D9485 DAVIC QPSK Bridge

Installation and Operation Guide

Please Read

Important

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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Contents

Safety Precautions

Read, Retain, and Follow These Instructions

Carefully read all safety and operating instructions before operating this product. Follow all operating instructions that accompany this product. Retain the instructions for future use. Give particular attention to all safety precautions.

Warning and Caution Icons

WARNING:

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

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

You will find this icon in the literature that accompanies this product. This icon indicates important operating or maintenance instructions.

You may find this icon affixed to this product and in this document to alert you of electrical safety hazards. On this product, this icon indicates a live terminal; the arrowhead points to the terminal device.

You may find this icon affixed to this product. This icon indicates a protective earth terminal.

You may find this icon affixed to this product. This icon indicates excessive or dangerous heat.

You may find this symbol affixed to this product and in this document. This symbol indicates an infrared laser that transmits intensity-modulated light and emits invisible laser radiation and an LED that transmits intensity-modulated light.

Heed All Warnings

Adhere to all warnings on the product and in the operating instructions.

Avoid Electric Shock

Follow the instructions in this warning.

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.

Servicing

WARNING:

Avoid electric shock! Opening or removing the cover may expose you to dangerous voltages.

Do not open the cover of this product and attempt service unless instructed to do so in the operating instructions. Refer all servicing to qualified personnel only.

Cleaning, Water, Moisture, Open Flame

To protect this product against damage from moisture and open flames, do the following:

- Before cleaning, unplug this product from the AC outlet. Do *not* use liquid or aerosol cleaners. Use a dry cloth for cleaning.
- Do not expose this product to moisture.
- Do not place this product on a wet surface or spill liquids on or near this product.
- Do not place or use candles or other open flames near or on this product.

Ventilation

To protect this product against damage from overheating, do the following:

- This product has openings for ventilation to protect it from overheating. To ensure product reliability, do not block or cover these openings.
- Do not open this product unless otherwise instructed to do so.
- Do not push objects through openings in the product or enclosure.

Placement

To protect this product against damage from breakage, do the following:

- Place this product close enough to a mains AC outlet to accommodate the length of the product power cord.
- Route all power supply cords so that people cannot walk on, or place objects on, or lean objects against them. This can pinch or damage the cords. Pay particular attention to cords at plugs, outlets, and the points where the cords exit the product.
- Make sure the mounting surface or rack is stable and can support the size and weight of this product.

WARNING:

Avoid personal injury and damage to this product! An unstable surface may cause this product to fall.

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

- Move the cart slowly and carefully. If the cart does not move easily, this condition may indicate obstructions or cables that you may need to disconnect before moving this cart to another location.
- Avoid quick stops and starts when moving the cart.
- Check for uneven floor surfaces such as cracks or cables and cords.

WARNING:

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

Fuse

When replacing a fuse, heed the following warnings.

WARNING:

Avoid electric shock! Always disconnect all power cables before you change a fuse.

WARNING:

Avoid product damage! Always use a fuse that has the correct type and rating. The correct type and rating are indicated on this product.

Grounding This Product (U.S.A. and Canada Only)

Safety Plugs

If this product is equipped with either a three-prong (grounding pin) safety plug or a two-prong (polarized) safety plug, do not defeat the safety purpose of the polarized or grounding-type plug. Follow these safety guidelines to properly ground this product:

- For a 3-prong plug (consists of two blades and a third grounding prong), insert the plug into a grounded mains, 3-prong outlet.

  Note: This plug fits only one way. The grounding prong is provided for your safety. If you are unable to insert this plug fully into the outlet, contact your electrician to replace your obsolete outlet.
- For a 2-prong plug (consists of one wide blade and one narrow blade), insert the plug into a polarized mains, 2-prong outlet in which one socket is wider than the other.

Note: If you are unable to insert this plug fully into the outlet, try reversing the plug. The wide blade is provided for your safety. If the plug still fails to fit, contact an electrician to replace your obsolete outlet.

Grounding Terminal

If this product 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 an earth ground, such as an equipment rack that is grounded.

20050727 Headend/Rack

FCC Compliance

Where this equipment is subject to U.S.A. FCC and/or Industry Canada rules, the following statements apply.

United States FCC Compliance

This device 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 such 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.

Canada EMI Regulation

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la class A est conforme à la norme NMB-003 du Canada.

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About This Guide

Introduction

This guide describes the Cisco Model D9485 (DAVIC) Quadrature Phase-Shift Keying (QPSK) Bridge. The unit may be purchased with redundant AC power supplies or redundant DC power supplies. This guide provides installation, operation, and troubleshooting procedures (including routine maintenance), as well as technical specifications.

Note: In this guide the DAVIC QPSK Modulator/Demodulator Bridge will be referred to as the QPSK Bridge.

Purpose

This guide provides a detailed specifications and component description for the QPSK Bridge. After reading this guide, you will be able to successfully install, operate, and troubleshoot the QPSK Bridge. In addition, you will be able to perform routine maintenance which will aid in trouble-free operation. This guide also includes a detailed specifications appendix and component descriptions.

Audience

This guide is written for Digital Broadband Delivery System (DBDS) system administrators, Digital Network Control System (DNCS) operators, call center personnel, and system operators who are responsible for installing and operating the QPSK Bridge. These individuals should have extensive working experience with cable communications equipment.

Document Version

This is the first formal release of this document.

1

Introducing the DAVIC QPSK Bridge

Introduction

This chapter describes how the QPSK Bridge functions, and how it functions within the DBDS. This chapter also includes illustrations and descriptions of the QPSK Bridge front and back panel components.

In This Chapter

System Overview

Introduction

The D9485 QPSK Bridge replaces the functions of the D9482 Modulator and up to eight D9494/D9492 demodulators. It is an integral component of the DBDS. The QPSK Bridge works with Digital Home Communication Terminals (DHCTs) to provide a forward-signaling and reverse-communications path for interactive two-way video and data services.

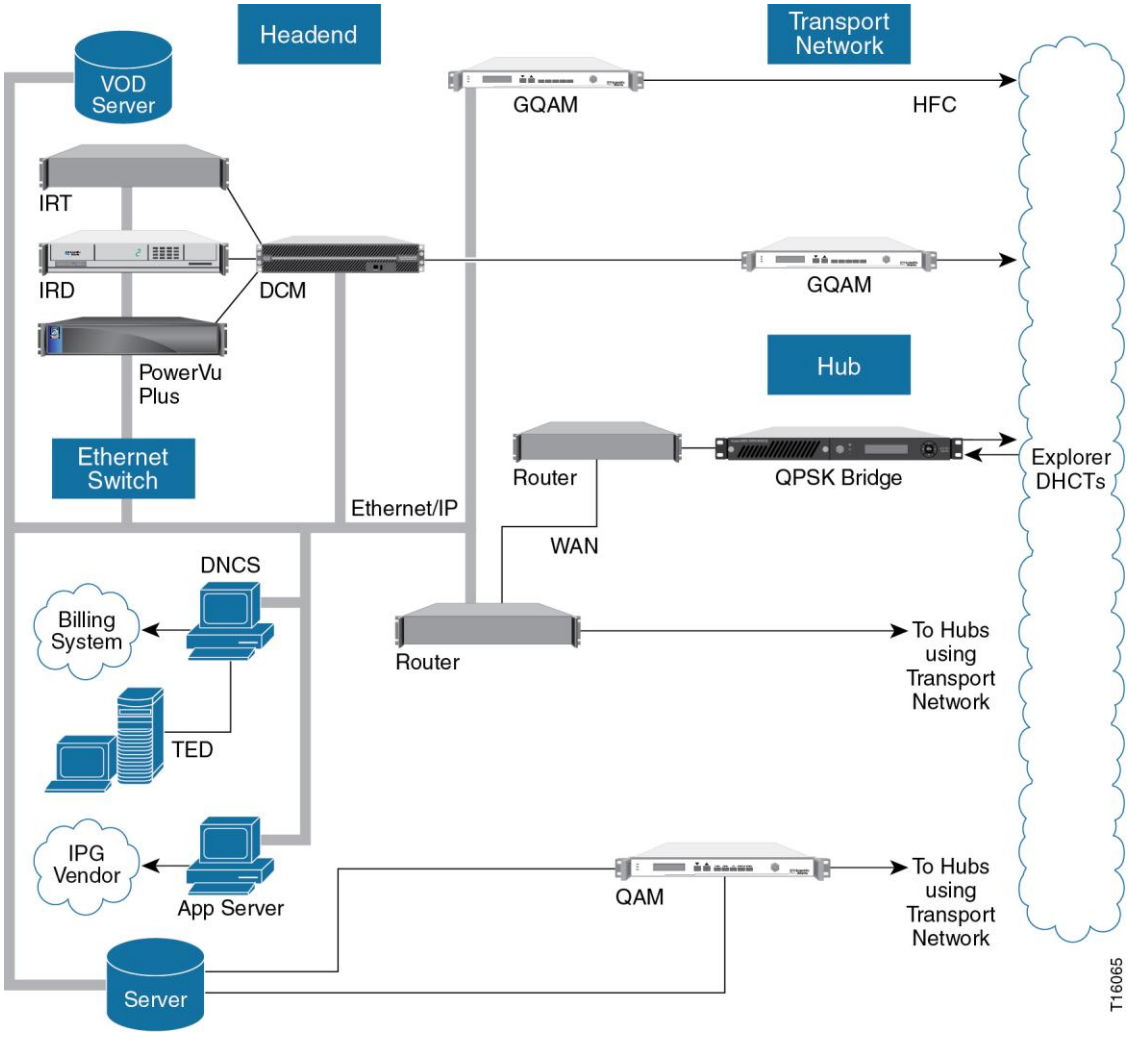
The Modulating/Demodulating Process

The QPSK Bridge's internal QPSK modulator initiates and controls configuration and setup through the QPSK forward path. The QPSK modulator splits messages into Asynchronous Transfer Mode (ATM) cells, formats the messages in DAVIC-compliant frames, adds QPSK modulation, and then transmits the messages to the DHCT at a rate of 1.544 Mbps. After the DHCTs are configured, all control and status information travels through the QPSK forward path, while all video and audio sources are carried by high-bandwidth Quadrature Amplitude Modulation (QAM) channels to the DHCT via a separate QAM modulator.

The QPSK Bridge's internal QPSK demodulators receive the messages that originate from a DHCT, such as a request for a service, on a 1.544 Mbps reverse-path channel. The QPSK demodulators demodulate the incoming QPSK signals, perform error correction on the detected data, and transmit the messages to the main internal processor in the QPSK Bridge. The QPSK Bridge uses the slot number information inserted by the internal QPSK demodulator, along with the demodulator port number (for example, reverse channel number) to create a "success feedback" word to acknowledge or confirm receipt to the DHCT. These words generate the "acknowledge bits." The DHCT needs these bits to determine whether its cell was received successfully. Received cells from the demodulators are routed to the main memory of the QPSK Bridge, where complete messages are reassembled. The QPSK Bridge processes these reassembled messages as a part of its Media Access Control (MAC) functions. The QPSK Bridge serves as a DAVIC Router by implementing the DAVIC MAC functions and by communicating signaling and status information back to the DNCS through an Ethernet/IP connection.

Diagram of Major DBDS Components

The following diagram shows the major components of the DBDS:



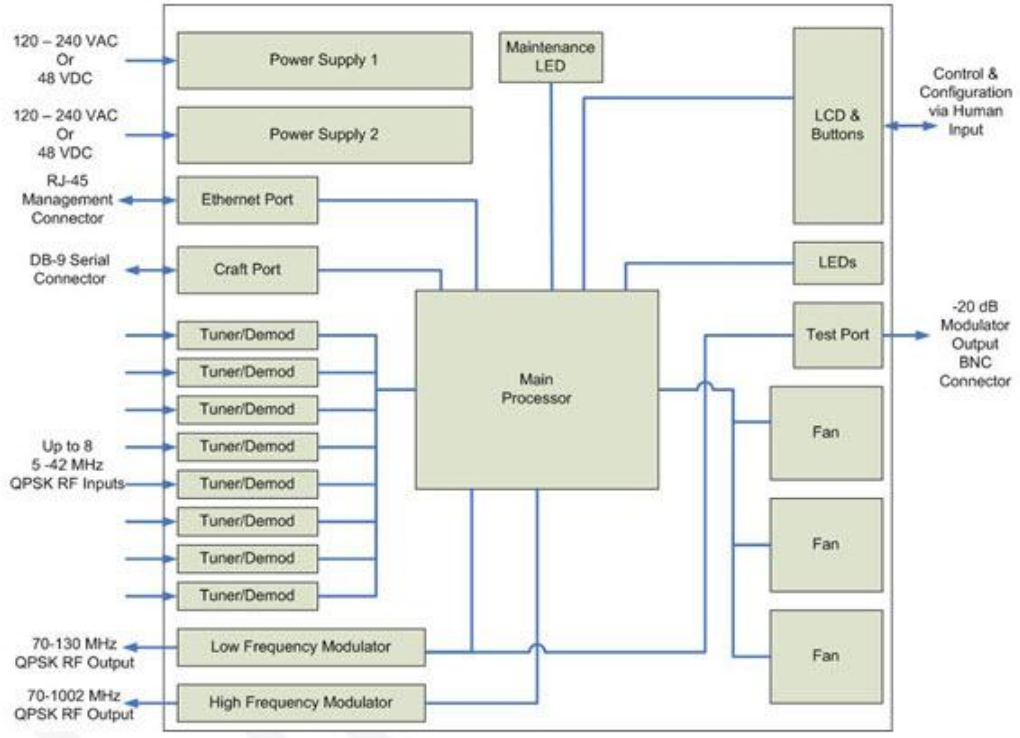
Major Stages and Descriptions

Note: The following table describes the operational stages of the QPSK Bridge:

Stage	Description
RF Inputs	The QPSK demodulator(s) receive a QPSK reverse burst carrier signal from the DHCT by way of the hybrid fiber coax (HFC) CATV plant through its Radio Frequency (RF) input ports in the range of 5 to 42 MHz.
Tuner/Demodulator	Each tuner/demodulator can be configured to a specific input frequency in the 5.00-42.00 MHz range in 250 KHz steps. There are four input level ranges supported by the demodulator, as follows: Range 1 -13 to +3 dBmV Range 2 -5 to +11 dBmV Range 3 +3 to +19 dBmV Range 4 +11 to +27 dBmV
Modulator	The low frequency modulator port is used for typical installation where the downstream DAVIC channel is configured in the 70-130 MHz range. The high frequency modulator port can be used to support CATV plants where the downstream split is greater than 130Mhz. **Note:** The HF port is reserved for future use. The low frequency and high frequency ports contain the same data. If both ports are active, the downstream DAVIC signal is cloned and output by both ports.
Main Processor	■ Controls all user interfaces (LCD, buttons, LEDs, Craft Port, Web interface, and so on). ■ Controls the modulators/demodulators. ■ Monitors the environmental conditions of the QPSK Bridge and adjusts fan speeds to ensure adequate cooling. ■ Monitors power supplies. ■ Performs DAVIC MAC functions. ■ Interfaces with the DNCS via remote procedure calls (RPC).

Internal Components

The following illustration identifies the internal components and processes of the QPSK Bridge:



The QPSK Bridge Communication

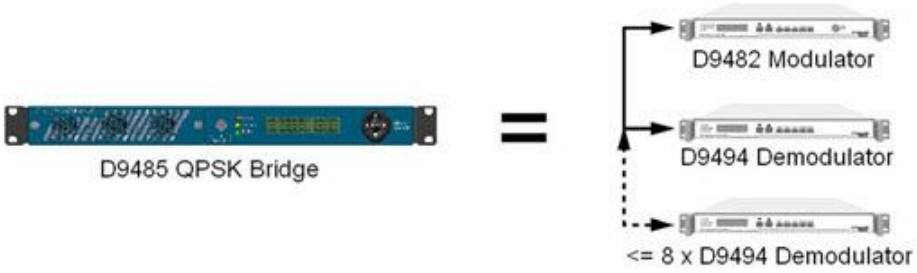
This section describes how the QPSK Bridge communicates with devices on the Ethernet network and devices on the DAVIC network.

Communication Path

The QPSK Bridge is a DAVIC-compliant headend QPSK signaling hub. This single device acts as a bridge between the Ethernet Network and the DAVIC network. The QPSK Bridge uses BOOTP to get its IP settings for the Ethernet interface. On the DAVIC network, the QPSK Bridge performs all of the MAC functionality required to allow a DAVIC device to send/receive data to/from the Ethernet network.

Replacement of Existing DAVIC Modulator / Demodulators

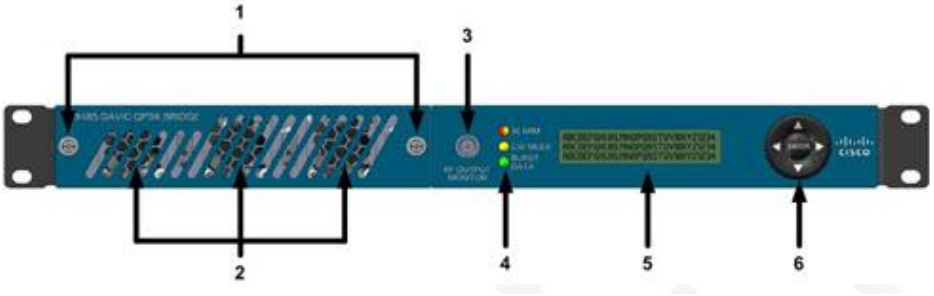
A single D9485 QPSK Bridge replaces the functionality of one D9482 Modulator and up to eight D9494 / D9492 demodulators.



Front Panel Overview

Front Panel Components

The following illustration shows the front panel components of the QPSK Bridge:



Description of Components

The following table contains the front panel alarm and component descriptions that correspond to each number in the preceding labeled diagram of the QPSK Bridge front panel:

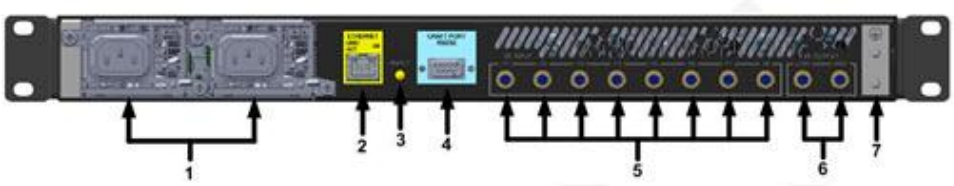
Item	Component	Description
1	Front Panel Retaining Thumb Screws	Two thumb screws that secure the protective front panel encasing the replaceable fan modules.
2	Fan Modules	Three field-replaceable fan modules for cooling internal circuitry.
3	RF Output Monitor Port	Single BNC connector, which provides a monitor for the low frequency RF output port located on the rear of the chassis.
4	LED Indicators: ■ ALARM indicator (red/yellow) illuminates for any alarm. Refer to ***Troubleshooting the DAVIC QPSK Bridge*** (on page 85) for more information. ■ CW Mode (yellow) illuminates when the output modulator(s) are in Continuous Wave mode. ■ BURST DATA indicator (green) illuminates when the demodulator(s) are receiving data.	
5	LCD Alphanumeric Display	Displays information and menus for front panel keys.

Item	Component	Description
6	Directional buttons and Enter button.	Allows you to navigate through the LCD menus, make selections, and save changes to non-volatile memory.

Back Panel Overview

Back Panel Components

The following illustration shows the back panel components of the 110-240 VAC QPSK Bridge:



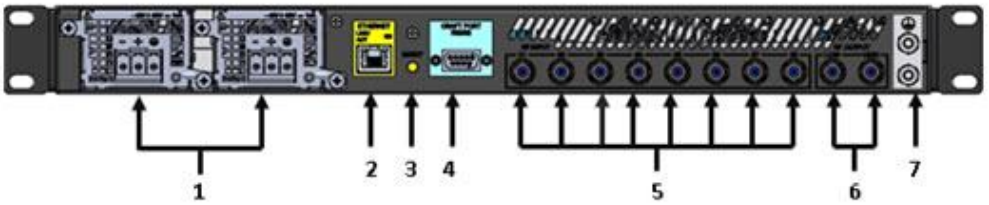
Description of Components

The following table describes the back panel components. Each item in the table corresponds to the appropriate number in the preceding labeled diagram of the D9485 back panel.

Item	Component	Description
1	Power Inlet	3-prong male socket.
2	Ethernet Connector	Connects (indirectly) to the DNCS. This is a 10/100/1000 RJ-45 Ethernet port used for remote communication and configuration.
3	Maintenance LED indicator	Illuminates when configured by the operator to do so. Allows for easier identification of the QPSK Bridge from the rear.
4	Craft Port	Standard female DB-9 RS-232 serial connector for direct or remote connection to the system's text-based diagnostic and configuration menus.
5	RF Inputs	Eight QPSK demodulators, each with its own 75 Ω female F-connector. These connect to the external HFC plant.
6	RF Outputs	Two 75 Ω QPSK modulator ports. One female F-connector is for the high frequency range (70-1002 MHz); the other is for the low frequency range (70-130 MHz). These connect to the external HFC plant.
7	GND	Ground screw for grounding the unit.

Back Panel Components for 48 VDC QPSK Bridge

The following illustration shows the back panel components of the 48 VDC QPSK Bridge:



Description of Components

The following table describes the back panel components:

Item	Component	Description
1	Power Inlet	Three position, screw-cage, clamp plug (Phoenix Contact 1804917 supplied with unit), with a mating jack on the unit. Recommended wire AWG is 12 maximum, 18 minimum.
2	Ethernet Connector	Connects (indirectly) to the DNCS. This is a 10/100/1000 RJ-45 Ethernet port used for remote communication and configuration.
3	Maintenance LED indicator	Illuminates when configured by the operator to do so. Allows for easier identification of the QPSK Bridge from the rear.
4	Craft Port	Standard female DB-9 RS-232 serial connector for direct or remote connection to the system's text-based, diagnostic and configuration menus.
5	RF Inputs	Eight QPSK demodulators, each with its own 75 Ω female F-connector. These connect to the external HFC plant.
6	RF Outputs	Two 75 Ω QPSK modulator ports. One female F-connector is for the High frequency range (70-1002 MHz); the other is for the Low frequency range (70-130 MHz). These connect to the external HFC plant.
7	GND	Ground screw for grounding the unit.

2

Installing the DAVIC QPSK Bridge

Introduction

This chapter provides procedures for installing the QPSK Bridge into a rack and for connecting the QPSK Bridge to other DBDS components. For detailed instructions on how to provision the QPSK Bridge on the DNCS, refer to the DNCS online help.

Important: The QPSK Bridge must be installed in the system headend before you can perform any calibration or provisioning.

In This Chapter

Installation Prerequisites

This section describes the rack, power, and operating temperature requirements for the QPSK Bridge.

Rack Requirements

The QPSK Bridge fits into a standard rack mount: type EIA RS-310.

CAUTION:
When installing the QPSK Bridge into a rack, be careful not to tangle or strain interconnecting cables.

