Bull

PCI Asynchronous Serial Communications Adapters
Installation & Configuration Guide

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PCI Asynchronous Serial Communications Adapters
Installation & Configuration Guide

Hardware

May 2000

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About This Book

This manual describes the installation of Asynchronous Serial Communications Adapters in computers that use the PCI (Peripheral Component Interconnect) bus.

Who Should Use This Book

It is written for the technician who is to install the adapter.

Overview

The manual is organized as follows:

- Introduction
- Hardware Installation
- Software Installation and Configuration
- Connecting Peripherals
- Diagnostics and Error Identifiers

Related Publications

AIX Asynchronous Communication Guide, 86 A2 26AQ.

Cabling Guide for Multiple Bus Systems, 86 AT 70JX.

AIX and Related Products Documentation Overview, 86 A2 71WE.

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Chapter 1. Introduction

This Installation Guide covers the installation and configuration of the Asynchronous Serial Communications Adapters for a PCI bus (“PCI” stands for Peripheral Component Interconnect).

There are four versions of the adapter:

- 8 port Async. Adapter EIA-232 (PCI) Type B3-A
- 8 port Async. Adapter RS-422A (PCI) Type B3-B
- 64 port Async. Adapter EIA-232 / RS – 422A (PCI) Type B3-C
- 128 port Async. Adapter EIA-232 (PCI) Type B3-9

In addition to the board itself (hardware), you must also install a device driver software for the operating system, so that programs can communicate with the board.

Software driver and diagnostics are provided on the Bull–Enhancements CD–ROM.

Components

Marketing Identifier	Identification Number		Designation
DCCG087–0000	Board Connector Box Documentation	76729564-001 50000340-001 86 A1 47AT	8-Port Async. Adapter EIA-232 (PCI) 8-Port DB25 DTE EIA-232 Connector Box
DCCG088–0000	Board Connector Box Documentation	76729565 -001 50000422-001 86 A1 47AT	8-Port Async. Adapter RS-422A (PCI) 8-Port DB25 DTE RS-422A Connector Box
DCCG089–0000 or DCCG117–0000	Board Cable Documentation	76729566-001 76000274 86 A1 47AT	64-Port Async. Adap. EIA-232/RS-422A (PCI) Cable Interface 3m
DCCG091–0000 or DCCG118–0000	Concentrator Cable	76729567-001 76000273	16-Port EIA-232 Concentrator for 64-Port adapter. Cable Interface 0.4m
DCCG092–0000 or DCCG119–0000	Concentrator Cable	76729568-001 76000273	16-Port RS-422A Concentrator for 64-Port adapter. Cable Interface 0.4m
PSSG013-–0000 or PSSG019-–0000	Power Supply	76000275-001	International Power Supply for 64-Port Adapt.
DCCG090–0000	Board Documentation	76729569-001 60000388 86 A1 47AT	128-Port Async. Adapter EIA-232 (PCI) 2 terminators included

Marketing Identifier	Identification Number		Designation
DCCG093–0000	Concentrator 	76729777-001 10000895 60000388 60000401	C/CON-16 Concentrator for128-Port Adapter International Power Supply Terminator Plug DB15 Wrap Plug RJ45
CBLG032–1700	Cable	62110180	4.6m Cable for 128-Port RAN (15M/15F)
CBLG033–1000	Cable	62110009	0.2m Cable for 128-Port RAN (15M/15F)
CBLG037–2000	Cable	90003001-001	15m Cable for 128-Port RAN (15M/15F)
CBLG104–1600	Cable	90232001-001	3.5m Cable Local EIA-232 (25F/25M)
CBLG104–2000	Cable	90232002-001	15m Cable Local EIA-232 (25F/25M)
CBLG105–1600	Cable	90233001-001	3.5m Cable Local EIA-232 (25F/25F)
CBLG105–1800	Cable	90233002-001	7.5m Cable Local EIA-232 (25F/25F)
CBLG105–2000	Cable	90233003-001	15m Cable Local EIA-232 (25F/25F)
CBLG106–2000	Cable	90234001-001	15m Cable Remote EIA-232 (25F/25M)
CBLG107–1200	Cable	90235001-001	1.5m Cable Local RS-422A (25F/15M)
CBLG108–2000	Cable	90236001-001	15m Cable BCS1 with Sub-D (25F/15M)
CBLG109–2000	Cable	90237001-001	15m Cable BCS2 Modular Jack (25F/RJ45M)
CBLG165–1800	Cable	90870001-001	7.5m Cable Local EIA-232 (RJ45M/25M)
CBLG165–2000	Cable	90870002-001	15m Cable Local EIA-232 (RJ45M/25M)
CBLG166–1800	Cable	90871001-001	7.5m Cable Local EIA-232 (RJ45M/25F)
CBLG166–2000	Cable	90871002-001	15m Cable Local EIA-232 (RJ45M/25F)
CBLG169–2000	Cable	90872001-001	15m Cable Remote EIA-232 (RJ45M/25M)
CKTG016–0000	Cable x 4	43G0935	0.2m Cable local EIA-232 (RJ45M/25M)

About the Adapters

The 8-port, 64-port, and 128-port Asynchronous Adapters EIA-232/RS-422A are multi-channel intelligent serial communications boards which occupy one PCI slot of the system.

The heart of the Adapters is a RISC microprocessor and dual ported RAM, which relieves your computer of the burden of managing the serial ports.

Adapter	Microprocessor	Dual-Ported Memory
8-Port EIA-232	20MHz 3041 RISC	128K bytes
8-Port RS-422A	20MHz 3041 RISC	128K bytes
64-Port EIA-232/RS-422A	20MHz 3051 RISC	1M bytes
128-Port EIA-232	20MHz 3041 RISC	1M bytes

The computer can transfer large blocks of data directly to the memory on the adapter, then move on to other tasks while the adapter sends the data out the serial port, one character at a time. Similarly, the adapter receives input data and stores it in buffers in its dual ported RAM, so the computer only needs to check periodically to see if data is available.

The dual ported RAM is memory which is accessible for read and write operations by both the adapter and the computer. To the computer, the dual ported RAM looks exactly like its own memory, and can be accessed by the same high speed memory referencing commands it uses for its internal memory. This means that a block of data that may take a number of seconds for the adapter to receive or transmit to the outside world can be transferred between the adapter and the computer in mere microseconds.

8-Port Connector-box Characteristics

The 8-port connector-box picks up all the signals concerning the eight ports on the 78-pin connector of the 8-Port Async board and dispatches them on eight 25-pin connectors, one for each channel.

16-Port Concentrator Characteristics (for 64-Port Async. Adapters)

The 16-port concentrator is a subsystem with four 16C554-compatible UARTs, which support sixteen RJ45 EIA-232 or sixteen DB25 RS-422A asynchronous serial ports.

Up to four 16-port concentrators may be daisy chained together on the line of the 64-port adapter.

The first two concentrators are power supplied by the 64-port adapter. For the third and the fourth concentrators, the external power supply (76000275) must be connected to the third concentrator.

