts	6.91 mohms	24.81 deg.C
Battery 10	13.50 Volts	7.18 mohms	24.81 deg.C
Battery 11	13.53 Volts	5.98 mohms	26.08 deg.C
Battery 12	13.48 Volts	9.81 mohms	26.08 deg.C
Battery 13	13.53 Volts	7.96 mohms	26.68 deg.C
Battery 14	13.56 Volts	7.87 mohms	26.68 deg.C
Battery 15	13.50 Volts	7.94 mohms	27.86 deg.C
Battery 16	13.45 Volts	6.24 mohms	27.86 deg.C
Battery 17	13.56 Volts	7.76 mohms	25.78 deg.C
Battery 18	13.54 Volts	8.18 mohms	25.78 deg.C
Battery 19	13.56 Volts	7.95 mohms	27.30 deg.C
Battery 20	13.52 Volts	6.43 mohms	27.30 deg.C
Battery 21	13.57 Volts	8.49 mohms	26.90 deg.C
Battery 22	13.55 Volts	8.57 mohms	26.90 deg.C
Battery 23	13.63 Volts	6.22 mohms	27.08 deg.C
Battery 24	13.49 Volts	6.33 mohms	27.08 deg.C
Battery 25	13.53 Volts	11.18 mohms	29.73 deg.C
Battery 26	13.50 Volts	8.48 mohms	29.73 deg.C
Battery 27	13.54 Volts	7.46 mohms	26.35 deg.C
Battery 28	13.53 Volts	6.58 mohms	26.35 deg.C
Battery 29	13.58 Volts	7.37 mohms	26.33 deg.C
Battery 30	13.54 Volts	7.77 mohms	26.33 deg.C
Battery 31	13.54 Volts	10.95 mohms	25.38 deg.C
Battery 32	13.57 Volts	6.31 mohms	25.38 deg.C

String 2:	UPS B
calculating...	calculating...

Battery	DC Voltage	Impedance	Temperature
Battery 1	13.61 Volts	6.35 mohms	24.41 deg.C
Battery 2	13.53 Volts	5.49 mohms	24.41 deg.C
Battery 3	13.63 Volts	5.87 mohms	24.48 deg.C
Battery 4	13.55 Volts	7.16 mohms	24.48 deg.C
Battery 5	13.52 Volts	8.76 mohms	26.31 deg.C
Battery 6	13.51 Volts	6.78 mohms	26.31 deg.C
Battery 7	13.54 Volts	7.55 mohms	26.38 deg.C
Battery 8	13.48 Volts	6.69 mohms	26.38 deg.C
Battery 9	13.57 Volts	7.52 mohms	25.85 deg.C
Battery 10	13.52 Volts	7.52 mohms	25.85 deg.C
Battery 11	13.50 Volts	8.08 mohms	25.85 deg.C
Battery 12	13.48 Volts	7.96 mohms	25.85 deg.C
Battery 13	13.53 Volts	7.89 mohms	26.05 deg.C
Battery 14	13.49 Volts	7.83 mohms	26.05 deg.C
Battery 15	13.53 Volts	7.01 mohms	25.42 deg.C
Battery 16	13.47 Volts	8.30 mohms	25.42 deg.C
Battery 17	13.57 Volts	9.42 mohms	25.93 deg.C
Battery 18	13.97 Volts	7.89 mohms	25.93 deg.C
Battery 19	13.50 Volts	9.06 mohms	25.96 deg.C
Battery 20	13.46 Volts	8.76 mohms	25.96 deg.C
Battery 21	13.50 Volts	9.44 mohms	26.13 deg.C
Battery 22	13.48 Volts	7.92 mohms	26.13 deg.C
Battery 23	13.55 Volts	5.90 mohms	25.96 deg.C
Battery 24	13.48 Volts	7.32 mohms	25.96 deg.C
Battery 25	13.49 Volts	8.13 mohms	26.23 deg.C
Battery 26	13.50 Volts	7.49 mohms	26.23 deg.C
Battery 27	13.53 Volts	7.46 mohms	24.74 deg.C
Battery 28	13.53 Volts	6.65 mohms	24.74 deg.C
Battery 29	13.53 Volts	7.66 mohms	25.42 deg.C
Battery 30	13.47 Volts	7.22 mohms	25.42 deg.C
Battery 31	13.53 Volts	10.14 mohms	24.72 deg.C
Battery 32	13.50 Volts	7.93 mohms	24.72 deg.C

String 2:	UPS C
calculating...	calculating...

