









Prisma II High Density Low Noise Dual Reverse Receiver Installation Guide

For Your Safety

Explanation of Warning and Caution Icons

Avoid personal injury and product damage! Do not proceed beyond any symbol until you fully understand the indicated conditions.

The following warning and caution icons alert you to important information about the safe operation of this product:

-  You may find this symbol in the document that accompanies this product. This symbol indicates important operating or maintenance instructions.
-  You may find this symbol affixed to the product. This symbol indicates a live terminal where a dangerous voltage may be present; the tip of the flash points to the terminal device.
-  You may find this symbol affixed to the product. This symbol indicates a protective ground terminal.
-  You may find this symbol affixed to the product. This symbol indicates a chassis terminal (normally used for equipotential bonding).
-  You may find this symbol affixed to the product. This symbol warns of a potentially hot surface.
-  You may find this symbol affixed to the product and in this document. This symbol indicates an infrared laser that transmits intensity-modulated light and emits invisible laser radiation or an LED that transmits intensity-modulated light.

Important

Please read this entire guide. If this guide provides installation or operation instructions, give particular attention to all safety statements included in this guide.

Notices

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Important Safety Instructions

Read and Retain Instructions

Carefully read all safety and operating instructions before operating this equipment, and retain them for future reference.

Follow Instructions and Heed Warnings

Follow all operating and use instructions. Pay attention to all warnings and cautions in the operating instructions, as well as those that are affixed to this equipment.

Terminology

The terms defined below are used in this document. The definitions given are based on those found in safety standards.

Service Personnel - The term *service personnel* applies to trained and qualified individuals who are allowed to install, replace, or service electrical equipment. The service personnel are expected to use their experience and technical skills to avoid possible injury to themselves and others due to hazards that exist in service and restricted access areas.

User and Operator - The terms *user* and *operator* apply to persons other than service personnel.

Ground(ing) and Earth(ing) - The terms *ground(ing)* and *earth(ing)* are synonymous. This document uses *ground(ing)* for clarity, but it can be interpreted as having the same meaning as *earth(ing)*.

Electric Shock Hazard

This equipment meets applicable safety standards.



WARNING:

To reduce risk of electric shock, perform only the instructions that are included in the operating instructions. Refer all servicing to qualified service personnel only.

Electric shock can cause personal injury or even death. Avoid direct contact with dangerous voltages at all times. The protective ground connection, where provided, is essential to safe operation and must be verified before connecting the power supply.

Know the following safety warnings and guidelines:

- Dangerous Voltages

Important Safety Instructions

- Only qualified service personnel are allowed to perform equipment installation or replacement.
- Only qualified service personnel are allowed to remove chassis covers and access any of the components inside the chassis.
- Grounding
 - Do not violate the protective grounding by using an extension cable, power cable, or autotransformer without a protective ground conductor.
 - Take care to maintain the protective grounding of this equipment during service or repair and to re-establish the protective grounding before putting this equipment back into operation.

Installation Site

When selecting the installation site, comply with the following:

- **Protective Ground** - The protective ground lead of the building's electrical installation should comply with national and local requirements.
- **Environmental Condition** - The installation site should be dry, clean, and ventilated. Do not use this equipment where it could be at risk of contact with water. Ensure that this equipment is operated in an environment that meets the requirements as stated in this equipment's technical specifications, which may be found on this equipment's data sheet.

Installation Requirements



WARNING:

Allow only qualified service personnel to install this equipment. The installation must conform to all local codes and regulations.

Equipment Placement



WARNING:

Avoid personal injury and damage to this equipment. An unstable mounting surface may cause this equipment to fall.

To protect against equipment damage or injury to personnel, comply with the following:

- Install this equipment in a restricted access location.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other equipment (including amplifiers) that produce heat.
- Place this equipment close enough to a mains AC outlet to accommodate the length of this equipment's power cord.

- Route all power cords so that people cannot walk on, place objects on, or lean objects against them. This may pinch or damage the power cords. Pay particular attention to power cords at plugs, outlets, and the points where the power cords exit this equipment.
- Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with this equipment.
- Make sure the mounting surface or rack is stable and can support the size and weight of this equipment.
- The mounting surface or rack should be appropriately anchored according to manufacturer's specifications. Ensure this equipment is securely fastened to the mounting surface or rack where necessary to protect against damage due to any disturbance and subsequent fall.

Ventilation

This equipment has openings for ventilation to protect it from overheating. To ensure equipment reliability and safe operation, do not block or cover any of the ventilation openings. Install the equipment in accordance with the manufacturer's instructions.

Rack Mounting Safety Precautions

Mechanical Loading

Make sure that the rack is placed on a stable surface. If the rack has stabilizing devices, install these stabilizing devices before mounting any equipment in the rack.



WARNING:

Avoid personal injury and damage to this equipment. Mounting this equipment in the rack should be such that a hazardous condition is not caused due to uneven mechanical loading.

Reduced Airflow

When mounting this equipment in the rack, do not obstruct the cooling airflow through the rack. Be sure to mount the blanking plates to cover unused rack space. Additional components such as combiners and net strips should be mounted at the back of the rack, so that the free airflow is not restricted.



CAUTION:

Installation of this equipment in a rack should be such that the amount of airflow required for safe operation of this equipment is not compromised.

Elevated Operating Ambient Temperature

Only install this equipment in a humidity- and temperature-controlled environment that meets the requirements given in this equipment's technical specifications.

Important Safety Instructions



CAUTION:

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install this equipment in an environment compatible with the manufacturer's maximum rated ambient temperature.

Handling Precautions

When moving a cart that contains this equipment, check for any of the following possible hazards:



WARNING:



Avoid personal injury and damage to this equipment! Move any equipment and cart combination with care. Quick stops, excessive force, and uneven surfaces may cause this equipment and cart to overturn.

- Use caution when moving this equipment/cart combination to avoid injury from tip-over.
- If the cart does not move easily, this condition may indicate obstructions or cables that may need to be disconnected before moving this equipment to another location.
- Avoid quick stops and starts when moving the cart.
- Check for uneven floor surfaces such as cracks or cables and cords.

Grounding

This section provides instructions for verifying that the equipment is properly grounded.

Safety Plugs (USA Only)

This equipment may be equipped with either a 3-terminal (grounding-type) safety plug or a 2-terminal (polarized) safety plug. The wide blade or the third terminal is provided for safety. Do not defeat the safety purpose of the grounding-type or polarized safety plug.

To properly ground this equipment, follow these safety guidelines:

- **Grounding-Type Plug** - For a 3-terminal plug (one terminal on this plug is a protective grounding pin), insert the plug into a grounded mains, 3-terminal outlet.
Note: This plug fits only one way. If this plug cannot be fully inserted into the outlet, contact an electrician to replace the obsolete 3-terminal outlet.
- **Polarized Plug** - For a 2-terminal plug (a polarized plug with one wide blade and one narrow blade), insert the plug into a polarized mains, 2-terminal outlet in which one socket is wider than the other.

Note: If this plug cannot be fully inserted into the outlet, try reversing the plug. If the plug still fails to fit, contact an electrician to replace the obsolete 2-terminal outlet.

Grounding Terminal

If this equipment is equipped with an external grounding terminal, attach one end of an 18-gauge wire (or larger) to the grounding terminal; then, attach the other end of the wire to a ground, such as a grounded equipment rack.

Safety Plugs (European Union)


- **Class I Mains Powered Equipment** – Provided with a 3-terminal AC inlet and requires connection to a 3-terminal mains supply outlet via a 3-terminal power cord for proper connection to the protective ground.

Note: The equipotential bonding terminal provided on some equipment is not designed to function as a protective ground connection.

- **Class II Mains Powered Equipment** – Provided with a 2-terminal AC inlet that may be connected by a 2-terminal power cord to the mains supply outlet. No connection to the protective ground is required as this class of equipment is provided with double or reinforced and/or supplementary insulation in addition to the basic insulation provided in Class I equipment.

Note: Class II equipment, which is subject to EN 50083-1, is provided with a chassis mounted equipotential bonding terminal. See the section titled **Equipotential Bonding** for connection instructions.

Equipotential Bonding

If this equipment is equipped with an external chassis terminal marked with the IEC 60417-5020 chassis icon () , the installer should refer to CENELEC standard EN 50083-1 or IEC standard IEC 60728-11 for correct equipotential bonding connection instructions.

AC Power

Important: If this equipment is a Class I equipment, it must be grounded.

- If this equipment plugs into an outlet, the outlet must be near this equipment, and must be easily accessible.
- Connect this equipment only to the power sources that are identified on the equipment-rating label normally located close to the power inlet connector(s).
- This equipment may have two power sources. Be sure to disconnect all power sources before working on this equipment.
- If this equipment **does not** have a main power switch, the power cord connector serves as the disconnect device.

Important Safety Instructions

- Always pull on the plug or the connector to disconnect a cable. Never pull on the cable itself.
- Unplug this equipment when unused for long periods of time.

Connection to -48 V DC/-60 V DC Power Sources

If this equipment is DC-powered, refer to the specific installation instructions in this manual or in companion manuals in this series for information on connecting this equipment to nominal -48 V DC/-60 V DC power sources.

Circuit Overload

Know the effects of circuit overloading before connecting this equipment to the power supply.



CAUTION:

Consider the connection of this equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Refer to the information on the equipment-rating label when addressing this concern.

General Servicing Precautions



WARNING:

Avoid electric shock! Opening or removing this equipment's cover may expose you to dangerous voltages.



CAUTION:

These servicing precautions are for the guidance of qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

Be aware of the following general precautions and guidelines:

- **Servicing** - Servicing is required when this equipment has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into this equipment, this equipment has been exposed to rain or moisture, does not operate normally, or has been dropped.
- **Wristwatch and Jewelry** - For personal safety and to avoid damage of this equipment during service and repair, do not wear electrically conducting objects such as a wristwatch or jewelry.
- **Lightning** - Do not work on this equipment, or connect or disconnect cables, during periods of lightning.
- **Labels** - Do not remove any warning labels. Replace damaged or illegible

warning labels with new ones.

- **Covers** - Do not open the cover of this equipment and attempt service unless instructed to do so in the instructions. Refer all servicing to qualified service personnel only.
- **Moisture** - Do not allow moisture to enter this equipment.
- **Cleaning** - Use a damp cloth for cleaning.
- **Safety Checks** - After service, assemble this equipment and perform safety checks to ensure it is safe to use before putting it back into operation.

Electrostatic Discharge

Electrostatic discharge (ESD) results from the static electricity buildup on the human body and other objects. This static discharge can degrade components and cause failures.

Take the following precautions against electrostatic discharge:

- Use an anti-static bench mat and a wrist strap or ankle strap designed to safely ground ESD potentials through a resistive element.
- Keep components in their anti-static packaging until installed.
- Avoid touching electronic components when installing a module.

Fuse Replacement

To replace a fuse, comply with the following:

- Disconnect the power before changing fuses.
- Identify and clear the condition that caused the original fuse failure.
- Always use a fuse of the correct type and rating. The correct type and rating are indicated on this equipment.

Batteries

This product may contain batteries. Special instructions apply regarding the safe use and disposal of batteries:

Safety

- Insert batteries correctly. There may be a risk of explosion if the batteries are incorrectly inserted.
- Do not attempt to recharge 'disposable' or 'non-reusable' batteries.
- Please follow instructions provided for charging 'rechargeable' batteries.

Important Safety Instructions

- Replace batteries with the same or equivalent type recommended by manufacturer.
- Do not expose batteries to temperatures above 100°C (212°F).

Disposal

- The batteries may contain substances that could be harmful to the environment
- Recycle or dispose of batteries in accordance with the battery manufacturer's instructions and local/national disposal and recycling regulations.



廢電池請回收

- The batteries may contain perchlorate, a known hazardous substance, so special handling and disposal of this product might be necessary. For more information about perchlorate and best management practices for perchlorate-containing substance, see www.dtsc.ca.gov/hazardouswaste/perchlorate.

Modifications

This equipment has been designed and tested to comply with applicable safety, laser safety, and EMC regulations, codes, and standards to ensure safe operation in its intended environment. Refer to this equipment's data sheet for details about regulatory compliance approvals.

Do not make modifications to this equipment. Any changes or modifications could void the user's authority to operate this equipment.

Modifications have the potential to degrade the level of protection built into this equipment, putting people and property at risk of injury or damage. Those persons making any modifications expose themselves to the penalties arising from proven non-compliance with regulatory requirements and to civil litigation for compensation in respect of consequential damages or injury.

Accessories

Use only attachments or accessories specified by the manufacturer.

Electromagnetic Compatibility Regulatory Requirements

This equipment meets applicable electromagnetic compatibility (EMC) regulatory requirements. Refer to this equipment's data sheet for details about regulatory compliance approvals. EMC performance is dependent upon the use of correctly shielded cables of good quality for all external connections, except the power source, when installing this equipment.

- Ensure compliance with cable/connector specifications and associated installation instructions where given elsewhere in this manual.

Otherwise, comply with the following good practices:

- Multi-conductor cables should be of single-braided, shielded type and have conductive connector bodies and backshells with cable clamps that are conductively bonded to the backshell and capable of making 360° connection to the cable shielding. Exceptions from this general rule will be clearly stated in the connector description for the excepted connector in question.
- Ethernet cables should be of single-shielded or double-shielded type.
- Coaxial cables should be of the double-braided shielded type.

