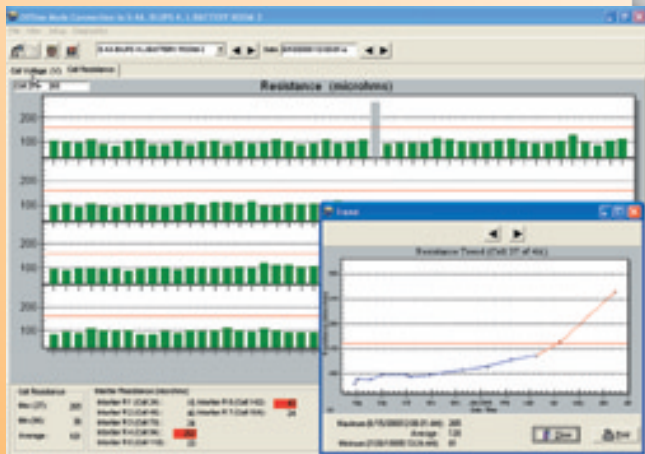
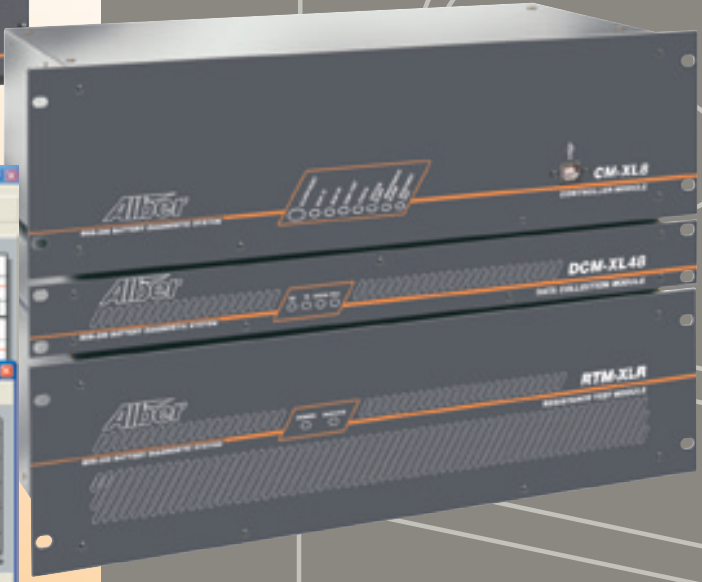


Alber

Trust Your Batteries™

Battery Monitor Products



Doing it right!

www.alber.com



Trust Your Batteries™

*Your battery is the heart of your backup system.
And just like your own heart, you don't want it to fail.*

The Solution

For more than thirty years, Albér has dedicated its worldwide operations to raising the bar in battery testing and monitoring. It's what we do and we take our mission very seriously. Today, Albér is the trusted name in many business sectors that depend on power backup systems with mission critical battery applications, including:

- Major data centers
- Global financial networks

- Industrial manufacturing facilities
- Telecommunications providers
- Critical aviation communication centers
- Nuclear power plants
- Hospitals and other organizations with vital power backup requirements

Albér is about integrity, reliability, and product innovation. It is our proven technology that makes the difference between unexpected failure and continued success!

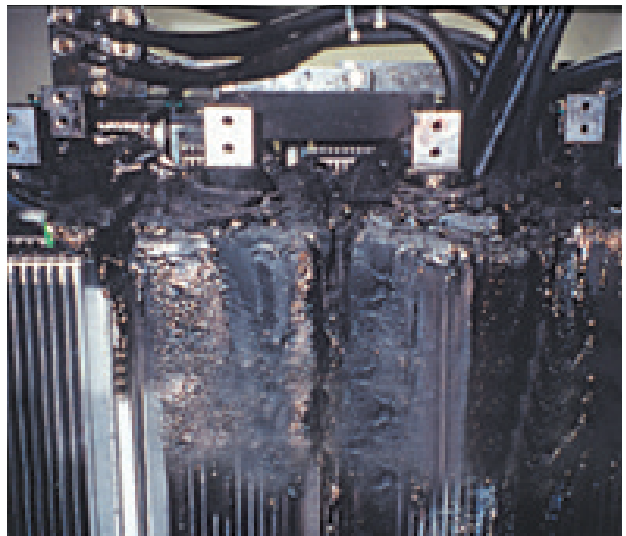
Healthy batteries make for a healthier bottom line

Mission critical technology fuels the global economy 24/7, 365 days a year. Downtime, even a few critical minutes, can cost millions of dollars. As a precaution, many large enterprises invest in backup power systems with sophisticated electronics and generators. The reality, however, is that these high priced systems are completely dependent upon stationary batteries. If these batteries fail before the generator kicks in, backup power will be lost and valuable raw material and production time wasted. Critical data can be erased, not to mention the costly aftereffects of downtime in business communications.