Power Requirements

The QPSK Bridge requires a power source with the following specifications:

Item	Specification
Voltage	■ 48 VDC +20/-15% ■ 100-240 VAC model: 90 to 264 VAC (100 to 240 VAC power systems) **WARNING:** **Avoid damaging the QPSK Bridge and creating a possible fire hazard! Do not connect the QPSK Bridge to an incorrect power source.**
Power	< 175W
Connector Specifications	■ 48 VDC model: Three-position screw-cage clamp plug (Phoenix Contact 1804917 supplied with unit), with mating jack on unit. Recommended wire AWG is 12 maximum, 18 minimum. ■ 100-240 VAC model: Three-prong male socket
Line frequency (AC)	47 to 63 Hz (50 to 60 Hz power systems)

WARNINGS:

- **This product is for indoor use only.**
- **This product must be installed in accordance with all national and local building/electrical codes.**
- **The main disconnect for the AC powered unit is the line cord. The AC plug needs to be readily accessible or an alternate disconnect installed near the unit.**
- **The DC supply branch circuit should be fused for 20A or less. A power disconnect is required.**

Operating Temperature

The operating temperature of this equipment is 0 to 50°C (32 to 122°F).

CAUTION:

- **Avoid damage to this product! Your warranty is void if you operate this product above or below the maximums specified operating temperature.**
- **Avoid damage to this product! Your warranty is void if you install this product without proper ventilation.**

To help maintain the operating temperature in the acceptable range, follow these guidelines:

- Place the equipment in an air-conditioned environment
- Keep cooling vents obstruction-free

  Note: The intake vents are on the front panel. The exhaust vent is on the back panel.
- Maintain a cool temperature in your headends and hubs where the QPSK Bridges are in use.

Measure RF Output on Existing QPSK

Prior to installing the new D9485 QPSK Bridge, measure the RF output power levels on the QPSK modulator you are replacing. Then, after installing the new D9485 QPSK Bridge, use the front panel of the D9485 QPSK Bridge to match those output levels.

Unpack and Inspect the QPSK Bridge

This section provides the procedures for unpacking and inspecting the QPSK Bridge.

Carrier's Responsibility

We inspect and carefully pack all products before shipment. The carrier is responsible for safe shipping and delivery. Do not return products damaged in transit to us. If there are any missing parts or damage to the product, contact Cisco Services.

Note: Retain all boxes for future equipment shipping needs. They have been designed for use with this equipment.

Unpacking and Inspecting Procedure

Follow these steps to unpack and inspect the QPSK Bridge:

1. Review the safety precautions.
2. Inspect the shipping carton for visible damage.
3. Open the shipping carton.
4. Remove all packing material.
5. Inspect the product for visible damage.
6. Inspect the box or product for loose items that may indicate concealed damage.
7. Inspect for missing parts, using the packing slip as a guide.

Install the DAVIC QPSK Bridge into a Rack

This section describes the rack requirements and the procedure for installing the QPSK Bridge into a rack.

Rack Requirements

The QPSK Bridge dimensions are 1.75 inches high x 19.00 inches wide x 16.5 inches in diameter. The QPSK Bridge fits into a type EIA RS-310 rack mount.

CAUTION:

- **Do not to tangle or strain interconnecting cables.**
- **Be sure to install additional support.**

Installing the QPSK Bridge into a Rack

Follow these steps to install the QPSK Bridge into a rack:

1. Place the QPSK demodulator in the rack.
2. Insert a mounting screw through each of the four mounting holes on the attached angle support brackets of the QPSK Bridge and then into the rack.

3. Firmly tighten each mounting screw.

Important: When you use the attached angle support brackets, you can install the QPSK Bridges above or below each other in the rack. These support brackets provide additional support and allow correct air circulation through the unit and compensate for the additional weight of wire connectors and cabling.

Connect Power Sources

This section contains instructions for connecting the DC and AC power sources to the QPSK Bridge.

Connecting an Earth Ground

Complete the following steps to connect an earth ground to either the DC or AC versions of the QPSK Bridge.

> **CAUTION:**
> **When using the 48 VDC power supply, the product's ground terminal must be connected to an earth ground.**

1. Cut the appropriate length of ground wire (18 AWG minimum) to make the connection from the ground lug (marked with a ground symbol) to the electrical system protective ground.
2. Strip the wire and crimp on a #8 ring terminal, sized appropriately for the gauge of ground wire used. Attach in accordance with the manufacturer's instructions, using the correct tools.
3. Place the ring terminal and #8 lock washer on the ground lug and tighten with the provided nut.
4. Connect the other end of the ground wire to the electrical system protective ground using connectors and methods that are in accordance with national and local building/electrical codes.

Power Source Combinations

The QPSK Bridge may be operated with either of the following combinations of power supply:

- Dual AC
- Dual DC
- AC/DC

Important: Always operate the QPSK Bridge with the correct Cisco power supplies.

Connecting a DC Power Source

Complete the following steps to connect a DC power source to the 48 VDC QPSK Bridge:

1. Verify that the DC power source is set to the **Off** position.
2. Insert the wires from the DC power source into the screw-cage clamp plug. Use a small flat-blade screwdriver to tighten the screws at the top of the screw-cage clamp plug to secure the wires.

3 Insert the plug into the mating jack on the back panel of the 48 VDC power supply.

CAUTION:

Keep the DC power source set to the Off position until you are ready to power on the QPSK Bridge.

Connecting an AC Power Source

Complete the following steps to connect an AC power source to the 100-240 VAC.power supply:

1 Connect the power cord to the AC power inlet on the back panel of the 100-240 VAC power supply.

2 Connect the other end of the power cord to an AC electrical outlet.

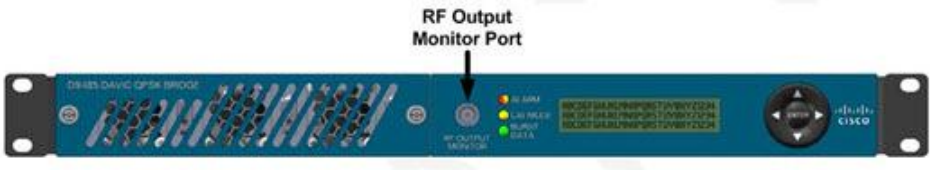
CAUTION:

The QPSK Bridge will power up immediately after the power cord is inserted into a live AC electrical outlet. Do not insert the plug until you are ready for unit operation.

Connect the Test Port (Optional)

The QPSK Bridge includes an RF Output Monitor port for monitoring the RF spectrum of the 'Low' RF Output port located on the back of the QPSK Bridge chassis. The Output Monitor port is a female BNC connector that outputs a -20 dB signal of the 'Low' RF Output port for diagnostic and troubleshooting purposes. This section describes the procedure for connecting to the RF Output Monitoring Port (optional).

1. Connect one end of the BNC coaxial cable to the RF Output Monitor port on the QPSK Bridge.
2. Connect the other end of the BNC coaxial cable to the desired monitoring equipment.



Connect the Craft Port (Optional)

The craft port on the QPSK Bridge is a standard female DB-9 RS-232 connector. Use the craft port to connect the QPSK Bridge to a diagnostic PC. This section describes the procedure for connecting the craft port.

Important: This port is for diagnostic use and is not designed to be connected for normal operation.

1. Connect the male end of a DB-9 data cable to the Craft (Diagnostics) port on the back of the QPSK Bridge.

   Note: The cable connection is straight-through.

2. Connect the other end of a DB-9 data cable to an available serial port on the diagnostic PC.

   Note: To maintain signal clarity and strength, do not use a cable longer than 50 ft.

3. Power on the PC and activate a ProComm or HyperTerminal window using the following modem connection settings:
   - 19200 baud
   - 1 stop bit
   - No parity
   - 8 data bits
   - No flow control

Connect the Ethernet Port

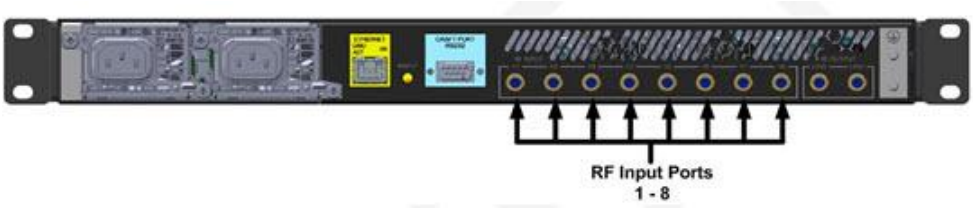
The Ethernet port on the QPSK Bridge is a standard female RJ-45 connector. Use the Ethernet port to connect the QPSK Bridge to the DNCS to obtain an IP address via BootP and configuration information via a downloadable file. The Ethernet port can also be used to view and change system information from a remote PC. This section describes the procedure for connecting to the Ethernet port.

1. Connect the male end of the Ethernet cable to the Ethernet port on the QPSK Bridge.
2. Connect the other end of the Ethernet cable to the DNCS or to another piece of network equipment (switch, router) that is connected to the DNCS via a network connection.

Important: While using external routing equipment in association with the D9485 QPSK Bridge, ensure that the external routing equipment is set to **autonegotiate mode**. Using half or full duplex mode may cause problems while communicating with the device.

Connect the RF Input Ports

The RF input ports connect the QPSK Bridge to the HFC network and to the DHCT upstream signal path using a 75 Ω RG-59 coaxial cable. There are 8 RF input ports on the QPSK Bridge. This section describes the procedure for connecting the RF input port.



1. Locate the RF input port on the back panel of the QPSK Bridge to which you want to connect.
2. Connect the male end of a 75 Ω RG-59 coaxial cable to the RF input port.
3. Connect the male end of the 75 Ω RG-59 coaxial cable to a RF signal splitter in the distribution plant (headend).

Note: If you are upgrading from the legacy D9494 Demodulator and D9482 Modulator, connect the RG-59 coaxial cable to the RF input port on the QPSK Bridge that corresponds to the 'Demodulator Interface port' on the modulator. Repeat for all demodulators being replaced.

Example: If the legacy demodulator (D9494) has its Network Data port connected to the Demodulator Interface #1 on the modulator, you will connect the RF coaxial cable connected to the RF input of the legacy demodulator (D9494), (from the demodulator) to the QPSK Bridge RF input #1.

Connect the RF Output Ports

The RF output ports connect the QPSK Bridge to the HFC network and to the DHCT downstream signal path, using a 75 Ω RG-59 coaxial cable. There are two RF output ports on the QPSK Bridge; one is for low frequency operation in the 70 – 130 MHz range to replace the functionality of the current D9482 modulator. The other is for high frequency operation in the 70 – 1002 MHz range for future use. This section describes the procedure for connecting the RF output ports.

1. Locate the RF Output port on the back of the QPSK Bridge labelled as "Low".
   Note: The Output Port labeled as "High" is for future use and may require a firmware update for operation.
2. Connect one end of the 75 Ω RG-59 coaxial cable to the 'Low' RF output port.
3. Connect the other end of the 75 Ω RG-59 coaxial cable to an RF signal splitter in the distribution plant (headend).

Note: If you are replacing the legacy D9482 modulator, remove the RG-59 coaxial cable from the RF OUT port on the modulator and connect it to the 'Low' RF output port on the QPSK Bridge.

Provision the QPSK Bridge on the DNCS

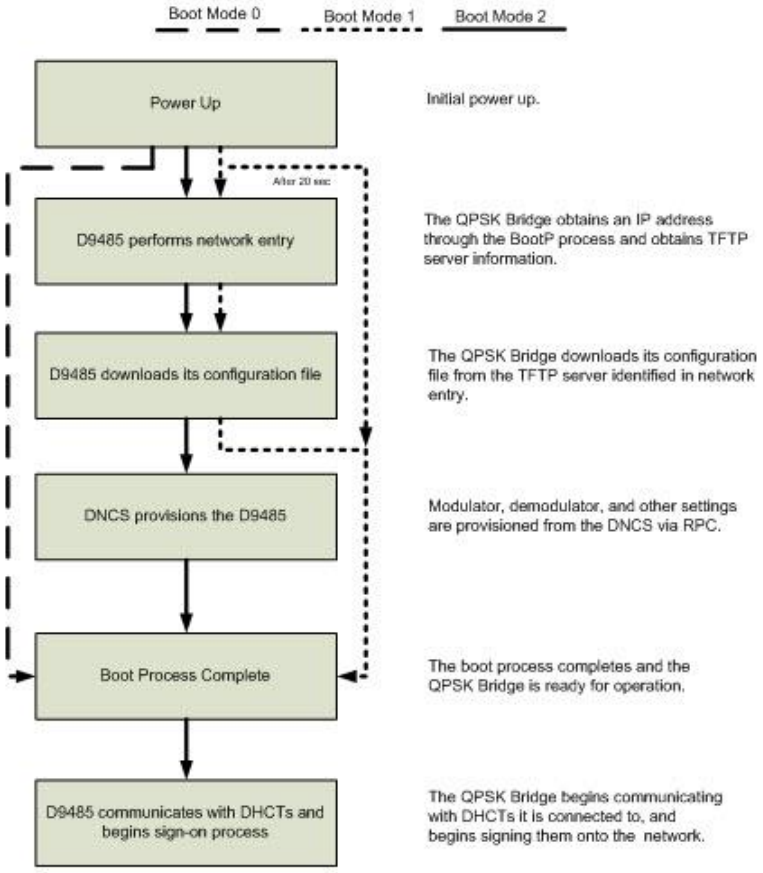
After you have installed and connected the QPSK Bridge, you must provision the QPSK Bridge on the DNCS. For detailed instructions on how to provision the QPSK Bridge on the DNCS, refer to the DNCS online help for your system release.

Power On the QPSK Bridge

After you have installed and connected the QPSK Bridge to your network, power on the device. The DNCS manages the QPSK Bridge and should provision it upon boot.

QPSK Bridge Boot Process

The following figure shows the boot process for the different boot modes available on the QPSK Bridge. Unless previously configured, the system will only be able to sign on DHCTs when configured in Boot Mode 2.



D9485 Boot Process

Important: Boot Mode 1 will attempt to obtain an IP address for 20 seconds before skipping that process and obtaining configuration from NVRAM.

Configuration File

The QPSK Bridge configuration file is an .xml file that is downloaded upon each boot from the TFTP server identified during the BootP process. The configuration file is used by the QPSK Bridge to configure settings that are required for normal operation. For any settings present in both the configuration file and through the DNCS provisioning process, the values in the provisioning process will take priority over the configuration file values. For more information regarding the QPSK Bridge configuration file, refer to ***QPSK Bridge Configuration File*** (on page 105).

Install the QPSK Bridge Software

1. Acquire the new QPSK code. Contact the representative who handles your account for assistance.
2. Open an xterm window on the DNCS as the **dncs** user.
3. Become the **root** user.
   ```
   su root
   ```
   Important: Do not use a dash in this command.
4. Get the current D9485 QPSK Bridge information.
   ```
   pkginfo -l SAIqpsk2
   ```
5. Remove any existing package instance of the new QPSK code.
   ```
   pkgrm SAIqpsk2
   ```
6. Insert the CD containing the QPSK code into the CD drive of the DNCS.
7. Enter **cd /cdrom0/cdrom** to change the working directory.
8. Begin the installation of the software.
   ```
   pkgadd -d .
   ```
   Note: Do not overlook the space and the period at the end of the command.
9. When prompted, select **SAIqpsk2**.
10. Upon completion, verify that the code was correctly installed on the DNCS.
    ```
    pkginfo -l SAIqpsk2
    ```
    Expected output:
    ```
    PKGINST:  SAIqpsk2
          NAME:  D9485 QPSK Modulator and Demodulator 10-21-13
      CATEGORY:  application
          ARCH:  SunOS_sparc
       VERSION:  1.2.13
       BASEDIR:  /tftpboot
        VENDOR:  Cisco Systems, Inc.
          DESC:  D9485 QPSK Modulator and Demodulator 10-21-13
        PSTAMP:  thor20131021103221
      INSTDATE:  Oct 21 2013 14:53
        STATUS:  completely installed
         FILES:        2 installed pathnames
                     31345 blocks used (approx)
    ```
    Note: The version information highlighted in blue reflects the installed version on the DNCS for the next generation of QPSK.
11. Change the working directory.
    ```
    cd /tftpboot
    ```
12. Open the qpsk2.xml file with a text editor.
13. Change the SSH, HTTP, and SNMP entries from **Disabled** to **Enabled**.

14 Save and close the file.

15 Complete these steps at the QPSK UI on the DNCS:

   a Select the appropriate QPSK, and then choose **File > Open** to open the QPSK's configuration information.

   b Verify that the configuration file name is qpsk2.xml.

   c Verify that **Database Persistence** is set to **On**.

   d Save your changes.

16 Choose **File > Reset** to reboot the QPSK.

17 Monitor the QPSK to be sure that it received the reboot request.

18 At the DNCS, open the /dvs/dncs/tmp/bootpd* file to verify that the QPSK has made a provision request.

   Note: The QPSK will reboot twice, once from the initial reboot request, and once more after the QPSK code has completed downloading to the QPSK.

Important: Before using the new D9485 QPSK Bridge, use the front panel to match the RF output power levels of the QPSK modulator that was replaced.

Install the QPSK Bridge ISO Image

1 Transfer the QPSK ISO image file to the /tmp directory of the DNCS.

   Notes:

   - If transferring via FTP, be sure that the transfer is done in binary mode.
   - Confirm file ownership and permissions.

2 Log in to the DNCS using Telnet or SSH.

3 Switch to the **root** user.

4 Are you replacing existing QPSK Bridge software on the DNCS?

   - If **yes**, then back up the existing qpsk2.xml file:

     a Change to the /tftpboot directory:
     ```
     cd /tftpboot
     ```

     b Back up the existing qpsk2.xml file:
     ```
     cp qpsk2.xml qpsk2.xml.old
     ```

   - If **no**, continue with step 5.

5 Return to the /tmp directory:
```
cd /tmp
```

6 Type the following command and press **Enter** to create a loopback device for the ISO image:
```
lofiadm -a <full path to iso file> /dev/lofi/1
```
   Note: The last character is the number 1.

   Example: `lofiadm -a /tmp/QPSK2-1.2.16.iso /dev/lofi/1`

7 Mount the device as /mnt:
```
mount -o ro -F hsfs /dev/lofi/1 /mnt
```

8 Change to the /mnt directory:
```
cd /mnt
```

9 Type the following command and press **Enter** to install the QPSK Bridge software:
```
install_pkg SAIqpsk2
```
10 Type **y** and press **Enter** at the confirmation message.

11 After verifying the successful installation, type the following command and press **Enter** to exit from the /mnt directory.
```
cd /tmp
```
12 Type the following command and press **Enter** to unmount the image:
```
umount /mnt
```
13 Type the following command and press **Enter** to remove the device:
```
lofiadm -d /dev/lofi/1
```

3

Operating the DAVIC QPSK Bridge

Introduction

This chapter provides operational information for user interfaces which include the web interface, the console port interface, and the LCD interface. This chapter shows how to access your QPSK Bridge, navigate the front panel LCD, view system information, and make changes to your systems configuration. Changes made to the configuration using these interfaces can be so that they persist across reboots.

In This Chapter

QPSK Bridge User Interfaces

Interfacing with the QPSK Bridge can be accomplished both remotely and while directly connected with a PC. Remote connectivity is achieved through the RJ-45 Ethernet port located on the back panel of the chassis, while direct connectivity is achieved over the RS-232 console port located on the back panel of the chassis or through the front panel LCD.

Remote Connectivity

Accessing the QPSK Bridge over a network is a convenient way of accessing your QPSK Bridge remotely. In order to do this, the unit must have gained network access and obtained an IP address via a BootP server. Once a network IP address has been obtained, remote connectivity to your QPSK Bridge can be done in two different ways.

- **SSH —** Provides access to the text-based shell menu. An SSH client is required in order to access this menu and will allow you to view device information, statistics, and also perform configuration and maintenance functions.
- **Web GUI (WebUI) —** Provides access to a web-based point-and-click system of menus. A web browser client is required to access this interface and allows you to view device information and statistics, as well as perform basic maintenance functions.

  Important: Mozilla Firefox Versions 14 and 15, Microsoft Internet Explorer Version 9, and Google Chrome Versions 21 and 22 have been tested in conjunction with the QPSK Bridge. Newer versions of these Web browsers can also be used.

Direct Connectivity

When in the proximity of the QPSK Bridge, you can connect directly to the chassis RS-232 console port. This port provides a serial connection to the text-based shell menu. Very similar to SSH connectivity, a terminal emulation client is required in order to access this menu. It will allow you to view device information and statistics, and also perform configuration and maintenance functions.

1. Connect a computer running terminal emulation software (such as Hyper Terminal) to the RS-232 port on the back of the D9485 QPSK Bridge.
2. Using your terminal emulation software, create a new connection and select the COM port to which your RS-232 cable is connected.
3. Specify the following connection settings:
   - Baud Rate — 19200
   - Data — 8
   - Parity — N
   - Stop — 1
   - Flow Control — No

All configuration functions that can be accomplished over the serial connection can also be accomplished through the SSH connection.

Front LCD

The front panel LCD allows you to change the configuration of the QPSK Bridge and reset the admin password, if forgotten. No special tools are required to use this interface. Navigation buttons are present on the front panel to navigate the menus, make changes, and commit changes. For more information on the front panel LCD, see ***LCD Interface*** (on page 67).

QPSK Bridge Shell Menu

The shell menu on the QPSK Bridge has a simple text-based menu system navigated using numerical entries. Regardless of how you connect to the text-based shell menu (RS-232 or SSH), the same basic functions can be performed. This section outlines the different menus that can be accessed, and the functions you can perform while connected to this interface.

Sort and Filter

Some menus within the shell menu allow you to sort and/or filter data. Filtering is useful when searching for a specific string or piece of information, while sorting is useful to help re-organize a table in a fashion which best suits you.

To sort data, type **s** in the **Enter Option** field in the shell menu and follow the onscreen commands to sort a table. You can sort multiple columns in ascending or descending order.

To filter data, type **f** in the **Enter Option** field in the shell menu and follow the onscreen commands. You can sort data in a table by column and then filter by specific text or numbers. When filtering text, note that the text is case sensitive.

Additionally, some menus now have a jump function that allows the user to jump to any page of the list or log. There is also a "bottom" function that allows the user to go to the last page of the list or log.

Making Changes

Some menus will allow you to make configuration changes to the QPSK Bridge. If you are able to make a change or to perform a function, an option number will be located on the left of the table or widget that you can reference.

Enter the option number to modify, then follow the on-screen instructions to commit a change. If a change is no longer desired, simply leave the entry blank and the value will remain at the current value.

Note: Any changes that you make in this interface are automatically saved.

Initial Login

The first time you connect to the text-based shell menu, you will be prompted for a login and a password. The default login credentials are:

Login: D9485_admin

Password: MAC address of the D9485 unit, with colons

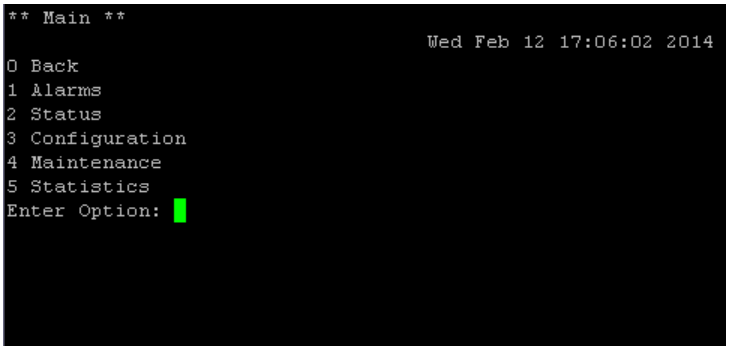
You will be asked immediately to confirm the password, and then to change the password to something other than the MAC address of the unit.

