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USER MANUAL



DuraNET 3300

Rugged Cisco ESS-3300 L2/L3 Ethernet Switch

24x 1000BASE-T w/PoE+ and 2x 10GBASE-SR

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Revision History Table

REVISION HISTORY			
Rev	Date	Page(s) / Section(s) Affected	Detailed Description of Changes
-	*	All	Creation
A1	10/20/2020	All	Initial Release
A2	10/29/2020	44	Table 3.14, Pin 78 from: P16.MDI2_N to: P16.MDI1_N
A3	10/30/2020	6, 40	Added this Table. Corrected Figure 3.5, pins 20&28 incorrect location.
A4	2/25/2021	15, 33, 35, 37, 38, 42, 47, 48, 65, 66, 67, 68, 74	Updated cable connection diagram (Figure 2.1). Added “Recommended Settings” section for post-zeroization setting changes. Removed references to Amphenol connectors, updated optical connector PN. Corrected J1 power pinout. Added links to Cisco manuals and IOS-XE software releases. Updated mechanical dimensions/mounting section. Removed references to EN55xxx testing.

Chapter 1 Introduction

The Parvus® DuraNET® 3300 is a MIL-rugged 26-port Cisco IOS-managed L2/L3 switch integrating the Cisco® Systems ESS-3300 Embedded Services Switch in a robust design optimized for the harshest deployed military, aerospace, and industrial applications.

About This Document

Manual Organization

This manual provides functional and technical descriptions of the DuraNET 3300 hardware, instructions on connecting the system to test equipment, connector descriptions and pinouts, and specifications.

- Chapter 1 provides an introduction and function description of the DuraNET-3300
- Chapter 2 provides a Quick Start Guide.
- Chapter 3 contains connector pinouts and part numbers for all external connectors and their mating connector
- Chapter 4 explains how to operate the DuraNET 3300. It describes the system connectors and cables, and includes procedures for starting the system, and usage of the zeroization capabilities.
- Chapter 5 provides chassis specifications, dimensions, and mounting instructions. In addition, it provides the technical and environmental specifications for the DuraNET 3300.
- Chapter 6 provides troubleshooting instructions and technical support contact information
- Chapter 7 provides additional contact information.

Definitions

Please refer to the Glossary at the end of this document for an explanation of terms.

Description of Safety Symbols

The following symbols are used in this manual to indicate important information and potentially dangerous situations.



Warning! Danger, electrical shock hazard!
Personal injury or death could occur. Also damage to the system, connected peripheral devices, or software could occur if the warnings are not followed carefully.



Caution! Hazard to individuals, environment, devices, or data!
If you do not adhere to the safety advice next to this symbol, there is obvious hazard to individuals, to environment, to materials, or to data.



Note: This symbol highlights important information or instructions that should be observed.

Functional Description

The Parvus® DuraNET® 3300 is a MIL-rugged 26-port Cisco IOS-managed L2/L3 switch integrating Cisco® Systems' "Hellcat" Embedded Services Switch (ESS-3300) in a robust design optimized for the harshest deployed military, aerospace, and industrial applications. With a small form factor (SFF), fan-less and IP67-rated design, this 1G / 10G (24 x 1000BASE-T + 2 x 10GBASE-SR) ultra-rugged Commercial-Off the Shelf (COTS) network device provides up to 44 Gbps of line-rate multi-layer forwarding, along with advanced network security, data, video and voice services supported by Cisco IOS® software. The DuraNET 3300 serves as an ideal high bandwidth connectivity solution for size, weight, power and cost (SWaP-C)-sensitive vehicle and aircraft platforms exposed to harsh environmental and noisy conditions (e.g. high altitude, extreme shock and vibe, extended temperatures, humidity, dust and water exposure, noisy EMI, dirty power). Integrated EMI and power filtering comply with civil / military vehicle and aircraft requirements, including power input voltage, spikes, surges, transients, and EMI/EMC compatibility requirements per MIL-STD-704F, MIL-STD-1275D, MIL-STD-461F, and RTCA/DO-160. The unit also delivers support for PoE (Power-Over-Ethernet) devices (i.e. IP cameras, IP phones) and MIL-STD-704 hold-up capabilities for aircraft power switch-over requirements.

Not only does the DuraNET 3300 deliver an ultra-reliable and SWaP-optimized design, it notably delivers the latest in Cisco's ESS-3300 IOS-managed Gigabit and 10 Gigabit Ethernet connectivity for a devices installed at the tactical network edge on-board unmanned air/ground vehicles (UAVs, UGVs), helicopters, fixed-wing aircraft, tactical ground vehicles and other SWaP-constrained platforms deploying Ethernet backbones. With Cisco Network Essentials (switching) or Network Advantage software (switching + routing) software license options, the unit can support fully managed Layer 2/3 switching and dynamic routing with a comprehensive set of enterprise-grade networking features for robust and secure network services including efficient multicasting, flexible Quality of Service (QoS), precision timing (IEEE-1588), and a range of security features, such as MACsec, secure boot, and zeroize, etc)

Housed in a sealed IP67-rated (dust + water proof) aluminum chassis with MIL-DTL-38999 circular connectors, the DuraNET 3300 combines rugged robust mechanical design with high-performance networking, delivering new capabilities for situational awareness and Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) applications. Built with industrial-temperature components, this compact system supports a wide ambient operating temperature range of -40 to +71°C (-40 to +160ºF) without fans or cold plate. It thrives in extreme shock/vibration conditions, high altitude, and humidity, making it well suited for mobile, tactical, aerospace, and ground vehicle applications. The unit will undergo extensive qualification testing to MIL-STD-810G, MILSTD-461F, MIL-STD-1275D, MIL-STD-704F and RTCA/DO-160G conditions for environmental, power and EMI compatibility (thermal, shock, vibration, dust, water, humidity, altitude, power spikes/ surges, conducted/radiated emissions & susceptibility.

Features

- Small form factor L2/L3 Ethernet Switch
- 24x ports of Gigabit 1000BASE-T (copper) interfaces + optional 2 x ports of 10 Gigabit 10GBASE-SR (fiber optic) ports for trunking / uplinks / long hauls / EMI immunity. USB 2.0 console, RS232 console, zeroize discrete input, and optional 50ms holdup for core switch (not for PoE power)
- SWaP-optimized
    - Size: ~ 150 in^3 volume; ~ 2U high
    - Weight: ~ 5.6 lb (2.52 kg)
    - Power: < 50 W, excluding PoE

Cisco Technology

- Integrated 10G/1G Cisco Embedded Services Switch (ESS-3300) cards
- Cisco IOS-XE with Network Essentials or Network Advantage license options
- Data, video, and voice service features for security, QoS, and high availability: TCP, UDP, Telnet, IGMP, IP, RADIUS, SNMP, RMON, DHCP, HTTPS, VLAN, WEBUI Device Manager, Industrial Network Director (IND), IEEE-1588v2 time-stamping, Media Access Control Security (MACsec)
- Optional Layer 3 IP Services support for dynamic routing: Inter-VLAN Routing, Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), Routing Information Protocol (RIP), Intermediate System to Intermediate System (IS-IS), Protocol Independent Multicast (PIM)

Rugged MIL-STD Design

- MIL-STD-810G and DO-160G environmental qualifications (shock, vibration, thermal, altitude, humidity, ingress)
- Filtered, transient and EMI-protected MIL-STD-1275/704/ DO-160 compliant power supply for aircraft and vehicle “dirty power” input; support for PoE injected IP phones and cameras; 50ms power hold-up option
- MIL-STD-461F and DO-160 EMI/EMC (conducted and radiated emissions and susceptibility)
- -40 to +71°C fan-less extended temp operation with no moving parts (passive natural convection)
- Corrosion-resistant, aluminum chassis sealed for water immersion, dust exposure (equivalent to IP67 rating)
- High-performance MIL-circular connectors
- Conformal coating for humidity/tin-whisker mitigation

Target Applications

- High throughput in-vehicle / airborne L2/L3 Ethernet switching and routing in harsh temperature and vibration environments (for onboard computers, cameras, sensors, monitoring devices, communications, and command-and-control equipment)
- Civil and military SWaP-sensitive Communications - On the Move (C-OTM) systems for mobile, tactical, airborne, and vehicle platforms, enhancing situational awareness and network centric operations at network edge (i.e. UAV, UAS, UGV, helicopter, aircraft, vehicle, maritime vessels, outdoor, underground)

- C4ISR technology refresh on retrofit / new platforms
- ITAR-free export, U.S. Commerce EAR controlled
- Commercial and military aerospace platforms requiring compliance to MIL-STD-810G, MIL-STD-461F, MIL-STD- 1275D, MIL-STD-704F, CE Mark, RTCA/DO-160

Configurations

Details on DuraNET 3300 Early Access Unit (EAU) and Production configurations follow. Both EAUs and Production units share the same form factor and function, but have different power connectors and external connector coatings.

EAU system and cable set configurations include:

Table 1.1: EAU System Configurations

Product Number	Description
NET-3300-01H-E	DuraNET 3300 Ethernet Switch, 24 x 1000BASE-T with 50 ms switch holdup, Network Essentials IOS, EAU
NET-3300-02-E	DuraNET 3300 Ethernet Switch, 24 x 1000BASE-T, 2 x 10GBASE-SR, Network Essentials IOS, EAU
NET-3300-11-E	DuraNET 3300 Ethernet Switch, 24 x 1000BASE-T, Network Advantage IOS, EAU

Table 1.2: EAU Breakout I/O Cable Configurations

Product Number	Description
CBL-NET-3300-01-E	Starter cable set for DuraNET 3300, 24 x GbE, Mating Circular Connectors to RJ-45/USB/DB9, EAU
CBL-NET-3300-02-E	Starter cable set for DuraNET 3300, 24 x GbE, 2 x 10G, Mating Circular Connectors to RJ-45/USB/DB9/Fiber-LC, EAU

Production system and cable set configurations include:

Table 1.3: Production System Configurations

Product Number	Description
NET-3300-01	DuraNET 3300 Ethernet Switch, 24 x 1000BASE-T, Network Essentials IOS
NET-3300-01H	DuraNET 3300 Ethernet Switch, 24 x 1000BASE-T with 50 ms switch holdup, Network Essentials IOS
NET-3300-02	DuraNET 3300 Ethernet Switch, 24 x 1000BASE-T, 2 x 10GBASE-SR, Network Essentials IOS
NET-3300-02H	DuraNET 3300 Ethernet Switch, 24 x 1000BASE-T, 2 x 10GBASE-SR with 50 ms switch holdup, Network Essentials IOS
NET-3300-11	DuraNET 3300 Ethernet Switch, 24 x 1000BASE-T, Network Advantage IOS
NET-3300-11H	DuraNET 3300 Ethernet Switch, 24 x 1000BASE-T with 50 ms switch holdup, Network Advantage IOS
NET-3300-12	DuraNET 3300 Ethernet Switch, 24 x 1000BASE-T, 2 x 10GBASE-SR, Network Advantage IOS
NET-3300-12H	DuraNET 3300 Ethernet Switch, 24 x 1000BASE-T, 2 x 10GBASE-SR with 50 ms switch holdup, Network Advantage IOS

Table 1.4: Production Breakout I/O Cable Configurations

Product Number	Description
CBL-NET-3300-01	Starter cable set for DuraNET 3300, 24 x GbE, Mating Circular Connectors to RJ-45/USB/DB9
CBL-NET-3300-02	Starter cable set for DuraNET 3300, 24 x GbE, 2 x 10G, mating circular connectors to RJ-45/USB/DB9/Fiber-LC

Architecture Block Diagram

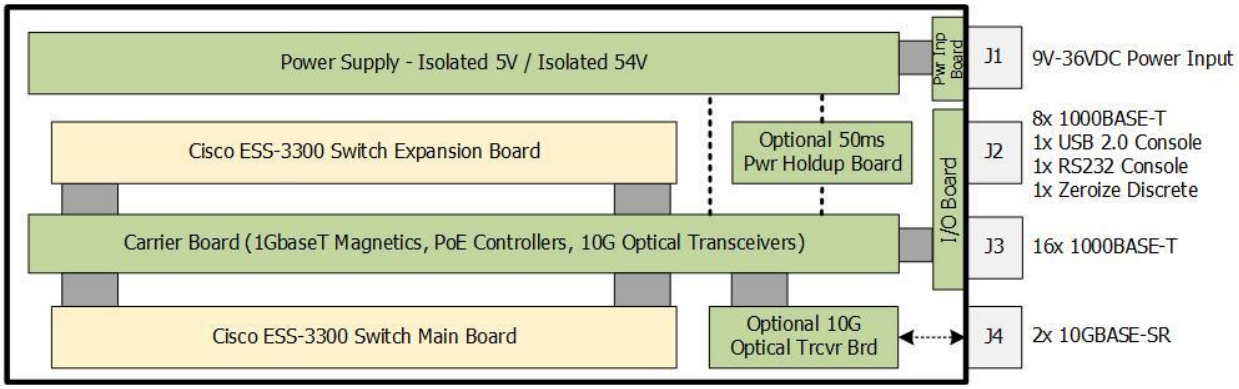


Figure 1.1: DuraNET 3300 Architecture Block Diagram

Chapter 2 Quick-Start Guide

This section describes the physical configuration and quick-start operational testing of the DuraNET 3300. You will need two computers with at least a single USB port and single network connection.

Tables 2.1 and Table 2.2 list the relationship between cables, cable port labels, and Cisco port definitions.

Table 2.1: DuraNET 3300 Breakout Cables, Cisco Ports and Port Labels

J2 CBL-2884-01		J3 CBL-2885-01			
Cisco Port	Cable Label	Cisco Port	Cable Label	Cisco Port	Cable Label
Gi1/3	P3	Gi2/1	P11	Gi2/9	P19
Gi1/4	P4	Gi2/2	P12	Gi2/10	P20
Gi1/5	P1	Gi2/3	P9	Gi2/11	P17
Gi1/6	P2	Gi2/4	P10	Gi2/12	P18
Gi1/7	P7	Gi2/5	P15	Gi2/13	P23
Gi1/8	P8	Gi2/6	P16	Gi2/14	P24
Gi1/9	P5	Gi2/7	P13	Gi2/15	P21
Gi1/10	P6	Gi2/8	P14	Gi2/16	P22

Note: J4 optical ports Te1/1 and Te1/2 assigned to LC1 and LC2 respectively.

Table 2.2: Physical Cable Labels vs Cisco Port Numbers/Long Names

Physical Cable Label	Cisco Software Shorthand Name	Cisco Software Long Name
LC1	Te1/1	Tengigabitethernet1/1
LC2	Te1/2	Tengigabitethernet1/2
P1	Gi1/5	Gigabitethernet1/5
P2	Gi1/6	Gigabitethernet1/6
P3	Gi1/3	Gigabitethernet1/3
P4	Gi1/4	Gigabitethernet1/4
P5	Gi1/9	Gigabitethernet1/9
P6	Gi1/10	Gigabitethernet1/10
P7	Gi1/7	Gigabitethernet1/7
P8	Gi1/8	Gigabitethernet1/8
P9	Gi2/3	Gigabitethernet2/3
P10	Gi2/4	Gigabitethernet2/4
P11	Gi2/1	Gigabitethernet2/1
P12	Gi2/2	Gigabitethernet2/2
P13	Gi2/7	Gigabitethernet2/7
P14	Gi2/8	Gigabitethernet2/8
P15	Gi2/5	Gigabitethernet2/5
P16	Gi2/6	Gigabitethernet2/6
P17	Gi2/11	Gigabitethernet2/11
P18	Gi2/12	Gigabitethernet2/12
P19	Gi2/9	Gigabitethernet2/9
P20	Gi2/10	Gigabitethernet2/10
P21	Gi2/15	Gigabitethernet2/15
P22	Gi2/16	Gigabitethernet2/16
P23	Gi2/13	Gigabitethernet2/13
P24	Gi2/14	Gigabitethernet2/14

Starter Breakout Cable Sets

Cable sets are made of the following individual cable assemblies:

- CBL-2883-01 CBL LAB DURANET 3300 POWER J1 80IN
- CBL-2884-01 CBL LAB DURANET 3300 8X1G J2 80IN
- CBL-2885-01 CBL LAB DURANET 3300 16X1G J3 80IN
- CBL-2886-01 CBL LAB DURANET 3300 10G-SR J4 80IN

Cable Install and Connections

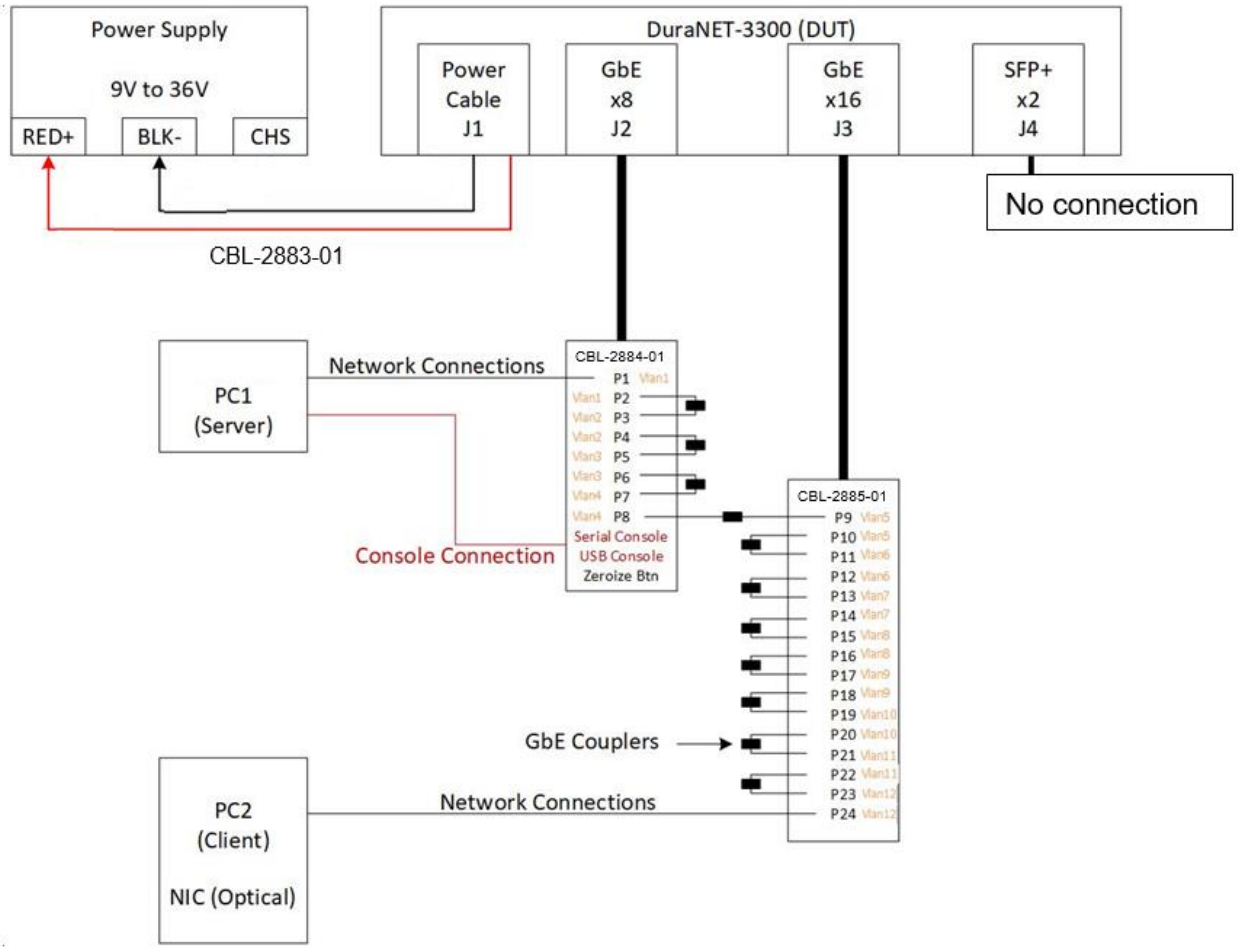


Figure 2.1: Cable Diagram

1. Connect a power cable (CBL-2883-01) to port J1 on the DuraNET 3300 and the other end of the cable to the **unpowered** DC power source.
2. Connect network cable (CBL-2884-01) to port J2 on the DuraNET 3300
    a. Connect either the RS-232 or USB communication link to PC1 USB or serial port.
3. Connect network cable (CBL-2885-01) to port J3 on the DuraNET 3300
4. Connect Optical cable (CBL-2886-01) to port J4 on the DuraNET 3300

Accessing the CLI through the Console Port

You can enter Cisco IOS commands and parameters through the CLI, by using one of the console connections. Note: if both the USB and RS-232 are connected, the USB takes precedence.

- USB Console Port
- RS-232 Console Port

Software Terminal Emulator and Serial Console Setup

Prior to communicating with the DuraNET 3300, software installation and setup must be performed to ensure proper communication. The installation instructions will be tailored for both Windows 10 and Linux operating systems for multi-user preference and experience.

See appendix A for the install of required software

Linux:

- Open a terminal window. If this is the first time opening a terminal window you will need to set the baud rate for the console port. If this is not the first time you can simply enter "***sudo minicom***"
- From the terminal window prompt enter the following command
  - ~$ ***sudo minicom –s***
  - password for parvus: ***parvus*** "if asked for a password"

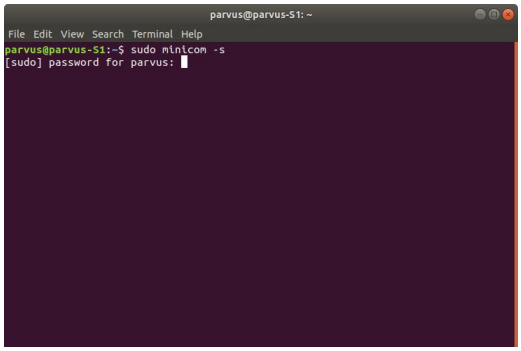


Figure 2.2: Minicom Term

- Use the up and down arrow keys to select *"Serial port setup"* in the [configuration] menu
  - ***Serial port setup***

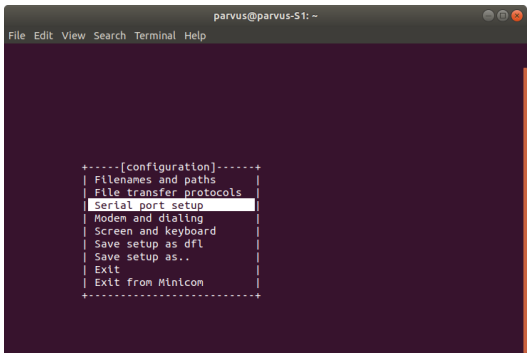


Figure 2.3: Minicom Serial Setup

- Under setup option enter ***E*** and change the Bps/Par/Bits to
  - ***9600 8N1***

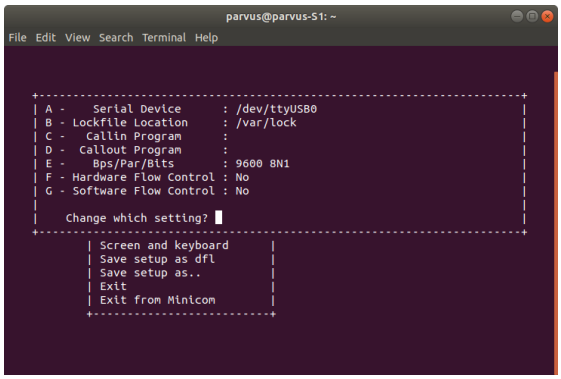


Figure 2.4: Minicom Baud

- Then save as default and exit

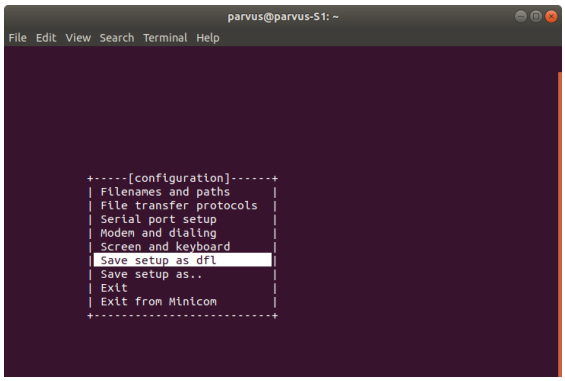


Figure 2.5: Minicom Default

- To confirm correct configuration and communication link
  - Hit <return> and confirm the Cisco CLI prompt is displayed
    - ***Switch>***

Windows:

First-time use of Windows will require installation of a USB driver, terminal emulator, console and IP address setup.