Unfortunately, a majority of UPS batteries are neglected and left without proper care and maintenance. UPS manufacturers claim that at least 40% of all UPS power failures are caused by batteries.

The moment you realize that your batteries are the main cause for costly downtime, and that there is a solution for this problem, you have made a huge step towards protecting your enterprise bottom line.

A full-functioning battery is the most reliable and cost effective backup power alternative; so, it boils down to making sure that the battery is healthy.



*THAT IS WHERE THE ALBÉR
BATTERY MONITOR SYSTEM COMES IN.*

Why do we have to monitor batteries?

A battery has a finite life and, sooner or later, it will fail. All battery manufacturers specify how many discharges their batteries can handle. Every time a lead acid battery goes through a discharge, the internal mechanical structure comes under stress and weakens. Over time, the battery ages as corrosion attacks the grid plates and makes it impossible to deliver the required power. The battery manufacturer specifies environmental parameters such as temperature and charge voltage to avoid premature aging

A battery string consists of multiple cells connected in series. This means that, if one cell fails, the complete string has failed, just like a link in a chain.

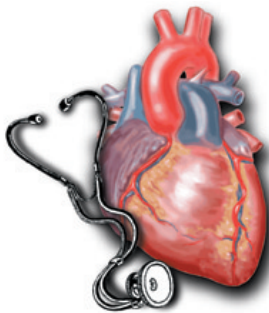
It comes down to making sure that all cells in a battery system are in good condition. The Albér battery monitor keeps track of each cells' internal condition and provides data that allow

the owner to optimize the environmental conditions. This not only ensures the detection of weak cells before they jeopardize the integrity of the complete backup system, but also maximizes the battery's useful life.

Albers monitor customers can rely on their batteries and maintenance activities can be limited to the battery module requiring attention.

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Not all testing methods are created equal

In advanced medicine, most heart problems are detected early, in large part because the medical industry has advanced beyond the basic test of using a stethoscope. Unfortunately, AC test systems can be compared to a stethoscope because they are unable to

assess the true health and longevity of a battery.

Albér's Internal DC Resistance test method eliminates the uncertainty of outdated test methods. Much like a battery ultrasound, our proven method enables the user to "look inside" and assess the battery's true condition.

This is the very reason our customers trust Albér to detect potential battery problems before they become a major financial problem.

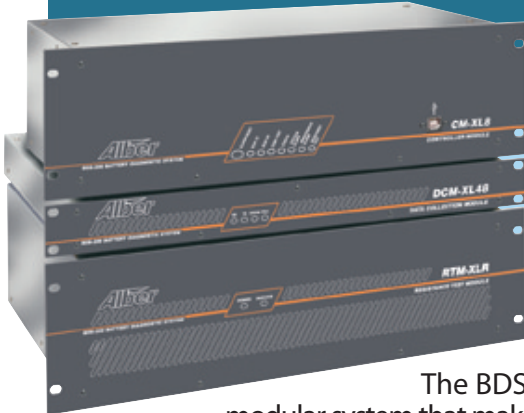
Trust the best

Albér has an impressive track record of providing the most reliable battery monitoring system.

Albér monitors ensure well functioning batteries at mission critical facilities that we all rely upon in our demanding information society.

Trust Your Batteries™

BDS-256 XL



The BDS-256 XL is a modular system that makes it possible to monitor virtually any battery configuration. The BDS-256 XL is composed of the Controller, the Data Collection Module and the Resistance Test Module.

The Controller is the brain of the system and coordinates alarms and traffic to and from the other components in the system. It is capable of monitoring up to 8 strings of 256 cells on independent UPS's. That is a total of 2048 cells per Controller! It has a nonvolatile memory that

can hold up to one years' worth of data. The built in power supply provides 24VAC for all components in the system.

