

DRAFT

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MC-1000 Users Guide

Users Guide

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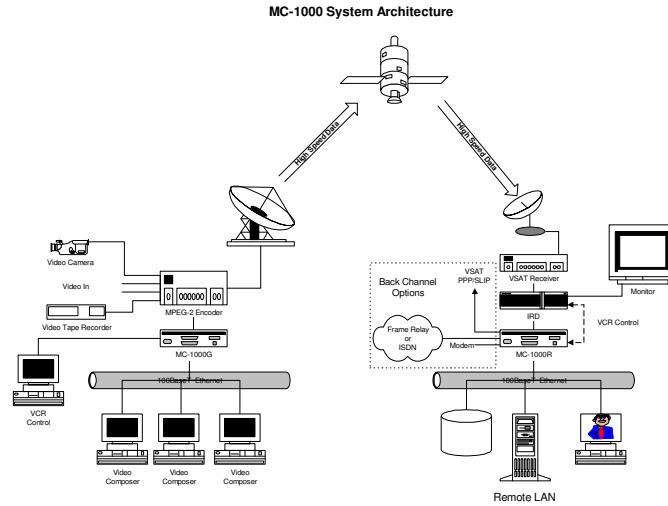
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1. Introduction

The MediaMagic MC1000 is a 10/100BaseT Ethernet protocol converter, bridge and router and is connected directly to the input and output of a satellite



transmission system. The MC1000 is capable of routing IP unicast and multicast data. When the MC1000R “Remote” is used in conjunction with the MC1000G “Gateway”, the network provides a high-speed, end-to-end data solution. Refer to Figure 1-1 for a network diagram of a typical MC1000 network. The MC1000 also provides an asynchronous transmission path for Sony “S-Control” for remote VCR control.

Figure 1-1 Network Topology

At the uplink facility, the MC1000G is connected to an Encoder, such as a GI DCII or Scientific PowerVu which converts the outgoing data from a serial-bit stream to Intermediate Frequency (IF) and eventually to Radio Frequency (RF).

2. Physical Characteristics

Description	Specification
Dimension	9.00" X 6.00" X 1.78"
Operating Environment	32 to 100 Degrees F
Operating Humidity	10 to 90% non-condensing

Table 2-1 Physical Characteristics

3. Electrical Characteristics

Input Voltage	5VDC 2.4Amps
Memory	4M Bytes Expandable to 64M Bytes
WAN Interface	1 RS-530 DTE DB-25 Male
LAN Interface	1 10/100BaseT RJ-45 Port IEEE 802.3u
Console Interface	1 RS-232 RJ-11
Sony Control	1 RJ-45 and Phono
EMI Compliance	FCC Class A (ETL)
Safety Compliance	UL 1950 (ETL)

Table 3-2 Electrical Characteristic

4. Installation

The MC1000 contains sensitive electronic equipment and should be treated with care. Please observe the following precautions when installing the unit.

- **Keep the MC1000 located in a climate controlled and dust-free environment**
- **Provide adequate ventilation and open airflow to the unit**
- **Mount the unit on a stable surface**
- **Ensure that strain relief is provided for the wiring and connectors**
- **Keep cables under floors or in ceilings to avoid tripping or damage to the connections**

4.1 MC1000R

Use the following procedure when installing the MC1000R.

1. Remove the MC1000R and power supply from the shipping container. Visually inspect the packaging, MC1000R unit and power supply for damage. If any damage is visible, return to MediaMagic for inspection and/or replacement.
2. Record the MC1000R serial number located bottom of the unit. This serial number is also the MAC address of the unit.
3. Connect the MC1000R to the Ethernet concentrator using the MC1000R's RJ-45 10/100BaseT Ethernet port. The Ethernet cable must be minimally Category III type cabling, however, Category V type cabling (MediaMagic part # 750-002) is preferred. To insure compliance with standard Ethernet practices, the total length of the Ethernet cable must be less than 200 Meters between the Ethernet concentrator and the MC1000R.
4. Connect the MC1000R RJ-45 S-Control port to the S-Control port of the Sony VCR. Note: when extending commands via Category V cabling from RJ 45 port the custom filter cable (MediaMagic part # 750-001) MUST be used to connect to the VCR.
5. Connect the power supply to the MC1000R.

4.2 MC1000G

Use the following procedure when installing the MC1000G.