- USB Driver
  - Connection of either the USB or RS232 console cables will initiate an auto USB CP2102 driver load. User interaction during this process is not required.

- Download the PuTTY Terminal Emulator (or equivalent, i.e. TeraTerm) and Serial Console Application software and following the instructions
- www.putty.org
  - Download PuTTY installation
    - PuTTY-64bit-0.74-installer

  - Software installation can be accomplished by following the instructions from the URL page.
    - *https://www.ssh.com/ssh/putty/windows/install*

Execute and Configure the PuTTY installer

Open the Windows Explorer (right-click on the Windows logo in the bottom left corner), navigate to the Downloads directory (or wherever you saved the installer), and double-click on the file name. Note, however, that the installation has to be performed with Administrator rights (either using the Administrator account or your personal account must have Administrator permissions).
When the installer starts, it shows the welcome screen. Just click **Next**.

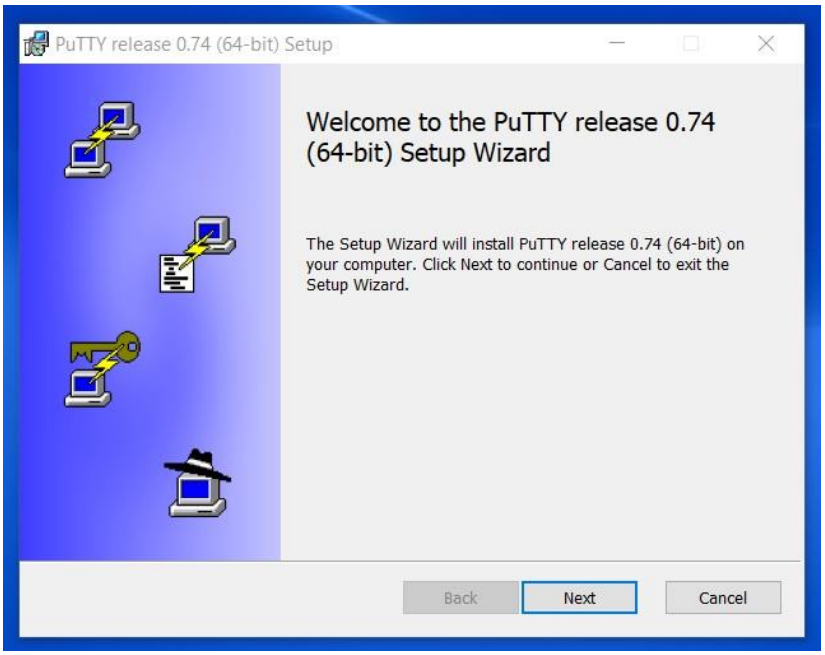


Figure 2.6: PuTTY Install

The installer then asks for the Destination folder in which to install the software. Almost always it is best to use the default value. Just click **Next**.

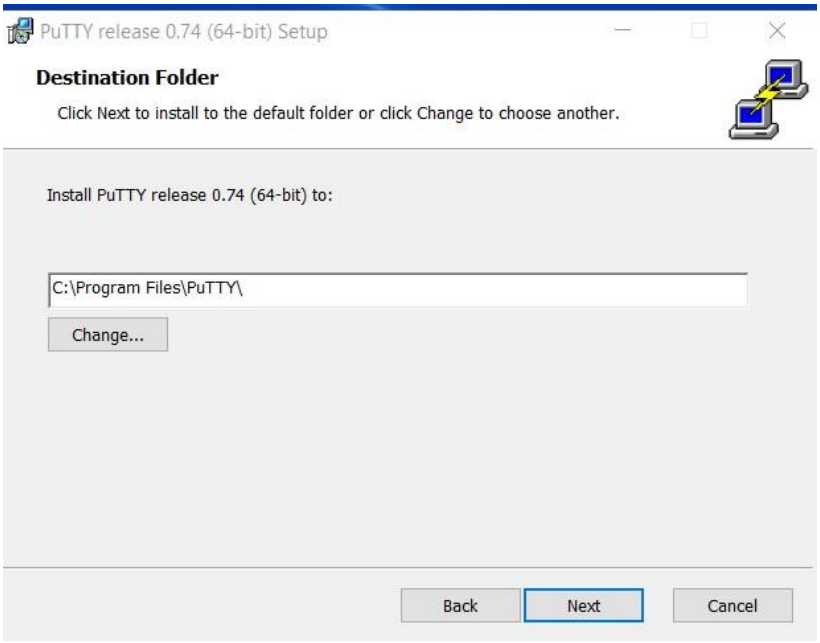


Figure 2.7: PuTTY Destination

Then, the installer asks to select product features to install. You probably want to add a shortcut on the desktop if you expect to use the software frequently. All the other options generally should be enabled. When ready, click **Install**.

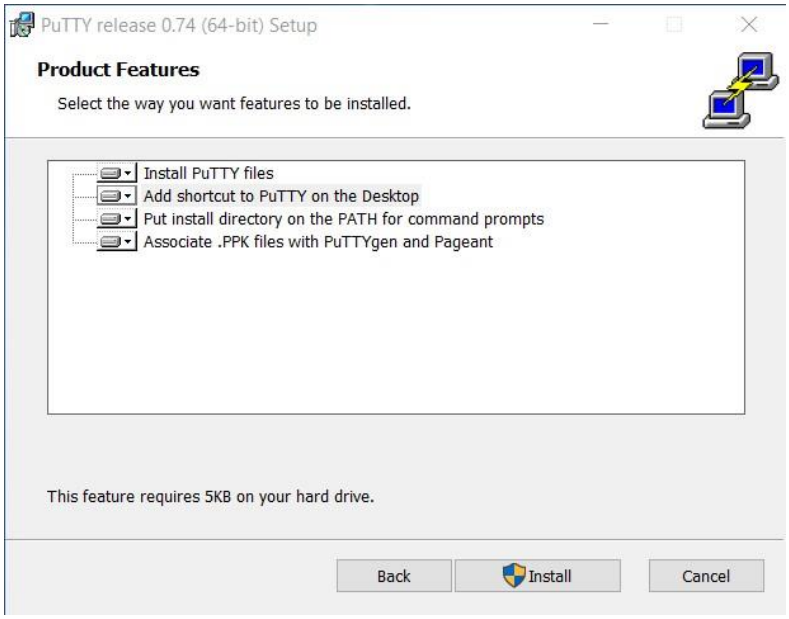


Figure 2.8: PuTTY Features

When the installation has completed successfully, it should show a "Completed" screen. Click **Finish** to exit the installer.

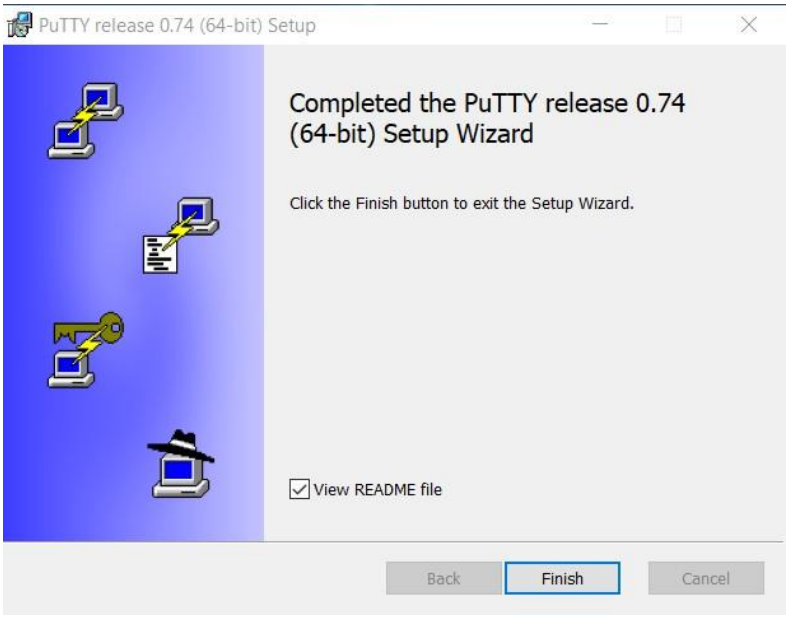


Figure 2.9: PuTTY Completed

Running PuTTY

Once installation successfully completed, you should test to make sure that PuTTY (or equivalent terminal emulator) runs correctly and you can find the program. If you installed a shortcut on the desktop, you should be able to find the icon for PuTTY. Try (double-)clicking on the icon to start the software.

Otherwise, you should be able to find the software from the Windows Start menu in the bottom left corner of the screen. The menu looks different in each version of Windows. On Windows 10, scroll down until you see "PuTTY". Open the group, and select "PuTTY".

When the software starts, you should get a window with the title "PuTTY Configuration".

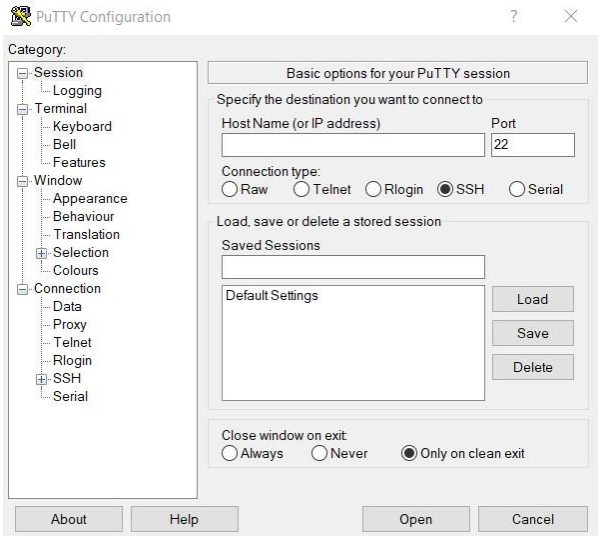


Figure 2.10: PuTTY Configuration

At this point, you need to confirm the COM port connection being used for the CLI console from the DuraNET 3300. Navigate to Device Manager on your PC and select “Ports (COM & LPT) to display the COM port connection.

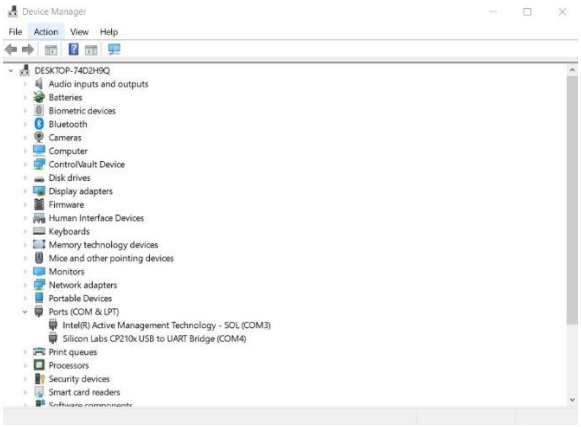


Figure 2.11: PuTTY COM Port Assigned

From the PuTTY configuration window select ***Serial*** and enter the COM port number then select ***Open***. You should now be connected to the DuraNET 3300 Console.

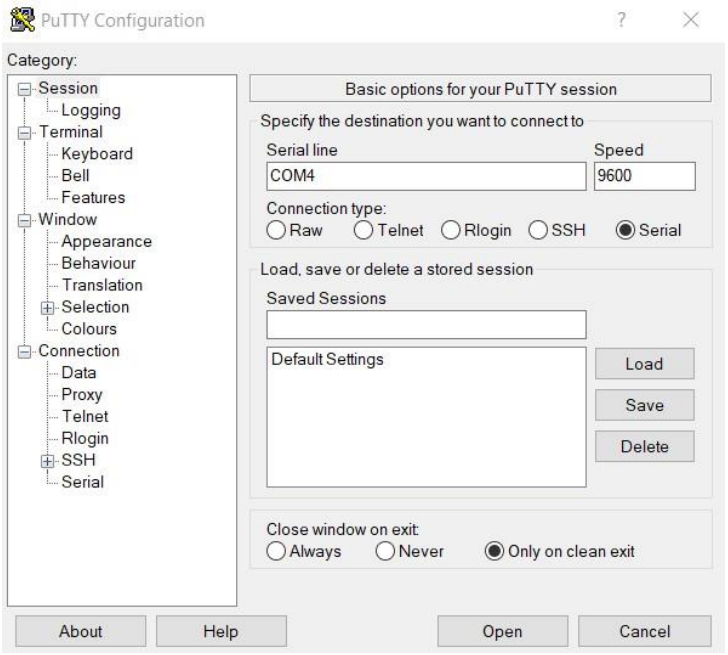


Figure 2.12: PuTTY Configuration with COM #

Press the <Enter> key to display the DuraNET 3300 console prompt ***Switch>***



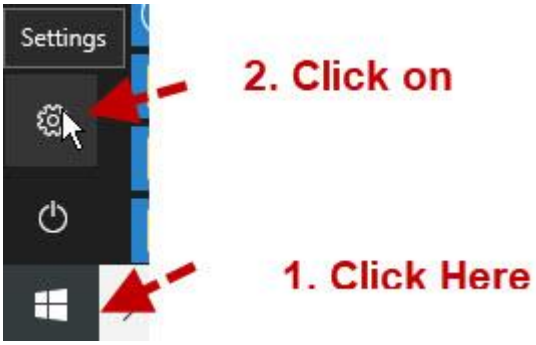
Figure 2.13: Console Prompt

Setting static IP address

Instruction for setting a static IP address can also be found here:

- *https://stevessmarthomeguide.com/setting-up-static-ip-address-windows-10/*

To set up a static address.



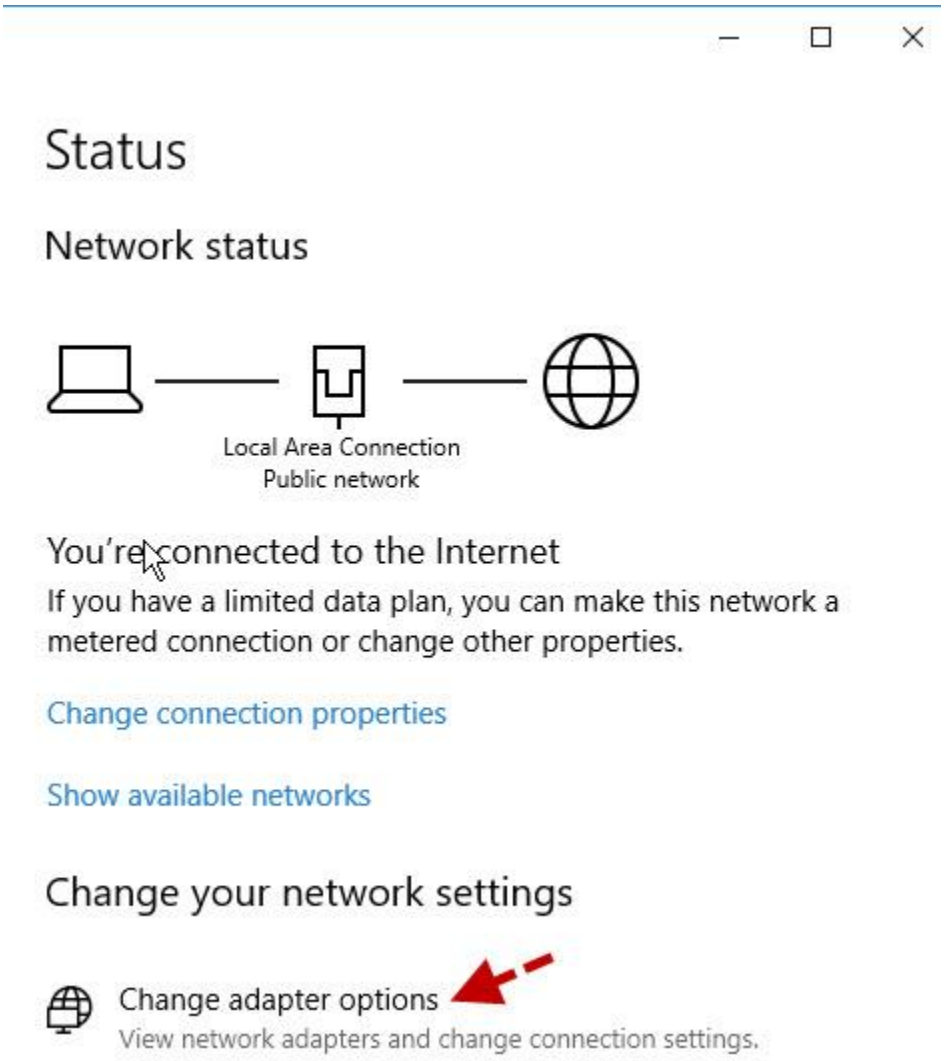
1. Click on the ***Windows icon***

2. Click the ***Settings icon***

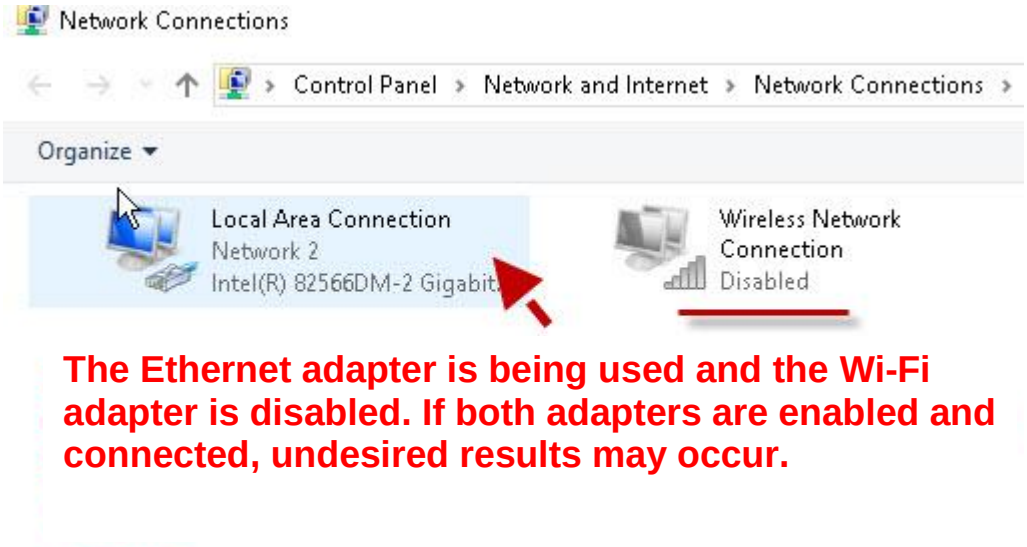
3. The windows setting screen appears click on the ***Network and Internet*** link.



4. In the Network status pane locate the ***change adapter options*** link and click it



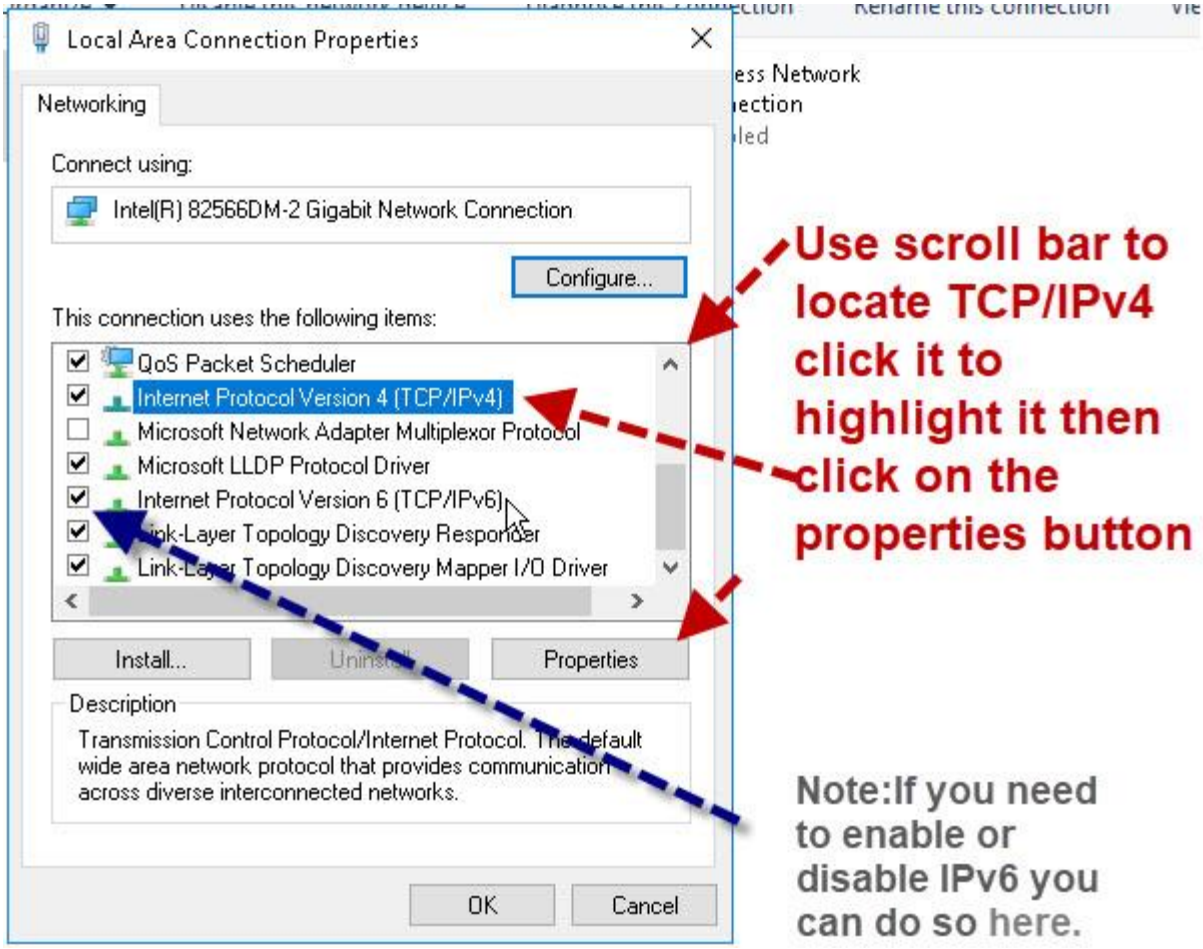
5. You should now see your network adapters. If your PC is equipped with two, as most are, then only use one and disable the other.



