

Arshanold Modular Battery Monitoring Systems

1 Introduction

BM (Rack mount system), Arshanold and **Sentry** are 3 series of BatteryDAQ product to cover wide range variety of battery applications. Along with our cutting edge software and networking technologies, we provide the reliable and competitive monitoring solutions to both backup and deep cycle battery power.

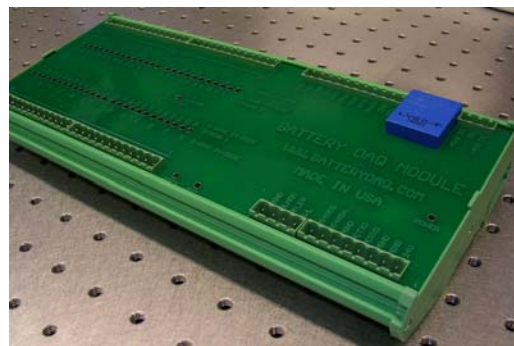
Arshanold is designed to significantly reduce the installation cost. Unlike rack mount systems which require wiring from each battery to distant rack, the compact Arshanold TM module (UL 94-V0 flame retardant housing) can be installed next to battery rack or cabinet. The 3rd generation technology has powered the module for the challenging applications, such as high common voltage, large number of cells, extreme low internal resistance, etc. All excellent performances come in a rigid, 2/3 book size compact module.



Arshanold monitoring system can be flexibly constructed with TM module(s), RM module(s) and communication optional parts for large scale up to several thousands batteries per system.

2 Features

- Advanced precise IR (Internal Resistance) measurement technology
- Separate ohmic value for connection resistance between batteries (2-wire mode for high precision)
- +/-20V for each channel with +/-400V protection at any battery input terminal
- Up to 400VDC (600V for TM-40 high voltage version) super wide voltage range for whole string
- 16-bit high resolution data acquisition
- No mechanical scanning relays, high reliability for industrial application
- High noise immunity for high ripple application
- System-on-board design, no need for other controller
- Industry standard communication: Modbus/RTU.
- ESD protected RS-232C and RS-485 interface
- Dual-color LEDs for each channel for scanning and battery alarm indication
- Easy DIN-rail or wall mount installation



3 Arshanold Modular Systems

Product Number	2-wire Mode	1-wire Mode	Typical Application
AM2402	24 batteries	48 batteries (or 2 X 24)	48V Telecom
AM3002	30 batteries	60 batteries	120, 220VDC Electric Utility DC 480V, 600V Large UPS with 2V cells
AM4012HV	N/A	40 batteries	Up to 600V UPS with 12V blocks

4 Specifications

4.1 Simple Power Supply

Voltage	+12VDC (Universal AC or DC adapter available)
Maximum Power Consumption	< 10W per module
Isolation	500VDC@1min 1,000VDC@1min for high voltage version

4.2 Current Input

Current Sensor	Close loop sensor is suggested for high accuracy. Split core sensor available.
Accuracy	0.1% + sensor accuracy

4.3 Temperature Measurement

Sensor	Digital high precision
Range and Accuracy	-20 to 60°C, 1 °C accuracy

4.4 Battery Voltage Channel

Valid Input Range	+/- 20V
Protected input	+/- 400V at any voltage input terminal
Accuracy	0.1%
Input Wiring	2-wire or 1-wire for each battery

4.5 String Voltage

Sensor	1 separate Channel for string voltage
Range	0 to 400V (0 to 600V for TM-40HV)
Accuracy	0.1%

4.6 Internal Resistance Measurement

Please provide battery capacity for RM module selection.

Range	0 to 30mΩ
2-wire mode	Separate value for Internal Resistance of each battery and Connection Resistance between adjacent batteries.
1-wire mode	Total value of Internal + Connection resistance.

4.7 Communication

Serial Port	Isolated RS-232C and RS-485 interface, Serial to network adapter optional
Isolation protection	500VDC to battery
Protocol	MODBUS RTU
Connection Mode	Mode 1: One-to-One. 1 port to 1 module through RS-232 Mode 2: All modules link through RS-485
Transmission speed	Default 9600 (14400/19200/28800/57600 selectable)
Maximum capacity per system	1 to 30 modules for MODBUS system
Network adapter (optional)	Serial to Ethernet adapter, RJ45, 10/100M
Wireless GPRS (optional)	Connect to Battery Analyzer software or MyBattery platform GSM mobile data plan (AT&T SIM validated) GSM 900/1800MHz, GSM 850/1900MHz
Virtual GPRS module (optional)	Connect to MyBattery platform through regular land network, 10/100Mbps, no SIM

4.8 LED Indication and Alarm Output

- Dual-color LEDs for each channel
- Green LEDs indicate dynamic scanning
- Red LEDs indicate battery condition alarm.
- Alarm output. (DIN-rail relay optional)
- Programmable alarm condition.

