Xtreme/GbE
Managed Carrier Ethernet Switch
Users Guide

Table of Contents

Preface

Disclaimer

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Customer Support Overview

If you experience difficulties after reading the manual and/or using the product, contact the Connect Tech reseller from which you purchased the product. In most cases the reseller can help you with product installation and difficulties.

In the event that the reseller is unable to resolve your problem, our highly qualified support staff can assist you. Our support section is available 24 hours a day, 7 days a week on our website at: www.connecttech.com/sub/support/support.asp. See the contact information section below for more information on how to contact us directly. Our technical support is always free.

Contact Information

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Guelph, Ontario
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Email/Internet

sales@connecttech.com
support@connecttech.com
www.connecttech.com

> **Note:**
> Please go to the **Download Zone** or the **Knowledge Database** in the **Support Center** on the Connect Tech website for product manuals, installation guides, device driver software and technical tips.
> Submit your technical support questions to our customer support engineers via the **Support Center** on the Connect Tech website.

Telephone/Facsimile
Technical Support representatives are ready to answer your call Monday through Friday, from 8:30 a.m. to 5:00 p.m. Eastern Standard Time. Our numbers for calls are:

Toll Free: 800-426-8979 (North America only)
Telephone: 519-836-1291 (Live assistance available 8:30 a.m. to 5:00 p.m. EST, Monday to Friday)
Facsimile: 519-836-4878 (on-line 24 hours)

Limited Product Warranty

Connect Tech Inc. provides a lifetime Warranty for the Xtreme/GbE - Managed Carrier Ethernet Switch. Should this product, in Connect Tech Inc.'s opinion, fail to be in good working order during the warranty period, Connect Tech Inc. will, at its option, repair or replace this product at no charge, provided that the product has not been subjected to abuse, misuse, accident, disaster or non-Connect Tech Inc. authorized modification or repair.

You may obtain warranty service by delivering this product to an authorized Connect Tech Inc. business partner or to Connect Tech Inc. along with proof of purchase. Product returned to Connect Tech Inc. must be pre-authorized by Connect Tech Inc. with an RMA (Return Material Authorization) number marked on the outside of the package and sent prepaid, insured and packaged for safe shipment. Connect Tech Inc. will return this product by prepaid ground shipment service.

The Connect Tech Inc. Limited Warranty is only valid over the serviceable life of the product. This is defined as the period during which all components are available. Should the product prove to be irreparable, Connect Tech Inc. reserves the right to substitute an equivalent product if available or to retract the Warranty if no replacement is available.

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ESD Warning

Electronic components and circuits are sensitive to ElectroStatic Discharge (ESD). When handling any circuit board assemblies including Connect Tech COM Express carrier assemblies, it is recommended that ESD safety precautions be observed. ESD safe best practices include, but are not limited to:

- Leaving circuit boards in their antistatic packaging until they are ready to be installed.
- Using a grounded wrist strap when handling circuit boards, at a minimum you should touch a grounded metal object to dissipate any static charge that may be present on you.
- Only handling circuit boards in ESD safe areas, which may include ESD floor and table mats, wrist strap stations and ESD safe lab coats.
- Avoiding handling circuit boards in carpeted areas.
- Try to handle the board by the edges, avoiding contact with components.

Revision History

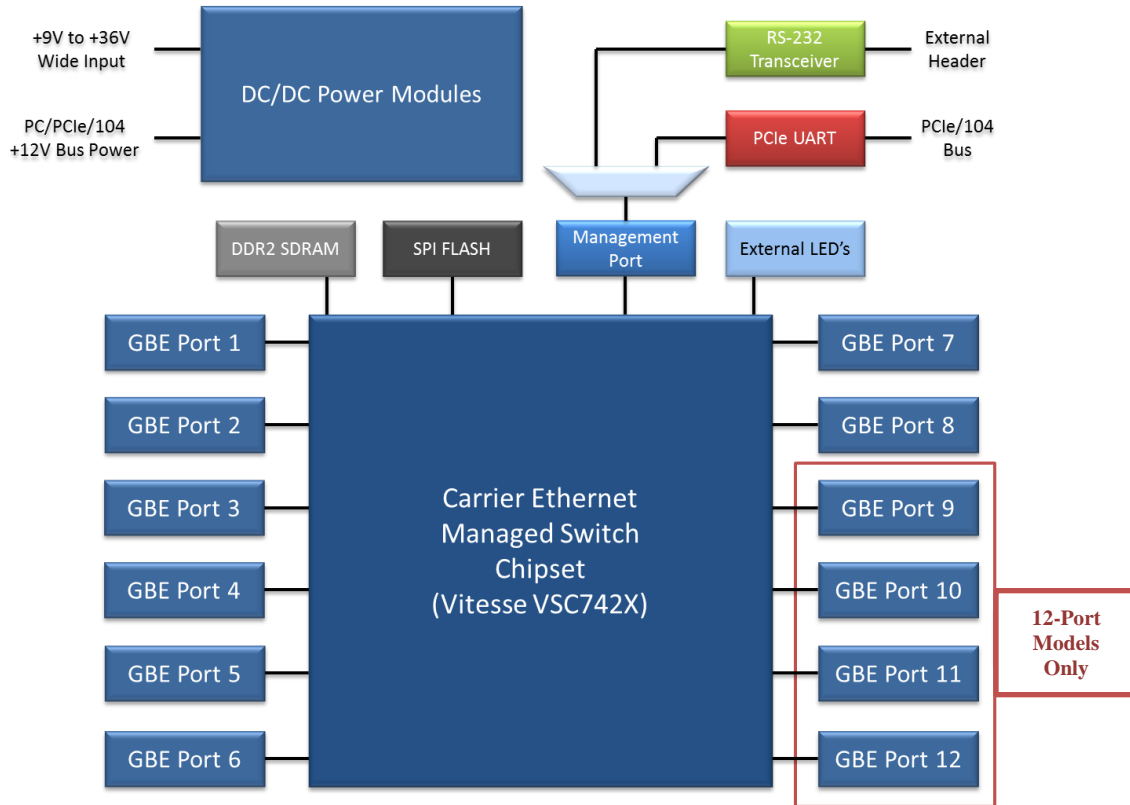| Revision	Date	Changes
0.00	11/19/2013	Original
0.01	11/28/2013	Added Stacking Multiple Xtreme/GbE Section
0.02	01/09/2013	Corrected pinout of P2 for XDG007/8/9 Products
0.03	04/25/2014	Added XDG010 Information
0.04	09/01/2014	Corrected Cable Drawings
0.05	12/15/2015	Major Release Update: - Changed to CTI latest template - Updated all photos and connector call outs - Added additional CLI and Web Configuration info - Added Conduction Cooled Info

Introduction

Connect Tech's Xtreme/GbE Managed Carrier Ethernet Switch provides high density, high port count, Carrier Grade Ethernet switching capabilities in an extremely small embedded form factor. Excellent for any space constrained, mission-critical application needing an embedded high-density/high-port count managed Ethernet Switch.

