OPTICAL
SYSTEMS
DESIGN

OPERATOR MANUAL

OSD2244V SERIES

5-PORT REDUNDANT RING

GIGABIT ETHERNET SWITCH

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1 TECHNICAL SUMMARY

1.1 BRIEF DESCRIPTION

1.1.1 OVERVIEW

The OSD2244V is a 5-port Ethernet switch with simple network management designed to operate in tough industrial applications providing real-time redundant performance. It has two 10/100/1000Base-T RJ45 copper ports, two SFP ports for the ring and one SFP port which can be specified by the user for 1000Base-Lx fiber mode or as 1000Base-T RJ45 copper.

The OSD2244V incorporates redundant ring technology providing maximum reliability on critical networks. In the event of device or fiber failure the data path will automatically switch to a secondary path in less than 5ms per hop to maintain ring network integrity. The OSD2244V is a 802.1Q with IEEE802.1ac Tag and IEEE802.1p priority VLAN tagging system allowing traffic for multiple VLANs to be carried on a single link.

The unit will operate on either singlemode or multimode fiber. Operation over at least 50km of singlemode fiber is possible by use of the appropriate optical devices. It normally requires two fibers but is optionally available for one fiber operation.

A major benefit of the OSD2244V is its reliable and consistent performance over the -20°C to +75°C temperature range that allows it to be used in uncontrolled environments such as roadside cabinets, mine sites and factories.

1.1.2 APPLICATIONS

- Any network utilising a mix of copper and fiber
- Industrial IP communications
- Self-healing Gigabit Ethernet backbone networks

1.1.3 FEATURES AND BENEFITS

- Complies with IEEE802.3i/802.3u/ 802.3ab 10/100/1000Base-T, IEEE802.3u/802.3z 100Base-Fx or 1000Base-LX standards.
- Has a total of five ports: two fixed copper ports for 10/100/1000Base-T, two SFP ports for the ring and one SFP port which may be either copper or fiber
- A network diameter of hundreds of kilometers is practical
- Ring reconfiguration in the case of cable or modem failures takes less than five milliseconds per hop
- Can be used with either singlemode or multimode fiber over a variety of link budgets
- Available for operation over 1 or 2 fibers
- Supports network traffic of 1Gbps
- MDI/MDX Crossover: no need for crossover cables
- Auto-Negotiation for half or full duplex operation
- Powered by non critical $12V_{DC}$ supplies / Dual power supply inputs
- Operates over the temperature range of -20°C to +75°C
- SFP module sold separately
- Lite Network Management System
- IEEE 802.1Q VLAN Tag with up to 64VIDs
- Dual Power Supply Inputs

1.2 TYPICAL CONFIGURATION

Figure 1 below indicates a possible set-up for an OSD2244V system.

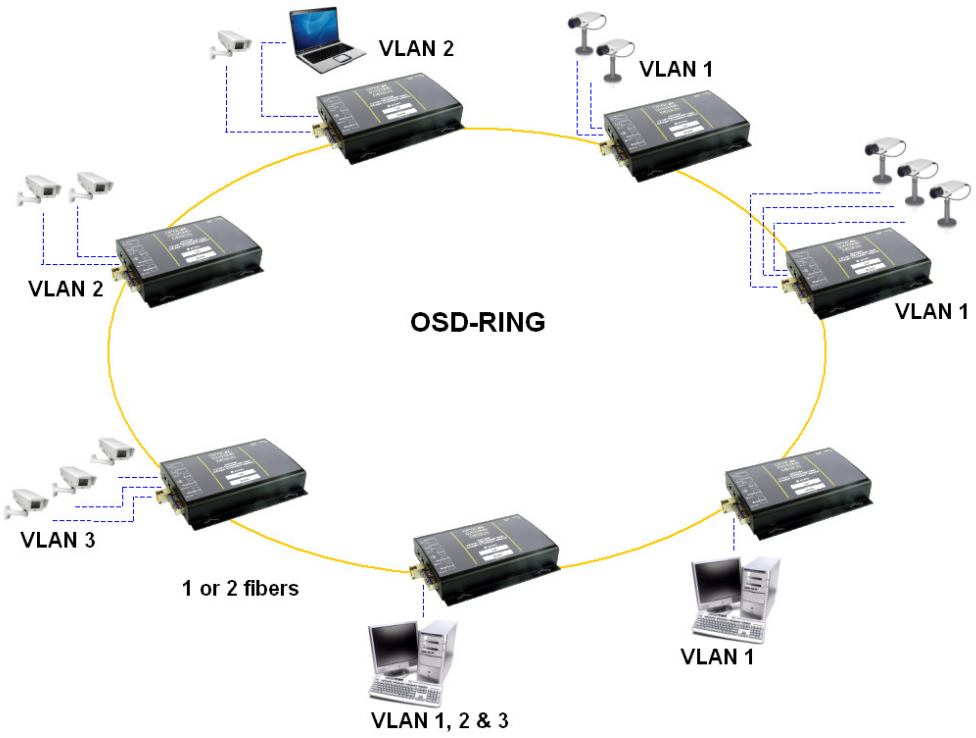

FIGURE 1: OSD2244V TYPICAL RING CONFIGURATION

1.3 TECHNICAL SPECIFICATIONS

TABLE 1: TECHNICAL SPECIFICATIONS

SPECIFICATION	PERFORMANCE
Electrical Data Interface	IEEE802.3ab IEEE802.3u, IEEE802.3i, Base-T Ethernet at 10, 100 or 1000Mbps
Electrical Data Connector	RJ45 on the two fixed copper ports 1 and 2 and for SFP modules
NMS Serial Data Interface	USB 2.0
NMS Serial Data Connector	USB Type B
Service Port Interface	USB 2.0
Service Port Connector	USB Type A
Optical Data Interface	IEEE802.3u, IEEE802.3z 100Base-Fx or 1000Base-Lx
Optical Connector	LC
SFP Port 3, 4 and 5 Options	100Base-Fx, 1000Base-Lx, 10/100/1000Base-T
Operating Mode	Half or full duplex for 10/100 Full duplex for 1000 Pause frames for flow control
Transmitter Wavelength	1310 ±30nm
Transmit Optical Power	>-10dBm to –4dBm (-5dBm and +2dBm @ 1310nm and 1550nm are optional)
Receiver Sensitivity	<-21dBm
Standard Optical Link Budget	>11dB: >800m on multimode fiber @ 1310nm (Fiber bandwidth limited) >20km on singlemode fiber @ 1310nm >40km on singlemode fiber @ 1550nm
Optional Optical Link Budget	>23dB: >100km on singlemode fiber with optional 1550nm devices
Various SFP Options Possible	Short haul, long haul, single fiber operation, etc. Please consult OSD DATASHEET #1002100002 or contact OSD
Indicators	1x Power 2x Copper Speed/Activity/Link on 2 x RJ45 2x Copper Duplex on 2x RJ45 3x SFP Speed/Activity/Link for copper or fiber 1x Initialise/Ring/Bus 1x Ring Port Forward/Revere 1x Ring Partner 1x Ring Master (by auto selection)
Dimensions (mm)	114W x 173D x 31H (module) 25W x 208D x 100H (card)
Weight	0.5kg (module), 0.3kg (card)
Power Requirements	+8V to +35V_{DC} or 22 to 28V_{AC} @ 10VA (with 3x SFPs loaded)
Operating Temperature	-20°C to +75°C
Relative Humidity	0 to 95% non-condensing

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1.4 OSD2244V FRONT AND REAR PANELS

There are two fixed copper ports for 10/100/1000Base-T and three optional SFP ports which can be either copper or fiber on the front panel. The rear panel consists of a 6-way terminal block power connector, 4-Way DIP switch, Type-A USB connector and a Type-B USB connector. Each section will be described further throughout this manual.

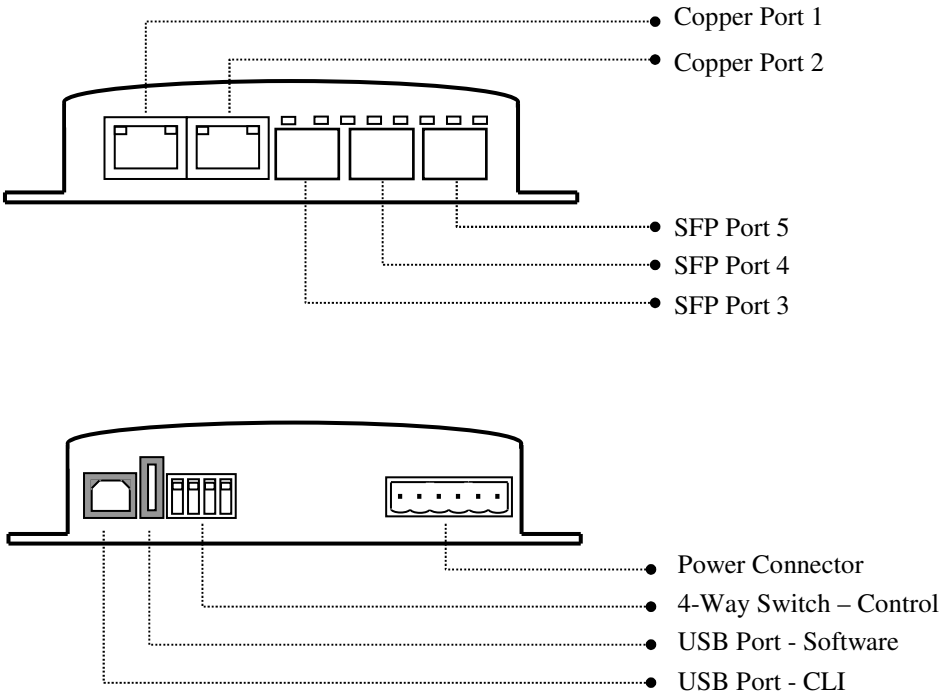


FIGURE 2: OSD2244V CONNECTORS

2 INSTALLATION AND OPERATION

2.1 INTRODUCTION

This section outlines the methods required to install and operate the OSD2244V successfully. It should be studied carefully if damage to the equipment or poor results are to be avoided.

This equipment has been fully tested prior to dispatch and is ready for immediate operation. However it is advisable to check for external transportation damage before operation. If damage is evident, return the unit with the packaging to your supplier immediately.

2.2 INSTALLATION

2.2.1 WARNING AND PRECAUTIONS

▲ **ELECTROMAGNETIC COMPATIBILITY**

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

▲ **OPTICAL OUTPUT OPERATION**

WARNING: **Laser Safety:** Class 1 Laser Product per IEC/EN 60825-1:20011 standard.

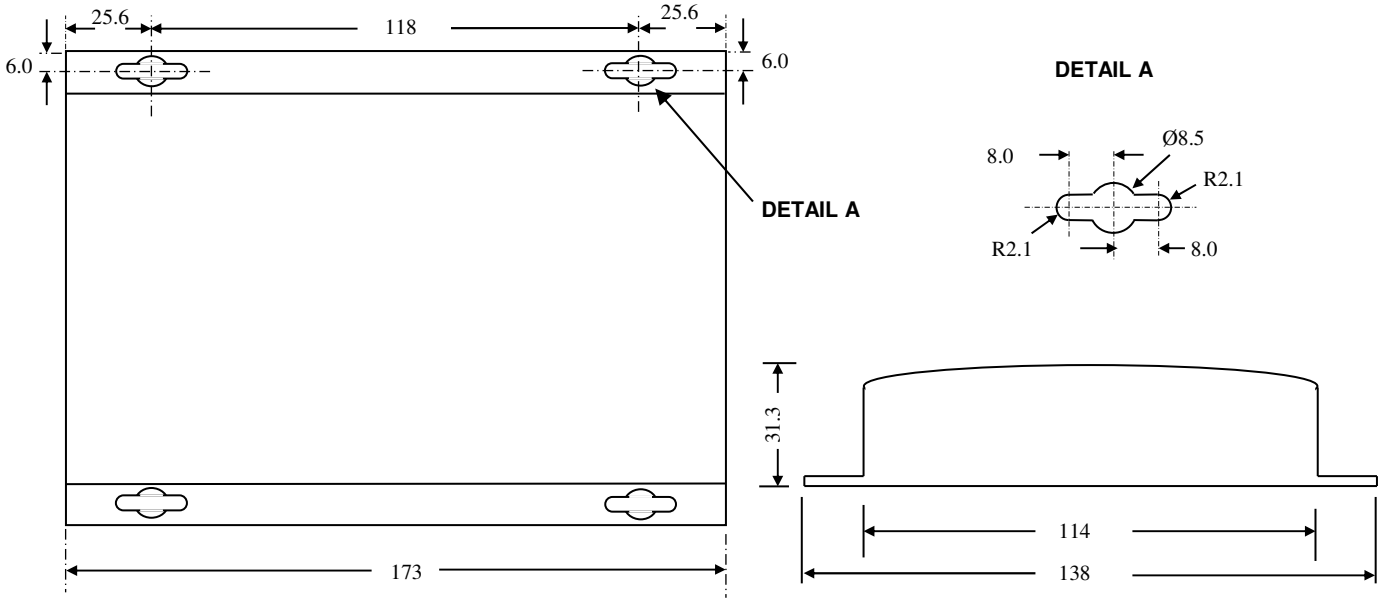
Class 1
The OSD2244V is a **Class 1 laser product.**


PRECAUTIONS

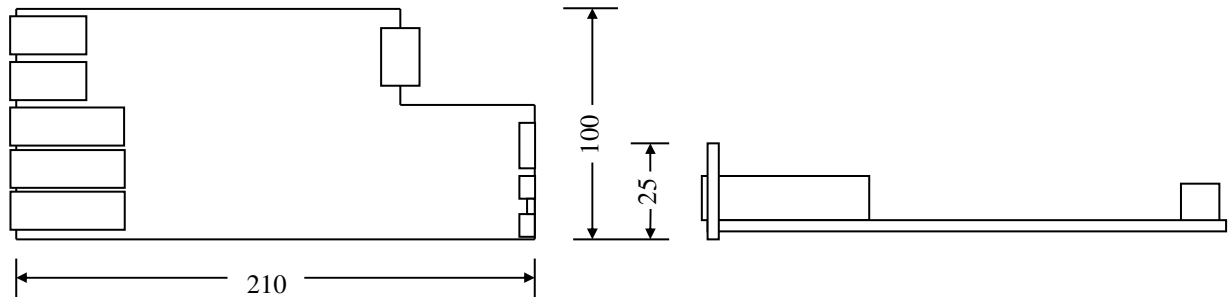
- ▲ All service personnel should be provided training as to the hazards of direct viewing of laser radiation and of the precautionary measures during servicing of equipment
- ▲ Areas where laser products are installed should be restricted in access to trained service personnel only and appropriate warning signs posted in the work area.
- ▲ All laser apertures should be covered by protective covers when not connected to optical fibers. Never leave outputs uncovered.
- ▲ Laser equipment should be positioned above or below eye level where possible. Apertures should be positioned away from personnel.
- ▲ Protective eyewear should be worn in the vicinity of laser equipment.

2.2.2 OSD2244V DRAWINGS AND DIMENSIONS

The OSD2244V standalone module is designed to be mounted on an even surface and to be secured by means of M4 or smaller screws. The OSD2244V card version is designed to be inserted into a chassis and secured by means of captivated screws.



(a) Module Version



(b) Card Version

FIGURE 3: OSD2244V MOUNTING DIMENSIONS

2.2.3 POWER SUPPLY CONNECTIONS

The OSD2244V card version is powered from the OSD370 or OSD350 chassis. DC power on the OSD2244V card version is connected via the DB9 connector. The card version of the OSD2244V should be fixed into the OSD370 (or OSD350) chassis using the captivated screws. The card can be plugged in or out of the OSD370 (or OSD350) chassis with power on or off.

The OSD2244V module requires external 8 to $35V_{DC}$ or 22 to $28V_{AC}$ @ 10VA. The OSD2244V features a second input voltage channel for redundant power operation. Power should be connected to the power socket located at the back of the case as indicated in Table 2.

TABLE 2: DC OR AC POWER CONNECTION

External Power Pin	Specification
Pin 1 and/or 5	$+8V_{DC}$ to $+35V_{DC}$ or 22 to $28V_{AC}$ @ 10VA
Pin 2 and/or 6	Ground – 0V
Pin 3 & 4	Not Used

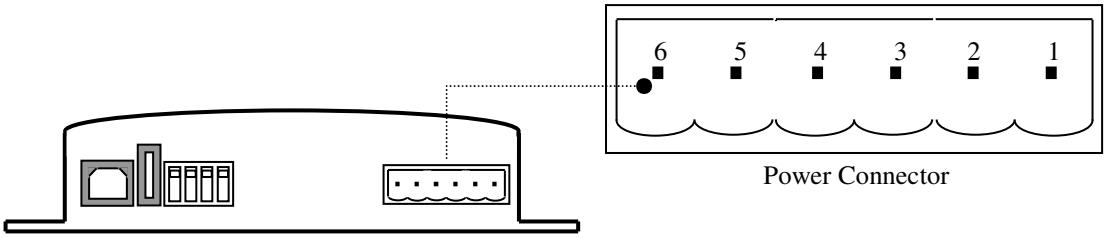
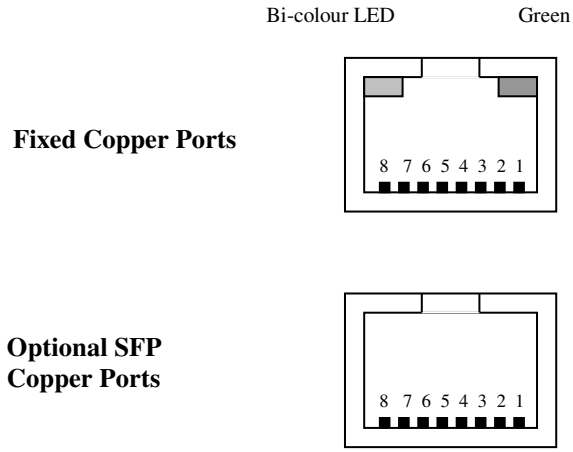


FIGURE 4: 2244V POWER SUPPLY CONNECTIONS

2.2.4 RJ45 COPPER PIN ASSIGNMENTS

Figure 5 shows the pin configuration for both the fixed copper ports or the optional SFP ports fitted with RJ45 copper port

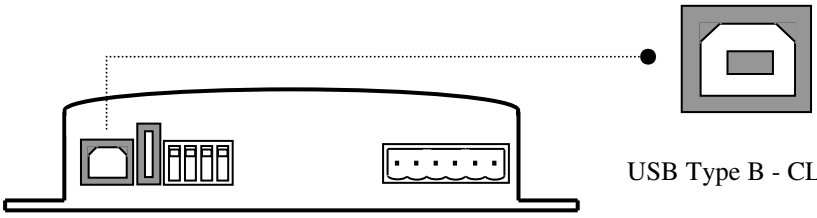


Pin No	10Base-T 100Base-T	1000Base-T
1	Tx+	BI_DA+
2	Tx-	BI_DA-
3	Rx-	BI_DB+
4	Unused	BI_DC+
5	Unused	BI_DC-
6	Rx-	BI_DB-
7	Unused	BI_DD+
8	Unused	BI_DD-

FIGURE 5: FIXED 10/100/1000BASE-T ETHERNET RJ45 CONNECTORS

2.2.5 USB CONNECTOR

The OSD2244V has a USB – Type B connector located on the rear of the unit that is used for Command Line Interface (CLI) from the PC to the OSD2244V via the PC's USB connector. See section 2.5 for further CLI information.