16-port EIA-232 and 16-port RS-422A concentrators may be mixed.

16-Port Concentrator Characteristics (for 128-Port Async. Adapters)

The C/CON-16 concentrator is a complete subsystem with its own 16MHz 80C186 microprocessor, 128K of RAM, 16K of EPROM, 16C550-compatible UARTs for the sixteen RJ45 EIA-232 asynchronous serial ports, and a high-speed synchronous EIA-422A port for communication with the 128-port host adapter and other concentrators.

The concentrator receives packets of data from the host adapter at data rates of up to 1.2 megabaud, then distributes the data, as appropriate, to the sixteen EIA-232 ports.

Up to 4 concentrators may be daisy chained together on each of the two lines of the adapter.

By using high-speed synchronous modems, remote concentrators may be located virtually anywhere in the world.

Output Signals

The EIA-232 connector-boxes and concentrators supply the following signals for each port:

TxD, RxD, RTS, CTS, DSR, DTR, DCD, RI and Ground.

The RS-422A connector-boxes supply the following signals for each port:

TxD+, TxD–, RxD+, RxD– and Ground.

Environment Requirements and Compliance

Electrical power source loading

8-port EIA-232/RS-422A board:
+5V (±5%) : 1.2 A typical

64-port EIA-232 /RS-422A board:
+5V (±5%) : 1.5 A typical

16-port EIA-232A concentrator:
+5V (±5%) : 0.795 A typical

16-port RS-422A concentrator:
+5V (±5%) : 0.650 A typical

128-port EIA-232 board:
+5V (±5%) : 0.9 A

C/CON-16 concentrator:
+5V (±5%) : 0.760 A typical
+12V (±5%) : 0.180 A typical
–12V (±5%) : 0.050 A typical

Operating environment

Ambient temperature	: 10 to 55 °C
Relative humidity	: 5 to 90% (20 to 80% for C/CON-16)
Air movement	: 30 CFM forced
Altitude	: 0 to 3660 m (12,000 feet)

Chapter 2. Hardware Installation

This section provides instructions for installing and configuring Asynchronous Serial Communications Adapters in PCI computers.

Warning: Asynchronous Serial Communication Adapters contain static-sensitive components. Always touch a grounded surface to discharge static electricity before handling the adapter.

8-Port Asynchronous Serial Communications Board

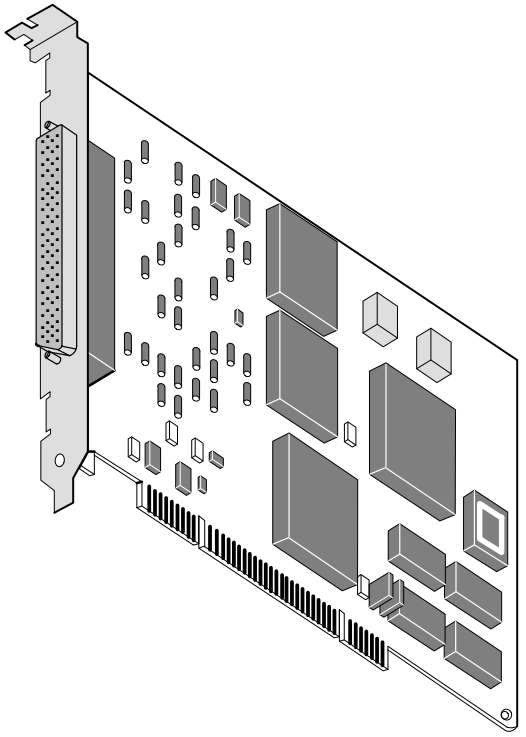


Figure 1. 8-Port Adapter Layout

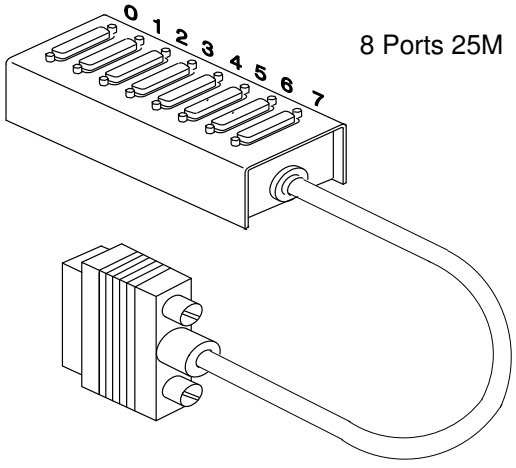


Figure 2. 8-Port DB-25 Connector Box

Two connector boxes are available:

- an 8-Port DB25 DTE EIA-232 connector box,
- an 8-Port DB25 DTE RS-422A connector box.

Warning: Use the connector box associated to the board (see ”Components” on page 1-1).

64-Port Asynchronous Serial Communications Board

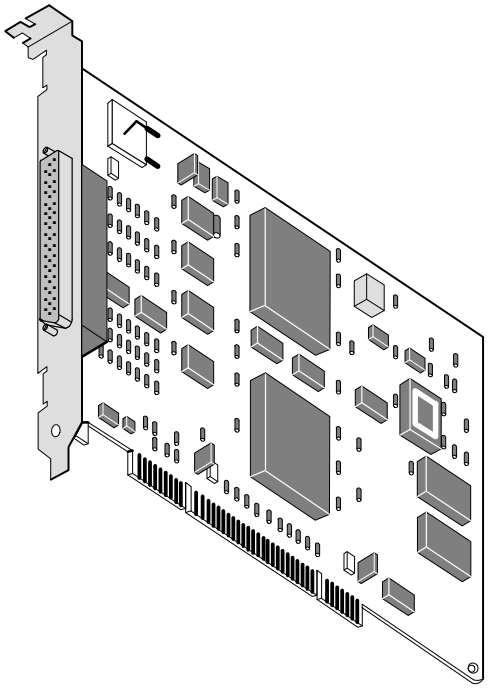


Figure 3. 64-port Adapter Layout

Two concentrators are available:

- a 16-Port EIA-232 concentrator, Figure 4
- a 16-Port RS-422A concentrator, Figure 5.

CAUTION:
Back panel logo warns that the RJ45 connectors are not telephone connectors.

