

Summary

This procedure will allow Q-Sys to integrate with an existing CobraNet system by providing instructions on setting up CobraNet Bundle Assignments for the Q-Sys CCN32 CobraNet Card.

NOTE: If the CCN32 Card is used in a Q-Sys Core, it can only accept a maximum of 32 Audio Channels per card. Multiple CCN32 cards can be used in an "Integrated Core" model to expand the CobraNet channel count. Also if a CCN32 card is used in a Q-Sys I/O Frame, a maximum of 16 Audio Channels can be used. Only one CCN32 card can be used in an I/O Frame when "maximizing" the CobraNet channel count, no other cards can be used on the same I/O Frame at that point.

The example provided is based on a system that is using all eight audio channels per assigned bundle. There are situations where a CobraNet device may only transmit 2 or 4 audio channels per bundle. It is possible to setup the CCN32 to receive in this configuration. The last section titled "Additional Notes" will discuss SubMap routing to maximize the CobraNet Audio channel count getting in to the Core or I/O Frame.

Requirements

This procedure requires the use of a third-party software called "CobraNet Discovery" or "Disco" to be installed. If you are unfamiliar with the software or do not have the software installed, instructions on where to find and use the software are included within this document.

This procedure will require a basic knowledge on how to change your computer's wired network adaptor settings as well as require that you have administrative rights to adjust your Firewall and Antivirus Protection software.

This procedure will require that a CCN32 is installed in a Q-Sys Core or Q-Sys I/O Frame and that the Core or Frame must be powered on. Also the CCN32 must be wired to a network switch or must be connected directly to the local computer's network interface adaptor. A network cross-over cable may be required for a direct connection.

Procedure

If you do not have CobraNet Discovery or "Disco" loaded on your computer, the software can be found at the following URL as a FREE download:

<http://www.cobranet.info/downloads/disco>

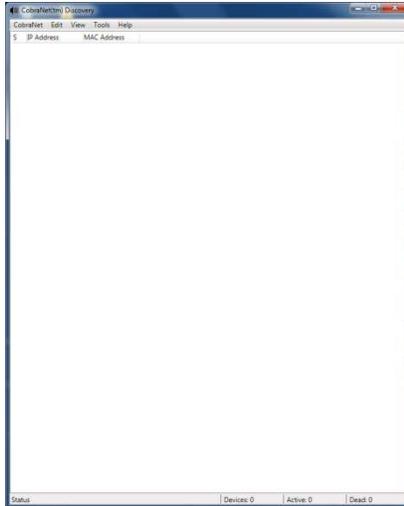
Download Disco version 4.0.5 and save to your local computer. Once the download is complete, EXTRACT the contents of the zipped file by right-clicking on the compressed folder and select "Extract All". Once the installer has been extracted, double click the appropriate installer for your computer.

Windows 7 64 bit = CNDisco_v405_x64

Windows 7 32 bit / Vista / XP = CNDisco_v405_x32

Once the software is installed, connect your computer to the CobraNet network.

Go ahead and launch Disco....



Unpopulated Discovery Window



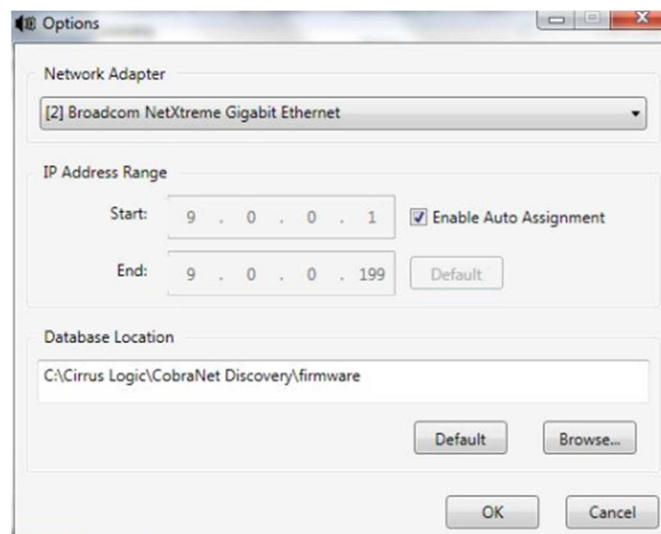
Populated Discovery Window

Once open, the CobraNet devices on the network may start to populate the "Discovery Window". If they DO NOT or the Q-Sys device that you need to see does not populate then you will need to perform the following steps.

If the CobraNet hardware being used DOES NOT have an IP address assigned to the CobraNet device or if you are not sure if there is an IP address, you will want to setup up Disco to function as a temporary DHCP server to issue IP addresses out to each device. Without an IP address, Disco will not be able to communicate with the CobraNet device.

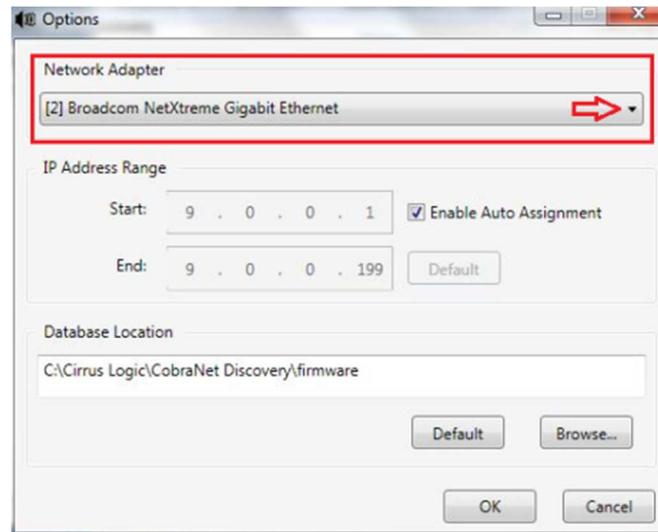
NOTE: When setting up the CCN32 Card for Q-Sys, the Q-LAN A & B network connections are completely different network interface connections hence the IP Addresses assigned to the Core or I/O Frame for those Network Adaptors do not apply to the CobraNet Card.

To change the network settings for Disco, you will want to navigate to the "Tools" drop-down menu within Disco and select "Options" to open the Options window.



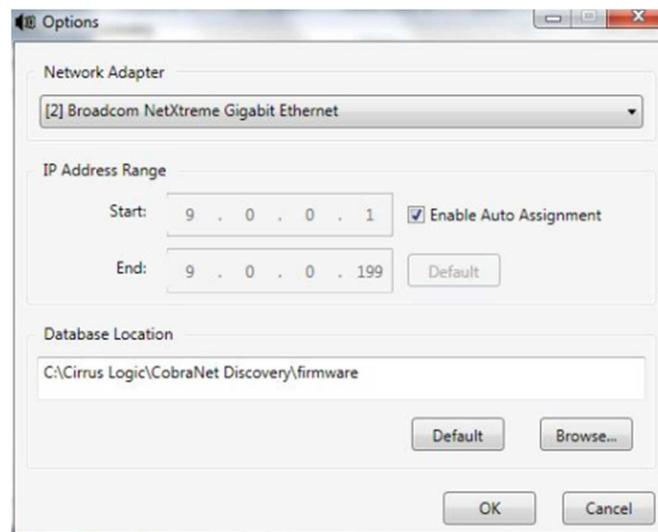
Options Window - Default

Now select the appropriate Network Adaptor that is being used by the local computer to communicate with the CobraNet hardware.