Battery	DC Voltage	Impedance	Temperature
Battery 1	13.54 Volts	5.72 mohms	23.92 deg.C
Battery 2	13.52 Volts	5.42 mohms	23.92 deg.C
Battery 3	13.60 Volts	4.96 mohms	24.02 deg.C
Battery 4	13.54 Volts	5.68 mohms	24.02 deg.C
Battery 5	13.61 Volts	5.68 mohms	24.38 deg.C
Battery 6	13.52 Volts	6.35 mohms	24.38 deg.C
Battery 7	13.59 Volts	5.72 mohms	24.81 deg.C
Battery 8	13.44 Volts	6.07 mohms	24.81 deg.C
Battery 9	13.58 Volts	4.92 mohms	25.04 deg.C
Battery 10	13.49 Volts	5.94 mohms	25.04 deg.C
Battery 11	13.50 Volts	5.51 mohms	24.64 deg.C
Battery 12	13.51 Volts	5.89 mohms	24.64 deg.C
Battery 13	13.56 Volts	5.12 mohms	24.13 deg.C
Battery 14	13.50 Volts	4.85 mohms	24.13 deg.C
Battery 15	13.58 Volts	5.11 mohms	24.56 deg.C
Battery 16	13.51 Volts	5.39 mohms	24.56 deg.C
Battery 17	13.60 Volts	5.11 mohms	25.25 deg.C
Battery 18	13.50 Volts	5.76 mohms	25.25 deg.C
Battery 19	13.60 Volts	5.05 mohms	24.61 deg.C
Battery 20	13.51 Volts	5.54 mohms	24.61 deg.C
Battery 21	13.65 Volts	6.11 mohms	24.43 deg.C
Battery 22	13.54 Volts	5.19 mohms	24.43 deg.C
Battery 23	13.56 Volts	4.95 mohms	24.61 deg.C
Battery 24	13.52 Volts	5.78 mohms	24.61 deg.C
Battery 25	13.58 Volts	4.89 mohms	26.48 deg.C
Battery 26	13.50 Volts	5.16 mohms	26.48 deg.C
Battery 27	13.49 Volts	5.33 mohms	23.94 deg.C
Battery 28	13.53 Volts	5.72 mohms	23.94 deg.C
Battery 29	13.64 Volts	5.09 mohms	23.87 deg.C
Battery 30	13.52 Volts	5.17 mohms	23.87 deg.C
Battery 31	13.51 Volts	4.66 mohms	24.81 deg.C
Battery 32	13.58 Volts	5.92 mohms	24.81 deg.C

Technical Specifications

GENERAL

Nominal Voltage:	2 x 12	*VDC*
Power Supply Current:	25	*mA*
Measurement Interval:	5	*secs*
Voltage Measurement		
Range:	1.7 – 16.2	*VDC*
Resolution:	10	*mV*
Typical Accuracy:	±1.0	*%*
Current Measurement (String)		
Range:	±1000	*A*
Resolution:	0.5	*A*
Typical Accuracy:	1.5	*% FS*
Impedance Measurement		
Range:	.5 – 100	*mΩ*
Resolution (12-bit):	5	*μΩ*
Typical Accuracy:	1.0	*% FS*
Test Current:	50 – 100	*mA*
Test Current Frequency:	1	*kHz*
Temperature Measurement		
Range:	-10 – 60	*°C*
Resolution:	0.5	*°C*
Typical Accuracy:	1.0	*% FS*

ENVIRONMENTAL

Operating Temperature:	0 – 60	*°C*
Operating Humidity:	10 – 90	*% RH*
Storage Temperature:	-20 – 85	*°C*

COMMUNICATIONS

Electrical:	RS/EIA-485 Isolated)	(500kV
Protocol:	Modbus RTU	
Address Range:	1 to 247	
Baud Rate:	9600, 19200, 38400	
Data Bits:	8	
Parity:	None	
Stop Bits:	2	

The EMS*pro* / *pBDL* Advantange

The EMS*pro* and pBDL as an Environmental Monitoring / DCIM / Battery Data Logging System solution is completely supported by a dedicated nationwide support team of technicians and certified affiliate installers operating in accordance with Pivotal Technologies strict guidelines.

The Pivotal Technologies R&D team back the platform with ongoing development and system software enhancements to meet the dynamically changing environment of the technology industry. These upgrades are essential in guaranteeing a robust, reliable and state of the art system which provides the end user an element of complete confidence in the product.

A key feature of the EMS platform is the inherent ability to allow for future expansion and portability. Such is the design one can easily expand upon the initial installation as the end user's requirements grow and/or change. Given the nature of the data centre environment to constantly evolve and expand in step with technology advancements, this unique feature sets EMS*pro* apart from its competitors.

♦ *Pivotal Technologies - the pivotal source to the success of your business* ♦