Multi-Port Controller

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Firmware Version: 1.6

8500116

1. DESCRIPTION

1.1 Overview

The Multi-Port Controller (MPC) is available in two versions. The standard version, available in 4, 8, 16, 24 or 32 port models uses 2-digit port identification numbers. The BT version, available only in 4 or 8 port models, uses 1-digit port identification numbers. Both versions can be set to emulate BayTech Mode 1 or Mode 2 operation. The default is Mode 2.

All ports are easily configured for speed, word length, parity and stop bits using menu-driven commands from the Network Management Port (NMP). The message terminate character, host control character, XON / XOFF flow control and Mode of Operation are also user selectable.

1.2 Mode 1 Operation

Mode 1 provides a Full Duplex communication mode. In this mode, the host sends an ASCII Ctrl-T followed by the port number which enables a full-duplex connection between the host and the selected port. Characters received on other ports are buffered until the host selects that port.

1.3 Mode 2 Operation

The Multi-Port Controller connects to a host computer and provides multiplexing of messages from peripheral devices. Data is buffered until a terminating character is received. The message is then sent to the host, preceded by a one or two digit port identification number. The host can also select individual device ports to transmit data to while simultaneously receiving data from all device ports.

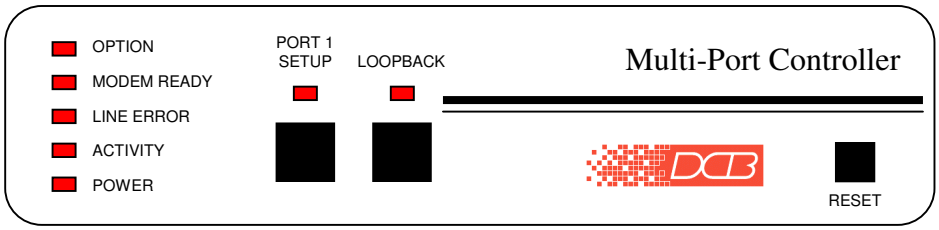
The host port is usually connected to a computer and the device ports are connected to peripheral devices such a cash registers, bar code readers, digital instruments, etc.

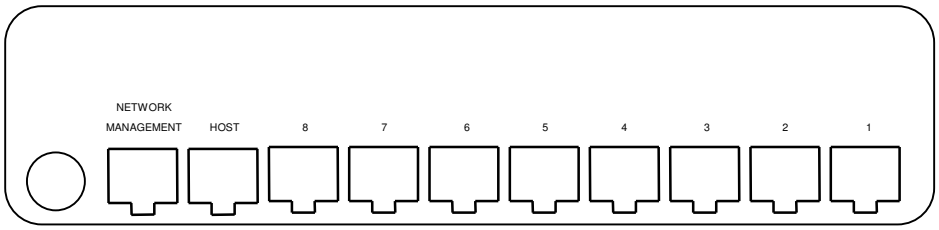
To transmit data to a peripheral device, the host sends the control character followed by the desired device port number. The host will remain connected to that peripheral device until a different device (port number) is selected. The control character and port number are trapped and not sent to the peripheral device. If you wish to send the control character to the peripheral device, you must send it twice. The first control character is trapped and the second is passed through to the device port.

Data received from the peripheral devices is treated as a message (or block). The message begins when a device port receives a character from the attached device and ends when the port terminate character is received. The block is then sent to the host port using the host terminate character. If the host block prefix character is enabled, then the message to the host port will be preceded by the selected prefix character. The blocks of data from the ports can be further separated using the inter-message delay. The MPC automatically inserts the port number as the first one or two characters of each block for port identification.

1.4 Features and Options

- All ports can be individually configured for rate, word length, parity, stop bits, and block terminate character.
- Monitor functions allow network management port user to monitor transmit or receive of any device port.
- The MPC is available in models with 4, 8, 16, 24, or 32 device ports.
- Optional external RS232 to RS422 interface converters are available.
- Optional power supplies are available for 12 VDC, 24 VDC, 48 VDC, and 240 VAC.
- Rack mount options available.





