

MPM-100 Monitor

Product Description Guide



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MPM-100 Product Description Guide

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Drawings

IMPORTANT NOTE:

The drawings in this manual may not be the most recent revision and are included for reference only. Refer to the Engineering Drawing Package included with your system for the newest drawings.

Drawings in this manual may be for reference only or superseded by later drawings. For the latest information, refer to the drawings supplied with your system.

General Assembly BDS-154-B557

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1. MPM-100 General Description

The MPM-100 is a stand-alone monitor for communication and power industry applications. What sets Albér monitors apart from others is their ability to provide early warning of battery problems. The monitor checks the state of health of each cell by performing a proactive resistance test, a reliable predictor of battery performance. In addition, to indicate immediate battery health and monitor status of a given location, the system reports to a Central computer (a generic PC) displaying status screens.

Using polling and data transfer algorithms, the Battery Monitor Data Manager program lets a Central computer manage over 1000 monitor systems. Data is stored in the computer database for later analysis and reporting. At any time, service personnel may call a battery location from the Central computer or a remote location (such as from home), or directly connect to the monitor without losing contact with the computer.

The Data Manager string and monitor status indicators make central battery monitoring easy. Terms such as Discharging, Alarm or Warning for string status or Active for monitor status quickly summarize events. Conditions reported to the Central computer are displayed as a list, to easily identify trouble spots. The system also features several methods of automated reporting of alarm occurrences, such as contacting key personnel via a pager, email or fax.

Flexibility was a major design consideration. Because the monitors are stand-alone units with no external computer needed, a primary protocol using Modbus ASCII was selected to let you incorporate the monitor into large-scale facility monitors. This allows third-party interfaces to access all the stand-alone features of the monitor, yet leaves the advanced features of the Data Manager remote communication software available for service personnel.

1.1. Normal Operating Mode

In normal mode, the system scans all parameters in one to five seconds, depending on the configuration. As readings are taken, they are compared to user-programmed alarm levels. The monitor can then call a Central computer and energize an alarm contact if a parameter exceeds a level. Front panel LEDs indicate scan and alarm status, and alarm events are stored in memory for future analysis.

1.2. Discharge Mode

If a discharge is detected, the system goes into a data logging mode and stores battery voltages and discharge current into a discharge record.

1.3. Resistance Test Mode

A battery resistance test may be performed at user-set intervals. The test is similar to that performed by the Albér Cellcorder. On an MPM-100, up to eight intertiers can be configured for this measurement.

1.4. Alarm Features

The monitor may be set to automatically call the Central computer to report an alarm condition when detected. You can program high and low alarm levels on all voltage and temperature parameters, and a high alarm level for resistance. When any parameter goes outside the normal range, the monitor stores the event in memory, the Alarm LED lights up, and an alarm relay with a Form C contact energizes. The alarms may be set for latching or nonlatching.

1.5. Controlled Run Down Test

You can program time intervals (in days) and length of time (in minutes) to have a contact closure optionally put the system on battery. During this time, the system treats the condition as a discharge and saves the changing parameters to a discharge record for playback and analysis.

1.6. MPM-100 Features

This section describes standard and optional MPM-100 features.

NOTE:

Some features require optional accessories or are unit configuration dependent.

- Scans all pertinent battery parameters, such as overall voltage, cell voltages, current, and temperature.
- Performs a scheduled resistance test of all cells/jars, intertiers, and stores results for trending analysis.
- Auto detects discharges based on Overall Volts or Discharge Current, and stores data for real time or accelerated time playback.
- Signals if any parameter is outside user-programmed limits, energizes a Form C relay contact, and calls a Central computer to report the alarm condition.
- Incorporates a Form C alarm contact for monitor hardware failure or power failure.
- Incorporates three 3 programmable contacts that are configurable to N/O or N/C.
- Communicates with an external computer via USB, modem, and RS-232/RJ-45/LAN.
- Performs a scheduled, user-programmed test of putting the system on battery and monitoring discharge, with real time or fast time playback.
- Monitors up to 16 digital inputs.
- Network compatible.
- Continuous load unit (CLU) control.

1.7. Battery Monitor Data Manager (BMDM) Program Features

- Windows™ 2000, XP, 7 and 8 compatible Central computer control software.
- Easy to read string and monitor status.
- Automatic polling for over 1000 monitor sites for monitor and string status reporting.
- Historical event list for complete string history.
- Automatically receives calls from monitors and updates the central database for data analysis.
- Service mode for service personnel, and local USB direct connect viewing of string details and system setup when loaded on a laptop computer.
- Microsoft Access™ database compatible, with management of all stored data.
- Playback of discharge rundown test and controlled rundown test data.
- Automatic paging, emailing, and faxing of alarm events.
- Instant trend graphs of any selected parameter.
- Complete memo tracking down to the cell/module level.
- Status display can be customized for multi-customer monitoring.
- Network compatible.
- SQL server compatible.

1.8. Optional and additional Accessories

The standard optional accessories are shown here, others are also readily available 954-623-6660.

Optional and Additional Parts

Description	Photo	Purpose
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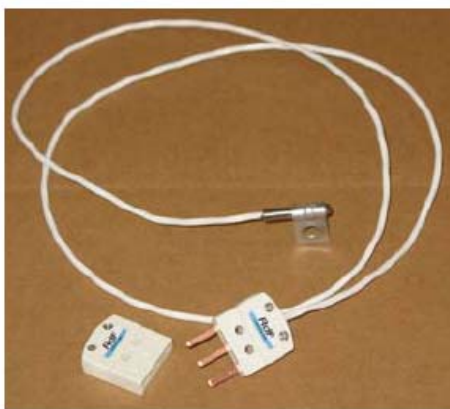
Shunt
4720-017



Shunt for measuring discharge current. PHOTOS and PART NUMBERS VARY WITH CONFIGURATION REQUIREMENTS

Figure 1. Shunt/Shunt Adapters

Ambient
temperature probe
2900-029



Temperature probe that hangs free for ambient temperature measurement. Refer to drawing BDS-159-A421.

