How to Configure the NV9000 Router Control System Using SE Utilities, UniConfig, and MRC- The Tutorial

Draft V1.1

There are many ways to configure a router control system. In this tutorial we will define a customer scenario and decide how to best meet the requirements.

1.0 Overview:

A customer has an NV8144 hybrid router populated as shown below. He uses HD 1080i and SD sources that he would like to keep separate, such that with the exception of a few multi-format destination devices such as monitors and test equipment, HD sources can only route to HD destinations, and SD sources can only route to SD destinations.

NV81	44 Po	ort En	umera	ation											Hom	ne				Out	puts			
																	8	7	6	5	4	3	2	1
																	Emb	Emb	MADI	Emb	Emb	Emb	Std	Std
																	127 2017 2032	109 1729 1744	91 	73 1153 1168	55 865 880	37 577 592	¹⁹	1
																	128 2033 2048	110 1745 1760	92 	74 1169 1184	56 881 896	38 593 608	20	2
																	129 2049 2064	111 1761 1776	93 	75 1185 1200	57 897 912	39 609 624	21	3
		Inputs															130 2065 2080	112 1777 1792	94	76 1201 1216	58 913 928	40 625 640	22	4
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1		131	113	95	77	59	41	23	5
MADI	MADI	Dis	Dis	Dis	Dis	Dis	Dis	Dis	Std	Std	Std	→ Std	Std	Std	Std		2081 2096	1793 1808	-'-	1217 1232	929 944	641 656		
136 	127	118 1873 1888	109 1729 1744	100 1585 1 600	91 1441 1456	82 1297 1312	73 1153 1168	64 1009 1024	55	46 r	37	28	19	10	1		132 2097 2112	114 1809 1824	96	78 1233 1248	6U 945 960	42 657 672	24	6
137	128	119 1889 1904	110 1745 1760	101 1601 1616	92 1457 1472	83 1313 1328	74 1169 1184	65 1025 1040	56	47	38	29	20	11	2		133 2113 2128	115 1825 1840	97	79 1249 1264	61 961 976	43 673 688	25	7
138	129	120 1905 1920	111 1761 1776	102 1617 1632	93 1473 1488	84 1329 1344	75 1185 1200	66 1041 1056	57	48	39	30	21	12	3		134 2129 2144	116 1841 1856	98	80 1265 1280	62 977 992	44 689 704	26	8
139	130	121 1921 1936	112	103 1633 1648	94 1489 1504	85 1345 1360	76	67 1057 1072	58	49	40	31	22	13	4		135	117	99 1441 1504	81 	63	45 	27	9
140	131	122	113	104	95	86	77	68	59	50	41	32	23	14	5		136	118	100	82	64	46	28	10
	122	1337 1352	114	105	1505 1520	07	70	1073 1088	<u>co</u>	E1	12	22	24	16	C		2161 2176	1873 1888	101	1287 1312	1003 1024	121 736	20	11
141 	132	1253	1809 1824	1665 1680	1521 1536	1377 1392	1233 1248	1089 1104	•••	эт Г	42	33 •	24	13	0		2177 2192	1889 1904		0.3 1313 1328	1025 1040	47 737 752	23	
142	133	124 1969 1984	115	106	97 1537 1552	88 1393 1408	79 1249 1264	70 1105 1120	61	52	43	34	25	16	7		138	120	102	84 1329 1344	66 1041 1056	48 753 768	30	12
143	134	125	116	107	98	89	80	71	62	53	44	35	26	17	8		139	121	103	85	67	49	31	13
144	125	1365 2000	117	1637 1712	003 1068	1403 1424 QO	01	72	62	54	45	26	27	10	a		140	1221 1836	104	1345 1360 OC	CO	763 764 50	22	14
2161 2224	2017 2080		<u></u>				<u>_</u>	<u> </u>	°°,	J4 7	43	³⁰ ,	~		3		2225 2240	1937 1952		1361 1376	1073 1088	785 800	32	14
																	141 2241 2256	123 1953 1968	105	87 1377 1392	69 1089 1104	51 801 816	33	15
																	142	124	106	88	70	52	34	16
																	143	125	107	89	71	53	35	17
																	2273 2288	1985 2000		1409 1424	1121 1136	833 848		
11 22	2013		Customer	Name & F	'ertinent In	fo											144	126	108 1585 1648	90 	72	54 	36	18

He has an older NV5128 with a 32 port Machine Control matrix that he would like to use for his VTR control. The cards are stuffed into slots 12 and 13 in the 5128 frame, with one card in the input section and one in the output section.

He has a 64x64 SDI matrix with embedded audio beginning in Slot 1 of the NV5128 that he would like to connect to the NV8144 inputs through 8 tielines.



2.0 Router Control Cards:

Before you can begin configuring a router control system, you must first configure the Router Control cards in the router frames using UniConfig or MRC (depending on the type on control card). This is where IP addresses and level physical sizes are defined, and in the case of hybrid routers it is where card types are defined.

The NV5128 uses UniConfig to configure the control cards. The NV8144 uses UniConfig if the control cards are EM0666 Standard Control cards, and MRC if the control cards are EM0833 Hybrid Control cards. We will begin by configuring the NV5128 control cards in Uniconfig.

3.0 Configuring the NV5128 Control Cards with UniConfig:

UniConfig is a lightweight program that may be run from the NV9000 or a PC. It is usually included in the C:\nvision\utils folder.

3.1 Connecting a PC and Setting IP Addresses

Before you begin, you must decide if you are going to connect to the router over serial or over Ethernet. If you do not know what IP addresses are assigned to the Control Cards, you may have to use serial first so you can set the IP addresses.

