
Alber Training and Education Product Tutorial

Alber Monitoring System Basics



Tutorial Topics



- Monitored Parameters
- Monitor Modes of Operation
- Communications
- Alarms
- Input/Output Devices




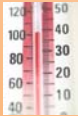

Introduction

- The following describes the general operation and functionality of an Alber monitor system, regardless of model

General Monitor Functions

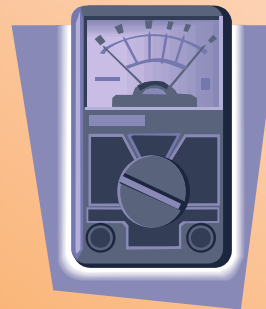
Monitored Parameters

Monitored Parameters

- All Alber monitors can measure the following parameters:
- Voltage 
- Battery current – discharge & recharge 
- Float current 
- Temperature 
- Resistance 

Voltage

- Jar or cell
- Overall battery
- Monitored 24 X 7 and scanned every 5 seconds
- Thresholds evaluated
 - If violated, an alarm is activated based on system programming



Why Monitor Voltage?

- Provides indication of the state of charge of the battery
- Low battery voltage results in loss of capacity and sulfation
- High battery voltage shortens service life and causes flooded batteries to use more water. VRLA types can dry out and cause thermal runaway
- Any out of voltage tolerance, high or low, will shorten service life

Battery Current – Discharge & Recharge

- Monitored 24 X 7 at the end of the system scan
- Detects discharges
- Records data during discharges



Why monitor Battery Current?

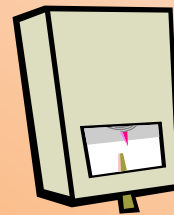
- Indicates battery system load
- Used to calculate system power
- Can be used to trigger system data logging when a discharge occurs

Float Current

- Also called charging current
- Very low value
 - Typically 100 milliamps/100 AH of battery capacity
- Requires special instrumentation
- Monitored 24 X 7 at the end of the system scan

Why Monitor Float Current?

- Indicates the current required to maintain full state of charge
- Useful in early detection of thermal runaway in VRLA batteries
- Is considered best for determining when a battery is fully charged



Temperature

- Ambient and pilot cell monitored
- Monitored 24 X 7 at the end of the system scan
- High and low thresholds evaluated
- If violated, alarm is activated and tagged per system programming



Why Monitor Temperature?

- High temperature is a major cause of premature failure of batteries
- Contributes to thermal runaway in VRLA batteries
- Alerts user to abnormal conditions that should be investigated

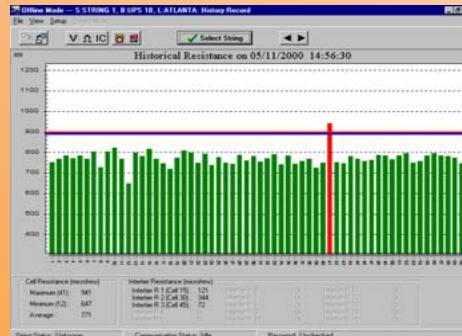
Cell Resistance

- Cell resistance is periodically measured and stored at pre-programmed intervals
- The programmed measurement interval is product specific
- High and low thresholds evaluated
- If violated, alarm is activated and tagged per system programming



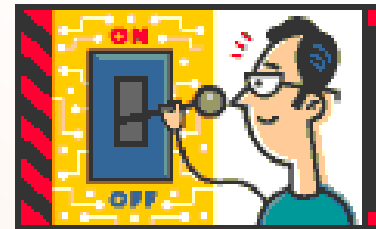
Why Monitor Cell Resistance?

- Why monitor cell resistance?
 - Early detection method
 - Provides a good indication of internal state of health of the cells
 - Trending resistance over time can provide the user with an indication as to when to replace cells before a major failure occurs
 - Allow scheduled maintenance only when needed



Intertier Resistance

- What is an intertier?
 - The cables that interconnect the 12 volt cells between shelves steps throughout the battery cabinet or rack
- Intertier resistance of connecting cables is measured and stored whenever a cell resistance test is performed



Monitor Modes of Operation

Introduction

- Alber monitors have three primary modes of operation
- The mode of operation is automatic and dependent upon the state of the battery at any given time, monitor programming, wiring and software settings
- Modes of operation
 - Normal
 - Resistance
 - Discharge

Normal Mode

- The following parameters are monitored and evaluated against pre-programmed thresholds
- The monitor scans these continuously;
 - Voltage
 - Overall & cell
 - Current
 - Temperature

Resistance Mode

- A cell resistance test is conducted at pre-programmed intervals
 - Example – 1st of each month
 - Prior to a resistance test, all cell parameters are measured and stored into a historical record
 - Alarms are inhibited during a resistance test

Testing and Data Storage

- A manual resistance test can be performed by the user at any time
 - Password protected
 - Resistance test results are compared to programmed thresholds
 - Data is stored in the system computer database

Discharge Mode

- There are only two parameters that can place the monitor into discharge mode
 - Voltage
 - Current