Important: When changing the password for the first time, there are a few security guidelines that must be followed while picking the new password.

- Cannot be the MAC address of the unit
- Must contain at least 8 characters
- Must contain at least three of the following:
  - Upper-case letter
  - Lower-case letter
  - Number
  - Symbol

Make note of your new admin password for future reference. If you forget the password, it can be set to a new temporary value using the LCD interface.

Important: If the LCD interface is locked, you cannot recover a lost password. Once the password is changed, you will be presented with the Main menu screen, as shown in the following figure:

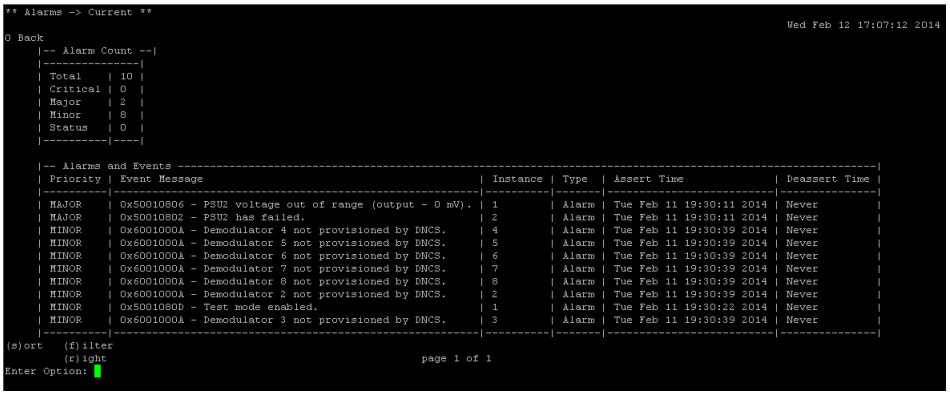


From this Main menu, you can access all other shell menus. For quick reference, the current time is located at the top right of every menu.

Alarms

The Alarms menu provides you with a list of the alarms that are currently active on the QPSK Bridge, and also a record of all past and present alarms.

Alarms are categorized according to severity. The severity levels from highest to lowest are Critical, Major, Minor, and Status. Each alarm menu has a total count of alarms and lists each severity level, as shown in the following figure:



History

This menu provides a list of all alarms that have been raised (and cleared) since the last reboot. Even if an alarm is cleared, it will show up in this list.

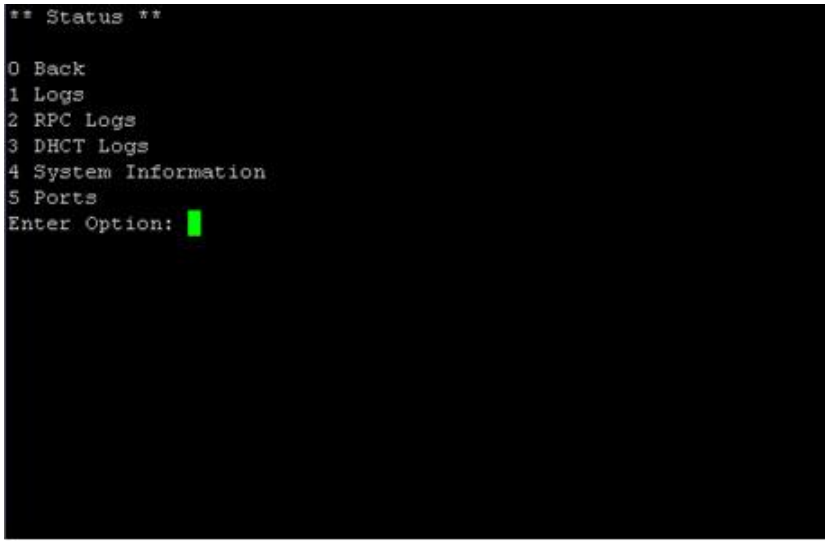
Current

This menu provides a list of all alarms that are currently active on the QPSK Bridge. Once an alarm is cleared, it will no longer show in this menu. The following table describes each column in this menu.

Column	Description
Priority	Displays the severity level of each alarm.
Event Message	Displays an alarm code and a short description of what caused the alarm.
Instance	Displays the instance of hardware in which the alarm has occurred. (1-8 if related to a demodulator, 1-2 if related to power supply, and so on.)
Type	Displays the type of event. In this menu, they are all alarms.
Assert Time	Displays the time and date when the alarm was asserted.
De-Assert Time	Displays the time and date when an alarm was cleared.

Status

The Status menu provides detailed insight into the current state of the OPSK Bridge.



1. Logs

This menu shows all log messages for the QPSK Bridge. Any event or alarm that occurs will be logged in this list, along with the time and date at which it occurred. Processes are also logged.

Note: During the boot process, log messages will show a timestamp of "Jan 1" until the actual date and time are received from the DNCS as part of the provisioning process.

2. RPC Logs

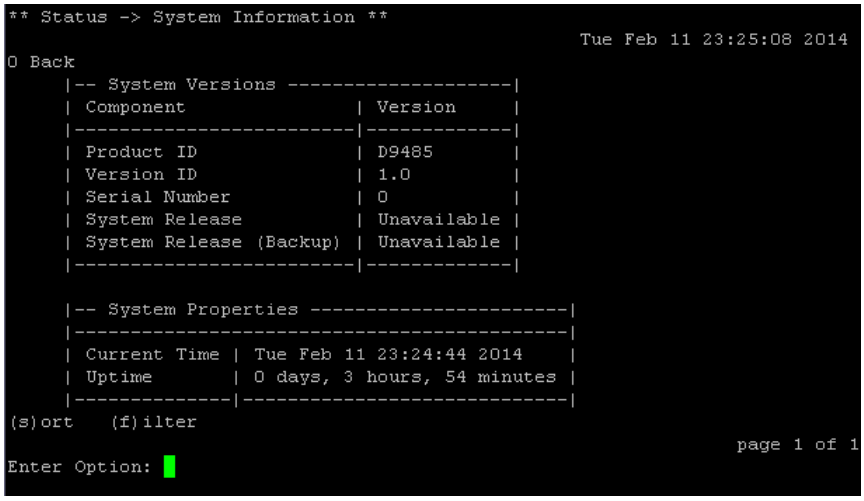
This menu shows all log messages as they relate to the RPC transactions. This refers to any communication between the QPSK Bridge and an RPC server. Each log message is time-stamped.

3. DHCT Logs

This menu shows all log messages between the QPSK Bridge and any DHCTs that it has provisioned. Each log message is labeled with the MAC address of the DHCT to which it pertains, along with a timestamp of when the event occurred.

4. System Information

This menu shows basic system information about the QPSK Bridge and how long your system has been running since the last reboot.



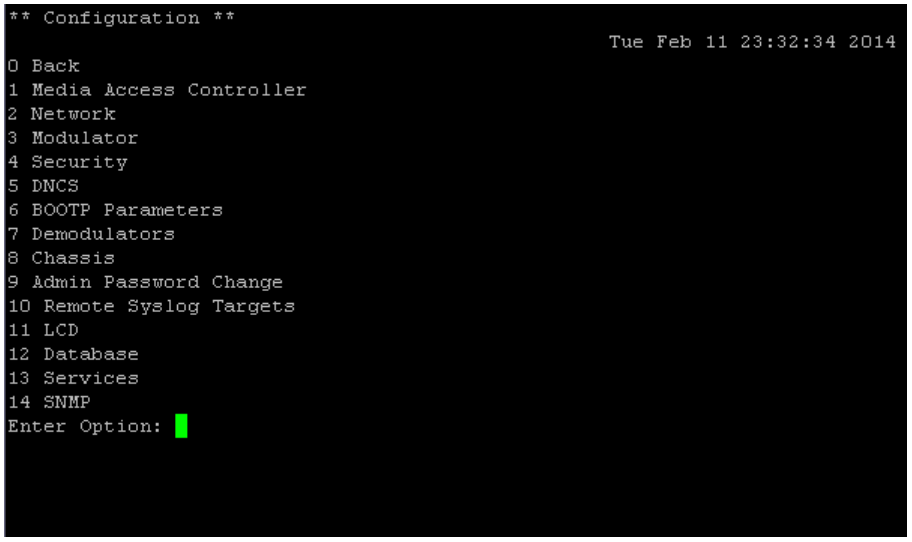
5. Ports

This menu shows all of the TCP and UDP ports that are open on the QPSK Bridge and their related processes.

Column	Description
Proto	Lists the protocol IP of the port
Local Address	Lists the IP address of the port on the QPSK Bridge
Remote Address	Lists the IP address to which the port is connected
State	Lists the active state of each open port
Process	Describes what type of a process is occurring on each port

Configuration

The Configuration menu provides you with the ability to change the configured parameters of the QPSK Bridge. When making changes, you must be aware that some configuration parameters are managed by the DNCS. Any changes made locally will be overwritten by the DNCS when the device is provisioned.



1. Media Access Controller

This menu allows you to configure various elements related to the MAC. This menu allows you to modify the following parameters:

- **Virtual Path Identifier (VPI)** - The VPI is used to identify the virtual circuit used by the DNCS to identify a unique QPSK Bridge. This can be modified to be any number between 0 and 255.
- **Service Frequencies** - The Service Frequency is the upstream frequency (or RDC) at which the QPSK Bridge tells the DHCTs to transmit data. This is a frequency between 5 MHz and 42 MHz and should correspond to the frequency of the associated demodulator. The backup frequency is used as an alternate service frequency should a change in network variables require a frequency change. Typically, these values are the same.
- **DAVIC Ranging** – This is the process of adjusting the transmitted power and timing delay for DAVIC messages from a DHCT for optimal performance. This functionality can be enabled or disabled for all DHCTs.
- **DAVIC Broadcast Messages** – Allows you to set the rate at which DAVIC broadcast messages are sent downstream to connected DHCTs. This can be used to reduce the amount of DHCT sign-on traffic.

- **Power Levels** – Allows you to set the upstream power levels (RDC) for the DHCTs.
  - The Acceptable minimum and maximum values are the worst case power levels of a DHCT as measured by a QPSK Bridge demodulator.
  - Target maximum and minimum values are the values of the ideal power levels of a DHCT as measured at a QPSK Bridge demodulator.
  - The DHCT maximum and minimum values are the transmission power levels as measured at the upstream port of a DHCT. The range of these values may depend on the model of DHCT.
- **Modulator Fiber Distance Setting** – Allows you to select the maximum node distance. This setting is configured per QPSK Bridge and affects all DHCTs connected to all demodulators. This value changes the timing delay between the DHCT and the QPSK Bridge. The range is from 0 km to 248 km, in 31 km increments.

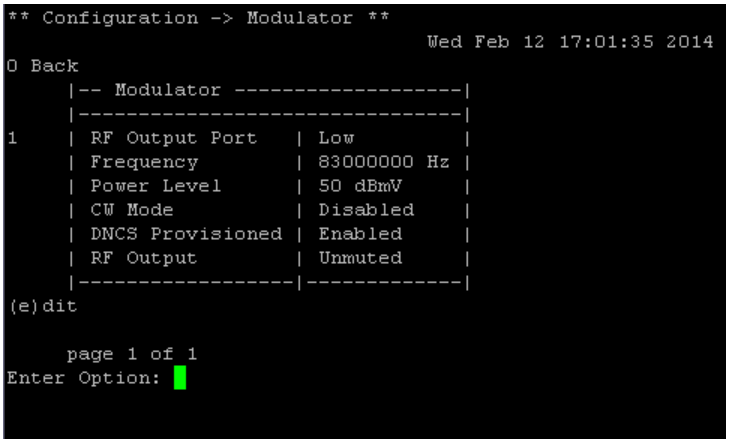
2. Network

This menu provides information about the IP networks to which the QPSK Bridge and DHCTs are connected, including its own MAC address and IP address, and the IP information of the DHCT network.

- **Data Routing** - Describes the different data types flowing through the QPSK Bridge and their destination locations as defined by the DNCS. The QPSK Bridge will treat each data type uniquely and pass the data along to the DHCTs it serves. These data flows can be edited through this menu; however, it is recommended that changes to these data flows take place through the DNCS.
- **DHCT Network** – Displays the base IP address and subnet mask for the network to which all DHCTs are connected.

3. Modulator

This menu shows the characteristics of the QPSK modulator output port(s), as shown in the following figure:



- **RF Output Port –** This field will always display "low" indicating the Low frequency RF port. Currently, only the Low Frequency RF output port is configurable on the QPSK Bridge. The High Frequency Output port is reserved for future use.
- **Frequency –** The output frequency of the RF Output port. Range is from 70 MHz to 130 MHz in 0.25 MHz steps.
- **Power Level –** The power level of the RF Output port. Range is from 50 dBmV to 60 dBmV. The default power level is 60 dBmV.
- **CW Mode –** This shows the status of the CW (continuous wave) mode for the RF Output Port. When enabled, the output will be a carrier only, at the pre-set frequency. To enable CW Mode, see the section on **CW Mode** under the ***Maintenance*** (on page 47) heading.

  Note: There is no downstream traffic (FDC) when this is enabled.
- **DNCS Provisioned –** Used to display/configure DNCS provisioning for this modulator.
- **RF Output –** Used to display the status of the RF Output port. When set to muted, there is no RF output.

4. Security

This menu is used to display/configure RADIUS authentication, as shown in the following figure:

- **Server –** This displays the IP address of the configured RADIUS server.
- **Secret –** This displays the password that the QPSK Bridge uses to authenticate with the RADIUS server.
- **Timeout –** This displays the timeout period before the QPSK Bridge will no longer attempt to get a password from the RADIUS server.
- **Enabled –** This displays the status of the RADIUS server. When set to 'no', the QPSK Bridge will not attempt to authenticate with the RADIUS server.

5. DNCS

This menu displays the RPC server IP information for the QPSK Bridge. There are four RPC servers with which the QPSK Bridge communicates under normal operation. The RPC Connection Parameters table is shown in the following figure. Each RPC server can be configured through this menu to an IPv4 address.

```
** Configuration -> DNCS **
                                  Wed Feb 12 17:47:49 2014
0 Back
     |-- DNCS Connection Parameters --|
     |--------------------------------|
1    | HCT RPC Server   | 10.253.0.1 |
     | MGR RPC Server   | 10.253.0.1 |
     | ALARM RPC Server | 10.253.0.1 |
     | STATS RPC Server | 10.253.0.1 |
     |------------------|------------|
(e)dit

     page 1 of 1
Enter Option:
```

6. BOOTP Parameters

This menu displays the BOOTP parameters for the QPSK Bridge. This menu displays BOOTP information from the last boot. This information is not configurable on the QPSK Bridge; it must be configured on the BOOTP server (typically the DNCS). The BOOTP Parameters table is shown in the following figure:

```
** Configuration -> BOOTP Parameters **
                                                  Wed Feb 12 17:46:51 2014
0 Back
     |-- BOOTP Parameters ------------------------------------|
     |-----------------------------------------------------------|
     | BOOTP Server           | 10.253.0.1                       |
     | BOOTP Filename         | /galianoconfig_no_upgrade.xml    |
     | QPSK Gateway           | 172.25.0.254                     |
     | QPSK Server            | 172.25.0.5                       |
     | QPSK Subnet            | 255.255.255.0                    |
     | Hops from BOOTP Server | 2                                |
     |------------------------|----------------------------------|

                                                          page 1 of 1
Enter Option:
```

7. Demodulators

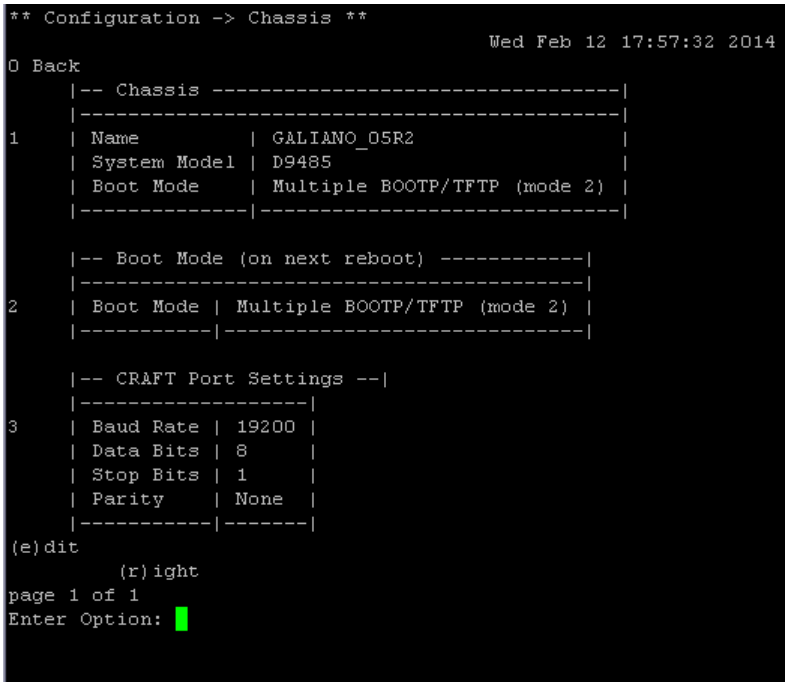
This menu displays the configuration settings for the eight QPSK demodulators in the QPSK Bridge. From this menu, you can enable/disable any demodulator and also modify the tuning frequency and attenuation of each demodulator. The Demodulator menu is shown in the following figure:

```
** Configuration -> Demodulators **
                                                                  Wed Feb 12 17:45:24 2014
0 Back
     |-- Demodulator ------------------------------------------------------------------|
     | Number | DNCS Name | Frequency (Hz) | Attenuation | DNCS Provisioned | DNCS Enabled |
     |--------|-----------|----------------|-------------|------------------|--------------|
1    | 1      | NODE15A   | 11000000       | 0 dB        | Enabled          | Enabled      |
2    | 2      | UNKNOWN   | 5000000        | 0 dB        | Disabled         | Disabled     |
3    | 3      | UNKNOWN   | 5000000        | 0 dB        | Disabled         | Disabled     |
4    | 4      | UNKNOWN   | 5000000        | 0 dB        | Disabled         | Disabled     |
5    | 5      | UNKNOWN   | 5000000        | 0 dB        | Disabled         | Disabled     |
6    | 6      | UNKNOWN   | 5000000        | 0 dB        | Disabled         | Disabled     |
7    | 7      | UNKNOWN   | 5000000        | 0 dB        | Disabled         | Disabled     |
8    | 8      | UNKNOWN   | 5000000        | 0 dB        | Disabled         | Disabled     |
     |--------|-----------|----------------|-------------|------------------|--------------|
(s)ort   (f)ilter   (e)dit
                                                          page 1 of 1
Enter Option:
```

Column	Description
Number	Identifies the demodulator.
DNCS Name	Name given to a DHCT node by the DNCS. Each demodulator is connected to a single DHCT node.
Frequency	Frequency to which the demodulator is tuning. This is the upstream frequency (or RDC) on which the DHCTs are transmitting. Tuning range is 5 MHz to 42 MHz.
Attenuation	Internal attenuation of each demodulator. Ideal power level at the input to the demodulator is 0 dB. The attenuation can be increased if the average receive level is higher than 0 dB. Each demodulator can be adjusted to have the following attenuation: 0 dB, 8 dB, 16 dB, or 24 dB.
DNCS Provisioned	Describes whether or not the demodulators are provisioned by the DNCS.
DNCS Enabled	The functioning state of each demodulator. When enabled, the demodulator is on and ready to receive upstream data (RDC). When disabled, the demodulator is off and will not receive data.

8. Chassis

This menu displays information about the chassis, its craft (serial) port settings, and its configured boot mode. The Chassis menu is shown in the following image:



From this menu, you can:

- Change the name of the chassis. The name of the chassis must be human-readable, and can contain numbers (0-9), letters (a-z, A-Z), an underscore "_", and a dash "-".
- Change the boot mode for next reboot. The different boot modes are:
  - **NVRAM (mode 0)** – Will use configuration information saved to NVRAM. The QPSK Bridge will not obtain an IP address, download a configuration file, or obtain provisioning from the DNCS. Any previous changes made to the system will be saved in NVRAM.
  - **Single BOOTP/TFTP (mode 1)** – Will attempt to obtain an IP address and configuration file for 20 seconds, and then default to using the configuration information saved in NVRAM. The QPSK Bridge will not attempt to obtain provisioning from the DNCS.
  - **Multiple BOOTP/TFTP (mode 2)** – Will continually attempt to obtain an IP address and configuration file until it is successful.

You can also change the CRAFT Port baud rate from this menu. Baud rates can be set to 9600, 19200 (default), 38400, 57600, or 115200.

Important: Changes to the baud rate are instantaneous if made through SSH or LCD. If logged into the CRAFT Port interface and the baud rate is changed (either through a SSH connection or the LCD) the CRAFT Port session will automatically be terminated to apply the new settings.

9. Admin Password Change

This menu allows you to change the D9485_admin user account password. The rules for creating a new password are the same as for changing the password on initial login:

- Cannot be the MAC address of the unit
- Must contain at least 8 characters
- Must contain at least one of each of the following
  - Capital letter
  - Lower case letter
  - Number
  - Symbol

10. Remote Syslog Targets

This menu displays the Syslog servers that have been configured for the QPSK Bridge. You can add and delete Syslog servers from this menu.

11. LCD

This menu allows the front panel LCD Interface to be locked or unlocked. When locked, pressing the buttons on the front panel of the QPSK Bridge will not allow you to navigate or alter any configuration settings on the unit. Additionally, a MINOR alarm is raised when the front panel LCD is locked.

12. Database

This menu allows the user to clear the DHCT database on the QPSK Bridge upon a reboot. When set to mode zero (0), the STB database will be cleared on the next reboot and all DHCTs connected to the QPSK Bridge will need to sign on again. When set to mode one (1), the STB database will persist across reboots and DHCTs will not be required to sign on again. The default mode for this menu is mode zero (0).

13. Services

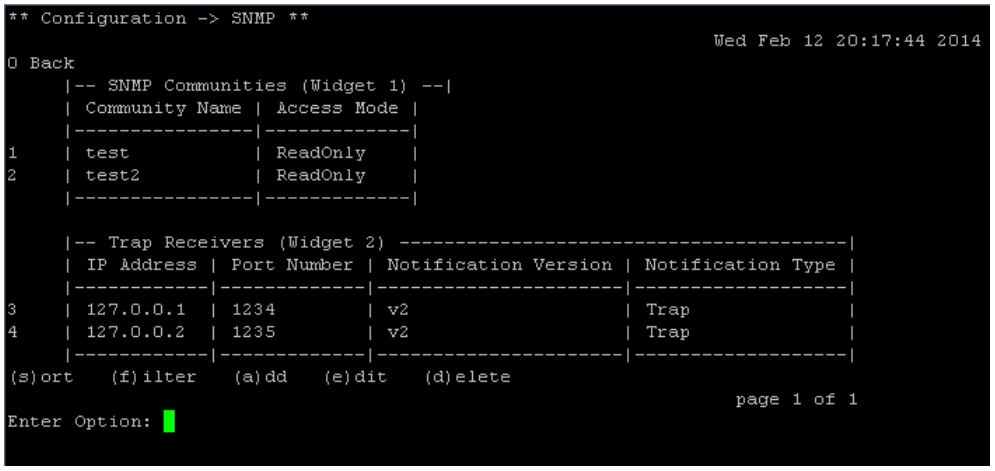
This menu displays the status of all QPSK Bridge network services (except RPC) and allows you to enable/disable services.