Feature	Description
Ethernet Switch Engine	Vitesse VSC7428 (8-port Models) / VSC7429 (12-Port Models) Carrier Grade Ethernet Switch Chipset A powerful embedded 416 MHz RISC 32-bit CPU with DDR2 external memory and DMA-based frame extraction and insertion supports timing over packet, Ethernet OAM, and performance monitoring.
Memories	1Gb DDR2 SDRAM (125MB) 128Mb Serial NOR Flash (16MB)
Ports	8 or 12 x Gigabit Ethernet (10/100/1000 Mbps)
Magnetics	On-board Gigabit Magnetics for all Ports (No external Magnetics required) Designed for Long-haul Gigabit Ethernet (10/100/1000 Mbps) applications
I/O Connectors	**Ethernet:** RJ-45 (8 or 12 Port Models), 2mm Pitch Locking Pin Headers (8 or 12 Port Models) **Power:** 3.5mm Pitch Terminal Block Header **Console:** 0.1" Pitch Header, 2mm Pitch Locking Pin Headers
Layer 2 Switching	802.1Q VLAN switch with 8K MACs and 4K VLANs
	Push/pop up to two VLAN tags
	IPv4/IPv6 multicast
	Policing with storm control and MC/BC protection
	RSTP and MSTP support
	Hardware and software-based learning
	Link aggregation (IEEE 802.3ad)
	Independent and shared VLAN learning (IVL, SVL)
	Jumbo frame support
Management Access	Web Interface CLI via RS-232 Software API SMNP PCIe/104 Bus (Option)
Indicator LEDs	2 LEDs per port Power Rail LEDs Status LEDs
Standalone Operation	Switch can be used as a standalone unit OR it can be paired with an embedded SBC.
Input Voltage	+9V to 36V Input Range (All Models) +12V only (Models with PCIe/104 Connector) +5V only (XDG029 Only)
Power Consumption	**VSC7428:** Idle: 0.3A, 3.6W Typical: 0.35A, 4.2W Max: 0.5A, 6W (with +12V input) **VSC7428:** Idle: 0.4A, 4.8W Typical: 0.5A, 6W Max: 0.75A, 9W (with +12V input)
Expansion Bus Interface	PCIe/104 bus (optional - sourcing power and management interface)
Dimensions	8-Port: 3.775" x 3.550" 12-Port: 4.393" x 4.550" Tallest Top Side Component: Heatsink 0.375" (9.5mm) **Download 3D Model Here**
Weight	TBD
MTBF	TBD
Operating Temp	-40°C to +85°C (chipset rated to +125°C thermals)
Warranty and Support	Lifetime Warranty and Free Technical Support

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Product Overview

Block Diagram

+9V to +36V
Wide Input

DC/DC Power Modules

PC/PCIe/104
+12V Bus Power

RS-232
Transceiver

External
Header

PCIe UART

PCIe/104
Bus

DDR2 SDRAM

SPI FLASH

Management
Port

External LED's

GBE Port 1

GBE Port 7

GBE Port 2

GBE Port 8

GBE Port 3

Carrier Ethernet
Managed Switch
Chipset
(Vitesse VSC742X)

GBE Port 9

GBE Port 4

GBE Port 10

**12-Port
Models
Only**

GBE Port 5

GBE Port 11

GBE Port 6

GBE Port 12

Ordering Part Numbers

| Part Number	GbE Ports	GbE Port Connector Type	Thermal Solution	Exp Bus Option
XDG004	8	RJ-45's	Air Cooled Heatsink	None
XDG005	8	RJ-45's	Air Cooled Heatsink	PC/104
XDG006	8	RJ-45's	Air Cooled Heatsink	PCIe/104
XDG007	8	Rugged Locking Pin Headers	Air Cooled Heatsink	None
XDG008	8	Rugged Locking Pin Headers	Air Cooled Heatsink	PC/104
XDG009	8	Rugged Locking Pin Headers	Air Cooled Heatsink	PCIe/104
XDG010	12	RJ-45's & Ruggd Locking Pin Headers	Air Cooled Heatsink	PCIe/104
XDG012	12	RJ-45's & Ruggd Locking Pin Headers	Air Cooled Heatsink	None
XDG013	12	Rugged Locking Pin Headers	Air Cooled Heatsink	PCIe/104
XDG016	8	RJ-45's	Conduction Cooled Heatplate	None
XDG017	8	RJ-45's	Conduction Cooled Heatplate	PC/104
XDG018	8	RJ-45's	Conduction Cooled Heatplate	PCIe/104
XDG019	8	Rugged Locking Pin Headers	Conduction Cooled Heatplate	None
XDG020	8	Rugged Locking Pin Headers	Conduction Cooled Heatplate	PC/104
XDG021	8	Rugged Locking Pin Headers	Conduction Cooled Heatplate	PCIe/104
XDG022	12	RJ-45's & Ruggd Locking Pin Headers	Conduction Cooled Heatplate	PCIe/104
XDG023	12	Rugged Locking Pin Headers	Conduction Cooled Heatplate	PCIe/104
XDG029	12	Rugged Locking Pin Headers	Conduction Cooled Heatplate	None **(+5V Only)**
XHG101	8 or 12 Port Conduction Cooled Heatplate (Standalone Item)			

Connector Locations

8-Port RJ-45 Models

Part Numbers: XDG004, XDG005, XDG006, XDG016, XDG017, XDG018
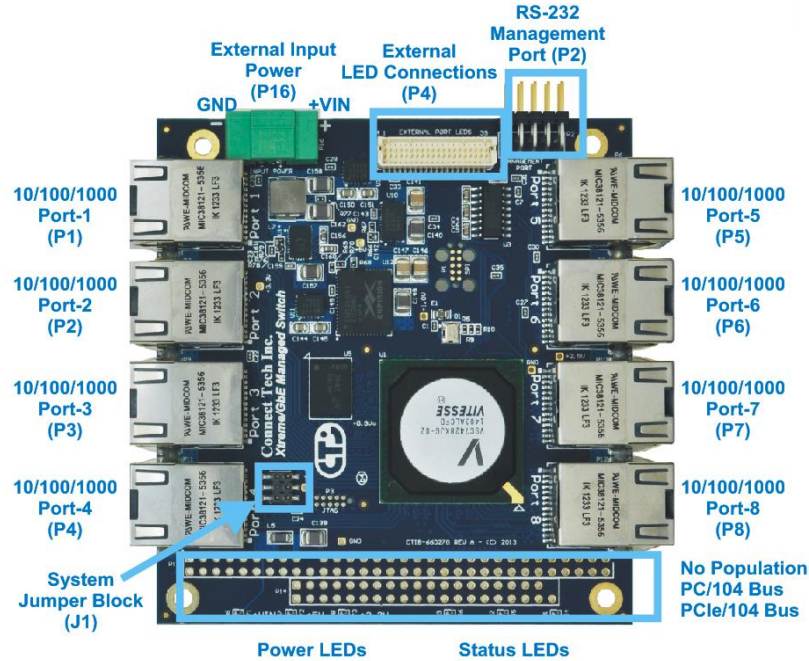
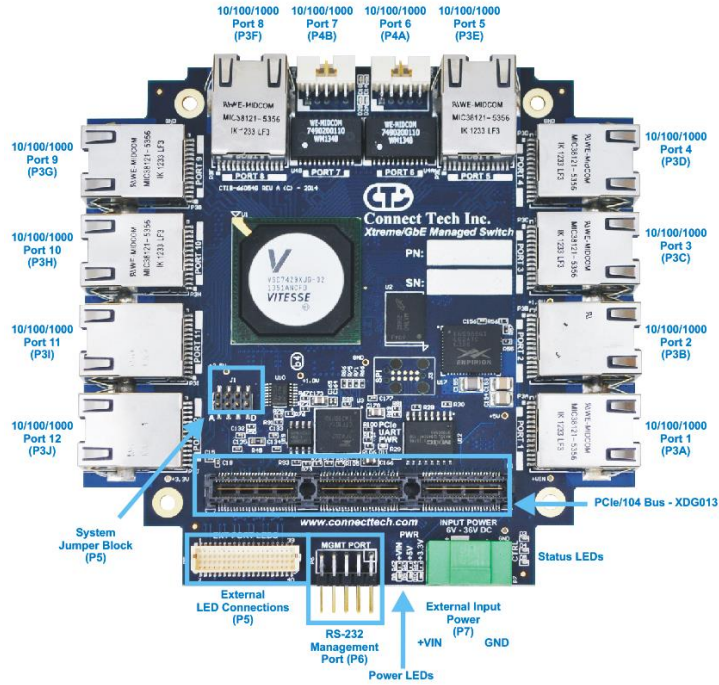## 8-Port Rugged Latching Models

