Switch Configuration Example **for Q-SYS™ Platform**

D-Link DGS-1210 Series I DGS-1500 Series

Important Note

This switch configuration example is intended to serve as a network setup guideline for systems using Q-LAN audio and video streaming within your Q-SYS system and should be used alongside the **Q-SYS Networking** requirements in Q-SYS Help for deeper setup insight. Keep in mind that QSC is unable to provide live network configuration support for third-party switch configuration. To learn more about network switch qualification services and the plug-and-play Q-SYS NS Series preconfigured network switches, visit http://www.qsc.com/switches.

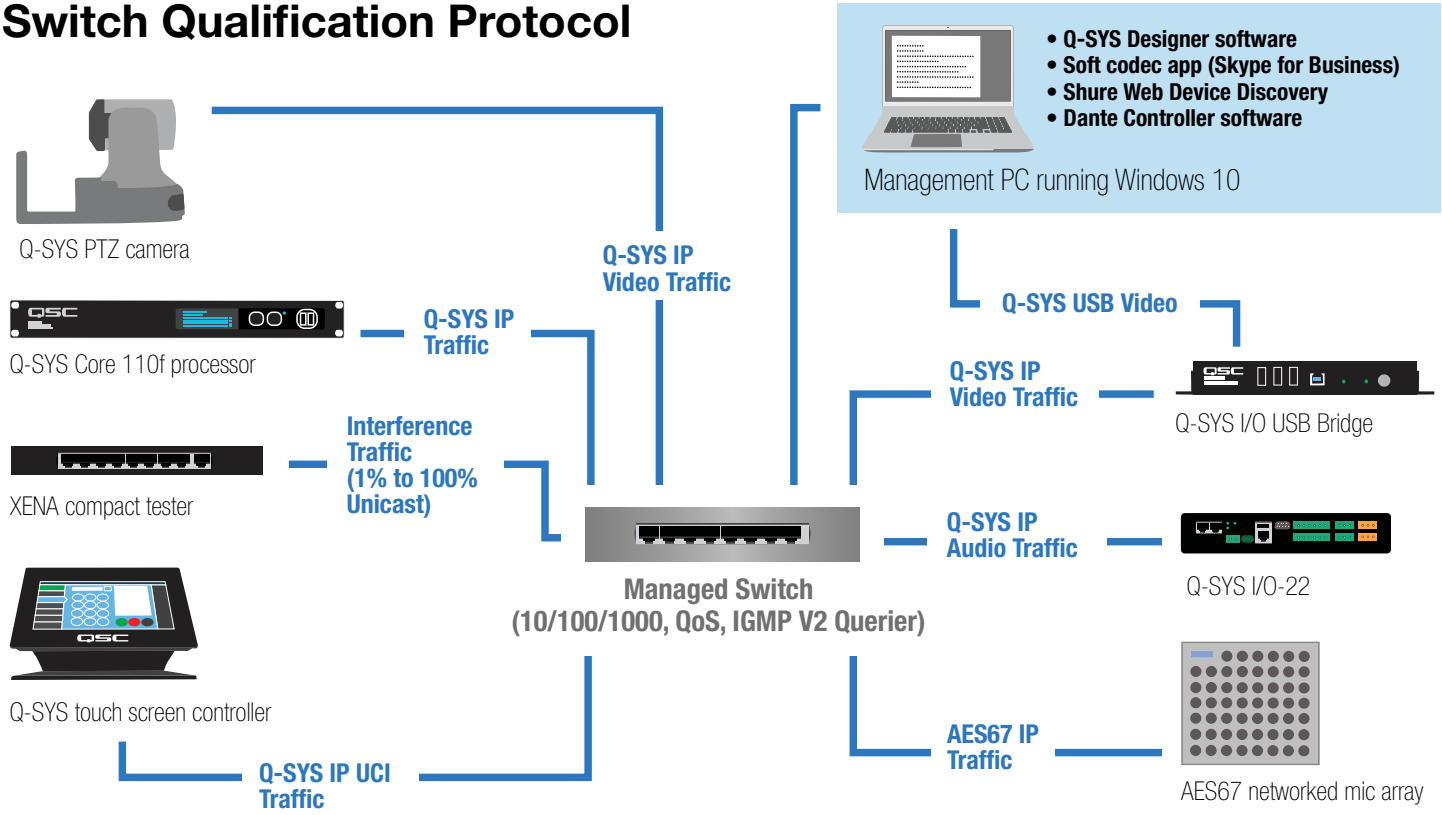
> This document applies to these D-Link switches:
> **DGS-1210 Series (DGS-1210-10P, DGS-1210-20, DGS-1210-28) I DGS-1500 Series (DGS-1500-20, DGS-1500-28, DGS-1500-28P)**