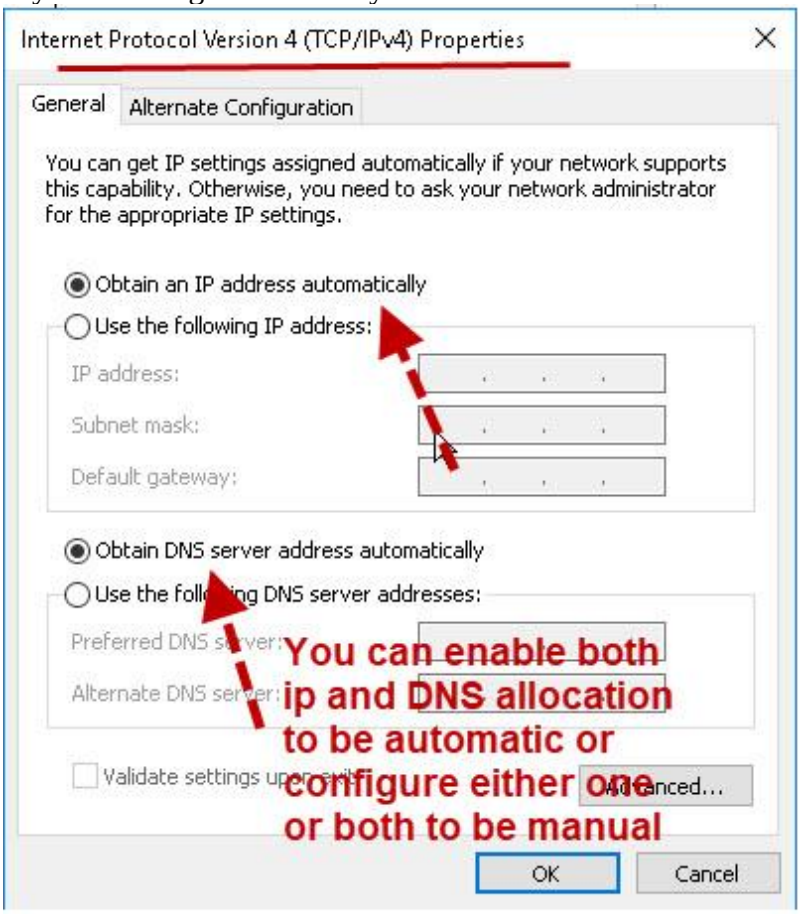
6. Right click on the icon and select ***properties*** from the drop down list.



7. Use the scroll bar to locate **TCP/IPv4** and click it to highlight and then click the **properties button**.

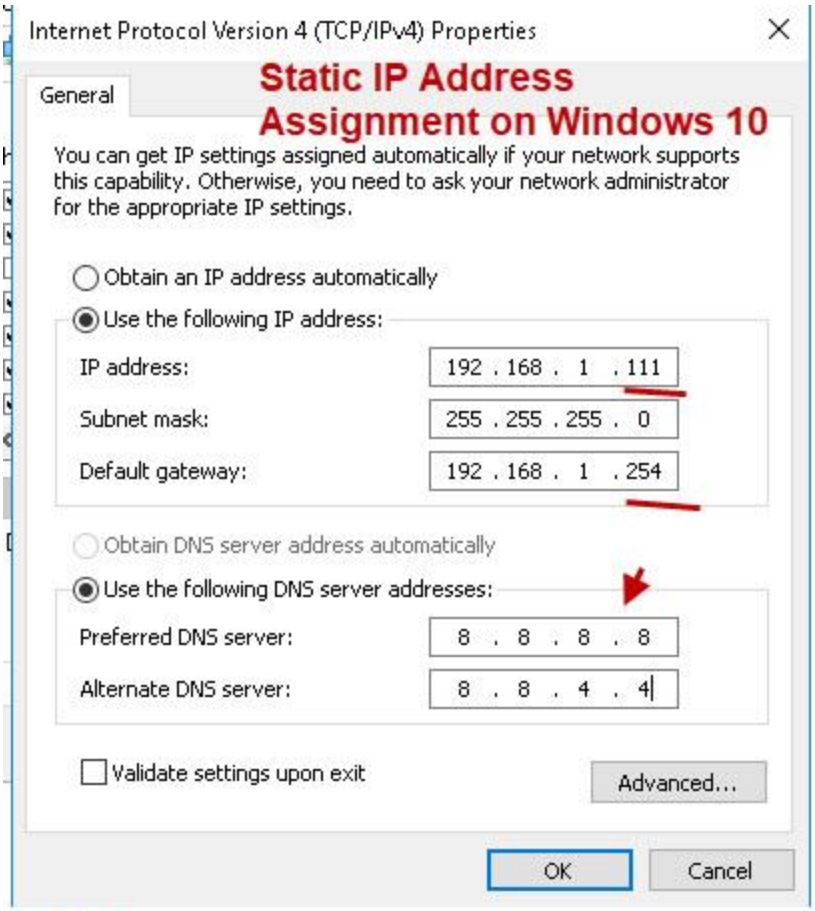


If you are using DHCP then you should see a screen like the one below.



Standard IP and DNS Settings

You can uncheck the **automatic assignment** of IP address and or DNS server address. Then enter your own details as show below:



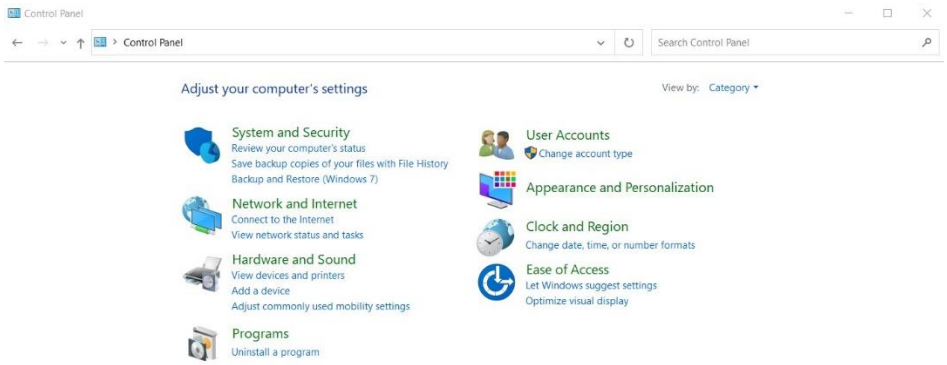
Notes:

1. The last number of the IP address e.g. 111 shown above must be unique. Don't assign it t another device on the network.
2. The 3 numbers 192.168.1 should be the same for the IP address and default gateway.
3. Your default gateway address may be the same (common) or another common address is 192.168.1.1
4. The subnet mask 255.255.255.0 is standard on home networks
5. The DNS server addresses shown are those of Google you can use those or your own DNS provider addresses

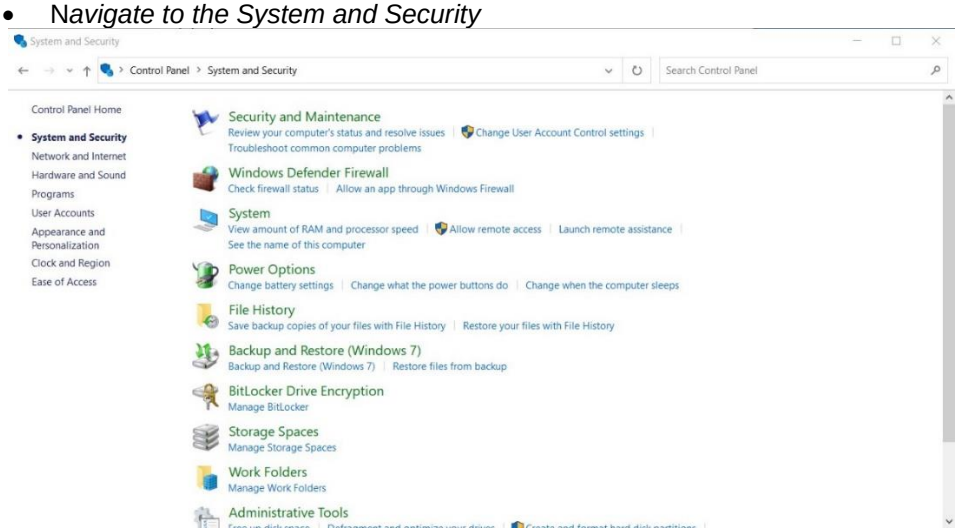
Setting an Open Firewall Port

To allow pings and data communication between the network port of this PC and the world we need to open a Firewall Port.

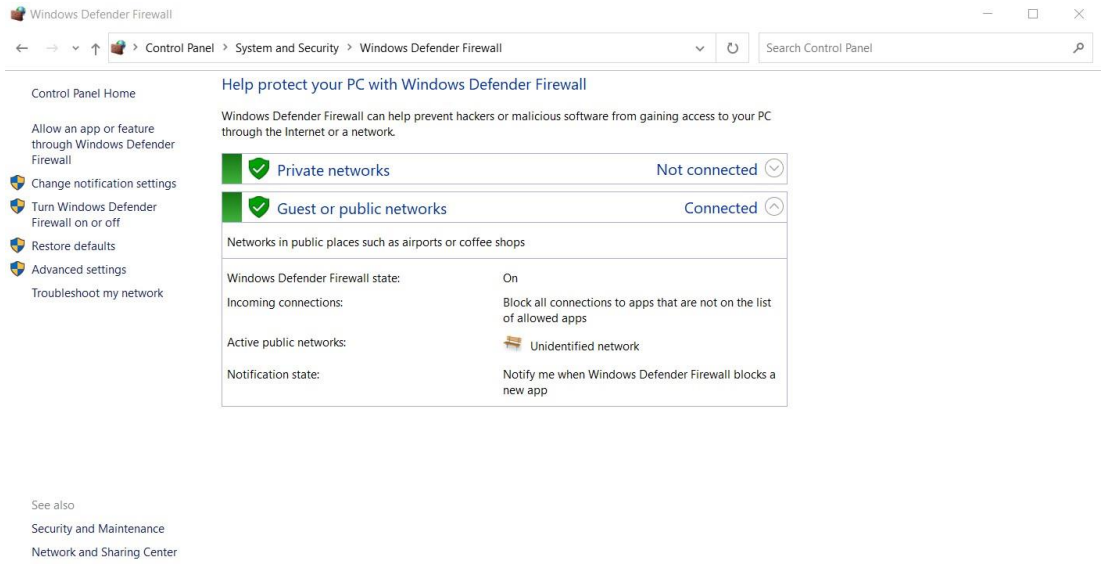
- Open the Control Panel



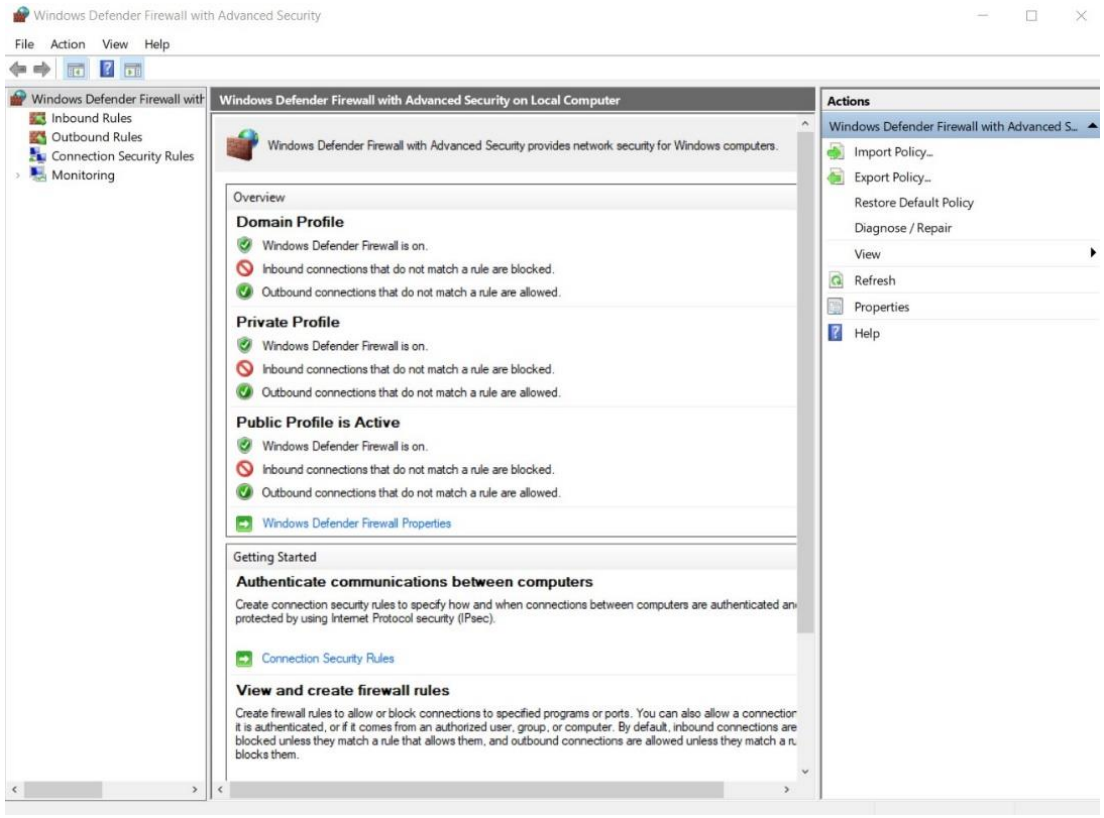
- N*avigate to the System and Security*



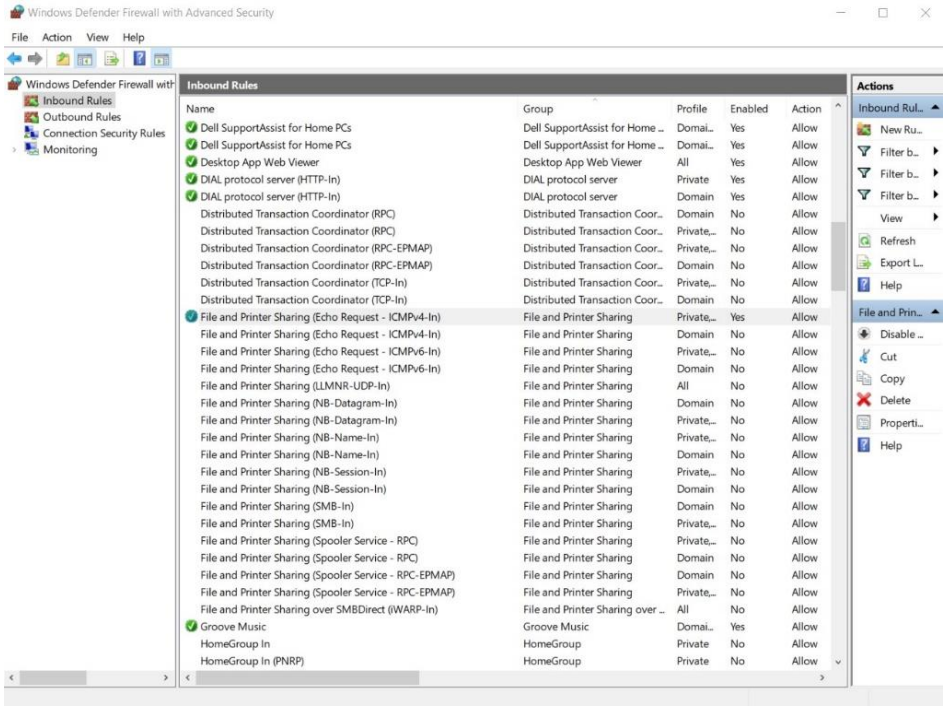
- Windows Defender Firewall



- Advanced Settings



- In the left panel
  - Inbound Rules
  - Enable both File and Printer Sharing (ICMPv4-In)



This completes opening the firewall port and you can now close all the open windows.

USB Console Port

Physically connect the USB cable from the J2 cable set to a USB port on the PC.

Linux:

- Open a terminal window
- From the terminal window prompt enter
  - ~$ ***sudo minicom***
  - password for parvus: ***parvus*** “if asked for a password”
- Power on the DUT
  - Boot information should begin to scroll in this terminal window.
  - At the end of the boot listing information “approximately 2.5min” simply hit <return> and confirm the CLI prompt
    - ***switch>***

Windows:

- Identify the COM port assigned to the selected USB port by performing the following windows commands
  - Start
  - Control Panel
  - System
  - Device Manager
  - Ports (COM & LPT)
    - Silicon Labs CP210x USB to UART Bridge (COM#)

- Start the terminal-emulation program ***PuTTY*** on the PC, making communication possible between the switch and a terminal window.
- Configure the serial communication
  - 9600 baud, 8 data bits, 1 stop bit, no parity, no flow control.
- Assign the COM port number as identified above
- To confirm correct configuration and communication link
  - Hit <return> and confirm the CLI prompt
  - ***Switch>***

RS-232 Console Port

Physically connect the RS232 cable / Null-Modem from the J2 cable set to a RS232 port on the PC. If the PC doesn't have an RS232 port, you will need to use a USB-to-RS232 adapter including a Null-Modem.

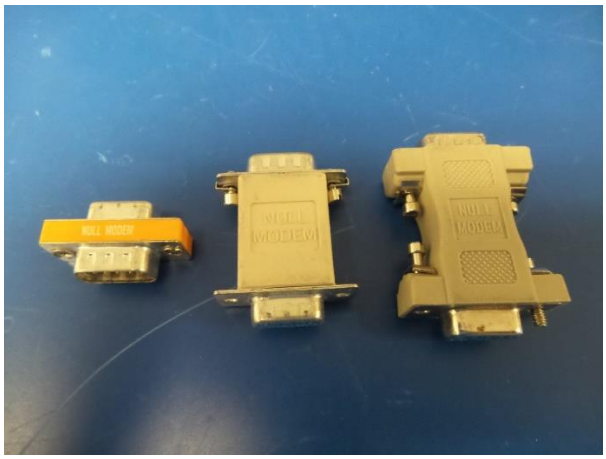


Figure 2.14: Null Modems

Linux:

- Please review section USB Console Port to ensure you have configured the baud rate.
- Open a terminal window
- From the terminal window prompt
  - ~$ sudo minicom
- To confirm correct configuration and communication link
  - Hit <return> and confirm the CLI prompt
    - switch>

Windows:

- Open the terminal emulator ***PuTTY***
- Enter correct COM port and Baud rate
- To confirm correct configuration and communication link
  - Hit<return> and confirm the CLI prompt
    - switch>



Figure 2.15: DuraNET 3300 *switch*> prompt

Recommended Settings

Each time the DuraNET 3300 is zeroized, the settings listed below are cleared. It is recommended to reenable these settings with the following commands:

enable
config t
license smart reservation
license smart transport off
service declassify erase-nvram
end
copy run start

license smart reservation: Specific License Reservation allows customers in highly secure networks to utilize smart licenses without communicating the license information.

license smart transport off: This command is useful for systems that never see internet, so the switch doesn't call home to verify and/or update license. Ideal for offline topology.

service declassify erase-nvram: This command enables nvram zeroization.

Chapter 3 Connector Descriptions

This chapter identifies the pinouts and signal descriptions for the DuraNET 3300. It also provides connector part numbers along with suggested mating connector details as necessary.

Early Access Units (EAU) and Production Units have different external connector coatings and power input connector.

Connector Identification

EAU Configuration**:**



Figure 3.1: EAU Front View

Table 3.1: EAU Connector Identification & Part Numbers

Recept-acle Used For	Recept-acle Label #	# of Pins	Wire Gauge (AWG)	Panel Connector Part Number	Mating Cable Connector Part Number
Power	J1	5	14	Phoenix Contact 1415337	Phoenix Contact 1027478 shell with 1029396 contacts for pins 1-4 and 1029398 contact for pin 5
Copper I/O	J2	85	22-28	Glenair 801-033-07ZNU17-85SA	Glenair 801-008-16ZNU17-85PA
Copper I/O	J3	130	22-28	Glenair 801-033-07ZNU21-130SA	Glenair 801-008-16ZNU21-130PA
Optical I/O	J4	4	N/A	Glenair 180-118-ZR08-11-4S1 shell 181-043-126C termini	Glenair 180-118-ZR06-11-4P1 shell 181-043-126C termini

Production Configuration:



Figure 3.2: Production Front View

Table 3.2: Production Connector Identification & Partnumbers

Recept-acle Used For	Recept-acle Label #	# of Pins	Wire Gauge (AWG)	Panel Connector Part Number	Mating Cable Connector Part Number
Power	J1	2	12	Glenair 801-033-07M10-2PA	Glenair 801-008-16M10-2SA
Copper I/O	J2	85	22-28	Glenair 801-033-07M17-85SA	Glenair 801-008-16M17-85PA
Copper I/O	J3	130	22-28	Glenair 801-033-07M21-130SA	Glenair 801-008-16M21-130PA
Optical I/O	J4	4	N/A	Glenair 180-118-ZR08-11-4S1 shell 181-043-126C termini	Glenair 180-118-ZR06-11-4P1 shell 181-043-126C termini

Connector Pinouts

This section provides the pinouts necessary for creating cables to connect to this assembly. If custom cabling is not designed and built by Curtiss-Wright, all EMI and EMC consideration must be handled by the customer.

Note: EAU and Production cable pinouts are identical other than the power connector.

J1 Power Connector

Table 3.3: J1 EAU Connector Information

Recept-acle Used For	Recept-acle Label #	# of Pins	Wire Gauge (AWG)	Panel Connector Part Number	Mating Cable Connector Part Number
Power	J1	5	14	Phoenix Contact 1415337	Phoenix Contact 1027478 shell with 1029396 contacts for pins 1-4 and 1029398 contact for pin 5

Figure 3.3: J1 EAU Pin Arrangement

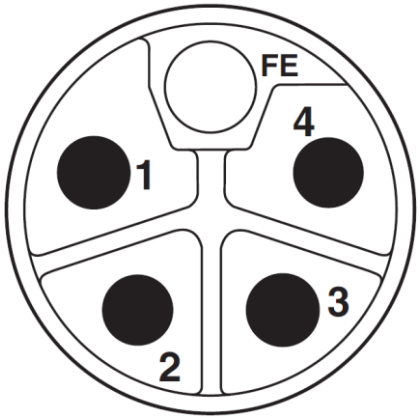


Table 3.4: J1 Connector Pinout

J1 Pins	Signal
1, 2	28VDC
3,4	28VDC RETURN
5	CHASSIS GROUND

Note: Phoenix Contact will not be releasing the 1027478 until sometime in Q3 2020 (delayed from Q4 2019). For customers that must start building a power cable before the 1027478 is available, there is an alternate solution if the requirement is for a cable that is no more than 10 meters in length. Phoenix Contact makes cable assemblies with a molded connector on one end, and flying leads on the other end. The cable assemblies have 14 gauge wires, an overall braid shield, and a thick outer jacket. The jacket and the braid shield can be removed if they are not required by the application. These cables are stocked by a few distributors including part numbers and lengths listed in Table 3.4.

Table 3.5: **Phoenix Power Cables**

Phoenix Part Number	Description
1414773	1.5 Meter Power Cable
1414791	3 Meter Power Cable
1414807	5 Meter Power Cable
1414824	10 Meter Power Cable

Table 3.6: J1 Production Connector Information

Recept-acle Used For	Recept-acle Label #	# of Pins	Wire Gauge (AWG)	Panel Connector Part Number	Mating Cable Connector Part Number
Power	J1	2	12	Glenair 801-033-07M10-2PA	GlenAir 801-008-16M10-2SA

Figure 3.4: J1 Production Pin Arrangement

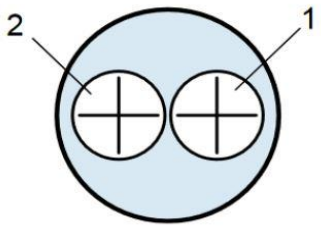


Table 3.7: J1 Connector Pinout

J1 Pins	Signal
1	28VDC RETURN
2	28VDC

J2 Copper I/O Connector

J2 supports GbE ports 1-8, the USB console port, the RS232 console port, and the zeroize discrete input.