In UniConfig, Select either Serial or Ethernet:



When connecting over Serial, use a straight pin for pin cable. I recommend connecting to the 9 pin connector on the front of the control card using 9600 baud. You could also connect to the Diag port on the back which is typically 38.4K baud. The baud rate is configurable on the back Diag port, while it is fixed on the front port.

Click on Communications, Setup to select the Baud rate and the Comm port:

Serial Commu	nications Settings
Comm. port:	COM1 -
Baud rate:	38400 💌
🗌 Log Comn	n Messages
ОК	Cancel

The Comm port number is dependent on your PC. You should be able to determine the Comm port number for your serial port in Windows Device Manager if you don't already know.

If you choose Ethernet in the Communications menu it opens a sidebar. Right click Control Cards at the top of the tree and add an IP address and a name for each Control Card.

W UniCo	nfig - NV5128	router	_	
File Cor	nmunications	Tools	Window	/ H
			<u>×</u>	MZ /
Contr	Add Cont	trol Card	d	F
				Lev

Once the IP addresses are set you should be able to connect to either control card by clicking on its IP address in the side bar.

W UniConfig - NV5128 router		
File Communications Tools Windo	w Help	
× Control Cards 	Configuration - NV5 Physical Inputs Level Start End 1 1 512	128 rout Cont Inj Start

Typically, we will connect over serial the first time to set the IP addresses. Then we connect over Ethernet after that. When connecting serially, you will need to move the cable to setup both cards.

Set the IP address of the Primary Control card to 192.168.1.5 and the Secondary Control card for 192.168.1.6. Press "Write All" and restart the controllers. At this point I suggest connecting over Ethernet, if not already.

One of the reasons to connect over Ethernet is to set the Control Card Bus:

Router Ethernet Settings]
Ethernet Control: 💿 Enabled 🔿 Disabled	
IP Address: 192 . 168 . 1 . 5	Control Card Bus
Subnet Mask: 255 . 255 . 255 . 0	⊂ 10Base2

This setting decides if the Control Cards synchronize the router state over an internal bus or over the 10Base2 connection. Typically it is set to Internal, but it must match on both cards or the standby card will not know the state of the router.

3.2 Physical Levels

Now we can define the levels and physical matrix size. We have a 32 port Machine Control matrix, and a 64x64 SDI level.

! Important note- The Machine Control level must be Level 1. It begins with port 1 regardless of the slot the cards are in.

Con	figuratio	on - NV5	128 route	er							
	Phys Inp	sical uts	Cont In;	roller out	Phy: Out;	sical outs	Cont Out	roller tput		Partitio	ns 1-4
Level	Start	End	Start	End	Start	End	Start	End	Signal Type		
1	1	32	1	32	1	32	1	32	Machine Control Forw	ard	▼ 1
2	1	64	1	64	1	64	1	64	Video,Async AES,Tin	necode	▼ 2
											- 3
											- 4

Set the Physical Inputs and Outputs to where the level physically begins and ends. Set the Controller Start for where you wish the port numbering to begin in SE Utilities, in this case 1. It is the Controller start and end that is used in SE Utilities. Write the changes and restart the control card.

3.3 Machine Control Port Setup

Open the Machine Control Port Setup window. Typically, most ports will be set for Dynamic. This means that the destination device is the Controlling device, and the source is the Controlled device.

You can change the rules by right-clicking on a port and selecting from the list. If you have a device such as an editing system, it will always be a Controlling device. Write any changes to the control card and restart.

Machine Control Port Se	etup	- • ×
	Select Ports, click right mouse button to change s	elections:
	Port Type	•
	1 207M Dynamic	
	2 207M Dynamic	
	3 207M Dynamic	
	4 207M Dynamia	
	5 207M Dy Select All	-
	6 207M Dy 7 207M Dy Set As Dynamic	
	8 207M Dy Set As DTE	
	9 207M Dy Set As DCE	
	10 207M Dy Set AS DCE	
	11 207M Dy Set As Master	
	12 207M Dy Set As Slave	
	14 207M Dy Set As Controlling	
	15 207M Dy Set As Controlled	
	16 207M Dy Set As Controlled	
Take Delay (frames)	17 207M Dy Read All	
125	18 207M Dy Write Ports	
125	19 20/M Dy	
	20 207M Dynamic 21 207M Dynamic	
Read	21 207M Dynamic 22 207M Dynamic	
	23 207M Dynamic	
Write	24 207M Dynamic	*
vvnie	•	•
	·	

3.4 Output Attributes

Go the Switch Point Setup Window. Choose either Redundant or dual Reference. If you selected Redundant, be sure to loop the reference through the two sets of reference inputs on the back of the router.

Set the Switch Point and Re-clocker options for each output. Write the changes and restart the control card. Repeat the settings for the 2nd Control card.

4.0 Configuring the NV8144 Control Cards with the Miranda Router Configurator (MRC):

MRC only connects over Ethernet to an 8500 Series Hybrid router with an EM0833 control card. It has the ability to find Router control cards even when they are on a different subnet address range.

Install MRC onto a config PC. This can be the same PC you run SE Utilities from as long as it has a NIC card that can reach Panel Router Net the Hybrid router is connected to. Either that or you connect the PC directly to the back of each control card using a crossover cable and configure each card by moving the cable.

MRC uses a great deal of memory, and therefore is not recommended to run from the NV9000s during normal operation. I have upon occasion run MRC from the offline NV9000 when nothing else was available.