Introduction

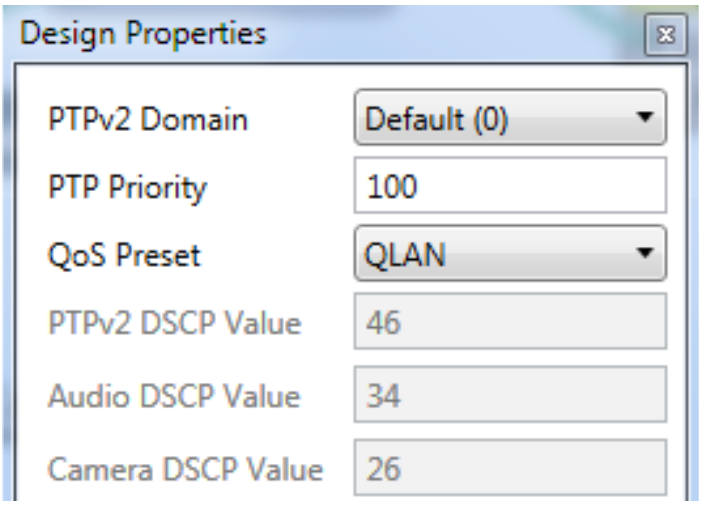
As of release 5.3.x, Q-SYS Designer Software now supports AES67-standard interoperability. The AES67 standard does not prescribe a method of discovery for devices so manufacturers are free to implement one or more discovery services for their devices. In this configuration document, the process uses Bonjour as the discovery method for AES67 devices.

Q-SYS Designer now also offers a selection of Differential Services Code Point (DSCP) setting presets to optimize Quality of Service (QoS) for different types of deployment. DSCP codes are a six-bit value placed in the IP header of data packet, and they instruct a network switch to handle various types of data with defined levels of priority that ensure proper QoS.

Switch Qualification Protocol



Selecting QoS presets in a Q-SYS design file



1. In Q-SYS Designer, open the design. Make sure it is disconnected from the Core processor (press **F7** or select **File > Disconnect**).
2. Select **File > Design Properties**.
3. Select the appropriate QoS preset (See specification table below.)

Specifications

Preset	Q-LAN	Audinate	Manual
Use for:	• Q-LAN-only network	• DANTE-only network	• If custom DSCP settings are necessary
	• Q-LAN + AES67 network	• DANTE + Q-LAN network	
		• DANTE + Q-LAN + AES67 network	
QoS class assigned:	PTPv2: 46 Audio: 34 Camera: 26	PTPv2: 56 Audio: 46 Camera: 26	PTPv2: 56 Audio: 46 Camera: 26

4. Leave the PTPv2 Domain and PTP Priority settings at default. Click **OK**.

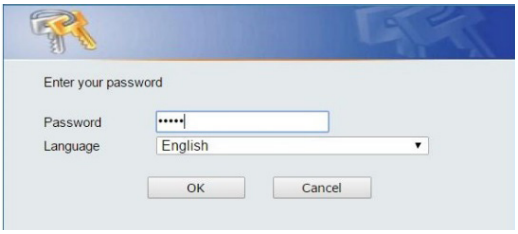
5. To save the settings, press **F5** or select **File > Save to Core & Run**.

Configuring the network switch for Q-SYS

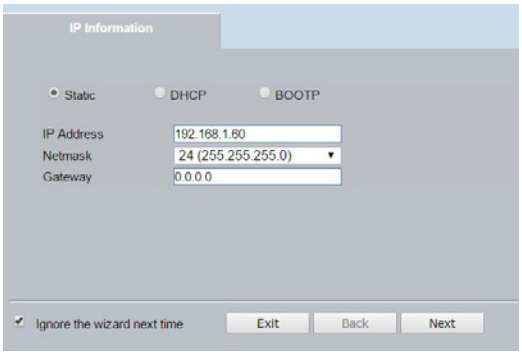
The network switch's default IP address is **10.90.90.90** and subnet is **255.0.0.0**. Make sure your computer's NIC uses an IP address that is within that subnet domain.