5 Software and Database

A. Battery Analyzer Software with SQL Server

Battery Analyzer software has been validated on 32 or 64-bit computer with any OS of:
 1) Windows XP + SP2; 2) Windows Vista; 3) Windows 7; 4) Windows Server 2003 or 2008

B. MyBattery.Info platform compatible

See MyBattery Platform white paper for details. Test Server: www.kokiidemo.com login: test/test
 Production Server: www.MyBattery.info or www.mybatterydata.com for subscribers.

6 Ordering Information

Please download Product Selection Questionnaire from our website. We will discuss with you to select correct product to best fit your application and budget.

Example 1: Remote electric utility site

- 120V DC power with 2V800Ah cells, 2 strings, each has 60 cells, total 120 cells.
- No existing land network
- Mobile phone coverage, GPRS links site to office or MyBattery.Info platform

Item	Part/Rev/Description/Details	Unit	Quantity	Note
1	AM3002 Modular System 30 channels at 2-wire mode	Each	4	Each module monitors 60 cells at 1-wire mode.
2	GPRS Module (RS485)	Each	1	Buyer pays for AT&T data plan
3	O-ring Lead with Fuse	Each	240	Buyer prepares wire from batteries to modules.
4	Current Sensor	Each	2	Current range and installation method need to be specified.
5	PC Software License	Site	1	Manage multiple remote sites.

Example 2: UPS

- High power UPS, 2 string, 40 batteries of 12V170Ah
- Windows Server with COM port on site

Item	Part/Rev/Description/Details	Unit	Quantity	Note
1	AM4012HV Modular System 40 channels at 1-wire mode	Each	2	Each module monitors up to 40 batteries at 1-wire mode.
2	CM65-GT-01 HMI, RS232	Each	2	Direct link to TM-40
3	O-ring lead with fuse	Each	82	Buyer prepares wire from batteries to modules.
4	Current Sensor	Each	2	Current range and installation method need to be specified.
5	PC Software License	Site	1	Each site needs 1 license

Example 3: Large UPS system

- Large UPS with 2V1000Ah cells, 2 strings, each string has 240 cells, total 480 cells in 1 site.
- Individual internal resistance and connection resistance online monitoring
- Network, Battery Analyzer software in multiple PCs

Item	Part/Rev/Description/Details	Unit	Quantity	Note
1	AM3002 Modular System 30 channels at 2-wire mode	Each	16	Each module monitors 30 cells at 2-wire mode for very low internal resistance.
2	Network Adapter (RS485)	Each	2	Each string utilizes 1 adapter
3	O-ring lead with fuse	Each	960	Buyer prepares wire from batteries to modules.
4	Current Sensor	Each	2	Current range and installation method need to be specified. Split-core sensor available
5	PC Software License	Site	1	Each site needs 1 license

Example 4: Telecom

- 48V DC system with 2V1500Ah cells, 2 strings. Each string has 24 cells, total 48 cells in 1 site.
- Land network available
- Centralized management for remote sites

Item	Part/Rev/Description/Details	Unit	Quantity	Note
1	AM2402 Modular System 24 channels at 2-wire mode	Each	2	Each module monitors 24 cells at 2-wire mode for very low internal resistance.
2	Virtual GPRS (RS485)	Each	1	Each site utilizes 1 adapter
3	O-ring lead with fuse	Each	96	Buyer prepares wire from batteries to modules.
4	Current Sensor	Each	1	Current range and installation method need to be specified. Split-core sensor available
5	MyBattery Platform subscription	Site	1	Annual fee for data access

References

1. USABC website: Battery testing procedure and terminology.
2. IEEE Std 1188 (1996) IEEE Recommended Practice for Maintenance, Testing, and Replacement of Valve-Regulated Lead-Acid(VRLA) Batteries for Stationary Applications
3. IEEE Std 1491 (2005) IEEE Guide for Selection and Use of Battery Monitoring Equipment in Stationary Application

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