Tekelec EAGLE® 5
Integrated Signaling System

Installation - Integrated Applications

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TEKELEC

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U.S. Patent Numbers:

5,008,929, 5,953,404, 6,167,129, 6,324,183, 6,327,350, 6,456,845, 6,606,379, 6,639,981, 6,647,113, 6,662,017, 6,735,441, 6,745,041, 6,765,990, 6,795,546, 6,819,932, 6,836,477, 6,839,423, 6,885,872, 6,901,262, 6,914,973, 6,940,866, 6,944,184, 6,954,526, 6,954,794, 6,959,076, 6,965,592, 6,967,956, 6,968,048, 6,970,542

Ordering Information

For additional copies of this document, contact your sales representative.

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Safety Information

General

These icons and text throughout this manual are to alert the reader, to assure personnel safety, to minimize service interruptions, and to warn of potential equipment damage.

NOTE: All personnel must be aware of and conform to the safety information provided in each "Safety Information" section of this manual.

	**TOPPLE/DANGER:** (This icon and text indicate the possibility of ***personnel injury and equipment damage***.)
	**DANGER:** (This icon and text indicate the possibility of ***personnel injury.***)
	**CAUTION:** (This icon and text indicate the possibility of ***service interruption and personnel injury.***)
	**WARNING:** (This icon and text indicate the possibility of ***equipment damage and personnel injury.***)

WARNING: All personnel associated with the installation of these systems must adhere to all safety precautions and use required protection equipment to avoid the possibility of injury, equipment damage, service degradation, or service interruption.

WARNING: This procedure may interrupt service. When possible, perform maintenance during low traffic and database provisioning periods, such as the maintenance window.

Frames

TOPPLE/DANGER: Always read and understand instructions thoroughly and completely before working on, moving, raising or lowering the frame, any portion of the frame, attachments to the frame, or equipment.

TOPPLE/DANGER: Never try to unpack any frame from the shipping container without at least two people to steady any movement of the frame and related components. At least two people are required to safely move and position a frame into place.

TOPPLE/DANGER: Never pull out the shelf of a frame that is not anchored properly. Systems with sliding shelves must be securely anchored to the floor and to the overhead cable racks. Extending a shelf without correctly anchoring the frame can cause the frame to topple and endanger personnel and damge equipment.

TOPPLE/DANGER: Frames are required to be attached to over-head ladder-racks before shelves are extended.

DANGER: Moving an application server chassis requires two people. Each chassis weighs approximately 25 kg (55 lbs) and may cause injury or damage to internal components due to shock and vibration if not handled properly.

WARNING: Before drilling holes in any flooring, verify with facilities personnel that the area is free of gas or water pipes, ventilation plenum, and electrical wiring conduits.

WARNING: Finger-tighten nuts on threaded rods inside the frames above the raised floor before finger tightening the nuts below the raised floor.

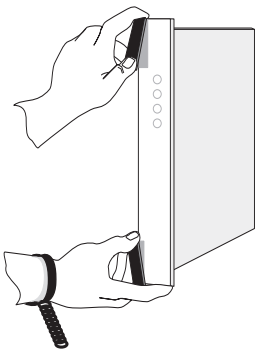
CAUTION: Frame ground. *Do not* "double lug": The practice of using one bolt through a lug and the ground bar, and through another lug on the other side of the ground bar, held in place by one nut.

A bolt through any nut must show at least two threads beyond the nut but When some CPCI cards arrive from the manufacturer they may have a small plastic cover over the screws and/or the alignment ejector pins. Remove and discard these plastic covers. If inserting the cards takes an excessive amount of force, check for obstructions. Forcing the card into a slot may damage the ejector handle or pin.

CAUTION: After the frame has been shipped or moved, remove all cards prior to applying power. Carefully reset cards to avoid possible faulty connections.

To remove or install a card, use the module locking tabs at the top and bottom of the card faceplate. See to Figure 1-1.

Figure 1-1. Removing a Card



Power

DANGER: Strictly observe all grounding requirements to reduce the risk of electric shock.

DANGER: Do not use or place commercially AC-powered equipment within 7 ft. of –48V equipment. Close proximity can create a shock or current loop that is severely hazardous to personnel and equipment.

WARNING: The power (-48 VDC) and return connections of Fuse and Alarm Panels (FAP) 870-0243-08 and 870-1606-xx are physically reversed at the input terminal.

WARNING: Before testing -48VDC power source:

- **Ensure that no power is being provided to the system from the –48VDC power source, such as a power board**
- **Ensure that no circuit cards are installed in the shelves**
- **Remove all fuses from the fuse and alarm panels.**
- **Recheck wiring and connections for proper polarity**

WARNING: Frames with HCMIM cards require 60A breakers, ELAP frames use 30A and 60A breakers, and EPAP and EOAP frames use 30A breakers. Existing frames that are fused at 40A can be upgraded to support 60A with a FAP upgrade kit.

WARNING: Always install an isolator pad between the frame and ground. Tekelec frames are shipped with isolator pads to completely isolate the frames from ground. If a non-Tekelec frame is used, an isolator pad must be provided.

WARNING: Application Servers. Verify that all breakers are set to the OFF (O) position. An application server chassis is redundantly powered from both A and B -48VDC buses. Ensure that both the circuit breaker supplying A power to the chassis and the circuit breaker supplying B power to the chassis are turned OFF by measuring the voltage with a VOM on the cable that connects the chassis to its breakers. Both A and B power LEDs on the front panel of the chassis should be OFF.

CAUTION: Redundant systems allow service during normal maintenance. When repairs require a total power disconnect, both input supply sources must be disconnected. This causes service interruption and takes down the systems.

CAUTION: This equipment has a connection between the earthed conductor of the DC supply circuit and the earthing conductor.

CAUTION: The Branch Circuit Overcurrent Protection shall be rated at 48V minimum and 40A maximum.

CAUTION: Install equipment in restricted access areas in accordance with articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70.

CAUTION: Incorporate a readily accessible approved disconnect device in the field wiring.

CAUTION: Connect to a reliably grounded SELV source that is reliably earthed and electrically isolated from the AC source.

CAUTION: Use only listed closed-loop connectors for connection to the power supply.

Electrostatic Discharge

DANGER: *Do not* wear metal, chains, rings, watches, or jewelry *or* carry exposed metal, keys, or tools in pockets when working on system equipment or other related electrostatic-sensitive components.

DANGER: Always wear a wrist strap or other electrostatic protection when handling printed circuit cards and other electrostatic-sensitive devices.

WARNING: Observe proper ESD procedures when handling the TekServer chassis. Always wear an ESD wrist strap connected to a grounded bench or frame.

WARNING: Use the antistatic wrist strap connected to the wrist strap grounding point on the frame when performing these procedures.

WARNING: *Do not* leave or allow unused metal objects, such as screws or washers, to remain anywhere within the equipment. Remove all unused material from the equipment

WARNING: *Do not* allow any metal shavings to remain in the equipment area. Shavings may occur from over tightened screws or bolts. These small metal particles are hazardous to electronic equipment. Be careful not to over tighten screws or bolts.

WARNING: *Do not* use tie wraps on or above the top traverse arms on a frame. *Always* trim tie wrap flush and turn the trimmed tie wrap to the rear of the cable. Contact the Site Supervisor for site-specific customer information.

Components

WARNING: If components arrive in containters that might have been subjected to extreme temperatures or variations in humidity (such as air transport), allow 6 hours for the components to aclimatize to your site conditions before operating.

WARNING: Metal points on Printed Circuit Boards conducts -48VDC and can cause shorts, shocks, and damage if not handled properly.

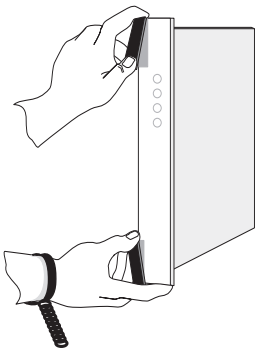
CAUTION: New CPCI cards may have a small plastic cover over the screws or the alignment ejector pins. Remove and discard these plastic covers. If inserting the cards takes an excessive amount of force, check for obstructions. Forcing the card into a slot may damage the ejector handle or pin.

CAUTION: In EAGLE 5 ISS, make sure that the DCM card is inserted into the correct odd numbered slots. In IP7 Secure Gateway systems, there are no slot provisioning requirements. Cards may be provisioned in any slot where they physically fit except for the HMUX and MAS dedicated card slots.

CAUTION: After the frame has been shipped or moved, remove all cards prior to applying power. Carefully reset cards to avoid possible faulty connections.

To remove or install a card, use the module locking tabs at the top and bottom of the card faceplate. See to Figure 1-1.

Figure 1-2. Removing a Card



CAUTION: Do not impact the faceplate in order to mate the connectors. Any impact to the card's faceplate can damage the faceplate, the pins, or the connectors.

CAUTION: Be sure to install the fan assembly 890-0001-01 before installing the HCMIM card.

CAUTION: Before powering up the fans, ensure that the shelf directly above the fan does not contain any empty slots. Install an air management card in any empty slots to ensure proper air flow. These filler cards have no electrical connection to the system.

CAUTION: *Do not* form FAN POWER cables with LIM cables.

2

Introduction

About this Manual

This manual provides installation information for

- Integrated Sentinel
- Non-Integrated Sentinel (Probed) Sentinel Collector and Server Frames

Organization

This manual is organized into the following chapters:

- Chapter 1, *Safety Information* provides important safety information for installers. Know this information prior to attempting an installation.
- Chapter 2, *Introduction* provides information about the manual, Tekelec products, and installation support.
- Chapter 3, *Sentinel System Components* describes the Netra-based Sentinel.
- Chapter A, *LED Information* provides Light Emitting Diode (LED) information.
- Chapter B, *Backplane Connectors* provides information on connectors.
- Chapter C, *Cables and Adapters* provides information on cables.
- Chapter D, *Power Cords to Peripherals* provides information on power cords patterns for different countries.
- Chapter E, *Part Numbers* provides part number information on orderable items.

Scope and Audience

This manual is intended for qualified technical installation and test personnel that must have thorough knowledge of telecommunication installation specifications, procedures, and equipment standards.

NOTE: All personnel must be aware of and conform to the safety information provided starting on page 2-3 and through out this document.

This manual does not cover testing or system software.

This manual covers only Netra-based Sentinel components; for infomation about the Tekelec 1000 Application Server platform, see the *Tekelec 1000 Application Server Hardware Manual.l*

Hardware operational testing is designed to verify the functionality of the finalized construction of the hardware at the customer site. The demarcation line for the testing is, up to and including the patch panel, directly connected to the system. All installations are site specific, therefore a comprehensive site survey is necessary for all installations.

For hardware descriptions or basic site engineering information, refer to the *EAGLE 5 ISS Hardware Manual* and the *Tekelec 1000 Hardware Manual* included with your system documentation. For replacement procedures of existing hardware components, refer to the *Maintenance Manual* included with your system documentation.

Admonishments and Conventions

Admonishments alert the reader and technical personnel to assure personal safety, to minimize possible service interruptions, and to warn of the potential for equipment damage. This manual has four admonishments, listed in descending order of priority.

	**TOPPLE/DANGER:** (This icon and text indicate the possibility of ***personnel injury and equipment damage***.)
	**DANGER:** (This icon and text indicate the possibility of ***personnel injury.***)
	**WARNING:** (This icon and text indicate the possibility of ***equipment damage and personnel injury.***)
	**CAUTION:** (This icon and text indicate the possibility of ***service interruption***.)

This manual uses the following conventions:

This type style indicates input by the user or a section of output that demonstrates a point to the user.

This typeface indicates system output. A section of output that demonstrates a point to the user is indicated in **bold**.

References

The following document is referenced in this manual:

[1] *TL 9000 Quality Management System Requirements Handbook, Release 3.0, QuEST Forum, March 2001*.

Related Publications

The *Installation Manual* is part of the EAGLE 5 ISS documentation set and may refer to one or more of the following manuals:

- The *Commands Manual* contains procedures for logging into or out of the EAGLE 5 ISS, a general description of the terminals, printers, the disk drive used on the system, and a description of all the commands used in the system.
- The *Commands Pocket Guide* is an abridged version of the *Commands Manual*. It contains all commands and parameters, and it shows the command-parameter syntax.
- The *Commands Quick Reference Guide* contains an alphabetical listing of the commands and parameters. The guide is sized to fit a shirt-pocket.
- The *Commands Error Recovery Manual* contains the procedures to resolve error message conditions generated by the commands in the *Commands Manual*. These error messages are presented in numerical order.
- The *Database Administration Manual – Features* contains procedural information required to configure the EAGLE 5 ISS to implement these features:
  - X.25 Gateway
  - STP LAN
  - Database Transport Access
  - GSM MAP Screening
  - EAGLE 5 ISS Support for Integrated Sentinel
- The *Database Administration Manual - Gateway Screening* contains a description of the Gateway Screening (GWS) feature and the procedures necessary to configure the EAGLE 5 ISS to implement this feature.
- The *Database Administration Manual – Global Title Translation* contains procedural information required to configure an EAGLE 5 ISS to implement these features:
  - Global Title Translation
  - Enhanced Global Title Translation
  - Variable Length Global Title Translation

  - Interim Global Title Modification
  - Intermediate GTT Load Sharing
  - ANSI-ITU-China SCCP Conversion
  - Flexible GTT Loadsharing
  - Origin-Based SCCP Routing
- The *Database Administration Manual - IP7 Secure Gateway* contains procedural information required to configure the EAGLE 5 ISS to implement the SS7-IP Gateway.
- The *Database Administration Manual – SEAS* contains the EAGLE 5 ISS configuration procedures that can be performed from the Signaling Engineering and Administration Center (SEAC) or a Signaling Network Control Center (SNCC). Each procedure includes a brief description of the procedure, a flowchart showing the steps required, a list of any EAGLE 5 ISS commands that may be required for the procedure but that are not supported by SEAS, and a reference to optional procedure-related information, which can be found in one of these manuals:
  - Database Administration Manual – Gateway Screening
  - Database Administration Manual – Global Title Translation
  - Database Administration Manual – SS7
- The *Database Administration Manual – SS7* contains procedural information required to configure an EAGLE 5 ISS to implement the SS7 protocol.
- The *Database Administration Manual – System Management* contains procedural information required to manage the EAGLE 5 ISS database and GPLs, and to configure basic system requirements such as user names and passwords, system-wide security requirements, and terminal configurations.
- The *Dimensioning Guide for EPAP Advanced DB Features* is used to provide EPAP planning and dimensioning information. This manual is used by Tekelec personnel and EAGLE 5 ISS customers to aid in the sale, planning, implementation, deployment, and upgrade of EAGLE 5 ISS systems equipped with one of the EAGLE 5 ISS EPAP Advanced Database (EADB) Features.
- The *ELAP Administration Manual* defines the user interface to the EAGLE 5 ISS LNP Application Processor on the MPS/ELAP platform. The manual defines the methods for accessing the user interface, menus, screens available to the user and describes their impact. It provides the syntax and semantics of user input, and defines the output the user receives, including information and error messages, alarms, and status.
- The *EPAP Administration Manual* describes how to administer the EAGLE 5 ISS Provisioning Application Processor on the MPS/EPAP platform. The

manual defines the methods for accessing the user interface, menus, and screens available to the user and describes their impact. It provides the syntax and semantics of user input and defines the output the user receives, including messages, alarms, and status.

- The *Feature Manual - EIR* provides instructions and information on how to install, use, and maintain the EIR feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 ISS. The feature provides network operators with the capability to prevent stolen or disallowed GSM mobile handsets from accessing the network.
- The *Feature Manual - G-Flex C7 Relay* provides an overview of a feature supporting the efficient management of Home Location Registers in various networks. This manual gives the instructions and information on how to install, use, and maintain the G-Flex feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 ISS.
- The *Feature Manual - G-Port* provides an overview of a feature providing the capability for mobile subscribers to change the GSM subscription network within a portability cluster while retaining their original MSISDNs. This manual gives the instructions and information on how to install, use, and maintain the G-Port feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 ISS.
- The *Feature Manual - INP* provides the user with information and instructions on how to implement, utilize, and maintain the INAP-based Number Portability (INP) feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 ISS.
- The *FTP-Based Table Retrieve Application (FTRA) User Guide* describes how to set up and use a PC to serve as the offline application for the EAGLE 5 ISS FTP Retrieve and Replace feature.
- The *Hardware Manual* - EAGLE 5 ISS contains hardware descriptions and specifications of Tekelec's signaling products. These include the EAGLE 5 ISS, OEM-based products such as the the Netra-based Multi-Purpose Server (MPS), and the Integrated Sentinel with Extended Services Platform (ESP) subassembly.
- The Hardware Manual provides an overview of each system and its subsystems, details of standard and optional hardware components in each system, and basic site engineering. Refer to this manual to obtain a basic understanding of each type of system and its related hardware, to locate detailed information about hardware components used in a particular release, and to help configure a site for use with the system hardware.
- The *Hardware Manual - Tekelec 1000 Application Server* provides general specifications and a description of the Tekelec 1000 Application Server (T1000 AS). This manual also includes site preparation, environmental and

other requirements, procedures to physically install the T1000 AS, and troubleshooting and repair of Field Replaceable Units (FRUs).

- The *Hardware Manual - Tekelec 1100 Application Server* provides general specifications and a description of the Tekelec 1100 Application Server (T1000 AS). This manual also includes site preparation, environmental and other requirements, procedures to physically install the T1100 AS, and troubleshooting and repair of Field Replaceable Units (FRUs).
- The *Installation Manual* - EAGLE 5 ISS contains cabling requirements, schematics, and procedures for installing the EAGLE 5 ISS along with LEDs, Connectors, Cables, and Power Cords to Peripherals. Refer to this manual to install components or the complete systems.
- The *Installation Manual - Integrated Applications* provides the installation information for integrated applications such as EPAP 4.0 or earlier (Netra-based Multi-Purpose Server (MPS) platform) and Sentinel. The manual includes information about frame floors and shelves, LEDs, connectors, cables, and power cords to peripherals. Refer to this manual to install components or the complete systems.
- The *LNP Database Synchronization Manual - LSMS with* EAGLE 5 ISS describes how to keep the LNP databases at the LSMS and at the network element (the EAGLE 5 ISS is a network element) synchronized through the use of resynchronization, audits and reconciles, and bulk loads. This manual is contained in both the LSMS documentation set and in the EAGLE 5 ISS documentation set.
- The *LNP Feature Activation Guide* contains procedural information required to configure the EAGLE 5 ISS for the LNP feature and to implement these parts of the LNP feature on the EAGLE 5 ISS:
  - LNP services
  - LNP options
  - LNP subsystem application
  - Automatic call gapping
  - Triggerless LNP feature
  - Increasing the LRN and NPANXX Quantities on the EAGLE 5 ISS
  - Activating and Deactivating the LNP Short Message Service (SMS) feature
- The *Maintenance Manual* contains procedural information required for maintaining the EAGLE 5 ISS and the card removal and replacement procedures. The *Maintenance Manual* provides preventive and corrective maintenance procedures used in maintaining the different systems.

- The *Maintenance Pocket Guide* is an abridged version of the Maintenance Manual and contains all the corrective maintenance procedures used in maintaining the EAGLE 5 ISS.
- The *Maintenance Emergency Recovery Pocket Guide* is an abridged version of the Maintenance Manual and contains the corrective maintenance procedures for critical and major alarms generated on the EAGLE 5 ISS.
- The *MPS Platform Software and Maintenance Manual* - EAGLE 5 ISS *with Tekelec 1000 Application Server* describes the platform software for the Multi-Purpose Server (MPS) based on the Tekelec 1000 Application Server (T1000 AS) and describes how to perform preventive and corrective maintenance for the T1000 AS-based MPS. This manual should be used with the EPAP-based applications (EIR, G-Port, G-Flex, and INP).
- The *MPS Platform Software and Maintenance Manual* - EAGLE 5 ISS *with Tekelec 1100 Application Server* describes the platform software for the Multi-Purpose Server (MPS) based on the Tekelec 1100 Application Server (T1100 AS) and describes how to perform preventive and corrective maintenance for the T1100 AS-based MPS. This manual should be used with the ELAP-based application (LNP).
- The *Provisioning Database Interface Manual* defines the programming interface that populates the Provisioning Database (PDB) for the EAGLE 5 ISS features supported on the MPS/EPAP platform. The manual defines the provisioning messages, usage rules, and informational and error messages of the interface. The customer uses the PDBI interface information to write his own client application to communicate with the MPS/EPAP platform.
- The *Previously Released Features Manual* summarizes the features of previous EAGLE, EAGLE 5 ISS, and IP^7 Secure Gateway releases, and it identifies the release number of their introduction.
- The *Release Documentation* contains the following documents for a specific release of the system:
  - *Feature Notice* - Describes the features contained in the specified release. The Feature Notice also provides the hardware baseline for the specified release, describes the customer documentation set, provides information about customer training, and explains how to access the Customer Support website.
  - *Release Notice* - Describes the changes made to the system during the lifecycle of a release. The Release Notice includes Generic Program Loads (GPLs), a list of PRs resolved in a build, and all known PRs.

    NOTE: The *Release Notice* is maintained solely on Tekelec's Customer Support site to provide you with instant access to the most up-to-date release information.

  - *System Overview* - Provides high-level information on SS7, the IP7 Secure Gateway, system architecture, LNP, and EOAP.
  - *Master Glossary* - Contains an alphabetical listing of terms, acronyms, and abbreviations relevant to the system.
  - *Master Index* - Lists all index entries used throughout the documentation set.

- The *System Manual – EOAP* describes the Embedded Operations Support System Application Processor (EOAP) and provides the user with procedures on how to implement the EOAP, replace EOAP-related hardware, device testing, and basic troubleshooting information.

Table 2-1 provides a road map of the publications that contain information on Sentinel features, procedures, and components. The table arranges the documents in the following groups: general documents, software manuals, hardware/Integrated Applications Installation Manuals, and technical reference documents

Table 2-1. Sentinel Publications

Publication	Describes
General Documents	
Sentinel Feature Guide	Provides an overview of the Sentinel System and describes each feature, component, and application of the Sentinel System.
Feature Notice	Describes the features contained in the specified release.
Release Notice	Describes the changes made to the system for the specified release. Includes a report of known and resolved problem reports. The Release Notice also provides a list of run-time software licenses and instructions for accessing the Tekelec Web site.
Software Manuals	
Sentinel User's Manual	Provides procedural information intended for users who do not have administrative privileges to the monitoring functions of Sentinel. The following functions are covered: Base Sentinel Server functions, Protocol Analysis, Traffic Surveillance, Monitor Link Status, and Event Message Reports.
Sentinel System Administrator's Guide	Provides procedures for administering and provisioning the Sentinel system. The manual is divided into sections for Probed Sentinel, Probeless Sentinel, and common components. The manual is intended for system administrators.

Table 2-1. Sentinel Publications (Continued)

Publication	Describes
Data Collection Applications Manual	Provides an overview of the Call Detail Records/Transaction Data Records, Usage Measurement Data Feeds, the Mass Call Detection, and Loop Detection applications. Describes how to provision the above applications and how to generate the reports that the above applications provide.
Alarms Reference and User's Manual	Includes introductory and overview information, lists the various alarms generated by Sentinel, provides system administrator configuration information, contains detailed information about using the SAMS graphical user interface, and describes the optional Alarm Forwarding System.
Sentinel Hardware and Integrated Applications Installation Manuals	
Integrated Applications Installation Manual	Provides installation information for Sentinel.
Tekelec Signaling Products Hardware Manual	Describes each system and subsystem in the EAGLE 5 ISS network. Includes details of the standard and optional hardware components in each system; including Sentinel.
Tekelec 1000 Application Server Hardware Manual and Tekelec 1100 Application Server Hardware Manual	Provides general specifications and a description of the Tekelec 1000 or Tekelec 1100 Application Server. Both manuals includes site preparation, environmental and other requirements, procedures to physically install the servers, and troubleshooting and repair of Field Replaceable Units (FRUs). In Sentinel, the ESP and the Traffic Database Server can be hosted on the Teklec 1000 Application Server..
Signaling/Cellular Generic Hardware Reference	Describes the Basic Hardware Configuration (BHC)/SNAP shelf. The manual is intended for personnel who install or maintain the BHC.
i3000 Hardware Reference	Describes the i3000 hardware. The manual is intended for personnel who install or maintain the i3000 hardware.
Technical Reference Documents	
Data Collection Subsystem: Collection and Delivery	Provides an overview of the Sentinel Data Collection subsystem and its interface to the Service Application Platform.

Table 2-1. Sentinel Publications (Continued)

Publication	Describes
Sentinel Data Collection Subsystem: ANSI ISUP CDR Data Feed	Describes the interface of the ANSI ISUP Data Feed to the Service Application Platform. Also describes the format of the ANSI ISUP CDR data feed file.
Sentinel Data Collection Subsystem: ITU ISUP CDR Data Feed	Describes the interface of the ITU ISUP Data Feed to the Service Application Platform. Also describes the format of the ITU ISUP CDR data feed file.
Sentinel Data Collection Subsystem: LIDB TDR Data Feed	Describes the interface of the LIDB Data Feed to the Service Application Platform. Also describes the format of the LIDB TDRs data feed file.
Sentinel Data Collection Subsystem: Peg Counter Data Feed File Format	Describes the interface of the Peg Counter (Usage Measurement) Data Feed to the Service Application Platform. Also describes the format of Peg Counter data feed file.

Documentation Packaging, Delivery, and Updates

Each system provides a customer documentation set and is shipped to the sites specified by the customer. The number of documentation sets provided is in accordance with contractual agreements.

Customer documentation is updated whenever significant changes are made that affect system operation or configuration. Updates may be issued in the form of an addendum or a reissue of the relevant documentation.

The title page and the footer of each page show the document's date of publication, revision, and part number. This information is updated when a document is reissued.

Documentation Bulletins announce the release of new customer documentation or specific changes to customer documentation. The bulletins are posted on the Customer Secure web site and distributed via electronic mail to customers on the distribution list.

About this Product

Integrated Application Products

Integrated Application products use Commercial Off-The-Shelf (COTS) components configured in a Tekelec frame. Systems are configured at Tekelec for NEBS compliance and typically have redundant components for reliability and maintainability. Integrated Application systems support application-specific services that interact with the SS7 and IP networks.

Sentinel

The Integrated Sentinel™ system (probeless) with special provisioning procedures for EAGLE 5 ISS® requires at least one ESP node to transfer information to the Integrated Sentinel server for 32 links at a maximum of .8 Erlang (N+1=17 ESP nodes for a maximum 1500 monitored link system).

The Non-Integrated Sentinel™ system (probe) with special provisioning procedures for other Non EAGLE 5 ISS SS7 connections allows transfer information. Non - Integrated Sentinel system, probe = Non-EAGLE 5 ISS, customer supplied Signaling System # 7 (SS7) equipment + a combination of Flight Recorders and I2000 servers.

Sentinel is a complete network monitoring and diagnostic system that gives service providers total visibility of and access to their SS7 and Internet Protocol (IP) networks. Sentinel includes network surveillance capabilities and fault-management functions. Sentinel features a Call Detail Record (CDR) generation system that uses raw network traffic on the links to generate CDR data for use in various business intelligence applications. Sentinel can also work in conjunction with other monitoring systems and Expanded . The Sentinel is a factory-configured system in the heavy duty frame.

Regulatory Compliance and Certification

Tekelec products are tested to meet the following regulatory standards:

- Network Equipment Building System (NEBS) level 3 as listed in Telcordia SR-3580.
- Applicable Telcordia Electromagnetic Compatibility and Electrical Safety requirements in GR-1089-CORE.
- Applicable Physical Protection requirements in GR-63-CORE.
- Relevant directives and harmonized standards in support of the products Compliance European (CE) mark required in Europe. Figure 2-1 shows the mark used to indicate this compliance.

Figure 2-1. European Directives CE Mark

- Relevant standards in ElectroMagnetic Compatibility (EMC) directive 89/336/EEC.
- Relevant standards in Safety directive 73/23/EEC, supported by Certified Body (CB) Test Certificates US/5923/UL or US/5451/UL issued by the National Certification Body as tested to IEC 60950 with national differences for European countries
- Underwriters Laboratories (UL) listed under UL File E200146 for USA and c-UL for Canada. Figure 2-2 shows the mark used to indicate this compliance.

Figure 2-2. Combined UL Mark for the United States and Canada

- Relevent standards in SJ/T 11363-2006 for limits of certain hazardous substances.

Figure 2-3. Hazardous Substances

部件名称 (Parts)	有毒有害物质或元素 (Hazardous Substance)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr^{6+})	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
金属部件 (Metal Parts)	○	○	○	○	○	○
电路模块 (Circuit Modules)	×	○	○	○	○	○
电缆及电缆组件 (Cables & Cable Assemblies)	×	○	○	○	○	○
塑料和聚合物部件 (Plastic and Polymeric parts)	○	○	○	○	○	○

○：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/Txxxx-xxxx标准规定的限量要求以下。
Indicates that the concentration of the hazardous substance in all homogeneous materials in the parts is below the relevant threshold of the SJ/T 11363-2006 standard.

×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/Txxxx-xxxx标准规定的限量要求。
Indicates that the concentration of the hazardous substance of at least one of all homogeneous materials in the parts is above the relevant threshold of the SJ/T 11363-2006 standard.

Environmental Requirements

The environmental conditions for the system must be maintained to the following specifications.

Temperature Variation

Typical environmental conditions are temperature and humidity controlled. With loss of environmental control the equipment covered in this manual complies with these conditions:

- Operating: 5° C to 40° C (41° F to 104° F)
- Exceptional Operating Limit: -5° C to 50° C (23° F to 122° F) (no more than 96 hours duration at extremes and at elevations less than 1800m)
- Storage: -5° C to 50° C (23° F to 122° F)

Relative Humidity

- Operating: 5% to 85% non-condensing (maximum absolute humidity of 0.024 kg of water per kg of dry air)

- Short Term Operating: 5% to 90% non-condensing (maximum absolute humidity of 0.024 kg of water per kg of dry air)

Elevation

- Operating: 60m below sea level at ambient temperature of 30° C to +4000m above sea level at ambient temperature of 40° C.

Building Requirements

The building requirements are standard telephony industry requirements for equipment installation.

The building must provide a clear, uncluttered route between the loading/receiving dock and the planned location. In order to move the equipment to the proper location, recommend hall clearance is at least 4.5 feet, (1.4 meters) wide by 8 feet, (2.4. meters) tall.

Four feet, (1.2 meter) side aisles should be used to allow maneuvering frames into place and provide ample work space around the equipment.

Product Packaging and Delivery

DANGER: At least two people are required to safely move and position any frame.

Before opening any shipping container, inspect for evidence of damage during shipment. Report any damage to the carrier for investigation and possible claims. Also report any damage to the Tekelec site supervisor.

Check the packing slips against the equipment specification list for this installation site. Report any discrepancies to Tekelec Production Control at 1-888-673-4827, or if necessary, call 919-460-2150 inside the USA.

Inventory the shipment to make sure that all items listed on the pick list have been received in good condition. Report any discrepancies or damaged equipment by calling 1-888-673-4827.

TEKELEC

Attn: RMA Department

5200 Paramount Parkway

Morrisville, NC 27560

RMA#: <assigned by Tekelec>

Customer Care Center

The Customer Care Center offers a point of contact through which customers can receive support for problems that may be encountered during the use of Tekelec's products. The Customer Care Center is staffed with highly trained engineers to provide solutions to your technical questions and issues seven days a week, twenty-four hours a day. A variety of service programs are available through the Customer Care Center to maximize the performance of Tekelec products that meet and exceed customer needs.

Contact Information

To receive technical assistance, call the Customer Care Center at one of the following locations 24 hours a day, 7 days a week.

NOTE: For issues requiring emergency response, contact the Customer Care Center by phone only.

- Tekelec, USA

  Phone (US and Canada) +1 888-FOR-TKLC
  Phone (international) +1 919-460-2150
  Fax +1-919-460-0877
  Email: support@tekelec.com

- Tekelec, Europe and UK

  Phone +44 1784 467 804
  Fax +44 1784 477 120
  Email: ecsc@tekelec.com

Customer Service Request (CSR)

The Customer Care Center opens a Customer Service Request (CSR); and, along with the customer, determines the classification of the trouble.

Emergency Response

For critical problems, the Customer Care Center immediately initiates emergency response procedures such as immediate coverage, automatic escalation, and other features to ensure a rapid resolution to the problem.

Response

If the problem is not critical, the Customer Care Center records the serial number of the system, Common Language Location Identifier (CLLI), and initial problem symptoms and messages.

A primary Technical Support engineer is assigned to work the CSR and provide a solution to the problem. The CSR is closed when the problem has been resolved.

Problem Report (PR)

The assigned Technical Support engineer opens a problem report (PR) using problem criteria as defined in "TL-9000 Quality System Metrics (Book Two, Release 3.0" (Reference [1]) and shown next.

Critical

Critical problems severely affect service, capacity/traffic, billing, and maintenance capabilities and requires immediate corrective action, regardless of time of day or day of the week, as viewed by a customer upon discussion with the supplier. For example:

- A loss of service that is comparable to the total loss of effective functional capacity of an entire switching or transport system.
- A reduction in capacity or traffic handling capacity such that expected loads cannot be handled.
- Any loss of safety or emergency capability (for example, 911 calls).

Major

Major problems cause conditions that seriously affect system operations, maintenance, and administration, etc., and require immediate attention as viewed by the customer upon discussion with the supplier. The urgency is less than in a critical situations because of a lesser immediate or impending effect on system performance, customer, and the customer's operation and review. For example:

- Reduction in any capacity/traffic measurement function
- Any loss of functional visibility and/or diagnostic capability
- Short outage equivalent to system or subsystem outages, with accumulated duration of greater than two minutes in any 24-hour period, or that continue to repeat during longer periods
- Repeated degradation of DS1 or higher rate spans or connections
- Prevention of access for routine administrative activity
- Degradation of access for maintenance or recovery operations
- Degradation of the system's ability to provide any required critical or major trouble notification
- Any significant increase in product related customer trouble reports

- Billing error rates that exceed specifications
- Corruption of system or billing databases

Minor

Other problems that a customer does not view as critical or major are considered minor. Minor problems do not significantly impair the functioning of the system and do not significantly affect service to customers. These problems are tolerable during system use.

Engineering complaints are classified as minor unless otherwise negotiated between the customer and supplier.

Hardware Repair and Return

Any system components being returned for repair or replacement must be processed through the Tekelec Return Material Authorization (RMA) procedures. A hardware repair is defined as an item returned to Tekelec due to a failure, with the returned item being repaired and returned to the customer. It is essential that serial numbers are recorded correctly. RMAs cannot be created without a valid serial number. All repair and quality information is tracked by serial number. Table 2-1 lists the basic RMA types.

Table 2-1. Basic RMA Types

Replacement Type	Description	Turnaround
Priority Advance Replacement	Customer requests the URGENT replacement of a damaged product	Same Day Shipment
Advance Replacement	Customer request the replacement of a damaged product	Shipment Within 3 Business Days
Repair/Return	Customer will return a damaged product for repair	Shipment Within 5 Days After Receipt
Expendable	A damaged part, such as a cable, is replaced, but the Customer does not return the damaged product	Depends on Urgency - Shipment Within 3 Business Days

Table 2-2 lists the RMA return reasons.

Table 2-2. RMA Reasons for Return

Reason for Return	Description
Damaged by Environment	Product damaged by environmental phenomena such as water damage or earthquake
Damaged in Shipment	Damaged between shipment from Tekelec and receipt at the Customer's installation site.
DOA – Dead on Arrival	Product is not functional when it is first installed at the Customer's location.
Lab Return	Products returned from lab sites.
Product Capture	Defect to be captured by Quality or Engineering (not Product Recall).
Product Deficiency	Anything wrong with the part that doesn't fall into another category.
Product Recall	Products recalled by divisions for the repair of a defect or replacement of defective products.
Return – No Product Deficiency	Anything returned without the product being defective.

Repair and Return Shipping Instructions

All returned equipment, assemblies, or subassemblies must be shipped to the Tekelec Repair and Return Facility specified by the Technical Services engineer. The item being returned must be shipped in the original carton or in an equivalent container assuring proper static handling procedures and with the freight charges prepaid.

The assigned RMA number must be clearly printed on the "RMA#:" line of the shipping label on the outside of the shipping package. If the RMA number is not placed on the label, the return could be delayed.

Procedure — Request a Return of Material Authorization

1 Obtain and confirm the following information before contacting the Tekelec Customer Care Center:

- Your name:
- Company name:
- Call-back number:
- Email address:
- Which product you are calling about?
- Site location:
- CLLI number
- System serial number (NT, CE, LM, DS, etc…):
- Complete software release (e.g., 28.0.1-41.53.0):
- Upgrade forms
  WI005153
  WI005154
  WI005218
  WI005219
  WI005220
- Tekelec card type: (e.g., ILA, MPL, DSM, etc):
- Tekelec card part number (870-####-##):
- Associated serial number (102########):
- Reason for return or replacement (isolated from system):
- Full name of person the replacement card is being shipped to:
- Shipping address:

NOTE: If possible, include associated alarms (UAMs) and a copy of the associated output (capture file).

---

2 Contact the "*Customer Care Center*" on page 17 and request a Return of Material Authorization (RMA).

---

3 If the item is a like-for-like advance replacement, the Technical Services engineer arranges for shipment of the replacement item to the customer.

a Wait for the replacement component to arrive.

b Package the defective component in the box of materials you received with your replacement. Use proper static handling procedures.

c Label the outside and inside of the box with your RMA number clearly visible. Place the packing slip from the received replacements on the inside of your box.

d Ship the defective component to the return address listed on the packing slip.

---

4 If the item is a repair/return, the Technical Services engineer arranges for shipment of the replacement item to the customer.

a Package the defective component in a suitable package for shipping. Use proper static handling procedures.

b Label the outside and inside of the box with your RMA number clearly visible. Include a packing slip with all the information from Step 1 along with the RMA number.

c Ship the defective component to the following address:

TEKELEC

Attn: RMA Department

5200 Paramount Parkway

Morrisville, NC 27560

RMA#: <assigned by Tekelec>

d Wait for the repaired component to arrive.

Specifically Targeted PCBs

Manufacturing may be involved in the investigations. In certain unique circumstances the capture of an individual PCB, for evaluation, can be initiated through a customer request.

For any reason, the Director of Quality (QA), with input from other groups such as NSG Customer Service, Hardware Systems, Repair and Maintenance Support (RMS) or Manufacturing, can authorize a board type to be "captured" and sent to the North Carolina facility for evaluation and analysis. NSG QA receives the board(s), records board information such as part number, serial number, and problem description on the appropriate forms. Next, NSG sends the PCB to a Hardware Systems representative who initiates the design engineering evaluation. Once the evaluation and repair, if applicable, is complete, the results are documented and the PCB returned to NSG QA.

Returning a Crate

Use the following procedure to return a shipping crate and dollies to Tekelec.

Procedure — Preparing Crate and Dolly for Return to Tekelec

1. Replace the retaining brace.

2. Replace the shipping container front panel using the bolts saved previously and arrange the return shipment by contacting:

   Shipping Manager
   TEKELEC

   Attn: RMA Department

   5200 Paramount Parkway

   Morrisville, NC 27560

   RMA#: <assigned by Tekelec>

3. After the frame is positioned and the dollies are removed from the frame, the dollies are returned to the same address as the shipping container listed above.

   If the equipment is being immediately installed, ship the dollies back to Tekelec in the crate after use. After installing the equipment, bolt the dollies securely in the crate and return to Tekelec.

   OR

If the equipment is not being immediately installed, ship the dollies back to Tekelec in the box supplied with the crate. After unpacking the equipment, return the crate to Tekelec and retain the box to return the dollies. After installing the equipment, remove the dollies and return to Tekelec in the supplied box.

It is the site supervisor's responsibility to assure the crate and dollies are returned to Tekelec.

Post-Installation Inspection

This section describes a general system inspection. Check the site to insure the site and system are clean, complete, and connected securely. Check all items listed on the post-installation list.

Procedure — Inspect System After Installation

Verify the following:

1. All items listed in the Equipment Specification have been installed.

2. Shipping container is properly packed with ramp and frame dollies and shipped to Tekelec.

3. Cabling is neatly installed and the labels are correct and easily readable.

4. Power cabling does not run through a cable rack.

5. Power cabling is not to be routed together with any other cables and has at least six inches of clearance.

6. Racks have protective paper between the rack and any cables that would otherwise touch the rack.

7. The main central office ground cable is correctly labeled and is marked "TO and "FROM" with the "Do Not Remove" tag installed on both ends of the cable at the central office grounding bar.

8. The –48VDC power feeds are correctly labeled at the central office power distribution panel. There should be an A feed and a B feed for each breaker panel and Fuse and Alarm Panel (FAP).

9. Any –48VDC returns are correctly labeled.

10. Systems are neat, clean, and level.

11. Earthquake bracing, if any, is properly installed.

12. Adequate floor clearances have been maintained.

13. Panels are correctly installed.

14. All cable connections are checked to ensure a tight and complete connection.

15. Cable sheets are properly filled out.

16. All documentation has been received and is available.

17. Terminals and printers connected to the system are operational.

18. Data information has been received and is properly stored.

19. Any attached modems are operational.

20. Any attached Media Access Units (MAUs) are operational with power indicator on.

Acronyms

A	Ampere
ACL	Application Processor Code Loader
ACM	Applications Communications Module
AIN	Advanced Intelligent Networks
AINF	Application Interface Applique
ANSI	American National Standards Institute.
AP	Application Processor
APD	Application Processor DCM bootstrap code
API	Application Interface
ASM	Application Services Module
ATM	Asynchronous Transfer Mode
BITS	Building Integrated Timing System
BM	Buss Master (Cognitronics)
BOM	Bill Of Materials
BP	Board Prom
BPDCM	Board Prom DCM
Bps	Bit per second
CAIN	Carrier Advanced Intelligent Network
C&C	Configuration and Control
CAP	Communication & Application Processor
CAR	Corrective Action Report
CE CISPR A	Compliance European, Comite Internationale Special des Perturbations Radioelectrique (European Compliance, International Special Committee on Radio Interference, Class A)
CDU	CAP Downloadable Utility
CF	Control Frame
CLLI	Common Language Location Identifier
CI	Clock Interface Card
CNAM	Calling Name Delivery Service

COTS ..... Commercial Off-the-Shelf

CP ..... Communications Processor

cPCI ..... compact *International Telecommunications Union* International Point Code

CSR ..... Customer Service Request

D1G ..... Database Communication 1 Gigabyte Expansion Memory Module

DB ..... Database

DCM ..... Database Communications Module

DIAG ..... Diagnostics

DGS ..... Data Gateway Server

DMS ..... Disk Management Service

DRAM ..... Dynamic Random Access Memory

DS0 ..... Digital Signal Level-0 (64 Kbits/sec)

DS1 ..... Digital Signal Level-1 (1.544Mbits/sec)

DSM ..... Database Services Module

E1 ..... European Digital Signal Level-1 (2.048 Mbits/sec).

EBI ..... Extended Bus Interface

EDCM ..... Enhanced Database Communications Module

EF ..... Extension Frame

ELAP ..... EAGLE 5 ISS *Local Network Portability* Application Processor

EILA ..... Enhanced Integrated LIM Applique

EMAP ..... EAGLE 5 ISS Measurement Application Processor

EMM ..... Extended Memory Management

EPAP ..... EAGLE 5 ISS Provisioning Application Processor

EOAM ..... Enhanced OAM GPL

EOAP ..... Embedded Operation Support System Applications Processor

ESP ..... Expanded Services Platform

FAP ..... Fuse and Alarm Panel

GLS ..... Generic Loader Services

GPL .....Generic Program Load

GPLM .....GPL Management

GPSM-II.....General Purpose Service Module

GTT .....Global Title Translation

GWS.....GTT Gateway Screening

HCAP .....High-Speed Communications and Applications Processor

HMI.....Human-Machine

HCMIM.....High Capacity Multi-Channel Interface Module

HDLC .....High-Level Data Link Control

HIPR .....High-speed IMT Packet Router

HMUX .....High-speed Multiplexer

IAD.....Integrated Access Device

ICM .....IMT configuration manager task

ILA .....Integrated LIM Appliques

ILDR.....IMT loader task

IMT .....Inter-processor Message Transport

IMTC.....IMT Control task

IP .....Internet Protocol

IP^7.....Tekelec's Internet Protocol to SS7 Interface

IPD .....IMT Processor DCM operational code

IPMX.....IMT Power and Multiplexer card

ISDN .....Integrated Services Digital Network.

IS-NR .....In Service – Normal

ISR.....Interrupt Service Routine

ITU ..... International Telecommunications Union

Kb.....Kilobit

KB.....Kilobyte

KHz.....Kilo Hertz (1000 Hertz)

LAN .....Local Area Network.

LFS..... Link Fault Sectionalization

LIM..... Link Interface Module

LNP ..... Local Number Portability

LIM-AINF..... A LIM with a software-selectable interface

LSMS ..... Local Service Management System

M256..... 256 Megabyte Memory Expansion Card

MAS..... Maintenance and Administration Subsystem

MASP ..... Maintenance and Administration Subsystem Processor

MAU..... Media Access Unit

MBUS ..... Maintenance Bus

MCA..... Matrix Controller Assembly

MCAP ..... Maintenance Communications & Applications Processor

MDAL ..... Maintenance Disk and Alarm Card

MF..... Miscellaneous Frame

MEAS ..... Measurements

MG..... Media Gateway

MGC..... Media Gateway Controller

MGCP ..... Media Gateway Controller Protocol

MIB ..... Maintenance Information Base utility

MIM..... Multi-Channel Interface Module

MMI..... Machine-Machine Interfaces

MPL..... Multi-Port Link interface module

MPS ..... Multi-Purpose Sever

MSU..... (SS7) Message Signalling Unit

MTOS ..... Multi-Tasking Operating System, Industrial Programming Inc.

NEBS ..... Network Equipment Building System

NSD ..... Tekelec's Network Systems Division

NTP ..... Network Time Protocol

OAM.....Operations, Administration, and Maintenance

OA&M.....Operations, Administration, and Maintenance

OAP .....Operations System Support/Applications Processor

OAPF .....Operations System Support/Applications Processor Frame

OCU .....Office Channel Unit

OEM.....Original Equipment Manufacturer

OOS.....Out of Service

OOS-MT-DSBLD.....Out of Service-Maintenance Disabled

OSS.....Operations Support System

OS.....Operations System

PMTC.....Peripheral Maintenance task

PROT .....Protocol

PSTN.....Public Switched Telephone Network

RAM.....Random Access Memory

RMA.....Return Material Authorization

SCP.....Service Control Point (SS7 Network)

SCCP .....Signal Connection Control Part

SCM .....System Configuration Manager

SCN.....Switched Circuit Network

SCSI.....Small Computer Systems Interface

SEAC.....Signaling Engineering and Administration Center

SEAS .....Signaling Engineering and Administration System

SG.....Secure Gateway

SIP .....Session Initiation Protocol

SS7.....Signaling System Seven

SSP .....Service Switching Point (SS7 Network)

STC.....Signaling Transport Cards

STP .....Signal Transfer Point (SS7 Network)

STPLAN .....Signaling Transfer Point Local Area Network

SURV	Surveillance
T1	The North American telecommunications standard defining a circuit that multiplexes and switches 24 channels and operates at speeds of 1.544 Mbps
TAS	Tone and Announcement Server
TBS	To Be Specified
TCU	Table Creation Utility
TCP	Transport Control Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
TDM	Terminal Disk Module
TDS	Traffic Database Server
TEKOS	Tekelec Operating System
TOCA	Timing Output Composite Automatic
TOS486	Tekos Operating System for the 486
TOS4M	Tekos Operating System for the 486 implemented via MTOS
TSC	Time Slot Counter
TSM	Translation Services Module
UAM	Unsolicited Alarm Output
UI	User Interface
UIM	Unsolicited Information Messages
UD1G	Upgraded Database Communication 1 Gigabyte Expansion Memory Module
V.35	ITU Interface Recommendation, V.35
VPN	Virtual Private Network
WAN	Wide Area Network
XLX	Xilinx

3

Sentinel System Components

Introduction

This chapter describes the installation, positioning, and procedures for Sentinel™ Netra-based server components.

> **NOTE: For information on Tekelec 1000-based Sentinel components that have become available beginning with Sentinel 11.x, including interconnect diagrams, cable lists, and installation instructions, see the Tekelec *1000 Application Server Hardware Manual*.**

Sentinel can be deployed integrated with the EAGLE 5 ISS® system or in a non-integrated configuration with probes. The Integrated Sentinel monitors EAGLE 5 ISS links internally to eliminate hardware connections such as cabling, bridge amplifiers, and patch panels. The Integrated Sentinel can receive all acknowledged message signal units (MSU) as well as other important information from the EAGLE 5 ISS.

The non-integrated Sentinel product provides external monitoring of SS7 links without direct connection to an EAGLE 5 ISS. In the non-integrated Sentinel, SS7 traffic is processed by a series of processes collectively referred to as a Sentinel Site Collector. A Sentinel Site Collector System consists of user workstations, the EAGLE 5 ISS Shelves, Signaling Transfer Points (STPs) or other SS7 Network Equipment and a Site Collector Frame.

Table 3-1. Frame and Server Naming Conventions

Acronym	Name	Equipment
SPF	Sentinel Processor Frame	Frame plus provisioned hardware
ESP	Expanded	
ESPS	Expanded Server	Sun Netra™ 120 or Server model 120
FR	Flight Recorder (for probed Sentinel)	

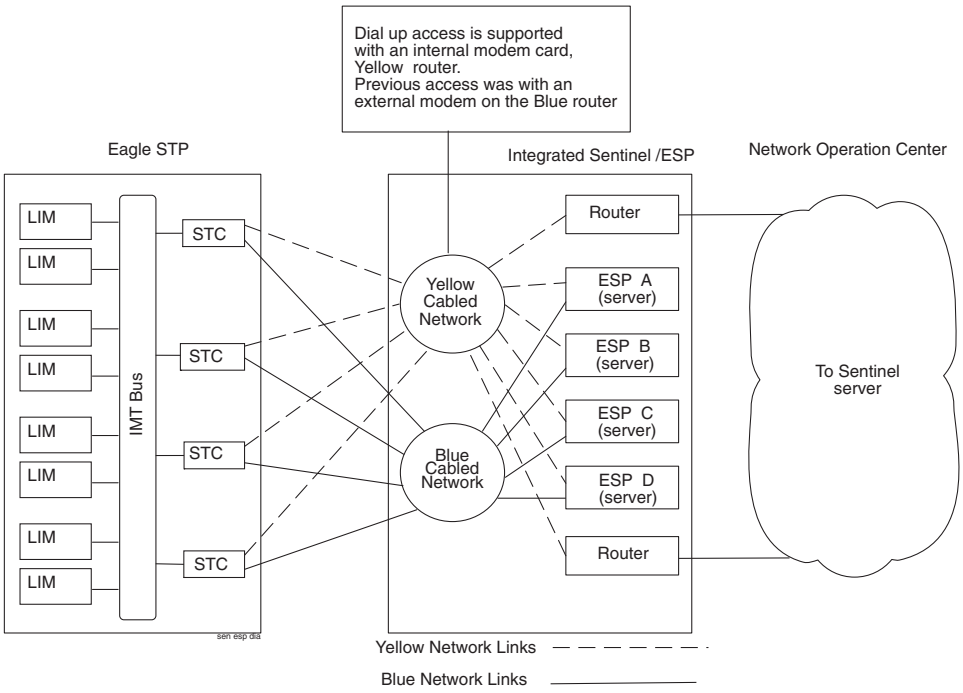
Table 3-2. Sentinel Server Frame Naming Conventions

Acronym	Name	Equipment
SSF	Sentinel Server Frame	Frame plus Sun Netra™ 20
BSS	Base Sentinel Server	Sun Netra™ 20 or Server model 20
SAMS	Sentinel Alarm Management System	
DGS	Data Gateway Server (optional)	
TS	Traffic Server (optional)	

Installing Integrated Sentinel Hardware

Integrated Sentinel consists of user workstations, the EAGLE 5 ISS shelves, STC cards in the EAGLE 5 ISS shelves, Expanded (ESP), and other SS7 network equipment.

Figure 3-1. EAGLE 5 ISS and Integrated Sentinel Diagram



Expanded

The Integrated Sentinel probeless system contains the Expanded (ESP). The ESP is the Sentinel system with the hardware and software platform that provides the interface to the Integrated EAGLE 5 ISS and Sentinel monitoring system.

NOTE: Prior to Sentinel 11.0, the ESP hardware and software platform runs on the model 120 server. Starting with Sentinel 11.2, the ESP is hosted on Tekelec's Tekelec 1000 Application Server. For installation information on Sentinel 11.0 and later ESPs, see the Tekelec *1000 Application Server Hardware Manual*.

All Netra-based ESP servers located at one EAGLE 5 ISS location are ESP subsystems. Up to 17 (16 active plus one standby for N+1 redundancy) ESP servers are installed in one frame. The Sentinel ESP subsystem consists of a minimum of two ESP servers in the initial frame. The first server, designated 1A, services 32 EAGLE 5 ISS links and the second server, designated 1B, provides redundancy. An additional server is added for each 32 links monitored to a maximum of 17 servers per frame, 3 frames (1500 links). Each ESP server is considered a separate processing element with respect to communications to the downstream Sentinel servers and therefore requires its own IP address. A single demarcation point is provided for the Customer's network at the ESP frame's router.

Additional hardware is required to make a fully functional system. An ESP subassembly frame with maximum configuration contains:

- 2 Breaker Panels
- 1 Break-Out Box
- 4 Ethernet Network Switches
- 2 Isolation Routers
- 1 Modem Card router A, yellow router.
- 2 Model 120 Servers, ESP Servers (N+1 configuration)
- 15 Expansion Model 120 Servers, ESP Servers
- Sun Blade Workstation

Figure 3-2. Integrated Sentinel Frames

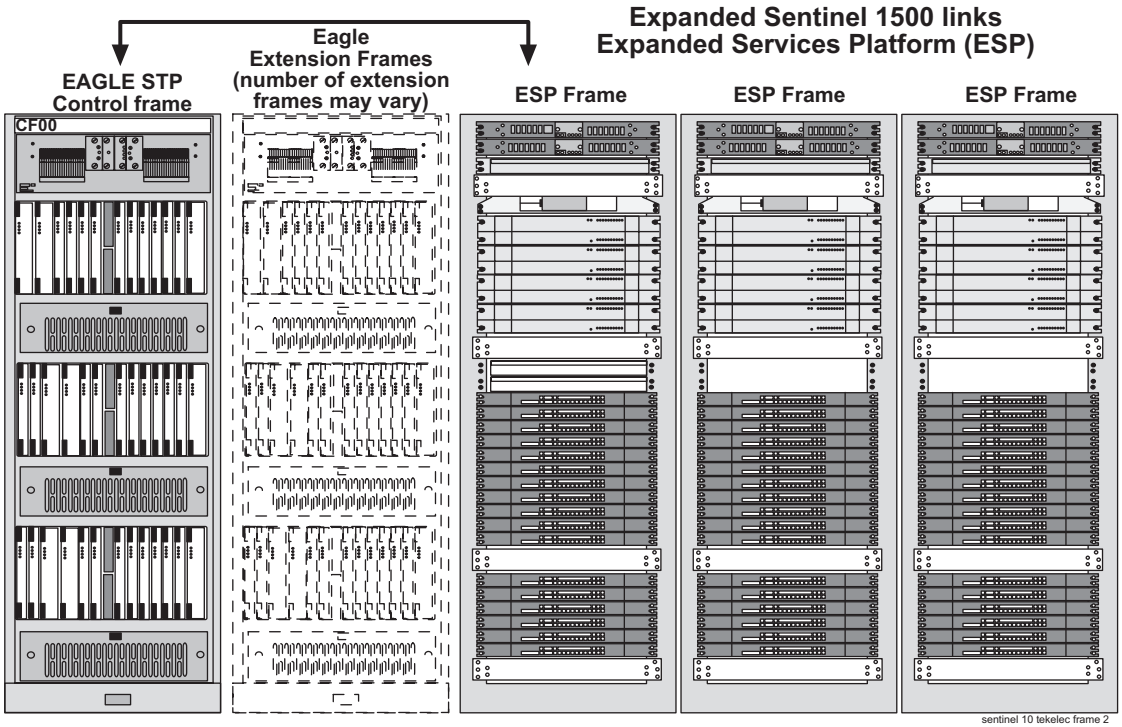


Figure 3-3 shows a maximum configuration front view of the Sentinel Processor Frame (SPF-00). 00 refers to the first Sentinel frame. Frame installation procedures are described in the *Tekelec 1000 Application Server Hardware Manual*.

Figure 3-3. Netra-based ESP Maximum Configuration

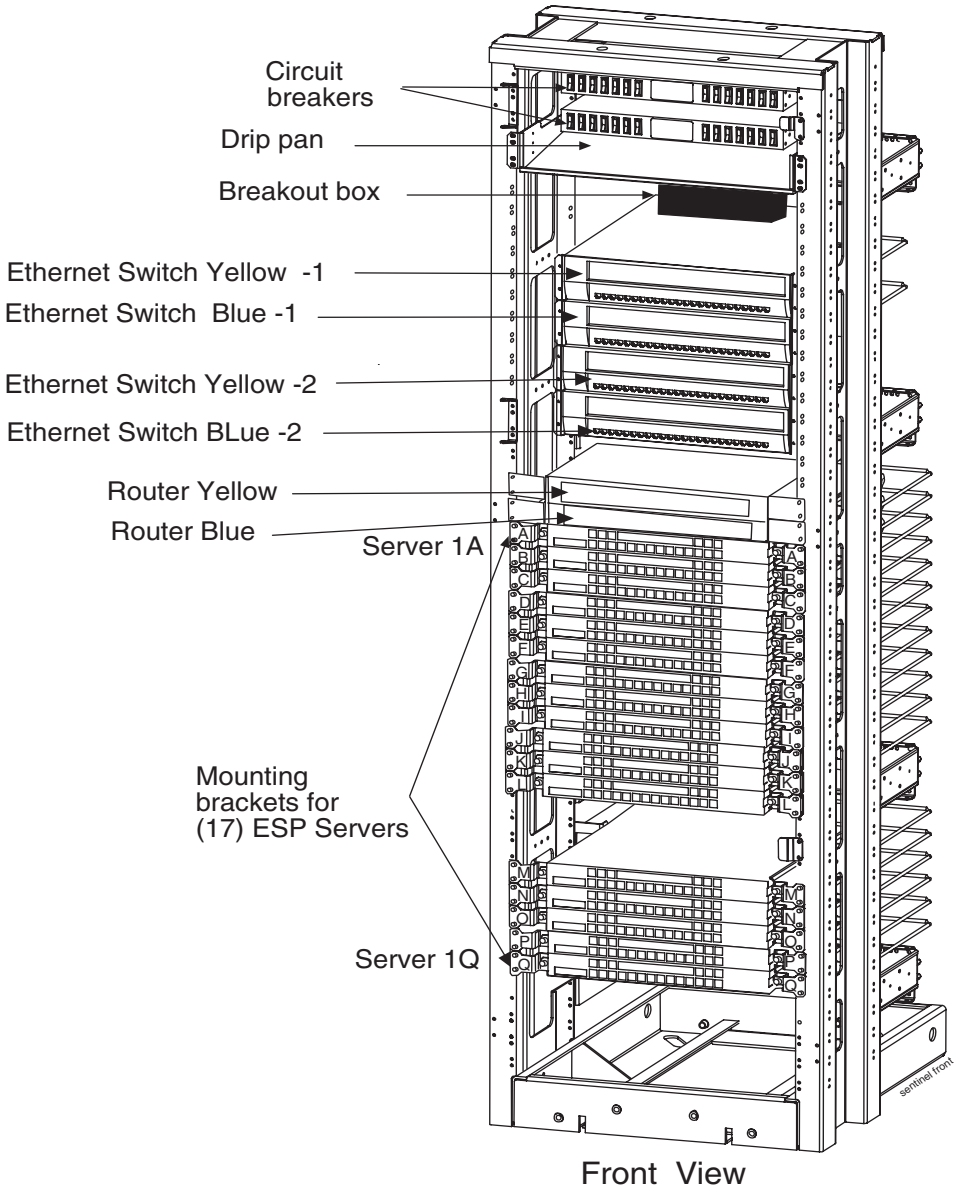
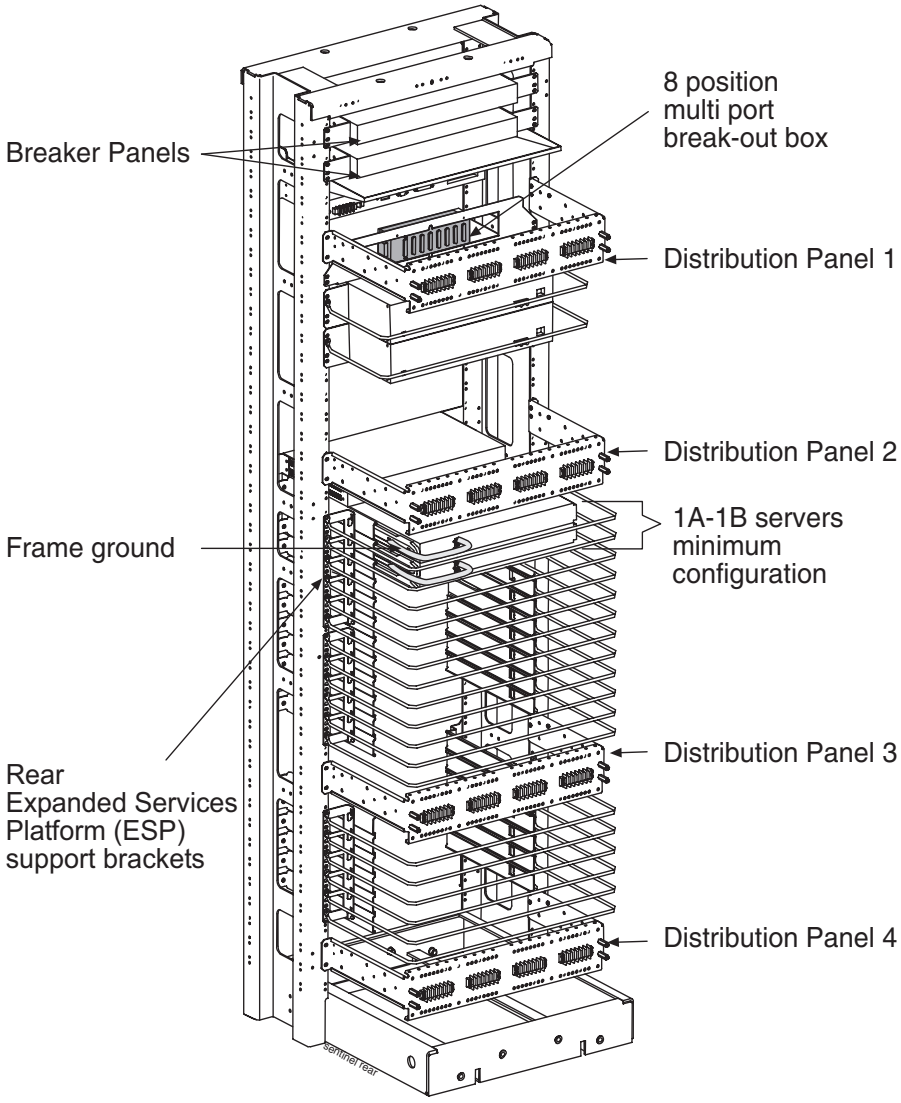


Figure 3-4. Netra-based ESP Minimum Configuration Rear



ESP Integrated Sentinel Rear View
(minimum configuration)

Breaker Panels

NOTE: Breaker Panels are the breaker panels in frames that support Sentinel products. See the information and the illustrations beginning with Figure 3-5, on page 3-10. These pages are referenced when breaker panels are referred to. Individual breaker panels are labeled on the finger guard over the breaker with associated information.

The following section describes the components of the Breaker Panels (BP) used in Integrated Sentinel prior to Sentinel 11.2. The BPs provide the following features:

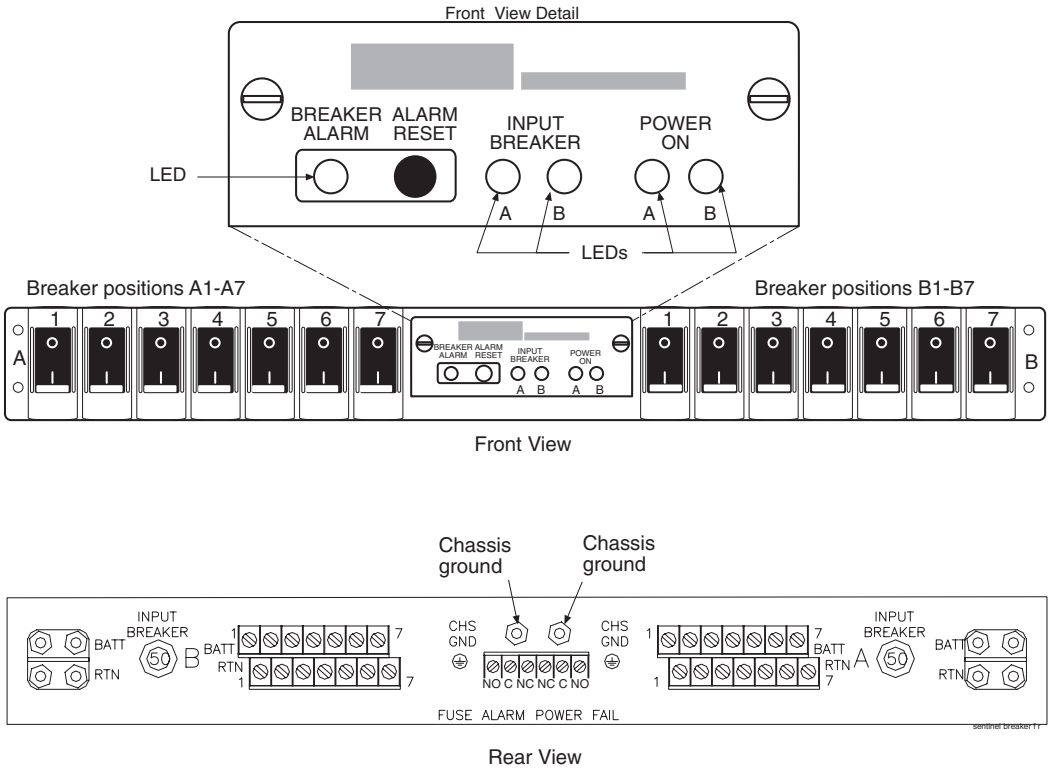
- Dual-feed power inputs (Input A and Input B) to each of 4 Power Distribution Panels (PDPs) and 2 BPs for the system. 40-amp domestic or 32-amp international/fuse/breaker supplied by the Power Distribution Center.
- Maximum of fourteen breakers for each breaker panel
- Breaker panels accept circuit breakers up to 20 ampere rating
- Visual A and B input power alarms with single remote dry contact indicator
- Replaceable alarm card

NOTE: The drip tray, located under the breaker panels, is designed to assure compliance with NEBS, UL, and CE safety requirements, aiding damage control in the event of a fire.

Figure 3-5 shows the details of the front and rear view of the breaker panel, and Figure 3-19 shows the details of the cabling of the breaker panels for the Sentinel ESP frame.

NOTE: If all breakers are not turned on, the alarm Light Emitting Diode (LED) lights. To turn off the alarm LED, press RESET. The alarm LED resets and turns off.

Figure 3-5. Breaker Panel Front and Rear



NOTE: When breakers trip to the half-way position as a result of an overload, they must be switched completely OFF, then ON to reset.

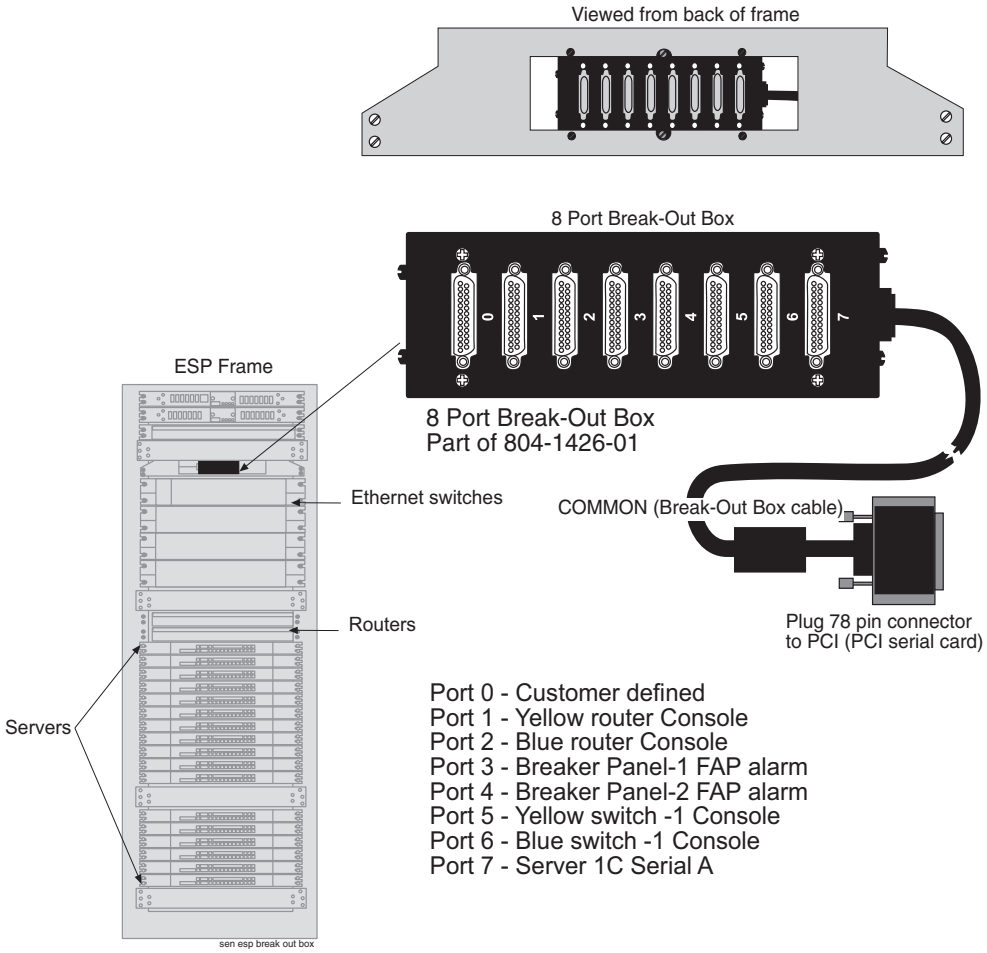
Table 3-3. Breaker Panel LEDs

LED	Color	Description
Power On A	Green	Lights whenever Side A is receiving input power. LED remains lit even if the input breaker has tripped.
Power On B	Green	Lights whenever Side B is receiving input power. LED remains lit even if the input breaker has tripped.
Breaker Alarm	Red	Lights whenever an output circuit breaker has tripped or turned off.
Input Breaker A/B	Green	Lights whenever Side A/B is receiving input power, not on if the input breaker is tripped.

Break-Out Box

The high performance Peripheral Component Interconnect (PCI)/Serial Asynchronous Interface connection I/O is through an 8 port break-out box. The ESP Integrated Sentinel frame contains a break-out box located above Yellow switch 1 and below the drip pan. See Figure 3-6 on page 3-11

Figure 3-6. Break-Out Box



Ethernet Switches

The following section provides an overview of the Ethernet Local Area Network (LAN) switches used in an ESP subassembly. The Ethernet switches cross-connect all the components in the ESP, functioning as an internal LAN. The switches support 24 auto-sensing 10/100Base-T ports each. See Figure 3-7 for switch information for maximum configuration with 17 servers. These Ethernet switches are switches in frames that support Sentinel products. See the information and the illustrations beginning with Figure 3-7, on page 3-12.

