

Serial Port Multiplexer

User's Guide



990 South Rogers Circle, Suite 11
Boca Raton, FL 33487
Tel: 561-997-2299 Fax: 561-997-5588
www.alber.com

Information in this document is subject to change without notice.

Serial Port Multiplexer User's Guide, Book Revision 2.0, P/N 4200-015

©1999, 2000 Albécorp., 990 South Rogers Circle, Suite 11, Boca Raton, FL 33487.

This manual may not be copied in whole or in part without express written permission from Albécorp.
Printed in the United States of America.

Regulatory Information

Type of Service: The MPM Series and the BDS Series equipment is designed to be used on standard device telephone lines. It connects to the telephone line by means of a standard jack called the USOC RJ11C (or USOC FJ45S). Connection to telephone company provided coin service (central office implemented systems) is prohibited. Connection to party line service is subject to state tariffs.

Telephone Company Procedures: The goal of the telephone company is to provide you with the best service it can. In order to do this, it may occasionally be necessary for the company to make changes in its equipment, operations or procedures. If these changes might affect your service or the operation of your equipment, the telephone company will give you notice, in writing, to allow you to make any changes necessary to maintain uninterrupted service.

In certain circumstances, it may be necessary for the telephone company to request information from you concerning the equipment that you have connected to your telephone line. Upon request of the telephone company, provide the FCC registration number and the ringer equivalence number (REN); both of these items are listed on the equipment label. The sum of all of the RENs on your telephone line should be less than five in order to assure proper service from the telephone company. In some cases, a sum of five may not be useable on a given line.

If Problems Arise: If any of your telephone equipment is not operating properly, you should immediately remove it from your telephone line, as it may cause harm to the telephone network. If the telephone company notes a problem, it may temporarily discontinue service. When practical, the company will notify you in advance of the disconnection. If advance notice is not feasible, you will be notified as soon as possible. When you are notified, you will be given the opportunity to correct the problem and informed of your right to file a complaint with the FCC. Contact your telephone company if you have any questions about your telephone line.

Safety Information

- Except as explained in this manual, do not attempt to service Albér equipment yourself. Opening the equipment may expose you to dangerous voltages. Refer servicing beyond that described in this manual to authorized personnel.
- Do not allow liquids or moisture to get into the equipment. If liquid does get into the equipment, unplug it immediately and contact your nearest authorized service center or Albércorp directly.
- Ensure equipment is provided adequate ventilation. Do not block equipment ventilation openings.
- Do not exceed equipment voltage or power ratings and capabilities.
- Make sure that equipment is properly grounded.
- Do not let unauthorized persons operate or service the equipment.

TABLE OF CONTENTS

1.	GENERAL DESCRIPTION	1
1.1.	Using an MPM with a Multiplexer	1
1.2.	Using a BDS with a Multiplexer	2
1.3.	Options Summary	2
2.	MPM DIP SWITCH CONFIGURATION	3
2.1.	Using the DIP Switch Diagnostic	3
2.2.	Setting the MPM DIP Switch	3
3.	MULTIPLEXER DIP SWITCH CONFIGURATION	4
4.	MULTIPLEXER COMMUNICATION	5
4.1.	Multiplexer to Computer via Modem	5
4.2.	Multiplexer to Computer via RS-232	5
5.	POWER SOURCE.....	5
5.1.	Multiplexer 120VAC Operation	5
5.2.	Multiplexer 24VDC or 48VDC Operation	5
5.3.	Power Source Configurations	6
6.	SELECTING THE MULTIPLEXER ID.....	6
7.	CONNECTION NOTES	7
8.	SPECIFICATIONS	8

TABLE OF FIGURES

Figure 1.	Multiplexer Models	1
Figure 2.	DIP Switch Settings	2
Figure 3.	System Setup - Link	7

TABLE OF DRAWINGS

General Assembly, MPM-100 Serial Port Multiplexer	BDS-161-B570
General Assembly, MPM-100.....	BDS-154-B557, Rev B

1. General Description

Use the Serial Port Multiplexer when more than one MPM-100 or BDS Controller, or a combination of both, must be connected to a single computer or telephone line.

You may connect the Multiplexer via modem to a remote Central computer, or via a serial cable to a Local or on-site Central computer. Both Telco modem (RJ-11) and RS-232 (serial) connectors are present on the rear of the Multiplexer, but only the customer-specified one is active. The following list describes the available Serial Port Multiplexer models.