1. It is good practice to start with the switch set to its factory default settings. To reset the switch, turn it on and wait for it to reboot if it is not already running. Using a straightened paper clip or a similar object, press and hold the reset button for five seconds. It is recessed, located behind a small hole on the front panel of the switch.

2. Use a network cable to connect the computer to the switch.

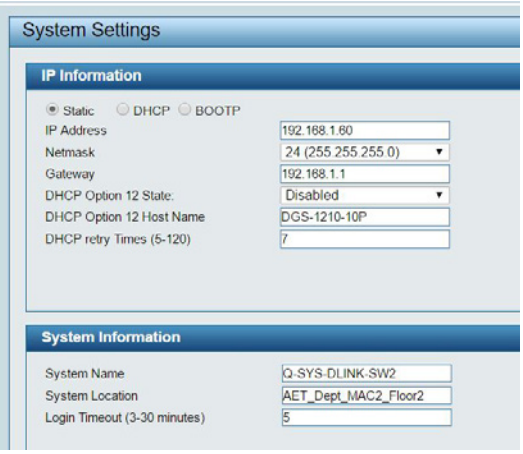


3. Type the switch's IP address into the address bar of your browser. Log into the switch (the default password is admin). Click **OK**.

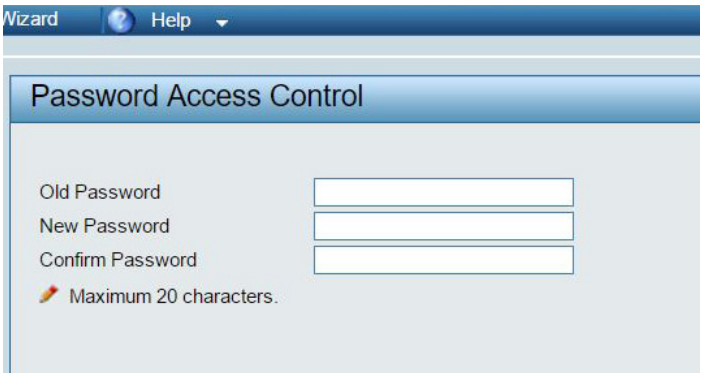


4. The switch's Smart Wizard will start. Select **Static**. Enter the intended **IP Address**. Select its subnet mask at **Netmask**. If the switch needs to be controllable from outside the subnet, enter an address for the **Gateway**.

   Select **Ignore the wizard next time** and click **Exit**.