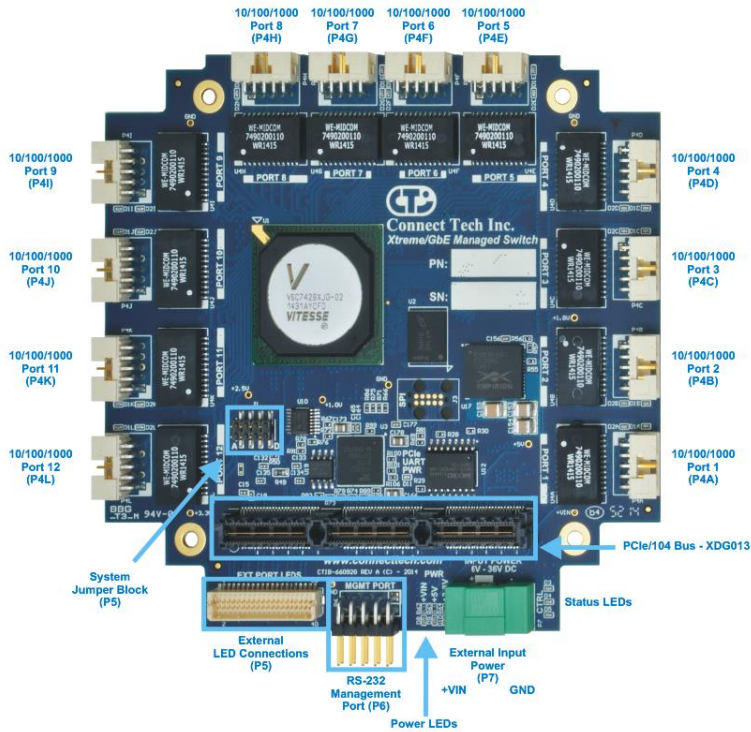Part Numbers: XDG007, XDG008, XDG009, XDG016,XDG017,XDG018
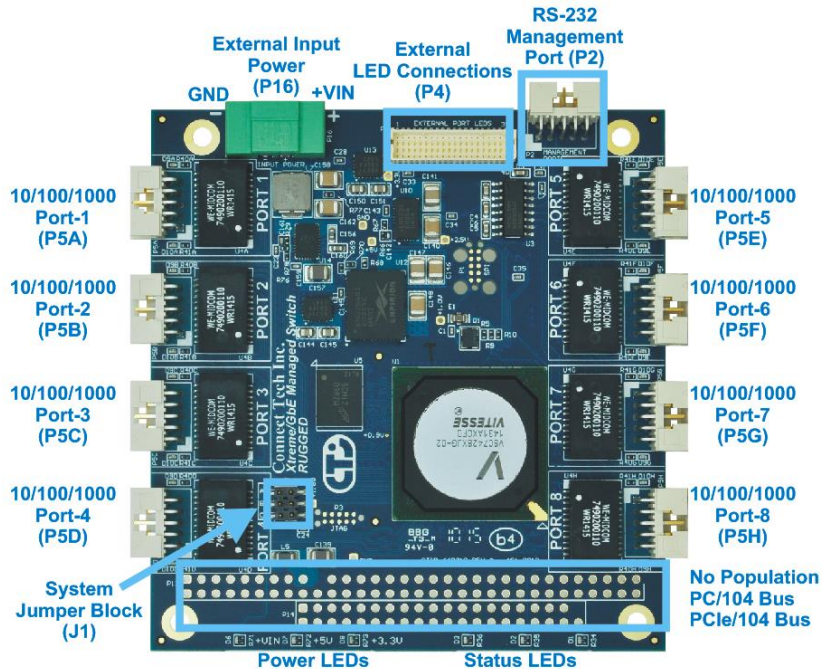
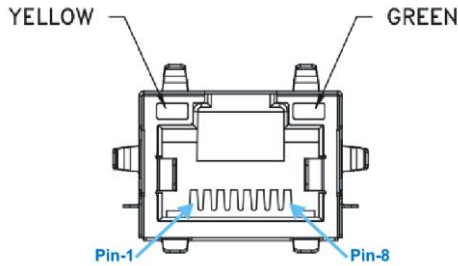## 12-Port RJ-45 Models

Part Numbers: XDG010, XDG012, XDG022

12-Port Rugged Latching Models

Part Numbers: XDG013, XDG023, *XDG029 (no PCIe/104)*

Detailed Feature Pinouts and Descriptions

10/100/1000 Ethernet RJ-45 Connector

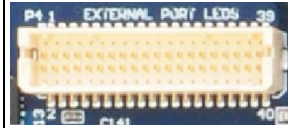| Function	LAN Connector	
Locations	P1-P8 (XDG004/5/6) P3A-J (XDG010)	
XDG Connector PN	7498111120 - Manufacturer: Wurth	
Mating Connector PN	Standard Cat5e (8P8C RJ-45 Plug)	
Pinout	<table><tr><th>Pin</th><th>Signal</th></tr><tr><td>1</td><td>MX1P</td></tr><tr><td>2</td><td>MX1N</td></tr><tr><td>3</td><td>MX2P</td></tr><tr><td>6</td><td>MX2N</td></tr><tr><td>4</td><td>MX3P</td></tr><tr><td>5</td><td>MX3N</td></tr><tr><td>7</td><td>MX4P</td></tr><tr><td>8</td><td>MX4N</td></tr></table>	Green Only = 1Gbps Green and Yellow = 100Mbps Yellow Only = 10Mbps

10/100/1000 Ethernet Rugged Latching Connector

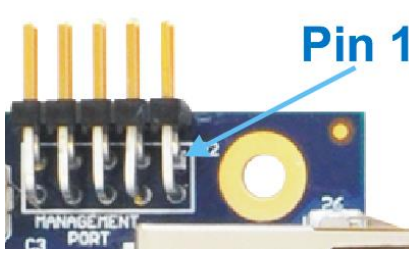| Function	LAN Connector		
Locations	P5A-H (XDG007/8/9) P4A-B (XDG010)		Top view
XDG Connector PN	98424-G52-10LF - Manufacturer: FCI		
Mating Connector PN	10073599-010LF - Manufacturer: FCI		
Pinout	<table><tr><th>Pin</th><th>Signal</th><th>Description</th></tr><tr><td>1</td><td>MX1-</td><td>Ethernet Pair 1</td></tr><tr><td>2</td><td>MX1+</td><td>Ethernet Pair 1</td></tr><tr><td>3</td><td>MX2-</td><td>Ethernet Pair 2</td></tr><tr><td>4</td><td>MX2+</td><td>Ethernet Pair 2</td></tr><tr><td>5</td><td>SHELL</td><td>RJ Shell Connection</td></tr><tr><td>6</td><td>SHELL</td><td>RJ Shell Connection</td></tr><tr><td>7</td><td>MX3-</td><td>Ethernet Pair 3</td></tr><tr><td>8</td><td>MX3+</td><td>Ethernet Pair 3</td></tr><tr><td>9</td><td>MX4-</td><td>Ethernet Pair 4</td></tr><tr><td>10</td><td>MX4+</td><td>Ethernet Pair 4</td></tr></table>		Side view looking at connector