4.1 Ethernet Settings

After installation, make sure your PC has a static IP address on the Panel/Router LAN. When using DHCP for panel addresses, DHCP begins assigning addresses at .41. I suggest using an unassigned address such as 192.168.1.37. You can ping it from the NV9000 to make sure it isn't already in use.

1	Miranda Router Configurator	6 march		Tast temp				
	Retwork Setup							
	Welcome NVISION Series Products Ethernet Settings							
	- Enternet County							
	© [™] Configuration							
	Firmware							
	Router Levels							
	Input Attributes							
	Output Attributes	Ethernet Se	ettings					
	Miscellaneous	Update	Online	Name	Type	IP Address 🔺	Subnet Mask	Gateway IP
	Module Types		Active	NV5128 P	NV5128	192.168.1.5	255.255.255.0	
	Copy Settings		Standby	NV5128 B	NV5128	192.168.1.6	255.255.255.0	
			Active	NV8144 PRI	NV8144	192.168.1.11	255.255.255.0	
			Standby	INV8144 SEC	INV8144	192 168 1 12	255 255 255 0	

Open MRC and select Ethernet Settings in the left sidebar:

You can edit the IP addresses and names of the 8500 series Hybrid control cards here. Be sure to press "Update Settings" and restart the control card for the settings to take effect.

You can also see the NV5128 control cards although they are configured in UniConfig. You can ignore them here.

4.2 Physical Levels

Select Router Levels in the sidebar. Select the "Edit" radio button for the primary control card on the bottom half of the right pane. In the top half, define your Digital Video and Synchronous Audio levels to the full size of the physical frame, even if the cards are not all present.

The Digital Video Level would be 144x144, while the Audio level is 144 * 16 (embedded audio channels) = 2304x2304 audio channels:

Miranda Router Configurato	r													_ 🗆 X
Network Setup	Crosspoi	nt Ranges for	r Level Setting]S	1	,					1	1		Q
Welcome NVISION Series Products Ethernet Settings	Level 🔺	Physical Input Start	Physical Input End	Controller Source Start	Controller Source End	Null Audio Source	Pass Thru Audio Source	Physical Output Start	Physical Output End	Controller Destination Start	Controller Destination End		Signal Type	
	1	1	144	1	1 144	NA	NA	1	144		1 14	1 Digital Video		-
の空 Configuration	2	1	2304	1	2304	None	None	1	2304		1 230	Synchronous Audio		•
Soundarianon			1		Î					ĺ .		Î.		
Firmware														
Router Levels		Image:												
Input Attributes														
Output Attributes														
Miscellaneous														
Module Types														
Copy Settings													Add Level	Delete Level
	- Network	Frame Summ	nary											
Router Tools	Control	Cards Ne	etwork Levels	7										
Crosspoints	Edit		Online			Name			Туре		IP A	ddress 🔺	Exc	ansion
Logs	0	Active			NV5128 P		N	V5128		19	2.168.1.5		Stand Alone	
System Status		Standby			NV5128 B		N	V5128		19	2.168.1.6		Stand Alone	
Module Status	•	Active			NV8144 PRI		N	V8144		19	2.168.1.11		Stand Alone	
		Standby			NV8144 SEC		N	V8144		19	2.168.1.12		Stand Alone	

Be sure to press "Update Control Card" and restart it before continuing.

4.3 Module Types

Go to Module Types in the left sidebar. Select the Primary Control card at the bottom of the screen and press "Refresh Summary".

Using the pull-downs, select the correct card type for each slot. If a card type is bold, it has detected the expected module in the expected location.

If it is in normal case, it may be configured for a future card. If the card type is red, then they type selected does not match the type detected.

Once you have set all the cards present to their correct type press Update Control Card. We expect all card types to be bold if present. In the picture below, only the control cards are present. This is because I am connected to a router emulator.

Miranda Router Configurator								
	Module Type Settings							
The work Setup	Location	Present		Module				
Welcome	Input 07	No	NV8500 3Gig SDL9 COA	X IN (EM0783)	▼ ▲			
NVISION Series Products	Input 08	No	NV8500 3Gig SDI 9 COA	X IN (EM0783)	T			
Ethernet Settings	Input 09	No	NV8500 3Gig SDI DEM 8	COAX IN (EM0814)	_			
	Input 10	No	NV8500 3Gig SDI DEM 8	COAX IN (EM0814)				
	Input 11	No	NV8500 3Gig SDI DEM 8	COAX IN (EM0814)	-			
-	Input 12	No	NV8500 3Gig SDI DEM 8	COAX IN (EM0814)				
Firmware	Input 13	No	NV8500 3Gig SDI DEM 8	COAX IN (EM0814)	-			
Router Levels	Input 14	No	NV8500 3Gig SDI DEM 8	COAX IN (EM0814)	-			
Input Attributes	Input 15	No	NV8500 3Gig COAX 8 SE	0 / 1 TDM IN (EM0814)	-			
Miscellancous	Input 16	No	NV8500 3Gig COAX 8 SE	01/1 TDM IN (EM0814)	•			
Module Types	Output 01	No	NV8500 3Gig SDI 18 CO/	AX OUT (EM0785)				
Conv Settings	Output 02	No	NV8500 3Gig SDI 18 CO/	AX OUT (EM0785)	-			
Copy Settings	Output 03	No	NV8500 3Gig SDI 18 CO/	AX OUT (EM0785)				
24	Output 04	No	NV8500 3Gig SDI 18 CO/	AX OUT (EM0785)	-			
Router Tools	Output 05	No	NV8500 3Gig SDI EMB 1	6 COAX OUT (EM0815)	•			
Crosspoints	Output 06	No	NV8500 3Gig SDI EMB 1	NV8500 3Gig SDI EMB 16 COAX OUT (EM0815)				
Logs	Output 07	No	NV8500 3Gig SDI EMB 1	6 COAX OUT (EM0815)				
System Status	Output 08	No	NV8500 3Gig COAX 16 S	DI / 2 TDM OUT (EM0815)	-			
Module Status	Crosspoint 01	No	NV8500 144X144 3Gig X					
	Crosspoint 02	No	NV8500 144X144 3Gig X	PT HYBRID (EM0819)	-			
Configurator Tools	Input/Output Monitor	No						
	Control Card - Primary	Yes	EM0833 Control Card	EM0833 Control Card				
Preferences	Control Card - Secondary	Yes	EM0833 Control Card					
Help	Power Supply 01	No	PS8300 Power Supply					
About	Power Supply 02	No	PS8300 Power Supply		~ .			
	Display: All Locations	-						
	Network Frame Summary							
	Hybrid Routers Network Lev	els All Control Cards						
	Edit Online		Name	Туре	IP Address			
	Active	NV814	4 PRI	NV8144	192.168.1.11			
	Standby	NV814	4 SEC	NV8144	192.108.1.12			
Miranda								
	Refresh Summary	Update Control Card	View Change Report					