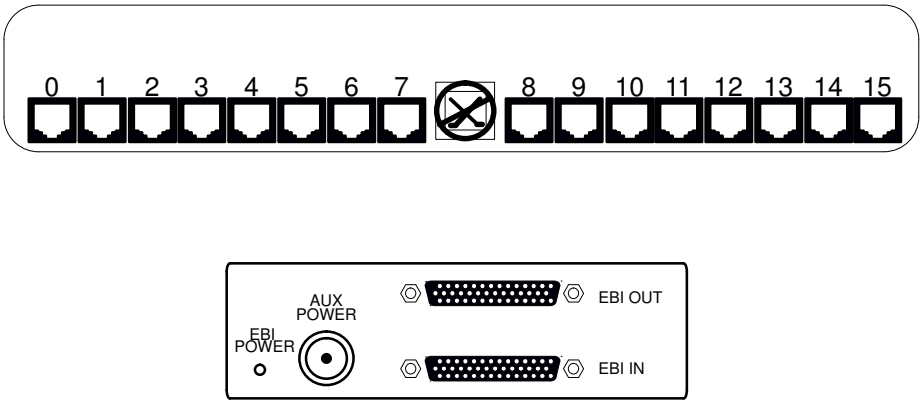


Figure 4. 16-Port EIA-232 Concentrator

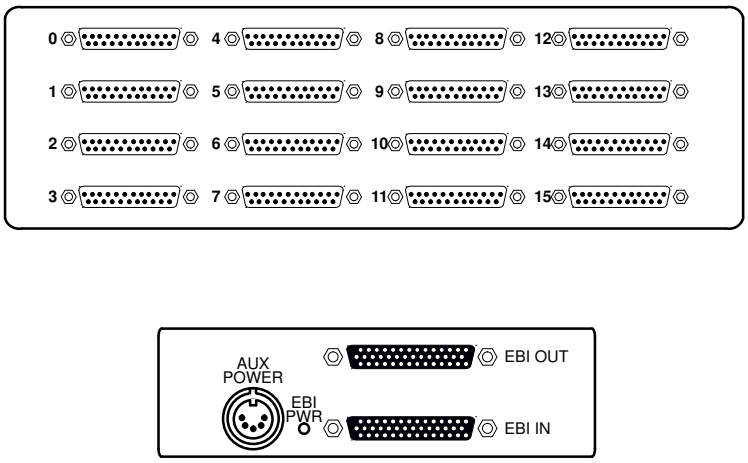


Figure 5. 16-Port RS-422A Concentrator

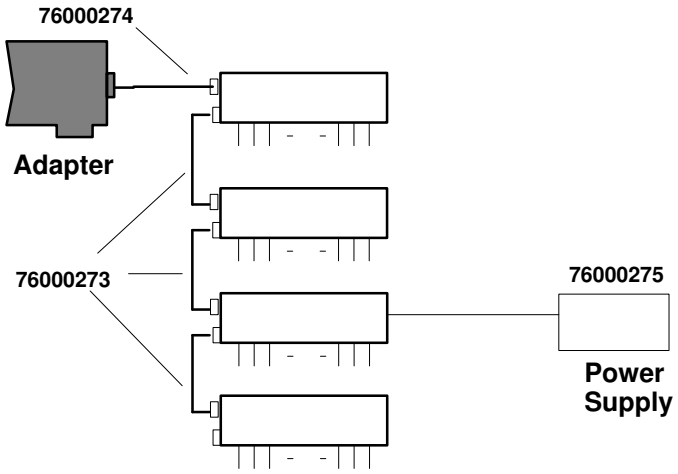


Figure 6. Connection of a 16-Port EIA-232 or RS-422A Concentrator

128-Port Asynchronous Serial Communications Board

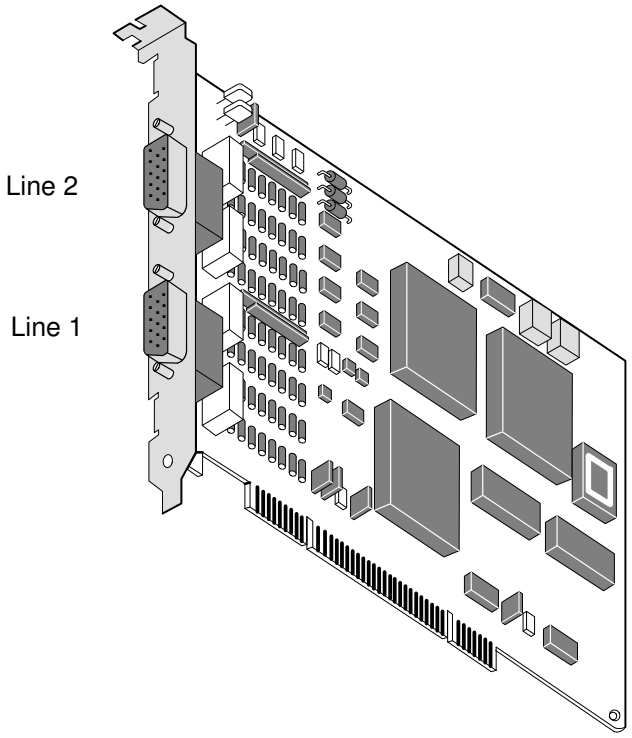
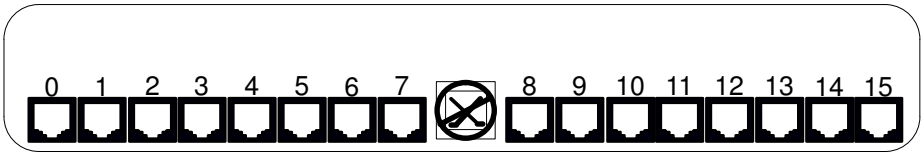


Figure 7. 128-Port Adapter Layout

CAUTION:
Back panel logo warns that the RJ45 connectors are not telephone connectors.



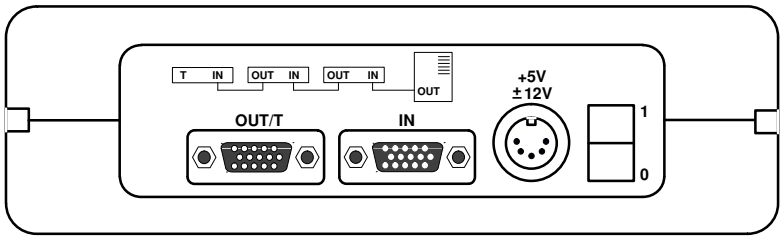


Figure 8. 16-Port Concentrator (RAN)