Figure 3-7. Ethernet Switches Maximum Configuration

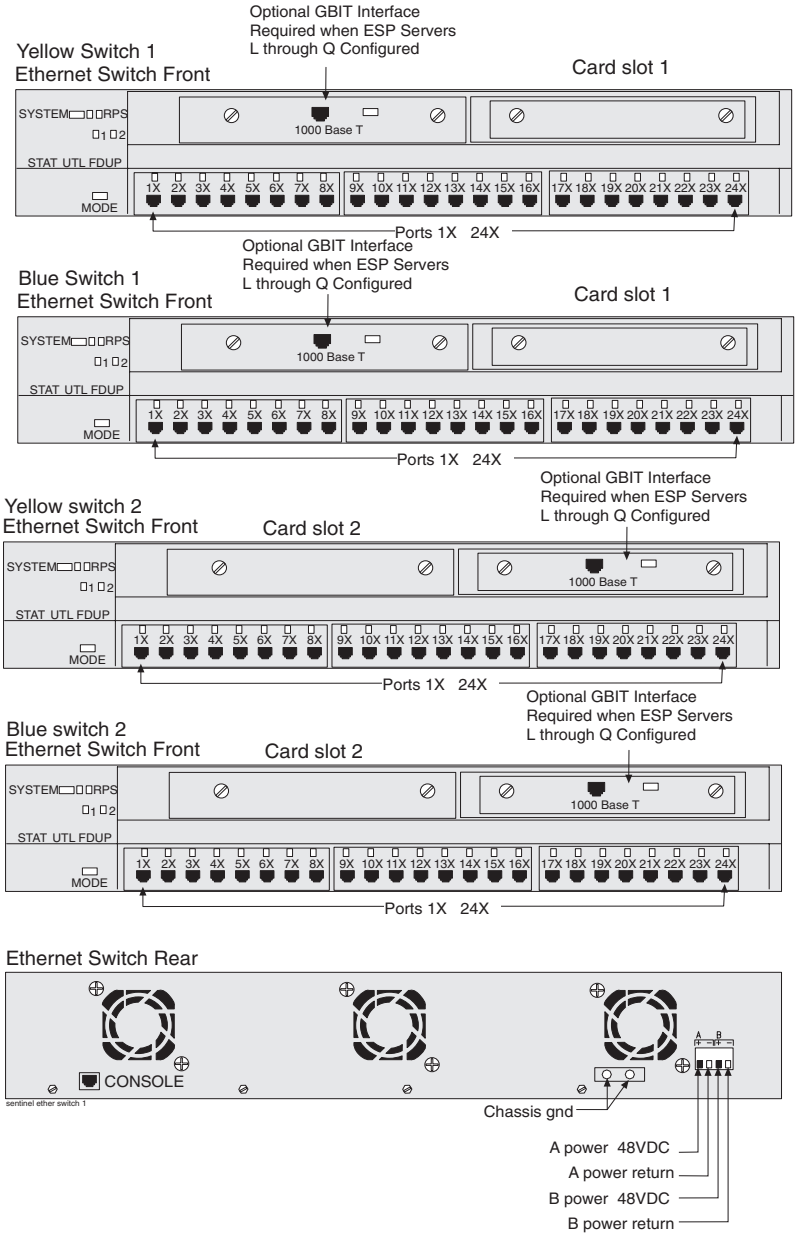


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Table 3-4. Ethernet Switch LEDs

LED	Description
System	Green-Indicates when power is present to the switch and the power switch is in the ON position. Amber-Indicates power is present but the system is not functioning properly.
1 and 2	Indicates expansion boards WS-X2932-XL are installed and functioning. LED 1 (Left board) LED 2 (Right board)
RPS (Always OFF)	OFF when the redundant power supply is not present. ON redundant power supply is present and functional.
Pressing the MODE switch on the front of the WS-C2924-XL-EN changes the per-port LED indications to the following.	
STAT (port status) Default	Off-No link. Solid green, Link present. Flashing green, Activity. Port is transmitting or receiving data. Alternating green/amber, Link fault. Error frames can affect connectivity, and errors such as excessive collisions, Cyclic Redundancy Check (CRC) errors, and alignment and jabber errors are monitored for a link-fault indication. Solid amber, Port is not forwarding. Port was disabled by management or an address violation or was blocked by Spanning Tree Protocol (STP). **NOTE: After a port is reconfigured, the port LED can remain amber for up to 30 seconds as STP checks the switch for possible loops.**
UTL (utilization)	Green The LEDs display backplane utilization on a logarithmic scuffle all port LEDs are green, the switch is using 50 percent or more of its total bandwidth capacity. If the right-most LED is amber, the switch is using less than 50 percent of its total bandwidth. If the LED to the left of the right-most LED is amber, the switch is using less than 25 percent of its total capacity, and so on.
FDUP (port full-duplex)	Off Port is operating in half duplex. Green Port is operating in full duplex.
100 (port speed)	Off Port is operating at 10 Mbps. Green Port is operating at 100 Mbps.

Installation of Ethernet Switches

Figure 3-8. Ethernet Switches

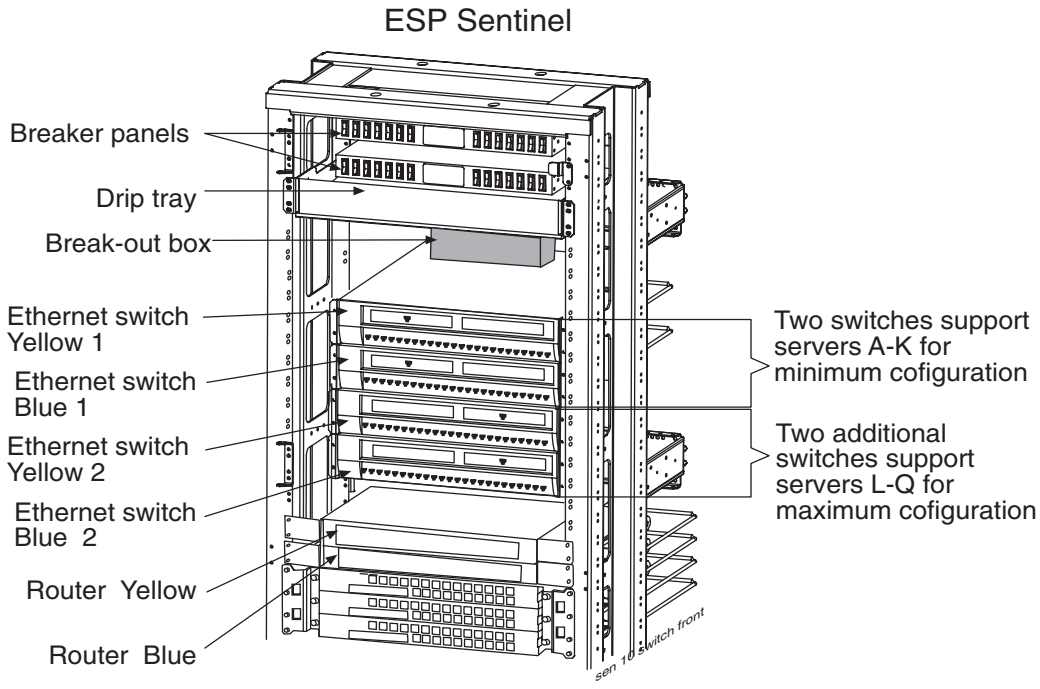


Figure 3-9. Ethernet Switches Assembly

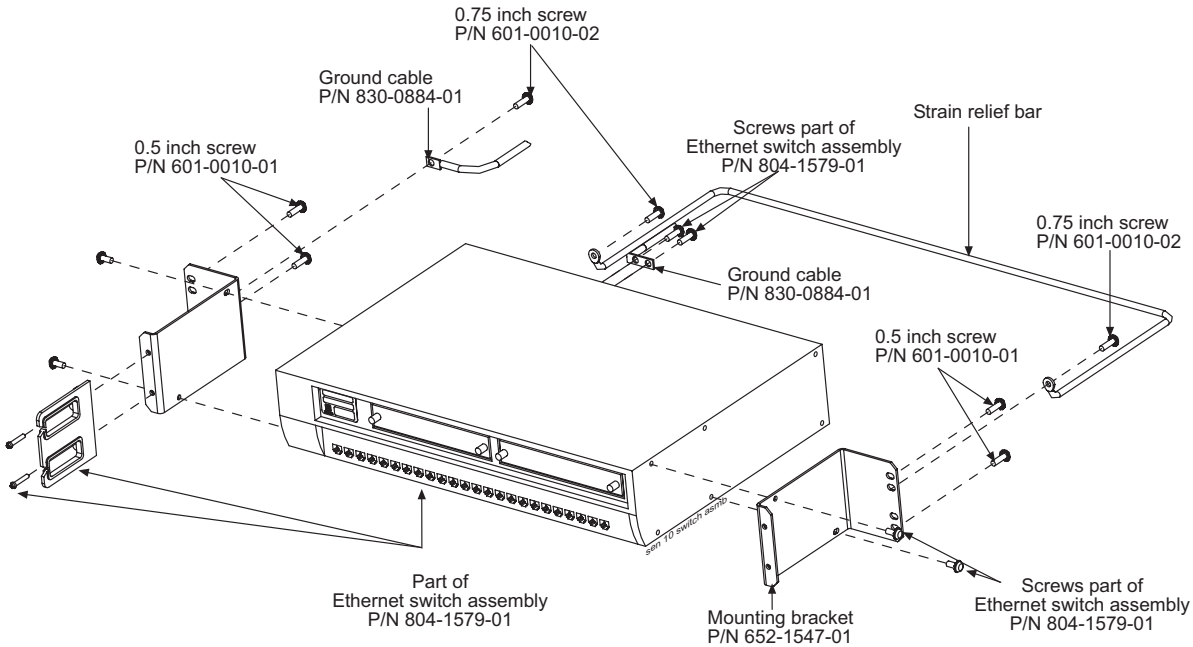


Table 3-5. Tools and Equipment

Check	Tools and Equipment
	Safety glasses
	Tie wraps
	Lacing cord
	Flushcutter (to cut cable ties)
	Diagonal cutters
	#2 Phillips screwdriver
	#3 Phillips screwdriver
	Slotted screwdriver 1/8 inch blade, 8-inch shank, preferred
	Wrench set (1/4 inch or 3/8 inch drive or open-end wrenches)
	Crimper

Procedure — Installing Switches

1. Inventory equipment to ensure that Ethernet switches assembly P/N 804-1579-01 and related equipment including cables are on site.

2. Secure the mounting brackets (P/N 652-1547-01) to both switches. There are two screws (P/N 600-0258-01) per bracket.

3. If applicable remove the cable strain relief bars below the switches.

4. Mount the Yellow Switch 2 directly below Blue Switch 1, using mounting positions 63-66. Mounting positions are counted from the bottom of the frame.

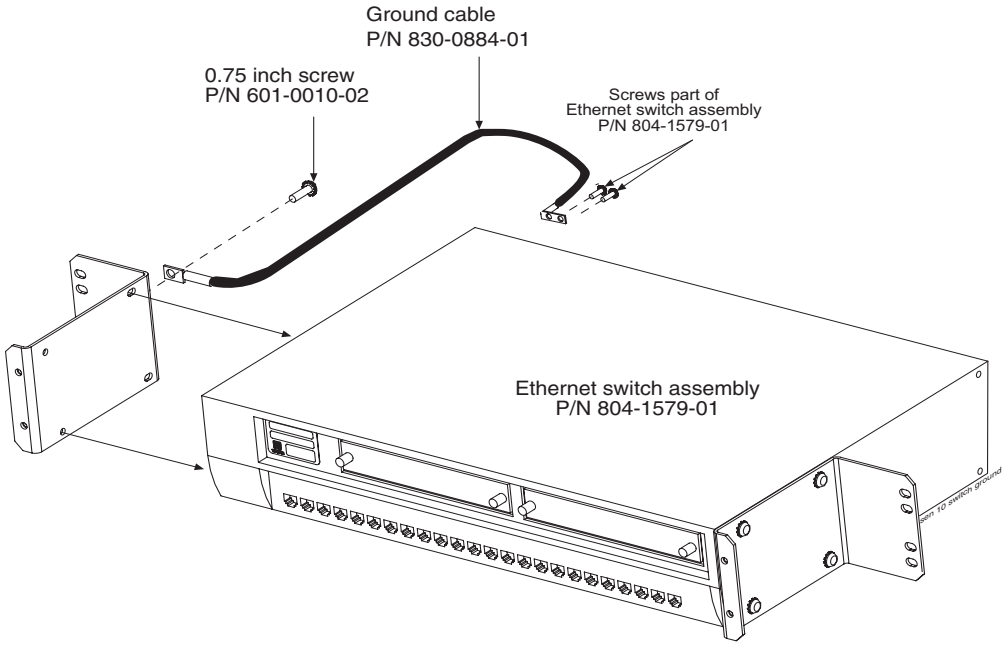
5. Holding the switch in place start the shorter of the available screws, 0.5 inch (P/N 601-0010-01) into the top hole of the mounting bracket on either side of the switch.

6. The strain relief bar mounting holes should be **above** the bar.
   With one of the strain relief bars (P/N 652-1437-04) that was removed earlier, place the strain relief bar mounting hole over the second mounting hole from the top on the switch bracket. Insert and twist a 0.75 inch (P/N 601-0010-02) screw into the mounting hole on the strain relief bar, through the hole on the switch bracket, and into the frame.
   On the other side, of the rear, of the switch, place the strain relief bar mounting hole over the second hole from the top of the switch mounting bracket. Insert a 0.75 inch (P/N 601-0010-02) screw into the strain relief bar mounting hole, through the mounting hole on the bracket, and into the frame. Torque both screws, one on either rear side of the switch, to 35 inch-pounds.
   The strain relief bar should be straight across the rear of the switch.

7. Remove the two screws, lower right side, below the fan exhaust, on the back of the switch for the chassis ground. Attach the ground cable (P/N 830-0823-03) with a two hole lug to the switch ground.

8. The ground strap is terminated in the third hole from the top of the mounting bracket on the right, rear, of the switch. With a 0.75 inch (P/N 601-0010-02) screw terminate the ground strap to the frame.

Figure 3-10. Ethernet Switches Ground Strap



9. On the **left** side, rear, of the switch, in the third and fourth holes of the bracket start a 0.5 inch (P/N 601-0010-01) screw.
On the **right** side, rear, of the switch, in the fourth hole of the bracket start a 0.5 inch (P/N 601-0010-01) screw. When the screws are securely in place Torque the screws to 35 inch-pounds.

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10. Mount the Blue Switch 2 directly below the Yellow Switch 2, in mounting positions 59-62. Again, mounting positions are counted from the bottom of the frame.

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11. Holding the switch in place start the shorter of the available screws 0.5 inch (P/N 601-0010-01) in to the third hole of the mounting bracket on either side of the switch. The reason for placing the screw in the third hole first, is because the cable strain relief bar mounting lugs will mount in both the top and second mounting holes on this switch bracket.
The strain relief bar should be straight across the rear of the switch.

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12. These strain relief bar mounting holes should be **below** the bar.
Place the cable strain relief bar (P/N 652-1437-04) mounting hole over the second mounting hole from the top on the switch bracket. Insert and twist a 0.75 inch (P/N 601-0010-02) screw into the mounting hole on the strain relief bar, through the hole on the switch bracket, and into the frame.
On the other side of the rear of the switch place the strain relief bar mounting hole over the second hole from the top of the switch mounting bracket. Insert a 0.75 inch (P/N 601-0010-02) screw into the strain relief bar mounting hole, through the mounting hole on the bracket, and into the frame. Torque both screws one on either rear side of the switch to 35-inch-pounds.
The strain relief bar should be straight across the rear of the switch.

---

13. On Blue Switch 2 remove the two screws, rear, lower right side, below the fan exhaust, on the back of the switch for the chassis ground. Attach the ground cable (P/N 830-0823-03) with a two hole lug, to the switch ground.

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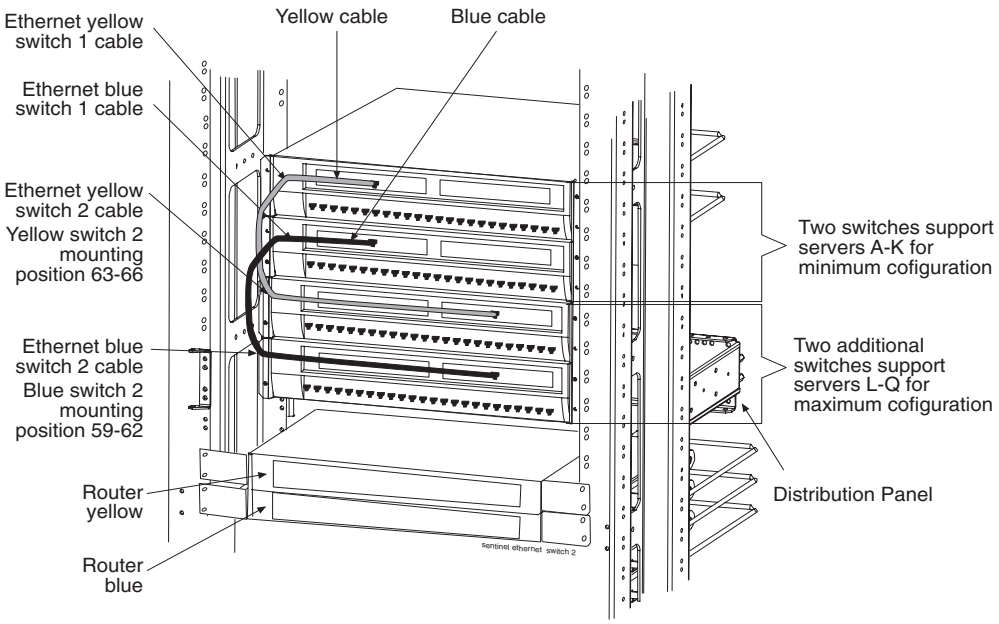
14. On this switch the mounting screw in the third hole will be removed to terminate the ground strap. The ground strap is terminated in the third hole from the top of the mounting bracket on the right, rear, of the switch. With a 0.75 inch (P/N 601-0010-02) screw terminate the ground strap to the frame.

Figure 3-11. Ethernet Switches Connections



Routers

This section provides descriptions and installation instructions for Sentinel routers. These Routers (P/N 870-2249-06 or P/N 870-2711-02) are the routers used in frames that support Sentinel products. See the information and the illustrations beginning with Figure 3-12, on page 3-19.

The isolation routers provide 10/100Base-T LAN communications between the customer LAN or dedicated network. Figure 3-12 shows the front and rear views of the router. Table 3-6 describes the LED indicator functions on the front and rear of the router.

Figure 3-12. Sentinel Router Front and Rear

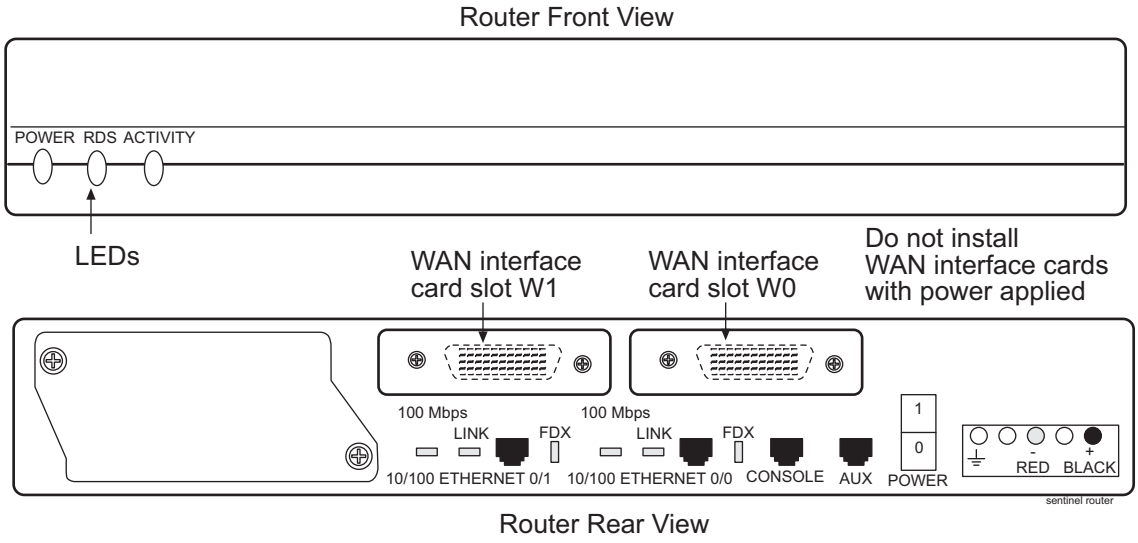


Table 3-6. Router LEDs

LED	**Description Front**
POWER	Indicates connection and power
RDS	Ready Data Set
ACTIVITY	Blink-indicates data activity on the link
LED	**Description Rear**
LNK	Indicates link is established to far end connection.
ACT	Blink-indicates data activity on the link.

Servers Model 120

This section describes the parts of the Netra-based ESP server nodes. An ESP server can monitor a maximum of 32 SS7 links. ESP server nodes are populated in an N + 1 configuration for redundancy to a maximum of 17 in an ESP subassembly frame. ESP server nodes are rack mounted in heavy-duty frames.

The ESP server node is a one-processor device and has no frame buffer, audio capability, mouse port, or keyboard port. The console ports and Ethernet ports are the primary interfaces of model 120 server.

The server node provides the following:

- High performance processor.
- Modular internal design.
- High performance disk, system, memory and I/O subsystems.
- High performance Peripheral Component Interconnect (PCI)/Serial Asynchronous Interface connection I/O (8 port break-out box).
- Redundant hot swap power supply units.
- Powered by redundant –48VDC supplies.

Server Model 120 Features

The server primary board contains the Central Processing Unit (CPU) module, memory, system control Application-Specific Integrated Circuits (ASICs) and I/O ASICs.

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Table 3-7. System Specifications

Server Node Specifications	
Dimensions and Weight Height Width Depth Weight (unpackaged but fully configured)	 44.0 mm (1.73 in.) 437.2 mm (17.21 in.) 487.4 mm (19.19 in.) 10kg (22 lbs.)
CPU Processor type Clock rate CPUs provided Cache on module	 UltraSPARC-II 650 MHz One Processors (NEBS level 3 compliant) 256 Kbyte Internal
Memory Size Memory type	 4 GB maximum PC133 standard Registered DIMMs
Storage (Internal) Bus Disks CD-ROM	 66 MB/second UltraSCSI Two 3.5x1-in. disks (36GB); disk bays are front accessible and support hot-plug 644 MB Slim line CD-ROM drive; 24X speed or DVD-ROM
I/O Architecture PCI Interface/Serial Asynchronous Interface connection Serial ports I/O ports	**See Note:** Two RS-232C/RS-423 serial ports (RJ45) Expansion Serial port interface. Two Ultra-SCSI port Two standard 10/100BASE-T ports
Operating System	Solaris 8

NOTE: ESP server 1A (top server) has an expansion serial board connected by cable to the serial break-out box. ESP server 1B through 1-Q are accessible only though the standard Ethernet ports and serial ports.

Adding Servers to the Netra-based ESP Frame

NOTE: Netra (Model 120) ESP Servers: Server A (P/N 870-2655-xx) and Server B (P/N 870-2655-01 or -05) are servers in the frames that support Sentinel products. See the information and the illustrations beginning on Figure 3-13, on page 3-23 when model 120 ESP Servers are referred to.

NOTE: When adding servers to the frame system, refer to the Internal Frame Expansion Kit (P/N 840-0117-01).

Up to 15 additional servers (total 17) may be added to an ESP frame.

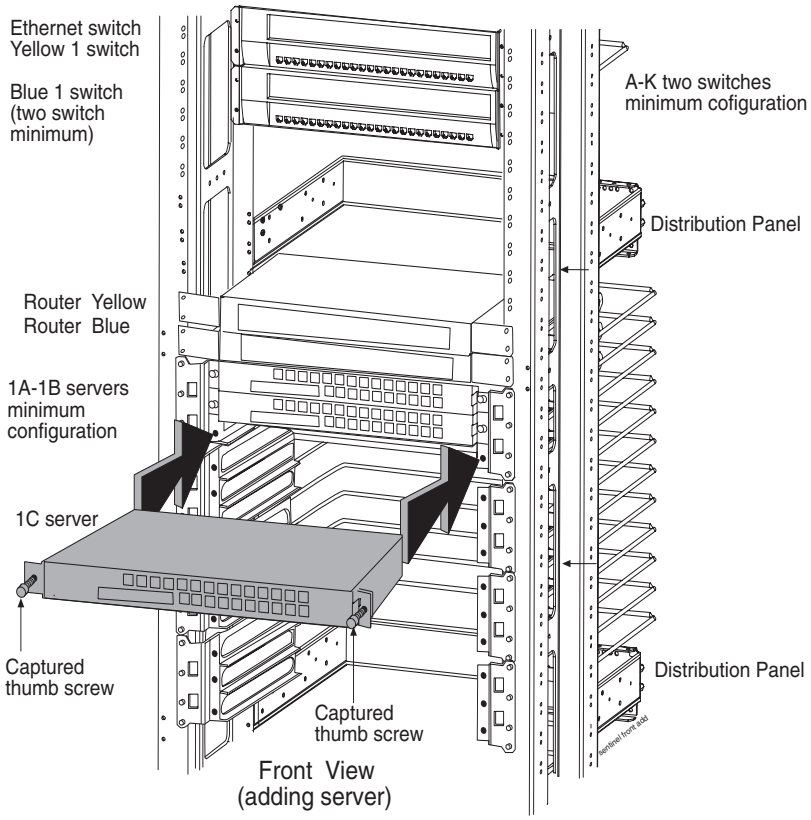
Procedure — Adding the Server to the Frame

1. Notice that the expansion brackets are installed at the factory during manufacture. See Figure 3-13 through Figure 3-18for the location of the captive thumb screws, brackets, and grounding information.

2. Stand in front of the frame and slide the additional server into the slot of the bracket, attached to the frame immediately below the lowest existing server. Captive thump screws are on either side of the server.

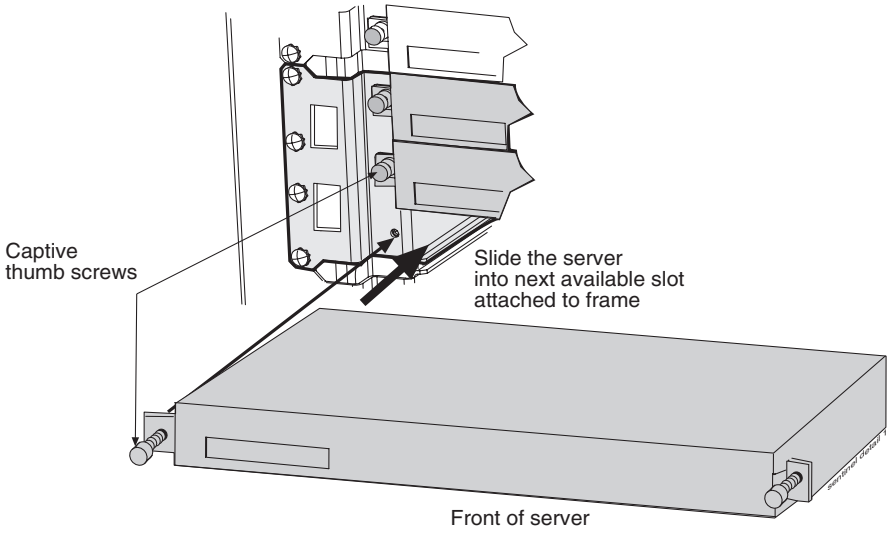
3. The captive thumb screws line up with the next available hole provided in the bracket attached to the frame.

Figure 3-13. Adding ESP Server to Frame



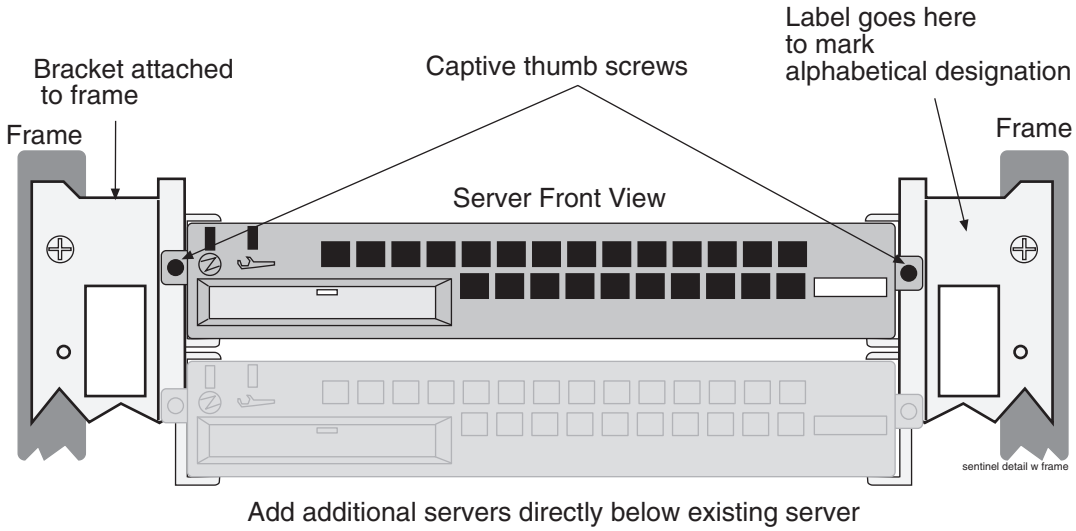
See Figure 3-15 for the location of the thumb screws.

Figure 3-14. Adding a Server



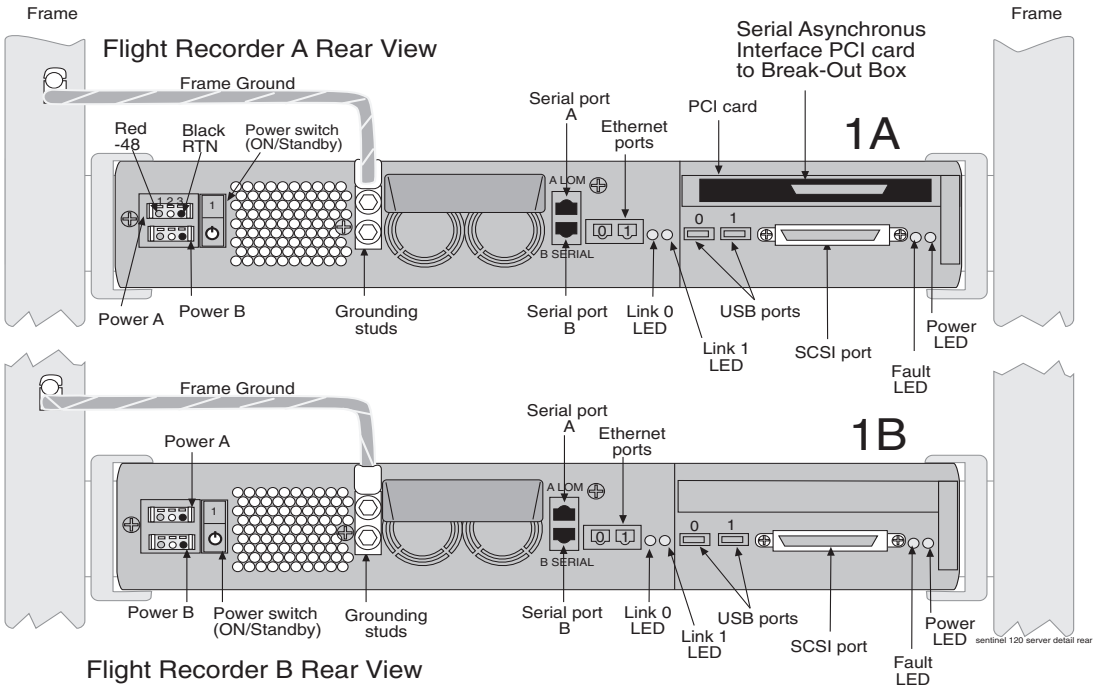
See Figure 3-15 for the location of the captive thumb screws and brackets.

Figure 3-15. Server Model 120 Front



Place the next added server directly below the existing installed server using the Internal Frame Expansion Kit.

Figure 3-16. Server Model 120, 1A and 1B Rear



The frame groundings studs are located on the rear of the sentinel server and the provided cable attaches to the side of the bracket on the frame holding the server in place. See Figure 3-17 and Figure 3-18 for an illustration showing the frame ground cables.

These figures also show Philip pan head screws that screws through the brackets on the frame, on either side of the server. These screws, pressing against the server to maintain stability.

Figure 3-17. Frame Ground Detail

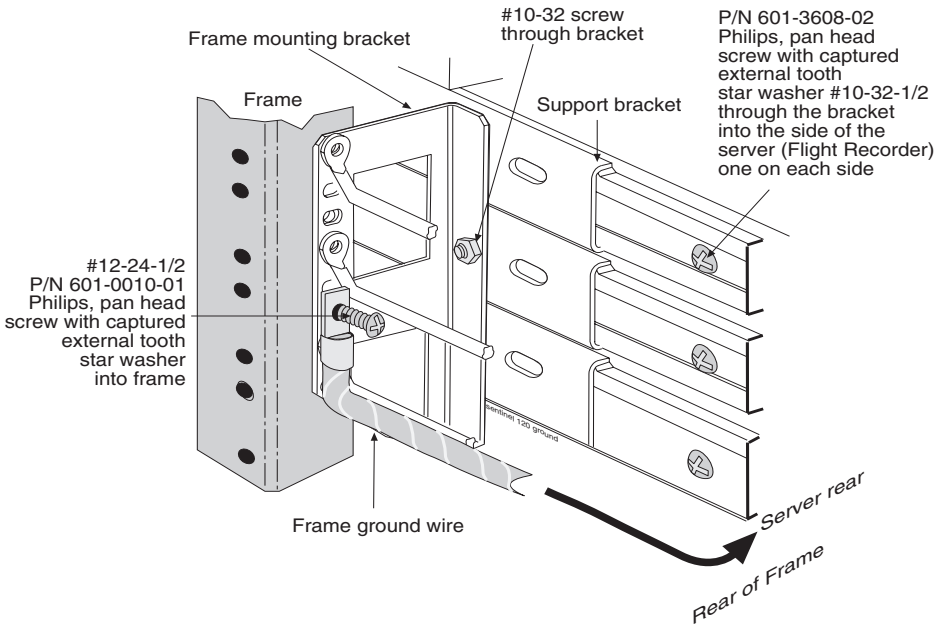
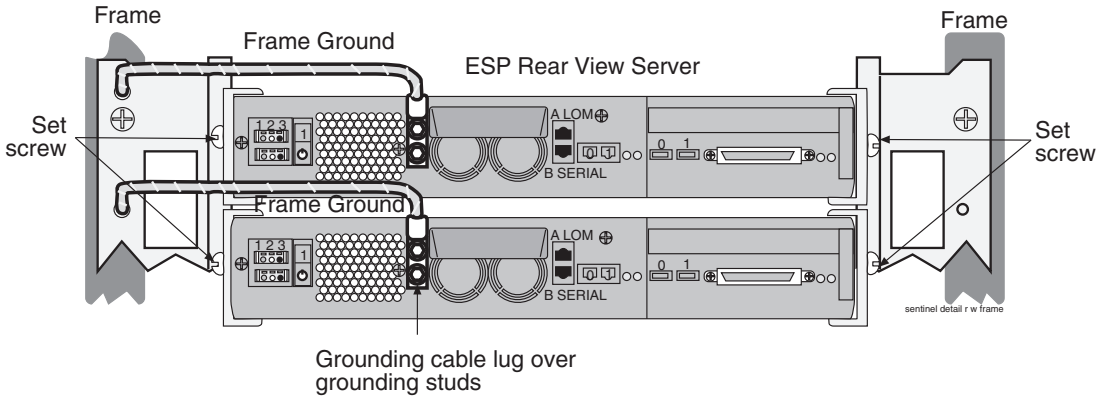


Figure 3-18. Server Frame Ground



Integrated Sentinel ESP Cabling

NOTE: Remove any covering for the back of the Breaker Panel (BP) to gain unobstructed access to the breaker panel connections.

Figure 3-19. ESP BP Cabling

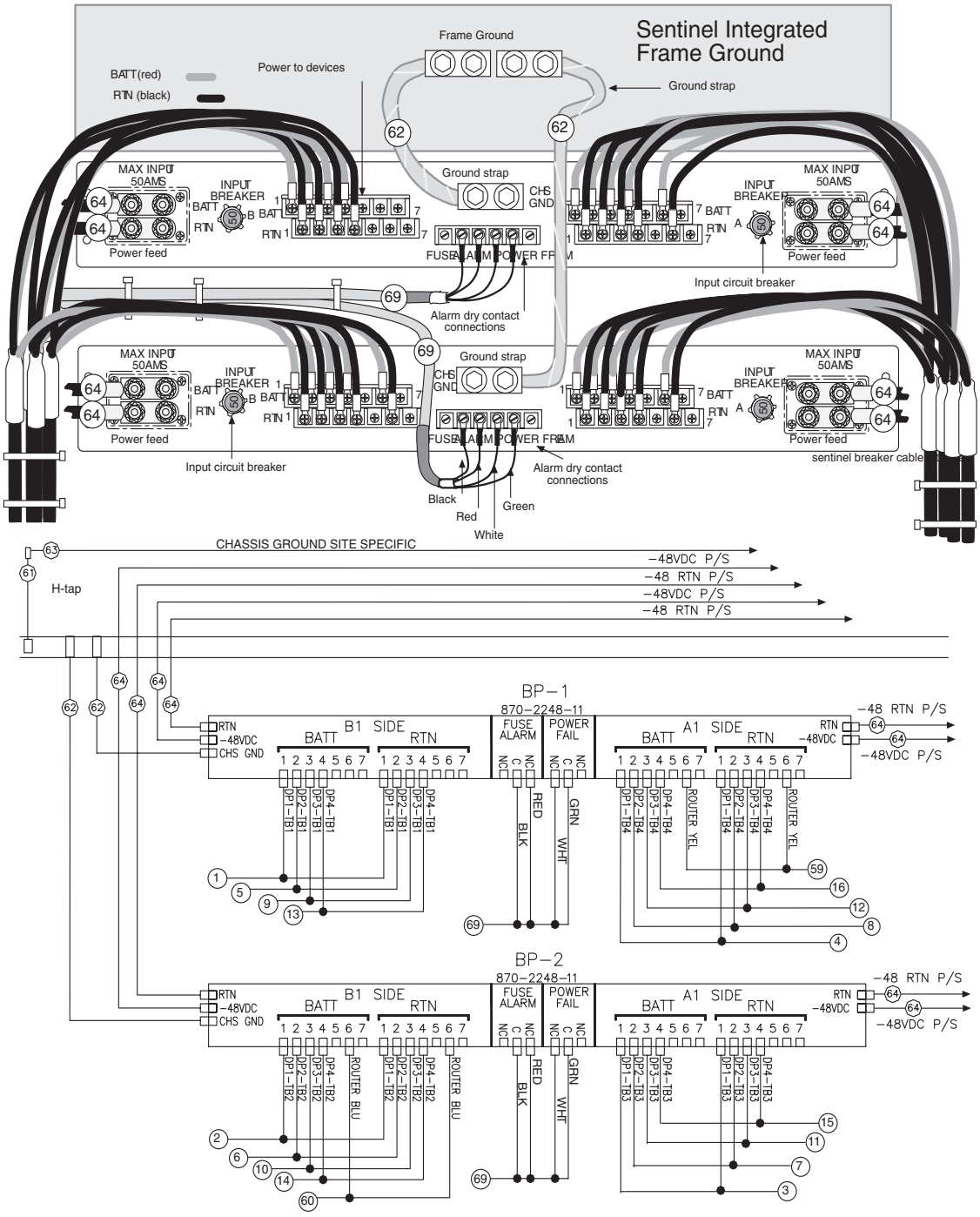


Figure 3-20. ESP Interconnect

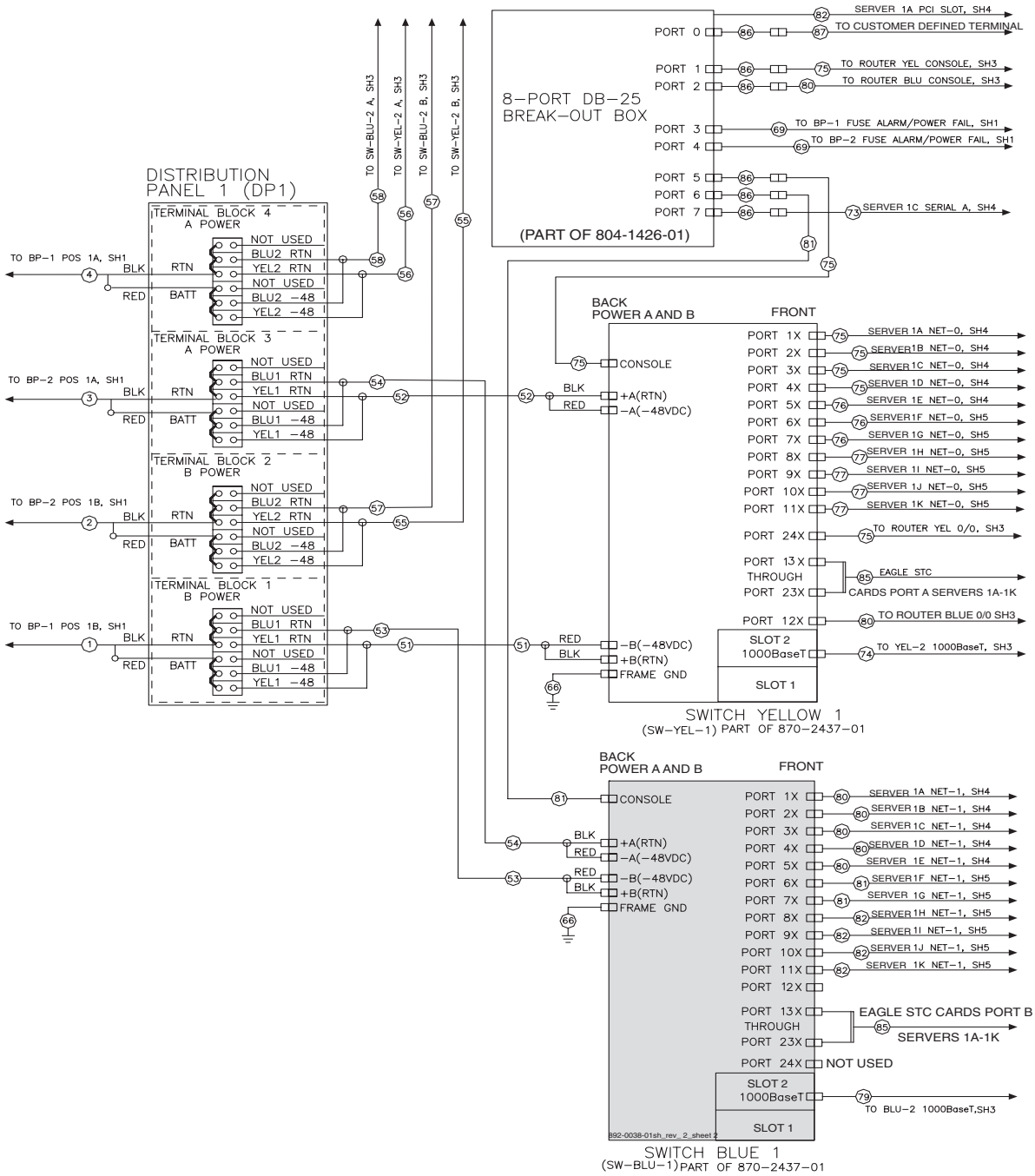


Figure 3-21. ESP Interconnect

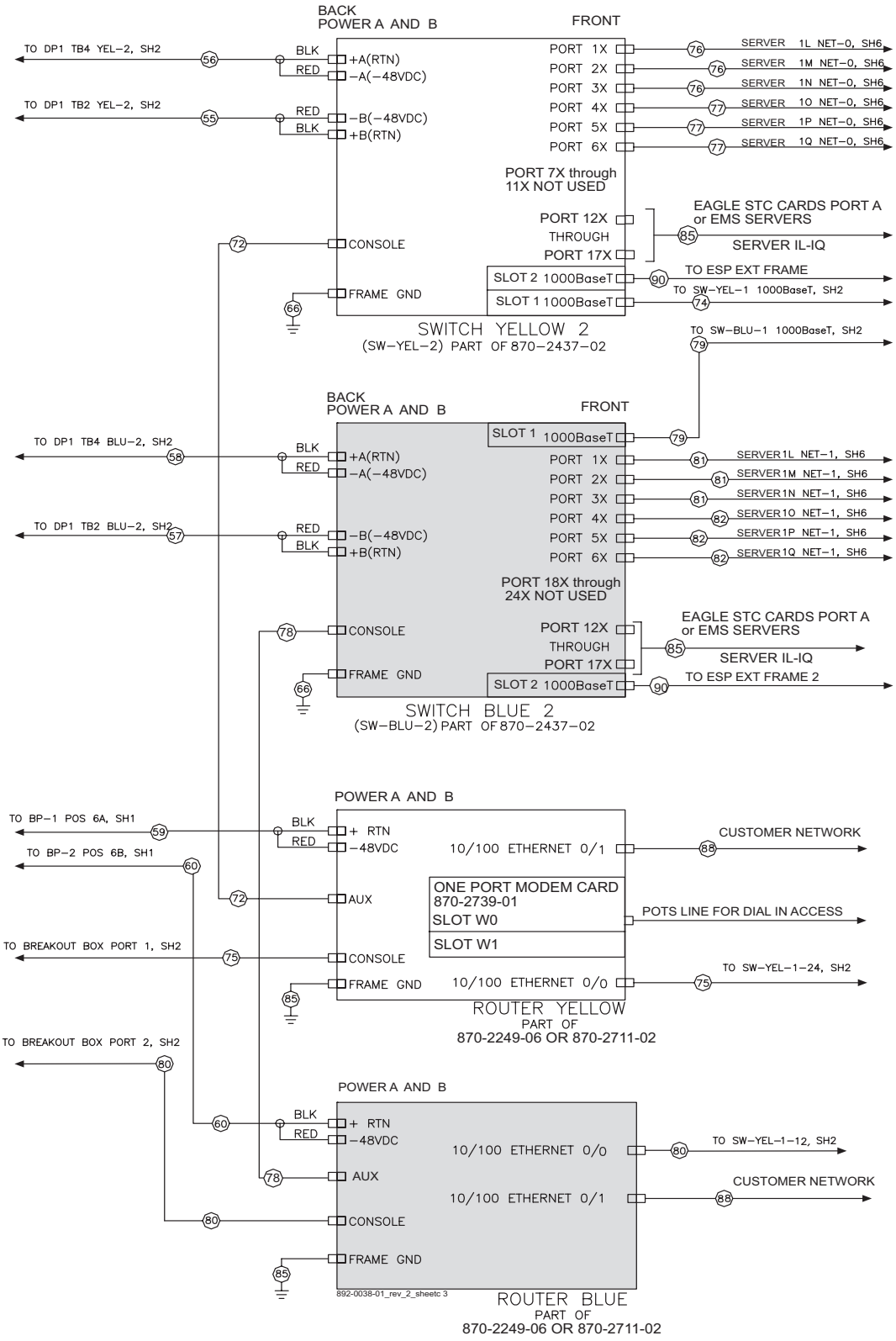


Figure 3-22. ESP Interconnect

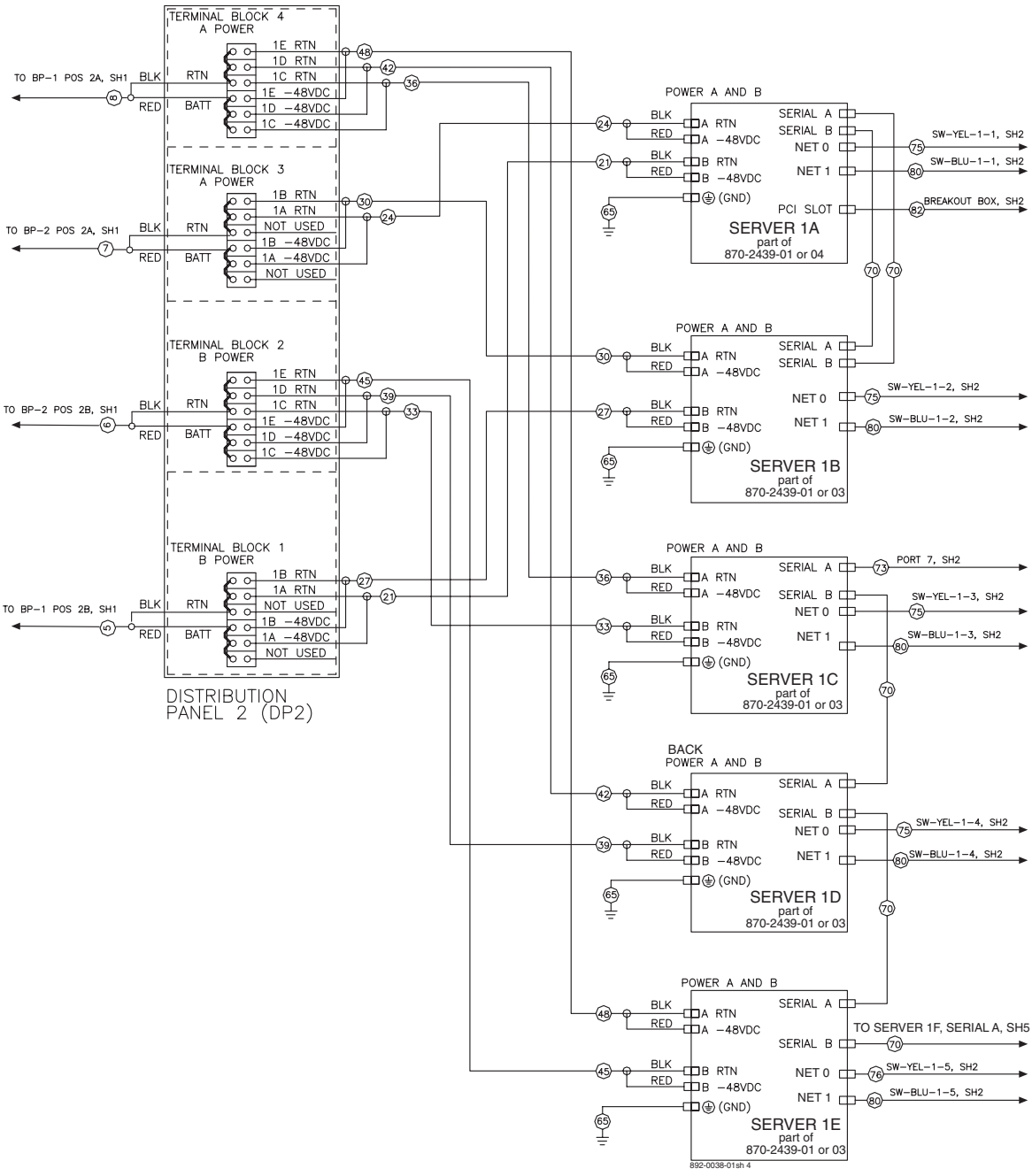


Figure 3-23. ESP Interconnect

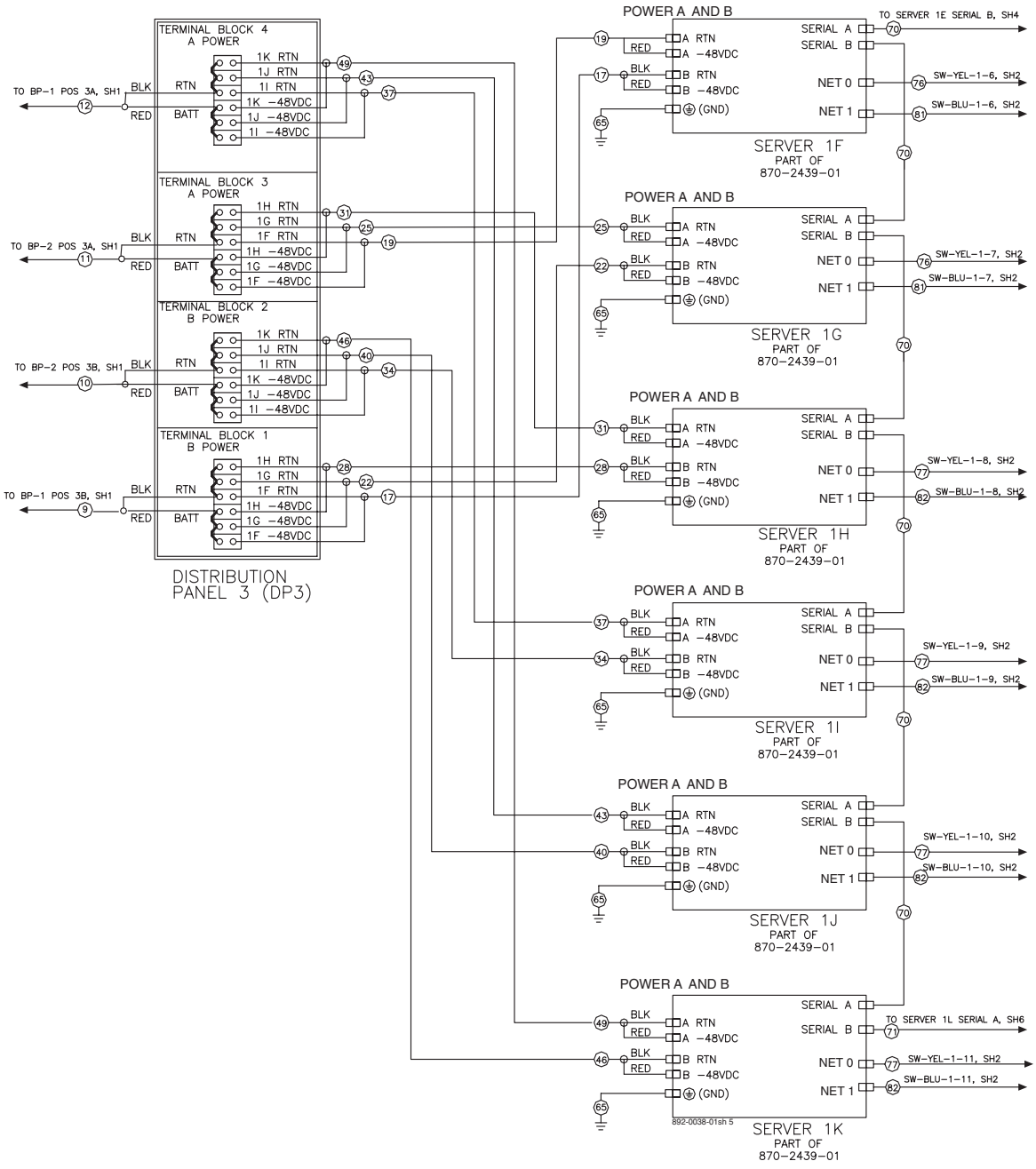


Figure 3-24. ESP Interconnect

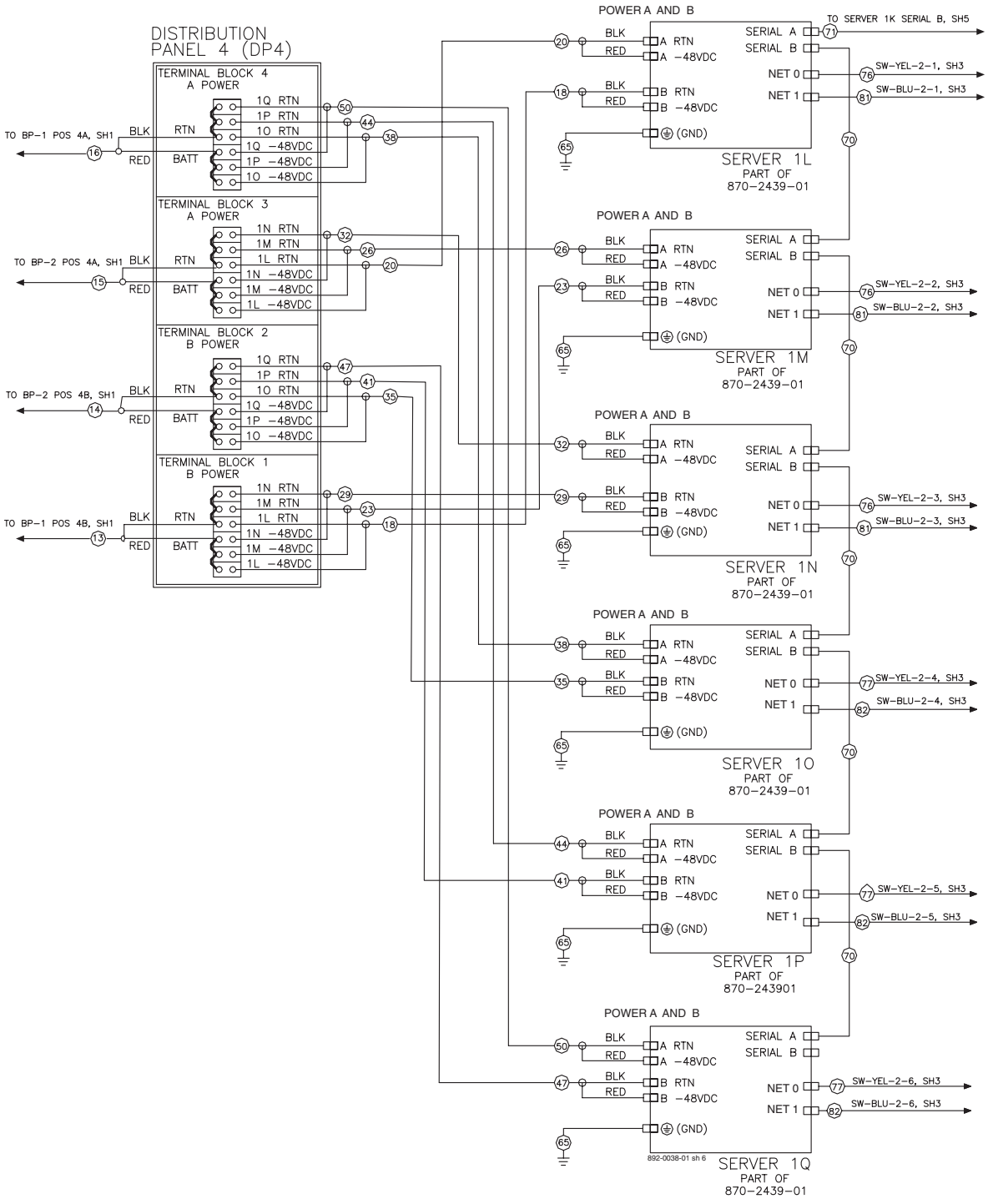


Table 3-8. ESP Cable Specifications

POWER CABLE PART NUMBERS					
Item No.	Part Number		Qty	Length (inches)	Comment
	North American	International			
1	830-0881-01	--	1	31	BP-1 POS 1B TO DP1 TB1
2	830-0881-02	--	1	33	BP-2 POS 1B TO DP1 TB2
3	830-0881-03	--	1	35	BP-2 POS 1A TO DP1 TB3
4	830-0881-04	--	1	33	BP-1 POS 1A TO DP1 TB4
5	830-0881-05	--	1	50	BP-1 POS 2B TO DP2 TB1
6	830-0881-06	--	1	52	BP-2 POS 2B TO DP2 TB2
7	830-0881-07	--	1	53.5	BP-2 POS 2A TO DP2 TB3
8	830-0881-08	--	1	51.5	BP-1 POS 2A TO DP2 TB4
9	830-0881-09	--	1	81	BP-1 POS 3B TO DP3 TB1
10	830-0881-10	--	1	83	BP-2 POS 3B TO DP3 TB2
11	830-0881-11	--	1	84	BP-2 POS 3A TO DP3 TB3
12	830-0881-12	--	1	82	BP-1 POS 3A TO DP3 TB4
13	830-0881-13	--	1	97	BP-1 POS 4B TO DP4 TB1
14	830-0881-14	--	1	99	BP-2 POS 4B TO DP4 TB2
15	830-0881-15	--	1	99	BP-2 POS 4A TO DP4 TB3
16	830-0881-16	--	1	97	BP-1 POS 4A TO DP4 TB4
17	830-0882-02	--	1	42.5	DP3 TB1 1F TO SERVER 1F B
18	830-0882-03	--	1	44	DP4 TB1 1L TO SERVER 1L B
19	830-0882-05	--	1	52.5	DP3 TB3 1F TO SERVER 1F A
20	830-0882-06	--	1	54	DP4 TB3 1L TO SERVER 1L A
21	830-0882-07	--	1	37.5	DP2 TB1 1A TO SERVER 1A B
22	830-0882-08	--	1	41	DP3 TB1 1G TO SERVER 1G B
23	830-0882-09	--	1	42	DP4 TB1 1M TO SERVER 1M B
24	830-0882-10	--	1	47.5	DP2 TB3 1A TO SERVER 1A A
25	830-0882-11	--	1	51	DP3 TB3 1G TO SERVER 1G A
26	830-0882-12	--	1	52.5	DP4 TB3 1M TO SERVER 1M A
27	830-0882-13	--	1	39.5	DP2 TB1 1B TO SERVER 1B B

Table 3-8. ESP Cable Specifications

28	830-0882-14	--	1	43	DP3 TB1 1H TO SERVER 1H B
29	830-0882-15	--	1	41.5	DP4 TB1 1N TO SERVER 1N B
30	830-0882-16	--	1	49.5	DP2 TB3 1B TO SERVER 1B A
31	830-0882-17	--	1	53	DP3 TB3 1H TO SERVER 1H A
32	830-0882-18	--	1	51.5	DP4 TB3 1N TO SERVER 1N A
33	830-0882-19	--	1	45.5	DP2 TB2 1C TO SERVER 1C B
34	830-0882-20	--	1	45	DP3 TB2 1I TO SERVER 1I B
35	830-0882-21	--	1	43.5	DP4 TB2 1O TO SERVER 1O B
36	830-0882-22	--	1	55.5	DP2 TB4 1C TO SERVER 1C A
37	830-0882-23	--	1	55	DP3 TB4 1I TO SERVER 1I A
38	830-0882-24	--	1	53.5	DP4 TB4 1O TO SERVER 1O A
39	830-0882-25	--	1	47.5	DP2 TB2 1D TO SERVER 1D B
40	830-0882-26	--	1	44	DP3 TB2 1J TO SERVER 1J B
41	830-0882-27	--	1	42.5	DP4 TB2 1P TO SERVER 1P B
42	830-0882-28	--	1	57.5	DP2 TB4 1D TO SERVER 1D A
43	830-0882-29	--	1	54	DP3 TB4 1J TO SERVER 1J A
44	830-0882-30	--	1	52.5	DP4 TB4 1P TO SERVER 1P A
45	830-0882-31	--	1	50	DP2 TB2 1E TO SERVER 1E B
46	830-0882-32	--	1	42.5	DP3 TB2 1K TO SERVER 1K B
47	830-0882-33	--	1	41	DP4 TB2 1Q TO SERVER 1Q B
48	830-0882-34	--	1	60	DP2 TB4 1E TO SERVER 1E A
49	830-0882-35	--	1	52.5	DP3 TB4 1K TO SERVER 1K A
50	830-0882-36	--	1	51	DP4 TB4 1Q TO SERVER 1Q A
51	830-0886-01	--	1	44.5	DP1 TB1 YEL1 TO YEL-1 B
52	830-0886-02	--	1	53.5	DP1 TB3 YEL1 TO YEL-1 A
53	830-0886-03	--	1	48.5	DP1 TB1 BLU1 TO BLU-1 B
54	830-0886-04	830-1190-04	1	57.5	DP1 TB3 BLU1 TO BLU-1 A

Table 3-8. ESP Cable Specifications

55	830-0886-05	830-1190-05	1	57	DP1 TB2 YEL2 TO YEL-2 B
56	830-0886-06	830-1190-06	1	66	DP1 TB4 YEL2 TO YEL-2 A
57	830-0886-07	830-1190-07	1	61	DP1 TB2 BLU2 TO BLU-2 B
58	830-0886-08	--	1	70	DP1 TB4 BLU2 TO BLU-2 A
59	830-0869-07	830-1188-07	1	80	BP-1 POS 6A TO ROUTER YEL
60	830-0869-08	830-1188-08	1	72	BP-2 POS 6B TO ROUTER BLU
61	830-0715-01	830-1171-01	1	Site Specific	CHASSIS GROUND TO GROUND WINDOW
62	830-0830-01	830-1181-01	2	N/A	CIRCUIT BREAKER TO FRAME GND
63	Chassis GND (Field Routed)		1	Site Specific	
64	-48VDC & 48V RTN (Field Routed)		8	Site Specific	

Table 3-9. ESP Cable Specifications

CABLE PART NUMBERS					
Item No.	**Part Number**		**Qty**	**Length (inches)**	**Comment**
	North American	**International**			
65	830-0823-01	--	2	22	ROUTER TO FRAME GND
66	830-0823-02	--	17	18	SERVER TO FRAME GND
67	830-0823-03	--	4	22	SWITCH TO FRAME GND
68	NOT USED				
69	830-0836-02	830-1284-02	2	48	BREAKER ALARM TO BREAKOUT BOX
70	830-0890-01	--	15	8	CROSS-PINNED RJ45 TO RJ45
71	830-0890-02	830-1193-02	1	12	CROSS-PINNED RJ45 TO RJ45
72	830-0890-03	--	1	72	CROSS-PINNED RJ45 TO RJ45
73	830-0724-01	830-1174-01	1	12	STRAIGHT THRU RJ45 TO RJ45
74	830-0888-11	830-1191-11	1	3	STRAIGHT THRU RJ45 TO RJ45 - YELLOW JACKET

Table 3-9. ESP Cable Specifications

75	830-0888-02	--	7	66	STRAIGHT THRU RJ45 TO RJ45 - YELLOW JACKET
76	830-0888-03	830-1191-03	6	72	STRAIGHT THRU RJ45 TO RJ45 - YELLOW JACKET
77	830-0888-04	830-1191-04	7	78	STRAIGHT THRU RJ45 TO RJ45 - YELLOW JACKET
78	830-0890-04	--	1	72	CROSS-PINNED RJ45 TO RJ45
79	830-0889-11	--	1	3	STRAIGHT THRU RJ45 TO RJ45 - BLUE JACKET
80	830-0889-02	830-1192-02	7	66	STRAIGHT THRU RJ45 TO RJ45 - BLUE JACKET
81	830-0889-03	830-1192-03	6	72	STRAIGHT THRU RJ45 TO RJ45 - BLUE JACKET
82	830-0889-04	830-1192-04	7	78	STRAIGHT THRU RJ45 TO RJ45 - BLUE JACKET
83	NOT USED				
84	804-1426-01	--	1	N/A	BREAKOUT BOX W/ CABLE PART OF PCI CARD, 804-1426-01
85	830-0788-XX	830-1177-XX	12	Site Specific	YELLOW SWITCH PORTS 13X THRU 23X TO EAGLE STC
86	Part of 804-1573-01 830-0859-XX	Part of 804-1573-01 830-1186-XX	5	N/A	DB25 TO RJ45 ADAPTER - Comes with NETRA T1 DC200 804-1516-01 can be used as an alternate DB25/DB25 M/M Site Specific Null Modem Serial Cable
87			1	Site Specific	
88	Customer Supplied		--	Site Specific	To Customer Network - RJ45 Connection Required
89	830-0723-XX	830-1173-XX	1	Site Specific	Straight Through J45 to RJ45-Length Site Specific
90	830-0724-XX	830-1174-XX	2	Site Specific	Crossover J45 to RJ45-Length Site Specific

Integrated Sentinel ESP TO-FROM Table

Table 3-10. Integrated Sentinel ESP TO-FROM Table

Number	From	To	Length	Notes
8 Port Break-Out Box (see Figure 3-6)				
86/87	PORT-0 DB25	EAGLE 5 ISS TERMINAL *TBD*		SITE SPECIFIC
86/75	PORT-1 DB25	YELLLOW-ROUTER-CONSOLE RJ45	5.5FT	REQUIRES ADAPTER TO RJ45
86/80	PORT-2 DB25	BLUE-ROUTER-CONSOLE RJ45	5.5FT	REQUIRES ADAPTER TO RJ45
69	PORT-3 DB25	BP-1-ALARM #4 SPADE	4.0FT	POWER
69	PORT- 4 DB25	BP-2-ALARM #4 SPADE	4.0FT	POWER
86/75	PORT-5 DB25	SW-YELLLOW-1-CONSOLE RJ45	5.5FT	REQUIRES ADAPTER TO RJ45
86/81	PORT-6 DB25	BLUE-SW-1-CONSOLE R J-45	6.0FT	REQUIRES ADAPTER TO RJ45
86/73	PORT-7 DB25	ESP-1C-SERIAL A RJ45	6.0FT	REQUIRES ADAPTER TO RJ45
Expanded				
75	SW-YELLOW-1-24 RJ45	YELLLOW-ROUTER-NET 0/0 RJ45	5.5FT	STRAIGHT THRU
79	SW-YELLOW-1-12 RJ45	BLUE-ROUTER-NET 0/0 RJ45	5.5FT	STRAIGHT THRU
Expanded 1A				
70	ESP-1A-SERIAL A RJ45	ESP-1B-SERIAL B RJ45	0.67FT	CROSS-PINNED
70	ESP-1A-SERIAL B RJ45	ESP-1B-SERIAL A RJ45	0.67FT	CROSS-PINNED
80	ESP-1A-NET-1 RJ45	BLUE-SW-1-1X RJ45	5.5FT	STRAIGHT THRU
75	ESP-1A-NET-0 RJ45	YELLLOW-SW-1-1X RJ45	5.5FT	STRAIGHT THRU
Expanded 1B				
75	ESP-1B-NET-0 RJ45	YELLLOW-SW-1-2X RJ45	5.5FT	STRAIGHT THRU
80	ESP-1B-NET-1 RJ45	BLUE-SW-1-2X RJ45	5.5FT	STRAIGHT THRU
Expanded 1C				

Table 3-10. Integrated Sentinel ESP TO-FROM Table

Number	From	To	Length	Notes
70	ESP-1C-SERIAL B RJ45	ESP-1D-SERIAL A RJ45	0.67FT	CROSS-PINNED
75	ESP-1C-NET-0 RJ45	YELLLOW-1SW--3X RJ45	5.5FT	STRAIGHT THRU
80	ESP-1C-NET-1 RJ45	BLUE-SW-1-3X RJ45	5.5FT	STRAIGHT THRU
Expanded 1D				
70	ESP-1D-SERIAL B RJ45	ESP-1E-SERIAL A RJ45	0.67FT	CROSS-PINNED
75	ESP-1D-NET-0 RJ45	YELLLOW-SW-1-4X RJ45	5.5FT	STRAIGHT THRU
80	ESP-1D-NET-1 RJ45	BLUE-SW-1-4X RJ45	5.5FT	STRAIGHT THRU
Expanded 1E				
70	ESP-1E-SERIAL B RJ45	ESP-1F-SERIAL A RJ45	0.67FT	CROSS-PINNED
76	ESP-1E-NET-0 RJ45	YELLLOW-SW-1-5X RJ45	6.0FT	STRAIGHT THRU
80	ESP-1E-NET-1 RJ45	BLUE-SW-1-5X RJ45	5.5FT	STRAIGHT THRU
Expanded 1F				
70	ESP-1F-SERIAL B RJ45	ESP-1G-SERIAL A RJ45	0.67FT	CROSS-PINNED
76	ESP-1F-NET-0 RJ45	YELLLOW-SW-1-6X RJ45	6.0FT	STRAIGHT THRU
81	ESP-1F-NET-1 RJ45	BLUE-SW-1-6X RJ45	6.0FT	STRAIGHT THRU
Expanded 1G				
70	ESP-1G-SERIAL B RJ45	ESP-1H-SERIAL A RJ45	0.67FT	CROSS-PINNED
76	ESP-1G-NET-0 RJ45	YELLLOW-SW-1-7X RJ45	6.0FT	STRAIGHT THRU
81	ESP-1G-NET-1 RJ45	BLUE-SW-1-7X RJ45	6.0FT	STRAIGHT THRU
Expanded 1H				
70	ESP-1H-SERIAL B RJ45	ESP-1I-SERIAL A RJ45	0.67FT	CROSS-PINNED
77	ESP-1H-NET-0 RJ45	SW-YELLLOW-SW-1-8 X RJ45	6.5FT	STRAIGHT THRU
82	ESP-1H-NET-1 RJ45	BLUE-1-8X RJ45	6.5FT	STRAIGHT THRU

Table 3-10. Integrated Sentinel ESP TO-FROM Table

Number	From	To	Length	Notes
Expanded 1I				
70	ESP-1I-SERIAL B RJ45	ESP-1J-SERIAL A RJ45	0.67FT	CROSS-PINNED
77	ESP-1I-NET-0 RJ45	YELLLOW-SW-1-9X RJ45	6.5FT	STRAIGHT THRU
82	ESP-1I-NET-1 RJ45	BLUE-SW-1-9X RJ45	6.5FT	STRAIGHT THRU
Expanded 1J				
70	ESP-1J-SERIAL B RJ45	ESP-1K-SERIAL A RJ45	0.67FT	CROSS-PINNED
77	ESP-1J-NET-0 RJ45	YELLLOW-SW-1-10X RJ45	6.5FT	STRAIGHT THRU
82	ESP-1J-NET-1 RJ45	BLUE-SW-1-10X RJ45	6.5FT	STRAIGHT THRU
Expanded 1K				
77	ESP-1K-NET-0 RJ45	YELLLOW-SW-1-11X RJ45	6.5FT	STRAIGHT THRU
82	ESP-1K-NET-1 RJ45	BLUE-SW-1-11X RJ45	6.5FT	STRAIGHT THRU
Move to the Bottom Section of Servers ESP-1L through ESP-1Q				
Expanded 1L				
70	ESP-1L-SERIAL B RJ45	ESP-1M-SERIAL A RJ45	0.67FT	CROSS-PINNED
Expanded 1M				
70	ESP-1M-SERIAL B RJ45	ESP-1N-SERIAL A RJ45	0.67FT	CROSS-PINNED
Expanded 1N				
70	ESP-1N-SERIAL B RJ45	ESP-1O-SERIAL A RJ45	0.67FT	CROSS-PINNED
Expanded 1O				
70	ESP-1O-SERIAL B RJ45	ESP-1P-SERIAL A RJ45	0.67FT	CROSS-PINNED
Expanded 1P				
70	ESP-1P-SERIAL B RJ45	ESP-1Q-SERIAL A RJ45	0.67FT	CROSS-PINNED
Expanded 1Q				

Table 3-11. Upgrade Kit

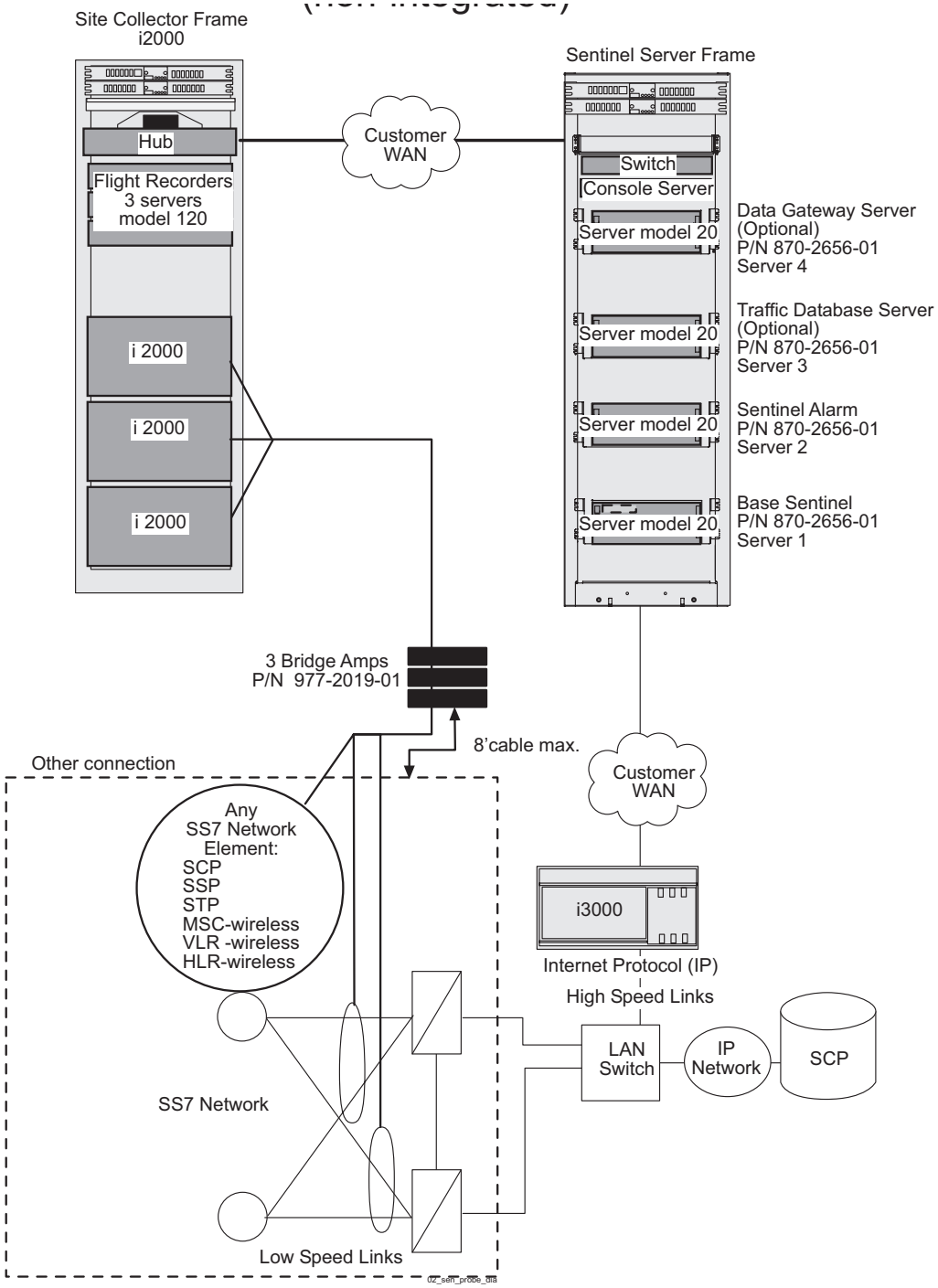
Upgrade Kit				
79	BLUE-SW-1-BASE T1000 RJ45	BLUE-SW-2-BASE T1000 RJ45	1.0FT	STRAIGHT THRU
74	YELLOW-SW-1-BASE T1000 RJ45	YELLOW-SW-2-BASE T1000 RJ45	1.0FT	STRAIGHT THRU
82	ESP-1Q-NET-1 RJ45	BLUE-SW-2-6X RJ45	6.5FT	STRAIGHT THRU
77	ESP-1Q-NET-0 RJ45	YELLLOW-SW-2-6X RJ45	6.5FT	STRAIGHT THRU
82	ESP-1P-NET-1 RJ45	BLUE-SW-2-5X RJ45	6.5FT	STRAIGHT THRU
77	ESP-1P-NET-0 RJ45	YELLLOW-SW-2-5X RJ45	6.5FT	STRAIGHT THRU
82	ESP-1O-NET-1 RJ45	BLUE-SW-2-4X RJ45	6.5FT	STRAIGHT THRU
77	ESP-1O-NET-0 RJ45	YELLLOW-SW-2-4X RJ45	6.5FT	STRAIGHT THRU
81	ESP-1N-NET-1 RJ45	BLUE-SW-2-3X RJ45	6.0FT	STRAIGHT THRU
76	ESP-1N-NET-0 RJ45	YELLLOW-SW-2-3X RJ45	6.0FT	STRAIGHT THRU
81	ESP-1M-NET-1 RJ45	BLUE-SW-2-2X RJ45	6.0FT	STRAIGHT THRU
76	ESP-1M-NET-0 RJ45	YELLLOW-SW-2-2X RJ45	6.0FT	STRAIGHT THRU
81	ESP-1L-NET-1 RJ45	BLUE-2-1X RJ45	6.0FT	STRAIGHT THRU
76	ESP-1L-NET-0 RJ45	YELLLOW-SW-2-1X RJ45	6.0FT	STRAIGHT THRU
71	ESP-1K-SERIAL B RJ45	ESP-1L-SERIAL A RJ45	1.0FT	CROSS-PINNED
78	BLUE-SW-2 CONSOLE RJ45	BLUE-ROUTER AUX RJ45	6.0FT	CROSS-PINNED
72	YELLOW-SW-2-CONSOLE RJ45	ROUTER-YELLLOWAUX RJ45	6.0FT	CROSS-PINNED

The next section addresses the installation of the Sentinel Site Collector Frame, i2000.