4.4 Output Attributes

Select Output Attributes from the left sidebar. Select redundant or dual Reference, what line to switch on, and whether or not to use the re-clocker for each output.

4.5 Input Attributes

Select Input Attributes. Typically, "Use Switching Rules" is selected. "Force Embedder On" will force the embedder on for whatever destination the input is routed to. Do not use Force Embedder On when using DHP.

4.6 Copy Settings

You can either repeat all the steps for the 2nd Control card, or you can use the Copy Settings page. Select Copy Settings on the left sidebar. Select the Control card you just configured at the top of the page, and the one you want to copy the settings to at the bottom of the page.

Make sure the IP Address and Subnet Mask, and the Device Name boxes are unchecked, or you will have to fix them after the copy. Press the "Copy Settings" button.

Miranda Router Configurator							
E Notwork Cotup	From Device						
The wetwork Setup	Select	Online	Name		Туре	IP Address 🔺	
Welcome	Active		NV5128 P	NV5128		192.168.1.5	Stand Alone
NVISION Series Products	O Standby		NV5128 B	NV5128		192.168.1.6	Stand Alone
Ethernet Settings	Active Active Active		NV8144 PRI	NV8144		192.168.1.11	Stand Alone
	Standby		*Different Subnet* 8144 Dist	NV8144		192.100.1.12	Stand Alone
						102.100.0.11	Cland Alone
Firmware							
Router Levels	Settings To Be Copied						
Output Attributes	Configuration Data				Read Only Stat	us Data	
Miscellaneous	Notwork Sotting	10			Control Car	rd State	
Module Types	Address	and Subnet Mask			Supported	Commands	
Copy Settings	Z Network G	atoway Address			System Sta	tus	
Poutor Tools		me			Version Da	ta	
Roulei Toois	Configurati	on Lock			RF File Ver	sion Data	
Crosspoints		0112001			Available P	rotocols	
Suctom Statue	Configuration S	ettings			Status of M	odules	
Module Status	Router Lev	els				this Ctatua	
inodulo ciado	Input Attribution	utes				ril Pupping Log	
Configurator Tools	AES Refere	ence Setting				d Startun Log	
Preferences	🗾 Dual Refer	ence Setting				d Startup Eog	
Help	🗾 Output Attri	butes					
About	🖌 Serial Com	munication Settings					
	Control Ca	rd Expansion Setting	s				
	Module Typ	pes					
	Crosspoint Setti	ings					
	Discostia	Video Occaso inte					
	Сору То						(
	Select	Online	Name		Туре	IP Address 🔺	
	Standby	hual	NV8144 SEC	NV8144		192.168.1.12	Stand Alone
	C Export	luai	To File				
	- CAPOIT						
Miranda							
A BELDEN BRAND	Refresh Summa	ary 🚺 Copy S	Settings 📴 Import Configuratio	in			

Now verify the configuration of the 2nd control card.

5.0 Configuring the NV9000s with SE Utilities:

Although SE Utilities is installed on Controller 1 for initial configuration, it is recommended that SE Utilities be installed on its own PC. The reason is that SE Utils uses a significant amount of RAM, so we don't recommend leaving it open on the controller during normal operation.

The NV9000 typically has 6 network interface cards (NICs), and the SE Utilities PC can connect to any that are in use except the Control NICs. The Control NIC addresses are only used for the instance of SE Utils that is installed on the Controllers.

If connecting SE Utilities for the first time, you must configure it with the IP physical IP address of each controller. Click on System, Add ControlSystem:

<u>*</u>	1V90	00-SE	Utilities v6.3.3	ł	SE Utils	Tut	ori
File	Syst	em) V	Vindow Help				
		Add	ControlSystem		Routers	×	
		outers					

If you need to edit the existing IP addresses, Under System Management, right-click the top of the tree and select Edit This Control System.

File System Window Help		
Configuration		Routers × NV9000
Tasks		Controller Summar
Views		Controller IP Addre 192.168.1.1
► ₩ NV9002 No Sys	Add ControlSystem Edit This Control System Ignore This Control System Remove This Control System	
	Edit/View DH	ICP

Check the Redundant box if you have two controllers. Enter the physical IP address of the NICs that connect to the same segment as the config PC. In the picture below the PC was connected to Panel/Router Net 1. It could have been connected to the House LAN instead.