USB Type B - CLI Port

FIGURE 6: USB TYPE B CLI PORT

To operate and control the OSD2244V using the CLI an OSD2244V driver will be required to be installed onto the PC being used. The driver can be found on the included CD or available on the OSD website. Please contact OSD sales if the driver cannot be found or installed. For Windows XP, Vista and Windows 7: CP210x_VCP_Win_XP_S2K3_Vista_7.exe. For Windows 2000: CP210x_VCP_Win2K.exe

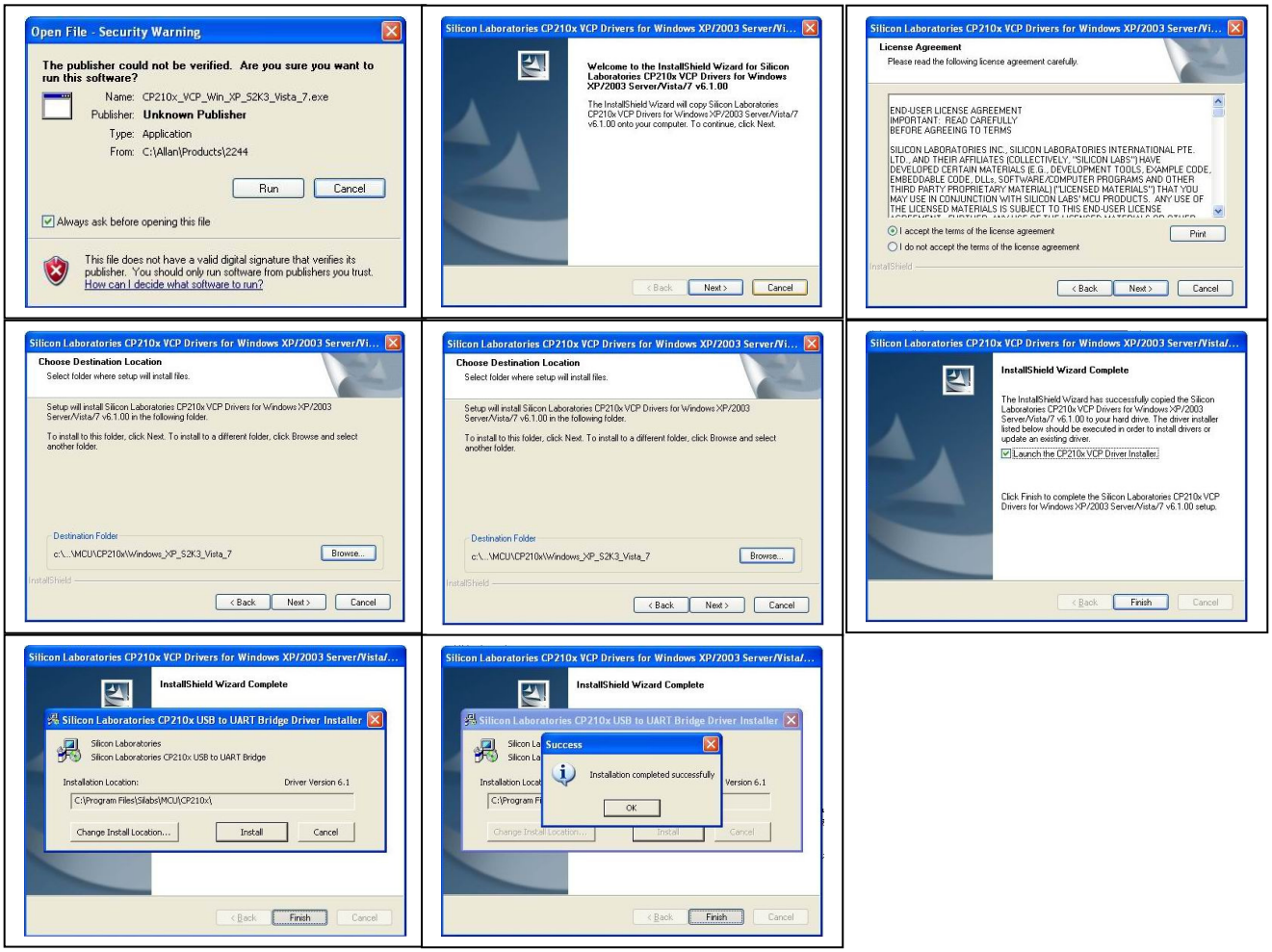


FIGURE 7: WIN XP INSTALLATION

2.2.6 PORT ALLOCATION AND LED INDICATORS

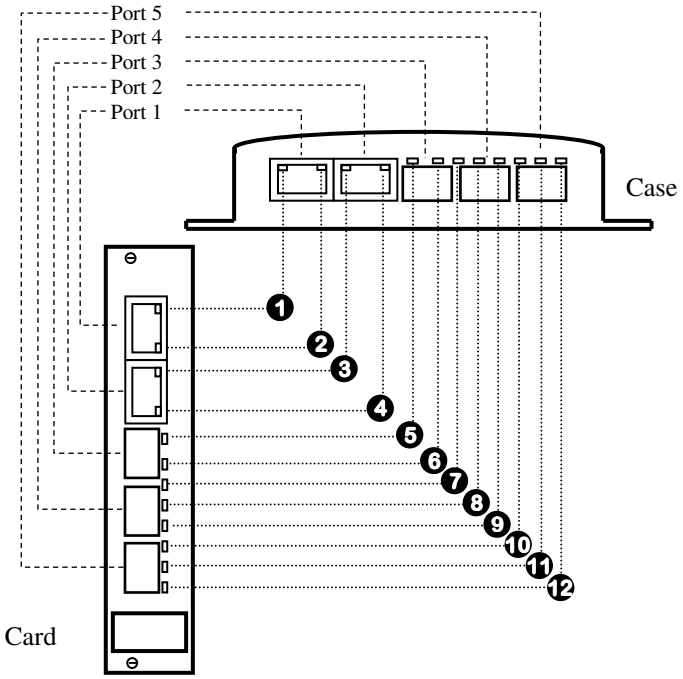


FIGURE 8: PORT/LED

TABLE 3: LED FUNCTION

* Note On LED could be either Green or Amber

No	Function			LED Colour Function		
	On	Blink	Off	Green	Gr/Am	Amber
1	No Activity	Activity	No Link	1Gbps	100Mbps	10Mbps
2	Full Duplex	-	Half Duplex	On*	-	On*
3	No Activity	Activity	No Link	1Gbps	100Mbps	10Mbps
4	Full Duplex	-	Half Duplex	On*	-	On*
5	Power On	-	Power Off	On	-	-
6	Ring/Bus Master	-	Ring/Bus Slave	On	-	-
7	No Activity	Activity	No Link	1Gbps	100Mbps	10Mbps
8	Forward	Backup	-	On	-	-
9	No Activity	Activity	No Link	1Gbps	100Mbps	-
10	Established Ring/Bus	Initializing	-	Ring	Init	Bus
11	Forward	Backup	-	On	-	-
12	No Activity	Activity	No Link	1Gbps	100Mbps	-

2.2.7 CONTROLS

The OSD2244V has a 4-way DIP switch to control a number of functions. Table 4 outlines the function of each switch.

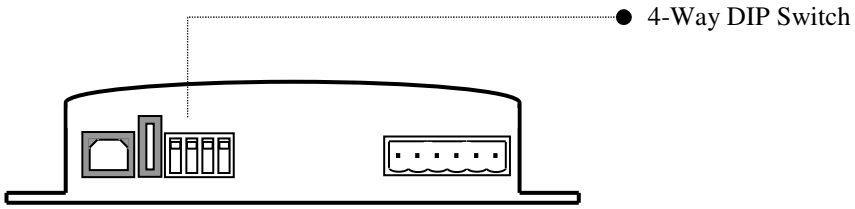


FIGURE 9: OSD2244V CONTROLS

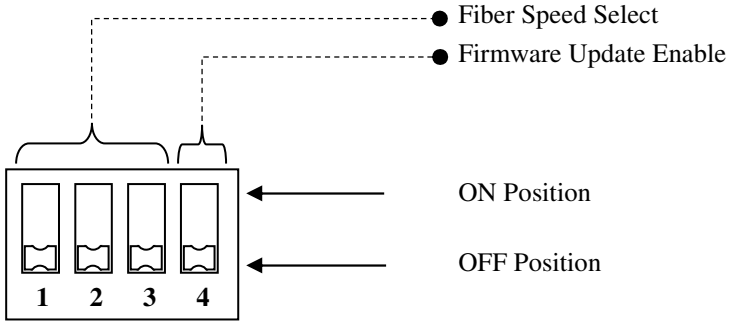


FIGURE 10: OSD2244V 4-WAY DIP SWITCH

TABLE 4: OSD2244V 4-WAY DIP SWITCH SETTINGS

SWITCH NUMBER	DESCRIPTION	FUNCTION	SWITCH POSITION
1	Port 5 Fiber Speed	1000Mbps 100Mbps	OFF* ON
2	Port 4 Fiber Speed	1000Mbps 100Mbps	OFF* ON
3	Port 3 Fiber Speed	1000Mbps 100Mbps	OFF* ON
4	Firmware Update	Disable Enable	OFF* ON

* Default settings. Firmware update switch should remain in OFF position unless updating firmware.

2.2.8 FITTING SFP CONNECTORS

Care should be taken when inserting/removing the SFP connectors from SFP port 3,4 and 5 as SFP modules are Electrostatic (ES) sensitive and Electrostatic Discharge (ESD) precautions should be taken when installing. Ensure that the SFP is fully engaged and latched into position.

Inserting SFP – Ensure that the SFP lever is in the locked position and insert into appropriate SFP port. Gently push the SFP until it locks into place. Remove plastic/rubber dust cap and fit fiber cable or RJ45 plug.

Removing SFP – Remove fiber connector or RJ45 plug. Pull the SFP lever down to unlock SFP from housing. Using the lever, gently pull the SFP out.

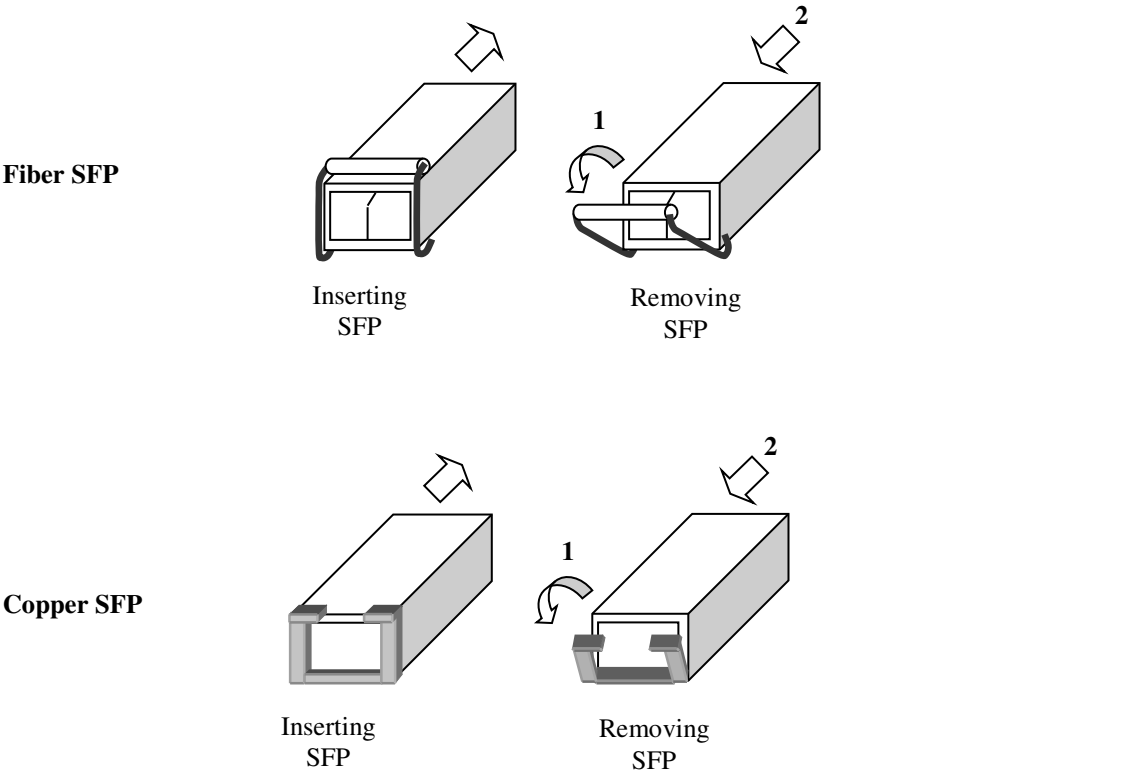


FIGURE 11: FITTING/REMOVING SFP CONNECTORS

2.3 OSD2244V OPERATION

When using the OSD2244V for the first time, check that the unit is in good condition with no visible damage.

If a card version is used, insert it in an appropriate slot on the OSD370 or OSD350 chassis and check that the indicators illuminate accordingly on power up (see Table 3). If a module version (OSD2244VC) is used, connect the unit to an appropriate power source and check that the indicators illuminate accordingly on power up (see Table 3).

2.3.1 CONNECTIONS

For RJ45 connection use Category 5 (CAT5) or higher. Length should be no more than 100 meters.

For singlemode fiber connections, fiber used must be 9/125µm singlemode fiber.

For multimode fiber connections, fiber used must be 50 or 62/ 125µm multimode fiber.

Plug in the appropriate connectors for system configuration;

- RJ45 cable to fixed copper ports (port 1 and 2) and copper SFP modules
- LC fiber cable to fiber SFP modules.

Redundant Ring Operation

The OSD2244V connected in a redundant ring topology providing maximum reliability on critical networks. In the event of device or fiber failure the data path will automatically switch to a secondary path in less than 5ms per node to maintain ring network integrity.

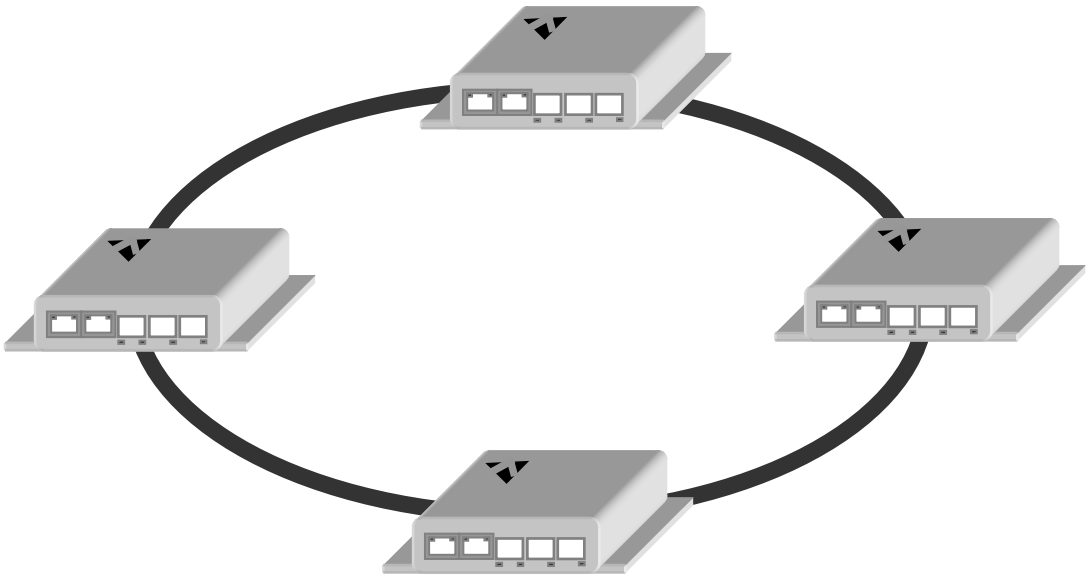


FIGURE 12: REDUNDANT RING CONFIGURATION

To connect the OSD2244V in a redundant ring configuration ports 4 and 5 must be used together with fiber SFPs. The non-ring ports (ports 1,2, &3) should be used to connect to your Ethernet devices (eg. Cameras, PLCs, computers, etc.)

Figure 13 shows the connection method. Typically the SFP used would be a fiber SFP with duplex LC connectors. The dashed line indicates the closed loop, but more OSD2244V units can be connected to the ring as required using this topology. Ensure that the switch settings for port 4 and 5 are set to 1000Mbps (1Gbps) – see Table 4.