EMC Compliance Statements

Where this equipment is subject to USA FCC and/or Industry Canada rules, the following statements apply:

FCC Statement for Class A Equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

Industry Canada - Industrie Canadienne Statement

This apparatus complies with Canadian ICES-003.
Cet appareil est conforme à la norme NMB-003 du Canada.

CENELEC/CISPR Statement with Respect to Class A Information Technology Equipment

This is a Class A equipment. In a domestic environment this equipment may cause radio interference in which case the user may be required to take adequate measures.

Safe Operation for Software Controlling Optical Transmission Equipment

If this manual discusses software, the software described is used to monitor and/or control ours and other vendors' electrical and optical equipment designed to transmit video, voice, or data signals. Certain safety precautions must be observed when operating equipment of this nature.

For equipment specific safety requirements, refer to the appropriate section of the equipment documentation.

For safe operation of this software, refer to the following warnings.

**WARNING:**

- **Ensure that all optical connections are complete or terminated before using this equipment to remotely control a laser device. An optical or laser device can pose a hazard to remotely located personnel when operated without their knowledge.**
- **Allow only personnel trained in laser safety to operate this software. Otherwise, injuries to personnel may occur.**
- **Restrict access of this software to authorized personnel only.**
- **Install this software in equipment that is located in a restricted access area.**

Warning Labels

The following labels are located on this product.



1

Module Introduction

Overview

This chapter describes the Prisma II™ High Density Low Noise Dual Reverse Receiver Module.

Purpose

This guide provides information about the receiver. This chapter describes the front and back panels, and presents a setup summary for the receiver.

Who Should Use This Document

This document is intended for authorized service personnel who have experience working with similar equipment. The service personnel should have appropriate background and knowledge to complete the procedures described in this document.

Qualified Personnel

Only appropriately qualified and skilled personnel should attempt to install, operate, maintain, and service this product.



WARNING:

Only appropriately qualified and skilled personnel should attempt to install, operate, maintain, and service this product. Otherwise, personal injury or equipment damage may occur.

Scope

This guide discusses the following topics.

- Description of Receiver
- Installation Procedures
- Maintenance and Troubleshooting
- Customer Support Information
- Module Parameter Descriptions

Document Version

This is the first release of this guide (Rev A).

In This Chapter

- Receiver Description..... 3
- High Density Low Noise Dual Reverse Receiver..... 5
- Host Module..... 7

Receiver Description

The receiver contains two separate optoelectronic receivers. Optical input is through two optical connectors mounted on the front of the module. The RF output is through two connectors on the rear of the module.

In the reverse receiver, each optical input signal is separately detected by a photodiode and converted to an electrical signal before being sent to an RF amplifier. Each amplified RF signal then goes to its respective output connector on the rear of the module.

Each RF output can be attenuated by as much as 26.25 dB, relative to no attenuation, in 0.75 dB increments. The actual RF output levels of the receiver, attenuated by 20 dB, can be monitored at two -20 dB test points on the front panel.

An optical AGC feature can be used to regulate each RF output level. With this feature disabled, each receiver RF output level will change by 2 dB for every 1 dB change in its optical input level. When enabled, optical AGC automatically adjusts RF output attenuation to maintain the RF output level at a set value (within limits) despite changes in optical input level.

When the receiver module is placed in Single operating mode, both receiver channels in the module will continue to operate even if the optical input level falls below the major alarm threshold.

When the receiver module is placed in Independent operating mode, each receiver channel in the module can be independently configured for Master or Slave redundant operation. This eliminates the need for additional interface hardware to configure redundancy relationships, and if multiple chassis are used, requires only that the chassis be connected to the same ICIM domain.

RF output attenuation, optical AGC, redundancy, and other operating parameters of the reverse receiver can be controlled by an ICIM2 or ICIM2-XD, LCI software, TNCS or ROSA software, CLI commands, or the ICIM Web Interface.

Receiver Features

The receiver has the following features.

- Front panel green light emitting diode (LED) to indicate operating status
- Front panel red LED to indicate alarm status
- -20 dB test point
- Optical input connectors
- Optical automatic gain control (AGC)

Chapter 1 Module Introduction

- Independently configurable redundancy mode for each receiver channel
- Plug-and-play capability
- Compatible with Intelligent Communications Interface Module (ICIM2 or ICIM2-XD), Local Craft Interface (LCI) software, Transmission Network Control System (TNCS) and ROSA software, Command Line Interface (CLI) software, and the ICIM Web Interface
- Blind-mate radio frequency (RF) connections

Receiver Optical Input

The optical inputs are standard SC/APC connectors.

Laser Warning

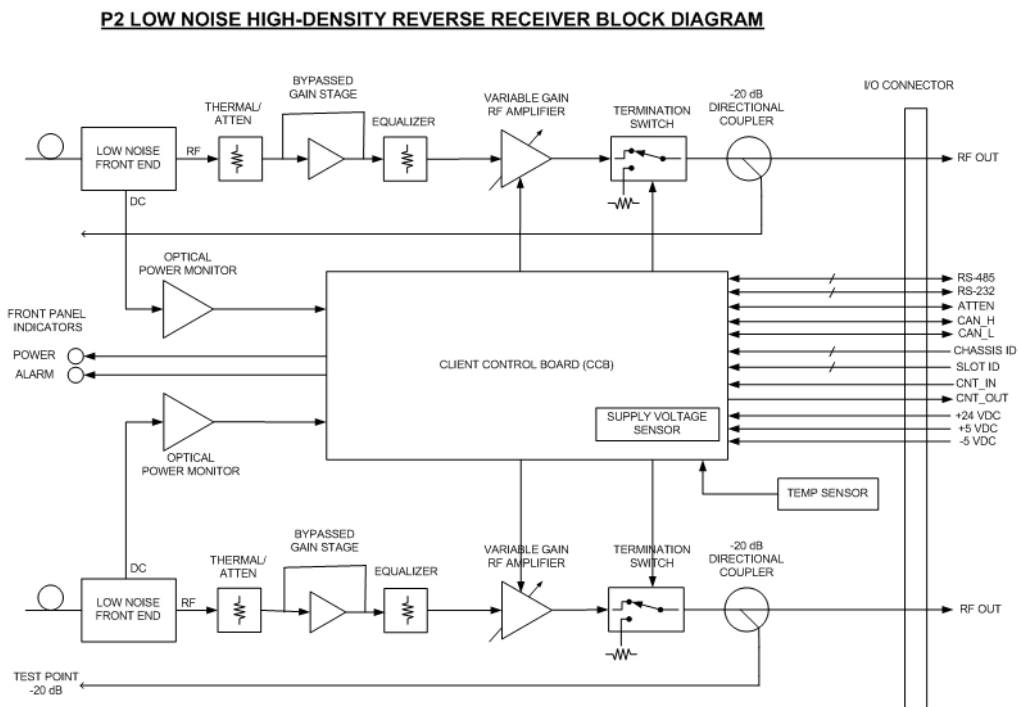


WARNING:

Avoid damage to your eyes! Do not look into any optical connector while the system is active. Even if the unit is off, there may still be hazardous optical levels present.

High Density Low Noise Dual Reverse Receiver Block Diagram

The following block diagram illustrates the Low Noise Dual Reverse Receiver.

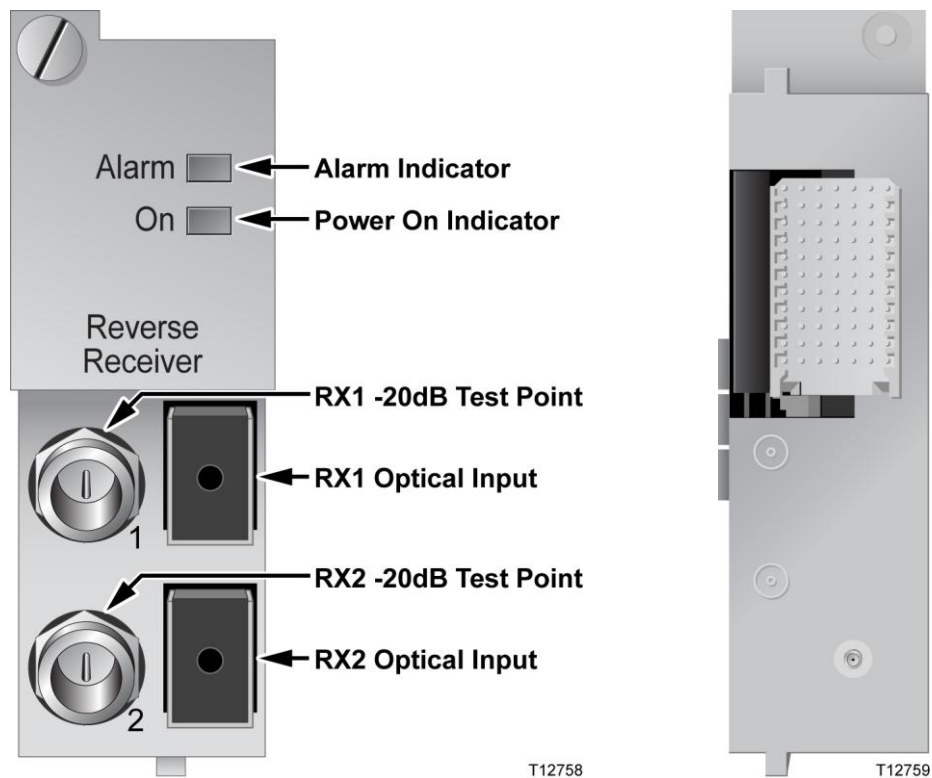


High Density Low Noise Dual Reverse Receiver

High Density Low Noise Dual Reverse Receiver Front Panel Features

Part	Function
Alarm Indicator	Illuminates or blinks when an alarm condition occurs.
Power On Indicator	Illuminates when power is supplied to the module.
Optical Inputs	Connects the input signal from the optical cable.
-20 dB Test Points	Provides a -20 dB sample of the RF output signal.

High Density Low Noise Dual Reverse Receiver Illustration (Front and Back)



Back Panel Connectors

Blind-mate connectors make it easy to install this module. The push-on connector on the back of the module mates with the back plane bus connector inside the chassis. This 55-pin connector and the two RF connectors provide the following facilities.

- RF signal connection
- Electrical power input connection
- Alarm communications connections
- Status-monitoring communications
- Communications and control connections

The ESD guide pin near the bottom of the back panel serves as both a guide pin and an ESD ground connection. The length of the pin ensures that ground is the first electrical connection made as the module is inserted, and the last connection to be broken as the module is removed.

Host Module

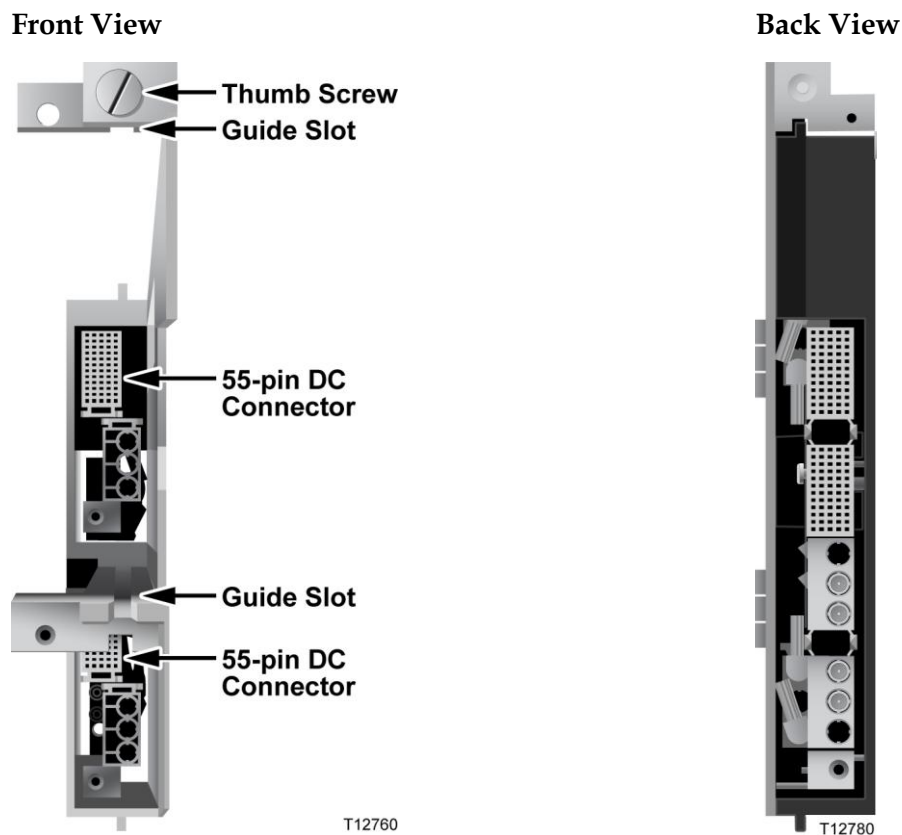
A host module is required to mount the application module in a standard Prisma II Chassis. The host module doubles the density of the Prisma II Chassis by providing two high density module slots for each current Prisma II slot. Its simple design allows for efficient routing of RF and electrical signal between the chassis back plane and each high density module.