The Data Collection Module (DCM) is a scanning voltmeter that acquires overall voltage, cell voltage, current and temperature readings from the monitored battery string. The DCM can monitor cells or blocks between 1 - 16VDC. When the DCM has captured the data, it compares all parameters with preset thresholds and alerts the user via the Controller if any of these parameters are violated. Each DCM can measure up to 48 cells or battery blocks per string. (See specifications for more detail). If more than one DCM is required for a string, they can be connected in series via fiber optics to accommodate monitoring of up to 256 cells per string. The DCM also controls the load module during the important resistance test.

The last and maybe the most important component is the RTM (Resistance Test Module), which provides the load during the patented resistance test. Without this, the monitor system would not be able to provide the high reliability and repeatable results that Alber customers rely on.

General features and functions of Alber battery monitors

Monitored Parameters

Cell voltage:

Each individual cell or multicell module is measured within every four seconds. The data is immediately compared with thresholds, and if no violations are noticed, the system continues with another scan. If there is a violation, the system alerts the user.

Overall voltage:

A summary of all individual battery cells is presented as overall voltage.

Ambient temperature:

Alber monitors captures the ambient temperature rather than the internal cell temperature. Ambient temperature is an important parameter to monitor, as batteries are greatly affected by high or low temperature. Temperature differences within a string or between parallel strings make the batteries charge differently and age prematurely.

Internal resistance:

An automatic, proactive resistance test is made on every battery cell or module to detect weak cells. The resistance result is compared to preset thresholds, and alarms are generated when violated.

Inter tier resistance:

The longer connections between battery segments measured and presented as a separate value.

Discharge current:

The outgoing current is always measured. This current is an important parameter to watch during discharges and is often used as trigger for discharge capture.

Discharge events:

Planned or unplanned discharge events are automatically recorded for further analysis. A unique safety feature is the ability to see each cell/module voltage in real time on a computer screen during discharge.

Float current: (optional)

Float current sensors measure the charge current.

Digital inputs: (optional on some models)

The BDS-256 and MPM-100 offer the ability to detect external contact open or close operations.

Alarms and communication

Control output: (optional on BDS-256 only)

Form-C contacts can be programmed for any of the measured parameters.

Alarm contacts:

From-C contacts for programmable critical or

Systems and Software

BDS-256 XL (cont.)

The system collects data from all cells or modules within 4 seconds. This high scan rate ensures safe and reliable discharges.

Advantages and Features

- Designed for large UPS systems
- Modular design allows for unlimited battery string configurations with maintained high scan rate and accuracy

- Robust unit designed for up to 256 cells/modules per string
- Controller communicates via modem, serial or TCP/IP for network communication
- Modbus and SNMP protocol for interfacing to third party building management systems
- Fiber optic cable is used for problem-free communication between modules.



The BDS-40 is designed and optimized for UPS batteries using 12V modules. It is built on the same technical platform as the BDS-256 XL and provides the same reliable results, but functions and features are optimized for this 12VDC module application.

The system consists of two different products: the BDS-40 Base unit and the BDS-40 Plus unit. The BDS-40 Base unit consists of all Alber monitoring building blocks: The Controller, DCM and the RTM in one enclosure. The BDS-40 Plus unit consists of the DCM and RTM modules.

The BDS-40 Base unit is a complete, stand alone monitoring system for one string with the ability to expand to a total of 6 strings by using BDS-40 Plus

maintenance alarm violations for BDS series and parameter and hardware violations for the MPM-100.

Visual indications:

LED's on the front panel indicate monitor system and alarm status.

Modbus:

Modbus is available via serial/USB connection, modem (if installed) and network.

SNMP:

SNMP is available via network.

Basic operation

All Alber battery monitors are considered stand-alone so they do not require a connected computer to perform their job. Non-volatile memory resides in each controller to allow data back up for a typical one years worth of alarm, historical, resistance and discharge data.

Continuous monitoring:

The system continuously monitors all critical battery parameters and alerts the user when any of these violate preset alarm thresholds. When the alarm is initiated, the Controller communicates the alarm via network, modem and/or Form-C contacts. The alert can immediately be picked up by third party building management software via the MODBUS or SNMP protocols. The

BMDM software alerts the users via the main BMDM software screen and through email or SMS. The alarm notification can also be sent via fax or to a pager if the monitor system is connected to an analog phone line via modem.

Resistance test:

An automatic, proactive resistance test is performed on a regular interval to detect internal problems of every monitored battery. The intercell and intertier connection resistances are also measured to evaluate the condition of the complete conduction path.

