

# Application Guide Using Q-SYS with Dolby® Atmos







### 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 preconfigured for most Q-SYS applications but also easily adaptible 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.

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### USING Q-SYS WITH ATMOS

#### 🔜 Q-SYS Designer 7.1 Properties

Security General	Detail: Sho	s tcut	Previous Versions Compatibility			
<b>,</b>	Q-SYS Designer 7.1					
Target type: Application						
Target location: Q-SYS Designer 7.1						
Target:	get: -SYS Designer 7.1\Q-Sys Designer.exe" /cinema					
Start in:	"C:\Program Files\QSC\Q-SYS Designer 7.1\"					
Shortcut key:	None					
Run:	Normal window $\sim$					
Comment:	ent: Link to Q-Sys Designer.exe					
Open File Lo	cation Cl	nange Icon.	Advanced			
	OK	(	Cancel Apply			

### Enabling the cinema library in Q-SYS Designer Software

- 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.

File	Edit View Tools Help		Design Properties	
	New Design	Ctrl+N	PTPv2 Disable LAN B	Yes
	Open Sample Design	Ctrl+O Ctrl+Shift+O	PTPv2 Domain	Yes
	Save	Ctrl+S	PTP Priority	No
	Save As	Ctrl+Shift+S	QoS Preset	QLAN
	Check Design	Shift+F6	PTPv2 DSCP Value	46
	Save to Core & Run Load from Core & Connect	F5	Audio DSCP Value	34
	Emulate	F6	Camera DSCP Value	26
	Recently Opened Designs	F7		ОК
	Design Properties			
	Preferences			
	Close			

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

1. Go to File > Design Properties.

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÷ Cancel

Ctrl+Shift+G

- 2. At PTPv2 Disable LAN B select Yes.
- **3.** Match the setting in **PTPv2 Domain** to the setting configured in the Dolby CP850.
- 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.



Untitled\* - Q-SYS Designer [7.1.2]
File Edit View Tools Help

Design Elements

Inventory D

A Default Locatio

Atmos RX : A

Atmos RX : A

Atmos RX : A

Core 110f
 Status
 Mic/Lin

Status/

Status/

Status/

Group

Align Distribute

Pack

Order

Lock

Unlock All

Component Controls

View Named Component Info...

Show Q-SYS Asset Manager.

Extract Named Controls.

Ungroup

 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.

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-	less-onk Protocols: (siloi to Blac by protocol)		
	High-Levil Network Services	LAN A	UN B
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	Q-SYS Designer Communications - Legary Requests during store the O SYS Core to version 2.1 or shown others events in Requires that either O SYS Design Discovery is instantion Head Links are used to booter this Core on the remont.	0	•
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#### 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.
- 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

- 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-byside 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/.)
- 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 destina**tion 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.

Design Properties	
PTPv2 Domain	User (4-127) ~
PTPv2 User Domain	109
PTP Priority	100 🗘
QoS Preset	QLAN ~
PTPv2 DSCP Value	46 🔹
Audio DSCP Value	34 🗘
Camera DSCP Value	26 🗘
	OK Cancel

- 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
- Dolby CP850 proces
   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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