



MARCH 2006

LMC5200A - LMC5207A - LMC5208A

LMC5209A - LMC5210A - LMC5211A

LMC5212A

## High Density Media Converter System II 20-Slot Rackmount Chassis



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Notes:

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European Directive 2002/96/EC (WEEE) requires that any equipment that bears this symbol on product or packaging must not be disposed of with unsorted municipal waste. This symbol indicates that the equipment should be disposed of separately from regular household waste. It is the consumer's responsibility to dispose of this and all equipment so marked through designated collection facilities appointed by government or local authorities. Following these steps through proper disposal and recycling will help prevent potential negative consequences to the environment and human health. For more detailed information about proper disposal, please contact local authorities, waste disposal services, or the point of purchase for this equipment.



## About the 20-Slot Media Converter System

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The 20-Slot Media Converter System is a modular chassis platform designed for use with Black Box SNMP-manageable series of modules. The 20-Slot Media Converter System is a 3U high, rackmountable chassis that features 20 slots for installing application series modules plus an additional slot for installing an SNMP management module. Each 20-Slot Media Converter System includes a redundant AC power supply. Power supplies are user-replaceable and hot-swappable.

SNMP Management Modules include two twisted pair ports, one for management and one reserved for future use. The management module also features a DB-9 serial port, and supports SNMP V1/V2c.

This manual applies to:

LMC5207A 20-Slot Rackmount, Dual AC Power

LMC5208A 20-Slot Rackmount, Dual DC Power

Accessories:

LMC5200A SNMP Management Module

LMC5209A Modular Fan Assembly

LMC5210A Dual-AC Module

LMC5211A AC Module

MC5212A Dual DC Module

## Installing the 20-Slot Media Converter System

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Before installing any modules into a 20-Slot Media Converter System, install the chassis first. When installing the chassis, be sure to observe the following precautions to prevent electrical or mechanical damage:

- Stay within the chassis' power rating to prevent overload of supply circuits or damage to overcurrent protection and supply wiring.
- Maintain reliable earth ground, especially when connecting to a power strip instead of directly to a branch circuit.
- Protect the chassis from exposure to sunlight and electrical or magnetic fields.
- Ensure that the equipment rack remains stable, even with the addition of the chassis and its associated cabling.

To install a 20-slot rackmount chassis, have four #10 screws and four clip nuts available. (Hardware may vary depending on rack type.) The rest of the hardware is supplied with the unit.

First, locate a suitable location in the rack for installation and secure the clip-nuts onto the mounting rails. Use screws to attach the chassis to the rack. Finally, plug the chassis into a reliable, filtered power source.

## Federal Communication Commission Radio Frequency Interference Statement

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This equipment has been tested and found to comply with the limits for a Class B computing device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

The use of non-shielded I/O cables may not guarantee compliance with FCC RFI limits. This digital apparatus does not exceed the Class B limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

*Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe B prescrites dans le Règlement sur le brouillage radioélectrique publié par le ministère des Communications du Canada.*

## Fiber Optic Cleaning Guidelines

Fiber optic equipment is extremely susceptible to contamination by particles of dirt or dust which can obstruct the optics and cause performance degradation. Good system performance requires clean optics and connector ferrules.

- 1) Only use fiber patch cords (or connectors) from a reputable supplier; low-quality components can cause many hard-to-diagnose problems.
- 2) IMC Networks installs dust caps to ensure factory-clean optical devices. These protective caps should not be removed until the moment of connecting the fiber cable to the device. Assure that the fiber is properly terminated, polished and free of any dust or dirt and that the location is as free from dust and dirt as possible.
- 3) Store spare caps in a dust-free environment such as a sealed plastic bag or box so reinstalled caps do not introduce any contamination to the optics.

### WARNING

Integrated circuits and fiber optic components are extremely susceptible to electrostatic discharge damage. Only qualified service technicians using tools and techniques conforming to accepted industry practices should handle these components.

- 4) Reinstall the protective caps when disconnecting the fiber device.
- 5) To clean contaminated optics, alternate between blasting with clean, dry, compressed air and flushing with methanol to remove particles of dirt.

## Warranty

Contact Black Box for warranty information.

## SNMP Management Module LEDs

Each SNMP Management Module features several LEDs. The LED functions are:

**LNK/ACT:** Glows green when a link is established on port. Blinks green when data activity occurs.

**FDX/COL:** Glows yellow when port is in Full-Duplex mode. Blinks yellow when port is operating in Half-Duplex mode and collisions occur.