**Figure 2. Ambient Temperature Probe
2900-029**

Electrolyte
temperature probe
2900-010



Teflon coated probe, may be immersed in a flooded cell. Refer to drawing BDS-159-A421.

**Figure 3. Electrolyte Temperature
Probe 2900-010**

External Network
Interface 2025-063
to include
2025-063P
2025-118
2025-120
4000-047R1.0



Please refer to part number 4000-047R1.0, UDS-10 External Network Interface Setup User's Guide for further instructions.

Figure 4. External network interface

600 amp CT
5610-016



Use Drawing BDS-1120-A483 Rev C - PHOTOS VARY DEPENDING UPON MODEL(S) CHOSEN

Figure 5. 600 amp Current Transducer (CT)

FCCP Kit
5610-051



Float current measurement transducer for a single string.

NOTE:
Part number 5610-050 is for dual strings and would include one more clamp on the probe.

Figure 6. Multitel Float Charging Current Probe Kit

2. Panel Controls and Indicators

2.1. Panel Controls and Indicators

This section describes the front and rear panels that comprise a typical MPM-100 system.

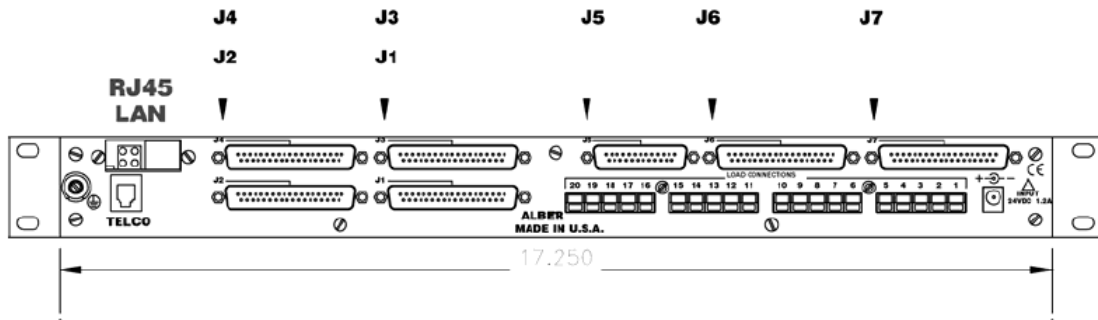


Figure 7. Rear Panel with RJ45

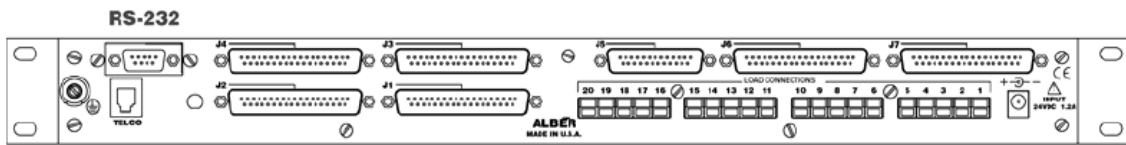


Figure 8. Rear Panel with RS-232

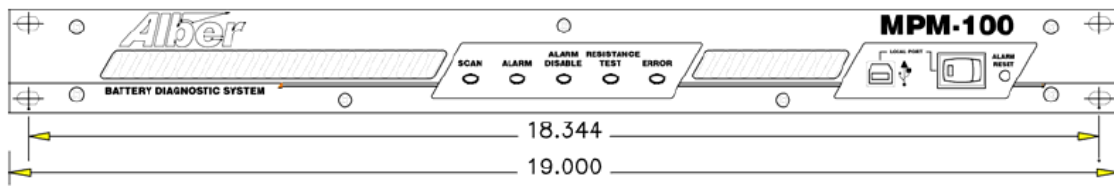


Figure 9. Front Panel

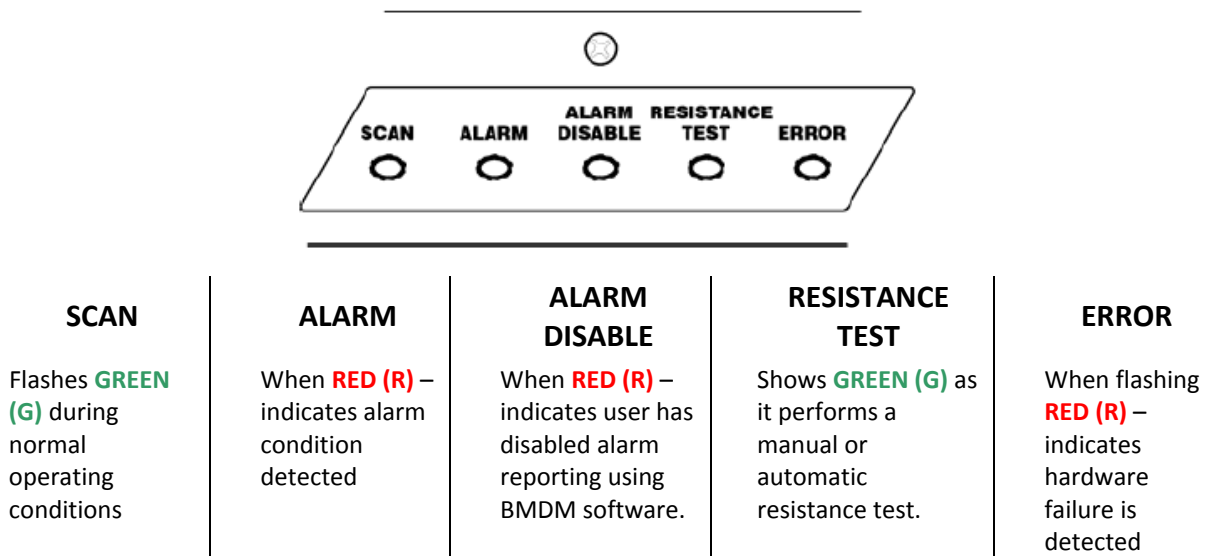


Figure 10. Front Panel Indicators Close up

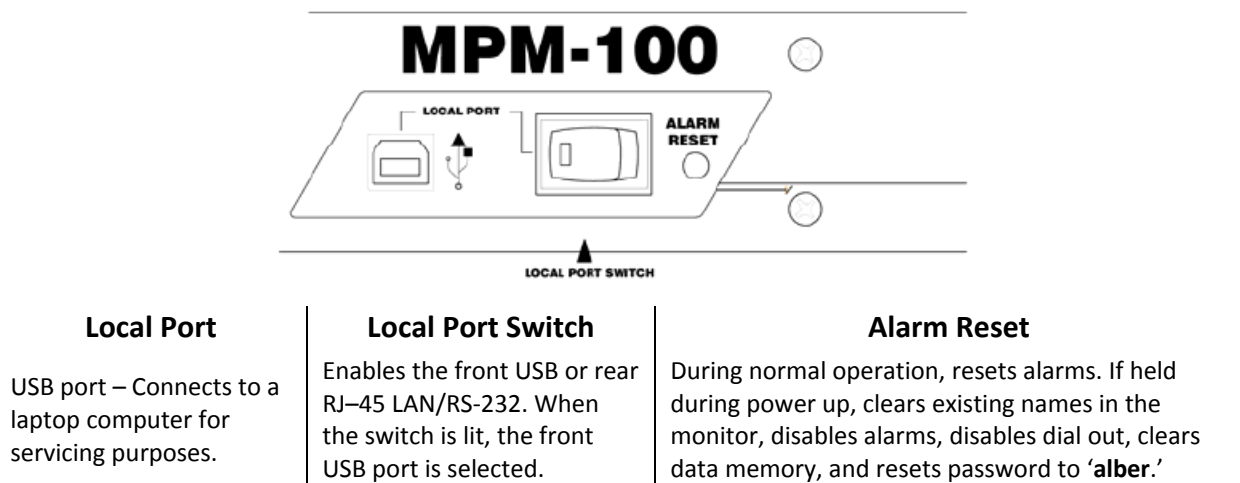
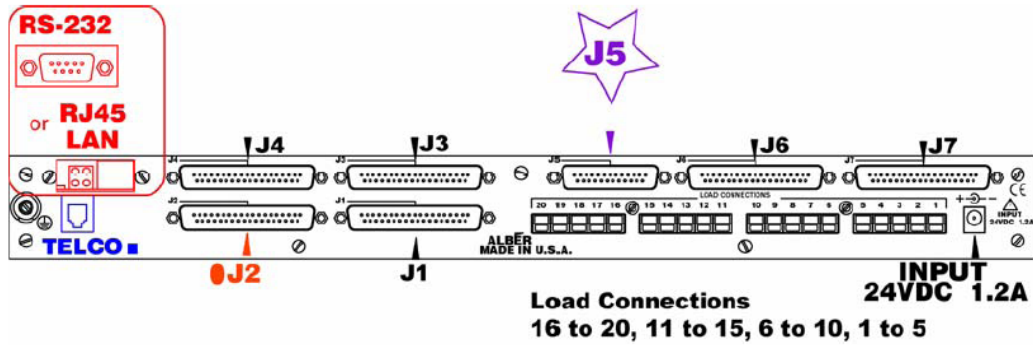


Figure 11. Front Panel Connector and Controls



