

E1 Controller with SNMP (3603-86)

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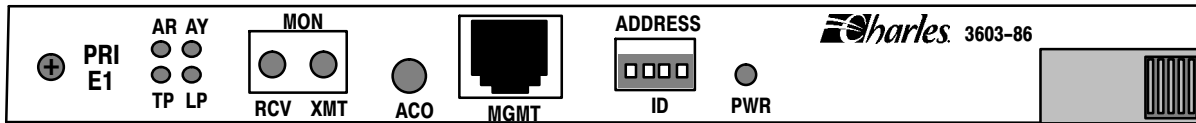


Figure 1. E1 Controller Unit Front Panel (3603-86)

1. GENERAL

1.1 Document Purpose

This document provides general, installation and testing information for the E1 Controller Unit (E1-S), shown in Figure 1. This document covers model number 3603-86.

1.2 Equipment Function

The E1-S is part of the 360-80 Intelligent Channel Bank (ICB). It combines the functions of a line interface unit (LIU) and a channel service unit (CSU), allowing direct connections to public E1 networks.

1.3 Equipment Location/Mounting

Mount the E1-S in the primary slot of the 360-80. One controller unit must be installed in the primary slot for proper system operation.

1.4 Reference Documentation

- 360-80 ICB Craft Port User's Guide (LT360-386-C01)
- SNMP Network Node Manager Guide (LT360-386-N01)
- Network Management Software Guide (LT360-386-S01)
- 3608-85 Secondary E1 unit (LT360-885-201)

1.5 Equipment Features

This unit provides the following features:

- Front panel craft interface.
- Ethernet network management interface (10/100 Base-T Full/Half Duplex).
- Front panel status LEDs.
- Non-volatile storage of system provisioning and performance.
- Front panel address switch for network management.
- Front panel E1 monitor jacks.
- Dry contacts for alarm indication.
- Allows internal, loop (recovered from E1) or external (composite clock) timing source.
- Drop and reinsert operation with additional card (3608-85).
- Interfaces with HDSL/HDSL2 with adaptor kit.
- Time slot assignment on a per-channel basis.
- Auto framing and identification – two formats:
 1. Conventional, CAS,
 2. CRC4-CAS
- 0 dB digital test tone for equipment level adjustments.
- Tone test generation and detection on a per-channel basis.
- Hot unit insertion or extraction.
- 30-channel E1 multiplexing operation.
- Temperature hardened (-40 to +65 C).

- Performs local E1 loopback, test and performance monitoring of the E1 interface.
- Complies with UL1950, FCC part 68 and FCC part 15.
- Meets Bellcore 1089, 43801, 62411, TR-57 and ITU-T G.703, G704, Q.421 standards for E1.

1.6 Performance History

This unit stores performance history for the last 30 days in 24 hour intervals and over the last 24 hours in 15-minute intervals. This performance history includes failed seconds, errored seconds (ES) and severely errored seconds (SES) (per E1M1.3/93-00). A reset is provided for the current 15-minute interval. A reset is also provided for the current 24 hour interval and will reset all 15-minute intervals within that 24 hour period.

1.7 Network Management Interface

The ICB stores all configuration settings in the E1-S. This unit is managed through the Network Management Interface (NMI), which controls the provisioning of the unit and obtains status information from the unit. This is achieved through the craft interface using RS232, SNMP using Ethernet or a proprietary graphical interface using Ethernet. For operation of this interface, see the Craft Port documentation, SNMP Network Node Manager documentation or Network Management Software documentation.

This unit is shipped with default provisioning for all units in the ICB. Provisioning is altered through the software interface. If the provisioning is changed, it will maintain the new provisioning even if power is lost. If replaced with a new unit, the new unit's provisioning must be changed to the same provisioning as was set for the prior unit. The unit provides two levels in which provisioning can be reset. "Provisioning Reset to Stored Value" will soft reset the ICB. "Provisioning Reset to Factory Defaults" will clear all settings for provisioning, timeslots and IP information.

A Real-Time Clock (RTC) is provided through the Network Management interface.

1.8 Status Indicators

This unit is able to provide a variety of status information. The following is a list of all status information available from the E1-S. Some status information is also provided through front panel LEDs. See individual channel units for additional status information.

- Red (AR) Alarm Status (LED)
- Yellow (AY) Alarm Status (LED)
- Loss of frame (LOF) Alarm Status
- Loss of signal (LOS) Alarm Status
- Power status (LED)
- E1 framing selected
- Trunk processing (TP) status (LED)
- Transmit E1 timing source
- E1 loopback selected (LED)
- Carrier Group Alarm Immediate (CGAI) action
- Carrier Group Alarm Delayed (CGAD) action
- Remote terminal status in a CO/RT configuration
- Tone/pattern test generator and error detection

1.9 Loopbacks

The E1-S provides the following type of loopback.

- Near-End Line Loopback

The near-end line loopback transmits information back to the customer or drop side.

1.10 Testing

The E1-S card provides test tones for analog voice card testing that can be enabled using the network management interface. The E1-S also provides a V.54 loopback code generator for testing 64xN data cards.

2. INSPECTION

2.1 Inspect for Damages

Inspect the equipment thoroughly upon delivery. If the equipment has been damaged in transit, immediately report the extent of damage to the transportation company.

2.2 Equipment Identification

Charles Industries' equipment is identified by a model and issue number imprinted on the front panel or located elsewhere on the equipment. Each time a major engineering design change is made on the equipment, the issue number is advanced by 1 and imprinted on subsequent units manufactured. Therefore, be sure to include both the model number and its issue number when making inquiries about the equipment.