1. Remove the MC1000G and power supply from the shipping container. Visually inspect the packaging, MC1000G unit and power supply for damage. If any damage is visible, return to MediaMagic for inspection and/or replacement.
2. Record the MC1000G serial number located bottom of the unit. This serial number is also the MAC address of the unit.
3. Connect the MC1000G to the Ethernet concentrator using the MC1000G's RJ-45 10/100BaseT Ethernet port. The Ethernet cable must be minimally Category III type cabling, however, Category V type (MediaMagic part # 750-002) cabling is preferred. To insure compliance with standard Ethernet practices, the total length of the Ethernet cable must be less than 200 Meters between the Ethernet concentrator and the MC1000G.
4. Connect the MC1000G DB-9 port to the PCD/VCR controller.
5. Connect the power supply to the MC1000G.

5. Configuring the MC1000

Many of the MC1000 configuration parameters have already been set. The MC1000 may require some configuration depending on the site requirements. Software administrative functions can also be performed such as setting up the IP address and subnet mask, modifying the L-band receiver parameters, or upgrading the firmware.

The unit is accessed locally through the Terminal (Term) port using the Window 3.1, Windows Hyper Terminal, or a standard communications emulator program. The unit can be accessed via the network remotely using the Telnet, PING, and FTP applications, once the IP parameters have been assigned and activated. For security reasons, a password is assigned to each unit for accessing Telnet and FTP.

5.1 Connecting to a local MC1000

To configure the MC1000, the installer must connect the terminal cable between the PC's serial port, and the RJ-11 connector to the MC1000's Terminal port. This cable is an optional accessory and is available from MediaMagic (P/N 750-007). The cable can also be fabricated on-site using commonly available standard parts. Refer to the specification section of this manual for pin-out connections.

5.2 Configuring the Terminal Emulator

When accessing the MC1000 unit through a terminal emulator, the communication parameters will need to be configured. The terminal emulator must provide **No Flow Control, 9600 BAUD, 8 Data Bits, 1 Stop Bit, and No Parity**. The correct communications port will need to be assigned to ensure proper communications. Refer to Figure 5.1 for an example of the configuration screen. When all the terminal settings are correct and communication has been established, pressing <enter> displays the opening banner followed by the Main Menu.

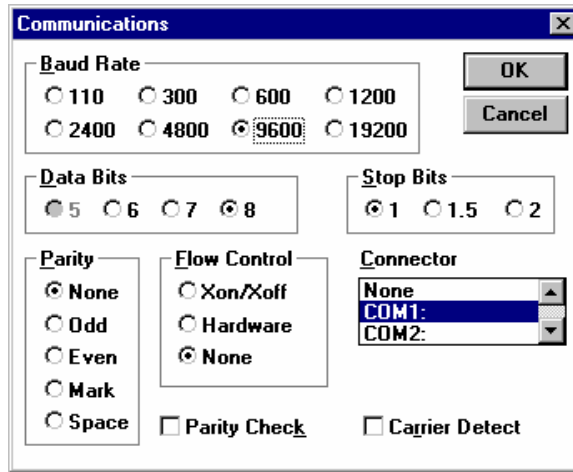


Figure 5-1 Terminal Emulator Screen

5.3 MC1000 Main Menu

The MC1000 main menu allows access to all configuration parameters.

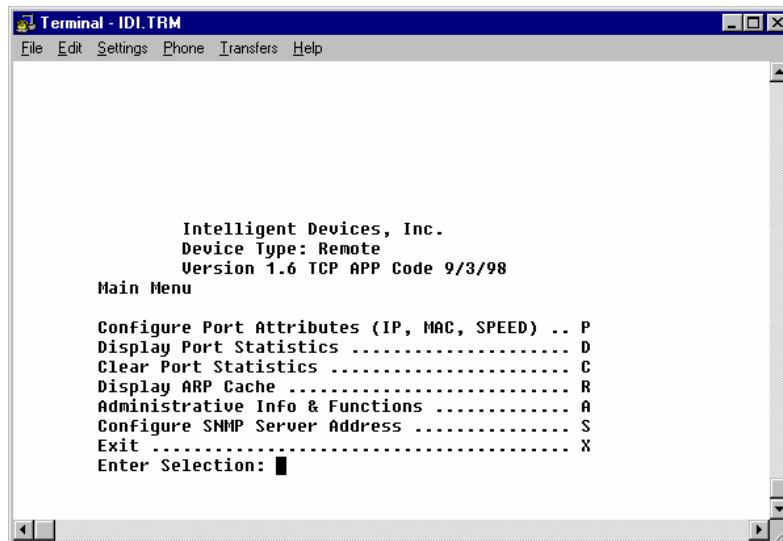


Figure 5-2 MC1000 Main Menu

5.3.1 Main Menu Tree

The following is a breakdown of the MC1000 remote Main Menu tree that shows the locations of each menu option.