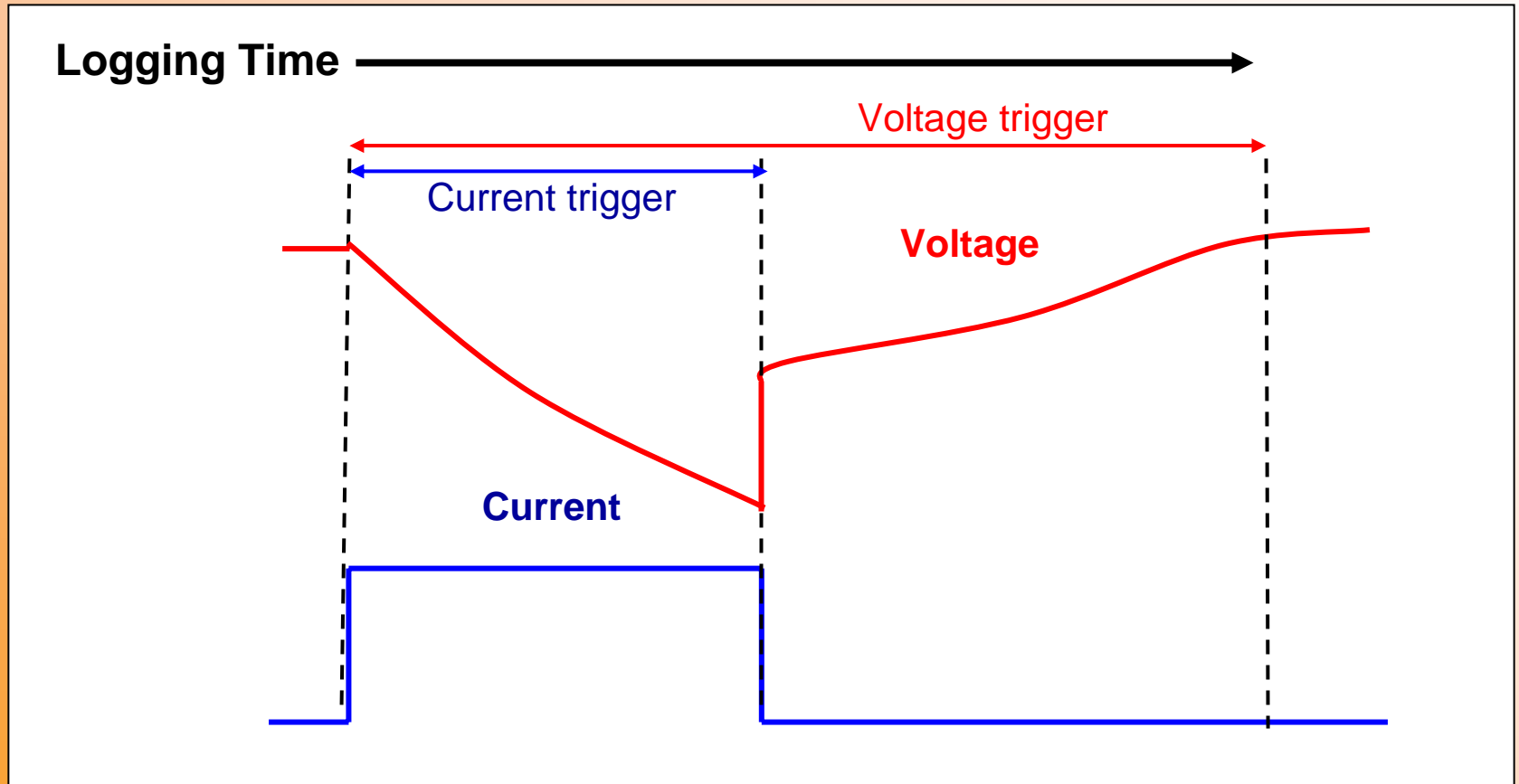
Voltage Trigger

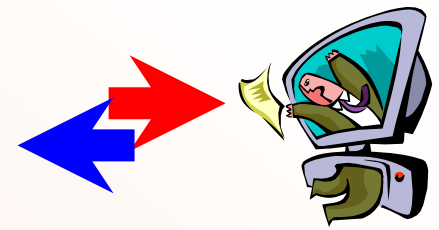
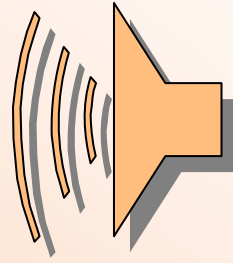
- Voltage trigger
 - Captures all discharge and recharge data as long as the battery voltage is below the trigger value
 - Requires a long time to log all data
 - Delays viewing of discharge data
 - Not recommended for commissioning tests
 - Requires more memory than current trigger

Current Trigger

- Current trigger
 - Captures only the discharge time
 - Provides quick access to data after a discharge occurs, as recharge time is not logged
- Operational note
 - The monitor must be powered by a protected source to ensure continuous operation during a utility outage