2.3 Static Concerns

Each unit is shipped in static-protective packaging to prevent damages from electrostatic charges. Use approved static-preventive measures, such as static-conductive wrist straps and a static-dissipative mat, when handling units outside of their protective packaging. A unit intended for future use should be tested as soon as possible and returned to its original protective packaging for storage.



STATIC-SENSITIVE



This equipment contains static-sensitive electronic devices. To prevent electrostatic charges from damaging static-sensitive units:

- **Use approved static-preventive measures (such as static-conductive wrist straps and static-dissipative mats) at all times whenever touching units outside of their original, shipped, protective packaging.**
- **Do not ship or store units near strong electrostatic, electromagnetic, or magnetic fields.**
- **Always use the original static-protective packaging for shipping or storage. Return a tested unit to its original protective packaging for storage.**

3. APPLICATION GUIDELINES

A typical application of the 360-80 Intelligent Channel Bank (ICB) system using the E1-S is to provide an interface between the bipolar E1 signal from the public E1 network and data or voice interface units. The E1-S can interface to a powered line that uses line-powered repeaters. See Figure 2 and Figure 3 for typical applications.

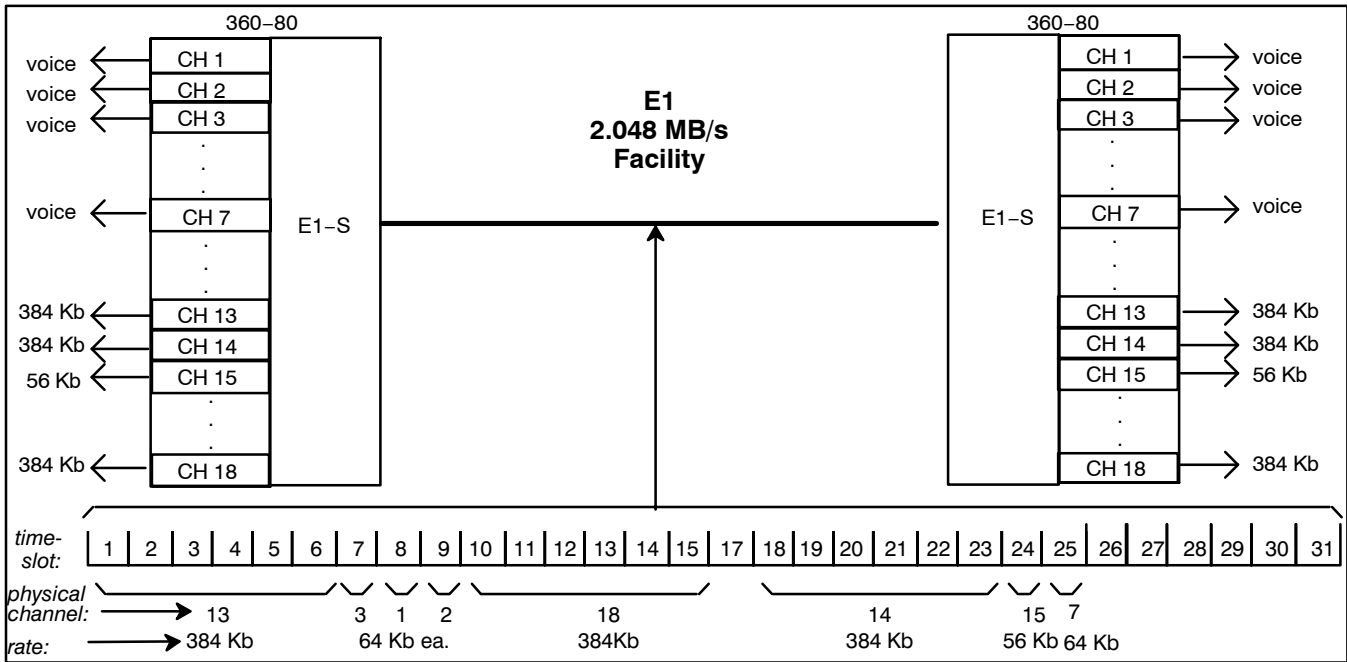


Figure 2. Application #1, Point-Point Full E1

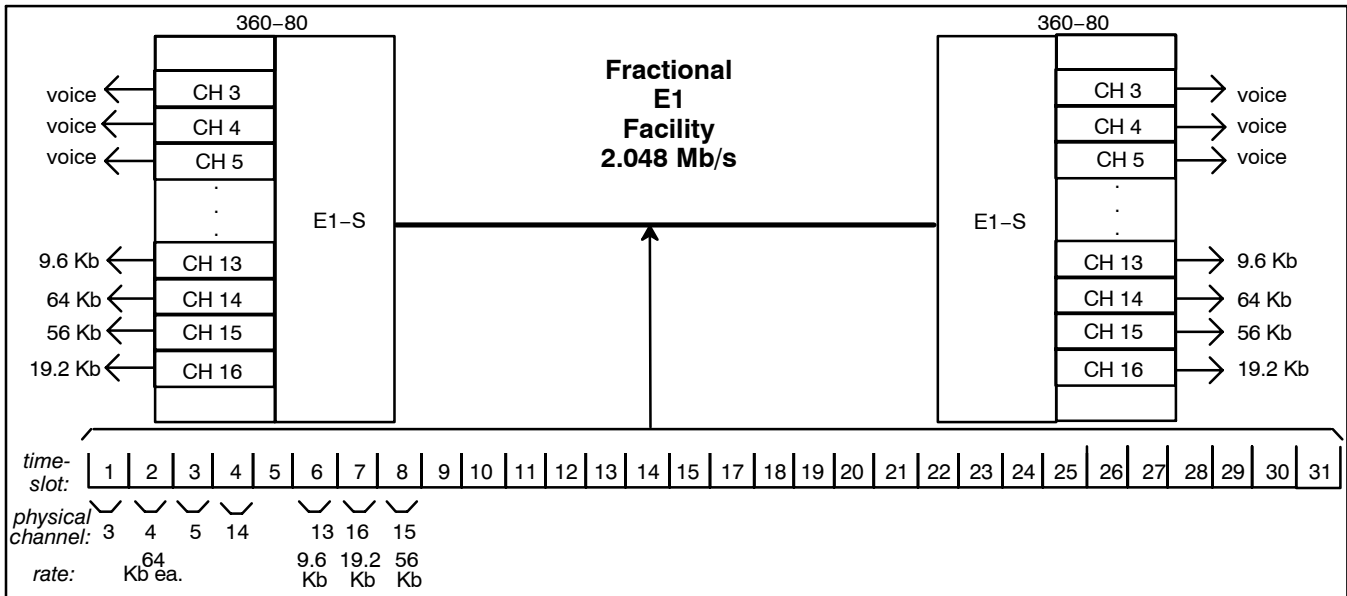


Figure 3. Application #2, Point-Point Fractional E1

3.1 Point-to-Point Applications

The 360-80 ICB can be used in point-to-point applications, as shown in Figure 2, and can transport a mix of voice and data traffic. In these applications, the 360-80 ICB multiplexers are interconnected via a 2.048 Mb/s E1 facility. This facility can be a leased public network channel or a private, dedicated facility.