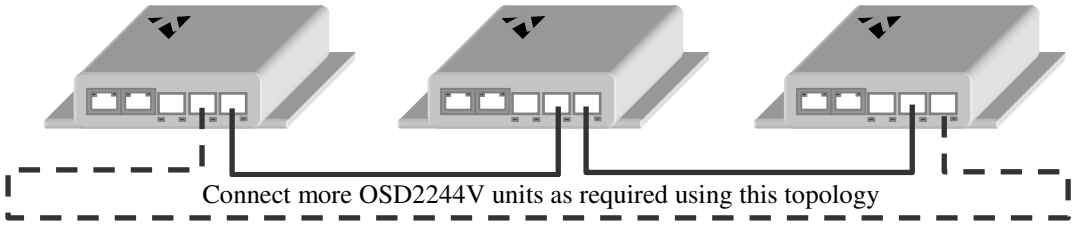


FIGURE 13: REDUNDANT RING CONNECTION

Each OSD2244V has it's own unique MAC address. The MAC address of each unit is labelled on the OSD2244V. When the unit is connected in a ring configuration, one of the OSD2244V units will be allocated the 'ring master'. The ring master will be automatically configured by 'searching' for the unit with the lowest MAC address. Furthermore, the ring master will be identified by the LED indicator (see Figure 8 and Table 3). The ring master determines which local ring ports are to be in the forwarding or backup state.

Bus Operation

To connect the OSD2244V in a bus configuration ports 4 and 5 must be used together with fiber SFPs. The remaining ports (ports 1,2, &3) should be used to connect to your Ethernet devices (eg. Cameras, PLCs, computers, etc.)

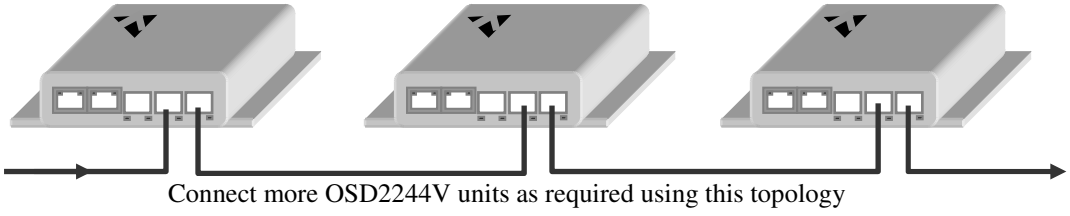


FIGURE 14: BUS CONNECTION

2.4 FIRMWARE UPDATES

All OSD2244V units will be shipped with the latest firmware already installed. The Type- A USB port is used for any firmware updates. To enable the OSD2244V for firmware updates, switch 4 will need to be toggled to the 'on' position before unit is powered on. Upon completion of firmware updating, toggle switch 4 to the 'off' position and power the unit on again.

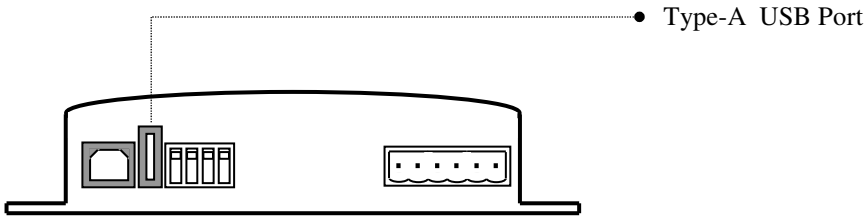


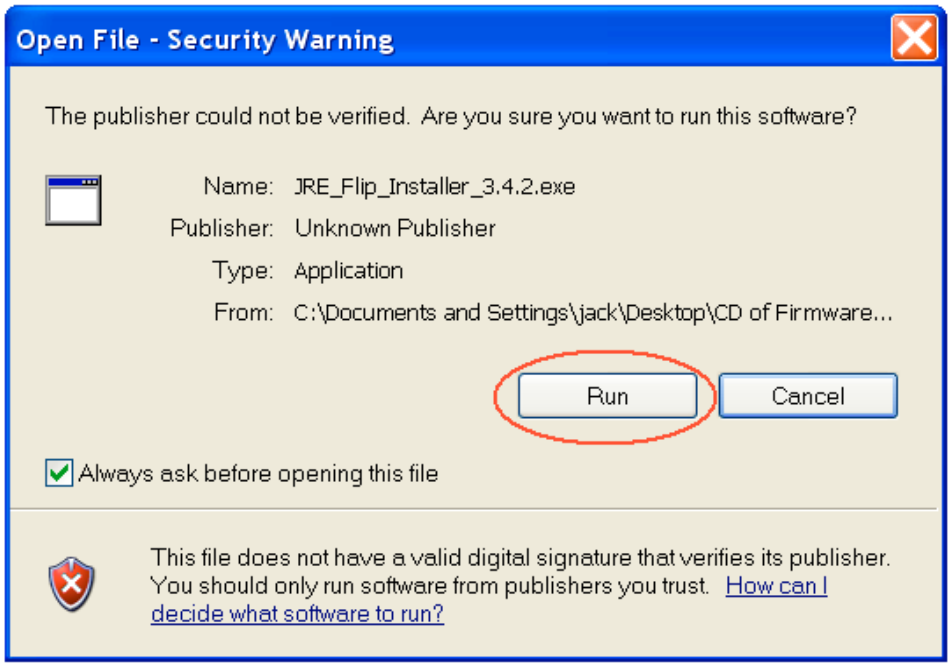
FIGURE 15: OSD2244V USB CONNECTOR

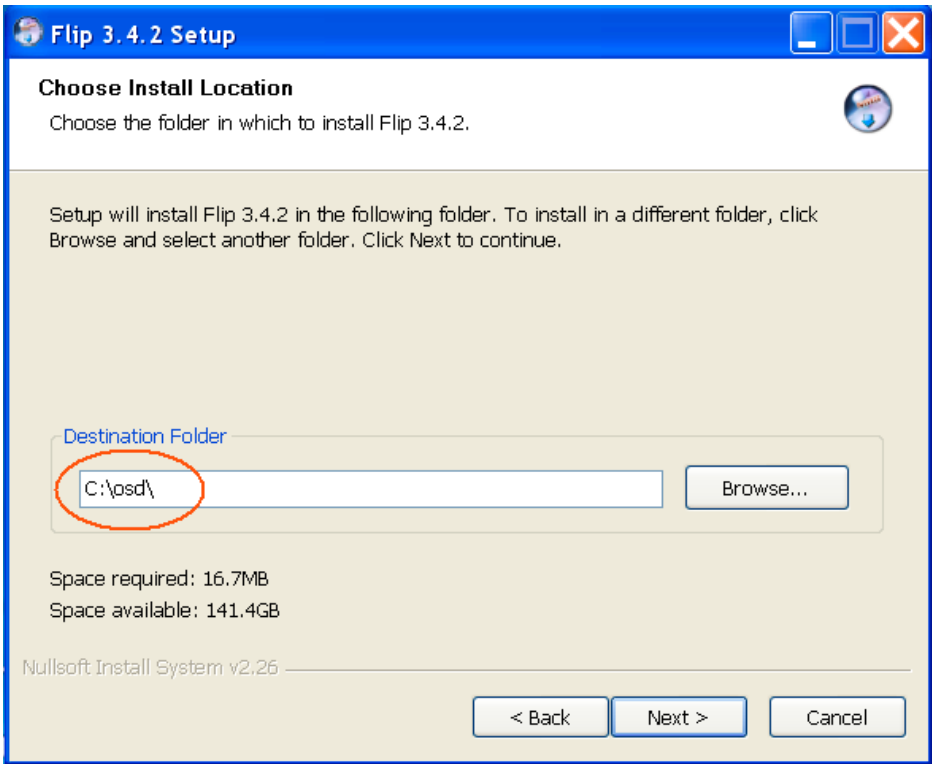
Upgrading the OSD2244V latest firmware consists of three steps;

1. Install FLIP (Flexible In-System Programmer) on user PC
2. Install the driver on user PC for the USB port of OSD2244V target unit
3. Copy firmware (from CD or other multimedia) to local disk and program new firmware to target unit.

2.4.1 INSTALLING FLIP

- Create a new folder : ***c:\osd*** on users PC as the destination folder for FLIP.
- Execute JRE_Flip_Installer_3.4.2.exe from CD and follow steps outlined below;





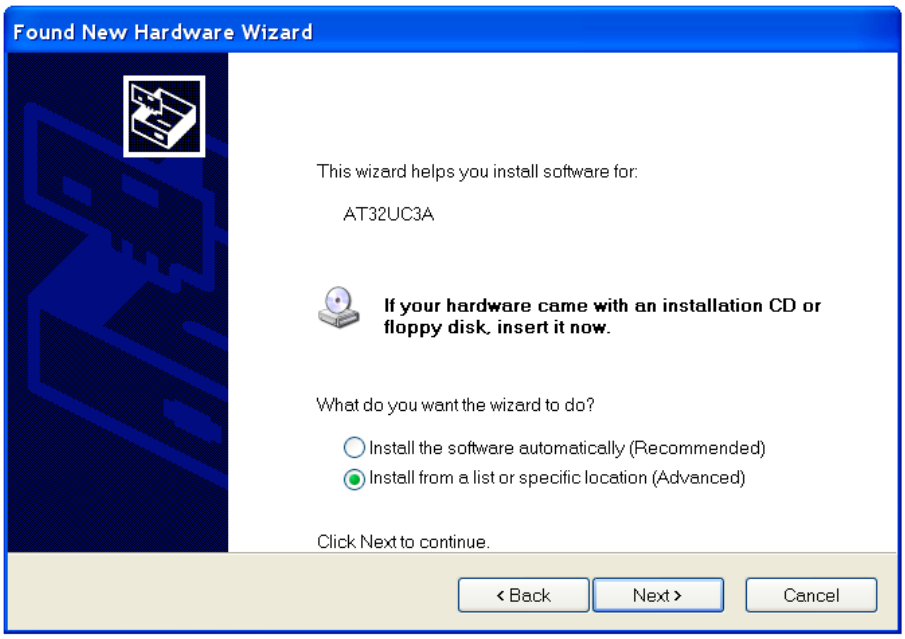
- Disable ***Create desktop shortcut*** and ***Show readme*** and click ***Finish***.

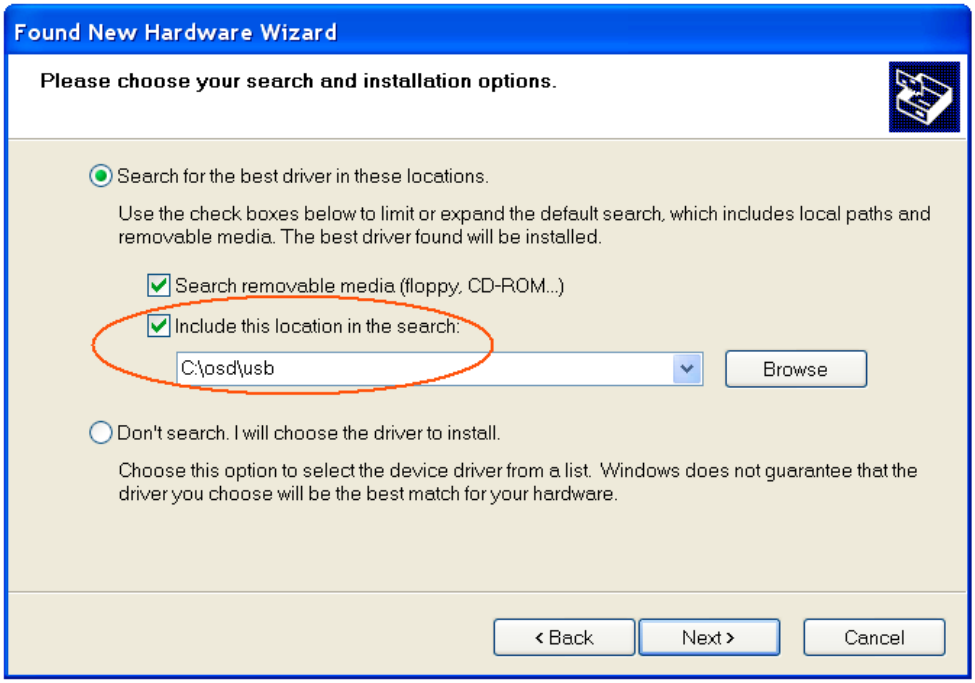
2.4.2 INSTALLING USB DRIVER

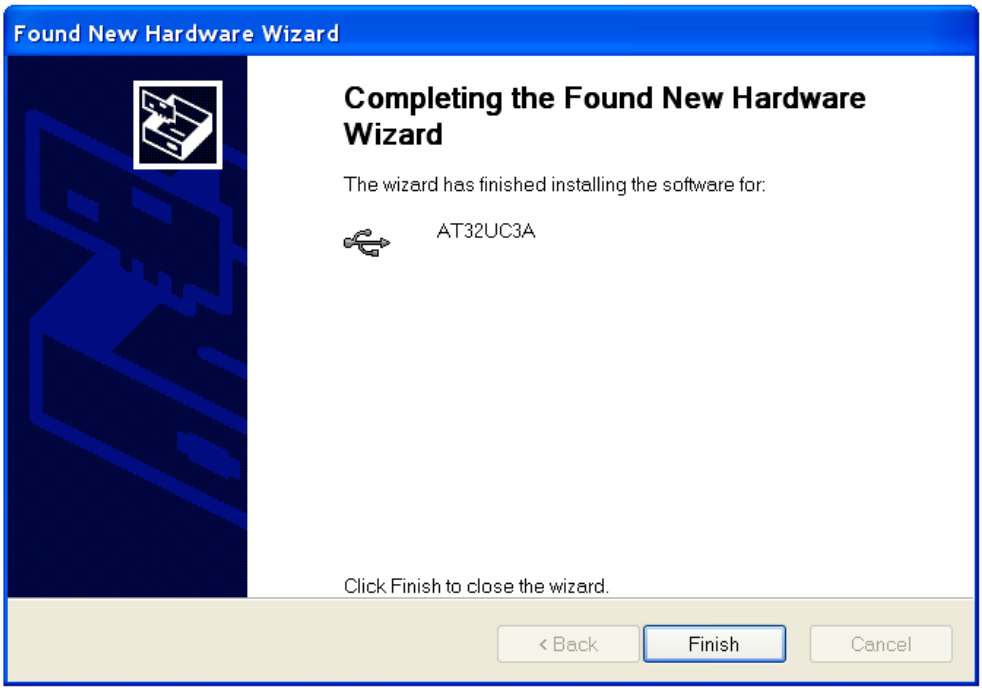
- Toggle switch 4 to ‘on’ position (see Figure 10) before unit is powered on.
- Connect USB cable between target unit and PC with FLIP installed.
- Power the OSD2244V unit and follow steps outlined below;

1. DRIVER FOR WINDOWS XP

Install driver file manually on a Windows XP PC as shown below;

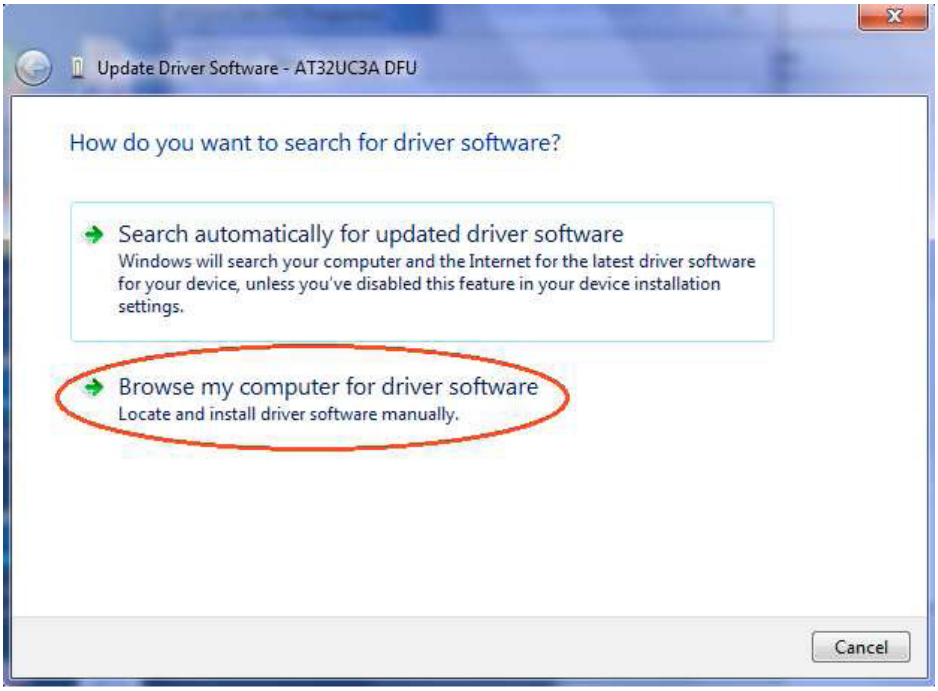



Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
C:\osd\usb
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel


Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
AT32UC3A
Click Finish to close the wizard.
< Back
Finish
Cancel

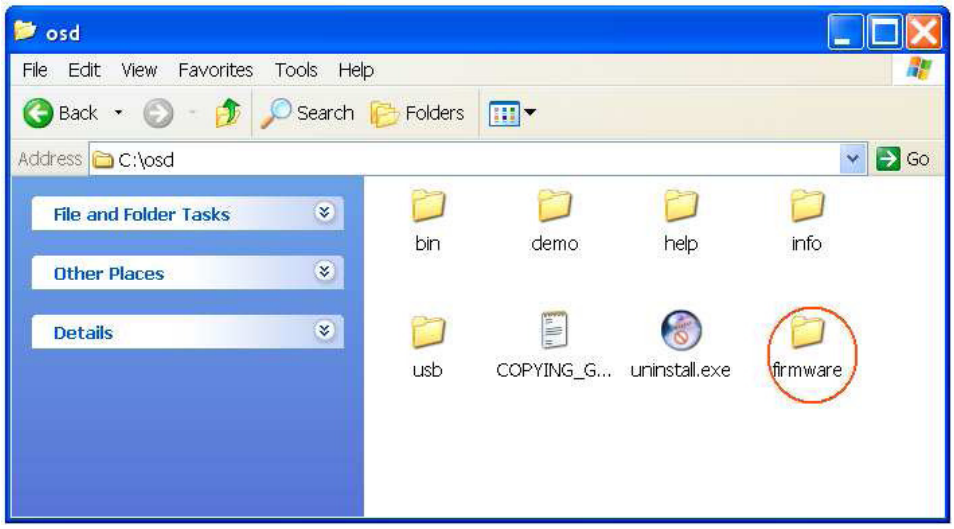
2. DRIVER FOR WINDOWS 7 64bit

For 64bit operating systems use directory named ***win7 driver*** on CD as destination location for driver file.