Host Module Features

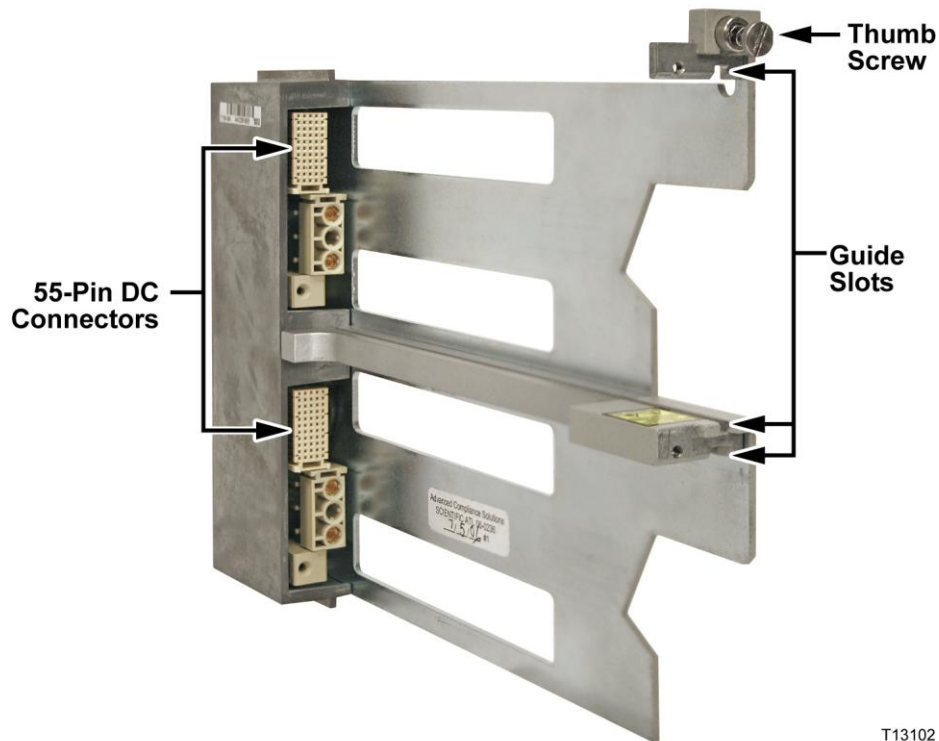
The host module has the following features:

- Provides upper and lower slots for two high density modules
- Incorporates a passive design for high reliability
- Provides for RF and DC routing between the chassis back plane and each high density module

Host Module Illustration



Side View



T13102

Host Module Back Panel Connectors

Blind-mate connectors make it easy to install the host module. The push-on connector on the back of the module mates with the back plane bus connector inside the chassis. This 110-pin connector provides the following facilities:

- RF signal input connection
- Electrical power input connection
- Alarm communications connections
- Status-monitoring connections
- Communications and control connections

2

Module Configuration

This chapter provides instructions for configuring the module for operation. This section explains the hardware configurations and controls that are available to configure the receiver. Refer to the Cisco Local Craft Interface (LCI) Software Installation Guide, part number 4041426 for configuration procedures using the LCI, or the Prisma II Platform Remote User Interface Guide, System Release 2.03, part number 4025477 for details on configuring using command line interface (CLI) commands and the ICIM Web Interface.

In This Chapter

- Configuring Controls 10
- Configuring Redundancy 11
- Configuring AGC..... 17

Configuring Controls

Refer to Appendix A for a list of configurable parameters for the receiver. The following sections provide instructions on how to setup redundancy and operate AGC control settings.

Configuring Redundancy

You can configure the receiver module for redundancy in one of two ways:

- Use the ICIM or LCI to place both receiver channels in either Master or Slave operating mode, and then use a redundancy interface panel to hard-wire the desired Master-Slave relationships between receiver modules.
- Use the ICIM or LCI to place the receiver module in Independent operating mode, configure each receiver channel individually for either Master or Slave operation, and define the desired Master-Slave relationships between receiver channels.

This section explains the hardware configurations required to support each of the methods described above.

Important: The two methods described in this section are not compatible with each other. Do not connect the redundancy interface panel to the receiver module when using Independent mode operation to provide redundancy.

External Alarm Connections

The Prisma II Standard and XD Chassis can be configured for local hard-wired redundancy using the **ALARMS IN** and **ALARMS OUT** connectors located on the connector interface panel. A pair of application modules can be configured in a Master-Slave relationship so that, if the Master fails, the Slave takes over in response to **ALARMS IN** and **ALARMS OUT** signaling.

This module ships from the factory configured for Single mode operation. In Single mode, the module acts as a stand-alone device unaffected by the alarm status of any other application module. When used in pairs in a redundant configuration, one module in the pair is set to Master mode operation and the other is set to Slave mode.

With this configuration, the Master communicates its critical alarm status to the Slave. When the Master module is not in alarm, the Master is enabled and the Slave is disabled. When the Master is in alarm, the Master is disabled and the Slave is enabled.

The ICIM2 front panel, LCI, TNCS or ROSA, CLI, or ICIM Web Interface can be used to select Master, Slave, or Single mode operation of the module as needed.

ALARMS IN and ALARMS OUT Connectors

Every Prisma II standard and Prisma II XD chassis provides connectors for external alarms to and from each module slot. These alarm connectors are located on the chassis connector panel and are labeled **ALARMS IN** and **ALARMS OUT**.

Chapter 2 Module Configuration

For detailed information on **ALARMS IN** and **ALARMS OUT** connectors, see the *Prisma II Chassis Installation and Operation Guide*, part number 713375 or the *Prisma II™ XD Platform System Guide*, part number 4021339.

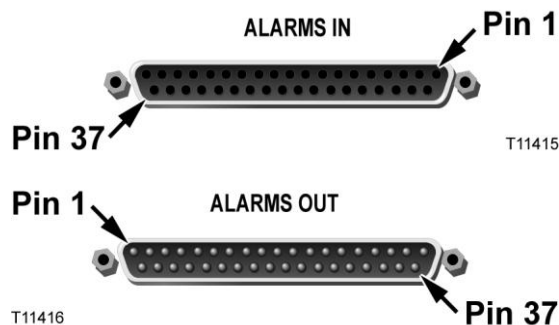
When a critical alarm occurs in a Master module, the Master turns off and the Slave (redundant module) is enabled. To make this happen, the pin representing the Master module slot in the **ALARMS OUT** connector must be externally wired to the pin representing the Slave module slot in the **ALARMS IN** connector. After wiring these contacts, take care to ensure that the Master and Slave modules are not moved to other slots. Otherwise, the **ALARMS IN** and **ALARMS OUT** connectors will need to be rewired to the appropriate pins.

Note:

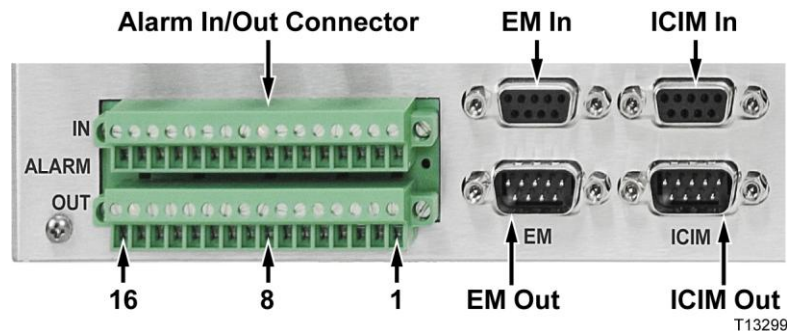
- Any device configured as Single or Master ignores its **ALARMS IN** contacts.
- To verify proper wiring and redundant configuration, simply unplug the Master module and observe that the Slave module turns on.

ALARMS IN and ALARMS OUT Connector Illustration

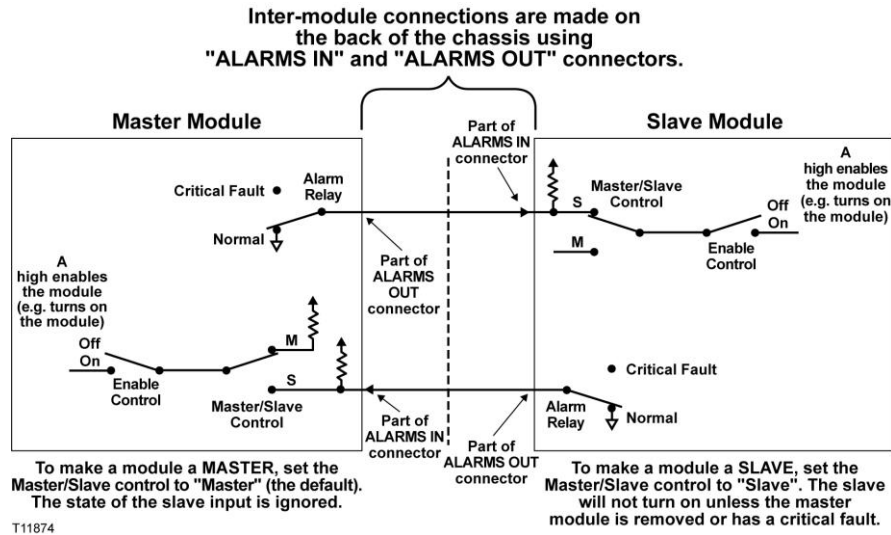
Prisma II Standard Chassis



Prisma II XD Chassis



Master/Slave Illustration



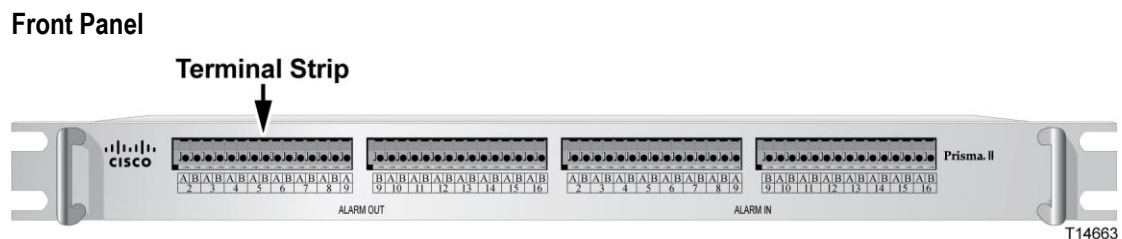
Redundancy Interface Panel

The Prisma II Redundancy Interface Panel is an accessory to the Prisma II platform. It is intended to be used with the master/slave feature and the contact closure alarm feature of the Prisma II platform.

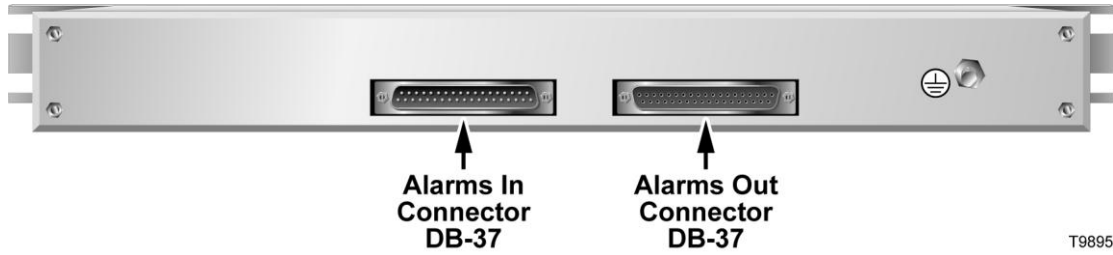
The Prisma II Redundancy Interface Panel serves as an extension to the two DB-37 connectors labeled **ALARMS IN** and **ALARMS OUT** on the connector interface panel of the chassis. The terminals on the redundancy interface panel are extensions of pins on the **ALARMS OUT** and **ALARMS IN** connectors on the chassis.

For additional information, see the *Prisma II Chassis Installation and Operation Guide*, part number 713375.

Prisma II Redundancy Interface Panel Illustrations



Back Panel



T9895

Close-up of Front Panel Terminal Strips



T11921

Independent Mode Redundancy

The use of Independent mode to configure redundancy for the module avoids the need for ALARM IN/ALARM OUT hard-wiring to define the Master-Slave relationships between receiver channels.

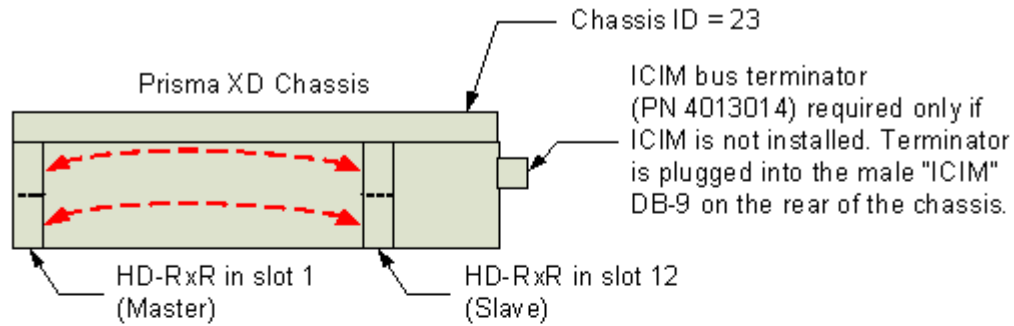
The only additional hardware requirement for Independent mode redundancy is that every chassis in the configuration must be connected to the same ICIM domain using an appropriate interconnect cable (part number 180143 or equivalent) through the chassis ICIM IN and ICIM OUT ports.