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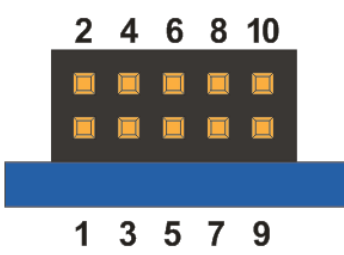
External LED Connectors
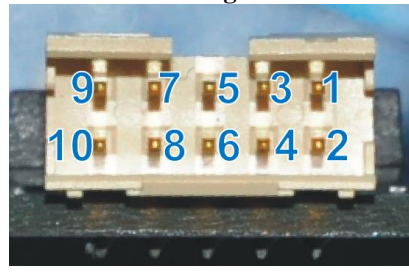
Function	External Port LEDs	
Locations	P4 (XDG004-009) P5 (XDG010)	
XDG Connector PN	DF20G-40DP-1V(56) - Manufacturer: Hirose	
Mating Connector PN	DF20A-40DS-1C - Manufacturer: Hirose	
Pinout (XDG004-009)		
Pinout (XDG010)		

IDC Serial Management Connector (RJ-45 Models)

Function	Serial Management Connector	
Locations	P2 (8-Port Models) P6 (12-Port Models)	**Top view**
XDG Connector PN:	TSW-105-08-L-D-RA - Manufacturer: Samtec	
Mating Connector PN:	Any IDC 2x5 0.1" pitch female assembly.	
Pinout	<table><tr><th>Pin</th><th>Signal</th></tr><tr><td>1</td><td>-</td></tr><tr><td>2</td><td>-</td></tr><tr><td>3</td><td>RX</td></tr><tr><td>4</td><td>-</td></tr><tr><td>5</td><td>TX</td></tr><tr><td>6</td><td>-</td></tr><tr><td>7</td><td>-</td></tr><tr><td>8</td><td>-</td></tr><tr><td>9</td><td>GND</td></tr><tr><td>10</td><td>-</td></tr></table>	**Side view looking at connector**

Rugged Locking Serial Management Connector (Rugged Models)

Function	Serial Management Connector	
Locations	P2	**Top view**
XDG Connector PN:	98464-G61-10ULF - Manufacturer: FCI	
Mating Connector PN:	10073599-010LF - Manufacturer: FCI	
Pinout	<table><tr><th>Pin</th><th>Signal</th></tr><tr><td>1</td><td>-</td></tr><tr><td>2</td><td>RX</td></tr><tr><td>3</td><td>TX</td></tr><tr><td>4</td><td>-</td></tr><tr><td>5</td><td>GND</td></tr><tr><td>6</td><td>-</td></tr><tr><td>7</td><td>-</td></tr><tr><td>8</td><td>-</td></tr><tr><td>9</td><td>-</td></tr><tr><td>10</td><td>-</td></tr></table>	**Side view looking at connector**

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System Jumper Block

Function	System Jumper Block	
Locations	J1	
Type	2x3 (or 2x4) 2mm pitch Jumper Block	

Pinout (8-Port Models)	Pos	Signal Name	Description	
	A	RESET#	**JUMPER ON =** XDG goes into reset **JUMPER OFF =** XDG boots up normally *Note: A reset button can be installed on these pins*	
	B	TBD	No functionality at this time	
	C	UART Source Select *(Only present on XDG006 and XDG009)*	**JUMPER ON =** VSC7428 UART connects to PCIe/104 Bus **JUMPER OFF =** VSC7428 UART connects to External Management Port (P2)	
	D	TBD	No functionality at this time	

Pinout (12-Port Models)	Pos	Signal Name	Description	
	A	TBD	No functionality at this time	
	B	RESET#	**JUMPER ON =** XDG goes into reset **JUMPER OFF =** XDG boots up normally *Note: A reset button can be installed on these pins*	
	C	TBD	No functionality at this time	
	D	UART Source Select *(Only present on XDG006 and XDG009)*	**JUMPER ON =** VSC7428 UART connects to PCIe/104 Bus **JUMPER OFF =** VSC7428 UART connects to External Management Port (P2)	
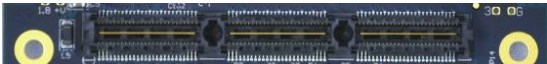
PC/104 Connector

Function	PC/104 Connector	
Locations	P9, P10 (8-Port Models)	
Type	PC/104 Stacking Connector	
Pinout	Pinout compliant to PC/104 specification pinout. This connector is only used to source power for the board (+12V), all other pins will be pass-through. Visit http://www.pc104.org to download the specification free of charge.	*Shown uninstalled*

PCIe/104 Connector

Function	PCIe/104 Connector	
Locations	P9 (8-Port Models) P1 (12-Port Models)	
Type	PCIe/104 Stacking Connector	
Pinout	Pinout compliant to PCIe/104 specification pinout v2.01. The Xtreme/GbE connects its management port to the x1 PCIe Link of the PCIe/104 bus (Type-1 or Type-2). The Xtreme/GbE also uses the +12V power rail from the PCIe/104 bus to power the board. Visit http://www.pc104.org to download the specification free of charge.	

Input Power Connector

The Xtreme/GbE can be powered by EITHER an external 3.5mm pitch Phoenix style connector OR directly via the PC/104 or PCIe/104 bus.

- Powering via the Phoenix style connector is called *standalone mode*
- Powering via the PC/104 connector is called *bus mode*

Standalone Power Requirements

Minimum Voltage	+9 VDC
Maximum Voltage	+36 VDC

XDG029 – Power Requirements

The XDG029, 12-Port Rugged Switch will accept a +5V input.

Bus Mode Power Requirements

Bus Connector	Voltage Rail used
PC/104	+12V
PCIe/104	+12V

External Input Power Connector Details

Function	Main Input Power +9V to +36V: All Models +5V Only: XDG029	
Location	P16 (8-Port Models) P7 (12-Port Models)	
XDG Connector PN	1843790 - Manufacturer: Phoenix Contact	
Mating Connector PN	1847055 - Manufacturer: Phoenix Contact	
Pinout		

Pinout table:

Pin	Signal	Description
1	+VIN	Power In
2	GND	Power Return

On-board Indicator LEDs (8-Port Models)

LED	Function	Details
D1	Xtreme/GbE Main Status LED	Normal behavior = blinking every 1000ms Programming = blinking every 100ms Firmware Check Error = blinking every 100ms (with D2)
D2	Xtreme/GbE Error State LED	Error State = blinking every 500ms Fatal Error = LED stays ON permanently Firmware Check Error = blinking every 100ms (with D1)
D3	TBD	No Function at this time.
D6	Indicates +VIN voltage is ON	This is connected to the +VIN of the external input or the +12V of the PC/104 or PCIe/104 bus connectors.
D7	Indicates +5V voltage is ON	If ON this voltage has been successfully generated on board the XDG
D8	Indicates +3.3V voltage is ON	If ON this voltage has been successfully generated on board the XDG
D9	PCIe UART Power Good	If ON the PCIe UART (only available on PCIe/104 models) has properly powered its internal circuitry

On-board Indicator LEDs (12-Port Models)

LED	Function	Details
D1	Gigabit Ethernet LED's	Rugged Positive Locking Header GbE LED (Operation similar to RJ-45 Green LED)
D2	Gigabit Ethernet LED's	Rugged Positive Locking Header GbE LED (Operation similar to RJ-45 Yellow LED)
D3	Xtreme/GbE Main Status LED	Normal behavior = blinking every 1000ms Programming = blinking every 100ms Firmware Check Error = blinking every 100ms (with D2)
D4	Xtreme/GbE Error State LED	Error State = blinking every 500ms Fatal Error = LED stays ON permanently Firmware Check Error = blinking every 100ms (with D1)
D5	TBD	No Function at this time.
D8	Indicates +VIN voltage is ON	This is connected to the +VIN of the external input or the +12V of the PC/104 or PCIe/104 bus connectors.
D9	Indicates +5V voltage is ON	If ON this voltage has been successfully generated on board the XDG
D10	Indicates +3.3V voltage is ON	If ON this voltage has been successfully generated on board the XDG
D11	PCIe UART Power Good	If ON the PCIe UART (only available on PCIe/104 models) has properly powered its internal circuitry

CLI Management Interface

CLI Access via External Serial Port

To use the CLI management on the XDG you must connect to the RS-232 external management serial port. Only TX, RX and GND connections are needed for operation. You then must open the serial port in a terminal program such as: RealTerm, Putty, HyperTerminal, minicom, etc. The COM port must be set up to run with a baud rate of **115200, 8 data bits, 1 stop bit and no parity**.