Installing Non-integrated Sentinel Hardware

Non-integrated Sentinel consists of user workstations, Signaling Transfer Points (STPs), probes, site collector frame containing Netra-based Flight Recorder servers, and other SS7 network equipment and a site collector frame.

Figure 3-25. Sentinel Probe



NOTE: If Integrated Sentinel (EAGLE 5 ISS and an ESP) is part of the system, the Sentinel i2000 Site Collector frame may not be used.

When maximally configured, the Probed Site Collector Frame contains:

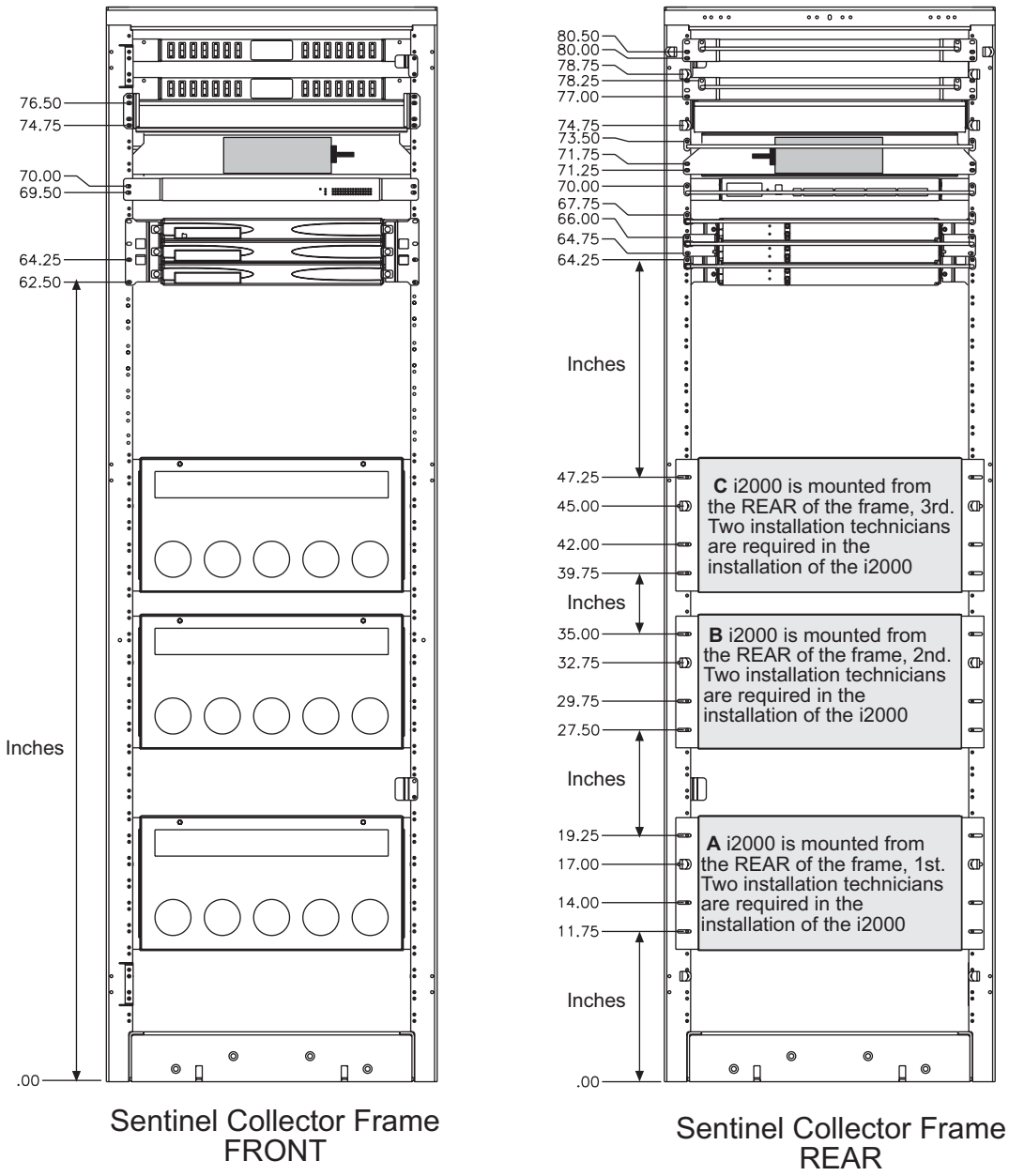
- 2 Breaker Panels
- 1 Network Hub
- 3 Model 120 Servers (known as flight recorders).The first server (A) contains an serial asynchronous interface adapter card with a serial cable connected to an 8 port break-out box.
- Up to 3 i2000 servers (shelves).

The i2000 servers are never shipped in the frame and are installed on site. The i2000, shelf A is installed from the rear of the frame at the bottom of the frame. If other i2000 shelves are installed they are also installed from the rear of the frame with the second i2000, shelf B, above the first i2000 shelf A. The third i2000 shelf C is installed above the second i2000 shelf B. All i2000 shelves related to the site collector frames are DC powered.

Printed Circuit Boards (PCBs) for the i2000 are installed on site. See Figure 3-26, on page 3-42 for detailed information.

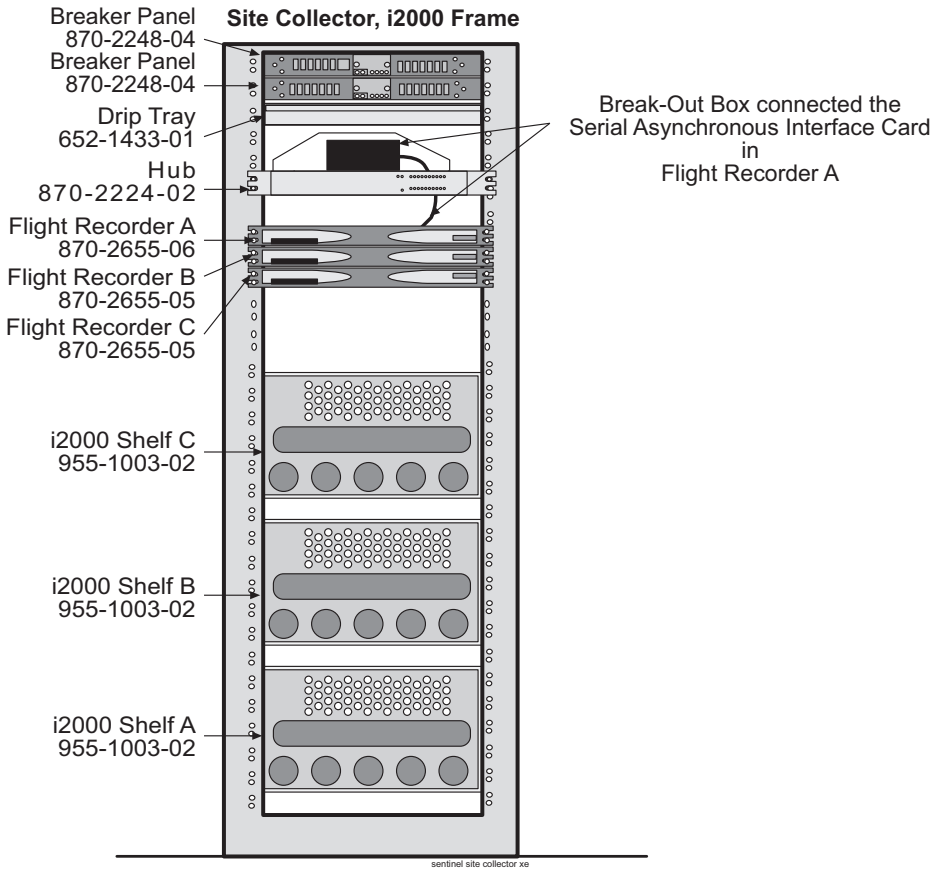
For more information on the i2000 shelf see *Signalling/Cellular Generic Hardware Reference*.

Figure 3-26. Site Collector, i2000 Frame



All measurements in Figure 3-26 are in inches. The i2000 shelf weighs approximately 44 kilos or 96.8lbs and requires two technicians to install it properly from the rear of the frame. Use four 12-24 0.75 inch (P/N 601-0010-02) screws, with a captive external tooth lock washers, on each side for a total of eight screws per shelf.

Figure 3-27. Site Collector, i2000 Frame



Site Collector, i2000 Frame

The Sentinel site collector frame arrives at the site partially populated and internally cabled to support; breaker panels, network hubs, flight recorders (servers) A, B, and C, and up to three i2000 server shelves. The i2000 shelves are installed at the site and never shipped in the frame.

Breaker Panels (2)

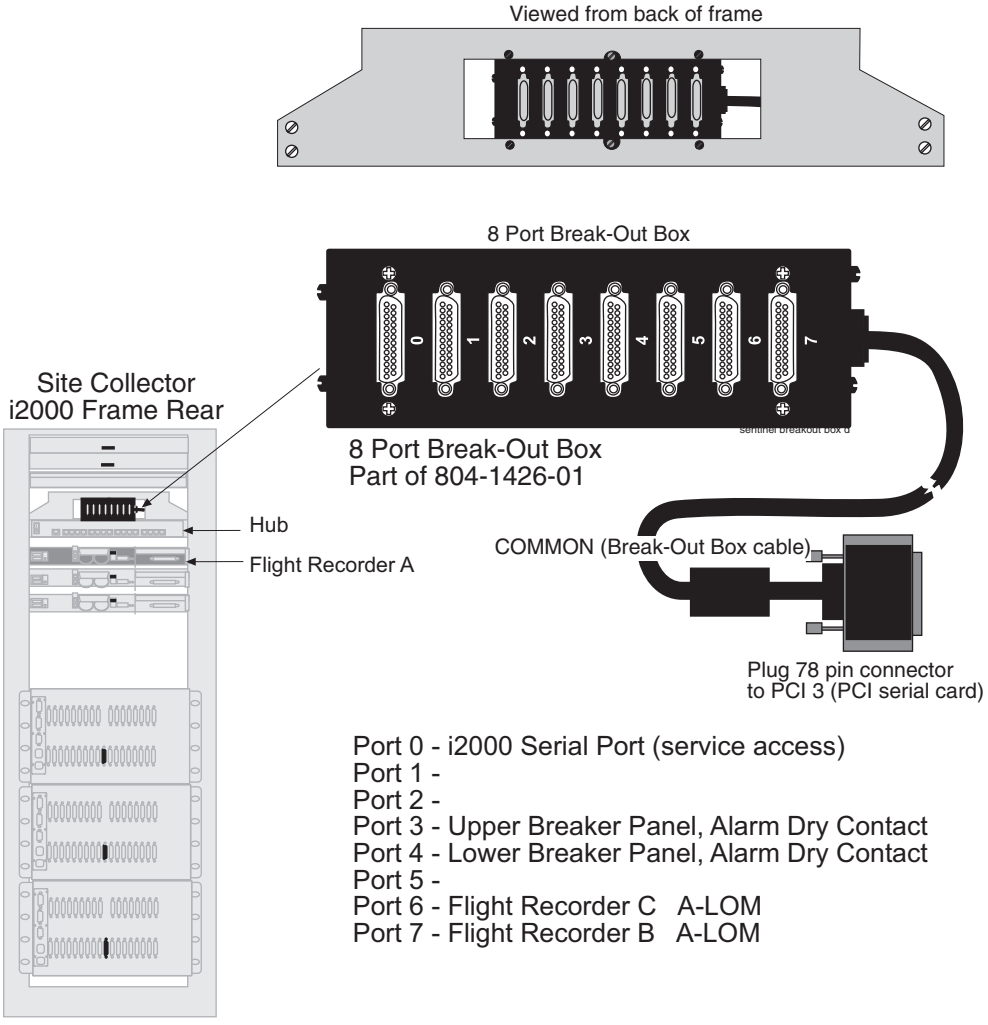
NOTE: Breaker Panels are the breaker panels in frames that support Sentinel products. See the information and the illustrations beginning with Figure 3-5, on page 3-10. These pages are referenced when breaker panels are referred to. The wiring diagrams and cable configurations are different but the breaker panels are typical. Individual breaker panels are labeled on the finger guard, over the breaker, with associated information.

Site Collector, Break-Out Box

Flight Recorder A)(P/N 870-2655-02 or -06), in the site collector frame is the top server and contains an serial asynchronous interface card (P/N 804-1426-01) connected to an eight port break-out box. The break-out box is located above the hub and below the breaker panels.

Service access to components is provided through the break-out box.

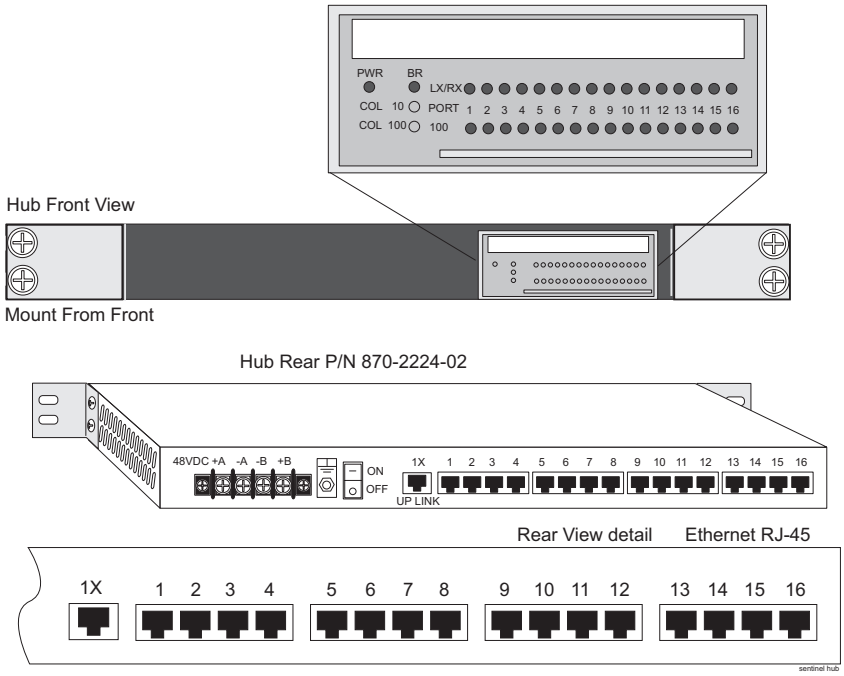
Figure 3-28. Break-Out Box Assembly



Hub

The hub is NEBS compliant and provides 16 RJ45 ports per hub. The dual-speed network chip enables the hub to identify and accept either 10/100MB signals on a per-port basis. Each RJ45 port is independent to match the speed of the server, providing flexibility in transition to Ethernet speeds. The hub is pre-installed from the front of the frame during manufacturing.

Figure 3-29. HUB



The frame grounding stud are located on the rear of the hub and the provided cable attaches to the side of the frame.

Flight Recorders

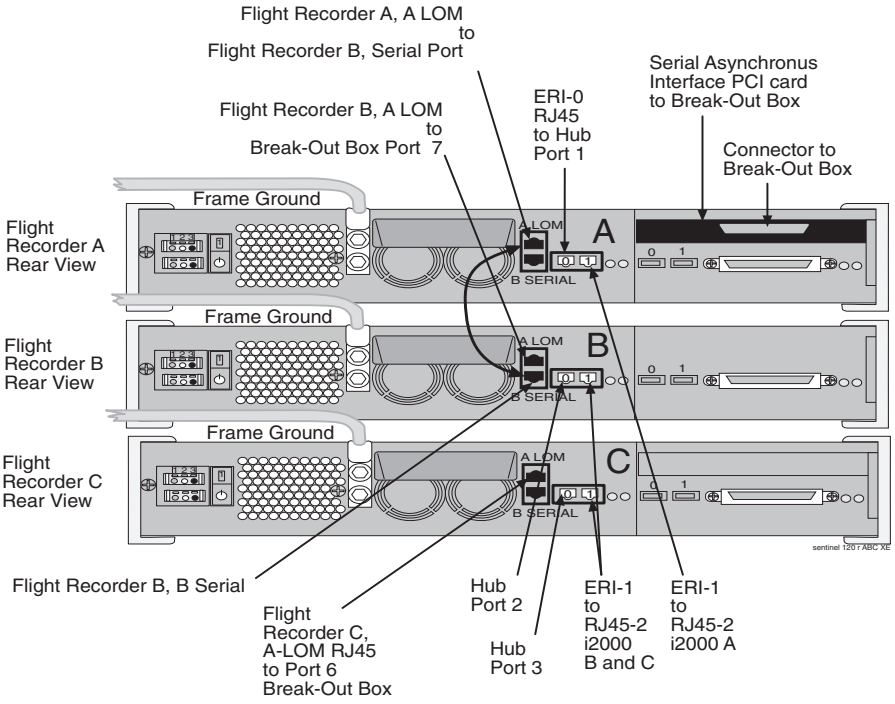
NOTE: Netra (Model 120) ESP Servers (flight recorders): Server A (P/N 870-2655-02- or 06) and Server B (P/N 870-2655-01 or -05) are servers in the site collector frames that support Sentinel products. See the information and the illustrations beginning on Figure 3-13, on page 3-23 referenced when model 120, ESP Servers, are referred to.

Up to three flight recorders may populate a site collector frame that is maximally configured. The top recorder is referred to as Flight Recorder A. The middle recorder is referred to as Flight Recorder B. The bottom recorder is referred to as Flight Recorder C and is the same as Flight Recorder B.

Flight recorder A contains a serial PCI card with serial asynchronous interface connected to an 8-Port break-out box.

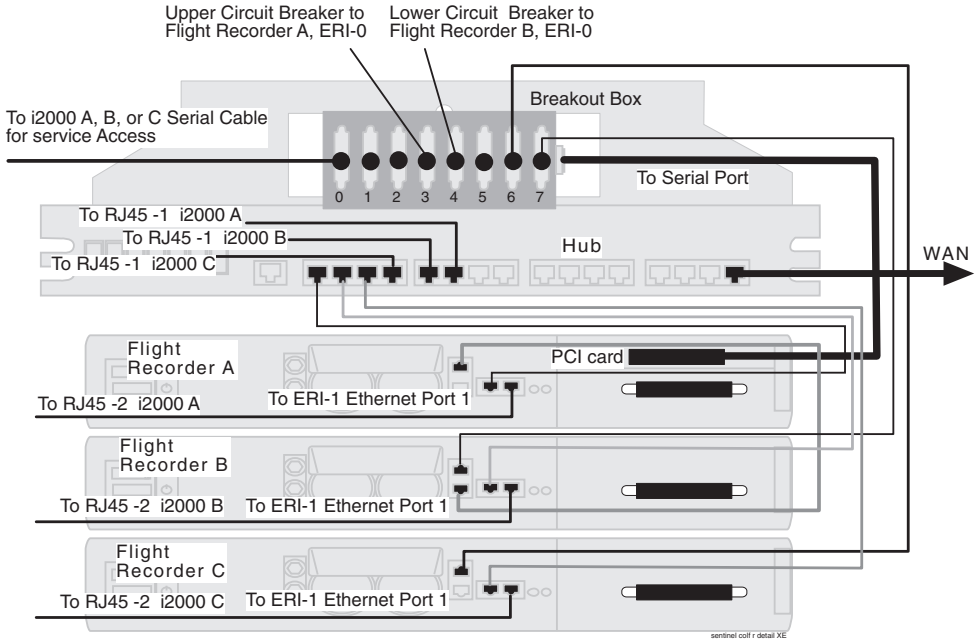
There are different configurations possible in the site collector frame. For illustrations of the combinations of flight recorders available in a site collector frame; see Figure 3-30 on page 3-46.

Figure 3-30. Flight Recorders A, B, and C Cabling



See Figure 3-13 for installation information on the flight recorders (model 120 servers).

Figure 3-31. Site Collector Frame, i2000 Cabling



i2000 Shelves

The i2000 shelves are not shipped in the frame. Printed circuit boards are not shipped in the i2000 and must be installed on site. All i2000 shelves are packaged in a cardboard container, and then packed and shipped in a wooded crate. The first i2000 shelf is installed from the rear of the frame at the bottom of the frame, i2000 shelf **A**. If other i2000 shelves are to be installed they are installed from the rear of the frame with the second i2000 shelf **B** above the first i2000 shelf **A**. The third i2000 shelf **C** is installed above the second i2000 shelf **B**. For more information on the i2000 shelf refer to *Signalling/Cellular Generic Hardware Reference* and see Figure 3-26, on page 3-42 through Figure 3-36, on page 3-52.

Figure 3-32. i2000 Shelf

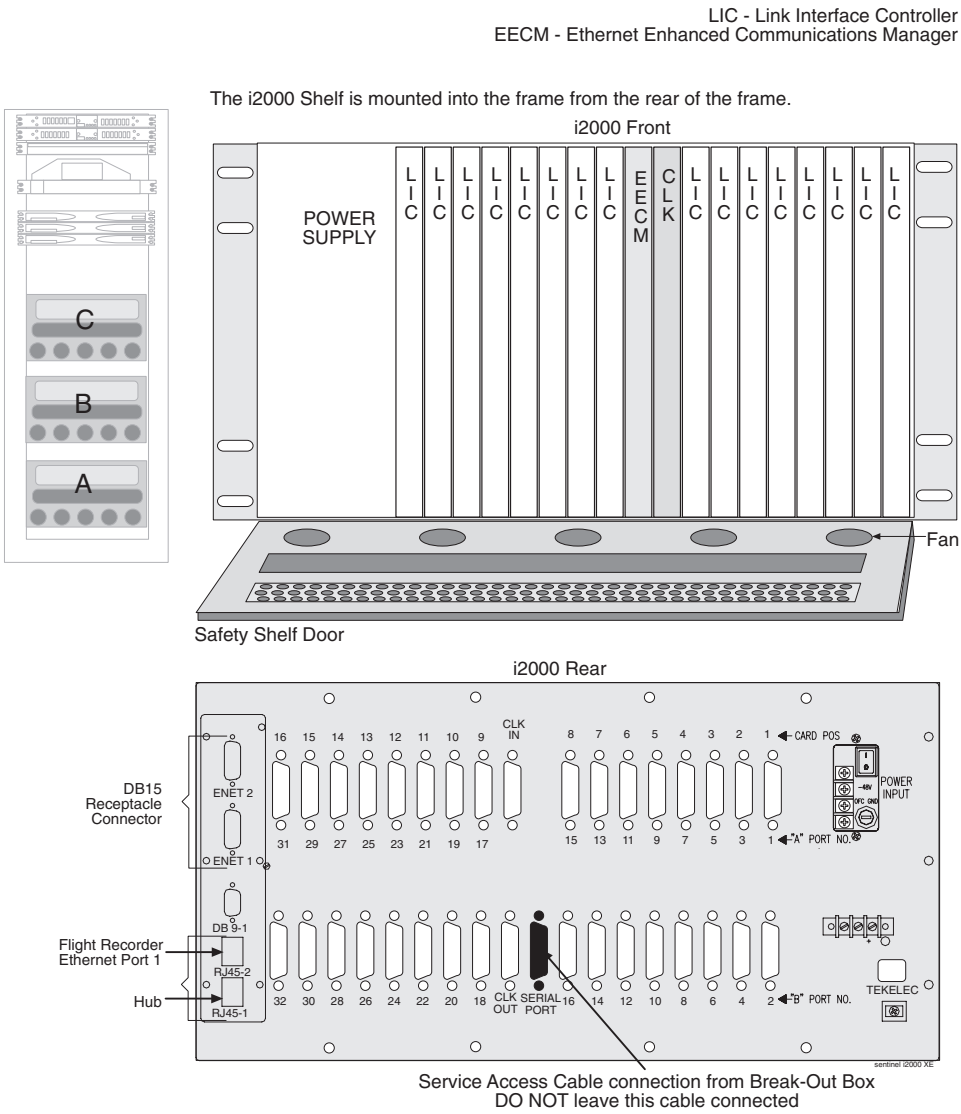


Figure 3-33. i2000 Shelf Installation

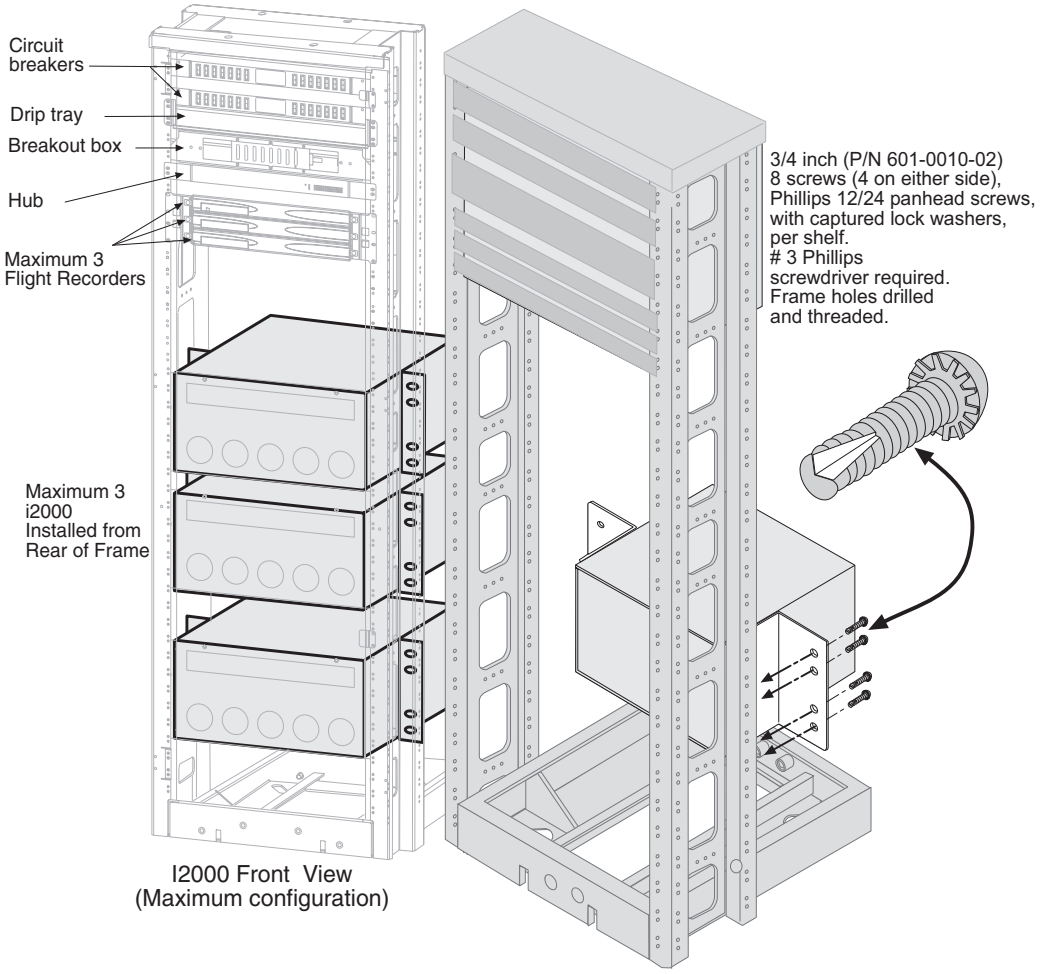
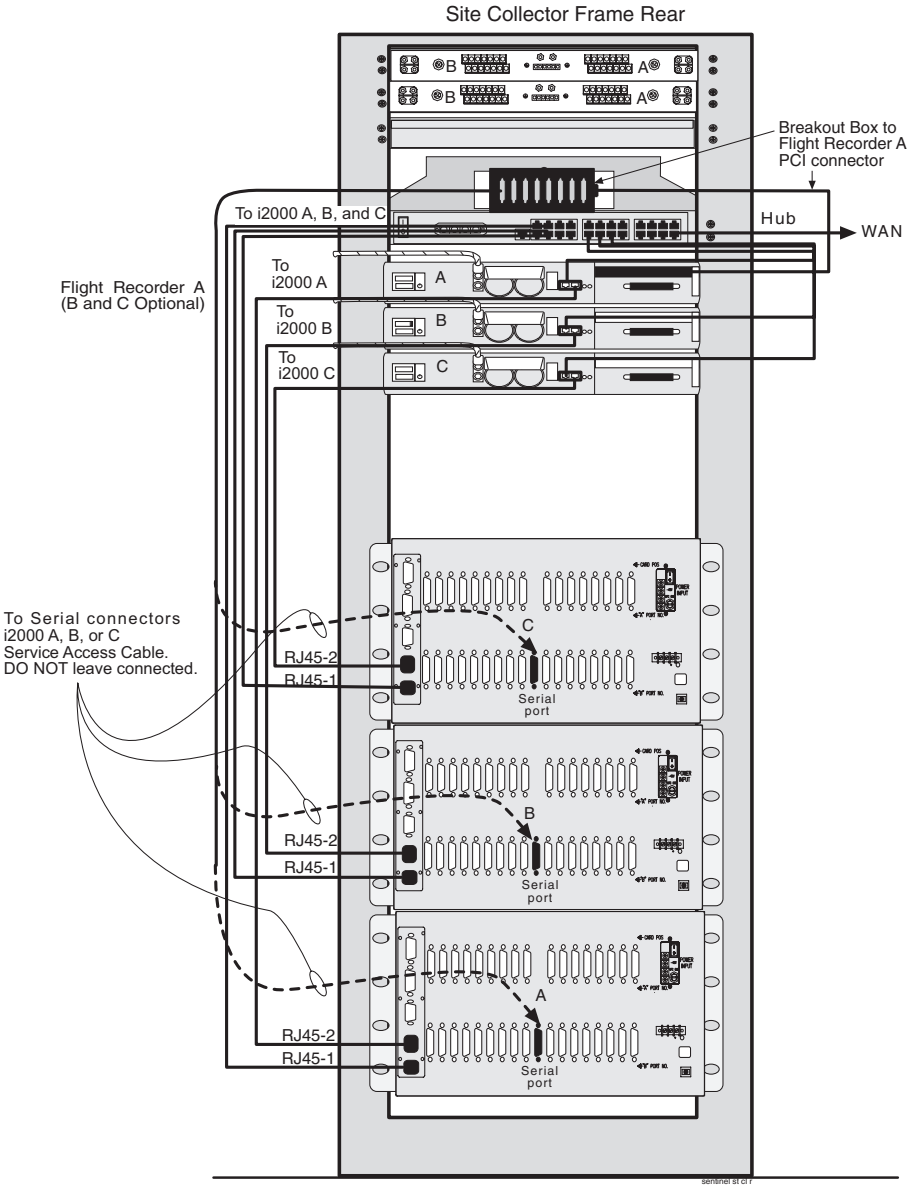


Figure 3-34. Site Collector Frame, Rear



Site Collector, i2000 Frame, Interconnect

The Sentinel site collector frame can interconnect with any STP frame. For the Sentinel site collector i2000 interconnect diagrams see Figure 3-35 on page 3-51 through Figure 3-37, on page 3-53. Table 3-12 on page 3-54 contains the cable legend.

Figure 3-35. Site Collector, BP

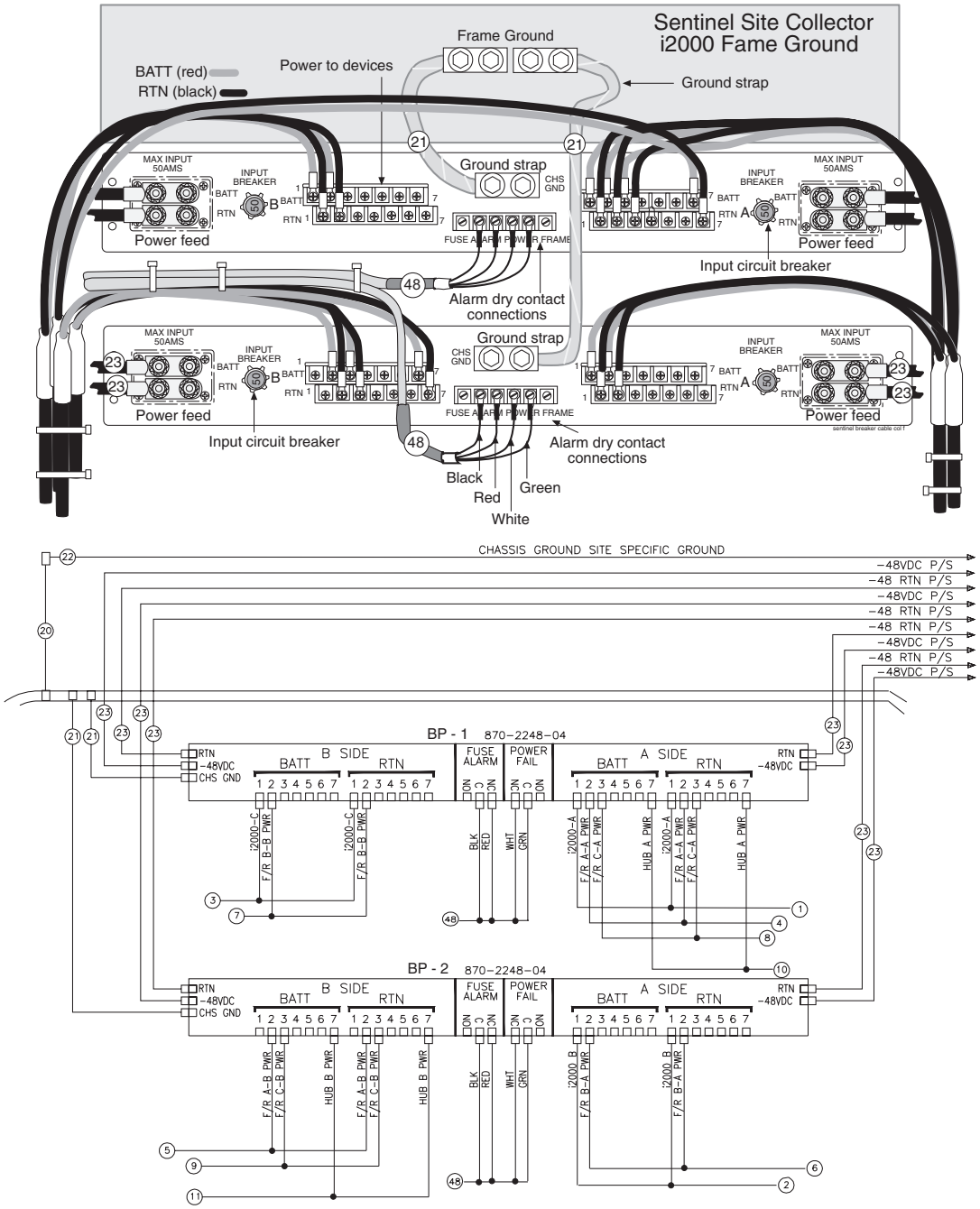


Figure 3-36. Site Collector, Interconnect

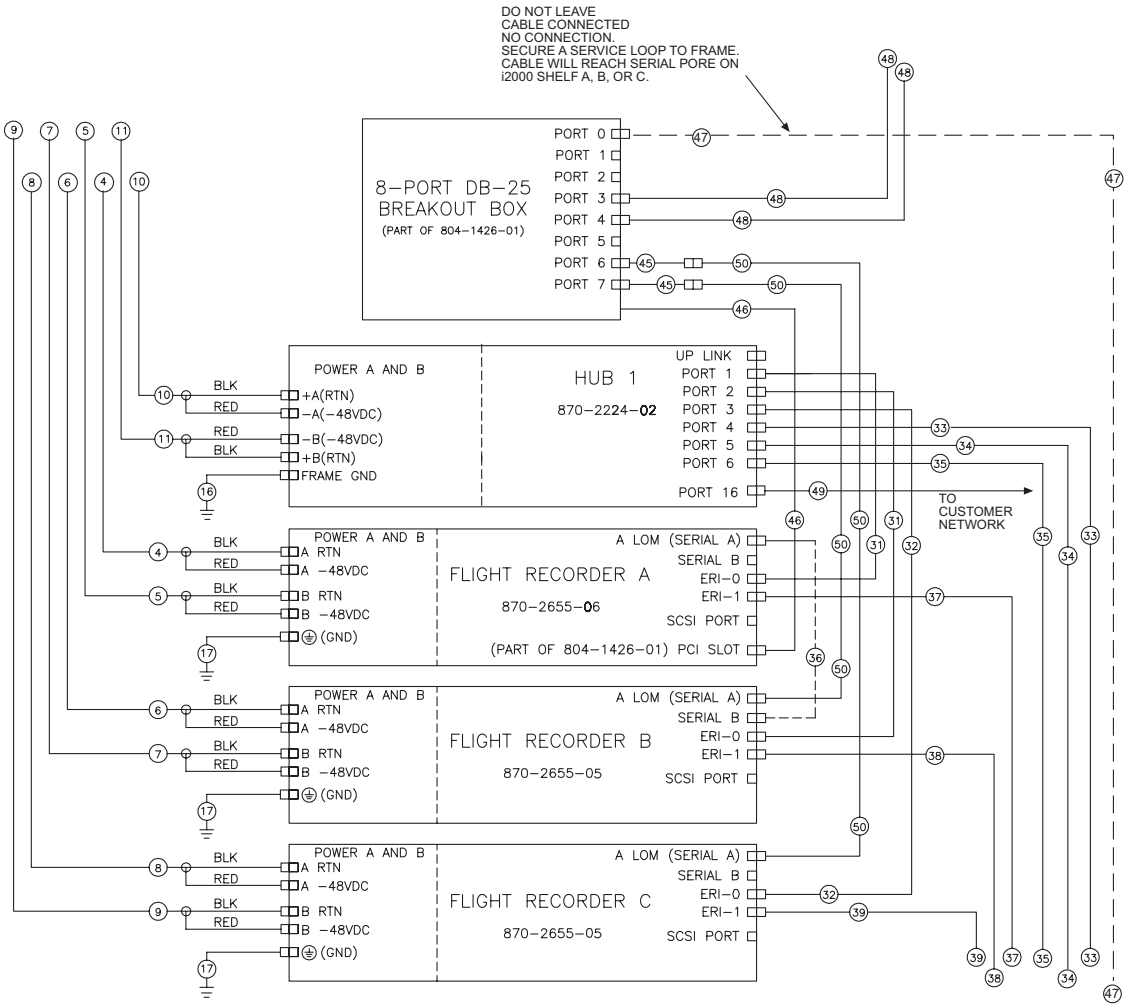


Figure 3-37. Site Collector, Interconnect

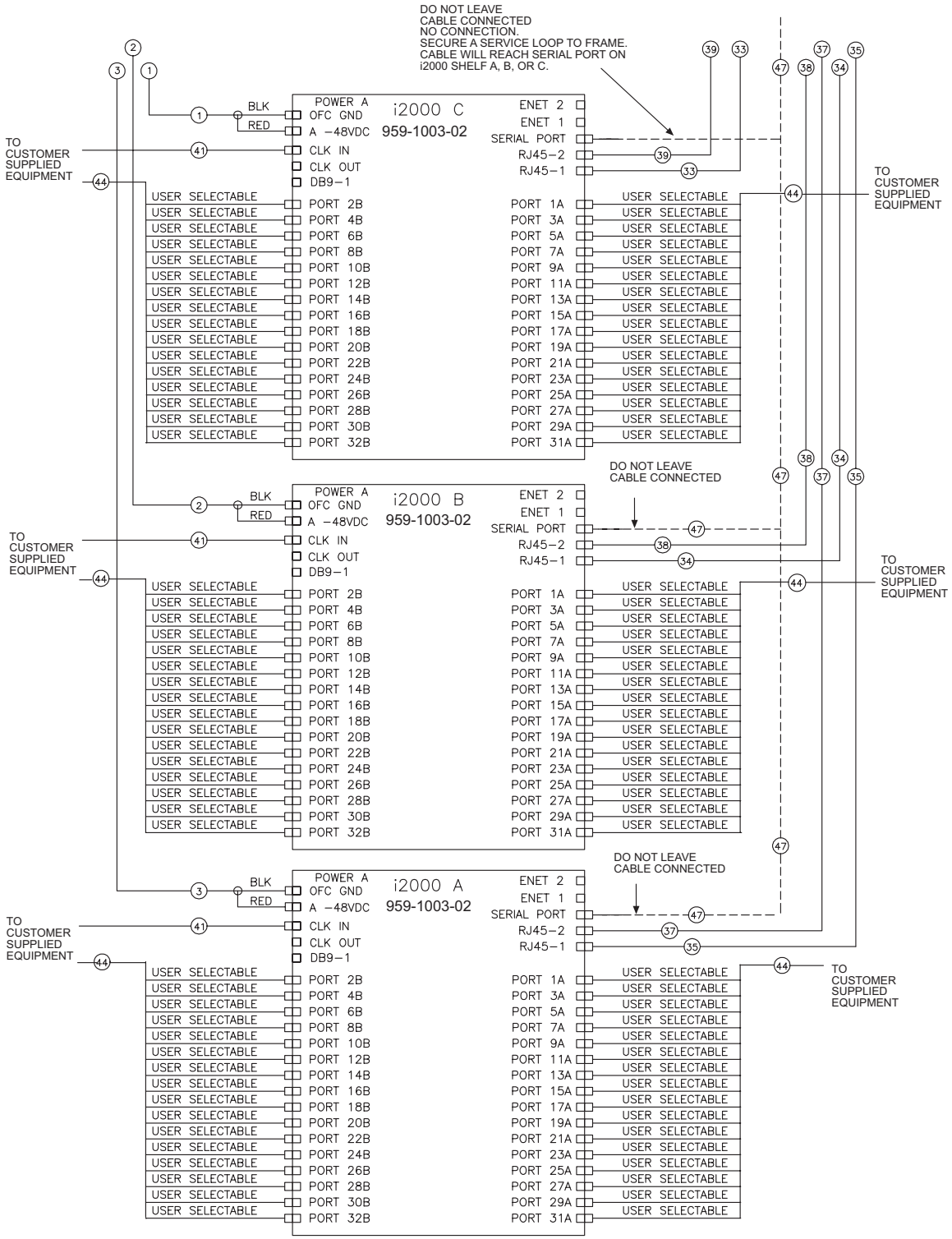


Table 3-12. Site Collector Cable Specifications

TABLE A -- POWER/GROUND CABLE PART NUMBERS					
Item No.	Part Number		Qty	Length (inches)	Comment
	North American	International			
1	830-0929-03	--	1	77	BP-1 POS 1B TO i2000 POS C
2	830-0929-02	--	1	80	BP-2 POS 1A TO i2000 POS B
3	830-0929-01	--	1	98	BP-1 POS 1A TO i2000 POS A
4	830-0930-01	--	1	50	BP-1 POS 2A TO F/R A-A POWER
5	830-0930-02	--	1	41	BP-2 POS 2B TO F/R A-B POWER
6	830-0930-03	--	1	49	BP-2 POS 2A TO F/R B-A POWER
7	830-0930-04	--	1	46	BP-1 POS 2B TO F/R B-B POWER
8	830-0930-05	--	1	54	BP-1 POS 3A TO F/R C-A POWER
9	830-0930-06	--	1	45	BP-2 POS 3B TO F/R C-B POWER
10	830-0868-17	--	1	45	BP-1 POS 7A TO HUB A POWER
11	830-0868-18	--	1	36	BP-2 POS 7BTO HUB B POWER
12	NOT USED				
13	NOT USED				
14	NOT USED				
15	NOT USED				
16	830-0822-01	--	1	14.38	HUB TO FRAME GROUND
17	830-0823-02	--	3	18	F/R TO FRAME GROUND
18	NOT USED				
19	NOT USED				
20	830-0715-01	830-1171-01	1	Site Specific	CHASSIS GROUND TO MAIN GROUND
21	830-0830-01	830-1181-01	2	N/A	CIRCUIT BREAKER TO FRAME GROUND
22	Chassis GND (Field Routed)		1	Site Specific	SEE TABLE D
23	-48VDC & 48V RTN (Field Routed)		8	Site Specific	SEE TABLE E
24	NOT USED				

Table 3-12. Site Collector Cable Specifications

25	NOT USED				
26	NOT USED				
27	NOT USED				
28	NOT USED				
29	NOT USED				
30	NOT USED				
TABLE C-- DATA CABLE PART NUMBERS					
Item No.	**Part Number**		**Qty**	**Length (inches)**	**Comment**
	North American	**International**			
31	830-0724-66	--	2	48	STRAIGHT THRU RJ45 TO RJ45 FROM: F/R A ERI-0 TO: HUB PORT 1 FROM: F/R B ERI-0 TO: HUB PORT 2
32	830-0724-01	830-1174-01	1	60	STRAIGHT THRU RJ45 TO RJ45 FROM: F/R C ERI-0 TO: HUB PORT 3
33	830-0724-06	830-1174-06	1	72	STRAIGHT THRU RJ45 TO RJ45 FROM: i2000 C PORT RJ45-1 TO: HUB PORT 4
34	830-0724-07	830-1174-07	1	84	STRAIGHT THRU RJ45 TO RJ45 FROM: i2000 B PORT RJ45-1 TO: HUB PORT 5
35	830-0724-67	830-1174-67	1	96	STRAIGHT THRU RJ45 TO RJ45 FROM: i2000 A PORT RJ45-1 TO: HUB PORT 6
36	830-0890-05	--	1	8	CROSS PINNED RJ45 TO RJ45 FROM: F/R A A LOM TO: F/R B SERIAL B
37	830-0723-63	--	1	96	CROSSOVER RJ45 TO RJ45 FROM: F/R A ERI-1 TO: i2000 A PORT RJ45-2
38	830-0723-64	--	1	84	CROSSOVER RJ45 TO RJ45 FROM: F/R B ERI-1 TO: i2000 B PORT RJ45-2
39	830-0723-65	830-1173-65	1	72	CROSS PINNED RJ45 TO RJ45 FROM: F/R C ERI-1 TO: i2000 C PORT RJ45-2
40	NOT USED				

Table 3-12. Site Collector Cable Specifications

41	958-0551-XX	--	A/R	Site Specific	CLOCK CABLE (i2000 SHELF)
42	NOT USED				
43	NOT USED				
44	SEE TABLE B		A/R	Site Specific	LINK INTERFACE CABLES USER SELECTABLE
45	804-1516-01	--	2	N/A	ADAPTER DB25 TO RJ45 TO: BREAKOUT BOX PORTS 6 & 7
46	Part of 804-1426-01		1	Site Specific	BREAKOUT BOX W/ CABLE (PART OF PCI CARD PN 804-1426-01) CONNECTS TO THE 78 PIN CONNECTOR IN PCI SLOT
47	830-0859-02	--	1	120	DB25 TO DB25 SERIAL CABLE FROM: BREAKOUT BOX PORT 0 TO: i2000 A,B, OR C SERIAL PORT
48	830-0836-03	830-1284-03	2	60	BREAKER ALARM DB25 TO RING TERMINALS FROM: BREAKOUT BOX PORT 3 TO: BP 1 ALARM FROM: BREAKOUT BOX PORT 4 TO: BP 2ALARM
49	830-0724-XX	830-1174-XX	1	Site Specific	TO CUSTOMER NETWORK - RJ45 STRAIGHT THRU
50	830-0724-06	830-1174-06	2	72	STRAIGHT THROUGH RJ45 TO RJ45 FROM: BREAKOUT BOX PORT 7 TO: F/R B- A LOM FROM: BREAKOUT BOX PORT 6 TO: F/R C- A LOM

Installing the Sentinel Server Frame

The Sentinel Server Frame contains the Base Sentinel Server and the Sentinel Alarm Management System, and optional servers. The Base Sentinel Server (BSS) and the Sentinel Alarm Management System (SAMS) are required for both the Integrated and Non-Integrated Sentinel products. The Sentinel Server Frame is site specific and can be populated with a variety of options relating to the configuration and provisioning of the Model 20 server.

The frame containing the Model 20 is the Sentinel Server Frame.

The two optional servers are:

- Traffic Database Server (TDS)
- Data Gateway Server (DGS)

The other optional servers listed directly above may be configured and linked in various combinations.Traffic Database Servers can be Netra-based or Tekelec 1000-based servers. For information on Tekelec 1000-based TDS, see Tekelec *1000 Application Server Hardware Manual*.

When maximally configured, the Server Frame contains:

- **2** Breaker Panels
- **1** Ethernet Switch
- **1** Console Server
- **4** Model 20 servers

Figure 3-38. Sentinel Server Frame

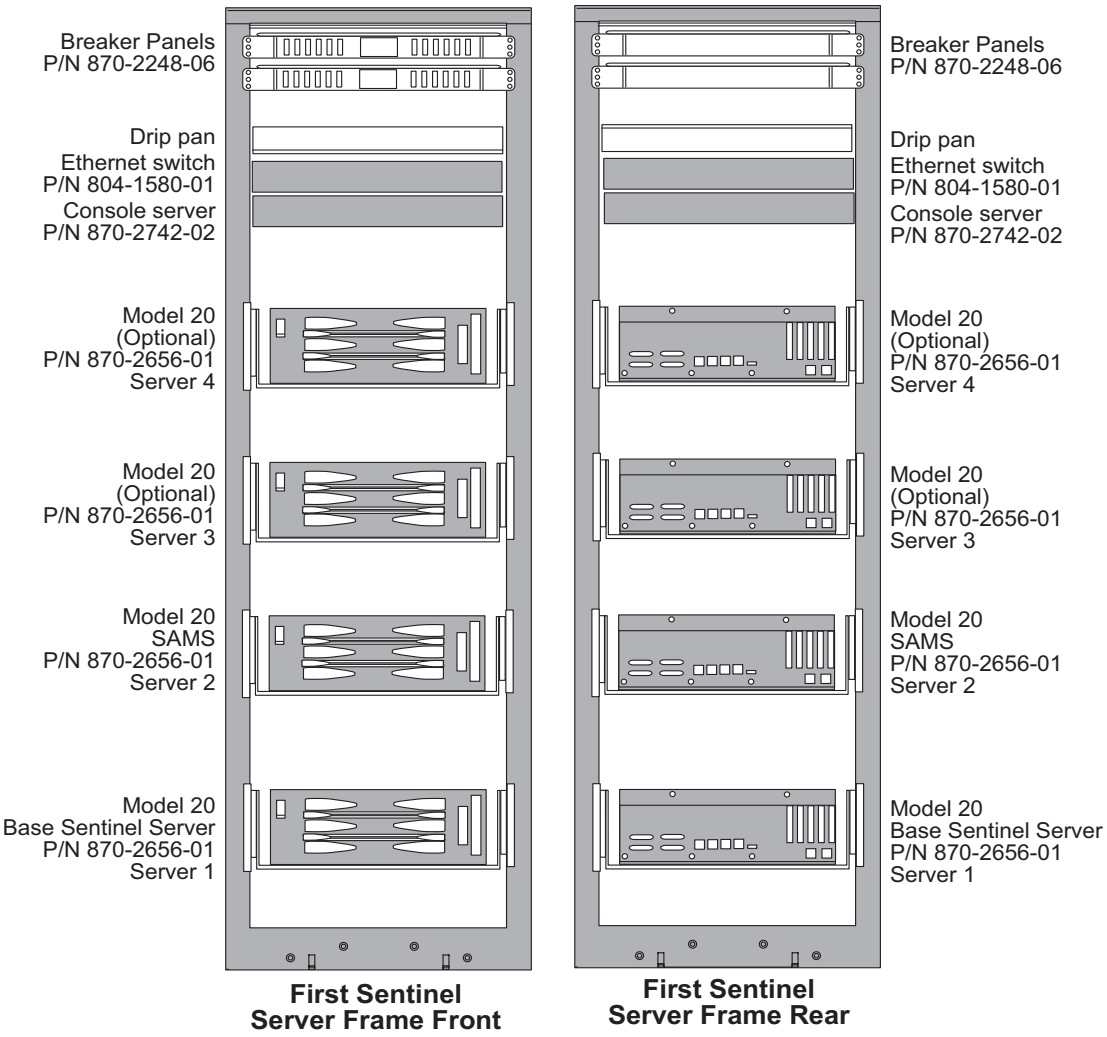


Table 3-13. Server Frame, Acronyms

Acronym	Name	Equipment
SSF	Sentinel Server Frame	Frame plus model 20 Server
BSS	Base Sentinel Server	Model 20 Server
SAMS	Sentinel Alarm Management System	
DGS	Data Gateway Server (optional)	
TDS	Traffic Database Server (optional) **NOTE: Beginning with Sentinel 11.2, the Traffic Database Server can be Netra-based or Tekelec 1000 based. Tekelec 1000-based TDS can be in an AC or DC environment. For information on Tekelec 1000-based TDS, see the Tekelec *1000 Application Server Hardware Manual*.**	

Server Frame, BP

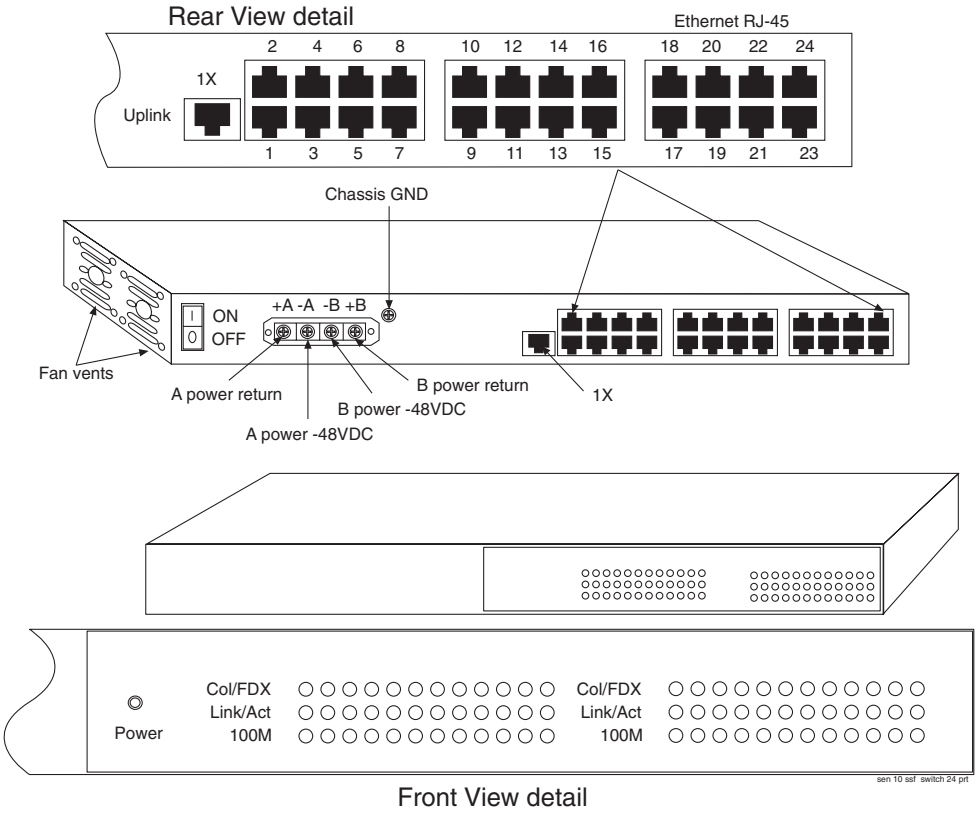
Breaker Panels (2) are the breaker panels in Sentinel server frames that support Sentinel products.

NOTE: Breaker Panels are the breaker panels in frames that support Sentinel products. See the information and the illustrations beginning with Figure 3-5, on page 3-10. These pages are referenced when breaker panels are referred to. The wiring diagrams and cable configurations are different but the breaker panels are typical. Individual breaker panels are labeled on the finger guard over the breaker with associated information.

Server Frame, Switch

Ethernet switch (P/N 804-1580-01) is part of assembly (P/N 870-2441-01) in the Sentinel Server Frame to support Sentinel products. See the information and the illustration Figure 3-39, on page 3-60.

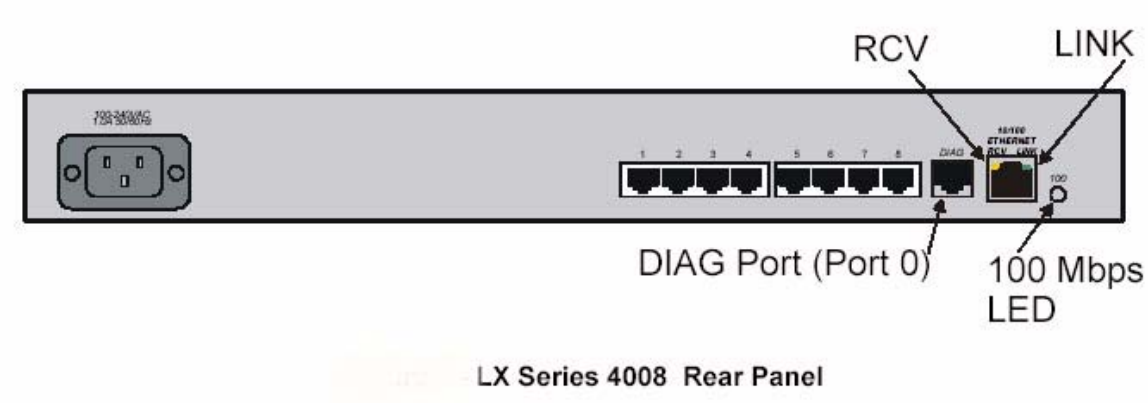
Figure 3-39. Ethernet Switch



Server Frame, Console Server

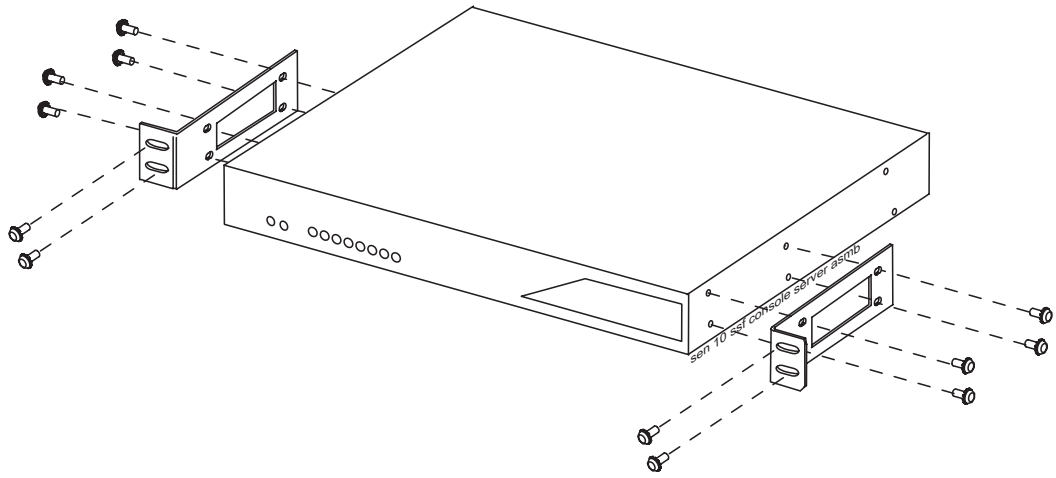
Figure 3-40. Console Server

Figure 3-41. Sentinel Server Frame Console Server



MRV™ Model LX Series 4008M with modem rear panel (console server) hardware in the Sentinel server frames that support Sentinel products.

Figure 3-42. Server Frame Console Server



Procedure — Mounting the Console Server

The three bottom screws hold the cover on the server.

1. To front-mount the server:
   Remove the front and center-top and bottom screws before attaching the rack mounted brackets.
   Insert the supplied screws through the brackets and into the same holes.

Figure 3-43. Sentinel Server Frame Console Server

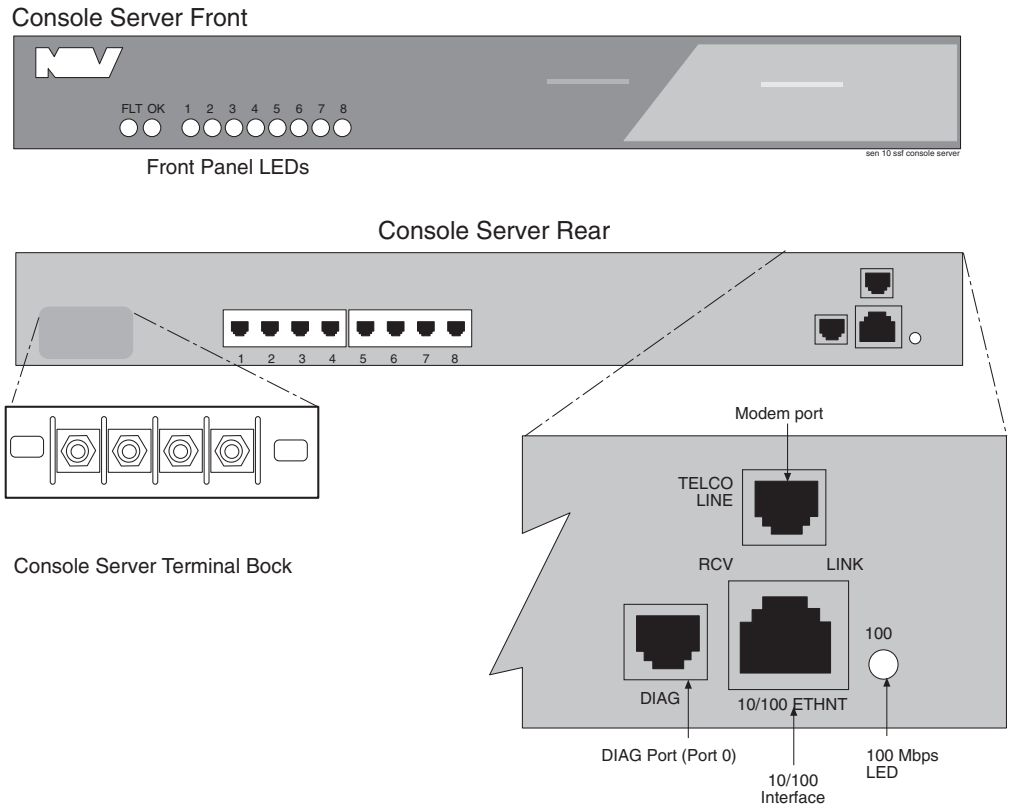


Table 3-14. Console Server, LEDs

LED Front	Description Front
FLT	Red indicates a fault condition exist or maintenance is required. This LED remains on until the initial Power On Shelf Test (POST) is completed successfully.
OK	Green indicates the system's voltage is normal and the server has passed POST test.
Port Status LEDs	All eight LEDs flash GREEN when receive, transmit, or status activity is detected on the corresponding serial port. The port status LEDs are used in several ways. During the initialization process, the LEDs indicate self-test plans are being performed, and if self-test fails, they indicate an error code. After the POST test and a system software boot, the LEDs indicate when a ports is actively being used.
LED Rear	**Description Rear**
100	Indicates 100 Mbps LED active.