Add Control System	X
Control System Name: NV9000]
Redundant	
Controller1 IP address: 192 . 168 . 1 . 1]
Controller2 IP address: 192 . 168 . 1 . 2]
Save and Dismiss Save and Clear Cance	I

The Nvision icon turns green when you have connectivity to the control system:

System Management	Before, no connectivity.
🕎 System Management	
	After, connectivity.

5.1 Routers

Select Routers from the Configuration section of the sidebar:

W NV9000-SE Utilities v6.3.3 - SE Utils Tutoria			
File System Window Help			
Configuration	Routers ×		
Routers			

Click Add Router at the bottom of the screen. Enter "NV5128" in the Name field. Select NV Ethernet Protocol, and leave "New" for both control points:

Name	NV5128
Router Host	NVCONFIG -
Protocol	NV Ethernet
Primary Control Point	-New-
Secondary Control Point	-New-

Click Next. Enter the IP addresses in the Primary and Secondary Control Point Fields that were assigned to the NV5128 in UniConfig. In this case that is 192.168.1.5, and 192.168.1.6.

Router Connection Info	۲
Primary Control Point-	- Secondary Control Point- IP Addr: 192 . 168 . 1 . 6

Under Physical Levels click Add. Edit the Level Name from NV5128_PL1 to NV5128_Data. Set the Start and End input and output parameters to match what was set for the <u>Controller</u> start and end in UniConfig, in this case it starts at 1 and ends at 32

Use the Router Type pull down to select NVISION Machine Control.

Name # Input Start Output End Output End Output End Name NV5128_Data Input Router Type	nput Protect Disabled

Add another level to the NV5128. Edit the name from NV5128_PL2 to NV5128_Video. Set the level size from 1 to 64 for both inputs and outputs as done in UniConfig.

Routers × Router: NV5128 ×	
Router Info	6
	Name WV5128 Protocol : NVElhemetProtocol
Router Connection Info	6
Primary Control Point	IP Addr: 192.168.1.5
Physical Levels	8
Name # Input. Start Input. End Output. Start Output. End Output. End NV51 1 1 32 1 32 NV51 2 1 64 1 64	Name NV5128_Data Input Protect Disabled Input Lock Disabled Output Protect In Server Output Lock In Server Shared Control False Router Type NV15IDN Machine Control Number Virtual XPTS 0 Chop Interval 6 Virtual XPT Default Input 1
	Ad Delete

Click Save and Close.

In Configuration, Routers, click Add Router at the bottom of the screen. Enter "NV8144" in the Name field. Select NV Ethernet Protocol, and leave "New" for both control points:

Name	NV8144
Router Host	NVCONFIG -
Protocol	NV Ethernet
Primary Control Point	-New-
Secondary Control Point	-New- 🔻

Click Next. Enter the IP addresses in the Primary and Secondary Control Point Fields that were assigned to the NV8144 in MRC. In this case that is 192.168.1.11, and 192.168.1.12.

Router Connection Info	۲
Primary Control Point IP Addr: 192 . 168 . 1 . 11	- Secondary Control Point

Under Physical Levels click Add. Edit the Level Name from NV8144_PL1 to NV8144_Video. Set the Start and End input and output parameters to match what was set for the <u>Controller</u> start and end in MRC, in this case it starts at 1 and ends at 144.

Add another level to the NV8144. Edit the name from NV8144_PL2 to NV8144_Audio. Set the level size from 1 to 2304 for both inputs and outputs as done in MRC. The "#" column is the level number. In this case the video is level 1 and the audio is level 2.

R	uters × Router: NV8141	
	Router Info	۲
	Name MV8144 Protocol : IN/EthernetProtocol	
	Router Connection Info	(8)
	Primary Control Point Secondary Control Point IP Addr: 192.168.1.12	
	Physical Levels	۲
	Name # Input Start End Start End	
	Invol 1 144 1 144 Nvol 2 1 2304 1 2304	
	Add Delete	

Click Save and Close.

5.2 Level Sets

Level sets are arguably the most important part of the configuration. Here is where we define our virtual levels and tie them to physical levels. We decide what levels can be routed to one another, and what line on a panel display each level will appear on. You can even define a free source for tielines once all of the devices are defined.

Miranda treats levels differently than our competitors. In other Manufacturers routers, you would not be allowed to route one level to another. In the Miranda Nvision control system we use signal types to determine what levels can route to another.

A Device can consist of one or more virtual levels. When a device is routed to a destination, all virtual levels with a corresponding signal type will route.

The questions I usually ask a customer before configuring his level sets are:

- 1) What type of signals do we need to route?
- 2) What virtual levels need to switch at the same time?
- 3) What is the maximum number of audio channels?
- 4) What type of control panels do we have? Some panels can only display one level.

For our scenario, we will be using both 1080i and SD digital video, 8 embedded audio channels, and RS422 machine control.

Before we can create a Level Set we need to first make sure we have the Virtual Level names and Signal Types defined. Go to Views, Virtual Levels in the sidebar.

By default, there are 31 predefined virtual levels. Usually, we can use these names and signal bindings without any changes, but there are exceptions.

	ID	Mnemonic*
1	1	HD
2	2	SD
3	3	VIDEO
4	4	AV
5	5	AA
6	6	AES 1/2
7	7	AES 3/4
8	8	AES 5/6
9	9	AES 7/8
10	10	AES 9/10
11	11	AES11/12
12	12	AES13/14
13	13	AES15/16
14	14	AUDIO 1
15	15	AUDIO 2
16	16	AUDIO 3
17	17	AUDIO 4
18	18	AUDIO 5
19	19	AUDIO 6
20	20	AUDIO 7
21	21	AUDIO 8
22	22	AUDIO 9
23	23	AUDIO 10
24	24	AUDIO 11
25	25	AUDIO 12
26	26	AUDIO 13
27	27	AUDIO 14
28	28	AUDIO 15
29	29	AUDIO 16
30	30	RS422

One consideration is that the iTX automation system can only status virtual level 1. Another consideration is that the iTX system tried to talk to every virtual level in this table, whether it was used, or not.