Note: the XDG external serial port is compatible with RS-232 Input/Output Levels (NOT TTL or CMOS).

RS-232 Serial Parameter	Value
Baud Rate	115200 bps
Data Bits	8
Parity	None
Stop Bit	1
Output Voltage Swing	±4.2 V
Input Voltage Range	±15 V
Input Threshold Low	0.8 V
Input Threshold High	2.4 V

CLI Access via PCIe/104 Bus

The XDG product connects to the CLI management interface via the PCIe/104 bus. This serial port is generated from on-board PCIe UART the Exar 17V352. Ensure the DIP Switch position 2/B is ON if you want to access the CLI via the PCIe/104 bus.

Additional drivers will be needed to properly operate the additional serial port.
Drivers for this functionality can be found on Exar's website here:
http://www.exar.com/connectivity/uart-and-bridging-solutions/pcie-uarts/xr17v352

CLI Basics

Once opening the COM port attached to the management port, after boot up your terminal output should look like the output below. The **default login** is **admin** and **password** is **blank(""). So after typing admin** hit <ENTER> then hit <ENTER> again to login and "?" will display a list of the available commands.

Below is a list of common quick CLI commands. For a complete CLI reference please see the documents described below.

Common Task	CLI Command Syntax
What are the IP addresses used by my switch?	`show ip int br`
What ports are linked and at what speed?	`show int * status`
What software version is on my switch?	`show ver`
How do I save my configuration?	`copy running-config startup-config`

How do I setup my IP address for vlan1?	`conf t`
	`int vlan 1`
	`ip add xxx.xxx.xxx.xxx 255.255.255.0`
	`end`

Complete CLI and Protocol Configuration Reference Guide

The complete CLI and Protocol Configuration reference guide from Microsemi for the VSC7428/9 device can be **downloaded here**.

The following documents:
- **AN1104-Software_Configuration_Guide_ICLI**
- **AN1115Layer2ProtocolConfigurationGuide**
Will have the below mentioned copyright notice.

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Web Management Interface

The Xtreme/GbE Managed Carrier Ethernet Switch allows users to configure and monitor the device from any web enabled device. Below describes how to access this management interface as well as provides on overview on the web GUI itself.

Accessing the Web Management Interface

There are two ways to access the web interface for first time use.

Method #1 - Using the default shipping IP
This method DOES NOT require having access to the CLI interface. By default the Xtreme/GbE will have an IP address of **192.168.42.1**, if you would like to connect to this address follow the steps below:
  o   Directly connect any port of Xtreme/GbE to your host PC using a standard Cat5e ethernet cable
  o   Setup your host PC's IP address to be on the same subnet as Xtreme/GbE (192.168.42.X)
  o   Open a web browser and go to the 192.168.42.1 address.
  o   Now you should see the login screen and from here you can setup the Xtreme/GbE to an IP address on your network.

Method #2 – Changing the Xtreme/GbE IP to one on your network via the CLI
This method requires having access to the CLI interface through means of the external management serial port or the PCIe/104 bus
  o   Login to the CLI interface
  o   Type in the following commands
  o   configure terminal
  o   interface vlan 1
  o   ip address xxx.xxx.xxx.xxx 255.255.255.0
  o   end
  o   Now connect Xtreme/GbE to any place on your network.
  o   Once the system is up simply go to your specified address of xxx.xxx.xxx.xxx in a web browser of your choice and you will see the login screen for the web interface

Login Screen of Web Management Interface

To login into the web management interface, the default login is **admin** and the password is blank.
(See below)
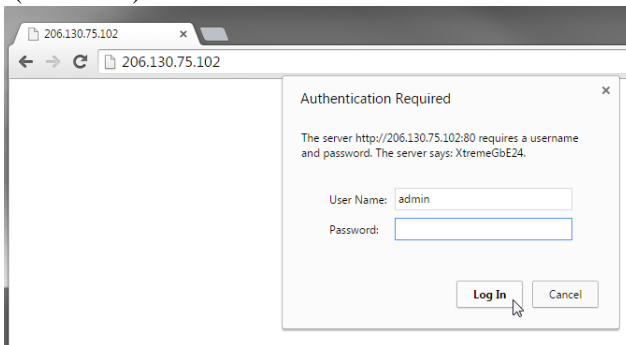
Web Management Interface Overview
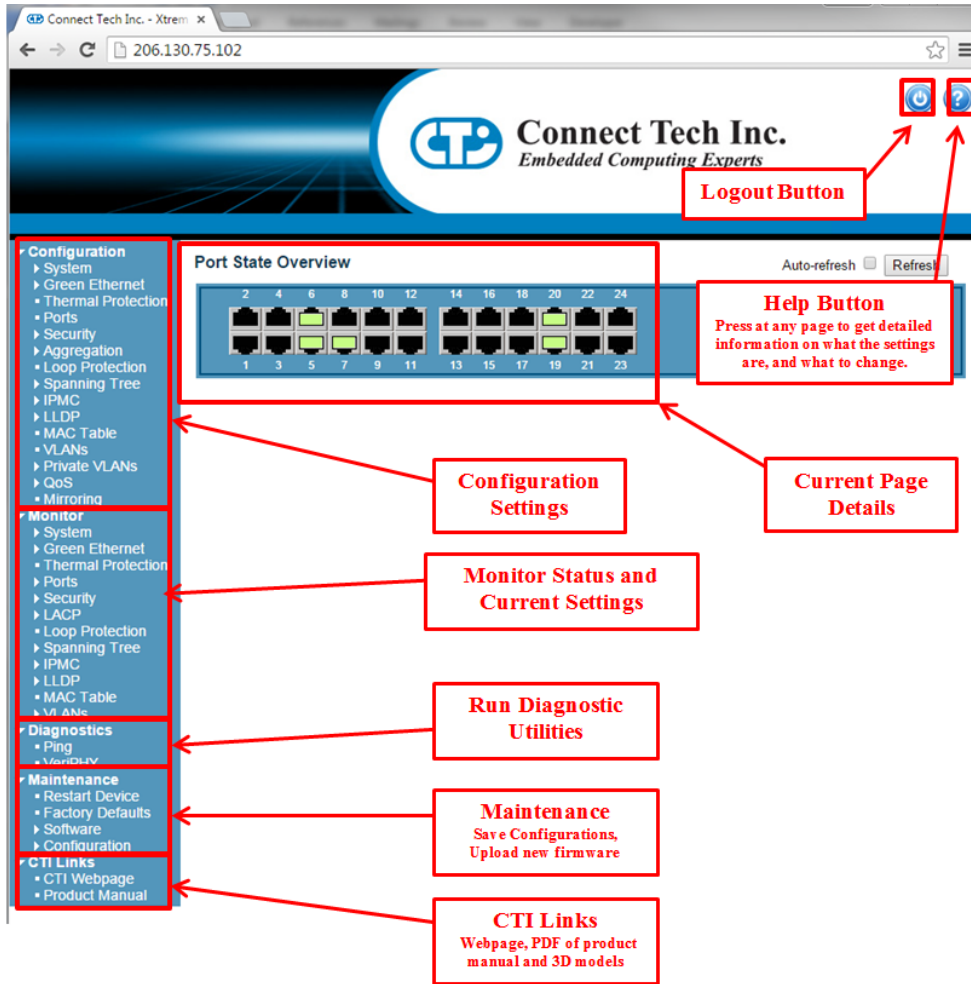
Complete Web Protocol Configuration Reference Guide

As mentioned in the CLI section, the complete Protocol Configuration reference guide from Microsemi for the VSC7429 device can be **downloaded here**. It will have CLI and Web configuration methods listed.