8 Port Multi-Port Controller

2. SPECIFICATIONS

2.1 Ports

Speed
300, 600, 1200, 2400, 4800, 9600, or 19,200 bps

Data Format
Bits: 5, 6, 7, or 8
Parity: Even, Odd, or None
Stop Bits: 1, 1.5, or 2

Interface
CCITT V.24, RS-232D, implemented in RJ-45, 8 position connectors. (RS-561 standard physical pin-out used on RJ-45 connectors)

Flow Control
Hardware (CTS/BUSY): Always Active
Software (Xon/Xoff): Optional

Buffer
512 bytes per port

2.2 Network Management Port Commands

Show Host Port Configuration
Show Unit Configuration
Configure Host (Port)
Configure (Device) Ports
Set Unit Identifier
Show Activity Counters
Zero Activity Counters
Show (device port) Flow Control
Test Tools
Loop MPC Host Port
Quit Loop
Monitor (Device) Port Tx
Monitor (Device) Port Rx
Set NMP Parity
Reset MPC
Reset to Factory Default Settings
Type
Repeat Last Command
Disconnect NMP

2.3 Environmental

Operation: -40 to 70° C, 10 to 85% relative humidity
Storage: -40 to 85° C, 10 to 85% relative humidity

2.4 Physical / Electrical

10¼" W x 9¾" D x 2½" H – 8 and 16 channel units
10¼" W x 9¾" D x 4 ¼" H – 24 and 32 channel units
120 VAC external power supply
30 watts, .25 amps
Optional 12 VDC, 24VDC, 48VDC, or 240VAC power supply available

2.5 Other Specifications

Front Panel Indicators
- Power
- Activity
- Line Error
- Modem Ready
- Option (8-32 port models only)
- Port 1 Setup
- Loopback

Front Panel Switches
- Loopback
- Port 1 Setup
- Reset

3. INSTALLATION

3.1 Unpacking

Remove the unit from the shipping container and examine it carefully for external damage. If shipping damage is apparent, notify the shipper immediately.

The following accessories are included with all units:

- external power supply
- manual
- warranty, maintenance contract and repair information
- Network Management Port cable (green) for connecting the network management port to a PC for configuration.

3.2 Setup

Configuration of the MPC can be done either by a terminal connected to the Host port or throught the Network Management port on the rear of the unit.

3.2.1 Using the Host Port

To configure the MPC using the Host port connect a terminal device to the Host port, using the appropriate cable from Section 6.3, and type Ctrl-T C. The following menu should appear.

```
SR-MPC Multiport Controller
Version 1.1

Status.............................1
Set Serial Port Configuration.......2
Set Control Character...............3
Set Host Terminate Character........4
Set XON/XOFF Handshaking............5
Set Mode of Operation...............6
Exit...............................X

Enter Request:
```

Follow the prompts and make changes as required.

3.2.2 Using the Network Management Port

The easiest way to configure the MPC is by using the NMP. Network Management Port operation is described in Section 5.

3.3 Resetting Factory Defaults

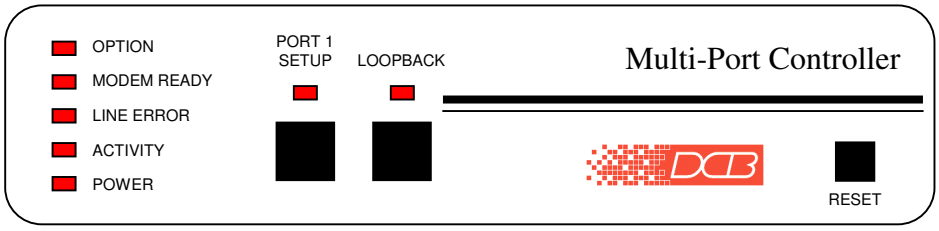
The factory default settings for the MPC are as follows:

Rate:	9600
Word Length:	8
Parity:	None
Stop Bits:	1
Block Terminate character:	0DH (Ctrl-M / CR)
Host Control character:	14H (Ctrl-T / DC4)
Host Block Prefix character:	Disabled
Inter-Message Delay:	0 ms
XON/XOFF Flow Control:	Disabled
MPC Mode:	Mode 2

To reset the unit to factory defaults use the **!R** command from the network management port or perform the following steps using the front panel switches:

1. Depress and hold the PORT 1 SETUP switch. Press and release the RESET switch.
2. Continue to hold the Port 1 Setup switch until its LED has gone OFF.
3. All settings should be at the factory defaults. Use the SC (Show Configuration) command to check the settings.

4. FRONT PANEL CONTROLS AND INDICATORS



Front Panel – MPC 8 – 32 port models

4.1 Switches

Port 1 Setup – Used with the RESET switch to return the unit to factory default settings.

Loopback – Enables a bi-directional loopback of the MPC Host port.

Reset – Performs a hardware reset of the MPC.

4.2 Indicators

POWER – ON when the MPC is connected to power.

ACTIVITY – Flashes every time a device port sends a block of data to the Host port.

LINE ERROR – Flashes when a Host port framing and/or parity error is detected.

MODEM READY – ON when Host port DCD is HI.

OPTION – Always ON. (MPC 8-32 only)

PORT 1 SETUP – Turns ON when the Host port is in configuration mode (Ctrl-T C).

LOOPBACK – ON when MPC loopback is enabled.

5. NETWORK MANAGEMENT PORT

5.1 Introduction

The Network Management port (NMP) is used to configure the MPC for proper operation. This connection can be used to configure the host and device ports.

5.2 Connections

Connection to the NMP is made through a port on the rear of the MPC using the green cable and 9 pin adapter supplied.

5.2.1 Using a PC

The NMP functions are available through a port on the rear of the unit labeled Network Management. To connect a PC to this port, use the green cable and adapter provided. Set the PC terminal emulator software for 9600 bps, 8 data bits, no parity, one stop bit (9600, 8, N, 1) and no flow control.

5.2.2 Dedicated Modem

For remote access to NMP functions, a dial-up modem may be connected to the Network Management Port. You must fix the DTE interface speed of the modem at 9600 bps, 8 data bits, no parity and one stop bit. Refer to your modem manual for appropriate setup procedures. Use the appropriate cable from paragraph 6.3.3 for connection.

5.3 Using the Network Management port

To activate the NMP, press the ENTER key. When you see **AT YOUR COMMAND >>**, the NMP is active and ready for your commands. Type H <Enter> to display the command set.

5.4 Commands

5.4.1 Help (H or ?)

COMMAND		PARAGRAPH
Show: Host	SH	5.4.2
Config	SC	5.4.3
Change: Host Config	CH	5.4.4
Port Config	CP	5.4.5
Set ID	ID	5.4.6
Activity Counters/Zero	AC/Z	5.4.7
Flow Control	FC	5.4.8
Test Tools	TT	5.4.12
Type	TY	5.4.9
Repeat Last Command	*	5.4.10
Disconnect NMP	BYE	5.4.11

This Help screen shows the choice of commands available. The commands allow you to display the selected options, configure the MPC, and perform diagnostic functions such as monitor data, show flow control state, show activity and other useful tests.

5.4.2 Show Host port configuration

This command (SH) displays the current configuration of the host port. Parameters displayed are rate, word length (5, 6, 7, or 8 bits), parity (even, odd, or none) and stop bits (1, 1.5, or 2). The host terminate character, host control character, host block prefix character, inter-message delay and XON/XOFF flow control settings are also displayed.

5.4.3 Show (MPC) Configuration

The Show Config (SC) command shows the current MPC configuration settings for both the Host and Device ports. Port numbers may be included with this command to limit the display range. If no port numbers are included, settings for all ports are shown. Use this command to verify proper unit configuration.