Discharge capture:

When the battery is subjected to a discharge, the system automatically enters capture mode and starts to capture voltage, current and temperature through the discharge event. Separate thresholds can be set to allow reporting of alarm violations during a discharge event. The discharge can later be replayed and analyzed in the BMDM software.

Historical readings:

A snapshot of all monitored parameters is captured at user selectable intervals. Historical readings are used for trending and reporting reasons and provide a solid information base for warranty claims.

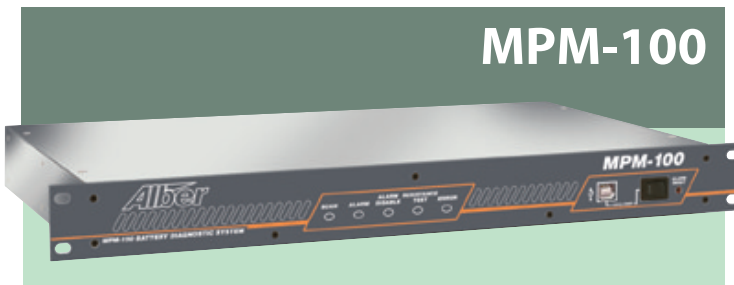
BDS-40 (cont.)

units for strings 2 to 6. BDS-40 is connected via fiber optics to allow monitoring of isolated UPS's.

To simplify installation, the battery sense leads are manufactured to standard battery configurations. The cables are easy to connect, as each lead is cut to specified length and marked to identify the terminal to which it should be connected. The BDS-40 is designed

to sit on top of a battery cabinet or very close to a battery rack.

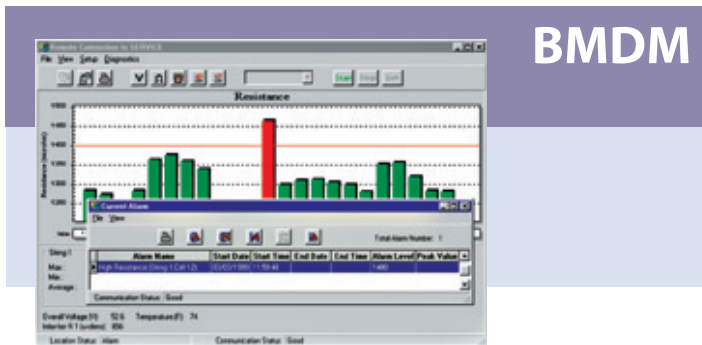
- Utilizes the well proven Albér DC resistance test method
- Monitors all critical battery parameters
- Separate 19" rack enclosure not required
- Easy to install and configure



MPM-100 is an all-in-one battery monitoring solution for smaller battery systems up to 150VDC. It can be configured for all battery configurations that are based on single cells of 1V up to 12V multicell modules.

The MPM-100 measures voltage, current and temperature and performs the internal resistance test on all connected batteries. The MPM-100 can measure a total of 100 measurement points, in a maximum of four parallel strings with a maximum nominal bus voltage of 120V. The MPM-100 is used for utility switchgear batteries, telecom battery applications, generator startup batteries and other configurations that meet the above specifications.

- Utilizes the well proven Albér DC resistance test method
- Monitors all critical battery parameters
- Can be mounted in 19" racks or flush to the wall



The Battery Monitor and Data Management software is the most comprehensive software package for on-line monitoring on the market.

The Software offers five fundamental functions:

- Hardware configuration and management
- Data management using an Access database or optional Microsoft SQL MSDE database
- Records all parameters during discharge events for replay and analysis
- Alarm/alert management via email, SMS, fax and/or pager

- Battery analysis, including real time data monitoring, resistance trending and discharge analysis
- Report and alarm management
- Generates PDF reports every night

The standard Access database offers a simple to configure and manage database environment for users who primarily log in on one computer for report and analysis. The SQL server offers dynamic data support for multiple users.

Each battery module in a system can be analyzed. Trending of internal resistance, charge voltage history and discharge analysis allow the user to properly assess the condition of the battery and make the correct decision.

A Java based web client is also available as a thin client for users who don't want to use the full BMDM software.

The BMDM software gives the user full control of the monitored batteries. Graphs are easy to interpret with color codes indicating weak cells. The built-in setup wizard assists during startup for problem free install.

The BMDM software converts all the detailed data from the batteries into useful information for the user.