The following document:
- AN1115Layer2ProtocolConfigurationGuide
Will have the below mentioned copyright notice.

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Factory Default Configuration

The factory default configuration is a VLAN unaware L2 switch with automatic learning/ageing and auto negotiation enabled on all ports:

- System: The system name string is empty.

- Console: The password string is empty and inactivity timeout is disabled. The prompt is "#".

- Port: All ports are enabled for auto negotiation and flow control is disabled. Max frame size is 9600.

- MAC table: The table is empty, auto learning and ageing is enabled. The ageing timer is 300 seconds.

- VLAN: Only VLAN 1 is present in the table and includes all ports. All ports are VLAN unaware with Port VLAN ID 1. All ports accept all frame types.

- User Groups: User group 1 exists and includes all ports.

- QoS: If supported, IP ToS Precedence priority is enabled and all Precedence values are given high priority, otherwise port mode is enabled. VLAN tag priorities will be set according to 802.1p. The UDP/TCP port list is empty. Default priority is high. Default user priority is 0. L4 default priority and match priority are low. All shaper and policers are disabled.

- Mirror: Mirroring is disabled.

- IP: IP mode is enabled and the default IP address is **192.168.42.1**

- IP: DHCP mode is disabled.

- SNMP: SNMP is enabled. Traps are disabled.

- Dot1X: 802.1X is disabled. All ports set to "Force Authorized"

Hardware Usage Examples

Instructions for Standalone Operation

1. Ensure all external system power supplies are off.
2. Plug in external power into the external input power connector.
3. Ensure voltage is in the range of +9V to +36V (+5V for XDG029)
4. Turn on external power supply
5. XDG will now boot up
6. Plug in all Ethernet cables to XDG and begin setup operation and use.

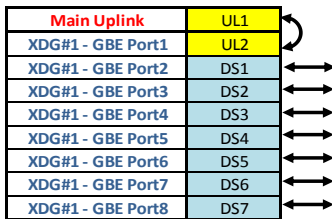## Instructions for Installation in PCIe/104 Stack

1. Ensure all external system power supplies are off.
2. Plug XDG board onto PCIe/104 stack (top or bottom stacking)
3. Ensure that the PCIe/104 bus will supply +12V over the bus connector
4. Turn on the PCIe/104 system
5. XDG will now boot up
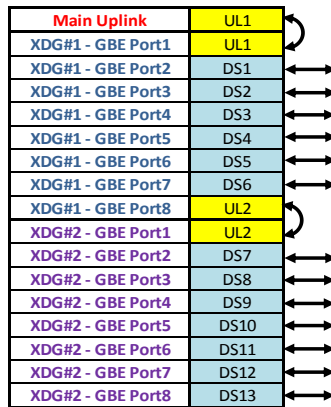6. Plug in all Ethernet cables to XDG and begin setup operation and use.

Stacking Multiple Xtreme/GbE Boards to Achieve Higher Port Densities

Due to the stacking nature of the PC/104 and PCIe/104 for factor board, the Xtreme/GbE can easily be stacked with other XDGs to achieve higher switch port densities. Some simple topology examples are listed below to achieve 7 downstream ports with one XDG, 13 downstream ports with two XDG's and 20 downstream ports with 3 XDG's. This pattern will continue when stacking 4 or more XDGs.
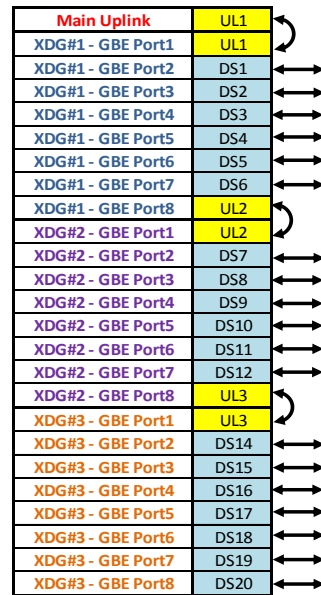
1 x XDG = 7 Downstream Ports

Main Uplink	UL1
XDG#1 - GBE Port1	UL2
XDG#1 - GBE Port2	DS1
XDG#1 - GBE Port3	DS2
XDG#1 - GBE Port4	DS3
XDG#1 - GBE Port5	DS4
XDG#1 - GBE Port6	DS5
XDG#1 - GBE Port7	DS6
XDG#1 - GBE Port8	DS7

2 x XDGs = 13 Downstream Ports

Main Uplink	UL1
XDG#1 - GBE Port1	UL1
XDG#1 - GBE Port2	DS1
XDG#1 - GBE Port3	DS2
XDG#1 - GBE Port4	DS3
XDG#1 - GBE Port5	DS4
XDG#1 - GBE Port6	DS5
XDG#1 - GBE Port7	DS6
XDG#1 - GBE Port8	UL2
XDG#2 - GBE Port1	UL2
XDG#2 - GBE Port2	DS7
XDG#2 - GBE Port3	DS8
XDG#2 - GBE Port4	DS9
XDG#2 - GBE Port5	DS10
XDG#2 - GBE Port6	DS11
XDG#2 - GBE Port7	DS12
XDG#2 - GBE Port8	DS13

3 x XDGs = 20 Downstream Ports

Main Uplink	UL1
XDG#1 - GBE Port1	UL1
XDG#1 - GBE Port2	DS1
XDG#1 - GBE Port3	DS2
XDG#1 - GBE Port4	DS3
XDG#1 - GBE Port5	DS4
XDG#1 - GBE Port6	DS5
XDG#1 - GBE Port7	DS6
XDG#1 - GBE Port8	UL2
XDG#2 - GBE Port1	UL2
XDG#2 - GBE Port2	DS7
XDG#2 - GBE Port3	DS8
XDG#2 - GBE Port4	DS9
XDG#2 - GBE Port5	DS10
XDG#2 - GBE Port6	DS11
XDG#2 - GBE Port7	DS12
XDG#2 - GBE Port8	UL3
XDG#3 - GBE Port1	UL3
XDG#3 - GBE Port2	DS14
XDG#3 - GBE Port3	DS15
XDG#3 - GBE Port4	DS16
XDG#3 - GBE Port5	DS17
XDG#3 - GBE Port6	DS18
XDG#3 - GBE Port7	DS19
XDG#3 - GBE Port8	DS20

Thermal Details

XDG Thermal Parameters

Thermal Parameter	Value
Minimum Ambient Operating Temperature	-40 °C
Maximum Operating Junction Temperature	125 °C
Recommended XDG TDP	8W
Die junction to package case top	3.27 °C/W
Die junction to PCB	6.03 °C/W
Die junction to Ambient	12.14 °C/W
Die junction to moving air @ 1 m/s	9.42 °C/W

Air Cooled Heatsinks

All air cooled models of the XDG ship with a black anodized 28x28x6.35mm Heatsink.
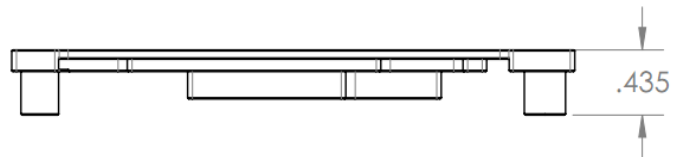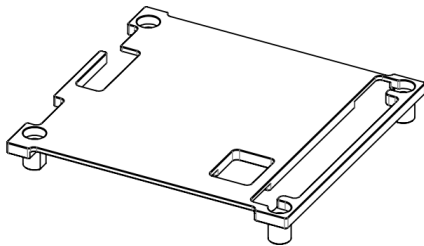
Part Number: 658-25ABT3
Manufacture: Wakefield-Vette
Thermal Resistance @ Forced Air Flow: 5°C/W @ 500 LFM