**TEMP:** Glows yellow when temperature of unit surpasses a user-defined level.

**PS:** Glows yellow when one power supply malfunctions.

**FAN A / FAN B:** Glows yellow when a fan malfunctions.



## Installing Modules

To install a module, remove the blank bracket (if present) covering the slot where the module will be installed. Slide the module into the chassis using the card guides, and secure the module to the chassis by tightening the captive screw. Each module slot provides 1.5 Amps, which is enough power to accommodate most any type of application modules. Refer to the installation guide shipped with the module for configuration information.

### Installing Management Modules

In order to manage a 20-Slot Media Converter System, install the SNMP Management Module. SNMP Management Modules install in the first slot, on the far left of the chassis. This slot is **ONLY** for the management module; do not install Application Modules such as media conversion and mode conversion modules in this slot. Follow the instructions for installing a module, shown above.

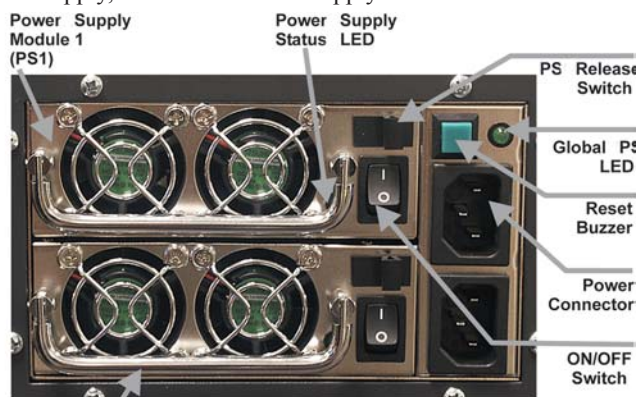
## Power Supplies, Fans and Temperature Gauge

The mechanical nature of power supplies, fans, and temperature gauges makes them more susceptible to wear and tear, so they may wear out before the accompanying electronic components. With this in mind, the 20-Slot Media Converter System supports modular fans and power supplies, so that worn parts can be replaced without having to send an entire unit in for repair. Keeping fans functional ensures that the modules will operate within their temperature specifications.

### USER-REPLACEABLE POWER SUPPLIES

The 20-Slot Media Converter System ships with two power supplies installed. Power supplies are auto-sensing (i.e. either 115 or 230 for AC power supplies) and are also hot-swappable.

Power down the 20-Slot Media Converter System before installing a power supply. To remove a power supply, move both Power Supply Release switches inward and hold the power supply by the silver handle and slide out of the chassis.



AC Redundant Power Supply Close-up



DC Redundant Power Supply Close-up

#### NOTE

Do not mix AC and DC power supply modules.

## Black Box Customer Service

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## Specifications

### Environmental

Operating Temperature: 32° - 122° F (0° - 50° C)

Storage Temperature: 0° - 160° F (-20° - 70° C)

Humidity: 5 - 95% (non-condensing)

### Power

AC Input Load: 100/240VAC±10% ~ 50/60 Hz, 115V = 10A and 230V = 5A

DC Input Load: -38VDC 15A max / -48VDC 12A max / -72VDC 8A max

## Using iView<sup>2</sup>

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iView<sup>2</sup> is a network management application for Black Box intelligent networking devices. It features a graphic user interface (GUI) and gives network managers the ability to monitor and control products from a variety of platforms. iView<sup>2</sup> can also function as a snap-in module for HP OpenView NNM.

### System Requirements

To run iView<sup>2</sup>, the management PC must be equipped with:

- 29 MB free disk space, 64 MB RAM
- One of the following Windows Operating Systems: NT 4.0 Service Pack 5, 2000 Professional, XP Professional
- Microsoft SNMP Services Installed
- Microsoft IE 4.0 or Higher
- Microsoft IIS required for Web Server Version

### Java versions require the following:

- 25 MB free disk space, 64 MB RAM
- Any OS capable of running Java (Windows 98 or above, Solaris, LINUX)
- Java Runtime v 1.3 (Standalone)
- Java Runtime v 1.2 (Servlet)

### Strongly recommended:

- 128 MB RAM
- Pentium III 650Mhz or Faster
- 17" Monitor @ 1024 x 768 Resolution or higher

Please consult the iView<sup>2</sup> CD for installation information. The *Help* tab in iView<sup>2</sup> provides assistance in configuring/managing Black Box modules.

### USING iVIEW<sup>2</sup> WITH HP OPENVIEW

During the installation, the iView<sup>2</sup> application will ask if HP OpenView is installed on the management PC. Click **Yes** to integrate the appropriate files. Once in OpenView, highlight the media converter icon and select the media converter; OpenView will then launch iView<sup>2</sup>.