Options Window - Network Adaptor

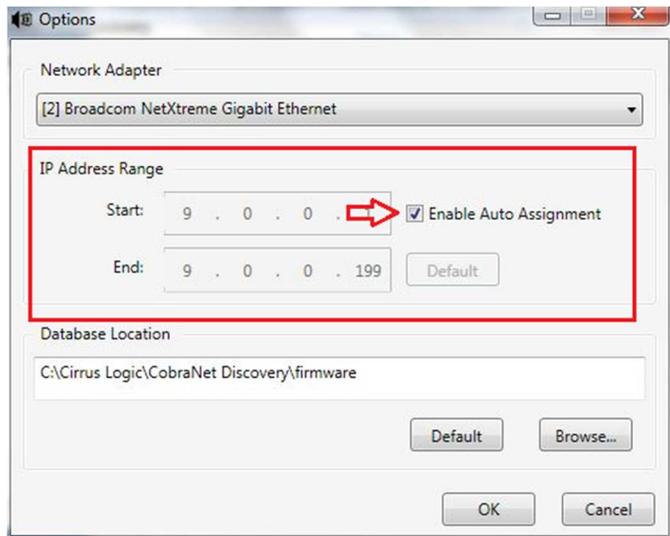
With the appropriate network adaptor identified, now you will want to establish an IP Address Range for Disco's DHCP server. You can use the default Disco address range OR you can change the IP Address Range so that it matches the IP Subnet of the selected network adaptor on the local computer.



Options Window - Default

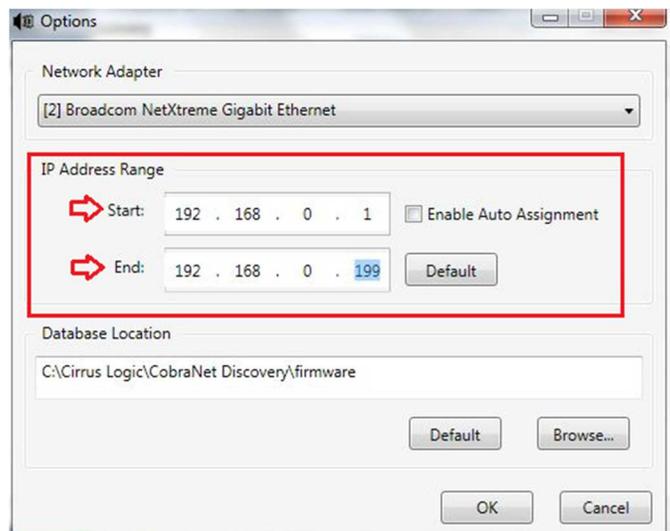
Please note that if you decide to use the "Default" IP Address Range within Disco, you will most likely need to change the IP Configuration of the computer so that it will live in the same subnet range as the Disco IP Address Range. The default range is a 9.0.0.1 to 9.0.0.199 with an 8 bit Subnet Mask so your local computer's IP configuration will need to be changed to sit within that range.

On the contrary if you decide to enter in a custom IP Address Range in Disco to match the Subnet of the local computer, you must first remove the checkmark from the "Enable Auto Assignment" box. Once that is done, you can now make the appropriate changes.



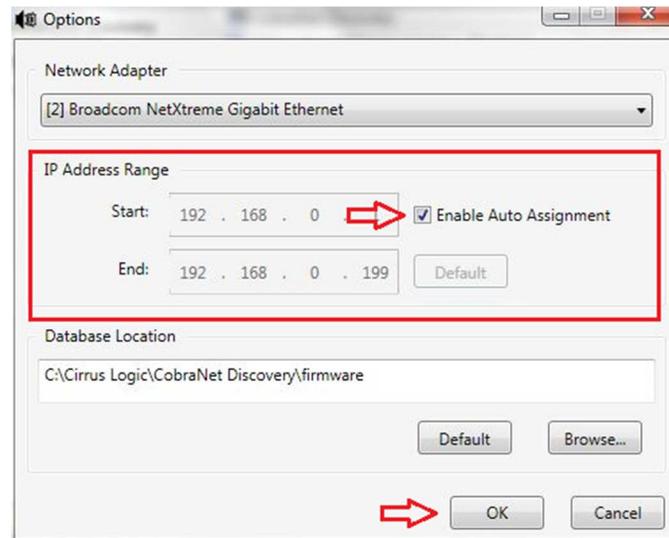
Options Window - Disable Auto Assignment

Now you can enter the appropriate “Start” and “End” IP Address to establish the Range.



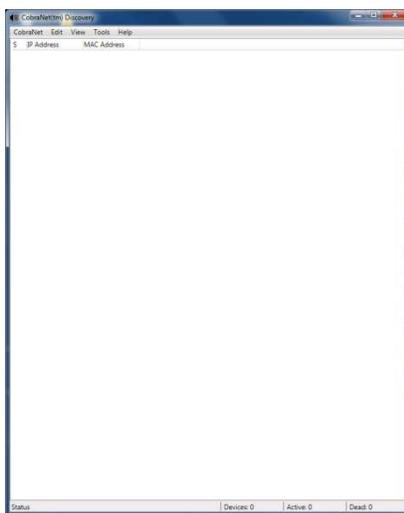
Options Window - Enter in IP Address Range

Once the changes have been made, you will need to reapply the checkmark back to “Enable Auto Assignment”. Now you can click “OK” to close out of this window.



Options Window - Enable IP Address Range Change

The CobraNet Hardware may start to populate the Discovery Window at this point.



Unpopulated Discovery Window



Populated Discovery Window

If the CobraNet hardware still does not appear in Disco, you will want to make sure that you temporarily disable all anti-virus software, firewall, and/or network protection as this may be blocking communication with the CobraNet hardware.

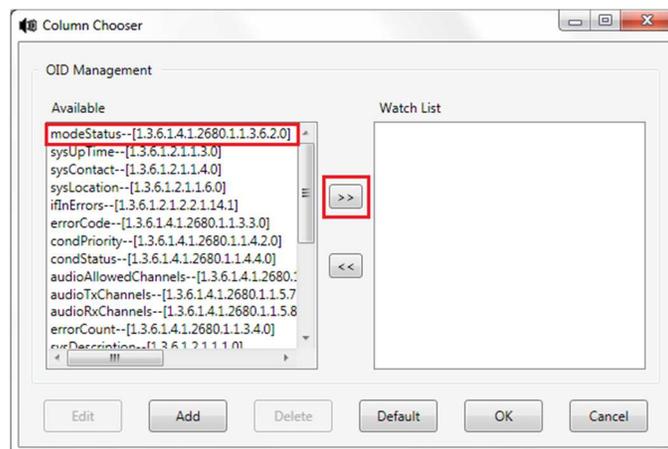
At this point all the CobraNet devices will start to populate the Discovery Window; listing each IP Address, MAC Address, as well as the Status for each device.