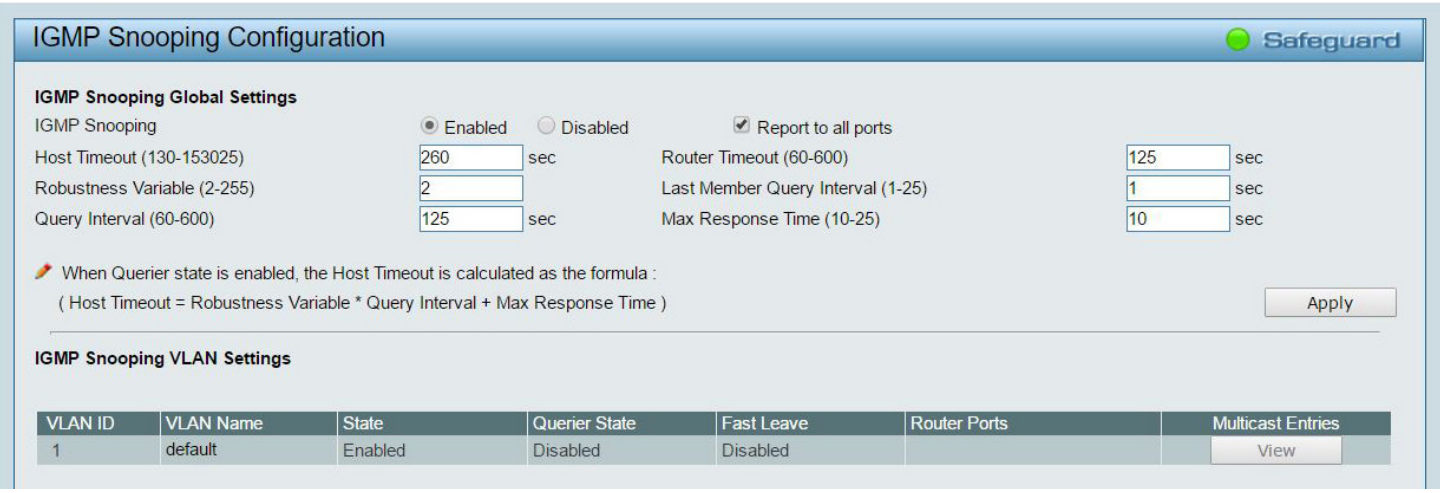


5. At the **System > System Settings** page of the switch's Web interface, assign a **System Name** of your choosing (under **System Information**). Also enter a description at **System Location**. To make the setup easier, extend the **Login Timeout** up to 30 minutes. Click **Apply**.



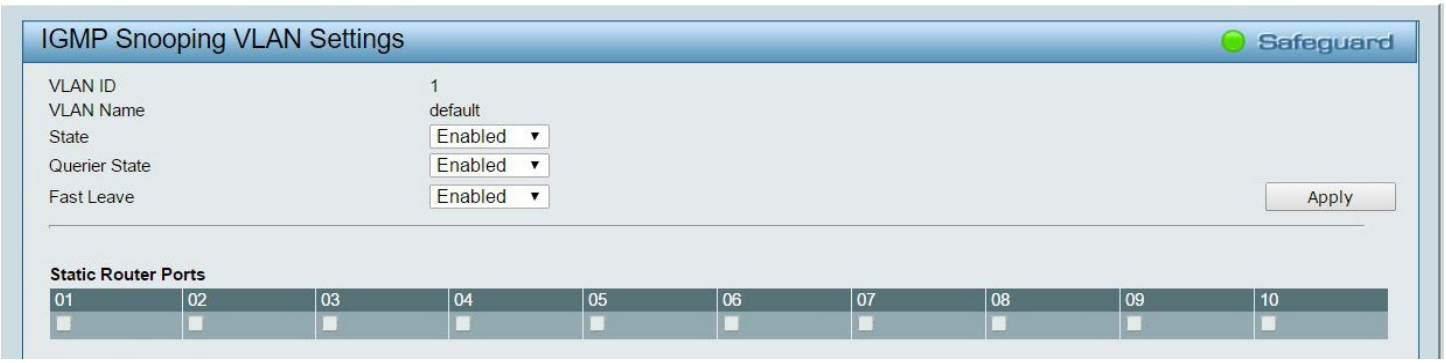
6. Go to **System > Password**. Set a new password for the switch and click **Apply**.

7. Go to **L2 Functions > Multicast > IGMP Snooping**. Under **IGMP Snooping Global Settings**, enter the following settings:



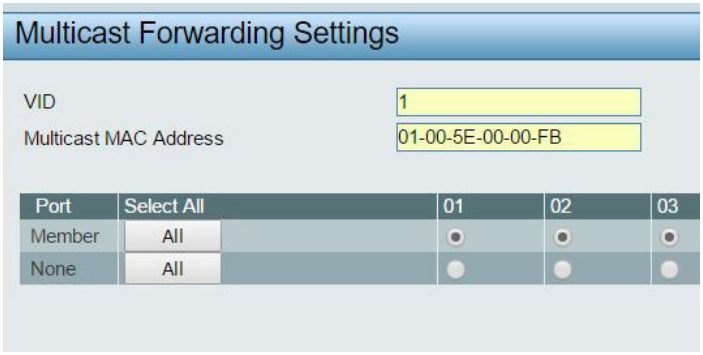
Click **Apply**. Under **IGMP Snooping VLAN Settings**, click on **VLAN 1**.

1. Set **Querier State** to **Enabled** (unless another switch on the subnet has already been or will be given that designation). Set **State** and **Fast Leave** to **Enabled** and click **Apply**. All the **Static Router Ports** should be unselected. Click **Apply**.