- Set Clocking Mode
- Set Port Attributes (IP, MAC, Speed)
 - Set Ethernet MAC Address
 - Set Ethernet IP Address
 - Set 10/100 Full/Half Duplex Parameters
 - Set Ethernet Default Gateway
- Show Port Statistics
- Clear All Statistics
- Program Downloader
 - Local (via Terminal)
 - Show Application Header
 - Reboot Local Application
 - Exit
- Exit

5.3.2 MC1000 Menus

MC1000 unit addresses are user configurable. Use the **Set Port Attributes** menu to set the IP address, subnet mask, and the default gateway. The serial number of the unit also serves as the MAC address and cannot be changed.

5.3.2.1 Displaying the MAC address

To display the MAC address, go to the Port Attributes Menu by choosing Set Port Attributes under the Main Menu. Select **Set Ethernet MAC Address**. The current MAC address is displayed. The MAC address is set from the factory and is identical to the serial number of the unit. This parameter cannot be modified.

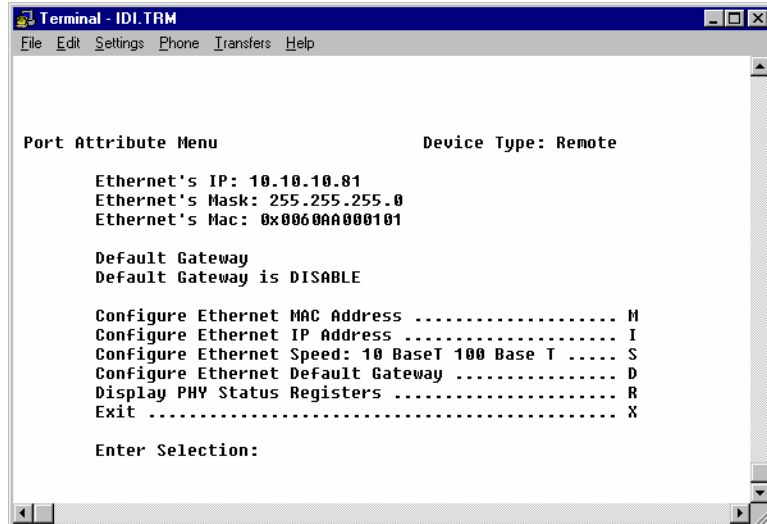


Figure 5-3 Displaying Interface Configuration

5.3.2.2 Displaying and Setting the IP address and Mask

To set the IP address or mask, choose **Set Ethernet IP Address** under the **Set Port Attribute** option under the Main Menu. Select either **Set IP Address** or **Set Mask Address** and make changes as necessary. The IP address and subnet mask assigned to the MC1000 should be assigned by the network administrator. The address entered will be in “dotted notation.” An example of dotted notation will be 10.10.10.1 or 199.210.10.1.

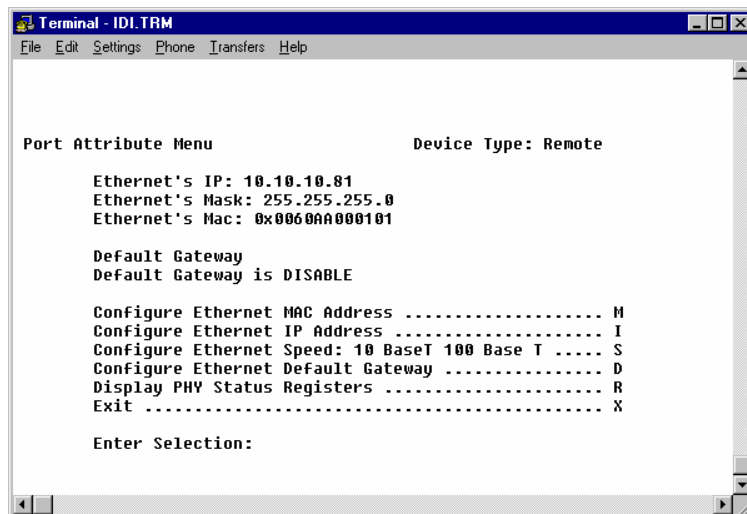


Figure 5-4 Setting IP Address and Subnet Mask

5.3.2.3 Displaying and Setting the Default Gateway

To display or set the Default Gateway address, choose **Set Ethernet Default Gateway** under the Set Port Attributes. **Consult the network administrator when making any changes to the default gateway settings.**