Monitor Systems Specifications

	BDS-256 XL	BDS-40	MPM-100
Automatic resistance test		YES	
Discharge event capture		YES	
Historical data		YES	
Real time display on computer		YES	
Cell scan rate		< 4 seconds	
Inputs			
Number of strings per controller	≤ 8	≤ 6	≤ 4
Number of cells/modules per string	≤ 256	≤ 40	≤ 100
Maximum overall nominal bus voltage	600 VDC	600 VDC	150 VDC
Intertier values	15	10	Up to 8
Digital inputs	Up to 16 (optional)	N/A	Up to 8 (std) Up to 16 (opt)
Temperature		YES	
Discharge current		YES	
Float current		YES	
Outputs			
Control outputs	8 (optional)	—	1
Alarm contacts		YES	
Measurement range/tolerance			
Nominal cell/module voltage	1-12 VDC	12 VDC	1-12 VDC
Cell resistance	0 to 32,000 $\mu\Omega$, 5% of reading $\pm 1 \mu\Omega$		
Intertier resistance	0 to 5 m Ω , 5% of reading $\pm 5 \mu\Omega$		
Temperature	0° C to 80° C (32° F to 176° F) $\pm 1^\circ$ C		
Discharge current	0 to 4,000 A 0.1% of reading ± 1 A (shunt), $\pm 5\%$ of full scale (CT)		
Float current	0 to 5,000 mA ± 50 mA		
Communication			
Network, Modem, Serial, USB	YES		
Modbus	YES (Modbus ASCII), TCP/IP and Serial		
SNMP	YES, TCP/IP		
Miscellaneous			
Operating temperature	0° C to 80° C (32° F to 176° F)		
UL listed	YES (E212234)		
CE approved	YES		
Dimensions			
Size	Controller 19"w x 8"d x 5"h	Base 19"w x 16.2"d x 7.8"h	MPM 19"w x 10"d x 1.75"h
	DCM 19"w x 10"d x 1.75"h	Plus 19"w x 16.2"d x 6.1"h	
	RTM 19"w x 12"d x 5"h		
Weight	Controller 16 lbs	Base Unit 34 lbs	MPM 6 lbs
	DCM 6 lbs / RTM 16 lbs	Plus Unit 25 lbs	

*Specifications subject to change without notice / Made in U.S.A.



Other Albér products and services

Albér is known as the battery testing experts. As a driving force in the battery industry, Albér has always spear-headed new product technology and test initiatives in the stationary battery industry.



Information about Albér's portable test systems such as the Cellcorder, BCT-2000 capacity test system and other tools for the battery tester is available on the www.alber.com web site.

Albér is also devoted to educating users in battery technology and offers multiple educational services.

+BATTCON STAY ENERGIZED

The three-day symposium is the central event in the yearly power storage equipment calendar. With seminars and exhibits, Battcon offers presentations from users and manufacturers of batteries and related products, enabling industry to understand the needs of its users.

Sessions on manufacturing, maintenance, and testing issues, including presentations of papers, open forum discussions with the authors, and panel discussions with industry specialists, go hand in hand with a great networking opportunity.

The conference is non-commercial and dedicated to advancing the industry.

Albér Regional Battery Basic Seminars

Albér offers battery seminars and workshops that focus on safeguarding emergency back-up systems through proper battery maintenance and testing. Hands-on sessions cover topics such as: battery fundamentals; battery installation, storage, inspection, and maintenance; charging; safety; monitoring; and load testing.

Seminars are held in different cities throughout the country every month. Please visit our website www.alber.com for a listing of seminars in your area.

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Albér Product Training

Classroom and hands-on training for users of new equipment is available at the customer's facility. Classroom training instructs key personnel about the highly specialized field of battery test and maintenance. Hands-on work sessions ensure understanding of equipment operation.

Lectures directly relate to equipment use and typically address topics such as battery test equipment, battery monitoring, and related equipment.

Battery training sessions usually have 10 to 20 students and last 8 to 12 hours, depending on customer requirements. Session content can be adjusted to individual customer needs.

Albér Leads the Way ...

As the only manufacturer offering comprehensive solutions for ALL accepted battery maintenance procedures, Albér continues to set the standard in battery testing and monitoring technology. Our broad range of products provides you every possible solution your business could ever need.

Alber *Trust Your Batteries™*

Albécorp

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Battcon International Battery Conference
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