Populated Discovery Window

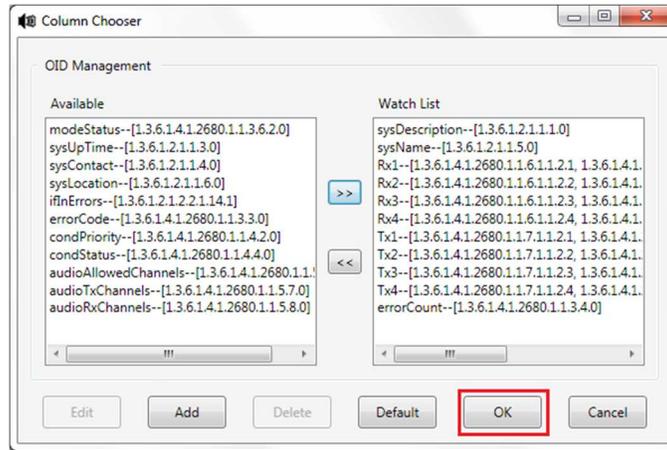
In order to make Disco more useful, there are additional columns of information that you can add that will help with identifying CobraNet hardware as well as determining the number of Transmit (TX) and Receive (RX) bundle are being used for each device. Here is a procedure for adding those functions.

From the “Discovery” window, navigate to the “View” drop-down menu and select “Column Chooser”



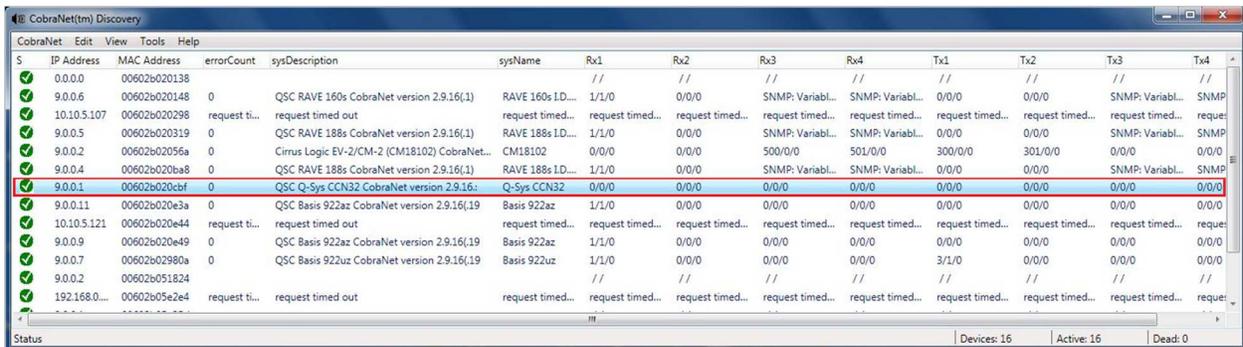
Column Chooser - Default

To ADD or REMOVE Columns, first select the column feature and then use the “double arrow” buttons to add or remove feature to/from the “Watch List”



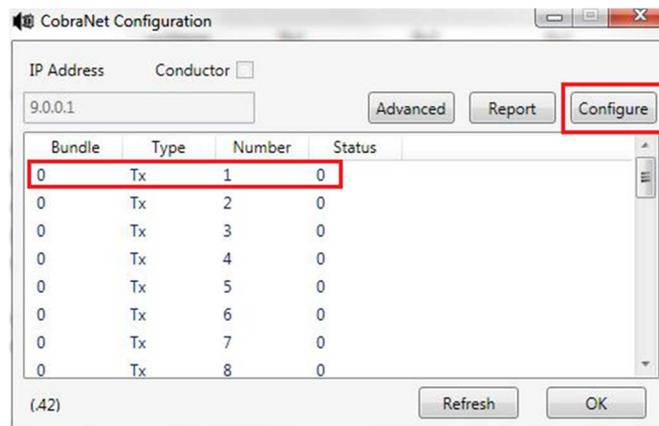
Column Chooser – Edited

We recommend using the listed columns. Once the list is populated, click “OK” to close the window.



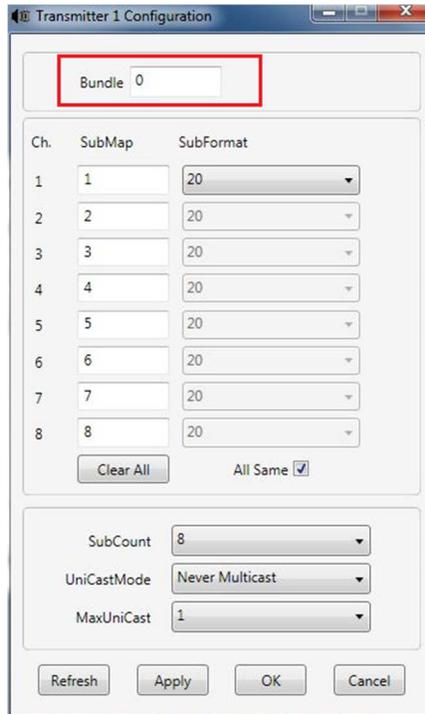
CobraNet Discovery Window – Additional Columns Added

Now we can go ahead and start editing the bundle assignments. Double-click on the MAC address that is described as QSC Q-Sys CCN32 CobraNet Version. This will open up the CobraNet Configuration window for that device.



CobraNet Configuration – TX Default

This will list all the available Transmit or TX bundles for that device and their associated bundle numbers. The default bundle assignment of the CCN32 card is 0 or Null. To change that bundle assignment, select the TX bundle that you would like to change. Once the bundle is selected, click on the “Configure” button located at the top right corner of the window.



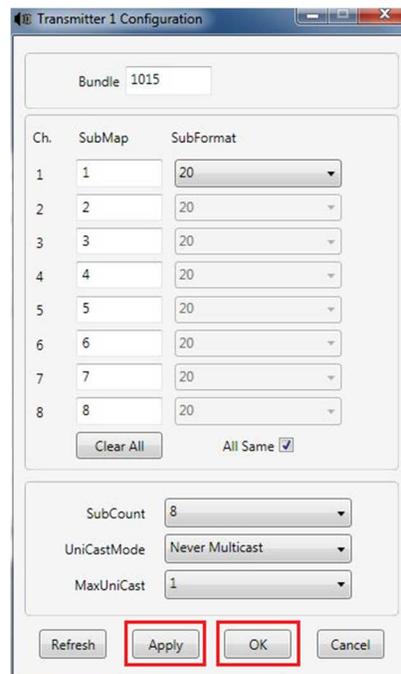
The screenshot shows the 'Transmitter 1 Configuration' dialog box. At the top, the 'Bundle' field is set to '0' and is highlighted with a red rectangle. Below this is a table with columns 'Ch.', 'SubMap', and 'SubFormat'. The table contains 8 rows, each with a channel number (1-8) and a 'SubFormat' dropdown menu set to '20'. Below the table are 'Clear All' and 'All Same' (checked) buttons. Further down are 'SubCount' (8), 'UniCastMode' (Never Multicast), and 'MaxUniCast' (1) dropdown menus. At the bottom are 'Refresh', 'Apply', 'OK', and 'Cancel' buttons.