For that reason we usually delete all unused virtual levels when iTX is involved. The thing is each ID is an SQL ID. Once you delete them, you don't get them back again. For this reason, I usually rename the lower numbered IDs and change the signal types and bindings.

	ID*	Name*	Description		
1	1	1080i/59.94	SMPTE 292M High Definition Video		
2	2	720p/29.97	SMPTE 292M High Definition Video		
3	3	525i/59.94	SMPTE 259M Standard Definition Video		
4	4	1080i/50	SMPTE 292M High Definition Video		
5	5	720p/50	SMPTE 292M High Definition Video		
6	6	625i/50	SMPTE 259M Standard Definition Video		
7	7	1080p/23.98	SMPTE 292M High Definition Video		
8	8 NTSC NTSC Analog Video				
9	9 PAL PAL Analog		PAL Analog Video		
10	20	AES/EBU	AES/EBU Digital Audio Interface		
11	21	Dolby E	Dolby E Encoded Digital Audio		
12	22	Analog Audio	Analog Monoaural Audio		
13	23	LtRt	Left Total/Right Total Analog Audio		
14	24	AES Mono	NVISION TDM AES		
15	30	RS422 Forward	RS422 Serial Data Forward		
16	31	RS422 Reverse	RS422 Serial Data Reverse		
17	32	RS232 DCE	RS232 Data Circuit-Terminating Equip		
18	33	RS232 DTE	RS232 Data Terminal Equipment		
19	40	Timecode	SMPTE Timecode		

We have some predefined signal types. What you need to understand is that these are just labels. 1080i/59.94 could have been called anything. If I call it "Orange" it will route to any virtual level that is also bound to Orange.

The Virtual Level Signal Type Binding table is where we assign signal types to virtual levels. You may assign multiple signal types to any virtual level. If one of them matches the destination signal type, a route will be made.

Notice in the table below that the HD virtual level is bound to 5 different signal types. This seems like a waste of effort. I could have defined just one signal type and called it HD. As long as that signal type is also assigned to the virtual level I want to route it to, it will route.

In our system we have HD, SD, HD/SD, 8 levels of Audio and Data. There is already an HD, SD, Audio, and Data Virtual levels defined. The closest thing to an HD/SD (multi-format) signal type the Video Virtual level. It includes signal types that have been assigned to both the HD and SD virtual levels.

	VirtualLevel*	SignalType*	
1	HD	1080i/59.94	
2	HD	720p/29.97	
3	HD	1080i/50	
4	HD	720p/50	
5	HD	1080p/23.98	
6	SD	525i/59.94	
7	SD	625i/50	
8	VIDEO	1080i/59.94	
9	VIDEO	720p/29.97	1
10	VIDEO	525i/59.94	Ξ
11	VIDEO	1080i/50	
12	VIDEO	720p/50	
13	VIDEO	625i/50	
14	VIDEO	1080p/23.98	
15	AV	NTSC	
16	AV	PAL	
17	AA	Analog Audio	
18	AA	LtRt	
19	AES 1/2	AES/EBU	
20	AES 1/2	Dolby E	
21	AES 3/4	AES/EBU	
22	AES 3/4	Dolby E	
23	AES 5/6	AES/EBU	
24	AES 5/6	Dolby E	
25	AES 7/8	AES/EBU	
26	AES 7/8	Dolby E	
27	AES 9/10	AES/EBU	
28	AES 9/10	Dolby E	
29	AES11/12	AES/EBU	
30	AES11/12	Dolby E	Ŧ

I would prefer a more descriptive name, so I am going to change the name of the Video virtual level to "HD/SD in the Virtual Levels table:

	ID	Mnemonic*
1	1	HD 🔺
2	2	SD
3	3	HD/SD
4	4	AV

Now that we have the right Virtual Level Signal Type Bindings, let's define our first Level set. Go to Configuration, Level Sets. Click "Add LevelSet". Name this level set "Core Inputs". In a minute I will explain why.

Le	vel Set	Details						
Le	evel Set	Name: Core	Inputs					
ſ	Virtual L	evels.			Level Set	Detail		
	ID	Mnemonic	Parent ID	Parent Mnemonic	Display Index	Virtual Level	Physical Level	Free Source
	1	HD			1			
	2	SD			2			
	3	HD/SD			3			
	2	SD HD/SD			3			

Notice the Display Index column. This is where we get to control what line on the control panel each virtual level will display on. I will usually display my Video, Audio, followed by Machine Control:

Lev	vel Set	Details											
Le	vel Set	Name: Core	Inputs										
	6- -					Laural Cat	Deteil						
	rirtual L	evers				Level Set	vel set Detail						
	ID	Mnemonic	Parent ID	Parent Mnemonic		Display Index	Virtual Level	Physical Level	Free Source				
		un				1	HD	NV8144_Video					
	1	CD.				2	SD	NV8144_Video					
	2	50				3	HD/SD	NV8144_Video					
	3	HU/SU				4	AUDIO 1	NV8144_Audio					
	4	AV			=	5	AUDIO 2	NV8144_Audio					
	5	AA			-	6	AUDIO 3	NV8144_Audio					
	6	AES 1/2				7	AUDIO 4	NV8144_Audio					
	7	AES 3/4	_		- 1	8	AUDIO 5	NV8144_Audio					
	8	AES 5/6	_		- 1	9	AUDIO 6	NV8144_Audio					
	9	AES 7/8			- 1	10	AUDIO 7	NV8144_Audio					
	10	AES 9/10			- 1	11	AUDIO 8	NV8144_Audio					
	11	AES11/12			_	12	RS422	NV5128_Data					
	12	AES13/14			_	13							
	13	AES15/16				14							
	14	AUDIO 1			*	15							
		Add Level	Set	Parent		16							

Click "Save & Close".