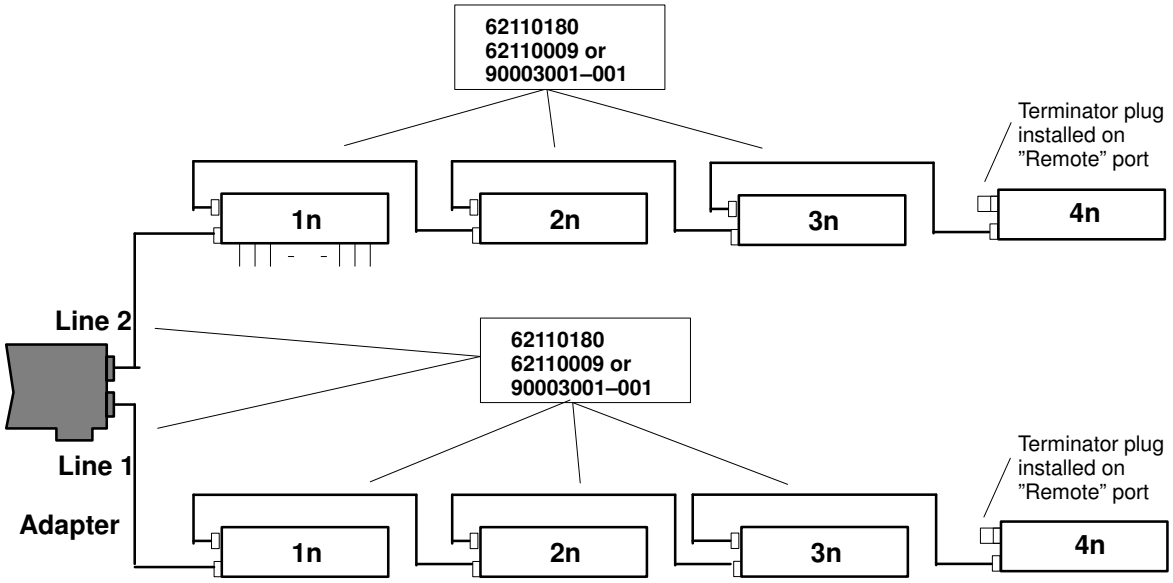


Figure 9. Eight C/CON-16 connected locally

Warning: Each line must be terminated by a terminator.

Plugging in the Adapter

Now you are ready to install the Asynchronous Serial Communications Adapter in your computer.

CAUTION:
Be very careful not to damage components of the adapter board you are inserting or of the boards already in the machine.

1. Turn off your computer’s power and remove the cover (refer to your computer’s manual for instructions on cover removal and option board installation and cautions).

   CAUTION: If several 64–Port Async Adapters are to be installed in the machine, do not plug them in adjacent PCI slots.
2. Locate an available PCI slot in your computer and remove the external slot plate (you will need to loosen the thumbscrew to do this).
3. Plug the adapter into the PCI slot, making sure that the ”fork” is in the position under the endplate thumbscrew. Tighten the thumbscrew.
4. Screw the connector into the board’s endplate. Do not over-tighten the screws. If the screws don’t go in several turns, or if they don’t reach the nuts in the endplate, the connectors are probably not completely mated.
5. Replace your computer’s cover.
6. Install the connector–boxes or concentrators (refer to the following paragraphs)
7. Turn on the power.

Installing the 8-Port Connector-box

Plug the connector–box cable into the host adapter.

Note: The connector–box cable can be plugged or unplugged at any time even if the computer’s power is on.

Installing the 16-Port Concentrator for 64-Port Async. Adapter

Plug one end of the 3m cable (ref. 76000274) into the host adapter, and the other end into the connector labeled EBI IN on the 16-Port concentrator.

Up to three additional concentrators can be daisy–chained to the first one with a 0.4m cable (ref. 76000273) between the EBI OUT connector of the first concentrator and the EBI IN connector of the added concentrator.

Warning: Power off the host adapter before plugging in concentrators, or make sure that a shutdown of the 64-Port Async. Adapter has been performed (see Chapter 3, Adapter Configuration).
Disconnection of the concentrator cable with the driver loaded, results in irreparable damage if the adapter has not been de-configured.

The concentrator cable carries the following WARNING label:

> **WARNING**
> Before connecting or disconnecting this cable, shutdown the adapter or power off the computer. See the ”Asynchronous Serial Communications Adapter” manual for instructions.

If three or four concentrators are connected, a power supply (ref. 76000275) is required on the third one.

CAUTION:
Plug the power supply into the third concentrator before plugging it into the AC receptacle.

Installing the 16-Port Concentrator for 128-Port Async. Adapter

Plug one end of the cable chosen for your configuration (see the Component table in Chapter 1) into one of the host’s adapter lines (line 1 or line 2) and the other end into the connector labeled ’IN’ on the 16-Port Concentrator.

The connector labeled ’OUT/T’ is used to connect either one additional concentrator or a terminator plug.

Up to four additional concentrators can be daisy–chained on each of the two adapter lines.

CAUTION:
Be sure to install a terminator plug on the ’OUT/T’ connector of the last concentrator in the chain.

Each concentrator requires its own external power supply (ref. 10000895) which must be plugged in before switching on the concentrator.

The adapter identifies Remote Asynchronous Nodes (RANs) by their node numbers. Each RAN in a daisy chain must have a unique node number (*1n-4n*), which must be set during installation. The node numbers must be assigned in ascending order with the lowest number assigned to the RAN closest to the adapter. You can skip node numbers (to facilitate insertion of additional RANs at a later date), as long as the ascending sequence is maintained.

Setting the RAN Node Number

1. Turn the RAN on and wait for the power-on self-test (POST) to complete.
2. When `P1` is displayed on the front panel seven-segment LED display, press the Left Arrow button once. The current node number will be displayed, for example, `1n` for node 1.
3. Press the Right Arrow push button to advance the node number through the eight possible settings (*1n-8n*). *Only 1n-4n* are supported, *5n-8n* can be displayed but are *not* supported node numbers.
4. When the desired node number is displayed, press the Left Arrow push button again to select the number. The display should now read `Pn` (indicating a pass condition). If there is an error, the display will read `En`.

   In the case of duplicate node numbers, the RAN farthest from the host adapter will display `En`, instead of `AC`, when the system is started.

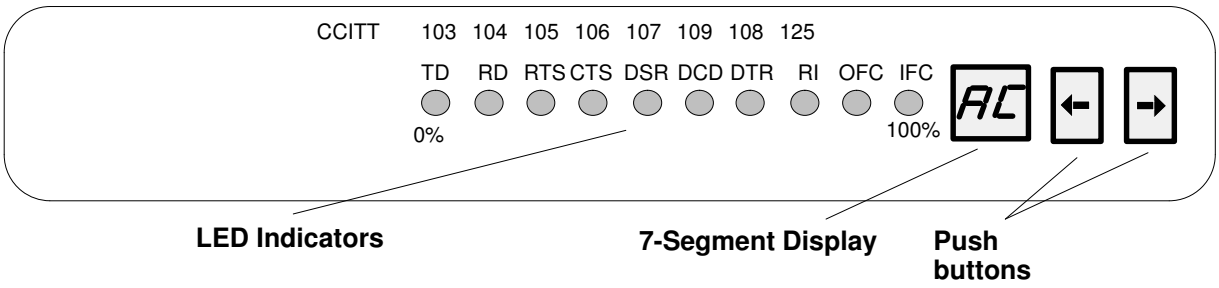


Figure 10. 16 port Concentrator (RAN) Front Panel

RAN Front Panel and Display Modes

The LED indicators can be used to reflect the activity of each of the EIA-232 lines and flow control status for a given line. They can also be set to act as a bar graph to show CPU utilization and the activity level of the EIA-422 synchronous line.

The RAN front panel display has several different display modes as indicated by the two-digit, seven-segment display. Pushing the Right or Left arrow push buttons will cycle the display sequentially through the modes.

The following table describes the RAN display modes.