Note: All user interface network services (SSH, HTTP, SNMP) are disabled by default.

- SSH – Provides remote access to the text-based shell menu.
- HTTP – Provides remote access to the WebUI.
- SNMP – Provides SNMP access.

14. SNMP

This menu displays the SNMP configuration of the QPSK Bridge and also allows you to change the SNMP communities and/or add/remove SNMP trap receivers. The QPSK Bridge can have up to five trap receivers. See ***QPSK Bridge Configuration File*** (on page 105) for more information on configuring SNMP communities and trap receivers through the configuration file. The following figure shows the SNMP menu:



The following data describe each of the tables in the SNMP menu:

SNMP Widget 1 Descriptions

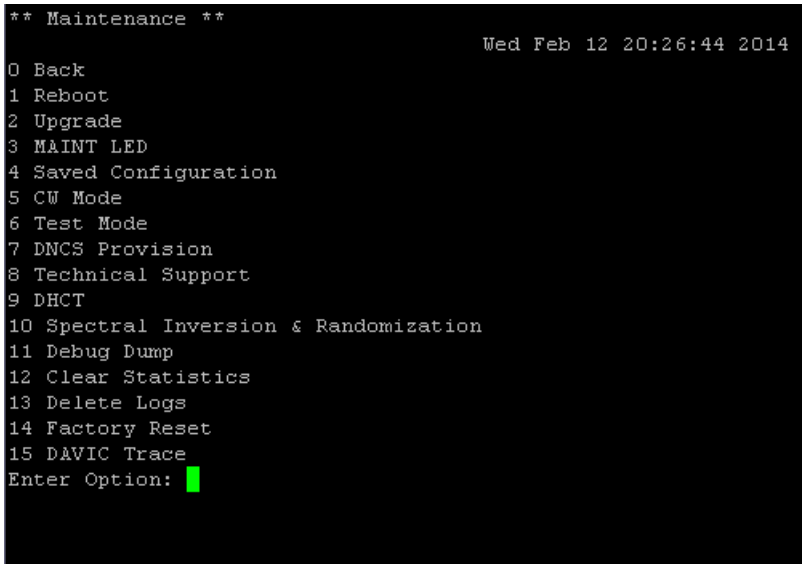
Column	Description
Community Name	The name of the SNMP Community the QPSK Bridge is to join. This can only be edited through the configuration file.
Access Mode	Can be set 'read only' or 'read / write'.

SNMP Widget 2 Descriptions

Column	Description
IP Address	IPv4 address of the SNMP trap server. This can only be edited through the configuration file.
Port Number	Port of the IP address of the SNMP trap server.
Notification Version	SNMP version: v2 or v3.
Notification Type	■ **Trap** – Sets receiver as a trap receiver. ■ **Inform** – Sets receiver as a information receiver. ■ **Disabled** – Disables the SNMP trap receiver.

Maintenance

The maintenance menu provides you with the ability to directly perform maintenance functions on the QPSK Bridge. Some maintenance functions under this menu can only be performed while accessing the shell menu, while others can also be accessed through the WebUI.

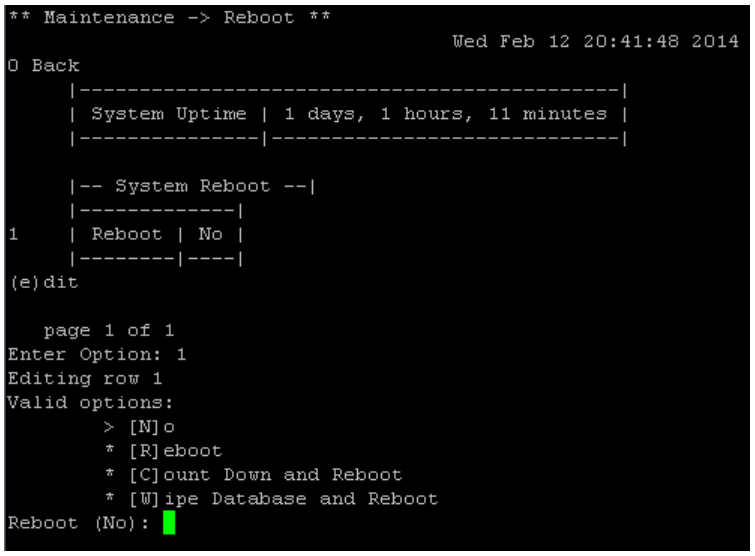


1. Reboot

This menu displays the System Uptime and also allows you to perform system reboot functions. While in this menu, there are four options.

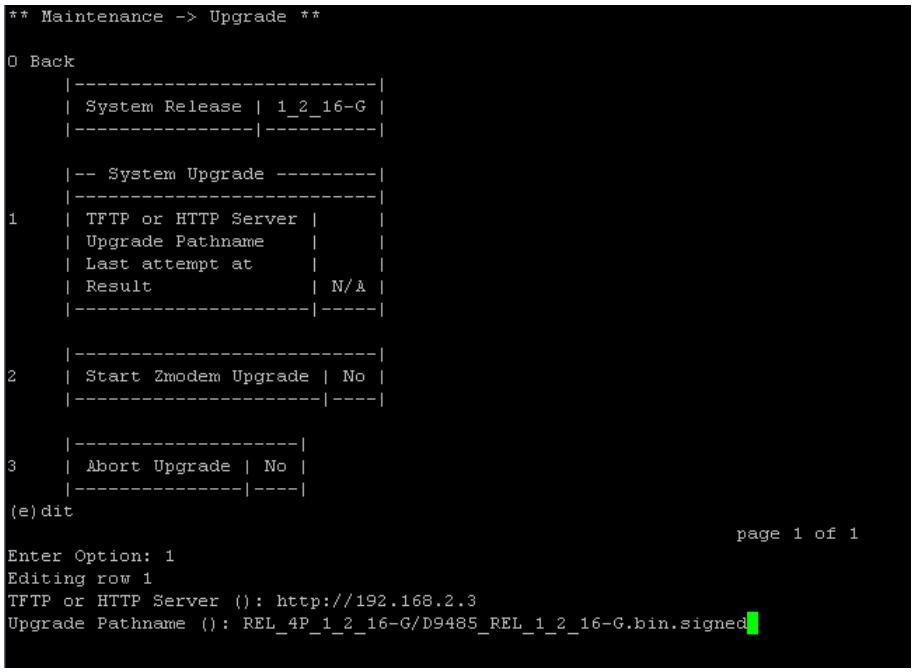
Option	Description
No	Does nothing and takes you out of the Reboot menu.
Reboot	Instantly reboots the QPSK Bridge.
Count Down and Reboot	Reboots the system after a 10-second timer.
Wipe Database and Reboot	Instantly reboots the QPSK Bridge and clears the DHCT database.

The Reboot menu is shown in the following illustration:



2. Upgrade

This menu allows you to perform a remote system upgrade, either through TFTP or HTTP file transfer, or through a local serial connection and a Z-modem file transfer. Upgrade file names must begin with “D9485”. The upgrade menu is shown in the following figure:



For more information on upgrading the QPSK Bridge, see ***Upgrading the QPSK Bridge*** (on page 75).

3. Maint LED

This menu allows you to toggle the maintenance LED on the back of the QPSK Bridge on and off. This is typically used to physically identify a specific QPSK Bridge that requires maintenance.

Note: The maintenance LED will turn on during the boot process.

4. Saved Configuration

This menu shows the last time that the system configuration was automatically saved to the NVRAM. Once a configuration has been saved, it will load upon successive reboots and will remain static until another change is made on the system. All changes made on the QPSK Bridge are automatically saved.

5. CW Mode

This menu allows you to enable or disable Continuous Wave (CW) mode on the output port of the QPSK Bridge. CW mode is disabled by default. While enabled, the output will be a continuous wave at a constant frequency and amplitude. RF Output port is always 'Low'.

6. Test Mode

Test Mode is used for advanced trouble-shooting with Tier 3 support personnel. Activating Test Mode will provide Tier 3 support personnel with more in-depth resources for troubleshooting your QPSK Bridge. Test Mode is disabled by default. To enable test mode, complete these steps:

1. Contact Cisco Services to ensure that Test Mode is required to be activated.
2. Display an Activation Request key in the shell menu.
3. Copy and paste the entire Activation Request key, including the header and footer information, into an email to Cisco Services. Cisco Services will use this key to generate an Activation Key.
4. Cisco Services will provide the Activation Key to you to enable Test Mode. You will have five attempts to enter the Activation Key correctly, before a new Activation Request key is required.

   Important: This "password" is only valid for 48 hours from the time the Activation Key is generated. After 48 hours, a new Activation Request key will need to be generated and provided to Cisco Services.

Test mode will remain enabled until it is disabled.

7. DNCS Provision

This menu contains information on the last time the QPSK Bridge was provisioned, as well as the IP address of the system.

8. Technical Support

This menu provides basic information for contacting Cisco Services. An example of this information is shown in the following figure:

9. DHCT

The DHCT menu allows you to query any DHCT that is connected to the QPSK Bridge by requesting a DAVIC Status Message or pinging the DHCT IP address.

- To request a DAVIC Status Message, enter the MAC address of the DHCT you wish to query. The response from the DAVIC status request can be found in the DHCT logs (**Status > DHCT Logs**).
- To ping a DHCT, enter the IPv4 address of the DHCT you wish to ping. The QPSK Bridge will ping the DHCT four times and display the results of the query in the Shell window. A list of DHCT IPv4 addresses can be found in the **Statistics > DHCT** menu.

10. Spectral Inversion and Randomization

This menu allows you to invert the upstream (RDC) and downstream (FDC) data channels and also pick an upstream and downstream randomizer sequence. The randomizer can be either Cisco proprietary, or SCTE-55. The default settings are upstream and downstream spectral inversion disabled and Cisco proprietary randomizer.

Important: If you modify these settings to something other than the default, it will result in a failure to communicate with most Cisco DHCTs.

11. Debug Dump

The debug dump is a snap-shot of the state of the QPSK Bridge and contains very detailed information about its processes. It is extremely useful and often required for any troubleshooting with Cisco Services. The debug dump menu allows you to generate and save a debug dump on a network TFTP server. To generate a debug dump:

1 Enter the entire path and filename of the location on the TFTP server to save the debug dump file. If only a filename is given, the debug dump is to be saved in the root directory of the TFTP server.

Note: The system provides a default filename, but not a default path.

2 Enter the IP address of the TFTP server for which the debug dump is to be saved.

While the debug dump is being generated, its status will be presented in this menu. The QPSK Bridge will remain fully operational while the debug dump is being generated.

Note: A debug dump can also be generated via the WebUI. For more information on how to generate a debug dump through the WebUI, see ***QPSK Bridge Web Interface*** (on page 60).

One debug dump can be generated at any given time. A new debug dump that is generated will overwrite any previously generated debug dump that is stored on the system. Debug dumps do not persist across a system reboot.

12. Clear Statistics

This menu allows you to individually clear the statistics for the modulator, demodulator, and DHCTs. Statistics that are cleared will be instantaneously reset and a log message will be created.

13. Delete Logs

This menu allows you to delete and clear all of the system logs messages from the Shell menu. This includes the logs, DHCT logs, and RPC logs. Once deleted, these logs messages cannot be recovered by the user.

14. Factory Reset

A system wipe will erase all configuration data, system logs, the DHCT database, and will also clear the D9485_admin password. When complete, the system will automatically reboot and you will be required to connect to the Shell menu to change the D9485_admin password. See ***Initial Login*** (on page 35) for more details on setting a password.

15. DAVIC Trace

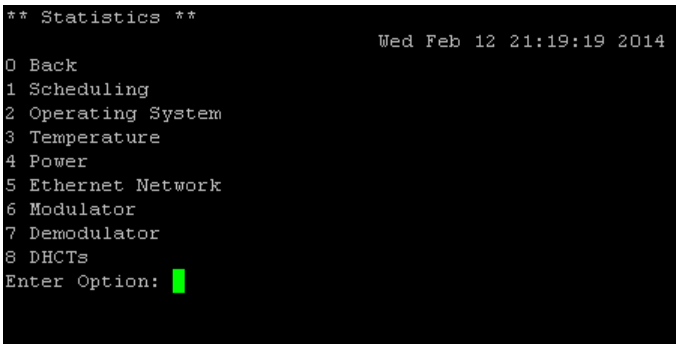
This menu allows for the trace of specific DAVIC messages. By enabling a message type, those messages will appear in the DHCT logs for all DHCTs signed onto the QPSK Bridge. Each message type can be enabled/disabled individually.

Note: The settings of this menu are not stored in system memory and will be disabled after a reboot.

Important: DAVIC Trace can be CPU-intensive and is intended for informational and troubleshooting purposes. We recommend that DAVIC Traces not be enabled indefinitely.

Statistics

The Statistics menus display information about the QPSK Bridge and its operational statistics. These menus provide an overall picture of the health of the QPSK Bridge and can be used to help diagnose any issues that may arise from normal operation. Each sub-menu provides in-depth statistics about a different element of the QPSK Bridge.



1. Scheduling

The Scheduling menu displays information and statistics about demodulator slot timing and scheduling. This menu also describes the rate at which ranging slots are received at the QPSK Bridge.

- **Demodulator Slot Allocations** describes the rates at which contention and reservation slots are occurring on a per demodulator basis. This table also shows how many contention and reservation slots occur, on average, per frame.
- **Demodulator Reservation Requests** provides statistics on how many reservation slots are requested and granted per demodulator.
- **Demodulator Reservation Latency** describes the delay between a DHCT requesting a reservation slot and being granted a reservation slot.

2. Operating System

The Operating System menu displays tables containing system resource statistics, such as Disk, Memory, and CPU usage. There is also a Load table that displays the average system load and a count of the number of processes currently running on the QPSK Bridge.

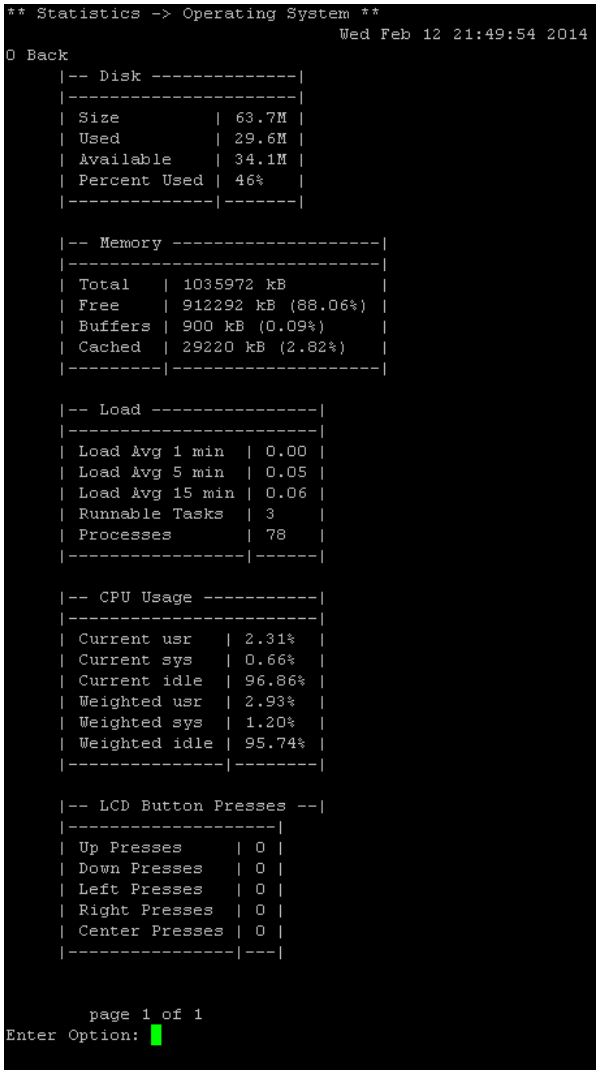
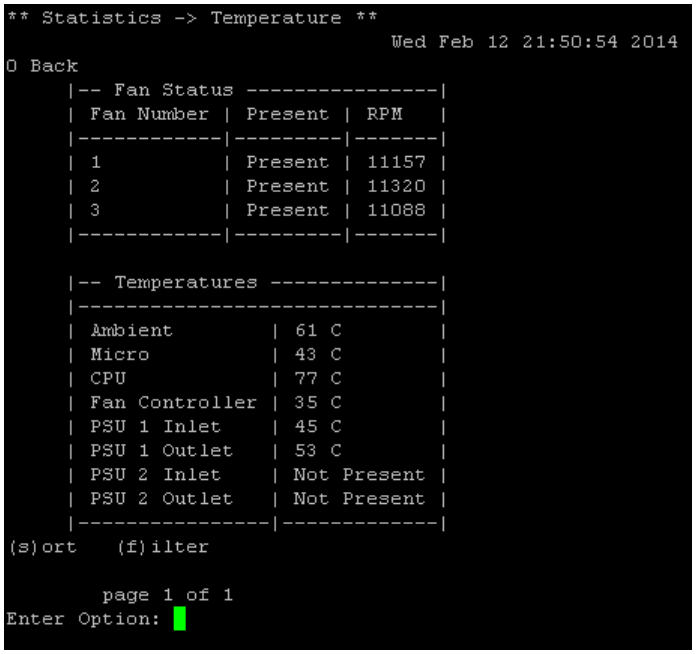


Table	Description
Disk	Displays the amount of NVRAM system storage being used by the system, and how much is free.
Memory	Displays the system RAM memory usage.
Load	Displays the system load statistics and an active process count.
CPU Usage	Displays CPU usage statistics by user, system, and idle.

Table	Description
LCD Button Presses	Displays the number of times each of the LCD navigation buttons have been pressed.

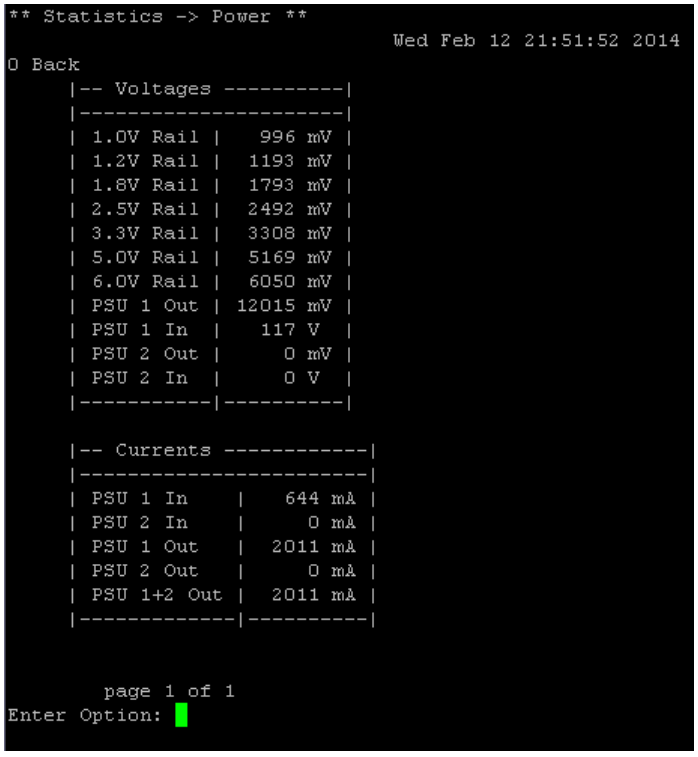
3. Temperature

The Temperature statistics menu displays information about the system's temperature and related elements. This includes the fan speed of the three front fan modules and temperature statistics from the internal temperature sensors. The temperature statistics menu is shown in the following figure.



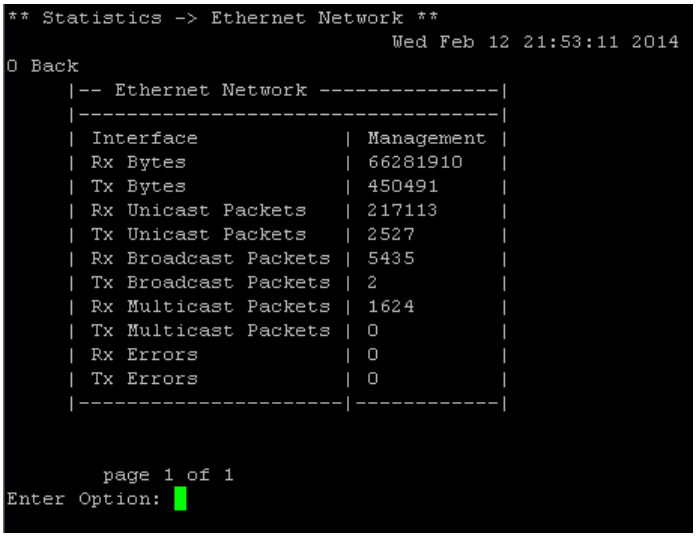
4. Power

The Power statistics menu displays the input and output power statistics of the QPSK Bridge, including currents and voltages. The voltage rails are the internal voltages of the QPSK Bridge that are used to power the various components within the unit.



5. Ethernet Network

The Ethernet Network statistics menu displays the total number of packets that are sent and received over the Ethernet Management interface, located on the rear panel of the QPSK Bridge. The receive (Rx) and transmit (Tx) errors can be useful in troubleshooting connectivity issues with the unit. The Ethernet Network Statistics menu is shown in the following figure:



6. Modulator

The Modulator statistics menu displays the health of the Low RF output port. It displays various statistics related to the functions of the QPSK Bridge. The following table describes the three tables located in this menu.

Table	Description
Overview	■ Total number of DHCTs connected to the QPSK Bridge. ■ The state of the Low QPSK modulator. **Notes:** – **Good** means that there are no known problems with the modulator. – **Not Present** means that the system does not detect a modulator. – **Failover Event** means that the modulator has internally detected a major problem. – **Muted** means that the output of the modulator is muted and is no longer transmitting. – **Software Error** means something went wrong contacting the modulator. – **General Error** means that there is an unknown issue with the modulator. ■ Total number of Extended Super Frames sent to the DHCTs.

Table	Description
Transmitted Cells	■ Total number of cells transmitted in the FDC. ■ The average number of cells transmitted in a 50 ms period calculated over a one minute window. ■ The peak number of cells transmitted in a 50 ms period over a one minute window. ■ The total number of cells dropped due to oversubscription of the FDC.
Transfer Rates	Displays the total amount of data traffic as well as a breakdown of different data types transmitted from the DNCS to the DHCTs over the FDC.

7. Demodulator

The Demodulator Statistics menu displays information about the eight QPSK demodulators located on the rear panel of the QPSK Bridge. This menu provides information on each demodulator itself, as well as the DHCTs that are connected to the QPSK Bridge. Descriptions of each table located in this menu can be found below.

- **Total Received Cells –** Provides in-depth statistics about the total number of cells received across all eight demodulators and includes a breakdown of all AAL5 errors, packet drops, and buffer overflows. In a healthy network, all values in this table should be close to zero, except the number of received cells.

