BLACK BOX Catalogue Ltd

The Source for Connectivity

MTU9030

16 NOV 2000

SNMP Management
Processor
User Guide

Copyright

Product Limited Warranty

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ISO Compliance

Products Manufactured Under
An ISO 9001 Certified
Quality Management System

Warning

The Management Access Processor complies with FCC Part 15 of the Federal Communications Commission (FCC) Rules concerning radio frequency emissions for Class A computing devices. The following section is required by the FCC.

Caution

In accordance with FCC Part 15 section 15.21, changes or modifications made by the buyer that are not expressly approved by BLACK BOX Ltd could void the buyer's authority to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class A digital 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 case the user will be required to correct the interference at his own expense.

Description

The SNMP Management Processor

The SNMP Management Processor is an intelligent communications controller that enables you, through either a direct Ethernet or (SLIP) Serial Line Internet Protocol connection, to manage Black Box CSUs/DSUs and inverse multiplexers, either as stand-alone units or as part of a shelf.

The SNMP Management Processor is available in ~~three~~ *Two* configurations: as a stand-alone unit with a self contained power supply, and as a module.

When directly attached to an Ethernet backbone, the SNMP Management Processor provides simultaneous Simple Network Management Protocol (SNMP) and Telnet access to either stand-alone or shelf DSU Modules and associated remote units. An Ethernet connection provides direct LAN access to the DSUs.

Access to daisy chained DSUs and shelf DSUs is enabled by the Ethernet, COMM 3 port and craft ports. LAN access is provided by an Ethernet port. SLIP access is provided through the COMM 3 port or craft port. Local access is provided with an ASCII terminal using either the COMM 3 port or craft port.

SNMP Management Processor Stand-alone

Figure 1-1 and Figure 1-2, respectively, show the front and back views of the stand-alone SNMP Management Processor. The front view shows the various LEDs and the craft port connector. The rear view shows the fuse, AC and DC power connectors, and the COMM 1, COMM 2, COMM 3, Alarm In/Out and Ethernet connectors.
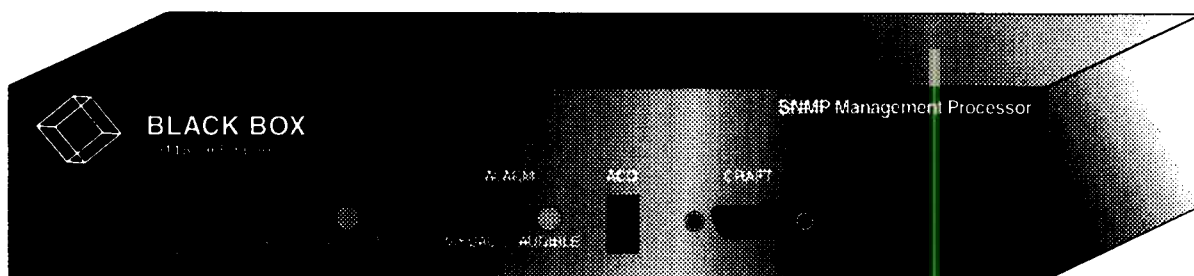

Figure 1-1   Front View of Stand-alone SNMP Management Processor

SNMP Management Processor Module Features

The SNMP Management Processor provides management access through an Ethernet connection to stand-alone Black Box ~~Catalogue, Ltd~~ DSUs and Black Box ~~Catalogue, Ltd~~ ~~Ensemble Encore or Broadband DL3900 Shelf DSU~~ shelf modules and their remote units.

WAN (handwritten annotation)

The SNMP Management Processor converts Ethernet data to the SLIP data at the physical and data link level. The DSUs communicate with the SNMP Management Processor via a SLIP connection while the NMS supports Ethernet.

The following features are particular to the SNMP Management Processor module. These are:

- External Alarms
- Alarm Cut-Off
- External Clock
- Power Supply Fail Signal
- Hot Swappable Module

External Alarms

The SNMP Management Processor enables you to use visual and audible alarm relay contacts and illuminates the VISUAL and AUDIBLE ALARM LEDs on the front panel when an alarm signal is generated by a DSU module in the shelf. The DSU module must be configured to send the external alarm signal. Refer to the DSU/CSU module users guide for further information about configuring the DSU modules to send an external alarm signal.