2.4.3 UPGRADE FIRMWARE

1. Copy **firmware** directory from CD to ***c:\osd*** as shown below



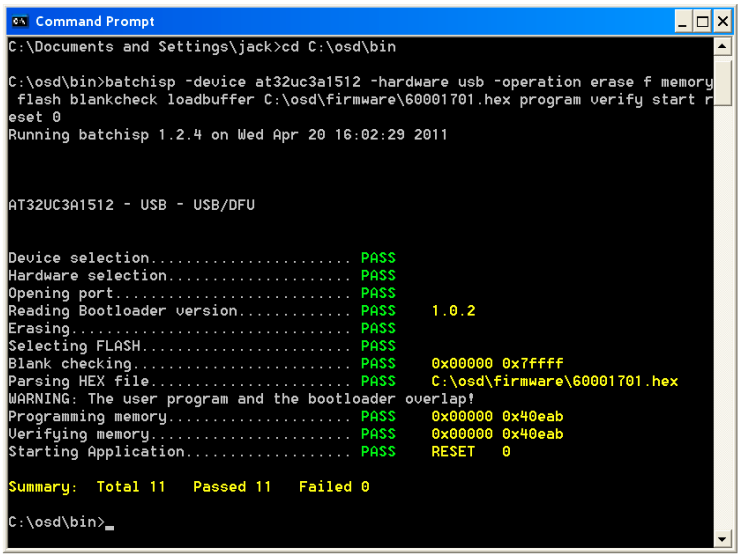
2. Upgrade Firmware

Click the OSD2244RevXX Firmware.bat file supplied on the CD. *Note: XX denotes revision number of firmware.* The batch file contains a small command to install the firmware. The main command is as follows;

batchisp -device at32uc3a1512 -hardware usb -operation erase f memory flash blankcheck loadbuffer c:\osd\firmware\60001701.hex program verify start reset 0

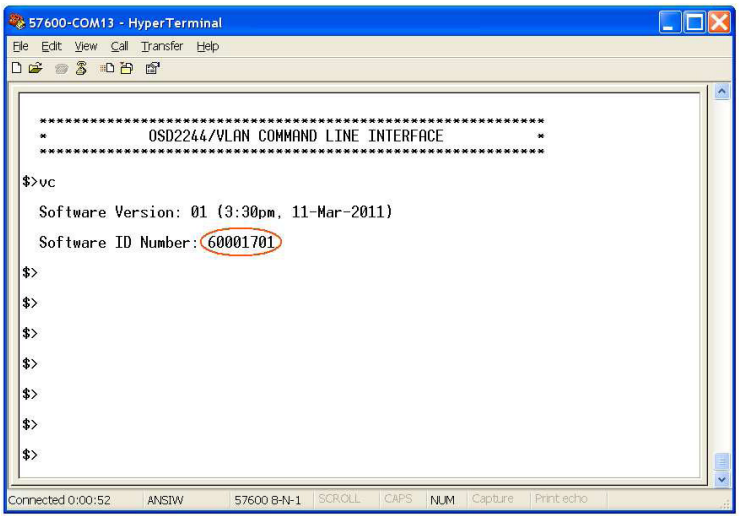
⚠ **NOTE:** 60001701.hex used in the command line above is just an example. Use the latest firmware number supplied.

The final result on command prompt window when installation is complete should be as shown below;



2.4.4 INSTALLATION CHECK

Using CLI as described in section 2.5, use command ***vc*** and confirm that the latest/new OSD2244V firmware has been installed.



2.5 COMMAND LINE INTERFACE

The Command Line Interface (CLI) is a useful tool for checking link status and debugging link connections. To enable the use of CLI the OSD2244V must be connected to a PC with a serial port and an appropriate cable as specified in section 2.2.5. Using a terminal emulation program such as Hyperterminal, a number of command lines specific to the OSD2244V can be implemented to check link/node status, ring/bus topology and enable/diable float backup.

2.5.1 TERMINAL EMULATION SETUP

Using a terminal emulation program such as hyperterminal the following parameters should be set up for correct command line operation. Select the appropriate "COM port" set up for the serial port.

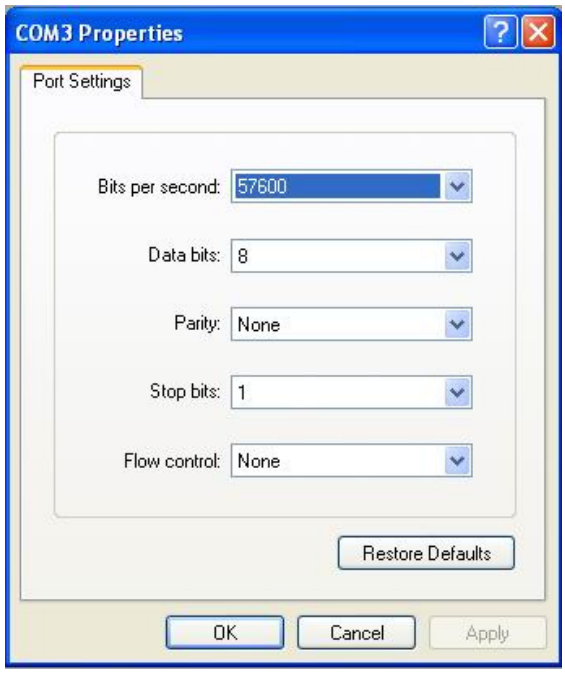


FIGURE 16: SERIAL PORT SETTINGS

2.5.2 COMMAND LINE FUNCTIONS

There are a number of command line functions that enables the user to obtain running information of a single OSD2244V unit or the complete topology of the ring/bus network. This section explains the command lines and its functions.

When the terminal emulation program is operating, connect the USB cable to any one of the OSD2244V units on the ring/bus network – or alternatively, the OSD2244V unit which the user wishes to interrogate. Note: A message will be displayed on the terminal emulation program when the unit is powered after USB connection. This message will not open when the unit is switched on while plugging in the USB cable, however the command lines are functional.

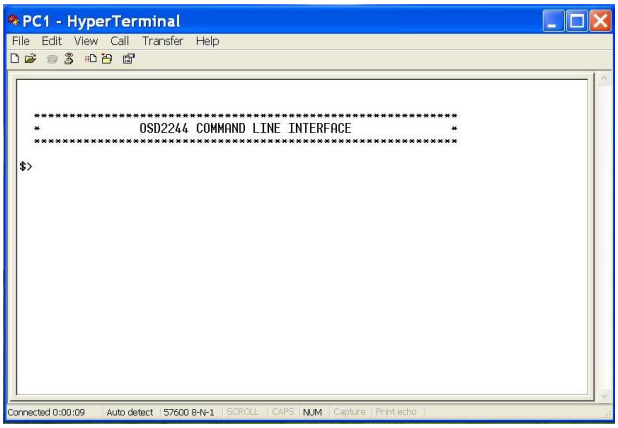


FIGURE 17: INITIAL COMMAND LINE SCREEN

The following table outlines the user available command line commands and their functions

TABLE 5: TERMINAL COMMAND LINES

TERMINAL COMMAND LINE	SPECIFICATION	FUNCTION	FIGURE
help	help	Displays all user available CLI commands	-
tc	Topology Check	Displays the topology status of the established ring/bus	Figure 18
nc	Node Check	Displays the running status of the node with given MAC address	Figure 20
lnc	Local Node Check	Gets running status of the local node	Figure 21
fbe	Float Backup Enable	Enables float backup function for all nodes on the ring/bus	Figure 22
fbd	Float Backup Disable	Disables float backup function for all nodes on the ring/bus	Figure 26
vc	Version Check	Displays the current software version and revision installed on the unit	-

TOPOLOGY CHECK - <tc> Command Line

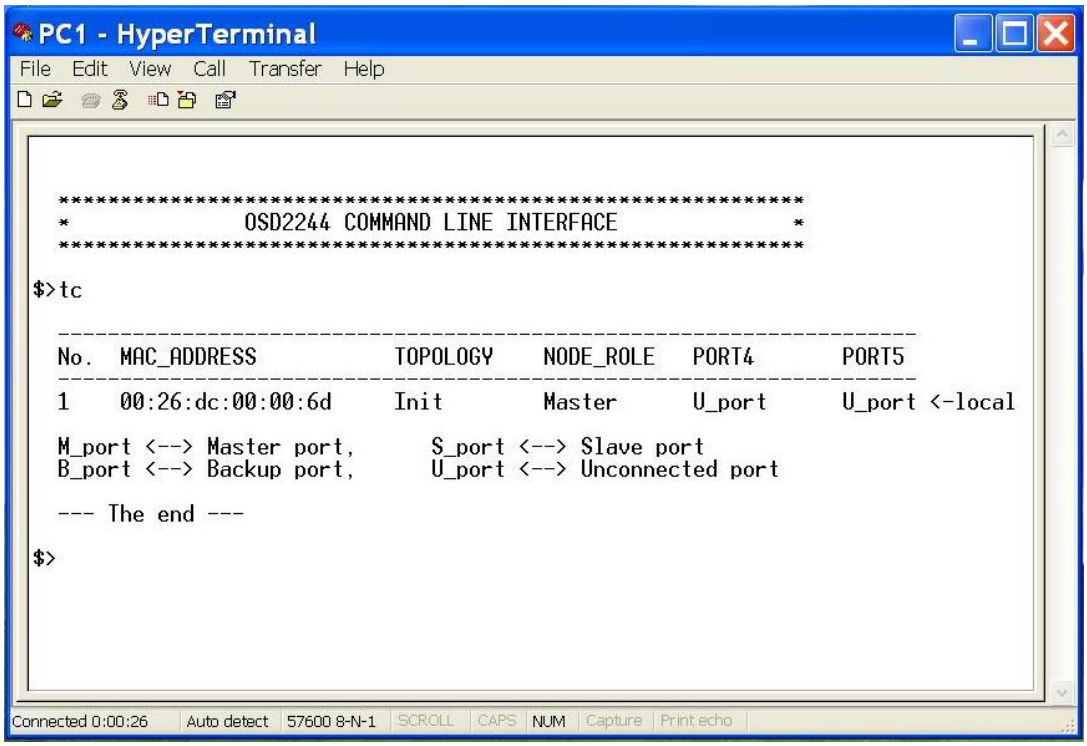


FIGURE 18: TOPOLOGY CHECK

In this case, only one OSD2244V is connected to the USB cable. The display indicates the following;

No: 1 – Number of units connected on the ring/bus (in this case only one unit)

MAC_ADDRESS: 00:26:dc:00:00:6d – Displays all the MAC addresses of the units connected on the ring/bus

TOPOLOGY: Init – Displaying type of connection (in this case "Init" as there is only one unit)

NODE_ROLE: MASTER – Displays whether the unit is either the Master or Slave on the ring/bus (in this case only one unit is connected thus displaying master)

PORT4: U_port. Indicates the function of port 4 and its relation to the ring/bus. There are four possibilities;

1. M_port – Master Port
2. S_port – Slave Port
3. B_Port – Backup Port
4. U_Port – Unconnected Port

PORT5: U_port. Indicates the function of port 5 and its relation to the ring/bus. There are four possibilities;

1. M_port – Master Port
2. S_port – Slave Port
3. B_Port – Backup Port
4. U_Port – Unconnected Port

<-local: This points to the unit that the USB cable is plugged into on the ring/bus.

In the example below there are four OSD2244V connected in a ring configuration.

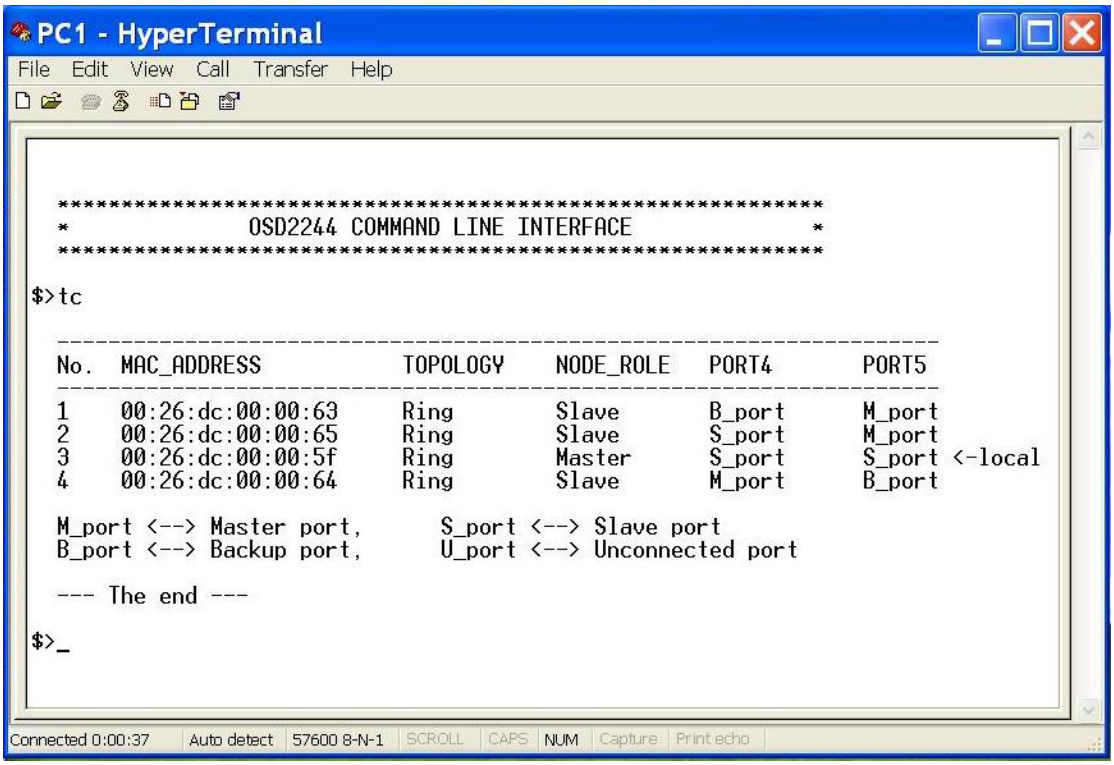


FIGURE 19: TOPOLOGY CHECK

No: 4 – Four units connected

MAC_ADDRESS:– Displaying all the MAC addresses of the units connected on the ring/bus

TOPOLOGY: Ring – Displaying type of connection.

NODE_ROLE: MASTER – Displays if the unit is either the Master or Slave on the ring/bus. Master is determined by the lowest MAC address

PORT4: U_port. Indicates the function of port 4 and its relation to the ring/bus. There are four possibilities;

1. M_port – Master Port
2. S_port – Slave Port
3. B_Port – Backup Port
4. U_Port – Unconnected Port

PORT5: U_port. Indicates the function of port 5 and its relation to the ring/bus. There are four possibilities;

1. M_port – Master Port
2. S_port – Slave Port
3. B_Port – Backup Port
4. U_Port – Unconnected Port

<-local: This points to the unit that the USB cable is plugged into on the ring/bus.

NODE CHECK - <nc> Command Line

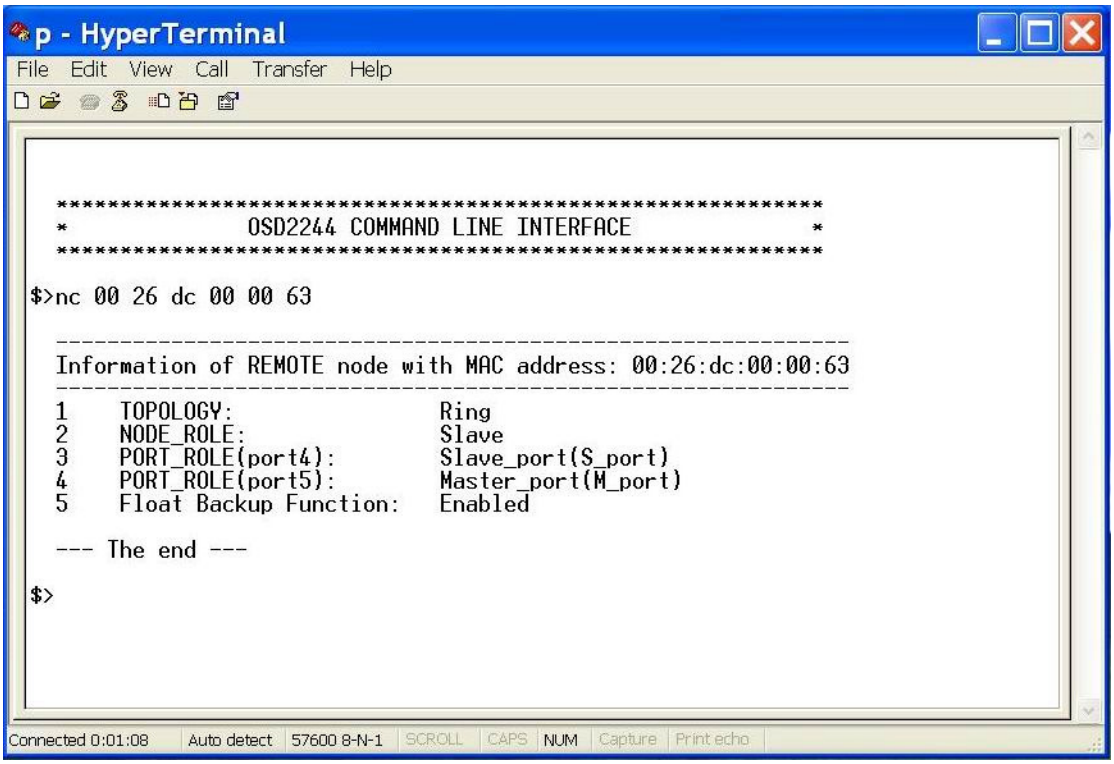


FIGURE 20: NODE CHECK

The Node Check command line is a useful command for checking the running status of any remote node connected to the ring/bus topology from any particular node that the USB cable is plugged into. This enables the user to perform a node check on any OSD2244V unit from one location on the ring/bus network.