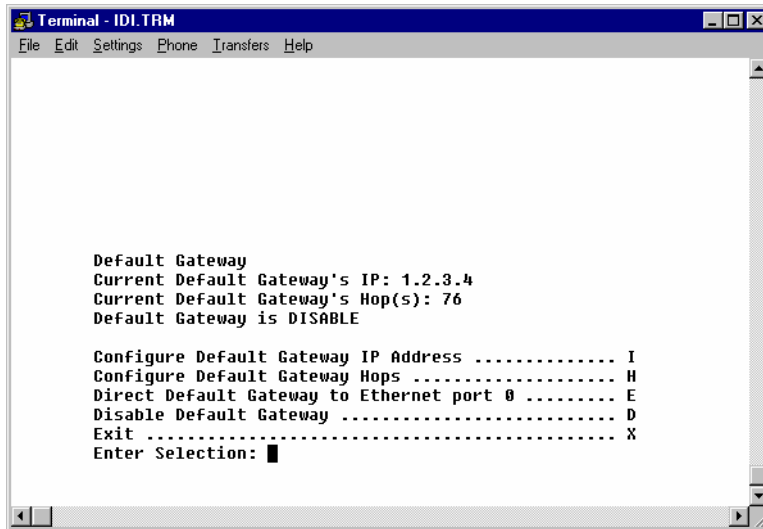


Figure 5-5 Setting IP Address and Subnet Mask

The default gateway assigned must be within the IP subnet of the MC1000's IP address. The number of hops defines the total number of routers the MC1000's packets will be capable of traversing before the hop count (TTL) goes to zero and the packet is discarded. For most networks, setting the number of hops to one (1) will be sufficient.

5.3.2.4 Displaying the Port Statistics

The MC1000 will display the statistics for the Ethernet and the High-Speed Port (HSP) interface. The statistics are updated every time the <enter> key is depressed. If the "x" is depressed, the main menu is restored. The number of packets transmitted is the amount of packets that have been routed through the unit. To reset the Ethernet and HSP packet counters, press "c" while displaying the port statistics. This will not interrupt packet processing by the MC1000.

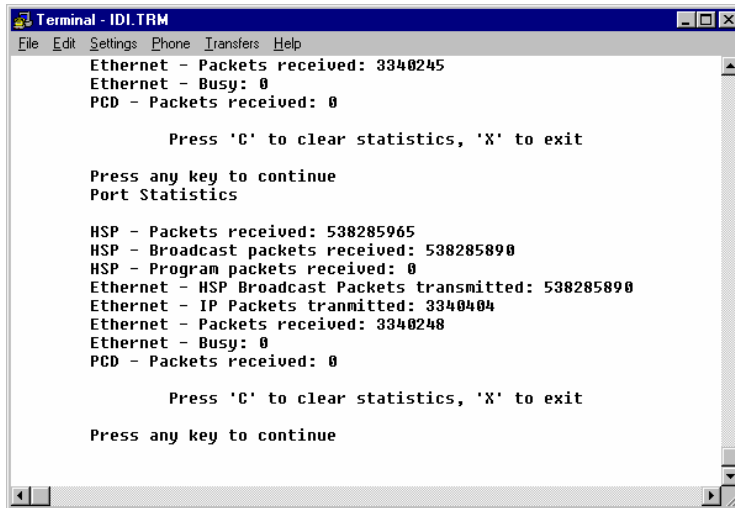


Figure 5-6 Displaying Port Statistics

5.3.2.5 The Program Downloader

The Program Downloader menu provides access for downloading firmware code to the local unit through the Terminal port. This function should only be used when an upgrade is required. Please refer to software release notes to perform this function.