NOTE

Several commands allow port numbers or port number ranges to be included on the command line. When port numbers are included, the syntax is as follows:

(Command)1	Port 1
(Command)1,2,6	Ports 1, 2 & 6
(Command)1 2 6	Ports 1, 2 & 6
(Command)2-6	Ports 2 thru 6
(Command)1,5-8	Ports 1 and 5 thru 8

5.4.4 Change Host (port) Configuration

The CH command is used to change the host port speed, word length, parity and stop bits settings. The default setting is 9600, 8, N, 1. The host block terminate character, host control character, host block prefix character, inter-message delay, XON / XOFF flow control and Mode of Operation are also set using this command.

NOTE

The XON / XOFF flow control setting is a golbal setting and affects all ports.

5.4.5 Change (Device) Port Configuration

The Change Port Config (CP) command sets the rate, word length, parity, stop bits configuration and block terminate character for each device port. Select the port or ports to be changed and follow the on screen prompts to change the desired setting. To leave a setting unchanged, press Enter. The factory default setting is 9600, 8, N, 1 0DH.

5.4.6 Set ID

The Set ID (ID) command allows you to set or change the MPC identifier. IDs can be a maximum of 15 characters in length. Pressing <Enter> with no entry will leave the ID unchanged.

5.4.7 Activity Counts / Zero

The Activity Counts (AC) command shows transmit and receive data statistics for all ports. The data are presented in terms of bytes of information sent and received by the host and each device port. Error counts are also shown.

The ERRORS column indicates framing and/or parity errors. The OVRFLW column shows buffer overflows. A range of ports may be included with this command to reduce the number of ports shown.

The Z command is used to zero the counters so that current activity can be monitored.

5.4.8 Flow Control

The Flow Control (FC) command displays the current device port flow control status. A port range may be included with this command.

5.4.9 Type

The Type (TY) command displays information about the MPC including firmware version, number of ports and unit ID.

5.4.10 Repeat Last Command

To repeat the last command, simply press the * key. This is handy for repeating screens of constantly changing data.

5.4.11 Disconnect NMP

The BYE command toggles the RTS output from the Network Management port. This is used to disconnect equipment such as dial-up modems or the DCB Access Switch.

5.4.12 Test Tools

The Test Tools (TT) menu summarizes the test and troubleshooting commands. These commands are listed separately to reduce the clutter in the main help list, but are always available from the command prompt.

COMMAND		PARAGRAPH
MPC Loop/Quit	ML/QML	5.4.13
Monitor Port Tx	MT#	5.4.14
Monitor Port Rx	MR#	5.4.14
NMP Parity	P	5.4.15
Reset MPC	RESET	5.4.16
Reset Factory Defaults	!R	5.4.17

5.4.13 MPC Loop / Quit

The MPC Loop command (ML) enables a bi-directional loopback of the MPC Host port. When enabled, the front panel Loopback indicator is on and data from any or all device port(s) will be looped back to the originating port.

Use the QML command to end the loopback.

5.4.14 Monitor (Device) Port Tx or Rx

The Monitor Port Tx (MT#) command monitors data transmitted from the selected device port to the host port. The Monitor Port Rx (MR#) command monitors data received by the selected device port from the host port. A device port number must be included on the command line.

In short, MT# monitors data coming in to the device port from the attached device and MR# monitors data sent from the device port to the attached device.

When port monitor is active, two ESC characters are required to end the test.

5.4.15 NMP Parity

The NMP Parity command (P) sets the parity for the network management port. The factory default is SPACE (8,N,1).

