

QSC

Application Guide

Using Q-SYS with Dolby® Atmos



AET Application
Engineering
Team

Q-SYS AND DOLBY® ATMOS.

The versatility and processing power of Q-SYS and Q-SYS Core Processors make them an ideal cinema audio infrastructure to implement a Dolby Atmos system on. The QSC cinema core processor family comprises two models, the Core 110c and the Core 510c.

Q-SYS BEST PRACTICES FOR CINEMA

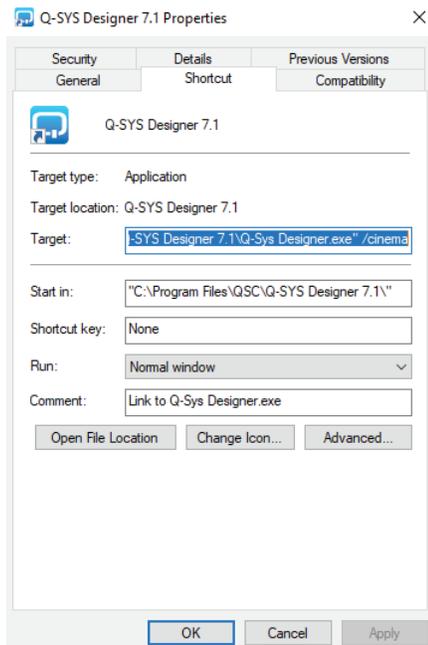
Use this check list to be sure you've adopted the best practices for launching a Q-SYS network for cinema.

- Use qualified, properly configured network switches. QSC now makes available a line of switches that are pre-configured for most Q-SYS applications but also easily adaptable for more specialized ones. For more information on Q-SYS NS Series network switches or for guidance on identifying and setting up third-party network switches, see <https://www.qsc.com/systems/products/q-sys-platform/products-peripherals-accessories/network-switches/q-sys-networking-solutions/>
- For information on general third-party switch requirements for Q-LAN, see https://www.qsc.com/resource-files/productresources/dn/3rd_party_control/q_tn_sys_dn_qsys_generalswitchrequirements.pdf
- Use separate switches for each LAN unless you have the IT support resources available to set up VLANs on managed switches.
- Disable PTPv2 (clock) on any network interface controller (NIC) that connects to the house/control network (typically on LAN B).
- Use a separate PTP clock domain for each core processor.
- For sharing music, use WAN TX and RX.
- Isolate all Q-SYS devices into LAN A.
- There should be only one gateway per core processor.
- Do not duplicate any IP addresses or overlap any subnet ranges.

A typical cinema system with Q-SYS has three networks:

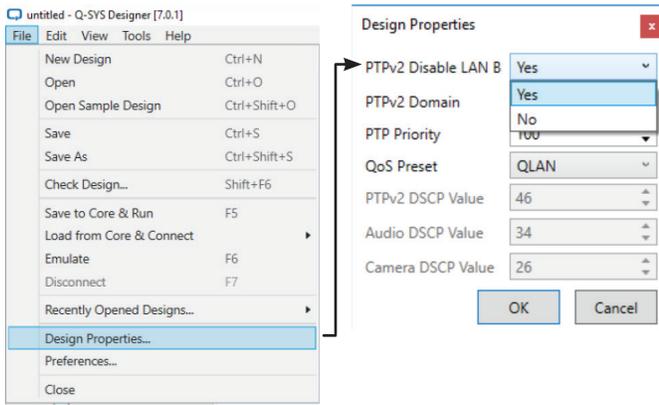
- QLAN, where all the Q-SYS components reside and are interconnected on LAN A.
- Management network, used by the theatre management system (TMS) to communicate commands, schedules, and status with the individual components of each stadium.
- Media network, used exclusively for media or content transfer. Each server receives via this network both its media to be played and also its key delivery messages (KDMs) that enable it to be played with the appropriate server features.

USING Q-SYS WITH ATMOS



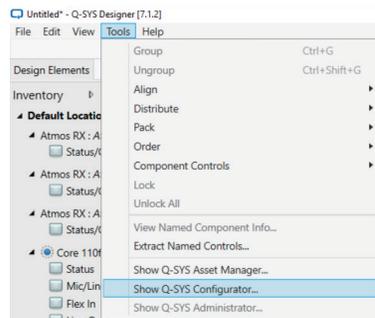
Enabling the cinema library in Q-SYS Designer Software

1. Unlock the cinema library to gain access to the Atmos receiver block. To do this, right-click on the Q-SYS Designer Software application or shortcut.
2. Select **Properties**.
3. Select **Shortcut**.
4. Add **/cinema** to the **Target** address.
5. Click **OK**.