Table 3.8: J2 EAU Connector Information

Recept-acle Used For	Recept-acle Label #	# of Pins	Wire Gauge (AWG)	Panel Connector Part Number	Mating Cable Connector Part Number
I/O	J2	85	22-28 AWG	Glenair 801-033-07ZNU17-85SA	Glenair 801-008-16ZNU17-85PA

Table 3.9: J2 Production Connector Information

Recept-acle Used For	Recept-acle Label #	# of Pins	Wire Gauge (AWG)	Panel Connector Part Number	Mating Cable Connector Part Number
I/O	J2	85	22-28 AWG	Glenair 801-033-07M17-85SA	Glenair 801-008-16M17-85PA

Figure 3.5: J2 Pin Arrangement

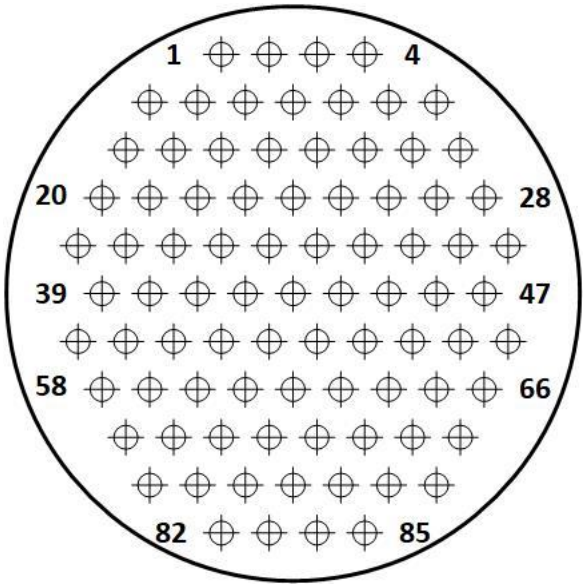


Table 3.10: J2 Connector Pinout – By Pin Number

J2 Pin	Signal	Function	J2 Pin	Signal	Function
1	VBUS	USB VBUS Sense	44	GBE_P6.MDI3_P	GBE Port 6
2	VBUS_GND	USB VBUS Ground	45	GBE_P6.MDI2_P	GBE Port 6
3	NC	No Connect	46	GBE_P6.MDI1_P	GBE Port 6
4	GND	USB Ground	47	GBE_P6.MDI0_P	GBE Port 6
5	USB_P	USB Console P	48	NC	No Connect
6	USB_N	USB Console N	49	GBE_P5.MDI3_P	GBE Port 5
7	GND	Zeroize Input Ground	50	GBE_P5.MDI2_P	GBE Port 5
8	ZEROIZE_INPUT	Zeroize Input Discrete	51	GBE_P5.MDI1_P	GBE Port 5
9	RS232_GND	RS232 Ground	52	GBE_P5.MDI0_P	GBE Port 5
10	RS232_RXD	RS232 Console Receive Input	53	GBE_P6.MDI3_N	GBE Port 6
11	RS232_TXD	RS232 Console Transmit Output	54	GBE_P6.MDI2_N	GBE Port 6
12	GBE_P1.MDI3_N	GBE Port 1	55	GBE_P6.MDI1_N	GBE Port 6
13	GBE_P1.MDI2_N	GBE Port 1	56	GBE_P6.MDI0_N	GBE Port 6
14	GBE_P1.MDI1_N	GBE Port 1	57	NC	No Connect
15	GBE_P1.MDI0_N	GBE Port 1	58	GBE_P8.MDI3_N	GBE Port 8
16	GBE_P3.MDI3_N	GBE Port 3	59	GBE_P8.MDI2_N	GBE Port 8
17	GBE_P3.MDI2_N	GBE Port 3	60	GBE_P8.MDI1_N	GBE Port 8
18	GBE_P3.MDI1_N	GBE Port 3	61	GBE_P8.MDI0_N	GBE Port 8
19	GBE_P3.MDI0_N	GBE Port 3	62	NC	No Connect
20	GBE_P1.MDI3_P	GBE Port 1	63	GBE_P2.MDI3_P	GBE Port 2
21	GBE_P1.MDI2_P	GBE Port 1	64	GBE_P2.MDI2_P	GBE Port 2
22	GBE_P1.MDI1_P	GBE Port 1	65	GBE_P2.MDI1_P	GBE Port 2
23	GBE_P1.MDI0_P	GBE Port 1	66	GBE_P2.MDI0_P	GBE Port 2
24	NC	No Connect	67	GBE_P8.MDI3_P	GBE Port 8
25	GBE_P3.MDI3_P	GBE Port 3	68	GBE_P8.MDI2_P	GBE Port 8
26	GBE_P3.MDI2_P	GBE Port 3	69	GBE_P8.MDI1_P	GBE Port 8
27	GBE_P3.MDI1_P	GBE Port 3	70	GBE_P8.MDI0_P	GBE Port 8
28	GBE_P3.MDI0_P	GBE Port 3	71	GBE_P2.MDI3_N	GBE Port 2
29	GBE_P7.MDI3_P	GBE Port 7	72	GBE_P2.MDI2_N	GBE Port 2
30	GBE_P7.MDI3_N	GBE Port 7	73	GBE_P2.MDI1_N	GBE Port 2
31	GBE_P7.MDI2_P	GBE Port 7	74	GBE_P2.MDI0_N	GBE Port 2
32	GBE_P7.MDI2_N	GBE Port 7	75	NC	No Connect
33	NC	No Connect	76	GBE_P4.MDI3_N	GBE Port 4
34	NC	No Connect	77	GBE_P4.MDI2_N	GBE Port 4
35	GBE_P7.MDI1_P	GBE Port 7	78	GBE_P4.MDI1_N	GBE Port 4
36	GBE_P7.MDI1_N	GBE Port 7	79	GBE_P4.MDI0_N	GBE Port 4

J2 Pin	Signal	Function	J2 Pin	Signal	Function
37	GBE_P7.MDI0_P	GBE Port 7	80	NC	No Connect
38	GBE_P7.MDI0_N	GBE Port 7	81	NC	No Connect
39	GBE_P5.MDI3_N	GBE Port 5	82	GBE_P4.MDI3_P	GBE Port 4
40	GBE_P5.MDI2_N	GBE Port 5	83	GBE_P4.MDI2_P	GBE Port 4
41	GBE_P5.MDI1_N	GBE Port 5	84	GBE_P4.MDI1_P	GBE Port 4
42	GBE_P5.MDI0_N	GBE Port 5	85	GBE_P4.MDI0_P	GBE Port 4
43	NC	No Connect			

Table 3.11: J2 Connector Pinout – By Function

J2 Pin	Signal	Function	J2 Pin	Signal	Function
1	VBUS	USB VBUS Sense	52	GBE_P5.MDI0_P	GBE Port 5
2	VBUS_GND	USB VBUS Ground	42	GBE_P5.MDI0_N	GBE Port 5
4	GND	USB Ground	51	GBE_P5.MDI1_P	GBE Port 5
5	USB_P	USB Console P	41	GBE_P5.MDI1_N	GBE Port 5
6	USB_N	USB Console N	50	GBE_P5.MDI2_P	GBE Port 5
7	GND	Zeroize Input Ground	40	GBE_P5.MDI2_N	GBE Port 5
8	ZEROIZE_INPUT	Zeroize Input Discrete	49	GBE_P5.MDI3_P	GBE Port 5
9	RS232_GND	RS232 Ground	39	GBE_P5.MDI3_N	GBE Port 5
10	RS232_RXD	RS232 Console Receive Input	47	GBE_P6.MDI0_P	GBE Port 6
11	RS232_TXD	RS232 Console Transmit Output	56	GBE_P6.MDI0_N	GBE Port 6
23	GBE_P1.MDI0_P	GBE Port 1	46	GBE_P6.MDI1_P	GBE Port 6
15	GBE_P1.MDI0_N	GBE Port 1	55	GBE_P6.MDI1_N	GBE Port 6
22	GBE_P1.MDI1_P	GBE Port 1	45	GBE_P6.MDI2_P	GBE Port 6
14	GBE_P1.MDI1_N	GBE Port 1	54	GBE_P6.MDI2_N	GBE Port 6
21	GBE_P1.MDI2_P	GBE Port 1	44	GBE_P6.MDI3_P	GBE Port 6
13	GBE_P1.MDI2_N	GBE Port 1	53	GBE_P6.MDI3_N	GBE Port 6
20	GBE_P1.MDI3_P	GBE Port 1	37	GBE_P7.MDI0_P	GBE Port 7
12	GBE_P1.MDI3_N	GBE Port 1	38	GBE_P7.MDI0_N	GBE Port 7
66	GBE_P2.MDI0_P	GBE Port 2	35	GBE_P7.MDI1_P	GBE Port 7
74	GBE_P2.MDI0_N	GBE Port 2	36	GBE_P7.MDI1_N	GBE Port 7
65	GBE_P2.MDI1_P	GBE Port 2	31	GBE_P7.MDI2_P	GBE Port 7
73	GBE_P2.MDI1_N	GBE Port 2	32	GBE_P7.MDI2_N	GBE Port 7
64	GBE_P2.MDI2_P	GBE Port 2	29	GBE_P7.MDI3_P	GBE Port 7
72	GBE_P2.MDI2_N	GBE Port 2	30	GBE_P7.MDI3_N	GBE Port 7

J2 Pin	Signal	Function	J2 Pin	Signal	Function
63	GBE_P2.MDI3_P	GBE Port 2	70	GBE_P8.MDI0_P	GBE Port 8
71	GBE_P2.MDI3_N	GBE Port 2	61	GBE_P8.MDI0_N	GBE Port 8
28	GBE_P3.MDI0_P	GBE Port 3	69	GBE_P8.MDI1_P	GBE Port 8
19	GBE_P3.MDI0_N	GBE Port 3	60	GBE_P8.MDI1_N	GBE Port 8
27	GBE_P3.MDI1_P	GBE Port 3	68	GBE_P8.MDI2_P	GBE Port 8
18	GBE_P3.MDI1_N	GBE Port 3	59	GBE_P8.MDI2_N	GBE Port 8
26	GBE_P3.MDI2_P	GBE Port 3	67	GBE_P8.MDI3_P	GBE Port 8
17	GBE_P3.MDI2_N	GBE Port 3	58	GBE_P8.MDI3_N	GBE Port 8
25	GBE_P3.MDI3_P	GBE Port 3	3	NC	No Connect
16	GBE_P3.MDI3_N	GBE Port 3	24	NC	No Connect
85	GBE_P4.MDI0_P	GBE Port 4	33	NC	No Connect
79	GBE_P4.MDI0_N	GBE Port 4	34	NC	No Connect
84	GBE_P4.MDI1_P	GBE Port 4	43	NC	No Connect
78	GBE_P4.MDI1_N	GBE Port 4	48	NC	No Connect
83	GBE_P4.MDI2_P	GBE Port 4	57	NC	No Connect
77	GBE_P4.MDI2_N	GBE Port 4	62	NC	No Connect
82	GBE_P4.MDI3_P	GBE Port 4	75	NC	No Connect
76	GBE_P4.MDI3_N	GBE Port 4	80	NC	No Connect
			81	NC	No Connect

J3 Copper I/O Connector

J3 supports GbE ports 9-24.

Table 3.12: J3 EAU Connector Information

Recept-acle Used For	Recept-acle Label #	# of Pins	Wire Gauge (AWG)	Panel Connector Part Number	Mating Cable Connector Part Number
I/O	J3	130	22-28 AWG	Glenair 801-033-07ZNU21-130SA	Glenair 801-008-16ZNU21-130PA

Table 3.13: J3 Production Connector Information

Recept-acle Used For	Recept-acle Label #	# of Pins	Wire Gauge (AWG)	Panel Connector Part Number	Mating Cable Connector Part Number
I/O	J3	130	22-28 AWG	Glenair 801-033-07M21-130SA	Glenair 801-008-16M21-130PA

Figure 3.6: J3 Pin Arrangement

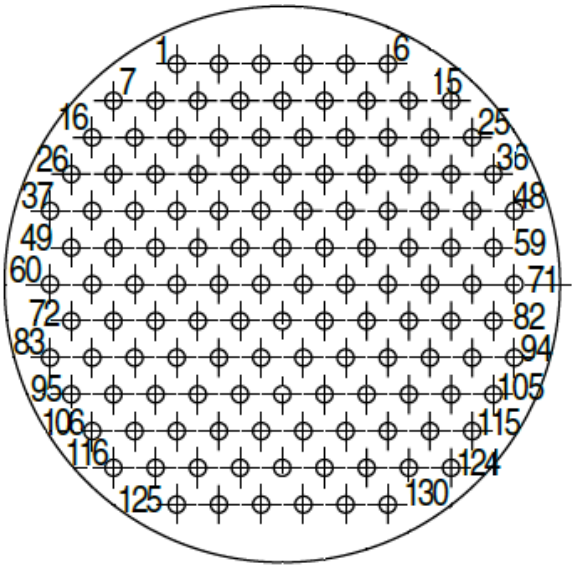


Table 3.14: J3 Connector Pinout – By Pin Number

J3 Pin	Signal	Function	J3 Pin	Signal	Function
1	GBE_P9.MDI3_N	GBE Port 9	66	P14.MDI1_P	GBE Port 14

J3 Pin	Signal	Function	J3 Pin	Signal	Function
2	GBE_P9.MDI2_N	GBE Port 9	67	P14.MDI0_P	GBE Port 14
3	GBE_P9.MDI1_N	GBE Port 9	68	P22.MDI0_N	GBE Port 22
4	GBE_P9.MDI1_P	GBE Port 9	69	P22.MDI1_N	GBE Port 22
5	GBE_P24.MDI3_P	GBE Port 24	70	P23.MDI3_N	GBE Port 23
6	GBE_P24.MDI3_N	GBE Port 24	71	NC	No Connect
7	GBE_P9.MDI0_P	GBE Port 9	72	P15.MDI0_P	GBE Port 15
8	GBE_P9.MDI0_N	GBE Port 9	73	P15.MDI3_P	GBE Port 15
9	GBE_P9.MDI3_P	GBE Port 9	74	P15.MDI2_P	GBE Port 15
10	GBE_P9.MDI2_P	GBE Port 9	75	P15.MDI1_P	GBE Port 15
11	GBE_P10.MDI3_N	GBE Port 10	76	P16.MDI3_N	GBE Port 16
12	GBE_P10.MDI2_N	GBE Port 10	77	P16.MDI2_N	GBE Port 16
13	GBE_P10.MDI1_N	GBE Port 10	78	P16.MDI1_N	GBE Port 16
14	GBE_P10.MDI0_N	GBE Port 10	79	P16.MDI0_N	GBE Port 16
15	GBE_P24.MDI2_N	GBE Port 24	80	P23.MDI0_P	GBE Port 23
16	GBE_P11.MDI0_N	GBE Port 11	81	P23.MDI1_P	GBE Port 23
17	GBE_P11.MDI3_N	GBE Port 11	82	P23.MDI2_P	GBE Port 23
18	GBE_P11.MDI2_N	GBE Port 11	83	P18.MDI3_P	GBE Port 18
19	GBE_P11.MDI1_N	GBE Port 11	84	P18.MDI0_P	GBE Port 18
20	GBE_P10.MDI3_P	GBE Port 10	85	P18.MDI1_P	GBE Port 18
21	GBE_P10.MDI2_P	GBE Port 10	86	P18.MDI2_P	GBE Port 18
22	GBE_P10.MDI1_P	GBE Port 10	87	P16.MDI3_P	GBE Port 16
23	GBE_P10.MDI0_P	GBE Port 10	88	P16.MDI2_P	GBE Port 16
24	GBE_P24.MDI2_P	GBE Port 24	89	P16.MDI1_P	GBE Port 16
25	GBE_P22.MDI3_P	GBE Port 22	90	P16.MDI0_P	GBE Port 16
26	GBE_P11.MDI0_P	GBE Port 11	91	P23.MDI0_N	GBE Port 23
27	GBE_P11.MDI3_P	GBE Port 11	92	P23.MDI1_N	GBE Port 23
28	GBE_P11.MDI2_P	GBE Port 11	93	P23.MDI2_N	GBE Port 23
29	GBE_P11.MDI1_P	GBE Port 11	94	P21.MDI3_P	GBE Port 21
30	GBE_P12.MDI3_N	GBE Port 12	95	P18.MDI3_N	GBE Port 18
31	GBE_P12.MDI2_N	GBE Port 12	96	P18.MDI0_N	GBE Port 18
32	GBE_P12.MDI1_N	GBE Port 12	97	P18.MDI1_N	GBE Port 18
33	GBE_P12.MDI0_N	GBE Port 12	98	P18.MDI2_N	GBE Port 18
34	GBE_P24.MDI0_N	GBE Port 24	99	P20.MDI0_P	GBE Port 20
35	GBE_P24.MDI1_N	GBE Port 24	100	P20.MDI1_P	GBE Port 20
36	GBE_P22.MDI3_N	GBE Port 22	101	P20.MDI2_P	GBE Port 20
37	GBE_P13.MDI0_N	GBE Port 13	102	P20.MDI3_P	GBE Port 20
38	GBE_P13.MDI3_N	GBE Port 13	103	P21.MDI1_P	GBE Port 21
39	GBE_P13.MDI2_N	GBE Port 13	104	P21.MDI2_P	GBE Port 21

J3 Pin	Signal	Function	J3 Pin	Signal	Function
40	GBE_P13.MDI1_N	GBE Port 13	105	P21.MDI3_N	GBE Port 21
41	GBE_P12.MDI3_P	GBE Port 12	106	P17.MDI3_P	GBE Port 17
42	GBE_P12.MDI2_P	GBE Port 12	107	P17.MDI0_P	GBE Port 17
43	GBE_P12.MDI1_P	GBE Port 12	108	ISO_P17.MDI1_P	GBE Port 17
44	GBE_P12.MDI0_P	GBE Port 12	109	ISO_P17.MDI2_P	GBE Port 17
45	GBE_P24.MDI0_P	GBE Port 24	110	ISO_P20.MDI0_N	GBE Port 20
46	GBE_P24.MDI1_P	GBE Port 24	111	ISO_P20.MDI1_N	GBE Port 20
47	GBE_P22.MDI2_P	GBE Port 22	112	ISO_P20.MDI2_N	GBE Port 20
48	GBE_P22.MDI2_N	GBE Port 22	113	ISO_P20.MDI3_N	GBE Port 20
49	GBE_P13.MDI0_P	GBE Port 13	114	ISO_P21.MDI1_N	GBE Port 21
50	GBE_P13.MDI3_P	GBE Port 13	115	ISO_P21.MDI2_N	GBE Port 21
51	GBE_P13.MDI2_P	GBE Port 13	116	ISO_P17.MDI3_N	GBE Port 17
52	GBE_P13.MDI1_P	GBE Port 13	117	ISO_P17.MDI0_N	GBE Port 17
53	GBE_P14.MDI3_N	GBE Port 14	118	ISO_P17.MDI1_N	GBE Port 17
54	GBE_P14.MDI2_N	GBE Port 14	119	ISO_P17.MDI2_N	GBE Port 17
55	GBE_P14.MDI1_N	GBE Port 14	120	ISO_P19.MDI1_P	GBE Port 19
56	GBE_P14.MDI0_N	GBE Port 14	121	ISO_P19.MDI2_P	GBE Port 19
57	GBE_P22.MDI0_P	GBE Port 22	122	ISO_P19.MDI3_P	GBE Port 19
58	GBE_P22.MDI1_P	GBE Port 22	123	ISO_P21.MDI0_N	GBE Port 21
59	GBE_P23.MDI3_P	GBE Port 23	124	ISO_P21.MDI0_P	GBE Port 21
60	GBE_P15.MDI0_N	GBE Port 15	125	ISO_P19.MDI0_N	GBE Port 19
61	GBE_P15.MDI3_N	GBE Port 15	126	ISO_P19.MDI0_P	GBE Port 19
62	GBE_P15.MDI2_N	GBE Port 15	127	ISO_P19.MDI1_N	GBE Port 19
63	GBE_P15.MDI1_N	GBE Port 15	128	ISO_P19.MDI2_N	GBE Port 19
64	GBE_P14.MDI3_P	GBE Port 14	129	ISO_P19.MDI3_N	GBE Port 19
65	GBE_P14.MDI2_P	GBE Port 14	130	NC	No Connect

Table 3.15: J3 Connector Pinout – By Function

J3 Pin	Signal	Function	J3 Pin	Signal	Function
7	GBE_P9.MDI0_P	GBE Port 9	107	P17.MDI0_P	GBE Port 17
8	GBE_P9.MDI0_N	GBE Port 9	117	P17.MDI0_N	GBE Port 17
4	GBE_P9.MDI1_P	GBE Port 9	108	P17.MDI1_P	GBE Port 17
3	GBE_P9.MDI1_N	GBE Port 9	118	P17.MDI1_N	GBE Port 17
10	GBE_P9.MDI2_P	GBE Port 9	109	P17.MDI2_P	GBE Port 17
2	GBE_P9.MDI2_N	GBE Port 9	119	P17.MDI2_N	GBE Port 17
9	GBE_P9.MDI3_P	GBE Port 9	106	P17.MDI3_P	GBE Port 17
1	GBE_P9.MDI3_N	GBE Port 9	116	P17.MDI3_N	GBE Port 17
23	GBE_P10.MDI0_P	GBE Port 10	84	P18.MDI0_P	GBE Port 18
14	GBE_P10.MDI0_N	GBE Port 10	96	P18.MDI0_N	GBE Port 18
22	GBE_P10.MDI1_P	GBE Port 10	85	P18.MDI1_P	GBE Port 18
13	GBE_P10.MDI1_N	GBE Port 10	97	P18.MDI1_N	GBE Port 18
21	GBE_P10.MDI2_P	GBE Port 10	86	P18.MDI2_P	GBE Port 18
12	GBE_P10.MDI2_N	GBE Port 10	98	P18.MDI2_N	GBE Port 18
20	GBE_P10.MDI3_P	GBE Port 10	83	P18.MDI3_P	GBE Port 18
11	GBE_P10.MDI3_N	GBE Port 10	95	P18.MDI3_N	GBE Port 18
26	GBE_P11.MDI0_P	GBE Port 11	126	P19.MDI0_P	GBE Port 19
16	GBE_P11.MDI0_N	GBE Port 11	125	P19.MDI0_N	GBE Port 19
29	GBE_P11.MDI1_P	GBE Port 11	120	P19.MDI1_P	GBE Port 19
19	GBE_P11.MDI1_N	GBE Port 11	127	P19.MDI1_N	GBE Port 19
28	GBE_P11.MDI2_P	GBE Port 11	121	P19.MDI2_P	GBE Port 19
18	GBE_P11.MDI2_N	GBE Port 11	128	P19.MDI2_N	GBE Port 19
27	GBE_P11.MDI3_P	GBE Port 11	122	P19.MDI3_P	GBE Port 19
17	GBE_P11.MDI3_N	GBE Port 11	129	P19.MDI3_N	GBE Port 19
44	GBE_P12.MDI0_P	GBE Port 12	99	P20.MDI0_P	GBE Port 20
33	GBE_P12.MDI0_N	GBE Port 12	110	P20.MDI0_N	GBE Port 20
43	GBE_P12.MDI1_P	GBE Port 12	100	P20.MDI1_P	GBE Port 20
32	GBE_P12.MDI1_N	GBE Port 12	111	P20.MDI1_N	GBE Port 20
42	GBE_P12.MDI2_P	GBE Port 12	101	P20.MDI2_P	GBE Port 20
31	GBE_P12.MDI2_N	GBE Port 12	112	P20.MDI2_N	GBE Port 20
41	GBE_P12.MDI3_P	GBE Port 12	102	P20.MDI3_P	GBE Port 20
30	GBE_P12.MDI3_N	GBE Port 12	113	P20.MDI3_N	GBE Port 20
49	GBE_P13.MDI0_P	GBE Port 13	124	P21.MDI0_P	GBE Port 21
37	GBE_P13.MDI0_N	GBE Port 13	123	P21.MDI0_N	GBE Port 21
52	GBE_P13.MDI1_P	GBE Port 13	103	P21.MDI1_P	GBE Port 21
40	GBE_P13.MDI1_N	GBE Port 13	114	P21.MDI1_N	GBE Port 21

J3 Pin	Signal	Function	J3 Pin	Signal	Function
51	GBE_P13.MDI2_P	GBE Port 13	104	P21.MDI2_P	GBE Port 21
39	GBE_P13.MDI2_N	GBE Port 13	115	P21.MDI2_N	GBE Port 21
50	GBE_P13.MDI3_P	GBE Port 13	94	P21.MDI3_P	GBE Port 21
38	GBE_P13.MDI3_N	GBE Port 13	105	P21.MDI3_N	GBE Port 21
67	GBE_P14.MDI0_P	GBE Port 14	57	P22.MDI0_P	GBE Port 22
56	GBE_P14.MDI0_N	GBE Port 14	68	P22.MDI0_N	GBE Port 22
66	GBE_P14.MDI1_P	GBE Port 14	58	P22.MDI1_P	GBE Port 22
55	GBE_P14.MDI1_N	GBE Port 14	69	P22.MDI1_N	GBE Port 22
65	GBE_P14.MDI2_P	GBE Port 14	47	P22.MDI2_P	GBE Port 22
54	GBE_P14.MDI2_N	GBE Port 14	48	P22.MDI2_N	GBE Port 22
64	GBE_P14.MDI3_P	GBE Port 14	25	P22.MDI3_P	GBE Port 22
53	GBE_P14.MDI3_N	GBE Port 14	36	P22.MDI3_N	GBE Port 22
72	GBE_P15.MDI0_P	GBE Port 15	80	P23.MDI0_P	GBE Port 23
60	GBE_P15.MDI0_N	GBE Port 15	91	P23.MDI0_N	GBE Port 23
75	GBE_P15.MDI1_P	GBE Port 15	81	P23.MDI1_P	GBE Port 23
63	GBE_P15.MDI1_N	GBE Port 15	92	P23.MDI1_N	GBE Port 23
74	GBE_P15.MDI2_P	GBE Port 15	82	P23.MDI2_P	GBE Port 23
62	GBE_P15.MDI2_N	GBE Port 15	93	P23.MDI2_N	GBE Port 23
73	GBE_P15.MDI3_P	GBE Port 15	59	P23.MDI3_P	GBE Port 23
61	GBE_P15.MDI3_N	GBE Port 15	70	P23.MDI3_N	GBE Port 23
90	GBE_P16.MDI0_P	GBE Port 16	45	P24.MDI0_P	GBE Port 24
79	GBE_P16.MDI0_N	GBE Port 16	34	P24.MDI0_N	GBE Port 24
89	GBE_P16.MDI1_P	GBE Port 16	46	P24.MDI1_P	GBE Port 24
78	GBE_P16.MDI1_N	GBE Port 16	35	P24.MDI1_N	GBE Port 24
88	GBE_P16.MDI2_P	GBE Port 16	24	P24.MDI2_P	GBE Port 24
77	GBE_P16.MDI2_N	GBE Port 16	15	P24.MDI2_N	GBE Port 24
87	GBE_P16.MDI3_P	GBE Port 16	5	P24.MDI3_P	GBE Port 24
76	GBE_P16.MDI3_N	GBE Port 16	6	P24.MDI3_N	GBE Port 24
71	NC	No Connect	130	NC	No Connect

J4 Optical I/O Connector

J4 supports 10GBASE-SR optical ports 1-2.