Figure 2 shows how the 360-80 ICB maps the physical channel unit positions into E1 facility time slots. The particular mapping shown is for example only; any physical slot can be mapped into any time-slot. The only restriction to the mapping is that channel units whose bandwidth occupies more than one 64KB time-slot must map their bandwidth into adjacent time slots and cannot use timeslot 16 (this channel is for signalling information).

Figure 3 shows a similar application, except the facility is fractional "E1". The 360-80 ICB maps the physical slots into the first eight time slots and places "all ones" in the remaining time slots.

3.2 Additional Application with Optional Secondary E1 unit.

When equipped with a Secondary E1 unit (SE1U) in addition to the E1-S, Drop and Re-insert is available. For additional information, see the documentation of the Secondary E1 unit.

3.2.1. Drop and Re-Insert Mode

Drop and Re-insert mode allows the primary E1 from the E1-S to be connected to a channel bank toward the network (west) and the secondary E1 from the SE1U to be connected to a channel bank toward a remote location (east). The data/voice on the Primary E1 can be “dropped” to any one of the cards in the 360-80. Any data/voice that is not “dropped” to a card in the 360-80 can be reinserted into the E1 on the SE1U and sent to the remote location. Data/voice from dropped channels is reinserted on the E1 in the same direction it was dropped from. For example, data/voice dropped from the west would be reinserted toward the west. The same would be true from the east.

Additionally, data/voice from cards in the 360-80 can be “re-inserted” into any vacant timeslots to a remote location. This allows better use of the E1 timeslots by keeping them as full as possible between locations. See Figure 4 for an application in which the 360-80 is used to “drop” dedicated circuits on a E1 and then send the switched voice to a PBX. See Figure 5 for an application where the 360-80 is used to “drop” channels and re-insert channels from multiple locations to reduce the number of E1s needed between locations by keeping the E1 full. A channel that is dropped and reinserted can terminate on any ICB along it’s path.