Server Frame, Interconnect

Figure 3-44. Server Frame, BP

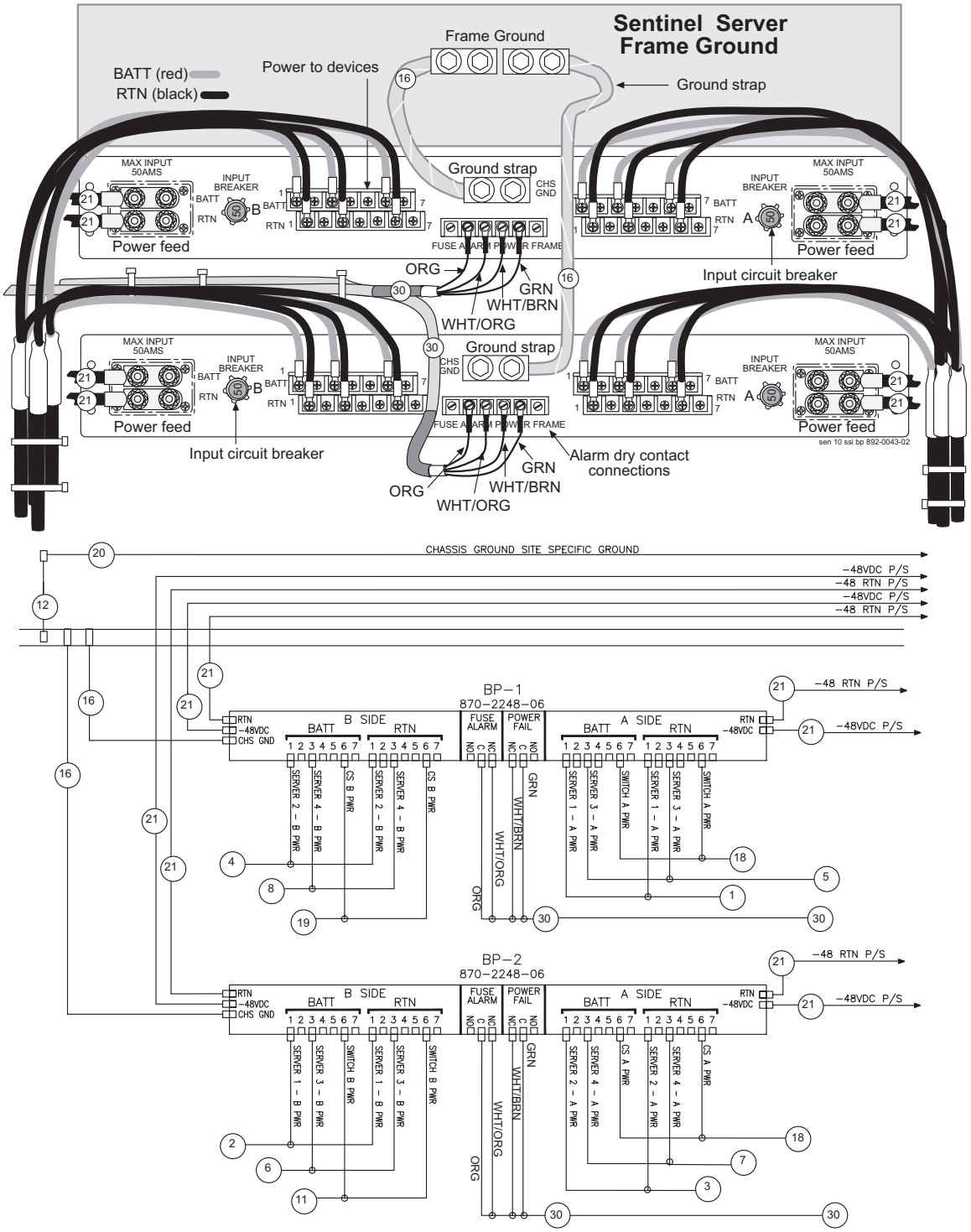


Figure 3-45. Server Frame, Interconnect

TABLE A — POWER/GROUND CABLE PART NUMBERS

ITEM NO.	TEKELEC P/N	QUANTITY	LENGTH	COMMENT
1	830−0931−01	1	103.00 INCHES	BP−1 POS 1A TO SERVER 1−A POWER
2	830−0931−02	1	106.00 INCHES	BP−2 POS 1B TO SERVER 1−B POWER
3	830−0931−03	1	84.00 INCHES	BP−2 POS 1A TO SERVER 2−A POWER
4	830−0931−04	1	93.00 INCHES	BP−1 POS 1B TO SERVER 2−B POWER
5	830−0931−05	1	72.00 INCHES	BP−1 POS 3A TO SERVER 3−A POWER
6	830−0931−06	1	75.00 INCHES	BP−2 POS 3B TO SERVER 3−B POWER
7	830−0931−07	1	50.00 INCHES	BP−2 POS 3A TO SERVER 4−A POWER
8	830−0931−08	1	60.00 INCHES	BP−1 POS 3B TO SERVER 4−B POWER
9	830-1003-01		24.00 INCHES	CHASSIS GROUND SWITCH
10	830−0868−25	1	42.00 INCHES	BP−1 POS 6A TO SWITCH−A POWER
11	830−0868−26	1	33.00 INCHES	BP−2 POS 6B TO SWITCH−B POWER
12	830−0715−01	1	36.00 INCHES	CHASSIS GROUND TO GROUND WINDOW
13	NOT USED			
14	830−0820−01	4	23.50 INCHES	GROUND, SLIDE SHELF TO FRAME
15	830−0907−03	4	16.00 INCHES	GROUND, NETRA 20 TO SLIDE SHELF
16	830−0830−01	2	N/A	GROUND, BP 1 AND 2 TO FRAME GROUND
17	830−0822−02	1	14.38 INCHES	GROUND, SWITCH FRAME GROUND
18	830−0868−27	1	41.00 INCHES	BP−2 POS 6A TO CONSOLE SERVER−A POWER
19	830−0868−28	1	38.00 INCHES	BP−1 POS 6B TO CONSOLE SERVER−B POWER
20	CHASSIS GND (FIELD ROUTED)	1	SITE SPECIFIC	SEE TABLE D
21	−48VDC AND 48V RTN (FIELD ROUTED)	8	SITE SPECIFIC	SEE TABLE C
22−29	NOT USED			

TABLE B — DATA CABLE PART NUMBERS

ITEM NO.	TEKELEC P/N	QUANTITY	LENGTH	COMMENT
30	830−1000−01	2	46.00 INCHES	BREAKER ALARM RING TERMINALS TO RJ45 FROM: BP 1 ALARM TO: CONSOLE SERVER PORT 6 FROM: BP 2 ALARM TO: CONSOLE SERVER PORT 7
31	830−0724−02	2	120.00 INCHES	STRAIGHT THRU RJ45 TO RJ45 FROM: SERVER 1 10/100 PORT TO: SWITCH PORT 3 FROM: SERVER 1 EHT PCI CARD TO: SWITCH PORT 7
32	830−0724−67	2	96.00 INCHES	STRAIGHT THRU RJ45 TO RJ45 FROM: SERVER 2 10/100 PORT TO: SWITCH PORT 4 FROM: SERVER 2 EHT PCI CARD TO: SWITCH PORT 8
33	830−0724−07	2	84.00 INCHES	STRAIGHT THRU RJ45 TO RJ45 FROM: SERVER 3 10/100 PORT TO: SWITCH PORT 5 FROM: SERVER 3 EHT PCI CARD TO: SWITCH PORT 9
34	830−0724−07	2	84.00 INCHES	STRAIGHT THRU RJ45 TO RJ45 FROM: SERVER 4 10/100 PORT TO: SWITCH PORT 6 FROM: SERVER 4 EHT PCI CARD TO: SWITCH PORT 10
35	NOT USED			
36	830−0724−XX	1	SITE SPECIFIC	TO CUSTOMER NETWORK − RJ45 STRAIGHT THRU
37	830−0724−XX	A/R	SITE SPECIFIC	TO CUSTOMER SUPPLIED TERMINAL
38	830−1001−01	1	NA	ADAPTER−CONSOLE SERVER TO NETRA
39	830−0990−09	1	108.00	CONSOLE CABLE RJ45 TO RJ45 FROM SERVER 1 LOM PORT TO: CONSOLE SERVER PORT 1
40	830−0990−08	1	108.00	CONSOLE CABLE RJ45 TO RJ45 FROM SERVER 2 LOM PORT TO: CONSOLE SERVER PORT 2
41	830−0990−07	1	108.00	CONSOLE CABLE RJ45 TO RJ45 FROM SERVER 3 LOM PORT TO: CONSOLE SERVER PORT 3
42	830−0990−06	1	108.00	CONSOLE CABLE RJ45 TO RJ45 FROM SERVER 4 LOM PORT TO: CONSOLE SERVER PORT 4
43	870-0724-66	−	−	
44	830−0990−10	1	108.00	CONSOLE CABLE RJ45 TO RJ45 FROM: SERVER 1 SERIAL PORT TO: CONSOLE SERVER DIAG PORT
45	SITE SPECIFIC	1	SITE SPECIFIC	POTS LINE FOR DIAL IN ACCESS
46	NOT USED			
47	NOT USED			
48	NOT USED			
49	NOT USED			
50	NOT USED			

sen 10 892-0043-02_tables a-b

Table 3-15. Server Frame, Legends A and B

TABLE A -- POWER/GROUND CABLE PART NUMBERS					
Item No.	Part Number		Qty	Length (inches)	Comment
	North American	International			
1	830-0931-01	--	1	103	BP-1 POS 1B TO i2000 POS C
2	830-0931-02	--	1	106	BP-2 POS 1A TO i2000 POS B
3	830-0931-03	--	1	84	BP-2 POS 1A TO i2000 POS A
4	830-0931-04	--	1	93	BP-1 POS 2A TO F/R A-A POWER
5	830-0931-05	--	1	72	BP-1 POS 2B TO F/R A-B POWER
6	830-0931-06	--	1	75	BP-2 POS 2A TO F/R B-A POWER
7	830-0931-07	--	1	50	BP-2 POS 2B TO F/R B-B POWER
8	830-0931-08	--	1	60	BP-1 POS 3A TO F/R C-A POWER
9	830-1003-01	830-1273-01		24	CHASSIS GROUND SWITCH
10	830-0868-25	--	1	42	BP-1 POS 6A TO SWITCH-A POWER
11	830-0868-26	--	1	33	BP-2 POS 6B TO SWITCH-B POWER
12	830-0715-01	830-1171-01	1	36	CHASSIS GROUND TO GROUND WINDOW
13	NOT USED				
14	830-0820-01	--	4	23.5	GROUND, SLIDE SHELF TO FRAME
15	830-0907-03	--	4	16	GROUND, NETRA 20 TO SLIDE SHELF
16	830-0830-01	830-1181-01	2	N/A	GROUND, BP 1 & 2 TO FRAME GROUND
17	830-0822-02	--	1	14.38	GROUND, SWITCH FRAME GROUND
18	830-0868-27	830-1235-27	1	41	BP-2 POS 6A TO CONSOLE SERVER-A POWER
19	830-0868-28	830-1235-28	1	38	BP-1 POS 6B TO CONSOLE SERVER-B POWER
20	Chassis GND (Field Routed)		1	Site Specific	SEE TABLE D

Table 3-15. Server Frame, Legends A and B (Continued)

21	-48VDC & 48V RTN (Field Routed)		8	Site Specific	SEE TABLE C
22-29	NOT USED				

TABLE B -- DATA CABLE PART NUMBERS

Item No.	Part Number		Qty	Length (inches)	Comment
	North American	International			
30	830-1000-01	830-1211-01	2	46	BREAKER ALARM RING TERMINALS TO RJ45 FROM: BP 1 ALARM TO: CONSOLE SERVER PORT 6 FROM: BP 2 ALARM TO: CONSOLE SERVER PORT 7
31	830-0724-02	830-1174-02	2	120	STRAIGHT THRU RJ45 TO RJ45 FROM: SERVER 1 10/100 PORT TO: SWITCH PORT 3 FROM: SERVER 1 ETH PCI CARD TO: SWITCH PORT 7
32	830-0724-67	830-1174-67	2	96	STRAIGHT THRU RJ45 TO RJ45 FROM: SERVER 2 10/100 PORT TO: SWITCH PORT 4 FROM: SERVER 2 ETH PCI CARD TO: SWITCH PORT 8
33	830-0724-07	830-1174-07	2	84	STRAIGHT THRU RJ45 TO RJ45 FROM: SERVER 3 10/100 PORT TO: SWITCH PORT 5 FROM: SERVER 3 ETH PCI CARD TO: SWITCH PORT 9
34	830-0724-07	830-1174-07	2	84	STRAIGHT THRU RJ45 TO RJ45 FROM: SERVER 4 10/100 PORT TO: SWITCH PORT 6 FROM: SERVER 4 ETH PCI CARD TO: SWITCH PORT 10
35	NOT USED				
36	830-0724-XX	830-1174-XX	1	Site Specific	TO CUSTOMER NETWORK - RJ45 STRAIGHT THRU
37	830-0724-XX	830-1174-XX	A/R	Site Specific	TO CUSTOMER SUPPLIED TERMINAL
38	830-1001-01	--	1	N/A	ADAPTER-CONSOLE SERVER TO NETRA

Table 3-15. Server Frame, Legends A and B (Continued)

39	830-0990-09	830-1209-09	1	108	CONSOLE CABLE RJ45 TO RJ45 FROM: SERVER 1 LOM PORT TO: CONSOLE SERVER PORT 1
40	830-0990-08	830-1209-08	1	108	CONSOLE CABLE RJ45 TO RJ45 FROM: SERVER 2 LOM PORT TO: CONSOLE SERVER PORT 2
41	830-0990-07	830-1209-07	1	108	CONSOLE CABLE RJ45 TO RJ45 FROM: SERVER 3 LOM PORT TO: CONSOLE SERVER PORT 3
42	830-0990-06	830-1209-06	1	108	CONSOLE CABLE RJ45 TO RJ45 FROM: SERVER 4 LOM PORT TO: CONSOLE SERVER PORT 4
43	830-0724-66	--	--	--	
44	830-0990-10	830-1209-10	1	108	CONSOLE CABLE RJ45 TO RJ45 FROM: SERVER 1 SERIAL PORT TO: CONSOLE SERVER DIAG PORT
45	Site Specific		1	Site Specific	POTS LINE FOR DIAL IN ACCESS
46	NOT USED			Site Specific	
47	NOT USED				
48	NOT USED				
49	NOT USED				
50	NOT USED				

Packet Backplane Chassis

This section provides instructions for handling the Packet Based Chassis (PBC). For infomation on how to prepare floors and install Tekelec heavy-duty frames for both Netra-based servers and Tekelec 1000-based servers, see the Tekelec *1000 Application Server Hardware Manual*.

The Packet Backplane Chassis consists of the following standard features:

- Steel Packet Backplane Chassis (PBC) with high frequency shielding for protection against radiation and interference.
- 12U (21 inches) height chassis with 23-inch rack mount options.
- 21-slot Compact Peripheral Component Interconnect (cPCI) backplane.
- Two 2.16 compliant redundant CPSB Switch Module (CSM) cards.
- 17 PCI Industrial Computer Manufactures Group (PICMG) 2.16 compliant node slots.
- Replaceable chassis front Air Filter.
- Two hot-swappable, high performance fan trays with four fans mounted in each Fan Tray.
- Three 500w hot-swappable, N+1 redundant Power Supplies.
- Dual wide-ranging DC inputs.
- Power circuit breakers accessible on the back panel.
- Front access service and installation of cards, fans, and Power Supplies.
- Access to rear transition cards.

Taking ESD and Antistatic Precautions

When handling circuit cards and associated internal computer components, use an antistatic wrist strap.

CAUTION: Circuit cards and associated system components are sensitive to Electro Static Discharge (ESD) and can be damaged by ESD. To avoid damaging cards or components, take appropriate precautions when handling them.

- Plug in the anti-static grounding wire from the wrist strap to the grounding plug on the service panel or to the grounding plug on the DC power input panel on the rear.
- Plug in the card and lock the handles on the card firmly onto the front panel.
- Tighten the retaining screws in the handles.
- Provide adequate space around the fans and all air inlets and outlets for successful airflow. Insufficient cooling may cause the operating system software to fail with resultant serious hardware damage.
- Use shielded Ethernet cables.

CAUTION: To avoid damage to the cards or Field Replaceable Units (FRUs) installed before the delivery of the system, Do Not reseat FRUs or cards in this system. Install cards only in the designated slots.

PBC Handling the Chassis

Due to the weight of the fully loaded chassis at least two technicians are required for transport and installation of this shelf.

Procedure — Unpacking the PBC

1. Make sure the packing carton is upright. (Shelves may be shipped in a wooden crate).
2. Carefully cut the sealing tape with a box cutter and open the box.
3. Remove the cardboard packing and any other packing material carefully from the box.
4. Lift up the chassis carefully out of the carton.
5. Visually inspect the product for any physical damage.
6. Report any product damage immediately to Tekelec.
7. Do not block any area with used packing material.
8. Move the chassis to the location designated for installation.
9. Properly dispose of any used packing material that is not to be returned to Tekelec.

A

LED Information

Introduction

This section contains Light Emitting Diode (LED) information for circuit cards in this system. This section assists maintenance personnel in troubleshooting.

WARNING: Use the antistatic wrist strap connected to the wrist strap grounding point when handling any card components.

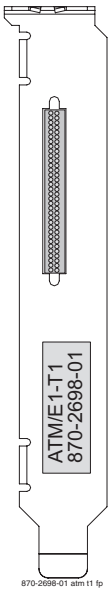
The Systems are configured with card modules (cards) that provide specific functions and services. Cards are connected to the shelf backplane through connectors located on the rear of the card. Cam-out/lock-in levers, mounted on the front edge of the card, assist in insertion and removal of the card. Part numbers, LEDs, Text and Bar codes are also located on the front of the cards.

To remove a card use both hands to toggle the levers out from the face of the card. To insert a card, align the card in the slot, push slowly in until the connectors engage and press both levers in until they lock the card in place. To ensure proper seating, the toggle levers must be held in the release position until the locking tabs can engage the upper and lower flange on the shelf. Once the locking tabs on the levers engage the shelf plane, the levers are pressed in toward the card faceplate, and must be flush with the faceplate when the card is completely seated.

Card LEDs and Faceplates

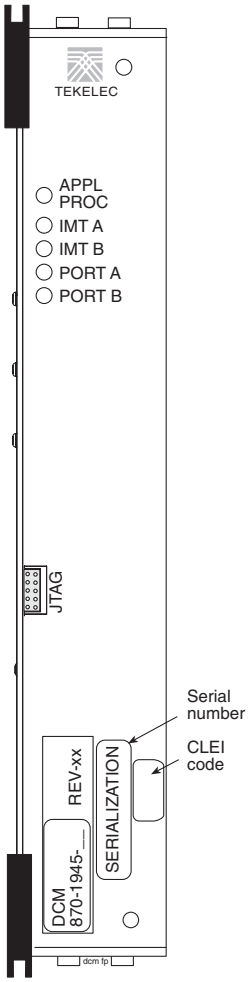
ATM E1/T1 Card

Figure A-1. ATM E1/T1 Card



DCM, Database Communications Module; DSM, Database Service Module

Figure A-2. DCM and DSM LEDs

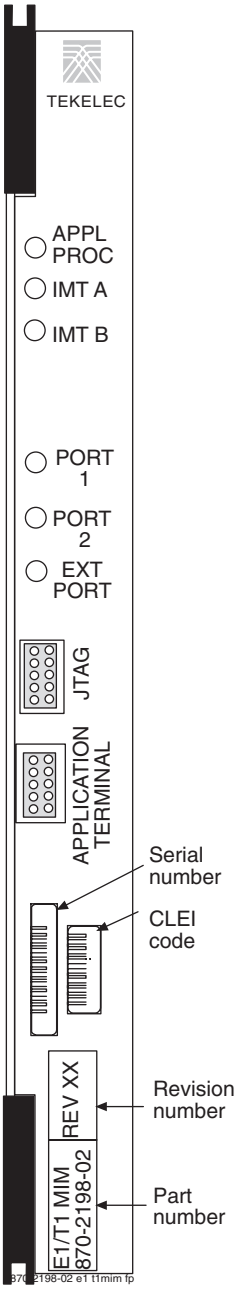


LEDs	Descriptions
APPL PROC	RED – Critical alarm condition detected. GREEN – No alarm
IMT A	RED – Major alarm condition detected. GREEN – No alarm
IMT B	AMBER – Minor alarm condition detected. GREEN – No alarm
PORT A	GREEN – PORT A is the active PORT. RED – PORT A is inactive
PORT B	GREEN – PORT B is the active PORT. RED – PORT B is inactive.

E1/T1 MIM, E1/T1 Multichannel Interface Module

European and North American standard for signaling and channels MIM (Multi-channel Interface Module).

Figure A-3. E1/T1 MIM)



LEDs	Descriptions
APPL PROC	RED – Critical alarm condition detected GREEN – No alarm
IMT A	RED – Major alarm condition detected GREEN – No alarm
IMT B	AMBER – Minor alarm condition detected GREEN – No alarm
PORT 1	AMBER – Card is an E1-T1 Channel Card GREEN – All channels provisioned =ISNR AMBER BLINKING – Any channels provisioned = OOS RED BLINKING – All channels provisioned = OOS RED – No channels are provisioned
PORT 2	AMBER – Card is an E1-T1 Channel Card GREEN – All channels provisioned =ISNR AMBER BLINKING – Any channels provisioned = OOS RED BLINKING – All channels provisioned = OOS RED – No channels are provisioned
EXT PORT	AMBER – Card is an E1-T1 Master Card GREEN – All channels provisioned =ISNR AMBER BLINKING – Any channels provisioned = OOS RED BLINKING – All channels provisioned = OOS RED – No channels are provisioned
OOS	Out of service

E5-E1T1, E5-E1T1 Interface Module

Figure A-4. E5-E1T1 Interface Module

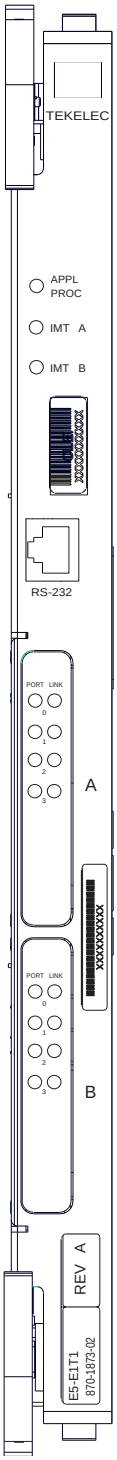
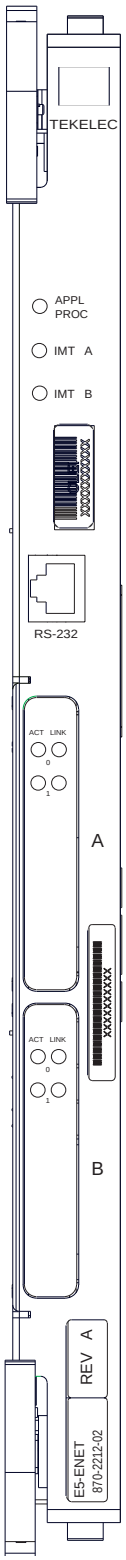


Table A-1. E5-E1T1 LED

LED	Color	Descriptions
APPL PROC	Red	Application processor is not running or is failing diagnostics.
	Amber	Card is loading an application or is being polled (may be prevented from loading by maintenance-out-of-service condition)
	Green	Card is running an application.
IMT	Red	Card is off IMT bus
	Amber	Card is on IMT bus, but testing is not complete.
	Green	Card is on IMT bus
	Off	Communication processor is not operating.
Port	Red	Port not provisioned
	Red blinking	Loss of signal and remaining errors
	Amber	Remote alarm condition
	Amber blinking	Loss of Frame Synchronization
	Green	No alarms, port has acquired timing and framing synchronization
LINK	Red	No channels are provisioned
	Red blinking	All channels provisioned = OOS
	Amber	Indicates port is the “reflected” port in Channel Bridging mode of operation. Applies only to “even” numbered ports
	Amber blinking	Any channels provisioned = OOS
	Green	All channels provisioned =ISNR

E5-ENET, E5 -ENET Interface Module

Figure A-5. E5-ENET Interface Module



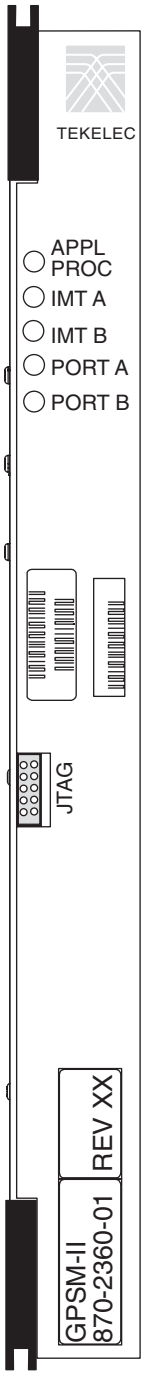
LED	Color	Descriptions
APPL PROC	Red	Application processor is not running or is failing diagnostics.
	Amber	Card is loading an application or is being polled (may be prevented from loading by maintenance-out-of-service condition)
	Green	Card is running an application.
IMT	Red	Card is off IMT bus
	Amber	Card is on IMT bus, but testing is not complete.
	Green	Card is on IMT bus
	Off	Communication processor is not operating.
ACT	Red	Signaling links inactive, or 1 or more active links are out-of-service
	Green	All active links are in-service
	Off	Card nonfunctional
LINK	Red	N/A
	Green	Ethernet signal detected
	Off	No Ethernet signal detected

NOTE 1: ACT/LINK A1 and B1 are for future use.

NOTE 2: The E5-ENET is provisionable for IPLIMx or IPGWx, but does not support both functions on a single card simultaneously.

GPSM-II, General Purpose Service Module

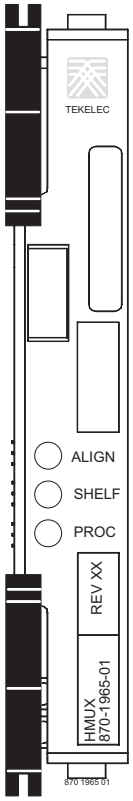
Figure A-6. GPSM-II



LEDs	Descriptions
APPL PROC	RED – Critical alarm condition detected. GREEN – No alarm
IMT A	RED – Major alarm condition detected. AMBER – Minor alarm condition detected. GREEN – No alarm
IMT B	RED – Major alarm condition detected. AMBER – Minor alarm condition detected. GREEN – No alarm
PORT A	GREEN – PORT A is the active PORT. RED – PORT A is inactive
PORT B	GREEN – PORT B is the active PORT. RED – PORT B is inactive.

HMUX, High-Speed Multiplexer

Figure A-7. HMUX LEDs



LEDs	Descriptions
ALIGN	AMBER – Programming FPGA complete GREEN – Complete code initialization (stays Amber until the first valid Shelf ID is received from MASP), Code running
SHELF ID	AMBER – Programming FPGA complete, Complete code initialization RED – While code running if ID address received from OAM **does not** match the on-board stored address read from the assigned shelf address register (see first note below) GREEN – While code running if ID address received from OAM matches the on-board stored address read from the assigned shelf address register (see second note below)
PROC Health	RED – Power on Reset AMBER – Programming FPGA GREEN – Programming FPGA complete, Complete code initialization, Code running

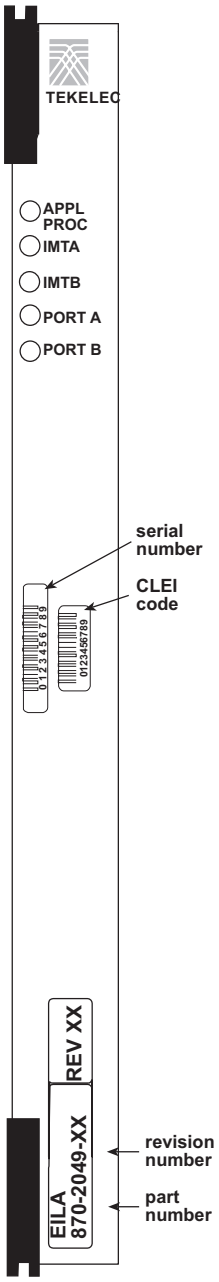
NOTE 1: The LED color state change during power up and reset happens within one second. To determine operating status, wait until reset is over.

NOTE 2: At start up, each HMUX card receives an ID address from the OAM. The HMUX card stores this address in on-board memory, in register FF. Every five seconds, the OAM re-sends the same addresses to the HMUX cards, which compare the re-send with the address that the HMUX cards previously received and stored in memory. If the address sent to an HMUX card by OAM does not match the stored address, the HMUX Illegal Address Error alarm will cause the Shelf LED color to change to RED.

LIM-ATM, LIM-AINF, LIM-E1, LIM, EILA, ILA

ATM Link Interface Module, AINF Link Interface Module, E1 Link Interface Module, Enhanced Integrated LIM AINF, Integrated LIM AINF.

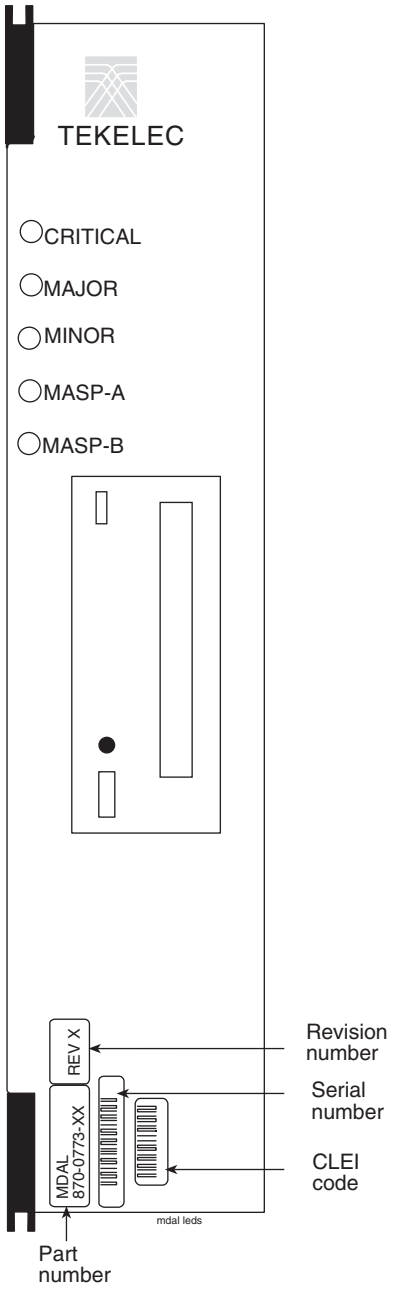
Figure A-8. LIM LEDs



LEDs	Descriptions
APPL PROC	RED – Application processor is not running or is failing diagnostics. AMBER – LIM is loading an application or is being polled (may be prevented from loading by maintenance out of service condition). GREEN – LIM is running an application. RED/GREEN – Operational, no communication with MASP
IMTA	RED – LIM is off IMT bus A. AMBER – LIM is on IMT bus A, but testing is not complete. GREEN – LIM is on IMT bus A. BLANK – Communication processor is not operating.
IMTB	RED – LIM is off IMT bus B. AMBER – LIM is on IMT bus B, but testing is not complete. GREEN – LIM is on IMT bus B. BLANK – Communication processor is not operating.
PORT A	RED – Link is out of service. AMBER – Link is attempting to align GREEN – Link is aligned and in service.
PORT B	RED – Link is out of service. AMBER – Link is attempting to align GREEN – Link is aligned and in service.

MDAL, Maintenance Disk and Alarm Card

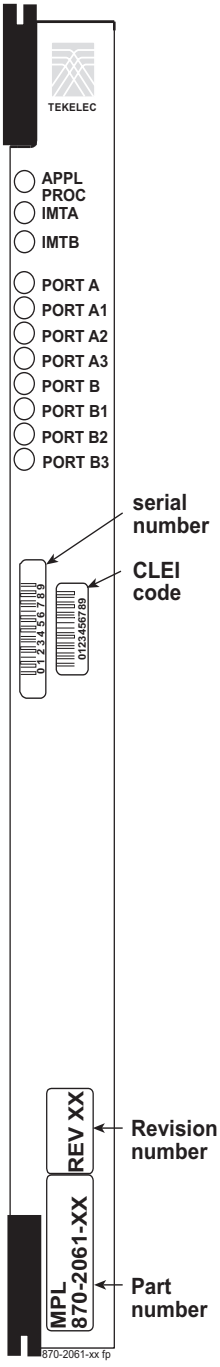
Figure A-9. MDAL LEDs



LEDs	Descriptions
CRITICAL	RED – Critical alarm condition detected GREEN – No alarm
MAJOR	RED – Major alarm condition detected GREEN – No alarm
MINOR	AMBER – Minor alarm condition detected GREEN – No alarm
MASP-A	GREEN – MASP-A is the active MASP OFF – MASP-A is the standby MASP or is not present
MASP-B	GREEN – MASP-B is the active MASP OFF – MASP-B is the standby MASP or is not present

MPL LIM, Multi-Port Link Interface Module

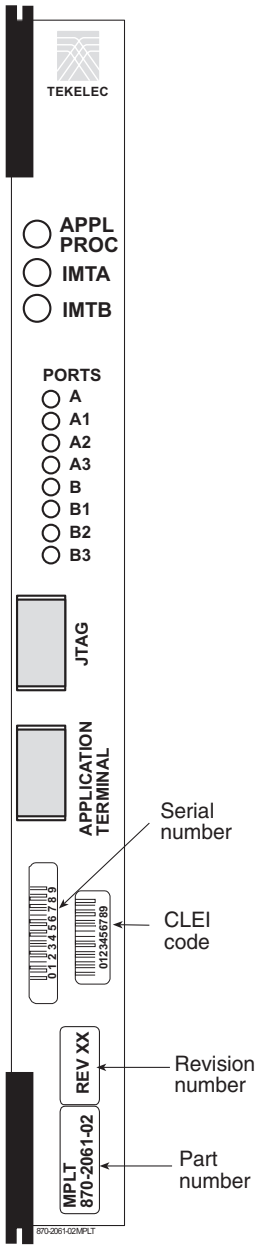
Figure A-10. MPL LEDs



LEDs	Descriptions
APPL PROC	RED – Application processor is not running or is failing diagnostics. AMBER – MPL is loading an application or is being polled (may be prevented from loading by maintenance out of service condition). GREEN – MPL is running an application. RED/GREEN (Alternating) Operational but no communication with MASP
IMTA	RED – MPL is off IMT bus A. AMBER – MPL is on IMT bus A, but testing is not complete. GREEN – MPL is on IMT bus A. BLANK – Communication processor is not operating.
IMTB	RED – MPL is off IMT bus B. AMBER – MPL is on IMT bus B, but testing is not complete. GREEN – MPL is on IMT bus B. BLANK – Communication processor is not operating.
PORT A	RED – Link is out of service. AMBER – Link attached to Port is attempting to align GREEN – Link is aligned and in service. RED/GREEN (alternating) – Link attached to Port is in a loop-back condition.
PORT A1	RED – Link is out of service. AMBER – Link attached to Port is attempting to align GREEN – Link is aligned and in service. RED/GREEN (alternating) – Link attached to Port is in a loop-back condition.
PORT A2	RED – Link is out of service. AMBER – Link attached to Port is attempting to align GREEN – Link is aligned and in service. RED/GREEN (alternating) – Link attached to Port is in a loop-back condition.
PORT A3	RED – Link is out of service. AMBER – Link attached to Port is attempting to align GREEN – Link is aligned and in service. RED/GREEN (alternating) – Link attached to Port is in a loop-back condition.
PORT B	RED – Link is out of service. AMBER – Link attached to Port is attempting to align GREEN – Link is aligned and in service. RED/GREEN (alternating) – Link attached to Port is in a loop-back condition.
PORT B1	RED – Link is out of service. AMBER – Link attached to Port is attempting to align GREEN – Link is aligned and in service. RED/GREEN (alternating) – Link attached to Port is in a loop-back condition.
PORT B2	RED – Link is out of service. AMBER – Link attached to Port is attempting to align GREEN – Link is aligned and in service. RED/GREEN (alternating) – Link attached to Port is in a loop-back condition.
PORT B3	RED – Link is out of service. AMBER – Link attached to Port is attempting to align GREEN – Link is aligned and in service. RED/GREEN (alternating) – Link attached to Port is in a loop-back condition.

MPLT, Multi-Port LIM with Taxi Component

Figure A-11. MPLT LEDs



LEDs	Descriptions
APPL PROC	RED – Application processor is not running or is failing diagnostics. AMBER – MPL is loading an application or is being polled (may be prevented from loading by maintenance out of service condition). GREEN – MPL is running an application.
IMTA	RED – MPL is off IMT bus A. AMBER – MPL is on IMT bus A, but testing is not complete. GREEN – MPL is on IMT bus A. BLANK – Communication processor is not operating.
IMTB	RED – MPL is off IMT bus B. AMBER – MPL is on IMT bus B, but testing is not complete. GREEN – MPL is on IMT bus B. BLANK – Communication processor is not operating.
PORT A	RED – Link is out of service. GREEN – Link is aligned and in service.
PORT A1	RED – Link is out of service. GREEN – Link is aligned and in service.
PORT A2	RED – Link is out of service. GREEN – Link is aligned and in service.
PORT A3	RED – Link is out of service. GREEN – Link is aligned and in service.
PORT B	RED – Link is out of service. GREEN – Link is aligned and in service.
PORT B1	RED – Link is out of service. GREEN – Link is aligned and in service.
PORT B2	RED – Link is out of service. GREEN – Link is aligned and in service.
PORT B3	RED – Link is out of service. GREEN – Link is aligned and in service.

Integrated Applications LEDs

Visual alarms and operational status are indicated on the front of all components with Light Emitting Diodes (LEDs). This section describes these LEDs.

Field Replaceable Unit (FRU) component failures can be diagnosed using the LEDs with the referenced tables in this chapter. For replacement procedures, refer to the *Maintenance Manual* included in your current Documentation Suite.

Alarms for vendor-supplied equipment are referenced in associated documentation supplied with your system. For server conditions that are tested and abnormalities reported, alarm information is logged in the server and sent to an attached workstation.

A workstation connected to the system must be running the Network Event Monitoring System (NEMS) application for alarm notification. To display system information at the workstation, the System Status Display (SSD) application must be selected from the application menu. For additional information about the NEMS, SSD, and other system administration applications, refer to your system's user guide.

Breaker Panel LEDs

The visual alarm indicators are on the front of the breaker panel. Refer to Figure A-12 for breaker panel LED locations. Table A-2 describes the breaker panel alarm LED indications.

Figure A-12. Breaker Panel LEDs

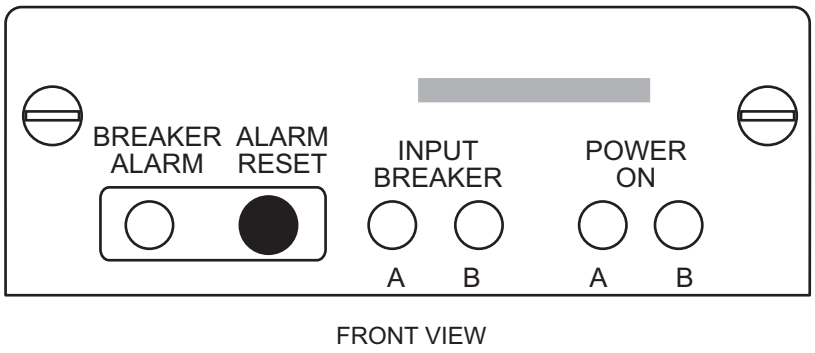


Table A-2. Beaker Panel LED Description

LED	Color	Description
Power On A	Green	Lights whenever Side A is receiving input power (LED will remain lit even if the input breaker has tripped)
Power On B	Green	Lights whenever Side B is receiving input power (LED will remain lit even if the input breaker has tripped)
Breaker Alarm	Red	Lights whenever an output circuit breaker has tripped or turned off
Input Breaker A/B	Green	Lights whenever Side A/B is receiving input power (Not lit if input breaker is tripped)

Host Server LEDs

The LEDs on the front and rear of the host server indicate the current status of the system. Refer to Figure A-13 for a view of the front LEDs. Table A-3 describes the LED indicators on the front and rear of the server.

Figure A-13. Host Server LEDs

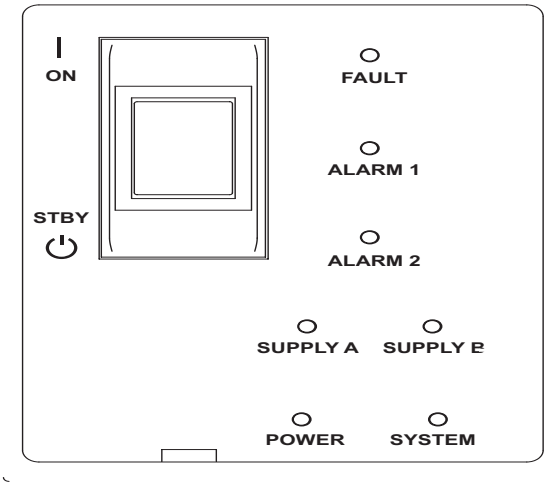


Table A-3. Host Server LED Descriptions

LED	Color	Description
FAULT	Amber	Flashes when a fan or Power Supply Unit (PSU) has failed Lights continuously when manually switched on
ALARM 1	Amber	Illuminated when the VX*i* MGC server critical alarms are present
ALARM 2	Amber	Illuminated when the VX*i* MGC server major alarms are present
SUPPLY A	Green	Lights whenever DC input A is present on all fitted PSUs
SUPPLY B	Green	Lights whenever DC input B is present on all fitted PSUs
POWER	Green	Lights at all times when the system is on
SYSTEM	Green	Off (or reset) during power up procedures Lights when UNIX is running and the alarms driver is installed **NOTE: This LED is reset by a hardware watchdog time-out or whenever user-defined Alarm 3 is asserted**
LINK	Green	Located on Quad Fast Ethernet card in slot 1 at the rear of the server. LED indicators from top to bottom correspond to QFE0 to QFE3. Lights when links are connected.

Hub LEDs

Figures A-14 shows the front view of the hub indicating L.ED locations. Table A-4 describes the LEDs on the front of the hub.

Figure A-14. Hub Front View

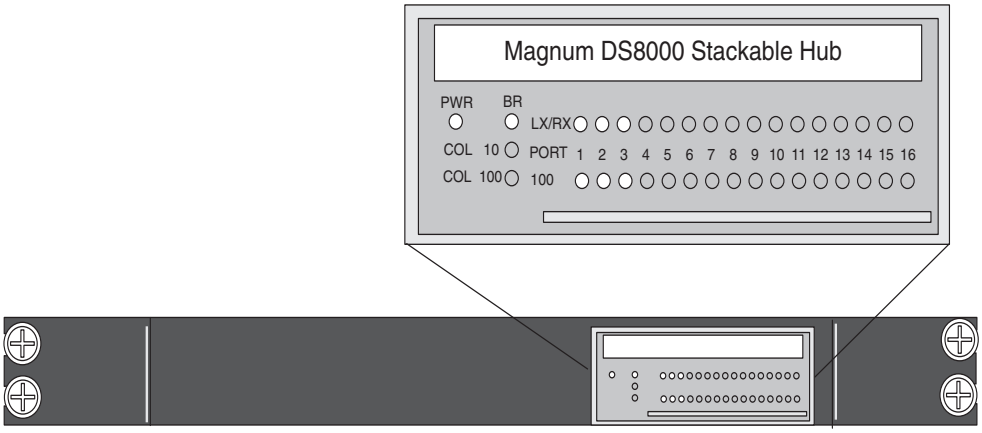


Table A-4. Hub Front LEDs

LED	Color	Description
PWR	Green	Lights when -48VDC power is applied
COL 10	Red	Blinks intermittently when a collision occurs in the 10 Mb domain
COL 100	Red	Blinks intermittently when a collision occurs in the 100 Mb domain
BR	Green	Lights when the 10/100 Mb bridge module is installed
100 (Per Port)	Green	• Lights when port speed is 100 Mb • Unlit when speed is 10 Mb • Blinks when link is not connected or when auto-negotiating
LK/RX (Per Port)	Green	• Lights steadily when port is operational • Blinks when port is receiving data or is not connected

Router LEDs

Three routers are configured by Tekelec for NEBS compliancy. Two are configured as isolation routers and one is configured as a dial-in router. Figure A-15 shows the positions of LED indicators on the front of the routers and Table A-5 describes the front LED functions.

Figure A-15. Front View Routers

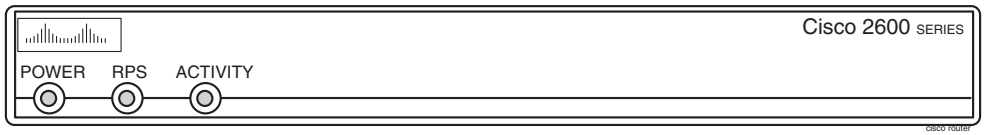


Table A-5. Routers - Front LEDs

LED	Description
PWR	Indicates when power is present to the router.
RPS	Off when the redundant power supply is not present. On redundant power supply is present and functional.
Activity	Off-No network activity Blink-(500 ms ON and 500ms OFF) in ROMMON no errors detected. Blink-(500 ms ON and 500ms OFF two seconds between codes) in ROMMON and error detected

Figures A-16 and A-17 show the rear views of the Isolation and Dial-In routers. Link (LNK) and activity (ACT) LEDs are located near each ethernet port at the rear of the routers. Table A-6 describes the rear LED indicators.

Figure A-16. Rear View Isolation Router

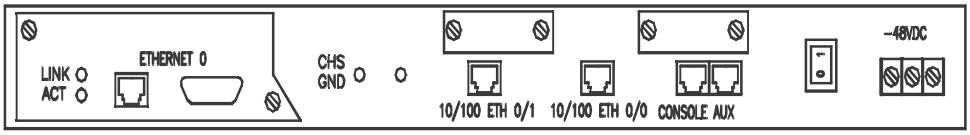


Figure A-17. Rear View Dial-in Router

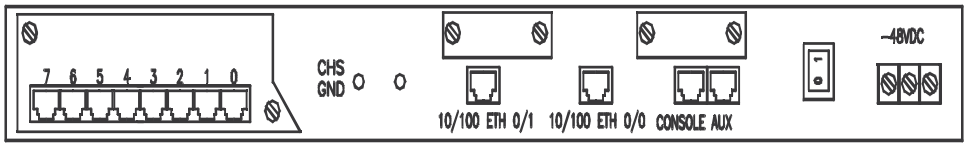


Table A-6. Routers - Rear LEDs

LED	Description
LNK	Indicates link is established to far end connection
ACT	Blink-indicates data activity on the link

Expanded (ESP) Ethernet Switches

The ESP interconnects all components on the ESP internal LANs using WS-C2924-XL-EN Ethernet switches. Figure A-18 illustrates the front and rear of the Ethernet switch.

Figure A-18. Ethernet Switch

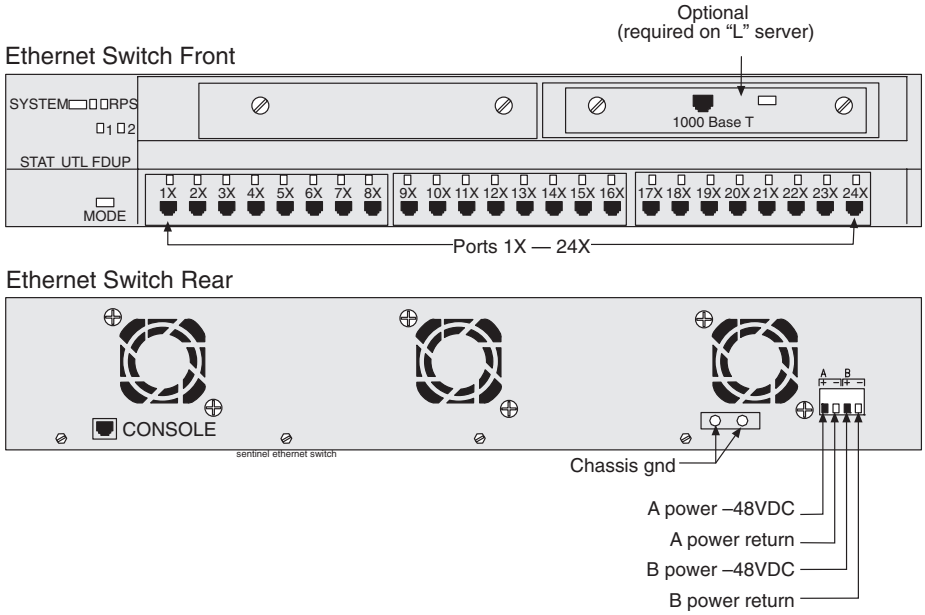


Table A-7 describes the LEDs located on the front of the switches.

Table A-7. Ethernet Server LEDs

LED	Description
System	Green-Indicates when power is present to the switch and the power switch is in the ON position. Amber-Indicates power is present but system is not functioning properly
1 and 2	Indicates expansion boards WS-X2932-XL are installed and functioning LED 1 (Left board) LED 2 (Right board)
RPS (Always OFF)	Off when the redundant power supply is not present. On redundant power supply is present and functional.
Pressing the MODE switch on the front of the WS-C2924-XL-EN changes the per-port LED indications to the following.	

Table A-7. Ethernet Server LEDs (Continued)

LED	Description
STAT (port status) Default	Off-No link. Solid green-Link present. Flashing green-Activity. Port is transmitting or receiving data. Alternating green/amber-Link fault. Error frames can affect connectivity, and errors such as excessive collisions, CRC errors, and alignment and jabber errors are monitored for a link-fault indication. Solid amber-Port is not forwarding. Port was disabled by management or an address violation or was blocked by Spanning Tree Protocol (STP). **NOTE: Note After a port is reconfigured, the port LED can remain amber for up to 30 seconds as STP checks the switch for possible loops.**
UTL (utilization)	Green-The LEDs display backplane utilization on a logarithmic scuffle all port LEDs are green, the switch is using 50 percent or more of its total bandwidth capacity. If the right-most LED is amber, the switch is using less than 50 percent of its total bandwidth. If the LED to the left of the right-most LED is amber, the switch is using less than 25 percent of its total capacity, and so on.
FDUP (port full-duplex)	Off-Port is operating in half duplex. Green-Port is operating in full duplex.
100 (port speed)	Off-Port is operating at 10 Mbps. Green-Port is operating at 100 Mbps.

TAS, Tone and Announcement Server LEDs

Figure A-19 shows the front view of the TAS indicating LED locations. Table A-8. describes the LEDs.

For information on TAS alarms, refer to the *Cognitronics Exchange (CX) Series CX3000 Hardware Manual*.

Figure A-19. TAS - Front View

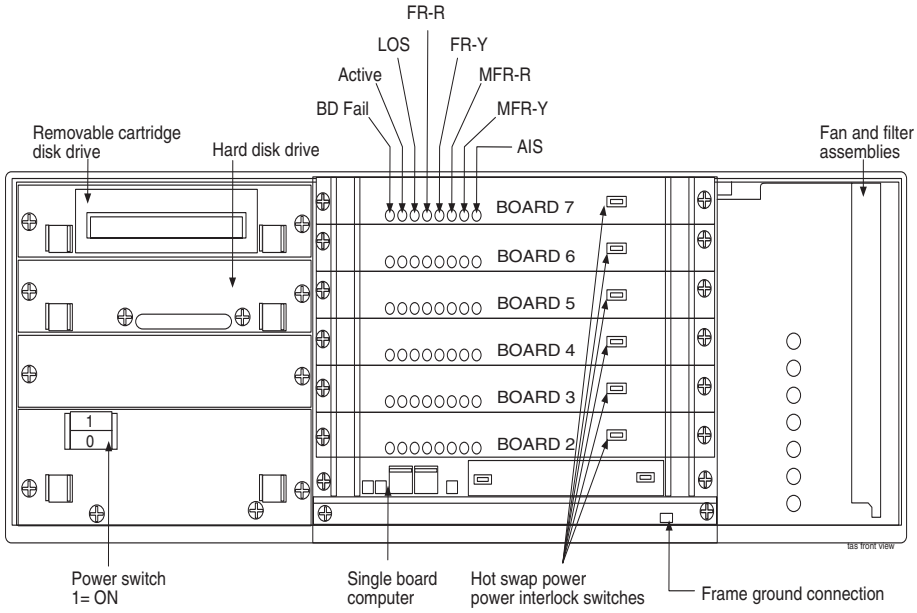


Table A-8. TAS LEDs

Location	LED Name	Color	Description
Front Panel	Maj	Red	Major alarm
Front Panel	Min 1	Yellow	Minor alarm level one
Front Panel	Min 2	Yellow	Minor alarm level two
Front Panel	Min 3	Yellow	Minor alarm level three
Front Panel	Standby	Yellow	Power applied unit in standby mode
Front Panel	Alive	Green	Blinks five seconds on and five seconds off when operating
Front Panel	Power	Green	Indicates when power is present to the router and the power switch is in the ON position.

Table A-8. TAS LEDs (Continued)

Location	LED Name	Color	Description
Single Board Computer (SBC)	DIAG	Green	Not Used
(SBC)	Run	Green	SBC in operation
(SBC)	Buss Master (BM)	Green	Blinks during normal operation
Telephony Interface (TI) Cards	Board Fail (BD) Fail	Red	TI board failure
(TI) Cards	Active	Green	Idle - Blinks two seconds on two seconds off Calls Received - Blinks accelerate as call activity increases
(TI) Cards	Loss Of Signal (LOS)	Red	TAS received no signal from switch
(TI) Cards	Frame Red (FR-R)	Red	TAS unable to synchronize with switch. May indicate LOS of unframed signal
(TI) Cards	Frame Yellow (FR-Y)	Yellow	Yellow alarm from switch
(TI) Cards	Multi-Frame Red (MFR-R)	Red	TAS unable to synchronize with multi-frame signal from switch
(TI) Cards	Multi-Frame Yellow (MFR-Y)	Yellow	Yellow alarm from switch
(TI) Cards	Alarm Indication Signal (AIS)	Yellow	Switch is receiving no signal from TAS
Hard Drive		Green	Hard drive operational.

B

Backplane Connectors

Control Shelf Connectors

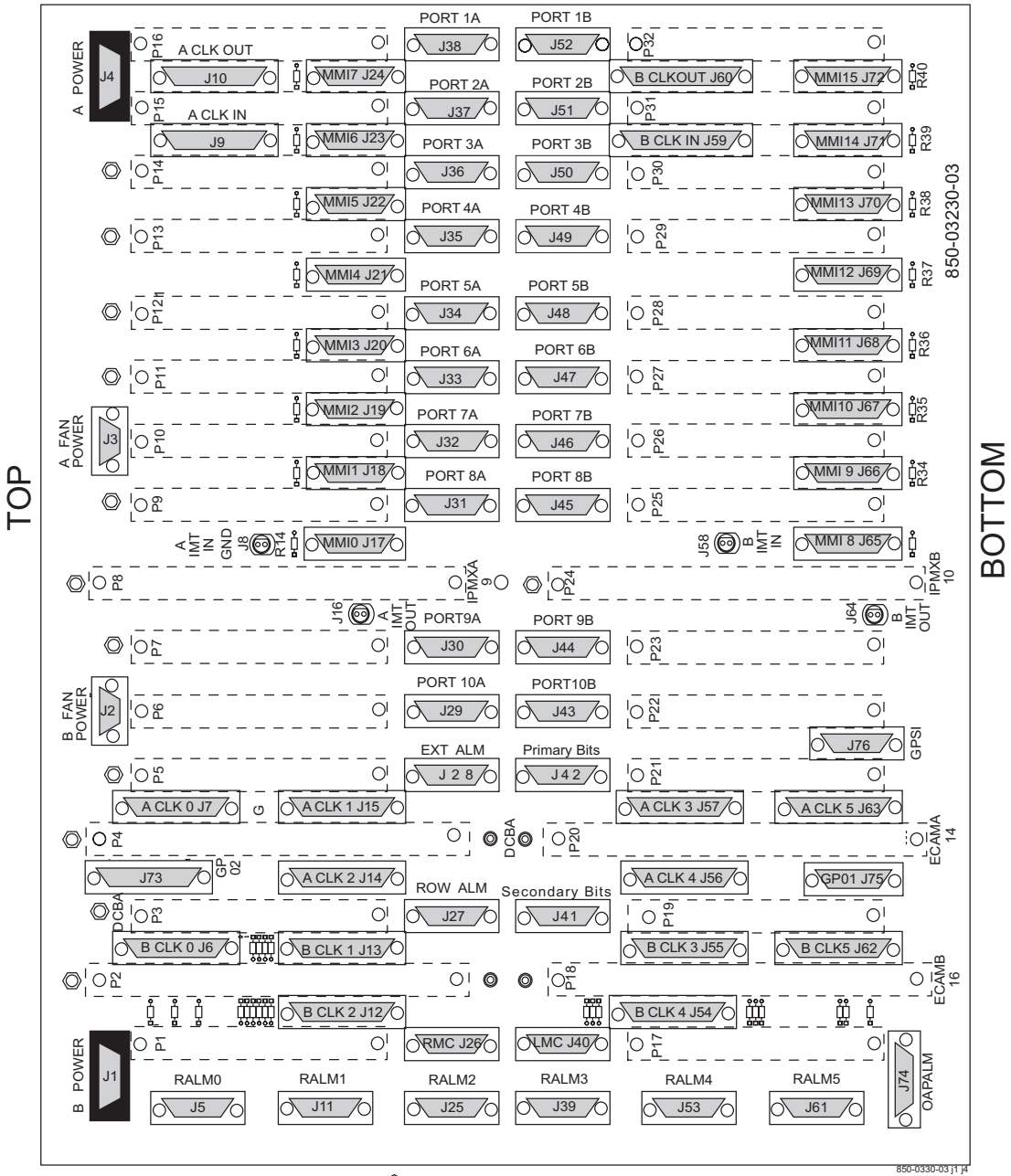
This section describes the Control shelf backplanes and their connectors. The control shelf backplane provides connectors for the system circuit cards. These connectors are four column High Density Interconnect (HDI) male headers with shrouds of varying pin quantities, depending on card position.

The control shelf backplane provides –48VDC power and ground to all card positions. The power is distributed into two parts, A and B. Power is brought to the shelf from the Fuse and Alarm Panel (FAP) using two cables. The connectors on the control shelf backplane are DB-26 high density connectors. The power is distributed over two separate pins per power connection to handle the current load.

- Power connectors
  - Fuse and Alarm Panel (FAP) connectors
  - Fan Power connectors
- Alarm connectors
  - Remote Maintenance Center Alarm connector
  - Local Maintenance Center Alarm connector
  - Rack Alarm connectors
  - Row Alarm connector
  - External Alarm connector
  - CUST Alarm 1 connector
  - CUST Alarm 2 connector
  - OAP Alarm connector
- System clock connectors
- Shelf clock connectors (850-0330-04 only)
- BITS connectors
- Serial port connectors
- Interface connectors
- IMT connectors
- General purpose relay connectors
- General purpose serial interface connectors

Control Shelf Backplane 04

Figure B-1. Control Shelf Backplane 04

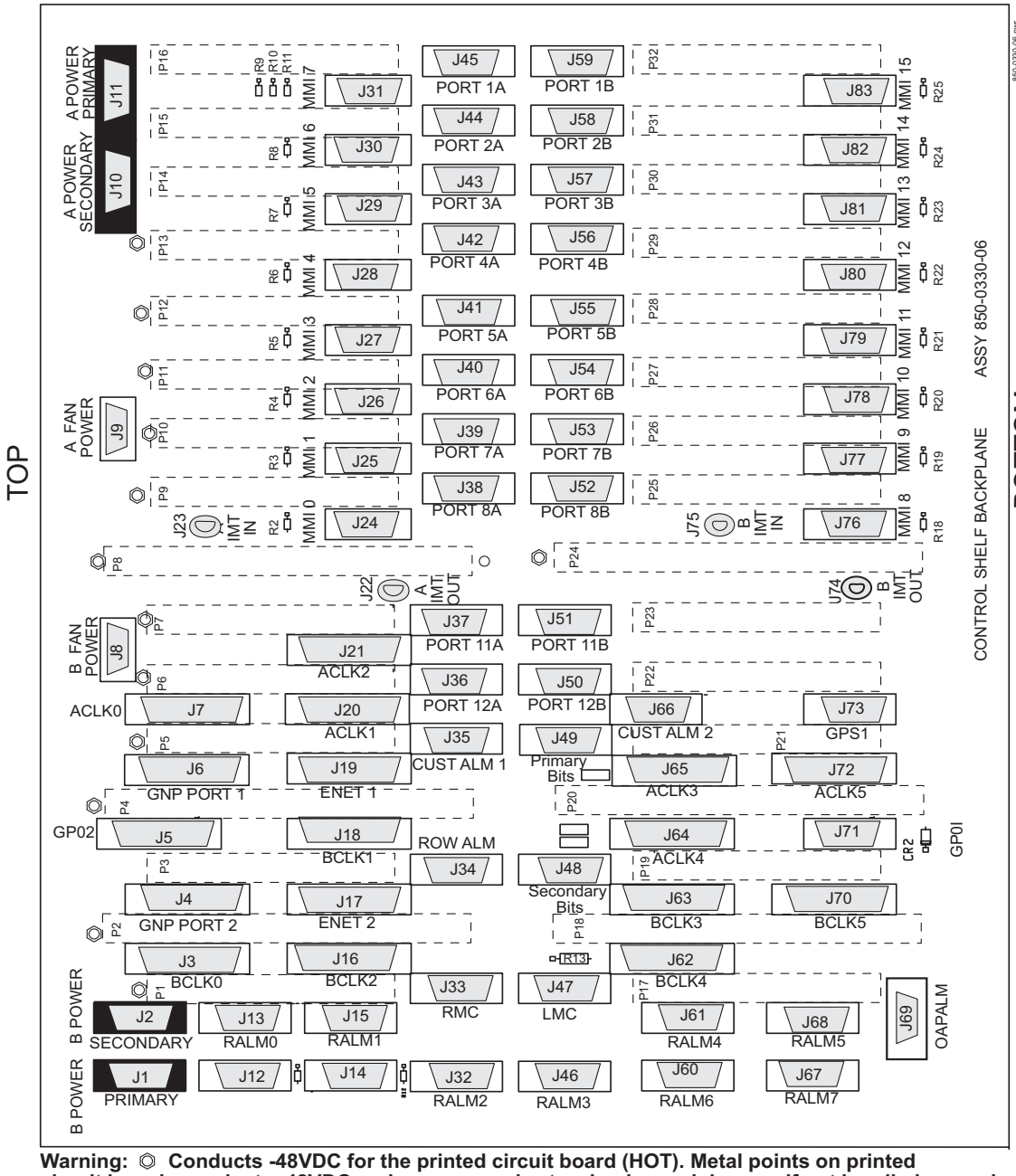


NOTE: ⬡ Conducts -48VDC for the printed circuit board

Control Shelf Backplane 06/07

The connectors on backplanes -06 and -07 are identical.

Figure B-2. Control Shelf Backplane 06/07)



Warning: ⏣ Conducts -48VDC for the printed circuit board (HOT). Metal points on printed circuit boards conducts -48VDC and can cause shorts, shocks, and damage if not handled properly.

Overview of the Control Shelf Backplane Connectors

Table B-1 compares the connectors of Control Shelf backplane 04 with the connectors of Control Shelf backplane 06/07.

Table B-1. Control Shelf Backplanes -04 and -06/07

Control Shelf Backplane (P/N 850-0330-04)	Control Shelf Backplane (P/N 850-0330-06/07)
J-1 B POWER	J-1 B POWER PRIMARY
J-2 B FAN POWER	J-8 B FAN POWER
J-3 A FAN POWER	J-9 A FAN POWER
	J-10 A POWER SECONDARY
	J-2 B POWER SECONDARY
J-4 A POWER	J-11 A POWER PRIMARY
J-5 RALM0	J-13 RALM0
J-6 B CLK 0	J-3 B CLK 0 J-4 B CLK 6
J-7 A CLK 0	J-7 A CLK 0 J-6 A CLK 6
J-8 A IMT IN GND	J-23 A IMT IN
J-9 A CLK IN	N/A
J-10 A CLK OUT	J-14 CI
J-11 RALM 1	J-15 RALM 1
J-12 B CLK 2	J-16 B CLK 2 J-17 B CLK 7
J-13 B CLK 1	J-18 B CLK 1
J-14 A CLK 2	J-21 A CLK 2
J-15 A CLK 1	J-20 A CLK 1
J-16 A IMT OUT	J-22 A IMT OUT
J-17 MMI 0	J-24 MMI 0
J-18 MMI 1	J-25 MMI 1
J-19 MMI 2	J-26 MMI 2
J-20 MMI 3	J-27 MMI 3
J-21 MMI 4	J-28 MMI 4
J-22 MMI 5	J-29 MMI 5

Table B-1. Control Shelf Backplanes -04 and -06/07 (Continued)

Control Shelf Backplane (P/N 850-0330-04)	Control Shelf Backplane (P/N 850-0330-06/07)
J-23 MMI 6	J-30 MMI 6
J-24 MMI 7	J-31 MMI 7
J-25 RALM2	J-32 RALM2
J-26 RMC	J-33 RMC
J-27 ROW ALM	J-34 ROW ALM
J-28 EXT ALARM	J-35 CUST ALM 1 J-66 CUST ALM 2
J-29 PORT 10A	J-36 PORT 10A
J-30 PORT 9A	J-37 PORT 9A
J-31 PORT 8A	J-38 PORT 8A
J-32 PORT 7A	J-39 PORT 7A
J-33 PORT 6A	J-40 PORT 6A
J-34 PORT 5A	J-41 PORT 5A
J-35 PORT 4A	J-42 PORT 4A
J-36 PORT 3A	J-43 PORT 3A
J-37 PORT 2A	J-44 PORT 2A
J-38 PORT 1A	J-45 PORT 1A
J-39 RALM 3	J-46 RALM 3
J-40 LMC	J-47 LMC
J-41 SECONDARY BITS	J-48 SECONDARY BITS
J-42 PRIMARY BITS	J-49 PRIMARY BITS
J-43 PORT 10B	J-50 PORT 10B
J-44 PORT 9B	J-51 PORT 9B
J-45 PORT 8B	J-52 PORT 8B
J-46 PORT 7B	J-53 PORT 7B
J-47 PORT 6B	J-54 PORT 6B
J-48 PORT 5B	J-55 PORT 5B
J-49 PORT 4B	J-56 PORT 4B
J-50 PORT 3B	J-57 PORT 3B
J-51 PORT 2B	J-58 PORT 2B

Table B-1. Control Shelf Backplanes -04 and -06/07 (Continued)

Control Shelf Backplane (P/N 850-0330-04)	Control Shelf Backplane (P/N 850-0330-06/07)
J-52 PORT 1B	J-59 PORT 1B
J-53 RALM4	J-61 RALM4 J-60 RALM 6
J-54 B CLK4	J-62 B CLK 4
J-55 B CLK 3	J-63 B CLK 3
J-56 A CLK 4	J-64 A CLK 4
J-57 A CLK 3	J-65 A CLK 3
J-58 B IMT IN	J-75 B IMT IN
J-59 B CLK IN	N/A
J-60 B CLK OUT	N/A
J-61 RALM5	J-68 RALM5
J-62 B CLK 5	J-70 B CLK 5 J-71 GP01
J-63 A CLK 5	J-72 A CLK 5
J-64 B IMT OUT	J-74 B IMT OUT
J-65 MMI 8	J-76 MMI 8
J-66 MMI 9	J-77 MMI 9
J-67 MMI 10	J-78 MMI 10
J-68 MMI 11	J-79 MMI 11
J-69 MMI 12	J-80 MMI 12
J-70 MMI 13	J-81 MMI 13
J-71 MMI 14	J-82 MMI 14
J-72 MMI 15	J-83 MMI 15
J-73 GP02	J-69 OAPALM
J-74 OAPALM J-75 GP01	J-5 GP02 J-71 GP01
J-76 GPSI	J-73 GPS1
	J-67 RALM7

Power Connectors

The control shelf backplane provides –48VDC power and ground to all card positions. The power is distributed into two parts, A and B. Power is brought to the shelf from the Fuse and Alarm Panel (FAP) using two cables. The connectors on the control shelf backplane are DB-26 high density connectors. The power is distributed over two separate pins per power connection to handle the current load.

J1, J4 on Control Shelf backplane 04
J1, J11 Primary and J2, J10 Secondary on Control Shelf backplane 06/07

Figure B-3. Power Connector

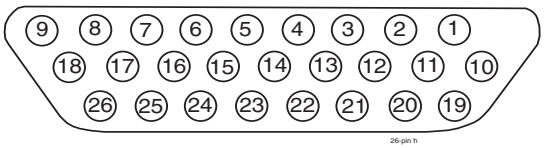


Table B-2. Power Connector

Pin	Signal	Pin	Signal
1	P5$48VDC	14	LGND
2	P5$48RTN	15	P3$48RTN
3	P4$48VDC	16	P3$48VDC
4	P4$48RTN	17	P2$48RTN
5	LGND	18	P2$48VDC
6	P3$48RTN	19	P1$48RTN
7	P3$48VDC	20	P1$48RTN
8	P2$48RTN	21	P1$48VDC
9	P2$48VDC	22	P1$48VDC
10	P5$48VDC	23	PF$48RTN
11	P5$48RTN	24	PF$48RTN
12	P4$48VDC	25	PF$48VDC
13	P4$48RTN	26	PF$48VDC
$= A or B, A POWER (J4) or B POWER (J1)			

Fuse and Alarm Panel 870-2320-01/03

The FAP provides protected distribution of power to the system. Protection is provided by fuses placed in fuse holders on the front panel. The FAP contains a fuse fail alarm circuit that operates when one or more fuses fail.

Figure B-4. Control/Extension FAP Rear View

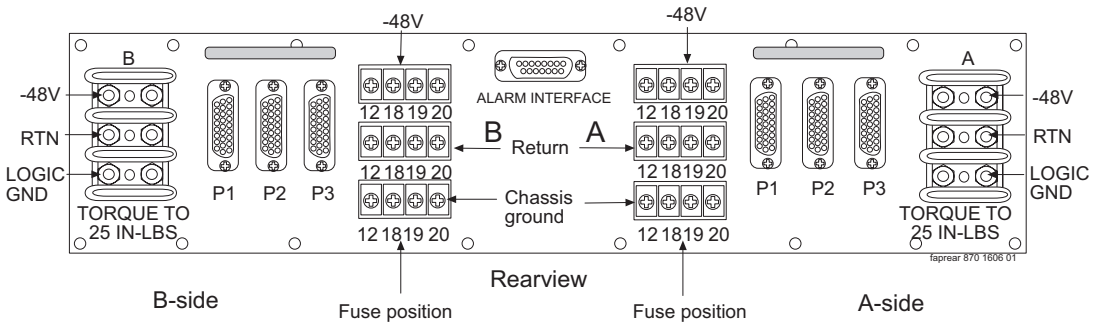


Figure B-5. Alarm Interface Connector

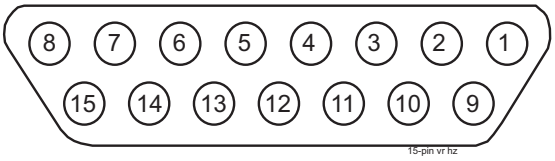


Table B-3. Alarm Interface Connector

Pin	Circuit Descriptions
1 / 2 / 3 / 4	
5	Critical Alarm
6 / 7	
8	Fuse Normally Closed
9	
10	Minor Alarm
11	Major Alarm
12	Common
13	
14	Test
15	Fuse Normally Open

Shelf Power

The Fuse and Alarm Panel powers up to three shelves in the frame through the FAP connectors P1, P2, and P3.

Figure B-6. Shelf Power Connector

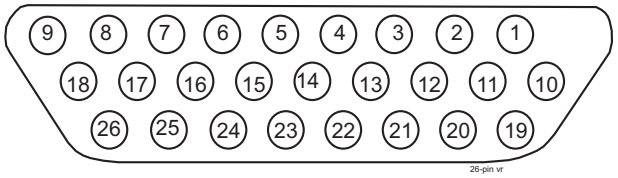


Table B-4. Shelf Power Connector

Connector	Fuse Position	Pin Numbers	Circuit Descriptions
P1 (to top shelf in frame)	1	3 and 12	+48VDC
		2 and 11	48VDC return
	2	1 and 10	+48VDC
		19 and 20	48VDC return
	3	21 and 22	+48VDC
		4 and 13	48VDC return
	4	23 and 24	+48VDC
		6 and 15	48VDC return
	5	9 and 18	+48VDC
		8 and 17	48VDC return
	6	7 and 16	+48VDC
		25 and 26	48VDC return

Table B-4. Shelf Power Connector (Continued)

Connector	Fuse Position	Pin Numbers	Circuit Descriptions
P2 (to middle shelf in frame)	7	3 and 12	+48VDC
		2 and 11	48VDC return
	8	1 and 10	+48VDC
		19 and 20	48VDC return
	9	21 and 22	+48VDC
		4 and 13	48VDC return
	10	23 and 24	+48VDC
		6 and 15	48VDC return
	11	9 and 18	+48VDC
		8 and 17	48VDC return
	12	7 and 16	+48VDC
		25 and 26	48VDC return
P3 (to bottom shelf in frame)	13	3 and 12	+48VDC
		2 and 11	48VDC return
	14	1 and 10	+48VDC
		19 and 20	48VDC return
	15	21 and 22	+48VDC
		4 and 13	48VDC return
	16	23 and 24	+48VDC
		6 and 15	48VDC return
	17	9 and 18	+48VDC
		8 and 17	48VDC return
	18	7 and 16	+48VDC
		25 and 26	48VDC return
P1, P2, and P3		5 and 14	logic ground
NOTES: A side and B side connectors, fuse positions, and pins are identical. All return pins are common.			