Table 3.16: J4 Connector Information

Receptacle Used For	Receptacle Label #	# of Pins	Fiber Rating	Panel Connector Part Number	Mating Cable Connector Part Number
Optical I/O	J4	4	50/125um OM3/OM4 multimode	Amphenol NG03-BD12 shell M29N0226Y termini	Amphenol NG02-BD12 shell M29N0226Y termini

Figure 3.7: J4 Pin Arrangement

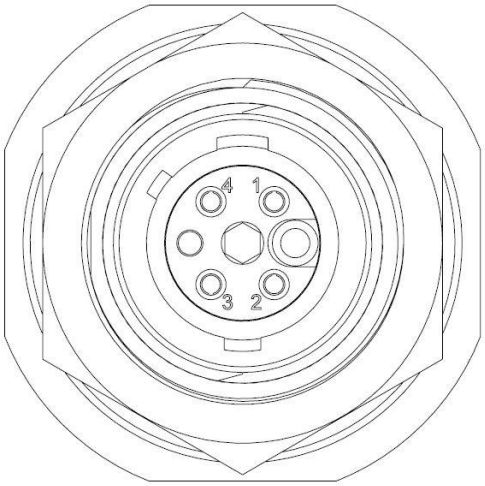


Table 3.17: J4 Connector Pinout

J4 Pin	Signal	Function
1	CH1_RX	Channel 1 Receive
2	CH2_RX	Channel 2 Receive
3	CH2_TX	Channel 2 Transmit
4	CH1_TX	Channel 1 Transmit

Chapter 4 Operational Description

This section describes the steps a user may need to perform during configuration of the DuraNET 3300. It assumes that a user has already followed the quick start instructions in Chapter 2.

For additional information, use Cisco Embedded Services 3300 Series Switch manuals found at the following link:

https://www.cisco.com/c/en/us/support/switches/embedded-service-3000-series-switches/series.html#~tab-documents

For the latest IOS-XE release and EOL notices for discontinued releases, visit:

https://www.cisco.com/c/en/us/support/ios-nx-os-software/index.html

Configure IP Address, User Name and Password

In order to configure and set parameters of the DuraNET 3300 via the Cisco WebUI, a known IP Address, Username and Password need to be assigned. Ensure a PC is connected to the DuraNET 3300 via the USB or RS232 Console and powered on.

Linux/Windows-10:

Open a terminal window to communicate via the USB or RS232 Console from the PC to the DuraNET 3300. For ***Linux*** that would be ***minicom*** and for ***Windows*** it would be ***PuTTY.***

Execute the following CLI commands to set the IP Address

- ***switch>enable***
- ***switch# config t***
- ***switch(config)# int vlan 1***
- ***switch(config-if)# ip address 192.168.1.150 255.255.255.0***
- ***switch(config-if)# no shutdown***
- ***switch(config-if)# exit***
- ***switch(config)# exit***
- ***switch# copy running-config startup-config***

Execute the following CLI commands to set the Username and Password. For this example the Username is ***DuraNET*** and the Password is ***3300.***

- ***switch>enable***
- ***switch# config t***
- ***switch(config)# int vlan 1***
- ***switch(config-if)# username DuraNET privilege 15 password 0 3300***
- ***switch(config-if)# no shutdown***
- ***switch(config-if)# exit***
- ***switch(config)# exit***
- ***switch# copy running-config startup-config***
- ***Destination filename [startup-config]? <return>***

Execute the following CLI command to reboot DuraNET 3300

- ***switch# reload***

Confirm reload and system reboots.

After reboot enter the following CLI commands to confirm IP Address, Username and Password in the terminal window listing.

- ***switch>enable***
- ***switch# sho ip interface***
- ***switch#sho running-config bri***

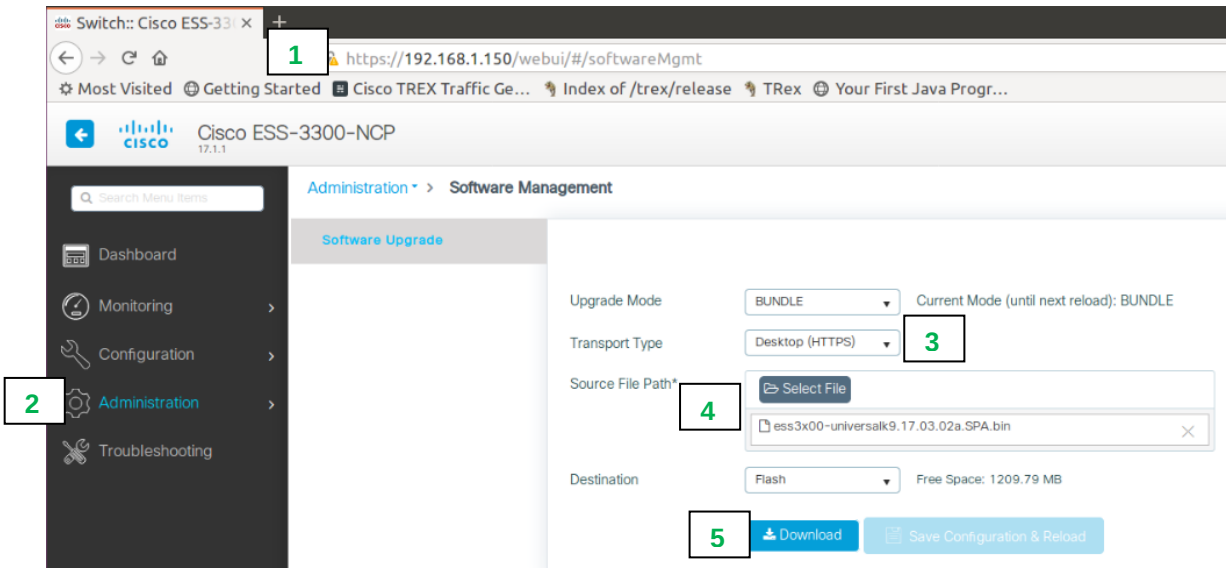
Updating Cisco IOS-XE Version

The Cisco IOS can be updated through the WebUI or console.

WebUI:

Open a browser window and navigate to an IP address of the switch. For example, if VLAN1 is set to 192.168.1.150, ensure the computer that is connected to VLAN1 is configured with the same subnet (e.g. 192.168.1.100). This can be done by setting a static IP address.

On the left panel, select Administration → Software Management. Choose the following settings:
Upgrade Mode: BUNDLE
Transport Type: Desktop (HTTPS)
Source File Path: [select new image]
Destination: Flash



Click the Download button and wait for completion. Once complete, click the “Save Configuration & Reload” button.

Once the new IOS is loaded, it may be desired to remove the existing IOS. To do so, enter the following command through a console port using the exact name of the IOS to be deleted (may not match exactly what is shown below depending on version). The Tab key can be used to auto-complete the command.

delete flash:ess3x00-universalk9.17.01.01.SPA.bin

Console (Linux):

To confirm and verify the Cisco IOS version enter the following CLI commands

- ***switch> enable***
- ***switch# sho configuration***

The configuration option may show ***"Version 17.1".*** This is representative only as your system may have a different Cisco IOS.

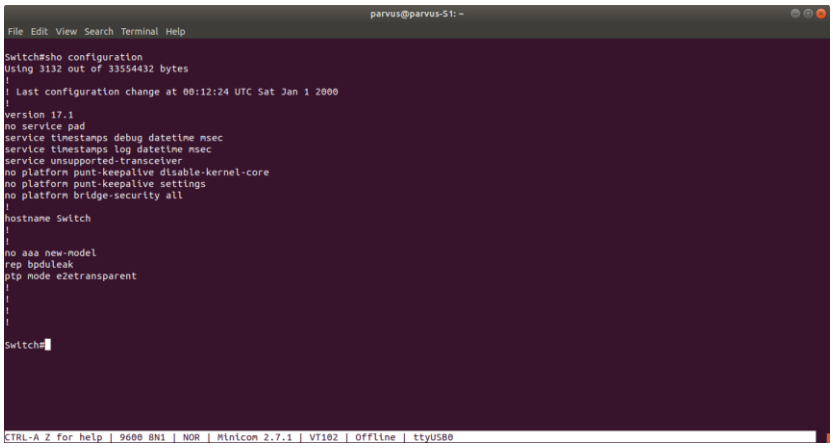


Figure 4.1: Show Configuration Listing

To confirm and verify the IOS file name and version

- ***switch> enable***
- ***switch# sho boot***

The boot option will list the complete file name including embedded version

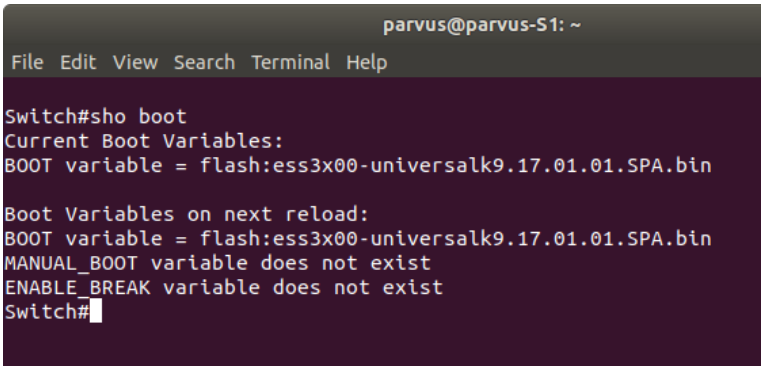


Figure 4.2: Show Boot Listing

Install TFTP Server (Linux)

In order to update or change the IOS of the DuraNET 3300, PC1 needs to have a TFTP server.

Reference documents:
"Access Router Software Upgrade Procedure", Doc ID 49044, July 31, 2015
"Installing and Configuring TFTP Server on Ubuntu"

From the TFTP documents; Install and Configure the Server (PC1) only.

Excerpts taken from "Access Router Software Upgrade Procedure"

TFTP (Trivial File Transfer Protocol) is a simplified version of FTP (File Transfer Protocol).
Installing TFTP Server: (**Note**: Ensure you have an Internet connection).

From PC1 open a terminal window (Figure 4.3) and execute the following commands…
~$ sudo apt update

The APT package repository cache should be updated.

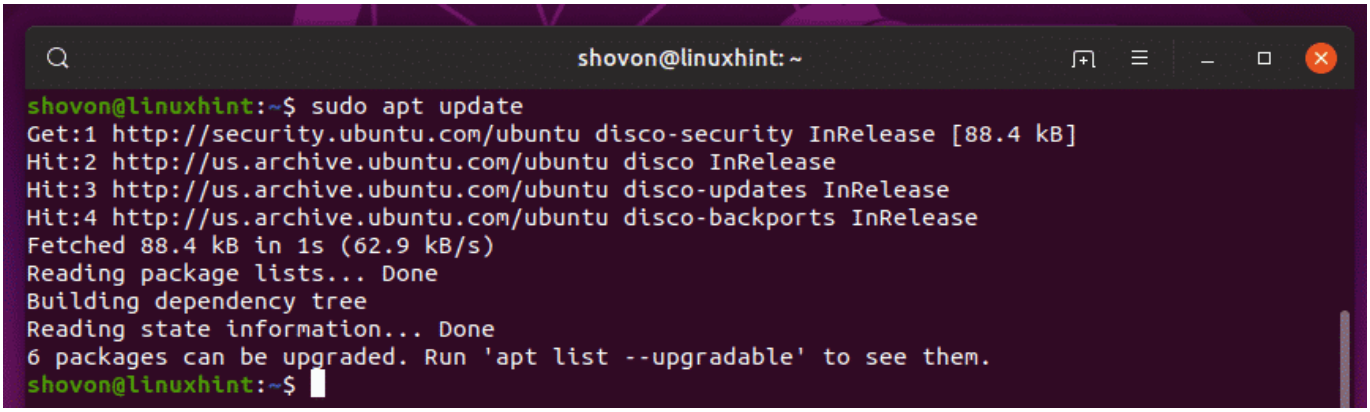


Figure 4.3: Update APT package repository cache.

Now install the tftpd-hpa package with the following command (Figure 4.4):

```
~$ sudo apt install tftpd-hpa
```

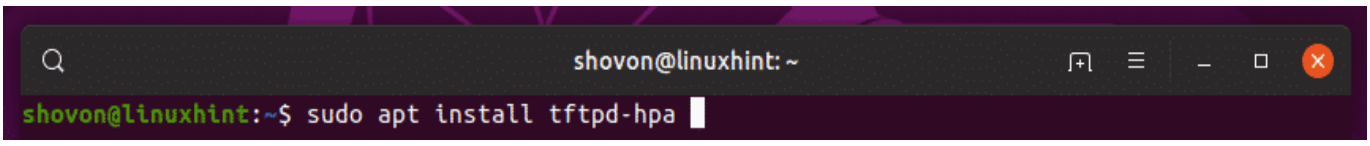


Figure 4.4: Install the tftpd-hpa package.

tftpd-hpa package should be installed (Figure 4.5:.5).

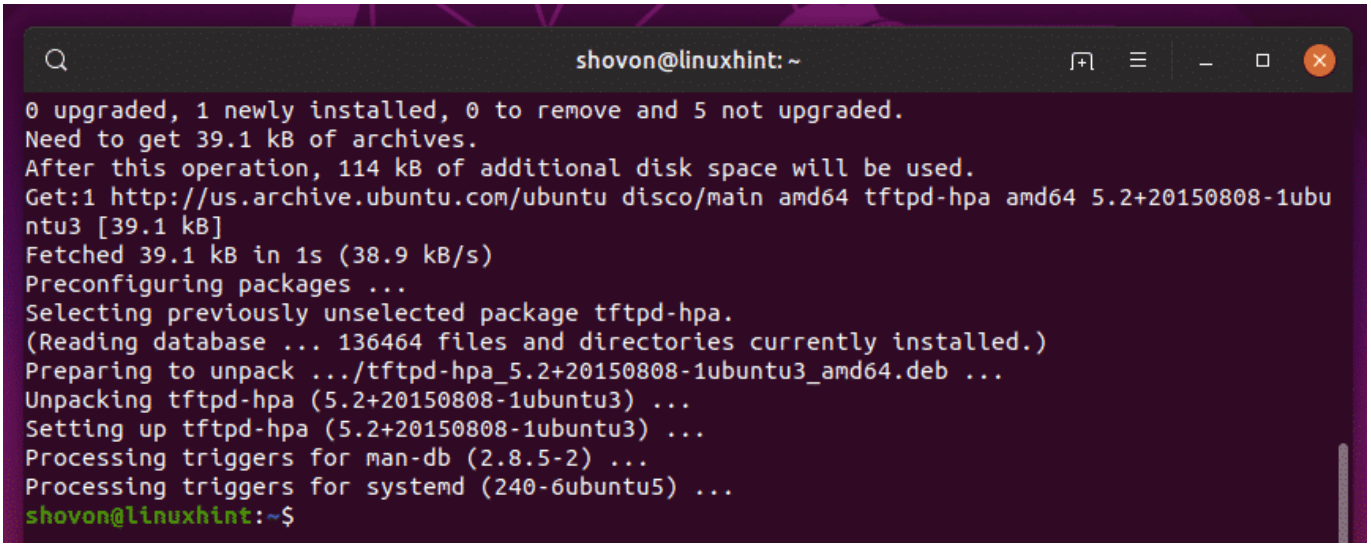


Figure 4.5: tftpd-hpa package installed...

Now, check whether the **tftpd-hpa** service is running (Figure 4.6).

```
~$ sudo systemctl status tftpd-hpa
```

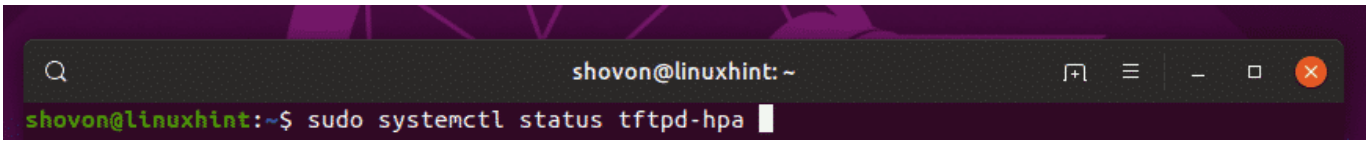


Figure 4.6: Check whether the tftpd-hpa service is running.

If you see something similar to Figure 4.7, then the **tftpd-hpa** service is running and next we configure it.

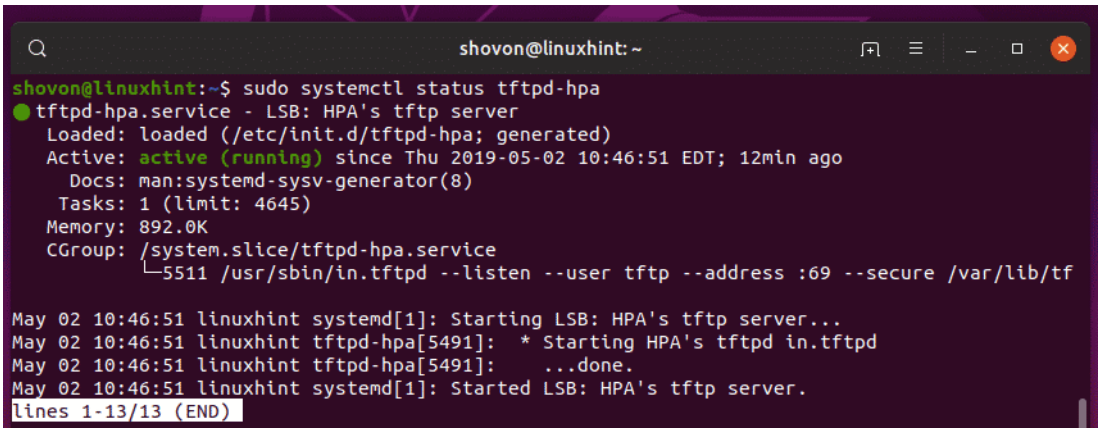


Figure 4.7: tftpd-hpa is running.

The default configuration file of **tftpd-hpa** server is **/etc/default/tftpd-hpa**. If you want to configure the TFTP server, then you have to modify this configuration file and restart the **tftpd-hpa** service.

- To modify the **/etc/default/tftpd-hpa** configuration file (Figure 4.8), run the following command:

```
~$ sudo nano /etc/default/tftpd-hpa
```

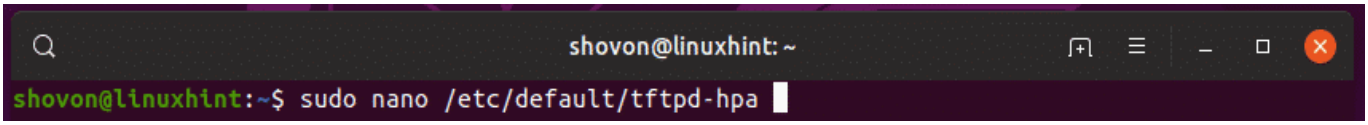


Figure 4.8: Modify the /etc/default/tftpd-hpa configuration file.

The configuration file should now be open for editing, and showing the default configuration of the TFTP server. See figure 4.9 below.

Here, **TFTP_USERNAME** is set to **tftp**. It means the TFTP server will run as the user **tftp**.
TFTP_DIRECTORY is set to **/var/lib/tftpboot**. It means **/var/lib/tftpboot** is the directory on this server which you will be able to accessing via TFTP.
TFTP_ADDRESS is set to **:69**. It means TFTP will run on port **69**.
TFTP_OPTIONS is set to **–secure**. This variable sets the TFTP options. There are many options that you can use to configure how the TFTP server will behave.
The **–secure** option means change the TFTP directory to what is set on the **TFTP_DIRECTORY** variable when you connect to the TFTP server automatically. This is a security feature. If you hadn't set the **–secure** option, then you would have to connect to the TFTP server and set the directory manually.