Note:

- Every chassis that does not have an ICIM installed but has an open ICIM IN or ICIM OUT connector on the back panel must have an ICIM bus terminator, part number 4013014 or equivalent, installed in the open ICIM connector (one terminator per chassis is sufficient).
- The ICIM itself is needed only to configure modules for redundant operation. It is not required to support actual redundant operation.

Example 1: Single Chassis Configuration

This example shows the control parameter values needed to define the Master-Slave relationship between two receiver modules installed in slots 1 and 12 of chassis 23.

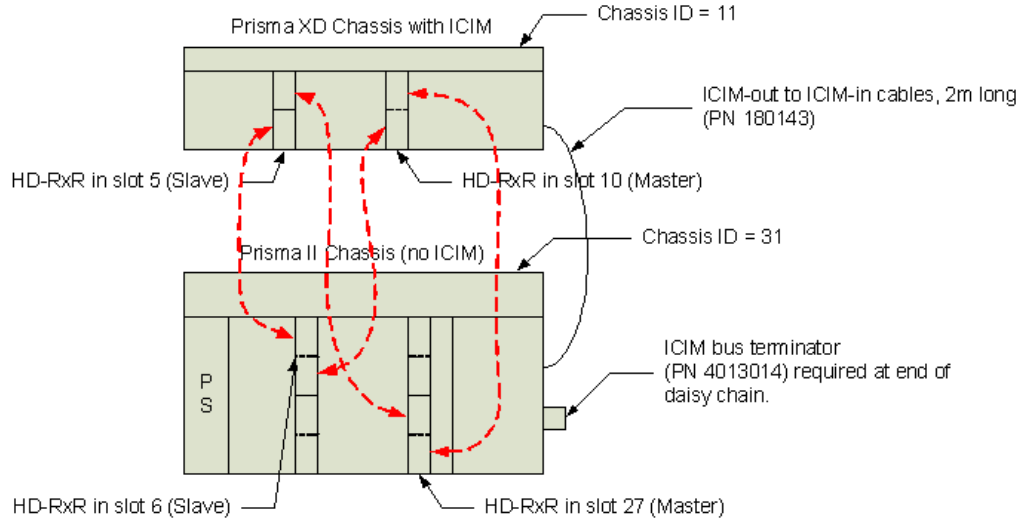


Control	Slot 1 Settings	Slot 12 Settings
Mode	Independent	Independent
Mode1	Master	Slave
Mode2	Master	Slave
Alarm1	Off	Off
Alarm2	Off	Off
Red1Chas	23	23
Red1Slot	12	1
Red1Sub	1	1
Red2Chas	23	23
Red2Slot	12	1
Red2Sub	2	2

Note: Because each receiver channel is individually configurable, pairs of control parameters (Mode1 and Mode2, Alarm1 and Alarm2, etc.) are needed to define the settings for each module. All controls are described in *Module Parameter Descriptions* (on page 47).

Example 2: Multiple Chassis Configuration

This example shows the control parameter values needed to define a more complex Master-Slave relationship among four individual receiver channels in slots 6 and 27 of chassis 31 and slots 5 and 10 of chassis 11.



Control	Slot 5 Settings	Slot 10 Settings	Slot 6 Settings	Slot 27 Settings
Mode	Independent	Independent	Independent	Independent
Mode1	Slave	Slave	Slave	Master
Mode2	Master	Master	Slave	Master
Alarm1	Off	Off	Off	Off
Alarm2	Off	Off	Off	Off
Red1Chas	31	31	11	11
Red1Slot	27	27	5	5
Red1Sub	1	2	2	1
Red2Chas	31	31	11	11
Red2Slot	6	6	10	10
Red2Sub	1	2	2	1

In this example:

- Receiver 1 in slot 27 of chassis 31 is backed up by receiver 1 in slot 5 of chassis 11.
- Receiver 2 in slot 27 of chassis 31 is backed up by receiver 1 in slot 10 of chassis 11.
- Receiver 2 in slot 5 of chassis 11 is backed up by receiver 1 in slot 6 of chassis 31.
- Receiver 2 in slot 10 of chassis 11 is backed up by receiver 2 in slot 6 of chassis 31.

This configuration takes advantage of the ability to configure each receiver channel individually to provide greater flexibility in defining Master-Slave relationships.

Configuring AGC

Each receiver can be set for AGC control. AGC control is implemented by monitoring the optical input level and controlling the RF attenuator.

When AGC is set to Manual mode (i.e., AGC off), the RF output changes by 2 dB for every 1 dB of optical input level change.

When AGC is set to Auto mode (i.e., AGC on), the RF attenuator is controlled to maintain a steady RF output level if the optical input level changes. For example, if the optical input level drops by 1 dB, the internal RF attenuator will change to increase the RF output by 2 dB (thus the RF output stays stable).

AGC Setup Control Behavior

Each receiver has two AGC controls.

- AGC state (Manual/ Auto)
- AGC set control (Set/Lock)

The AGC state control does not matter when setting up the AGC feature.

To set up the AGC feature, change the AGC set control to **Set**.

Once the control is changed to Set, the AGC feature is disabled (as if the AGC state is set to Manual) and the Attenuator value stored in the App Database is loaded into the Attenuator control.

The RF Attenuator is manually adjusted until the RF output is at the desired level with respect to the Optical Input Power. The RF Attenuator can be set from 0 to 26.25 dB.

It is necessary to set the Attenuator to account for the desired AGC range. For example, if +/- 6dB RF AGC range is desired, the attenuator value should be within 6 and 20.25 dB.

When the AGC set control is set to Lock, the Attenuator setting and the current Optical Input Power are stored.

The AGC feature will be enabled and AGC will behave according to the AGC state setting.

While the AGC set control is in the Set position, the module, regardless of the AGC state setting, will act as if the AGC state is set to Manual. While the AGC set control is set to Lock, the module will behave according to the AGC state setting.

AGC Control Behavior

Auto Mode

When the AGC state is in Auto and the AGC set control is in Lock mode, the RF attenuator will adjust to keep the RF output at the desired RF level (determined during AGC setup) as the Optical Power increases or decreases. The RF level calculated from the current Optical Input Power is compared to the RF level calculated from the Optical Input Power stored in the App Database to determine the correct attenuator value to set.

As the attenuator value is set by the AGC feature, the current value will be reflected in the Attenuator control monitor.

If the AGC has not been previously set up and the AGC state is set to Auto, the default values will be used to adjust the level.

Manual Mode

If the AGC state is in Auto mode and is changed to Manual, the RF attenuator control is automatically set using the AGC Attenuator value stored (default value or user set value). The AGC feature is disabled and the RF level will change as the Optical Input Power changes.

If the Attenuator control is changed while the AGC state is in Manual mode, the attenuator will change.

If the AGC state is in Manual mode and set to Auto, the Attenuator control will be set to the Attenuator value stored and the AGC feature will enable and function as previously described.

AGC Alarm Behavior

AGC Set Control

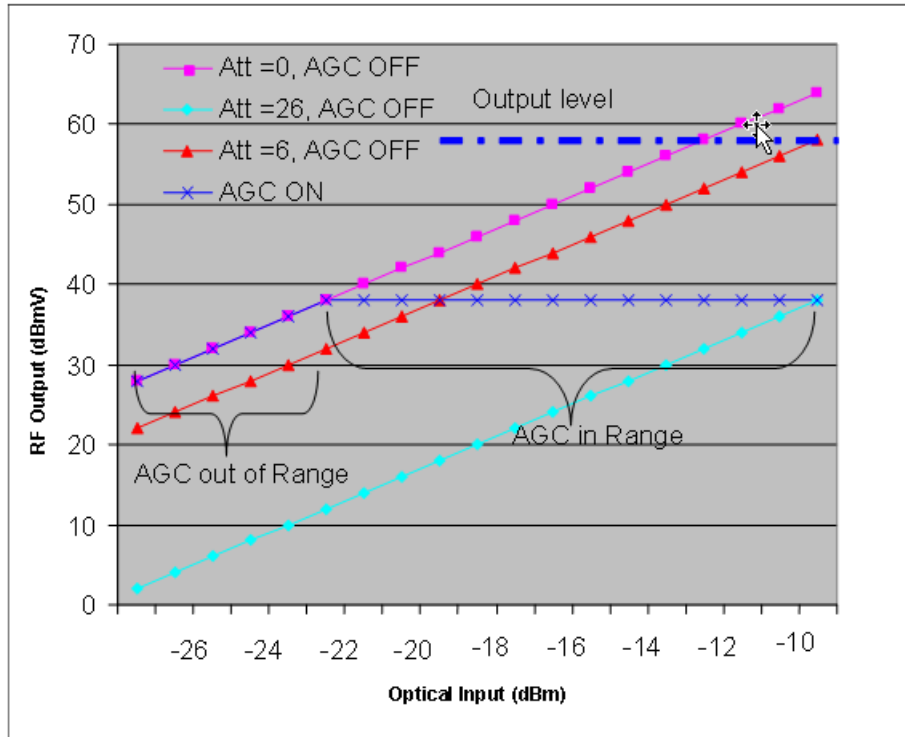
If AGC set control is set to Set, the AGC Ok alarm will show Ok.

If AGC set control is set to Lock, the AGC Ok alarm will function according to the AGC control setting.

AGC State Control

If the AGC state control is set to Manual, the AGC Ok alarm will show **Ok**.

If the AGC state control is set to Auto, the AGC Ok alarm will show Ok until the RF Attenuator is adjusted out of the attenuator range by the AGC feature. This means the AGC feature is trying to set the Attenuator value to less than 0 dB or greater than 26.25 dB. The following illustration shows the attenuator range.



Configuring/Input Power Alarms

Alarm limits can be set to monitor the receiver's optical input. A description of those configurable limits is listed below.

Nominal Value

The nominal input power value can be set between -25 and -10 dBm in steps of 0.5 dB. The user should set this nominal value to coincide with the expected received power. The default value for nominal input power is set to -15 dBm.

Minor Alarm Low Limit

The minor alarm low limit can be set to provide a minor alarm when the input power falls below this limit. A minor alarm can alert the user when a problem may be developing with regard to input power.

The number that is entered in this parameter is relative to the nominal input power set. For example, if the nominal input is set to -15 and the minor alarm low limit is set to -4, a minor alarm will occur when the input reaches -19 dBm. The default value for minor alarm low limit is -4 dB.

Chapter 2 Module Configuration

Minor Alarm High Limit

The minor alarm high limit can be set to provide a minor alarm when the input power rises above this limit. A minor alarm can alert the user when a problem may be developing with regard to input power.

The number that is entered in this parameter is relative to the nominal input power set. For example, if the nominal input is set to -15 and the minor alarm high limit is set to 3.2, a minor alarm will occur when the input reaches -11.8 dBm. The default value for minor alarm high limit is 3.2 dB.

Major Alarm Low Limit

The major alarm low limit can be set to provide a major alarm when the input power falls below this limit. A major alarm low can be an indication that the optical input power has been lost.

The number that is entered in this parameter is relative to the nominal input power set. For example, if the nominal input is set to -15 and the major alarm low limit is set to -20, a major alarm will occur when the input reaches -35 dBm. The default value for major alarm low limit is -20 dB.

Major Alarm High Limit

The major alarm high limit can be set to provide a major alarm when the input power rises above this limit. The number that is entered in this parameter is relative to the nominal input power set. For example, if the nominal input is set to -15 and the major alarm high limit is set to 3.2, a major alarm will occur when the input reaches -11.8 dBm. The default value for major alarm high limit is 3.2 dB.

3

Module Installation

This chapter provides instructions for installing the module and describes the site requirements, equipment, and tools needed for module installation.

In This Chapter

- Preparing for Installation..... 22
- Site Requirements 23
- Connecting the RF Cables to the Chassis 27
- Installing the Module in the Chassis..... 29
- Connecting Optical Cables 33
- Connecting the ICIM to Additional Chassis 37
- Connecting a Chassis to the TNCS Server..... 39

Preparing for Installation

Before you begin, make sure that the module is in good condition and that you have the tools and equipment listed here.

Unpacking and Inspecting the Module

As you unpack the module, inspect it for shipping damage. Inspect the rear connectors for bent pins.

If you find any damage, contact Customer Service. Refer to Customer Support Information for information on contacting Customer Service.

Equipment and Tools Needed

Before you begin, make sure that the module is in good condition. You need the following equipment and tools to install these modules.

You need . . .	To . . .
a Prisma II or Prisma II XD Chassis with power supply	provide housing, power, and input/output connections to the module.
3/8-in. flat-blade screwdriver	secure the module in the chassis.
optical cables with connectors	carry optical input and output signals.
optical cleaning materials	clean optical connectors.
optical power meter	verify optical input and output levels.
spectrum analyzer (for transmitter)	verify proper RF input.

Site Requirements

Before you begin, make certain that your installation site meets the requirements discussed in this section.

Access Requirements

**WARNING:**

Use this product in locations that restrict access to all persons who are not authorized. Otherwise, personal injury or equipment damage may occur.

Ensure that only authorized personnel have access to this equipment. Otherwise, personal injury or equipment damage may occur.

Equipment Rack

To install this module, your site must be equipped with an Electronics Industry Association (EIA) equipment rack that properly houses the chassis with proper spacing for air circulation. For instructions on installing the chassis in the rack, refer to the guide that was shipped with the chassis.

Operating Environment

**CAUTION:**

Avoid damage to this product! Operating this product outside the specified operating temperature limits voids the warranty.

Follow these recommendations to maintain an acceptable operating temperature of the equipment.