Local Port	J2	J5	J1, J3, J4, J6, J7
<p>May be an RS-232 or an RJ-45 network port (LAN). The front panel Local Port Switch enables this port.</p>	<p>Provides for alarm (Parameter & System) & digital input relay connections on all MPM configurations. Two sets of dry Form C alarm contacts are also available.</p> <p>Do not use for current transducers if J5 is available.</p>	<p>Current Transducer CT connector – optional. Provides for signal connection and +15V and -15V power for up to 4 discharge CTs and signal connection for the Float Current Sensor.</p>	<p>Sense lead wiring to these connectors – Depends upon battery configuration. Cell/Jar voltage sense leads connect from J1 to the individual cells/jars. (& J3 on units with the expansion module)</p>
<p>TELCO</p> <p>RJ-11 jack. Communicates with a remote computer via telephone.</p>	<p>Load Connections</p> <p>16 to 20, 11 to 15, 6 to 10, 1 to 5</p> <p>The most-positive battery connection for string 1 must always be to Load Connection #1. The negative connection is determined by the battery configuration.</p>	<p>Input 24VDC 1.2A</p> <p>When the MPM requires AC power because of battery configuration, connect a 24VDC wall plug transformer to this connector. AC power must be from a UPS protected source.</p>	

Figure 12. Rear Panel Connectors

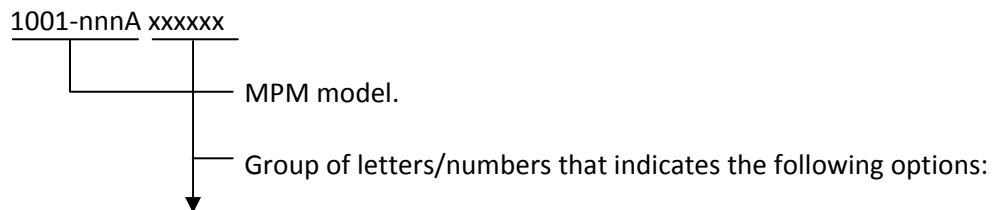
3. MPM-100 Configurations

This section is an overview of the MPM-100 monitor configurations.