### IF NOT USING iVIEW<sup>2</sup>

If using an application other than iView<sup>2</sup> for management, integrate the SNMP vendor files (a.k.a. MIBs) into the application. The SNMP agent uses the following MIB, which can be found in the MIB directory on the CD included with the 20-Slot Media Converter System: MCIMC.MIB.

Refer to the application's documentation for information on how MIB files are integrated.

### Buzzer Reset Button

When one power supply malfunctions, an audible alarm sounds to indicate the loss of one power supply. There is a **Buzzer Reset** button, located next to the power connector on the power supply, which is pressed to stop this alarm. Remove and replace the power supply immediately.

### Last Gasp Alarm

The 20-Slot Media Converter System includes a Last Gasp feature, which sends a trap (configured in iView<sup>2</sup>) when both power supplies malfunction, when both power supplies are powered down, or when the AC line fails.

### USER REPLACEABLE FANS

The 20-Slot Media Converter System includes two user replaceable fans with tachometers. Users define a threshold for fan operation via SNMP (when installed in a managed environment). If a fan's speed falls below the specified level, SNMP sends a trap (configured in iView<sup>2</sup>) to the administrator. There are also two LED indicators on the SNMP Management Module for fan failure.

Power down the 20-Slot Media Converter System before installing or removing fans. Then, remove the AC power cord. To replace a fan, remove the four screws on the outside edges of the fan, then gently slide the fan out of the chassis and unplug the attached cables. To install a fan, connect the attached cables to the backplane, gently slide the fan into the chassis and tighten the screws.

### TEMPERATURE GAUGE

The 20-Slot Media Converter System includes a temperature monitoring gauge with a heat sensor on the management module. Users define a threshold for chassis temperature via SNMP. If the chassis' temperature rises above the specified level, the SNMP agent sends a trap (configured in iView<sup>2</sup>) to the administrator. There is also an LED indicator on the SNMP Management Module for chassis temperature.



## Connecting a Managed Chassis and Modules

A 20-Slot Media Converter System with an installed management module connects to the LAN via an external 10/100 twisted pair connection. Connect the chassis to the network by plugging one end of a CAT-5 twisted pair cable into the port labeled **MGMT** on the 20-Slot Media Converter System. Plug the other end of the cable into a device (e.g., switch, hub, etc.) in the existing Ethernet network. The port labeled **Option** is reserved for future use. Both twisted pair ports include the AutoCross feature that automatically selects between a crossover workstation or pass-through depending on the connected device.

## Configuring the 20-Slot Media Converter System

Once connected to a network, assign the 20-Slot Media Converter System IP configuration information (e.g., IP address, subnet mask, etc.). There are three ways to do this:

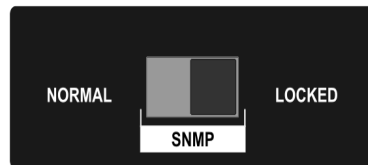
- Using iConfig
- Using the management module's serial port
- Using DHCP (Dynamic Host Control Protocol); DHCP must be enabled through serial configuration

In addition to assigning an IP address and subnet mask, the 20-Slot Media Converter System also allows creation of community strings, assigning access rights, configuration of traps and more. iConfig offers more options than configuring via the serial port.

After assigning the 20-Slot Media Converter System an IP address, use iView<sup>2</sup> or another SNMP-compatible Network Management System (NMS) to remotely configure, monitor and manage the modules installed.

### SNMP WRITE LOCK

There is an **SNMP Write Lock** switch located above the SNMP module slot on the front of the 20-Slot Media Converter System. The SNMP Write Lock switch prevents a new management board from re-configuring the application module settings (e.g. the status of features such as LinkLoss, FiberAlert, Force mode, etc.) made via SNMP on any previous management board(s).



#### NOTE

Leave this switch in the **NORMAL** position during day-to-day operation; the **LOCKED** position should only be used when changing the SNMP management board.

### ENDING A SESSION

When ending a session, press **E** before disconnecting the cable in order to stop the device from continuing to send feedback status through to the serial port.

### DEVICE-SPECIFIC OPTIONS— DOWNLOADING FILES

With the 20-Slot Media Converter System firmware can be downloaded from a central server via the TFTP protocol. Initiate this download via serial configuration or Telnet session. Make sure the IP Address and the name of the file being downloaded are correct in the Current Values section of the Main Configuration screen. To download a file, press the **Space Bar** in the Command List section of the Main Configuration screen (serial configuration). Type **download** and press **Enter** to be taken to the *Download a File* screen. This screen displays the IP Address of the TFTP server and the name of the file. Press **Enter** to start downloading the file.