RAN Display Modes

Mode	Mode Name	Description
P1	POST Complete	`P1` appears on the seven-segment display. Power-on self-test is complete; relays are open waiting for connection.
P2	Ping Packet Receive	`P2` appears on the seven-segment display. Indicates that the operating system successfully transmitted a ping packet to RAN. The ping packet contains configuration information used by the RAN (for example, baud rate, type of interface.)
P3	Transmit Configuration Packet	`P3` is *not* displayed on the seven-segment display. The RAN transmits a packet that contains information about the RAN's physical characteristics. The operating system uses this information to determine which download image to send to the RAN. The RAN does not receive confirmation that the operating system has received the packet.
P4	Image Receive	`P4` appears on the seven-segment display. Download image is being received from the host. The RAN will normally stay at `P4` for a length of time, depending on the synchronous baud rate being used.
AC	Activity	`AC` appears on the seven-segment display. The 10 LEDs turn on sequentially from left to right. The speed of this "chase light" display increases with the overall activity level of the RAN.
00-15	Line Monitor	`00-15` appears on the seven-segment display. Modes `00` through `15` correspond to channels 0 through 15. Press the right or left push buttons until the desired channel number appears in the seven-segment display. The LEDs act as line monitor for the selected channel. The first eight LED indicators show the activity of each of the eight EIA-232 signals (TD, RD, RTS, CTS, DSR, DCD, DTR and RI). The last two LED indicators show when output flow control (OFC) and input flow control (IFC) are active.
En	Error Node	`En` appears on the seven-segment display. Indicates that a valid ping packet was received but the node number in EEPROM is incorrect.
PC	Packet Count	`PC` appears on the seven-segment display. The 10 LEDs show a binary representation of the total number of packets transmitted or received. Pressing both push buttons simultaneously resets the count to 0.
EC	Error Count	`EC` appears on the seven-segment display. The 10 LEDs show a binary representation of the total number of errors counted in the data. Pressing both pushbuttons simultaneously resets the count to 0.
PU	Processor Utilization	`PU` appears on the seven-segment display. The 10 LEDs become a bar graph indicating the percentage (0-100%) of the time the RAN microprocessor is being used.
LU	Line Utilization	`LU` appears on the seven-segment display. The 10 LEDs become a bar graph indicating the percentage (0-100%) of the time that the synchronous communications line is being used.
1n, 2n,...,8n	Node Number	The seven-segment display shows the node number of the RAN. **Note:** Only node numbers *1n* through *4n* are valid. Node numbers *5n* through *8n* are not supported.

Chapter 3. Software Installation and Configuration

Software Delivery

The installation is done with the Bull Enhancement Installation Bundle. It contains the following LPPs.

1. `bullasync.base`, which contains the common part for all the asynchronous adapters. It contains one OPP:

   `bullasync.base.rte` common utilities

2. `bullasync.pci`, which is necessary to support PCI asynchronous adapters. It contains two OPPs:

   `bullasync.pci.diag` diagnostics tests

   `bullasync.pci.rte` driver, microcodes and configuration methods

3. `devices.pci.4f111300`, which is necessary to support the 8–Port EIA–232 Asynchronous adapters. It contains one OPP:

   `devices.pci.4f111300.rte` ODM objects

4. `devices.pci.4f111400`, which is necessary to support the 8–Port RS–422A Asynchronous adapters. It contains one OPP:

   `devices.pci.4f111400.rte` ODM objects

5. `devices.pci.4f111500`, which is necessary to support the 64–Port EIA–232/RS-422A Asynchronous adapters. It contains one OPP:

   `devices.pci.4f111500.rte` ODM objects

6. `devices.pci.4f111700`, which is necessary to support the 128–Port EIA–232 Asynchronous adapters. It contains one OPP:

   `devices.pci.4f111700.rte` ODM objects

Software Installation

The software is normally pre-installed. You can verify the software installation with the **lslpp** command.

If for some reason it must be reinstalled, proceed as follows:

1. Switch on the computer.
2. Log in as root.
3. Insert the media containing the device driver software into the appropriate media device, for example, CD–ROM drive.
4. Enter:

   ```
   smit cfgmgr
   ```

   and press Enter.

   The `Install/Configure Devices Added After IPL` screen is displayed. The ”INPUT device/directory for software” option is highlighted. The cursor is positioned on the entry field where you will identify the input device you are using.

5. Press F4 to display a list of input devices you can select.
6. Select the device by moving the cursor to the appropriate media type and pressing Enter.

   The device or directory you selected is now displayed in the ”INPUT device/directory for software” option on the `Install/Configure Devices Added After IPL` screen.

7. Press Enter to execute the software installation command.

   The COMMAND STATUS screen is displayed. The status will change from Running to OK when the software installation is complete.

Note: If an error message is displayed on the COMMAND STATUS screen, verify that the adapter board is seated properly. If the board is secure, refer to the documentation that came with your computer for information on running hardware diagnostics.

8. Remove the installation media from the drive.
9. Press F10 to exit SMIT.

Installation Check

Check the successful installation with the **lsdev** command, which lists the adapters installed on the system.

For instance:

#lsdev –C

.../...

sa2	Available 04–01	8–Port PCI Async Adapter EIA–232
sa3	Available 04–02	8–Port PCI Async Adapter RS–422A
xem0	Available 04–03	64–Port PCI Async Adapter EIA–232/RS422A
sa4	Available 04–03–1x	16–Port Module EIA–232 for 64–Port Adapter
sa5	Available 04–03–1x’	16–Port Module RS–422A for 64–Port Adapter
pcx0	Available 04–04	128–Port PCI Async Adapter EIA–232
sa6	Available 04–04–yz	16–Port RAN EIA–232 for 128–Port Adapter

Note: x, x’: module number (1 to 4)
y: line number (1 or 2)
z: RAN number (1 to 4)

Adapter Configuration

An adapter can be configured or de-configured at any time in the following ways:

- de-configuration (controlled shutdown):

```
# rmdev –R –l adapter-name
```

- configuration

```
# cfgmgr –l adapter-name
```

`adapter-name` must be:

sa<n> for a 8-Port adapter

xem<n> for a 64-Port adapter

pcx<n> for a 128-Port adapter

Note: If the de-configuration fails because the device is busy, check that all the tty supported by the adapter are disabled and not currently used by any application.

TTY Configuration

This procedure allows you to define and configure a tty device connected to an 8-Port Async adapter in EIA-232 mode or in RS-422A mode, to a 64–port or a 128–port Async adapter in EIA-232 mode.

Procedure

1. Enter the SMIT fast path:

   ```
   smit tty
   ```

Note: Depending on your environment, you access SMIT in ASCII mode or AIXwindows mode. The following steps apply to both interfaces.

2. Select **Add a TTY**.

For an 8, 64 or 128-Port Async adapter EIA-232:

1. Select **tty rs232 Asynchronous Terminal**.
2. Make a selection from the available 8–port EIA–232 Adapters, or 16–port Module EIA–232 for 64–port Adapters, or 16–port RAN EIA–232 for128-port adapters displayed on the screen. If no adapters are displayed or if they are in a defined state, check the configuration, cabling and setup again.

