MPP-01
(Mid Point Probe)

User Manual

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PROPRIETARY INFORMATION

Printed in Canada (06/2000).

Document name: UMMPP0122
Issue: 2.2
Revised by: Karine Simard
Date: 2000/06/10

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FIGURES:

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CONTROL SHEET

ISSUE	*DATE*	*DESCRIPTION*	*ORIGINATOR*
1.0	94/06/29	First issue.	Stéphan Méthot
1.1	95/05/31	Separate and common mode addition.	Daniel Rondy
2.0	97/04/23	Calibration procedure revised and the document's format.	Stéphan Méthot
2.1	98/04/01	Minor modifications.	Érick Pelletier
2.2	2000/06/10	Corrections and technical verification	Karine Simard (R&D person)

GENERAL DESCRIPTION

Stationary batteries will age or deteriorate much more rapidly than expected due to high temperature, over voltage, deep charges and harmful conditions. As a result, battery failures, such as shorted or reversed polarity cells, dryness, and positive plate corrosion, will decrease battery capacity and its ability to carry the load.

The MPP-01 provides a reliable and effective way to monitor up to six (6) battery strings for potential battery problems. It measures mid-point unbalance voltage for each battery string. When the mid-point unbalance voltage exceeds acceptable limits, it is an indication of a battery problem.

An analog output signal proportional to the unbalance voltage of each string can be forwarded to an analog input channel on Multitel's remote monitoring equipment.

1.1 Specifications

Typical application:	24 and 48 Vdc
String voltage range:	10 to 60 Vdc
Supply voltage:	Auto-sense
Power consumption:	3mA at 60Vdc
Output signal:	± 5 Vdc
Overall dimensions (LxWxH):	5.3" x 3.3" x 2.85"
Available color:	Dolphin gray

INSTALLATION

1.2 List of Required Tools:

- Screwdrivers
- Crimper for loose pins (AMP part# 90123) and lugs
- Multimeter
- Computer and direct RS232 cables (for programming the monitoring unit)
- In-line fuse and 2 Amp fuse (MT part number FSBL-TL, F2BSs) (1 per string and 2 for battery voltage).

1.3 List of Required Material:

- #22 AWG stranded gauge wire
- #14 AWG stranded gauge wire (for frame ground)
- Lug to install the sense wire on the battery post (not provided with MPP-01)
- Miscellaneous hardware to anchor the MPP-01 (provided by Multitel)

1.4 Step by step Installation and Connection Procedure (Common Mode Connection)

Most utilized, this mode is set for six (6) battery strings installed in parallel. A factory-installed harness simplifies connections (refer to Figure #1 when going through this procedure).

1. Install the MPP-01 as close as possible to monitored battery strings. Install the MPP-01 on a flat wall surface or on a battery stand.

2. Using a lug, connect an in-line fuse (2A 250V) to the positive (+) battery post. Connect the other end of the fuse to pin #1 (also identified +) of the MPP-01 "JCOM" connector.
3. Using a lug, connect an in-line fuse (2A 250V) to the negative (-) battery post. Connect the other end of the fuse to pin #2 (also identified +) of the MPP-01 "JCOM" connector.
4. Using a lug, connect an in-line fuse (2A 250V) to the mid-point intercell of battery string #1. Connect the other end of the fuse to pin #2 of the MPP-01 "JIN1" connector. Repeat step #4 for all other battery string midpoints using connectors "JIN2" to JIN6".

NOTE:

With a 24-cell battery configuration, the connection should be made between cell #12 and #13.

Pay attention to polarity.

You will notice that a harness (CMT059) has been connected from the "JIN1" to the "JIN 6" connector. This cable must stay connected to insure proper operation of the product.

5. Connect a #14 AWG wire from the ground lug located inside the MPP-01, to the frame ground or the battery stand ground.
6. Connect a pair of #22 AWG wire from each analog output of the MPP-01 "JOUT1" to "JOUT6" connectors to a +/- 5V analog input channel on a Multitel monitoring device.
7. See the "Configuration" section for monitoring unit adjustments.

1.5 Step by Step Installation Procedure (Separate Mode Connection)

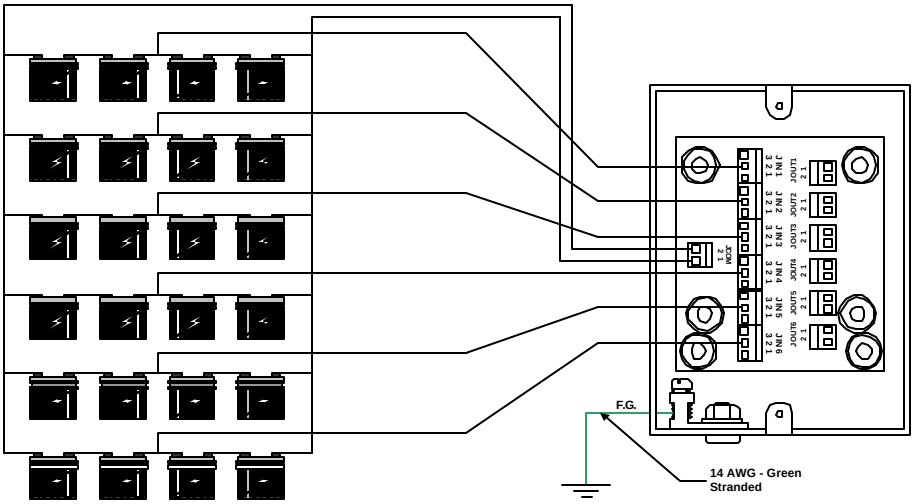
This mode is set for the monitoring of different battery plant voltages (e.g.: 48 Vdc and 24 Vdc).