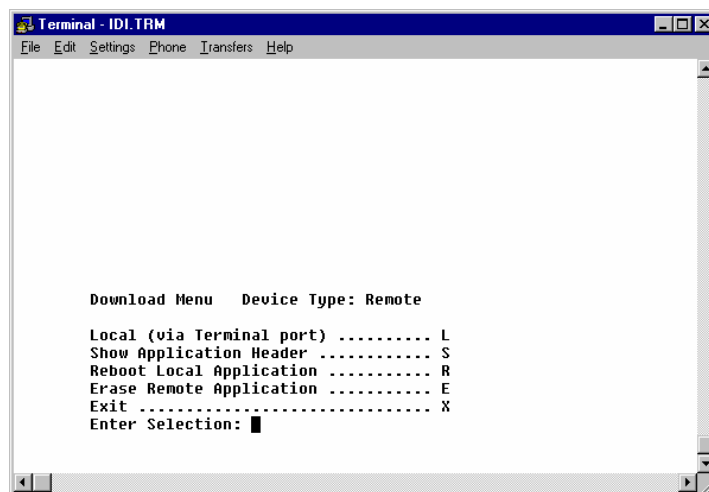


Figure 5-7 Program Downloader

5.3.2.6 Show Application Header

To determine the version of firmware running on the MC1000 unit, choose **Show Application Header** under Download Menu. The information provided will be the current application software which is running. If an application file is not present, then only the boot code will be displayed. If no application is present, the boot software build date and version will be listed.

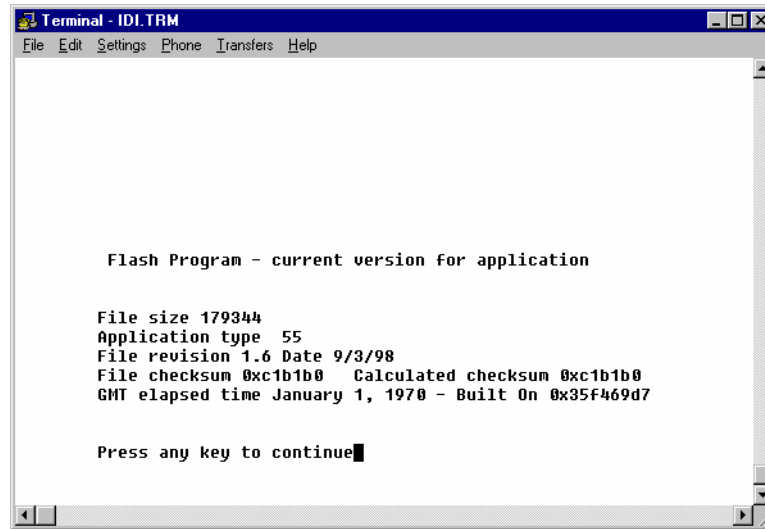


Figure 5-8 Show Application Header

5.3.2.7 Reboot Local Application

To reboot a local unit that is directly attached to the terminal port, select the **Reboot Local Application** option under Download Menu. This command will cause the MC1000 to “warm boot” and reload its boot and application software. If a new valid version of boot or application code has been downloaded, it will be loaded at this time.

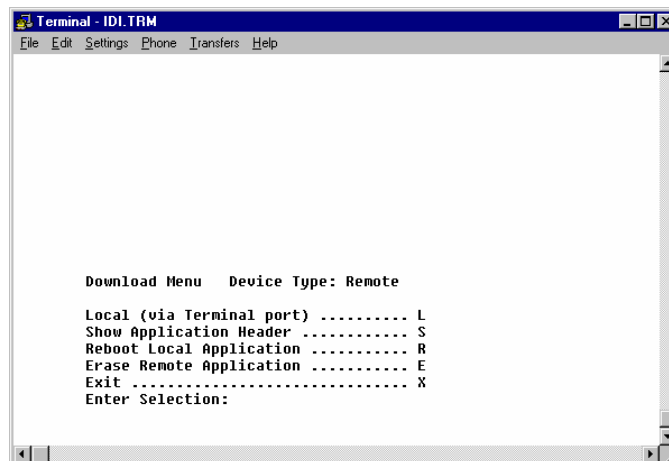


Figure 5-9 Reboot Local Application

5.3.2.8 Configure Ethernet Port

The Ethernet port can be configured with the following options:

10BaseT or 100BaseT
Half Duplex or Full Duplex

Once the port has been changed, the unit *must be reset* before the changes take place.

The menu selections reset PHY, disable PHY and Switch, and Enable PHY and Switch should only be used for troubleshooting purposes and not used for normal operation.