The Node Check command requires the MAC address number for the node being interrogated. The command line format is as follows;

nc 00 26 dc xx xx xx

Notes: When entering the MAC address, leave one space between every two hex digits as shown in the example in Figure 20.

The information displayed is the remote MAC address, Topology, Node Role, Port Role and Float Backup status.

LOCAL NODE CHECK - <lnc> Command Line

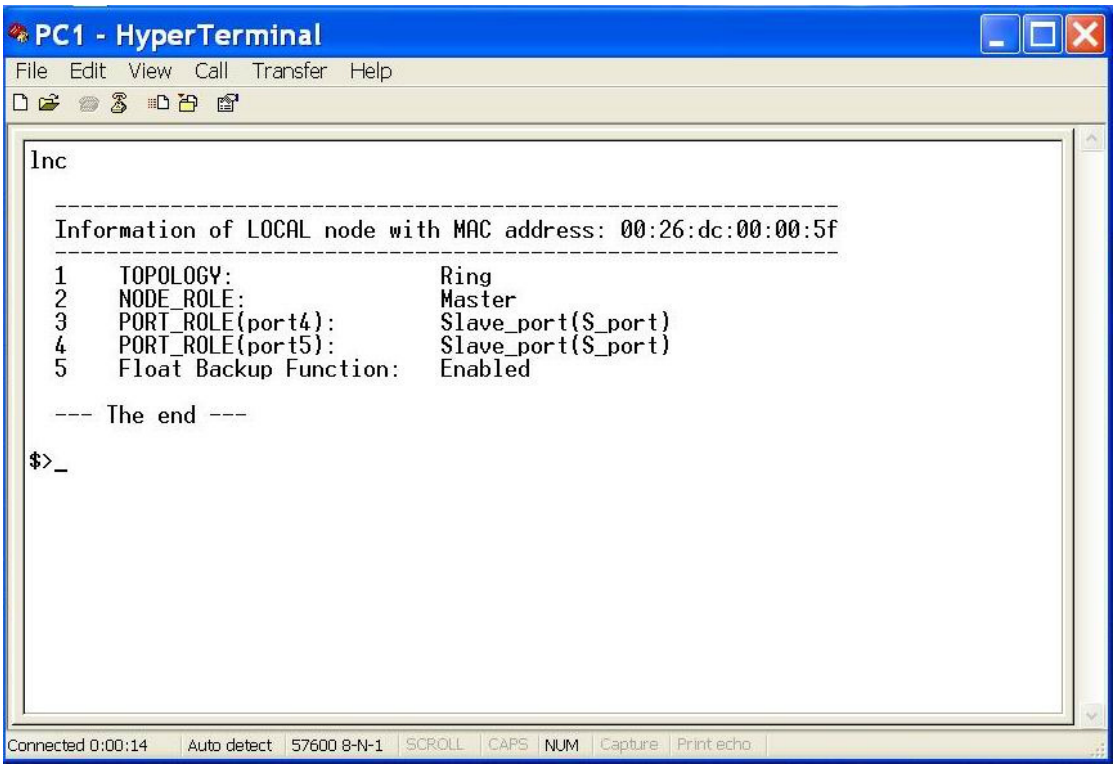


FIGURE 21: LOCAL NODE CHECK

This command line displays the running status of the local node that the USB cable is plugged into. The information provided is the MAC address, Topology, Node Role, Port Role and Float Backup status.

FLOAT BACKUP ENABLE <fbe> Command Line

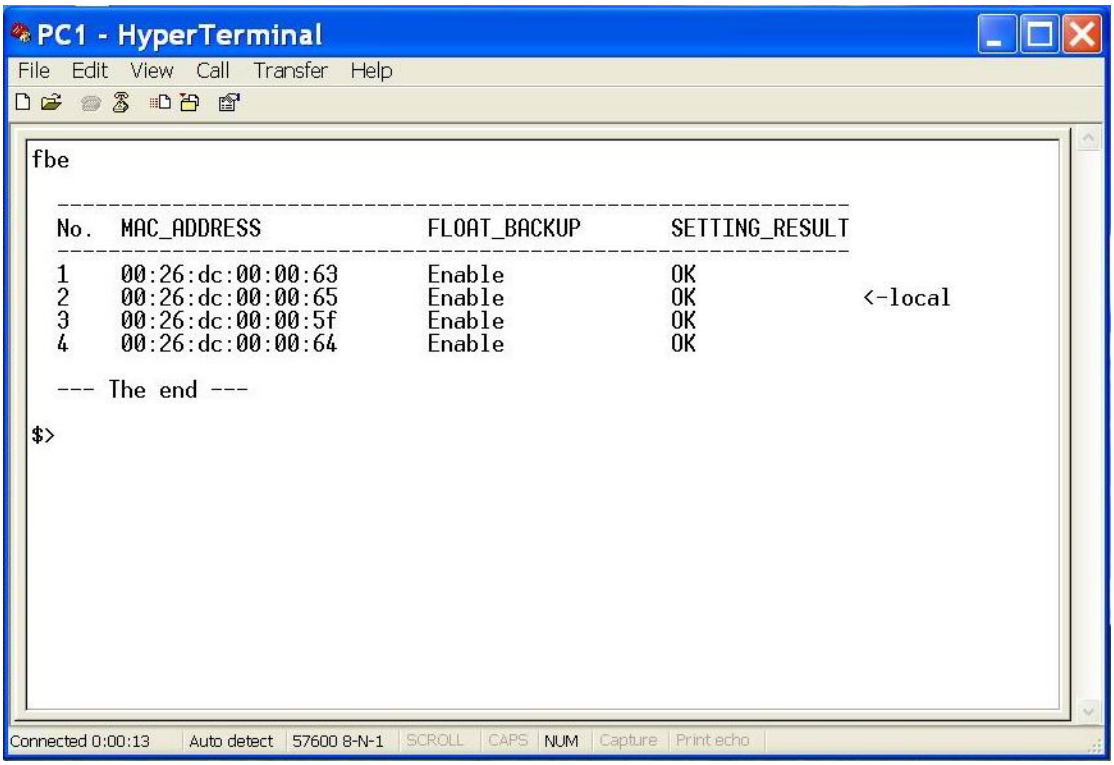


FIGURE 22: FLOAT BACKUP ENABLED 1

No: 4 – Lists number of units connected (in this case 1,2,3,4)

MAC_ADDRESS:– Displaying all the MAC addresses of the units connected on the ring/bus

FLOAT_BACKUP: Enable – Displays all the units connected to the ring/bus having Float Backup enabled.

SETTING_RESULT: OK – Displays the Float Backup enable has been successfully implemented.

<-local: This points to the unit that the USB cable is plugged into on the ring/bus.

The link furthest from the smallest MAC addressed unit in a ring configuration is automatically selected as the backup branch. In the case of even units on a ring the fiber link on port 4 will always be the backup branch – indicated by a dashed line on a ring topology.

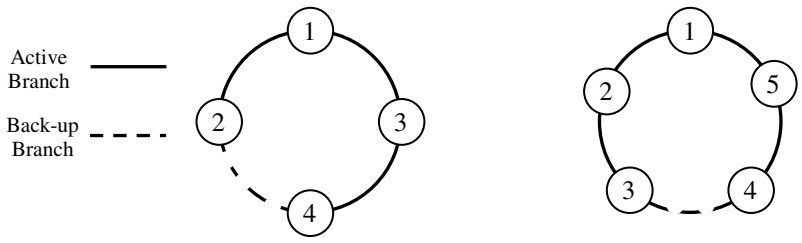


FIGURE 23: RING TOPOLOGY

In Figure 23, node 1 will communicate with node 2, node 3 and node 4 via node 3. Node 2 will communicate to node 4 only via node 1 and 3.

In the event of a fiber link being broken or disconnected (indicated by a cross) the backup branch will become the active branch. If the link between node 1 and 3 is broken (see Figure 24), node 1 will communicate with node 3 via node 2 and node 4.

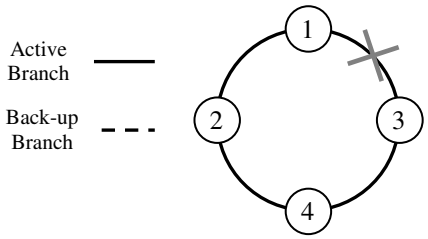


FIGURE 24: FLOAT BACKUP ENABLED 2

When the float backup is in enabled mode, if the broken or disconnected branch is re-established, the backup branch will now be the last broken/disconnected branch as shown in Figure 25.

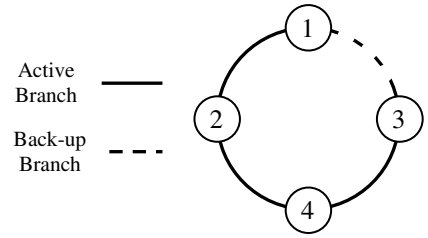


FIGURE 25: FLOAT BACKUP ENABLED 3

Note: When configuring the float backup function ***all*** units on the ring/bus network ***must*** have the same float backup configuration for correct operation.

All OSD2244V are set to **enabled** float backup upon shipment.

FLOAT BACKUP DISABLE - <fbd> Command Line

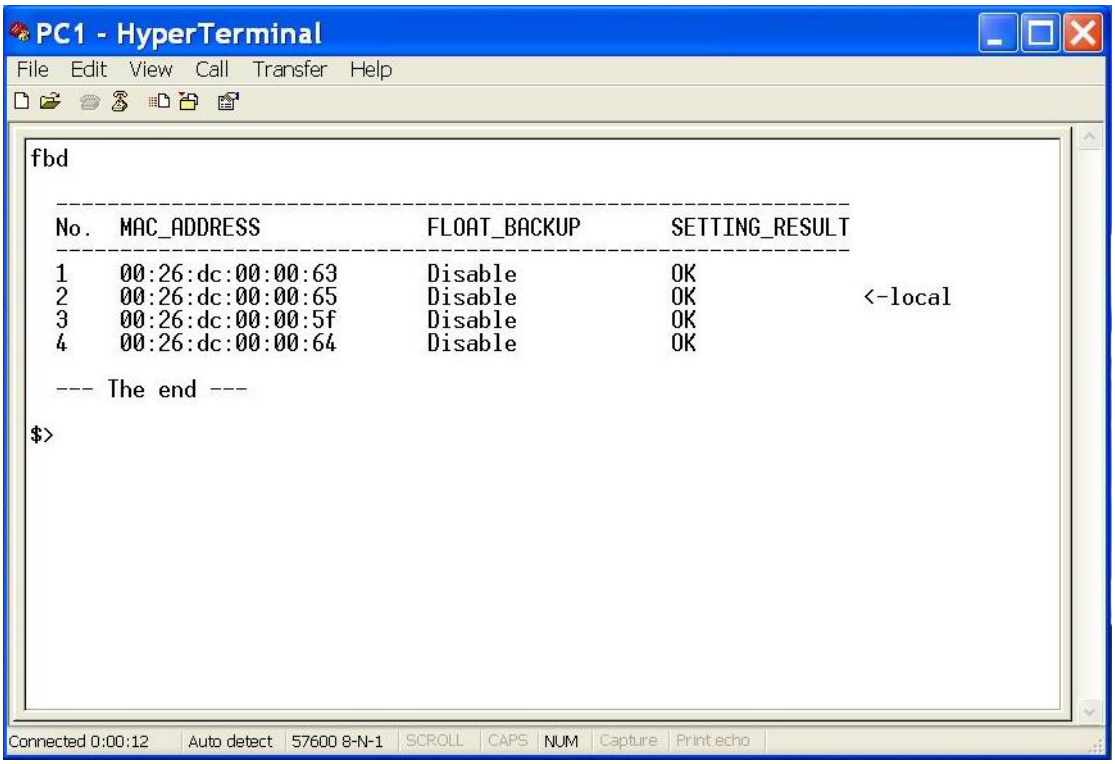


FIGURE 26: FLOAT BACKUP DISABLED 1

No: 4 – Lists number of units connected (in this case 1,2,3,4)

MAC_ADDRESS:– Displaying all the MAC addresses of the units connected on the ring/bus

FLOAT_BACKUP: Disable – Displays all the units connected to the ring/bus having Float Backup disabled.

SETTING_RESULT: OK – Displays the Float Backup disable has been successfully implemented.

<-local: This points to the unit that the USB cable is plugged into on the ring/bus.

The link furthest from the smallest MAC addressed unit in a ring configuration is automatically selected as the backup branch. In the case of even units on a ring the fiber link on port 4 will always be the backup branch – indicated by a dashed line on a ring topology.

In the event of a fiber link being broken or disconnected (indicated by a cross) the backup branch will become the active branch.

If the link between node 1 and 3 is broken (see Figure 27) , node 1 will communicate with node 3 via node 2 and node 4.

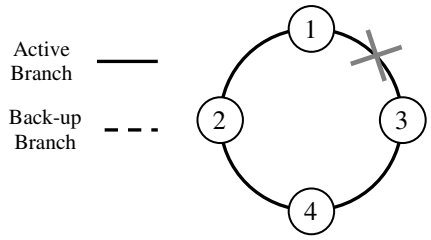


FIGURE 27: FLOAT BACKUP DISABLED 2

When the float backup is in disabled mode, if the broken or disconnected branch is re-established, the backup branch will again be the furthest link from the smallest MAC addressed unit as shown in Figure 28.

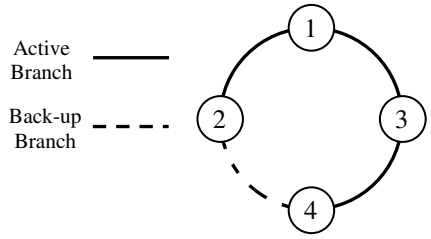


FIGURE 28: FLOAT BACKUP DISABLED 3

Note: When configuring the float backup function ***all*** units on the ring/bus network ***must*** have the same float backup configuration for correct operation.

All OSD2244V are set to **enabled** float backup upon shipment.

3 VIRTUAL LAN (VLAN)

3.1 INTRODUCTION

VLAN simply means Virtual Local Area Network or in other terms - Virtual LAN. A VLAN is a group of devices (OSD2244V) within a LAN which can communicate with each other as if they were on a common LAN. Setting up a VLAN environment allows the user to segment a LAN into several VLANs in order to reduce congestion on a large and heavy traffic LAN.

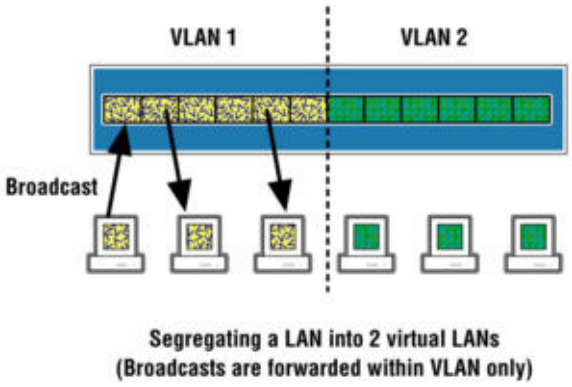


FIGURE 29: VLAN BASIC SETUP

Figure 29 shows a basic VLAN setup. Broadcast packets created by a user in VLAN 1 will reach all others within the VLAN 1 while users on VLAN 2 will not see the broadcast packets. This clearly displays advantages of a VLAN setup;

- **Performance**

  VLAN increases efficiency of a LAN by setting up barriers within a LAN to prevent unnecessary traffic flow between devices. A regular LAN (ie no VLAN setup) broadcasts packets of data to entire network devices regardless of whether they need it or not causing congestion to the entire network.

- **Greater Flexibility**

  Traditional LAN setups made it difficult to relocate a PC or network device and retain its relationship with other devices. With VLAN setup the PC or network device can be easily relocated and retain its relationship by using the OSD2244V CLI (Command Line Interface).

- **Added Security**

  Devices within a VLAN can only communicate with other devices within the same VLAN ie. cannot communicate with devices belonging to another VLAN group. The OSD2244V also offers two ingress security levels, which will be discussed in more detail later.

The OSD2244V is an 802.1Q with IEEE802.1ac Tag and IEEE802.1p priority VLAN tagging system allowing traffic for multiple VLANs to be carried on a single link. The Ethernet frame coming out of the OSD2244V (via port1, port 2, port 3) can be tagged or untagged.

3.2 VLAN PROTOCOL

The OSD2244V employs frame tagging to identify the VLAN the packet belongs to (see Figure 30). The VLAN frame tag is placed on the frame when the frame reaches a switch from an access port, which is a member of a VLAN. This enables each switch to see what VLAN the frame belongs to and can forward the frame to the corresponding VLAN access ports.