Part Number	Description	Max No. of MPMs or BDS Controllers	Power Source
1000-290	8 channel RS-232 multiplexer 12V	8	120VAC
1000-291	16 channel RS-232 multiplexer 12V	16	120VAC
1000-294	8 channel RS-232 multiplexer 24V	8	24VDC
1000-295	16 channel RS-232 multiplexer 24V	16	24VDC
1000-298	8 channel RS-232 multiplexer 48V	8	48VDC
1000-299	16 channel RS-232 multiplexer 48V	16	48VDC
1000-292	8 channel Telco multiplexer 12V	8	120VAC
1000-293	16 channel Telco multiplexer 12V	16	120VAC
1000-296	8 channel Telco multiplexer 24V	8	24VDC
1000-297	16 channel Telco multiplexer 24V	16	24VDC
1000-300	8 channel Telco multiplexer 48V	8	48VDC
1000-301	16 channel Telco multiplexer 48V	16	48VDC

Figure 1. Multiplexer Models

The Multiplexer has fiber optic transmit (Tx) and receive (Rx) ports for communicating with up to eight or sixteen MPMs and/or BDS Controllers.

NOTE: In this document, when BDS is used, it is in reference to the BDS Controller.

1.1. Using an MPM with a Multiplexer

The MPM has two factory options for Telco connection: a Tx/Rx fiber optic port and an RJ-11 port. Both ports are installed, but only one is active. If you are using the MPM with a Multiplexer set for Telco communication, the MPM fiber optic Telco port must be used.

The MPM also has two factory options for rear panel serial connection: a Tx/Rx fiber optic port and an RS-232 (DB-9) port. Only one port is installed. If you are using the MPM with a Multiplexer set for serial communication, the MPM fiber optic serial port must be used. This fiber optic port replaces the RS-232 (DB-9) port.

The MPM front RS-232 port is still available for use with a Service computer. If you connect a Service computer via this port, set the MPM front panel switch to the Local position. When this switch is lit, the MPM front RS-232 port is enabled, and the rear RS-232 or fiber optic port is disabled.

1.2. Using a BDS with a Multiplexer

When using the BDS Controller with a Multiplexer, you must set the configuration settings DIP switch on the BDS Controller rear panel. The switch is factory set for BDS operation with the modem and RS-232 rear local port enabled. To change the switch settings, do the following.

WARNING: Do not use a pencil to change the DIP switch settings. Graphite residue may harm the internal BDS components.

1. Power off the BDS Controller.
2. Change the configuration settings DIP switch, positions 1 through 4, to select Modem or Telco Multiplexer.
3. Change the DIP switch, positions 5 through 8, to select RS-232 Local Port or RS-232 Multiplexer.
4. The new switch setting takes effect when the power is applied.

Configuration DIP Switch Switch Position	Modem		Rear Panel RS-232	
	Modem	Telco Fiber Optic	RS-232 Local Port	Local Fiber Optic
1	ON	OFF	X	X
2	ON	OFF	X	X
3	OFF	ON	X	X
4	OFF	ON	X	X
5	X	X	ON	OFF
6	X	X	ON	OFF
7	X	X	OFF	ON
8	X	X	OFF	ON

Figure 2. DIP Switch Settings

The Multiplexer has a front LED that indicates power and rear LEDs that indicate transmit and receive status. The unit is designed for 19" rack mount or optional wall mount.

1.3. Options Summary

The Serial Port Multiplexer may be ordered with several different configurations:

- Operating voltage of 120VAC, 24VDC or 48VDC.
- Communicate with computer via modem or RS-232.
- Manage 8 or 16 MPMs and/or BDS Controllers.
- Customer-specified fiber optic cable length.
- Rack mount or wall mount.

2. MPM DIP Switch Configuration

The MPM internal DIP switches are factory set, and no adjustment should be needed. However, if you must verify or reset the switch settings, follow these steps.

If the Serial Port Multiplexer is used via modem to a remote Central computer, the MPM internal DIP switch SW-1, position 8 (SW1-8) must be ON. For all other conditions, including the use of the Multiplexer with RS-232 serial communication, set SW1-8 to OFF.

2.1. Using the DIP Switch Diagnostic

Instead of opening the MPM and inspecting the switch settings, you may use the DIP switch diagnostic in the BMDM software to confirm the settings. To access the DIP Switch Diagnostics screen, select Diagnostics|DIP Switch from the String View screen. The Diagnostics screen indicates each switch position.