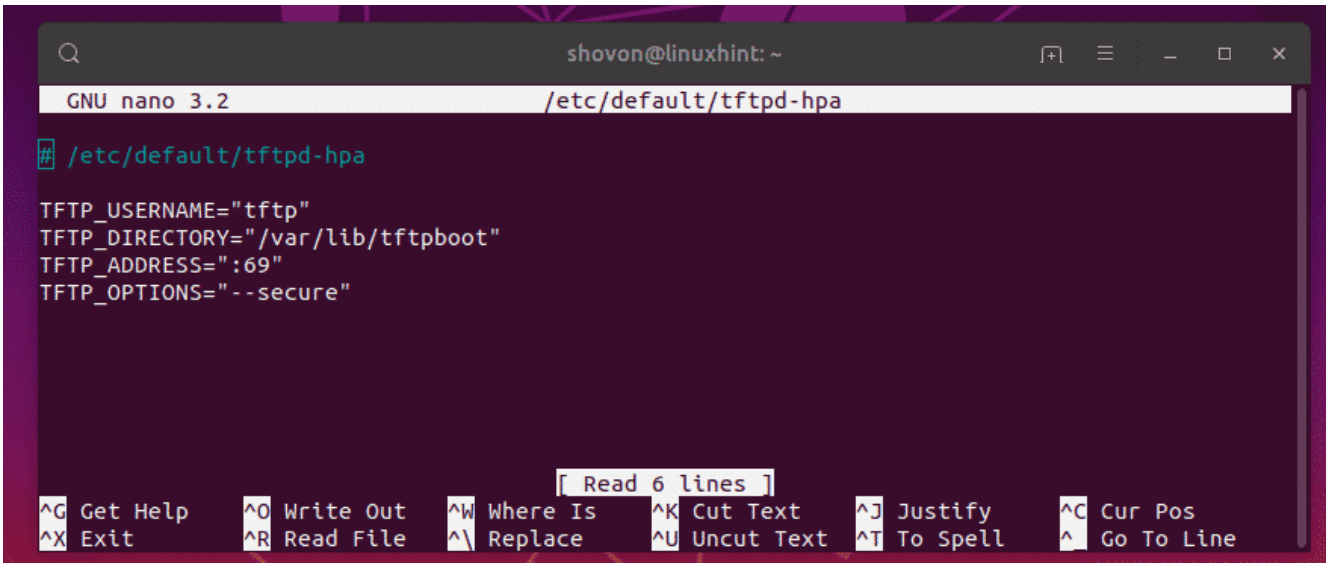


Figure 4.9: Configuration file editing.

Now, we only want to change the **TFTP_DIRECTORY** to **/tftp** and add the **–create** option to the **TFTP_OPTIONS**. Without the **–create** option, you won't be able to create or upload new files to the TFTP server. You will only be able to update existing files (Figure 4.10).

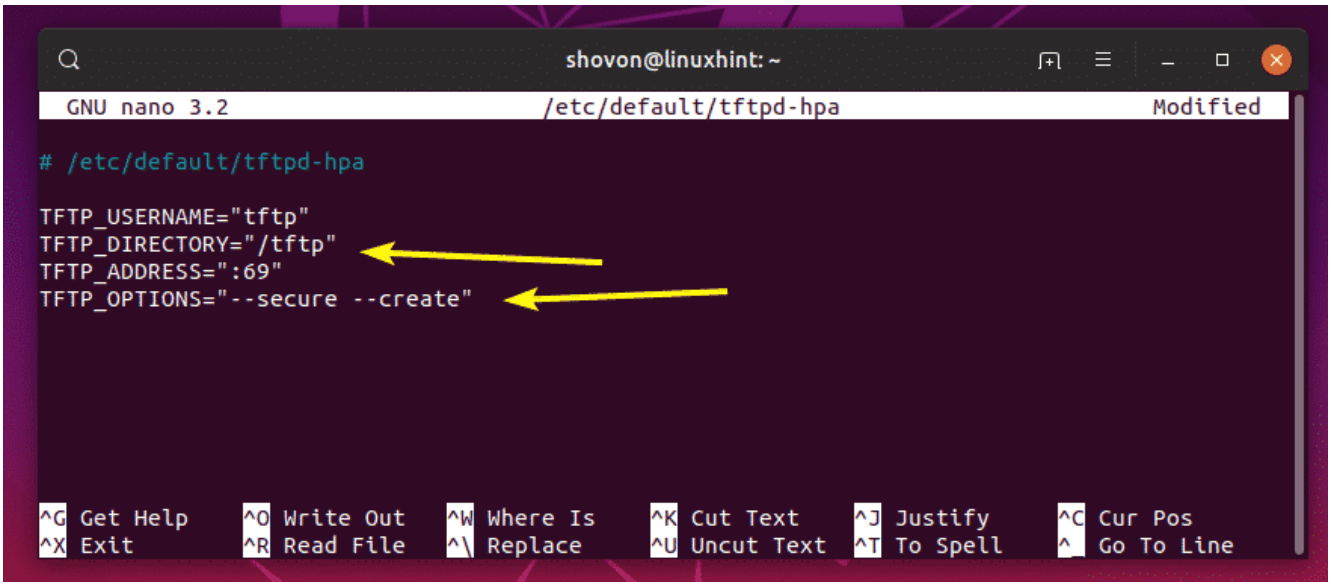


Figure 4.10: Adding the --create option.

The final configuration file should look as above. Now, press **<Ctrl>** + **x** followed by **y** and then **<Enter>** to save the changes.

Now, we need to create a new directory **/tftp**. See Figure 4.11.

```
~$ sudo mkdir /tftp
```

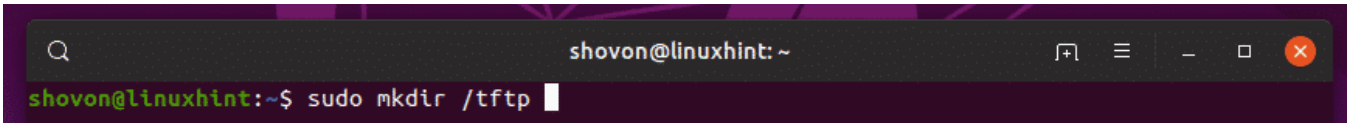


Figure 4.11: Create a new directory.

Now, change the owner and group of the **/tftp** directory to **tftp.** See Figure 4.12

```
~$ sudo chown tftp:tftp /tftp
```

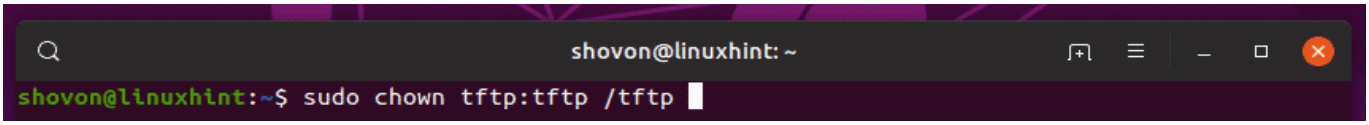


Figure 4.12: Change the owner and group.

Now, restart the **tftpd-hpa** service as shown in Figure 4.13.

```
~$ sudo systemctl restart tftpd-hpa
```

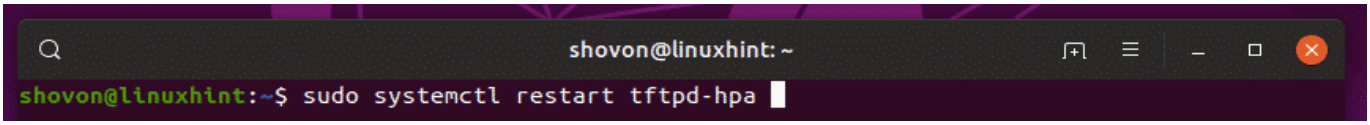


Figure 4.13: Restart the tftpd-hpa service.

Now, check whether the **tftpd-hpa** service is running. Enter as shown in Figure 4.14.

```
~$ sudo systemctl status tftpd-hpa
```

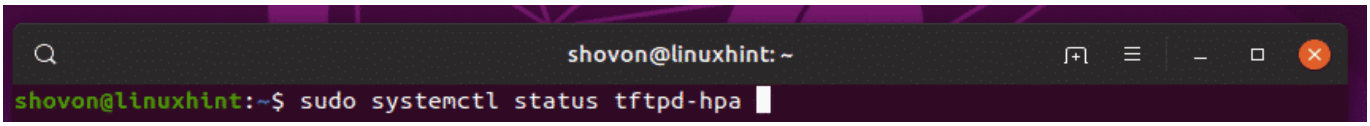


Figure 4.14: Enter command to check that tftpd-hpa service is running.

As you can see, the **tftpd-hpa** service is running. Configuration is successful (Figure 4.15).

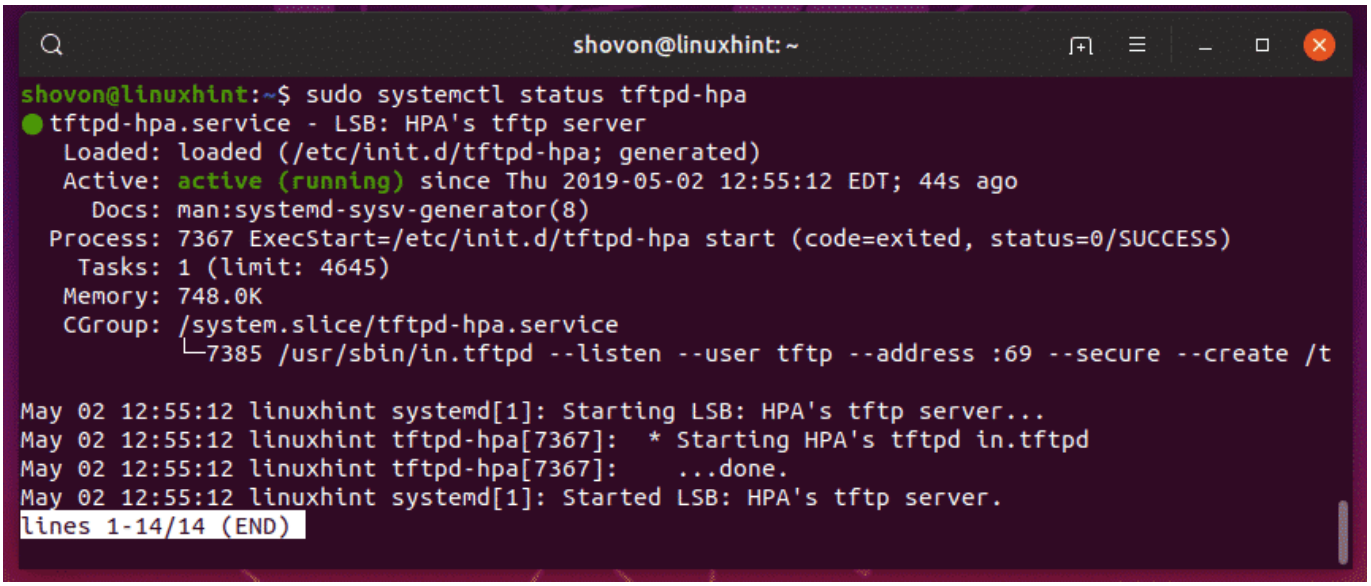


Figure 4.15: tftpd-hpa is running.

Loading a new Image

Select a Cisco IOS Software Image
ess3x00-universalk9.17.01.01.SPA.bin

Download the Cisco IOS Software Image to the TFTP Server
Download the Cisco IOS software image onto your workstation or PC from the Download Software Area (Registered Customers Only).
You can also download and store the image on a USB thumb-drive.
Place the new image in the /tftp/ folder you created above.
Identify the File System to Copy the Image too.
Flash:
Verify that the TFTP Server has IP Connectivity to the Router
From PC1 execute Ping 192.168.1.100 “router address” to confirm.
Now that you have IP connectivity and can ping between the computer that acts as a TFTP server and router, you can copy the Cisco IOS Software image to the flash.

Copy IOS Image to the Router
Note: Before you copy the image, ensure that you have started the TFTP server software on your PC, and that you have the file name mentioned in the TFTP server root directory.

```
switch>enable
switch# copy tftp: flash:
switch# 192.168.1.140 "PC1 Laptop IP address of TFTP server"
switch# source filename "this is the file located at /tftp"
switch# destination filename [IOS image filename]?
```

The copy process should take approximately 5 minutes, but may be different from network to network.
When the copy process is in progress, messages are displayed that indicate which file has been accessed.

The exclamation point ***"!"*** indicates that the copy process is in progress.

When complete, confirm with the following CLI commands

```
switch#cd flash:
switch# dir "You should see the new file in the flash: directory
switch# config t
switch(config)#boot system flash:ess3x00-universalk9.17.01.01.SPA.bin
            "Case sensitive"
switch(config)#exit
switch# write memory
switch#show boot
switch#reload
```
[confirm]

To view the tftp directory

```
~$ cd /tftp
~$ dir
```

PoE Type1 and PoE+ Type2 Functionality and Power Check

Power over Ethernet (PoE/PoE+) is supported on any 1GBaseT port, up to 30.0W per port, not to exceed 130W total PoE power at 65°C. See Figure 4.16 below. This supports power and data to PoE type 1/2 devices (phone, camera, AP, etc.) over twisted pair. It is configurable by IOS software to manage the ports and watts supported for PoE. PoE+ can provide 30.0 watts at the device at a voltage between 42.5 and 57 volts. Two operating modes are defined in PoE+: Positive power is supplied to Ethernet pair (1,2) for Mode A and to pair (4,5) for Mode B. Negative power is supplied to (3,6) for Mode A and to pair (7,8) for Mode B. For longer cable (100-m) CAT6 is recommended due to higher current carrying capacity.

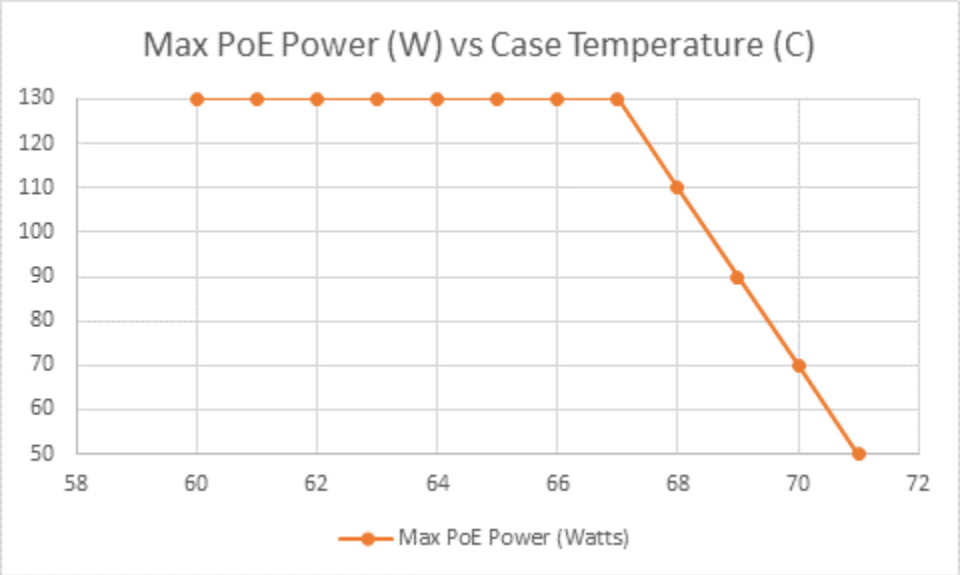


Figure 4.16: Max PoE Power vs Temperature

To change the PoE+ power of the DUT, we first need to know the IP address, Username and Password. The IP address can be found from the minicom terminal window as shown below in figure 4.17.

- ***switch>enable***
- ***switch#sho ip interface***

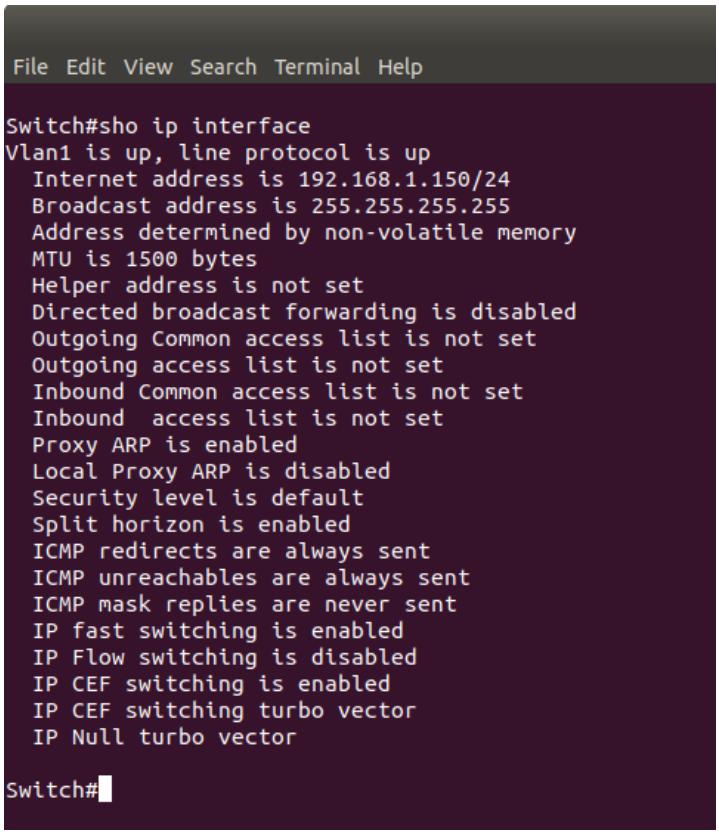


Figure 4.17: minicom IP address

The Username and Password can be found from the minicom window.

- ***switch>enable***
- ***switch#sho running-config bri***

From PC1, open a web browser such as Firefox.
Enter the DUT IP address in the URL window to bring up a Cisco GUI login:

Username: DuraNET
Password: 3300

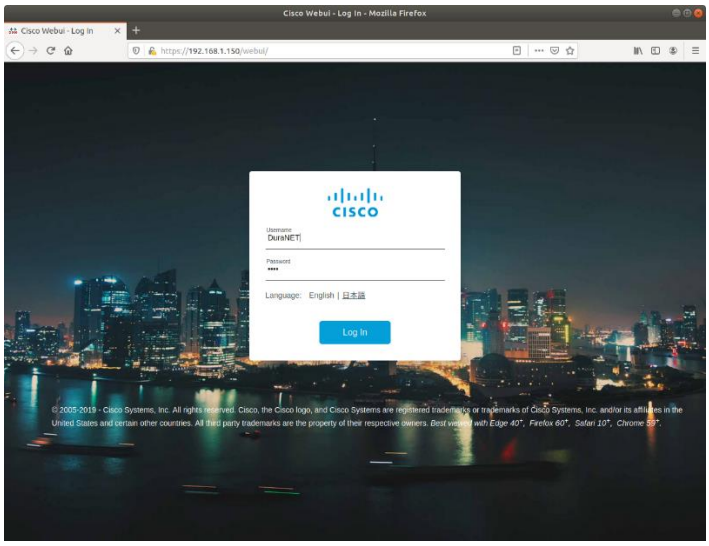


Figure 4.18: DUT Login Window.

From the GUI, navigate to
Administration -> Power Management -> Total Power Supported Block Watts …enter total power requirement in the Block of 125 Watts as shown below within the red oval in figure 4.18, then click outside the block:

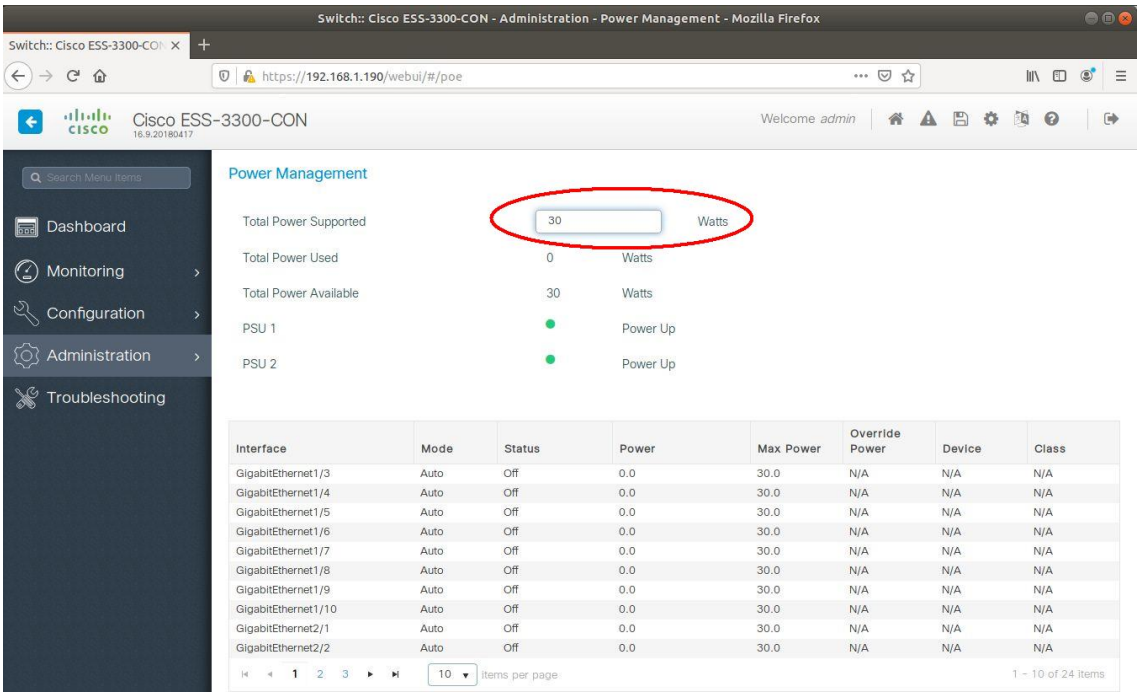


Figure 4.19: DUT Login Window.

Select Yes as shown in figure 4.20.

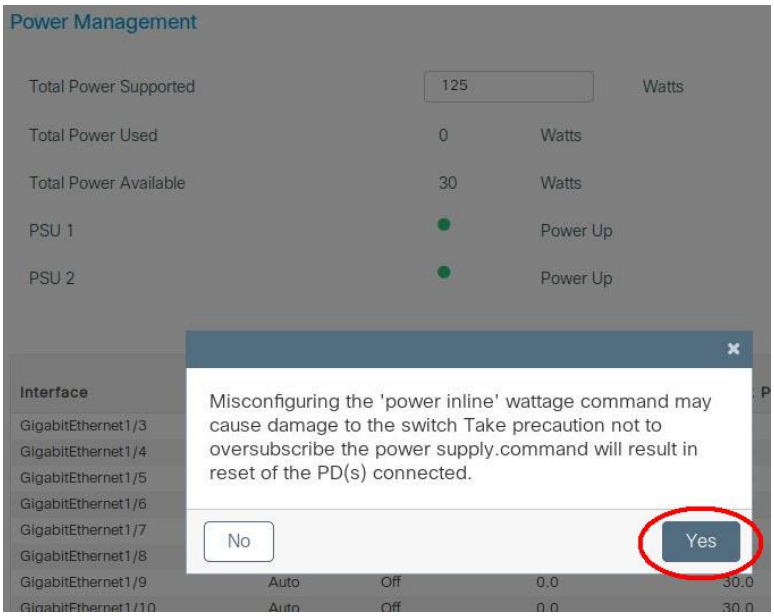


Figure 4.20: Click Yes to continue.

Navigate back to dashboard to confirm setting of 125-watts as shown in POE Power Consumption pie chart (red oval).