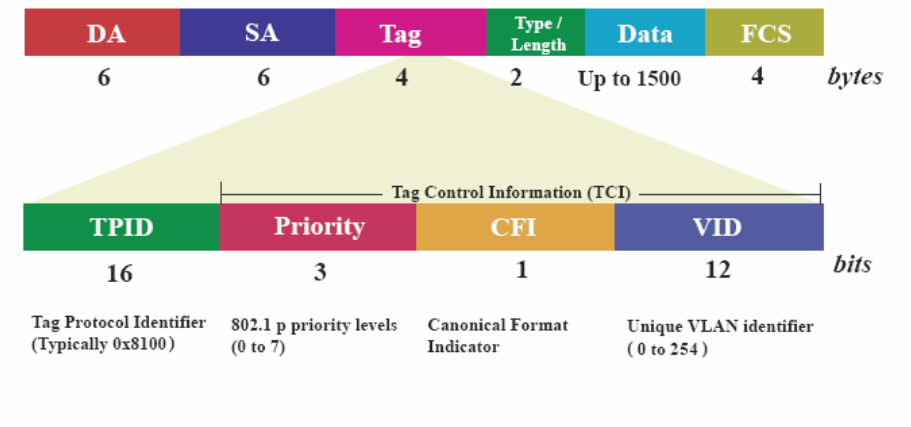


FIGURE 30: FRAME TAG

The OSD2244V frame tag consists of 16-bit Tag Protocol Identifier (TPID) which is inserted into the header of an Ethernet packet. The TPID indicates that a Tag Control Information (TCI) is following containing the user Priority, Canonical Format Indicator (CFI) and VLAN Identifier (VID).

The processing for an 802.1W frame into an OSD2244Vcan be divided into three steps and implemented by three function modules as shown in Figure 31.

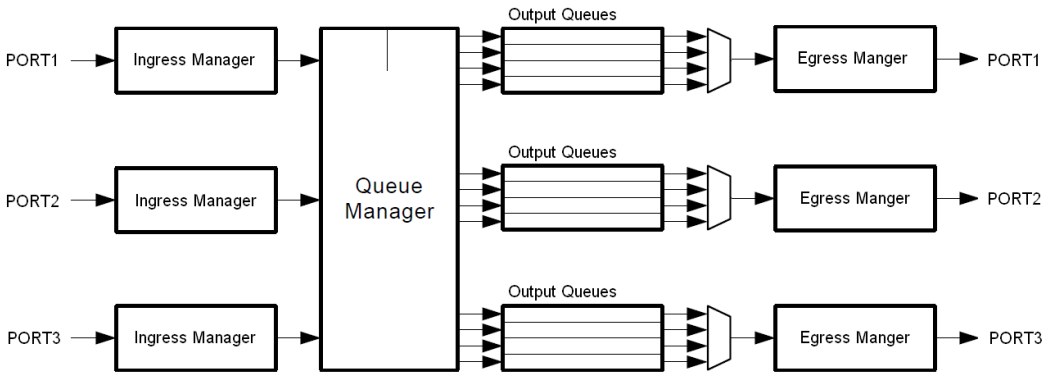


FIGURE 31: OSD2244V 802.1Q FRAME PROCESSOR

- **Ingress Manager:**

  1) Decide if the ingressing frame is allowed to enter into OSD2244V.
  2) Add 802.1ac Tag to an Untagged Frame and decide whether or not to modify the VID and Priority Level of a Tagged Frame. VID is decided firstly and then Priority Level.

- **Queue Manager:**

  1) Remap the Priority Level of input frame from seven levels into four levels for Queue Manager.
  2) Pick up a frame from Output Queues and forward it, this frame has the highest priority in the queue.
  3) Decide the Scheduling Mode for this four-level Priority used by the Queue Manager.

- **Egress Manager:**

  1) Decide which is the egress port(s) according to the VLAN Table.
  2) Decide the egress mode of VLAN frame – Tagged or Untagged.

3.2.1 OSD2244V PRIORITY

The OSD2244V uses IEEE 802.1p Priority tagged frame. It is a 3-bit field that indicates the frame priority level. There are eight levels of priority where values are from 0 (lowest priority) to 7 (highest priority).

The Ingress Manager has the task of determining the priority of each frame for the Queue Controller, but the QoS switching function itself is the task of the Queue Manager.

Port Default PRI (priority) is a parameter assigned to every Non-Ring Port via CLI and stored in a non-volatile memory within the OSD2244V. It may be used as the priority level for the ingressing frame depending on relevant settings for Ingress Manager.

VLAN Entry PRI (priority) is another parameter bundled with VID and is assigned when a VLAN Entry is added into the VLAN Table. This priority value may also be used as the priority level for the ingressing frame depending on the related settings for Ingress Manager.

There are two selectable Priority Modes for every non-ring port of the OSD2244V;

- **VID Based Priority**
  For an ingressing frame, after the VID is decided by the Ingress Manager, the priority value bundled with this VID will be used as the frame priority for the Queue Manager and the old one, if existing, is overridden.

- **Normal Priority**
  If an ingressing frame is tagged or it is a Priority only frame, the original priority value of this frame is kept for the Queue Manager to process it. If the frame is untagged the ingress Port Default PRI is used as the priority.

The Ports Default Priority and Priority Mode can be set separately on a per-port basis for every non-ring port (port1, 2 or 3).

⚠ Do NOT use priority level 7. Using priority level 7 for continuous Ethernet traffic is PROHIBITED.

See the Flow Chart below for details outlining the PRI selection process.

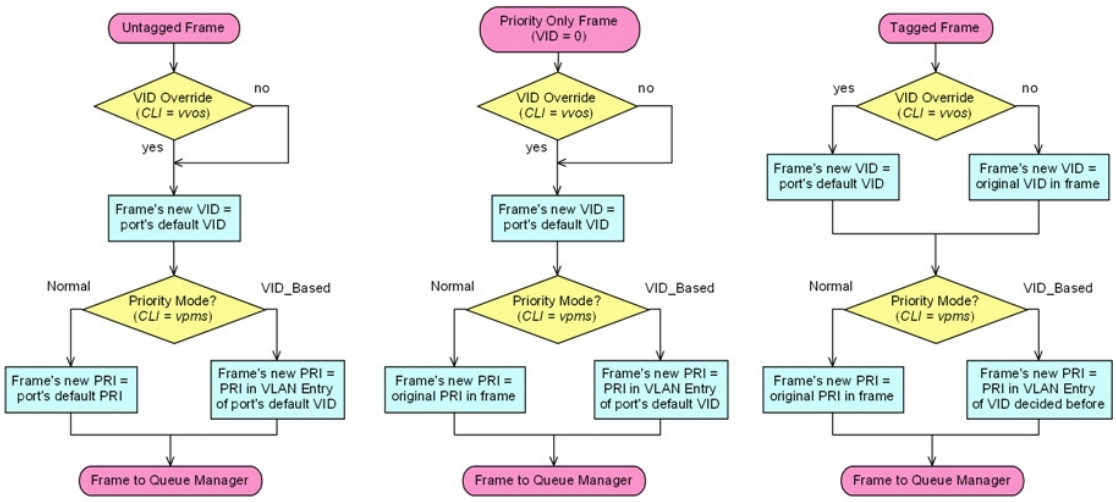


FIGURE 32: PRIORITY AND VID TAG SELECTION FLOW CHART

3.2.2 PRIORITY REMAPPING AND SCHEDULING MODE FOR QUEUE MANAGER

- **Priority Remapping**

  The OSD2244V Queue Manager supports 4-Level priority only. As a result, the 802.1p 7-Level priority structure requires to be remapped to a 4-Level priority structure. Table 6 outlines the details.

- **Priority Scheduling Mode**

  The OSD2244V supports either a Fixed Priority or Weighted Fair queuing modes. The modes can be selected via CLI. Table 6 outlines the details.

  For Fixed Priority mode, all top priority frames egress for a port until that priority's queue is empty, then the next lower priority queue's frame egress, etc. This approach can cause the lower priorities to be starved out preventing them from transmitting any frames but also ensures that all high priority frames egress sooner.

  For Weighted Priority mode, an 8, 4, 2, 1weighting is applied to the four priorities. This approach prevents the lower priority frames being starved out with only a slight delay to the higher priority frames.

TABLE 6: PRIORITY REMAPPING & SCHEDULING FOR QUEUE MANAGER

PRI of frame entering Queue Manager	Remapped PRI used by Queue Manager	PRI of egressing frame (egressing tagged)	Weighted Ratio for Scheduling Mode = Weighted
0	0	0	1
1		1	
2	1	2	2
3		3	
4	2	4	4
5		5	
6	3	6	8
7		7	

3.2.3 CANONICAL FORMAT INDICATOR (CFI)

The CFI bit of the IEE Tag is ignored and left unmodified by the OSD2244V

3.2.4 VLAN IDENTIFIER (VID)

VLAN Identifier (VID) is a 12-bit field specifying the VLAN to which the frame belongs. Each frame entering OSD2244V with 802.1Q enabled must have a VLAN Identifier (VID) assigned to it, which can be the original VID in a tagged frame or a modified tagged frame by the Ingress Manager.

A frame with VID = 0 indicates that the frame does not belong to any VLAN, which carries priority information only and is referred to as Priority Only Frame. A Priority Only Frame is treated as a tagged frame.

The OSD2244V supports up to 64 VIDs out from 0~254. VID = 1 is often reserved for management purposes and is the default VID for all ports once VLAN is enabled. Suggested user's VID range is 2~254.

The Port's Default VID is a parameter assigned to each Non-Ring Port (port1,2 and 3) via CLI and stored in a non-volatile memory within the OSD2244V. It may be used as the VID for the ingressing frame depending on relevant settings of the Ingress Manager.

For an Untagged Frame or Priority Only Frames, the Port Default VID of the ingressing port will be used as the frame's VID. For a Tagged Frame where the VID Override Function is enabled, the Port Default VID is used as the new VID for this frame, otherwise original VID of the frame will be kept.

Refer to Figure 32 Flow Chart for details regarding VID selection process.

3.2.5 VLAN TABLE

The VLAN Table (accessed via the CLI) displays the database of OSD2244V's VLAN setup. It indicates all information relevant to the VID including membership, egress mode of every member port and priority level for this OSD2244V VID. Each of the entries in the VLAN table represents a VLAN group, which is identified by its VID.

Once a frame goes into OSD2244V, it will be processed by the Ingress Manager first. The VID of a Tagged Frame may be modified if VID Override function is enabled. Then the renewed VID is used to look up the VLAN Table. If a non-ring port of this OSD2244V is a member of this VID, this frame will be forwarded to it.

Ring ports (port4 and port5) are members of every VLAN entry, and every ingressing frame is allowed to exit them.

By using a PC and CLI, an entry of VLAN can be added or deleted from the VLAN Table. Once 802.1Q VLAN is enabled on OSD2244V, a VLAN Entry with VID = 1 is added into VLAN Table automatically including all ports as its member. See Figure 33 as an example. This table indicates all the VID associated with the OSD2244V the PC is connected to.

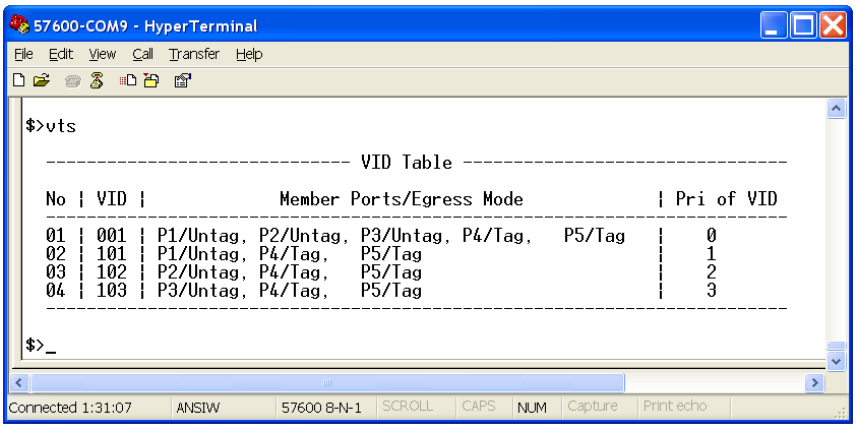


FIGURE 33: VLAN TABLE EXAMPLE

3.2.6 SECURITY LEVEL

Every non-ring port (port 1, port 2, port 3) has two possible Security Level settings – High or Low:

- **High Level:**

  The VID of an ingressing frame must be contained in the VLAN Table and the ingress port must be a member of this VLAN, otherwise the frame is discarded. Only member port (s) of this VLAN is allowed for the frame to exit.

- **Low Level:**

  An ingressing frame will not be discarded if the ingress port is not a member of the frame's VID. But still, only member port (s) of this VLAN is allowed for the frame to exit.

3.3 VLAN CONFIGURATIONS

⚠ It is highly recommended to perform configurations on each OSD2244Vunit prior to connecting any devices and optical fiber.

⚠ It is also equally important to understand the topology and network the user is attempting to achieve. A topology diagram is useful when setting the system up such as shown in Figure 34.

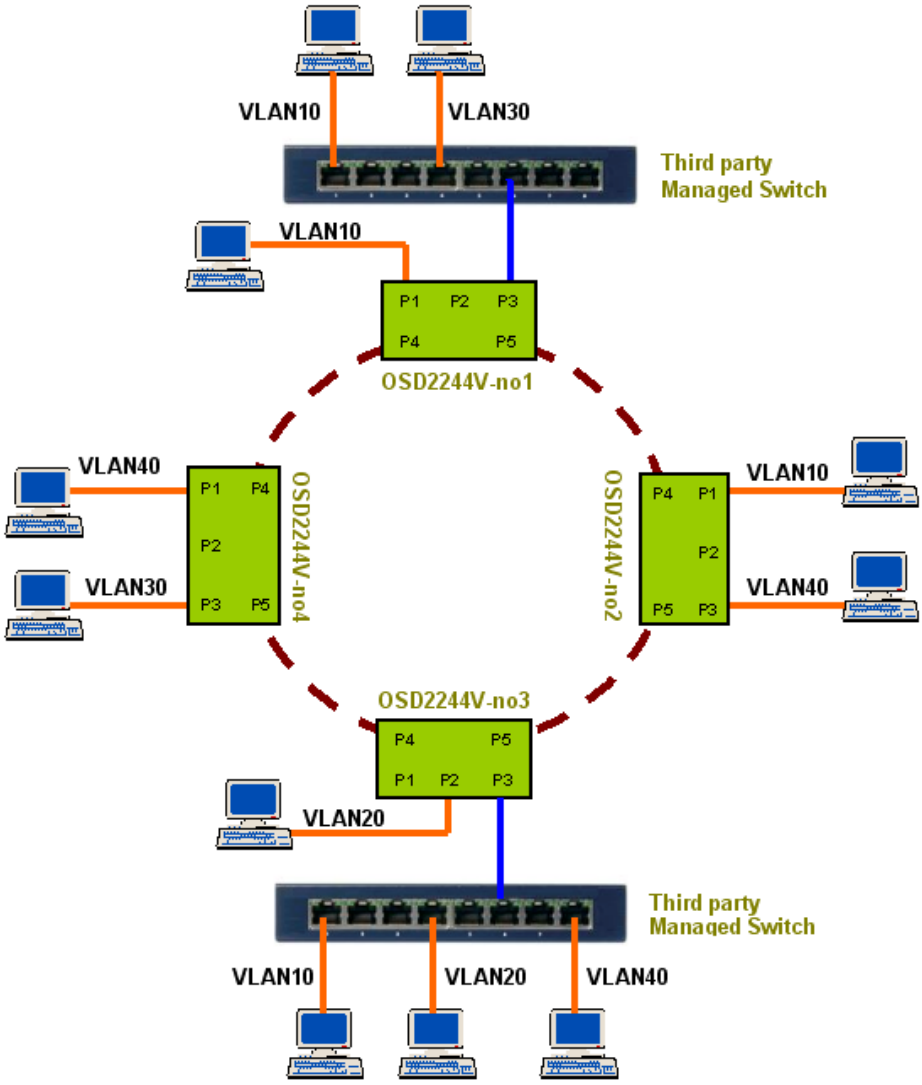


FIGURE 34: VLAN TOPOLOGY DIAGRAM EXAMPLE

⚠ The following information regarding VLAN configurations and setups requires knowledge of the Command Line Interface (CLI) which is described in section 2.5.

3.3.1 CONFIGURATION STORAGE

A non-volatile memory is used to store VLAN configurations for the OSD2244V, therefore all configurations will be restored back to set values at power on.

3.3.2 CONFIGURATION CHECK

Two CLI commands are available for checking the VLAN settings;

VLAN MODE AND SCHEDULING MODE CHECK - <vmc> Command Line

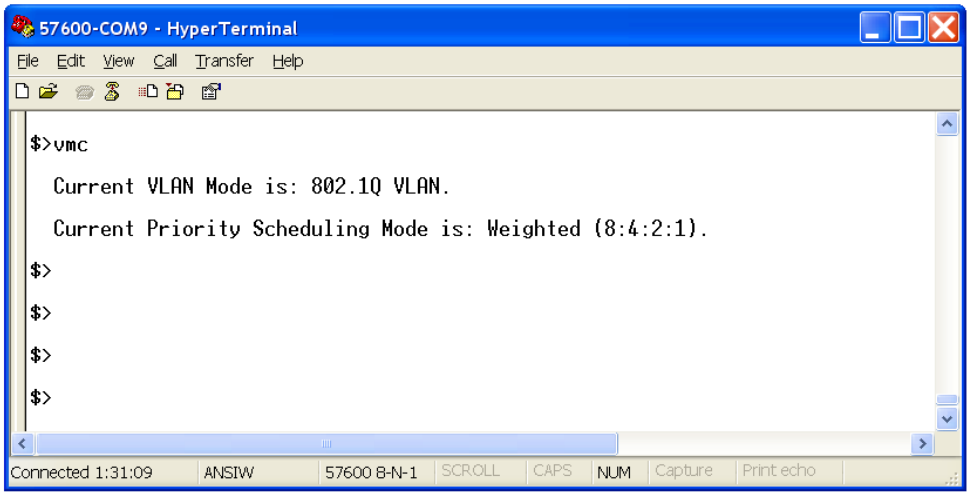


FIGURE 35: VLAN MODE CHECK

The VLAN Mode and Scheduling Mode Check is used for checking the configuration of the VLAN Table.