Rack Alarm (Alarm Interface)

Figure B-7. Rack Alarm Connector

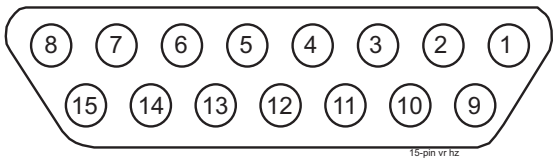


Table B-5. Rack Alarm Connector

Pin	Circuit Descriptions
1 / 2 / 3 / 4	
5	Critical Alarm
6 / 7	
8	Fuse Normally Closed
9	
10	Minor Alarm
11	Major Alarm
12	Common
13	
14	Test
15	Fuse Normally Open

Fan Power

J2, J3 on Control Shelf backplane 04 and
J8, J9 on Control Shelf backplane 06/07

Figure B-8. Fan Power Connector

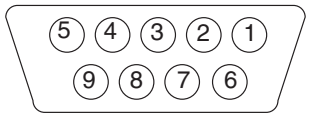


Table B-6. Fan Power Connector

Pin	Signal	Pin	Signal
1	PF$48RTN	6	FAN$ALM-
2	PF$48RTN	7	
3		8	CHASSIS GND
4	PF$48VDC	9	FANCNTRL
5	PF$48VDC		
$= A or B, A fan power (J3) or B fan power (J2)			

Alarm Connectors

Local Maintenance Center Alarm Connector

Local Maintenance Center Alarm Connector connector provides the system's alarm condition indicators to the local maintenance center.

J40 on Control Shelf backplane 04 and
J47 on Control Shelf backplane 06/07

Figure B-9. Local Maintenance Center Alarm Connector

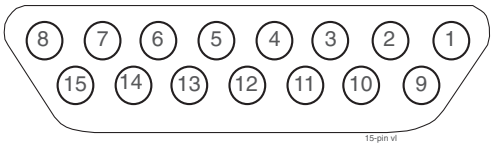


Table B-7. Local Maintenance Center Alarm Connector

Pin	Signal
1, 3, 4, 5, 11, 12	Not used
2	LMCANC - Local Maintenance Center Audible Alarm, Normally Closed
6	LMCVMJNC - Local Maintenance Center Major Alarm, Normally Closed
7	LMCVMNNC - Local Maintenance Center Minor Alarm, Normally Closed
8	LMCVCRNC - Local Maintenance Center Critical Alarm, Normally Closed
9	LMCACOM - Local Maintenance Center Audible Alarm Common
10	LMCANO - Local Maintenance Center Audible alarm, normally Open
13	LMCVCOM - Local Maintenance Center Common
14	LMCVMJNO - Local Maintenance Center Major Alarm, Normally Open
15	LMCVMNNO - Local Maintenance Center Minor Alarm, Normally Open

Remote Maintenance Center Alarm Connector

The Remote Maintenance Center Alarm connector provides system alarm condition indicators to the remote maintenance center.

J26 on Control Shelf backplane 04 and
J33 on Control Shelf backplane 06/07

Figure B-10. Remote Maintenance Center Alarm Connector

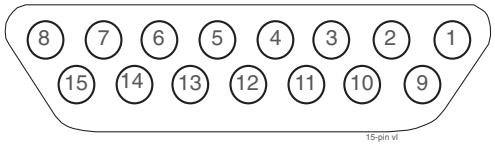


Table B-8. Remote Maintenance Center Alarm Connector

Pin	Signal
1, 3, 4, 5, 9, 11, 12	not used
2	RMCANC - Remote Maintenance Center Audible Alarm, Normally Closed
6	RMCMJNC - Remote Maintenance Center Major Alarm, Normally Closed
7	RMCMNNC - Remote Maintenance Center Minor Alarm, Normally Closed
8	RMCCRNC - Remote Maintenance Center Critical Alarm, Normally Closed
10	RMCANO - Remote Maintenance Center Audible Alarm, Normally Open
13	RMCCOM - Remote Maintenance Center Common
14	RMCMJNO - Remote Maintenance Center Major Alarm, Normally Open
15	RMCMNNO - Remote Maintenance Center Minor Alarm, Normally Open

Rack Alarm Connectors

The output of the Rack Alarm Connectors control the alarm condition indicators on each control or extension frame fuse and alarm panel.

J5, J11, J25, J39, J53, J61 on Control Shelf backplane 04 and
J13,J15, J32, J46, J61, J68 on Control Shelf backplane 06/07

Figure B-11. Rack Alarm Connector

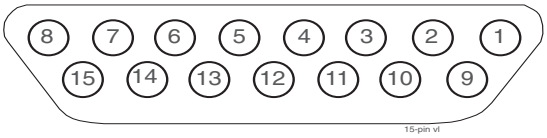


Table B-9. Rack Alarm Connector

Pin	Signal
1, 2, 6, 7, 9, 13, 14	Not used
3	R$MNNC - Rack Alarm, Minor, Normally Closed
4	R$MJNC - Rack Alarm, Major, Normally Closed
5	R$CRNC - Rack Alarm, Critical, Normally Closed
8	R$FA+ - Rack Fuse Alarm (+)
10	R$MNNO - Rack Alarm, Minor, Normally Open
11	R$MJNO - Rack Alarm, Major, Normally Open
12	R$COM - Rack Alarm, Common
15	R$FA- - Rack Fuse Alarm (-)
$= 0 through 5, RALM0 through RALM5 (J5, J11, J25, J39, J53, J61 respectively)	

Row Alarm Connector

Row Alarm Connector controls the alarm condition indicators on an end panel at the end of a set of the frames.

J27 on Control Shelf backplane 04 and J34 on Control Shelf backplane 06/07

Figure B-12. Row Alarm Connector

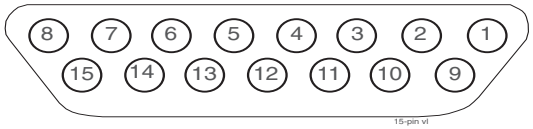


Table B-10. Row Alarm Connector

Pin	Signal
1, 2, 3, 6, 7, 8, 9, 13, 14, 15	Not used
4	–48VDC
5	RACRNC - Row Alarm, Critical, Normally Closed
10	RAMNNO - Row Alarm, Minor, Normally Open
11	RAMJNO - Row Alarm, Major, Normally Open
12	48VDC return

External Alarm Connector

External Alarm Connector is also used for alarm condition inputs from an optional holdover clock.

J28 on Control Shelf backplane 04 External Alarm
J35 on Control Shelf backplane 06/07 CUST ALM 1
J66 on Control Shelf backplane 06/07 CUST ALM 2 (not supported by software)

Figure B-13. External Alarm Connector

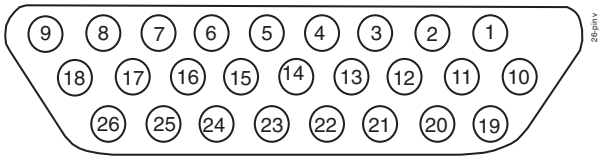


Table B-11. External Alarm Connector

Pin	Signal	Description
2	CUFA13	Signals a customer defined trouble #13 to the system when connected to P5A48RTN (pin 10) or P4B48RTN (pin 11).
3	CUFA14	Signals a customer defined trouble #14 to the system when connected to P5A48RTN (pin 10) or P4B48RTN (pin 11).
4	CUFA3	Signals a customer defined critical alarm (trouble #3) to the system when connected to P5A48RTN (pin 10) or P4B48RTN (pin 11).
5	CUFA1	Reserved
6	CUFA9	Reserved
7	CUFA2	Signals a holdover clock critical alarm to the system when connected to P5A48RTN (pin 10) or P4B48RTN (pin 11).
8	CUFA4	Signals a customer defined critical alarm (trouble #4) to the system when connected to P5A48RTN (pin 10) or P4B48RTN (pin 11).
9	CUFA10	Signals a holdover clock minor alarm to the system when connected to P5A48RTN (pin 10) or P4B48RTN (pin 11).
10	P5A48RTN	Signal return path
11	P4B48RTN	Signal return path
19	CUFA8	Signals customer defined major alarm (trouble #8) to the system when connected to P5A48RTN (pin 10) or P4B48RTN (pin 11).
20	CUFA16	Signals a customer defined trouble #16 to the system when connected to P5A48RTN (pin 10) or P4B48RTN (pin 11).
21	CUFA7	Signals a customer defined major alarm (trouble #7) to the system when connected to P5A48RTN (pin 10) or P4B48RTN (pin 11).
22	CUFA15	Signals a customer defined trouble #15 to the system when connected to P5A48RTN (pin 10) or P4B48RTN (pin 11).
23	CUFA12	Signals a customer defined minor alarm (trouble #12) to the system when connected to P5A48RTN (pin 10) or P4B48RTN (pin 11).
24	CUFA6	Signals a holdover clock major alarm to the system when connected to P5A48RTN (pin 10) or P4B48RTN (pin 11).
25	CUFA5	Reserved
26	CUFA11	Signals a customer defined minor alarm (trouble #11) to the system when connected to P5A48RTN (pin 10) or P4B48RTN (pin 11).

OAP Alarm Connector

The OAP alarm connector controls the alarm condition indicators on an OAP frame.

J74 on Control Shelf backplane 04 and
J69 on Control Shelf backplane 06/07

Figure B-14. OAP Alarm Connector

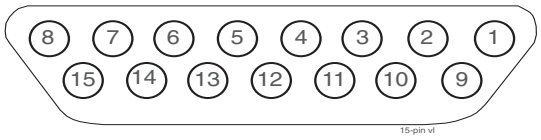


Table B-12. OAP Alarm Connector

Pin	Signal
1, 2, 6, 7, 13, 14	Not used
3	OAPMNNC - OAP Alarm, Minor, Normally Closed
4	OAPMJNC - OAP Alarm, Major, Normally Closed
5	OAPCRNC - OAP Alarm, Critical, Normally Closed
8	OAPFA+ - OAP Fuse Alarm (+)*
9	OAPBNO - OAP Alarm, busy, Normally Open*
10	OAPMNNO - OAP Alarm, minor, normally Open
11	OAPMJNO - OAP Alarm, Major, Normally Open
12	OAPCOM - OAP Alarm, Common
15	OAPFA- - Row Fuse Alarm (-)*
* not currently supported	

System Clock Connectors

The control shelf backplane provides system clock output to the rest of the system from the TDMs. Redundancy is accomplished by allowing TDM A and TDM B to distribute clocks independently of each other.

A Clock 0 through A Clock 5

J7, J14, J15, J56, J57, J63 on Control Shelf backplane 04 and
J7, J21, J20, J64, J65, J72 on Control Shelf backplane 06/07

Figure B-15. A Clock 0 Through A Clock 5 Connectors

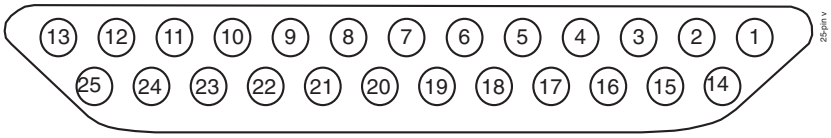


Table B-13. A Clock 0 Through A Clock 5 Connectors

Connector	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
850-0330-04 J7 (CF00) (rack 0) 850-0330-06/07 J7	1		8	MBUS1RX-_50	15	A56KHZ0-_50	22	A56KHZ2+_50
	2	MBUS0TX-_50	9	MBUS1RX+_50	16	A8KHZ0+_50	23	A56KHZ2-_50
	3	MBUS0TX+_50	10	MBUS2TX-_50	17	A8KHZ0-_50	24	A8KHZ2+_50
	4	MBUS0RX-_50	11	MBUS2TX+_50	18	A56KHZ1+_50	25	A8KHZ2-_50
	5	MBUS0RX+_50	12	MBUS2RX-_50	19	A56KHZ1-_50		
	6	MBUS1TX-_50	13	MBUS2RX+_50	20	A8KHZ1+_50		
	7	MBUS1TX+_50	14	A56KHZ0+_50	21	A8KHZ1-_50		
850-0330-06/07 J64, J65, J72	not currently supported							

B Clock 0 through B Clock 5

J6, J12, J13, J54, J55, J62 on Control Shelf backplane 04 and
J3, J16, J18, J62, J63, J70 on Control Shelf backplane 06/07

Figure B-16. B Clock 0 through B Clock 5 Connectors

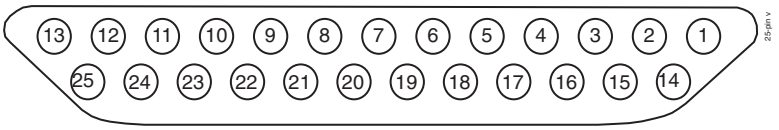


Table B-14. B Clock 0 through B Clock 5 Connectors

Connector	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
850-0330-03 J6 (CF00) (rack 0) 850-0330-06/07 J3	1	R0FAALM-	8		15	B56KHZ0-_50	22	B56KHZ2+_50
	2		9		16	B8KHZ0+_50	23	B56KHZ2-_50
	3		10		17	B8KHZ0-_50	24	B8KHZ2+_50
	4		11		18	B56KHZ1+_50	25	B8KHZ2-_50
	5		12		19	B56KHZ1-_50		
	6		13	R0FBALM-	20	B8KHZ1+_50		
	7	R0FANCTRL	14	B56KHZ0+_50	21	B8KHZ1-_50		
850-0330-06/07 J62, J63, J70	not currently supported							

Shelf Clock Connectors (for Control Shelf Backplane -04 only)

Connectors for both A and B clocks are provided using 25 pin D type connectors at J9, J10, J59, and J60 on Control Shelf backplane 04.

System clock connectors are used on Control Shelf backplane 06/07.

Clock A In Connector

J9 on backplane (P/N 850-0330-04).

Figure B-17. Clock A In Connector on Backplane

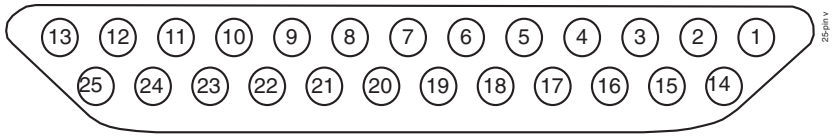


Table B-15. Clock A In Connector on Control Shelf Backplane 04

Pin	Signal	Pin	Signal
1		14	MA56KHZ+_50
2	MBUSSTX-_50	15	MA56KHZ-_50
3	MBUSSTX+_50	16	MA8KHZ+_50
4	MBUSSRX-_50	17	MA8KHZ-_50
5	MBUSSRX+_50	18	SH2A56KHZ+_50
6	SH2MBUSTX-_50	19	SH2A56KHZ-_50
7	SH2MBUSTX+_50	20	SH2A8KHZ+_50
8	SH2MBUSRX-_50	21	SH2A8KHZ-_50
9	SH2MBUSRX+_50	22	SH3A56KHZ+_50
10	SH3MBUSTX-_50	23	SH3A56KHZ-_50
11	SH3MBUSTX-_50	24	SH3A8KHZ+_50
12	SH3MBUSRX-_50	25	SH3A8KHZ-_50
13	SH3MBUSRX+_50		

Clock A Out Connector

J10 on Control Shelf backplane 04.

Figure B-18. Clock A Out Connector

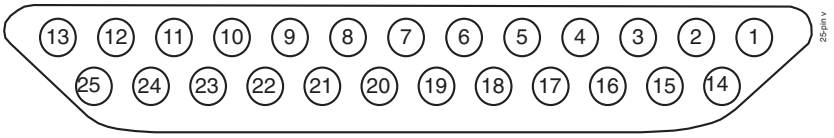


Table B-16. Clock A Out Connector

Pin	Signal	Pin	Signal
1		14	SH2A56KHZ+_50
2	SH2MBUSTX-_50	15	SH2A56KHZ-_50
3	SH2MBUSTX+_50	16	SH2A8KHZ+_50
4	SH2MBUSRX-_50	17	SH2A8KHZ-_50
5	SH2MBUSRX+_50	18	SH3A56KHZ+_50
6	SH3MBUSTX-_50	19	SH3A56KHZ-_50
7	SH3MBUSTX+_50	20	SH3A8KHZ+_50
8	SH3MBUSRX-_50	21	SH3A8KHZ-_50
9	SH3MBUSRX+_50	22	
10		23	
11		24	
12		25	
13			

Clock B In Connector

J59 on Control Shelf backplane 04

Figure B-19. Clock B In Connector on Backplane

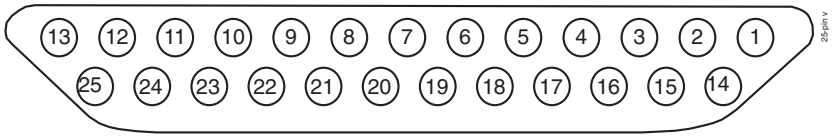


Table B-17. Clock B In Connector on Control Shelf backplane 04

Pin	Signal	Pin	Signal
1	FANAALM-	14	MB56KHZ+_50
2		15	MB56KHZ-_50
3		16	MB8KHZ+_50
4		17	MB8KHZ-_50
5		18	SH2B56KHZ+_50
6		19	SH2B56KHZ-_50
7	FANCNTRL	20	SH2B8KHZ+_50
8		21	SH2B8KHZ-_50
9		22	SH3B56KHZ+_50
10		23	SH3B56KHZ-_50
11		24	SH3B8KHZ+_50
12		25	SH3B8KHZ-_50
13	FANBALM-		

Clock B Out Connector

J60 on Control Shelf backplane 04.

Figure B-20. Clock B Out Connector on Backplane

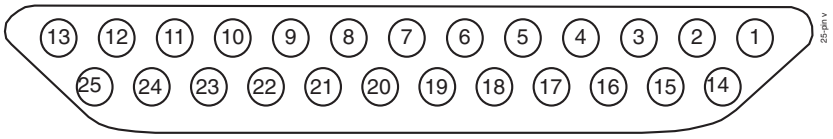


Table B-18. Clock B Out Connector on Control Shelf backplane 04

Pin	Signal	Pin	Signal
1	FANAALM-	14	SH2B56KHZ+_50
2		15	SH2B56KHZ-_50
3		16	SH2B8KHZ+_50
4		17	SH2B8KHZ-_50
5		18	SH3B56KHZ+_50
6		19	SH3B56KHZ-_50
7	FANCNTRL	20	SH3B8KHZ+_50
8		21	SH3B8KHZ-_50
9		22	
10		23	
11		24	
12		25	
13	FANBALM-		

BITS Clock Connectors

The system connects to the Building Integrated Timing System (BITS) clocks using two DB-15 style connectors. The two clocks are labeled Primary and Secondary and are supplied from the central office clock. Both clocks go to both TDMs, where one is selected to provide the system clocks used to provide system timing.

J41, J42 on Control Shelf backplane 04 and
J48, J49 on Control Shelf backplane 06/07

Figure B-21. BITS Clock Connector

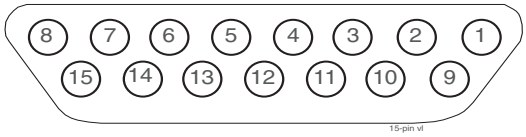


Table B-19. BITS Clock Connector

Pin	Signal	Pin	Signal
1		9	
2		10	
3		11	
4		12	$BITSIN-_60
5	$BITSIN+_60	13	
6		14	
7		15	
8			
$= P for primary BITS clock (J42), S for secondary BITS clock (J41)			

Serial Port Connectors

The control shelf backplane provides an interface for 16 separate serial port connections from the TDMs. These connections provide RS-232 interfaces for terminals, printers, and modems. The system is set up as Data Terminal Equipment (DTE).

J17 - J24, J65 - J72 on Control Shelf backplane 04 and J24 - J31, J76 - J83 on Control Shelf backplane 06/07

Figure B-22. Serial Port Connector

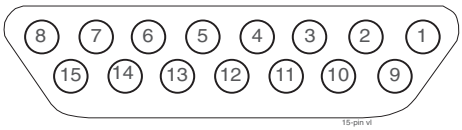


Table B-20. Serial Port Connector

Pin	Signal	Pin	Signal
1		9	
2		10	
3	DCD$	11	
4	RX$	12	
5	TX$	13	CTS$
6	DTR$	14	RTS$
7	logic ground	15	
8			
$= 0 through 15, MMI0 through MMI15 respectively, J17 through J24 and J65 through J72 respectively			

Interface Connectors

For slots 1 through 8, 11, and 12 on the control shelf backplane, there are two associated DB-26 interface connectors for each slot. These provide interfacing to the outside world in the form of Ethernet networks, SS7 links, or X.25 networks.

J29 - J38, J43 - J52 on Control Shelf backplane 04 and
J36 - J45, J50 - J59 on Control Shelf backplane 06/07

Figure B-23. Interface Connector

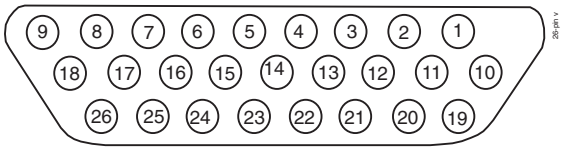


Table B-21. Interface Connector Pins and Signal

Interface Connector Pins and Signal									
DB-26 Pin	**V.35 Signal**	**V.35 Pin**	**DS0A/ OCU Signal**	**Ethernet Signal (ACM)**	**DB-26 Pin**	**V.35 Signal**	**V.35 Pin**	**DS0A/OCU Signal ATM**	**Ethernet Signal (ACM)**
1	RxCA	V		RXD-	14				
2	RxCB	X		RXD+	15				
3	TxCCA	Y		COL+	16				
4	TxCCB	AA		COL-	17				CHASS GND
5	TEST			-	18	LOOPL	J		
6	RLSD	F		TXD-	19	RTS	C		SIG GND
7	DSR	E			20	TxDA	P	TX-RING	+12VDC
8	CHASS GND	A		TXD+	21	TxDB	S	TX-TIP	+12VDC
9	CTS	D			22	RxDA	R	RX-RING	
10	SIG GND	B		SIG GND	23	RxDB	T	RX-TIP	
11					24	TxCTA	U		
12					25	TxCDB	W		
13					26	LOOPM	BB		

Table B-22. Interface Connectors, Ports, and Card Slots

Interface Connectors, Ports, and Card Slots				
Card slot	**Port**	**Connector**	**Port**	**Connector**
01	1A	J38	1B	J52
02	2A	J37	2B	J51
03	3A	J36	3B	J50
04	4A	J35	4B	J49
05	5A	J34	5B	J48
06	6A	J33	6B	J47
07	7A	J32	7B	J46
08	8A	J31	8B	J45
11	9A	J30	9B	J44
12	10A	J29	10B	J43

Control Shelf Modules

This section details the backplane circuit board connectors used for

- Application Communication Modules (ACMs)
- Database Communications Modules (DCMs),
- Database Services Modules (DSMs)
- Enhanced Integrated Link Interface Modules Appliques (EILAs)
- Integrated Link Interface Modules Appliques (ILAs)
- Link Interface Modules (LIMs)
- Multi-Port LIMs (MPLs)
- Translation Service Modules (TSMs).

ACM/DCM/DSM/EILA/ILA/LIM/MPL/TSM/ Control Shelf Backplane top connectors are P6, P7, and P9 through P16; bottom connectors are P22, P23, and P25 through P32.

Pin-Outs, Top Connector

Table B-23 lists pinouts for connectors P6, P7, and P9 through P16 on the control shelf.

Refer to Table B-25 on page B-34 for signal symbol values ($, #, &, @, and ^).

Figure B-24. Control Shelf Backplane Pin-Outs, Top Connector

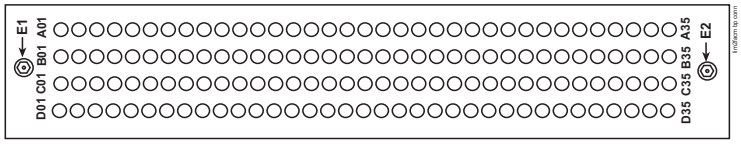


Table B-23. Control Shelf Backplane Pin-Outs, Top Connector

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A01	LGND	B01	LGND	C01	EBI_^XA02	D01	EBI_^XA14
A02	ASERO#-_50	B02	LGND	C02	EBI_^XA03	D02	EBI_^XA15
A03	ASERO#+_50	B03	LGND	C03	EBI_^XA04	D03	EBI_^XA16
A04	LGND	B04	LGND	C04	EBI_^XA05	D04	EBI_^XA17
A05		B05	LGND	C05	EBI_^XA06	D05	EBI_^XA18
A06		B06	LGND	C06	EBI_^XA07	D06	EBI_^XA19
A07	LGND	B07	LGND	C07	EBI_^XA08	D07	EBI_^XA20
A08	ASEL#-	B08		C08	EBI_^XA09	D08	EBI_^XA21
A09		B09		C09	EBI_^XA10	D09	EBI_^XA22
A10	AMUXIN-	B10		C10		D10	EBI_^XA23
A11	LGND	B11	AIN#-	C11		D11	EBI_^XA24
A12		B12	LGND	C12		D12	EBI_^XA25
A13		B13	LGND	C13		D13	EBI_^XA26
A14	LGND	B14	LGND	C14		D14	EBI_^XA27
A15	ASERI#-_50	B15	LGND	C15		D15	
A16	ASERI#+_50	B16	LGND	C16		D16	
A17	LGND	B17	LGND	C17		D17	
A18		B18		C18		D18	
A19	LGND	B19	MBUSSRX+ _50	C19	LGND*	D19	
A20		B20	MBUSSRX- _50	C20		D20	LGND

Table B-23. Control Shelf Backplane Pin-Outs, Top Connector (Continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A21	LGND	B21	MBUSSTX+_50	C21	MA56KHZ+_50	D21	
A22		B22	MBUSSTX-_50	C22	MA56KHZ-_50	D22	LGND
A23	LGND	B23		C23	MA8KHZ+_50	D23	
A24	&-IF1_60	B24		C24	MA8KHZ-_50	D24	LGND
A25	LGND	B25		C25	EBI_^XSP4	D25	EBI_^XSP5
A26	&-IF2_60	B26		C26	EBI_^XA11	D26	
A27	LGND	B27		C27	EBI_^XA12	D27	
A28	&-IF3_60	B28	&-IF10_60	C28	EBI_^XA13	D28	LGND
A29	LGND	B29	&-IF19_60	C29	EBI_^BREQ-	D29	
A30	&-IF4_60	B30	&-IF20_60	C30	EBI_^BG-	D30	LGND
A31	&-IF5_60	B31	&-IF21_60	C31	EBI_^XIRQ-	D31	
A32	&-IF6_60	B32	&-IF22_60	C32	EBI_^HOSTSAN-	D32	LGND
A33	&-IF7_60	B33	&-IF23_60	C33	EBI_^GSTSAN-	D33	
A34	&-IF8_60	B34	&-IF25_60	C34	&-IF24_60	D34	LGND
A35	&-IF9_60	B35	&-IF18_60	C35	&-IF26_60	D35	
E2	LGND	*Connection to logic ground for slots 2 (P16), 4 (P14), 6 (P12), 8 (P10) only.					

Pin-Outs, Bottom Connector

Table B-24 Pinouts for ACM/ASM/DCM/DSM/EILA/ILA/LIM/MPL/TSM Control Shelf Backplane bottom connectors P22, P23, and P25 through P32

Figure B-25. Control Shelf Backplane Pin-Outs, Bottom Connector

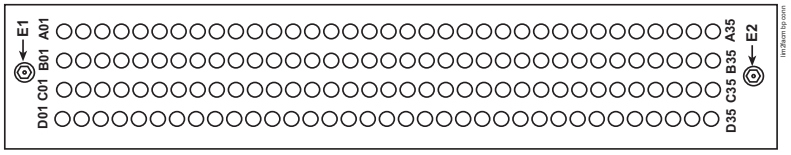


Table B-24. Control Shelf Backplane Pin-Outs, Bottom Connector

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A01	LGND	B01	&-IF1_60	C01	&-IF10_60	D01	IN2-
A02	&-IF3_60	B02	&-IF2_60	C02	&-IF19_60	D02	LGND
A03	LGND	B03		C03	&-IF20_60	D03	LGND
A04	&-IF4_60	B04		C04	&-IF21_60	D04	LGND
A05	&-IF5_60	B05		C05	&-IF22_60	D05	LGND
A06	&-IF6_60	B06	&-IF24_60	C06	&-IF23_60	D06	LGND
A07	&-IF7_60	B07	&-IF26_60	C07		D07	@-IF25_60
A08	&-IF8_60	B08	&-IF9_60	C08	&-IF18_60	D08	LGND
A09	LGND	B09		C09		D09	LGND
A10		B10		C10	EBI_^XSP2	D10	EBI_^XSP3
A11	LGND	B11	LGND	C11	EBI_^XBE0-	D11	EBI_^XD00
A12	BSERO@-_50	B12	LGND	C12	EBI_^XBE1-	D12	EBI_^XD01
A13	BSERO@-_50	B13	LGND	C13	EBI_^XBE2-	D13	EBI_^XD02
A14	LGND	B14	LGND	C14	EBI_^XBE3-	D14	EBI_^XD03
A15		B15	LGND	C15	EBI_^XBS8-	D15	EBI_^XD04
A16		B16	LGND	C16	EBI_^XBS16-	D16	EBI_^XD05
A17	LGND	B17	LGND	C17	EBI_^ADS0-	D17	EBI_^XD06
A18	BSEL@-	B18		C18	EBI_^ADS1-	D18	EBI_^XD07
A19		B19		C19	EBI_^XW/R	D19	EBI_^XD08
A20	BMUXIN-	B20		C20	EBI_^XM/IO	D20	EBI_^XD09
A21	LGND	B21	BIN@-	C21	EBI_^XSP1	D21	EBI_^XD10
A22		B22	LGND	C22	EBI_^XINTA-	D22	EBI_^XD11
A23		B23	LGND	C23	EBI_^XRDY-	D23	EBI_^XD12
A24	LGND	B24	LGND	C24	EBI_^XCAS0-	D24	EBI_^XD13
A25	BSERI@-_50	B25	LGND	C25	EBI_^XCAS1-	D25	EBI_^XD14
A26	BSERI@+_50	B26	LGND	C26	EBI_^XCAS2-	D26	EBI_^XD15
A27	LGND	B27	LGND	C27		D27	
A28		B28		C28		D28	LGND
A29	LGND	B29		C29		D29	
A30		B30		C30		D30	LGND

Table B-24. Control Shelf Backplane Pin-Outs, Bottom Connector

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A31	LGND	B31		C31	MB56KHZ+_50	D31	
A32		B32		C32	MB56KHZ-_50	D32	LGND
A33	LGND	B33		C33	MB8KHZ+_50	D33	
A34		B34		C34	MB8KHZ-_50	D34	LGND
A35	CHASSIS GND	B35	CHASSIS GND	C35	CHASSIS GND	D35	CHASSIS GND

Backplane Pin-Out Symbols

Table B-25 lists the signal symbol values used in Table B-23 through Table B-45.

Table B-25. Backplane Pin-Out Symbols

Slot/Connector	Interface Port	Address	Signal Symbol Values				
			$	#	&	@	^
1 top / P16	0A	0	1A	L	0A		0
1 bottom / P32	0B	0	1A		0B	A	0
2 top / P15	1A	1	1A	K	1A		0
2 bottom / P31	1B	1	1A		1B	B	0
3 top / P14	2A	2	1B	J	2A		2
3 bottom / P30	2B	2	1B		2B	C	2
4 top / P13	3A	3	1B	I	3A		2
4 bottom / P29	3B	3	1B		3B	D	2
5 top / P12	4A	4	2A	H	4A		4
5 bottom / P28	4B	4	2A		4B	E	4
6 top / P11	5A	5	2A	G	5A		4
6 bottom / P27	5B	5	2A		5B	F	4
7 top / P10	6A	6	2B	F	6A		6
7 bottom / P26	6B	6	2B		6B	G	6
8 top / P9	7A	7	2B	E	7A		6
8 bottom / P25	7B	7	2B		7B	H	6
11 top/P7	8A	8	4A	D	8A		8

Table B-25. Backplane Pin-Out Symbols (Continued)

Slot/Connector	Interface Port	Address	Signal Symbol Values				
			$	#	&	@	^
11 bottom/P23	8B	8	4A		8B	I	8
12 top/P6	9A	9	4A	C	9A		8
12 bottom/P22	9B	9	4A		9B	J	8

Maintenance Disk and Alarm Connector

Pin-Outs, Top Connector

Table B-26 lists pinouts for connectors P1on the control shelf.

Figure B-26. Maintenance Disk and Alarm Connector, Top

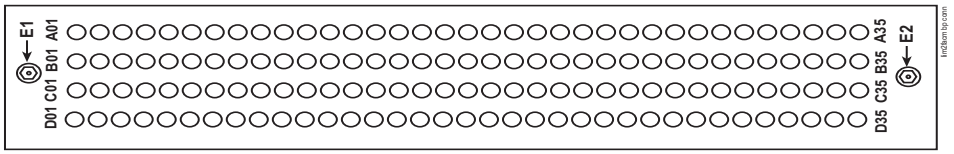


Table B-26. MDAL Backplane, Top

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A01	BALMEN0-	B01	BALMD0-	C01		D01	LGND
A02	BALMEN1-	B02	BALMD1-	C02	LGND	D02	LGND
A03	BALMEN2-	B03	BALMD2-	C03	LGND	D03	
A04	BALMEN3-	B04	BALMD3-	C04	LGND	D04	
A05	BALMEN4-	B05	BALMD4-	C05		D05	LGND
A06	BALMCK-	B06	BALMD5-	C06		D06	
A07	BALMD7-	B07	BALMD6-	C07	R0CRNC	D07	LGND
A08	R0FANCTRL	B08	LGND	C08	R0MJNC	D08	R0COM
A09	AALMEN0-	B09	AALMD0-	C09	R0MNNC	D09	R0MJNO
A10	AALMEN1-	B10	AALMD1-	C10	R0BNC	D10	R0MNNO
A11	AALMEN2-	B11	AALMD2-	C11		D11	R0BNO
A12	AALMEN3-	B12	AALMD3-	C12	LGND	D12	LGND
A13	AALMEN4-	B13	AALMD4-	C13		D13	LGND

Table B-26. MDAL Backplane, Top (Continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A14	AALMCK-	B14	AALMD5-	C14	LGND	D14	LGND
A15	AALMD7-	B15	AALMD6-	C15		D15	LGND
A16	CHASSIS GND	B16	CHASSIS GND	C16	CHASSIS GND	D16	CHASSIS GND
A17		B17	LGND	C17		D17	
A18	LGND	B18	LGND	C18	LGND	D18	
A19	LGND	B19	LGND	C19		D19	
A20	R0FBALM-	B20		C20	R1FBALM-	D20	
A21	R0FAALM-	B21	LGND	C21	R1FAALM-	D21	
A22	LGND	B22	R2FBALM-	C22		D22	
A23	LGND	B23	R2FAALM-	C23	R1CRNC	D23	R1COM
A24	LGND	B24		C24	R1MJNC	D24	R1MJNO
A25	R1FANCTRL	B25	LGND	C25	R1MNNC	D25	R1MNNO
A26	R2FANCTRL	B26	LGND	C26	R1BNC	D26	R1BNO
A27	LGND	B27		C27		D27	
A28	RACRNC	B28	RACOM	C28	R2CRNC	D28	R2COM
A29	RAMJNC	B29	RAMJNO	C29	R2MJNC	D29	R2MJNO
A30	RAMNNC	B30	RAMNNO	C30	R2MNNC	D30	R2MNNO
A31	RABNC	B31	RABNO	C31	R2BNC	D31	R2BNO
A32	RMCANC	B32		C32		D32	LGND
A33	RMCBNC	B33		C33	LGND	D33	RMCANO
A34	RMCMJNC	B34	RMCMNNC	C34	RMCCOM	D34	RMCBNO
A35	RMCCRNC	B35		C35	RMCMNNO	D35	RMCMJNO
E2	LGND						

Pin-Outs, Bottom Connector

Table B-27 lists pinouts of the bottom connector P17 on the control shelf.

Figure B-27. MDAL Backplane, Bottom

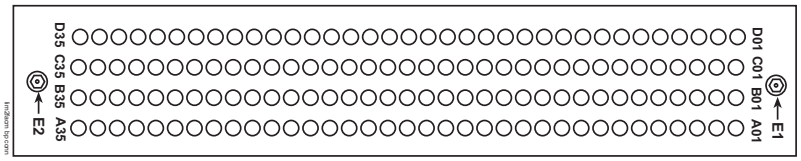


Table B-27. MDAL Backplane, Bottom

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A01	LMCANO	B01		C01	LMCACOM	D01	LMCANC
A02	LMCVMJNC	B02		C02		D02	LMCVCOM
A03	LMCVCRNC	B03	LMCVMNNC	C03	LMCVMJNO	D03	LMCVMNNO
A04	R3FANCTRL	B04		C04	LGND	D04	
A05	R4FANCTRL	B05	R4FBALM-	C05	R3CRNC	D05	R3COM
A06		B06	R4FAALM-	C06	R3MJNC	D06	R3MJNO
A07	R3FBALM-	B07		C07	R3MNNC	D07	R3MNNO
A08	R3FAALM-	B08		C08	R3BNC	D08	R3BNO
A09	LGND	B09	LGND	C09		D09	LGND
A10		B10		C10	R4CRNC	D10	R4COM
A11	LGND	B11	LGND	C11	R4MJNC	D11	R4MJNO
A12		B12		C12	R4MNNC	D12	R4MNNO
A13	LGND	B13	LGND	C13	R4CRNC	D13	R4BNO
A14		B14		C14		D14	
A15	TPWR	B15	LGND	C15		D15	
A16	AUDCTOFF-	B16		C16	LGND	D16	
A17	ALMTRANS-	B17	LGND	C17	R5FBALM-	D17	
A18	AMS/BMS-	B18	SDB0-_100	C18	R5FAALM-	D18	
A19	MASBSAN-	B19	SDB1-_100	C19		D19	
A20	MASASAN-	B20	SDB2-_100	C20		D20	
A21	LGND	B21	SDB3-_100	C21		D21	LGND
A22		B22	SDB4-_100	C22		D22	
A23		B23	SDB5-_100	C23		D23	

Table B-27. MDAL Backplane, Bottom (Continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A24		B24	SDB6-_100	C24		D24	
A25		B25	SDB7-_100	C25		D25	
A26		B26	SDBP-_100	C26		D26	
A27		B27	SBSY-_100	C27		D27	
A28		B28	SATN-_100	C28	R5CRNC	D28	R5COM
A29		B29	SACK-_100	C29	R5MJNC	D29	R5MJNO
A30	LGND	B30	SRST-_100	C30	R5MNNC	D30	R5MNNO
A31	LGND	B31	SMSG-_100	C31	R5CRNC	D31	R5BNO
A32	R5FANCTRL	B32	SSEL-_100	C32		D32	
A33		B33	SI/O-_100	C33		D33	
A34		B34	SC/D-_100	C34		D34	
A35	LGND	B35	SREQ-_100	C35		D35	
E2 P5B48RTN							

Terminal Disk Module

Terminal Disk Module P2, P4, P18, P20

Pin-Outs, Top Connectors

TDM, Top Connectors P2, P4

Figure B-28. TDM, Top

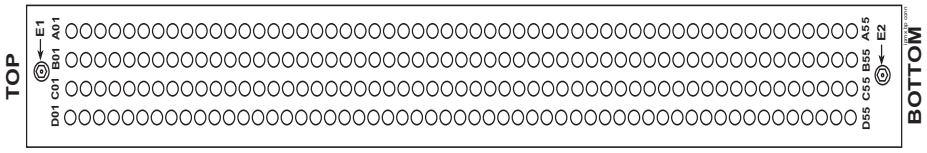


Table B-28. TDM Backplane, Top

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A01	LGND	B01	R0FA+	C01	$ALMEN0-	D01	$ALMD0-
A02	LGND	B02	R0FA-	C02	$ALMEN1-	D02	$ALMD1-
A03	CUFA1	B03		C03	$ALMEN2-	D03	$ALMD2-
A04	CUFA2	B04	LGND	C04	$ALMEN3-	D04	$ALMD3-

Table B-28. TDM Backplane, Top (Continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A05	MBUS2RX+_50	B05	LGND	C05	$ALMEN4-	D05	$ALMD4-
A06	MBUS2RX-_50	B06	$8KHZ2-_50	C06	$ALMCK-	D06	$ALMD5-
A07	MBUS2TX+_50	B07	$8KHZ2+_50	C07	$ALMD7-	D07	$ALMD6-
A08	MBUS2TX-_50	B08	$56KHZ2-_50	C08	EBI_$XA02	D08	EBI_$XA14
A09	MBUS1RX+_50	B09	$56KHZ2+_50	C09	EBI_$XA03	D09	EBI_$XA15
A10	MBUS1RX-_50	B10	$8KHZ1-_50	C10	EBI_$XA04	D10	EBI_$XA16
A11	MBUS1TX+_50	B11	$8KHZ1+_50	C11	EBI_$XA05	D11	EBI_$XA17
A12	MBUS1TX-_50	B12	$56KHZ1-_50	C12	EBI_$XA06	D12	EBI_$XA18
A13	MBUS0RX+_50	B13	$56KHZ1+_50	C13	EBI_$XA07	D13	EBI_$XA19
A14	MBUS0RX-_50	B14	$8KHZ0-_50	C14	EBI_$XA08	D14	EBI_$XA20
A15	MBUS0TX+_50	B15	$8KHZ0+_50	C15	EBI_$XA09	D15	EBI_$XA21
A16	MBUS0TX-_50	B16	$56KHZ0-_50	C16	EBI_$XA10	D16	EBI_$XA22
A17		B17	$56KHZ0+_50	C17	CUFA13	D17	EBI_$XA23
A18	LGND	B18		C18	CUFA14	D18	EBI_$XA24
A19	CUFA3	B19	CUFA9	C19	HST/GST	D19	EBI_$XA25
A20	CUFA4	B20	CUFA10	C20		D20	EBI_$XA26
A21	LGND	B21	LGND	C21	LGND	D21	EBI_$XA27
A22	CUFA5	B22	CUFA11	C22		D22	MBUS8RX+_50
A23	CUFA6	B23	CUFA12	C23	LGND	D23	$8KHZ8-_50
A24	LGND	B24	LGND	C24	CUFA15	D24	MBUS8RX-_50
A25	CUFA7	B25	LGND	C25	CUFA16	D25	$8KHZ8+_50
A26	CUFA8	B26	LGND	C26	MBUS8TX+_50	D26	$56KHZ8-_50
A27	LGND	B27		C27	MBUS8TX-_50	D27	$56KHZ8+_50
A28	EBI_$XSP5	B28	R1FA+	C28	MBUS7RX+_50	D28	$8KHZ7-_50
A29	EBI_$XSP4	B29	R1FA-	C29	MBUS7RX-_50	D29	$8KHZ7+_50
A30	EBI_$XA11	B30	EBI_$XA12	C30	MBUS7TX+_50	D30	$56KHZ7-_50

Table B-28. TDM Backplane, Top (Continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A31	EBI_$XA13	B31	EBI_$BREQ-	C31	MBUS7TX-_50	D31	$56KHZ7+_50
A32	EBI_$BG-	B32	EBI_$XIRQ-	C32	MBUS6RX+_50	D32	$8KHZ6-_50
A33	EBI_$HOSTSAN-	B33	EBI_$GSTSAN-	C33	MBUS6RX-_50	D33	$8KHZ6+_50
A34	MBUS5RX+_50	B34	$8KHZ5-_50	C34	MBUS6TX+_50	D34	$56KHZ6-_50
A35	MBUS5RX-_50	B35	$8KHZ5+_50	C35	MBUS6TX-_50	D35	$56KHZ6+_50
A36	MBUS5TX+_50	B36	$56KHZ5-_50	C36	RTS0	D36	RTS4
A37	MBUS5TX-_50	B37	$56KHZ5+_50	C37	CTS0	D37	CTS4
A38	MBUS4RX+_50	B38	$8KHZ4-_50	C38	TX0	D38	TX4
A39	MBUS4RX-_50	B39	$8KHZ4+_50	C39	RX0	D39	RX4
A40	MBUS4TX+_50	B40	$56KHZ4-_50	C40	DCD0	D40	DCD4
A41	MBUS4TX-_50	B41	$56KHZ4+_50	C41	RTS1	D41	RTS5
A42	MBUS3RX+_50	B42	$8KHZ3-_50	C42	CTS1	D42	CTS5
A43	MBUS3RX-_50	B43	$8KHZ3+_50	C43	TX1	D43	TX5
A44	MBUS3TX+_50	B44	$56KHZ3-_50	C44	RX1	D44	RX5
A45	MBUS3TX-_50	B45	$56KHZ3+_50	C45	DCD1	D45	DCD5
A46		B46		C46	RTS2	D46	RTS6
A47		B47		C47	CTS2	D47	CTS6
A48	LGND	B48	LGND	C48	TX2	D48	TX6
A49		B49	LGND	C49	RX2	D49	RX6
A50		B50		C50	DCD2	D50	DCD6
A51	LGND	B51	LGND	C51	RTS3	D51	RTS7
A52		B52		C52	CTS3	D52	CTS7
A53	RAFA+	B53		C53	TX3	D53	TX7
A54	RAFA-	B54	R2FA+	C54	RX3	D54	RX7
A55		B55	R2FA-	C55	DCD3	D55	DCD7
E1	P#$48VDC	$= A or B, for TDM connectors P4 and P2 respectively # = 4 or 5, for TDM connectors P4 and P2 respectively					
E2	P#$48RTN						

Pin-Outs, Bottom Connector

TDM, Bottom Connectors P18, P20 Control Shelf Backplane

Figure B-29. TDM Backplane Pin-outs, Bottom

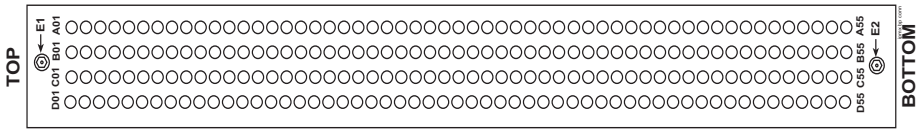


Table B-29. TDM Backplane Pin-outs, Bottom

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A01	CHASSIS GND	B01	CHASSIS GND	C01	CHASSIS GND	D01	CHASSIS GND
A02		B02		C02	LGND	D02	
A03	PBITSIN+_60	B03	LGND	C03	SBITSIN+_60	D03	LGND
A04	PBITSIN-_60	B04		C04	SBITSIN-_60	D04	
A05	LGND	B05	LGND	C05		D05	
A06	LGND	B06		C06		D06	SPARE1
A07		B07	LGND	C07	LGND	D07	R3FA+
A08		B08		C08		D08	R3FA-
A09		B09		C09		D09	R4FA+
A10	LGND	B10	LGND	C10	LGND	D10	R4FA-
A11	MBUS11RX+_50	B11	$8KHZ11-_50	C11	MBUS14RX+_50	D11	
A12	MBUS11RX-_50	B12	$8KHZ11+_50	C12	MBUS14RX-_50	D12	$8KHZ14-_50
A13	MBUS11TX+_50	B13	$56KHZ11-_50	C13	MBUS14TX+_50	D13	$8KHZ14+_50
A14	MBUS11TX-_50	B14	$56KHZ11+_50	C14	MBUS14TX-_50	D14	$56KHZ14-_50
A15		B15		C15	MBUS13RX+_50	D15	$56KHZ14+_50
A16	MBUS10RX+_50	B16	$8KHZ10-_50	C16	MBUS13RX-_50	D16	$8KHZ13-_50
A17	MBUS10RX-_50	B17	$8KHZ10+_50	C17	MBUS13TX+_50	D17	$8KHZ13+_50
A18	MBUS10TX+_50	B18	$56KHZ10-_50	C18	MBUS13TX-_50	D18	$56KHZ13-_50
A19	MBUS10TX-_50	B19	$56KHZ10+_50	C19	MBUS12RX+_50	D19	$56KHZ13+_50
A20	MBUS9RX+_50	B20	$8KHZ9-_50	C20	MBUS12RX-_50	D20	$8KHZ12-_50
A21	MBUS9RX-_50	B21	$8KHZ9+_50	C21	MBUS12TX+_50	D21	$8KHZ12+_50
A22	MBUS9TX+_50	B22	$56KHZ9-_50	C22	MBUS12TX-_50	D22	$56KHZ12-_50
A23	MBUS9TX-_50	B23	$56KHZ9+_50	C23		D23	$56KHZ12+_50
A24	EBI_$XD00	B24	EBI_$XBE0-	C24	EBI_$XSP2	D24	EBI_$XSP3

Table B-29. TDM Backplane Pin-outs, Bottom (Continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A25	EBI_$XD01	B25	EBI_$XBE1-	C25		D25	LGND
A26	EBI_$XD02	B26	EBI_$XBE2-	C26		D26	
A27	EBI_$XD03	B27	EBI_$XBE3-	C27	LGND	D27	SPARE2
A28	EBI_$XD04	B28	EBI_$XBS8-	C28	LGND	D28	TPWR
A29	EBI_$XD05	B29	EBI_$XBS16-	C29		D29	AUDCTOFF-
A30	EBI_$XD06	B30	EBI_$ADS0-	C30		D30	ALMTRANS-
A31	EBI_$XD07	B31	EBI_$ADS1-	C31	SDB0-_100	D31	AMS/BMS
A32	EBI_$XD08	B32	EBI_$XW/R	C32	SDB1-_100	D32	MASASAN-
A33	EBI_$XD09	B33	EBI_$XM/IO	C33	SDB2-_100	D33	MASBSAN-
A34	EBI_$XD10	B34	EBI_$XSP1	C34	SDB3-_100	D34	R5FA+
A35	EBI_$XD11	B35	EBI_$XINTA-	C35	LGND	D35	R5FA-
A36	EBI_$XD12	B36	EBI_$XRDY-	C36	RTS8	D36	RTS12
A37	EBI_$XD13	B37	EBI_$XCAS0-	C37	CTS8	D37	CTS12
A38	EBI_$XD14	B38	EBI_$XCAS1-	C38	TX8	D38	TX12
A39	EBI_$XD15	B39	EBI_$XCAS2-	C39	RX8	D39	RX12
A40	LGND	B40		C40	DCD8	D40	DCD12
A41		B41		C41	RTS9	D41	RTS13
A42	LGND	B42	SDB4-_100	C42	CTS9	D42	CTS13
A43		B43	SDB5-_100	C43	TX9	D43	TX13
A44	LGND	B44	SDB6-_100	C44	RX9	D44	RX13
A45	MBUS15RX+_50	B45	SDB7-_100	C45	DCD9	D45	DCD13
A46	$8KHZ15-_50	B46	SDBP-_100	C46	RTS10	D46	RTS14
A47	MBUS15RX-_50	B47	SBSY-_100	C47	CTS10	D47	CTS14
A48	$8KHZ15+_50	B48	SATN-_100	C48	TX10	D48	TX14
A49	MBUS15TX+_50	B49	SACK-_100	C49	RX10	D49	RX14
A50	$56KHZ15-_50	B50	SRST-_100	C50	DCD10	D50	DCD14
A51	MBUS15TX-_50	B51	SMSG-_100	C51	RTS11	D51	RTS15
A52	$56KHZ15+_50	B52	SSEL-_100	C52	CTS11	D52	CTS15
A53	+12VB	B53	SI/O-_100	C53	TX11	D53	TX15
A54	SIG GND	B54	SC/D-_100	C54	RX11	D54	RX15
A55	SIG GND	B55	SREQ-_100	C55	DCD11	D55	DCD15

Interprocessor Message Transport Connectors

Inter-processor Message Transport (IMT) connectors on the control shelf backplane provide connections between the system shelves as part of the two high speed IMT buses.

J8, J16, J58, J64 on Control Shelf backplane 04 and
J23, J22, J75, J74 on Control Shelf backplane 06/07

Figure B-30. IMT Connector

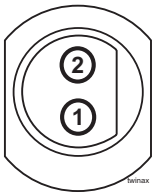


Table B-30. IMT Connector Pins

Connector	Pin	Signal
A IMT IN backplane (P/N 850-0330-04)(J8) A IMT IN backplane (P/N 850-0330-06/07)(J23)	1	AIMTIN+_78
	2	AIMTIN-_78
A IMT OUT backplane (P/N 850-0330-04)(J16) A IMT OUT backplane (P/N 850-0330-06/07)(J22)	1	AIMTOUT+_78
	2	AIMTOUT-_78
B IMT IN backplane (P/N 850-0330-04)(J58) B IMT IN backplane (P/N 850-0330-06/07)(J75)	1	BIMTIN+_78
	2	BIMTIN-_78
B IMT OUT backplane (P/N 850-0330-04)(J64) B IMT OUT backplane (P/N 850-0330-06/07)(J74)	1	BIMTOUT+_78
	2	BIMTOUT-_78

High Speed Message Multiplexer

The High-Speed Multiplexer card supports requirements for more than 1024 linksl.

J8, J24 on Control Shelf backplane 04 and
J23, J31 on Control Shelf backplane 06/07

HMUX A, P8

Figure B-31. Control Shelf HMUX A Pin-Outs

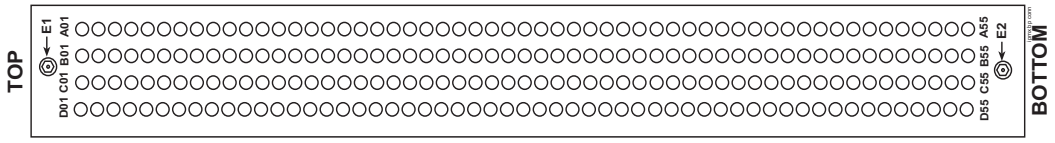


Table B-31. Control Shelf HMUX A Backplane Pin-Outs

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A01	LGND	B01	LGND	C01	LGND	D01	LGND
A02	ASEROD-_50	B02	LGND	C02	ASEROE-_50	D02	LGND
A03	ASEROD+_50	B03	LGND	C03	ASEROE+_50	D03	LGND
A04	LGND	B04	ASELD-	C04	LGND	D04	ASELE-
A05	ASERID-_50	B05	LGND	C05	ASERIE-_50	D05	LGND
A06	ASERID+_50	B06	LGND	C06	ASERIE+_50	D06	LGND
A07	LGND	B07	AIND-	C07	LGND	D07	AINE-
A08	ASEROC-_50	B08	LGND	C08	ASEROF-_50	D08	LGND
A09	ASEROC+_50	B09	LGND	C09	ASEROF+_50	D09	LGND
A10	ABMUXIN-	B10	ASELC-	C10	LGND	D10	ASELF-
A11	ASERIC-_50	B11	LGND	C11	ASERIF-_50	D11	LGND
A12	ASERIC+_50	B12	LGND	C12	ASERIF+_50	D12	LGND
A13	LGND	B13	AINC-	C13	LGND	D13	AINF-
A14	ASEROB-_50	B14	LGND	C14	ASEROG-_50	D14	LGND
A15	ASEROB+_50	B15	LGND	C15	ASEROG+_50	D15	LGND
A16	LGND	B16	ASELB-	C16	LGND	D16	ASELG-
A17	ASERIB-_50	B17	LGND	C17	ASERIG-_50	D17	LGND
A18	ASERIB+_50	B18	LGND	C18	ASERIG+_50	D18	LGND
A19	LGND	B19	AINB-	C19	LGND	D19	AING-
A20		B20	LGND	C20	ASEROH-_50	D20	LGND
A21		B21	LGND	C21	ASEROH+_50	D21	LGND
A22	LGND	B22		C22	LGND	D22	ASELH-
A23		B23	LGND	C23	ASERIH-_50	D23	LGND

Table B-31. Control Shelf HMUX A Backplane Pin-Outs (Continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A24		B24	LGND	C24	ASERIH+_50	D24	LGND
A25	LGND	B25		C25	LGND	D25	AINH-
A26	ASEROA-_50	B26	LGND	C26	ASEROI-_50	D26	LGND
A27	ASEROA+_50	B27	LGND	C27	ASEROI+_50	D27	LGND
A28	LGND	B28	ASELA-	C28	LGND	D28	ASELI-
A29	ASERIA-_50	B29	LGND	C29	ASERII-_50	D29	LGND
A30	ASERIA+_50	B30	LGND	C30	ASERII+_50	D30	LGND
A31	LGND	B31	AINA-	C31	LGND	D31	AINI-
A32		B32	LGND	C32	ASEROJ-_50	D32	LGND
A33		B33	LGND	C33	ASEROJ+_50	D33	LGND
A34	LGND	B34		C34	LGND	D34	ASELJ-
A35		B35	LGND	C35	ASERIJ-_50	D35	LGND
A36		B36	LGND	C36	ASERIJ+_50	D36	LGND
A37	LGND	B37		C37	LGND	D37	AINJ-
A38		B38	LGND	C38	ASEROK-_50	D38	LGND
A39		B39	LGND	C39	ASEROK+_50	D39	LGND
A40	LGND	B40		C40	LGND	D40	ASELK-
A41		B41	LGND	C41	ASERIK-_50	D41	LGND
A42		B42	LGND	C42	ASERIK+_50	D42	LGND
A43	LGND	B43		C43	LGND	D43	AINK-
A44		B44	LGND	C44	ASEROL-_50	D44	LGND
A45		B45	LGND	C45	ASEROL+_50	D45	LGND
A46	LGND	B46		C46	LGND	D46	ASELL-
A47		B47	LGND	C47	ASERIL-_50	D47	LGND
A48		B48	LGND	C48	ASERIL+_50	D48	LGND
A49	LGND	B49		C49	LGND	D49	AINL-
A50	AIN-_78	B50	LGND	C50	AIMTOUT-_78	D50	LGND
A51	AIMTIN+_78	B51	LGND	C51	AIMTOUT+_78	D51	LGND
A52	LGND	B52	LGND	C52	LGND	D52	LGND
A53		B53	MBUSSRX-_50	C53	MBUSSRX+_50	D53	

Table B-31. Control Shelf HMUX A Backplane Pin-Outs (Continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A54		B54	MBUSSTX-_50	C54	MBUSSTX+_50	D54	LGND
A55	CHASSIS GND	B55	CHASSIS GND	C55	CHASSIS GND	D55	CHASSIS GND
E2	P3A48RTN						

HMUX B, P24

Figure B-32. Control Shelf HMUX B Pin-Outs

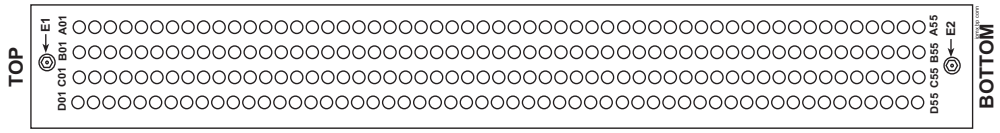


Table B-32. Control Shelf HMUX B Backplane Pin-Outs

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A01	LGND	B01	LGND	C01	LGND	D01	LGND
A02	BSEROH-_50	B02	LGND	C02	BSEROI-_50	D02	LGND
A03	BSEROH+_50	B03	LGND	C03	BSEROI+_50	D03	LGND
A04	LGND	B04	BSELH-	C04	LGND	D04	BSELI-
A05	BSERIH-_50	B05	LGND	C05	BSERII-_50	D05	LGND
A06	BSERIH+_50	B06	LGND	C06	BSERII+_50	D06	LGND
A07	LGND	B07	BINH-	C07	LGND	D07	BINI-
A08	BSEROG-_50	B08	LGND	C08	BSEROJ-_50	D08	LGND
A09	BSEROG+_50	B09	LGND	C09	BSEROJ+_50	D09	LGND
A10	BMUXIN-	B10	BSELG-	C10	LGND	D10	BSELJ-
A11	BSERIG-_50	B11	LGND	C11	BSERIJ-_50	D11	LGND
A12	BSERIG+_50	B12	LGND	C12	BSERIJ+_50	D12	LGND
A13	LGND	B13	BING-	C13	LGND	D13	BINJ-
A14	BSEROF-_50	B14	LGND	C14	BSEROK-_50	D14	LGND
A15	BSEROF+_50	B15	LGND	C15	BSEROK+_50	D15	LGND
A16	LGND	B16	BINF-	C16	LGND	D16	BSELK-
A17	BSERIF-_50	B17	LGND	C17	BSERIK-_50	D17	LGND

Table B-32. Control Shelf HMUX B Backplane Pin-Outs (Continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A18	BSERIF+_50	B18	LGND	C18	BSERIK+_50	D18	LGND
A19	LGND	B19	BINF-	C19	LGND	D19	BINK-
A20	BSEROE-_50	B20	LGND	C20		D20	LGND
A21	BSEROE+_50	B21	LGND	C21		D21	LGND
A22	LGND	B22	BSELE-	C22	LGND	D22	
A23	BSERIE-_50	B23	LGND	C23		D23	LGND
A24	BSERIE+_50	B24	LGND	C24		D24	LGND
A25	LGND	B25	BINE-	C25	LGND	D25	
A26	BSEROD-_50	B26	LGND	C26	BSEROL-_50	D26	LGND
A27	BSEROD+_50	B27	LGND	C27	BSEROL+_50	D27	LGND
A28	LGND	B28	BSELD-	C28	LGND	D28	BSELL-
A29	BSERID-_50	B29	LGND	C29	BSERIL-_50	D29	LGND
A30	BSERID+_50	B30	LGND	C30	BSERIL+_50	D30	LGND
A31	LGND	B31	BIND-	C31	LGND	D31	BINL-
A32	BSEROC-_50	B32	LGND	C32		D32	LGND
A33	BSEROC+_50	B33	LGND	C33		D33	LGND
A34	LGND	B34	BSELC-	C34	LGND	D34	
A35	BSERIC-_50	B35	LGND	C35		D35	LGND
A36	BSERIC+_50	B36	LGND	C36		D36	LGND
A37	LGND	B37	BINC-	C37	LGND	D37	
A38	BSEROB-_50	B38	LGND	C38		D38	LGND
A39	BSEROB+_50	B39	LGND	C39		D39	LGND
A40	LGND	B40	BSELB-	C40	LGND	D40	
A41	BSERIB-_50	B41	LGND	C41		D41	LGND
A42	BSERIB+_50	B42	LGND	C42		D42	LGND
A43	LGND	B43	BINB-	C43	LGND	D43	
A44	BSEROA-_50	B44	LGND	C44		D44	LGND
A45	BSEROA+_50	B45	LGND	C45		D45	LGND
A46	LGND	B46	BSELA-	C46	LGND	D46	
A47	BSERIA-_50	B47	LGND	C47		D47	LGND
A48	BSERIA+_50	B48	LGND	C48		D48	LGND

Table B-32. Control Shelf HMUX B Backplane Pin-Outs (Continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A49	LGND	B49	BINA-	C49	LGND	D49	
A50	BIMTIN-_78	B50	LGND	C50	BIMTOUT-_78	D50	LGND
A51	BIMTIN+_78	B51	LGND	C51	BIMTOUT+_78	D51	LGND
A52	LGND	B52	LGND	C52	LGND	D52	LGND
A53		B53	MBUSSRX-_50	C53	MBUSSRX+_50	D53	
A54		B54	MBUSSTX-_50	C54	MBUSSTX+_50	D54	LGND
A55	CHASSIS GND	B55	CHASSIS GND	C55	CHASSIS GND	D55	CHASSIS GND
E2	P3B48RTN						

General Purpose Relay Connectors

General Purpose Relay connectors provide software controlled, general purpose outputs for the system. Currently, Generic Program (GP01) provides reset signals for any optional OAPs that may be present in the system.

GP01

J75 on Control Shelf backplane 04 and
J71 on Control Shelf backplane 06/07

Figure B-33. General Purpose Relay Connector 01

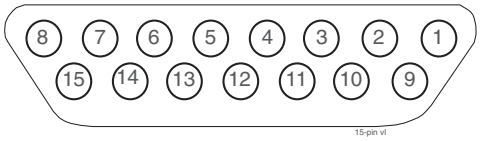


Table B-33. General Purpose Relay Connector 01

Pin	Signal
4, 8, 10, 15	not used
1	GPRNO0 - General Purpose Relay 0, Normally Open
2	GPRCOM0 - General Purpose Relay 0, Common
3	GPRNC0 - General Purpose Relay 0, Normally Closed
5	GPRNO1 - General Purpose Relay 1, Normally Open
6	GPRCOM1 - General Purpose Relay 1, Common
7	GPRNC1 - General Purpose Relay 1, Normally Closed
9	Logic ground
11	OAP1_RST+ - OAP 1 reset, +
12	OAP1_RST- - OAP 1 reset, -
13	OAP2_RST+ - OAP 2 reset, +
14	OAP2_RST- - OAP 2 reset, -

GP02

J73 on Control Shelf backplane 04 and
J75 on Control Shelf backplane 06/07

Figure B-34. General Purpose Relay Connector 02

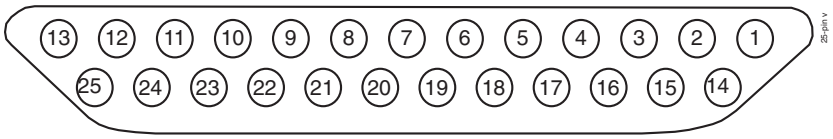


Table B-34. General Purpose Relay Connector 02

Pin	Signal
1, 2, 13, 14, 18, 25	not used
3	GPRNC2 - General Purpose Relay 2, Normally Closed
4	GPRCOM2 - General Purpose Relay 2, Common
5	GPRNO2 - General Purpose Relay 2, Normally Open
6	GPRNC2 - General Purpose Relay 3, Normally Closed
7	GPRCOM2 - General Purpose Relay 3, Common
8	GPRNO2 - General Purpose Relay 3, Normally Open
9	GPRNC2 - General Purpose Relay 4, Normally Closed
10	GPRCOM2 - General Purpose Relay 4, Common
11	GPRNO2 - General Purpose Relay 4, Normally Open
12	Logic ground
15	GPRNC2 - General Purpose Relay 5, Normally Closed
16	GPRCOM2 - General Purpose Relay 5, Common
17	GPRNO2 - General Purpose Relay 5, Normally Open
19	GPRNC2 - General Purpose Relay 6, Normally Closed
20	GPRCOM2 - General Purpose Relay 6, Common
21	GPRNO2 - General Purpose Relay 6, Normally Open
22	GPRNC2 - General Purpose Relay 7, Normally Closed
23	GPRCOM2 - General Purpose Relay 7, Common
24	GPRNO2 - General Purpose Relay 7, Normally Open

General Purpose Serial Interface Connectors

The General Purpose Serial Interface connector provides a General Purpose Serial Interfaces (GPSI) for the system. The GPSI also provides communications between an optional holdover clock system and the rest of the system.

J76 on Control Shelf backplane 04 and
J73 on Control Shelf backplane 06/07

Figure B-35. General Purpose Serial Interface Connector 01, GPSI

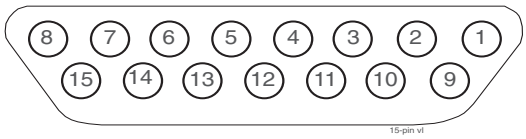


Table B-35. General Purpose Serial Interface Connector 01, GPSI

Pin	Signal
1, 2, 3, 8, 9, 10, 11, 12, 13, 14, 15	Not used
4	RX_HO - Holdover Clock Receive Data
5	TX_HO - Holdover Clock Transmit Data
6	DTR_HO - Holdover Clock Data Terminal Ready
7	Logic ground

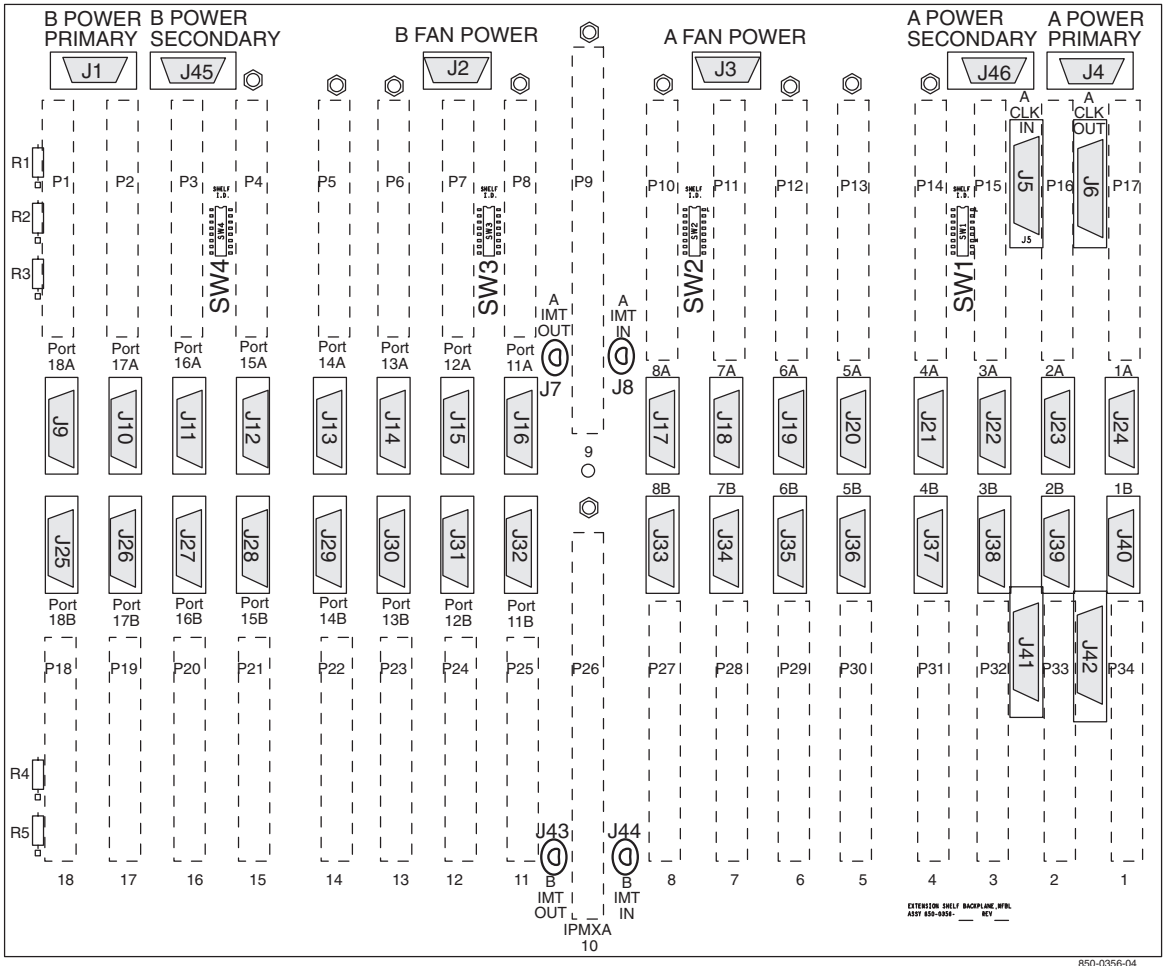
Extension Shelf

The extension shelf backplane provides connectors for 18 circuit cards. These connectors are four column High Density Interconnect (HDI) male headers with shrouds of varying pin quantities depending on card position. The reverse or component side of the backplane contains DB style connectors for interfacing to the rest of the system.

- Power connectors
- System clock connectors
- Interface connectors
- IMT connectors

Extension Shelf Backplane 04

Figure B-36. Extension Shelf Backplane 04



NOTE: ⬡ Conducts -48VDC for the printed circuit board (HOT)

Power Connectors

The extension shelf backplane provides –48VDC power and return to all card positions. The power is divided into parts A and B and brought to the shelf from the Fuse and Alarm Panel (FAP) using two cables. The power connectors on the extension shelf backplane are DB-26 high density connectors with two pins per power connection to handle the current load.