  Notes:

  - **Unknown VPI –** Packet received with unexpected VPI value, such as an STB not in the database. Cells discarded.
  - **Number Received —** Total number of cells received on all demodulators.
  - **HEC Correctable Errors –** Number of cells received with corrected HEC errors. Uncorrectable HEC cells are dropped.
  - **HEC Uncorrectable Errors –** Number of cells received with uncorrectable HEC errors.
  - **LLDMA Packet Drops –** Number of MAC packets received but discarded due to LLDMA buffer overflow.
  - **Received Buffer Overflow Errors –** Number of input ATM cells discarded due to input buffer overflow.
  - (**AAL5) CRC Errors –** Packet reassembly failed due to CRC error. Packet discarded.
  - **(AAL5) Time-out Errors –** Packet reassembly failed due to too long a spacing between received cells. Packet discarded.
  - **(AAL5) Abort Errors –** Packet reassembly failed due to receiving the AAL5 abort indicator. Packet discarded.

- **(AAL5) Length Failure** - Numbers of times a packets fails reassembly due to an incorrect length in the AAL5 trailer when reassembly is attempted. The packet is discarded.
- **Total AAL5 Errors —** The sum of all AAL5 errors.

- **DHCTs –** Provides a breakdown of the total number of DHCTs that are connected to each demodulator, with a further breakdown of how many DHCTs have their status pending. A DHCT with its status pending has not sent a status response to the QPSK Bridge.
- **Cell Counts –** Shows the total number of cells, by demodulator, that have been received. A further breakdown of the number of peak, average, good, bad, and erroneous cells is also given.

  Notes:
  - **Peak** - The highest number of cells received in a 50 ms window over the last 1 minute window.
  - **Average** - Total number of cells received in the last 1 minute window.
  - **Bad** - Number of cells received with an uncorrectable number of errors.
  - **One Error** - Number of cells received with one error corrected by FEC.
  - **Two Errors** - Number of cells received with two errors corrected by FEC.
  - **Three Errors** - Number of cells received with three errors corrected by FEC.
  - **Total Good** - Number of cells received with no errors.
- **Counts by Slot Type –** Shows a breakdown of the total number of each type of cell that is received by each demodulator. This table also shows the total number of errors of each type of cell on a per demodulator basis.
- **Power and Timing –** Shows the power and timing measurements for each demodulator.

Column	Description
Demodulator ID	Identifies each demodulator on the QPSK Bridge.
Last Power	The power of the last cell received at the demodulator.
Current Average Power	The average power of all cells received.
Maximum Power in Last 24 H	The highest power level of any cell received within the last 24 hours.
Minimum Power in Last 24 H	The lowest power level of any cell received within the last 24 hours.
Last Arrival Time	The amount of time after the start of the framing window at which the start of the last packet was received on the demodulator.

8. DHCTs

The DHCT statistics menu shows a summary of the state of all DHCTs connected to the QPSK Bridge along with detailed statistics for each individual DHCT. The following table describes the detailed statistics.

Column	Description
MAC Address	Unique physical address of the DHCT.
VCI	Virtual Circuit Identifier of the DHCT.
IPv4 Address	The IP address assigned to the STB by the DNCS.
Demodulator	Identifies the physical demodulator (1-8) to which the DHCT is connected on the QPSK Bridge.
State	Describes the operational state of the DHCT.
Last Arrival Time	The amount of time after the start of the framing window at which the start of the last packet from the DHCT was received on the demodulator.
Slot	The slot of the frame (1-9) through which the DHCT is communicating.
Maximum Power	The maximum RF power of a cell arriving from the DHCT, as measured at the demodulator. Range is between +31.75 and -32 dBmV.
Last Power	The RF power of the last cell arriving from the DHCT, as measured at the DHCT. Range is between +31.75 and -32 dBmV.
Good Cells	Total number of cells that had either no errors or correctable errors.
Bad Cells	Total number of cells that had uncorrectable (>3) errors.
0 Error Cells	Total number of cells that had 0 errors.
1 Error Cells	Total number of corrected cells that had 1 error.
2 Error Cells	Total number of corrected cells that had 2 errors.
3 Error Cells	Total number of corrected cells that had 3 errors.

QPSK Bridge Web Interface

The Web Interface on the QPSK Bridge is a system of point-and-click menus used to view system information and statistics. The information in these menus is the same as the information that is available through the Shell menu; however, it is presented in a more user-friendly manner.

While using the Web interface, you cannot configure the QPSK Bridge as can be done with the Shell menu. Basic maintenance functions can be performed, but that is the extent of user interaction with the device. This section will describe the Web Interface, its layout, and its functionality.

Important: Prior to using the Web Interface, ensure that HTTP is enabled. Choose **Configuration > Services**.

Connecting to the Web Interface

To connect to the QPSK Bridge's Web interface, point your web browser to the IP address of the QPSK Bridge.

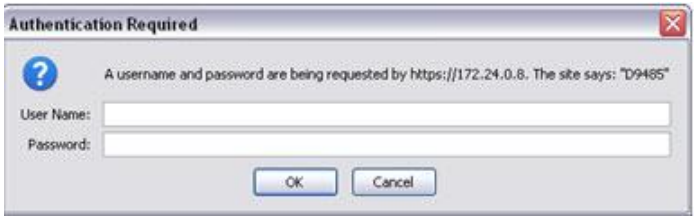
Note: Supported Web browsers are Mozilla Firefox Versions 14 and 15, Microsoft Internet Explorer Versions 9, and Google Chrome versions 21 and 22. Newer versions of these Web browsers can also be used.

The QPSK Bridge uses a security certificate to authenticate itself. Depending upon the web browser used to connect to the QPSK Bridge, different security warnings may appear. You will be asked to accept the QPSK Bridge's security certificate in order to continue and access the Web Interface.

An example of the FireFox security warning follows:

After clicking **Add Exception…**, another window appears. Click **Confirm Security Exception** to proceed to the login window, as shown in the following figure:

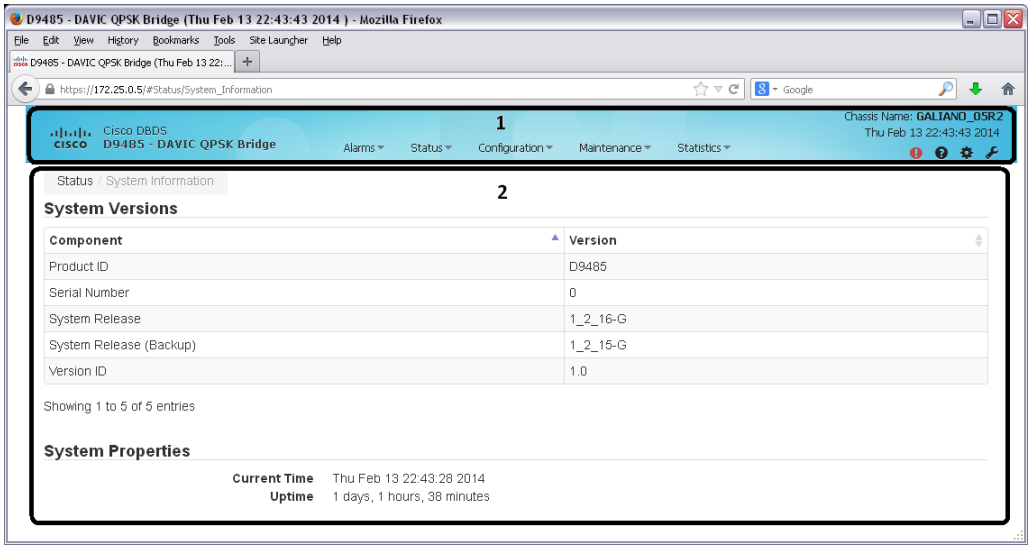
The login window will authenticate that you have permission to access the QPSK Bridge's data and statistics. The credentials (username and password) are the same credentials that are used to access the QPSK Bridge via the Shell menu. The default login is **D9485_admin** and the password is a user-configured password.



Important: Prior to accessing the Web Interface, initial login must occur through the Shell menu so that the default password can be changed and the web service enabled. See ***Initial Login*** (on page 35).

Using the Web Interface

Once successfully logged in to the QPSK Web interface, you are presented with the System Information menu as shown in the following figure:



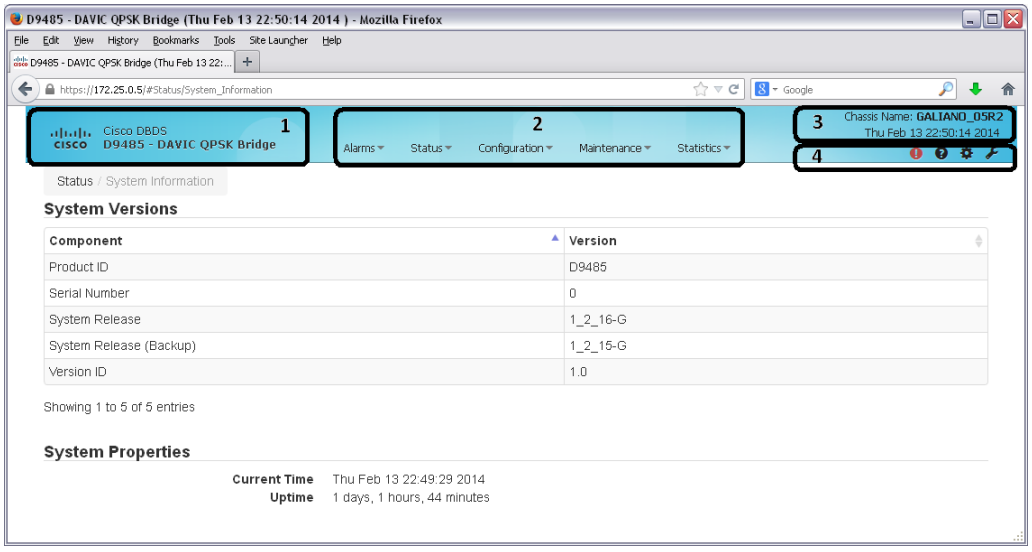
The Web interface is broken into two main areas:

1 **Navigation Pane** – Provides a tool for navigating the Web interface to obtain information about the QPSK Bridge.

2 **Information Pane** – Displays information relevant to the menu you have selected in the QPSK Bridge Navigation Pane.

Navigation Pane

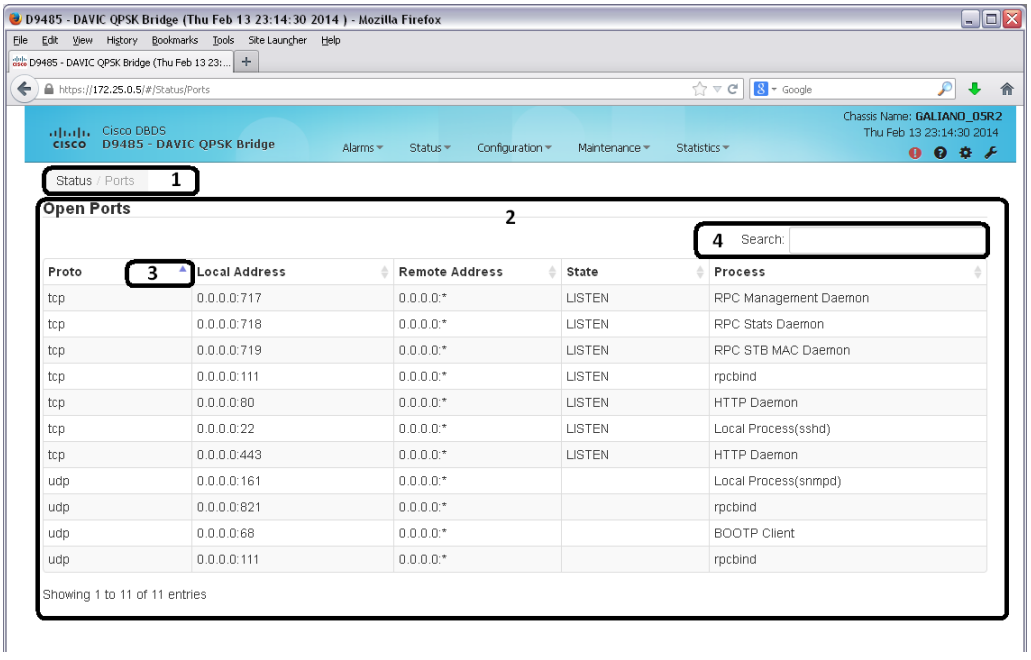
The Navigation Pane can also be broken into different areas, as shown in the following figure:



Area	Name	Description
1	Cisco device information	Shows the Cisco device model number and logo. Clicking on the Cisco logo will take you to the Cisco.com homepage.
2	Data and Statistics Menus	These menus display various types of information about the QPSK Bridge. Clicking on a menu will produce a drop-down list with more options.
3	Chassis Name	Displays the chassis name you set up.
4	Quick Buttons	Provides a quick access to specific information and also the current time and date. ■ Provides quick access to the Current Alarms menu ■ Provides a pop-up list showing technical support information. ■ Provides quick access to the Debug Dump generation menu. ■ Provides quick access to the Maintenance LED menu.

Information Pane

The Information Pane displays the data within each of the Data and Statistics menus.



Following are descriptions of the four areas of the information pane:

1 **Menu Path** – This path helps you locate where within the menus the information in area 2 is being displayed.

2 **Information and Statistics** – This is the main area of the Information Pane. It displays all of the data/statistics for the currently selected menu. This area may contain tools for sorting and filtering the data displayed.

3 **Sort –** Clicking the top of some columns will sort that column. You can sort in either ascending or descending order. Not all menus have columns that can be sorted.

4 **Search Filter –** In this field, you can search for a specific string of text. The results from any search will automatically be displayed as you type in the entry. Not all menus contain the search option.

Data and Statistics Menus

The menu system in the Web interface follows the same structure as the menu system for the Shell menu. All of the information displayed in the Web interface is pulled from the same locations within the QPSK Bridge as the Shell menu. For additional information on the Data and Statistics menu, see ***Statistics*** (on page 52).

Note: The SNMP MIB file for the QPSK Bridge can be downloaded at any time by choosing **Configuration > SNMP**.

Maintenance

The Maintenance menu in the Web interface is very limited in the actions that can be performed. There are two sub-menus under the Maintenance menu:

- MAINT LED
- Debug Dump

Both sub-menus perform the same function as their Shell menu counterparts.

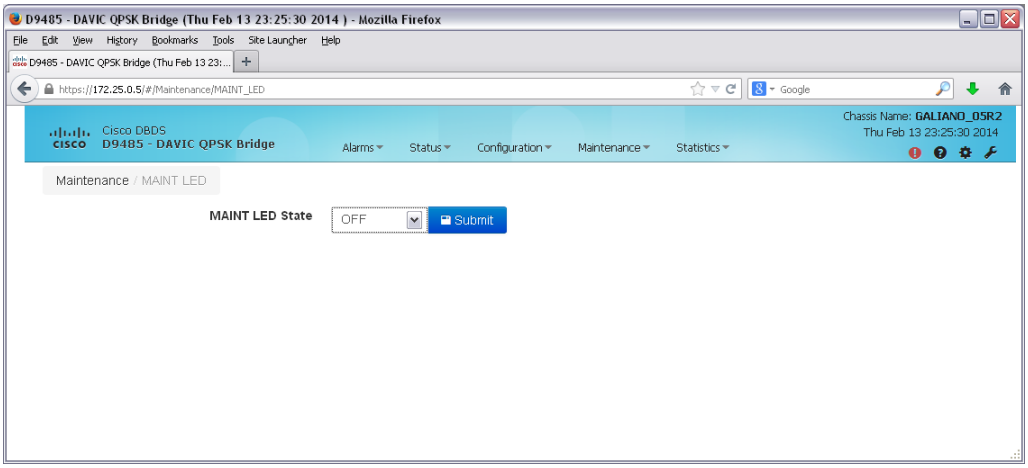
MAINT LED

The maintenance LED is an LED located on the rear of the QPSK Bridge and is used to help locate a specific QPSK Bridge when many are racked together. This is typically turned on to identify a unit that requires maintenance to be performed (for example, power supply or fan replacement). The maintenance LED can be turned on and off through the WebUI by following these steps:

1 Select the MAINT LED State to which you wish to set the LED from the drop-down list.

2 Click **Submit**.

After you click **Submit**, a green banner indicator, as seen in the following figure, should appear to indicate that the command was successful. A log message will also appear to show that the MAINT LED state was set to 'ON'.



Debug Dump

A debug dump that is generated through the Web interface provides the exact same information as a debug dump generated through the Shell menu. It is a snapshot of the state of the QPSK Bridge and includes all alarms, log messages, and other detailed information about the operational state of the device. For quick access to a debug dump, the Web interface is often the best option.

To obtain a debug dump through the Web Interface:

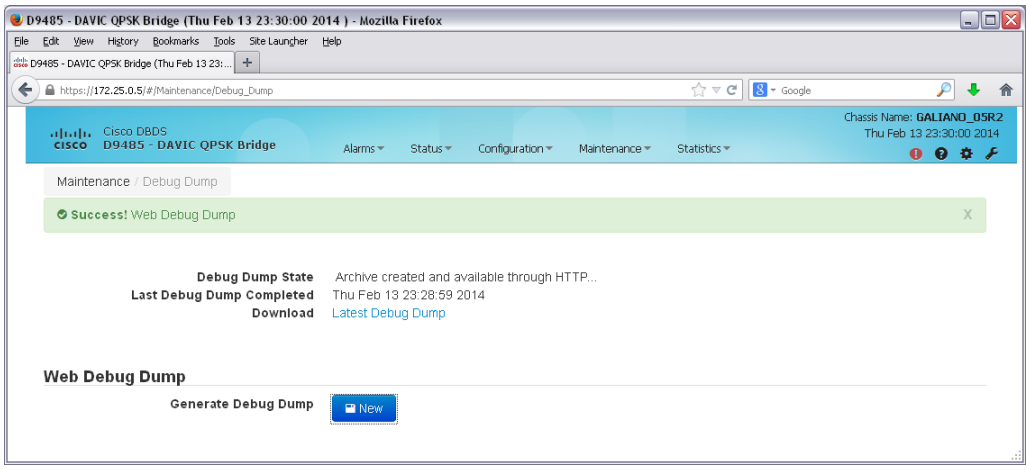
1. Generate a new debug dump by clicking **New**.

   Note: The Debug Dump State will change multiple times until the debug dump has been generated. This takes a few minutes.
2. Download the debug dump from the QPSK Bridge by clicking on the web link provided next to the **Download** heading. The file is a tarball (.tgz) and will require an archiving tool to decompress.

Note: Not all files within the debug dump will be able to be opened and read. Some files are encrypted for Cisco Services' use only.

After a debug dump has been successfully generated, there will be a timestamp of when the debug dump was **Last Completed**, and a green banner at the top of the page indicating that the changes have been successfully submitted.

The following figure shows the outcome of a successful web interface debug dump:



LCD Interface

The LCD interface, located on the front of the QPSK Bridge, is a digital LCD display with accompanying navigation buttons. It provides access to a series of menus used to gather information and change configuration settings on the QPSK Bridge. Changes made through the LCD interface are instantaneous and require physical access to the device. To prevent access, you can lock the LCD interface through the Shell menu.

Using the LCD Interface

The LCD interface is shown in the following figure. It consists of a 192 x 32 pixel screen and a directional button pad with an **Enter** button located in the center.

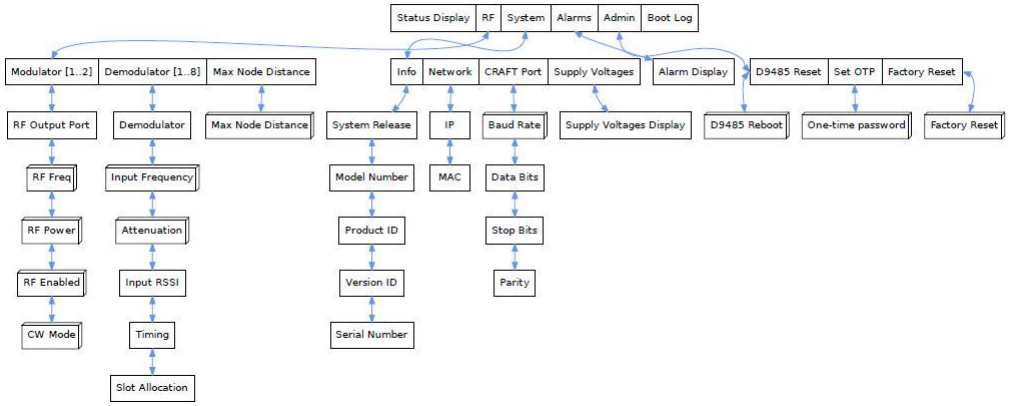
The LCD interface is navigated with the directional button pad and the **Enter** button. Status items are broken down into related categories and some can be modified using the directional buttons. The directional buttons allow you to scroll through a list of selectable items or trigger an event within the system. Any changes that you make using the front panel are automatically saved.

There are three types of nodes in the LCD menu system:

- **Menu Node –** Top level menu that provides access to other menus, display nodes, and configuration nodes.
- **Display Node –** Displays system configuration information, but cannot be modified through the LCD interface.
- **Configure Node –** Allows you to make configuration changes.

Navigational Chart

Following is a high-level navigational chart for the LCD Interface menu system. The legend in the following figure shows which blocks (or groups of blocks) are which types of nodes in the navigational chart:



The following table describes the actions of the directional pad for each node type:

Node	Left/Right Arrows	Up/Down Arrows	Enter/OK
Menu	Move to previous/next heading in same menu level.	Traverse up/down in menu hierarchy. Moving up from the top-most level of the menu hierarchy will enter the default display. Moving down from a "leaf" node will enter the display nodes for the current view.	Same as Down key.
Display	Return to Menu navigation	Move to previous/next item in display node list.	Enters CONFIG mode for the selected display node, if applicable.
Configure	Return to DISPLAY mode without committing changes	Select previous/next allowable value for the configurable field.	Start configuration action or indicate acceptance of change of configuration.

When on a configure node, the configuration list, once selected by the **Enter** key, allows you to scroll through a list, using the ▲and ▼ keys, of configuration values for the node. If a new value is desired, the **Enter** key is pressed while the new value is displayed and the focus returns to the display item name. To back out of selecting a new value the ◄ or ► key can be used to return focus to the display item name. Each Modulator and Demodulator has its own menu heading, and its numeric identifier will appear in each associated Display node.

Status Display Node

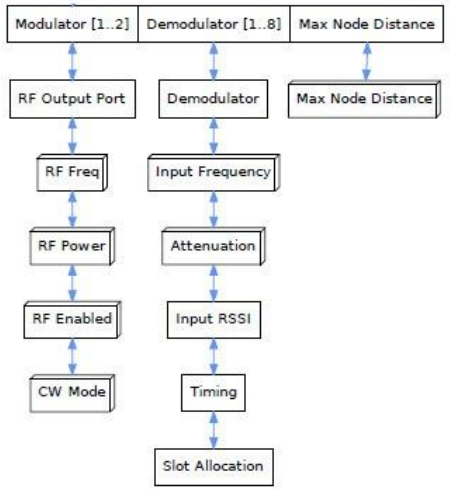
The Status Display node is the QPSK Bridge's default LCD screen and displays basic information about the QPSK Bridge. The Status Display is shown in the following figure:

```
CISCO_D9485

RF Output: 97.00 MHz 50.00 dBmV
Primary Service Freq: 11.00 MHz
```

RF Node

The RF node allows you to change the RF characteristics of the modulators and demodulators on the QPSK Bridge. To access this node, press the ◄ and ► arrow keys until RF shows on the LCD. Then, press **Enter**.