- Temperature at the air inlet must be between -40°C and 65°C (-40°F and 149°F).
- Keep cooling vents clear and free of obstructions.
- Provide ventilation as needed using air-deflecting baffles, forced-air ventilation, or air outlets above enclosures, either alone or in combination.

Power Requirements

All Prisma II application modules receive their electrical power from the chassis. The modules may be installed with the chassis under power.

Space Requirements

This is a single-width, half-height module. Actual space requirements depend on whether the module is installed in a Prisma II standard or a Prisma II XD chassis.

Prisma II Standard Chassis Installation

When installed in a Prisma II standard chassis, the module is placed in a host module and then inserted into the chassis in slots 5 through 16.

- If the module occupies the upper host module position, its slot number is the same (5 through 16) as that of the host module.
- If the module occupies the lower host module position, its slot number is 16 plus the host module slot number, or 21 through 32.

Slots 1 through 4 are usually reserved for the power supplies. If an ICIM is installed, it occupies slots 15 and 16. If an ICIM is not installed, any other module (or host module) can occupy these slots.

Slots 2 and 4 are reserved for an internal power supply, if installed. If an internal power supply is not installed here, any other module (or host module) can occupy these slots.

Prisma II XD Chassis Installation

When installed in a Prisma II XD Chassis, the module is inserted directly into an available application module slot on the chassis front panel. The application module slots are numbered 1 through 16.

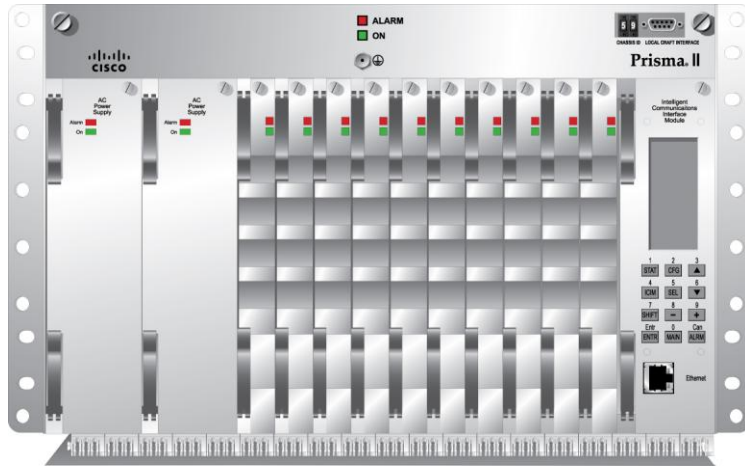
The chassis power supplies and ICIM are installed in dedicated slots on the chassis back panel, so slots 1 through 16 are available for application modules no matter how the chassis is configured.

Prisma II Standard Chassis Style

The Prisma II standard chassis may be configured as front-access or rear-access depending on the system you have purchased. Power, RF input or output, and other connectors may be located on either the front or rear of the chassis. Connections to the chassis serve the same function and are made in the same manner regardless of the location of the connectors or chassis configuration.

Rear-Access Chassis - Front Panel Illustration

The following illustration shows the front of the rear-access Prisma II standard chassis with two power supplies, 10 full-height modules, and the ICIM installed.

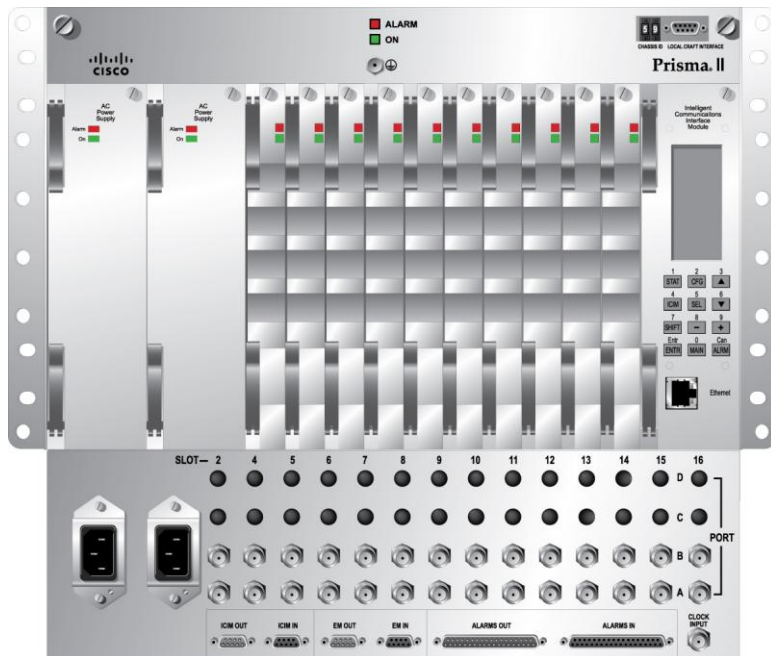


T14534

Front-Access Chassis - Front Panel Illustration

The following illustration shows the front of the front-access Prisma II standard chassis with two power supplies, 10 full-height modules, and the ICIM installed.

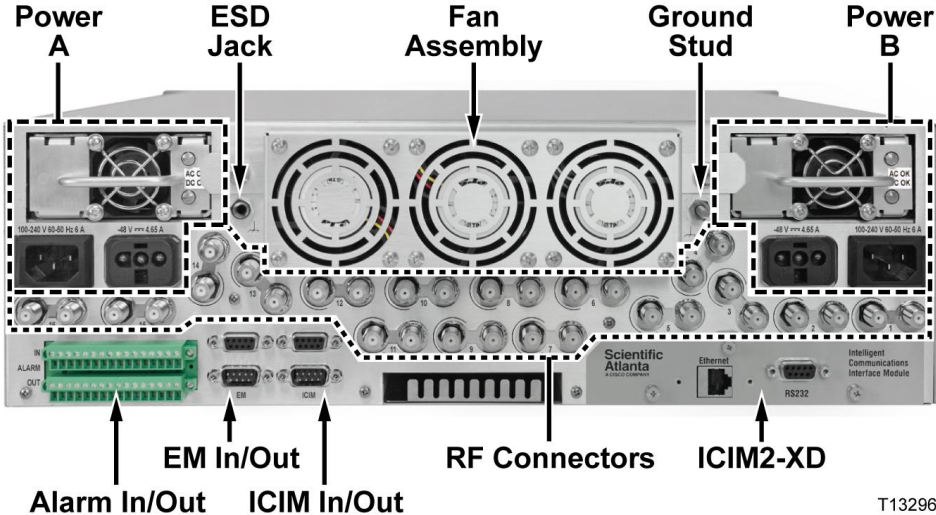
The power inlets, RF input/output, and RF ports are located on the recessed bottom of the connector interface panel on the front-access version of the chassis.



T14535

Prisma II XD Chassis Style

The Prisma II XD chassis back panel serves as both a connector panel and a receptacle for AC power supply modules and the ICIM2-XD, when installed.



The RF connectors are arranged in numbered pairs to identify the corresponding application module slot. One connector in each pair has a black retaining nut and a black circle in the panel artwork to mark it as belonging to the upper connector on the chassis midplane.

Connecting the RF Cables to the Chassis

To Connect RF Cables for Each Module

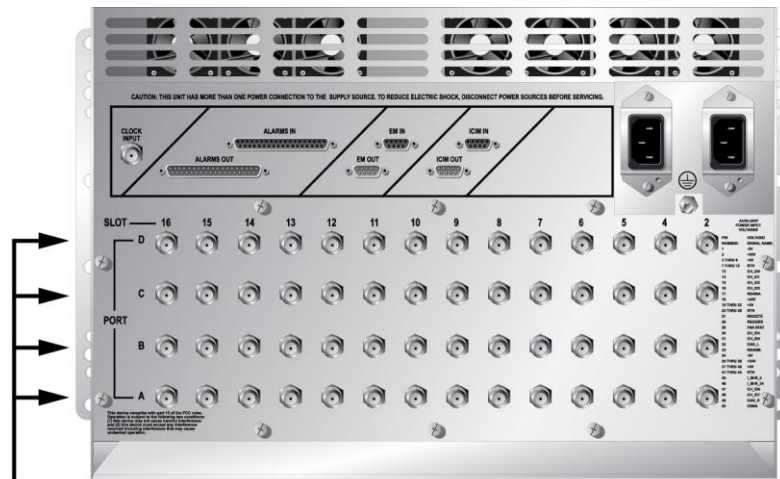
Complete the appropriate procedure below to connect RF cables for the module.

Note: This procedure assumes that the chassis is mounted in a rack.

Standard Prisma II Chassis

Note: This procedure assumes a host module with receivers in both lower and upper half-slot positions. If only one receiver is installed, it is not necessary to connect RF cables for the unused position.

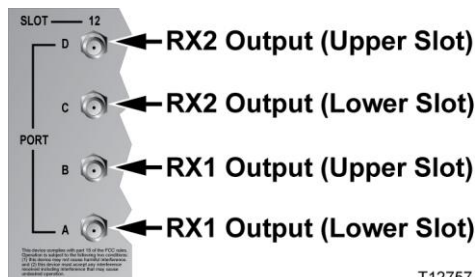
- 1 Locate the RF ports on the chassis connector panel. The connector panel is on the front of a front-access chassis, and on the rear of a rear-access chassis. The figure below shows the connector panel for a rear-access chassis.



RF Ports

T12770

- 2 Connect RF cables to the Port A and Port C connectors for the chassis slot in which the host module will be installed. These are the RF output connections for the module in the lower half-slot position. Hand-tighten the connectors.



T12757

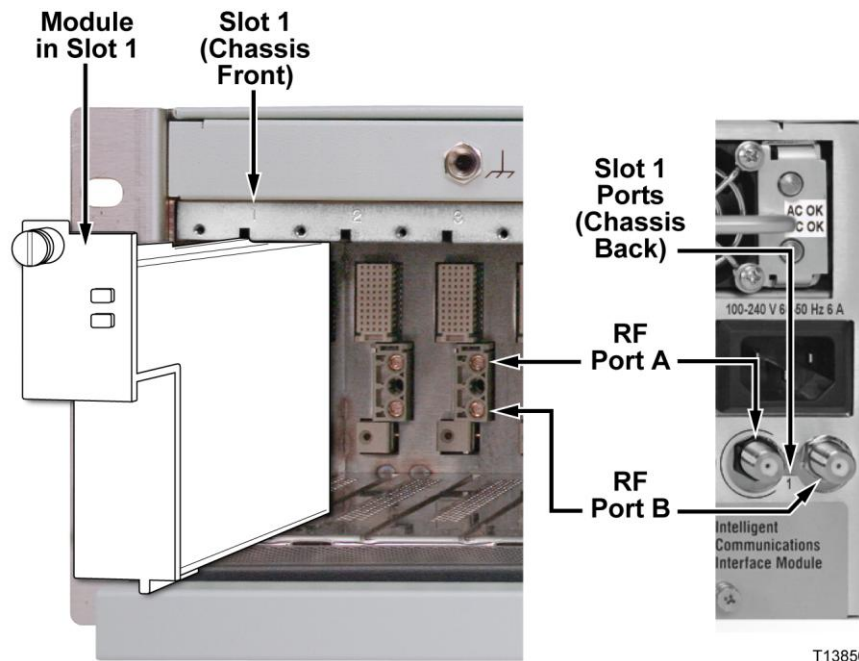
- 3 Route the RF cables from Ports A and C (for the lower half-slot module) to the appropriate RF destinations.

Chapter 3 Module Installation

- 4 Connect RF cables to the Port B and Port D connectors for the chassis slot in which the module will be installed. These are the RF output connections for the module in the upper half-slot position. Hand-tighten the connectors.
- 5 Route the RF cables from Ports B and D (for the upper half-slot module) to the appropriate RF destinations.
- 6 If F connectors are installed, use a 7/16-in. open-end wrench to secure all cables to the connectors at the chassis.

Prisma II XD Chassis

- 1 Attach a 75-ohm RF cable to the appropriate RF destination.
- 2 Locate the RF ports at the back of the chassis.



- 3 Attach the other end of the RF cable to Port A connector of the corresponding slot where the module is to be installed. This is the RF output connection.
- 4 If F connectors are installed, use a 7/16-in. open-end wrench to secure all cables to the connectors at the chassis.

Installing the Module in the Chassis

To Install the Receiver Modules in the Host Module

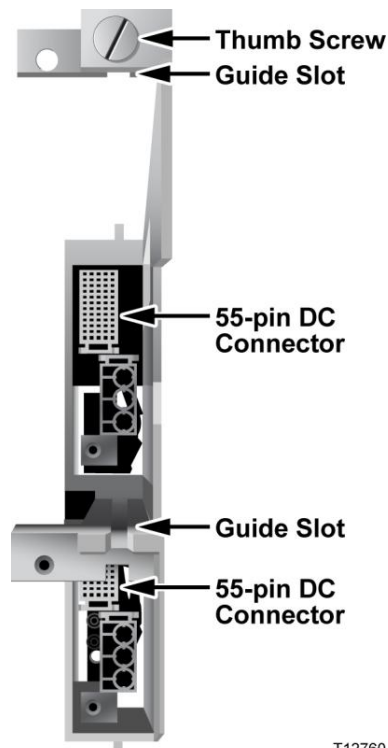
Notes:

- All Prisma II high-density application modules must be installed in a host module before they can be mounted in a standard Prisma II Chassis.
- Prisma II host modules prior to Rev C (date codes through A2006) do not support the Controller Area Network (CAN) bus.
- To support Independent Mode redundancy, the ICIM2 must be Rev B or later.