J1, J4 on Extension Shelf backplane 01

J1, J4, Primary and J45, J46 Secondary on Extension Shelf backplane 03

Figure B-37. Power Connector

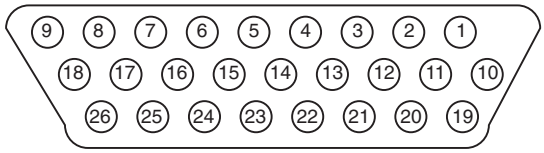


Table B-36. Power Connectors

Pin	Signal	Pin	Signal
$= A or B, A POWER (J4) or B POWER (J1)			

System Clock Connectors

Each extension shelf receives and passes along Clock signals A (J5 and J6) and B (J41and J42).

Clock A In Connector J5

Figure B-38. Clock A In Extension Shelf Connector

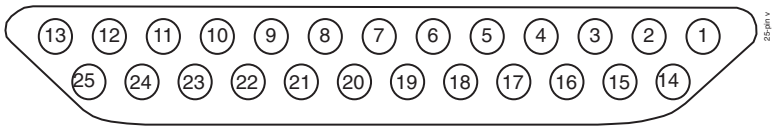


Table B-37. Clock A In Extension Shelf Connector

Pin	Signal	Pin	Signal
1		14	MA56KHZ+_50
2	MBUSSTX-_50	15	MA56KHZ-_50
3	MBUSSTX+_50	16	MA8KHZ+_50
4	MBUSSRX-_50	17	MA8KHZ-_50
5	MBUSSRX+_50	18	SH2A56KHZ+_50
6	SH2MBUSTX-_50	19	SH2A56KHZ-_50
7	SH2MBUSTX+_50	20	SH2A8KHZ+_50
8	SH2MBUSRX-_50	21	SH2A8KHZ-_50
9	SH2MBUSRX+_50	22	SH3A56KHZ+_50
10	SH3MBUSTX-_50	23	SH3A56KHZ-_50
11	SH3MBUSTX-_50	24	SH3A8KHZ+_50
12	SH3MBUSRX-_50	25	SH3A8KHZ-_50
13	SH3MBUSRX+_50		

Clock A Out Connector J6

Figure B-39. Clock A Out Extension Shelf Connector

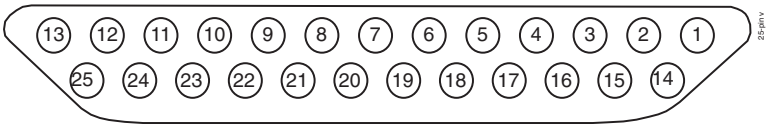


Table B-38. Clock A Out Extension Shelf Connector

Pin	Signal	Pin	Signal
1		14	SH2A56KHZ+_50
2	SH2MBUSTX-_50	15	SH2A56KHZ-_50
3	SH2MBUSTX+_50	16	SH2A8KHZ+_50
4	SH2MBUSRX-_50	17	SH2A8KHZ-_50
5	SH2MBUSRX+_50	18	SH3A56KHZ+_50
6	SH3MBUSTX-_50	19	SH3A56KHZ-_50
7	SH3MBUSTX+_50	20	SH3A8KHZ+_50
8	SH3MBUSRX-_50	21	SH3A8KHZ-_50
9	SH3MBUSRX+_50	22	
10		23	
11		24	
12		25	
13			

Clock B In Extension Shelf Connector J41

Figure B-40. Clock B In Extension Shelf Connector

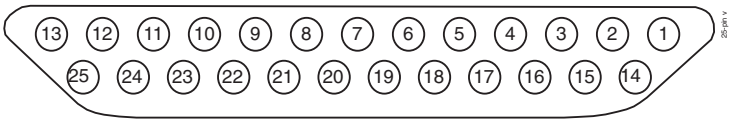


Table B-39. Clock B In Extension Shelf Connector

Pin Number	Signal	Pin Number	Signal
1	FANAALM-	14	MB56KHZ+_50
2		15	MB56KHZ-_50
3		16	MB8KHZ+_50
4		17	MB8KHZ-_50
5		18	SH2B56KHZ+_50
6		19	SH2B56KHZ-_50
7	FANCNTRL	20	SH2B8KHZ+_50
8		21	SH2B8KHZ-_50
9		22	SH3B56KHZ+_50
10		23	SH3B56KHZ-_50
11		24	SH3B8KHZ+_50
12		25	SH3B8KHZ-_50
13	FANBALM-		

Clock B Out Extension Shelf Connector J42

Figure B-41. Clock B Out Extension Shelf Connector

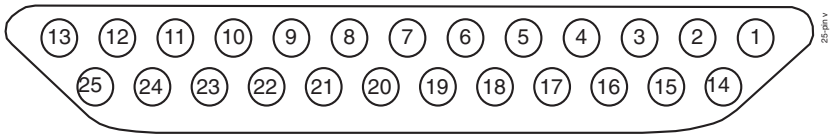


Table B-40. Clock B Out Extension Shelf Connector

Pin Number	Signal	Pin Number	Signal
1	FANAALM	14	SH2B56KHZ+_50
2		15	SH2B56KHZ-_50
3		16	SH2B8KHZ+_50
4		17	SH2B8KHZ-_50
5		18	SH3B56KHZ+_50
6		19	SH3B56KHZ-_50
7	FANCNTRL	20	SH3B8KHZ+_50
8		21	SH3B8KHZ-_50
9		22	
10		23	
11		24	
12		25	
13	FANBALM		

Interface Connectors

Behind each slot on the extension shelf backplane are two DB-26 connectors. These provide connection to the outside world in the form of TCP/IP networks, SS7 links, or X.25 networks. The interface connectors are designated as J9 through J40.

Extension Shelf Interface Connectors J9 through J40

Figure B-42. Extension Shelf Interface Connector

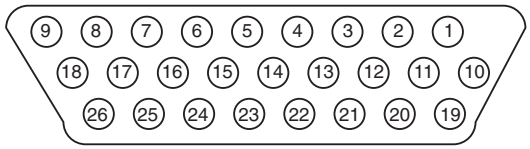


Table B-41. Extension Shelf Interface Connector Pins and Signals

Interface Connector Pins and Signals									
Pin	**V.35 Signal**	**V.35 Pin**	**DS0A/OCU Signal ATM**	**Ethernet Signal (ACM)**	**Pin**	**V.35 Signal**	**V.35 Pin**	**DS0A/OCU Signal ATM**	**Ethernet Signal (ACM)**
1	RxCA	V		RXD-	14				
2	RxCB	X		RXD+	15				
3	TxCCA	Y		COL+	16				
4	TxCCB	AA		COL-	17				CHASS GND
5	TEST			-	18	LOOPL	J		
6	RLSD	F		TXD-	19	RTS	C		SIG GND
7	DSR	E		-	20	TxDA	P	TX-RING	+12VDC
8	CHASS GND	A		TXD+	21	TxDB	S	TX-TIP	+12VDC
9	CTS	D		-	22	RxDA	R	RX-RING	
10	SIG GND	B		SIG GND	23	RxDB	T	RX-TIP	
11					24	TxCTA	U		
12					25	TxCDB	W		
13					26	LOOPM	BB		

Table B-42. Connectors, Ports, and Card Slots

Interface Connectors, Ports, and Card Slots				
Card Slot	**Port**	**Connector**	**Port**	**Connector**
01	1A	J24	1B	J40
02	2A	J23	2B	J39
03	3A	J22	3B	J38
04	4A	J21	4B	J37
05	5A	J20	5B	J36
06	6A	J19	6B	J35
07	7A	J18	7B	J34
08	8A	J17	8B	J33
11	9A	J16	9B	J32
12	10A	J15	10B	J31
13	11A	J14	11B	J30
14	12A	J13	12B	J29
15	13A	J12	13B	J28
16	14A	J11	14B	J27
17	15A	J10	15B	J26
18	16A	J9	16B	J25

Extension Shelf Modules

This section details the Extension Shelf backplane circuit board pin-outs used for

- Application Communication Modules (ACMs)
- Database Communications Modules (DCMs),
- Database Services Modules (DSMs)
- Enhanced Integrated Link Interface Modules Appliques (EILAs)
- Integrated Link Interface Modules Appliques (ILAs)
- Link Interface Modules (LIMs)
- Multi-Port LIMs (MPLs)
- Translation Service Modules (TSMs).

Refer to Table B-45 on page B-63 for signal symbol values ($, #, &, @, and ^).

Pin-Outs, Top Connector

Table B-43 lists pinouts for ACM/DCM/DSM/EILA/ILA/LIM/MPL/TSM Extension Shelf Backplane Top Connectors P1 through P8 and P10 through P17.

Figure B-43. Extension Shelf Backplane Pin-Outs, Top Connector

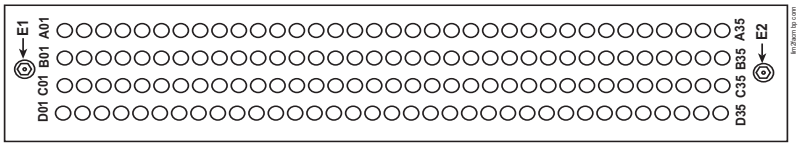


Table B-43. Extension Shelf Backplane Pin-Outs, Top Connector

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A01	LGND	B01	LGND	C01	EBI_^XA02	D01	EBI_^XA14
A02	ASERO#-_50	B02	LGND	C02	EBI_^XA03	D02	EBI_^XA15
A03	ASERO#+_50	B03	LGND	C03	EBI_^XA04	D03	EBI_^XA16
A04	LGND	B04	LGND	C04	EBI_^XA05	D04	EBI_^XA17
A05		B05	LGND	C05	EBI_^XA06	D05	EBI_^XA18
A06		B06	LGND	C06	EBI_^XA07	D06	EBI_^XA19
A07	LGND	B07	LGND	C07	EBI_^XA08	D07	EBI_^XA20
A08	ASEL#-	B08		C08	EBI_^XA09	D08	EBI_^XA21

Table B-43. Extension Shelf Backplane Pin-Outs, Top Connector (Continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A09		B09		C09	EBI_^XA10	D09	EBI_^XA22
A10	AMUXIN-	B10		C10		D10	EBI_^XA23
A11	LGND	B11	AIN#-	C11		D11	EBI_^XA24
A12		B12	LGND	C12		D12	EBI_^XA25
A13		B13	LGND	C13		D13	EBI_^XA26
A14	LGND	B14	LGND	C14		D14	EBI_^XA27
A15	ASERI#-_50	B15	LGND	C15		D15	
A16	ASERI#+_50	B16	LGND	C16		D16	
A17	LGND	B17	LGND	C17		D17	
A18		B18		C18		D18	
A19	LGND	B19	MBUSSRX+_50	C19	LGND*	D19	
A20		B20	MBUSSRX-_50	C20		D20	LGND
A21	LGND	B21	MBUSSTX+_50	C21	MA56KHZ+_50	D21	
A22		B22	MBUSSTX-_50	C22	MA56KHZ-_50	D22	LGND
A23	LGND	B23		C23	MA8KHZ+_50	D23	
A24	&-IF1_60	B24		C24	MA8KHZ-_50	D24	LGND
A25	LGND	B25		C25	EBI_^XSP4	D25	EBI_^XSP5
A26	&-IF2_60	B26		C26	EBI_^XA11	D26	
A27	LGND	B27		C27	EBI_^XA12	D27	
A28	&-IF3_60	B28	&-IF10_60	C28	EBI_^XA13	D28	LGND
A29	LGND	B29	&-IF19_60	C29	EBI_^BREQ-	D29	
A30	&-IF4_60	B30	&-IF20_60	C30	EBI_^BG-	D30	LGND
A31	&-IF5_60	B31	&-IF21_60	C31	EBI_^XIRQ-	D31	
A32	&-IF6_60	B32	&-IF22_60	C32	EBI_^HOSTSAN-	D32	LGND
A33	&-IF7_60	B33	&-IF23_60	C33	EBI_^GSTSAN-	D33	
A34	&-IF8_60	B34	&-IF25_60	C34	&-IF24_60	D34	LGND
A35	&-IF9_60	B35	&-IF18_60	C35	&-IF26_60	D35	
E2 LGND *Connection to logic ground for slots 2 (P16), 4 (P14), 6 (P12), 8 (P10) only.							

Pin-Outs, Bottom Connector

Table B-44 lists Pinouts for ACM/DCM/DSM/EILA/ILA/LIM/MPL/TSM Extension Shelf Backplane Bottom Connectors P18 through P25, and P27 through P34.

Figure B-44. Extension Shelf Backplane Pin-Outs, Bottom Connector

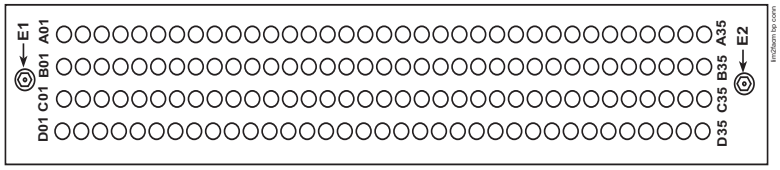


Table B-44. Extension Shelf Backplane Pin-Outs, Bottom Connector

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A01	LGND	B01	&-IF1_60	C01	&-IF10_60	D01	IN2-
A02	&-IF3_60	B02	&-IF2_60	C02	&-IF19_60	D02	LGND
A03	LGND	B03		C03	&-IF20_60	D03	LGND
A04	&-IF4_60	B04		C04	&-IF21_60	D04	LGND
A05	&-IF5_60	B05		C05	&-IF22_60	D05	LGND
A06	&-IF6_60	B06	&-IF24_60	C06	&-IF23_60	D06	LGND
A07	&-IF7_60	B07	&-IF26_60	C07		D07	@-IF25_60
A08	&-IF8_60	B08	&-IF9_60	C08	&-IF18_60	D08	LGND
A09	LGND	B09		C09		D09	LGND
A10		B10		C10	EBI_^XSP2	D10	EBI_^XSP3
A11	LGND	B11	LGND	C11	EBI_^XBE0-	D11	EBI_^XD00
A12	BSERO@-_50	B12	LGND	C12	EBI_^XBE1-	D12	EBI_^XD01
A13	BSERO@-_50	B13	LGND	C13	EBI_^XBE2-	D13	EBI_^XD02
A14	LGND	B14	LGND	C14	EBI_^XBE3-	D14	EBI_^XD03
A15		B15	LGND	C15	EBI_^XBS8-	D15	EBI_^XD04
A16		B16	LGND	C16	EBI_^XBS16-	D16	EBI_^XD05
A17	LGND	B17	LGND	C17	EBI_^ADS0-	D17	EBI_^XD06
A18	BSEL@-	B18		C18	EBI_^ADS1-	D18	EBI_^XD07
A19		B19		C19	EBI_^XW/R	D19	EBI_^XD08
A20	BMUXIN-	B20		C20	EBI_^XM/IO	D20	EBI_^XD09
A21	LGND	B21	BIN@-	C21	EBI_^XSP1	D21	EBI_^XD10

Table B-44. Extension Shelf Backplane Pin-Outs, Bottom Connector (Continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A22		B22	LGND	C22	EBI_^XINTA-	D22	EBI_^XD11
A23		B23	LGND	C23	EBI_^XRDY-	D23	EBI_^XD12
A24	LGND	B24	LGND	C24	EBI_^XCAS0-	D24	EBI_^XD13
A25	BSERI@-_50	B25	LGND	C25	EBI_^XCAS1-	D25	EBI_^XD14
A26	BSERI@+_50	B26	LGND	C26	EBI_^XCAS2-	D26	EBI_^XD15
A27	LGND	B27	LGND	C27		D27	
A28		B28		C28		D28	LGND
A29	LGND	B29		C29		D29	
A30		B30		C30		D30	LGND
A31	LGND	B31		C31	MB56KHZ+_50	D31	
A32		B32		C32	MB56KHZ-_50	D32	LGND
A33	LGND	B33		C33	MB8KHZ+_50	D33	
A34		B34		C34	MB8KHZ-_50	D34	LGND
A35	CHASSIS GND	B35	CHASSIS GND	C35	CHASSIS GND	D35	CHASSIS GND
E1	P$48VDC						
E2	LGND						

Backplane Pin-Out Symbols

Table B-45 lists the signal symbol values used in Table B-23 through Table B-45.

Table B-45. Extension Shelf Backplane Pin-Out Symbols

Slot/Connector	Interface	Address	Signal Symbol Values				
			$	#	&	@	^
1 top / P17	0A	0	1A	P	0A		0
1 bottom / P34	0B	0	1A	P	0B	A	0
2 top / P16	1A	1	1A	O	1A		0
2 bottom / P33	1B	1	1A	O	1B	B	0
3 top / P15	2A	2	1B	N	2A		2
3 bottom / P32	2B	2	1B	N	2B	C	2
4 top / P14	3A	3	1B	M	3A		2
4 bottom / P31	3B	3	1B	M	3B	D	2

Table B-45. Extension Shelf Backplane Pin-Out Symbols (Continued)

Slot/Connector	Interface	Address	Signal Symbol Values				
			$	#	&	@	^
5 top / P13	4A	4	2A	L	4A		4
5 bottom / P30	4B	4	2A	L	4B	E	4
6 top / P12	5A	5	2A	K	5A		4
6 bottom / P29	5B	5	2A	K	5B	F	4
7 top / P11	6A	6	2B	J	6A		6
7 bottom / P28	6B	6	2B	J	6B	G	6
8 top / P10	7A	7	2B	I	7A		6
8 bottom / P27	7B	7	2B	I	7B	H	6
11 top / P8	8A	8	4A	H	8A		8
11 bottom / P25	8B	8	4A	H	8B	I	8
12 top / P7	9A	9	4A	G	9A		8
12 bottom / P24	9B	9	4A	G	9B	J	8
13 top / P6	10A	A	4B	F	10A		A
13 bottom / P23	10B	A	4B	F	10B	K	A
14 top / P5	11A	B	4B	E	11A		A
14 bottom / P22	11B	B	4B	E	11B	L	A
15 top / P4	12A	C	5A	D	12A		C
15 bottom / P21	12B	C	5A	D	12B	M	C
16 top / P3	13A	D	5A	C	13A		C
16 bottom / P20	13B	D	5A	C	13B	N	C
17 top / P2	14A	E	5B	B	14A		E
17 bottom / P19	14B	E	5B	B	14B	O	E
18 top / P1	15A	F	5B	A	15A		E
18 bottom / P18	15B	F	5B	A	15B	P	E

Interprocessor Message Transport Connectors

The extension shelf backplane provides connections for the two high speed Inter-processor Message Transport (IMT) buses. The connections use twin-axial type connectors at J7, J8, J43, and J44.

Figure B-45. IPMX Connector

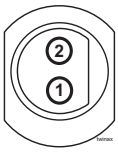


Table B-46. IPMX Connector

Connector	Pin	Signal
A IMT IN J8	1	AIMTIN+_78
	2	AIMTIN+_78
A IMT OUT J7	1	AIMTOUT+_78
	2	AIMTOUT+_78
B IMT IN J44	1	BIMTIN+_78
	2	BIMTIN+_78
B IMT OUT J43	1	BIMTOUT+_78
	2	BIMTOUT+_78

High Speed Message Multiplexer Extension Shelf

HMUX Extension Shelf Backplane Pin-Outs P9, P26

Figure B-46. HMUX Extension Shelf Backplane Connector P9

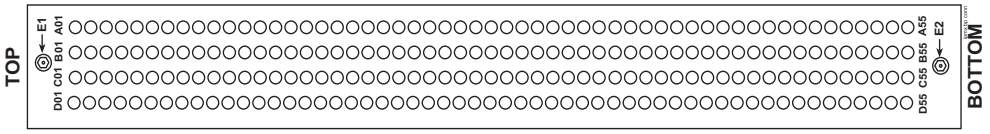


Table B-47. HMUX Extension Shelf Backplane Pin-Outs P9 and P26

Pin #	Signal	Pin #	Signal	Pin #	Signal	Pin #	Signal
A01	LGND	B01	LGND	C01	LGND	D01	LGND
A02	$SEROH-_50	B02	LGND	C02	$SEROI-_50	D02	LGND
A03	$SEROH+_50	B03	LGND	C03	$SEROI+_50	D03	LGND
A04	LGND	B04	$SELH-	C04	LGND	D04	$SELI-
A05	$SERIH-_50	B05	LGND	C05	$SERII-_50	D05	LGND
A06	$SERIH+_50	B06	LGND	C06	$SERII+_50	D06	LGND
A07	LGND	B07	$INH-	C07	LGND	D07	$INI-
A08	$SEROG-_50	B08	LGND	C08	$SEROJ-_50	D08	LGND
A09	$SEROG+_50	B09	LGND	C09	$SEROJ+_50	D09	LGND
A10	$BMUXIN-	B10	$SELG-	C10	LGND	D10	$SELJ-
A11	$SERIG-_50	B11	LGND	C11	$SERIJ-_50	D11	LGND
A12	$SERIG+_50	B12	LGND	C12	$SERIJ+_50	D12	LGND
A13	LGND	B13	$ING-	C13	LGND	D13	$INJ-
A14	$SEROF-_50	B14	LGND	C14	$SEROK-_50	D14	LGND
A15	$SEROF+_50	B15	LGND	C15	$SEROK+_50	D15	LGND
A16	LGND	B16	$INF-	C16	LGND	D16	$SELK-
A17	$SERIF-_50	B17	LGND	C17	$SERIK-_50	D17	LGND
A18	$SERIF+_50	B18	LGND	C18	$SERIK+_50	D18	LGND
A19	LGND	B19	$INF-	C19	LGND	D19	$INK-
A20	$SEROE-_50	B20	LGND	C20	$SEROL-_50	D20	LGND
A21	$SEROE+_50	B21	LGND	C21	$SEROL+_50	D21	LGND
A22	LGND	B22	$SELE-	C22	LGND	D22	$SELL-
A23	$SERIE-_50	B23	LGND	C23	$SERIL-_50	D23	LGND
A24	$SERIE+_50	B24	LGND	C24	$SERIL+_50	D24	LGND
A25	LGND	B25	$INE-	C25	LGND	D25	$INL-
A26	$SEROD-_50	B26	LGND	C26	$SEROM-_50	D26	LGND
A27	$SEROD+_50	B27	LGND	C27	$SEROM+_50	D27	LGND
A28	LGND	B28	$SELD-	C28	LGND	D28	$SELM-
A29	$SERID-_50	B29	LGND	C29	$SERIM-_50	D29	LGND

Table B-47. HMUX Extension Shelf Backplane Pin-Outs P9 and P26 (Continued)

Pin #	Signal	Pin #	Signal	Pin #	Signal	Pin #	Signal
A30	$SERID+_50	B30	LGND	C30	$SERIM+_50	D30	LGND
A31	LGND	B31	$IND-	C31	LGND	D31	$INM-
A32	$SEROC-_50	B32	LGND	C32	$SERON-_50	D32	LGND
A33	$SEROC+_50	B33	LGND	C33	$SERON+_50	D33	LGND
A34	LGND	B34	$SELC-	C34	LGND	D34	$SELN-
A35	$SERIC-_50	B35	LGND	C35	$SERIN-_50	D35	LGND
A36	$SERIC+_50	B36	LGND	C36	$SERIN+_50	D36	LGND
A37	LGND	B37	$INC-	C37	LGND	D37	$INN-
A38	$SEROB-_50	B38	LGND	C38	$SEROO-_50	D38	LGND
A39	$SEROB+_50	B39	LGND	C39	$SEROO+_50	D39	LGND
A40	LGND	B40	$SELB-	C40	LGND	D40	$SELO-
A41	$SERIB-_50	B41	LGND	C41	$SERIO-_50	D41	LGND
A42	$SERIB+_50	B42	LGND	C42	$SERIO+_50	D42	LGND
A43	LGND	B43	$INB-	C43	LGND	D43	$INO-
A44	$SEROA-_50	B44	LGND	C44	$SEROP-_50	D44	LGND
A45	$SEROA+_50	B45	LGND	C45	$SEROP+_50	D45	LGND
A46	LGND	B46	$SELA-	C46	LGND	D46	$SELP-
A47	$SERIA-_50	B47	LGND	C47	$SERIP-_50	D47	LGND
A48	$SERIA+_50	B48	LGND	C48	$SERIP+_50	D48	LGND
A49	LGND	B49	$INA-	C49	LGND	D49	$INP-
A50	$IMTIN-_78	B50	LGND	C50	$IMTOUT-_78	D50	LGND
A51	$IMTIN+_78	B51	LGND	C51	$IMTOUT+_78	D51	LGND
A52	LGND	B52	LGND	C52	LGND	D52	LGND
A53		B53	MBUSSRX-_50	C53	MBUSSRX+_50	D53	
A54		B54	MBUSSTX-_50	C54	MBUSSTX+_50	D54	LGND
A55	CHASSIS GND	B55	CHASSIS GND	C55	CHASSIS GND	D55	CHASSIS GND
E2	P3$48RTN						

C

Cables and Adapters

Labeling Cables

This section provides general labeling instructions for cables.

Before installing any cable use this procedure to label the cables to ensure connection to the proper ports and ease of future maintenance.

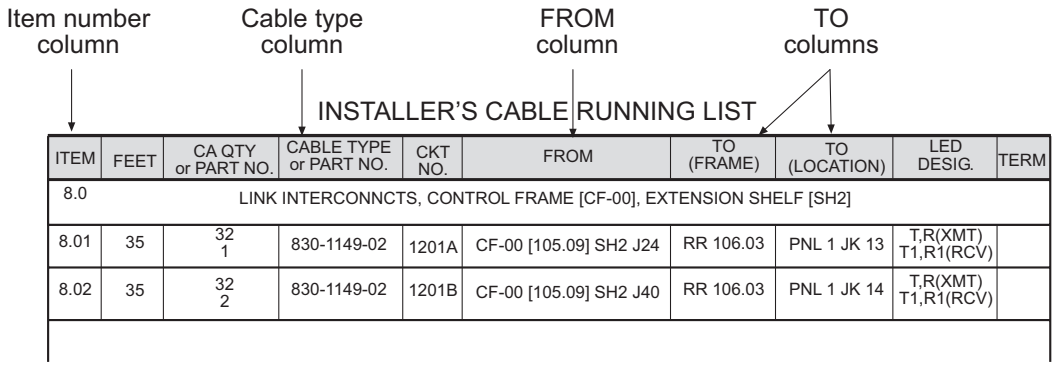
Tools

- Installer's Cable Running List
- All cables listed in Installer's Cable Running List
- Any non-Tekelec cables
- Cable labels (including blank labels for non-Tekelec cables)
- Fine point marker

Procedure — Mark and Label Cables

1. Locate the Installer's Cable Running List in the *Equipment Specification* for the site. Refer to Figure 0-1 for an example.

Figure 0-1. Installer's Cable Running List Example



ITEM	FEET	CA QTY or PART NO.	CABLE TYPE or PART NO.	CKT NO.	FROM	TO (FRAME)	TO (LOCATION)	LED DESIG.	TERM
8.0	LINK INTERCONNCTS, CONTROL FRAME [CF-00], EXTENSION SHELF [SH2]								
8.01	35	32 1	830-1149-02	1201A	CF-00 [105.09] SH2 J24	RR 106.03	PNL 1 JK 13	T,R(XMT) T1,R1(RCV)	
8.02	35	32 2	830-1149-02	1201B	CF-00 [105.09] SH2 J40	RR 106.03	PNL 1 JK 14	T,R(XMT) T1,R1(RCV)	

2. Locate the labels included with the cable shipment.

3. Take one cable and identify the cable's part number in the *Cable Type* column of the cable running list.

4. Match the cable with its corresponding pair of labels:
   a. Go to the cable's *From* column of the cable running list.
   b. Match the *From* column information to the *From* information on one label.

c. Match the *From* column information to the *To* information on the other label.

NOTE 1: The label for the connector end of these cables can be identified by the presence of a "J" number, for example: J32, that appears in the "From" area of the label.

NOTE 2: Make sure that all cables specific to an A or B side are clearly labeled as A cable and B cable.

---

5. Repeat Step 4 for each cable to ensure that all labels are present and that originations and destinations of all cables are clearly identified.

---

6. For cables that come from the factory with connectors already installed, apply the appropriate label onto each end of the cable approximately two inches from the connector.

NOTE: Ensure that the labels are positioned so they are still readable after the cables are installed.

---

7. For cables that need to be cut to the appropriate length:
After the cable is cut to the appropriate length, affix labels with the item number approximately two inches from the end of the cable insulation.

---

8. For cables not ordered through Tekelec, confirm source, part number, and origination/destination points before labeling them.

NOTE: All cables must be labeled with "TO" and "FROM" destinations

After you have labeled all cables, you are ready for cable installation.

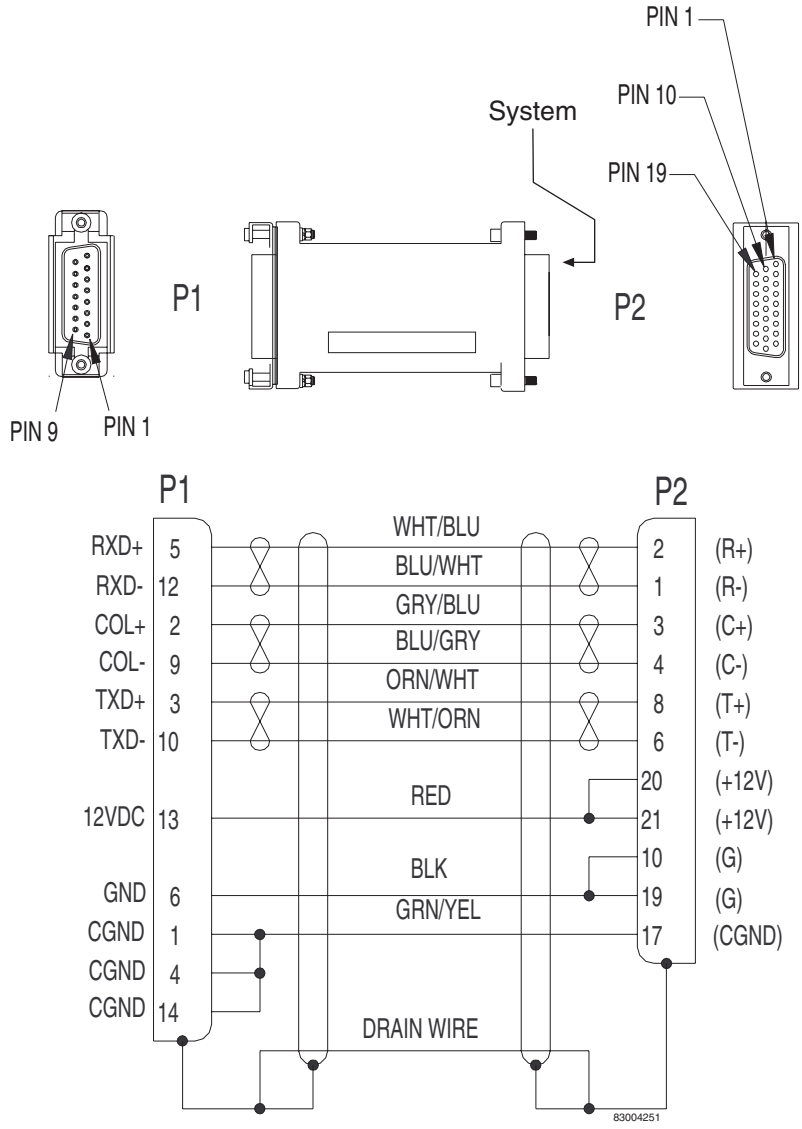
Cables and Adapters

Cables and adapters are listed in alphabetical order.

The words NOT TERMINATED or UNTERMINATED refers to the end of the cable that is not equipped with a connector in manufacturing and the wires must be cut, dressed, and connected at the site specific location.

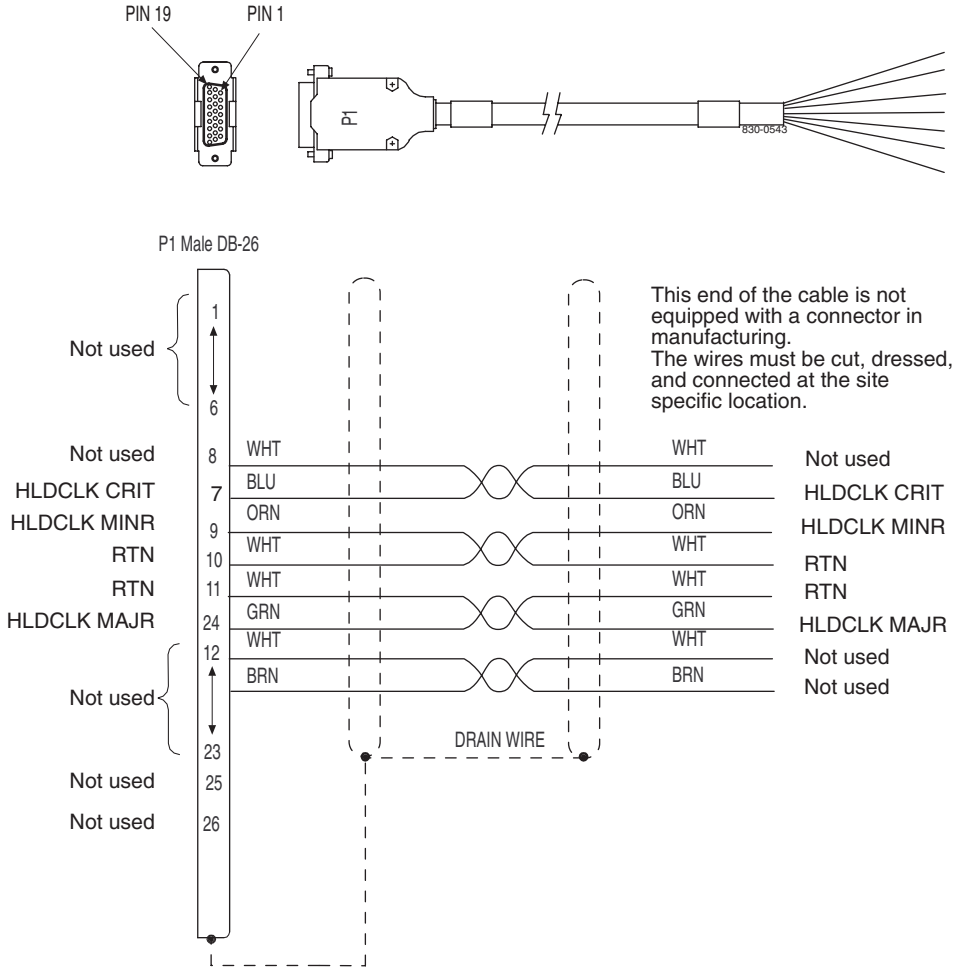
15-Pin to 26-PinAdapter

Figure C-2. Adapter 15 Pin to 26 Pin



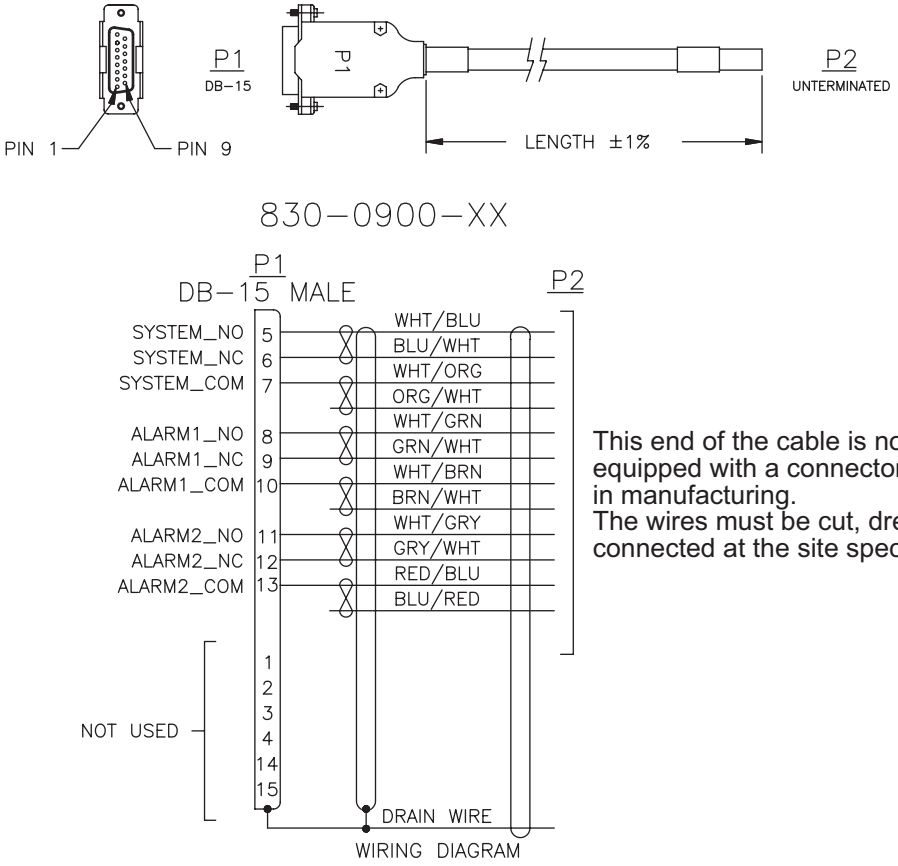
Alarm Cable (Holdover Clock)

Figure C-3. Holdover Clock Alarm Cable



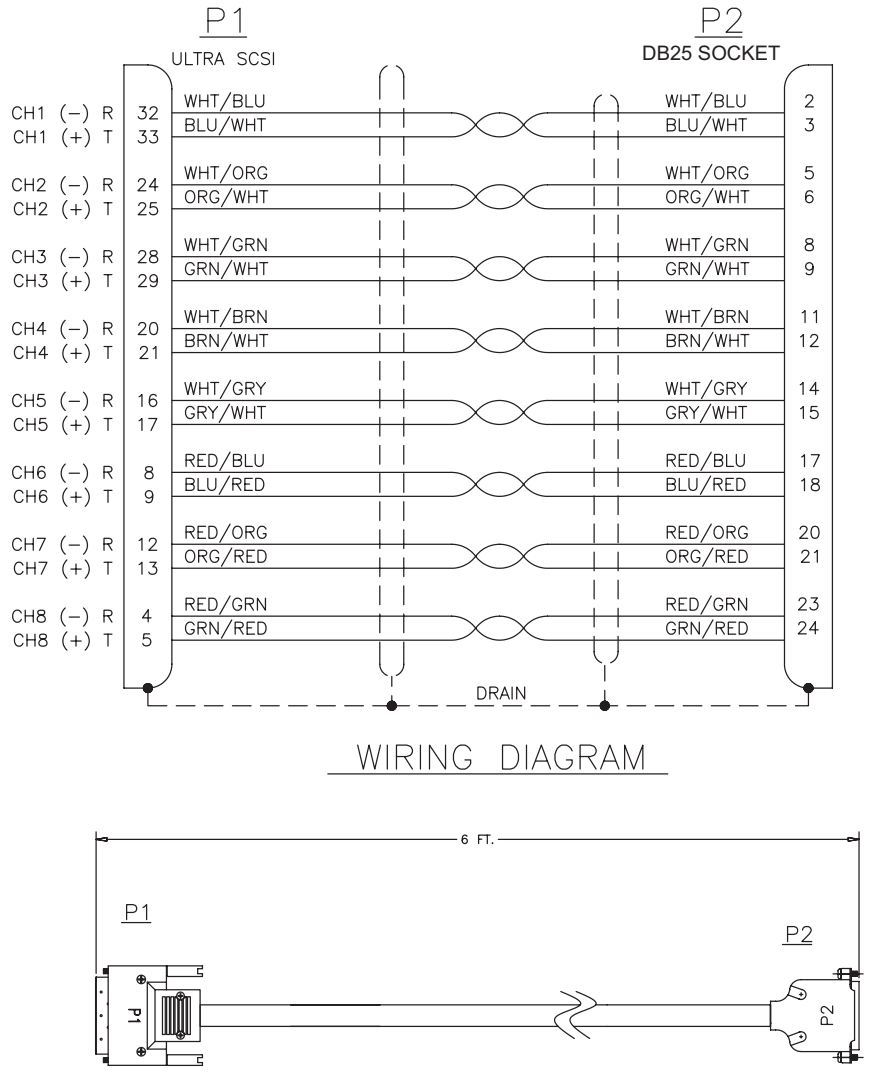
Alarm NETRA Server Cable

Figure C-4. Alarm NETRA Server Cable



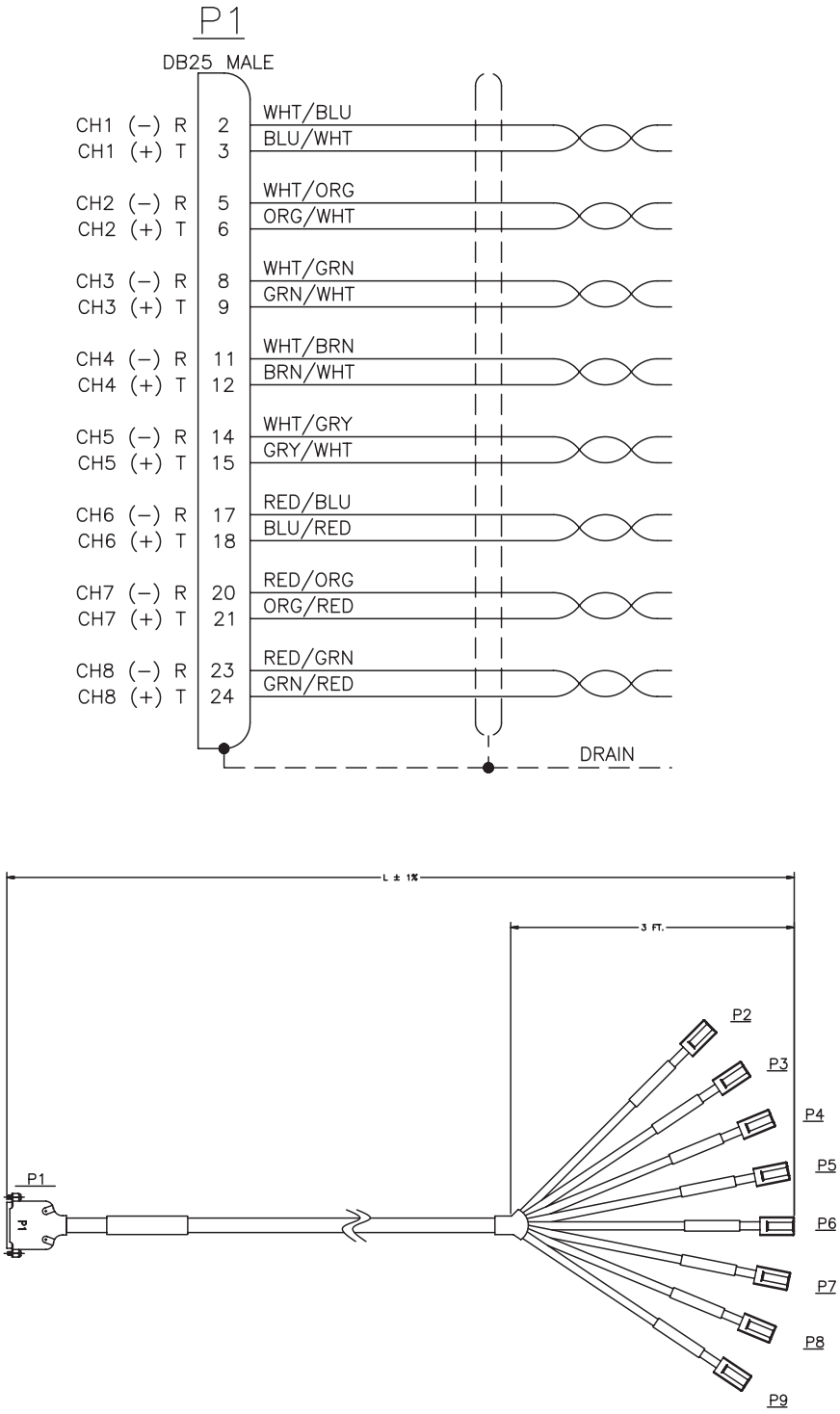
ATM Cable

Figure C-5. ATM Cable



ATM E1-T1 Cable

Figure C-6. ATM E1/T1 Cable

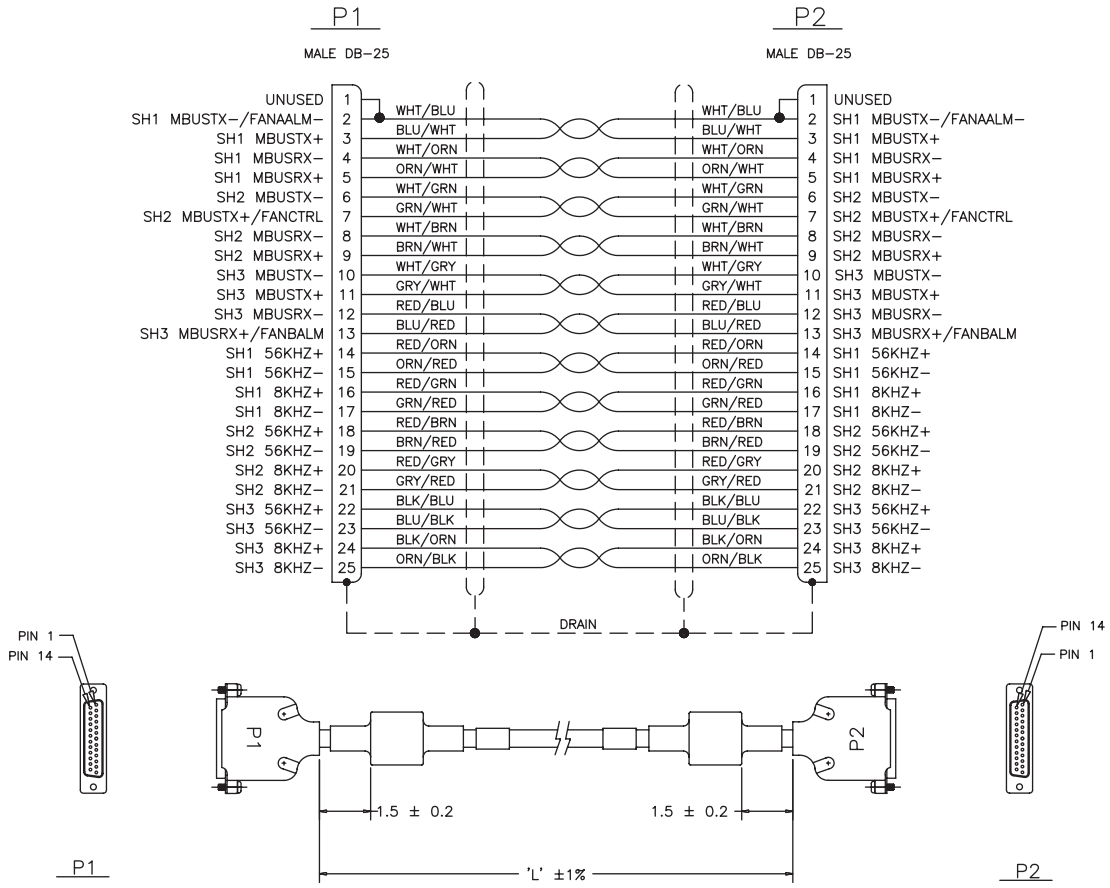


B-Clock Cable

Table C-1. Clock Cable

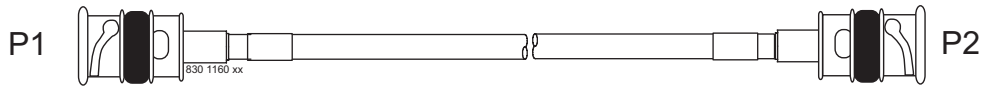
Part Number		Length (inches)	Part Number		Length (inches)
North American	International		North American	International	
830-0398-01	830-1150-01	96	830-0398-12	--	164
830-0398-02	--	144	830-0398-13	830-1150-13	176
830-0398-03	--	192	830-0398-14	830-1150-14	208
830-0398-04	830-1150-04	240	830-0398-15	--	224
830-0398-05	--	288	830-0398-16	--	232
830-0398-06	830-1150-06	360	830-0398-17	830-1150-17	252
830-0398-07	--	18	830-0398-18	--	272
830-0398-08	--	48	830-0398-19	830-1150-19	284
830-0398-09	--	84	830-0398-20	830-1150-20	52
830-0398-10	830-1150-10	116	830-0398-21	830-1150-21	78
830-0398-11	830-1150-11	132			

Figure C-7. Clock Cable



BNC- to-BNC Cable Assembly

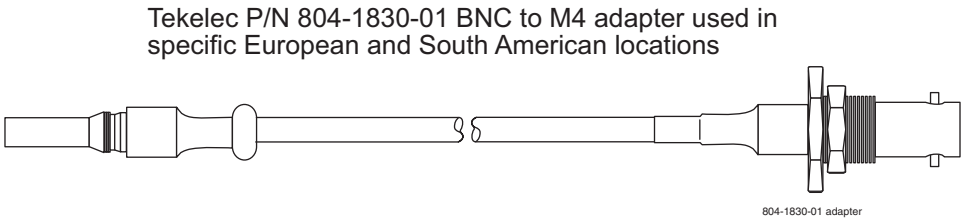
Figure C-8. ,BNC to BCN Cable Assembly



BNC- to-M4 Adapter

BNC to M4 adapter used in site specific European and South American locations.

Figure C-9. Coaxial Cable Adapter

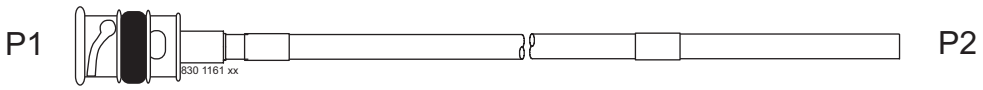


BNC/Open End Cable

Table C-2. BNC/Open End Cable

Part Number		Length	
North American	International	feet	meters
830-0625-01	830-1161-01	15	4.57
830-0625-02	830-1161-02	25	7.62
830-0625-03	830-1161-03	50	15.24
830-0625-04	830-1161-04	75	22.86
830-0625-05	830-1161-05	100	30.48
830-0625-06	830-1161-06	125	38.10
830-0625-07	830-1161-07	150	45.72
830-0625-08	830-1161-08	175	53.34
830-0625-09	830-1161-09	200	60.96
830-0625-10	830-1161-10	250	76.2
830-0625-11	830-1161-11	300	91.44
830-0625-12	830-1161-12	500	152.4
830-0625-13	830-1161-13	1000	304.8

Figure C-10. BNC/Open End Cable

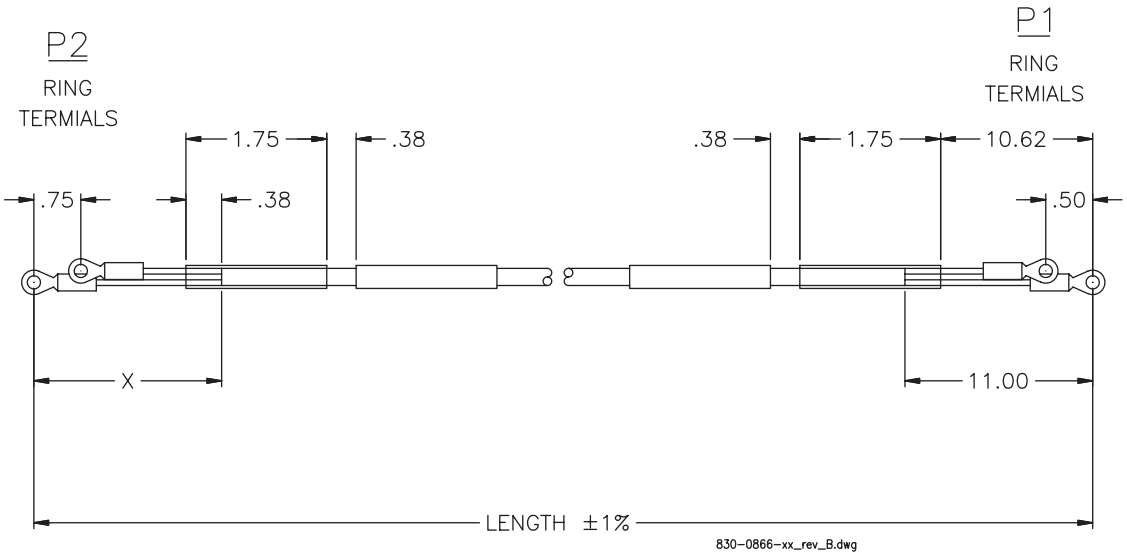


Breaker-to-Terminal Strip Power Cable

Table C-3. Power Cable to Breaker Strip

Part Number		Length		P1 Long Lead	P2 Long Lead	Label "A" usage	Label "B" usage
North American	International	Inches	Meters				
830-0866-01	830-1236-01	48.5	14.78	Black	Red	BP-1, POS 1B	TB1, POS 3 and 4
830-0866-02	830-1236-02	51.5	15.69	Black	Black	BP-2, POS 1B	TB2, POS 3 and 4
830-0866-03	830-1236-03	53.5	16.30	Black	Red	BP-1, POS 1A	TB3, POS 3 and 4
830-0866-04	830-1236-04	46.5	14.17	Black	Black	BP-2, POS 1B	TB4, POS 3 and 4
830-0866-05	---	86.0	26.21	Black	Red	BP-2, POS 3B	TB2, POS 3 and 4
830-0866-06	---	88.0	88.0	Black	Black	BP-1, POS 3A	TB3, POS 3 and 4

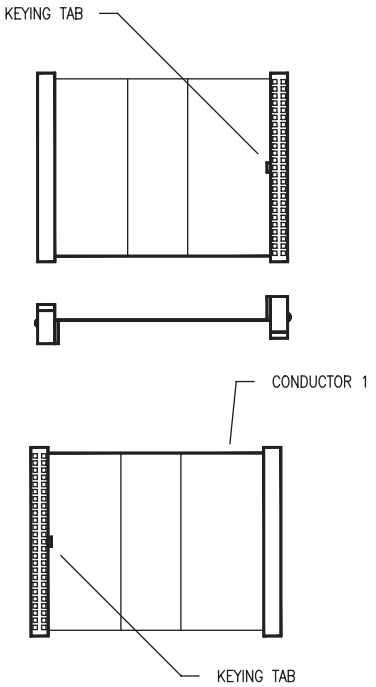
Figure C-11. Power Cable to Breaker Strip



CD ROM Cable

Figure C-12. CD ROM Cable

PART NUMBER	LENGTH	
	INCHES	CENTIMETERS
830-0421-01	3.50	8.87
830-0421-02	2.50	6.33



Clock Connection Cable

Connect the clock connection cable to port BCLKIN-A of the EOAP backplane and to port BCLKOUT (J42) located at the lower right side of the last extension shelf backplane in the control frame.

Use one EOAP clock connection cable to connect the EOAP shelf (backplane P/N 850-0488-xx) to the last EAGLE 5 ISS extension shelf backplane in the control frame

CAUTION: Do Not connect this cable to the EAGLE 5 ISS until both sides of the EOAP have been integrated into the system. Refer to the procedure.

Connect the clock connection cable to port BCLKIN-A of the EOAP backplane and to port BCLKOUT (J42) located at the lower right side of the last extension shelf backplane in the control frame. Tighten the cable connectors.

NOTE: If no extension shelf is present, cable to connector B CLK 5 (J70) on control shelf backplane P/N 850-0330-04 or connector B CLK 7 (J17) on control shelf backplane P/N 850-0330-06/-6.

Converter

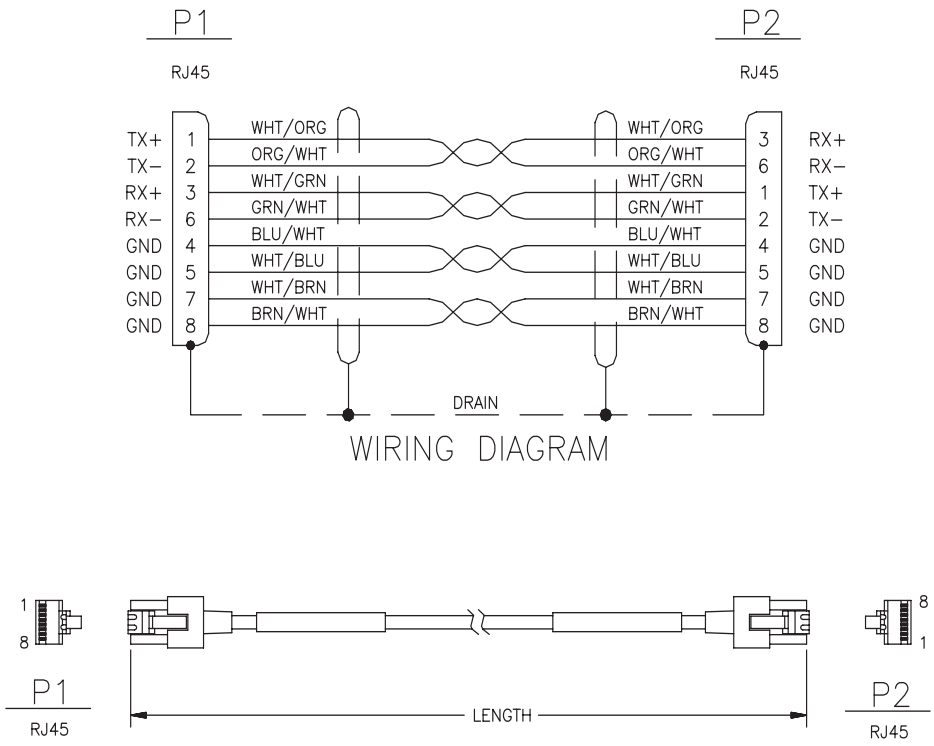
This straight through converter is a purchased part. There is no illustration or wiring diagram.

Crossover (CAT-5) Cable

Table C-4. Crossover CAT-5 Cable

Part Number		Length	
North American	**International**	**meters**	**feet**
830-0723-01	830-1173-01	0.30	1
830-0723-02	830-1173-02	0.90	3
830-0723-03	830-1173-03	1.37	4.5
830-0723-xx	830-1173-xx	available in many more lenghts	

Figure C-13. Crossover CAT-5 Cable

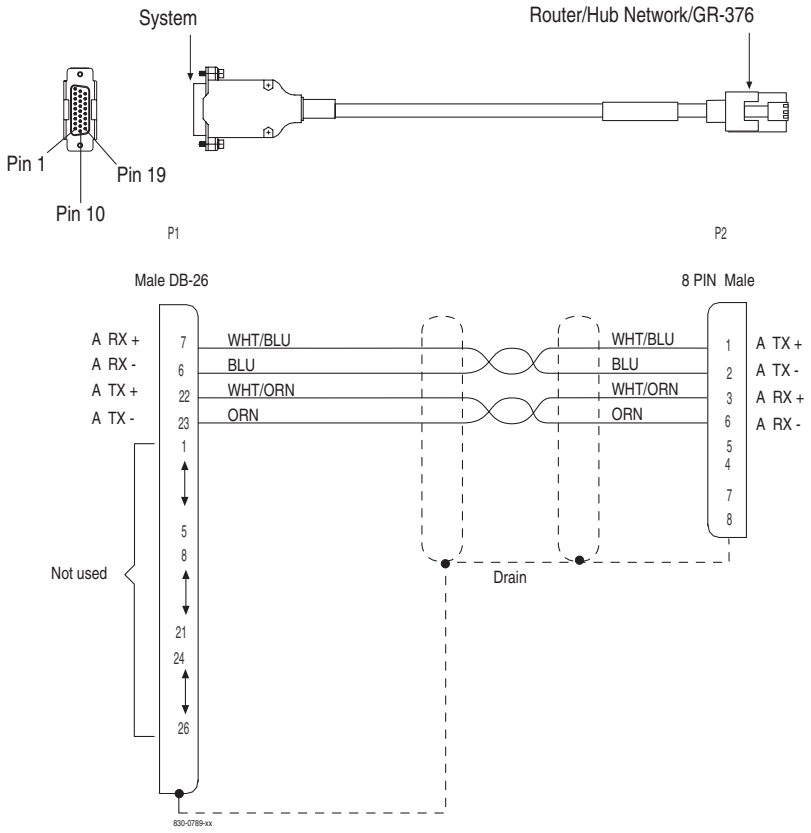


Crossover DCM Patch Panel Cable

Table C-5. Crossover DCM Patch Panel Cable

Part Number		Length	
North American	**International**	**feet**	**meters**
830-0789-01	830-1178-01	15	4.57
830-0789-02	830-1178-02	25	7.62
830-0789-03	830-1178-03	35	10.67
830-0789-04	830-1178-04	50	15.25
830-0789-05	830-1178-05	75	45.75
830-0789-06	830-1178-06	100	30.50
830-0789-07	830-1178-07	150	45.75
830-0789-08	830-1178-08	200	60.10
830-0789-09	830-1178-09	250	76.25
830-0789-10	830-1178-10	328	107.54

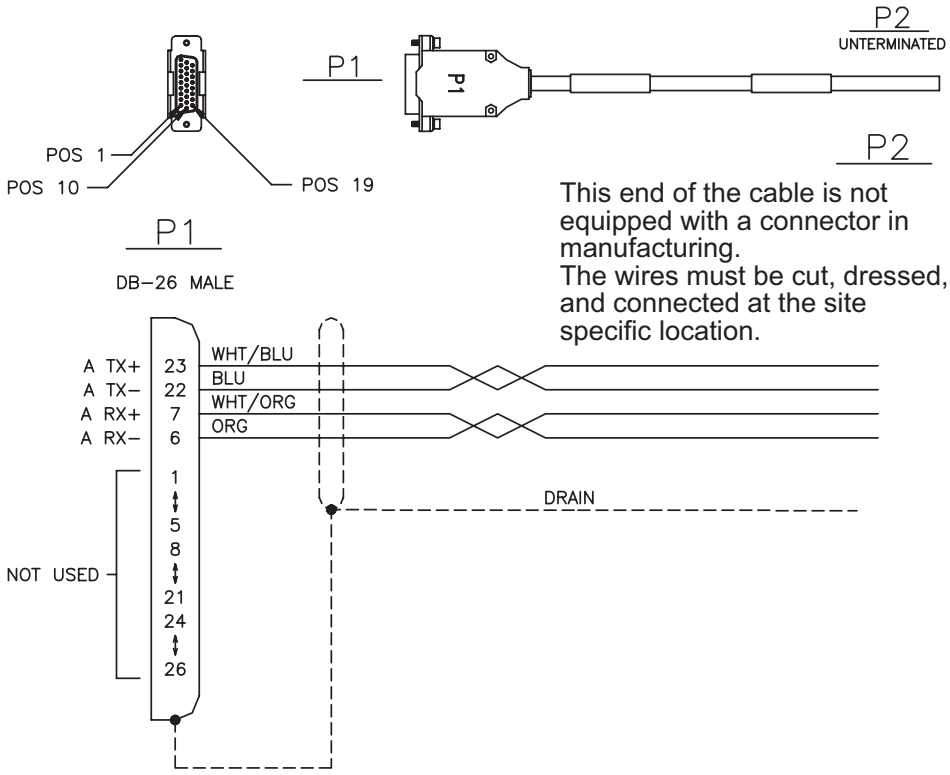
Figure C-14. Crossover DCM Patch Panel Cable



DCM, 100-BASE TX Interface

Figure C-15. DCM, 100-BASE TX Interface

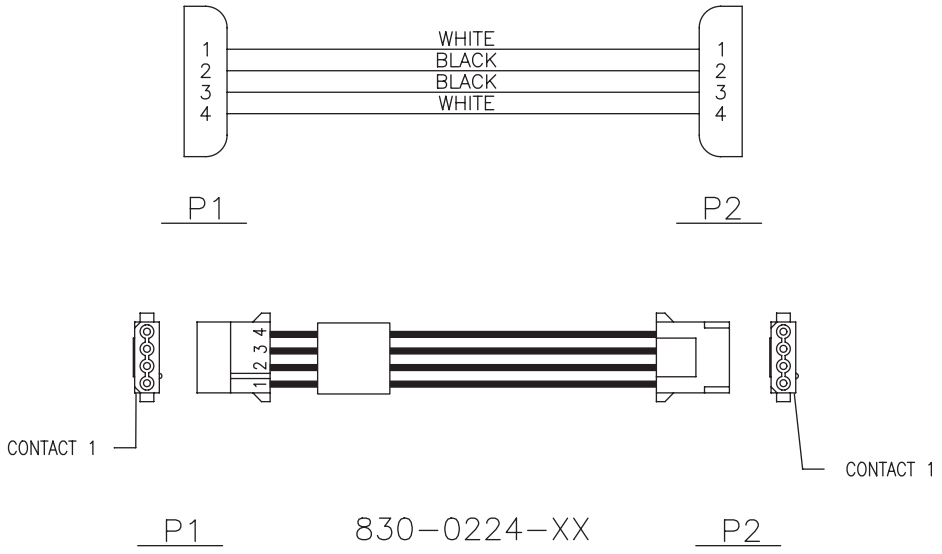
DASH NUMBER	LENGTH FEET	METERS
830–0711–01	15	4.57
830–0711–02	25	7.62
830–0711–03	35	10.66
830–0711–04	50	15.24
830–0711–05	75	22.86
830–0711–06	100	30.48
830–0711–07	150	45.72
830–0711–08	200	60.96
830–0711–09	250	76.2
830–0711–10	328	99.99



Drive Power Cable

Figure C-16. Drive Power Cable

PART NUMBERS	INCHES	CENTIMETERS
830-0224-01	4.50	11.41
830-0224-02	3.50	8.87

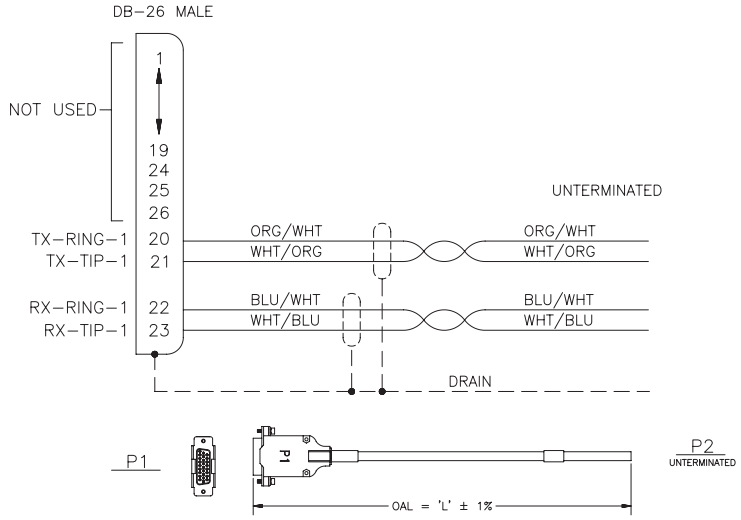


DS1 Cable

Table C-6. DS1 Cable

Part Number		Length	
North American	**International**	**feet**	**meters**
830-0849-01	830-1184-01	15	4.57
830-0849-02	830-1184-02	20	6.09
830-0849-03	830-1184-03	25	7.62
830-0849-04	830-1184-04	30	9.14
830-0849-05	830-1184-05	35	10.66
830-0849-06	830-1184-06	50	15.24
830-0849-07	830-1184-07	75	22.86
830-0849-08	830-1184-08	100	30.48
830-0849-09	830-1184-09	125	38.10
830-0849-10	830-1184-10	150	45.72
830-0849-11	830-1184-11	175	53.34
830-0849-12	830-1184-12	200	60.96
830-0849-13	830-1184-13	250	76.20
830-0849-14	830-1184-14	300	91.44
830-0849-15	830-1184-15	500	152.40
830-0849-16	830-1184-16	650	198.12

Figure C-17. DS1 Cable

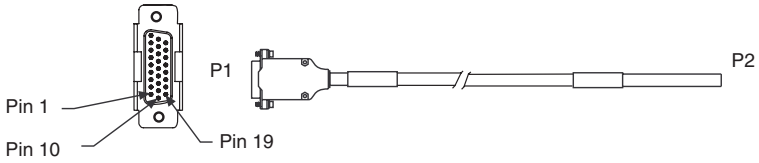


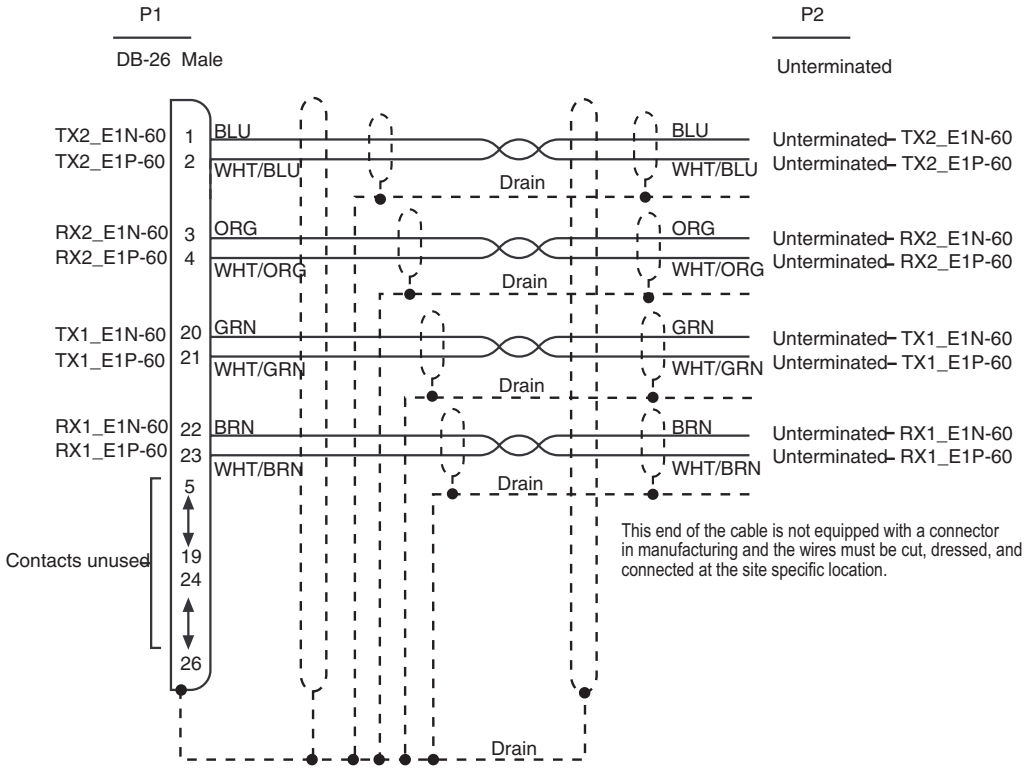
E1 Cable

Table C-7. E1 Cable

Part Number		Length		Part Number		Length	
North American	International	feet	meters	North American	International	feet	meters
830-0622-01	830-1233-01	15	4.57	830-0622-08	830-1233-08	175	53.34
830-0622-02	830-1233-02	25	7.62	830-0622-10	830-1233-09	200	60.96
830-0622-03	830-1233-03	50	15.24	830-0622-11	830-1233-10	250	76.20
830-0622-04	830-1233-04	75	22.86	830-0622-12	830-1233-11	300	91.44
830-0622-05	830-1233-05	100	30.48	830-0622-13	830-1233-12	500	152.40
830-0622-06	830-1233-06	125	38.10	830-0622-14	830-1233-13	1000	304.8
830-0622-07	830-1233-07	150	45.72	830-0622-15	830-1233-15	400	121.92