From this top Menu node, you can scroll through the different RF characteristics to configure the following nodes:

- **Modulator [1…2] Node** – Allows you to configure the Low RF output port.

Node	Node Type	Description	Value
RF Output Port	Display	Displays the selected RF Output port.	Low only
RF Freq	Configure	Allows you to set the RF Output Frequency.	70 – 130 MHz 0.25 MHz steps
RF Power	Configure	Allows you to set the RF Output Power.	50 – 60 dBmV 1 dBmV steps

Node	Node Type	Description	Value
RF Enabled	Configure	Allows you to enable / disable the Low RF Output port.	Enable – Disable
CW Mode	Configure	Allows you to enable / disable CW Mode.	Enable – Disable

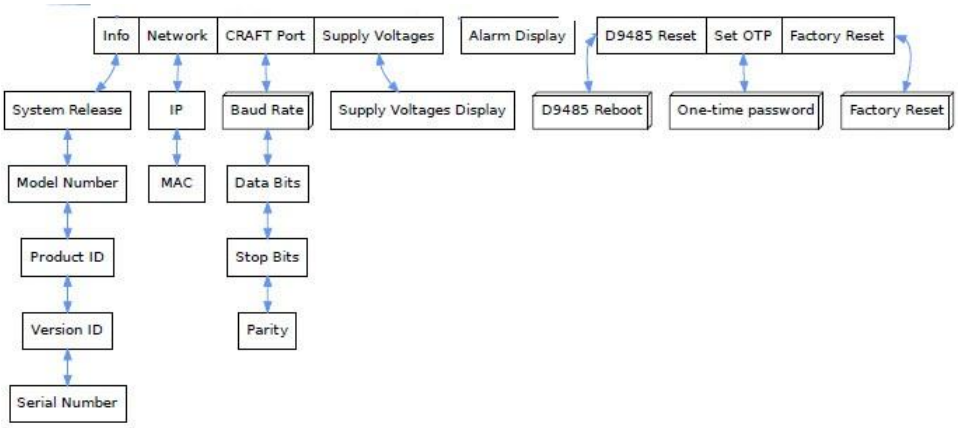
- **Demodulator [1…8] Node** – Allows you to configure demodulators 1 – 8.

Node	Node Type	Description	Value
Demodulator	Display	Displays the selected demodulator.	1 – 8
Input Frequency	Configure	Allows you to configure the selected demodulator input frequency.	5 – 42 MHz 1 MHz steps
Attenuation	Configure	Allows you to set the attenuation at the selected demodulator.	0, 8, 16, 24 dB
Input RSSI	Display	Displays the signal strength of the last received cell on the selected demodulator.	dB
Last Arrival Time	Display	Displays the number of nanoseconds since the start of the frame that the last cell on the selected demodulator arrived.	0 – 999999 ns
Slot Allocation	Display	Displays the total number of receive time slots used on the demodulator, relative to the total number of receive time slots available.	percentage

- **Max Node Distance Node** – Allows you to configure the maximum node distance, that is, the furthest distance from the QPSK Bridge to a group of DHCTs assigned to a demodulator. The Max Node Distance is configurable between 0 – 248 km, with a 31 km step size.

System Node

The System node displays information about the QPSK Bridge itself, its IP network, Craft port, and supply voltages. The baud rate for the Craft port is the only element that can be configured from within this node. To access this node, press the ◄ and ► arrow keys until System shows on the LCD. Then, press **Enter**. The following figure provides a closer look at this node:



- **Info Node –** Displays system information about the QPSK Bridge.

Node	Node Type	Description	Value
System Release	Display	Displays the system software version currently running on the QPSK Bridge.	1_X_Y
Model Number	Display	Displays the model number of the QPSK Bridge.	D9485
Product ID	Display	Displays the product ID of the QPSK Bridge.	D9485

- **Network Node –** Displays basic network information about the QPSK Bridge.

Node	Node Type	Description	Value
IP	Display	Displays the QPSK Bridge's IP address.	www.xxx.yyy.zzz
MAC	Display	Displays the QPSK Bridge's MAC address.	aa:bb:cc:dd:ee:ff

- **CRAFT Port Node –** Displays the settings required to connect to the QPSK Bridge's RS-232 CRAFT port.

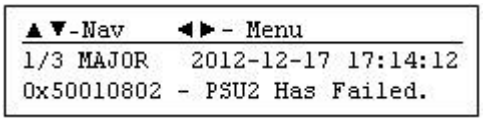
Node	Node Type	Description	Value
Baud Rate	Configure	Displays a user-configurable baud rate.	9600, 19200, 38400, 57600, 115200
Data Bits	Display	Displays the number of data bits.	8
Stop Bits	Display	Displays the number of stop bits.	1
Parity	Display	Displays if there is not a parity bit.	None

- **Supply Voltages Node –** Displays all of the QPSK Bridge's internal voltage rails and power supply voltages.

Node	Node Type	Description	Value
1.0 V Rail	Display	Displays the current 1.0 V rail voltage.	~ 1000 mV
1.2 V Rail	Display	Displays the current 1.2 V rail voltage.	~ 1200 mV
1.8 V Rail	Display	Displays the current 1.8 V rail voltage.	~ 1800 mV
2.5 V Rail	Display	Displays the current 2.5 V rail voltage.	~ 2500 mV
3.3 V Rail	Display	Displays the current 3.3 V rail voltage.	~ 3300 mV
5.0 V Rail	Display	Displays the current 5.0 V rail voltage.	~ 5000 mV
6.0 V Rail	Display	Displays the current 6.0 V rail voltage.	~ 6000 mV
PSU 1 Out	Display	Displays the DC output voltage of power supply #1	~ 120000 mV
PSU 1 In	Display	Displays the AC input voltage of power supply #1	~ 120 V
PSU 2 Out	Display	Displays the DC output voltage of power supply #2	~ 120000 mV
PSU 2 In	Display	Displays the AC input voltage of power supply #2	~ 120 V

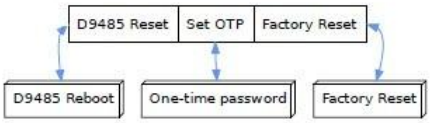
Alarms Node

The Alarms node lists all current active alarms present on the QPSK Bridge. This node will display when the alarm was raised, the severity of the alarm, the alarm ID, and a short description of the alarm. Use the ▲and ▼buttons to scroll through the active alarms. An example of the Alarms node LCD screen follows:



Admin Node

The Admin node allows you to perform a few major administration functions on the QPSK Bridge. To access this node, press the ◄ and ► arrow keys until **Admin** shows on the LCD, and then press **Enter**. The following figure provides a closer look at this node.

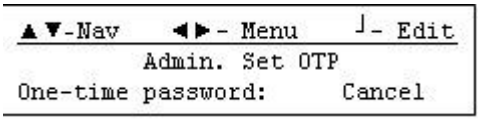


Within this node, you can access two configure nodes:

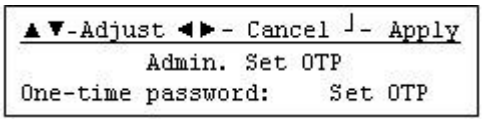
Set a One-Time Password (OTP)

This resets the D9485_admin password to a provided random character password. To reset the password, follow these steps.

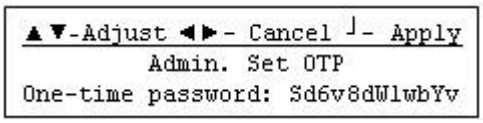
1 Navigate to the OTP node.



2 Press **Enter** and then ▲ or ▼ to select **Set OTP**.



3 Press **Enter** and the OTP is displayed.

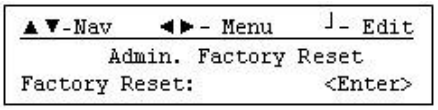


This password can only be entered once, at which time you will be asked to change the password. To use this password, you must log into the Shell menu. See ***Initial Login*** (on page 35) for more details on setting a password.

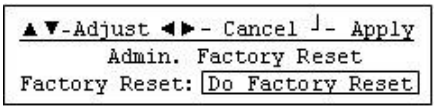
Perform a Factory Reset

A factory reset will reset the QPSK Bridge back to factory defaults. All configuration information, logs, and historical information will be removed.

1 Navigate to the Factory Reset node.



2 Press **Enter**, select **Do Factory Reset**, then press **Enter** again.

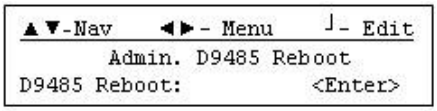


A factory reset will take a few minutes to complete. When the system wipe completes, the QPSK Bridge will reboot and the Status Display screen will appear on the LCD. Once the device reboots, the password will be reset to the factory default and you will need to perform initial login using the console port. See ***Initial Login*** (on page 35) on for more details on setting a password.

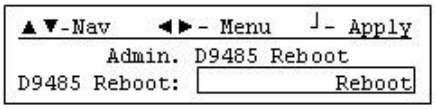
D9485 Reboot

The QPSK Bridge can be soft-reset from the LCD menu. A reboot takes affect immediately.

1 Navigate to the D9485 Reboot node.

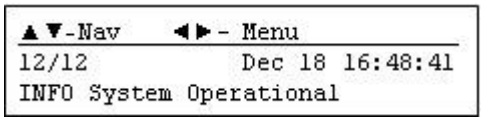


2 Press **Enter**, select **Reboot**, then press **Enter** again.



Boot Log Node

The Boot Log node displays information about the QPSK Bridge's last boot cycle. This node will display the time and date at which each boot element on the QPSK Bridge successfully completed. Use the ▲ and ▼ buttons to scroll through the twelve different boot log entries. Following is an example of a Boot Log screen:



The display shows when the QPSK Bridge has finished its boot process and has become fully operational.

Upgrading the QPSK Bridge

Upgrading the QPSK Bridge can be accomplished both remotely and while directly connected with a PC. Remote upgrades are achieved via a TFTP/HTTP download of the upgrade file over the Ethernet port. Direct upgrades are achieved through a Zmodem transfer over the RS-232 console port. Using either method, the system will automatically install the upgrade once the file has completed downloading on the QPSK Bridge and then reboot. Normal operation will persist while the upgrade file is being downloaded and installed.

The QPSK Bridge contains two complete software images: the active image and a backup image. If the device is running the active image, it will upgrade the backup image. Once the backup image has been upgraded, the system will reboot into the backup image, thus becoming the new active image. The old active image will become the new backup image.

The QPSK Bridge allows you to upgrade/ downgrade to versions of software that are older/newer than the currently running version. Caution should be taken while applying a new upgrade file to ensure that the software changes will not impact desired operation.

A system upgrade can be aborted at any time while the file is being downloaded or installed. If there is a problem with an upgrade, the **Result** in the System Upgrade table will show as **Failed**, an alarm will be raised, and log messages will be created. When troubleshooting an upgrade failure, the logs can provide insight as to the reason.

Important: An upgrade filename must start with the text "D9485". An upgrade file that fails to follow this naming convention will be rejected by the QPSK Bridge.

Note: While using external routing equipment in association with the D9485 QPSK Bridge, ensure that the external routing equipment is set to **autonegotiate** mode. Using half or full duplex mode may cause problems while communicating with the device.

TFTP/HTTP Transfer

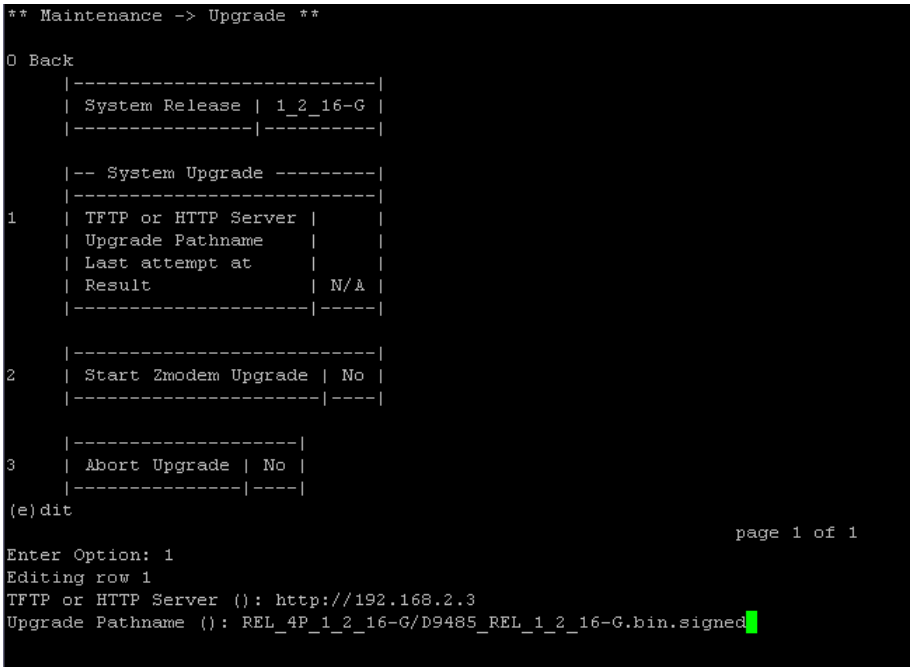
The QPSK Bridge can also be upgraded by initiating a TFTP/HTTP file transfer to download an upgrade file from a TFTP server. The upgrade can be initiated by either adding upgrade information to the configuration file, or by manually initiating an upgrade through the Shell menu. In this way, the QPSK Bridge will download the upgrade file, and then apply it before automatically rebooting.

Shell Menu

1 Choose **Maintenance > Upgrade** and select **1 - System Upgrade**.

2 Enter the TFTP server or HTTP address where the upgrade file is located.

3 Enter the entire path / filename of the upgrade file and press **Enter** to begin upgrade.

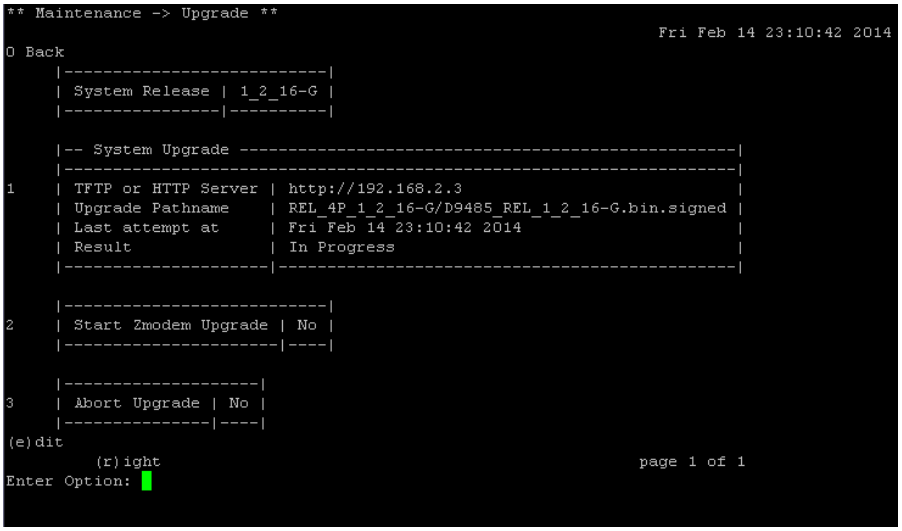


Important: When identifying which upgrade file to use, the entire path, filename, and extension are required.

Example: /tftpboot/Cisco/D9485/Upgrades/D9485_1_2_16.bin.signed

Result: The upgrade will begin and the **Result** will indicate the status of the upgrade.

- **In Progress** indicates that the QPSK Bridge was able to use the information provided to begin downloading the upgrade file
- **Failure** indicates that there was an error in downloading the upgrade file. Check the alarms and logs to determine the cause of the failure.



Note: When the upgrade is finished, the QPSK will automatically reboot and the current SSH connection is closed.

4 After an upgrade has completed (5 - 10 minutes), verify that the unit has successfully upgraded to the new software version by verifying the **System Release** in the System Information menu (**Status > System Information**).

Configuration File Upgrade

On every boot, the QPSK Bridge downloads and loads a configuration file (if configured on the DNCS). This configuration file can tell the QPSK Bridge to perform a system upgrade by indicating a TFTP/HTTP server address to go to and a file to download. The upgrade will be performed in the background and the system will reboot automatically when complete. For more information on the configuration file, see the online help for the QPSK, as well as ***QPSK Bridge Configuration File*** (on page 105).

Important: When performing an upgrade through the Shell menu, ensure that the configuration file does not indicate an upgrade that conflicts with the newly upgraded file. If so, the QPSK Bridge will upgrade to the file indicated in the configuration file, upon boot.

Zmodem Transfer

Note: Due to the nature of the Zmodem file transfer method, this is the least desirable method of upgrading.

Perform the Zmodem upgrade file transfer through the shell menu by using the RS-232 serial port. To access this upgrade option you must use a terminal program capable of sending a file using z-mode, such as TeraTerm or HyperTerminal.

Notes:

- A Linux PC with minicom is recommended for performing Zmodem upgrades. If you are using a Windows PC, TeraTerm is recommended.
- A Zmodem transfer can take anywhere from 20 minutes to 2 hours. The QPSK Bridge cannot be used during this time. If a transfer error occurs, an error message will be displayed in the terminal window.

1 Connect to the QPSK Bridge's serial port (see ***Direct Connectivity*** (on page 33)).

2 Enter the upgrade menu, in ***Maintenance*** (on page 47), in the Shell menu.

3 Choose option **2**, **Start Zmodem Upgrade**, and then enter **y** to start the transfer.

Note: Once the transfer has started, the shell menu will not be accessible.

4 Select the upgrade file you wish to transfer and begin the transfer.

Notes:

- In TeraTerm, choose **File > Transfer > ZMODEM > Send**. Select the upgrade file and click **Open**.
- Once the transfer has been started (Step 3), you will have about one minute to select the upgrade file and begin the transfer. Otherwise the transfer will time out. The sooner the Zmodem transfer can be started, the greater chance you have of a successful upgrade.

- To decrease the time required to make a Zmodem transfer, try increasing the baud rate. The baud rate can be increased on both the QPSK Bridge and the terminal program. See Chassis under ***Configuration*** (on page 39) for more information on how to change the baud rate.

5 Once the transfer is complete, the QPSK Bridge will automatically install the upgrade and reboot.

Note: Repeat Steps 3 and 4 if the Zmodem transfer fails.

4

Using the Delay Mode in the QPSK Data Link

Introduction

The standard mode of operation for the QPSK data link requires the QPSK modulator and demodulator hardware to be physically located near the geographic center of the desired coverage zone. The operation of the system then allows a radius of operation of about 70 KM from the site of the hardware in the hub.

There are a number of applications that need or desire to physically locate the QPSK hardware in the headend (or some location other than the center of the coverage zone) and yet provide QPSK coverage to set tops that are more than 70 KM from the headend site. In response to this need, Cisco has developed a software design modification for the D9485 QPSK Bridge to allow the QPSK modulator/demodulator hardware to be located in the headend and provide QPSK data services to a remote hub at a distance of up to 252 KM. This chapter provides application information to assure successful implementation of this feature.

In This Chapter

Feature Implementation

This feature has been implemented by introducing a delay in the DAVIC frame reference timing the QPSK modulator provides to the QPSK demodulator. This timing delay provides additional time in the DAVIC signal framing to compensate for the time required for the QPSK signal to propagate through the optical distribution cable and return back to the QPSK demodulator. This modification allows for nine different values of propagation delay to be programmed into the QPSK modulator via the front panel. The delay value options are specified as optical propagation distance equivalents of the delay time programmed in the QPSK modulator. The distance increment equivalents to the delay time are calculated by multiplying the delay time by the distance a signal can travel through an optical fiber, having an assumed propagation velocity factor of 70 percent of the speed of light. The propagation distance choices are offered in 31.5 KM increments (one way), starting with 31.5 KM and up to 252 KM. The actual timing delay increments occur in integer multiples of 300 microseconds.

When the delay feature is activated, the QPSK expects an optical transmission delay equal to or greater than the distance value programmed into the QPSK modulator. The QPSK system continues to have a zero to 70 KM ranging distance for set tops in the delay mode. Therefore, the maximum distance a set top can be located from the headend in the delay mode is the sum of the programmed delay distance plus the 70 KM ranging distance. The action of the timing delay causes the apparent "zero ranging distance" to occur at the optical cable distance physically equal to the delay (one-way) distance programmed in the modulator. If the optical cable is longer than the programmed distance value, the ranging radius will be reduced by the excess optical cable length. If the optical cable is shorter than the programmed distance value, the set tops within a radius equal to the distance the optical cable is shorter than the programmed distance value will not be able to complete a ranging sequence.

Delay Mode Setup and Operation

1. Configure the network per ***Application Rules*** (on page 81).
2. Download Version 1.2.16+ D9485 QPSK modulator software on to the QPSK modulator
3. Choose **Delay Mode** from the front panel options menu. After choosing this option, the QPSK will force another download of the QPSK application code. Wait for the new application download (now configured for delay mode) to complete.
4. Choose a value of optical cable length from the front panel options menu equal to or less than the sum of actual optical cable length used for the distribution to the remote hub, plus the minimum optical cable length used in the HFC network from the hub. Adjust the setting if the cable propagation velocity factor is not equal to 70 percent.
5. Place a set top at the closest possible location to where the HFC network transitions from optics to cable. Check the delay time on the set top diagnostic screen. The delay value should not be less than 200 microseconds. Place a set top in the location with the maximum possible cable distance from the cable breakout point in the HFC network. Check the delay time at the set top diagnostic screen. The delay value should not exceed 760 microseconds.
6. If the delay values do not fall within the 200 microseconds and 760 microseconds delay time bounds, the set tops in the affected region will not provide reliable ranging performance. Either the programmed delay value or the network must be adjusted to keep the delay times at the test boundaries within the specified limits.