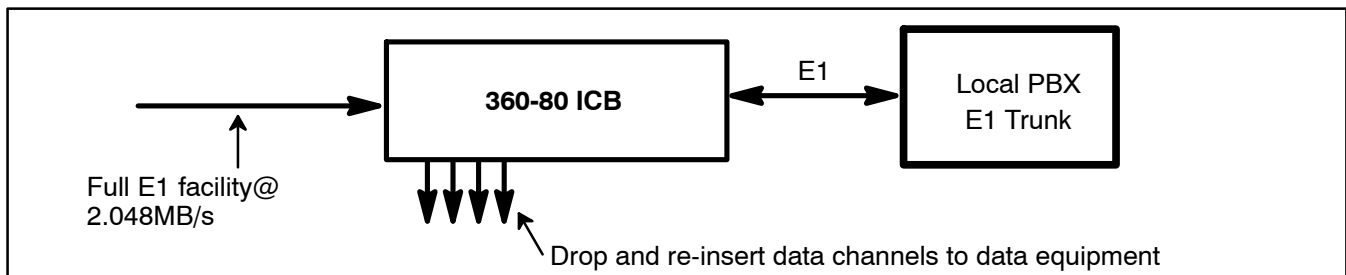


Figure 4. Drop and Re-Insert Application #1

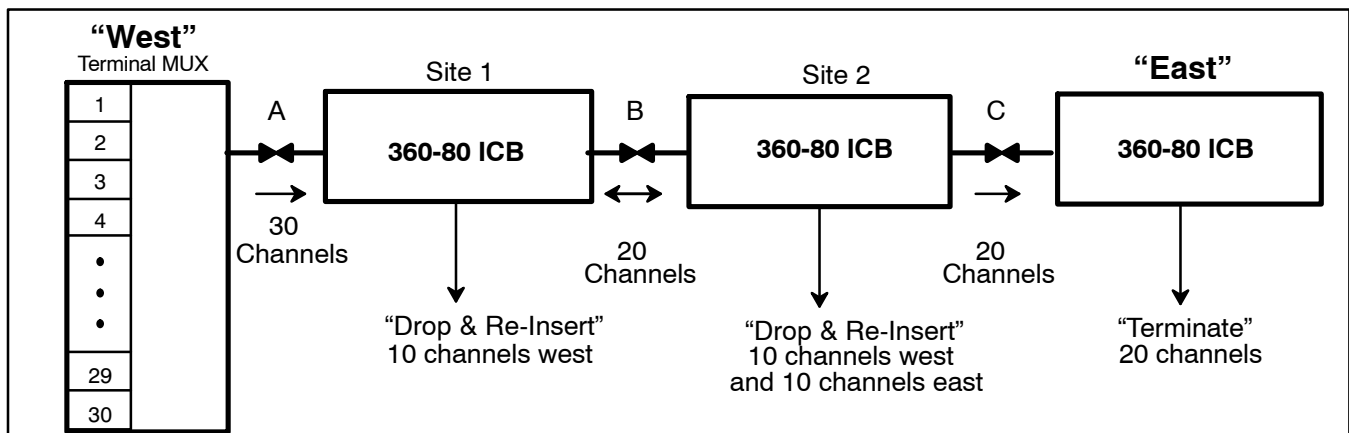


Figure 5. Drop and Re-Insert Application #2

3.3 HDSL/HDSL2 Applications

Using an adaptor kit (97-001787 DSL Adaptor) the ICB can house a 200-mechanics DSL converter unit. This unit plugs in to the half-size slot of the ICB and provides an interface between the DSL and the DSL to E1 converter unit.

The standard DSL adaptor kit provides the interface connections between the incoming DSL and the converter card, and a E1 output jack and a cable to connect the adaptor and the E1 control unit.

Note: When using HDSL modules for E1 transport, you may experience some problems with communication using the E1 facility data link (embedded operations channel) due to the E1 to DSL conversion/synchronization process.

See the documentation for the kit for more information.

4. TIMESLOT ALLOCATION

4.1 Default Timeslot Allocation

The E1-S uses timeslot allocation to control the routing of data that is sent and received on its E1 interfaces. The E1 has 30 timeslots, each timeslot can be allocated to any of the channels on any card in the 360-80 system.

When a new channel card is installed in the system or a system reset to factory default values is performed, the default timeslot allocation will be used by the E1-S. When a new card is installed in a system and some of its factory default timeslots have already been allocated to other channels, the timeslot allocation will be different than the factory default.

For the 360-80 system, the channel number associated with a circuit on a channel card is based on the chassis slot and the circuit on the card. The table below shows the relationship between the slot, channel numbers and default timeslots for the channels. It also shows the default number of timeslots per channel (TS/Chan). See individual channel card documentation for more information on timeslot allocation.

Module	TS/ Chan	Slot 1 (lower)		Slot 2 (upper)		Half Size Card Slot	
		Channel Numbers	Default Timeslots	Channel Numbers	Default Timeslots	Channel Numbers	Default Timeslots
3632-80 3633-80 3652-80 3657-85 3658-85	1	1-12	1-12	13-24	13-15, 17-25	--	--
3634-80	2	1-6	1-12	13-18	13-15, 17-25	--	--
3638-80	3	1-4	1-12	13-16	13-15, 17-25	--	--
3641-80	12	1	1-12	13	13-15, 17-25	--	--
3632-81 3633-81 3652-81 3657-86 3658-86	1	--	--	--	--	25-30	26-31
3634-81	2	--	--	--	--	25-27	26-31
3638-81	3	--	--	--	--	25-26	26-31

4.2 Timeslot Allocation

Timeslot allocation is done through SNMP, NMS or the craft interface. To allocate a timeslot to a channel on a card in the system, the timeslot must not be allocated to another channel. If the timeslot has already been allocated, the timeslot must be unallocated by selecting the channel (chassis slot) where it is currently allocated and then deleting it from the timeslot. For example, in Figure 6 timeslot 13 was allocated to channel 16. To allocate it to channel 20 it must first be unallocated from channel 16, then re-allocated to channel 20.

Any non-allocated timeslots can be allocated to any non-allocated channel. A timeslot cannot be allocated to more than one channel. Timeslot allocation is done by selecting the channel (chassis slot) associated with the circuit on the card and then selecting the timeslot to be allocated to that channel. As shown in Figure 6, timeslots 10 to 12 have been allocated to channels 7 to 9.

Some units use multiple timeslots per circuit such as 64xN, ISDN, etc. The timeslots allocated for the circuits on these units must be consecutive. In Figure 6 channel 24 has been allocated to timeslots 23 through 25. Selecting the circuit and then the first timeslot will allocate the correct number of timeslots for the circuit. The system

checks to make sure enough timeslots are available for the circuit, and if there are not enough consecutive timeslots, an error message will be displayed.

The E1-S will transmit an all 1's signal for any timeslot of the E1 that is not allocated. Any received data in a non-allocated timeslot will not be sent to a channel card.