Figure C-18. E 1 Cable



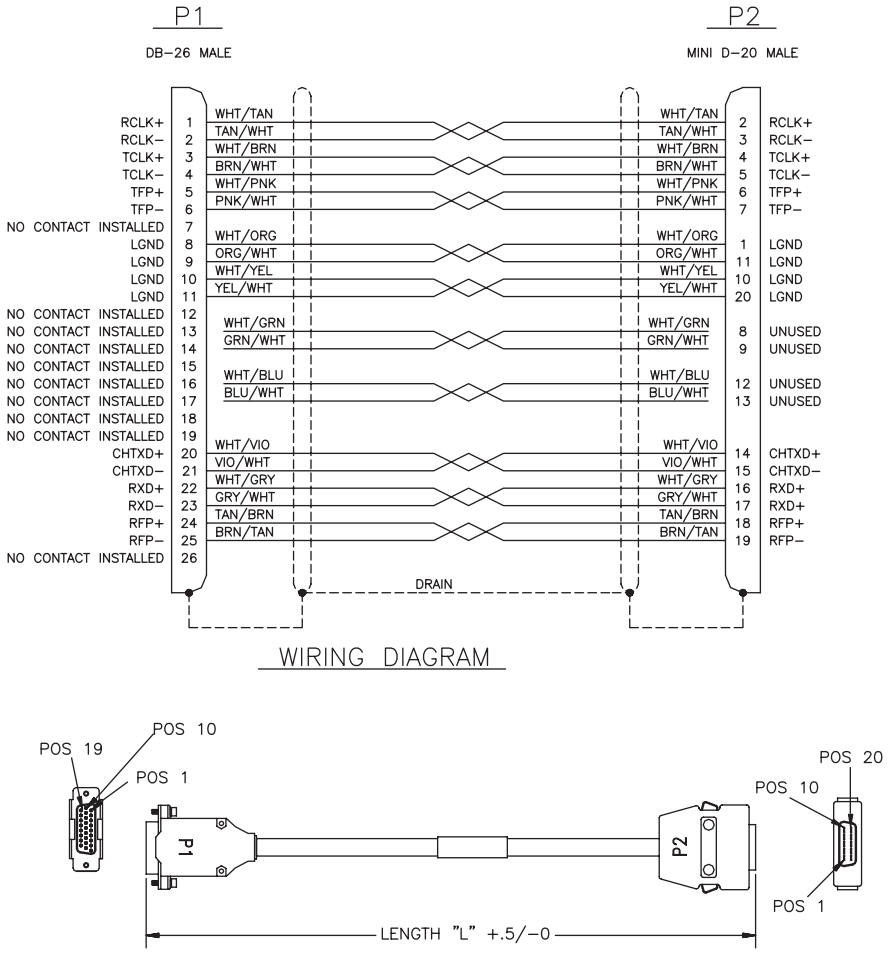


E1 Patch Cable

Table C-8. E1 Patch Cable

Part Number		Length	
North American	International	Inches	Centimeters
830-0605-01	--	12	30.48
830-0605-02	830-1116-02	15	38.1

Figure C-19. E1 Patch Cable

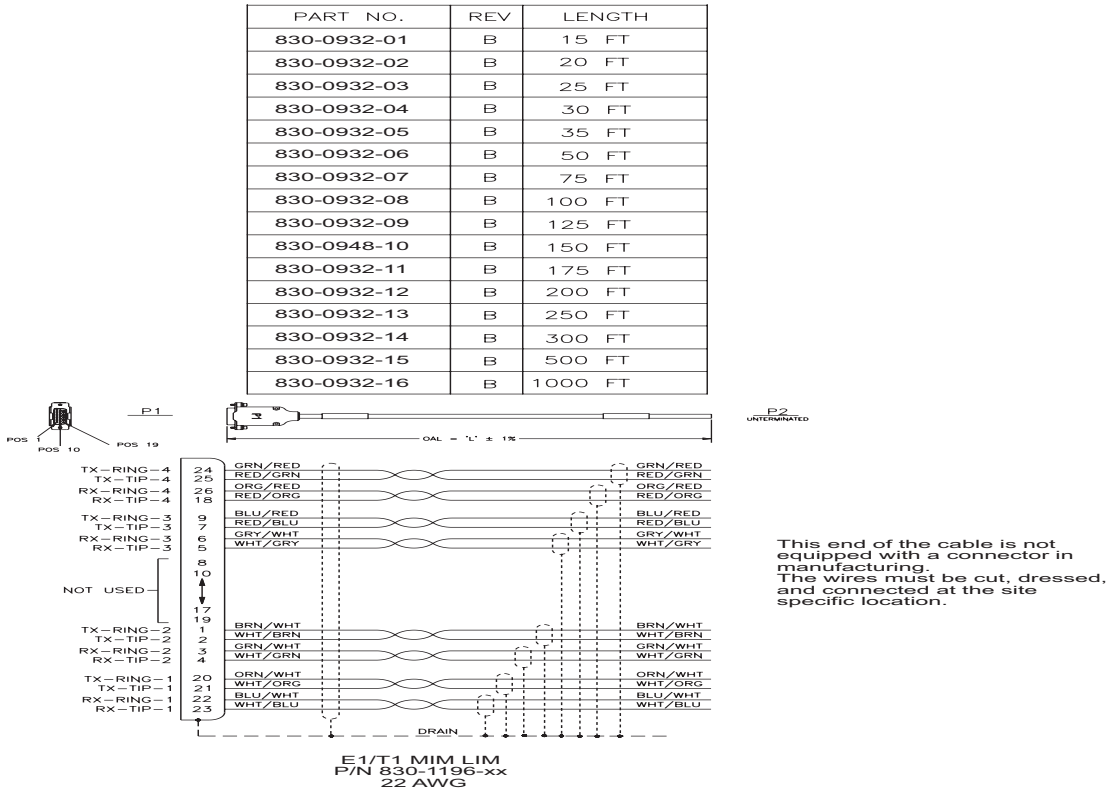


E1-T1 MIM (22 AWG)

Table C-9. E1/T1 MIM (22 AWG) Cable

Part Number		Length		Part Number		Length	
North American	International	Feet	Meters	North American	International	Feet	Meters
830-0932-01	830-1196-01	15	4.57	830-0932-09	830-1196-09	125	38.10
830-0932-02	830-1196-02	20	6.09	830-0932-10	830-1196-10	150	45.72
830-0932-03	830-1196-03	25	7.62	830-0932-11	830-1196-11	175	53.34
830-0932-04	830-1196-04	30	9.14	830-0932-12	830-1196-12	200	60.96
830-0932-05	830-1196-05	35	10.66	830-0932-13	830-1196-13	250	76.20
830-0932-06	830-1196-06	50	15.24	830-0932-14	830-1196-14	300	91.44
830-0932-07	830-1196-07	75	22.86	830-0932-15	830-1196-15	500	152.40
830-0932-08	830-1196-08	100	30.48	830-0932-16	830-1196-16	1000	304.80

Figure C-20. E1-T1 MIM 22 AWG

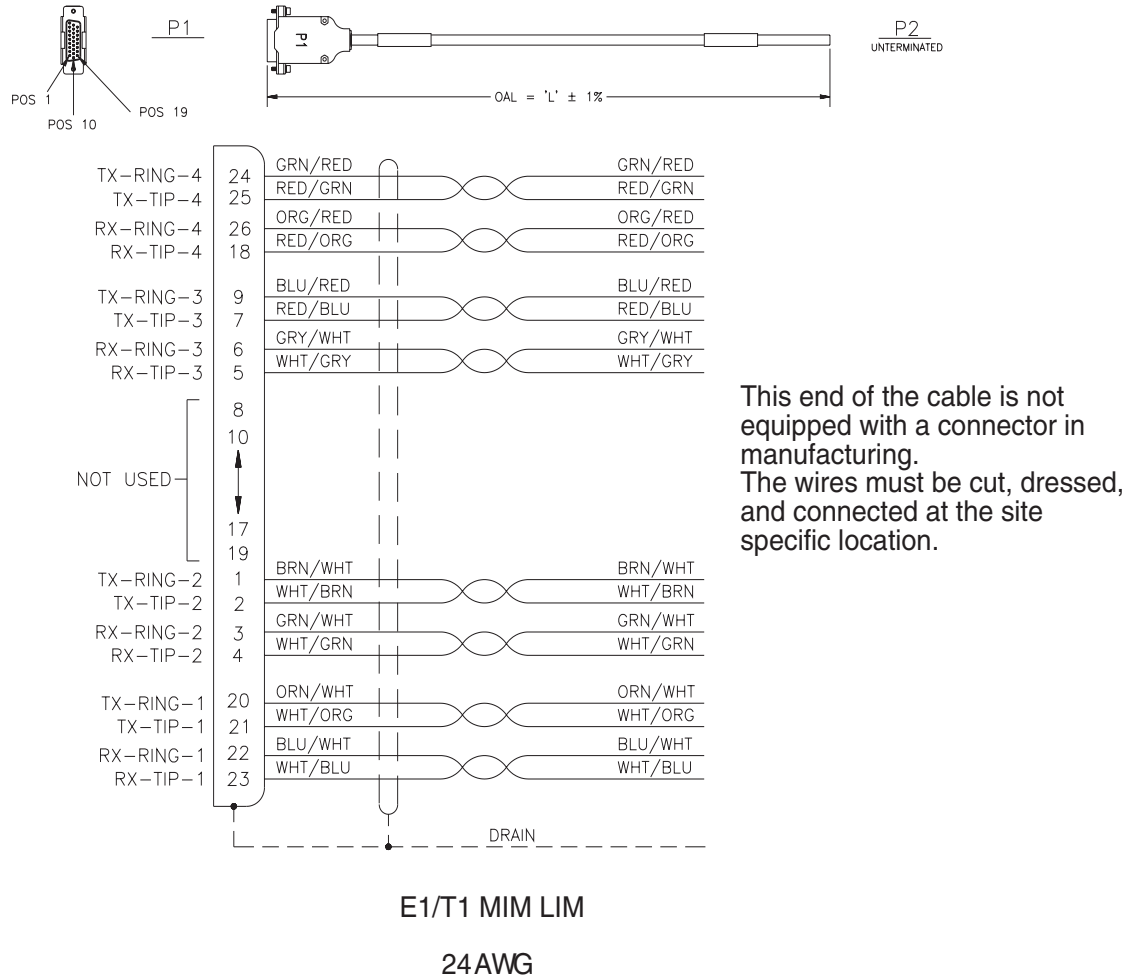


E1/T1 MIM LIM Cable

Table C-10. E1/T1 MIM LIM Cable

Part Number		Rev	Length		Part Number		Rev	Length	
North American	International		Feet	Meters	North American	International		Feet	Meters
830-0948-01	830-1197-01	B	15	4.57	830-0948-09	830-1197-09	B	125	38.10
830-0948-02	830-1197-02	B	20	6.09	830-0948-10	830-1197-10	B	150	45.72
830-0948-03	830-1197-03	B	25	7.62	830-0948-11	830-1197-11	B	175	53.34
830-0948-04	830-1197-04	B	30	9.14	830-0948-12	830-1197-12	B	200	60.96
830-0948-05	830-1197-05	B	35	10.66	830-0948-13	830-1197-13	B	250	76.20
830-0948-06	830-1197-06	B	50	15.24	830-0948-14	830-1197-14	B	300	91.44
830-0948-07	830-1197-07	B	75	22.86	830-0948-15	830-1197-15	B	500	152.40
830-0948-08	830-1197-08	B	100	30.48	830-0949-16	830-1197-16	B	1000	304.80

Figure C-21. E1/T1 MIM LIM Cable

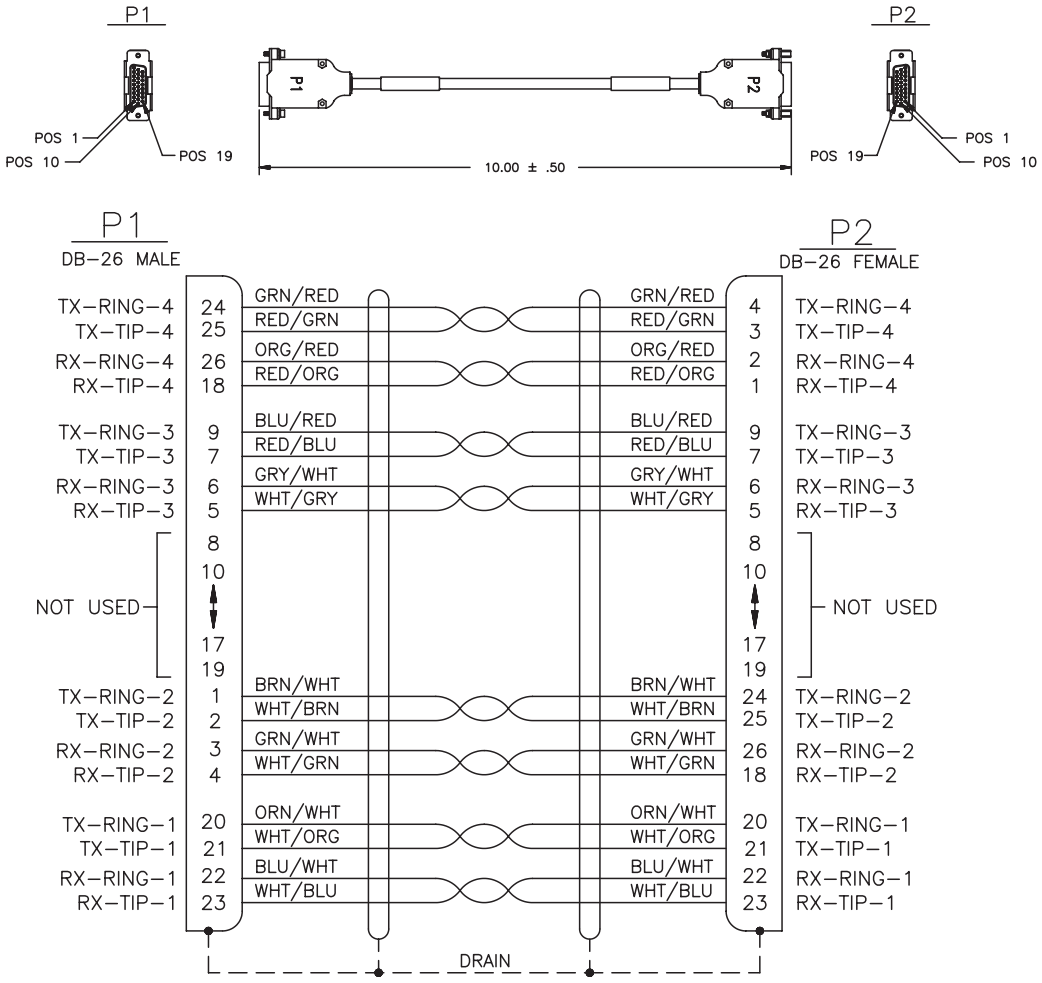


E1/T1 MIM LIM-to-MPL Adapter

Table C-11. E1/T1 MIM LIM To MPL Adapter

Part Number		Rev	Length		Part Number		Rev	Length	
North American	International		Feet	Meters	North American	International		Feet	Meters
830-0949-01	830-1198-01	B	15	4.57	830-0949-09	--	B	125	38.10
830-0949-02	--	B	20	6.09	830-0949-10	--	B	150	45.72
830-0949-03	--	B	25	7.62	830-0949-11	--	B	175	53.34
830-0949-04	--	B	30	9.14	830-0949-12	--	B	200	60.96
830-0949-05	--	B	35	10.66	830-0949-13	--	B	250	76.20
830-0949-06	--	B	50	15.24	830-0949-14	--	B	300	91.44
830-0949-07	--	B	75	22.86	830-0949-15	--	B	500	152.40
830-0949-08	--	B	100	30.48	830-0949-16	--	B	1000	304.80

Figure C-22. E1/T1 MIM LIM To MPL Adapter

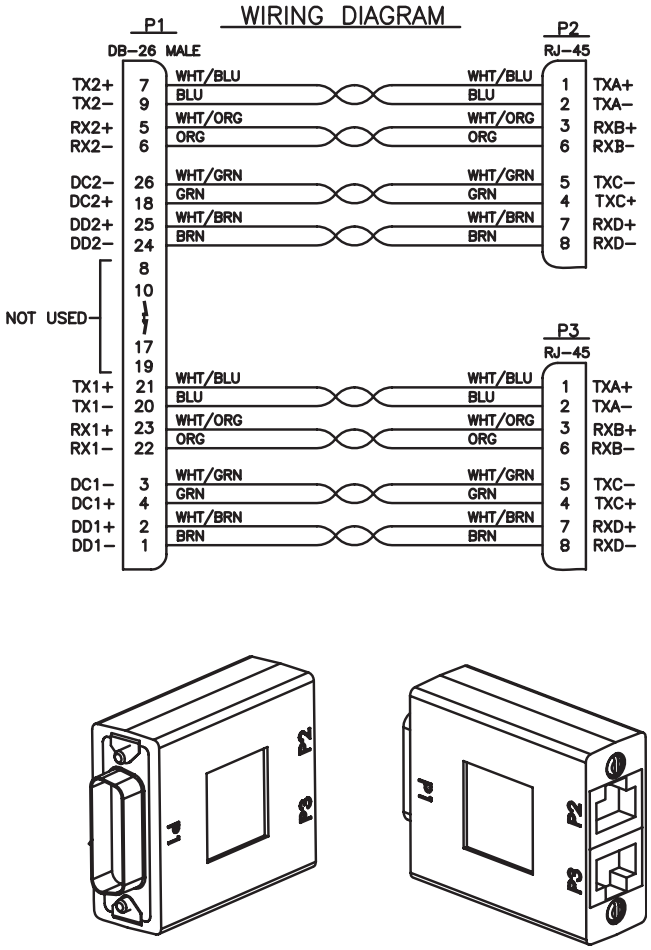


E5-ENET ADAPTER (DB26 Male-to-Dual RJ45)

The Ethernet cable pinouts differ between the E5-ENET card and the DCM or single-slot EDCM cards.

Adapter 830-1102-02 is required for installation of the E5-ENETwhen the DCM cable is replaced with a CAT5 straight-through cable 830-0724-xx. The adapter is connected to the backplane and the CAT5 straight-through cable cable is connected from the other side of the adapter to a switch, or a hub, or a patch panel (same place the DCM cable was terminated). If the card inserted into the slot does not match the backplane connector, the interface will not function.

Figure C-23. DB26 Male to Dual RJ45 Adapter



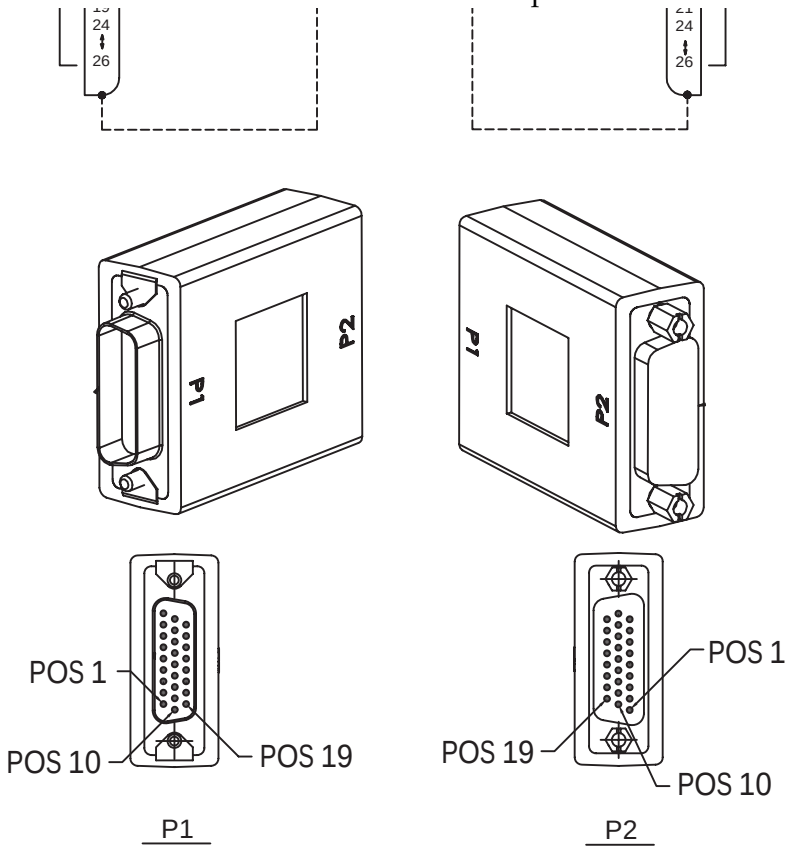
E5-ENET ADAPTER (DB26 Male-to-DB26 Female)

The Ethernet cable pinouts differ between the E5-ENET card and the DCM or single-slot EDCM cards.

Adapter 830-1103-02 is required for each E5-ENET interface used when using the existing DCM cable 830-0978-xx. The adapter is connected between the backplane connector and the existing DCM cable for the card.

NOTE: Does not support

Figure C-24. DB26 Male-to-DB26 Female Adapter0

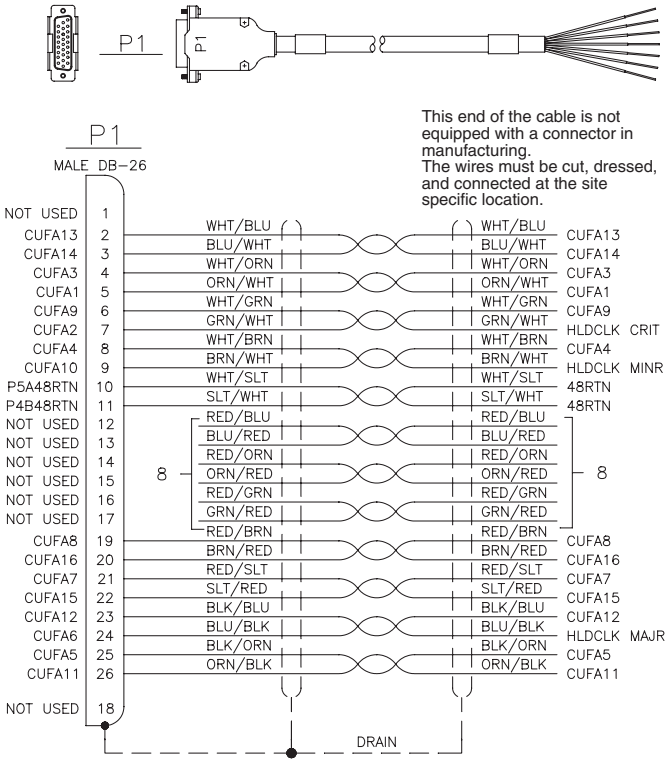


External Alarm Cable (Custom)

Table C-12. External Alarm Cable (Custom)

Part Number		Length	
North American	International	feet	meters
830-0435-01	830-1151-01	50	15.24
830-0435-02	830-1151-02	75	22.86
830-0435-03	830-1151-03	100	30.48
830-0435-04	830-1151-04	125	38.10
830-0435-05	830-1151-05	150	45.72
830-0435-06	830-1151-06	175	53.34
830-0435-07	830-1151-07	200	61.96
830-0435-08	830-1151-08	250	76.20
830-0435-09	830-1151-09	300	91.40
830-0435-10	830-1151-10	500	152.40
830-0435-11	830-1151-11	1000	304.80

Figure C-25. External Alarm Cable (Custom)



Fan Power and Alarm Cable

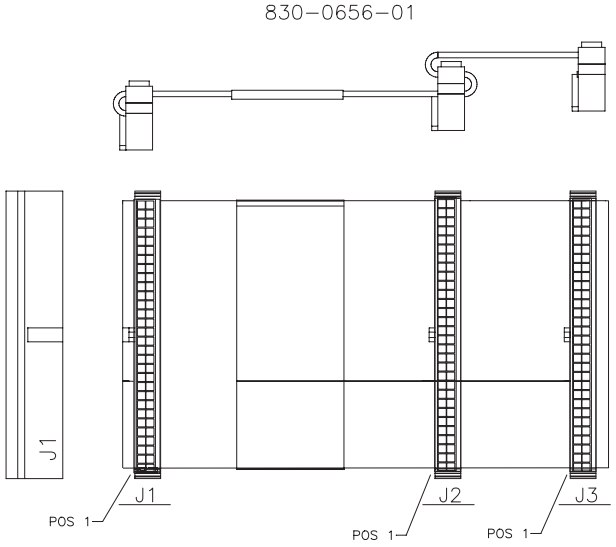
The fan power and alarm cable is part of the fan assembly.

For A fan power, plug one end of the cable into J-9 on backplane 850-0330-06. Route the cable to the left of the frame, faced from the rear, and to the assembly, to the connection marked FAN A POWER.

For B fan power, plug one end of the cable into J-8 on the backplane 850-0330-06. Route the cable to the left of the frame, faced from the rear, and to the fan assembly, to the connection marked FAN B POWER. Form and dress the two cables together and check the security of all of the connections.

Fifty Position Hard Drive I/O Cable

Figure C-26. Fifty Position/Hard Drive I/O Cable

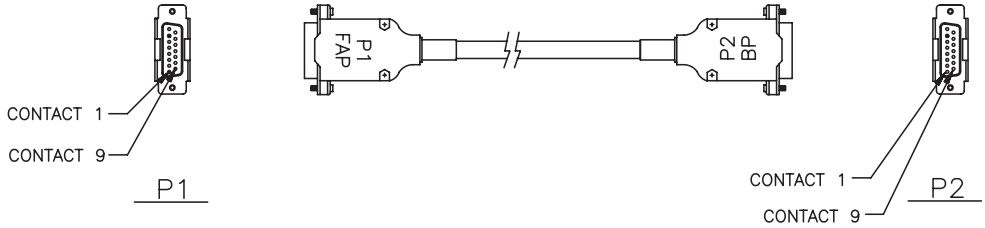


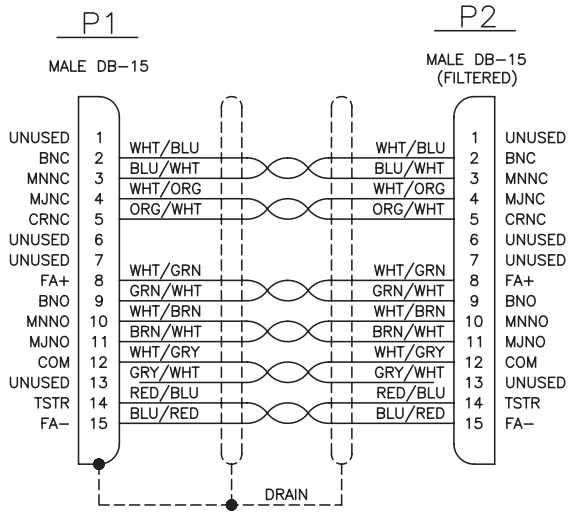
Filter Rack Alarm Cable

Table C-13. Filter Rack Alarm Cable

Part Number		Length	
North American	International	feet	meters
830-0638-01	830-1163-01	5.0	1.524
830-0638-02	830-1163-02	8.0	2.438
830-0638-03	830-1163-03	11.0	3.352
830-0638-04	830-1163-04	14.0	4.267
830-0638-05	830-1163-05	17.0	5.182
830-0638-06	830-1163-06	20.0	6.069
830-0638-07	830-1163-07	21.5	6.553
830-0638-08	830-1163-08	27.5	8.382

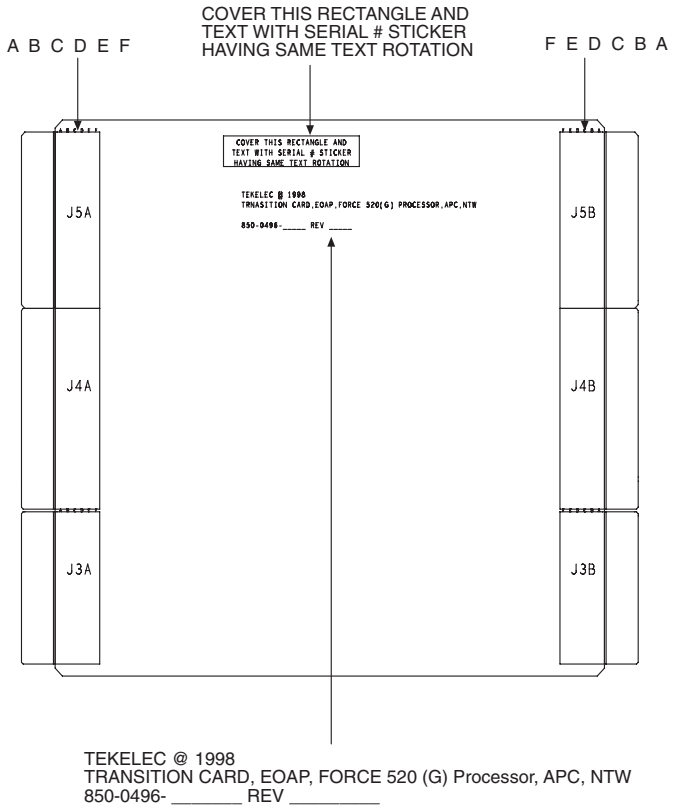
Figure C-27. Filter Rack Alarm Cable





Force Transition Card

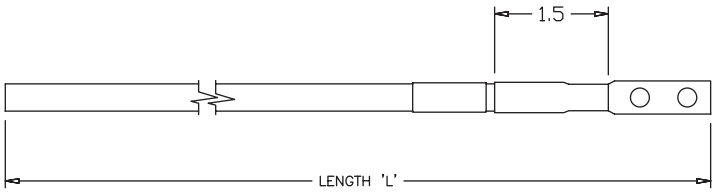
Figure C-28. Force Transition Card



Frame Ground Cable (2 Hole Lug)

Figure C-29. Frame Ground Cable

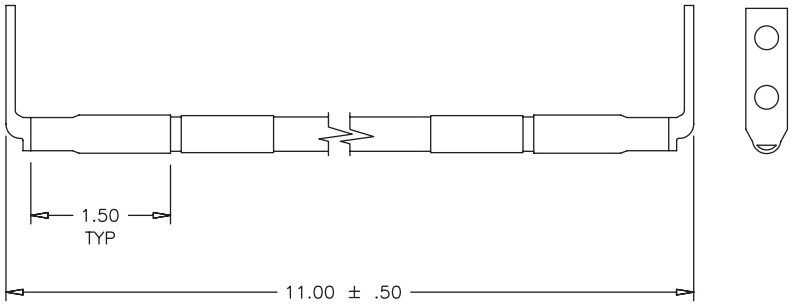
NUMBER	LENGTH "L" ± .50"	GAUGE	REVISION LEVEL
–01	36.00	6 AWG	A1
–02	36.00	2 AWG	A



830-1171-XX

Ground Breaker Panel-to-Frame Cable

Figure C-30. Ground Breaker Panel-to-Frame Cable

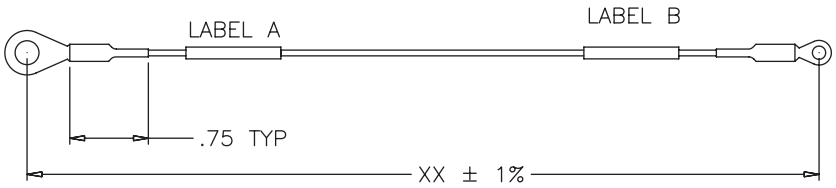


830-1181-01

Ground Hub-to-Frame Cable

Figure C-31. Ground Hub-to-Frame Cable

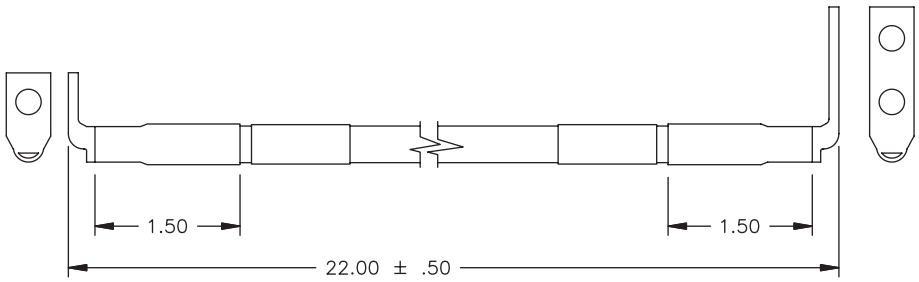
DASH NUMBER	CABLE LENGTH (XX)	LABEL 'A' USAGE	LABEL 'B' USAGE	REVISION LEVEL
–01	14.38"	FRAME	HUB	A
–02	14.38"	FRAME	SWITCH	A



830-0822-XX

Ground Switch-to-Frame Cable

Figure C-32. Switch to Frame Ground Cable



PART NUMBER	LENGTH (IN) ±.50	LABEL 'A' USAGE	LABEL 'B' USAGE	APPLICATION
830–0884–01	22.00	FRAME	SWITCH	CABLE GROUND, SWITCH TO FRAME, NTW

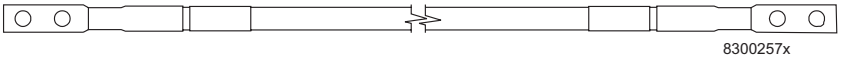
830-0884-01gnd

Hazard Ground Cable

Table C-14. Hazard Ground Cable

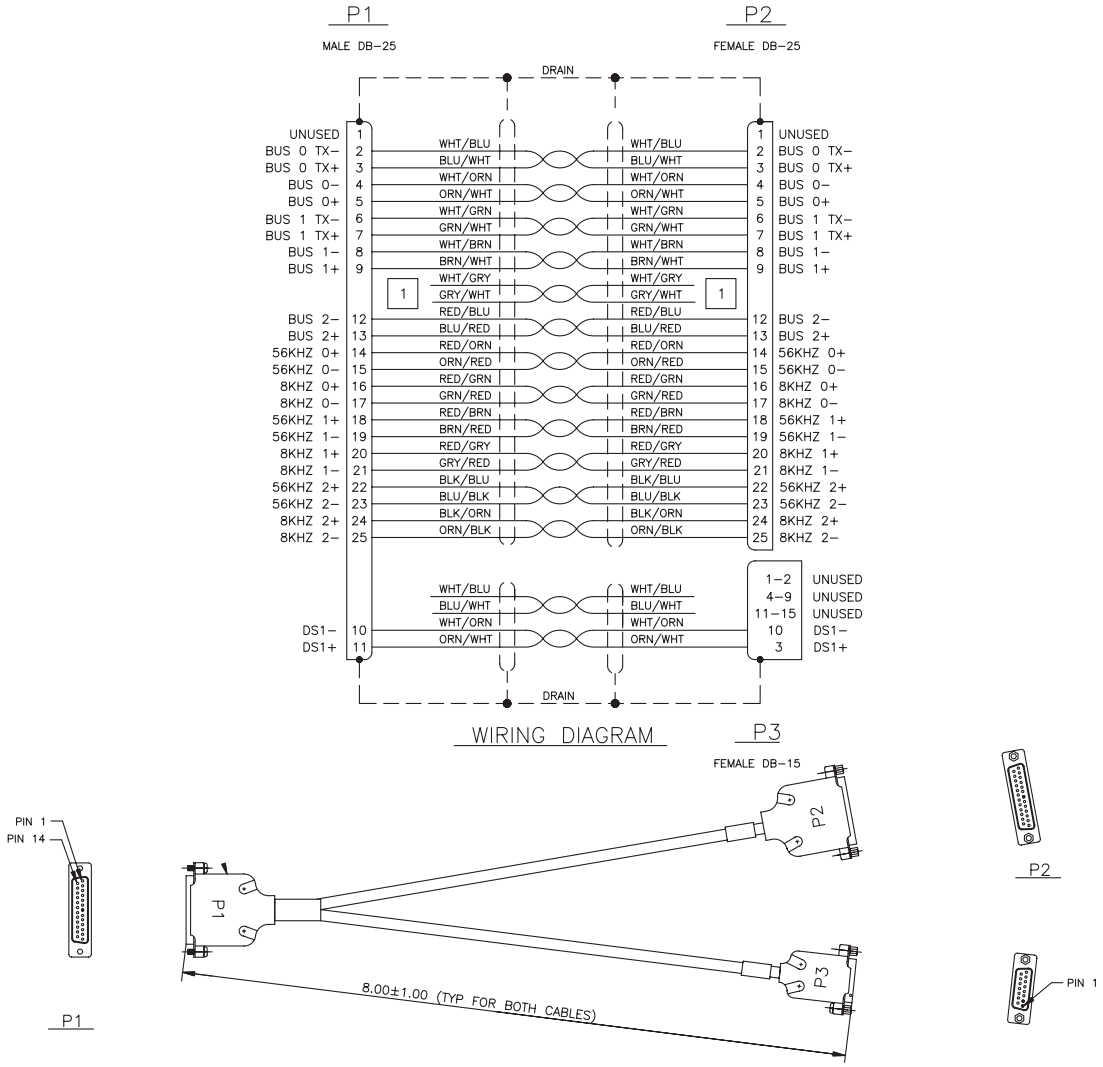
Part Number	Length		Part Number	Length	
	inches	centimeters		inches	centimeters
830-0257-01	15	38.1	830-0257-03	36	91.4
830-0257-02	24.75	62.9	830-0257-04	36	91.4

Figure C-33. Hazard Ground Cable



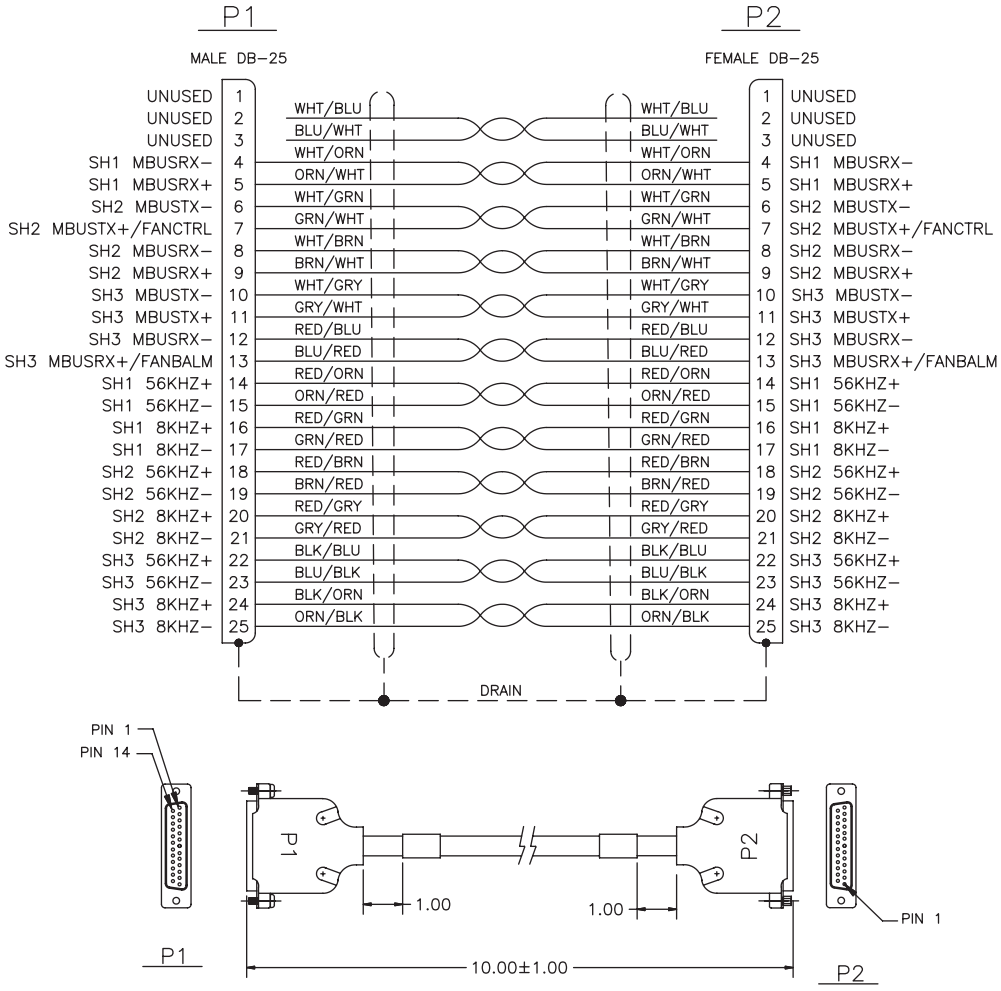
High Speed Master Timing Adapter

Figure C-34. High Speed Master Timing Adapter



HMUX Adapter

Figure C-35. HMUX Adapter

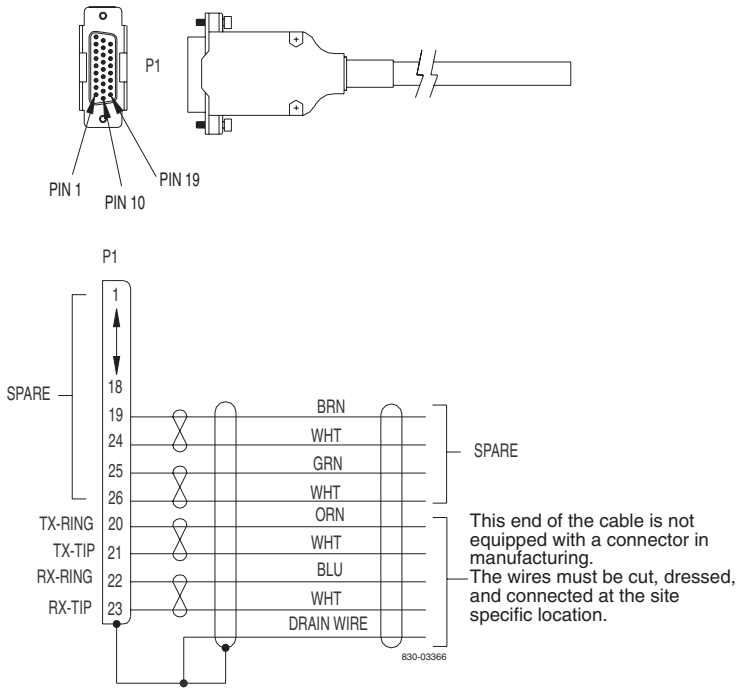


Interface Cable

Table C-15. Interface Cable

Part Number		Length	
North American	**International**	**feet**	**meters**
830-0366-01	830-1149-01	25	7.63
830-0366-02	830-1149-02	35	10.68
830-0366-03	830-1149-03	50	15.25
830-0366-04	830-1149-04	75	22.88
830-0366-05	830-1149-05	100	30.50
830-0366-06	830-1149-06	125	38.13
830-0366-07	830-1149-07	150	45.75
830-0366-08	830-1149-08	175	53.38
830-0366-09	830-1149-09	200	61.00
830-0366-10	830-1149-10	250	76.25
830-0366-11	830-1149-11	300	91.50
830-0366-12	830-1149-12	500	152.50
830-0366-13	830-1149-13	1000	305.00
830-0366-14	830-1149-14	15	4.58
830-0366-15	830-1149-15	20	6.10
830-0366-16	830-1149-16	30	9.15

Figure C-36. Interface Cable

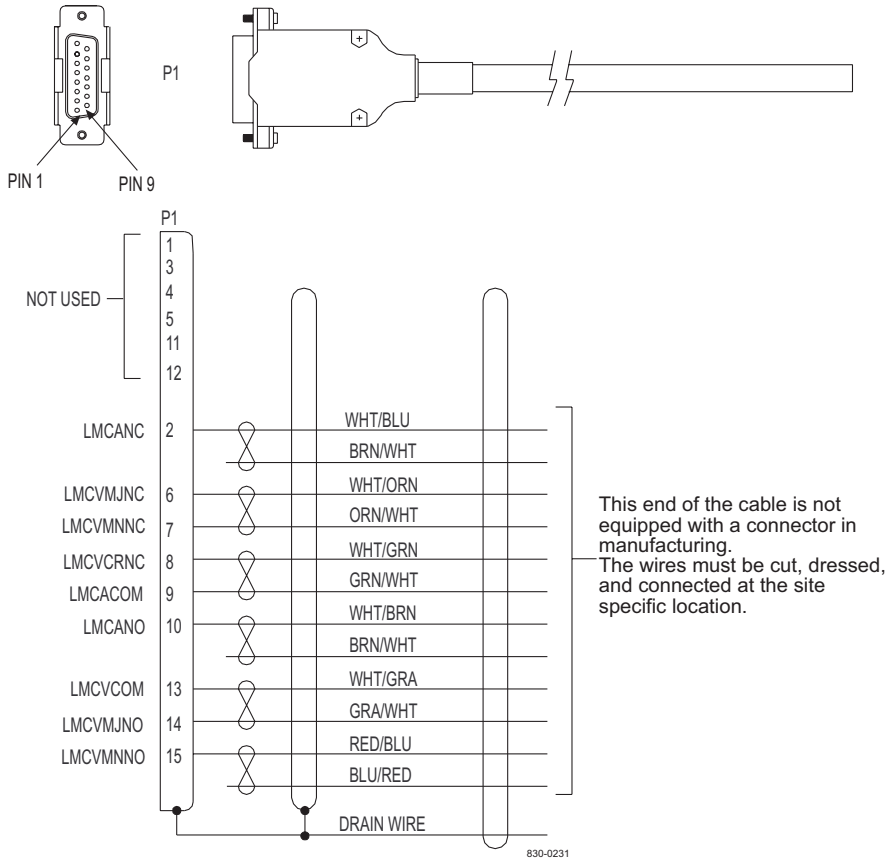


Local Maintenance Center Cable

Table C-16. Local Maintenance Center Cable

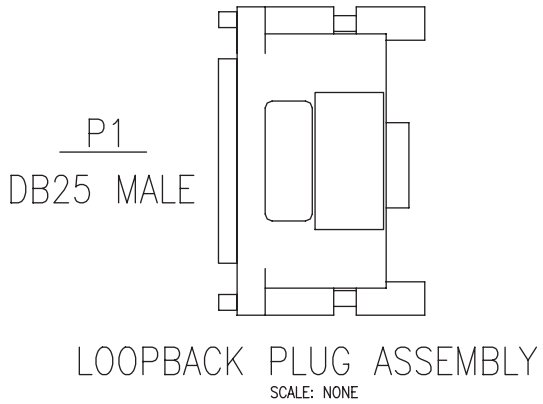
Part Number		Length	
North American	International	feet	meters
830-0231-01	830-1144-01	50	15.25
830-0231-02	830-1144-02	75	22.88
830-0231-03	830-1144-03	100	30.50
830-0231-04	830-1144-04	125	38.13
830-0231-05	830-1144-05	150	45.75
830-0231-06	830-1144-06	175	53.38
830-0231-07	830-1144-07	200	61.00
830-0231-08	830-1144-08	250	76.25
830-0231-09	830-1144-09	300	91.50
830-0231-10	830-1144-10	500	152.50
830-0231-11	--	1000	305.00

Figure C-37. Local Maintenance Center Cable



Loop Back Cable Adapter

Figure C-38. Loop Back Cable Adapter

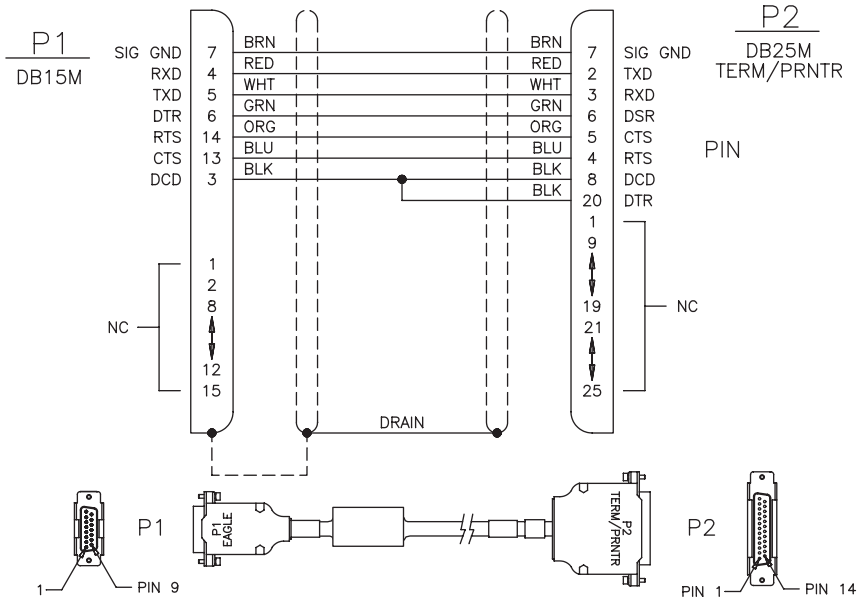


MMI Port Cable

Table C-17. MMI Port Cable

Part Number		Length		Part Number		Length	
North American	International	feet	meters	North American	International	feet	meters
830-0708-01	830-1169-01	25	7.62	830-0708-14	830-1169-01	350	106.68
830-0708-02	830-1169-01	15	4.57	830-0708-15	830-1169-01	400	121.92
830-0708-03	830-1169-01	50	15.24	830-0708-16	830-1169-01	450	137.16
830-0708-04	830-1169-01	75	22.86	830-0708-17	830-1169-01	550	167.64
830-0708-05	830-1169-01	100	30.48	830-0708-18	830-1169-01	600	182.88
830-0708-06	830-1169-01	125	38.10	830-0708-19	830-1169-01	650	198.12
830-0708-07	830-1169-01	150	45.72	830-0708-20	830-1169-01	700	213.36
830-0708-08	830-1169-01	175	53.34	830-0708-21	830-1169-01	750	228.60
830-0708-09	830-1169-01	200	60.96	830-0708-22	830-1169-01	800	243.84
830-0708-10	830-1169-01	250	76.20	830-0708-23	830-1169-01	850	259.08
830-0708-11	830-1169-01	300	91.40	830-0708-24	830-1169-01	900	274.32
830-0708-12	830-1169-01	500	152.40	830-0708-25	830-1169-01	950	289.56
830-0708-13	830-1169-01	1000	304.80				

Figure C-39. Man-Machine Interface Port Cable

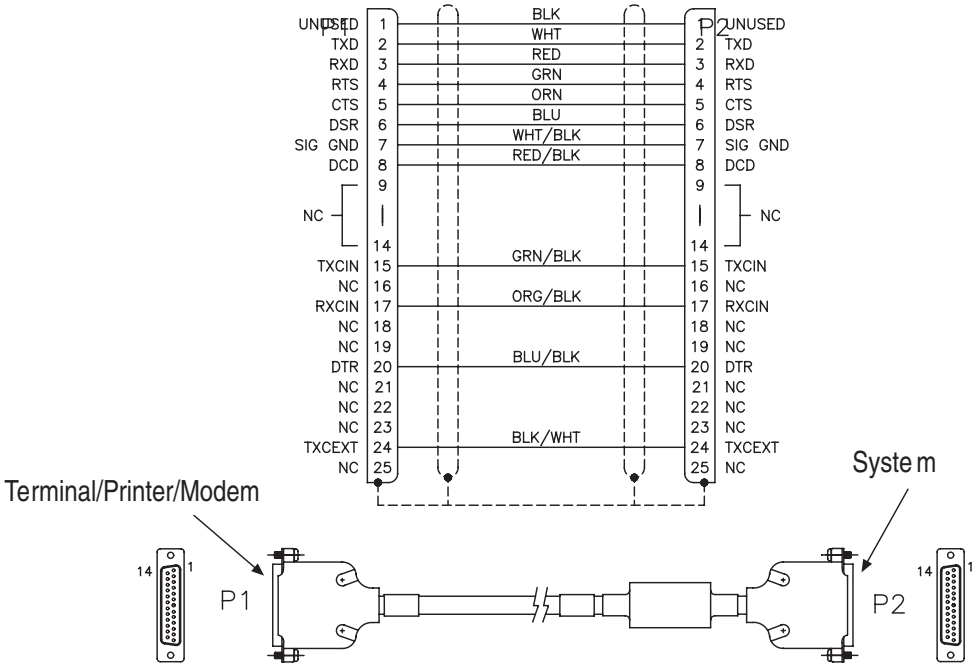


Modem/Terminal Cable

Table C-18. Modem/Terminal Cable

Part Number		Length	
North American	**International**	**inches**	**centimeters**
830-0709-01	830-1170-01	180.0 +/- 1.8	457.2
830-0709-02	830-1170-02	300.0 +/- 3.0	762.0
830-0709-03	830-1170-03	600.0 +/- 6.0	1524.0
830-0709-04	830-1170-04	900.0 +/- 9.0	2286.0
830-0709-05	830-1170-05	1200.0 +/- 12.0	3048.0
830-0709-06	830-1170-06	1500.0 +/- 15.0	3810.0
830-0709-07	830-1170-07	1800.0 +/- 18.0	4572.0

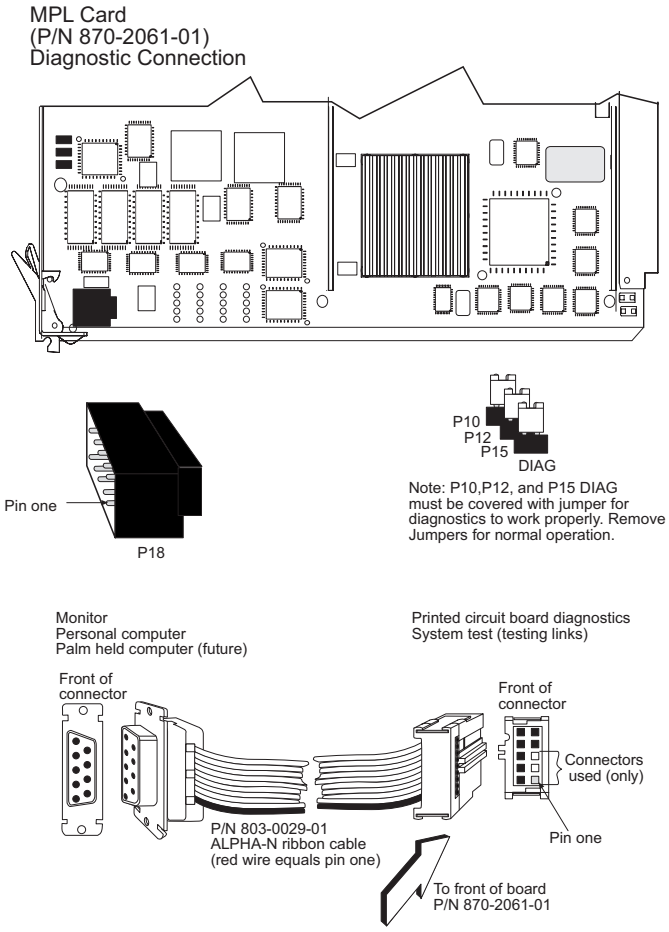
Figure C-40. Modem/Terminal Cable



Multi-Port LIM Card Diagnostic Cable

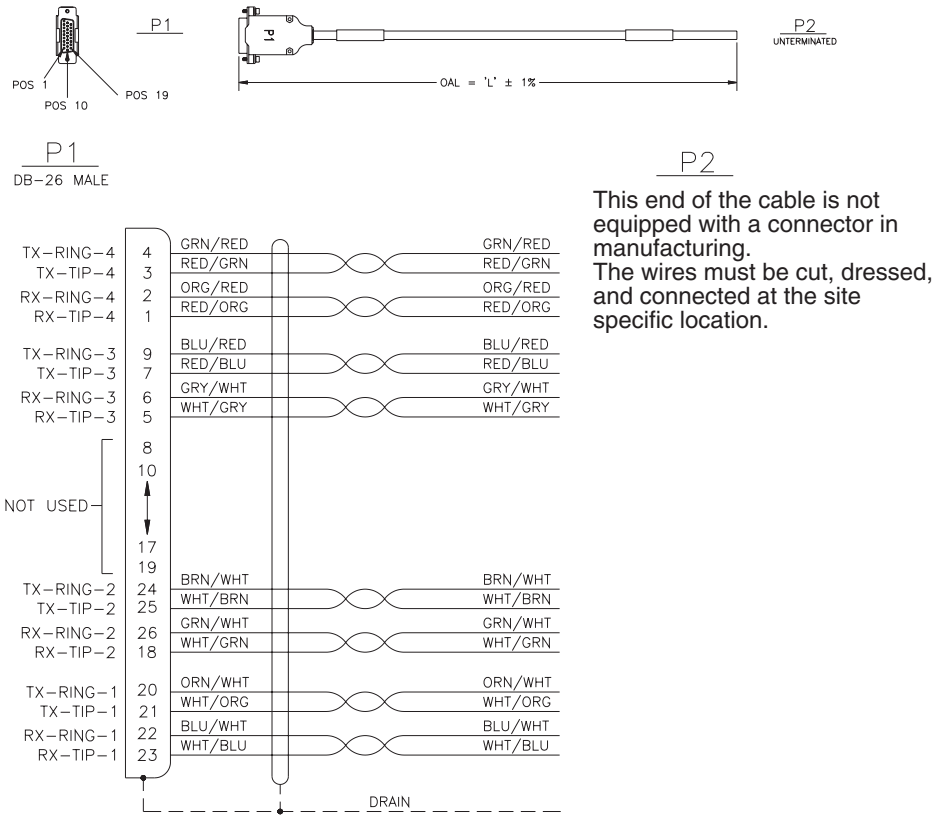
The MPL Diagnostic Cable provides a terminal interface for on board diagnostic tests of the Multi-Port Link Interface Module (MPL) card. The MPL card supports eight Digital Signal Level-0 (DS0) ports/links per module.

Figure C-41. MPL Card Diagnostic Cable



Multi-Port LIM DS0 Cable (26 AWG)

Figure C-42. Multi-Port LIM DS0 Cable

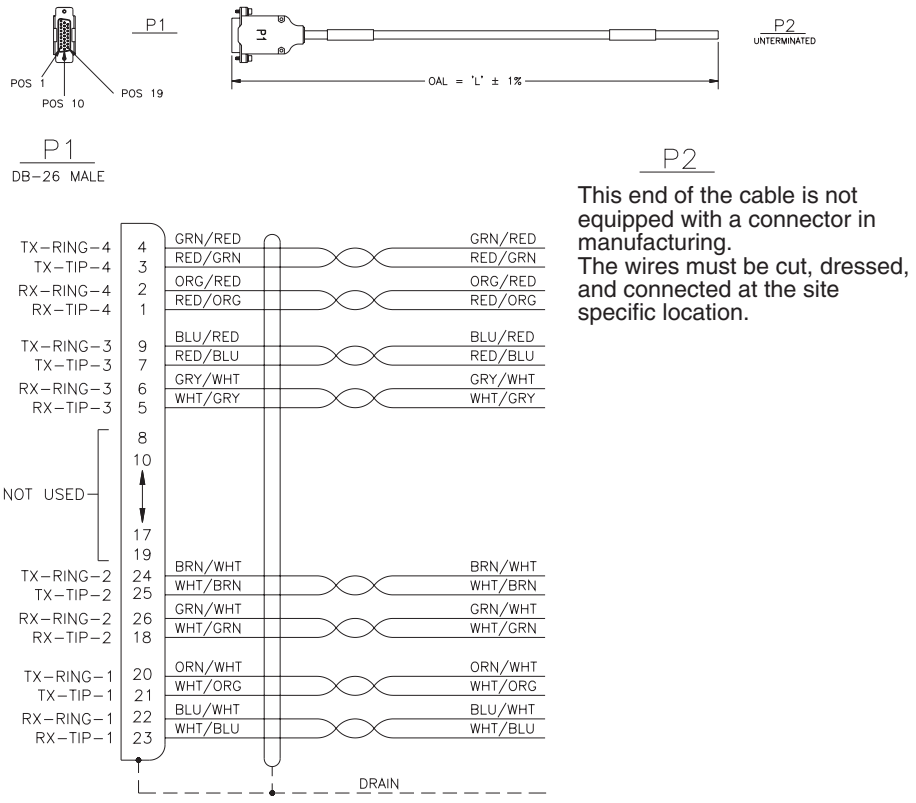


Multi-Port LIM DS0 Cable (24 AWG)

Table C-19. DS1 Cable

Part Number		Length		Part Number		Length	
North American	International	feet	meters	North American	International	feet	meters
830-0892-01	830-1194-01	15	4.57	830-0892-09	830-1194-09	125	38.10
830-0892-02	830-1194-02	20	6.09	830-089210	830-1194-10	150	45.72
830-0892-03	830-1194-03	25	7.62	830-0892-11	830-1194-11	175	53.34
830-0892-04	830-1194-04	30	9.14	830-0892-12	830-1194-12	200	60.96
830-0892-05	830-1194-05	35	10.66	830-0892-13	830-1194-13	250	76.20
830-0892-06	830-1194-06	50	15.24	830-0892-14	830-1194-14	300	91.44
830-0892-07	830-1194-07	75	22.86	830-0892-15	830-1194-15	500	152.40
830-0892-08	830-1194-08	100	30.48	830-0892-16	830-1194-16	1000	198.12

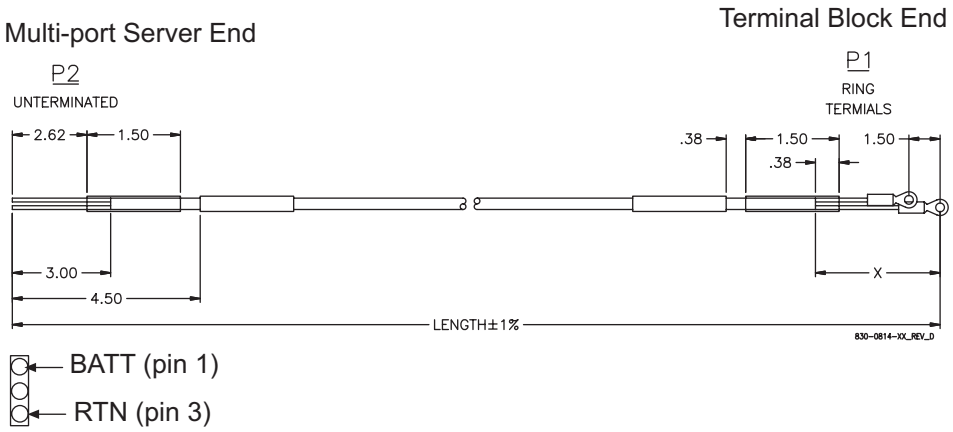
Figure C-43. Multi-Port LIM DS0



Multi-Port Power Cable

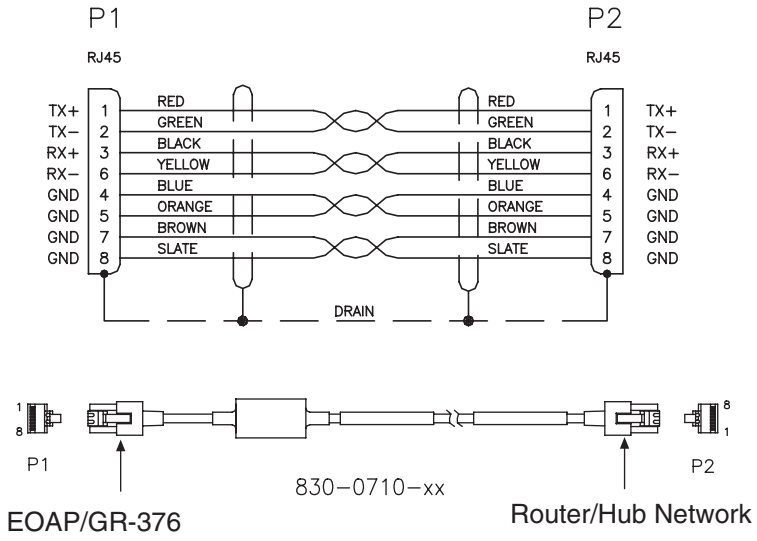
Figure C-44. Multi-Port Power Cable

TABULATION BLOCK				
DASH NUMBER	LENGTH (IN)±1%	X (IN)±.12	LABEL "A" USAGE	LABEL "B" USAGE
−01	64.0	6.0	TB1, POS 1&4	SERVER B, PS1B
−02	70.5	6.5	TB1, POS 2&5	SERVER B, PS2B
−03	77.0	7.0	TB1, POS 3&6	SERVER B, PS3B
−04	64.0	6.0	TB4, POS 1&4	SERVER B, PS3A
−05	70.5	6.5	TB4, POS 2&5	SERVER B, PS2A
−06	77.0	7.0	TB4, POS 3&6	SERVER B, PS1A
−07	44.5	11.5	TB2, POS 1&4	SERVER A, PS1B
−08	51.0	12.0	TB2, POS 2&5	SERVER A, PS2B
−09	57.5	12.5	TB2, POS 3&6	SERVER A, PS3B
−10	44.5	11.5	TB3, POS 1&4	SERVER A, PS3A
−11	51.0	12.0	TB3, POS 2&5	SERVER A, PS2A
−12	57.5	12.5	TB3, POS 3&6	SERVER A, PS1A



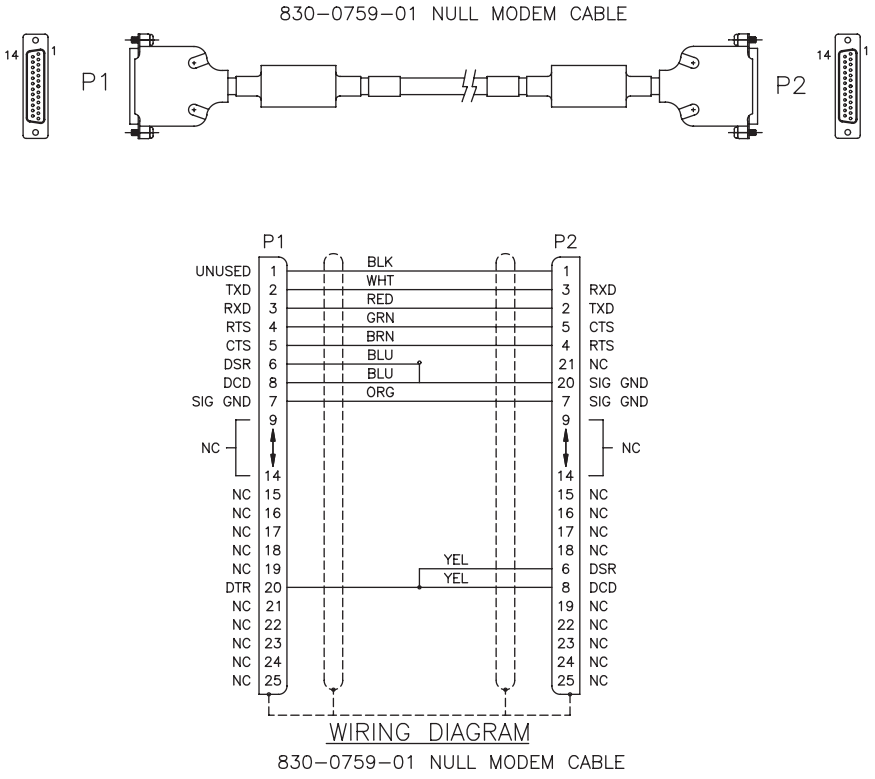
Network Cable

Figure C-45. Network Cable



Null Modem Cable

Figure C-46. Null Modem Cable

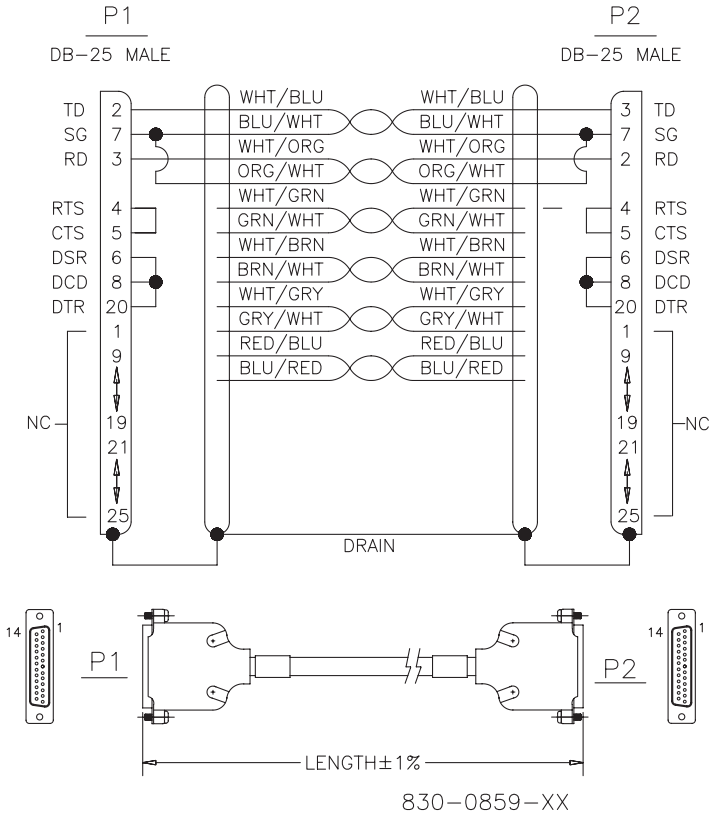


Null-Modem for Terminal Cable

Table C-20. Null-MODEM for Terminal

Part Number		Length			Rev Level
North American	International	feet	inches	meters	
830-0859-01	830-1186-01	.5	6	0.152	A
830-0859-02	830-1186-02	10	120	3.48	A
830-0859-03	830-1186-03	15	180	4.57	A
830-0859-04	830-1186-04	20	240	6.96	A
830-0859-05	830-1186-05	25	300	7.62	A
830-0859-06	830-1186-06	30	360	9.14	A
830-0859-07	830-1186-07	35	420	10.66	A
830-0859-08	830-1186-08	50	600	15.24	A
830-0859-09	830-1186-09	75	900	22.86	A
830-0859-10	830-1186-10	100	1200	30.48	A
830-0859-11	830-1186-11	125	1500	38.10	A
830-0859-12	830-1186-12	150	1800	45.72	A
830-0859-13	830-1186-13	200	2400	60.96	A
830-0859-14	830-1186-14	6.0	72	1.82	A
830-0859-15	830-1186-15	7.0	84	2.13	A

Figure C-47. Null-MODEM for Terminal

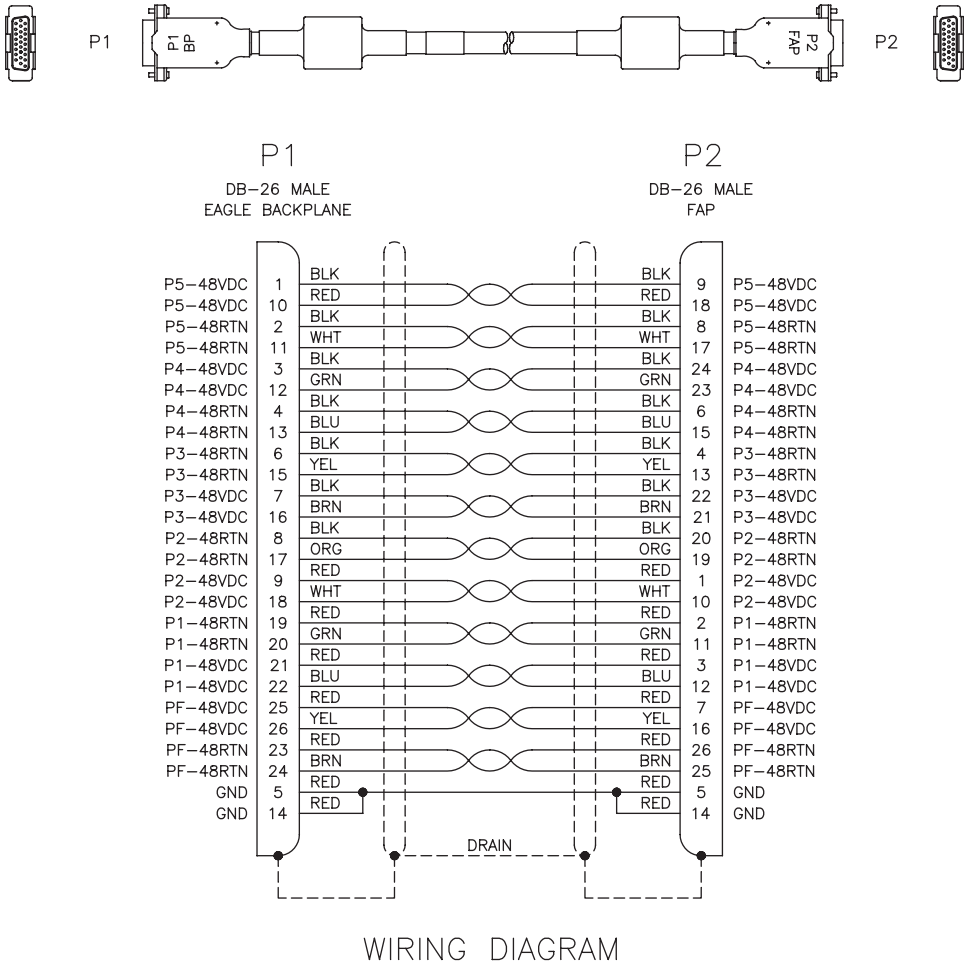


Power Cable

Table C-21. Power Cable

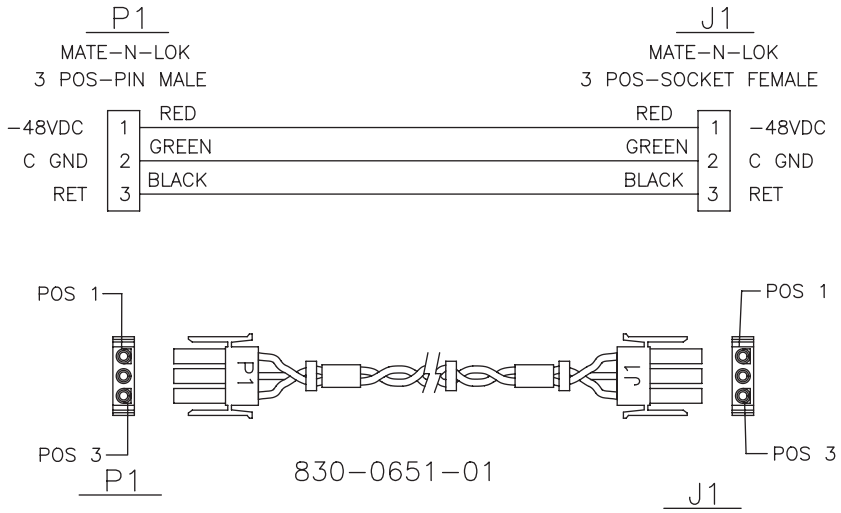
Part Number		Length	
North American	**International**	**feet**	**meters**
830-0315-01	--	4.0	1.07
830-0315-02	--	6.0	1.07
830-0315-03	--	8.0	2.29
830-0315-04	830-1147-04	4.5	1.22
830-0315-05	830-1147-05	6.5	1.98
830-0315-06	830-1147-06	8.5	2.58