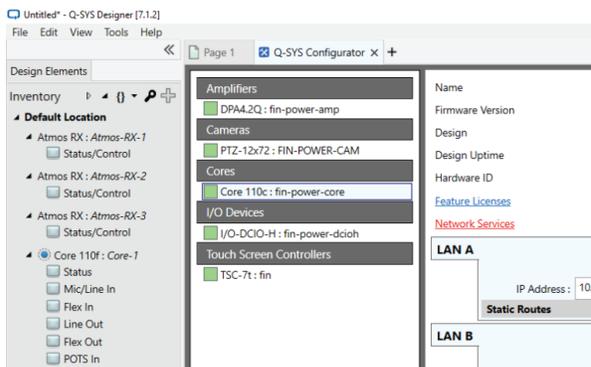
Disabling PTPv2 on LAN B in Q-SYS Designer Software (5.4 to 7.0.1)

1. Go to **File > Design Properties**.
2. At **PTPv2 Disable LAN B** select **Yes**.
3. Match the setting in **PTPv2 Domain** to the setting configured in the Dolby CP850.
4. Match the **PTPv2 User Domain** setting to the **PTP Domain Number** configured into the Dolby CP850.

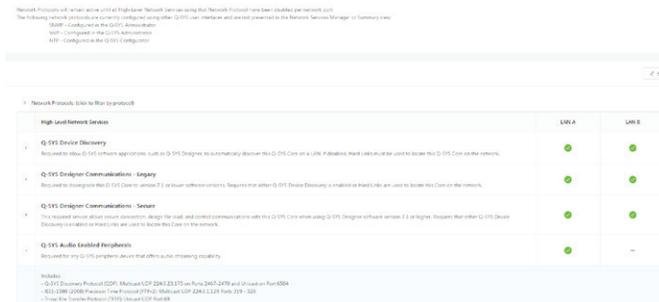


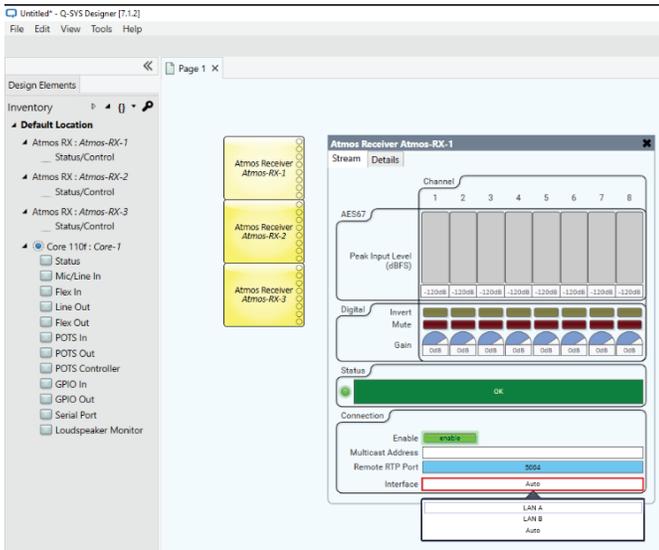
Disabling PTPv2 on LAN B in Q-SYS Designer Software (7.1 and higher)

1. Open the design in Q-SYS Designer.
2. Select **Tools > Show Q-SYS Configurator...**
3. Click the core processor. Click **Network Services**.



4. A window will open showing all the network services available for or configured for the core processor. Click **Edit** and then clear **Q-SYS Audio Enabled Peripherals** on **LAN B**. Click **Save**.

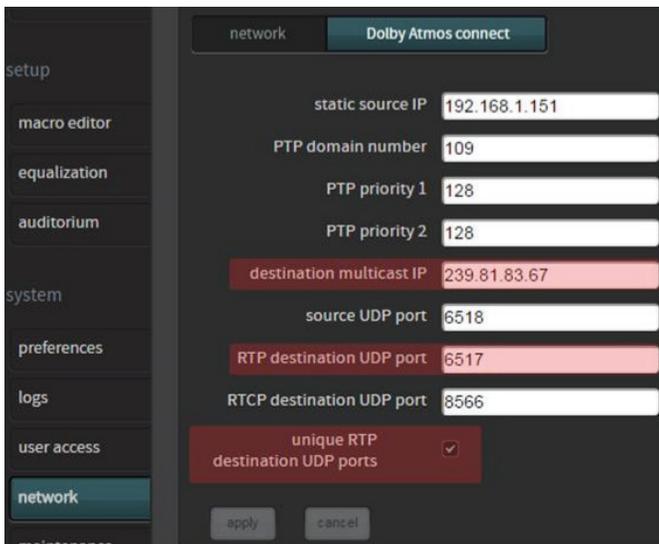




Using design blocks for Atmos

Enabling the cinema library in the first step gave you access to cinema-specific components and devices such as the Atmos Receiver.