1. Install the MPP-01 as close as possible to monitored battery strings. Install the MPP-01 on a flat wall surface or on a battery stand.

2. Connect an inline fuse (2A 250V) from the positive battery post (+) to pin #1 of the "JINX" connector, using a lug and a #22 AWG wire on each battery string to monitor (up to 6).
3. Connect an inline fuse (1/2A 250V) from the negative battery post (-) to pin #3 of the "JINX" connector, using a lug and a #22 AWG wire on each battery string to monitor (up to 6).
4. Connect an inline fuse (1/2A 250V) from the battery string's mid-point intercell to pin #2 of the "JINX" connector, using a lug and a #22 AWG wire on each battery string to monitor (up to 6). The connection should be made between cell #12 and #13 in a 24-cell string configuration.
5. Connect a #14 AWG wire from the ground lug, located inside the MPP-01, to the frame ground or the battery stand ground.
6. Using #22 AWG wire, connect each used analog output from the MPP-01 "JOUT1" to "JOUT6" connectors to a +/- 5V analog channel input on a Multitel monitoring device.

See the "configuration" section for monitoring unit adjustment.

Figure 1 - Common Mode Connection



1.6 MXP2 188 V2 and V3

Verify the analog input module configuration and make sure you have one of the following:

- M-3991 Universal analog module (select the ± 5V hardware scale)
- M-3615H ±5 V/ ±5 V/ ± 5 V input channel module
- M-3672H ±200V/ ±50mV/ ±5V input channel module

Using the "ANALOG (x)" command (where x corresponds to the analog channel number) set the following parameters

Table 1 - Analog Channel Parameters to set in a MXP2 188®

PARAMETER		*SETTING*
STATE		Enabled
FUNCTION		Vdc Signal
UNITS		Vdc
THRESHOLD AND STAT. SIGN PROCESSING		Disabled
SCALE		5
HARDWARE SCALE		+/- 5 Volts (universal analog module only)
THRESHOLD	NO.1 (AXH1)	See Table #3
	NO. 2 (AXL2)	
	NO. 3 (AXH3)	
	NO. 4 (AXL4)	
NAME		User programmable 20 characters

1.7 Mirador

Verify the analog input module configuration and make sure you have one of the following:

- M-3615V ±5 V / ±5 V / ± 5 V input channel module
- M-3672V ±200V / ±50mV / ±5V input channel module

Using the ANALOG command, then select the related "Real" analog channel, set the following parameters.

Table 2 - Analog Channel Parameters to set in a MIRADOR®

PARAMETER	*SETTING*
STATE	Enabled
FUNCTION	Vdc Signal
UNITS	Vdc
SCALE	5
NAME	User programmable 20 characters

Using the "TH" command, set a high and a low alarm using the recommend threshold values in Table #3.

Table 3 - Recommended Alarm (threshold adjustment)

BATTERY VOLTAGE (Vdc)	*VOLTS/CELLS (Vdc)*	*THRESHOLDS VALUE (Vdc)*
24 Vdc	2	0.8
24	6	0.8
	12	0.8
48 Vdc	2	1
48	6	1
	12	1

CALIBRATION

The MPP-01 has been factory-calibrated. Therefore, no field calibration should be required. However, adjustments may be performed in the field to enhance the factory calibration or to eliminate a battery string's natural unbalance.

1.8 Display the Natural Unbalance of the String

Using a multimeter, measure battery voltage and divide it in half. The result is the **ideal mid-point**.

The real mid-point is reference to ground, therefore use a multimeter and measure from the battery return ground up to the string's mid-point intercell. This last measurement is the **real mid-point**.

When subtracting the ideal and real mid-point measurements, you will get a value that should match the corresponding output channel of the MPP-01.

If a discrepancy remains, adjust using the corresponding potentiometer (P_1 to P_6).

1.9 Eliminate the String's Natural Unbalance

Simply adjust all potentiometers (P_1 to P_6) to measure 0.00V on all corresponding MPP-01 analog outputs.

TROUBLESHOOTING

This device has been verified and tested in the factory ensure that all steps have been followed as in the installation procedure. For more information, refer to the troubleshooting section in the corresponding manual of your Multitel monitoring system, or call us at (418) 847-2255 and ask for a customer service representative.

ORDERING

M-4191-G	MPP-01 Common channels, Dolphin gray.
M-4191-G-S	MPP-01 separate channels, Dolphin gray.

CONFIGURATION

NOTE:

The configuration of a monitoring unit is different from one model to another. If the monitoring unit is not part of the list below, contact the manufacturer's service department for detailed information.

- SDVA 4800 MXP and MXP2
- MXP2-188 V2 and V3
- Mirador system

Figure 2 - Separate Mode Connection