Application Rules

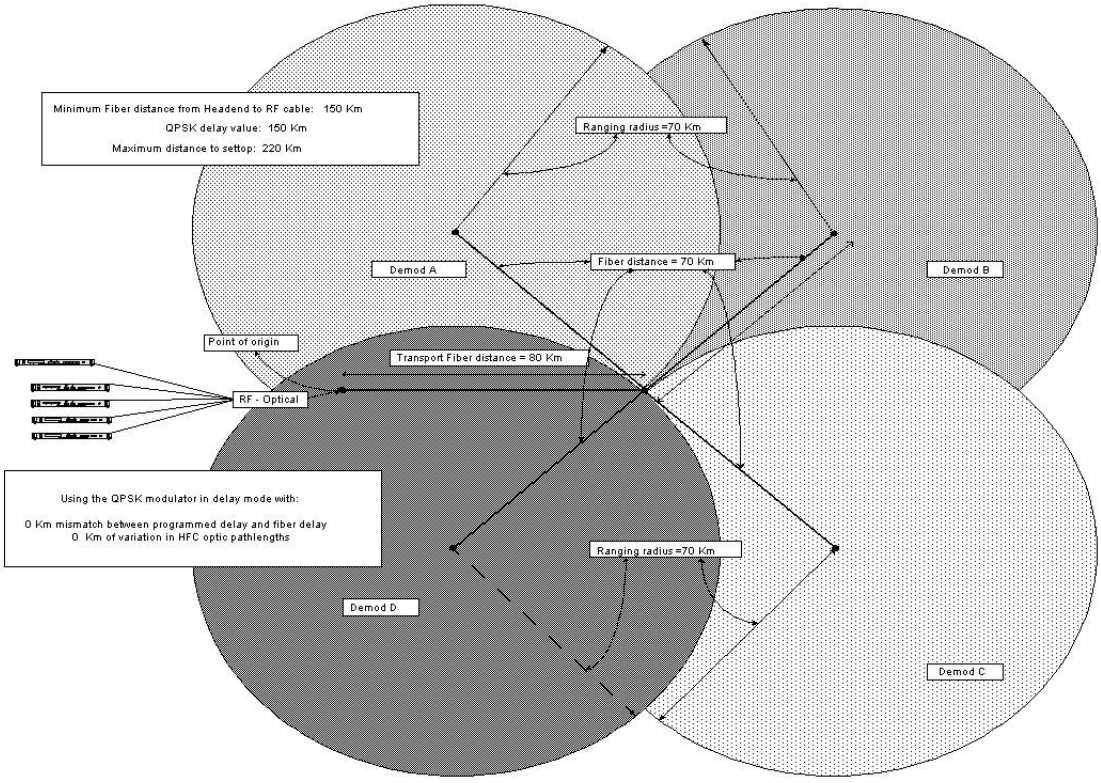
- Transport distances are in integer multiples of 31.5 KM, up to maximum of 252 KM.
- The programmed delay distance should be chosen to be equal to or less than the sum of the transport cable to the hub, plus the shortest optical cable distance on any of the attached nodes.
- The ranging radius is 0 to 70 KM, with 0 KM set at the programmed cable length.
- All demodulators are delayed by the same value programmed in the QPSK modulator.
- If the optical cable length exceeds the programmed distance value, the ranging radius shrinks.
- If the optical cable length is less than the programmed distance value, close-in set tops will not range.

- Variations in the optical cable length branching from the hub will cause a reduction in the ranging radius.
- If an errant distance value is programmed in the QPSK modulator, a new, corrected value can be entered, and the set tops will re-range after a ten-minute timeout. Or, the operator can force a set top reboot.
- In a pinch, coverage radii can be extended by matching the optical cable distance to the programmed distance value.

Design Examples

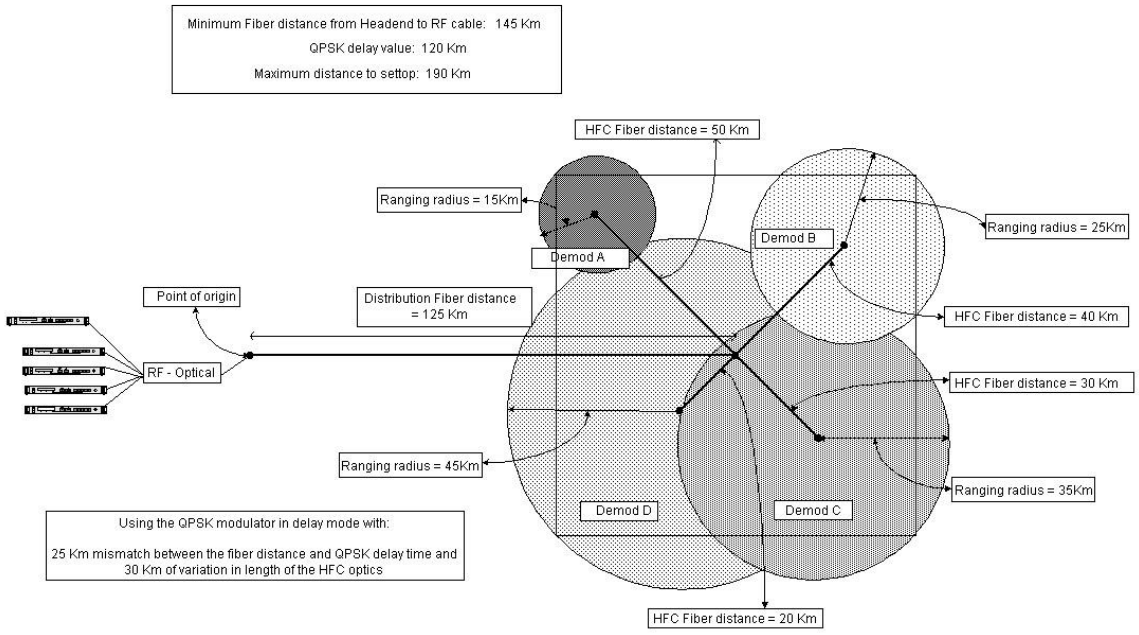
Matched Cable Length and Delay

The design example, shown in the following figure, is an application example of the QPSK modem in a matched configuration. The optical cable distance is equal to the programmed delay distance and all of the node distances from the hub have equal lengths.



Mismatched Cable Length and Delay

The following figure provides a design illustration of what happens when the delay parameters are mismatched. The primary item worth noting is that a significant reduction in ranging radius may occur if there is both a mismatch of cable distance relative to the programmed distance and a wide variation in the node optics distances from the hub. This combination could produce gaps in the coverage zone where set tops would not range on to the system if not properly managed.



5

Troubleshooting the DAVIC QPSK Bridge

Introduction

This chapter provides routine maintenance information, general troubleshooting guidelines, and explanations of major, minor, and status alarm conditions. This chapter also includes instructions for assessing alarm conditions. An alarm troubleshooting table, arranged alphabetically according to an alarm's front panel LCD message, is included along with additional information for resolving alarm conditions.

In This Chapter

Routine Maintenance

Performing routine maintenance ensures proper functionality of the QPSK Bridge and helps in trouble-free operation. This section describes important maintenance procedures.

> **WARNING:**
> **Only qualified personnel should attempt maintenance and service of the QPSK Bridge.**

Quarterly Visual Inspection

The QPSK Bridge can operate unattended for extended periods of time. If the QPSK Bridge is operating normally, do not make any adjustments. However, do conduct a visual inspection at least once every four months.

Check the following items during a visual inspection:

- **Cables and connectors —** Make sure that all cables are connected properly and that all retaining screws are tight. Inspect cables for stress and chafing.
- **Cover and back panel —** If necessary, clean the cover and back panel with a soft cloth dampened with a mild detergent solution.
- **Cooling fan and intakes —** Check the cooling fans on the front panel and the outtake vents on the rear panel for excessive lint or dust buildup. Remove the lint and dust from the fans and the outtake vents using a damp cloth or a small hand vacuum.
- **LEDs —** Make sure that all LEDs are indicating normal status.

Replacing the Fan

This section provides instructions for replacing the cooling fan unit on the QPSK Bridge. The QPSK modulator has three cooling fans located behind the cover on the front of the unit.

Follow these steps to replace the cooling fan on the front panel of the QPSK Bridge.

1. Power off the QPSK Bridge. While this step is not necessary due to the fans being hot-swappable, it is nonetheless recommended. If replacing more than one fan module, only replace one cooling fan at a time to ensure that the unit does not overheat.
2. Remove the front panel cover by removing the two thumb screws located at the sides of the cover.

   Note: The cover is attached to the chassis by a connecting wire. It is OK to let the cover hang while changing the chassis, but do not hang anything from it.

3 On the front panel of the QPSK Bridge, unplug the fan from the connector.

Note: Needle-nose pliers may be required to reach the connector.

4 Remove the retaining screws using a Phillips screwdriver and set the non-functioning fan and screws aside.

Note: Be sure not to drop or misplace the screws. You will need them to replace the fan.

5 Attach the replacement fan to the back panel using the same screws you removed, making sure that you orient the fan so that the airflow blows inward.

Note: Be sure to use a torque of approximately 4-6 in./lb.

6 Plug the replacement fan into the power connector provided on the front panel.

7 Power on the QPSK Bridge (if powered off).

8 Verify that the replacement fan is operating correctly. If the replacement fan does not operate correctly, contact Cisco Services for assistance.

Replacing a Power Supply

This section describes how to replace a power supply on the QPSK Bridge. The QPSK Bridge contains two field-replaceable and hot-swappable power supplies. Each power supply is independent and only one supply is required for the QPSK Bridge to function properly.

CAUTION:

Avoid damage to this product! Your warranty is void if you attempt to operate this product with non-genuine replacement parts.

1 Remove the power cable from the power supply you wish to replace.

Note: If only one power supply is present, removing power will turn off the QPSK Bridge.

2 Using a Phillips-head screwdriver, remove the two captive retaining screws securing the power supply to the QPSK Bridge chassis.

3 Remove the old power supply from the chassis by pulling on the handle.

4 Insert the new power supply into the empty power supply slot and use the handle to guide the power supply fully into its slot.

Note: Extra force may be needed to properly seat the power supply with the chassis power connector.

5 Secure the new power supply to the chassis by tightening the two captive retaining screws.

6 Apply power to the new power supply by inserting the power cord connector into the power supply.

General Troubleshooting Guidelines

Introduction

This section describes major, minor, and status alarms. In addition, this section explains how to access and read the alarms that display on the front panel LCD of the QPSK Bridge. If the QPSK Bridge indicates an alarm, check for false alarms, check the power supply, and/or follow the guidelines for troubleshooting major and minor alarms.

Checking AC Power

If the QPSK Bridge does not power up and the LEDs are either not lit or display red, this indicates a faulty power supply or power supply connection.

Follow these steps to determine whether a power problem is causing a power alarm.

1. Verify that the power wires and/or power cords are firmly connected in the QPSK Bridge and at the power outlet. Replace/reconnect the power wires or cords if necessary.
2. Verify that the outlet is supplying the proper voltage.
3. If the QPSK Bridge still indicates a power alarm, one or more power supplies may be defective.
   a. Attempt to power the QPSK Bridge with each single power supply individually to determine if the problem exists with only one supply.
   b. Each power supply contains an internal fan. If the fan is running and the power supply otherwise appears to be operating correctly, it may indicate an internal problem in the QPSK Bridge.

Troubleshoot Alarms

List of Alarms

When there is an alarm condition on the QPSK Bridge, the front panel display indicates which alarm condition is active and the ALARM indicator LED will be illuminated. An alarm Alarm Text message displays on the second line of the display, briefly describing which alarm condition is active. See **Alarms Node** under ***LCD Interface*** (on page 67) for additional information. Also, a list of all active alarms can be found in both the ***QPSK Bridge Shell Menu*** (on page 34) and the ***QPSK Bridge Web Interface*** (on page 60).

Each alarm's Alarm Text will begin with the alarm ID – a unique identifier (e.g., 0x50010812). Use the alarm ID and the table below to quickly gain additional insight into what may be causing the alarm to rise. Many of the alarms on the QPSK Bridge can be raised for multiple reasons, and often additional investigation will be required to find the cause, and thus the resolution, of any particular alarm.

Important: The Alarms table in this section should only be used as a guideline to help troubleshoot and resolve alarm conditions. If an alarm cannot be resolved, contact Cisco Services.

All alarms on the QPSK Bridge are assigned a priority level. Each priority level has an associated Alarm LED color. Below are the different priority levels in order of severity (most severe to least severe) and their associated Alarm LED colors.

Priority Level	Associated LED Color
CRITICAL	RED
MAJOR	RED
MINOR	YELLOW
STATUS	OFF

The highest alarm priority level will always be indicated by the Alarm LED. For more information on configuring SNMP Trap receivers, see the sample configuration file in ***QPSK Bridge Configuration File*** (on page 105).

Note: All alarms in the Alarms and Events List, which follows, are also sent as SNMP traps.

Alarms and Events List

Alarm Text	Priority	Associated LED	Description	Resolution
Group sys_maint				
0x50010812 - Maintenance mode activated.	STATUS	MAINT_LED	Maintenance LED has been turned on	
Group sys_sw				
0x5001080D - Test mode enabled.	MINOR	Yellow	Test Mode has been enabled.	
0x50010400 - System software out of memory.	MAJOR	Red	QPSK Bridge has run out of system memory.	
0x5001082B - Customer-specific data deleted.	MINOR	Yellow	All user data has been removed. QPSK Bridge is reset to factory default configuration.	
0x5001082D - Customer logs deleted.	MINOR	Yellow	All system, RPC, and DHCT log messages have been deleted.	
Group sys_passwd				
0x50010825 - Password changed via Front Panel.	STATUS	None	User has set a OTP for the QPSK Bridge through front panel LCD.	
0x5001082C - Failed to set Admin Default Password.	MAJOR	Red	User has not set a D9485_admin password.	Set the D9485_admin password.
Group sys_upgrade				
0x50010814 - Upgrade in progress (arguments: %s).	STATUS	None	Upgrade is in progress.	

Alarm Text	Priority	Associated LED	Description	Resolution
0x50010815 - Upgrade success. Reboot required.	STATUS	None	Upgrade was successful. Requires reboot.	
0x5001010A - Upgrade file download has started.	STATUS	None	QPSK Bridge has started an upgrade by downloading the new firmware.	
0x50010104 - Failed to open upgrade file (%s).	MINOR	Yellow	Could not open downloaded software upgrade. Corrupted data. %s: ■ Name not prefixed with 'D9485' ■ Invalid parameters of failed transfer ■ aborted	Check the file name to ensure it begins with D9485. Ensure that the upgrade file exists on the TFTP server.
0x50010105 - Failed to read upgrade file (%s).	MINOR	Yellow	After being downloaded and opened, the file was not able to be read. %s: ■ package verification ■ package extraction ■ upgrader verification ■ aborted	Confirm that the upgrade file is not corrupt on the TFTP server. Compare the MD5 sum to the expected value.
0x5001010B - Upgrade programming started.	STATUS	None	Upgrade has downloaded and started programming.	

Alarm Text	Priority	Associated LED	Description	Resolution
0x50010106 - Failed to program the upgrade.	MAJOR	Red	An error occurred that prevented the QPSK Bridge from completing the programming of the newly downloaded firmware.	Re-apply upgrade.
0x50010808 - Failed to boot the upgrade (%s).	MAJOR	Red	New software was downloaded and programmed, but failed to reboot and load upgrade image. %s: ■ run-time: <running release version> doesn't match: <Supposes active release>	Check/replace your upgrade file and try to re-apply the upgrade.
Group sys_temp				
0x50010826 - Processor board temperature threshold exceeded (%s).	MAJOR	Red	Safe processor board temperature exceeded.	Check the ambient room temperature and adjust if necessary. Check fans for proper operation.
0x50010827 - Ambient temperature threshold exceeded (%s).	MAJOR	Red	Safe internal ambient air temperature exceeded.	Check the ambient room temperature and adjust if necessary. Check fans for proper operation.
0x50010828 - Fan temperature threshold exceeded (%s).	MAJOR	Red	Safe internal ambient air temperature for fan controller board exceeded.	Check the ambient room temperature and adjust if necessary. Check fans for proper operation.

Alarm Text	Priority	Associated LED	Description	Resolution
0x50010829 - Output module temperature threshold exceeded (%s).	MAJOR	Red	Safe internal modulator temperature exceeded	Check the ambient room temperature and adjust if necessary. Check fans for proper operation.
0x5001082A - PSU%s temperature threshold exceeded (%s).	MAJOR	Red	Inlet or Outlet temperature of power supply exceeded.	Check the ambient room temperature and adjust if necessary. Check power supply fans for proper operation. Replace power supply.
GROUP sys_pwr				
0x50010804 - Processor board voltage out of range (%s).	MAJOR	Red	Voltage supplying processor board out of acceptable range.	Check/replace power supply. If power supply OK, Contact Cisco Services.
0x50010806 - PSU%s voltage out of range (%s).	MAJOR	Red	Input or output voltages of power supply are out of acceptable range.	Check input supply voltage to QPSK Bridge. Replace power supply.
0x50010807 - PSU%s current out of range (%s).	MAJOR	Red	Input or output currents of power supply are out of acceptable range.	Check input supply current to QPSK Bridge. Replace power supply.
GROUP sys_fan				
0x50010816 - FAN%s not present.	MAJOR	Red	QPSK Bridge does not detect a fan connected in the particular slot.	Check to ensure a fan is present. Replace fan assembly.
0x50010817 - FAN%s RPM out of range (%s).	MAJOR	Red	Fan RPM is too high (>18000 RPM) or too low (<3500 RPM).	Check/replace fan.
GROUP sys_psu				
0x50010818 - PSU%s not present.	MINOR	Yellow	Power supply is not present in Slot 1 or 2.	

Alarm Text	Priority	Associated LED	Description	Resolution
%s - PSU%s has failed.	MAJOR	Red	Power supply has failed and is not providing power.	Replace power supply. Ensure it is plugged into a power source.
GROUP sys_hw				
0x50010809 - Failed FPGA DDR memory test.	MAJOR	Red	FPGA has a bad memory module.	Try to reboot the system. Contact Cisco Services.
0x5001080E - Failed component (%s).	MAJOR	Red	An important system component has failed.	Check/replace component if possible. Reboot system. Contact Cisco Services.
0x5001080F - Failed ethernet port (%s).	MAJOR	Red	Ethernet port is not working. Not receiving or sending data.	
0x50010601 - Receive errors on ethernet port (%s).	MINOR	Yellow	Packets were not received correctly.	Check source and cables.
0x50010602 - Transmit errors on ethernet port (%s).	MINOR	Yellow	Packets were not transmitted correctly.	Check your cable. Reseat/replace cable.
0x50010810 - Front Panel failure (%s).	MINOR	Yellow	Front panel is no longer working, or communication with the front panel has been lost.	Reboot system. Contact Cisco Services.
GROUP dhcp				
0x5001010C - Pending BOOTP lease request.	STATUS	None	QPSK Bridge is waiting for a BOOTP lease from BOOTP server.	
0x50010805 - BOOTP lease successfully acquired.	STATUS	None	QPSK Bridge has successfully acquired a BOOTP lease.	

Alarm Text	Priority	Associated LED	Description	Resolution
0x50010107 - Failed to acquire a BOOTP lease.	MAJOR	Red	QPSK Bridge did not acquire a BOOTP lease and does not have an IP address.	Ensure that the QPSK Bridge is properly configured on the BootP server. Check the Ethernet cable to ensure a physical connection exists.
0x50010108 - Failed to open configuration file (%s).	MAJOR	Red	QPSK Bridge could not open the configuration file downloaded from the DNCS.	Ensure that the configuration file is in the correct format - .xml.
0x50010109 - Failed to read configuration file (%s).	MAJOR	Red	QPSK Bridge could not read the downloaded configuration file from the DNCS.	Verify that the configuration file on the DNCS is in the correct format and contains all required information.
GROUP stb_ctl				
0x50010208 - VCI usage exceeds threshold (%s).	STATUS	None	VCI usage has exceeded the threshold you set.	
0x50010207 - Invalid DAVIC message type.	STATUS	None	The QPSK Bridge received an invalid DAVIC message.	
0x50010200 - MAC configuration failed.	MAJOR	Red	MAC configuration failed to load properly.	Reboot
0x50010202 - DHCT not responding (%s).	STATUS	None	DHCT with MAC address %s did not send a response to the QPSK Bridge's STATUS message.	

Alarm Text	Priority	Associated LED	Description	Resolution
0x5001081B - Total DHCTs exceeds limit (%s).	MINOR	Yellow	The total number of DHCTs trying to sign onto the QPSK Bridge has exceeded the maximum set on DNCS.	Reduce the number of DHCTs provisioned on the QPSK Bridge.
0x5001020B - DHCT sign-on ranging failure (%s).	STATUS	None	DHCT with MAC address %s did not sign on because it has failed.	
0x5001020C - DHCT connected ranging failure (%s).	STATUS	None	DHCT with MAC address %s was in the idle state, but failed to stay in PETE and failed it's connection.	
GROUP stb_ctl_demod				
0x5001081C - DHCTs exceeds limit on demod %s.	MINOR	YELLOW	Too many DHCTs are trying to sign on to demod 1-8. Limit is user configurable.	Reduce the number of DHCTs signing on to demod (1-8).
GROUP scheduler				
0x50010204 - Temporarily lost slot boundary generation synchronization.	STATUS	None	The system has lost frame generation synchronization.	
0x5001020A - Dynamic Ranging reached max (ranging every frame).	STATUS	None	The system has enough contention on the sign-on ranging slot that it has reached the point that every frame has a sign-on opportunity.	

Alarm Text	Priority	Associated LED	Description	Resolution
0x5001082F - Scheduler discarded one or more schedules (%s).	STATUS	None	The system has discarded a DHCT schedule due to processing mismatch (high CPU load).	
0x50010831 - Scheduler encountered one or more full queues (%s).	STATUS	None	The system scheduler buffer is full and has overflown.	
GROUP inmapd				
0x5001081D - Issuing Multicast Join on %s.	STATUS	None	The system has issued an IGMP join request.	
0x5001081E - Issuing Multicast Leave on %s.	STATUS	None	The system has issued an IGMP leave request.	
GROUP mod_mgr_task				
0x50010000 - Reboot complete.	STATUS	None	System reboot has completed.	
0x50010001 - Modulator frequency changed %s.	STATUS	None	Modulator RF Output frequency has changed from x Hz to y Hz.	
0x50010002 - Modulator RF level changed %s.	STATUS	None	Modulator RF Output level has changed from x dB to y dB.	
0x50010003 - Front panel display locked.	STATUS	None	Front panel LCD and buttons are locked and cannot be used.	
0x50010004 - Modulator CW mode on.	MINOR	Yellow	CW Mode is enabled. Not used in normal operation.	
0x50010005 - Modulator FP RF muted.	MINOR	Yellow	The RF Output on the modulator is disabled.	Enable Modulator RF Output.

Alarm Text	Priority	Associated LED	Description	Resolution
0x50010007 - Modulator RF not locked.	MAJOR	Red	The RF Output on the modulator frequency is not constant.	Reboot. Contact Cisco Services.
GROUP demod_mgr_task				
0x6001000A - Demodulator %s not provisioned by DNCS.	MINOR	Yellow	Demodulator (1-8) is not configured by the DNCS.	Check to see if RPC is enabled. Check to see the if the QPSK Bridge was Provisioned by the DNCS (Maintenance-->DNCS Provision in shell menu).
0x6001000B - Demodulator %s frame sync error.	MINOR	Yellow	Demodulator (1-8) has lost frame synchronization with internal clock.	"Check input quality. Check distance offset setting. NOTE: This alarm is expected to raise after just changing this setting."
0x60010014 - Demodulator %s queue full.	MINOR	Yellow	Demodulator (1-8) FEC buffer queue is full and additional packets are arriving.	If causing service problems, reboot. If the problem persists, contact Cisco Services.
0x60010018 - Demodulator %s FEC error(s). Refer to demodulator stats for the aggregate number of failed cells.	MINOR	Yellow	This indicates that a packet was received on a demodulator (1-8) which contained uncorrectable errors.	Check network congestion.
GROUP rpc				
0x5001080A - %s queue depth at 20 percent.	MINOR	Yellow	RPC queue is 20% full and beginning to back up.	Check RPC servers. Disable then re-enable RPC (Configuration-->Services). Reboot.
0x5001080B - %s queue depth at 80 percent.	MAJOR	Red	RPC queue is 80% full and almost backed up.	Check RPC servers. Disable then re-enable RPC (Configuration-->Services). Reboot.