1. Add Atmos Receiver blocks to the design as needed. Each block has eight outputs available.
2. Double-click each Atmos Receiver block to open its interface window.
3. With the design running (either **Save To Core & Run** or **Emulate**), set each block to Enable. Set each to a unique **Remote RTP Port** as assigned by the Dolby CP850 processor or IMS3000 server.
4. Set each block's Interface to **LAN A**.



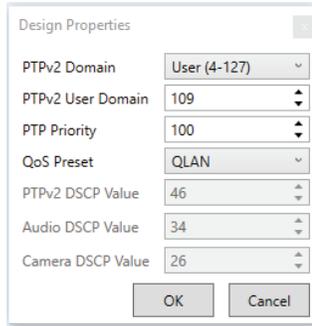
Dolby CP850 and IMS3000 settings

1. Open a web browser and enter the IP address of the Dolby CP850 processor in the address bar. Set up the browser and Q-SYS Designer Software windows side-by-side so you can match the settings between them.
2. Log into the server's web interface. Select **Dolby Atmos connect**.

Notes:

- The static source IP needs no modification. It is used by Dolby.
 - The PTP domain number must match that of the destination core processor but differ from the PTP domains of the other core processors.
 - Acceptable values for PTPv2 priorities are 1 through 253. (For more information, [see https://www.luminex.be/improve-your-timekeeping-with-ptpv2/](https://www.luminex.be/improve-your-timekeeping-with-ptpv2/).)
 - The **destination multicast IP address** here and in the Q-SYS core processor must match. The Q-SYS default is 239.81.83.67, but it can be changed in the Atmos Receiver block in Q-SYS Designer Software, if necessary.
 - The **RTP destination UDP port** must match the **Remote RTP Port** number in the first Atmos Receiver block. The port number in each successive additional Atmos Receiver block must increment by 1. Q-SYS defaults to these values, but you should check them to confirm.
3. In Dolby Atmos connect, select **unique RTP destination UDP ports** and click **apply**.

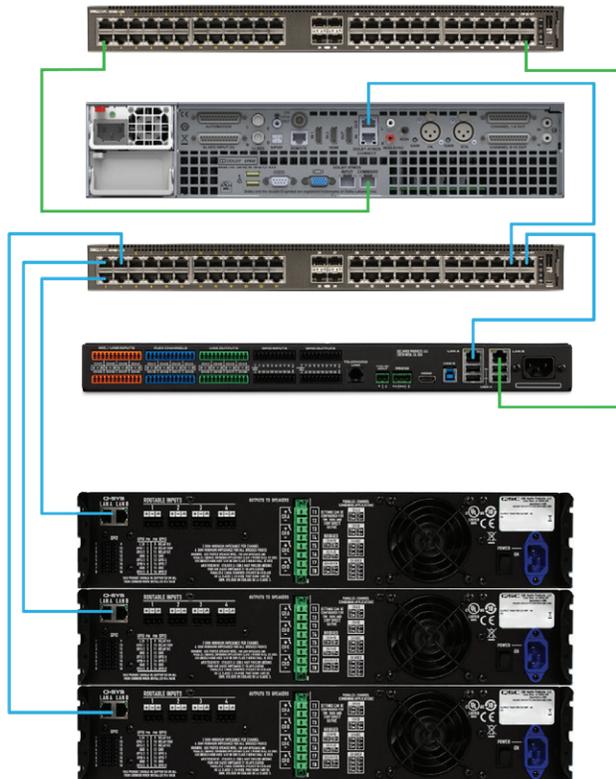
NOTE: Make sure you have Dolby Atmos and AES67 enablement licenses or keys in the CP850 or IMS3000. These are installed or enabled through a Key Delivery Message (KDM). Contact Dolby for information.



4. In Q-SYS Designer Software, with the Q-SYS design disconnected (**File > Disconnect** or **F7**), go to **File > Design Properties...**
5. At **PTPv2 Domain**, select **User (4-127)**. Match **PTPv2 User Domain** in the Q-SYS design and **PTP domain number** in Dolby Atmos connect.

SAMPLE SETUPS

NOTE: The following examples show networks set up with virtual LANs (VLANs) on managed switches. It is also acceptable to use separate switches for each LAN, and it is recommended for cinema installations where there is insufficient IT support to configure VLANs properly.