It is possible to use this level set for both the input and outputs for the NV8144 and for Machine control in the NV5128. But what happens if a customer has purchased NV9605 control panels that can only status one level?

Using this level set, they would only see status for the HD level on a NV9605 panel. If this were an SD destination, they would see no status at all.

Because the destination level set determines what levels are displayed on a panel, we can easily work around the issue by creating three destination level sets for the NV8144, referred to here as the "Core HD Out", "Core SD Out", and the "Core HD/SD Out" level sets.

Click "Add LevelSet", and name it "Core HD Out". This level set should only contain the HD, Audio, and RS422 virtual levels:

Le	vel Set	Details							
Ŀ	evel Set	Name: Core	HD Out						
	Virtual L	evels				Level Set	Detail		
	ID	Mnemonic	Parent ID	Parent Mnemonic		Display Index	Virtual Level	Physical Level	Free Source
						1	HD	NV8144_Video	
	1	HD			- Âl	2	AUDIO 1	NV8144_Audio	
	2	SD			-	3	AUDIO 2	NV8144_Audio	
	3	HD/SD			-	4	AUDIO 3	NV8144_Audio	
	4	AV			=	5	AUDIO 4	NV8144_Audio	
	5	AA				6	AUDIO 5	NV8144 Audio	
	6	AES 1/2				7	AUDIO 6	NV8144 Audio	
	7	AES 3/4				8		NV8144 Audio	
	8	AES 5/6				0		NV8144 Audio	
	9	AES 7/8				10	PC400	NV/5129 Data	
	10	AES 9/10				11		WV5120_0000	
									1

Click "Save & Close".

Click "Add LevelSet", and name it "Core SD Out". This level set should only contain the SD, Audio, and RS422 virtual levels:

Le	vel Set	Details							
Le	vel Set	Name: Core	SD Out						
ſ	/irtual L	evels				Level Set	Detail		
	ID	Mnemonic	Parent ID	Parent Mnemonic		Display Index	Virtual Level	Physical Level	Free Source
		UD				1	SD	NV8144_Video	
	1	HD			-A	2	AUDIO 1	NV8144_Audio	
	2	SD				3	AUDIO 2	NV8144 Audio	
	3	HD/SD				4		NV/8144 Audio	
	4	AV			=	4	A0010 3	NV8144_Audio	
	5	۵۵				5	AUDIO 4	NV8144_Audio	
					-	6	AUDIO 5	NV8144_Audio	
	6	AES 1/2				7	AUDIO 6	NV8144 Audio	
	7	AES 3/4				8		NV8144 Audio	
	8	AES 5/6							
	0	AFS 7/8				9	AUDIO 8	NV8144_Audio	
	10	AEC 0/10	-		-	10	R5422	NV5128_Data	
	10	MES 9/10				11			

Click "Save & Close".

Click "Add LevelSet", and name it "Core HD/SD Out". This level set should only contain the HD/SD, Audio, and RS422 virtual levels:

Le	vel Set	Details							
υ	evel Set	Name: Core	HD/SD O	ut					
	Virtual L	evels				Level Set	Detail		
	ID	Mnemonic	Parent ID	Parent Mnemonic		Display Index	Virtual Level	Physical Level	Free Source
		110				1	HD/SD	NV8144_Video	
	1	HD			-	2	AUDIO 1	NV8144_Audio	
	2	SD			_	3	AUDIO 2	NV8144_Audio	
	3	HD/SD				4	AUDIO 3	NV8144 Audio	
	4	AV			Ξ	5		NV/8144_Audio	
	5	AA				5			
	6	AES 1/2				0	AUDIO 5	NV8144_Audio	
	7	AFS 3/4				7	AUDIO 6	NV8144_Audio	
	- <u>'</u>	100 5/1			- 11	8	AUDIO 7	NV8144_Audio	
	8	AES 5/0			- 1	9	AUDIO 8	NV8144_Audio	
	9	AES 7/8				10	RS422	NV5128 Data	+
	10	AES 9/10				11			+

Click "Save & Close".

Click "Add LevelSet", and name it "SDI". This level set is for the NV5128 Video matrix, and should contain the only an SD virtual level. Unlike on the NV8144, we will use this level set for both the source and destination devices.

Le	evel Set Details										
Le	vel Set	Name: SDI									
Virtual Levels						Level Set	Detail				
	ID	Mnemonic	Parent ID	Parent Mnemonic		Display Index	Virtual Level	Physical Level	Free Source		
		UD		1		1	SD	NV5128_Video			
	1	HU CD				2					
	2	50				3					

Click "Save & Close". The Level set tab should now appear like this:

Level Sets ×		
	ID	LevelSet
	1	Core Inputs
	2	Core HD Out
	3	Core SD Out
	4	Core HD/SD Out
	5	SDI

5.3 Devices

We are now ready to begin creating devices and assigning ports to them. SE Utilities offers several methods for doing this. I will show you each one, and then show you my preferred method.