The SMIT panel for this selection resembles the following figure.

```
                                    TTY
 Move cursor to desired item and press Enter.

                              Parent Adapter

 Move cursor to desired item and press Enter.

   sa0   Available  00-C0     Standard I/O Serial Port 1
   sa1   Available  00-D0     Standard I/O Serial Port 2
   sa2   Available  04-01     8-Port PCI Async Adapter EIA-232
   sa4   Available  04-03-11  16-Port Module EIA-232 for 64-port Adapt.
   sa6   Available  04-04-11  16-Port RAN EIA-232 for 128-port Adapter

F1=H  F1=Help                 F2=Refresh                F3=Cancel
F5=U  F8=Image                F10=Exit                  Enter=Do
F9=S
```

For an 8-Port or 64-Port Async adapter RS–422A:

1. Select **tty rs422 Asynchronous Terminal**.
2. Make a selection from the available 8-port RS–422A adapters or 16–port Module RS–422A for 64–Port Adapters displayed on the screen. If no adapters are displayed or if they are in a defined state, check the configuration, cabling and setup again.

The SMIT panel for this selection resembles the following figure.

```
                                    TTY

 Move cursor to desired item and press Enter.

                              Parent Adapter

 Move cursor to desired item and press Enter.

 sa3   Available  04-02      8-Port Async Adapter RS-422A
 sa5   Available  04-03-12   16-Port Module RS-422A for 64-Port Adapt.

F1=H  F1=Help                 F2=Refresh                F3=Cancel
F5=U  F8=Image                F10=Exit                  Enter=Do
F9=S
```

When the appropriate asynchronous adapter is selected, a SMIT panel resembling the following figure will be displayed depending on the AIX release level:

```
                          Add a TTY

Type or select values in entry fields.
Press Enter AFTER making all the desired changes.

                                                  [Entry Fields]
 TTY type                                        tty
 TTY interface                                   rs232
 Description                                    Asynchronous Terminal
 Parent Adapter                                  sa2
*PORT number                                     []                      +
 Enable LOGIN                                    disable
 BAUD rate                                       [9600]                  +
 PARITY                                          [none]                  +
 BITS per character                              [8]                     +
 Number of STOP BITS                             [1]                     +
 TIME before advancing to next port setting      [0]                     +#
 TERMINAL type                                  [dumb]
 FLOW CONTROL to be used                         [xon]                   +
 OPEN DISCIPLINE to be used                      [dtropen]               +
 STTY attributes for RUN time                   [hupcl,cread,brkinit,icr. +
 STTY attributes for LOGIN                      [hupcl,cread,echoe,cs8,.
 LOGGER name                                     []
 STATUS of device at BOOT time                   [available]             +
 STREAMS modules to be pushed at OPEN time      [ldterm]                 +
 Transparent Print ON String                    [\033[5i]
 Transparent Print OFF String                   [\033[4i]
 Transparent Print Maximum Characters per Second [100]                   +#
 Transparent Print Maximum Characters Packet Size[50]                    +#
 Transparent Print Buffer Size                   [100]                   +#
 Force Carrier                                   disable                 +
 Receive Event Delay Time                        [100]                   +#
 2200 Flow Control                               disable                 +
 2200 Print Control                              disable                 +
 INPUT map file                                  [none]                  +
 OUTPUT map file                                 [none]                  +
 CODESET map file                                [sbcs]                  +
POSIX special control characters:
 INTERRUPT character                             [^c]
 QUIT character                                  [^\]
 ERASE character                                 [^h]
 KILL character                                  [^u]
 END OF FILE character                           [^d]

          [More]

F1=Help          F2=Refresh          F3=Cancel          F4=List
F5=Undo          F6=Command          F7=Edit            F8=Image
F9=Shell         F10=Exit            Enter=Do
```

SMIT Field Definitions for TTY Port

The following is a summary of the tty attributes and values shown on the SMIT Add a TTY screen.

TTY type Identifies the predefined tty device type. The value of this field cannot be changed.

TTY interface Identifies the predefined tty device subclass. The value of this field cannot be changed.

Description Provides a short text description of the tty device. The value of this field cannot be changed. The short text is used to assist device locations.

Parent adapter Identifies the logical name of the adapter device to which the tty is to be attached. The value of this field cannot be changed.

PORT number Indicates the port on an adapter board or asynchronous distribution box to which the tty device is connected. The value must be in the range:

- 0 through 7 for an 8-port adapter board.
- 0 through 15 for a 64 or 128-port adapter board.

Enable LOGIN Indicates whether a **getty** process is to be run on the port to allow user login. Possible values are:

disable	No getty process is run on the port.
enable	A getty process is run on the port.
share	A getty process is run on the port, but the getty process still allows programs dialing out on the port to share it by waiting for an open of the port to complete before attempting to get the tty lock. If an active process already owns the lock, the getty process lets that process own the tty port until the lock goes away.
delay	A getty process (for example, share) is run on port in bi-directional mode, but no herald is displayed until the getty process receives a keystroke from the user.

BAUD rate Specifies the speed at which data is transmitted to and from this port. Possible settings are values such as 300, 600, 1200, 2400, 4800, 9600, 19200, or 38400. The actual values that can be used vary among the possible devices that can be attached as tty devices.

PARITY Provides a means for detecting errors in the data transmitted to and from the device. The five possible parity settings are odd, even, none, mark, and space.

BITS per character
Indicates the number of bits per character to be transmitted to and from the device. The possible values are 5, 6, 7, and 8.

Number of STOP BITS
Indicates the number of stop bits transmitted to and from the device. The possible choices are 1 and 2.

TIME before advancing to next port setting
If a user name is not specified before the given number of seconds, the getty process advances to the next port setting or exits if all settings are exhausted. Note that the getty process advances to the next setting before the specified time has elapsed if a framing error occurs as a result of a BREAK on the line or a speed mismatch.

TERMINAL type
Identifies the default type of terminal attached to a port. A variety of applications and system functions are tailored to specific terminal types. Since terminal devices are not typically asked to identify themselves, this attribute is used to set the TERM environment variable.

FLOW CONTROL to be used

Describes how a serial device controls the amount of data being transmitted to itself. The three types of flow control used with ttys are XON/XOFF, RTS/CTS, and DTR/DSR.

XON/XOFF involves the sending of data transmission control characters along the data stream. It is referred to as software flow control.

RTS/CTS, sometimes called pacing or hardware handshaking, uses positive and negative voltages along dedicated pins or wires in the device cabling. The term hardware handshaking comes from the use of cabling and voltages as a method of data transmission control.

DTR/DSR, another form of hardware flow control, is normally generated by the devices, such as printers to indicate that they are ready to communicate with the system. This signal is used in conjunction with DSR (Data Set Ready) generated by the system to control data flow.

The FLOW CONTROL selection must match the device control setting in order to prevent data loss. Possible values are: xon, rts, and none. The default is xon.