NOTE: The DIP switch diagnostic can also confirm switch positions inside the BDS and DCM, but these settings are not relevant to Multiplexer operation. These switches are factory set and not usually changed by the user.

2.2. Setting the MPM DIP Switch

IMPORTANT NOTE: Record original switch settings before making any changes.

CAUTION: Do not use a pencil to change the DIP switch settings. Graphite residue may harm the MPM components.

1. Power off the MPM.
2. Remove the MPM cover by removing four screws on the top edges of the cover, two screws on the top edge of the rear panel, and one screw at the top center of the front panel.
3. Set DIP switch 1, position 8 inside the MPM to ON for Multiplexer using modem. Otherwise, set the switch to OFF.
4. Replace the MPM cover.
5. The new switch settings take effect when the power is applied.

3. Multiplexer DIP Switch Configuration

The Serial Port Multiplexer internal DIP switches are factory set, and no adjustment should be needed. However, if you must verify or reset the switch settings, follow these steps.

IMPORTANT NOTE: Record original switch settings before making any changes.

If the Multiplexer is used via modem to a Central computer, the Multiplexer internal DIP switch SW-1, position 1 (SW1-1) must be ON. For RS-232 serial operation, SW1-1 must be OFF. Set switches SW1-2, SW1-3 and SW1-4 to OFF for either condition. To verify or set Multiplexer switch SW1-1, do the following:

CAUTION: Do not use a pencil to change the DIP switch settings. Graphite residue may harm the Multiplexer components.

1. Power off the Multiplexer.
2. Remove the Multiplexer cover by removing four screws on the top edges of the cover, two screws on the top edge of the rear panel, and one screw at the top center of the front panel.
3. Set DIP switch 1, position 1 inside the Multiplexer to ON for Multiplexer using modem, or OFF for Multiplexer using RS-232. Set SW1-2, SW1-3 and SW1-4 to OFF.
NOTE: If the Multiplexer is equipped for 16 MPMs, the DIP switch is located on the lower board.
4. Replace the Multiplexer cover.
5. The new switch settings take effect when the power is applied.

4. Multiplexer Communication

The Serial Port Multiplexer is factory configured for either modem or RS-232 serial communication with the computer.

4.1. Multiplexer to Computer via Modem

When the MPMs or BDS Controllers must be managed by a remote Central computer, the Multiplexer is equipped for modem operation.

Connect fiber optic cables from the Multiplexer to the MPMs or BDS Controllers. Starting at the first available Multiplexer Tx and Rx ports (typically number 1), connect the Multiplexer Tx to the lower Rx on the MPM or to the Telco Rx/FO on the BDS Controller, and connect the Multiplexer Rx to the lower Tx on the MPM or to the Telco Tx/FO on the BDS. Continue connecting the remaining MPMs or BDSs.

Connect the Multiplexer to the telephone line using the Multiplexer rear panel modem connector. If more than one Multiplexer is used, connect each Multiplexer to a separate phone line, and configure the software as described in this manual. Connect the Central computer modem to the phone line according to the computer manufacturer's instructions.

4.2. Multiplexer to Computer via RS-232

When 16 or fewer MPMs or BDS Controllers must be managed by an on-site Central or Local computer, the Multiplexer is equipped for RS-232 serial operation.

Connect fiber optic cables from the Multiplexer to the MPMs or BDS Controllers. Starting at the first available Multiplexer Tx and Rx ports (typically number 1), connect the Multiplexer Tx to the upper Rx on the MPM or to the Local Rx/FO on the BDS Controller, and connect the Multiplexer Rx to the upper Tx on the MPM or to the Local Tx/FO on the BDS. Continue connecting the remaining MPMs or BDSs.

Connect a 9-pin female to female cable (pin to pin construction) to the Multiplexer rear panel RS-232 port and to an available port on the computer.

5. Power Source

The Multiplexer may be configured to operate on 24VDC or 48VDC bus voltage, or 12VDC using a 120VAC to 12VDC adapter. 24V and 48V are typically used by the telecommunication industry, and 12V is used by the power utilities industry.

5.1. Multiplexer 120VAC Operation

Connect the 12V cable from the 120VAC adapter to the Multiplexer rear panel Power connector. Plug the adapter into a protected AC uninterruptible power supply (UPS).

5.2. Multiplexer 24VDC or 48VDC Operation

The Anderson connectors described in the next section provide 24VDC or 48VDC power to the Multiplexer.