Current VLAN Mode is: displays the operating mode of the VLAN. There are two possibilities;

1. Normal – VLAN is disabled
2. 802.1Q VLAN

Current Priority Scheduling Mode is: displays the Schedule mode of the VLAN. There are two possibilities;

1. Fixed
2. Weighted (8:4:2:1)

VLAN TABLE SHOW - <vts> Command Line

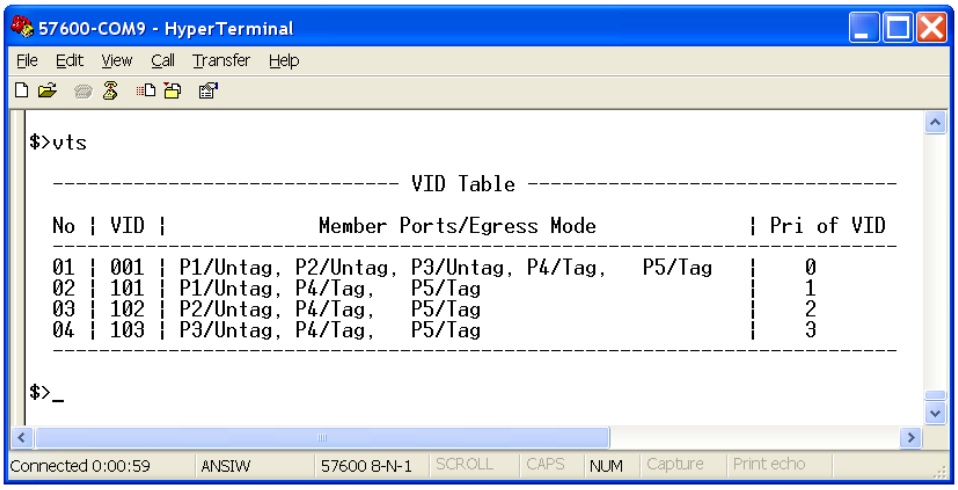


FIGURE 36: VLAN TABLE SHOW

The VLAN Table displays the database of OSD2244V's VLAN setup. It indicates all information relevant to the VID including membership, egress mode of every member port and priority level for this OSD2244V VID. Each of the entries in the VLAN table represents a VLAN group, which is identified by its VID.

Each row belongs to one VID giving all information for this VLAN. All member ports of this VID are listed after it. Egress Mode is given out for each member port.

No: Indicates the number of VLAN identifications assigned to the OSD2244V. There are a maximum of 255 VID numbers possible per OSD2244V.

VID: Indicates the assigned VLAN ID. 001 to 225 VIDs are valid. *Note: there cannot be two identical VIDs per OSD2244V.*

MEMBER PORTS/EGRESS MODE: Displays the port numbers assigned to the VID and whether the port is tagged or untagged. Note that the user can Tag/Untag port 1, port 2 and port 3 only. By default port 4 and 5 are ring ports and will always include the Tag.

Pri of VID: Indicates the Priority level setting of the VID. Valid priority levels are 0-7.

Note: The VID table configuration settings can be changed using the appropriate CLI commands. See section 3.4 COMMAND LINE INTERFACE (CLI) FOR VLAN for information on changing the OSD2244V configuration settings to implement users topology.

PORT CONFIGURATION SHOW - <vps> - Command Line

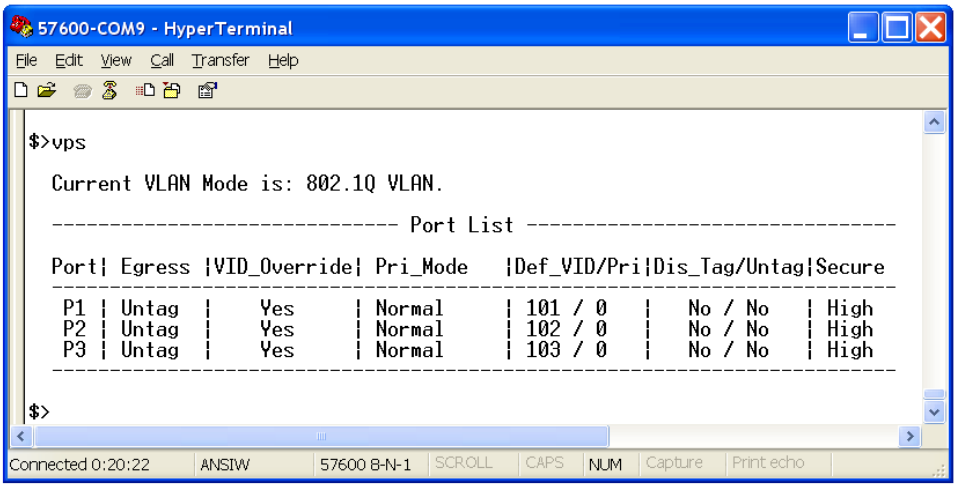


FIGURE 37: PORT CONFIGURATION SHOW

The Port Configuration Check is used for checking the settings of all non-ring ports. Every non-ring port has one row in the table. Figure 37 shows the default configuration as an example.

Port – Port number

Egress – Egress mode. There are two possibilities;

1. Tagged
2. Untagged

VID_Override – VID override mode. There are two possibilities;

1. Yes
2. No

Pri_Mode – Priority Mode of OSD2244V. There are two possibilities;

1. VID_Based
2. Normal

Def_VID/Pri – Port Default VID indicates the port VID. Values 0 – 254 are valid.
Port Default Priority indicates the priority level of the port. Values 0 – 7 are valid.

Dis_Tag/Untag – Displays whether the Tagged/Untagged ingressing frames is to be discarded or not. There are two possibilities;

1. Yes
2. No

Secure – Indicates the ports Security Level. There are two possibilities;

1. High
2. Low

Note: The Port Configuration settings can be changed using the appropriate CLI commands. See section 3.4 COMMAND LINE INTERFACE (CLI) FOR VLAN for information on changing the OSD2244V configuration settings to implement users topology.

3.3.3 DEFAULT CONFIGURATION

The default configuration upon shipment of the OSD2244V VLAN Mode is: **Normal (802.1Q VLAN is disabled)**. *Note: to enable 802.1Q VLAN type* ***vps*** *on the CLI. See section 3.4 for detailed information.*

When enabling the 802.1Q VLAN the initial configurations are as shown Figure 38. *Note: to view VID table type* ***vts*** *on the CLI. To view the VLAN Mode type* ***vps*** *on the CLI. See section 3.4 for detailed information.*

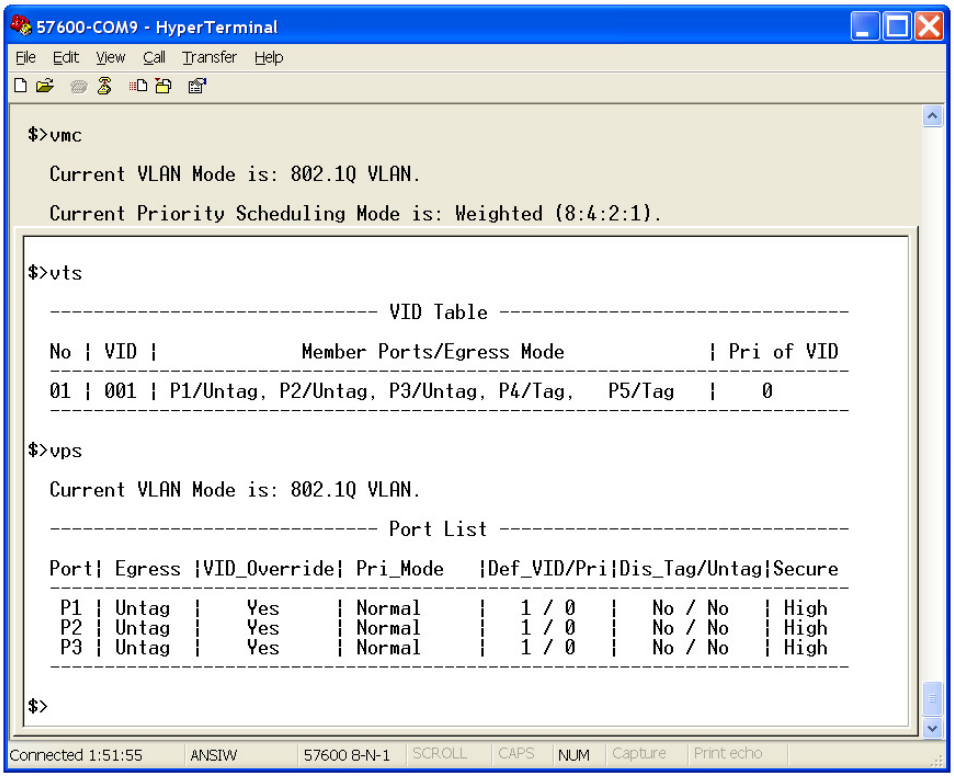


FIGURE 38: VLAN DEFAULT CONFIGURATION

3.4 COMMAND LINE INTERFACE (CLI) FOR VLAN

3.4.1 VLAN SETUP

As mentioned is section 3.3 there are a few steps to note before setting up the OSD2244V VLAN functions;

- Each OSD2244V unit requires VLAN settings to be configured individually
- When setting up the VLAN configurations the OSD2244V unit should not be connected to any optical fiber or Ethernet cabling.
- Refer to section 2.2.5 for USB connections to PC
- Refer to section 2.5 (Command Line Interface) to enable CLI configurations
- It is highly suggested to understand the topology and network the user is attempting to achieve before configuring the VLAN settings. A topology diagram such as shown in Figure 34 is useful when setting the system up. Further diagrams with examples of VLAN configurations are shown in section 3.6

3.4.2 VLAN CLI COMMAND TABLE

Table 7 is a complete summary of all the CLI commands pertaining to the VLAN functions for the OSD2244V. It describes the Command description, CLI command, Input format and Function description. Section 3.5 details each VLAN CLI command with examples.

Command Description	CLI Command	Format	VLAN Mode		Function Description
			Normal	802.1Q	
vlan_mode_set	vms	*{ vms} <mode_value>*	√	√	Enable or disable 802.1Q VLAN for OSD2244V.
vlan_mode_check	vmc	*{vmc}*	√	√	Check current VLAN mode.
vlan_port_defatult_vid	vpdv	*{vpdv} <p1_vid, p2_vid, p3_vid>*		√	Set Port Default VID for non-ring ports (port1, 2 and 3).
vlan_port_default_pri	vpdp	*{vpdp} <p1_pri, p2_pri, p3_pri>*		√	Set Port Default Priority for non-ring ports.
vlan_entry_table_add	veta	*{veta} <vid, pri, p1_bit, p2_bit, p3_bit>*		√	Add an entry into 802.1Q VLAN table.
vlan_entry_table_delete	vetd	*{vetd} <vid>*		√	Delete an entry from 802.1Q VLAN table.
vlan_entry_table_flush	vetf	*{vetf}*		√	Delete all entries from 802.1Q VLAN table.
vlan_vid_override_set	vvos	*{vvos} <p1_bit, p2_bit, p3_bit>*		√	Enable or disable VID Override function for non-ring ports.
vlan_port_egress_mode	vpem	*{vpem} <p1_mode, p2_mode, p3_mode>*		√	Set Egress Mode to Tagged or Untagged for non-ring ports.
vlan_pri_mode_set	vpms	*{vpms} <p1_mode, p2_mode, p3_mode>*		√	Enable or disable VID Based Priority for non-ring ports.
vlan_pri_scheduling_mode	vpsm	*{vpsm} <mode_value>*		√	Set Scheduling Mode for the Queue Controller in OSD2244V.
vlan_discard_tagged_frame	vdtf	*{vdtf} <p1_bit, p2_bit, p3_bit>*		√	Discard/Not Discard 802.3ac Tagged Frames for non-ring ports.
vlan_discard_untagged_frame	vduf	*{vduf} <p1_bit, p2_bit, p3_bit>*		√	Discard/Not Discard 802.3ac Untagged Frames for non-ring ports.
vlan_port_secure_set	vpss	*{vpss} <p1_bit, p2_bit, p3_bit>*		√	Set Security Level to High or Low for non-ring ports.
vlan_table_show	vts	*{vts}*		√	List all entries of current 802.3Q VLAN Table.
vlan_port_show	vps	*{vps}*		√	List all configurations for non-ring ports.

Notes : A warning message may be displayed if a command is incorrectly entered and settings will not take effect.

Both SPACE and COMMA are acceptable as a separator in between parameters for a command, e.g. ***vpdv 1 2 3*** is the same as ***vpdv 1, 2, 3***

TABLE 7: CLI COMMAND LIST FOR VLAN FUNCTIONS

3.5 VLAN CLI COMMANDS

VLAN MODE SET – *Enable or disable 802.1Q VLAN*

CLI Command	CLI Syntax	Parameters	Factory Default	Example
vms	vms <*mode value*>	0: Normal (VLAN disabled 1: 802.1Q VLAN	0	*vms 1*

Note: To reset the OSD2244V VLAN configurations to factory default set the parameter to 0 (vms 0) then enable VLAN 802.1Q (vms 1)

VLAN MODE CHECK – *Check current VLAN mode configuration*

CLI Command	CLI Syntax	Parameters	Factory Default	Example
vmc	vmc	-	-	*vmc*

VLAN PORT DEFAULT VID – *Set port default VID for non-ring ports (port 1, port 2, port 3)*

CLI Command	CLI Syntax	Parameters	Factory Default	Example
vpdv	vpdv <p1 vid, p2 vid, p3 vid>	0 – 254*	1^	*vpdv 101, 102, 103*

Note: * - The parameter value can by any value between 0 – 254. Duplicate values on different ports is not accepted
^ - The port default VID = 1 for all non-ring ports

VLAN PORT DEFAULT PRI – *Set port default priority for non-ring ports (port 1, port 2, port 3)*

CLI Command	CLI Syntax	Parameters	Factory Default	Example
vpdp	vpdp <p1 pri, p2 pri, p3 pri>	0 – 7	0	*vpdp 1, 2, 3*

VLAN ENTRY TABLE ADD – Adds an entry into 802.1Q VLAN table

CLI Command	CLI Syntax	Parameters	Factory Default	Example
veta	veta <vid, pri, p1 bit, p2 bit, p3 bit>	vid – 0-254* pri – 0-7^ p# bit – 0 or 1†	1	*veta 101, 1, 0, 0, 1*

Note: * - VID number to be added/modified
^ - Port priority value to be added/modified.
† - 0 = Not a member of this VID. 1 – Member of this VID

VLAN ENTRY TABLE DELETE – Delete an entry from 802.1Q VLAN table.

CLI Command	CLI Syntax	Parameters	Factory Default	Example
vetd	vetd <vid>	0 – 254	-	*vetd 101*

VLAN ENTRY TABLE FLUSH – Delete all entries from 802.1Q VLAN table.

CLI Command	CLI Syntax	Parameters	Factory Default	Example
vetf	vetf	-	-	*vetf*

VLAN VID OVERRIDE SET – Enable or disable VID override function for non-ring ports.

CLI Command	CLI Syntax	Parameters	Factory Default	Example
vvos	vvos <p1 bit, p2 bit, p3 bit>	0: No override 1: Override	1	*vvos 0, 1, 1*

VLAN PORT EGRESS MODE – Set Egress Mode to Tagged or Untagged for non-ring ports.

CLI Command	CLI Syntax	Parameters	Factory Default	Example
vpem	vpem <p1 mode, p2 mode, p3 mode>	0: Egress Untagged 1: Egress Tagged	0	*vpem 101*

VLAN PRI MODE SET – Enable or disable VID based priority for non-ring ports.

CLI Command	CLI Syntax	Parameters	Factory Default	Example
vpms	vpms <p1 mode, p2 mode, p3 mode>	0: Normal 1: VID based	0	*vpms 1, 0, 0*

VLAN PRI SCHEDULING MODE – Set Scheduling Mode for the Queue Controller.

CLI Command	CLI Syntax	Parameters	Factory Default	Example
vpsm	vpsm <mode value>	0: Weighted (8:4:2:1) 1: Fixed	1	*vpsm 1*

VLAN DISCARD TAGGED FRAME – Discard/Not Discard 802.3ac Tagged frames for non-ring ports.

CLI Command	CLI Syntax	Parameters	Factory Default	Example
vdtf	vdtf <p1 bit, p2 bit, p3 bit>	0: Not Discard 1: Discard	0	*vdtf 1, 0, 0*

VLAN DISCARD UNTAGGED FRAME – Discard/Not Discard 802.3ac untagged frames for non-ring ports.

CLI Command	CLI Syntax	Parameters	Factory Default	Example
vduf	vduf <p1 bit, p2 bit, p3 bit>	0: Not Discard 1: Discard	0	*vduf 1, 0, 0*

VLAN PORT SECURE SET – Set Security Level to High or Low for non-ring ports.

CLI Command	CLI Syntax	Parameters	Factory Default	Example
vpss	vpss <p1 bit, p2 bit, p3 bit>	0: Low 1: High	1	*vpss 0, 1, 1*

VLAN TABLE SHOW – List all entries of current 802.3Q VLAN table.

CLI Command	CLI Syntax	Parameters	Factory Default	Example
vts	vts	-	-	*vts*

VLAN PORT SHOW – List all configurations for non-ring ports.