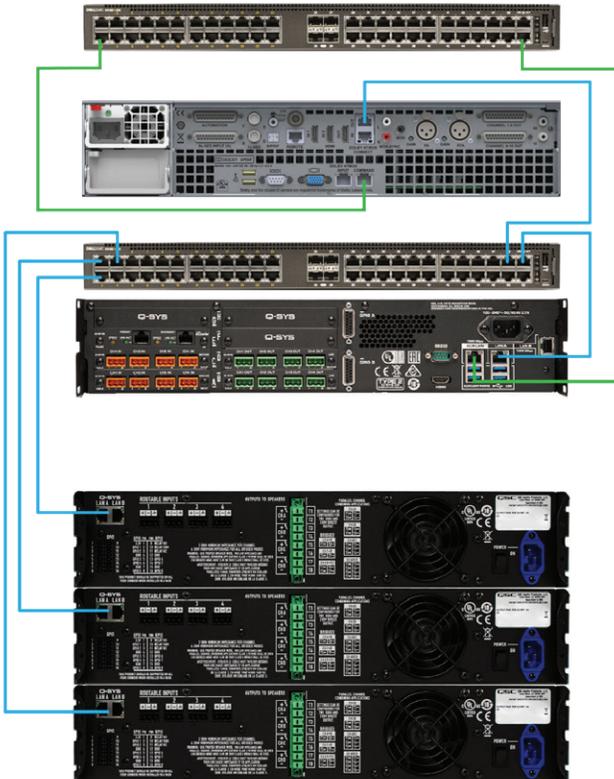
Atmos setup case 1.a

This is the simplest Q-SYS + Dolby Atmos scenario. It comprises these components:

- Dolby CP850 processor
- Q-SYS Core 110c
- QSC DPA-Q power amplifiers
- Managed switches separating Q-SYS and management into separate VLANs. Use separate switches for each LAN if you do not have the IT support resources available to set up VLANs on managed switches.

Blue—Q-SYS network

Green—Management network



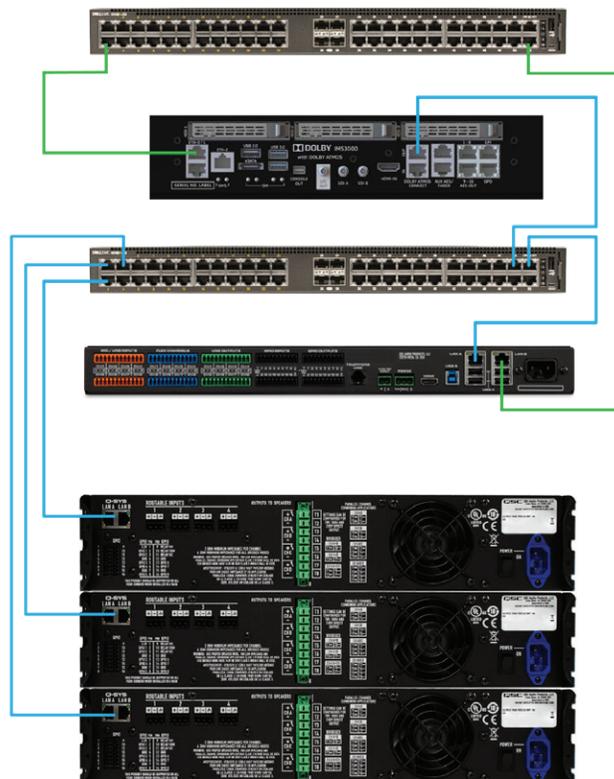
Atmos setup case 1.b

This is similar to Case 1.a, but with a Core 510c instead of a Core 110c. It comprises these components:

- Dolby CP850 processor
- Q-SYS Core 510c
- QSC DPA-Q power amplifiers
- Managed switches separating Q-SYS and management into separate VLANs. Use separate switches for each LAN if you do not have the IT support resources available to set up VLANs on managed switches.

Blue—Q-SYS network

Green—Management network



Atmos setup case 1.c

Here, the Dolby CP850 is integrated into the Dolby IMS3000 media server, with AES67 streaming configured within the Dolby web interface. The system comprises these components:

- Dolby IMS3000 media server
- Q-SYS Core 110c or Core 510c
- QSC DPA-Q power amplifiers
- Managed switches separating Q-SYS and management into separate VLANs. Use separate switches for each LAN if you do not have the IT support resources available to set up VLANs on managed switches.

Blue—Q-SYS network

Green—Management network

REDUNDANCY: THE SHOW MUST GO ON

Even as rare as hardware failure is, the reliability of the Q-SYS network can be made even more solid by taking advantage of the redundancy capabilities of Q-LAN and of Q-SYS core processors. Implementing a redundant network infrastructure adds a high degree of fault tolerance, and the automatic switchover abilities of a Q-SYS core processor eliminate the need for immediate human intervention to keep a cinema presentation going.

Reliability strategies can employ varying degrees of redundancy to suit various cost targets and a range of available resources. For more information, please see the QSC white paper on Q-LAN architecture and redundancy at https://www.qsc.com/resource-files/whitepapers/q_wp_sys_dn_qsys_qlan_networkredundancy.pdf.



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