Ch.	SubMap	SubFormat
1	1	20
2	2	20
3	3	20
4	4	20
5	5	20
6	6	20
7	7	20
8	8	20

Transmitter 1 Configuration - Default

This will open up a new window exposing all the audio channels within that bundle assignment. At the top of the window, enter in the bundle ID that you would like to use.

Note: For Transmitting (TX) Bundles 1-255, they are considered Multicast which are transmitted by a single CobraNet interface and received by any number of interfaces. For Transmitting (TX) Bundles 256 - 65279, they are considered unicast which are transmitted by a single CobraNet interface and may be received at a single interface.

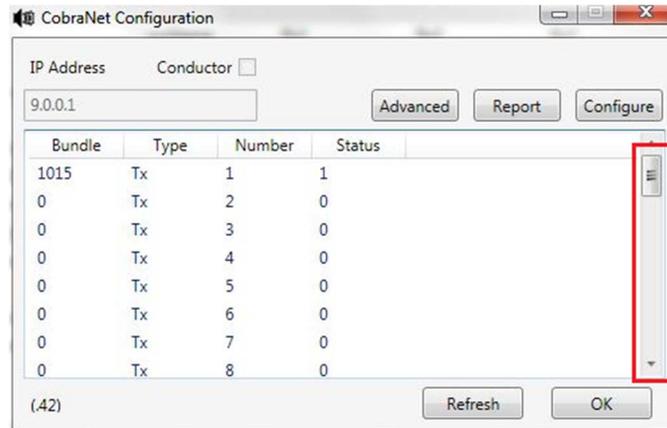


The screenshot shows the 'Transmitter 1 Configuration' dialog box with the 'Bundle' field set to '1015'. The table below has the same structure as the previous screenshot. At the bottom, the 'Apply' and 'OK' buttons are highlighted with red rectangles.

Ch.	SubMap	SubFormat
1	1	20
2	2	20
3	3	20
4	4	20
5	5	20
6	6	20
7	7	20
8	8	20

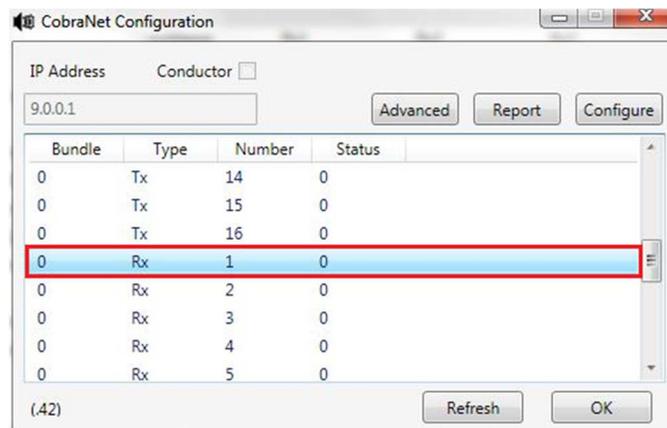
Transmitter 1 Configuration - Edited

After a bundle has been assigned an ID number, you will need to click the “Apply” button and then click the “OK” button. Just repeat this step for every TX Bundle that is part of the system.



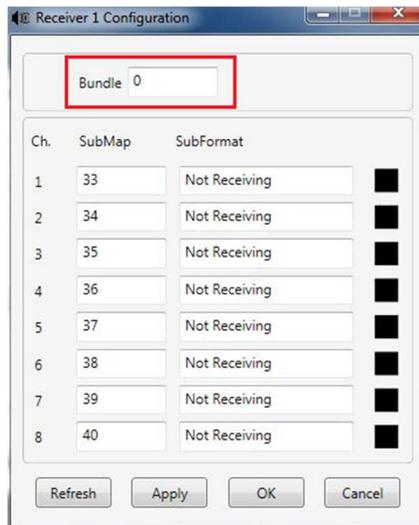
CobraNet Configuration – TX Bundle Edited

For Assigning the RX bundles, just scroll down the CobraNet Configuration window until you expose the RX bundles.



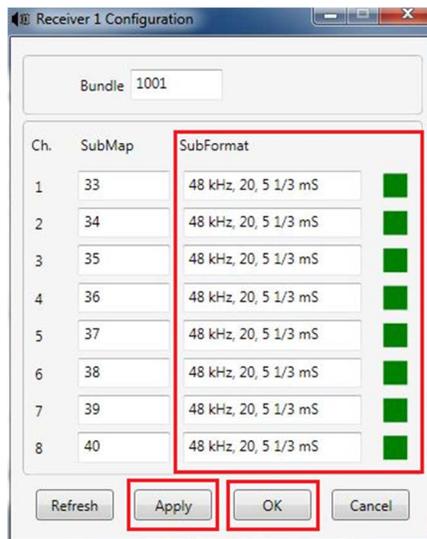
CobraNet Configuration – RX Default

This will list all the available Receive or RX bundles for that device and their associated bundle numbers. Again the default bundle assignment of the CCN32 card is 0 or Null. To change that bundle assignment, select the RX bundle that you would like to change. Once the bundle is selected, click on the “Configure” button located at the top right corner of the window.



Receiver 1 Configuration - Default

This will open up a new window exposing all the audio channels within that bundle assignment. At the top of the window, enter in the bundle ID that you would like to use.



Receiver 1 Configuration - Edited

After the Receiver has been assigned a Bundle number, you will need to click the "Apply" button and then click the "OK" button. Just repeat this step for every RX Bundle that is part of the system that will be sent to the Core or I/O Frame.