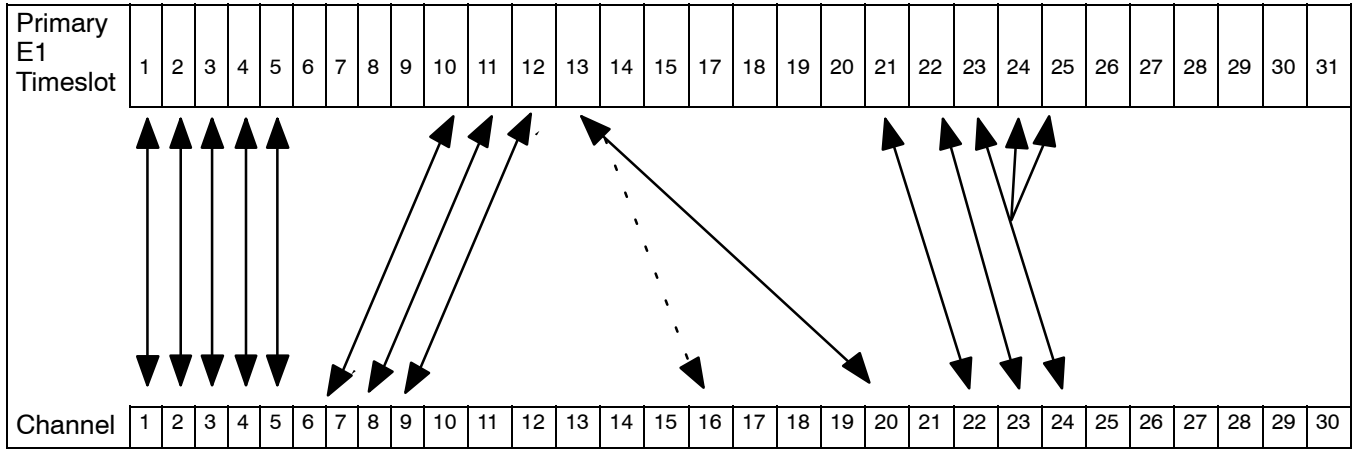


Figure 6. Timeslot Allocation w/E1-S

4.3 Timeslot Allocation with a T1-S and the Secondary T1 Unit (3608-85)

When the E1-S is used in conjunction with a secondary E1 unit (SE1U), 60 timeslots are available for allocation (30 for the E1-S and 30 for the SE1U). The timeslot allocation process is similar to that used for the E1-S only. See the section on timeslot allocation in the Secondary E1 documentation for more information.

5. INSTALLATION

5.1 Installing the Unit

The E1-S installs in the primary slot of the 360-80. A Secondary E1 unit may be mounted in the secondary slot for Drop and Re-insert applications. See Figure 7 for a sample of the shelf layout.

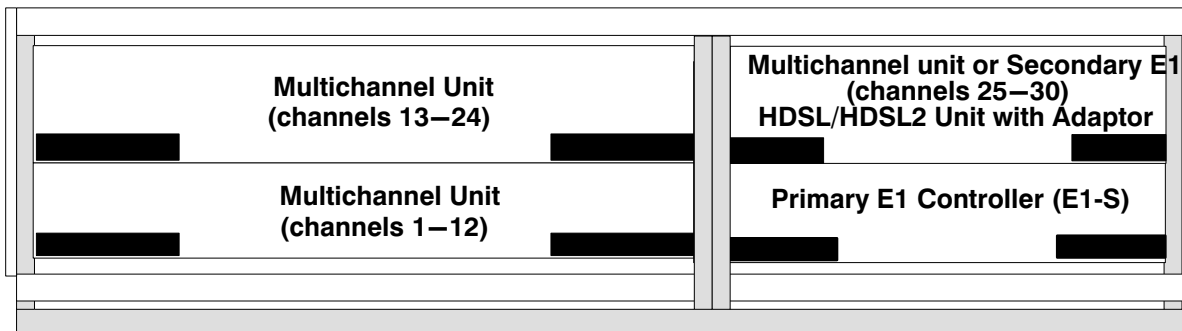


Figure 7. 360-80 ICB Common Equipment Configuration

5.1.1. Attaching the Rear Panel

The rear panel of the unit should be installed before the units are installed in the shelf, and before wiring begins.

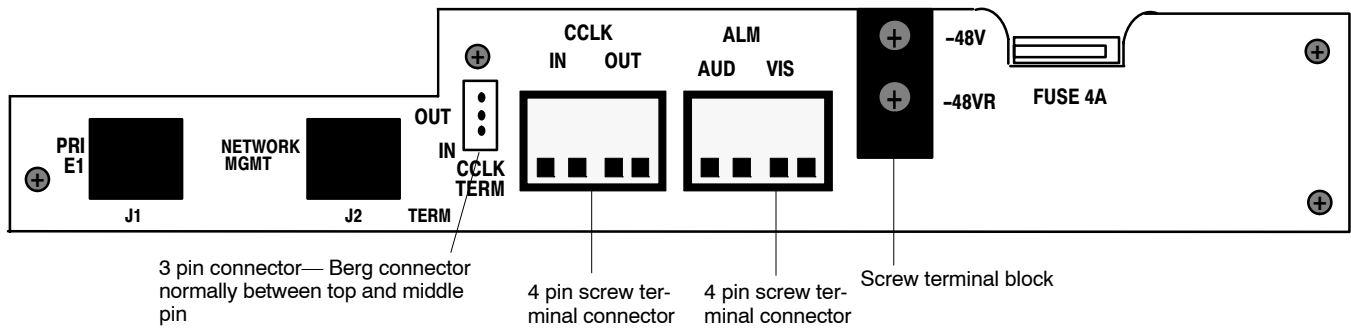


Figure 8. 3603-86 E1-S Rear Panel with Primary Slot Used ONLY

5.1.2. Installing a New Unit

Use the following steps to install the E1-S.

Step	Action
1.	If not already installed, install the rear panel, screwing it to the appropriate mounting locations on the shelf using the provided hardware. WARNING Due to mechanical differences the E1-S card can only be installed in Issue 3 or greater ICB shelves. If there is already a rear panel installed on the shelf, check for interference when installing. The rear panel may need to be removed and replaced with the rear panel that has been shipped with the new unit.
2.	Insert the unit into the shelf, making sure that the unit is aligned with the card guides inside the shelf.
3.	Slide the unit fully into the shelf. Use the insertion lever to fully seat the unit.
4.	Once the unit is fully inserted, tighten the securing screw on the front panel of the unit.
5.	When power is applied, the unit will perform a self-test.
6.	Wire the unit per the wiring information in the wiring section.
7.	After the self-test is performed, check the software provisioning of the card using the front panel craft interface on the front of the controller unit.