If the download is interrupted, do not reset the module or reboot the chassis. Close the session, then open a new TFTP session.

### ADDITIONAL DEVICE-SPECIFIC OPTIONS

The 20-Slot Media Converter System also includes the following device-specific options:

- **tasks:** Displays the Task List along with each tasks' priority.
- **memory:** Displays the memory usage
- **cleandb:** Reboot with clean database  
This removes all information in the database except the IP address.
- **date:** Displays the PROM build date
- **reboot:** Reboots

Press the **Space Bar** when in the Command List section of the Main Configuration screen (serial configuration/Telnet session), type the name of the action and press **Enter**.



## CREATING COMMUNITY STRINGS FOR SNMP

The purpose of community strings is to add a level of security to a network. The default community string is named "public" and has read/write access. Delete the "public" string and add necessary custom communities strings such as one with read-only access (for general use), the other with read/write access (for the administrator). To create a new community string, go to the main configuration screen and press **C**. Enter the name of the new community (up to 16 characters, no spaces) and press **Enter**. Then type one of the following to assign the community string's access rights:

• **R** = read-only access • **W** = read/write access • **Enter** = abort

Press **Enter**. When finished, press **Enter**, and type **reboot** for changes to take effect. The Saved Values and Current Values should now both display the changes made (e.g., new IP address and subnet mask).

## DELETING COMMUNITY STRINGS

To delete all community strings and start over, press **U**. Press **Y** to delete all strings or **N** to abort. Press **Enter**.

This function will delete ALL community strings. To selectively delete community strings, use iConfig.

## ASSIGNING TRAP DESTINATIONS

Manageable device sends traps when a certain events take place. To enter a trap destination, press **T**. Enter the IP address of the destination device and press **Enter**. Then, type the name of the community string (that the destination device has been configured to accept) and press **Enter**. This function enables ALL of the traps. To selectively activate and de-activate traps, use iConfig.

## REMOVING TRAP DESTINATIONS

To remove all trap destinations, press **K**. Press **Y** to remove all trap destinations. Press **N** to abort. Then, press **Enter**.

## PASSWORD PROTECTION

Password protect the serial configuration process by pressing **P** from the main configuration screen. Type the password and press **Enter**. Passwords are case sensitive and should be no more than eight characters in length with no spaces. This password will be requested whenever logging on or off. To remove password protection, select **P** and instead of entering a password, press **Enter**.

Passwords are a way to make the management of network devices secure. If the password(s) are lost, neither the end user nor Black Box has a way to "decode" it.

## ENABLING/DISABLING DHCP

To Enable/Disable DHCP, press **D**. Then type **reboot** for the changes to take effect.

As stated, SNMP management modules can be removed and replaced as necessary. If saved from the first SNMP management module, the PROM file can be downloaded to the second SNMP module, thus retaining the configuration settings. (See the iConfig help file for information.) Make sure the SNMP Write Lock switch is set to the **LOCKED** position. The PROM file should be saved periodically in case there is a need to replace the SNMP management module.

If the management module is removed with the SNMP Write Lock switch set to **NORMAL**, all settings revert to their default. Hardware settings should be configured to match those made via SNMP. Always reconfigure application modules when moving them from one chassis to another.

## USING THE SNMP WRITE LOCK SWITCH

- 1) Ensure the SNMP Write Lock switch is set to **NORMAL**.
- 2) After configuring all application module settings via SNMP, use the iConfig application to make a backup copy of the SNMP management board's firmware.
- 3) If the SNMP management module needs to be replaced, set the SNMP Write Lock switch to **LOCKED**.
- 4) Remove the old SNMP module and replace with another SNMP module.
- 5) Connect to this SNMP module via iView<sup>2</sup>, then launch iConfig. Select the **Administration** tab and click on **List Tasks**. Highlight **Flashsav** and then click on the **Terminate** button.
- 6) Update the new board with the firmware backup made in **Step 2**.
- 7) Reboot the SNMP management module to enable changes.
- 8) After rebooting, set the SNMP Write Lock switch back to **NORMAL**. The previously made settings to the application modules will be active.

## USING TELNET

The 20-Slot Media Converter System supports Telnet for remote configuration. Assign the 20-Slot Media Converter System an IP address BEFORE using a Telnet session (see the section on assigning TCP/IP information). All configuration that can be done via the serial port can also be performed using Telnet. Use only one Telnet session at a time. Do not use an RS-232 serial session and a Telnet session at the same time.