To get a SNMP trap you must enable the trap and message on Menu 8, "Alarm Configuration."

Alarm Cut-Off

You use the Alarm Cut-Off (ACO) button to terminate the AUDIBLE ALARM LED and audible alarm contacts. Refer to Chapter 5 for further information about the front panel LEDs and the ACO button.

External Clock

The SNMP Management Processor receives the external clock signal from the BNC connector on the Shelf rear panel and redistributes it to the DSU modules. If the external clock signal is being used by the DSU, removing the SNMP Management Processor from the Shelf removes the clock signal and disrupts DSU module functions that are dependent on the clock signal.

Power Supply Fail Signal

The SNMP Management Processor sends a Power Supply Fail signal to the DSU module (or to the NMS) when a power supply failure occurs. The SNMP Management Processor can send an SNMP trap to the NMS. The trap is enabled on Menu 8, *Alarm Configuration.*

Hot Swappable Module

The SNMP Management Processor can be inserted and removed without disrupting the DSU functions except when the external clock is being used by the DSU modules. The external clock signal is disconnected from the DSU modules when the SNMP Management Processor is removed.

SNMP Management Processor Operation

IP Addressing

The attached DSUs are DSUs installed in a shelf, connected to the COMM 1 or COMM 2 ports, and the remote units.

The SNMP Management Processor can access the attached DSUs using both multiple and single IP address access. With multiple IP address access, each unit is assigned a unique IP address. The attached units are thus addressable on the network. The SNMP Management Processor performs Proxy ARP, whereby the SNMP Management Processor is programmed to act as the proxy address for DSUs attached, and responds to the IP address of its attached units.

With single address access, the attached units are not assigned IP addresses. The SNMP Management Processor has the only registered IP address. The attached units are assigned "dummy" IP addresses, where the first digit is set to zero. The attached units are recognizable only by the SNMP Management Processor. This has the advantage of making the attached unit addresses invisible, and does not require the registration or administration of many IP addresses.

If you use single address access with Telnet, you are given a menu of attached units. With SNMP access, the unit ID of each unit is set as part of the community string. The unit ID is set in each attached unit. To ping an attached unit, you log into the SNMP Management Processor using either Telnet or a local ASCII terminal. You then bring up Menu 9, enter the IP address of the unit and proceed.

Downloading code from a workstation to an attached unit is performed using Trivial File Transfer Protocol (TFTP). If the remote file name includes the unit ID, then the code will be downloaded to that attached unit.

The SNMP Management Processor has four serial communication ports connectors—COMM 1, COMM 2, and COMM 3 on the back panel and the Craft connector on front. The Ethernet port has one connector on the back panel.

Remote management access is provided through the Ethernet, COMM 3 and craft connector by means of a SLIP connection. Local access, through a VT100 terminal is provided from the COMM 3 or craft connector.

A terminal provides ASCII access while a workstation provides Telnet, SNMP, and terminal emulation access.

Port Functions

The SNMP Management Processor has five external ports. These are:

*   COMM 1

New Features in Software Release 2.0

SNMP Management Processor software release 2.0 provides the following new features. These are described below.

Single IP Addressability

An NMS can manage all of the units attached to the SNMP Management Processor with only one IP address. Using SNMP, Telnet, and TFTP proxies, an NMS can manage any of the units attached to the SNMP Management Processor using the SNMP Management Processor IP address. Only one IP address is required, and this address is assigned to the SNMP Management Processor. You assign a dummy IP address to each attached unit. These dummy IP addresses are not visible to the NMS.

COMM 3 Activation

You can use the COMM 3 serial port to permit an NMS to communicate with the SNMP Management Processor and its attached units using SLIP and ASCII. COMM 3 operates simultaneously with the Ethernet port. For SLIP access, you assign an IP address to the COMM 3 port.

New Download Features

A non-disruptive dual image code download feature has been added to the SNMP Management Processor along with a scheduled reset feature. This allows you to download without interrupting management access. You can schedule the switch to the new code at a time of your choice to minimize any outage. You can also switch back to the old code if you choose.