Alarm Text	Priority	Associated LED	Description	Resolution
0x5001080C - %s queue depth at 99 percent.	MAJOR	Red	RPC queue is full.	Check RPC servers. Disable then re-enable RPC (Configuration-->Services). Reboot.
0x50010101 - QPSK_MGR not connected (%s).	MINOR	Yellow	QPSK Bridge cannot connect to the QPSK_MGR.	Check the IP address of the QPSK_MGR (Configuration-->DNCS in the Shell menu). Check network path to RPC server. Check to ensure the RPC service has not gone down.
0x50010102 - HCT_MGR not connected (%s).	MINOR	Yellow	QPSK Bridge cannot connect to the HCT_MGR.	Check the IP address of the HCT_MGR (Configuration-->DNCS in the Shell menu).Check network path to RPC server. Check to ensure the RPC service has not gone down.
0x50010103 - ALM_MGR not connected (%s).	MINOR	Yellow	QPSK Bridge cannot connect to the ALM_MGR.	Check the IP address of the ALM_MGR (Configuration-->DNCS in the Shell menu). Check network path to RPC server. Check to ensure the RPC service has not gone down.
0x50010811 - SMG_MGR not connected (%s).	MINOR	Yellow	QPSK Bridge cannot connect to the SMG_MGR.	Check the IP address of the SMG_MGR (Configuration-->DNCS in the Shell menu). Check network path to RPC server. Check to ensure the RPC service has not gone down.

Alarm Text	Priority	Associated LED	Description	Resolution
0x50010100 - Did not receive provisioning from DNCS.	MINOR	Yellow	QPSK Bridge did not download a configuration file from the DNCS as expected.	Check to ensure that the DNCS is configured to provide a configuration file to the QPSK Bridge. Ensure that system is in Boot Mode 2.
Group data_path				
0x50010504 - Upstream Buffer Overflow (%s).	MINOR	Yellow	Internal receive buffer has filled on Demod 1-8.	May resolve itself with time. Check DHCTs.
0x50010820 - Upstream Buffer Overflow rate exceeded threshold.	STATUS	None	Upstream buffer has exceeded 1.544 Mbps/demod.	
0x50010821 - Downstream Buffer Overflow rate exceeded threshold.	STATUS	None	Internal transmit buffer has exceeded 1.544 Mbps/demod.	
0x50010822 - OOB bandwidth Overflow exceeded threshold level.	STATUS	None	OOB bandwidth threshold has been exceeded and will raise a SNMP trap. OOB modulator is sending too much traffic to the DHCT population. Bandwidth threshold is configurable via SNMP.	
0x5001050B - AAL5 CRC Error (%s).	MINOR	Yellow	Reconstructed packets did not pass the CRC check.	Check RF network setup (upstream RF settings and levels). This can occur with a lot of sign on activity. Wait until sign on activity decreases and check if alarm is still raised.

Alarm Text	Priority	Associated LED	Description	Resolution
0x50010507 - AAL5 Abort.	STATUS	None	QPSK Bridge has discarded a DHCT message.	This can occur with a lot of sign on activity. Wait until sign on activity decreases and check if alarm is still raised.
0x50010506 - AAL5 Timeout.	MINOR	Yellow	QPSK Bridge did not receive entire DHCT message within DAVIC timeout window.	This can occur with a lot of sign on activity. Wait until sign on activity decreases and check if alarm is still raised. If problem persists, check the max node distance.
0x5001082E - Downstream Buffer Overflow (%s).	STATUS	None	There is a high amount of traffic on the system. Normal behavior at times.	
0x50010830 - Reassembly Error (%s).	STATUS	None	Problem occurred while attempting to reassemble a packet from a DHCT.	
GROUP generic				
0x50010201 - Set Frequency failed for modulator (%s).	MAJOR	Red	Could not set the modulator frequency.	Ensure that the Modulator output frequency is between 70 & 130 MHz. Reboot. Contact Cisco Services.
0x60010201 - Set Frequency failed for demodulator (%s).	MAJOR	Red	Could not set the demodulator frequency (demod 1-8).	Ensure that the demodulator output frequency is between 5 & 42 MHz. Reboot. Contact Cisco Services.

Alarm Text	Priority	Associated LED	Description	Resolution
0x50010823 - Primary Service Frequency is set to a value that is not serviced by any demodulators on this chassis.	MINOR	Yellow	The Primary Service Frequency from the DNCS for the DHCTs is set to a frequency for which no demodulators are configured.	Ensure that the Primary Service Frequency set in the DNCS and the frequency of the demodulators on the QPSK Bridge, match.
0x50010824 - Backup Service Frequency is set to a value that is not serviced by any demodulators on this chassis.	MINOR	Yellow	The Backup Service Frequency from the DNCS for the DHCTs is set to a frequency for which no demodulators are configured.	Ensure that the Backup Service Frequency set in the DNCS and the frequency of the demodulators on the QPSK Bridge, match.

6

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

QPSK Bridge Configuration File

Introduction

The QPSK Bridge configuration file, with explanation, found in this appendix, can be copied and pasted for use.

Note: The configuration file must be delivered to the QPSK Bridge as an XML file.

In This Appendix

The QPSK Configuration File

```
<?xml version="1.0" encoding="UTF-8"?>
<ifacade_config>

<!--Do not modify these settings. -->
 <head>
  <Version>1</Version>
  <Product>D9485</Product>
  <Checksum>0x12345</Checksum>
 </head>

 <config set="boot">

<!--Radius server information.  Mandatory: No. -->
  <RADIUS view="earlyboot">
   <Server></Server> <!--The IP address of RADIUS server-->
   <Secret></Secret> <!--The password that the D9485 uses to authenticate with the RADIUS server-->
   <Timeout__s_></Timeout__s_> <!--The timeout period before the D9485 will no longer attempt to obtain a password from the RADIUS server. -->
   <Enabled>No</Enabled> <!--Set the status of the RADIUS server.  When set to "No", the D9485 will not attempt to authenticate with the RADIUS server. -->
  </RADIUS>

<!--Leaving these fields blank or entering 'Disabled' will turn these connections off. Mandatory: Yes. -->
  <DNCS_Connection_Parameters view="earlyboot">
   <HCT_RPC_Server>10.253.0.1</HCT_RPC_Server> <!--This is the IPv4 address for the RPC HCT Server. -->
   <MGR_RPC_Server>10.253.0.1</MGR_RPC_Server> <!--This is the IPv4 address for the RPC MGR Server. -->
   <ALARM_RPC_Server>10.253.0.1</ALARM_RPC_Server> <!--This is the IPv4 address for the RPC ALARM Server. -->
```

```
    <STATS_RPC_Server>10.253.0.1</STATS_RPC_Server> <!--This is the IPv4 address for the RPC STATS Server. -->
  </DNCS_Connection_Parameters>

<!--Chassis identifiers used to set custom parameters for identifying the chassis. Mandatory: No. -->
  <Chassis view="earlyboot">
    <Name>GALIANO_05R2</Name> <!--User configurable chassis name. This can be set to any string. -->
    <System_Model>D9485</System_Model> <!--User configurable system model number. -->
    <Boot_Mode>Multiple BOOTP/TFTP (mode 2)</Boot_Mode> <!--Boot Mode for the system. Can be set to: NVRAM (mode 0); Singe BOOTP/TFTP (mode 1); Multiple BOOTP/TFTP (mode 2). Default is 'Multiple BOOTP/TFTP (mode 2)'. For more information on Boot modes, see Chassis -->
  </Chassis>

<!--Locks the front panel button functionality. When locked, the front panel buttons will not perform any function. Mandatory: No-->
  <Front_Panel_Lock view="earlyboot">
    <Locked>No</Locked> <!--Can be Yes or No-->
  </Front_Panel_Lock>

  <!--Craft Port Settings – for more information see 'Direct Connectivity'. Manditory: No. -->
<CRAFT_Port_Settings view="earlyboot">
    <Baud_Rate>19200</Baud_Rate>
    <Data_Bits>8</Data_Bits>
    <Stop_Bits>1</Stop_Bits>
    <Parity>None</Parity>
  </CRAFT_Port_Settings>

<!--User Configurable Technical Support Information. This information is displayed on the UI. Mandatory: No.-->
  <Technical_Support view="earlyboot">
```

```
    <Email>support@cisco.com</Email>
    <Telephone>(555)555-5555</Telephone>
    <Web>www.cisco.com</Web>
  </Technical_Support>

<!--Identifies the Remote Syslog servers for system logs. Syslog server addresses can be IPv4 or server names.  Mandatory: No.-->
  <Remote_Targets view="earlyboot">
    <Target_Host_Name>localhost</Target_Host_Name>
  </Remote_Targets>

  <Remote_Targets view="earlyboot">
    <Target_Host_Name>127.0.0.1</Target_Host_Name>
  </Remote_Targets>

<!--Fiber Distance Setting. User settable maximum node distance setting for the DHCTs connected to the D9485. Mandatory: No-->
  <Modulator_Fiber_Distance_Setting view="earlyboot">
    <Max_Node_Distance>0 km</Max_Node_Distance> <!-- Range: 0km–248km, in 31 km increments. For more information on correctly setting the modulator fiber distance setting, see “QPSK Delay Mode Technical Bulletin” application notes.-->
  </Modulator_Fiber_Distance_Setting>

<!--Modulator settings of the Low RF Output port.  See section ‘3. Modulator’ for more information. Mandatory: Yes. -->
  <Modulator view="running">
    <RF_Output_Port>Low</RF_Output_Port> <!--Always ‘Low’-->
    <Frequency>83000000 Hz</Frequency> <!--Frequency (70 – 130 MHz) -->
    <Power_Level>60 dBmV</Power_Level> <!--Power Level (50 – 60 dBmV) -->
    <CW_Mode>Disabled</CW_Mode> <!--Continuous Wave Mode. When enabled, the output will only be a carrier. -->
    <DNCS_Provisioned>Enabled</DNCS_Provisioned> <!--DNCS will configure the modulator port when enabled.  When disabled, the modulator must be a configured manually or via this configuration file. -->
```

<RF_Output>Unmuted</RF_Output> <!--Activates\Deactivates the RF Output port. When 'Muted', there is no output present on the port. Set to 'Unmuted' for normal operation. -->

</Modulator>

<!-- The entries below are for configuring each of the 8 QPSK demodulators. See section '7. Demodulators' for more information on these settings. Each demodulator must be configured individually. Mandatory: Yes. -->

<Demodulator view="running">

<Number>1</Number> <!--Demodulator identifier (1-8) -->

<DNCS_Name>NODE15A</DNCS_Name> <!--DHCT node name-->

<Frequency__Hz_>11000000</Frequency__Hz_> <!--Frequency (5 – 42 MHz) -->

<Attenuation>0 dB</Attenuation> <!--Attenuation (0, 8, 16, or 24 dB) -->

<DNCS_Provisioned>Enabled</DNCS_Provisioned> <!--Describes if the demodulator is provisioned by the DNCS. Enabled = Yes; Disabled = No. -->

<DNCS_Enabled>Enabled</DNCS_Enabled> <!--Functioning state of the demodulator. Enabled = On; Disabled = Off. -->

</Demodulator>

<Demodulator view="running">

<Number>2</Number>

<DNCS_Name>UNKNOWN</DNCS_Name>

<Frequency__Hz_>5000000</Frequency__Hz_>

<Attenuation>0 dB</Attenuation>

<DNCS_Provisioned>Disabled</DNCS_Provisioned>

<DNCS_Enabled>Disabled</DNCS_Enabled>

</Demodulator>

<Demodulator view="running">

<Number>3</Number>

<DNCS_Name>UNKNOWN</DNCS_Name>

<Frequency__Hz_>5000000</Frequency__Hz_>

<Attenuation>0 dB</Attenuation>

<DNCS_Provisioned>Disabled</DNCS_Provisioned>

```
  <DNCS_Enabled>Disabled</DNCS_Enabled>
</Demodulator>

<Demodulator view="running">
  <Number>4</Number>
  <DNCS_Name>UNKNOWN</DNCS_Name>
  <Frequency__Hz_>5000000</Frequency__Hz_>
  <Attenuation>0 dB</Attenuation>
  <DNCS_Provisioned>Disabled</DNCS_Provisioned>
  <DNCS_Enabled>Disabled</DNCS_Enabled>
</Demodulator>

<Demodulator view="running">
  <Number>5</Number>
  <DNCS_Name>UNKNOWN</DNCS_Name>
  <Frequency__Hz_>5000000</Frequency__Hz_>
  <Attenuation>0 dB</Attenuation>
  <DNCS_Provisioned>Disabled</DNCS_Provisioned>
  <DNCS_Enabled>Disabled</DNCS_Enabled>
</Demodulator>

<Demodulator view="running">
  <Number>6</Number>
  <DNCS_Name>UNKNOWN</DNCS_Name>
  <Frequency__Hz_>5000000</Frequency__Hz_>
  <Attenuation>0 dB</Attenuation>
  <DNCS_Provisioned>Disabled</DNCS_Provisioned>
  <DNCS_Enabled>Disabled</DNCS_Enabled>
</Demodulator>

<Demodulator view="running">
  <Number>7</Number>
```

```
    <DNCS_Name>UNKNOWN</DNCS_Name>
    <Frequency__Hz_>5000000</Frequency__Hz_>
    <Attenuation>0 dB</Attenuation>
    <DNCS_Provisioned>Disabled</DNCS_Provisioned>
    <DNCS_Enabled>Disabled</DNCS_Enabled>
   </Demodulator>

   <Demodulator view="running">
    <Number>8</Number>
    <DNCS_Name>UNKNOWN</DNCS_Name>
    <Frequency__Hz_>5000000</Frequency__Hz_>
    <Attenuation>0 dB</Attenuation>
    <DNCS_Provisioned>Disabled</DNCS_Provisioned>
    <DNCS_Enabled>Disabled</DNCS_Enabled>
   </Demodulator>

<!-- The VPI is used to identify the virtual circuit used by the DNCS to identify a
unique QPSK Bridge.  Mandatory: No. -->
   <VPI view="running">
    <VPI>29</VPI> <!-- Can be any number between 0 and 255. -->
</VPI>

   <Service_Frequencies view="running">
    <Service_Channel_Frequency>11000000 Hz</Service_Channel_Frequency> <!--
The Service Frequency is the upstream frequency (or RDC) at which the QPSK
Bridge tells the DHCTs to transmit data. This is a frequency between 5 MHz and 42
MHz and should correspond to the frequency of the associated demodulator.
Mandatory: Yes-->
    <Backup_Service_Channel_Frequency>11000000
Hz</Backup_Service_Channel_Frequency> <!-- The backup frequency is used as an
alternate service frequency should a change in network variables require a frequency
change. Typically, this value is the same as the Service Channel Frequency.
Mandatory: Yes. -->
   </Service_Frequencies>
```

<!--Allows the user to set the upstream (RDC) power levels for the DHCTs. These are typically configured through the DNCS. Mandatory: No. -->

<Power_Levels view="running">

<Acceptable_minimum>-9 dBmV</Acceptable_minimum> <!--The minimum acceptable power level of a DHCT as measured by the QPSK Bridge demodulator. -->

<Acceptable_maximum>-1 dBmV</Acceptable_maximum> <!--The maximum acceptable power level of a DHCT as measured by the QPSK Bridge demodulator. -->

<Target_minimum>-8 dBmV</Target_minimum> <!--The ideal minimum acceptable power level of a DHCT as measured by the QPSK Bridge demodulator. -->

<Target_maximum>-2 dBmV</Target_maximum> <!--The ideal maximum acceptable power level of a DHCT as measured by the QPSK Bridge demodulator. -->

<DHCT_minimum>0 dBmV</DHCT_minimum> <!--The minimum transmission power levels as measured at the upstream port of a DHCT. Levels depend on model of DHCT. -->

<DHCT_maximum>50 dBmV</DHCT_maximum> <!--The maximum transmission power levels as measured at the upstream port of a DHCT. Levels depend on model of DHCT. -->

</Power_Levels>

<!--Data Routing describes the different data types flowing through the QPSK Bridge. It is recommended that changes to these data flows be made through the DNCS. Each rule must be set individually. See '2. Networking' for more information. Mandatory: Yes. -->

<Data_Routing view="running">

<Rule>1</Rule> <!--Designator (1-8) -->

<Active>Enabled</Active> <!--Enabled/Disabled-->

<Name>CA</Name> <!--Data name-->

<Type>CA</Type> <!--Data type-->

<Dest_IP>10.15.64.1</Dest_IP> <!--Destination IP address for data type-->

<VPI>0</VPI> <!--Virtual Path Identifier (0-255) -->

<VCI>4000</VCI> <!--Virtual Channel Identifier-->

</Data_Routing>

```
<Data_Routing view="running">
 <Rule>2</Rule>
 <Active>Enabled</Active>
 <Name>SAR</Name>
 <Type>SAR</Type>
 <Dest_IP>10.15.64.2</Dest_IP>
 <VPI>0</VPI>
 <VCI>0</VCI>
</Data_Routing>

<Data_Routing view="running">
 <Rule>3</Rule>
 <Active>Enabled</Active>
 <Name>PASSTHRU</Name>
 <Type>PASSTHRU</Type>
 <Dest_IP>10.15.64.3</Dest_IP>
 <VPI>0</VPI>
 <VCI>4001</VCI>
</Data_Routing>

<Data_Routing view="running">
 <Rule>4</Rule>
 <Active>Enabled</Active>
 <Name>SI</Name>
 <Type>SIBASE</Type>
 <Dest_IP>10.15.64.4</Dest_IP>
 <VPI>0</VPI>
 <VCI>4002</VCI>
</Data_Routing>

<Data_Routing view="running">
 <Rule>5</Rule>
```

```
    <Active>Enabled</Active>
    <Name>BROADCAST</Name>
    <Type>BROADCAST</Type>
    <Dest_IP>10.15.127.255</Dest_IP>
    <VPI>255</VPI>
    <VCI>65535</VCI>
  </Data_Routing>

  <Data_Routing view="running">
    <Rule>6</Rule>
    <Active>Disabled</Active>
    <Name></Name>
    <Type>EMMG</Type>
    <Dest_IP></Dest_IP>
    <VPI>0</VPI>
    <VCI>0</VCI>
  </Data_Routing>

  <Data_Routing view="running">
    <Rule>7</Rule>
    <Active>Disabled</Active>
    <Name></Name>
    <Type>EMMU</Type>
    <Dest_IP></Dest_IP>
    <VPI>0</VPI>
    <VCI>0</VCI>
  </Data_Routing>

<!--Clear the DHCT database on next reboot.  Mandatory: No. -->
  <Options view="running">
    <Database_Restore_Mode>0</Database_Restore_Mode> <!--(1) DHCT database
will persist across reboots;(0) DHCT database will clear on reboot. -->
```

```
</Options>

<!--This is the process of adjusting the transmitted power and timing delay for
DAVIC messages from a DHCT for optimal performance.  Mandatory: Yes. -->
<DAVIC_Ranging view="lateboot">
 <State>Enabled</State> <!--Cab be Enabled or Disabled
</DAVIC_Ranging>

<!--Set the rate at which DAVIC broadcast messages are sent to DHCTs.  Mandatory:
Yes. -->
<DAVIC_Broadcast_Messages view="lateboot">
 <Broadcast_Rate>1 second(s)</Broadcast_Rate> <!--Between 1-15 seconds per
broadcast message. -->
</DAVIC_Broadcast_Messages>

<!--Enable/Disable Network Services. Used to enable non-essential networking
services. All non-essential services default to disabled if not explicitly set to enabled.
Mandatory: Yes-->
<Network_Services view="lateboot">
 <SSH>Enabled</SSH> <!-- Enabled/Disabled
 <HTTP>Enabled</HTTP> <!-- Enabled/Disabled
 <SNMP>Enabled</SNMP> <!-- Enabled/Disabled
</Network_Services>

<!--SNMP Communities – see SNMP on page 45 for more information. You may
define up to 5 SNMP Communities. Mandatory: No-->
<SNMP_Communities view="lateboot">
 <Community_Name>test</Community_Name> <!--User settable name of the
SNMP Community. Each Community Name must be a unique string. -->
 <Access_Mode>ReadOnly</Access_Mode> <!--Configurable permissions for
this community. Can be set to 'ReadOnly' or 'ReadWrite'. -->
</SNMP_Communities>

<SNMP_Communities view="lateboot">
 <Community_Name>test2</Community_Name>
```

```
    <Access_Mode>ReadOnly</Access_Mode>
  </SNMP_Communities>
```

<!--SNMP Trap Recievers - see SNMP on page 45 for more information. You may define up to 5 SNMP Trap receivers. Mandatory: No. -->

```
  <Trap_Receivers view="lateboot">
    <IP_Address>127.0.0.1</IP_Address> <!--IPv4 address of the SNMP Trap receiver. -->
    <Port_Number>1234</Port_Number> <!--Port to use for sending the SNMP traps to. [1 .. 65535]. Typically 162. -->
    <Notification_Version>v2</Notification_Version> <!--SNMP trap receiver version: "v2".-->
    <Notification_Type>Trap</Notification_Type> <!--Sets the receiver type: 'Trap' one way, no acknowledgement 'Inform' acknowledgment from receiver 'Disabled' receiver is disabled. Traps will not be sent. -->
  </Trap_Receivers>

  <Trap_Receivers view="lateboot">
    <IP_Address>127.0.0.2</IP_Address>
    <Port_Number>1235</Port_Number>
    <Notification_Version>v2</Notification_Version>
    <Notification_Type>Trap</Notification_Type>
  </Trap_Receivers>
```

<!--SNMP Trap Identifiers used to identify a D9485 from other trap devices in a network. These fields populate saltUserName and saltDeviceInstance in the SNMP trap. These cannot be set through the system Shell menu. Mandatory: No. -->

```
  <SNMP_Trap_Values view="lateboot">
    <SALTUSERNAME>System</SALTUSERNAME> <!--String of length 0 – 255 bytes.
    <SALTDEVICENAME>QPSK</SALTDEVICENAME> <!--String of length 0 – 255 bytes.
  </SNMP_Trap_Values>
```

<!--System Upgrade. Automatically start and upgrade on boot. For more information, see the section on Upgrading the QPSK Bridge. Mandatory: No. -->

<System_Upgrade view="lateboot">

<TFTP_Server_or_HTTP_Address>http://192.168.2.3</TFTP_Server_or_HTTP_Address> <!--TFTP or HTTP address of Upgrade Server. -->

<Upgrade_File>1.2.16.bin.signed</Upgrade_File> <!--TFTP: The full path and filename of the upgrade file as located on the TFTP Server identified above. For example, if the file is located on server 192.168.2.3 in /tftpboot/QPSK_files/D9485_REL_4P_1_2_16-G.bin.signed use TFTP_Server_or_HTTP_Address: 192.168.2.3. Upgrade_File: QPSK_files/D9485_REL_4P_1_2_16-G.bin.signed, assuming /tftpboot is the root directly for the server. The filename to use is located at the HTTP_Address above. If the file is accessible at http:<!--192.168.2.3/QPSK_files/D9485_REL_4P_1_2_16-G.bin.signed use TFTP_Server_or_HTTP_Address: http:<!--192.168.2.3/QPSK_files Upgrade_File: D9485_REL_4P_1_2_16-G.bin.signed-->

</System_Upgrade>

</config>

</ifacade_config>

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