3.1. MPM Model Number Description

The MPM can accommodate up to 30 different battery configurations, which may be modified for nonstandard battery configurations. (For example, a 1 x 60 configuration can have 59 cells.)

The MPM-100 model numbers are structured as follows.



Position 1 (Xxxxxx): Power

A = Unit is powered by AC wall plug. (Available only on 120V units.)

D = Unit is powered by the DC bus.

Position 2 (xXxxxx): Communication options (fiber optic, Ethernet or RS-232). Refer to *Communication Options* in this manual for details.

Position 3 (xxXxxx): Method of sensing discharge current.

C = Current transducer.

S = Shunt.

Position 4 (xxxXxx): Float current transducer.

[blank] = No float current transducer.

F = Float current transducer.

Position 5 (xxxxXx): Main power line frequency.

5 = 50Hz.

6 = 60Hz.

Position 6 (xxxxxX): Brand labeling.

A = Albér.

S = OEM model.

Warning: check the configuration on MPM-100 before installation. Make sure that drawings are rechecked for configuration information. If the wrong configuration is installed onto the battery, the unit could be permanently damaged.

3.2. MPM Configuration Options

To determine MPM hardware configuration, cross-reference the model number using the standard MPM Configuration Options Chart. For special configurations or custom system integration for OEM applications, contact Alber at 954-623-6660.

Model Number	Configuration	Description
12V Systems		
398	MPM-100-1x10x1*	1 string of 10 – 1v cells in series.
399	MPM-100-2x10x1	2 strings in parallel of 10 – 1v cells in series.
400	MPM-100-3x10x1	3 strings in parallel of 10 – 1v cells in series.
401	MPM-100-4x10x1	4 strings in parallel of 10 – 1v cells in series.

Figure 13. MPM 12V Systems Configuration Options Chart

Model Number	Configuration	Description
24V -36V Systems		
360	MPM-100-1x20x1	1 string of 20 – 1v cells in series.
371	MPM-100-2x20x1	2 strings in parallel of 20 – 1v cells in series.
372	MPM-100-3x20x1	3 strings in parallel of 20 – 1v cells in series.
373	MPM-100-4x20x1	4 strings in parallel of 20 – 1v cells in series.
361	MPM-100-1x25x1	1 string of 25 – 1v cells in series.
362	MPM-100-2x25x1	2 strings in parallel of 25 – 1v cells in series.
363	MPM-100-3x25x1	3 strings in parallel of 25 – 1v cells in series.
364	MPM-100-4x25x1	4 strings in parallel of 25 – 1v cells in series.
402	MPM-100-1x26x1	1 string of 26 – 1v cells in series.
403	MPM-100-2x26x1	2 strings in parallel of 26 – 1v cells in series.
404	MPM-100-3x26x1	3 strings in parallel of 26 – 1v cells in series.
395	MPM-100-1x36x1	1 string of 36 – 1v cells in series.
396	MPM-100-2x36x1	2 strings in parallel of 36 – 1v cells in series.
338	MPM-100-1x12x2	1 string of 12 – 2v cells in series.
339	MPM-100-2x12x2	2 strings in parallel of 12 – 2v cells in series.
340	MPM-100-3x12x2	3 strings in parallel of 12 – 2v cells in series.
375	MPM-100-4x12x2	4 strings in parallel of 12 – 2v cells in series.
382	MPM-100-1x13x2	1 string of 13 – 2v cells in series.
383	MPM-100-2x13x2	2 strings in parallel of 13 – 2v cells in series.
384	MPM-100-3x13x2	3 strings in parallel of 13 – 2v cells in series.
385	MPM-100-4x13x2	4 strings in parallel of 13 – 2v cells in series.
334	MPM-100-1x6x4	1 string of 6 – 4v modules in series.
335	MPM-100-2x6x4	2 strings in parallel of 6 – 4v modules in series.
336	MPM-100-3x6x4	3 strings in parallel of 6 – 4v modules in series.
337	MPM-100-4x6x4	4 strings in parallel of 6 – 4v modules in series.
378	MPM-100-1x4x6	1 string of 4 – 6v modules in series.
379	MPM-100-2x4x6	2 strings in parallel of 4 – 6v modules in series.

380	MPM-100-3x4x6	3 strings in parallel of 4 – 6v modules in series.
381	MPM-100-4x4x6	4 strings in parallel of 4 – 6v modules in series.
374	MPM-100-1x3x8	1 string of 3 – 8v modules in series.
343	MPM-100-2x3x8	2 strings in parallel of 3 – 8v modules in series.
344	MPM-100-3x3x8	3 strings in parallel of 3 – 8v modules in series.
345	MPM-100-4x3x8	4 strings in parallel of 3 – 8v modules in series.
330	MPM-100-1x2x12	1 string of 2 – 12v modules in series.
331	MPM-100-2x2x12	2 strings in parallel of 2 – 12v modules in series.
332	MPM-100-3x2x12	3 strings in parallel of 2 – 12v modules in series.
333	MPM-100-4x2x12	4 strings in parallel of 2 – 12v modules in series.