5.4.16 Reset MPC

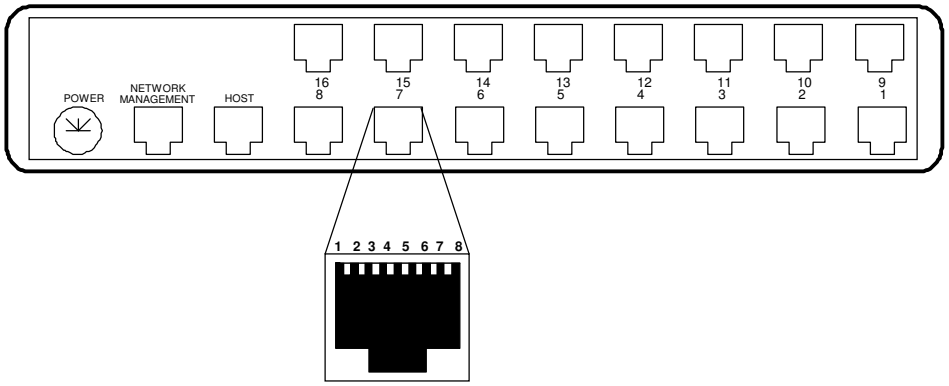
The Reset MPC (RESET) command performs a software reset of the MPC. This will not change the configuration settings.

5.4.17 Reset Factory Defaults

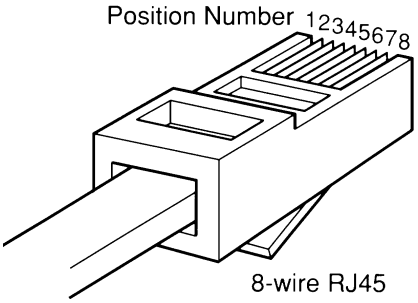
To reset the MPC to factory default settings, type **!R** (bang R) from the command prompt. This will set all parameters back to factory settings (see paragraph 3.3) and clear the unit ID.

6. INTERFACE SIGNALS AND CABLING

6.1 Connector Location and Pin Reference



MPC-16 Rear Panel and RJ-45 Jack



RJ-45 Plug Positions

6.2 Port Interface

6.2.1 Host Port (RJ-45)

Pin	Signal	In/Out
1	Not Used	
2	Not Used	
3	Data Carrier Detect	IN
4	Signal Ground	
5	Transmit Data	OUT
6	Receive Data	IN
7	Request to Send	OUT
8	Clear to Send	IN

6.2.2 Device Ports (RJ-45)

Pin	Signal	In/Out
1	Data Set Ready	OUT
2	Data Carrier Detect	OUT
3	Busy	IN
4	Signal Ground	
5	Receive Data	OUT
6	Transmit Data	IN
7	Clear to Send	OUT
8	Request to Send	IN

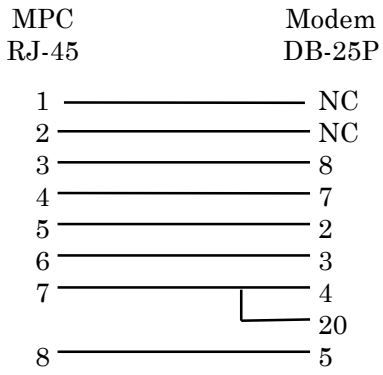
6.2.3 Network Management Port (RJ-45)

Pin	Signal	In/Out
1	Not Used	
2	Not Used	
3	Data Carrier Detect	IN
4	Signal Ground	
5	Transmit Data	OUT
6	Receive Data	IN
7	Request to Send	OUT
8	Clear to Send	IN

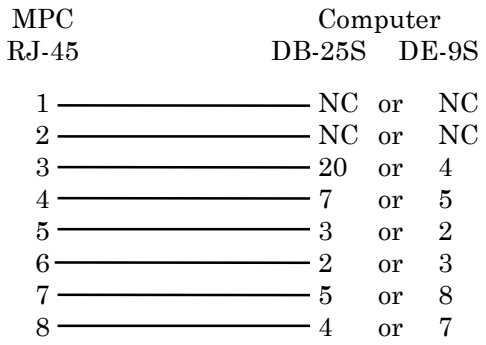
6.3 Cables

6.3.1 Host Port Cables

To Asynchronous Modem



To a PC Com Port



6.3.2 Device Ports to connected device

Configured as DTE

MPC RJ-45		Device DB-25	
1	———	6	
2	———	8	
3	———	20	(or other flow control output pin)
4	———	7	
5	———	3	
6	———	2	
7	———	5	(or other flow control input pin)
8	———	4	(or 20 if 4 is flow control)