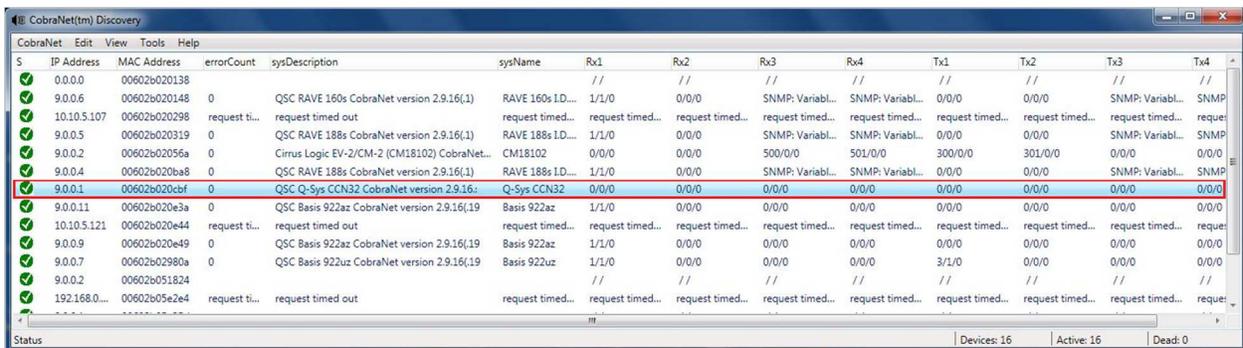
For Receiving (RX) Bundles, make sure the RX bundle IDs match the appropriate TX bundle number as this will dramatically affect your audio routing. Without a match, no audio will be transported through CobraNet. Once the RX bundle has been assigned to a legit TX bundle and that transmit device is online, you will then see the stream's Sample Rate and Bit Depth as well as a **GREEN** box illuminated next to each audio channel within that particular bundle. This will give you the indication that a connection has been established between TX and RX device AND the number of audio channels being sent from the CobraNet TX to CobraNet RX.

If the RX Bundle has been assigned to a legit TX bundle AND you see the stream’s Sample Rate and Bit Depth as well as a **RED** box illuminated next to each audio channel within that particular bundle, this would indicate that there is a hardware latency mismatch between the TX hardware and RX hardware using that Bundle ID. This could result in an accumulation of errors reported within CobraNet Discovery for both the TX and RX Device.

Receiver 1 Configuration – Latency Mismatch (Red Boxes)

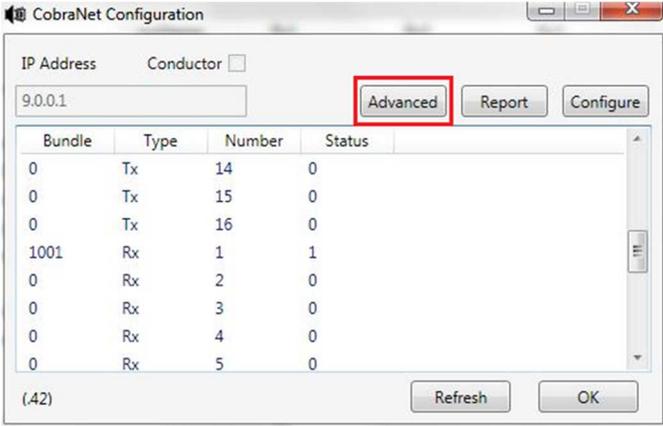
To resolve this latency mismatch you will first want to decide which latency setting is most appropriate for the system that you are setting up. The Q-Sys default is 48kHz at 5 1/3 mS (Milliseconds). A list of the available latency options as well as the Pro’s and Con’s for each are available later on in this document under the topic “Latency Settings”.

To make the change to the Latency Setting you will need to navigate back to the CobraNet Discovery window and select the appropriate device you would like to edit. For this example I will edit the Q-Sys CCN32 to meet the latency of a third-party device.



CobraNet Discovery Window – Select device to edit Latency

Once the device is selected, click on the advanced tab as indicated below.



CobraNet Configuration – RX Bundle Edited

This will open the “Advanced Configuration” window. From within this window the latency setting can be found next to the “modeRate Control”. Click on the down-arrow to expose the clock speed and network latency options. Just simply select the option that is best for your application. Now click “Apply” to lock in the selection and then “OK” to close out the window.

Advanced Configuration

Persistence

Name Q-Sys CCN32

Location Venue X

Contact QSC Technical Services

Conductor Priority 64

Serial Format 0x0

Serial Baud 19200

Serial PPeriod 2560

Serial RxMAC 01:60:2B:FD:00:00

SerialTxMAC 01:60:2B:FD:00:00

modeRate Control 48 kHz, 5 1/3 mS

Proc Mode N.A.

TagEnable N.A.

HMI Mode N.A.

FreeCycles 65.4%

NetMask N.A.

Refresh Apply OK Cancel

Advanced Configuration – modeRate Control Selection

Once ALL the bundles that are required for the design have been identified and assigned AND Latency settings match between the TX and RX devices, you will then need to click on the “Advanced” button within the CobraNet Configuration window. To configure the “Persistence” selection.

CobraNet Configuration

IP Address 9.0.0.1 Conductor

Advanced Report Configure

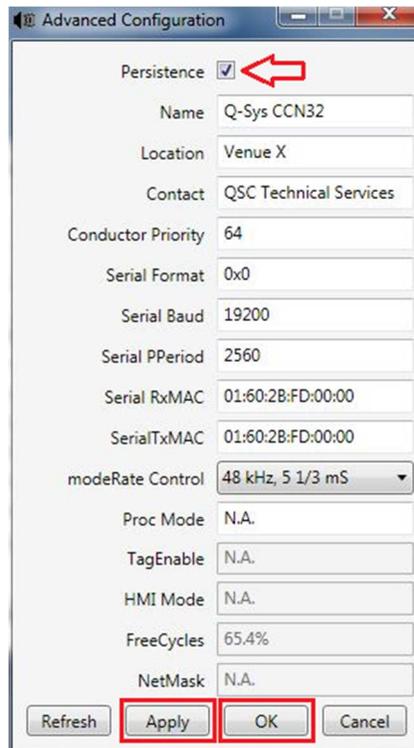
Bundle	Type	Number	Status
0	Tx	14	0
0	Tx	15	0
0	Tx	16	0
1001	Rx	1	1
0	Rx	2	0
0	Rx	3	0
0	Rx	4	0
0	Rx	5	0

(42) Refresh OK

CobraNet Configuration – RX Bundle Edited

The “Persistence” selection allows the CNCC32 card to retain the CobraNet configuration no matter the state of the Q-Sys Core.

NOTE: If Persistence IS NOT enabled, your bundle assignments will be reset back to 0 or NULL the next time a Q-Sys design is saved back to the Core OR if the Core's power is shut off. At this point you will have to reassign ALL bundle IDs.



Advanced Configuration – Persistence Enabled

Make sure that Persistence located at the top of the Advanced Configuration window is enabled. This is done by adding a check-mark in the box located to the right. After enabling Persistence, click the “Apply” button and then click the “OK” button to close out of that window. This action will ensure that your bundle IDs will remain in the Q-Sys design.