5.1.3. Installing a Replacement Unit

If you are replacing a unit that is already in service, insure that the new unit is the same as the unit being replaced.

Step	Action
1.	Remove the wiring connectors from the front and rear of the unit (J1 & J2 if applicable).
2.	Unscrew the front panel securing screw to release the unit from the shelf.
3.	Using the card ejector, remove the unit from the shelf.
4.	Follow the procedure for installing a new unit.

5.2 Wiring the Unit

Use the following steps to wire the unit.

Step	Action
1.	Connect E1 to the rear panel RJ48 jack (J1). If a coax (75 Ohm) connection is needed, a Balun 97-001811 is available to convert from twisted pair (120 Ohm) to coax (75 Ohm).
2.	If using the Ethernet interface, connect the Ethernet to J2 at the rear of the unit.

Step	Action
3.	Set composite clock termination for your system as described under Hardware Optioning, page 12.
4.	If you are using composite clock, remove the connector and wire the signal to the connector CCLK IN.
5.	Reinstall the connector with the composite clock signal wires.
6.	Power and alarm should already be wired. If not, see the documentation for the ICB shelf.

5.3 Front Panel Switch and LED Definitions

The Audible Alarm Cut Off (ACO) switch is a pushbutton used to open the audible alarm contacts from the 360-80 system. This switch will only mask audible indications of present alarm conditions—it does NOT clear the alarm. If a new alarm occurs, the audible indication will re-enable.

The Address ID switch on the front panel is a multi-section switch for setting the system address on the system management bus. This switch is used if the system is connected together with other 360-80 systems into a management control center. This switch allows the control center to 'address' the individual systems. See section on network management for more information.

Table 1. LED Definitions

Label	Color	Status	Indicates that...
POWER	Green	ON	The unit is receiving power.
		OFF	The unit is not powered.
AR	Red	ON	The unit is detecting a red alarm on the E1 interface caused by a loss of signal (LOS) or a loss of framing (LOF) or out of frame (OOF) condition.
		OFF	Normal operation.
AY	Yellow	ON	The unit is receiving a YELLOW alarm condition on the E1. This indicates that a problem is upstream at some other device or network node.
		OFF	Normal operation.
TP	Yellow	ON	The system is processing trunk signaling data based on detected alarm conditions.
		OFF	Normal operation.
LP	Green	ON	The unit is in a loopback condition. This indication only occurs during testing.
		OFF	Normal operation.

5.4 Connector Definitions

5.4.1. Bantam Jacks

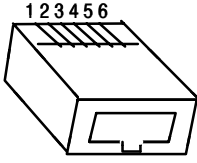
The two bantam jacks on the front of the unit allow monitoring of the transmit (XMT) and receive (RCV) sides of the primary E1 signal without interfering with operation.

5.4.2. Front Panel RJ11 Jack

The RJ-11 jack on the front of the unit is the local craft/control port. The default interface is an RS-232 connection that defaults to 9600 baud, 8 bits, 1 stop and no parity. The interface through the control port is VT-100. VT-100 operation on a PC requires VT-100 emulation software.

A cable (03-200542-0) is available to connect the front panel RJ11 jack to a DB-9 connector.

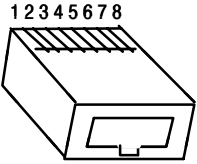
Table 2. Front Panel RJ11 Jack Pinouts

	Pin #	Use	DB9 Pinouts
	1	NC	
	2	GND	5
	3	RCV (ICB – input)	3
	4	XMIT (ICB + output)	2
	5	Enable PC (ICB input)	7
	6	NC	

5.4.3. E1 Jack

The RJ48 connector on the rear of the E1-S is for the primary E1.

Table 3. RJ-48C E1 Jack Pinouts

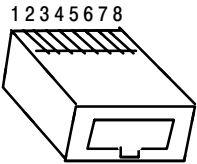
	Pin #	Use
	1	R (RCV from network)
	2	T (RCV from network)
	3	—
	4	R1 (XMIT to network)
	5	T1 (XMIT to network)
	6	—
	7	—
	8	—

5.4.4. Rear Panel RJ45 Jack

The J2 RJ45 jack on the rear of the unit is for interfacing to a network management control center using SNMP or proprietary NMS/GUI software over Ethernet. An IP address and IP subnet mask must be configured through the craft interface before the unit will communicate with the NMS/GUI or SNMP. To communicate with SNMP, the SNMP community table must also be configured. See the network management section or the network management interface documentation for more information.

The proprietary graphical user interface (GUI) is available through the Ethernet control port. Using the GUI interface requires that GUI software be loaded on the controller PC. The front panel craft interface requires only VT-100 emulation software loaded on the controller PC.

Table 4. RJ45 Jack Pinouts

	Pin #	Use
	1	XMIT (TD+)
	2	XMIT (TD–)
	3	RCV (RD+)
	4	NC
	5	NC
	6	RCV (RD–)
	7	NC
	8	NC

6. OPTIONING

6.1 Hardware Optioning

Option	Type	Choices	Description
Composite clock termination	3-pin connector	Termination	Place the Berg connector between the middle and bottom pins to terminate the composite clock input wired to the ICB. This is done for a single ICB, or on the last ICB in a “daisy-chained” series.
		No termination	Place the Berg connector between the top and middle pins to remove termination from the composite clock input. This is done when the clock will be connected to additional equipment with a termination.
ICB Address (address= 1 + switch setting)		Switch settings 00 through 15	The default is 00.