OPEN DISCIPLINE to be used

Specifies how to establish the connection. Possible values are: dtropen and wtopen. The use of dtropen means the system waits until the EIA signal DTR (Data Terminal Ready) is sent by the remote device before completing the open (port) request from the application.
The default value is dtropen.

STTY attributes for RUN time

Specifies a list of comma–separated stty command parameters used to configure the port after the login procedure is successfully completed.

STTY attributes for LOGIN

Specifies a list of comma–separated stty command parameters that are valid while you are attempting to log in to the system. This is normally a subset of the modes available at run time since few of the line discipline's processing features are required at the time of login.

Optional LOGGER name

Names an optional logger program to be used instead of the default logger program. This field must be left blank for the default logger program to be used.

STATUS of the device at BOOT time

Indicates the state to which the device is to be configured when the system is started. It can have a value of "defined," indicating that the device will be left in the defined state and not available for use, or a value of "available," indicating that the device will be configured and available for use.

STREAMS modules to be pushed at OPEN time

Specifies a comma-separated list of pushable STREAMS modules. These modules are pushed at open time in the order they are specified. The default value for terminal session is: ldterm.

Transparent Print ON String

Specifies the control codes (or data string) necessary to instruct the attached terminal to send all data received after the string to the printer port and not to the terminal's display. The transparent print on string is an octal number preceded by a backslash (\) and is specific to the type of terminal in use. Please consult your terminal reference guide for the transparent print on control sequence. For example, the print–on string for an IBM 3151 terminal is \020\022.

Transparent Print OFF String

Specifies the octal control codes (or data string) necessary to instruct the attached terminal to exit the transparent printing operation. This string is an octal number preceded by a backslash (\), and is specific to the type of terminal in use. Please consult your terminal reference guide for the transparent print off control sequence. For example, the print–off string for an IBM 3151 terminal is \020\024.

Transparent Print Maximum Characters per Second

Specifies the maximum characters per second (cps) rate at which to send characters to the transparent print device. A number just below the average print speed is recommended. If the estimate is too low, printer speed is reduced. If the estimate is too high, the printer performs flow control, which can impair terminal performance. See the printer manual for the valid entry range. The default rate is 100 cps.

Transparent Print Maximum Character Packet Size

Specifies the maximum number of characters to send in one transparent print buffer. Small packets can increase system overhead; large packets can delay display updates when the transparent printer is in use. Consult the printer manual for the valid entry range. The default packet size is 50 characters.

Transparent Print Buffer Size

Specifies the size of the transparent printer's input buffer. After a period of inactivity, the device driver bursts the specified number of characters to the transparent printer before slowing to the specified maximum characters–per–second transfer rate. This insulates the printer from the line transfer rate so that it can immediately begin printing at full capacity. Consult the printer documentation to determine the size of the printer's input buffer. The default buffer size is 100 characters.

Force Carrier Ignores the carrier detect signal for this tty port. Typically, carrier detect must be high in order to open a port and it must remain high for as long as the port is open. Possible values are enable (ignore carrier detect) and disable (do not ignore carrier detect). The default value is disable.

Receive Event Delay Time

Tunes the frequency that packets are sent to the host adapter from the remote async node (RAN) for this tty. Possible values are from 100 to 400. Selecting a larger value (250 and above) results in more characters being sent in a given time period and yields improved performance in cases of continuous raw data input. Smaller values, which result in fewer characters being sent, increased character response time, and increased processor utilization, should be reserved for normal tty activity such as typing and uucp. The default value is 100.

2200 Flow Control

Determines if Wang Series 2200 terminal flow control is to be used. Wang 2200 series terminals support an attached printer and use four flow–control characters: Terminal XON (0xF8) Terminal XOFF (0xFA) Printer XON (0xF9) Printer XOFF (0xFB) Possible values are enable (to use 2200 flow control) and disable (to use regular flow control). The default value is disable.

2200 Print Control

This attribute is valid only if 2200 flow control is set to enable. It determines how the 2200 flow control characters are interpreted. If 2200 print control is set to enable, the system runs independent flow controls for terminal and transparent print devices. Otherwise, terminal and printer flow control are logically tied together so that if either a terminal or printer XOFF character is received, both terminal and printer output is paused until the matching XON character is received. The default value is disable.

INPUT map file

Identifies the name of the terminal input map that describes how to convert extended characters in the data stream to the characters supported by asynchronous terminals. The default value is none. Other possible values are vt220 and ibm3161–C. Still other values are possible if additional input map files have been placed in the */usr/lib/nls/termmap* directory. See the **setmaps** command for additional details.

OUTPUT map file

Identifies the name of the terminal output map that describes how to convert extended characters in the data stream to the ASCII characters supported by asynchronous terminals. The default value is none. Other possible values are vt220 and ibm3161–C. Still other values are possible if additional output map files have been placed in the */usr/lib/nls/termmap* directory. See the **setmaps** AIX command for additional details.

CODESET map file

Identifies the name of the code set map file that describes the code set to be used (single or multibyte codeset, EUC or non–EUC codeset, possible converter modules, etc.).

The code set associated with most languages is a single byte code set (sbcs). These code sets require that every possible displayable element occupy one display position on a terminal. However, some Asian languages, such as Japanese, Korean and Taiwanese, require multibyte code sets, where one displayable element requires multiple byte representation and occupies multiple display positions on a screen.

The default code set map file is sbcs. If your system requires a multibyte code set, select the appropriate alternative. Alternatives are possible only if other code set map files have been placed in the */usr/lib/nls/csmap* directory. See the **setmaps** AIX command for more details.

Chapter 4. Connecting Peripherals

Connecting to a DTE Device

A DTE device is a terminal, serial printer, another computer's serial port, etc. To connect the Asynchronous Serial Communications Adapter (which are also DTE devices) to another DTE device, you need one of the following cables.

Local Connection:

EIA-232

CBLG104–1600	25F/25M Cable	3.5m
CBLG104–2000	25F/25M Cable	15m
CBLG105–1600	25F/25F Cable	3.5m
CBLG105–1800	25F/25F Cable	7.5m
CBLG105–2000	25F/25F Cable	15m
CBLG165–1800	RJ45M/25M Cable	7.5m
CBLG165–2000	RJ45M/25M Cable	15m
CBLG166–1800	RJ45M/25F Cable	7.5m
CBLG166–2000	RJ45M/25F Cable	15m
CKTG016–0000	RJ45M/25M Cable (128-port)	0.2m

RS-422A

CBLG107–1200	25F/15M Cable	1.5m
CBLG108–2000	25F/15M Cable	15m
CBLG109–2000	25F/RJ45M Cable	15m

Remote Connection Via a Modem:

CBLG106–2000	25F/25M Cable (EIA–232)	15m
CBLG169–2000	RJ45M/25M Cable (EIA–232)	15m
CKTG016–0000	RJ45M/25M Cable (128-port)	0.2m

See ”Multiport Adapters” in the *Cabling Guide for Multiple Bus Systems*, for more information about these cables.