Complete the following steps to install the application modules in the host module.

- 1 Align the ridges on the top and bottom of the module with the guide slots located on the host module and the chassis. Be careful to keep the module level as you slide it into the host to avoid bending the pins on the host back plane.
- 2 Gently slide the module into the host module until you feel the power and communications connections on the back of the module join connectors on the host module. Use the thumbscrew on the top of the module to lock it in place. **Do not over-tighten.** The maximum torque value is 5 in-lb.

Host Module Empty



T12760

Host Module Populated

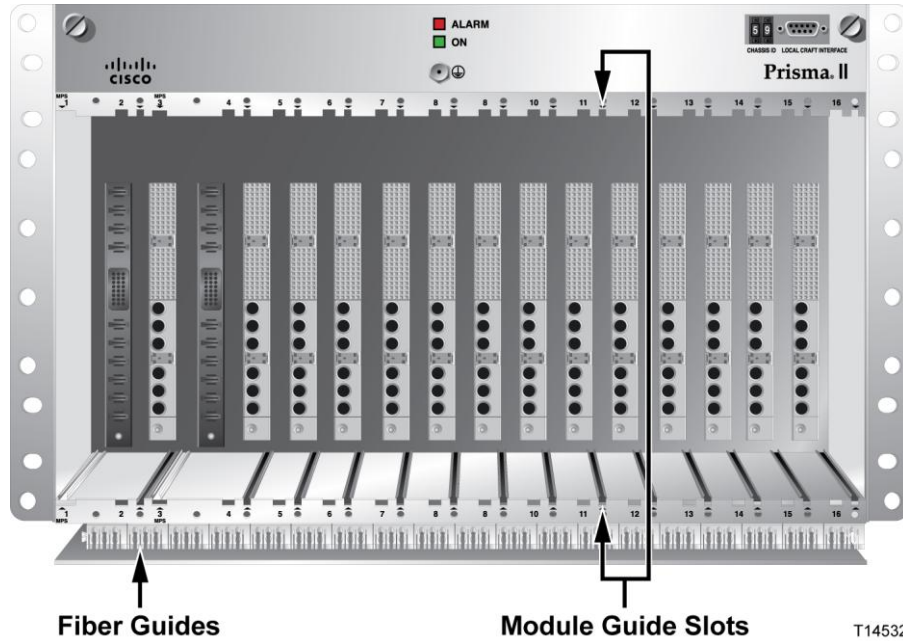


T12761

To Install the Module in the Chassis

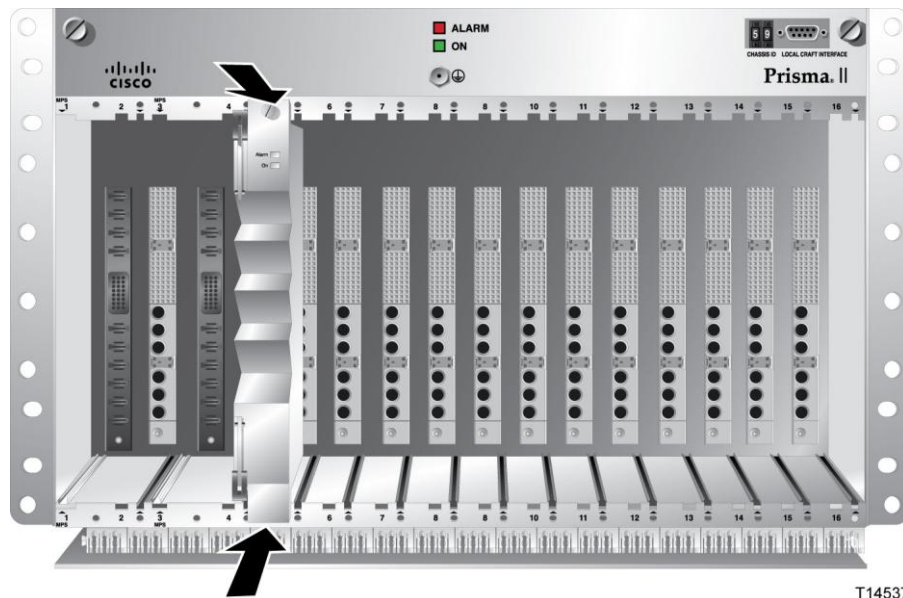
Note: This procedure assumes that the chassis is mounted in a rack.

- 1 Locate the fiber guides at the bottom of the chassis and the module guide slots inside the chassis as shown in the following illustration.



- 2 Align the ridges on the top and bottom of the host module with the guide slots on the chassis. Be careful to keep the host module level as you slide it into the chassis to avoid bending the pins on the back plane bus.
- 3 Gently slide the host module into the chassis until you feel the connections on the back of the host module join connectors on the back plane bus.

Note: Do not force or bang the host module into the chassis. If properly aligned, the host module should slide in with minimal force.



- 4 Hand-tighten the screw at the top of the host module to ensure that the first few threads engage smoothly. Use a 3/8-in. flat-blade screwdriver to secure the mounting screw. **Do not over-tighten.** The maximum torque value is 5 in-lb.
- 5 Fill any unused chassis slots with module blanks to help ensure proper cooling air flow. Blanks for high density modules are available to fill unused host module slots.

To Install the Module in a Prisma II XD Chassis

Note: This procedure assumes that the chassis is installed in a rack.



WARNING:

Avoid damage to your eyes! Do not look into any optical connector while the system is active. Even if the unit is off, there may still be hazardous optical levels present.

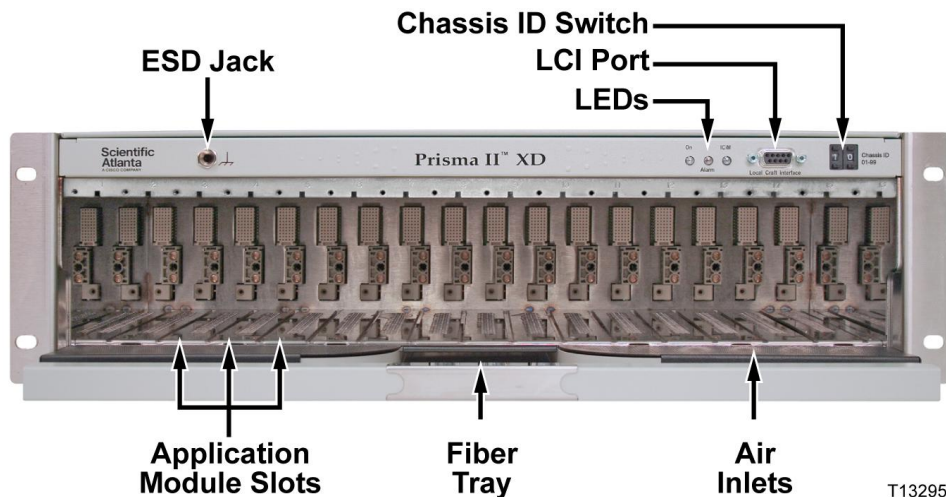
Complete the following steps to install the module in the chassis.



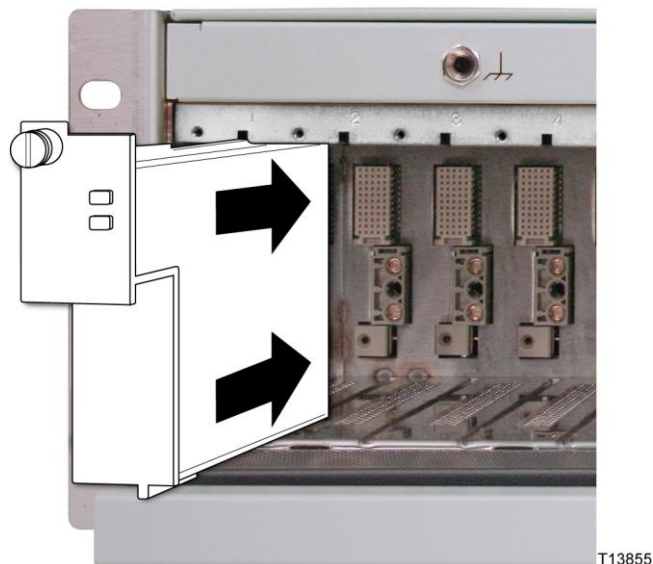
CAUTION:

Always use a screwdriver to loosen or tighten the screws holding the application modules, ICIM2-XD, fan assembly, power supply modules, DC-to-DC converters, or blanking panels in place. Do not attempt to loosen or tighten these screws solely by hand.

- 1 Locate the fiber guides at the bottom of the chassis and the module guide slots inside the chassis as shown in the following illustration.



- 2 Align the ridges on the top and bottom of the module with the module guide slots located on the chassis.
- 3 Gently slide the module into the chassis until its power and communications connections join connectors on the midplane bus. **Do not force the module into the chassis.** If properly aligned, it should slide in with minimal force.



- 4 Tighten the screw at the top of the module to secure it in the chassis. Use a 3/8-in. flat-blade screwdriver to secure. **Do not over-tighten.** The maximum torque value is 5 in-lb.
- 5 Fill any unused chassis slots with module blanks to help ensure proper cooling air flow.

Connecting Optical Cables

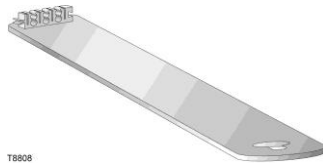
Fiber Fish Tool



WARNING:

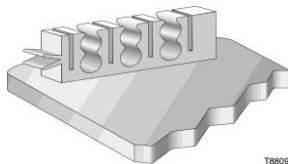
Unterminated fiber cables and connectors may emit invisible laser radiation. Avoid direct exposure to the laser light source. Ensure that the fiber cable is terminated before "fishing."

The Fiber Fish tool that was shipped with the Prisma II Chassis is used to pull an optical cable from the rear of the chassis to the front of the chassis so the optical cables can be connected to optical connectors on the front panel of the modules.



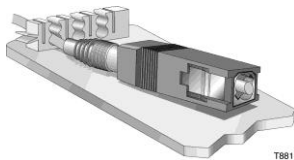
Fiber Fish Tool Hook

At the end of the Fiber Fish tool is a small hook that allows you to hold an optical cable so that you can pull it through to the front panel of the chassis.



To Pull the Optical Cable to the Module

- 1 Insert the Fiber Fish tool through the slot located just above the bottom of the chassis.
- 2 At the rear of the chassis, locate the appropriate optical cable.
- 3 Insert the optical cable into the notched area of the Fiber Fish tool as shown below.



- 4 At the front of the chassis, pull the Fiber Fish tool (with cable attached) to the front of the chassis.

- 5 Disengage the optical cable from the Fiber Fish tool and attach to the appropriate connector on the desired module.



CAUTION:

Proper operation of this equipment requires clean optical fibers. Dirty fibers will adversely affect performance. Proper cleaning is imperative.

The proper procedure for cleaning optical connectors depends on the connector type. The following describes general instructions for fiber optic cleaning. Use your company's established procedures, if any, but also consider the following.

Cleaning fiber optic connectors can help prevent interconnect problems and aid system performance. When optical connectors are disconnected or reconnected, the fiber surface can become dirty or scratched, reducing system performance.

Inspect connectors prior to mating, clean as needed, and then remove all residue. Inspect connectors after cleaning to confirm that they are clean and undamaged.

Recommended Equipment

- CLETOP or OPTIPOP ferrule cleaner (for specific connector type)
- Compressed air (also called “canned air”)
- Lint-free wipes moistened with optical-grade (99%) isopropyl alcohol
- Bulkhead swabs (for specific connector type)
- Optical connector scope with appropriate adaptor

Tips for Optimal Fiber Optic Connector Performance

- Do not connect or disconnect optical connectors with optical power present.
- Always use compressed air before cleaning the fiber optic connectors and when cleaning connector end caps.
- Always install or leave end caps on connectors when they are not in use.
- If you have any degraded signal problems, clean the fiber optic connector.
- Advance a clean portion of the ferrule cleaner reel for each cleaning.
- Turn off optical power before making or breaking optical connections to avoid microscopic damage to fiber mating surfaces.

To Clean Optical Connectors



Warning:

- **Avoid personal injury! Use of controls, adjustments, or procedures other than those specified herein may result in hazardous radiation exposure.**
- **Avoid personal injury! The laser light source on this equipment (if a transmitter) or the fiber cables connected to this equipment emit invisible laser radiation.**
- **Avoid personal injury! Viewing the laser output (if a transmitter) or fiber cable with optical instruments (such as eye loupes, magnifiers, or microscopes) may pose an eye hazard.**

- Do not apply power to this equipment if the fiber is unmated or unterminated.
- Do not stare into an unmated fiber or at any mirror-like surface that could reflect light emitted from an unterminated fiber.
- Use safety-approved optical fiber cable to maintain compliance with applicable laser safety requirements.

Important: Ensure that no optical power is present prior to this procedure.

- 1 Turn optical power off to the connector.
- 2 Using an optical connector scope, inspect the connector for scratches, burns, or other signs of damage.

Note: If the connector is damaged, replace the jumper.

- 3 If the connector requires cleaning, swipe it across the face of the appropriate ferrule cleaner several times. This will remove dust and some films.

Note: You may hear a slight "squeak" while cleaning the connector, indicating that it is clean.