*1 volt cells are NiCd

Figure 14. MPM 24V - 36V Systems Configuration Options Chart

Model Number	Configuration	Description
38 - 60V Systems		
392	MPM-100-1x38x1	1 string of 38 – 1v cells in series.
393	MPM-100-2x38x1	2 strings in parallel of 38 – 1v cells in series.
410	MPM-100-1x41x1	1 string of 41 – 1v cells in series.
411	MPM-100-2x41x1	2 strings in parallel of 41 – 1v cells in series.
405	MPM-100-1x22x2	1 string of 22 – 2v cells in series.
406	MPM-100-2x22x2	2 strings in parallel of 22 – 2v cells in series.
407	MPM-100-3x22x2	3 strings in parallel of 22 – 2v cells in series.
408	MPM-100-4x22x2	4 strings in parallel of 22 – 2v cells in series.
354	MPM-100-1x24x2	1 string of 24 – 2v cells in series.
355	MPM-100-2x24x2	2 strings in parallel of 24 – 2v cells in series.
365	MPM-100-3x24x2	3 strings in parallel of 24 – 2v cells in series.
366	MPM-100-4x24x2	4 strings in parallel of 24 – 2v cells in series.
350	MPM-100-1x8x6	1 string of 8 – 6v modules in series.
351	MPM-100-2x8x6	2 strings in parallel of 8 – 6v modules in series.
352	MPM-100-3x8x6	3 strings in parallel of 8 – 6v modules in series.
353	MPM-100-4x8x6	4 strings in parallel of 8 – 6v modules in series.
394	MPM-100-1x9x6	1 string of 9 – 6v modules in series.
346	MPM-100-1x4x12	1 string of 4 – 12v modules in series.
347	MPM-100-2x4x12	2 strings in parallel of 4 – 12v modules in series.
348	MPM-100-3x4x12	3 strings in parallel of 4 – 12v modules in series.
349	MPM-100-4x4x12	4 strings in parallel of 4 – 12v modules in series.

Figure 15. MPM 38V - 60V Systems Configuration Options Chart

Model Number	Configuration	Description
60 - 120V Systems		
367	MPM-100-1x80x1	1 string of 80 – 1v cells in series.
388	MPM-100-1x88x1	1 string of 88 – 1v cells in series.
386	MPM-100-1x90x1	1 string of 90 – 1v cells in series.
368	MPM-100-1x92x1	1 string of 92 – 1v cells in series.
369	MPM-100-1x96x1	1 string of 96 – 1v cells in series.
370	MPM-100-1x97x1	1 string of 97 – 1v cells in series.

389	MPM-100-1x100x1	1 string of 100 – 1v cells in series.
387	MPM-100-1x54x2	1 string of 54 – 2v cells in series.
409	MPM-100-1x56x2	1 string of 56 – 2v cells in series.
397	MPM-100-1x58x2	1 string of 58 – 2v cells in series.
357	MPM-100-1x60x2	1 string of 60 – 2v cells in series.
358	MPM-100-1x30x4	1 string of 30 – 4v modules in series.
391	MPM-100-1x18x6	1 string of 18 – 6v modules in series.
359	MPM-100-1x20x6	1 string of 20 – 6v modules in series.
376	MPM-100-1x15x8	1 string of 15 – 8v modules in series.
377	MPM-100-2x15x8	2 strings in parallel of 15 – 8v modules in series.
390	MPM-100-1x8x12	1 string of 8 – 12v modules in series.
412	MPM-100-2x9x12	1 string of 9 – 12v modules in series.
356	MPM-100-1x10x12	1 string of 10 – 12v modules in series.

Figure 16. MPM 60V - 120V Systems Configuration Options Chart

4. MPM-100 Specifications

Power

- 15 watts maximum. When monitoring 24V to 48V batteries, operates directly from the bus. When monitoring 120VDC batteries, powered off the battery or a 115VAC wall plug transformer. The transformer must be on a protected (uninterruptible) power source (UPS).

Wall Plug Transformer: Alber part number 4000-029

Input: 100 to 240VAC, 50Hz/60Hz, 1.0A maximum

Output: 24VDC (nominal), 1.5A 36W maximum

4.1. Fuses On PC Board (Not user replaceable)

- Fuse F1/F1A: 2A FB.
- Fuse F2: 1A FB.
- Fuse F3: 0.5A FB.

4.2. Measurement Range/Inputs

Inputs	Range	Tolerance
100 cell voltage channels		
2V range	(0 - 4V)	0.1% ±1mV
4V range	(0 - 8V)	0.1% ±2mV
6V range	(0 - 8.5V)	0.1% ±2mV
8V range	(0 - 10V)	0.1% ±10mV
12V range	(0 - 16V)	0.1% ±10mV
One string voltage channel.....	0 to 150 volts	0.1% of reading ±0.1V
Eight temperature channels*	0°C to 80°C (32°F to 176°F)	±1°C
Eight intertier resistance channels ...	0 to 5mΩ.....	5% of reading ±5μΩ
Four discharge current channels* ...	0 to 4000A.....	0.1% of reading ±1A (using shunt)
Four float current channels*	0 to 5000mA	±50mA
Sixteen optically isolated contact closure inputs for normally-open or normally-closed.		