5.3. Power Source Configurations

The MPM is designed to accommodate up to 30 different battery configurations. To identify the configuration, refer to the number on the bottom of the unit. The following list indicates which Anderson connectors on the MPM Load Connectors receive the plus and minus power cables from the Multiplexer. (Crimp the cables into the connectors when making the load cable assembly.)

		Load Connections	
Configuration		Plus (+)	Minus (-)
24V Batteries	MPM-100-1x2x12	J1	J3
	MPM-100-2x2x12	J1	J3
	MPM-100-3x2x12	J1	J3
	MPM-100-4x2x12	J1	J3
	MPM-100-1x6x4	J1	J4
	MPM-100-2x6x4	J1	J4
	MPM-100-3x6x4	J1	J4
	MPM-100-4x6x4	J1	J4
	MPM-100-1x12x2	J1	J5
	MPM-100-2x12x2	J1	J5
	MPM-100-3x12x2	J1	J5
	MPM-100-4x12x2	J1	J5
48V Batteries	MPM-100-1x3x8	J1	J4
	MPM-100-2x3x8	J1	J4
	MPM-100-3x3x8	J1	J4
	MPM-100-4x3x8	J1	J4
	MPM-100-1x4x12	J1	J5
	MPM-100-2x4x12	J1	J5
	MPM-100-3x4x12	J1	J5
	MPM-100-4x4x12	J1	J5
	MPM-100-1x8x6	J1	J5
	MPM-100-2x8x6	J1	J5
	MPM-100-3x8x6	J1	J5
	MPM-100-4x8x6	J1	J5
	MPM-100-1x24x2	J1	J5
	MPM-100-2x24x2	J1	J5
120V Batteries	MPM-100-1x10x12	Wall plug transformer*	
	MPM-100-1x20x6	Wall plug transformer*	
	MPM-100-1x30x4	Wall plug transformer*	
	MPM-100-1x60x2	Wall plug transformer*	

BDS-256 (All configurations) Wall plug transformer*

*The wall plug transformer must be supplied by a protected AC power source.

6. Selecting the Multiplexer ID

The System Setup - Link dialog box is fully described in the *MPM-100 Series and BDS-256 Series Monitors and Battery Monitor Data Manager Software User's Guide* in the Setting Up a New MPM or BDS Installation section. The following figure shows the Setup|System|Link dialog box.



Figure 3. System Setup - Link

When using a Serial Port Multiplexer, select a Multiplexer ID (MUX ID) from 1 to 16 on the System Setup - Link dialog box for a particular string. (A MUX ID of 0 indicates the MPM or BDS is not connected to a Multiplexer.) The MUX ID numbers correspond to the connection ports on the Multiplexer rear panel. These are the Tx/Rx ports to which the MPMs or BDSs are connected. The numbers 1 to 16 may be used only one time when using a Local or on-site Central computer connected via RS-232.

If a remote Central computer is connected via modem, the numbers 1 to 16 may be used once for each telephone number. This lets you manage more than 16 MPMs or BDSs. For example, with three Multiplexers on three telephone lines controlled by one Central computer, 1 to 16 may be used three times, once for each Multiplexer telephone line.

7. Connection Notes

On MPMs and BDSs equipped for Multiplexer operation, the front RS-232 Local port remains available for use with a Service computer. If you connect a Service computer via this port, set the front panel switch to Local. When this switch is lit, the front RS-232 port is enabled, and the rear RS-232 or fiber optic port is disabled. During this time, communication via the rear port is stopped.

Both RJ-11 and RS-232 connectors are present on the Multiplexer, but only one is active.

With the Multiplexer option, the MPM Telco (modem) RJ-11 port is disabled but still present.

8. Specifications

Power

- Less than 5 watts. Operates directly from the bus for 24V to 48V applications, or requires a wall plug adapter for 120VDC applications. The wall plug adapter must be used on a protected (uninterruptible power supply) 120VAC source.

Communication Input / Output

- One modem or RS-232 port.
- Eight or 16 fiber optic transmit and receive channels.
0 to 100 meters with HCS[®] fiber, or 0 to 25 meters with plastic fiber.

Indicators

- LEDs (one each): green transmit, green receive, and red power.

Environmental

- Operating temperature range of 0°F to 160°F.

Packaging

- Rack mount 19" and height of 1.75"
- Wall mount with optional mounting brackets.

^o Specifications subject to change without notice.