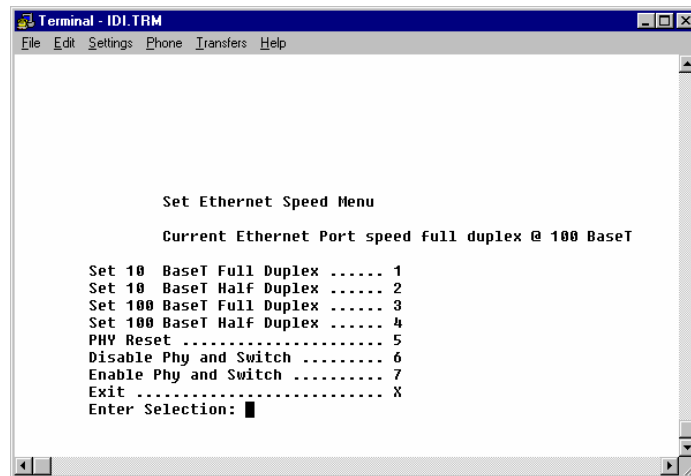


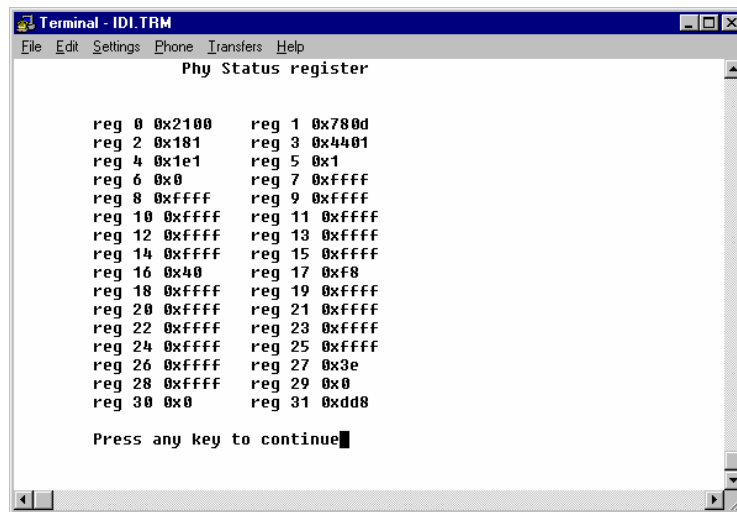
Figure 5-10 Ethernet Port Configuration

5.3.2.9 Show PHY Parameters

Displaying the PHY statistics should be used to determine whether the Ethernet port has an active link and the configuration of the Ethernet port. The registers which should be examined are as follows:

Register 0:	0x0	= 10BaseT Half Duplex
	0x100	= 10BaseT Full Duplex
	0x2000	= 100BaseT Half Duplex
	0x2100	= 100BaseT Full Duplex
	0x3000	= Auto Sensing Enabled (Not valid state for MC1000)
Register 1:	0x7809	= Ethernet port does not have a valid link
	0x780d	= Ethernet port has a valid link

Register 2-31 Are for debugging purposes



```
Terminal - IDI.TRM
File Edit Settings Phone Transfers Help
Phy Status register

reg 0 0x2100    reg 1 0x780d
reg 2 0x181     reg 3 0x4401
reg 4 0x1e1     reg 5 0x1
reg 6 0x0       reg 7 0xffff
reg 8 0xffff    reg 9 0xffff
reg 10 0xffff   reg 11 0xffff
reg 12 0xffff   reg 13 0xffff
reg 14 0xffff   reg 15 0xffff
reg 16 0x40     reg 17 0xf8
reg 18 0xffff   reg 19 0xffff
reg 20 0xffff   reg 21 0xffff
reg 22 0xffff   reg 23 0xffff
reg 24 0xffff   reg 25 0xffff
reg 26 0xffff   reg 27 0x3e
reg 28 0xffff   reg 29 0x0
reg 30 0x0     reg 31 0xdd8

Press any key to continue
```

Figure 5-11 Show PHY Parameters

6. Operation

This section describes the features, menus, and procedures for setting up and configuring the MC1000.