Alarm reset. Normally-open dry contact required.

*Optional temperature and current transducers are required.

Actual number of inputs are model dependent. Contact Alber for additional information 954-623-6660.

Outputs

- Three programmable relay contact configured to N/O or N/C
- Parameters alarm contact: one Form C alarm relay contact, 2A at 30VDC.
- Hardware failure or power failure alarm contact: one Form C alarm relay contact, 2A at 30VDC.
- Charger control relay: one NO dry contact, 2A at 30VDC.
- LEDs (one each): green status, red alarm, red alarm disable, green resistance test on, and red hardware error.

Measurement Range / Tolerance

- Cell resistance 0 to 32,000 $\mu\Omega$ 5% of reading $\pm 1\mu\Omega$

Communication

- A USB port
- A modem serial port
- An RJ-45 connection or RS-232 port connection
- Protocols: Modbus and SNMP.

Data Storage

- E² nonvolatile memory for calibration constants, alarm levels, telephone numbers, and setup information.
- 100 alarm events in revolving nonvolatile memory.
- 32K bytes of discharge data in nonvolatile memory.
- 1.6K bytes resistance test records.
- 1.65K bytes historical data.
- Flash memory for firmware upgrades.

Operating Environment

- Temperature range: 5°C to 40°C (41°F to 104°F)
- Humidity range: 0% to 80% RH (non condensing) at 5°C to 31°C
0% to 50% RH (non condensing) at 32°C to 40°C
- Indoor use only.
- Installation category II
- Pollution degree 2.
- Altitude 0 to 2000 meters above sea level.

Packaging

- Rack mount.
- Wall mount with optional mounting brackets.

Dimensions

- 19"W x 10"D x 1.75"H
- 6 lbs.

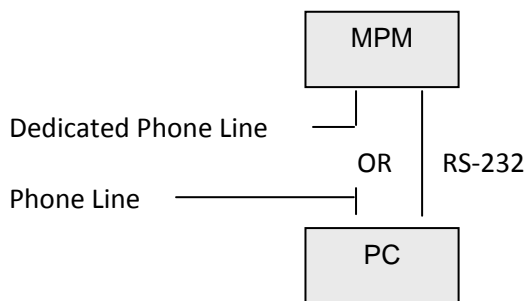
Agencies

- UL listed. File number E212234.
- CE approved.

5. Communication Options

This section describes the letter used in the second position of the MPM model number. Refer to the *MPM-100 Configurations* section for more details.

Communication Option A

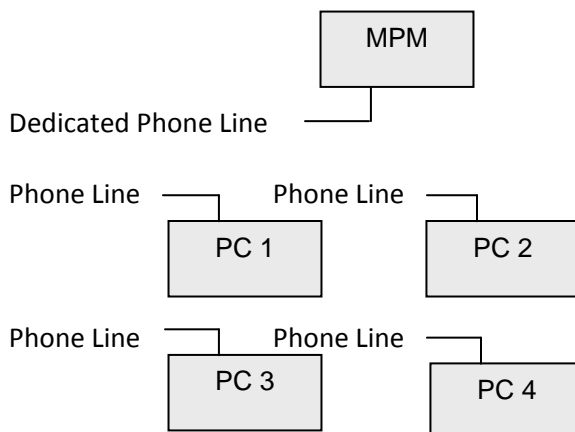


Option A

- This is for one MPM that will be accessed by one PC, either locally with an RS-232 connection or via telephone connection.
- NOTE: For all features to operate, the phone line used for the MPM must be dedicated to the MPM.

Figure 17. MPM Model Number Communication Option A

Communication Option B

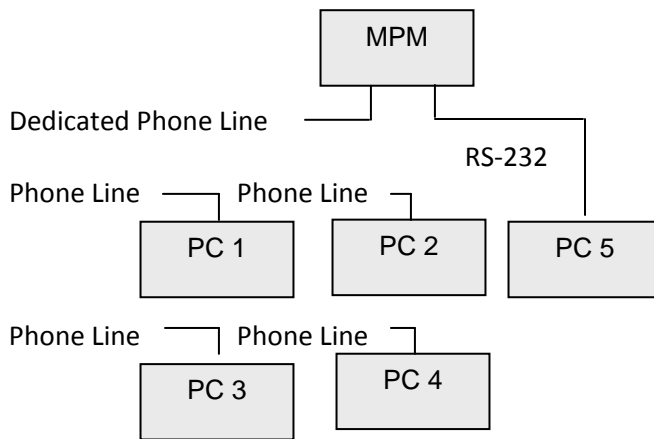


Option B

- This is for one MPM that will be accessed by two or more PCs via a telephone connection.
- NOTE: For all features to operate, the phone line used for the MPM must be dedicated to the MPM.