SNMP

SNMP management of the SNMP Management Processor has been added. It uses MIB II and an enterprise MIB for the SNMP Management Processor.

Two Unit Ports

In Release 1.5 and earlier, COMM 2 was a unit port, with COMM 1 being an NMS port. In Release 2.0, both COMM 1 and COMM 2 are unit ports. COMM 1 provides an uninterruptable management path to the attached units, while the Craft port can interrupt Ethernet and COMM 3 traffic to COMM 2. Using the Craft port, you can communicate with devices attached to COMM 2, but not with devices attached to COMM 1. Units attached to COMM 1 are always manageable through the Ethernet or COMM 3 ports. If the COMM 1 port is in use when the SNMP Management Processor software is downloaded, the COMM 1 port is automatically configured as an NMS port; otherwise COMM 1 is configured as a unit port.

SLIP Traffic Through Craft Port

You can configure SLIP traffic to pass through the Craft port. A craftsperson can connect with a portable workstation using for example WANviewRC to manage the network using SNMP.

Preparing for Installation

This chapter shows you how to mechanically install the stand-alone SNMP Management Processor. Mechanical installation procedures for the SNMP Management Processor module are covered in the appropriate shelf installation guide.

The first installation procedure is for AC power; the second is for DC power.
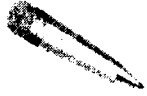
NOTE: If you are an experienced user, you can use the Quick Install procedure in Appendix B, *"Quick Install"* to configure the SNMP Management Processor.

After mechanically installing the SNMP Management Processor, go to Chapter 3, *"Configuration"* to learn how to connect a terminal and configure the SNMP Management Processor.

Before you begin you need to:

* Unpack and inspect the SNMP Management Processor for damage that may have occurred during shipment. Wipe the exterior with a soft cloth, if necessary.
* Save all enclosed packing slips and documents. Keep the shipping cartons and packing materials until you have completed the installation and verified the SNMP Management Processor's operation.
* Please fill out and mail the registration card.

Location Requirements

Install the SNMP Management Processor in a Restricted Access Area in accordance with the National Electric Code, ANSI/NFPA 70, Articles 110-16, 110-17 and 110-18. An example of a Restricted Access Area is a dedicated equipment room or closet that is clean, well ventilated and free of environmental extremes. Allow two to three feet clearance around the SNMP Management Processor during the installation.

Checking the Equipment

Make sure you have the cables, mounting tray, and terminal described in this section.

Comm Port Cable

Two types of cables are available. To connect the SNMP Management Processor COMM 1 or COMM 2 port to the attached units, a RS-232 straight-through ribbon cable with multi drop DE-9 male connectors is required. Three different numbers of connections are available as shown in Table 2-1.

Table 2-1   COMM Port Cables

Model Number	Description
EHU1081	DE-9 to DE-9 Comm cable, 2 connectors
EHU1082	DE-9 to DE-9 Comm cable, 4 connectors
EHU1083	DE-9 to DE-9 Comm cable, 8 connectors

Ethernet Cable

If using an Ethernet connection, use the standard Ethernet twisted pair interface.

Tray Cable

If using DC power, tray cable connecting SNMP Management Processor to DC power must be UL recognized 14 AWG, 3 conductors, copper strand wire, electrical power and control tray cable, type TC: tray cable, 600 V 90 °C. An example is Alpha Wire Company No. 45443.

Equipment Grounding Cable

This customer-provided cable connects the SNMP Management Processor or chassis to earth ground.

ANSI Terminal.

The terminal is used to configure the SNMP Management Processor.

Equipment Model Numbers

Table 2-2 lists Black Box ~~Catalogue, Ltd.~~ model numbers of products related to the ~~Ensemble Encore WAN Shelf.~~ SNMP Management Processor

Table 2-2   ~~Ensemble Encore WAN Shelf Product Numbers~~

Model Number	Description
MTU9030	SNMP Mangement Processor
MTU9085-75	E1 NTU with SNMP 75 ohms
MTU9085-120	E1 NTU with SNMP 120 ohms

Power Supply

You can use either AC or DC power supply to install the SNMP Management Processor.