Figure C-48. Power Cable



Power Cable, –48V

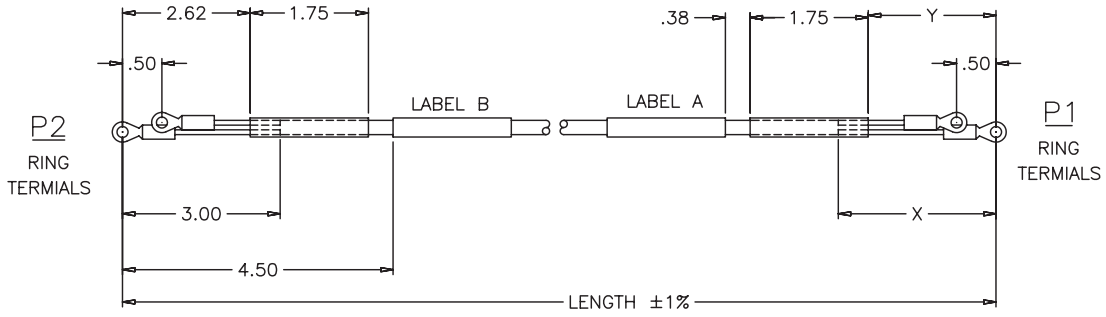
Figure C-49. –48V Power Cable



Power Cable (DC), Breaker Panel-to-Hub

Figure C-50. Power Cable

DASH NUMBER	LENGTH (IN)±1%	X (IN)±1%	Y (IN)±1%	P1 LONG LEAD	P2 LONG LEAD	LABEL "A" USAGE	LABEL "B" USAGE
−01	76.0	17.0	16.62	BLACK	RED	BP−1, POS 2A	HUB 1A
−02	66.0	11.0	10.62	BLACK	BLACK	BP−2, POS 2B	HUB 1B
−03	72.0	17.0	16.62	BLACK	RED	BP−2, POS 2A	HUB 2A
−04	70.0	11.0	10.62	BLACK	BLACK	BP−1, POS 2B	HUB 2B
−05	32.5	17.0	16.62	BLACK	RED	BP−1, POS 2A	HUB 1A
−06	25.0	11.0	10.62	BLACK	BLACK	BP−2, POS 2B	HUB 1B
−07	34.0	17.0	16.62	BLACK	RED	BP−1, POS 4A	HUB 2A
−08	26.5	11.0	10.62	BLACK	BLACK	BP−2, POS 4B	HUB 2B
−09	31.0	17.0	16.62	BLACK	RED	BP−2, POS 2A	HUB 3A
−10	29.5	11.0	10.62	BLACK	BLACK	BP−1, POS 2B	HUB 3B
−11	32.5	17.0	16.62	BLACK	RED	BP−2, POS 4A	HUB 4A
−12	31.0	11.0	10.62	BLACK	BLACK	BP−1, POS 4B	HUB 4B
−13	76.0	17.0	16.62	BLACK	RED	BP−1, POS 2A	SWITCH 1A
−14	66.0	11.0	10.62	BLACK	BLACK	BP−2, POS 2B	SWITCH 1B
−15	72.0	17.0	16.62	BLACK	RED	BP−2, POS 2A	SWITCH 2A
−16	70.0	11.0	10.62	BLACK	BLACK	BP−1, POS 2B	SWITCH 2B

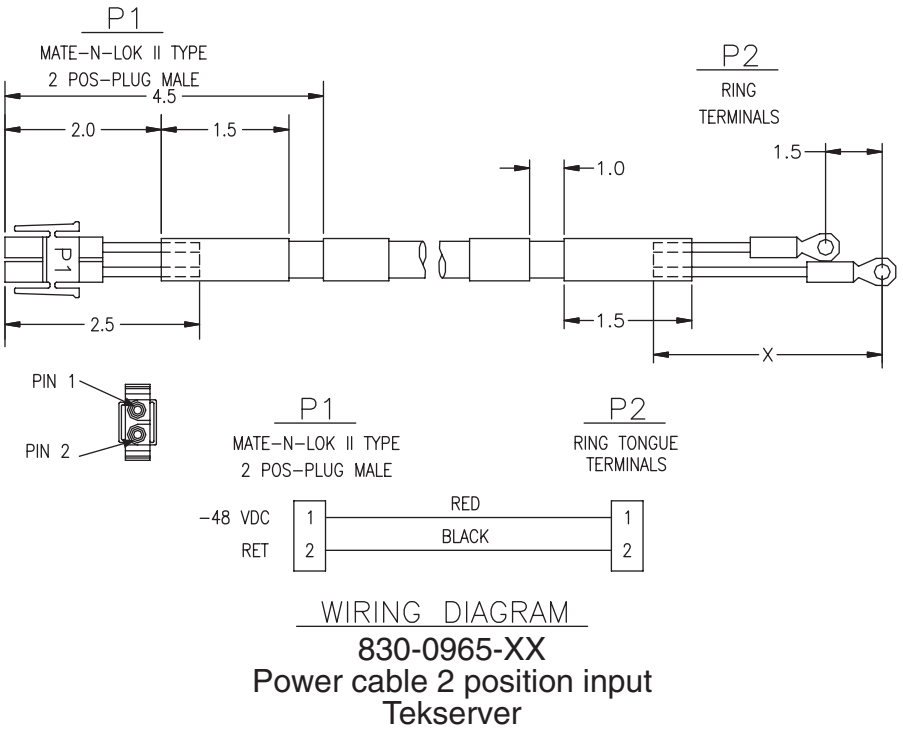


830-1187-XX rev_C

Power Cable, MPS (2 Position)

Figure C-51. Power Cable, MPS, (2 Position)0

DASH NUMBER	LENGTH (IN)±1%	X (IN)±.12	P2 LONG LEAD	LABEL "A" USAGE	LABEL "B" USAGE	REVISION LEVEL
830-0965-01	60.0	6.0	BLACK	TB3, POS 1&4	SERVER A, PWR A	A
830-0965-02	60.0	6.5	BLACK	TB2, POS 1&4	SERVER A, PWR B	A
830-0965-03	72.0	6.0	BLACK	TB4, POS 1&4	SERVER B, PWR A	A
830-0965-04	72.0	6.5	BLACK	TB1, POS 1&4	SERVER B, PWR B	A

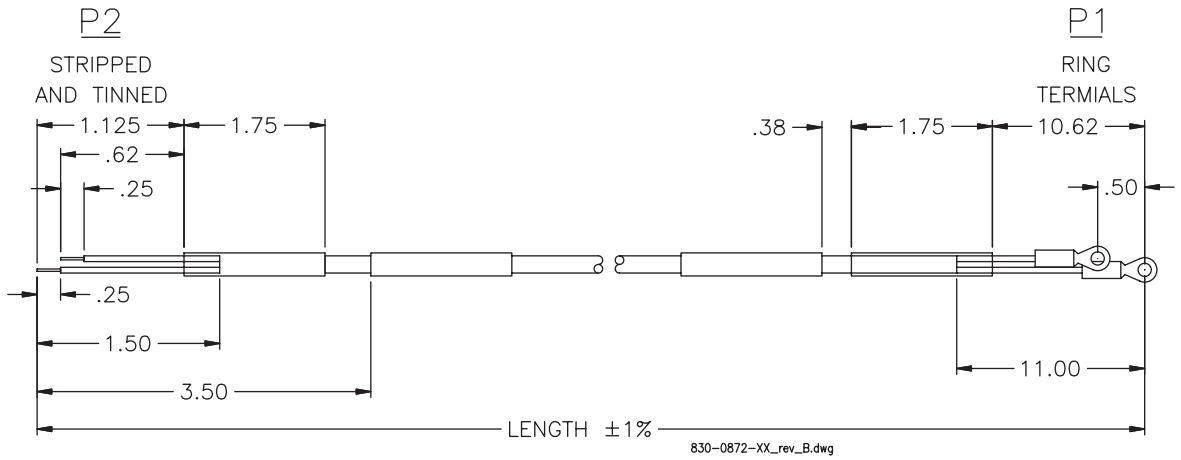


RAID Power Cable

Table C-22. RAID Power Cable

Part Number	Length		P1 Long Lead	P2 Long Lead	Label "A" usage	Label "B" usage
	inches	meters				
830-0872-01	91.0	27.73	Black	Red	BP-1, POS 3A	RAID A, PS A
830-0872-02	89.5	27.27	Black	Black	BP-2, POS 3B	RAID A, PS B
830-0872-03	95.0	28.95	Black	Red	BP-2, POS 3A	RAID B, PS A
830-0872-04	93.5	28.49	Black	Black	BP-1, POS 3B	RAID B, PS B
830-0872-05	95.0	28.95	Black	Red	Input Power	PS A
830-0872-06	93.5	28.49	Black	Black	Input Power	PS B
830-0872-07	49.0	14.93	Black	Red	BP-1, POS 5A	RAID A, PS A
830-0872-08	47.5	14.47	Black	Black	BP-2, POS 5B	RAID A, PS B
830-0872-09	79.5	24.23	Black	Red	BP-2, POS 5A	RAID B, PS A
830-0872-10	78.0	23.77	Black	Black	BP-1, POS 5B	RAID B, PS B

Figure C-52. RAID Power Cable

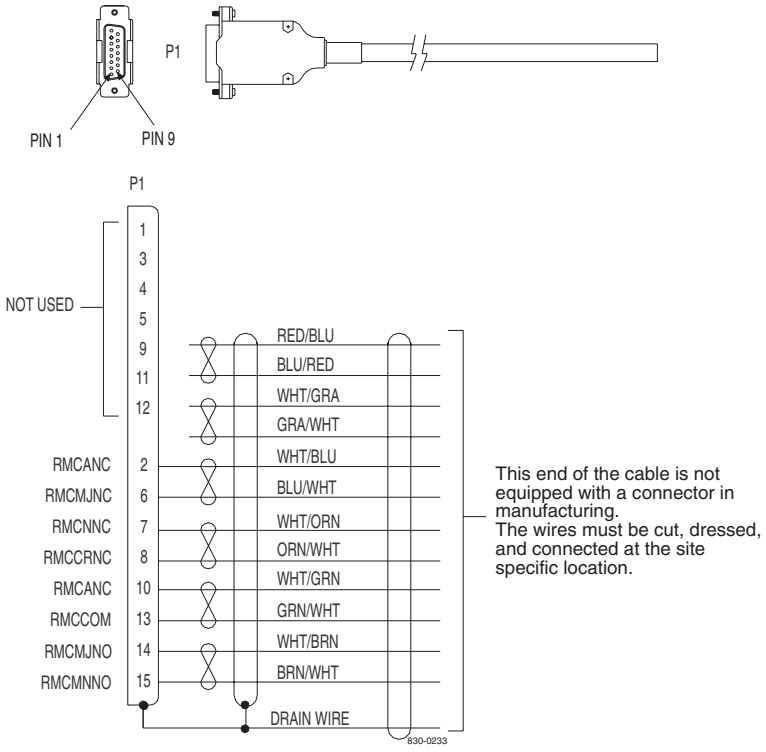


Remote Maintenance Center Cable

Table C-23. Remote Maintenance Center Cable

Part Number		Length	
North American	International	feet	meters
830-0233-01	830-1146-01	50	15.25
830-0233-02	830-1146-02	75	22.88
830-0233-03	830-1146-03	100	30.50
830-0233-04	830-1146-04	125	38.13
830-0233-05	830-1146-05	150	45.75
830-0233-06	830-1146-06	175	53.38
830-0233-07	830-1146-07	200	61.00
830-0233-08	830-1146-08	250	76.25
830-0233-09	830-1146-09	300	91.50
830-0233-10	830-1146-10	500	152.50
830-0233-11	830-1146-11	1000	305.00

Figure C-53. Remote Maintenance Center Cable

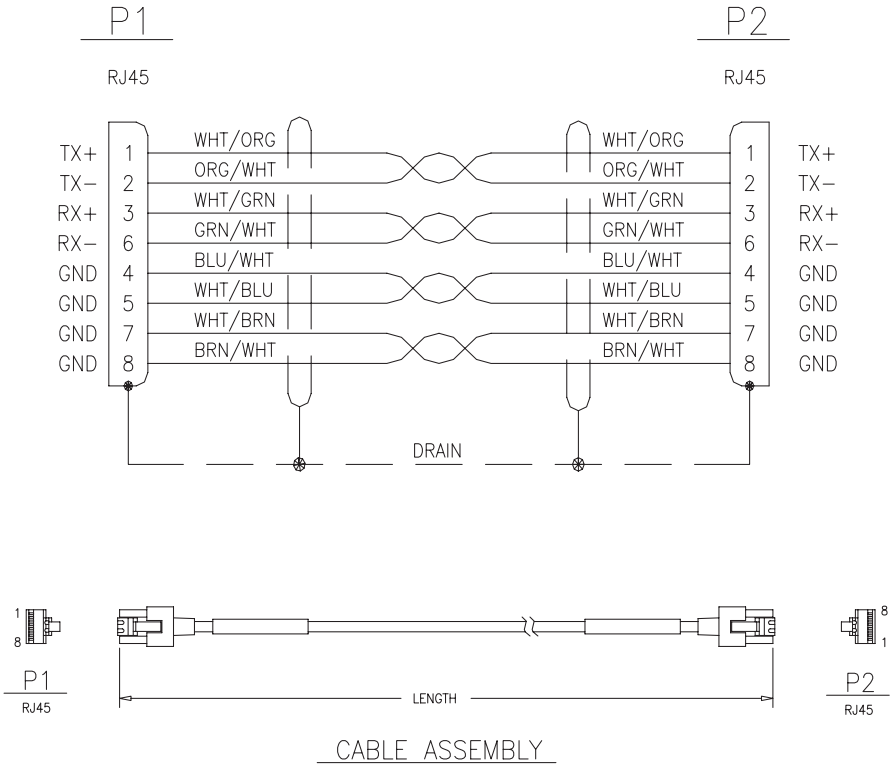


RJ45/RJ45 Cable (CAT-5) (Yellow)

Table C-24. RJ45/RJ45 Cable (CAT-5)

Part Number		Length	
North American	**International**	**feet**	**meters**
830-0888-01	--	1.0	.304
830-0888-02	--	5.5	1.67
830-0888-03	830-1191-03	6.0	1.82
830-0888-04	830-1191-04	6.5	1.98
830-0888-05	830-1191-05	7.0	2.13
830-0888-06	830-1191-06	8.0	2.43
830-0888-07	830-1191-07	10.0	3.04
830-0888-08	--	12.0	3.65
830-0888-09	--	15.0	4.57
830-0888-10	--	16.0	4.87
830-0888-11	830-1191-11	3.0	.91

Figure C-54. RJ45/RJ45 Cable (CAT-5)

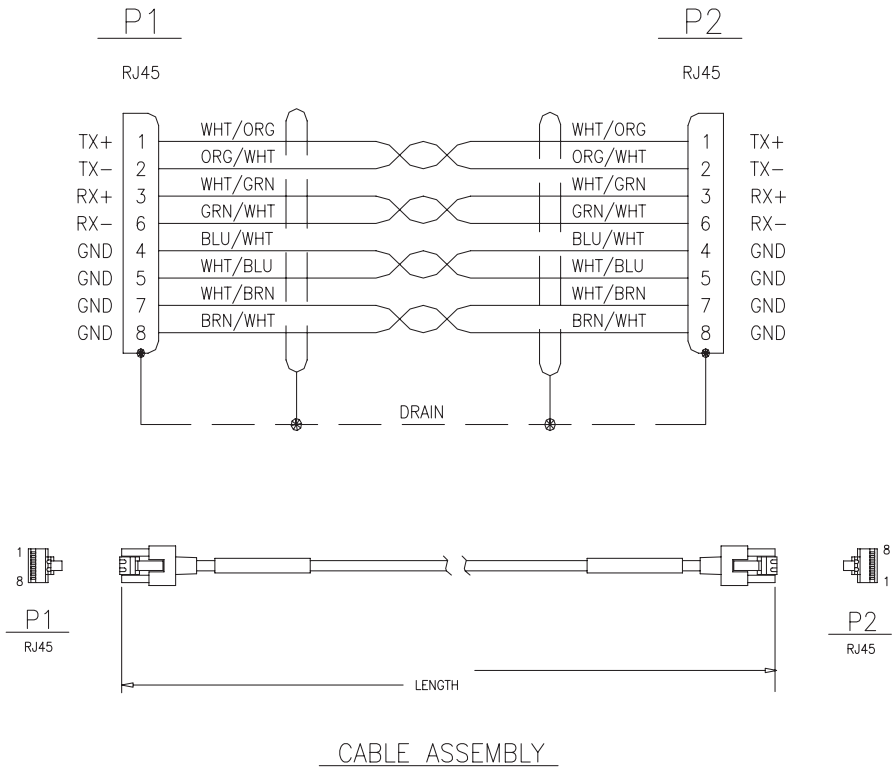


RJ45/RJ45 Cable (CAT-5) (Blue)

Table C-25. RJ45/RJ45 Cable (CAT-5)

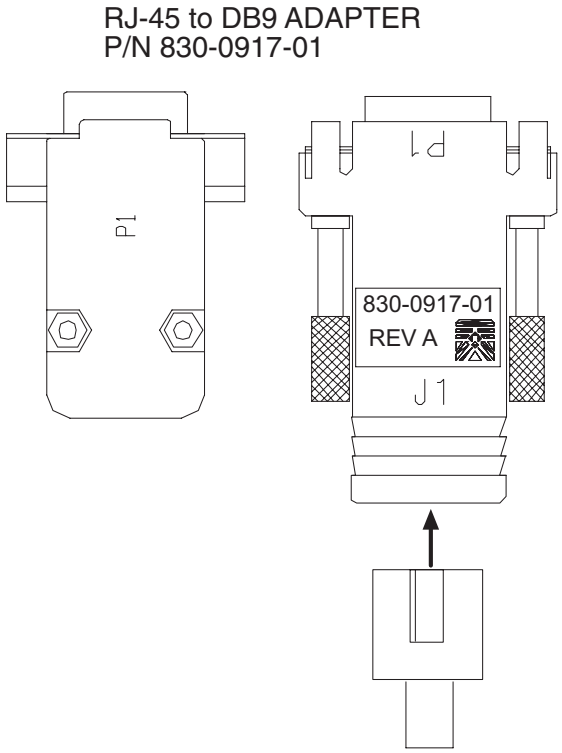
Part Number		Length	
North American	**International**	**feet**	**meters**
830-0889-01	--	1.0	.304
830-0889-02	830-1192-02	5.5	1.67
830-0889-03	830-1192-03	6.0	1.82
830-0889-04	830-1192-04	6.5	1.98
830-0889-05	830-1192-05	7.0	2.13
830-0889-06	830-1192-06	8.0	2.43
830-0889-07	830-1192-07	10.0	3.04
830-0889-08	--	12.0	3.65
830-0889-09	--	15.0	4.57
830-0889-10	--	16.0	4.87

Figure C-55. RJ45/RJ45 Cable (CAT-5)



RJ45-to-9 Pin Adapter

Figure C-56. RJ 45 to 9 Pin Adapter

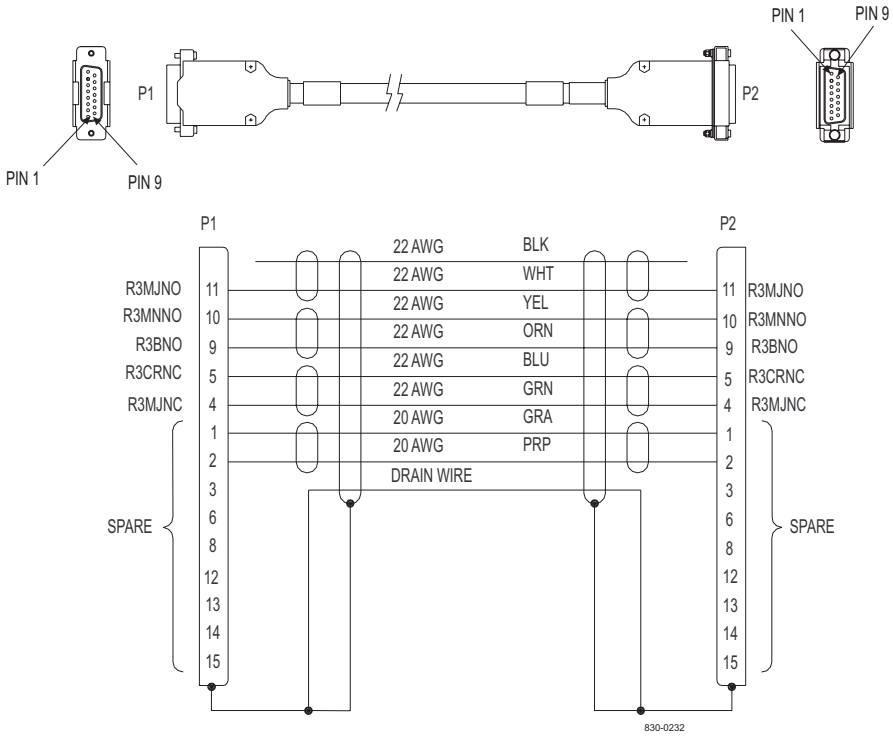


Row Alarm Cable

Table C-26. Row Alarm Cable

Part Number		Length	
North American	International	feet	meters
830-0232-01	830-1145-01	5	1.53
830-0232-02	830-1145-02	8	2.44
830-0232-03	830-1145-03	10	3.05
830-0232-04	830-1145-04	12	3.66
830-0232-05	830-1145-05	14	4.27
830-0232-06	830-1145-06	175	53.38
830-0232-12	830-1145-12	20	6.1
830-0232-13	830-1145-13	30	9.25
830-0232-14	830-1145-14	40	12.2
830-0232-15	830-1145-15	50	15.25

Figure C-57. Row Alarm Cable

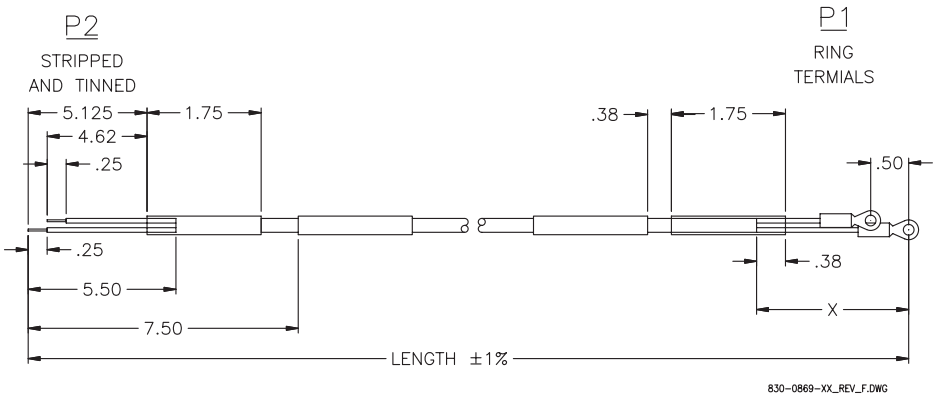


Router Power Cable

Table C-27. Router Power Cable

Part Number		Rev Level	Length (inches)	X (inches)	P1 Long Lead	P2 Long Lead	Label "A" usage	Label "B" usage
North American	International							
830-0869-01	--	C	72	11	Black	Red	BP-1, POS 3A	ISO Router A
830-0869-02	--	C	79	17	Black	Red	BP-1, POS 3B	Dial-in Router
830-0869-03	830-1188-03	C	78	17	Black	Red	BP-2, POS 3B	ISO Router B
830-0869-04	830-1188-04	C	78	17	Black	Red	BP-1, POS 6B	Dial-in Router
830-0869-05	--	C	72	11	Black	Red	BP-1, POS 5A	ISO Router A
830-0869-06	--	C	78	17	Black	Red	BP-1, POS 5B	ISO Router B
830-0869-07	830-1188-07	A	82	22	Black	Red	To BP-1, POS 6B from Router YEL	To Router YEL from BP-1 POS 6A
830-0869-08	830-1188-08	A	74	14	Black	Red	To BP-1, POS 6B from Router BLU	To Router BLU from BP-1 POS 6A
830-0869-09	--	A	38	11	Black	Red	BP-2, POS 4A	Dial-in Router

Figure C-58. Router Power Cable



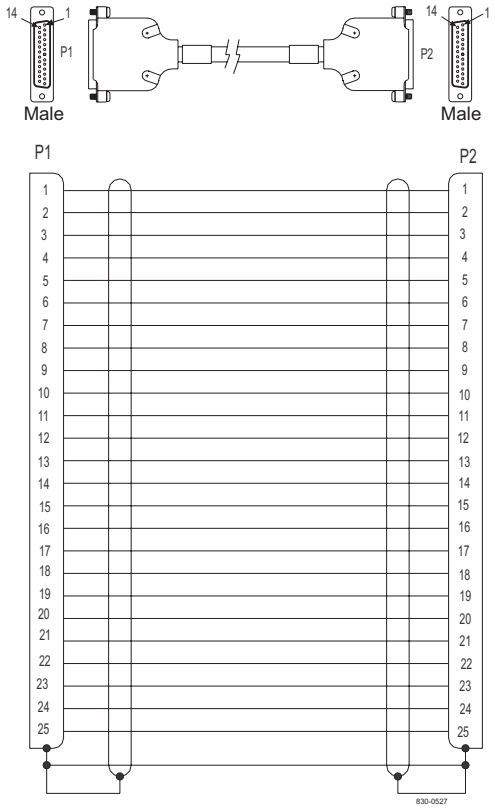
RS232

Standard Purchased part. Serial port connected to an optional second asynchronous maintenance modem and connections between the TTYA and a VT-520 terminal.

Table C-28. RS232

Part Number		Length	
North American	International	feet	meters
830-0527-01	830-1152-01	15	4.57
830-0527-02	830-1152-02	25	7.62
830-0527-03	830-1152-03	50	15.24
830-0527-04	830-1152-04	75	22.86
830-0527-05	830-1152-05	100	30.48
830-0527-06	830-1152-06	125	38.10
830-0527-07	830-1152-07	150	45.72

Figure C-59. RS232

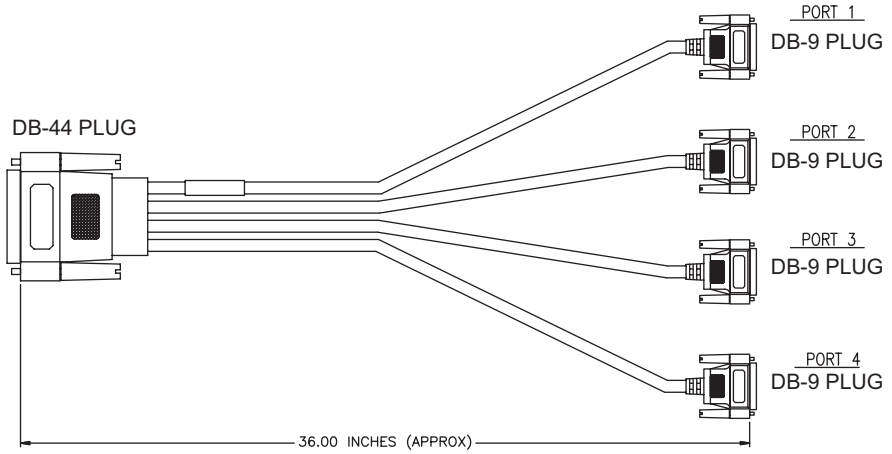


Serial DB44 to DB9 (X4) Connector (MPS)

Table 3-29. Serial DB44 to DB9 (X4) Pin Outs

Tekelec 1000 Serial DB44 to DB9											
	Pin 1	Pin 0		Pin 2	Pin 0		Pin 3	Pin 0		Pin 4	Pin 0
DCD	1	3	DCD	1	7	DCD	1	11	DCD	1	15
RD	2	4	RD	2	8	RD	2	12	RD	2	30
TD	3	1	TD	3	5	TD	3	9	TD	3	13
DTR	4	32	DTR	4	36	DTR	4	40	DTR	4	43
GND	5	17	GND	5	21	GND	5	24	GND	5	28
DSR	6	31	DSR	6	35	DSR	6	39	DSR	6	42
RTS	7	2	RTS	7	6	RTS	7	10	RTS	7	14
CTS	8	16	CTS	8	20	CTS	8	23	CTS	8	27
RI	9	33	RI	9	37	RI	9	41	RI	9	44

Figure C-60. Serial DB44 to DB9 Connector

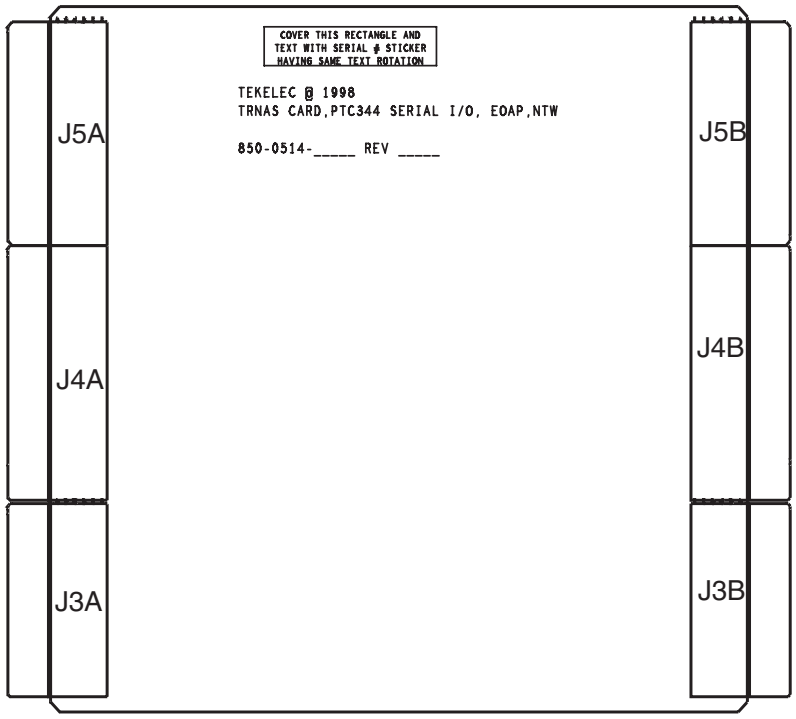


Serial I/O Transition Card

Table C-30. Serial I/O Transition Card

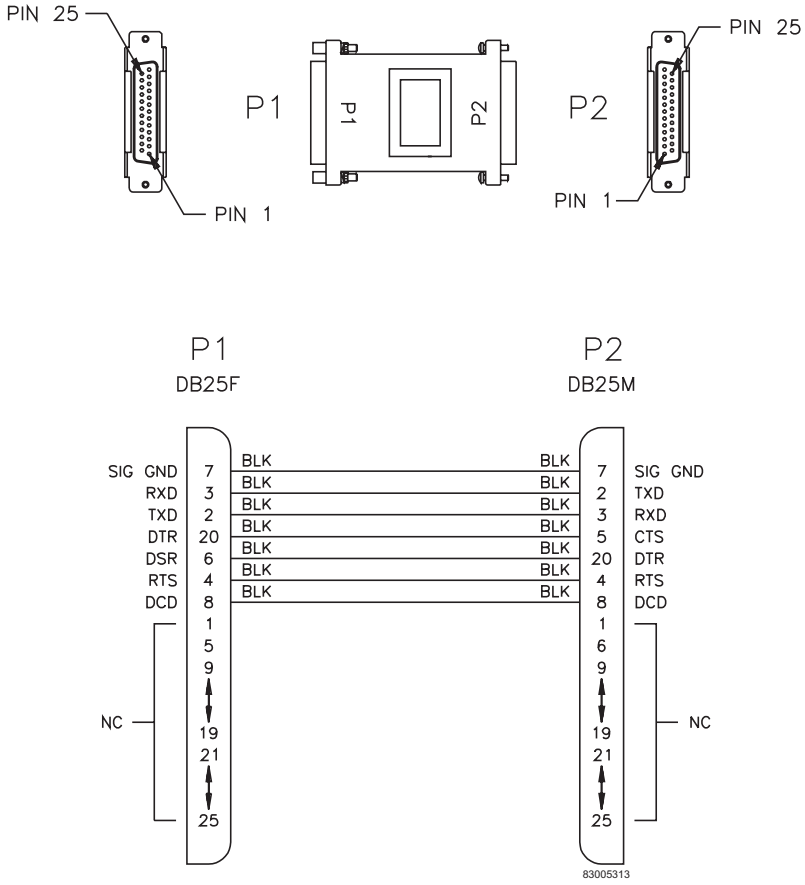
Part Number		Length	
North American	International	feet	meters
830-0514-01	---	5	1.53
830-0514-02	---	10	3.05
830-0514-03	---	15	4.57
830-0514-04	---	20	6.1
830-0514-05	---	25	7.62

Figure C-61. Serial I/O Transition Card



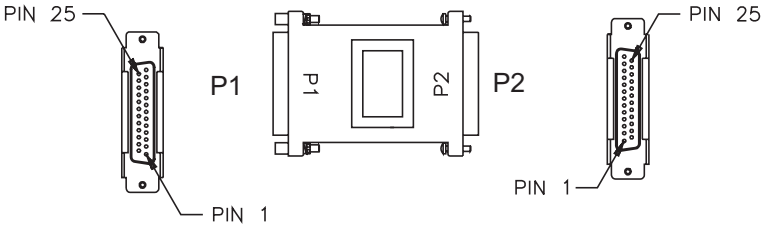
Serial Interface/Modem Adapter

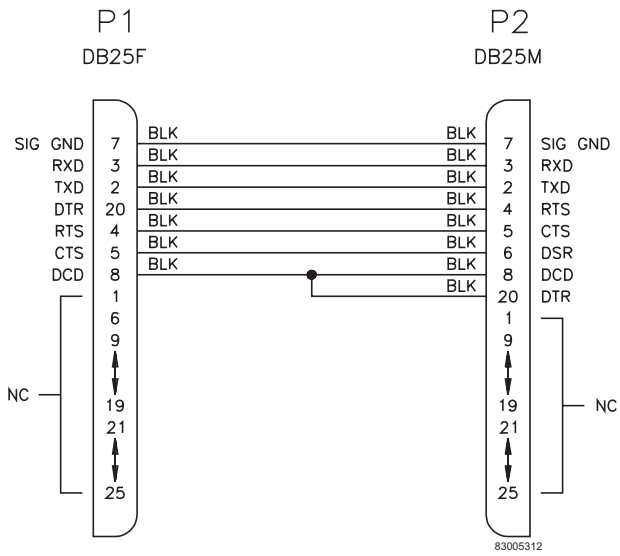
Figure C-62. Serial Interface/Modem Adapter



Serial Interface, Terminal, and Printer Adapter

Figure C-63. Serial Interface, Adapter



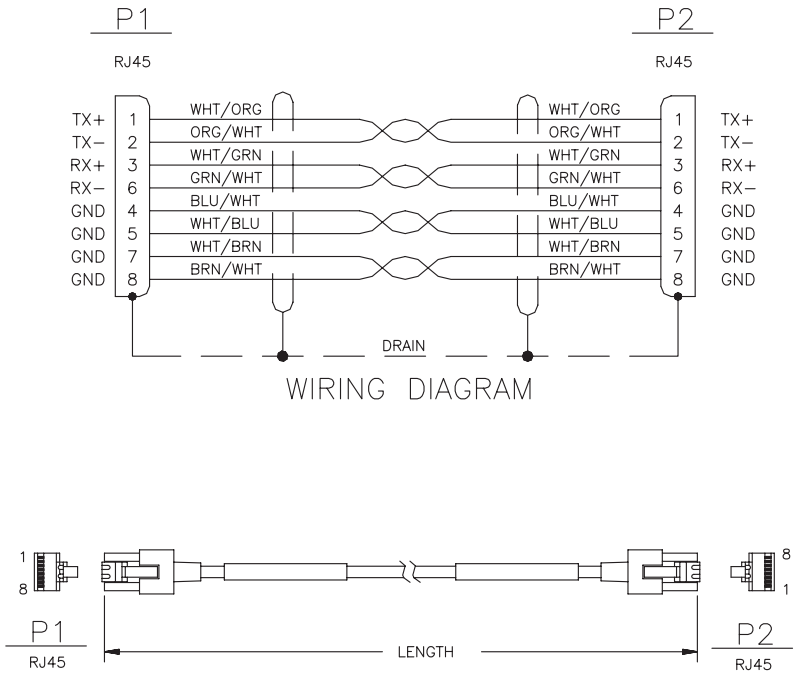


Straight Through Cable (CAT-5)

Table C-31. Straight Through Cable (CAT-5)

Part Number		Length	
North American	**International**	**meters**	**feet**
830-0724-01	830-1174-01	0.15	0.5
830-0724-02	830-1174-02	3.28	10.0
830-0724-03	830-1174-03	4.5	15.0
830-0724-04	830-1174-04	7.5	25.0
830-0724-05	830-1174-05	0.30	1.0
830-0724-06	830-1174-06	1.8	6.0
830-0724-07	830-1174-07	2.13	7.0
830-0724-08	--	0.52	1.6
830-0724-09	830-1174-09	15.24	50.0
830-0724-10	830-1174-10	30.48	100.0

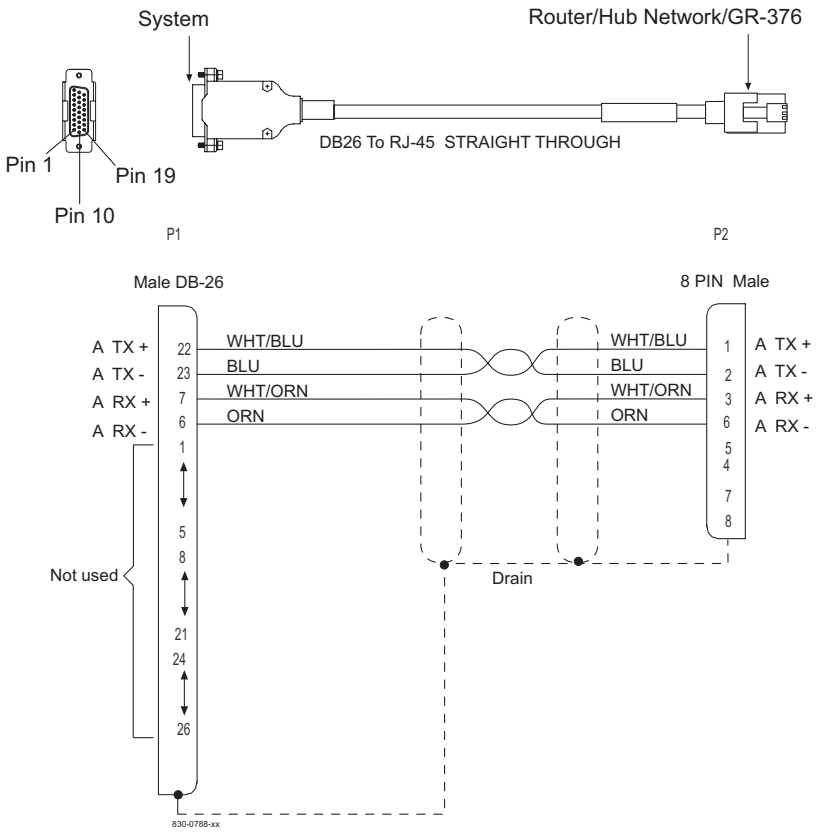
Figure C-64. Straight Through Cable (CAT-5)



Straight-Through Patch-Panel Cable

DB26 to RJ-45

Figure C-65. Straight Through Patch Panel Cable

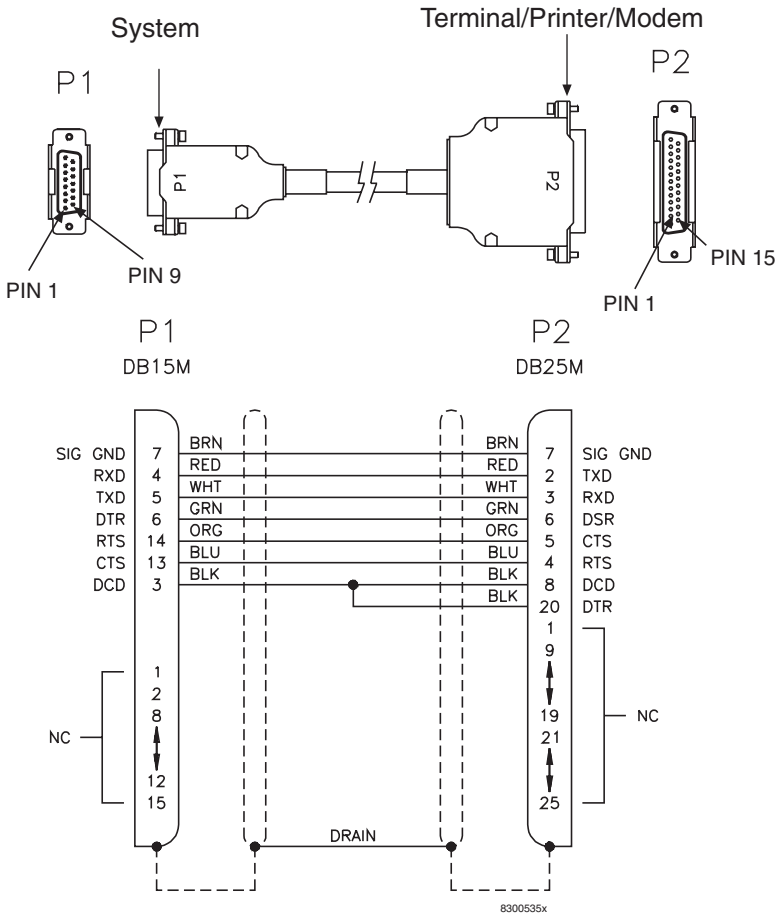


Terminal/Converter Cable

This converter is a purchased part and the pin-out is that of a straight through converter. The cable is 2 ft long. There is no illustration or wiring diagram.

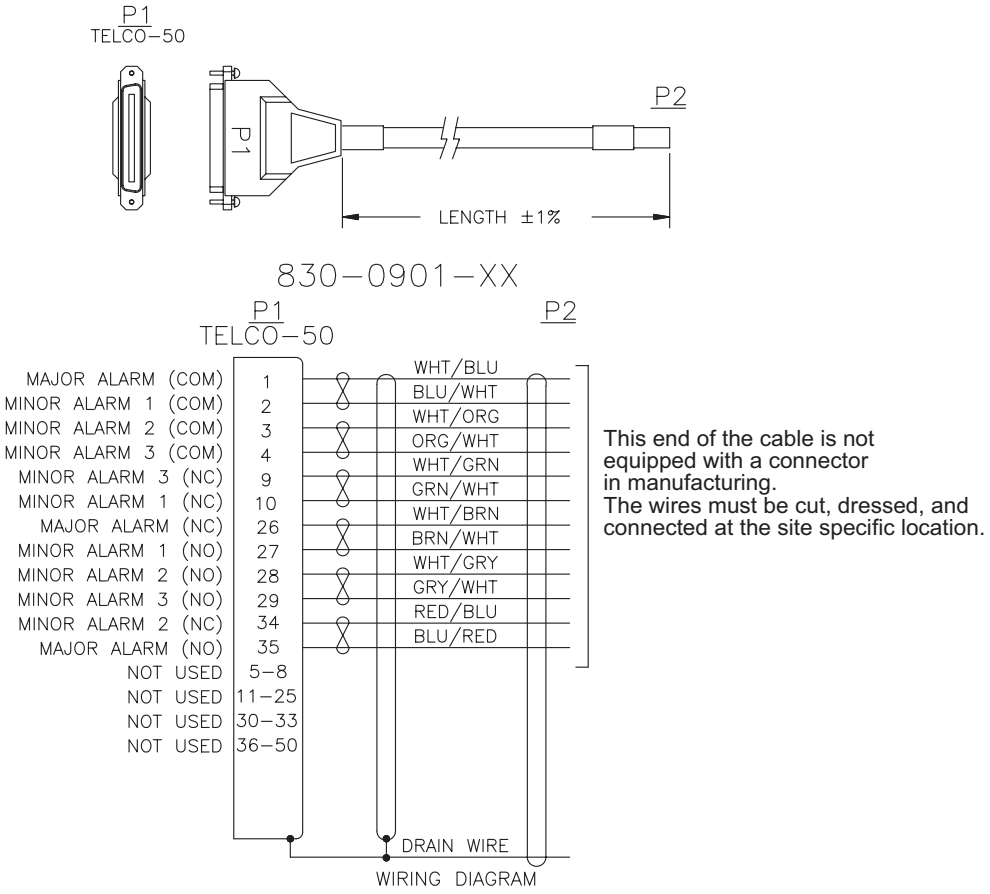
Terminal/Printer Cable

Figure C-66. Terminal/Printer Cable



Tone and Announcement Server Alarm Cable

Figure C-67. TAS Alarm Cable



D

Power Cords to Peripherals

International Power Cords

Table D-1. International Power Cords For Peripheral Equipment

Country	Part Number	Voltage	Frequency	Plug Pattern
USA	Cord provided	120	60	**K**
Argentina	804-1185-R02	220	50	C
Australia	804-1185-R02	240	50	**C**, P
Austria	804-1185-R01	220-230*	50	A, B
Belgium	804-1185-R01	220-230*	50	B, F
Brazil	804-1185-R01	110-220	50	B, K, N
Bulgaria	804-1185-R01	220	60	**A**, B
Canada	Cord provided	120	60	**K**, N
Chile	804-1185-R01	220	50	B, I
China	804-1185-R09	220	50	X
Columbia	Cord provided	110-220	60	N
Cyprus	804-1185-R03	240	50	D
Czech Republic	804-1185-R01	220	50	B, F
Denmark	804-1185-R04	220-230*	50	B, **E**
Egypt	804-1185-R01	220	50	B
Estonia	804-1185-R01	220	50	A, B
Finland	804-1185-R01	220-230*	50	**A**, B
France	804-1185-R07	220-230*	50	B, **F**
Germany	804-1185-R01	220-230*	50	A, B
Greece	804-1185-R01	220-230*	50	A, **B**
Hong Kong	804-1185-R03	200	50	**D**, G
Hungary	804-1185-R01	220	50	A
Iceland	804-1185-R01	220	50	**A**, B
India	804-1185-R06	220-250	50	**G**
Ireland	804-1185-R03	220	50	**D**
Israel	804-1185-R12	230	50	B, **H**
Italy	804-1185-R07	220-230*	50	B, **I**
Ivory Coast	804-1185-R01	220	50	B
Japan	804-1185-R10	100	50 and 60	J, M

Country	Part Number	Voltage	Frequency	Plug Pattern
Latvia	804-1185-R01	220	50	A, B
Liechtenstein	804-1185-R11	220	50	L
Lithuania	804-1185-R01	220	50	A, B
Luxembourg	804-1185-R01	220-230*	50	**A, B**
Malaysia	804-1185-R03	240	50	D
Malta	804-1185-R03	240	50	D
Mexico	Cord provided	127	60	**K**, N
Monaco	804-1185-R01	220	50	A, **B, F**
Netherlands	804-1185-R01	220-230*	50	A, B
New Zealand	804-1185-R02	230	50	**C**
Norway	804-1185-R01	220-230*	50	A, B
Peru	804-1185-R01	110/120	50/60	B
Philippines	Cord provided	115	60	**K**, N
Poland	804-1185-R01	220	50	A, B, F
Portugal	804-1185-R01	220-230*	50	**A**, B, G
Romania	804-1185-R01	220	50	A, B
Russia	804-1185-R01	220	50	A
Saudi Arabia	Cord provided	127/220	50/60	A, F, **K**
Singapore	804-1185-R03	230	50	D, G
Slovakia	804-1185-R01	220	50	B, F
South Africa	804-1185-R06	220-250	50	G
South Korea	804-1185-R01	220	60	A, K, N
Spain	804-1185-R01	220-230*	50	B, F
Sweden	804-1185-R01	220-230*	50	A, B
Switzerland	804-1185-R11	220-230*	50	L
Taiwan	Cord provided	110	60	**K**, N
Turkey	804-1185-R01	220	50	A, B
United Kingdom	804-1185-R03	240	50	**D**, G
United Arab	804-1185-R03	220-230*	50	**D**, G

A **BOLD** letter designation (example **A**, B) indicates most common usage.
* indicates a change in voltage

E

Part Numbers

Overview

This chapter lists the part numbers of Tekelec equipment, components, cables, and miscellaneous parts described in this manual.

Each table provides the item name, part number, and related notes. Items are listed by their name (as described in this manual) in alphabetical order. Shaded part numbers indicate that the item is obsolete or no longer shipped. Unless the item is indicated as obsolete, the item is still supported in the field.

NOTE: Tekelec reserves the right to ship compatible part numbers or revisions for new installations and replacements. Always check the latest Hardware Baseline for your release. The latest hardware baseline can be found in the Feature Notice of your release.

RoHS 5/6 - As of July 1, 2006, all products that comprise new installations shipped to European Union member countries will comply with the EU Directive 2002/95/EC "RoHS" (Restriction of Hazardous Substances). The exemption for lead-based solder described in the Annex will be exercised. RoHS 5/6 compliant components will have unique part numbers and are identified as the International part number in this manual.

NOTE: International part numbers will eventually replace North American part numbers to make all part numbers RoHS compliant. The items of either part number are of equivalent function or quality otherwise.

WEEE - All products shipped to European Union member countries comply with the EU Directive 2002/96/EC, Waste Electronic and Electrical Equipment. All components that are WEEE compliant will be appropriately marked. For more information regarding Tekelec's WEEE program, contact your sales representative.

Cables, Adapters

Table E-1. EAGLE 5 ISS Cables, Connectors, and Power Cords

Name	Part Numbers		Note
	North America	International	
Adapter, 15-Pin to 26-Pin	830-0425-01	---	
Adapter 25-Pin to 15-Pin	000-0088-01	---	POWER SUPPLY V.35 PATCH PANEL -48 VDC
Adapter cables	830-0846-01	830-1183-01	backplanes -03 and -04 for master timing and HS clock cable 830-0873-xx
Alarm cable	830-0543-01	---	Holdover Clock
Alarm cable	830-0638-xx	830-1163-xx	see Filtered Rack Alarm cable
Alarm NETRA Server Cable	830-0900-xx	---	
ATM Cable	830-0987-xx	---	SCSI/DB44
ATM E1/T1 cable	830-0959-xx	---	EMS; DB-44 to RJ45 4 Port
B Clock Cable	830-0404-xx	---	replaced by 830-0398-xx (NA) or 830-1150-xx (I) both are for HMUX
B Clock Cable	830-0398-xx	830-1150-xx	
A and B Frame Clock cable	---	---	see B Clock Cable
BITS clock cable	830-0226-xx	830-1146-xx	Backplanes -03 and -04
BITS clock cable	830-0873-xx	---	Backplane -06
BNC pen end cable	830-0625-xx	830-1161-xx	
BNC to BNC cable assembly	830-0624-xx	830-1160-xx	
Breaker-to-Terminal Strip Power Cable	830-0866-xx	830-1236-xx	
CD-ROM Cable	830-0421-xx	---	
Frame Ground cable	830-0715-xx	830-1171-xx	ESP
Clock Connection cable	830-0657-xx	830-1164-xx	Fan, alarm, control EOAP to Control shelf
Composite clock cable	---	---	See BITS clock cable

Table E-1. EAGLE 5 ISS Cables, Connectors, and Power Cords (Continued)

Name	Part Numbers		Note
	North America	International	
Converter	804-0176-01	---	
Crossover (CAT-5) Cable	830-0723-xx	830-1173-xx	
Crossover Patch Panel Cable	830-0789-xx	830-1178-xx	DCM
DB-26 to RJ-45	830-1102-02	830-1102-02	for new installations, with shielded Cat 5E cable; E5-ENET
DB-26 to DB-26	830-1103-02	830-1103-02	for current installations that use DCM cable, 830-0978-xx. Does not support Gigabit Ethernet; E5-ENET
DCM, 100-BASE TX Interface to unterminated -xx	830-0711-xx	---	
DCM_100 BASE TX Interface_DB26 to Non-shielded RJ45	830-0978-xx	---	
DCM 100BASE TX Interface_DB26 to RJ45 Plus to Minus	830-0788-xx	830-1177-xx	
Drive Power Cable	830-0224-xx	---	
DS1 Cable	830-0849-xx	830-1184-xx	
E1 cable	830-0622-xx	830-1233-xx	
E1 patch cable	830-0605-02	830-1116-02	
E1-T1 MIM 22 AWG	830-0932-01	830-1106-xx	
E1/T1 MIM LIM Cable	830-0948-01	830-1197-xx	4 Port 24 AWG
E1/T1 MIM LIM to MPL Adapter	830-0949-01	830-1197-01	
Ethernet cable	830-0788-xx	830-1177-xx	DCM, DSM, EDCM-A, and EDCM
External alarm cable	830-0435-xx	830-1151-xx	
Fan cable	830-0690-01	---	AC power
Fan power/alarm cable	830-0609-01	830-1157-01	incl. with fan assembly
Fifty Position Cable Hard Drive I/O	830-0656-01	---	
Filter Rack Alarm Cable	830-0638-xx	830-1163-xx	
Force Transition Card	850-0496-01	---	
Frame Ground cable	830-0715-xx	830-1171-xx	ESP

Table E-1. EAGLE 5 ISS Cables, Connectors, and Power Cords (Continued)

Name	Part Numbers		Note
	North America	International	
Ground Breaker Panel-to-Frame cable	830-0830-01	830-1181-01	ESP
Ground Hub-to-Frame cable	830-0822-xx	---	ESP
Hazard Ground Cable	830-0257-xx	---	
High density connector	000-0088-01	---	Power Supply V.35 Patch PaneL -48 VDC
High Speed (BITS) Clock Cable	830-0873-xx	830-1189-xx	
High Speed Master Timing Adapter	830-0846-01	830-1183-01	
HMUX Adapter Cable	830-0857-01	830-1185-01	
1/0 Green Ground Cable	690-0108-07	690-0108-R07	
Interface Cable	830-0366-xx	830-1149-xx	
Local Maintenance Center Cable	830-0231-xx	830-1144-xx	
Loop Back Cable Adapter	830-0763-01	830-1176-xx	
MMI Port Cable	830-0708-xx	830-1169-xx	
Modem/Terminal Cable	830-0709-xx	830-1170-xx	
Multi-port LIM Diagnostic Cable	803-0029-0	---	
Multi-port LIM DS0 cable	830-0772-xx	---	26 AWG, inacctive
Multi-port LIM DS0 cable	830-0892-xx	830-1194-xx	24 AWG, inacctive
Multi-Port Power Cable	830-0814-xx	830-1282-xx	
Network Cable	830-0710-xx	830-1257-xx	
Null Modem Cable	830-0759-xx	---	
Null-Modem for Terminal Cable	830-0859-xx	830-1186-xx	
Output panel frame ground cable	690-0009	---	
Pin Protector Assembly	830-0880-01	---	use with clock cable replacement (66 min for 6 shelves)
Power Cable	830-0315-xx	830-1147-xx	
Power Cable, –48V	830-0651-xx	---	
Power Cable, DC, BP to Hub	830-0868-xx	830-1235-xx	
Power Cable, DC, Netra 1400	830-0814-xx	830-1282-xx	
Power Cable, MPS	830-0965-xx		

Table E-1. EAGLE 5 ISS Cables, Connectors, and Power Cords (Continued)

Name	Part Numbers		Note
	North America	International	
Power Ring	830-0908-xx	---	AXi
Rack Alarm Cable	---	---	see Filtered Rack Alarm cable
RAID Power Cable	830-0872-xx	---	DC
Remote Maintenance Center Cable	830-0233-xx	830-1146-xx	
RJ45/RJ45 Cable (CAT-5) (Yellow)	830-0888-xx	---	
RJ45/RJ45 Cable (CAT-5) (Blue)	830-0889-xx	830-1192-xx	
RJ45 to 9 Pin Adapter	830-0917-01	---	
Row Alarm Cable	830-0232-xx	830-1145-xx	
Router Power Cable	830-0869-xx	830-1188-xx	DC
RS232 Cable	830-0527-xx	830-1152-xx	
ATM Cable	830-0987-xx	---	SCSI/DB44
Serial I/O Transition Card	850-0514-01	---	
Serial Interface Converter Cable	830-0531-01	---	inactive
Serial Interface/Modem Adapter	830-0531-03	830-1153-03	use with 830-0394-xx
Serial Interface/Modem Adapter	830-0531-04	830-1153-04	use with 830-0535-xx
Serial DB44 to DB9 (X4) cable	830-0972-01	830-1231-01	36-inch T1x00 AS
Serial Interface, Terminal, Printer Adapter	830-0531-02	830-1153-02	use with 830-0394-xx
Straight Through Cable (CAT-5)	830-0724-xx	---	RJ-45 CAT-5E
Straight Through Cable (Patch Panel)	---	---	see DCM 100BASE TX Interface_DB26 to RJ45 Plus to Minus
Switch-to-Frame Ground Cable	830-0884-01	---	
Terminal/Converter Cable	830-0528-01	---	
Terminal/Printer Cable	830-0535-xx	830-1154-xx	
Tone and Announcement Server Alarm Cable	830-0901-xx	---	
T1 LIM-to-MPL Cable Adapter	830-0895-01	---	
T1 MIM cable	830-0894-xx	---	
Terminal cable adapter	---	---	see Terminal/Printer cable

Components

Table E-2. EAGLE 5 ISS Components

Acronym	Name	Part Numbers		Note
		North America	International	
ACM	Application Communication Module	870-1008-xx	---	
---	Air Management Card	870-1824-01	870-1824-02	single slot, eeded for empty slots when using Fan Tray 890-0001-02
ASM	Application Service Module	870-1011-xx	---	Obsolete as of EAGLE 5 ISS 31.6
---	Breaker Panel Alarm Card	804-1489-01	804-1489-R01	
CI	Clock Interface Card (Holdover Clock)	804-0165-01	---	
DCM	Database Communications Module	870-1945-038	---	K6-lll, 200 TPS STC card
DCMX	Expandable Database Communications Module	870-1984-01	---	
DSM	Database Service Module	870-1984-07 870-1984-09	870-1984-13 870-1984-15	4GB 1GB
DSM	Database Service Module	870-2371-08	870-2371-13	1GB
E1/T1 MIM	E1-T1 Multichannel Interface Module 02	870-2198-01	870-2198-02	European equivalent of the North American T1
E5-E1T1	E5-E1T1 Interface Module	870-1873-02	870-1873-03	
E5-ENET	E5-ENET Interface Module	870-2212-02	870-2212-03	
EDCM	Enhanced Database Communications Module	870-2197-01	---	double-slot Pre-IP7 SG 4.0
EDCM	Enhanced Database Communications Module	870-2372-08 870-2372-09	870-2372-13 870-2372-14	single-slot
EDCM-A	Enhanced Database Communications Module A	870-2508-01	870-2508-02	single-slot

Table E-2. EAGLE 5 ISS Components (Continued)

Acronym	Name	Part Numbers		Note
		North America	International	
EILA	Enhanced Integrated Link Interface Module Applique	870-2049-xx	---	DS0A, LIM, OCU, V.35
EOAP	Embedded Operations Support System Applications Processor	890-1050-01 890-1050-03	---	singke dual
GPSM-II	General Purpose Service Module	870-2360-06	870-2360-07	Replaces MCAP as of 30.0
HC MIM	High Capacity Multi-channel Interface Module	870-2671-01	870-2574-02	Replaces IPMX
HIPR	High-Speed IMT Packet Router Module	870-2574-01	870-2574-02	Replaces IPMX
HMUX	High-Speed Multiplexer	870-1965-01	870-1965-03	Replaces IPMX
IPMX	Interprocessor Message Transport Power and Multiplexer	870-1171-01	---	replaced by HMUX
ILE1	Integrated Link Interface Module E1	870-2423-01	---	predessor of E1T1 MIM
ILA	Integrated Link Interface Module Applique	870-1484-xx	---	Use EILA
LIM	Link Interface Module	870-1014-xx	---	
LIM-AINF	Link Interface Module - Application Interface	870-1488-xx	---	Replaced by ILA and EILA
LIM-ATM	Link Interface Module - Asynchronous Transfer Module	870-1293-10	870-1293-13	
LIM-DS0A	Link Interface Module	870-1009-xx 870-1014-xx	---	Replaced by ILA and EILA
LIM- E1	Link Interface Module - E1	870-1379-01	870-1379-02	European equivalent of the North American T1
LIM-OCU	Link Interface Module - Office Channel Units	870-1010-xx 870-1486-xx	---	Replaced by ILA and EILA
LIM-V.35	Link Interface Module - Trunk Interface	870-1012-xx 870-1487-xx	---	Replaced by ILA and EILA

Table E-2. EAGLE 5 ISS Components (Continued)

Acronym	Name	Part Numbers		Note
		North America	International	
MCA	Matrix Controller Automatic (Holdover Clock)	000-0028-xx	---	
MCAP	Maintenance Administration Subsystem (MAS) Communications Applications Processor	870-1013-xx 870-1307-xx	---	Replaced by GPSM-II as of 30.0
MDAL	Maintenance Disk and Alarm Card	870-0773-08	870-0773-09	
MIS	Maintenance Interface System Card (Holdover Clock)	804-0175-xx	---	
MPL	Multi-Port Link Interface Module	870-2061-xx	870-2061-05 870-2061-05	
MPS	Multi-purpose Server	890-1287-xx 890-1374-xx	--- ---	OEM Open System
TDM-GTI	Terminal Disk Module - Global Timing Interface	870-0774-15	870-0774-18	As of 31.6 (NA) 35.0 (I)
TOCA	Timing Output Composite Automatic (Holdover Clock)	804-0166-xx	---	
TSM	Translation Service Module	870-1289-04 870-1291-xx 870-1292-xx	870-1289-06 --- ---	TSM-1G TSM-3G TSM-4G

Frames, Backplanes, FAPs, and Fans

Table E-3. EAGLE 5 ISS Frames, Backplanes, FAPs, and Fans

Acronym	Name	Part Numbers		Note
		North America	International	
BP	Breaker Panel	804-1423-01	804-1423-R01	
BP	Breaker Panel	870-1814-01	---	
	Control Shelf Backplane -02	850-0330-02	---	inactive
	Control Shelf Backplane -03	850-0330-03	---	inactive
	Control Shelf Backplane -04	850-0330-04	---	
	Control Shelf Backplane -05	850-0330-05	---	invalid
	Control Shelf Backplane -06	850-0330-06	850-0330-07	shelves 6 and 7 no longer supported
	E1 Backplane	850-0459-01	850-0459-02	
	Extension Shelf Backplane	850-0356-01	---	inactive
	Extension Shelf Backplane	850-0356-02	---	inactive
	Extension Shelf Backplane	850-0356-03	---	inactive
	Extension Shelf Backplane	850-0356-04	850-0356-06	
	Extension Shelf Backplane	850-0356-05	850-0356-06	not used
EOAP	Embedded Operations Support System Applications Processor	890-1050-01 890-1050-03	---	singke dual
	Fan Assembly	890-0001-02	890-0001-04	All systems with HCMIMs EAGLE 33.0
	Fan Assembly	890-1038-01	890-1038-03 890-1038-04	Standard frame Heavy Duty frame
	Filter, fan tray	551-0032-01	---	
	Fan filter	551-0022-01	---	

Table E-3. EAGLE 5 ISS Frames, Backplanes, FAPs, and Fans (Continued)

Acronym	Name	Part Numbers		Note
		North America	International	
FAP	Fuse and Alarm Panel	860-0434-01	860-0434-03 860-0434-04	Heavy Duty Frame
FAP	Fuse and Alarm Panel	870-1606-02 Rev C	---	Standard Frame 60 Amp feeds
FAP	Fuse and Alarm Panel	870-1606-02 Rev B	---	Standard 40 Amp feeds
FAP	Fuse and Alarm Panel	870-2320-028 Rev J	870-2320-04	Heavy Duty Frame 60 Amp feeds
FAP	Fuse and Alarm Panel	870-2320-01 Rev A - I	870-2320-03	Heavy Duty Frame 40 Amp feeds
FAP	Fuse and Alarm Panel	870-0243-08 Rev C	---	Control/ Extension Frame
FAP	Fuse and Alarm Panel	870-0243-09 Rev C	---	Misc Frame
	FAP Jumper Board	870-1641-01	---	
	FAP Jumper Board	870-1641-02	---	
	Heavy Duty Frame	860-0434-01	---	
	MPS Server	870-2640-01	870-2640-03	T1000 AS

Labels

Table E-4. EAGLE 5 ISS Labels

Name	Part Numbers
Label, Control frame	658-0486-01
Label, Extension frame 00	658-0486-02
Label, Extension frame 01	658-0486-03
Label, Extension frame 02	658-0486-04
Label, Extension frame 03	658-0486-05
Label, Extension frame 04	658-0486-06
Label, Miscellaneous frame 00	658-0374-01
Label, Miscellaneous frame 01	658-0374-02
Label, OAP frame	658-0486-08
Label, Heavy Duty Frame	658-0374-01
Label, CF-00, Shelf 1	658-0490-01
Label, CF-00, Shelf 2	658-0490-02
Label, CF-00, Shelf 3	658-0490-03
Label, EF-00, Shelf 1	658-0490-04
Label, EF-00, Shelf 2	658-0490-05
Label, EF-00, Shelf 3	658-0490-06
Label, EF-01, Shelf 1	658-0490-07
Label, EF-01, Shelf 2	658-0490-08
Label, EF-01, Shelf 3	658-0490-09
Label, EF-02, Shelf 1	658-0490-10
Label, EF-02, Shelf 2	658-0490-11
Label, EF-02, Shelf 3	658-0490-12
Label, EF-03, Shelf 1	658-0490-13
Label, EF-03, Shelf 2	658-0490-14
Label, EF-03, Shelf 3	658-0490-15
Label, EF-04, Shelf 1	658-0490-16
Label, EOAP	658-0499-05
Label, Field Tool Identification	658-0941-01
Label, Field Tool Identification wrap	658-0941-02

Miscellaneous Parts

Table E-5. EAGLE 5 ISS Miscellaneous Part Numbers

Name	Part Numbers		Note
	North America	International	
Drives			
Dual CD-RW\DVD-ROM	870-2746-01	870-2746-02	T1x00 AS
Disk Drive, 120GB	804-1804-01	804-1804-R01	ULTRA ATA/100/133_7 200RPM
Panels			
Alarm side pane	870-0259-02	---	
Alarm indicator lamps	525-0036-02)	---	
Blank side panel	840-0017-02	---	
Gray tinted plastic rear covers	654-0075-01	654-0075-R01	
Brackets, unit separation	652-0609-01	652-0609-02	
Bracket	652-0954-01	652-0954-02	Fan
Kits			
Cable Rack Mounting Kit	804-1571-01	---	Heay duty frame
Cable Rack Mounting Kit	804-0219-01 804-0219-02	804-0219-R01 804-0219-R02	raised floor
External tooth washers	606-0062-01	---	fan bracket
Diode Board A	870-1608-01	---	
Diode Board A	870-1608-03	---	
Diode Board B	870-1608-02	---	
Diode Board B	870-1608-04	---	
Diode Upgrade kit	870-1831-01	---	For 870-1606-02
Diode Upgrade kit	870-1831-02	---	For 870-2320-01
E1 Interface Kit	890-1037-01	890-1037-06	
Mounting hardware kit	840-0092-01	840-0092-03	For heavy duty frame. South America/India only
Brackets, Screws, and other small items			
Brackets, unit separation	652-0609-01	652-0609-02	

Table E-5. EAGLE 5 ISS Miscellaneous Part Numbers (Continued)

Name	Part Numbers		Note
	North America	International	
Bracket	652-0954-01	652-0954-02	Fan
Bracket, fan tray	652-0012-01	652-0012-02	Fan tray
Bracket, side, fan tray	652-0015-01	652-0015-02	Fan tray
Heat-shrink	804-0229-01	---	
Heat-shrink	804-0228-01	---	
Lugs, # 6 two-hole	502-0085-01	502-0085-R01	FAP connector
#6 AWG	690-0131-01	690-0131-R01	
1/0 pink lug	804-0977-01	804-0977-R01	
Pin Protector Assembly	830-0880-01		
Screws (12)	601-0010-01	---	
Screws	600-0193-01	---	12x24 .500 cs zinc fan bracket
Terminal lug	804-0817-02	804-0817-R02	
Terminating resistor	104-0032-01	---	E1 backplane

Power Cords for Peripherals

Table E-6. EAGLE 5 ISS Power Cords for Peripherals

Country	Part Number	Country	Part Number
USA	Cord provided	Latvia	804-1185-R01
Argentina	804-1185-R02	Liechtenstein	804-1185-R11
Australia	804-1185-R02	Lithuania	804-1185-R01
Austria	804-1185-R01	Luxembourg	804-1185-R01
Belgium	804-1185-R01	Malaysia	804-1185-R03
Brazil	804-1185-R01	Malta	804-1185-R03
Bulgaria	804-1185-R01	Mexico	Cord provided
Canada	Cord provided	Monaco	804-1185-R01
Chile	804-1185-R01	Netherlands	804-1185-R01
China	804-1185-R09	New Zealand	804-1185-R02
Columbia	Cord provided	Norway	804-1185-R01
Cyprus	804-1185-R03	Peru	804-1185-R01
Czech Republic	804-1185-R01	Philippines	Cord provided
Denmark	804-1185-R04	Poland	804-1185-R01
Egypt	804-1185-R01	Portugal	804-1185-R01
Estonia	804-1185-R01	Romania	804-1185-R01
Finland	804-1185-R01	Russia	804-1185-R01
France	804-1185-R07	Saudi Arabia	Cord provided
Germany	804-1185-R01	Singapore	804-1185-R03
Greece	804-1185-R01	Slovakia	804-1185-R01
Hong Kong	804-1185-R03	South Africa	804-1185-R06
Hungary	804-1185-R01	South Korea	804-1185-R01
Iceland	804-1185-R01	Spain	804-1185-R01
India	804-1185-R06	Sweden	804-1185-R01
Ireland	804-1185-R03	Switzerland	804-1185-R11
Israel	804-1185-R12	Taiwan	Cord provided
Italy	804-1185-R07	Turkey	804-1185-R01
Ivory Coast	804-1185-R01	United Kingdom	804-1185-R03
Japan	804-1185-R10	United Arab	804-1185-R03

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