Discharge Logging Time Requirements





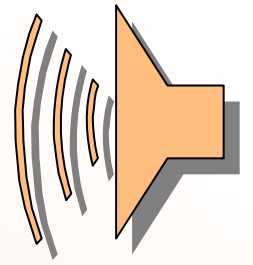
Communication, Alarm and Input/Output Functions



Communications

Types of Communication

- Several types provided depending upon order
- RS-232
 - Direct connection
 - When the system computer is co-located with the monitor
 - Building Management System (BMS) via Modbus
- Modem
 - For remote access
- Network LAN/WAN
 - For remote access









Alarms

Alarms

- Visual alarm indicator LED's on front panel
 - Critical - Red
 - Maintenance - Amber
- Form C contacts - dry
 - Critical
 - Maintenance
- Polled Modbus register
 - (BMS) RS-232/network

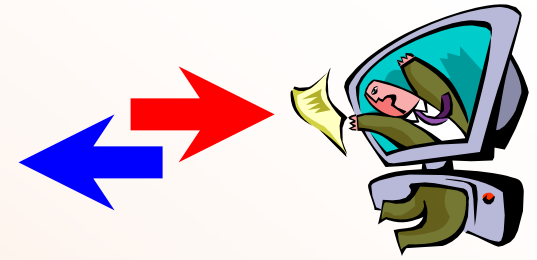


Alarms

- Battery Monitor Data Manager (BMDM) software on central PC
 - Audible on central PC 
 - Pager/SMS (short message service)  
 - Fax 
 - Email 
 - Print function 

Battery Monitor Data Manager Alarm Management

- Battery Monitor Data Manager (BMDM) software on central PC
 - Audible on central PC
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Input/Output Functions

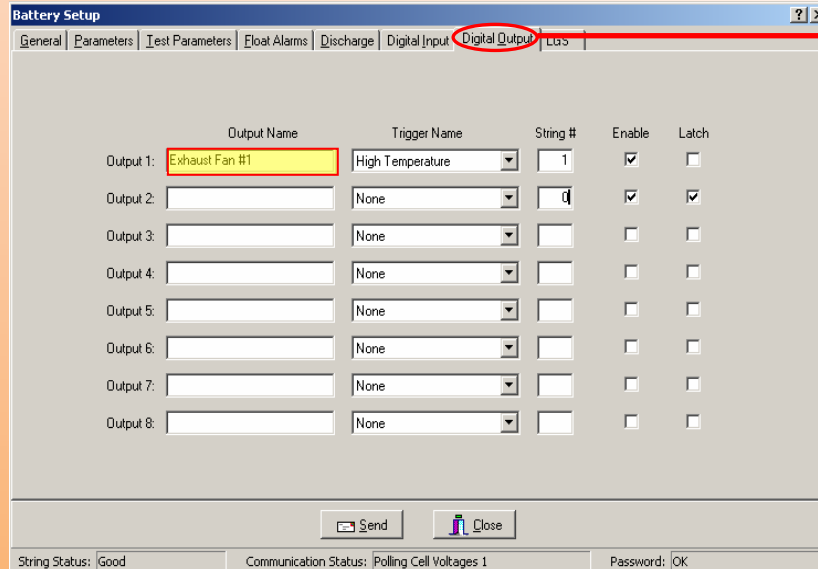
Input/Output Functions

- Some Alber monitors provide digital inputs to accommodate ancillary functions such as door open enunciation, HVAC system failure contact closure, site power failure, etc.
- Digital outputs in the form of dry contacts can be connected and tagged via Alber's software to digital inputs to allow control of devices or equipment
- The next slide illustrates an example of how this works

Digital I/O Option

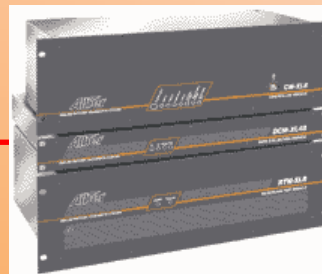
- BDS-256 only
 - Up to 16 digital inputs to monitor dry contacts
 - 12 Volt, 15 Milliamps
 - Up to 8 Form C relay outputs
 - 30 Volt, 2 Amps

Using I/O Option for Fan Control



Battery Room
Temperature
Sensor

Digital Input



Alber Monitor
with I/O Option



Battery Room
Exhaust Fan
(User
Supplied)

Digital Output

Technical Assistance

- Product support is available Monday-Friday, 8:00a.m.-5:00p.m. ET
- Main Phone – 954-623-6660
- Email support – support@alber.com
- Web – www.alber.com
 - Downloads
 - User manuals
 - Installation instructions
 - Product literature and more
 - Service Bulletins

More Tutorials from Alber

- Please visit our website at www.alber.com/training for additional tutorials about monitoring products and software
 - Battery monitoring theory
 - Monitoring system basics
 - BDS-40 monitor
 - BDS-256 monitor
 - MPM-100 monitor
 - Battery monitor data manager software