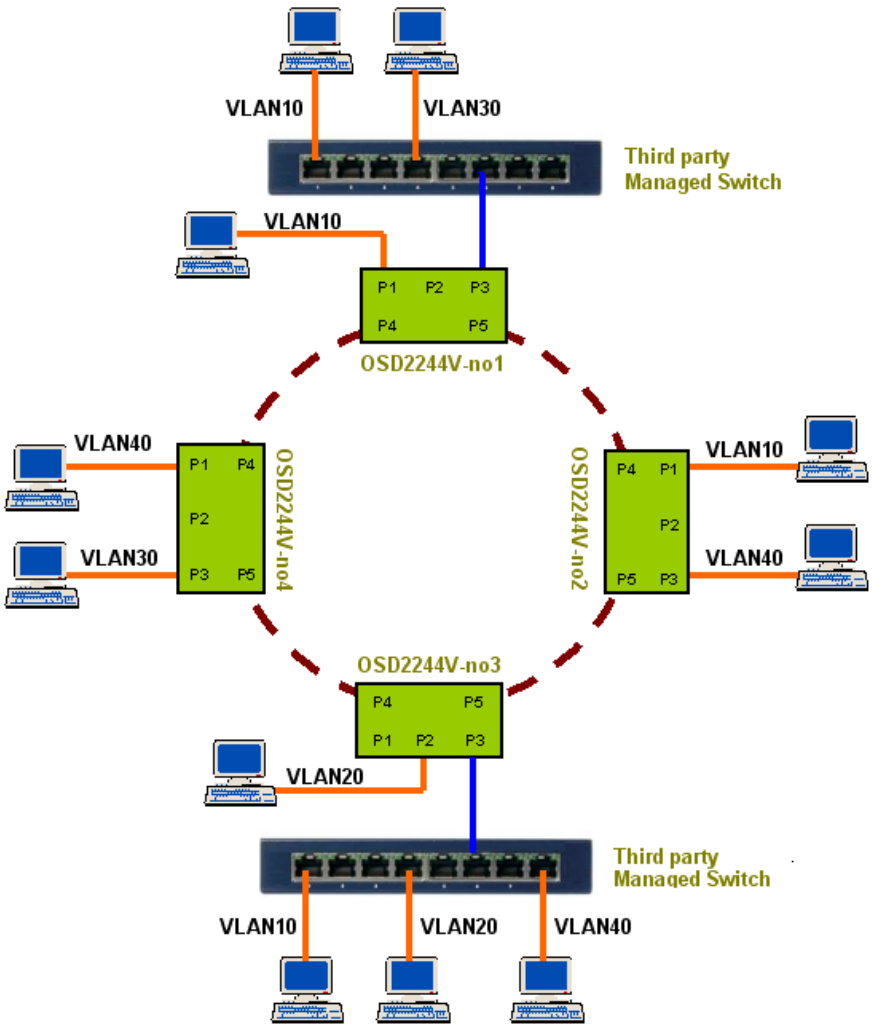
CLI Command	CLI Syntax	Parameters	Factory Default	Example
vps	vps	-	-	*vps*

3.6 VLAN SETTING SCENARIOS

The following scenarios are a few examples of the OSD2244V setup. A topology diagram is used as an example together with the VLAN CLI input commands used to set the system up for the given topology.

3.6.1 SCENARIO 1

In this scenario, four OSD2244Vs connected together with two third party managed switches to build IEEE802.1Q VLANs. There are four VLANs in this network and the QoS priority is required to be based on VID. Therefore the priority level values assigned with VLAN Entry will be used for the Queue Manager to decide which frame should use the bandwidth and be forwarded out first.



Four OSD2244V operating with two third-party managed switches to build an IEEE802.1Q VLAN

FIGURE 39: SCENARIO 1

TABLE 8: SCENARIO 1

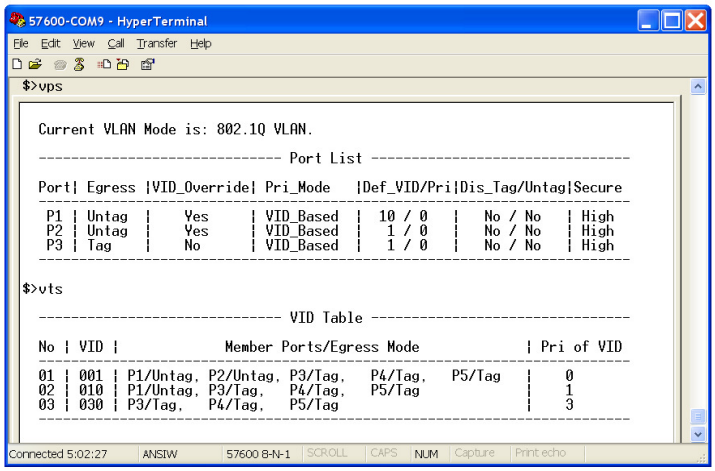
	OSD2244V No1	OSD2244V No2	OSD2244V No3	OSD2244V No4
CLI Commands	*vms 1* *vpdv 10, 1, 1* *vpem 0, 0, 1* *vvos 1, 1, 0* *veta 10, 1, 1, 0, 1* *veta 30, 3, 0, 0, 1* *vpms 1, 1, 1*	*vms 1* *vpdv 10, 1, 40* *vpem 0, 0, 0* *vvos 1, 1, 1* *veta 10, 1, 1, 0, 0* *veta 40, 4, 0, 0, 1* *vpms 1, 1, 1*	*vms 1* *vpdv 1, 20, 1* *vpem 0, 0, 1* *vvos 1, 1, 0* *veta 10, 1, 0, 0, 1* *veta 20, 2, 0, 1, 1* *veta 40, 4, 0, 0, 1* *vpms 1, 1, 1*	*vms 1* *vpdv 40, 1, 30* *vpem 0, 0, 0* *vvos 1, 1, 1* *veta 30, 3, 0, 0, 1* *veta 40, 4, 1, 0, 0* *vpms 1, 1, 1*

Notes: Configurations for the third party managed switch (use the top one as an example):

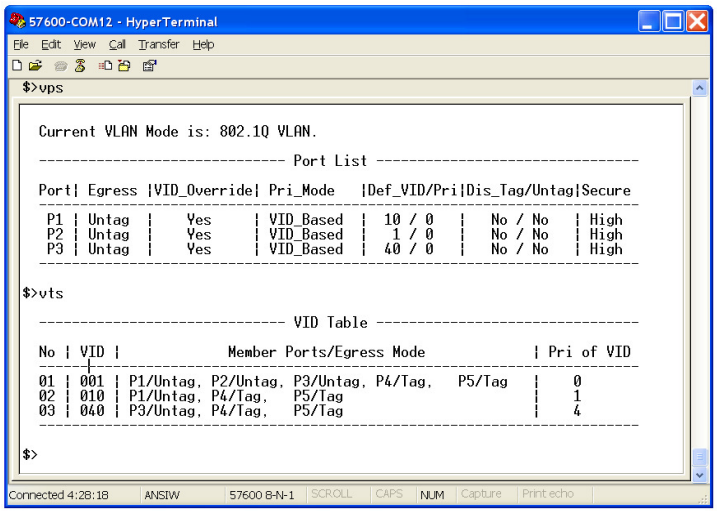
1) Assign port1 and 6 to VLAN10, port4 and 6 to VLAN30
2) Set port1 and 4 to egress untagged and port6 to egress tagged

Similar settings required for the other managed switch where three VLANs need to be assigned.

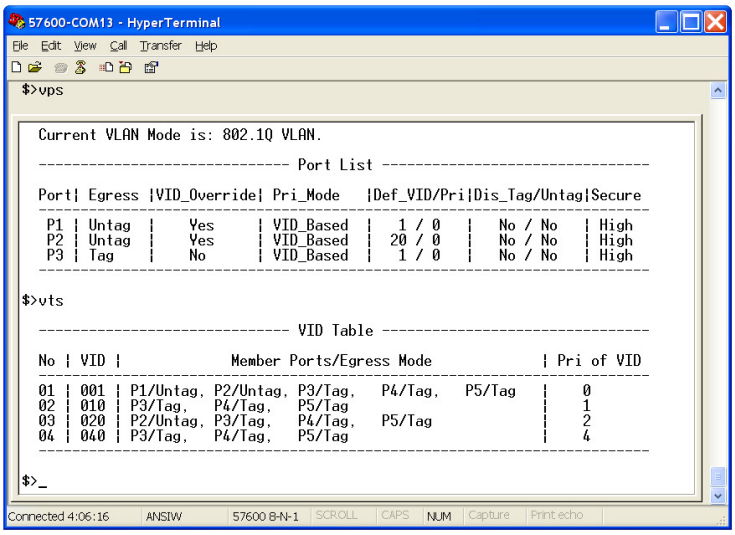
Use <vps> CLI to check Port List and <vts> to display the VID table.



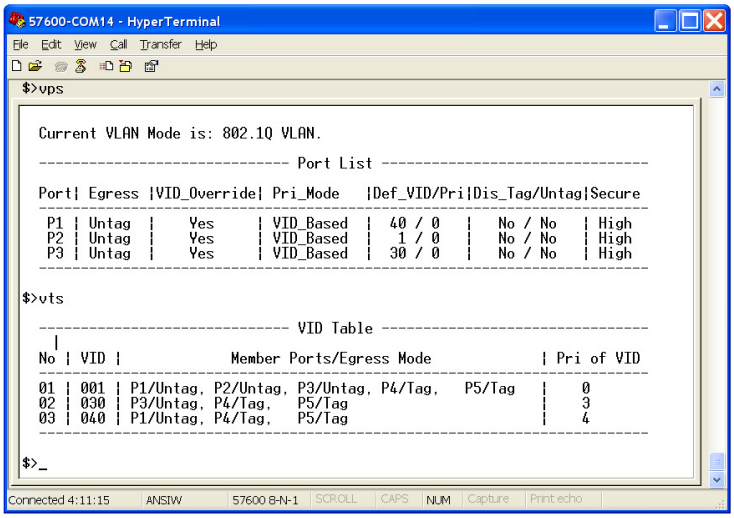
OSD2244V -- No1



OSD2244V -- No2



OSD2244V -- No3

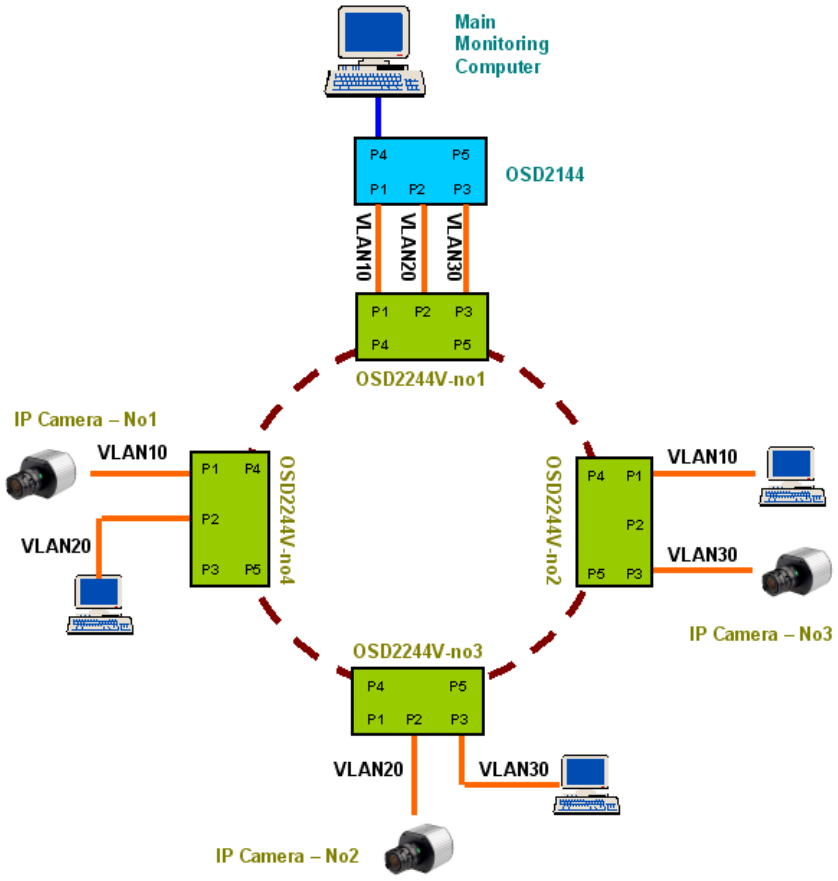


OSD2244V -- No4

3.6.2 SCENARIO 2

In this scenario, there are three IP Cameras connected to three OSD2244V (no2, 3 and 4) respectively. IP Camera No1 belongs to VLAN10, IP Camera No2 belongs to VLAN20 and IP Camera No3 belongs to VLAN30. OSD2244V No1 is connected to an OSD2144, which is an unmanaged ethernet switch.

Main monitoring computer, which is connected to OSD2144, can get images from all three IP Cameras simultaneously. Other three computers, which are connected to OSD2244V No2, 3 or 4, can only access the IP Camera of its own VLAN. All VLANs have the same priority levels.



Four OSD2244V operating with one OSD2144 (unmanaged switch)
to access multiple cameras on one PC

FIGURE 40: SCENARIO 2

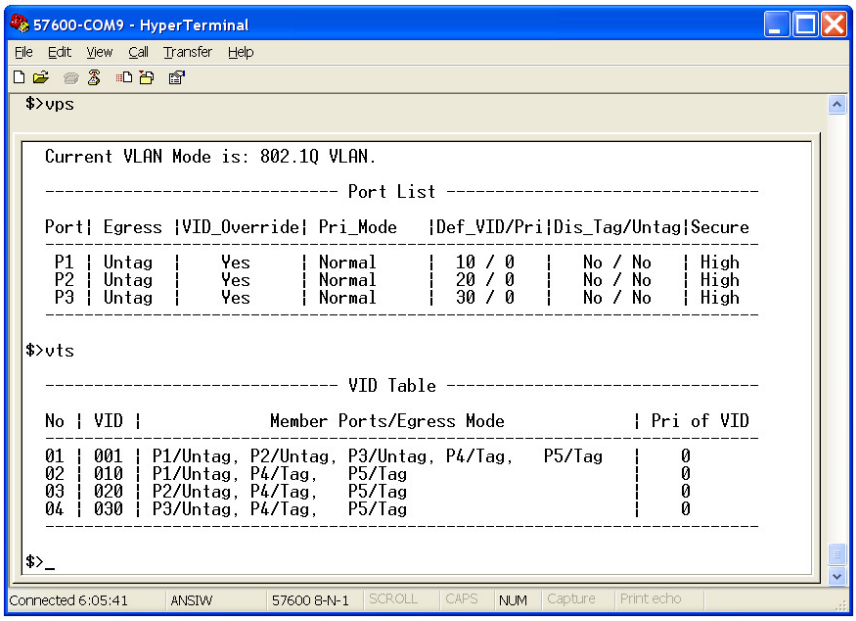
The configurations for this scenario:

	OSD2244V No1	OSD2244V No2	OSD2244V No3	OSD2244V No4
CLI Commands	*vms 1* *vpdv 10, 20, 30* *vpem 0, 0, 0* *vvos 1, 1, 1* *veta 10, 0, 1, 0, 0* *veta 20, 0, 0, 1, 0* *veta 30, 0, 0, 0, 1*	*Same as No1*	Same as No1	*Same as No1*

Notes:

As a replacement, a third party ethernet switch could be used for this scenario. But user should be sure that its port based VLAN mode does do any changes on 802.1ac Tag.

A screen-cut picture about the result of configuration on OSD2244V is given out below for checking purposes. (All OSD2244V in the RING Network have the same configuration)



4 MAINTENANCE

4.1 INTRODUCTION

The following section outlines the fault-finding procedure for the OSD2244V modems. Please take note of the following:

- Personnel without appropriate training should not attempt any maintenance except that outlined below.
- If further maintenance is attempted you are warned that every care should be taken to ensure that internal measurements made while the equipment is operational are taken carefully as some components within the unit are expensive and may be damaged by failure of any portion of their support circuitry.
- Some components within the unit are Electrostatic (ES) sensitive and Electrostatic Discharge (ESD) precautions should be taken when performing maintenance upon the unit.

4.2 EXTERNAL INSPECTION

Visually check for the following:

- Check that the correct power source is connected to the power socket.
- Check that the Ethernet cables are connected to the modem correctly and that the distant OSD2244V modem has been connected correctly to any external equipment.
- Inspect the optical connectors (for fiber SFP option) for any contamination and clean using isopropyl alcohol and a lint free tissue if any contamination is detected.

4.3 ROUTINE MAINTENANCE

- There is no routine maintenance required with the OSD2244V.

5 WARRANTY

Thank you for purchasing equipment designed, manufactured and serviced by Optical Systems Design (OSD). OSD warrants that at the time of shipment, its products are free from defects in material and workmanship and conforms to specifications. Our Warranty conditions are outlined below:

5.1 WARRANTY PERIOD

For warranty period, please contact your local OSD distributor.

5.2 REPAIRS

Optical Systems Design reserves the right to repair or replace faulty modules/units. Please obtain a "Return Material Authorisation" (RMA) form and number before returning goods.
Goods must be returned in adequate packing material to Optical Systems Design, Warriewood or its nominated authorised representative, for all repairs.

5.2.1 WARRANTY REPAIRS

Return shipments to OSD shall be at customer's expense and freight back to the customer will be at OSD expense.

5.2.2 OUT-OF-WARRANTY REPAIRS

OSD reserves the right to repair or replace any faulty goods. Freight costs and insurance for both journeys are met by the user. All equipment repaired by OSD will have a 3-Month Warranty from the date of dispatch.

5.2.3 SITE REPAIRS

By agreement site repairs may be undertaken for which out of pocket, hotel and travel expenses will be charged.

5.2.4 EXCLUSIONS

This warranty does not apply to defects caused by unauthorized modifications, misuse, abuse or transport damage to the equipment. All modifications to OSD's standard product will need written authorization and will be charged at normal repair rates. All modifications are to be carried out by OSD Technicians. Warranty is void if unauthorized removal and/or tampering with serial number and/or repair labels is evident.

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