AC Power

The SNMP Management Processor comes with a 110/220V AC 50/60Hz power cord.

DC Power

The SNMP Management Processor operates on -48VDC to -75VDC sources. The respective DC leads must not be crossed.

Installing the SNMP Management Processor on a Flat Surface or Tray

You can install the SNMP Management Processor on a flat surface or tray-mount it on a 19" rack. To install it on a flat surface:

1. Remove the covering from the four stick-on rubber feet (included in your package) and stick the rubber feet to the bottom of the SNMP Management Processor.

2. Place the SNMP Management Processor on a flat, stable surface.

3. You may stack other units on top of the SNMP Management Processor.

To mount the SNMP Management Processor on a tray:

1. Attach the mounting tray to a 19" rack.

2. Place the SNMP Management Processor in one corner of the rack, aligning its bottom holes with the holes in the tray. (Figure 2-1)

3. Attach the SNMP Management Processor to the tray with the provided screws. The tray is wide enough to hold two mounted SNMP Management Processor units side-by-side.

Note: For details of the tray contact Black Box.

The default 1st NMS IP Address is 0.0.0.0 which displays as blanks. Repeat this procedure to set the 2nd and 3rd NMS IP Addresses.

Setting the Output Ports

You must select the output port for each of the three NMS IP Addresses. Proceed as follows.

1. **Select the Output Port for the NMS IP Address you want to change. Press Enter.**

   You are prompted:

   ```
   Type Arrow keys to select a new value, RETURN to accept the change.
   ```

2. **Use the Up and Down arrow keys to cycle through the available settings.**

   The available settings are Ethernet (default), COMM 1 (if the COMM 1 mode is set to NMS), and COMM 3.

3. **Select a setting you and press Enter.**

   You are prompted:

   ```
   Do you really want to change the Configuration [Y/N]
   ```

4. **Press Y.**

NOTE: COMM 1 is only available to you when the COMM 1 mode selection in Menu—4 is set to NMS.

Setting the Community Strings

NOTE: The Get Community string of the SNMP Management Processor must be the same as the Get string of the attached units. If it is different, the attached unit IDs will not be displayed in Menu 6.

The default value for the community string is "public." For SNMP proxy, you must include the unit ID in the community string, for example "public@A12," where A12 is the unit ID. The unit ID is case sensitive, so if you enter "public@a12," it will not work.

To set the Community Strings Get, Set or Trap text items, proceed as follows:

1. **Select the text item to be changed. Press Enter.**

   You will be prompted with the following message:

   ```
   Enter community [32 characters max]:
   ```

2. **Type the new community string and press Enter.**

   You will be prompted with the following message:

   ```
   Do you really want to change the configuration [Y/N]?
   ```

3. **Press Y.**

Setting the Unit ID

1. **Select the Unit ID field using the arrows and press Enter.**

   The field starts to blink (signaling edit mode) and a prompt appears at the bottom of the screen:

   ```
   Please Enter an ID [15 characters max]:
   ```

2. **Type the unit ID and press Enter.**

   Type up to 15 alphanumeric characters. Do not begin with a number and do not enter a blank ID. A blank ID causes the SNMP Management Processor to be always logged on. The ID is not case sensitive. The SNMP Management Processor default ID is CC.

NOTE: On many broadband units, you can enter a unit ID of up to 20 characters. Since the SNMP Management Processor recognizes only the first 15 characters, it's a good idea to limit the unit ID to 15 characters or less.

NOTE: Some units may not have a unit ID. As an alternative to the unit ID you can use an encoding of the unit's IP address. If the IP address is www.xxx.yyy.zzz, you can encode it as AwwwBxxxCyyyDzzz. Encoding consists of 16 characters. This encoding is case sensitive and can be used in place of the unit ID for SNMP proxy and TFTP PUT.

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3. **A prompt appears. Type Y.**

   ```
   Do you really want to change the Configuration [Y/N]?
   ```
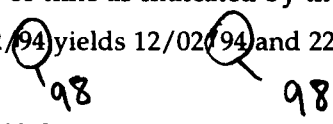
Setting the Date and Time

To set the date and time.