Configured as DCE

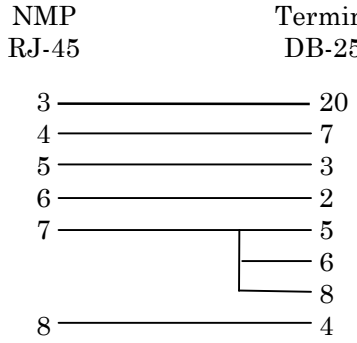
MPC RJ-45		Device DB-25	
1			
2	———	20	(or 4 if 20 is flow control)
3	———	5	(or other flow control output pin)
4	———	7	
5	———	2	
6	———	3	
7	———	4	(or other flow control input pin)
8	———	8	

To a PC Com Port

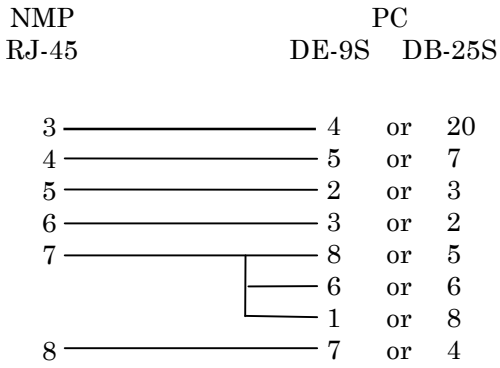
MPC RJ-45		Computer DB-25S		DE-9S
1	———	6	or	6
2	———	8	or	1
3	———	4	or	7
4	———	7	or	5
5	———	3	or	2
6	———	2	or	3
7	———	5	or	8
8	———	20	or	4

6.3.3 Network Management Port

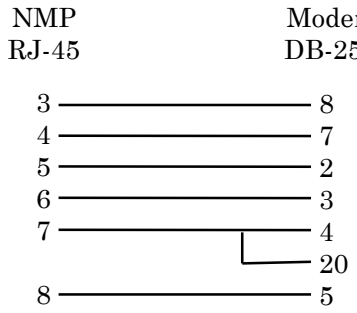
To a TERMINAL



To a PC using terminal emulation



To a dial-up MODEM for remote access



7. TROUBLESHOOTING

7.1 General Approach

When troubleshooting problems, a rational plan can save you many hours of frustration. The following is a brief outline of standard troubleshooting procedures.

1. Gather the facts to determine the exact nature of the problem.

2. Draw a picture of the system showing the equipment connections. Use this as a reference to note your observations, test steps and test results. A picture keeps you focused and often saves duplicate effort.

3. Record the front panel indications before changing anything. This is an important part of fact gathering

4. If you change anything, change only one thing at a time.

5. Use the built-in test functions and record your results.

7.2 Assistance

If you need assistance troubleshooting your system, contact DCB customer support at (217) 897-6600 between 8:00 am and 5:00 pm central time Monday through Friday.

8. WARRANTY

All DCB products are warranted to be free of defects in materials and workmanship for two years. Data Comm for Business will repair or replace any equipment proven to be defective within the warranty period. All warranty work is F.O.B. Dewey, IL. This warranty is exclusive of abuse, misuse, accidental damage, acts of God or consequential damages, etc. DCB liability shall not exceed the original purchase price.

All equipment returned for repair must be accompanied by a Returned Material Authorization (RMA) number. To receive an RMA number, call (217) 897-6600 between the hours of 8 AM and 5 PM central time. Equipment must be shipped prepaid to DCB and will be returned at DCB's expense.

Ship returned items to:

Data Comm for Business
2949 County Road 1000E
Dewey, IL 61840
ATTN: RMA#

Data Comm for Business, Inc.
PO Box 6329
Champaign, IL 61826-6329

Tel (217) 897-6600
Fax (217) 897-1331