Figure 18. MPM Model Number Communication Option B

Communication Option C

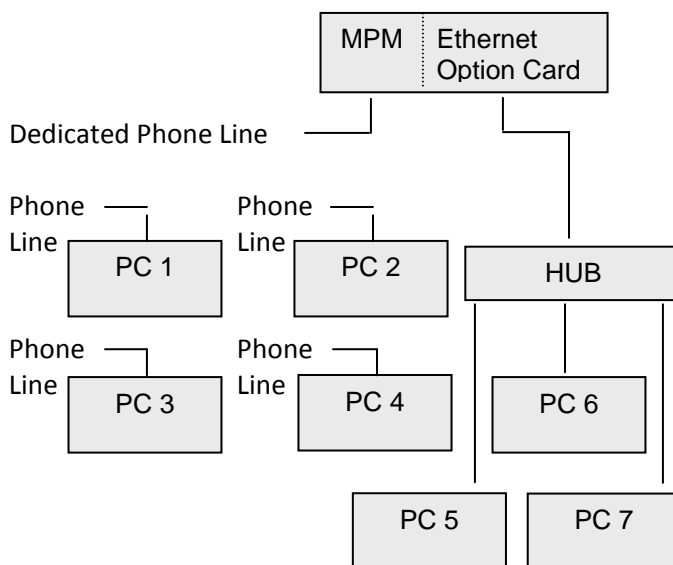


Option C

- This is for one MPM that will be accessed locally by one PC via an RS-232 connection and
- That will also be accessed by additional PCs via a telephone connection.
- **NOTE:** If the locally RS-232 connected PC is not the Central computer, then for all features to operate, the phone line used for the MPM must be dedicated to the MPM.

Figure 19. MPM Model Number Communication Option C

Communication Option D

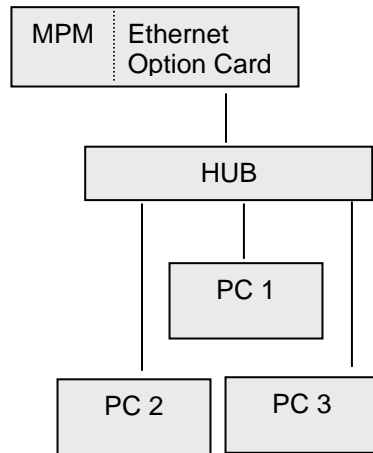


Option D

- This is for one MPM that will be accessed by two or more PCs locally.
- This option requires installation of the LAN option in the MPM, and
- This option also requires connection of the MPM to an existing LAN or installation of a LAN.
- The MPM can also be accessed by PCs via a telephone connection.
- The LAN can be set up to allow MPM access via the Internet.
- **NOTE:** If one of the PCs connected via the LAN is not the Central computer, then for all features to operate, the phone line used for the MPM must be dedicated to the MPM.

Figure 20. MPM Model Number Communication Option D

Communication Option E

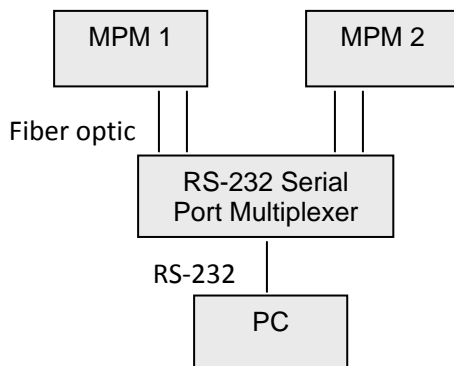


Option E

- This is for one MPM that will be accessed by two or more PCs locally.
- This option requires installation of the LAN option in the MPM, and
- This option also requires connection of the MPM to an existing LAN or installation of a LAN.
- The LAN can be set up to allow MPM access via the Internet.

Figure 21. MPM Model Number Communication Option E

Communication Option F

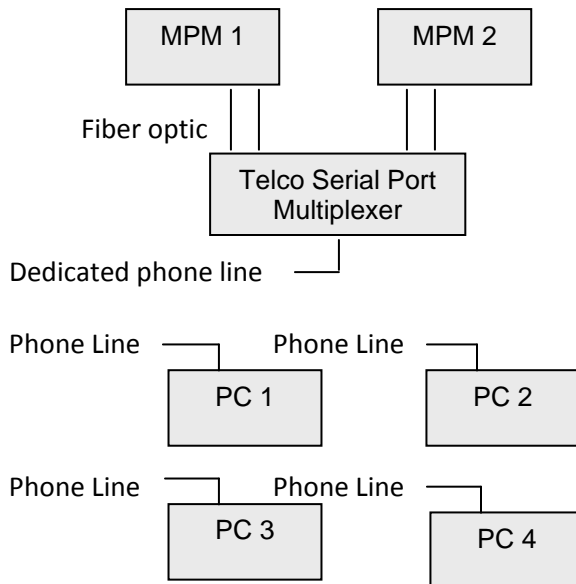


Option F

- This is for two to 16 MPMs that will be accessed by one PC via a serial connection.
- An RS-232 Serial Port Multiplexer is required.
- NOTE: The MPMs must be within 500 meters (cable run) of the Serial Port Multiplexer.

Figure 22. MPM Model Number Communication Option F

Communication Option G

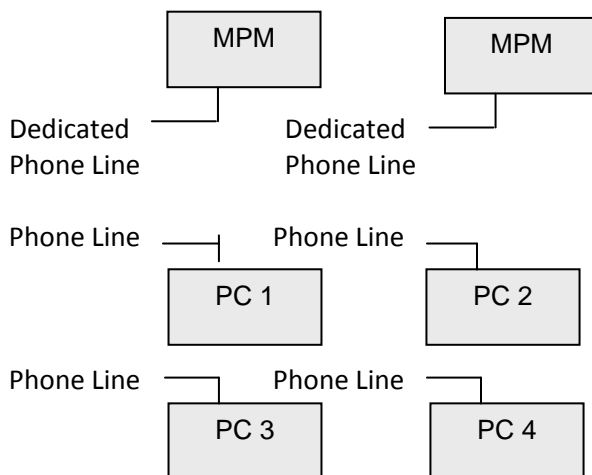


Option G

- This is for two to 16 MPMs that will be accessed by one or more PCs via a phone line connection, and
- There will be one phone line for up to 16 MPMs.
- A Telco Serial Port Multiplexer is required.
- NOTE: The MPMs must be within 500 meters (cable run) of the Serial Port Multiplexer.