S	IP Address	MAC Address	errorCount	sysDescription	sysName	Rx1	Rx2	Rx3	Rx4	Tx1	Tx2	Tx3	Tx4
✓	0.0.0.0	00602b020138				//	//	//	//	//	//	//	//
✓	9.0.0.6	00602b020148	0	QSC RAVE 160s CobraNet version 2.9.16(1)	RAVE 160s ID...	1/1/0	0/0/0	SNMP: Variabl...	SNMP: Variabl...	0/0/0	0/0/0	SNMP: Variabl...	SNMP
✓	10.10.5.107	00602b020298	request ti...	request timed out	request timed...	request							
✓	9.0.0.5	00602b020319	0	QSC RAVE 188s CobraNet version 2.9.16(1)	RAVE 188s ID...	1/1/0	0/0/0	SNMP: Variabl...	SNMP: Variabl...	0/0/0	0/0/0	SNMP: Variabl...	SNMP
✓	9.0.0.2	00602b02056a	0	Cirrus Logic EV-2/CM-2 (CM18102) CobraNet...	CM18102	0/0/0	0/0/0	500/0/0	501/0/0	300/0/0	301/0/0	0/0/0	0/0/0
✓	9.0.0.4	00602b020ba8	0	QSC RAVE 188s CobraNet version 2.9.16(1)	RAVE 188s ID...	1/1/0	0/0/0	SNMP: Variabl...	SNMP: Variabl...	0/0/0	0/0/0	SNMP: Variabl...	SNMP
✓	9.0.0.1	00602b020cbf	0	Q-Sys Q-Sys CCN32 CobraNet version 2.9.16...	Q-Sys CCN32	1001/1/0	1002/1/0	1003/1/0	1004/1/0	1015/1/0	0/0/0	0/0/0	0/0/0
✓	9.0.0.11	00602b020e3a	0	QSC Basis 922az CobraNet version 2.9.16(19)	Basis 922az	1/1/0	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0
✓	10.10.5.121	00602b020e44	request ti...	request timed out	request timed...	request							
✓	9.0.0.9	00602b020e49	0	QSC Basis 922az CobraNet version 2.9.16(19)	Basis 922az	1/1/0	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0
✓	9.0.0.7	00602b02980a	0	QSC Basis 922uz CobraNet version 2.9.16(19)	Basis 922uz	1/1/0	0/0/0	0/0/0	0/0/0	3/1/0	0/0/0	0/0/0	0/0/0
✓	9.0.0.2	00602b051824	request ti...	request timed out	request timed...	request							
✓	192.168.0...	00602b05e2e4	request ti...	request timed out	request timed...	request							

In the example “Discovery Window” shown above, the Q-Sys CCN32 card has been setup to receive four “unicast” bundles containing eight channels of audio on the first four CobraNet receivers (Rx1, Rx2, Rx3, and Rx4) for a total channel count in to Q-Sys of 32 audio channels via CobraNet. Also, the CCN32 card has been setup to transmit 8 audio channels on a single “unicast” bundle out the first transmitter (Tx1).

SubMap Routing Table

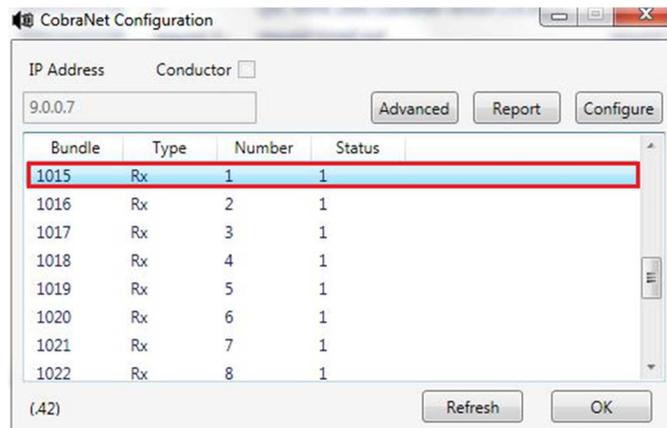
There are situations where a single CobraNet device or multiple CobraNet devices are setup to transmit less than 8 audio channels or the device(s) are just unable to send 8 audio channels per CobraNet bundle to a Q-Sys Core or I/O Frame. In this situation you may be required to change the CobraNet SubMap on the CobraNet Receiver so that you can maximize the channel count getting in to the Q-Sys Core or I/O Frame.

NOTE: By default, SubMap 33 will ALWAYS be routed to the first channel of the CobraNet Input Block within Q-Sys Designer. This will ALWAYS be the starting point for changing the SubMap.

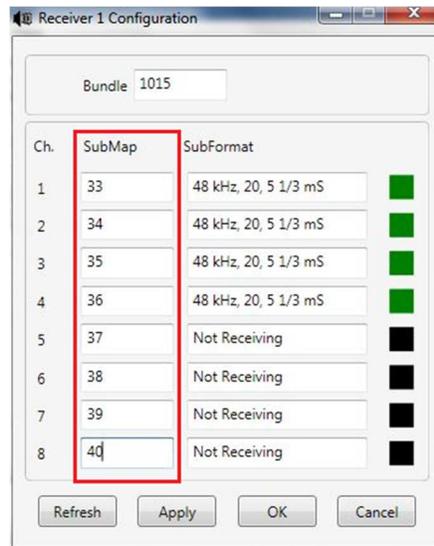
To demonstrate, I have setup a hypothetical example using 8 third-party devices only capable of transmitting 4 audio channels per CobraNet bundle. So in order to get all 32 audio channels in to the Core, the SubMap on the 8 inbound bundles being received by the Core will have to be edited.

In this example Q-Sys Designer will need to have the CCN32 Card Properties setup as a 32x32 device in order to accommodate all the inbound CobraNet audio channels. Once the CCN32 properties have been established and the Input Block is located in the Q-Sys Design, we should be ready to start mapping the audio channels within Disco.

At this point I am going to assume that the Bundle assignments have already been established and assigned according to the instructions listed earlier. I will be using all “unicast” bundles (1015 – 1022).



CobraNet Configuration – RX1 Bundle

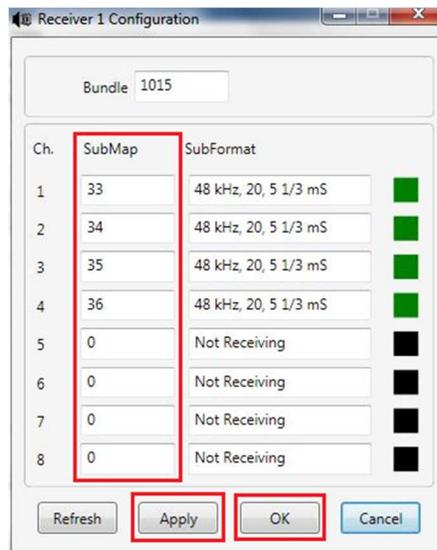


The image shows a dialog box titled "Receiver 1 Configuration" with a "Bundle" field set to "1015". Below this is a table with columns "Ch.", "SubMap", and "SubFormat". The "SubMap" column is highlighted with a red box. The table shows channels 1-4 with SubMap values 33, 34, 35, and 36, and SubFormat values of "48 kHz, 20, 5 1/3 mS". Channels 5-8 have SubMap values 37, 38, 39, and 40, and SubFormat values of "Not Receiving". The "SubMap" field for channel 8 is currently set to "40".

Ch.	SubMap	SubFormat
1	33	48 kHz, 20, 5 1/3 mS
2	34	48 kHz, 20, 5 1/3 mS
3	35	48 kHz, 20, 5 1/3 mS
4	36	48 kHz, 20, 5 1/3 mS
5	37	Not Receiving
6	38	Not Receiving
7	39	Not Receiving
8	40	Not Receiving

Receiver 1 Configuration – SubMap Default

At this point we need to un-assign the 4 audio channels that are not being received by entering a "0" in place of the default SubMap assignment.