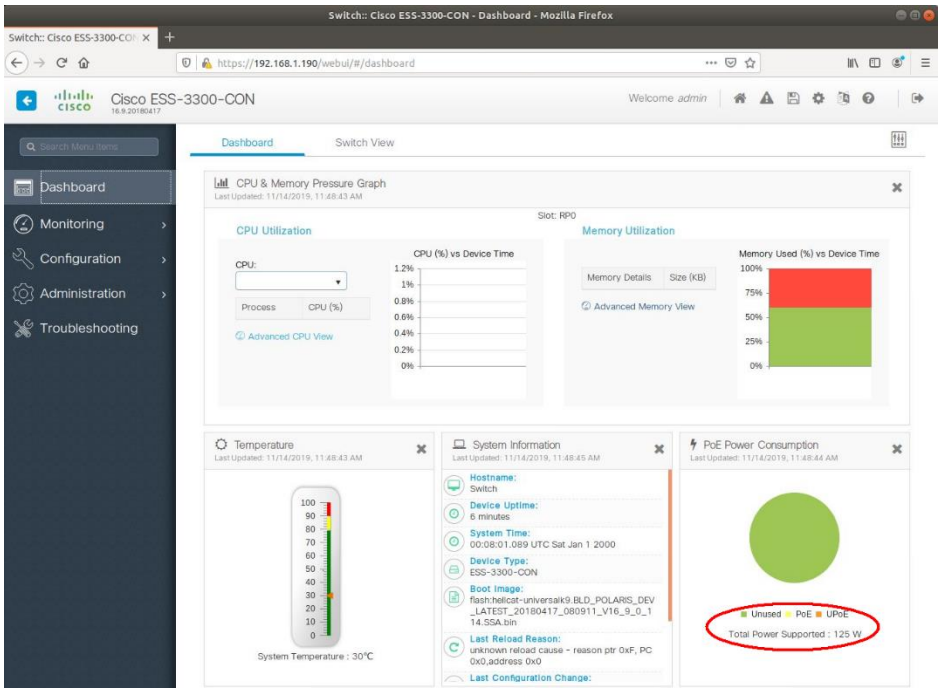


Figure 4.21: PoE power consumption box.

Zeroization or Declassification



Caution! The Zeroization function can delete all IOS and configuration files on the system!
Zeroization should only be enabled if it is intended to be used.

Zeroization consists of erasing any and all potentially sensitive configuration information in the switch. This function is also referred to as Declassification. This includes erasure of main memory, cache memories, and other memories containing packet data, NVRAM, and flash memory. The process of zeroization is launched upon the initiation of a software user command and a physical subsequent trigger.

On the DuraNET 3300, the Zeroize Discrete is used exclusively for triggering the Zeroization / Declassification process, which zeroes and erases the switch configuration files or the entire flash file system, depending on the option provided under "service declassify".

The zeroization process starts as soon as the physical trigger Zeroize Discrete is asserted for at least one second. The CLI command, "service declassify", is used to set the desired action in response to the Zeroize Discrete assertion. To prevent accidental erasure of the system configuration/image, the default setting is set to "no service declassify".

Command Line Interface

There are two levels of zeroization actions: erase-nvram and erase-all. The following CLI commands show the options:

```
switch>enable
switch# show declassify /* Lists status of parameters */
            |
      Erase Flash = no
      Erase nvram = no
            |
switch#conf t
switch(config)# service declassify erase-nvram
switch(config)# exit
switch# sho declassify
            |
      Erase Flash = no
      Erase nvram = yes
            |
switch# conf t
switch(config)# service declassify ?
erase-nvram  Enable erasure of switch configuration as declassification action. Default is no erasure.
erase-all    Enable erasure of both flash and nvram file systems as part of declassification.

             Default is no erasure
```

The “erase-nvram” level of declassification process searches for the following files, and erases the ones found.

- flash:/nvram_config
- flash:/vlan.dat

This also erases the complete NVRAM file system, therefore, all configurations, including startup and running configurations will be deleted.

```
running-config
startup-config
```

The perma-locked bootable image(s) in the flash file system will still be available and can be used for booting the device. See “Recovery Procedures” below.

The “erase-all” level of zeroization process erases the entire flash file system. This also wipes out all files and perma-locked bootable image(s). All interfaces are shut down prior to this process. Erasure of individual files in the flash file system is not possible and the only option is to erase the entire flash file system. Including packet data, ASIC data and processor-related caches along with scrubbing main memory.

With any level of zeroization, the switch always fall back to the ROMMON prompt on the console after the erasure of configuration files or flash file system.

- switch: /* ROMMON prompt */

Zeroization Trigger

The user needs to assert the physical Zeroize Discrete button after configuring the level of erasure required by the above CLI commands. To make sure that the assertion has been identified by the underlying software, the physical Zeroize Discrete button must be asserted for at least ONE second.

Recovery Procedures

Complete these steps in order to perform an emergency recovery:

1. Boot the emergency install image.

```
switch: boot emgy0:<image-name>.SPA.bin
Booting golden bootloader...
Initializing disk drivers...
Initializing file systems...
**********************************************************
* Rom Monitor for ESS3300 *
* Copyright (c) 2017-2018 by Cisco Systems, Inc. *
* All rights reserved. *
**********************************************************

* Version: 1.1.1
* Compiled: Sun 01-Jul-18 22:17 [RELEASE SOFTWARE]
* Boot Partition: qspi-golden-bootloader
* Reset Reason: Soft Reset

Loading "emgy0:ess3x00-universalk9.16.09.01.SPA.bin" to memory...
Verifying image "emgy0:ess3x00-universalk9.16.09.01.SPA.bin"...
Image passed digital signature verification
Checking for Bootloader upgrade...
Bootloader upgrade not required
SUP PL (profile: 1) configuration done successfully
<…>
Press RETURN to get started!

Switch>
```

2. Ping the terminal that contains the TFTP server in order to test the connectivity:

```
switch> ping 192.0.2.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echoes to 192.0.2.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms
```

3. Copy the image via tftp

```
switch> copy tftp: //location/directory/bundle_name flash:
```

<…>

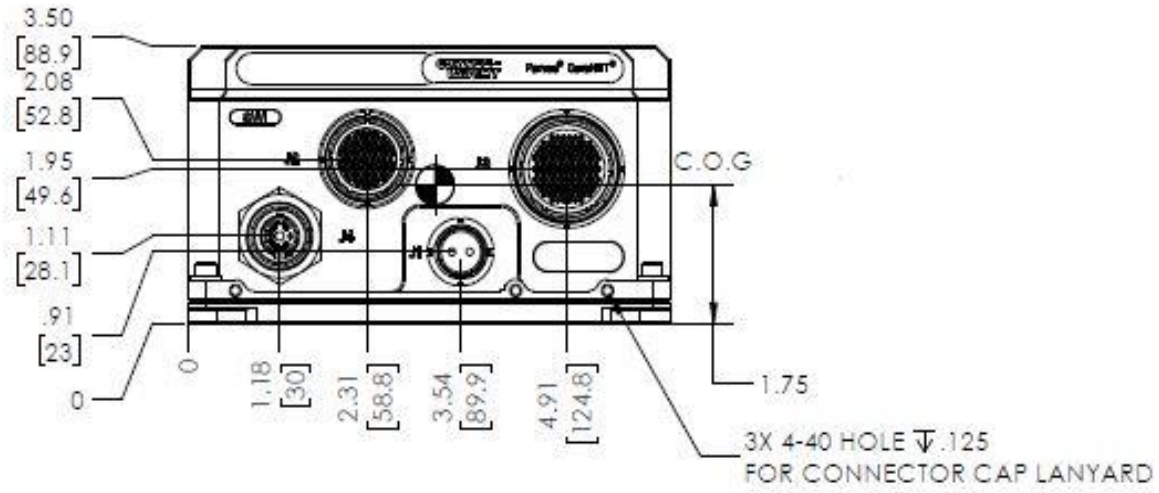
Chapter 5 Specifications

Mechanical & Technical Specifications

Dimensions

Figure 5.1, Front Panel Dimensions provide the physical dimensions of the DuraNET 3300.

Figure 5.1: Front Panel Dimensions



Physical

- Weight: 5.6 lb. (2.54 kg) for NET-3300-02H
- Dimensions (D x W x H), excluding connectors and mounting feet, 6.75” x 6.25” x 3.50” (17.15cm x 15.88cm x 8.89 cm)
- Chassis: aluminum alloy, corrosion resistant
- Cooling: passive, natural convection (fan-less)
- Ingress protection: dust and water resistant (similar to IP67)
- Finish: black anodize finish per MIL-A-8625, Type II, Class 2
- Rugged Connectors:
  - Glenair Mighty Mouse 801 series: 1GBaseT ports, console, and zeroize; also power input (for production units)
  - MIL-PRF-64266 NGCON: 10GBaseSR
  - M12: Power Input on EAU units only
- Installation: base flange mount (4x holes) or side boss mount (90° rotated orientation, 2x holes)

Installation & Mounting

Orientation

The DuraNET 3300 can be mounted either vertically or horizontally and will perform equally well in either orientation. The target location normally dictates the mounting orientation.

Choosing a Mounting Location – Thermal Considerations

The DuraNET 3300 enclosure is highly efficient at removing heat from the inside of the unit to the outside of the finned enclosure. It is best to mount the unit on a thermally cool, thermally conductive surface to keep the overall temperature as low as possible. Every effort has been made to meet stringent thermal performance criteria as outlined in the specifications. However, it is always good practice to keep the DuraNET 3300 as cool as possible, avoiding environments which do not allow the thermal conduction and/or natural convection of heat away from the unit.

Vertical Mounting

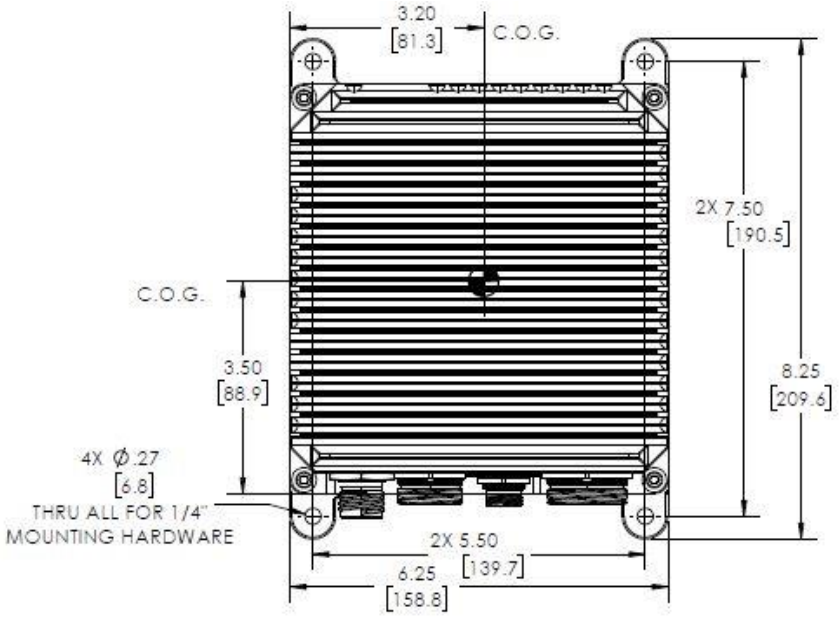
To install the DuraNET 3300 vertically on a mounting surface:

1. Create a hole pattern on the mounting surface that matches the pattern shown. The mounting holes are 0.27” in diameter.
2. Attach the baseplate to the mounting surface using the four mounting holes. Attachment screws should be 1/4".

Important!
Ensure that mounting screw length allows proper thread engagement of the mounting hardware.

The DuraNET 3300 is mounted using 4x 1/4" screws.

Figure 5.2: **Mounting Holes**



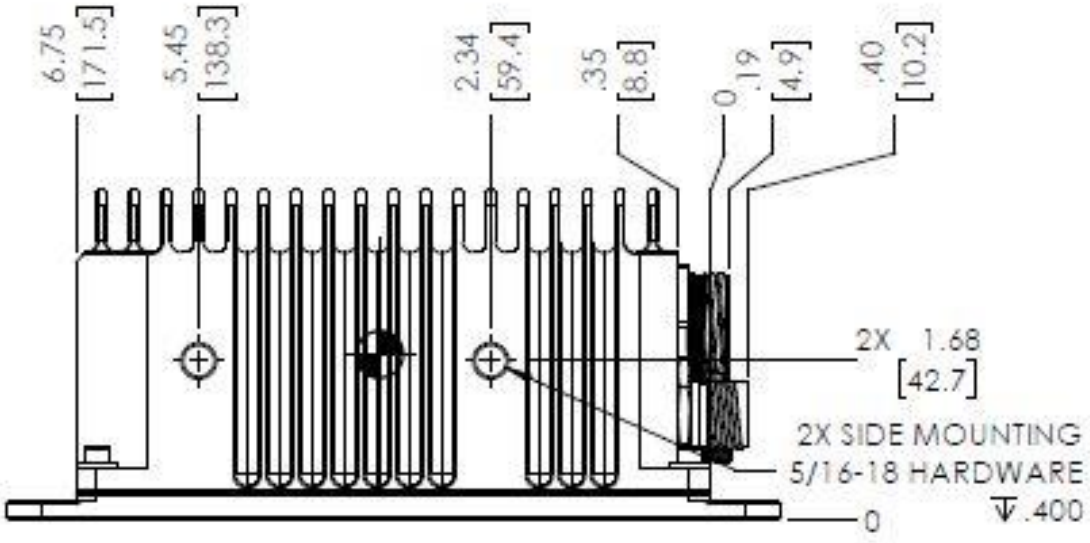
Horizontal Mounting

To install the DuraNET 3300 on its side (horizontal):

3. Create a hole pattern on the mounting surface that matches the pattern shown in Figure 5.3. The mounting holes are 0.33” in diameter.
4. Attach the switch to the mounting surface using the two side mounting holes. Attachment screws should be 5/16-18.

Important!
Ensure that mounting screw length allows proper thread engagement of the mounting hardware but is not so long that the screw bottoms out in the side mounting hole.

Figure 5.3: Side Mounting Holes

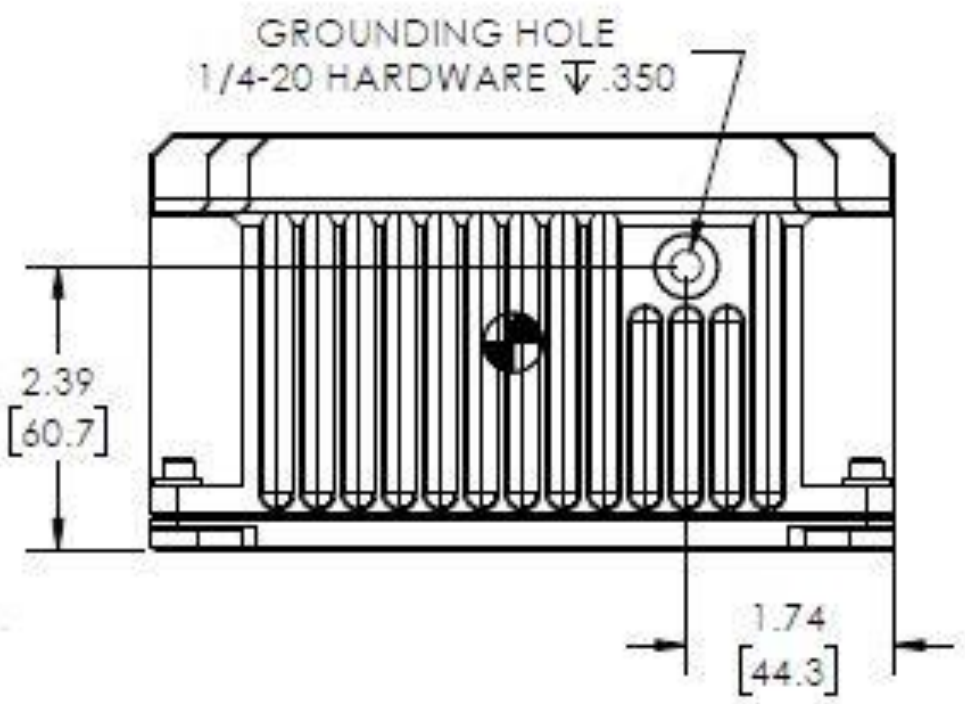


Grounding

- The bottom of the baseplate is conductive to allow the system grounding via the baseplate.
- A blind grounding hole for attachment of a grounding cable using a #1/4-20 screw is provided on the rear of each module of the system.
- It is recommended that you use only one grounding hole. Choose the grounding hole that allows the shortest grounding cable length.

Caution! The grounding lug tie holes are shallow (0.350").
Select the proper screw length for your grounding application and avoid over-tightening.

Figure 5.4: Rear View Grounding Hole



Power

- 28 VDC nominal power; input range: 9 to 36 VDC
- Power consumption:
  - <50 watts max(est), excluding PoE consumption
  - <180W at operating temp up to 65 C° with max PoE injection
- MIL-STD-704F 28 VDC compliant for aircraft electrical operation: over/under voltages, spikes, surges for normal, transfer, abnormal, emergency, starting, and power failure
  - Optional 50 ms power hold-up (per MIL-STD-704) for aircraft power switch-over requirements
- MIL-STD-1275D 28 VDC compliant for ground vehicle operation: steady state DC voltage variations, no fault/ single fault conditions, ripple voltage susceptibility on input power leads, imported voltage spikes, overvoltage and under voltage surges, starting disturbances, ESD immunity
- RTCA/DO-160G compliant for aircraft operation (Sections 16-18, 25): power input, voltage spikes, audio frequency conducted susceptibility-power inputs, electrostatic discharge
- IEEE 802.3at-2009 and IEEE-802.3af-2003: Power over Ethernet (PoE and PoE+) support for 1G ports, any combination adding up to 130W of output maximum at 65°C, configurable by the IOS software to manage the number of ports and watts of output.

Environmental Specifications

Temperature

- Operating temperature: -40 to +71°C (-40 to +160°F) ambient (per MIL-STD-810G Methods 501.5 and 502.5) and -40 to +70°C (per DO-160G, Sect 4 Cat A2 and D2 and Section 4.5.5, Category V/Table 4-1)
- Storage temperature: -55 to +85°C (per DO-160G, Sect 4, Cat A2) and -40 to +85ºC (-40 to +185ºF) per MIL-STD-810G Meth 502.5 and Meth 501.5

Shock/Vibration

- Operating shock: 40 g, 11 ms, 3 pos/neg per axis, 18 terminal peak shock pulses per MIL-STD-810G Meth 516.6, Procedure I; 6 g, 11 ms, terminal peak shock pulses per DO-160G, Sect 7, Class A)
- Crash hazard shock: 75 g, 11 ms, 12 terminal peak shock pulses, 2 pos/neg per axis (per MIL-STD-810G Method 516.6, Procedure V)
- Random vibration: 3 axes, 1 hour/axis (per MIL-STD-810G, Method 514, per Procedures I and II and DO-160G Section 8, Cat S, Curve B3 per combined jet-helo-tracked vehicle profile)

EMI/EMC Compliance

- MIL-STD-461F, DO-160G, and CE Mark:
- Conducted Emissions
  - MIL-STD-461F, CE102, power leads, 10 KHz to 10 MHz, basic curve, Figure CE102-1
  - DO-160G Sec. 21; conducted RF emissions, 150 kHz to 152 MHz, Category L; Figures 21-1, 21-2
- Conducted Susceptibility:
  - MIL-STD-461F, CS101, power leads, 30 Hz to 150 KHz, Curve 2, Figure CS101-1 (28V and below)

- MIL-STD-461F, CS114, bulk cable injection, 10k to 200 MHz; Curve 3, Figure 1
- MIL-STD-461F, CS115, bulk cable injection, impulse excitation; impulse, Figure 1
- MIL-STD-461F, CS116, damped sinusoidal transients, cables/power leads, 10k-100 MHz; transient, Figures 1-2
- RTCA/DO-160G Sec. 20; conducted susceptibility, 10 kHz to 400 MHz, category M; Figure 20-6

- Radiated Emissions:
  - MIL-STD-461F, RE102, electric field, 10 KHz to 18 GHz, fixed wing internal < 25 meters, Figure RE102-3
  - DO-160G Sec. 21; radiated RF emissions, 100 MHz to 6 GHz, Category L; Figure 21-7
- Radiated Susceptibility:
  - MIL-STD-461F, RS103, electric field, 2 MHz to 18 GHz, 200V/m, Table VII, RS103 limits
  - DO-160G Sec. 20; radiated susceptibility, 100 MHz to 8 GHz, Category R; Figure 20-10

Operating Conditions

- Operating temperature: -40 to +71°C (-40 to +160°F) ambient
  - Caveat: with full 125W of PoE injection, operating range up to approx. 65°C
- Humidity (operating/transport): up to 95% RH @ 40°C, non-condensing
- Ingress (dust/sand): no ingress (similar to IP6x)
- Fungus resistant
- Water immersion: no leakage per 1 meter submersion (similar to IPx7)
- Operating Altitude: Up to 50,000ft (15,240m)
- Storage Altitude: Up to 60,000ft (18,300m)

Cisco Specifications

- Cisco IOS-XE software with Network Essentials or Network Advantage license
- Non-blocking OSI data Layer 2/3 switching, IPv4/IPv6 multicast, low-latency, auto-MDI/MDIX, auto-negotiation, auto-detect; speed auto-sensing, auto-crossover
- Wire-speed switching: up to 44 GB/s forwarding
- Layer 2 Hardware Resources:
  - MAC address support: 8,000
  - VLAN IDs: 256
  - IGMP Groups: 1,000
  - Switch Virtual Interfaces (SVIs): 8
  - ACL (PACL, VACL, RACL): 3,000 rules total ACLs and QoS

- Layer 3 Hardware Resources:
  - IPv4 Unicast Routes: 7680
  - IPv6 Unicast Routes: 1024
  - QoS Access Control Entries (ACEs): 3,000 rules ACLs & QOS
  - Active Class-maps (ingress): 26
  - Active Class-maps (egress): 8
  - Buffer/ASIC: 12mb / 1.5MB

- Network Essentials IOS-XE Image Features:
  - Layer 2 switching:
    - IEEE 802.1, 802.3 standard, NTP, UDLD, CDP, LLDP, unicast MAC filter, VTPv2, VTPv3, EtherChannel, voice VLAN, PVST+, MSTP, and RSTP
  - Layer 3 Routing
    - Static IP routing (for dynamic routing, see Network Advantage option)
  - Multicast:
    - IGMPv1, v2, v3 snooping, IGMP filtering, IGMP querier
  - Management:
    - Web UI, MIB, SmartPort, SNMP, syslog, DHCP server, SPAN session, Full Flexible Netflow (FnF)
  - Precision Timing:
    - IEEE-1588v2 Precision Timing Protocol (PTP): hardware time-stamping supported on 1GBaseT ports for real time clock synchronization of devices with sub-microsecond accuracy (transparent / boundary clock)
  - Security:
    - Port security, Access Control Lists (ACLs), 802.1x, Dynamic Host Configuration Protocol (DHCP) snooping, DHCP-port based allocation, dynamic ARP inspection, IP source guard, guest VLAN. MAC authentication bypass, 802.1x multi-domain authentication, storm control - unicast, multicast, broadcast, SCP, SSH, SNMPv3, TACACS+, RADIUS server/client, MAC address notification, BPDU guard, RMON, MACsec-128
  - Layer 2 Line-rate Encryption and Information Assurance (IA):
    - IEEE 802.1AE MACsec support on 1GBaseT ports for point-to-point authentication and encryption of Ethernet LAN traffic
    - MACsec supports key exchange from switch-to-switch or switch-to-end-points using SAP/MKA protocols
    - Cisco ESS-3300 on NSA Commercial Systems for Classified (CSfC) MACSec Ethernet Encryption Device list and National Information Assurance Partnership (NIAP) Common Criteria Evaluation and Validation Scheme (CCEVS) List
  - Declassification:
    - Data zeroization support to erase nonvolatile Flash memory and return device to factory default configuration (initiated via discrete input)
  - Quality of Service (QoS):
    - Ingress policing, rate limit, egress queuing/shaping, autoQoS
  - Layer 2 IPv6:
    - IPv6 host support, HTTP over IPv6, SNMP over IPv6

- Network Advantage IOS-XE License Features:
  - All features supported in Network Essential IOS-XE License, plus:
  - Dynamic routing protocol support:
    - Open Shortest Path First (OSPF), v2, v3, v4 and v6
    - Enhanced Interior Gateway Routing Protocol (EIGRP), v4 and v6
    - Routing Information Protocol (RIP), v1 and v2