Figure 23. MPM Model Number Communication Option G

Communication Option H

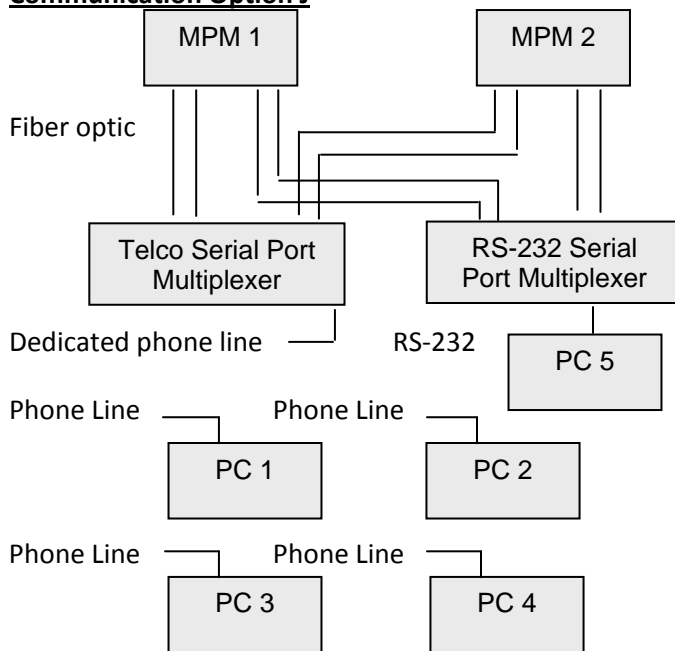


Option H

- This is for two or more MPMs that will be accessed via phone line connection, and
- All MPMs must have their own dedicated phone line.

Figure 24. MPM Model Number Communication Option H

Communication Option J

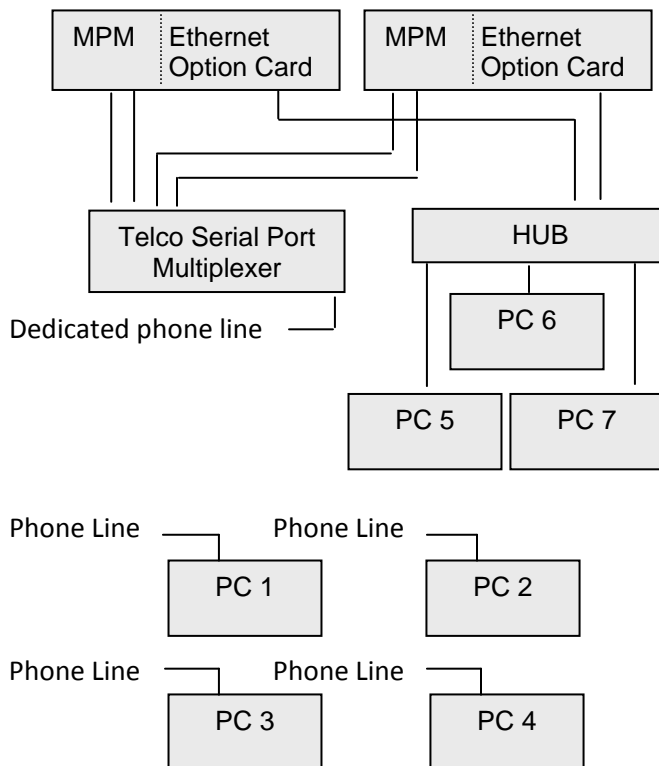


Option J

- This is for two to 16 MPMs that will be accessed by one PC via a serial connection and other PCs via a phone line connection, and
- There will be one phone line for up to 16 MPMs.
- An RS-232 Serial Port Multiplexer is required.
- A Telco Serial Port Multiplexer is required.
- NOTE: The MPMs must be within 500 meters (cable run) of the Serial Port Multiplexers.

Figure 25. MPM Model Number Communication Option J

Communication Option K

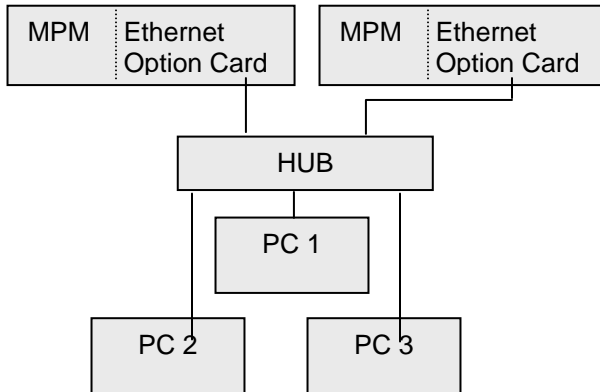


Option K

- This is for two to 16 MPMs that will be accessed locally by two or more PCs and accessed via a phone line, and
- There will be one phone line for up to 16 MPMs, and
- This option also requires connection of each MPM to an existing LAN or installation of a LAN, and
- This option requires installation of the LAN option in each MPM.
- The LAN can be set up to allow MPM access via the Internet.
- NOTE: The MPMs must be within 500 meters (cable run) of the Serial Port Multiplexer.

Figure 26. MPM Model Number Communication Option K

Communication Option L



Option L

- This is for two or more MPMs that will be accessed via a LAN and/or an Internet connection.
- This option requires installation of the LAN option in the MPMs, and
- This option also requires connection of each MPM to an existing LAN or installation of a LAN.

Figure 27. MPM Model Number Communication Option L