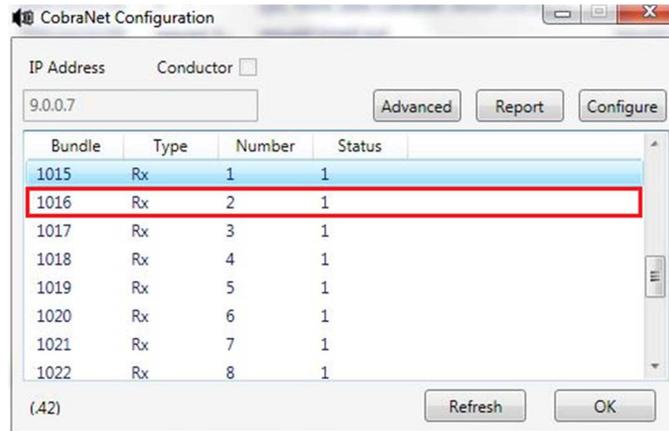


The image shows the same "Receiver 1 Configuration" dialog box. The "SubMap" column is highlighted with a red box. The table shows channels 1-4 with SubMap values 33, 34, 35, and 36, and SubFormat values of "48 kHz, 20, 5 1/3 mS". Channels 5-8 have SubMap values 0, 0, 0, and 0, and SubFormat values of "Not Receiving". The "SubMap" field for channel 8 is currently set to "0". The "Apply" and "OK" buttons are also highlighted with red boxes.

Ch.	SubMap	SubFormat
1	33	48 kHz, 20, 5 1/3 mS
2	34	48 kHz, 20, 5 1/3 mS
3	35	48 kHz, 20, 5 1/3 mS
4	36	48 kHz, 20, 5 1/3 mS
5	0	Not Receiving
6	0	Not Receiving
7	0	Not Receiving
8	0	Not Receiving

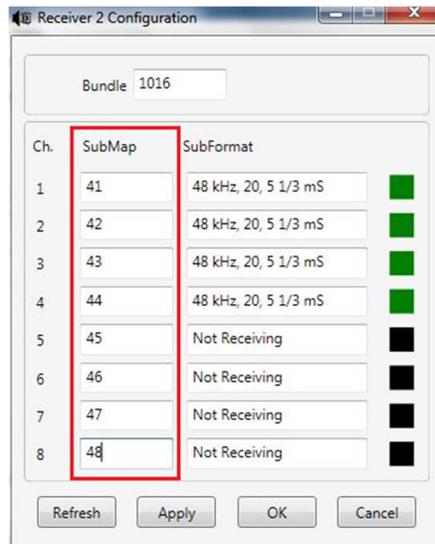
Receiver 1 Configuration – SubMap Edited

Once the edit has been made go ahead and click "Apply" and then "OK".



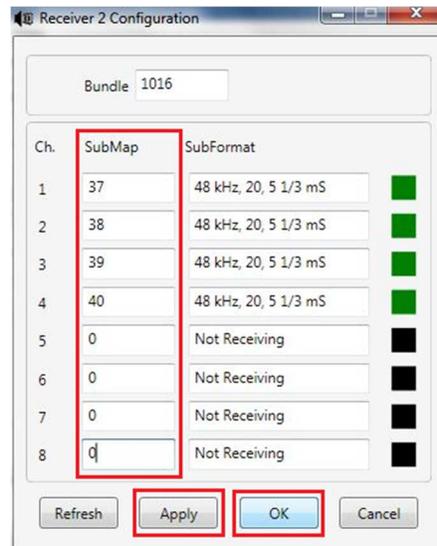
CobraNet Configuration – RX1 Bundle

Now open up the second bundle that will need to be edited.



Receiver 2 Configuration – SubMap Default

Due to the way the SubMap is set by default for the second bundle, the CobraNet audio channels will show up within the CCN32 Input Block starting at channel 9. Since the second bundle (1016) is actually carrying audio channels 5 – 8, we need to reassign the SubMap so that they show up at the proper CobraNet input within Q-Sys. Again the first bundle (1015) has a SubMap routing of 33 – 36 for audio channels 1 – 4 which means that in order to continue the sequence, the second bundle (1016) will need to have a SubMap routing of 37 - 40 in order to reach CCN32 Inputs 5 – 8.



Receiver 2 Configuration – SubMap Edited

Once the edit has been made go ahead and click “Apply” and then “OK”.

The key is to “zero out” the unused audio channels within each bundle and then follow the SubMap Sequence established by the first two bundles in the example. So the next four audio channels being received by the third bundle (1017) would need to have the SubMap assignment of 41 – 44 in order to reach CCN32 Input Block Channels 9 – 12.

To make the routing easier, I have included a set of **SubMap Routing Tables** for bundles that are transmitting 2, 4, or 8 audio channels per bundle and how the SubMap should be set for 32x32, 16x16, 8x8, and 4x4 CCN32 CobraNet Card configurations.

NOTE: The SubMap does have a default setting but ultimately is user defined. It is possible to have a mix of CobraNet bundles that are carrying 2, 4, AND 8 audio channels per bundle assigned to the same Q-Sys CCN32 Input Block. The SubMap will have to be adjusted on each bundle accommodate the routing so that ALL channels will show up at the appropriate CCN32 input channel on the Input Block.

32x32 SubMap Routing Table 8 Audio Channels per Bundle

CCN32 32 x 32	CobraNet Discovery				Q-Sys Designer 32 Channel CobraNet Input Block
	CobraNet Receiver	Bundle Number (Example)	Bundle Channel	Bundle SubMap	
(4) CobraNet Bundles of (8) Audio Channels	Rx1	1001	1	33	1
			2	34	2
			3	35	3
			4	36	4
			5	37	5
			6	38	6
			7	39	7
			8	40	8
	Rx2	1002	1	41	9
			2	42	10
			3	43	11
			4	44	12
			5	45	13
			6	46	14
			7	47	15
			8	48	16

	Rx3	1003	1	49	17
			2	50	18
			3	51	19
			4	52	20
			5	53	21
			6	54	22
			7	55	23
			8	56	24
	Rx4	1004	1	57	25
			2	58	26
			3	59	27
			4	60	28
			5	61	29
			6	62	30
			7	63	31
			8	64	32

32x32 SubMap Routing Table 4 Audio Channels per Bundle

CCN32 32 x 32	CobraNet Discovery				Q-Sys Designer 32 Channel CobraNet Input Block
	CobraNet Receiver	Bundle Number (Example)	Bundle Channel	Bundle SubMap	
(8) CobraNet Bundles of (4) Audio Channels	Rx1	1001	1	33	1
			2	34	2
			3	35	3
			4	36	4
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx2	1002	1	37	5
			2	38	6
			3	39	7
			4	40	8
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a

