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## ***MPM Firmware Revision History***

This documents the MPM-100 firmware revision history.

### **Version 1.16**

MPM now supports one string of 20 NiCad cells.

### **Version 1.15 (BMDM Software Version 3.20B42 required)**

1. The data extraction algorithm has changed in functionality. Before, it was possible to extract and clear data from the hardware without its actually being stored in the database. Data will not be cleared from hardware until it has successfully been stored to the database. Also, if communications is corrupted, multiple attempts of retrieving data will be tried before displaying the "Not responding" status.

### **Version 1.14**

1. The alarm relay contacts would not remain latched if configured to do so after a discharge occurred. The alarm relay now works as configured.
2. The Discharge Report selection under Battery Setup is now being saved in firmware. This was always getting cleared during a Check Settings upload.
3. The Memory diagnostic now supports a new feature that allows the firmware in the MPM to be verified against a selected file from the software.
4. Warning status is not being displayed in String Status or the Historical Events list.
5. If an alarm contact was energized during a memory clear function, it would not de-energize the alarm contact. The alarm contact now turns off if the memory clear function is used.
6. When a memory clear function is performed under Diagnostics, the String Status information now also is cleared.

### **Version 1.13**

1. The network interface (IP address) can now be set up by software under the Battery Setup|General tab.

### **Version 1.12**

1. Intertier assignments were being defined to the wrong cell on 3X3X8 configurations. Also added a 30 ms delay after reading intertier channel, so attached cell would not be affected.

### **Version 1.11**

1. The amps/mv setting under Battery Setup|General tab is now stored in the MPM-100. Even though this setting is not used in the MPM itself, it will be stored for use by the software. This setting will be transferred during an upload function through Check Settings.

2. DIP switch position five now commands the new resistance reading to always overwrite the old reading. When this switch is used, it will not allow multiple resistance readings to accumulate in memory in the MPM. This will make the data retrieval simpler for third party vendors to access the resistance data. The switch must be in the ON/CLOSED state to enable this feature.
3. When the MPM entered calibration from the modem port through a local serial multiplexer and calibration was entered, the MPM would lose communications. Calibration can now be performed by any port without any communication loss.
4. Discharge alarms can now be set to a latch mode or non latching. Before, all discharges would be in a non-latching mode.
5. Discharge events now get logged into Current Alarms and Current History Alarms.
6. The latest alarm events are now cleared when rebooting or clearing memory. This is not to be confused with Current Alarms. Latest alarm events are events that get reported when the MPM calls out to a Central computer and get logged into the Historical Events table.
7. Digital inputs can now be disabled individually by selecting a report selection under the Battery Setup|Digital Inputs tab.
8. Current initialization string supports cellular type connections and is not reliable for normal connection.

#### **Version 1.06 (BMDM Software Version 1.42 required)**

1. Problem: Firmware dials out continuously if an alarm occurs. Solution: Eliminate dial-out flag in firmware and implement dial-out counter. Now will dial out a maximum of three times or until another alarm occurs.
2. Add feature to scan digital I/O channels 1 through 8, so Modbus registers always have the current value.

#### **Version 1.05**

1. Added function to disable firmware dialing out to PC.

#### **Version 1.04**

1. This is a test version. We changed the threshold to log the OV from 200mv to 1V, and cell voltage from 30mv to 20mv.
2. Add \N5 and -K1 to modem initial command line to enable the error correction mode.
3. Reset stack pointer after flash memory test.
4. Extend the discharge data memory size from 10K to 20K.
5. Add 10ms time delay when we read intertier. This can eliminate the effects of CAP in intertier channel.
6. Read unload intertier and load intertier to calculate the final intertier. This can eliminate the influence of charger current.
7. Enlarge the range of intertier 8 times.
8. Enlarge the resistance range of 2v cell resistance 16 times.

### **Version 1.03**

1. Use the DIP switch (bit 8) for modem selection. If this bit is high, that means there is a modem on this PC board. Firmware can use this on-board modem to dial out. If this bit is low, no modem is on the PC board. Firmware should use the modem on the Telco Multiplexer to dial out. Add a function in software to disable firmware dial outs, so firmware checks this symbol in EEPROM before every dial out.
2. Take off the device ID check when receiving commands. Software will check location ID when connection is built.
3. Firmware checks the resistance alarm right after R test. If it is found alarming, it will dial out. After 30 minutes, all alarms will be enabled, so this resistance alarm is detected again. Thus firmware will dial out twice. To fix this problem, firmware will check all alarms, include resistance alarm, 30 minutes after resistance test.
4. Wait for 2 seconds before checking alarm reset key. This time delay can eliminate the chance to clear location ID to zero.

### **Version 1.02**

1. Problem: In firmware upgrade, if software sends some frames more than one time, the frame number in firmware is not the same as the number in the last frame, so firmware always thinks the upgrade failed.

Change: If the frame number in firmware is greater or equal to the number in last frame, firmware assumes the upgrade is successful.

### **Version 1.01**

1. Firmware doesn't check resistance alarm after R-test. The problem is timing to read the EEPROM. Put a time delay before read ALARM\_STATUS after R-test. The problem is fixed.
2. If firmware detects the alarm, then take resistance test. The firmware won't dial out for resistance alarm. The problem is CLEAR\_ALARM function doesn't clear symbol IS\_SEC\_ALARM, so the dial out symbol won't be set.
3. Change the way to erase the memory in firmware. The software will send command to control this.
4. Firmware clears the service symbol right after resistance test.
5. Firmware uses the bit7 of dip switch to determine if the dial out is enabled.
6. Problem: Software always gets "Not responding" error when it is trying to get historical resistance from central PC. Happened in using cable.  
Reason: Central PC can erase the data in firmware. There is a missed word in source code, so the tail of the frame is sent to wrong port.
7. Problem: When firmware reboots, the first date is always wrong, so this causes the resistance test if set duration of R test is one day.  
Reason: Firmware clears the RAM before going into main loop. It clears the current date, so when firmware goes into main loop and gets new current date, the day is different. Get first date right before going into main loop.
8. Subtract intertier in firmware instead of doing this in software.
9. Problem: After R test, can't report the intertier alarm. Reason: After R test, firmware disables the alarms except internal And intertier. In SCAN\_HIS\_ALARM function, skip intertier alarm check when the alarm is disabled by R test.

10. If the user holds the alarm reset key when the firmware boots up, that means user wants to reset the location ID to zero. Check this key before going to main loop.

11. Add a protection timer in firmware. The length of this timer is 13 seconds. If the load\_on lasts more than 13 seconds, firmware will turn off load. This check is done by 10ms interrupt function, so the firmware can make this check every 10ms.

12. For resistance test, if raw count of Vload is greater than 4000, that means saturated A/D. This resistance value is FFH.

13. Problem: When pressing alarm reset key on the front panel of MPM, it doesn't work.

Reason: Firmware works fast. New alarm overwrites the reset alarm, so function SCAN\_HIS\_ALARM can't find reset alarm in the memory. Call SCAN\_HIS\_ALARM right after resetting all alarms.

14. Problem: After upgrade, the self test screen still indicates the firmware is running from EPROM.

Reason: Clear the Diagnostic status before taking self test. The running information is stored in bit 15 of the diagnostic status, so this bit is always "0", always running from EPROM.

15. Problem: If the raw count of V load is greater than 4000, the load step is turned off for each reading.

Reason: In 4X4, each load step has one reading, so if the wrong case happened, call load off and then do next reading(load step). But, in other configurations, there may be more than one reading in one load step, so we can't use load off function. Has to use the same way as that used in getting V unload: turn the load control off, retain the state of load step.