Chapter 5. Diagnostics and Error Identifiers

User Diagnostics Under SMIT

The user diagnostics program may be used to check or identify a failure of the board. This program runs checks on the memory of the board and runs an internal loopback on each port of the board.

This program is run using the SMIT interface:

#smit [–C] diag

select

```
Current Shell Diagnotics
        Diagnostic Routines
                System Verification
```

Choose the board to test into the `DIAGNOSTICS SELECTION` menu.

The adapter is OK if the COMMAND STATUS report is OK, else a clear diagnostic is displayed showing the appropriate action to be taken.

Note: 1. You must have root permission to run diagnostics.
2. No tty must be available on the adapter during the test.
3. The ”Bull PCI Asynchronous Adapter Diagnostics” software (`bullasync.pci.diag`) must be installed.
4. The ”Hardware Diagnostics” software (`bos.diag.rte`) must be installed.

For the 128-Port adapters, diagnostics are also available on the Concentrators. Refer to ”Running the Remote Asynchronous Node Diagnostics” in the AIX Asynchronous Communication Guide.

Traces

The trace hook ID for the Async. Adapters is 40B.

To start the traces, you can use:

- the **trace** command:

  #trace –j 40B –a

- the smit interface:

  #**smit trace** and choose the sub–menu ”Start Trace” then select the ADDITIONAL event IDs to trace
  40B STTY PCIASL / MCXI / PCXE

To stop the traces, you can use:

- the **trcstop** command:

  #trcstop

- the smit interface:

  #smit trace and choose the sub–menu ”Stop Trace”

To generate a trace report, you can use:

- the **trcrpt** command

  #trcrpt

- the smit interface

  #smit trace and choose the sub–menu ”Generate a Trace Report” screens allow you to customize your report.

Error Identifiers for the Error Log

Error Identifiers	Description
ASYNC_CFG_PORT	Bad Adapter I/O Port Address: The Async device driver received a bad adapter I/O port address from the configuration method. The ODM database may be corrupted.
ASYNC_CFG_RST	Adapter Reset Failed: The Async adapter did not respond to a hardware reset. Run the diagnostics against the failing device or contact your service representative.
ASYNC_CFG_MTST	Adapter Memory Test Failed: The Async device driver detected an error during a memory test of the Async adapter's dual–ported memory. Run the diagnostics against the failing device or contact your service representative.
ASYNC_CFG_BIOS	Adapter BIOS Initialization Failed: An error occurred executing the Async adapter BIOS microcode. Run the diagnostics against the failing device or contact your service representative.
ASYNC_CFG_ FEPOS	Adapter FEPOS Execution Failed: An error occurred executing the Async adapter FEPOS microcode. Run the diagnostics against the failing device or contact your service representative.
ASYNC_CFG_ MPORT	Bad or Missing Port on Adapter: The Async device driver detected an error attempting to access a non–existing port on an adapter. Run the diagnostics against the failing device or contact your service representative.
ASYNC_CFG_ TALLOC	talloc failed: The Async device driver detected an error attempting to allocate a trb timer structure. Contact your service representative.
ASYNC_IO_ATT	I/O Segment Attach Failed: The Async device driver detected an error attempting to attach to I/O memory. Run the diagnostics against the failing device or contact your service representative.
ASYNC_MEM_ATT	Memory Segment Attach Failed: The Async device driver detected an error attempting to attach to bus memory. Run the diagnostics against the failing device or contact your service representative.
ASYNC_ADP_FAIL	Async Adapter Failed: The Async device driver detected an unrecoverable error communicating with the adapter. Run the diagnostics against the failing device or contact your service representative.
ASYNC_ERR_ ASSRT	Driver Assert Message: The Async device driver detected an internal error. The Driver Line Number field contains the line number in the device driver where the error occurred. Contact your service representative.
ASYNC_BIOS_ ERR1	Error Allocating Memory: The Async device driver detected an error attempting to allocate memory using the xmalloc call. Check the memory occupation on your machine or contact your service representative.
ASYNC_BIOS_ ERR2	Error opening BIOS microcode file: The Async device driver detected an error attempting to open the BIOS microcode file using the fp_open call. Check if the BIOS microcode is in correct location on filesystem or contact your service representative.

Error Identifiers	Description
ASYNC_BIOS_ ERR3	Error stating BIOS microcode file: The Async device driver detected an error attempting to access the BIOS microcode file using the fp_stat call. Check if the BIOS microcode is in correct location on filesystem or contact your service representative.
ASYNC_BIOS_ ERR4	Error reading BIOS microcode file: The Async device driver detected an error attempting to read the BIOS microcode file using the fp_read call. Check permissions of BIOS microcode file or contact your service representative.
ASYNC_BIOS_ ERR5	Error reading BIOS microcode file: The Async device driver detected an error attempting to read the BIOS microcode file using the fp_read call. Too few bytes were returned from fp_read. Contact your service representative.
ASYNC_BIOS_ ERR6	Error closing BIOS microcode file: The Async device driver detected an error attempting to close the BIOS microcode file using the fp_close call. Contact your service representative.
ASYNC_ FEPOS_ERR1	Error opening FEPOS microcode file: The Async device driver detected an error attempting to open the FEPOS microcode file using the fp_open call. Check if the FEPOS microcode is in correct location on filesystem or contact your service representative.
ASYNC_ FEPOS_ERR2	Error stating FEPOS microcode file: The Async device driver detected an error attempting to access the FEPOS microcode file using the fp_stat call. Check if the FEPOS microcode is in correct location on filesystem or contact your service representative.
ASYNC_ FEPOS_ERR3	Error reading FEPOS microcode file: The Async device driver detected an error attempting to read the FEPOS microcode file using the fp_read call. Check permissions of FEPOS microcode file or contact your service representative.
ASYNC_ FEPOS_ERR4	Error reading FEPOS microcode file: The Async device driver detected an error attempting to read the FEPOS microcode file using the fp_read call. Too few bytes were returned from fp_read. Contact your service representative.
ASYNC_ FEPOS_ERR5	Error closing FEPOS microcode file: The Async device driver detected an error attempting to close the FEPOS microcode file using the fp_close call. Contact your service representative.
ASYNC_ FEPOS_ERR6	Error moving adapter FEPOS to correct location: The Async device driver detected an error attempting to move the FEPOS microcode to the correct location on the adapter using the blk_mv call. Contact your service representative.

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__ __ ____ _ [__]		__ __ ____ _ [__]		__ __ ____ _ [__]	
__ __ ____ _ [__]		__ __ ____ _ [__]		__ __ ____ _ [__]	
__ __ ____ _ [__]		__ __ ____ _ [__]		__ __ ____ _ [__]	
__ __ ____ _ [__]		__ __ ____ _ [__]		__ __ ____ _ [__]	
__ __ ____ _ [__]		__ __ ____ _ [__]		__ __ ____ _ [__]	
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