	Rx3	1003	1	41	9
			2	42	10
			3	43	11
			4	44	12
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx4	1004	1	45	13
			2	46	14
			3	47	15
			4	48	16
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx5	1005	1	49	17
			2	50	18
			3	51	19
			4	52	20
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
Rx6	1006	1	53	21	
		2	54	22	
		3	55	23	
		4	56	24	
		5	0	n/a	
		6	0	n/a	
		7	0	n/a	
		8	0	n/a	
Rx7	1007	1	57	25	
		2	58	26	
		3	59	27	
		4	60	28	
		5	0	n/a	
		6	0	n/a	
		7	0	n/a	
		8	0	n/a	
Rx8	1008	1	61	29	

		2	62	30
		3	63	31
		4	64	32
		5	0	n/a
		6	0	n/a
		7	0	n/a
		8	0	n/a

32x32 SubMap Routing Table 2 Audio Channels per Bundle

CCN32 32 x 32	CobraNet Discovery				Q-Sys Designer 32 Channel CobraNet Input Block
	CobraNet Receiver	Bundle Number (Example)	Bundle Channel	Bundle SubMap	
(16) CobraNet Bundles of (2) Audio Channels	Rx1	1001	1	33	1
			2	34	2
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx2	1002	1	35	3
			2	36	4
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a

	Rx3	1003	8	0	n/a
			1	37	5
			2	38	6
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
	Rx4	1004	1	39	7
			2	40	8
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx5	1005	1	41	9
			2	42	10
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx6	1006	1	43	11
			2	44	12
			3	0	n/a
			4	0	n/a
5			0	n/a	
6			0	n/a	
7			0	n/a	
8			0	n/a	
Rx7	1007	1	45	13	
		2	46	14	
		3	0	n/a	
		4	0	n/a	
		5	0	n/a	
		6	0	n/a	
		7	0	n/a	
		8	0	n/a	

	Rx8	1008	1	47	15
			2	48	16
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx9	1009	1	49	17
			2	50	18
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx10	1010	1	51	19
			2	52	20
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx11	1011	1	53	21
			2	54	22
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx12	1012	1	55	23
			2	56	24
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
Rx13	1013	1	57	25	

			2	58	26
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
			Rx14	1014	1
	2	60			28
	3	0			n/a
	4	0			n/a
	5	0			n/a
	6	0			n/a
	7	0			n/a
	8	0			n/a
	Rx15	1015	1	61	29
			2	62	30
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx16	1016	1	63	31
			2	64	32
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a

16 x 16 SubMap Routing Table 8 Audio Channels per Bundle

CCN32 16x16	CobraNet Discovery				Q-Sys Designer 16 Channel CobraNet Input Block
	CobraNet Receiver	Bundle Number (Example)	Bundle Channel	Bundle SubMap	
CobraNet Bundles of (8)	Rx1	1001	1	33	1
			2	34	2
			3	35	3

			4	36	4		
			5	37	5		
			6	38	6		
			7	39	7		
			8	40	8		
			Rx2	1002	1	41	9
					2	42	10
					3	43	11
	4	44			12		
	5	45			13		
	6	46			14		
	7	47			15		
	8	48			16		

16 x 16 SubMap Routing Table 4 Audio Channels per Bundle

CCN32 16 x 16	CobraNet Discovery				Q-Sys Designer 16 Channel CobraNet Input Block
	CobraNet Receiver	Bundle Number (Example)	Bundle Channel	Bundle SubMap	
(4) CobraNet Bundles of (4) Audio Channels	Rx1	1001	1	33	1
			2	34	2
			3	35	3
			4	36	4
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx2	1002	1	37	5
			2	38	6
			3	39	7
			4	40	8
			5	0	n/a
			6	0	n/a
7			0	n/a	

	Rx3	1003	8	0	n/a
			1	41	9
			2	42	10
			3	43	11
			4	44	12
			5	0	n/a
			6	0	n/a
			7	0	n/a
	8	0	n/a		
	Rx4	1004	1	45	13
			2	46	14
			3	47	15
			4	48	16
			5	0	n/a
			6	0	n/a
			7	0	n/a
8			0	n/a	

16 x 16 SubMap Routing Table 2 Audio Channels per Bundle

CCN32 16 x 16	CobraNet Discovery				Q-Sys Designer 16 Channel CobraNet Input Block
	CobraNet Receiver	Bundle Number (Example)	Bundle Channel	Bundle SubMap	
(16) CobraNet Bundles of (2) Audio Channels	Rx1	1001	1	33	1
			2	34	2
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx2	1002	1	35	3
			2	36	4
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a

	Rx3	1003	8	0	n/a
			1	37	5
			2	38	6
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
	Rx4	1004	1	39	7
			2	40	8
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx5	1005	1	41	9
			2	42	10
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx6	1006	1	43	11
2			44	12	
3			0	n/a	
4			0	n/a	
5			0	n/a	
6			0	n/a	
7			0	n/a	
8			0	n/a	
Rx7	1007	1	45	13	
		2	46	14	
		3	0	n/a	
		4	0	n/a	
		5	0	n/a	
		6	0	n/a	
		7	0	n/a	
		8	0	n/a	

	Rx8	1008	1	47	15
			2	48	16
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a

8 x 8 SubMap Routing Table 8 Audio Channels per Bundle

CCN32 8 x 8	CobraNet Discovery				Q-Sys Designer 8 Channel CobraNet Input Block
	CobraNet Receiver	Bundle Number (Example)	Bundle Channel	Bundle SubMap	
(1) CobraNet Bundle of (8) Audio Channels	Rx1	1001	1	33	1
			2	34	2
			3	35	3
			4	36	4
			5	37	5
			6	38	6
			7	39	7
			8	40	8

8 x 8 SubMap Routing Table 4 Audio Channels per Bundle

CCN32 8 x 8	CobraNet Discovery				Q-Sys Designer 8 Channel CobraNet Input Block
	CobraNet Receiver	Bundle Number (Example)	Bundle Channel	Bundle SubMap	

(2) CobraNet Bundles of (4) Audio Channels	Rx1	1001	1	33	1
			2	34	2
			3	35	3
			4	36	4
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx2	1002	1	37	5
			2	38	6
			3	39	7
			4	40	8
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a

8 x 8 SubMap Routing Table 2 Audio Channels per Bundle

CCN32 8 x 8	CobraNet Discovery				Q-Sys Designer 8 Channel CobraNet Input Block
	CobraNet Receiver	Bundle Number (Example)	Bundle Channel	Bundle SubMap	
(4) CobraNet Bundles of (2) Audio Channels	Rx1	1001	1	33	1
			2	34	2
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
			8	0	n/a
	Rx2	1002	1	35	3
			2	36	4
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
7			0	n/a	

	Rx3	1003	8	0	n/a
			1	37	5
			2	38	6
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
	8	0	n/a		
	Rx4	1004	1	39	7
			2	40	8
			3	0	n/a
			4	0	n/a
			5	0	n/a
			6	0	n/a
			7	0	n/a
8			0	n/a	