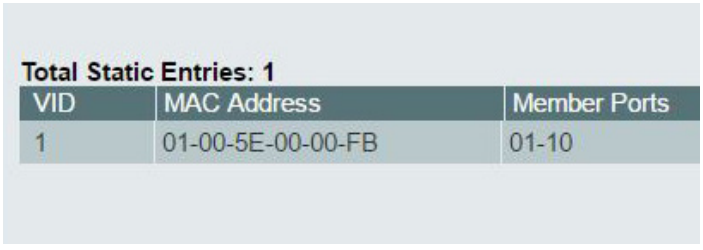
2. Go to **L2 Functions > Multicast > Multicast Filtering Mode**. At **VLAN ID**, enter **1** (the ID of the VLAN, since there is only one), and in **Filtering Mode**, select **Filter Unregistered Groups**. The Multicast Filtering Mode Table will update to show VLAN 1 in the Filter Unregistered Groups row.



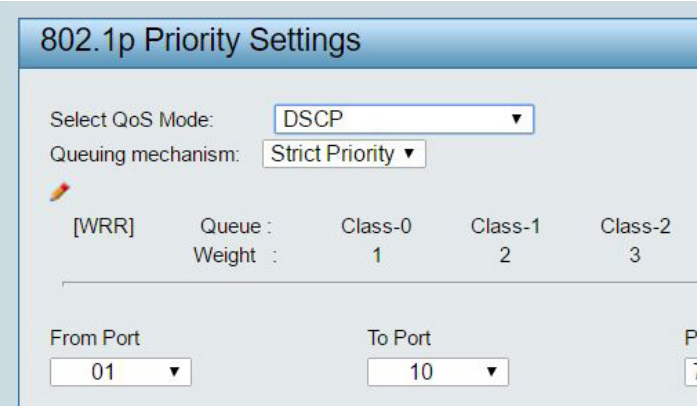
3. Go to **L2 Functions > Multicast > Multicast Forwarding**. Enter **1** (the ID of the VLAN) in **VID**, and in **Multicast MAC Address** type **01-00-5E-00-00-FB** (this is the multicast MAC address used by mDNS).

   In the **Port** table, in the **Member** row click **All**.

   Click **Add**.



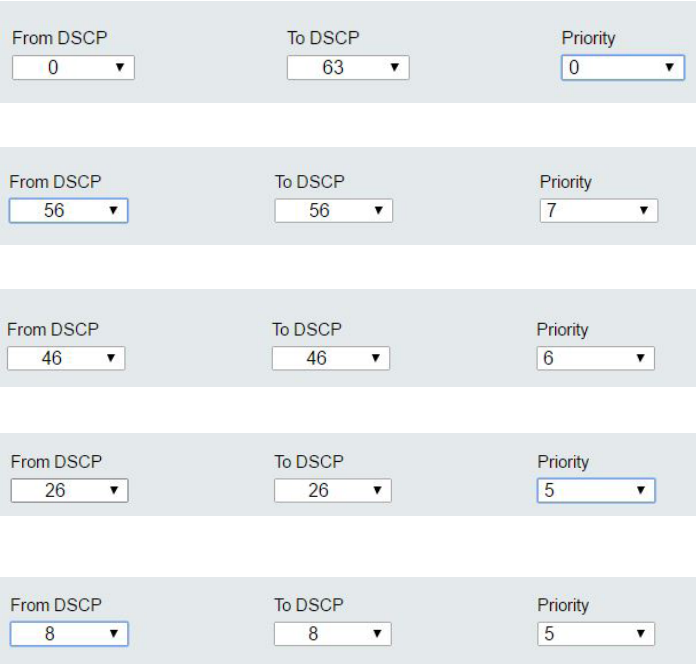
The MAC address and the ports will then appear in the Total Static Entries table.



4. The following steps will allow you to configure Quality of Service + (QoS).

   Go to **QoS > 802.1p/DSCP/ToS**. At **Select QoS Mode**, select DSCP. And for **Queuing mechanism**, select **Strict Priority**. Click **Apply**.

QoS for Audinate (Dante) or for Q-LAN+Audinate (Dante)



1. Apply priorities to the DSCP values. At **From DSCP**, select **0**. At **To DSCP**, select **63**. At **Priority**, select **Low** or **0**. Click **Apply**. This will set all DSCP values to low priority.