## ABOUT DHCP

The DHCP client is disabled by default and the management module is assigned a default IP Address of 10.10.10.10. If a DHCP server is present on the network and DHCP is enabled, the DHCP client will initiate a dialogue with the server during the boot up sequence. The server will then issue an IP address to the 20-Slot Media Converter System. Once the new IP address is received, 20-Slot Media Converter System will reboot so that the new IP address will take effect. See the *About Serial Port Configuration* section for Enable/Disable information. If there is no DHCP server on the network, use iConfig or serial configuration to manually set the IP addresses.

When DHCP is enabled, the default IP address (10.10.10.10) or the IP address assigned, is saved. When DHCP is disabled, the saved IP address will be reinstated and the 20-Slot Media Converter System will reboot.

DHCP servers give out lease times: devices renew their leases based on the administrator-specified time. If the 20-Slot Media Converter System cannot renew its lease, and the lease expires, the 20-Slot Media Converter System will be given the IP address 10.10.10.10 and reboot.

#### ABOUT iCONFIG

iConfig is an in-band configuration utility (in iView<sup>2</sup>) that lets users quickly and easily complete the first stages of SNMP configuration for SNMP-manageable devices. iConfig can set the IP address, subnet mask and default gateway as well as define the community strings and SNMP traps.

In addition to the above functions, iConfig offers an authorized IP address system and access restriction to MIB groups supported by manageable devices. These extra layers of security are purely optional and do not affect SNMP compatibility.

The iConfig utility can also be used to upload new versions of the system software and new MIB information. It also offers diagnostic capabilities for faster resolution of technical support issues. The default user ID for both iConfig and Telnet is:

User: **admin** / Password: **admin**

The iConfig utility works with the following platforms:

• Windows™ 98 • Windows NT • Windows 2000 • Windows XP

The iConfig utility is available as a standalone application as well as built in to the Windows version of iView<sup>2</sup> (Windows 98 users must use the standalone version of the iConfig utility). Both applications are included on the iView<sup>2</sup> CD. For information regarding the use of the iConfig utility, refer to the iConfig utility help file.

## About Serial Port Configuration

The SNMP management modules used with 20-Slot Media Converter System feature a serial port that includes an IBM-compatible DB-9 serial connector. To connect an 20-Slot Media Converter System to a terminal/computer, use a straight-through (pin-to-pin) cable. (If the computer/terminal's port is not compatible with a DB-9 COM port, use the pin connection chart for reference in making a cable.) Make sure the cable length is less than 50 feet (15.24 meters). Plug one end of the cable into the DB-9 connector and the other into the appropriate port on the computer/terminal.

Set the computer/terminal for VT-100 emulation. The serial port on the computer/terminal should be set for: 38.4K baud, 8 data bits, 1 stop bit, no parity, no flow control.

DB-9 PIN CONNECTION CHART	
Function	Pin #
Transmit (OUT)	2
Receive (IN)	3
Ground	5
Reserved	1, 4, 6-9

## MAIN CONFIGURATION SCREEN

After running through an initial self-test, the screen will display the following message: "Press <Enter> for Device Configuration." Press **Enter** for the main configuration screen, which includes the following displays:

**Saved Values** — displays changes made during current session.

- IP Address (MUST be assigned during initial configuration)
- Subnet Mask (MUST be assigned during initial configuration)
- Default Gateway

**Current Values** — displays values currently in use.

- IP Address (IP address of SNMP agent)
- Subnet Mask (mask to define IP subnet agent is connected to)
- Default Gateway (default router for IP traffic outside subnet)

#### Command List

- I = Enter New Saved Parameter Values
- P = Change Password
- T = New Trap Destination
- K = Remove ALL Trap Destinations
- C = New Community String
- U = Delete ALL Community Strings
- D = Enable/Disable DHCP
- E = End Session

**Space**= Device Specific Configuration (Tasks, Memory, CleanDB, Download, Date and Reboot) options available here.

NOTE
Reboot after making any modifications to the Saved Values or your changes will not take effect. To reboot, type <b>reboot</b> at the prompt on the main configuration screen, or turn the chassis OFF then ON again.

NOTE
The <b>F2</b> key functions as a Delete key on VT-100 terminal emulators.

## ASSIGNING TCP/IP INFORMATION

To modify the Saved Parameter Values (i.e., assign IP address and subnet mask), press **I**. Enter the IP address and subnet mask for the connected device, pressing **Enter** after each. The default gateway can also be assigned, if desired (press Enter to skip).

When finished, press **Enter**, then type **reboot** for changes to take effect. The Saved Values and Current Values should now both display the changes made (e.g., new IP address and subnet mask).