6.2 Software Optioning

This unit comes from the factory with default provisioning, which can be changed through the Network Management or the craft terminal interface. See the NMS or craft terminal interface documentation for procedures. The provisioning options are as follows with the default optioning noted:

Option	Choices	Default
Frame format	Conventional CAS, CRC4-CAS	CRC4-CAS
Transmit E1 Timing Source	External, Internal, Looped	Internal
Test Generator (per channel)	Tone Test, 1 KHz 0 dBm0, None	None
E1 Loopback Selection	Loopback, Release	None
CGA Process Mode	Normal, CM2, CM3	Normal
Remote Control Method	None, Occupy One Channel, Facility Data Link	Facility Data Link

7. ALARMS

Alarms provide an audible and visual indication that there is something functioning improperly within the system. There are three alarm modes, Normal, CM2 and CM3 on the 360-80 shelf. The E1-S will generate an alarm based on its configuration.

If an alarm occurs, pressing the Audible Alarm Cut-off (ACO) switch stops the audible alert associated with the alarm. However, it does not clear the alarm. To clear an alarm, the source of the alarm must be identified. Apparent indication of the source will be the unit with the RED alarm displayed. The other units in the network will display a yellow alarm indicating there is a problem somewhere, but not here.

7.1 Alarm Trunk Processing

When a loss of signal occurs for 1 to 2.5 seconds, depending on the alarm mode used, a red alarm condition is triggered. The unit where the error occurred will display the red alarm. When using the normal alarm mode and a red condition is present, the other units in the network will display a yellow alarm. CM2 and CM3 modes do not transmit a yellow alarm signal during a red alarm condition.

When loss of E1 or a yellow alarm signal is detected in normal mode, CGAI trunk conditioning occurs immediately. CGAD trunk conditioning occurs 2.5 seconds after the alarm is declared. Individual card provisioning determines the conditioning state during CGAI and CGAD.

During red alarm conditions in CM2 mode, individual card provisioning determines the conditioning state during CGAI and CGAD. During red alarm conditions in CM3 mode, trunk conditioning is done to “busy” the circuits and ignores the CGAI and CGAD card provisioning.

During yellow alarm conditions in CM2 or CM3 modes, no trunk conditioning occurs.

Table 5. Duration of Alarms

Alarm	Normal	CM2	CM3
E1 loss to Red Alarm declared	2.5 Sec.	1 Sec.	1 Sec.
E1 restore to Trunk Processing (TP) retired	15 Sec.	1 Sec.	1 Sec.
Yellow alarm detected to declared	< 1 Sec.	< 1 Sec.	< 1 Sec.
Yellow alarm not detected to Trunk Processing (TP) retired	< 1 Sec.	< 1 Sec.	< 1 Sec.
Yellow alarm transmitted during alarm	Yes	No	No

8. NETWORK MANAGEMENT

The 360-80 channel bank can be managed via three different interfaces. Each interface has a slightly different look and feel however each of them offers similar capabilities. The interfaces available include:

- Craft Interface
- The Network Management System (NMS)
- Network Node Manager (NNM)

8.1 Craft Interface

The craft interface is a menu based ASCII interface that utilizes the RS-232 port on the front of the E1-S. This interface utilizes any generic terminal emulation program loaded on a PC or similar equipment to operate. In this configuration the craft interface can only provision and monitor the 360-80 channel bank it is connected to. Visibility to other remote or local 360-80 channel banks is not provided.

The craft interface is used to establish the IP address required by the other management interfaces. It is also used to establish the SNMP community parameters required when using the NNM interface.

A cable adaptor is available to connect between the RJ-11 connector on the card front panel and a standard DB-9 connection to a terminal or PC serial port. See the documentation provided with the craft interface for more information.

8.2 Network Management System Interface

The NMS interface is a Graphical User Interface (GUI) based software package that is shipped with each unit on CD-ROM. This interface assumes that the NMS software package is loaded and running on a PC connected to the same Ethernet network as the E1-S card. Up to 16 local 360-80 channel banks can be provisioned and monitored with the NMS interface. Each local 360-80 can support up to 7 remote 360-80s connected to each local 360-80. To use this interface the IP address for the local E1-S card must be provisioned using the craft interface.

A local 360-80 channel bank is a 360-80 that is connected directly to the same network as the managing PC. A remote 360-80 channel bank is a 360-80 that is connected to a local 360-80 over a E1 and the E1 has been provisioned for remote control between the local and remote 360-80s. Remote control can utilize either the Embedded Operations Channel (EOC) or can utilize a timeslot on the E1. This is done through the optioning of the E1-S card.

For drop and reinsert applications where a remote 360-80 may be connected to another remote 360-80, each 360-80's E1-S and Secondary E1 card must be optioned for a remote control method between each 360-80. Each remote 360-80 is identified through an addressing scheme utilizing the NMS address of the local 360-80 and the Address ID switch setting on the remote E1-S card. See the NMS documentation for more information.

8.3 Network Node Manager Interface

The NNM interface is a Simple Network Management Protocol (SNMP) based interface that utilizes a central SNMP manager software package. This interface assumes that an SNMP manager is present on the same Ethernet network as the E1-S card. In order for the SNMP manager to operate correctly, the Management Information Base (MIB) file included on the CD-ROM that was shipped with the product must be loaded. The NNM interface allows provisioning and monitoring of as many local 360-80s as can be supported by the Ethernet network. Each

local 360-80 can support up to 7 remote 360-80s connected to each local 360-80. To use this interface the IP address and the community information for the E1-S card must be provisioned using the craft interface.

A local 360-80 channel bank is a 360-80 that is connected directly to the same network as the managing PC. A remote 360-80 channel bank is a 360-80 that is connected to a local 360-80 over a E1 and the E1 has been provisioned for remote control between the local and remote 360-80s. Remote control can either utilize the Embedded Operations Channel (EOC) or can utilize a timeslot in the E1. This is done through the optioning of the E1-S card.