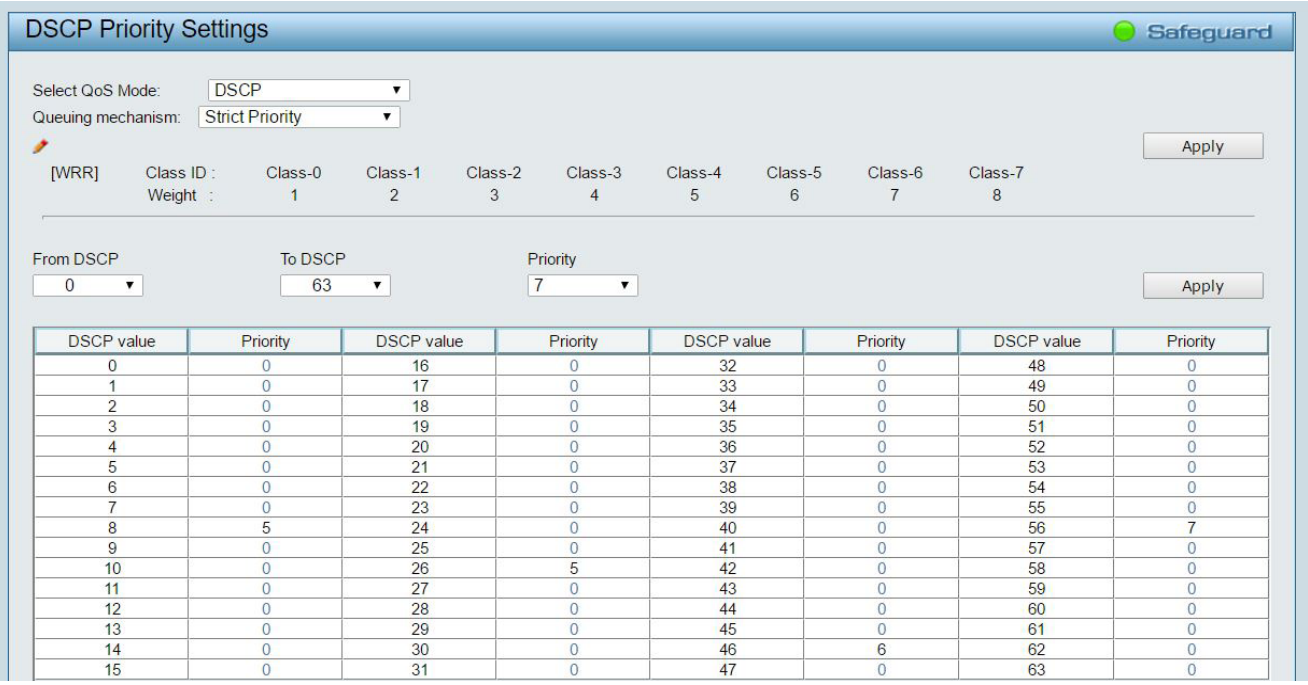
2. At **From DSCP**, select **56**. At **To DSCP**, also select **56** (if it is not already selected automatically). At **Priority**, select **Highest** or **7**. Click **Apply**.

3. At **From DSCP**, select **46**. At **To DSCP**, select **46** (if it is not already selected automatically). At **Priority**, select **High** or 6. Click **Apply**.

4. At **From DSCP**, select **26**. At **To DSCP**, select **26** (if it is not already selected automatically). At **Priority**, select **Medium** or **5**. Click **Apply**.

5. At **From DSCP**, select **8**. At **To DSCP**, select **8** (if it is not already selected automatically). At **Priority**, select **Medium** or **5**. Click **Apply**.

6. The DSCP Priority table should now have these values:



DSCP Priority Settings — Safeguard

Select QoS Mode: DSCP
Queuing mechanism: Strict Priority
Apply

[WRR]	Class ID :	Class-0	Class-1	Class-2	Class-3	Class-4	Class-5	Class-6	Class-7
	Weight :	1	2	3	4	5	6	7	8

From DSCP: 0 | To DSCP: 63 | Priority: 7 | Apply

DSCP value	Priority	DSCP value	Priority	DSCP value	Priority	DSCP value	Priority
0	0	16	0	32	0	48	0
1	0	17	0	33	0	49	0
2	0	18	0	34	0	50	0
3	0	19	0	35	0	51	0
4	0	20	0	36	0	52	0
5	0	21	0	37	0	53	0
6	0	22	0	38	0	54	0
7	0	23	0	39	0	55	0
8	5	24	0	40	0	56	7
9	0	25	0	41	0	57	0
10	0	26	5	42	0	58	0
11	0	27	0	43	0	59	0
12	0	28	0	44	0	60	0
13	0	29	0	45	0	61	0
14	0	30	0	46	6	62	0
15	0	31	0	47	0	63	0

Quality of Service for Q-LAN only



From DSCP: 0 | To DSCP: 63 | Priority: 0

1. At **From DSCP**, select **0**. At **To DSCP**, select **63**. At **Priority**, select **Low** or **0**. Click **Apply**.