Conduction Cooled Heatplate

All conduction cooled models of the XDG ship with the **XHG101** heatplate. This heatplate has an outer dimensions that are equal to the PC/104 form factor of 3.775" x 3.550". With a height of 0.435".
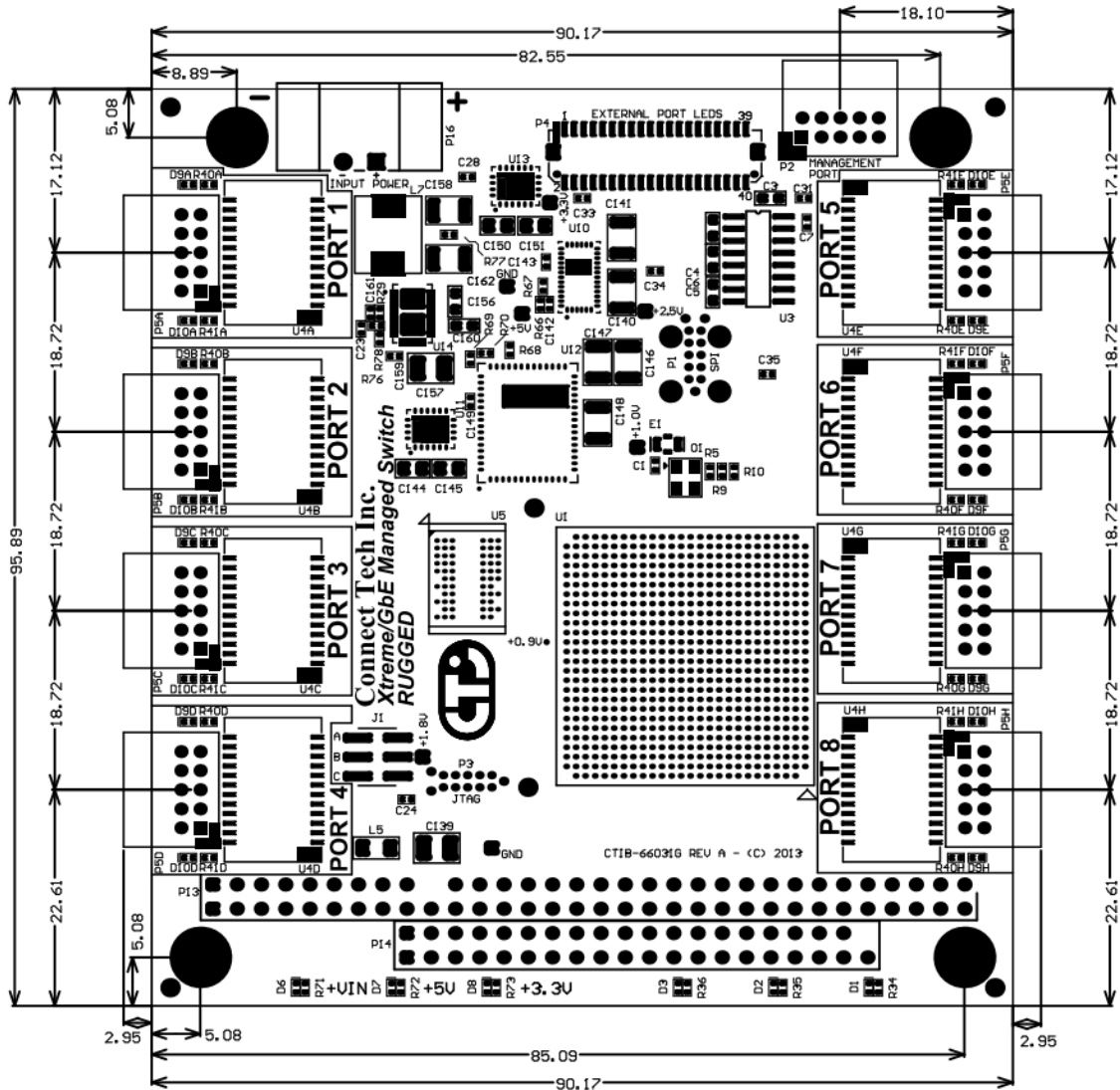
.435

Detailed Mechanical Drawings upon request… support@connecttech.com

Mechanical Details

3D STEP Models

A complete **3D STEP Model** file of COM Express Type 6 104e Carrier can be downloaded here:
http://www.connecttech.com/ftp/3d_models/XDG-Gen2_3D_MODEL.zip
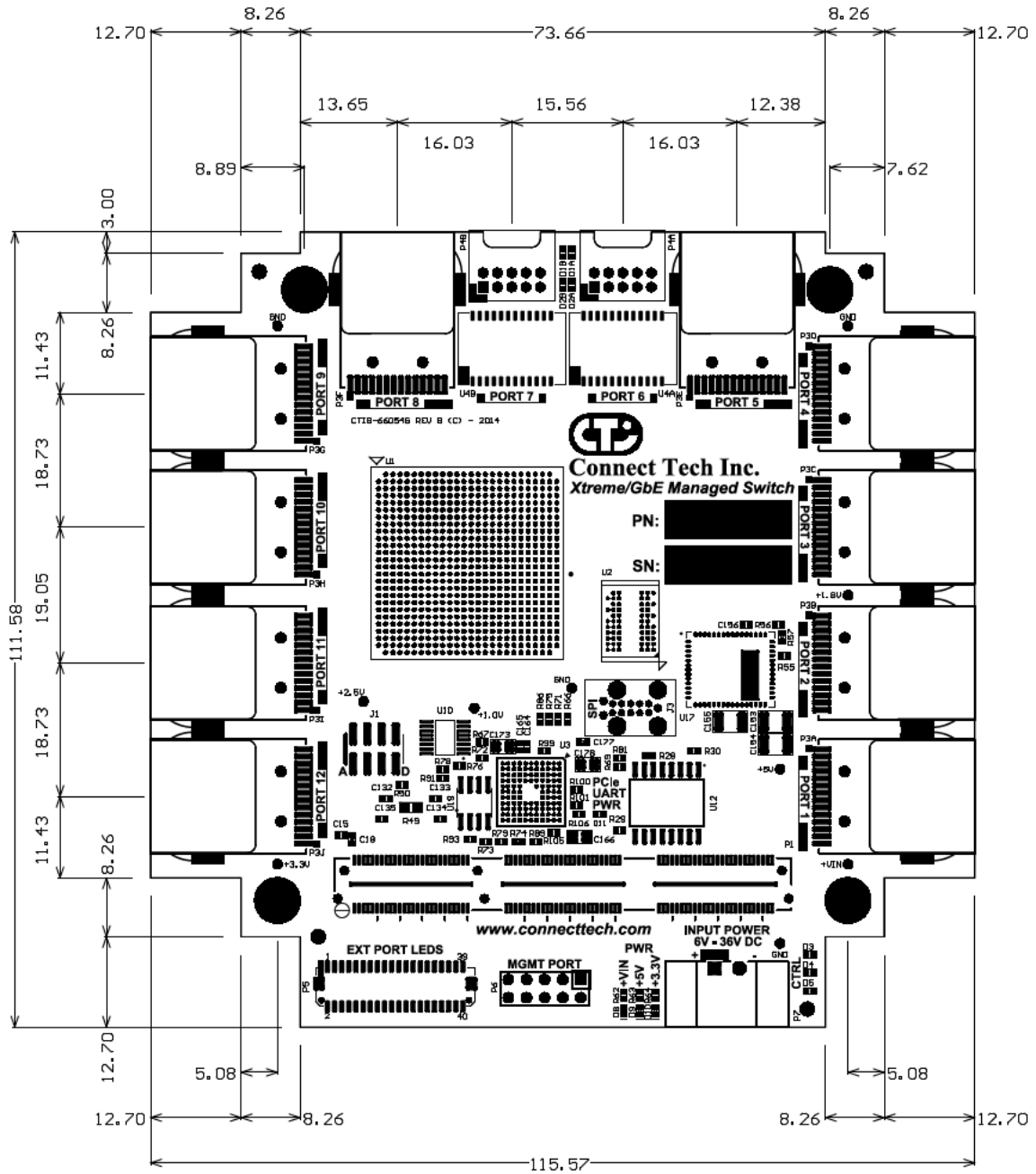
2D Dimension Drawings