        - Intermediate System to Intermediate System (IS-IS), v4 and v6
        - Inter-VLAN Routing
    - Enhanced security:
        - Layer 2 MACsec AES-256-bit crypto cypher support
    - Virtualization: Vrf-lite
    - IP Multicast:
        - Protocol Independent Multicast (PIM)-PIM-SM, PIM-DM

- Management & Standards
    - IEEE 802.1D MAC Bridges, STP
    - IEEE 802.1p Layer2 COS prioritization
    - IEEE 802.1q VLAN
    - IEEE 802.1s Multiple Spanning-Tree
    - IEEE 802.1w Rapid Spanning-Tree
    - IEEE 802.1x Port Access Authentication
    - IEEE 802.1AB LLDP; IEEE 802.3ad Link Aggregation (LACP)
    - IEEE 802.3x full duplex on 10BASE-T; IEEE 802.3 10BASE-T
    - IEEE 802.3u 100BASE-TX; IEEE 802.3ab 1000BASE-T
    - IEEE 802.3ae 10GBase-SR
- RFC Compliance
    - RFC 768: UDP; RFC 793: TCP; RFC 826: ARP
    - RFC 783: TFTP; RFC 1305: NTP
    - RFC 791: IPv4 protocol; RFC 1166: IP Addresses
    - RFC 854: Telnet; RFC 959: FTP
    - RFC 1157: SNMPv1; RFC 1901,1902-1907 SNMPv2
    - RFC 2273-2275: SNMPv3; RFC 2571: SNMP Management
    - RFC 792: ICMP; RFC 1256: ICMP Router Discovery
    - RFC 1492: TACACS+; RFC 1757: RMON
    - RFC 1493: Bridge MIB Objects
    - RFC 1643: Ethernet Interface MIB
    - RFC 2068: HTTP; RFC 2131, 2132: DHCP
    - RFC 2236: IGMP v2; RFC 3376: IGMP v3
    - RFC 2474: DiffServ Precedence
    - RFC 3046: DHCP Relay Agent Information Option
    - RFC 3580: 802.1x RADIUS
    - RFC 4250-4252 SSH Protocol
- SNMP MIB Objects:
    - BRIDGE-MIB
    - CISCO-ACCESS-ENVMON-MIB
    - CISCOAUTH-FRAMEWORK-MIB
    - CISCO-BRIDGE-EXT-MIB
    - CISCO-BULK-FILE-MIB
    - CISCO-CALLHOME-MIB
    - CISCO-CAR-MIB
    - CISCO-CDP-MIB
    - CISCO-CONFIGCOPY-MIB
    - CISCO-CONFIG-MAN-MIB
    - CISCO-DATACOLLECTION-MIB
    - CISCO-DHCP-SNOOPING-MIB
    - CISCO-ENTITY-VENDORTYPE-OID-MIB
    - CISCOENVMON-MIB
    - CISCO-ERR-DISABLE-MIB

- CISCOFLASH-MIB
- CISCO-FTP-CLIENT-MIB
- CISCOIF-EXTENSION-MIB
- CISCO-IGMP-FILTER-MIB
- CISCO-IMAGE-MIB
- CISCO-IP-STAT-MIB
- CISCOLAG-MIB
- CISCO-LICENSE-MGMT-MIB
- CISCO-MACAUTH-BYPASS-MIB
- CISCO-MAC-NOTIFICATION-MIB
- CISCO-MEMORY-POOL-MIB
- CISCO-PAE-MIB
- CISCOPING-MIB
- CISCO-PORT-QOS-MIB
- CISCO-PORTSECURITY-MIB
- CISCO-PORT-STORM-CONTROL-MIB
- CISCO-PRIVATE-VLAN-MIB
- CISCO-PROCESSMIB
- CISCO-PRODUCTS-MIB
- CISCO-ENTITYALARM-MIB
- CISCO-SNMP-TARGET-EXT-MIB
- CISCO-STP-EXTENSIONS-MIB
- CISCO-SYSLOGMIB
- CISCO-UDLDP-MIB
- CISCO-VLAN-IFTABLERELATIONSHIP-MIB
- CISCO-VLAN-MEMBERSHIPMIB
- CISCO-VTP-MIB
- ENTITY-MIB
- ETHERLIKE-MIB
- HC-RMON-MIB
- IEEE8021-PAE-MIB
- IEEE8023-LAG-MIB
- IF-MIB
- LLDP-EXT-MED-MIB
- LLDP-MIB
- NOTIFICATION-LOG-MIB
- OLD-CISCO-CPU-MIB
- OLD-CISCO-SYSTEM-MIB
- RMON-MIB
- SMON-MIB
- SNMP-COMMUNITY-MIB
- SNMP-FRAMEWORK-MIB
- SNMP-MPD-MIB
- SNMP-NOTIFICATION-MIB
- SNMPPROXY-MIB
- SNMP-TARGET-MIB
- SNMP-USM-MIB
- SNMP-VIEW-BASED-ACM-MIB
- SNMPV2-MIB
- 802.1X MIB

Other Specifications

Reliability

- Designed and manufactured using AS9100 aerospace grade / ISO 9001:2000 certified quality program
- No moving parts. No fan or cold plate required
- Conformal coated PCBs for humidity/tin-whisker mitigation
- Mean Time Between Failure (MTBF) calculated per MIL-HDBK-217F: see qualification report

Export Jurisdiction

- ITAR-free: EAR controlled (ECCN 5A001.A1)

Regulatory Compliance

- European CE Mark (including RTCA DO-160G, MIL-STD-461F/G, MIL-STD-704F, MIL-STD-1275D/E, RoHS 3)
- REACH compliant

Warranty

- 1 year return to depot warranty
- Warranty extensions and multi-year service agreements available which bundle Cisco SmartNET for access to Cisco IOS software updates and Cisco TAC support

Chapter 6 Troubleshooting

Product Identification

The product is labeled with the Parvus P/N and serial number. Please refer to this information when communicating with Technical Support.

Technical Assistance

If you have a technical question or if you cannot isolate a problem with your product, please call or e-mail the Parvus Technical Support team:

Email	slp_tsupport@curtisswright.com
Phone	1.801.433.6322
Fax	1.801.483.1523

Returning for Service

Before returning any Parvus product, please fill out a Return Material Authorization (RMA) request form available for download from the following website under the support section:

www.curtisswrightds.com

Email this form to the Technical Support email address (slp_tsupport@curtisswright.com) to receive authorization for shipment. An RMA number will be emailed back to you as soon as possible.



Note: You must have the RMA number in order to return any product for any reason.



Caution:
Any product returned to Parvus improperly packed will immediately void the warranty for that particular product.

Chapter 7 Contact Info

Company contact info:

Curtiss-Wright
Defense Solutions Division
3222 S. Washington St.
Salt Lake City, Utah, USA 84115

T: +1.801.483.1533
F: +1.801.483.1523

www.curtisswrightds.com

Sales:

T: +1.800.483.3152 or +1.801.483.1533
slp_sales@curtisswright.com

Product Technical Support:

T: +1.801.433.6322
slp_tsupport@curtisswright.com

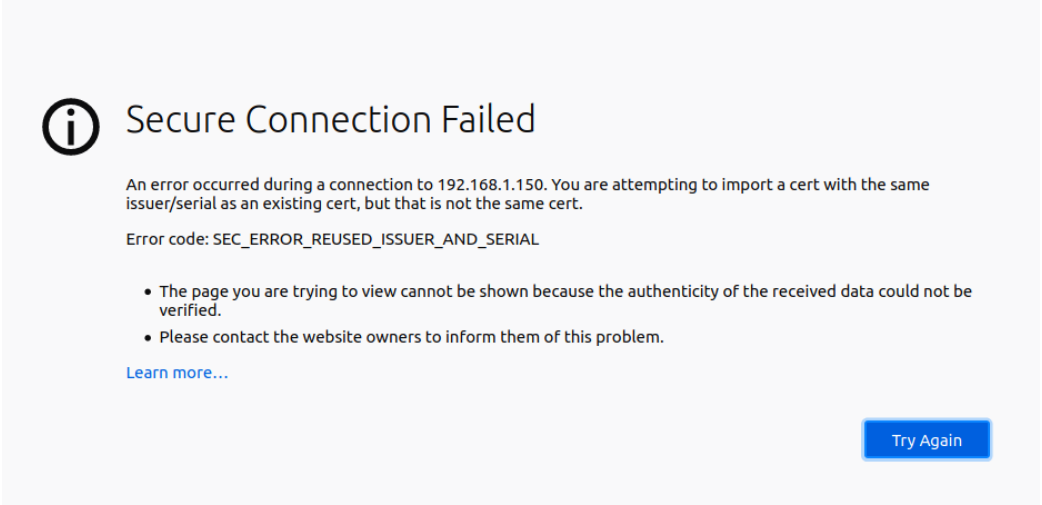
Customer Feedback:

slp_feedback@curtisswright.com

Appendix A

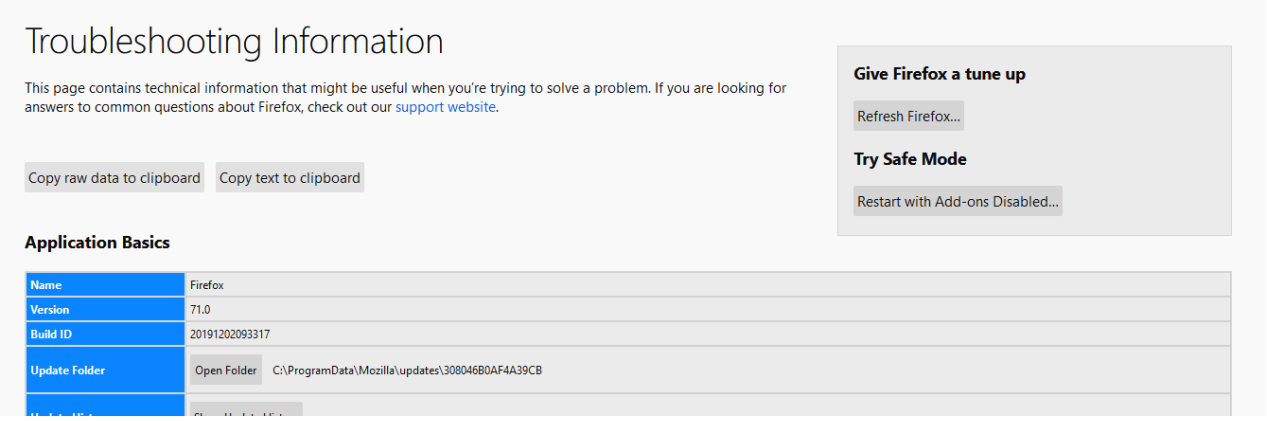
Firefox Browser Issue and Correction

Occasionally, when attempting to access the Cisco WebUI from a Firefox browser you may encounter the following access failure.



To correct this:

From the Firefox home page click on the symbol ≡ located in the upper right corner. This will bring up a list of options. Navigate to ***Help*** then navigate to ***Troubleshooting Information.*** This will presented the following web page.



Under the heading ***Give Firefox a tune up*** select Refresh Firefox…
This should resolve the failure.

Minicom Client Install and Setup - Ubuntu

Ensure you have an internet connection
Linux prompt: ~$

To install minicom

~$ sudo apt-get install minicom

To execute minicom

~$ sudo minicom –s

The –s allows for minicom setup of which the following should be confirmed

Serial Device:	*/dev/ttyUSB0*
Bps/Par/Bits:	*9600 8N1*
Hardware Flow Control:	*No*
Software Flow Control:	*No*

To confirm the Serial Device

~$ dmesg | grep tty

To list the active USB port

~$ ls | grep USB

Once minicom has been setup the (-s) option is longer needed, simply execute

~$ sudo minicom

For additional information;
https://developer.ridgerun.com/wiki/index.php/Setting_up_Minicom_Client_-_Ubuntu

iperf Install and Setup – Linux Ubuntu

Linux prompt: ~$

To install iperf

~$ sudo apt-get update

~$ sudo apt-get install iperf

Executing iperf

On the Server Machine (PC)

- ~$ iperf –s –i5

On the Client machine (PC)

- ~$ iperf –c 192.168.1.140 –i5 –t60

Note:

-i# is the time in seconds the terminal will be updated with results

-t# is the length of the test in seconds

The IP address 192.168.1.### may be different for your machine

To run iperf from a selected IP source

- ~$ iperf –I (source IP address) (destination IP address)

To determine maximum bandwidth using a single CAT-5 cable between PC1 and PC2

- run iperf –s “on PC1”
- run iperf –c 192.168.1.140 –i5 –t60 “on PC2”
  - #Mbytes
  - #GBytes

Additional information;

https://linuxhint.com/iperf_command_usage/

ifconfig
~$ sudo apt install net-tools

Automated Diagnostic Software Install and Execute

Linux prompt: ~$

Install the GNU Compiler Collection (gcc) onto both PCs

~$ sudo apt install gcc

Place the two test files in the following directory on the two Linux PCs

Linux1: IP address 192.168.1.140
~$/Desktop/DuraNET-3300/Software/PacketLossServer.c

Linux2: IP address 192.168.1.100
~$/Desktop/DuraNET-3300/Software/PacketLossClient.c

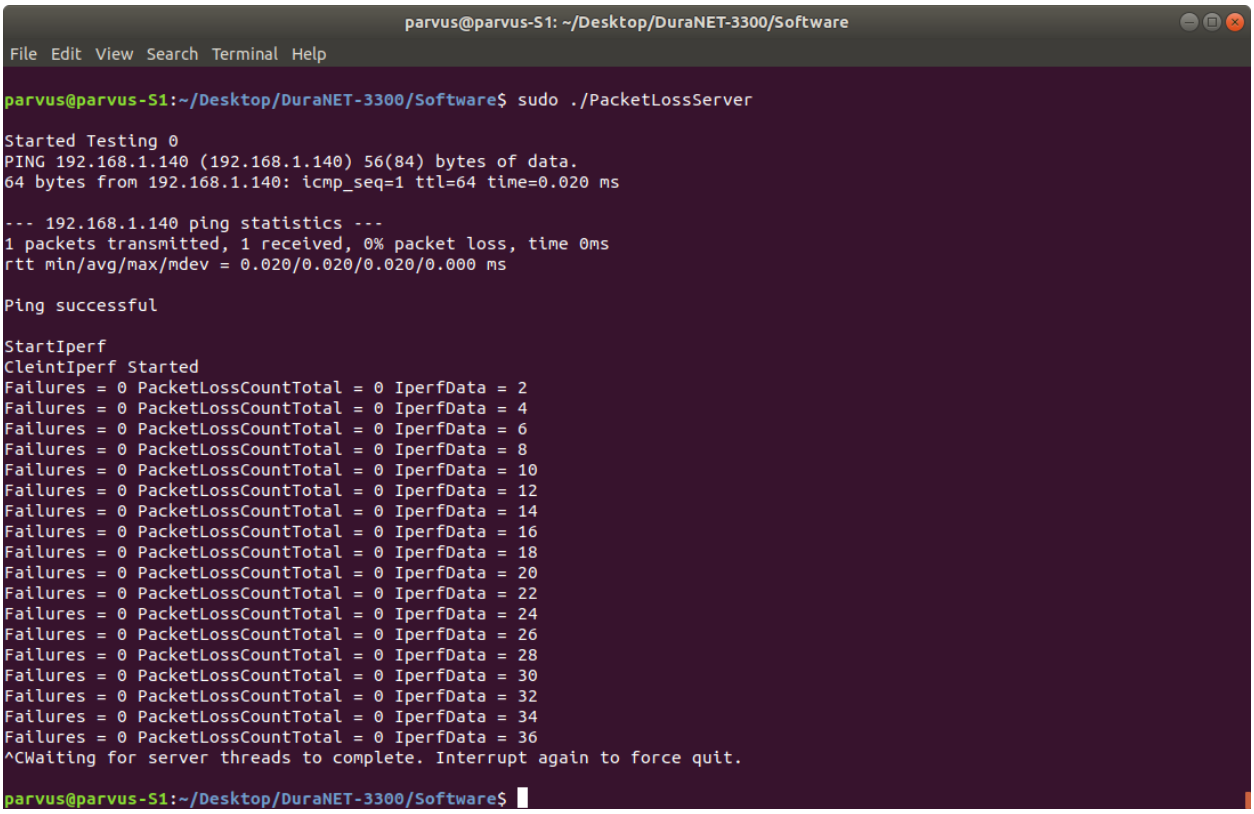
From their respective directory on the two PCs compile the .c files

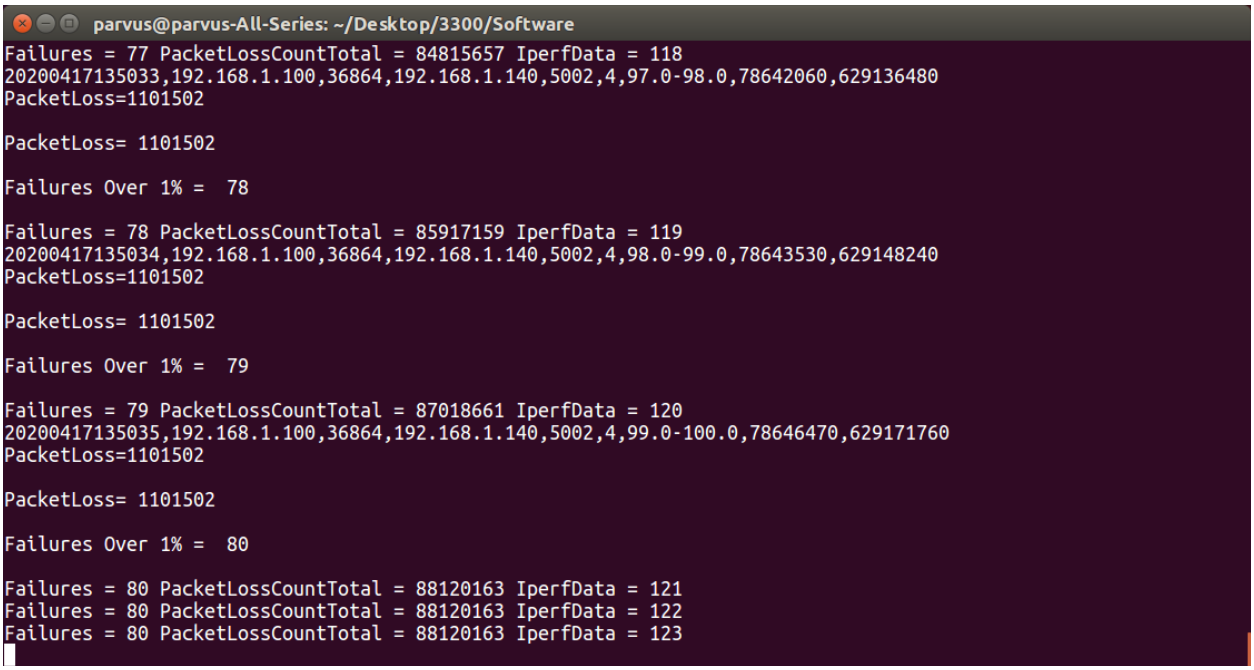
- ~$ gcc PacketLossServer.c -o PacketLossServer
- ~$ gcc PacketLossClient.c -o PacketLossClient

From their respective directory paths, execute the files starting with the Server first

- ~$ sudo ./PacketLossServer
- ~$ sudo ./PacketLossClient

The diagnostic output with without errors.


parvus@parvus-S1: ~/Desktop/DuraNET-3300/Software
File Edit View Search Terminal Help
parvus@parvus-S1:~/Desktop/DuraNET-3300/Software$ sudo ./PacketLossServer
Started Testing 0
PING 192.168.1.140 (192.168.1.140) 56(84) bytes of data.
64 bytes from 192.168.1.140: icmp_seq=1 ttl=64 time=0.020 ms
--- 192.168.1.140 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.020/0.020/0.020/0.000 ms
Ping successful
StartIperf
CleintIperf Started
Failures = 0 PacketLossCountTotal = 0 IperfData = 2
Failures = 0 PacketLossCountTotal = 0 IperfData = 4
Failures = 0 PacketLossCountTotal = 0 IperfData = 6
Failures = 0 PacketLossCountTotal = 0 IperfData = 8
Failures = 0 PacketLossCountTotal = 0 IperfData = 10
Failures = 0 PacketLossCountTotal = 0 IperfData = 12
Failures = 0 PacketLossCountTotal = 0 IperfData = 14
Failures = 0 PacketLossCountTotal = 0 IperfData = 16
Failures = 0 PacketLossCountTotal = 0 IperfData = 18
Failures = 0 PacketLossCountTotal = 0 IperfData = 20
Failures = 0 PacketLossCountTotal = 0 IperfData = 22
Failures = 0 PacketLossCountTotal = 0 IperfData = 24
Failures = 0 PacketLossCountTotal = 0 IperfData = 26
Failures = 0 PacketLossCountTotal = 0 IperfData = 28
Failures = 0 PacketLossCountTotal = 0 IperfData = 30
Failures = 0 PacketLossCountTotal = 0 IperfData = 32
Failures = 0 PacketLossCountTotal = 0 IperfData = 34
Failures = 0 PacketLossCountTotal = 0 IperfData = 36
^CWaiting for server threads to complete. Interrupt again to force quit.
parvus@parvus-S1:~/Desktop/DuraNET-3300/Software$


parvus@parvus-All-Series: ~/Desktop/3300/Software
Failures = 77 PacketLossCountTotal = 84815657 IperfData = 118
20200417135033,192.168.1.100,36864,192.168.1.140,5002,4,97.0-98.0,78642060,629136480
PacketLoss=1101502
PacketLoss= 1101502
Failures Over 1% = 78
Failures = 78 PacketLossCountTotal = 85917159 IperfData = 119
20200417135034,192.168.1.100,36864,192.168.1.140,5002,4,98.0-99.0,78643530,629148240
PacketLoss=1101502
PacketLoss= 1101502
Failures Over 1% = 79
Failures = 79 PacketLossCountTotal = 87018661 IperfData = 120
20200417135035,192.168.1.100,36864,192.168.1.140,5002,4,99.0-100.0,78646470,629171760
PacketLoss=1101502
PacketLoss= 1101502
Failures Over 1% = 80
Failures = 80 PacketLossCountTotal = 88120163 IperfData = 121
Failures = 80 PacketLossCountTotal = 88120163 IperfData = 122
Failures = 80 PacketLossCountTotal = 88120163 IperfData = 123

DuraNET 3300 Port to Cisco Name Mapping

The Port name mappings of the DuraNET 3300 and internal Cisco hardware are listed below and can be display by executing the CLI commands

- ***switch>enable***
- ***switch# sho int status***

DuraNET 3300 Port Name	Status	Cisco ESS-3300 Port Name
LC1	Connected	Te1/1
LC2	Connected	Te1/2
P1	Connected	Gi1/5
P2	Connected	Gi1/6
P3	Connected	Gi1/3
P4	Connected	Gi1/4
P5	Connected	Gi1/9
P6	Connected	Gi1/10
P7	Connected	Gi1/7
P8	Connected	Gi1/8
P9	Connected	Gi2/3
P10	Connected	Gi2/4
P11	Connected	Gi2/1
P12	Connected	Gi2/2
P13	Connected	Gi2/7
P14	Connected	Gi2/8
P15	Connected	Gi2/5
P16	Connected	Gi2/6
P17	Connected	Gi2/11
P18	Connected	Gi2/12
P19	Connected	Gi2/9
P20	Connected	Gi2/10
P21	Connected	Gi2/15
P22	Connected	Gi2/16
P23	Connected	Gi2/13
P24	Connected	Gi2/14

Glossary

Term	Definition/Description
IOS-XE	Cisco's operating system for their enterprise network devices (switches, routers, etc.)
10GBASE-SR	A 10 Gigabit optical Ethernet standard. Various fiber classes allow 300-400 meter max cable length

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