1. **Use the Arrows to move to the date or time field. Press Enter.**

   The date or time field starts to blink.

2. **Enter the date or time as indicated by the prompt and press Enter.**

   Example: 12/2/94 yields 12/02/94 and 22:6:7 yields 22:06:07 (The clock is a 24-hour clock.)

3. **A prompt appears:**

   ```
   Do you really want to change the Configuration [Y/N]?
   ```

4. **Type Y.**

Setting the Communications Port Parameters

You can set the communications parameters from Menu 4.

1. **Select the baud rate. Press Enter**

   The available baud rates are 1200, 2400, 4800, 9600 (default), 14400, 19200, 28800, and 38400.

2. **Select the number of bits per word and press Enter**

   The available bits per word are 7 and 8 (default).

3. **Select the number of stop bits.**

   The available settings are 1 and 2 (default).

4. **Select the Parity.**

   The available settings are None (default), Even, and Odd.

5. **Select the flow control (XON/XOFF).**

   The available settings are Disabled, XOFF until ANY, XOFF until XON (default).

6. **Select the Terminal Access.**

   Available settings are Enabled (default) or Disabled. If you enable Terminal Access, you can connect a terminal or an NMS to either the Craft port or the COMM 3 port. If you disable terminal access, all input at the Craft port is ignored.

7. **Select the COMM 1 mode.**

   The available settings are Attached Unit (default) or NMS.

   You can configure the COMM 1 port as either an attached unit port or as an NMS port. If you select attached unit port, the COMM 1 port is connected to other units. If you configure COMM 1 as an NMS port, it uses the same configuration parameters as the Craft port, and you lose the single IP address option. You should use the default option if possible.

Attached Unit Protocol

8. **Select the Attached Unit Protocol Field.**

   The available settings are ASCII and SLIP (default).

When you select ASCII Protocol, you can communicate remotely over Ethernet with the SNMP Management Processor and attached units using ASCII-based protocols, such as ASCII terminal and ~~Black Box Catalogue, Ltd.~~ Management System ~~(DLMS)~~ (for some attached units only). With ASCII protocol, once you establish a telnet connection to the SNMP Management Processor, you can do the same things as you would from a local terminal. For example, you can type Ctrl-x five times for a roll call of attached units, or you can type Ctrl-x followed by a unit ID and Return to log on to an attached unit. You can communicate over Ethernet using DLMS with a DLMS driver and instructions, available from Black Box Catalogue, Ltd.'s technical support.

If the attached unit has both an NMS and a COMM connector, use the COMM connector.

3. **Set the Scheduled Date**

   The Scheduled Date must be entered in the form mm/dd/yy. It must be greater than or equal to the current date. Default is 00/00/00.

4. **Set the Scheduled Time**

   The Scheduled Time must be of the form hh:mm. If the Scheduled Date equals the current date, then the Scheduled Time must be greater than the Current Time.

5. **Set the Count Down**

   The Count Down field displays the amount of time until a scheduled reset of the SNMP Management Processor. If a reset is not scheduled, or if a count down is in process and the user changes any one of the following fields:

   - CHANGE Code File
   - Method
   - Scheduled Date
   - Scheduled Time

   then the Count Down field displays Press 2 to Start. The time until reset is displayed as

   ```
   001d 12:14:09
   ```

   indicating the number of days, hours, minutes and seconds until the scheduled reset.

Downloading Code to Attached Units

You can download code to attached units with TFTP in one of two ways. The method chosen depends on the capability of the attached unit.

If the attached unit supports TFTP GET, then you initiate the TFTP GET from the attached unit, with the SNMP Management Processor forwarding the GET request to the NMS. Responses from the NMS are forwarded to the attached unit. The attached unit must have a real IP address. See "Real and Dummy IP Addresses" on page 3-16.

If the attached unit supports TFTP PUT, then you initiate the TFTP PUT from the NMS. When the PUT request arrives at the SNMP Management Processor, the file name in the put request is used to direct the request to the attached unit. You must:

1. **TFTP to the SNMP Management Processor IP Address**

2. **Initiate the PUT as:**

   PUT <Filename> <Unit ID.Filename>

Any more?