For drop and reinsert applications where a remote 360-80 may be connected to another remote 360-80, each 360-80's E1-S and Secondary E1 card must be optioned for a remote control method between each 360-80. Each remote 360-80 is identified through an addressing scheme utilizing the community information of the local 360-80 and the Address ID switch setting on the remote E1-S card. See the NNM documentation for more information.

9. TECHNICAL ASSISTANCE

If technical assistance is required, contact Charles Technical Services Center at:

847-806-8500

847-806-8556 (FAX)

800-607-8500

techserv@charlesindustries.com (e-mail)

10. WARRANTY & CUSTOMER SERVICE

10.1 Warranty

Charles offers a 2-year warranty on this product. Contact your local Sales Representative at the address or telephone numbers below for warranty details. The warranty provisions are subject to change without notice. The terms and conditions applicable to any specific sale of product shall be defined in the resulting sales contract.

Charles

5600 Apollo Drive

Rolling Meadows, Illinois 60008-4049

U.S.A.

847-806-6300 (Main Office)

847-806-6231 (FAX)

10.2 Field Repairs (In-Warranty Units)

Field repairs involving the replacement of components within a unit are not recommended and may void the warranty and compatibility with any applicable regulatory or agency requirements. If a unit needs repair, contact Charles for replacement or repair instructions, or follow the *Repair Service Procedure* below.

10.3 Advanced Replacement Service (In-Warranty Units)

Charles offers an "advanced replacement" service if a replacement unit is required as soon as possible. With this service, the unit will be shipped in the fastest manner consistent with the urgency of the situation. In most cases, there are no charges for in-warranty repairs, except for the transportation charges of the unit and for a testing and handling charge for units returned with no trouble found. Upon receipt of the advanced replacement unit, return the out-of-service unit in the carton in which the replacement was shipped, using the pre-addressed shipping label provided. Call your customer service representative at the telephone number above for more details.

10.4 Standard Repair and Replacement Service (Both In-Warranty and Out-Of-Warranty Units)

Charles offers a standard repair or exchange service for units either in- or out-of-warranty. With this service, units may be shipped to Charles for either repair and quality testing or exchanged for a replacement unit, as determined by Charles. Follow the *Repair Service Procedure* below to return units and to secure a repair or replacement. A handling charge applies for equipment returned with no trouble found. To obtain more details of this service and a schedule of prices, contact Charles at 217-932-5292 (FAX 217-932-2943).

Repair Service Procedure

1. Prepare, complete, and enclose a purchase order in the box with the equipment to be returned.

2. Include the following information:
 - Company name and address
 - Contact name and phone number
 - Inventory of equipment being shipped
 - Particulars as to the nature of the failure
 - Return shipping address
3. Ship the equipment, purchase order, and above-listed information, transportation prepaid, to the service center address shown below.

Charles
 503 N.E. 15th St, P.O. Box 339
 Casey, IL 62420-2054

4. Most repaired or replaced units will be returned within 30 or 45 days, depending on the product type and availability of repair parts. Repaired units are warranted for either 90 days from the date of repair or for the remaining unexpired portion of the original warranty, whichever is longer.

11. SPECIFICATIONS

11.1 Electrical

Parameter	Specification
Carrier Mode	Pulse Code Modulation (PCM)
Sampling Frequency	8000/s
Bits per Channel	8 bits
2.048Mb/S Framing Format	E1 interface is compliant with the ITU-T G.703 Conventional CAS, CRC4-CAS standard
Line code	HDB3
Input/output impedances	120 Ohms
Transmission Rate	2.048 Mb/s \pm 32 ppm
Channel bank input timing (software selectable) and composite clock output	1: free running timing 2: loop timing (recovered from Receive E1) 3: external timing: composite clock input terminal (on rear panel).
E1 connector (rear panel.)	RJ-48C
PC control interface: Two types of connectors. (RS232 with RJ-11 on the front and RJ45 Ethernet on the rear of the ICB)	RJ11 (RS-232) craft interface (directly connect PC on front panel) Default: data rate 9600, 8 data bit, 1 stop bit, No parity. RJ45 network management interface (10/100 Base-T, Half/Full Duplex, auto-detection Ethernet connection) The network management PC interface can control and monitor functionality for both local and remote environments.
E1 monitor bantam jacks (On front panel only)	This is to monitor the primary E1 signal (monitor transmit and monitor receive) without interference.

Parameter	Specification
Alarm interface and contacts	The alarm contact connector is a 4-lead connector rated for 1 amp. One set of isolated contacts each for the audible and visual alarms per PUB-43801. A typical connection is expected to be 18 or 22 gauge wire. The system provides visual and audible alarm contact closure when the channel bank is in alarm or there is a loss of power. When the ACO (Audible Alarm Cut Off) is activated, the audible alarm contacts return to open circuit.
Composite clock termination (jumper selectable, rear panel)	IN—135 Ohm termination on composite clock input. OUT—No termination on composite clock input.
ACO switch (front panel)	Use to silence the audible alarm contacts
Voice port test pattern generator and detector (software selectable on a per-channel basis)	DTMF tone test sequence for channel testing or 1 KHz 0 dBm0 test tone for calibration
Power supply input voltage range	-42V to -56V
Power supply current	0.100 amp
Heat dissipation	4.8 watts

11.2 Physical

See Table 6 for the physical characteristics of the unit.

Table 6. Physical Specifications

Feature	U.S.	Metric
Height	0.75 inch	1.9 centimeters
Width	5.64 inches	14.32 centimeters
Depth	9.25 inches	23.49 centimeters
Weight	10.8 ounces	306 grams
Temperature	-40° to +149° F	-40° to +65° C
Humidity	to < 95%	