6.1 Front Panel Indicators

The MC1000 is equipped with an array of front panel LED indicators that provide information about the current status of the MC1000. These indicators also serve as basic diagnostic tools, and show the degree of collisions occurring on the Ethernet network. The six LED indicators function as follows:

LED	Status	Description
PWR	On	Power Status – Indicates that power is being supplied to the unit by the 12/5 VDC power supplies.
LNK	On	Link Status – indicates that a successful link has been established between the receiver and the 10Base-T concentrator. Ethernet packets will not pass until the link status condition is satisfied.
RXD	Flashing	Received Data – indicates that an Ethernet packet has been received by the receiver on the Ethernet port
TXD	Flashing	Transmit Data – indicates that a packet is being transmitted onto the Ethernet network by the receiver. This is an indication the receiver has received a packet from the L-Band receiver and has passed it to the Ethernet port for transmission
FDX	On	Full Duplex – indicates whether half duplex or full duplex is select – LED illuminated is FDX
COM	Flashing	Communication - indicates a valid PCD command is being received when illuminated

Table 6-1 Front Panel Indicators

7. SNMP Management

SNMP supports remote management and status of the MC1000, and is compatible with HP Openview™ or SunNet Manager. SNMP should be used to allow periodic polling of the MC1000 to provoke a response from a remote should information be required. MediaMagic has implemented Management Information Base (MIB) II which allows any standard SNMP manager to manage the remote network. In the event an automatic notification is required, without an active response, SNMP traps can be generated by the E-Star. The messages which are supported by MediaMagic are LinkUp, LinkDown, and ColdStart. Each of these messages are indications of a significant status change.

- Cold Start (0) (Element 1.3.6.1.6.3.1.1.5.1)
- Interface Up (2) (Element 1.3.6.1.6.3.1.1.5.4)
- Interface Down (3) (Element 1.3.6.1.6.3.1.1.5.3)

A ColdStart (0) indication is a notification of the MC1000 coming active. The ColdStart condition is generated when the MC1000 is either powered up for the first time or a warm boot (software reset) has occurred.

The Interface Up (2) indication is a notification that the interface has come active. The Interface Up condition is generated when the MC1000 has found the first internal link status message on the space link.

The Interface Down (3) indication is a notification that the interface is going inactive. The Interface Down condition is generated when the MC1000 has not seen a valid internal link message. Note, the interface down message will only be sent one time to the SNMP manager. Due to the potential number of MC1000s in a network, a fixed back off on the generation of the Interface Down message is used to prevent a saturation of the network in the event of an outroute failure.

SNMP can be used to gather statistics such as total system up time, interface statistics, TCP connections, etc.

Appendix A: Cabling Specifications

RS-232 Diagnostic Interface Cable

<u>RJ-12</u>	<u>Description</u>	<u>DB-25</u>
1	SGND	7
2	RD	3
3	TD	2
4	CGND	1

Ethernet 10BaseT Interface Cable

<u>RJ-45</u>	<u>Description</u>	<u>RJ-45</u>
1	TX+	1
2	TX-	2
3	RX+	3
6	RX-	6

Remote to Encoder RS-530 Interface Cabling

<u>DB-25</u>	<u>Description</u>	<u>DB-37</u>
1	CGND	1
7	SGND	19
2	TxDA	24
14	TxDB	6
12	TxCB	17
15	TxCA	35
11	ETxCB	8
24	ETxCA	26

Gateway to Encoder RS-530 Interface Cabling

<u>DB-25</u>	<u>Description</u>	<u>DB-37</u>
1	CGND	1
7	SGND	19
3	RxDA	24
16	RxDB	6
9	RxCB	8
17	RxCA	26

Appendix B: Acronyms

BPS - Bits per Second
DCE - Data Communications Equipment
DF2000 - Data Formatter 2000
DSM-CC Digital Storage Media-Command & Control
DTAC - Dynamic TCP Acknowledgment Consolidation
DTE - Data Terminal Equipment
EIA – Electronics Industries Association
FTP - File Transfer Protocol
GND - Ground
HSP - High Speed Port
Hz - Hertz
MediaMagic – MediaMagic Corporation.
IP - Internet Protocol
IRD - Integrated Receiver Decoder
ISO – International Organization for Standards
LAN - Local Area Network
MAC - Media Access Control
MTU - Maximum Transmission Unit
NW – Network
PPM - Parts per Million
PPS - Packets per Second
RFC – Request for Comments
RXD - Receive
TCP - Transmission Control Protocol
TTL – Time To Live
VSAT - Very Small Aperture Terminal
WAN - Wide Area Network