   This will set all DSCP values to low priority.



From DSCP: 46 | To DSCP: 46 | Priority: 7

2. At **From DSCP**, select **46**. At **To DSCP**, also select **46** (if it is not already selected automatically). At **Priority**, select **Highest** or **7**. Click **Apply**.



From DSCP: 34 | To DSCP: 34 | Priority: 6

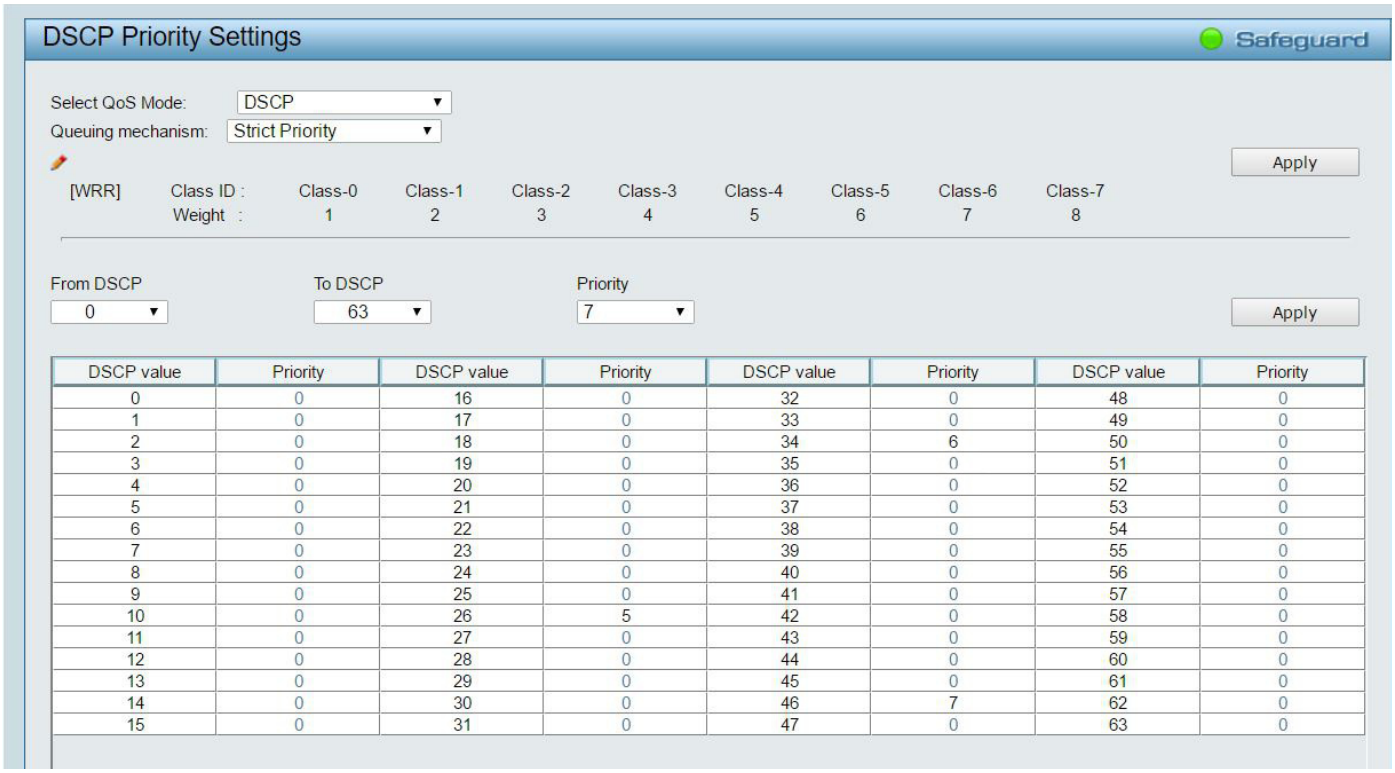
3. At **From DSCP**, select **34**. At **To DSCP,** select **34** (if it is not already selected automatically). At **Priority**, select **High** or **6**. Click **Apply**.