- 4 Inspect the connector again. If the connector requires further cleaning, clean it using 99% isopropyl alcohol and a lint-free wipe.
- 5 Swipe the connector across the face of the appropriate ferrule cleaner several more times to remove any film left by the alcohol.
- 6 Repeat all the steps above as needed until the connector is clean.

To Connect Optical Cables to Module

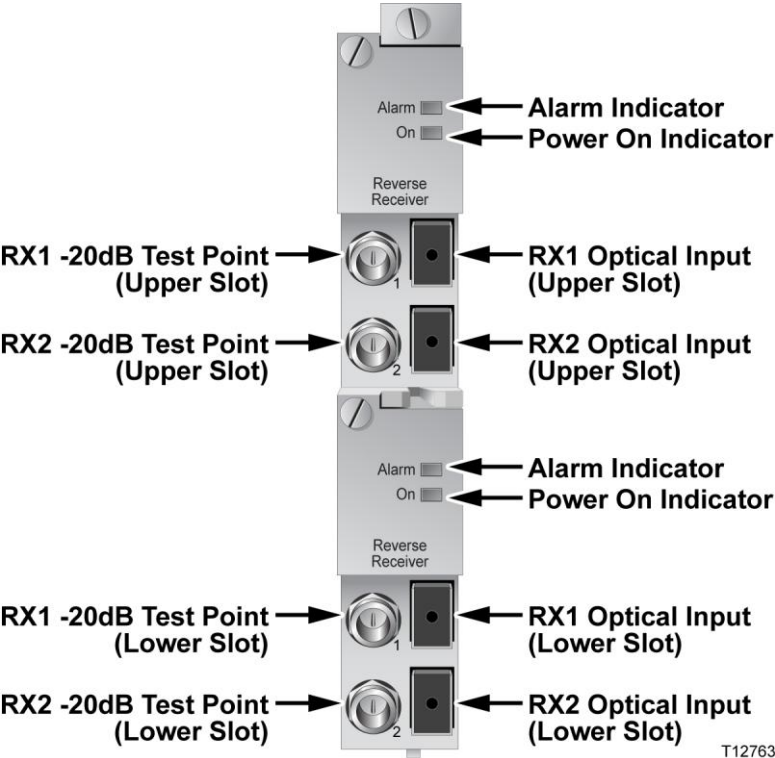
Note: This procedure assumes that the chassis is mounted in a rack.

Important: Observe laser safety precautions. Refer to the **Laser Safety** information earlier in this guide.

Complete the following steps for each optical cable to be connected to the module.

Chapter 3 Module Installation

- 1 Attach one end of the optical cable to the optical input connector located on the front of the module.



- 2 Route the other end of the optical cable to the appropriate destination.

Connecting the ICIM to Additional Chassis

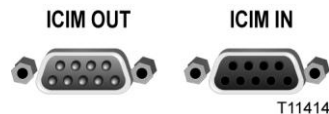
The Prisma II platform allows the ICIM2 or ICIM2-XD to be located in one chassis and control modules located in several other chassis. This communication “daisy-chain” can be enabled by connecting cables to the **ICIM IN** and **ICIM OUT** connectors located on the connector interface panel of the chassis. This connection is required if an ICIM2 or ICIM2-XD in one chassis is to communicate with or control any module located in a separate chassis.

Note: An ICIM2 or ICIM2-XD can control a maximum of 140 modules. Depending on your application, this is typically 6 or 7 chassis to a rack. Do not exceed these limits.

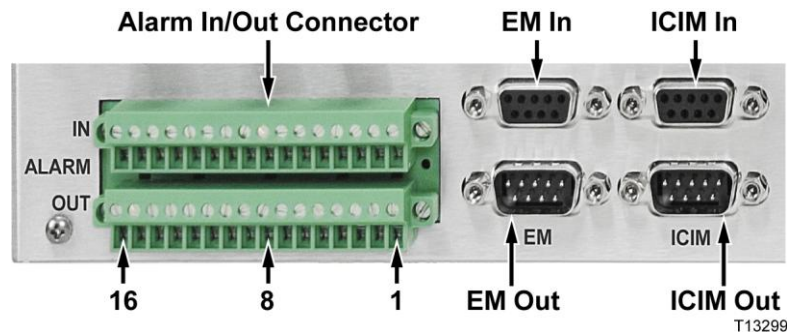
ICIM IN and ICIM OUT Connectors

Every Prisma II standard and Prisma II XD chassis has a DB9 **ICIM IN** and a DB9 **ICIM OUT** connector for the purpose of chassis-to-chassis ICIM connections. **ICIM IN** is a female connector and **ICIM OUT** is a male connector.

Prisma II Standard Chassis



Prisma II XD Chassis



ICIM IN and ICIM OUT Cables

The cable required for both **ICIM IN** and **ICIM OUT** connections is a shielded 9-wire serial extension cable, DB9 Female to DB9 Male. This cable can be purchased locally or from the factory. The chassis data sheet lists the part number for a 6-foot DB9 Female to DB9 Male serial extension cable. The connectors are a serial 9-pin D-shell (EIA 574/232).

To Connect Chassis-to-Chassis ICIM IN and ICIM OUT Ports

- 1 Connect the serial extension cable from the **ICIM OUT** of the chassis containing the ICIM to the **ICIM IN** connector of the second chassis.
- 2 Connect a serial extension cable from the **ICIM OUT** of the second chassis to the **ICIM IN** of the third chassis.
- 3 Continue this daisy-chain connection until all chassis are connected.
- 4 Connect an **ICIM OUT** terminator, part number 4013014, to the **ICIM OUT** connector on the last chassis in the daisy-chain connection. The **ICIM OUT** terminator ships with the ICIM.

Important:

- All chassis connected in the daisy-chain must be powered and have a fan tray installed. A chassis connected in the daisy-chain that is not powered or has no fan tray installed will cause faulty operation of the ICIM.
- All chassis connected in this daisy-chain must have a unique chassis ID number.
- If the **ICIM OUT** terminator that ships with the ICIM is not installed on the last chassis of a daisy-chain connection, faulty communication with the ICIM may occur.

Connecting a Chassis to the TNCS Server

Cable Kits for Connecting a Chassis to the TNCS Server

Connecting the chassis to the TNCS server requires two special cable kits that are available from the factory.

- The RS-485 cable kit, part number 735748, includes the following:
 - Breakout boxes, 4 each
 - RS-485 cable assemblies (50 feet), 4 each
 - Breakout box mounting brackets, 4 each
 - 6-32 screws (1.25 inches), 100 each
- The Prisma II cable kit, part number 738686, includes the following:
 - Prisma II cable assemblies, 4 each

The RS-485 cable kit is used to communicate with the RS-485/422/TTL devices.

To Connect TNCS to the Chassis EM IN Port

- 1 Mount one of the breakout boxes (included in the RS-485 cable kit) in a rack location central to the appropriate Prisma II Chassis.



- 2 Connect an RS-485 cable assembly (included in the RS-485 cable kit) from the breakout box to the **RS-485 COM** port on the TNCS server.
- 3 Connect one Prisma II cable assembly (included in the Prisma II cable kit) from the breakout box to the **EM IN** port of each Prisma II Chassis containing an ICIM2 or ICIM2-XD.

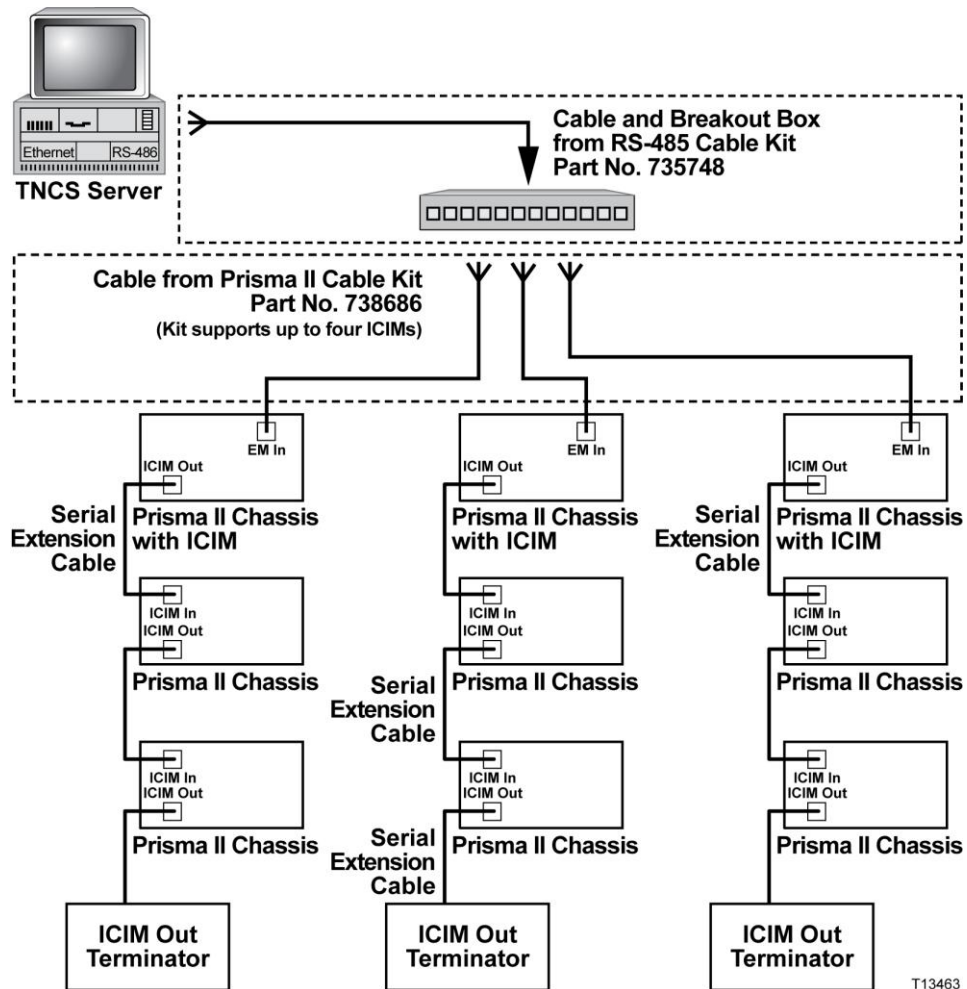


Note: As a general rule, it is recommended that the total number of ICIM2 or ICIM2-XD control units connected to any single COM port on the TNCS server be limited to four (4). However, you may connect more than four ICIM2 or ICIM2-XD control units per TNCS COM port as long as the total number of devices (modules) monitored by a single COM port does not exceed 400 and the total number of devices monitored by any single ICIM2 or ICIM2-XD does not exceed 140.

Using TNCS with Multiple Chassis

All chassis within an ICIM domain are connected in series via the **ICIM IN/ICIM OUT** connectors using standard 9-wire serial extension cable, DB9 Female to DB9 Male. Using the **EM IN/EM OUT** connectors, a chassis with an ICIM installed is connected to a breakout box as shown below.

The breakout box is connected to the TNCS server with the cable included in the RS-485 cable kit.



4

Maintenance and Troubleshooting

Introduction

This chapter describes the maintenance guidelines and troubleshooting procedures for this Prisma II module.

Qualified Personnel

Only appropriately qualified and skilled personnel should attempt to install, operate, maintain, and service this product.



WARNING:

Allow only qualified and skilled personnel to install, operate, maintain, and service this product. Otherwise, personal injury or equipment damage may occur.

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■ Troubleshooting Alarm Conditions.....	44

Maintenance

The following maintenance is recommended to ensure optimal performance.

Frequency	Maintenance Required
Yearly	<ul style="list-style-type: none"> ■ Check all parameters and test points. ■ Record data. ■ Make adjustments as needed. ■ Make sure all cables are mated properly. ■ Inspect cables for stress and chafing. ■ Make sure all retaining screws are tight. ■ Replace chassis air filter, if present. Depending on office environment cleanliness and filtration, the chassis air filter may require more frequent servicing.
When needed	Carefully clean the module with a soft cloth that is dampened with mild detergent.

Maintenance Record

It may be helpful to establish a maintenance record or log for this equipment. You may want to record laser power level, laser temperature readings, laser bias current, or power supply voltages, as well as the filter change dates.

Large variations in any of the parameters above should be investigated prior to failure.

General Troubleshooting Information

This troubleshooting information describes the most common alarms and gives typical symptoms, causes, and items to check before contacting Customer Service.

Equipment Needed

You may need the following equipment to troubleshoot these modules.

- Digital voltmeter
- Fiber connector cleaning materials

Additional Assistance

If you need additional assistance, telephone one of our Technical Service Centers or your local sales subsidiary.

Troubleshooting

Refer to *Troubleshooting Alarm Conditions* (on page 44) to identify and correct faults.



WARNING:

Avoid electric shock and damage to this product! Do not open the enclosure of this product. There are no user-serviceable parts inside. Refer servicing to qualified and skilled personnel.

Troubleshooting Alarm Conditions

Module Alarm Conditions

If the red ALARM indicator is illuminated or is blinking, check the display on the front panel to determine the cause of the alarm.