8-Port RJ-45 Models

8-Port Rugged Model

12-Port RJ-45 Model

12-Port Rugged Model

Drawing Coming soon…

Cable Details

The Xtreme/GbE Managed Carrier Ethernet Switch has following cable options available.

Drawing No.	Part No.	Description
CTIC-00048	CAG104	2x5 0.1" IDC to DB-9 cable
CTIC-00433	CBG117	RJ-45 panel mount to 10-pin MiniTek
CTIC-00388	CBG127	RJ-45 panel mount to 10-pin MiniTek
OEM	P115-012	RJ-45 panel mount to RJ-45 Male Plug

Cables Kits

Cable kits can also be ordered to include everything needed for your specific XDG model.

CKG012: 8 x P115-012
CKG019: 8x CBG117, 1 x CBG127
CKG029: 2x CBG117, 1 x CAG104

Complete cable drawings are available upon request. Send an email request to: **support@connecttech.com**
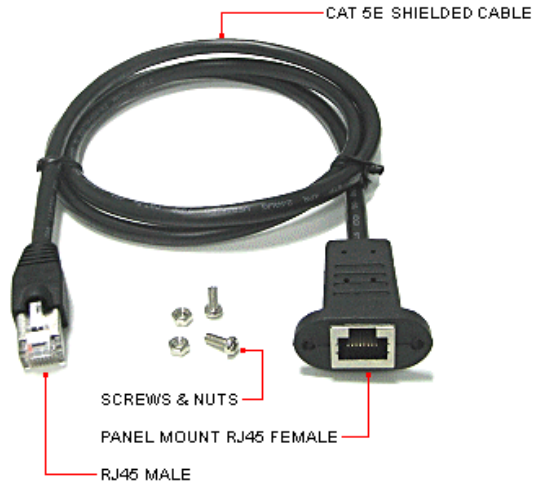
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RJ-45 panel mount to 10-pin MiniTek w/Latch - CBG117

RJ45 (8P8C)	Signal	10-pin MiniTek
1	MX1-	1
2	MX1+	2
3	MX2-	3
4	MX2+	4
SHELL	SHELL	5
SHELL	SHELL	6
7	MX3-	7
8	MX3+	8
9	MX4-	9
10	MX4+	10

RJ-45 panel mount to RJ-45 - P115-012

RJ45 (8P8C) Male	Signal	RJ45 (8P8C) Female
1	MX1-	1
2	MX1+	2
3	MX2-	3
4	MX2+	4
7	MX3-	7
8	MX3+	8
9	MX4-	9
10	MX4+	10

DB-9 to 10-pin IDC cable – CAG104
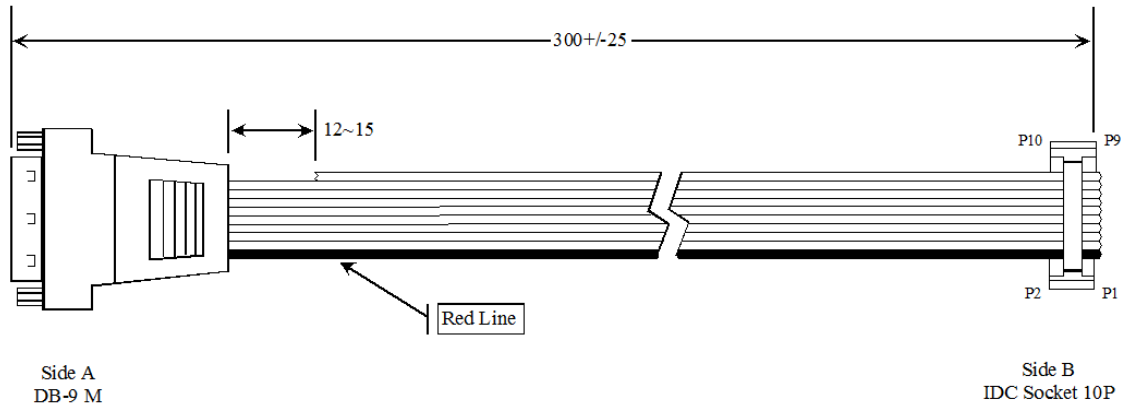
Male DB-9 Connector
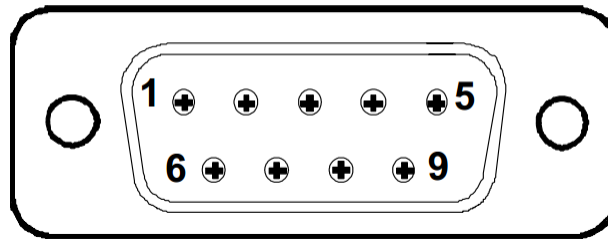
DB-9 Side A	Signal	2x5 0.1" IDC Side B
1	-	-
2	RX	3
3	TX	5
4	-	-
5	GND	9
6	-	-
7	-	-
8	-	-
9	-	-
-	-	-

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DB-9 to 10-pin MiniTek w/Latch - CBG127
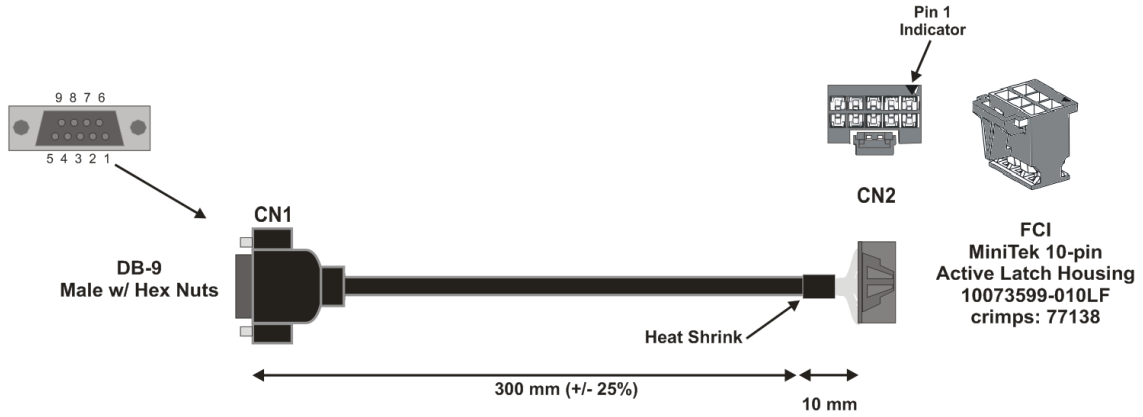
DB-9 CN1	Signal	2x5 2mm Minitek CN2
1	-	-
2	RX	2
3	TX	3
4	-	-
5	GND	5
6	-	-
7	-	-
8	-	-
9	-	-
-	-	-