From DSCP: 26 | To DSCP: 26 | Priority: 5

4. At **From DSCP** select **26**. At **To DSCP**, select **26** (if it is not already selected automatically). At **Priority**, select **Medium** or **5**. Click **Apply**.

5. The DSCP Priority table should now have these values:



DSCP Priority Settings

Safeguard

Select QoS Mode: DSCP

Queuing mechanism: Strict Priority

Apply

[WRR]	Class ID :	Class-0	Class-1	Class-2	Class-3	Class-4	Class-5	Class-6	Class-7
	Weight :	1	2	3	4	5	6	7	8

From DSCP: 0 | To DSCP: 63 | Priority: 7 | Apply

DSCP value	Priority	DSCP value	Priority	DSCP value	Priority	DSCP value	Priority
0	0	16	0	32	0	48	0
1	0	17	0	33	0	49	0
2	0	18	0	34	6	50	0
3	0	19	0	35	0	51	0
4	0	20	0	36	0	52	0
5	0	21	0	37	0	53	0
6	0	22	0	38	0	54	0
7	0	23	0	39	0	55	0
8	0	24	0	40	0	56	0
9	0	25	0	41	0	57	0
10	0	26	5	42	0	58	0
11	0	27	0	43	0	59	0
12	0	28	0	44	0	60	0
13	0	29	0	45	0	61	0
14	0	30	0	46	7	62	0
15	0	31	0	47	0	63	0



From Port	To Port	Speed	MDI/MDIX
01	10	Auto	Auto

6. For best results when the system includes a Q-SYS TSC-7w or TSC-7t touchscreen controller, you need to enable flow control. To do so, go to **System > Port Settings**. At **From Port**, select **01**. At **To Port**, select the highest port number on the switch. At **Speed**, select **Auto**. At **MDI/MDIX**, select **Auto**. At **Flow Control**, select **Enabled**. Click **Apply**.

   A warning box will pop up asking if you wish to proceed. Click **OK**. All the ports will disconnect and re-connect to renegotiate link speed, auto-crossover, and flow control with each device. The Port Settings table should indicate that all ports now have flow control enabled.

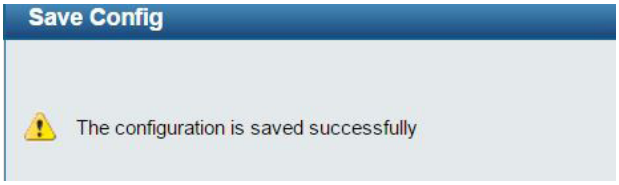
Completing switch configuration



1. Go to **Save > Save Configuration**.



2. Click **Save Config** to save the new settings to the switch's flash memory.



3. When it finishes saving the configuration, click **Continue**. The switch is now ready for use.

Troubleshooting discovery issues

This setup procedure for these D-Link switches will work for most Q-SYS applications. For reasons we haven't yet found, though, some systems have exhibited problems with discovery processes with these settings. Here are some examples of these problems:

- Q-SYS Configurator fails to list one or more core processors that are on the network
- Dante™ Controller does not see AES67 or Dante devices on the network
- The SHURE® Web Discovery application does not see devices on the network

If you encounter these or similar network discovery problems when using a switch configured according to this setup guide, there are a couple steps to try. First, log into the switch as instructed in this setup guide.

1. Disable IGMP snooping. To do this, go to **L2 Functions > Multicast > IGMP Snooping** (see page 4, step 7). Under **IGMP Snooping Global Settings**, select **Disabled**. Save the configuration.

2. Turn off multicast filtering of unregistered groups. To do this, go to **L2 Functions > Multicast > Multicast Filtering** (see page 5, step 9). Enter **1** at **VLAN ID**. At **Filtering Mode**, select **Forward Unregistered Groups**. Save the configuration.

   Possible complications: Large amounts of unfiltered multicast traffic could flood some devices on the network and cause them to lose communication intermittently. Devices that have very limited network processing capacities—for example, Q-SYS touchscreen controllers, small network printers, et al—are most likely to be affected. Q-SYS produces very small amounts of multicast traffic, but other traffic, such as video streaming, may cause problems.

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