Alarm	Function	Possible Causes	Possible Solutions
Rx 1 Optical Input Power	Optical input 1	<ul style="list-style-type: none"> ■ Broken fiber ■ Transmitter failure 	<ul style="list-style-type: none"> ■ Check fiber ■ Transmitter failure
Rx 2 Optical Input Power	Optical input 2	<ul style="list-style-type: none"> ■ Broken fiber ■ Transmitter failure 	<ul style="list-style-type: none"> ■ Check fiber ■ Transmitter failure
PsOk	Bus voltage status	<ul style="list-style-type: none"> ■ Power supply faulty 	<ul style="list-style-type: none"> ■ Check power supply
AGC 1 Range Status	AGC 1 out-of-range alarm	<ul style="list-style-type: none"> ■ Broken fiber ■ Transmitter failure ■ Input power too high or too low for AGC setting 	<ul style="list-style-type: none"> ■ Check fiber ■ Transmitter failure ■ Adjust AGC
AGC 2 Range Status	AGC 2 out-of-range alarm	<ul style="list-style-type: none"> ■ Broken fiber ■ Transmitter failure ■ Input power too high or too low for AGC setting 	<ul style="list-style-type: none"> ■ Check fiber ■ Transmitter failure ■ Adjust AGC



CAUTION:

Some 1310 nm transmitters with serial numbers beginning with NN are not compatible with these receivers. Do not install these transmitters in any daisy chain with one or more of these receivers.

5

Customer Information

If You Have Questions

If you have technical questions, call Cisco Services for assistance. Follow the menu options to speak with a service engineer.

Access your company's extranet site to view or order additional technical publications. For accessing instructions, contact the representative who handles your account. Check your extranet site often as the information is updated frequently.

A

Module Parameter Descriptions

Introduction

This appendix provides manufacturing data, monitored parameters, configurable parameters, and alarms for the Prisma II High Density Low Noise Dual Reverse Receiver module. The examples shown in the tables are for guidance only.



CAUTION:

The warranty may be voided and the equipment damaged if you operate the equipment above the specified temperature limits (131°F/55°C for post-amplifiers, 149°F/65°C for other products). Specification temperature limits are measured in the air stream at the fan tray inlet and may be higher than room ambient temperature.

In This Appendix

- Receiver Parameters 48

Receiver Parameters

Receiver Operating Status Parameters

Parameter Name (LCI)	ICIM Abbreviation	Function	Operating Range
Rx 1 Nominal Input	InPwr1	Displays optical input power for Rx1	-26 dBm to -9.0 dBm
Rx 2 Nominal Input	InPwr2	Displays optical input power for Rx2	-26 dBm to -9.0 dBm
Module Temperature	ModTemp	Displays module temperature	-40°C to 100°C
AGC 1 Attenuator	AGC1Attn	Attenuation used for AGC1 base settings	0 dB to 26.25 dB
AGC 2 Attenuator	AGC2Attn	Attenuation used for AGC2 base settings	0 dB to 26.25 dB
AGC 1 Opt Inp Pwr	AGC1OpIn	Optical input power used for AGC1 base settings	-25 dBm to -10 dBm
AGC 2 Opt Inp Pwr	AGC2OpIn	Optical input power used for AGC2 base settings	-25 dBm to -10 dBm
Receiver 1 Status	Rx1	Indicates the status of Rx1: Off = receiver disabled or in critical alarm Stby = receiver enabled with no alarms, but in Slave mode (no RF output) Active = receiver operating normally (RF output active)	Off (0) Stby (1) Active (2)
Receiver 2 Status	Rx2	Indicates the status of Rx2: Off = receiver disabled or in critical alarm Stby = receiver enabled with no alarms, but in Slave mode (no RF output) Active = receiver operating normally (RF output active)	Off (0) Stby (1) Active (2)

Receiver Parameters

Parameter Name (LCI)	ICIM Abbreviation	Function	Operating Range
Redundant Receiver 1 Status ¹	RedRx1	Indicates the status of the redundant mate for Rx1: Off = receiver disabled or in critical alarm Stby = receiver enabled with no alarms, but in Slave mode (no RF output) Active = receiver operating normally (RF output active) Missing = redundant receiver not detected	Off (0) Stby (1) Active (2) Missing (3)
Redundant Receiver 2 Status ¹	RedRx2	Indicates the status of the redundant mate for Rx2: Off = receiver disabled or in critical alarm Stby = receiver enabled with no alarms, but in Slave mode (no RF output) Active = receiver operating normally (RF output active) Missing = redundant receiver not detected	Off (0) Stby (1) Active (2) Missing (3)

¹ Visible in LCI in Independent mode only.

Receiver Configurable Parameters

Parameter Name (LCI)	ICIM Abbreviation	Description	Values	Default
- -	NomPwr1 NomPwr2	Nominal Rx1 or Rx2 optical input power level. Input power alarms are calculated relative to this value.	Decimal number between -25.0 and 10 dBm in increments of 0.5 dBm	15 dBm

Appendix A
Module Parameter Descriptions

Parameter Name (LCI)	ICIM Abbreviation	Description	Values	Default
Mode Select	Mode	Module redundancy control. If set to Master, the unit is only controlled by the Enable control. If set to Slave, the unit is controlled by the Enable control and the external input CNT_IN. If set to Single, Rx1 and Rx2 will continue to operate (i.e. not switch) even if the optical input level falls below the major alarm threshold. If set to Independent, Rx1 and Rx2 are independently set to Master or Slave mode by Mode1 and Mode2.	Single, Master, Slave, or Independent	Single
Rx 1 Receiver Enable Rx 2 Receiver Enable	Enable1 Enable2	Enables or disables Rx1 or Rx2. If set to Off, the receiver is muted (RF amplifier turned off), alarms are inhibited, and redundancy is turned off.	OFF = Disabled ON = Enabled	ON
Rx 1 Mute Switch Rx 2 Mute Switch	Mute 1 Mute 2	Defines the initial status of the Rx1 or Rx2 RF Output mute control. If On, the output is muted. However, the alarm can override the initial status and change the mute setting.	OFF = Mute Off ON = Mute On	OFF
Rx 1 Attenuator Rx 2 Attenuator	Attn1 Attn2	Sets the attenuation level of the Rx1 or Rx2 RF Output signal.	0 dB to 26.25 dB in increments of 0.75 dB	0 dB
Manual Alarm ¹	Alarm	Force alarm if the Enable control is On.	ON = Alarm On OFF = Alarm Off	OFF
Rx 1 Wavelength Rx 2 Wavelength	Wavelen1 Wavelen2	Selects the Rx1 or Rx2 optical wavelength for proper calibration of input power measurements.	1310 nm or 1550 nm	1310 nm
AGC 1 Control AGC 2 Control	AGC1 AGC2	Enables (Auto) or disables (Manual) the Rx1 or Rx2 AGC function.	Manual or Auto	Manual
AGC 1 Set Control AGC 2 Set Control	AGC1set AGC2set	In the Set state, the Rx1 or Rx2 AGC functions as if in Manual mode. When the state is changed to Lock, the user attenuation setting and optical input power are locked into the cal settings for the AGC function.	Set or Lock ²	Lock
Receiver 1 Mode ³ Receiver 2 Mode ³	Mode1 Mode2	Independently selects Master or Slave mode operation for Rx1 (Mode1) and Rx2 (Mode2).	Slave or Master	Master

Receiver Parameters

Parameter Name (LCI)	ICIM Abbreviation	Description	Values	Default
Receiver 1 Alarm ³ Receiver 2 Alarm ³	Alarm1 Alarm2	Forces an alarm on Rx1 (Alarm1) or Rx2 (Alarm2).	On or Off	Off
Receiver 1 Redundant ID Chassis ³ Receiver 2 Redundant ID Chassis ³	Red1Chas Red2Chas	Identifies the chassis in which the redundant mate for Rx1 (Red1Chas) or Rx2 (Red2Chas) is located.	1 to 99	1
Receiver 1 Redundant ID Slot ³ Receiver 2 Redundant ID Slot ³	Red1Slot Red2Slot	Identifies the slot in which the redundant mate for Rx1 (Red1Slot) or Rx2 (Red2Slot) is located.	1 to 32	1
Receiver 1 Redundant ID Rcvr ³ Receiver 2 Redundant ID Rcvr ³	Red1Sub Red2Sub	Identifies the receiver (1 or 2) that serves as the redundant mate for Rx1 (Red1Sub) or Rx2 (Red2Sub).	1 or 2	1

¹ Visible in LCI in Master mode only.

² In the Set state, the optical AGC functions as if in Manual mode. When the state is changed to Lock, the user Attn setting and optical input power are locked into calibration settings for the optical AGC function.

³ Visible in LCI in Independent mode only.

Receiver Alarm Data Parameters

Parameter Name (LCI)	ICIM Abbreviation	Nominal Value	Major Low Limit	Minor Low Limit	Minor High Limit	Major High Limit	Hysteresis	Operating Range
Rx 1 Nominal Input	InPwr1 ¹	-25.0 to -10 dBm in 0.5 step	-20	-4	3.2	3.2	1	OK or Alarm

Appendix A
Module Parameter Descriptions

Parameter Name (LCI)	ICIM Abbreviation	Nominal Value	Major Low Limit	Minor Low Limit	Minor High Limit	Major High Limit	Hysteresis	Operating Range
Rx 2 Nominal Input	InPwr2 ¹	-25.0 to -10 dBm in 0.5 step	-20	-4	3.2	3.2	1	OK or Alarm
Power Supply Status	PsOk	-	-	-	-	-	-	OK or Alarm
Forced Alarm Status	Alarm	-	-	-	-	-	-	OK or Alarm
Forced Alarm Rx1 Status ²	Alarm1	-	-	-	-	-	-	OK or Alarm
Forced Alarm Rx2 Status ²	Alarm2	-	-	-	-	-	-	OK or Alarm
AGC 1 Range Status	AGC1Rng	-	-	-	-	-	-	OK or Alarm
AGC 2 Range Status	AGC2Rng	-	-	-	-	-	-	OK or Alarm
CAN Bus Status ²	CANBus	-	-	-	-	-	-	OK or Alarm
Redundant Receiver 1 Alarm ²	RedRx1	-	-	-	-	-	-	OK or Alarm
Redundant Receiver 2 Alarm ²	RedRx2	-	-	-	-	-	-	OK or Alarm

¹ InPwr1 and InPwr2 values are reported to five decimal places, but for practical purposes, only the first two digits should be regarded as significant.

² Visible in LCI in Independent mode only.

Receiver Mfg Data Parameters

Parameter Name (LCI)	ICIM Abbreviation	Typical Values
Generic Name	-	Receiver
Description	Module	P2-HD-LN-RXR

Receiver Parameters

Parameter Name (LCI)	ICIM Abbreviation	Typical Values
Software Revision	Sw Ver	1.01.00
-	Script Ver	CF_CCB3
Serial Number	Serial #	^ABCDEFGG
Time of Service	In Service Hours (initial value)	0
-	Spec Data	Special data
Date Code	Date Code	A06
Module Type	Module Type	2022 (High Gain) 2023 (Standard Gain)

Glossary

ac, AC

alternating current. An electric current that reverses its direction at regularly recurring intervals.

AGC

automatic gain control. A process or means by which gain is automatically adjusted in a specified manner as a function of input level or other specified parameters.

CAN

cancel. The cancel character.

dc, DC

direct current. An electric current flowing in one direction only and substantially constant in value.

DFB laser

distributed feedback laser. An injection laser diode that has a Bragg reflection grating in the active region in order to suppress multiple longitudinal modes and enhance a single longitudinal mode.

DRR

dual reverse receiver.

EIA

Electronic Industries Association. A United States association that provides standards for use between manufacturers and purchasers of electronic products.

EMC

electromagnetic compatibility. A measure of equipment tolerance to external electromagnetic fields.

EMT

externally-modulated transmitter.

Glossary

ESD

electrostatic discharge. Discharge of stored static electricity that can damage electronic equipment and impair electrical circuitry, resulting in complete or intermittent failures.

HD

high density.

I/O

input/output.

ICIM

intelligent communications interface module.

LCD

liquid crystal display. A display medium made of liquid crystal. Liquid crystal's reflectance changes when an electric field is applied. Commonly used in monitors, televisions, cell phones, digital watches, etc.

LCI

local craft interface.

LED

light-emitting diode. An electronic device that lights up when electricity passes through it.

MIB

management information base. SNMP collects management information from devices on the network and records the information in a management information base. The MIB information includes device features, data throughput statistics, traffic overloads, and errors.

nm

nanometer. One billionth of a meter.

NMS

network management system. A software system designed specifically to monitor a network and to facilitate troubleshooting.

OMI

optical modulation index, expressed in decimal or percentage notation.

RF

radio frequency. The frequency in the portion of the electromagnetic spectrum that is above the audio frequencies and below the infrared frequencies, used in radio transmission systems.

RT

remote terminal. Remote equipment of a supervisory system.

RX

receive or receiver.

SMC

status monitoring and control. The process by which the operation, configuration, and performance of individual elements in a network or system are monitored and controlled from a central location.

SNMP

simple network management protocol. A protocol that governs network management and the monitoring of network devices and their functions.

TEC

thermoelectric cooler. A device used to dissipate heat in electronic assemblies.

TNCS

Transmission Network Control System. A Cisco application that allows status monitoring and control of all transmission equipment located in headends and hubs plus optical nodes, power supplies, and amplifiers in the outside plant. TNCS provides access to and information on the entire network in an easy to understand, topology driven, graphical user display.

torque

A force that produces rotation or torsion. Usually expressed in lb-ft (pound-feet) or N-m (Newton-meters). The application of one pound of force on a lever at a point on the lever that is one foot from the pivot point would produce 1 lb-ft of torque.

TX

transmit or transmitter.

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