One thing to be aware of is SQL device IDs are created in the order the devices are created. If you are using an NV5128-MC or NV5100MC Master Control system that uses internal and External Router Sources for KX talley there can be a conflict if any of the External Router Source

IDs are in the range of 1-64. In this instance you could define the outputs first, and thus avoid the conflict. In our case we are not connecting to a Master Control Switcher, so we will do our inputs first.

The first method to add a device uses the Configuration, Devices tab. Click "Add Device". Choose the Level Set you wish to add the device to. The Mnemonic is the device name and can be up to eight characters in length. It should use a common prefix with an index if you plan to select device by category and index such as you would on an NV9601 panel.

In this example I will create a source device called CAM 1:

1	Add Device ×
	Macmania, CAM 1
	Description: Camera 1
	LevelSet: Core Inputs

In the next field we add our port numbers. Because this level set is just for sources, we will not populate any of the output ports here.

Device Info for Device ID: 1				
Name: CAM 1 Description: Camera 1				
Level Set: Core Inputs Current Categories:				
Device Level Detail				
	Level	Input	Output	
	HD	1		*
	SD			
	HD/SD			
	AUDIO 1			
	AUDIO 2			=
	AUDIO 3			
	AUDIO 4			
	AUDIO 5			
	AUDIO 6			
	AUDIO 7			
	AUDIO 8			-

The audio port numbers related to the video input can be viewed on the NV8144 Cards sheet included in the Support Docs folder, and in the graphic at the top of this document.

They can also be viewed in the NV8144 Port Enumeration sheets found in the appendix of the 8500 Series User Guide.

Audio 1 – Audio 8 ports are only specified on disembedder and embedder hybrid I/O cards unless this router has the DHP option. That is why it is important to know what type of I/O card is in each slot when defining devices. We will cover DHP in a separate tutorial.

Press "Save & Close". Repeat for all of your devices. I don't really like this method as you can only see one device at a time. As such, the copy and paste functions are very limited in use.

5.4 Physical Connections, Input Phys Conns, and Output Phys Conns

In Views, Queries & Advanced Operations, Physical Connections you can see and define both your input and output devices. I find it hard to see all the input and output virtual levels in this view.

Devi	ces × Ph	ysical Connect	ions : Core HD Out ×																
							Select Le	evel Set for Q	uery: Core	HD Out 🔻	•								
	Device ID	avice D Device Description																	
				HD	AUDIO 1	AUDIO 2	AUDIO 3	AUDIO 4	AUDIO 5	AUDIO 6	AUDIO 7	AUDIO 8	RS422	HD	AUDIO 1	AUDIO 2	AUDIO 3	AUDIO 4	<u>A</u>

In the Configuration section after V 6.0.28 the inputs and outputs has been divided up into two separate tabs. Input Phys Conns, and Output Phys Conns.

W NV9000-SE Utilities v6.3.3 -	SE Utils Tutori	al	-	-	_										-	
File System Window Help																
Configuration	Input Physical (Connections :	Core HD Out × Outputs Physical	Connections :	Core HD Ou	t ×										
Routers																
Level Sets		Select Level Set for Query: Core Inputs														
Devices																
🛄 Input Phys Conns	Device TD	Davidas.	Device Dependence						1	n						
Output Phys Conns	Device ID	Device	Device Description	HD	SD	HD/SD	AUDIO 1	AUDIO 2	AUDIO 3	AUDIO 4	AUDIO 5	AUDIO 6	AUDIO 7	AUDIO 8	RS422	
Categories																

Let's create CAM 1 again, this time using Input Phys Conns. Click "Create Device" at the bottom of the page. In the Device column enter "CAM 1". Enter Input port 1 in the HD virtual column. You can add a description if you want. Do not enter anything in the Device ID field. The system will assign the device ID when you save your work.

I	nput Physical C	onnections : C	Core HD Out \star Outputs Physical C	onnections : C	ore HD Out	×									
								Select L	evel Set for 0	Query: Core	Inputs	•			
	Device ID														
	Device ID	Device	Device Description	HD	SD	HD/SD	AUDIO 1	AUDIO 2	AUDIO 3	AUDIO 4	AUDIO 5	AUDIO 6	AUDIO 7	AUDIO 8	RS422
	1	CAM 1	Camera 1	1											

Using this method you could create all of your devices. Be sure to add the audio port numbers to all disembedder and embedder hybrid cards.

The audio port numbers related to the video input can be viewed on the NV8144 Cards sheet included in the Support Docs folder, and in the graphic at the top of this document.

They can also be viewed in the NV8144 Port Enumeration sheets found in the appendix of the 8500 Series User Guide.

Keep in mind every 9th input and output on the disembedder and embedder hybrid cards are not used. On larger frames the invert the cards between the top and bottom halves of the frame. Refer to the port enumeration sheets to identify unused and MADI ports.

5.5 Using Excel to Create Devices

My personal favorite way to create devices is in Excel. I go to the Input and Output Phys Conns pages and use the Export button to export each level set. I populate the device names, port numbers, and device descriptions before importing the sheet back into SE Utilities.

We don't really need the output side of the Core Inputs levels set, or any of the input side of the Core Output level sets either. We will need both for the SDI (NV5128) level set.

Let's start by exporting the Core Inputs level set from Input Phys Conns by clicking the "Export" button:

W Save		X
Save in:	E Desktop	
Recent Items	Retwork	
Desktop	 HONSVICK Vern I!Customer service - Shortcut AJA 	
My Documents	Benoit Docs Excel Programs	
Computer	KFSN	
(Q) Network	File name: ExportDevPhysConnCore Files of type: All Files	Save Cancel

I like to append the level set name to the end of the default file name so I don't get files mixed up. I am going to save it to my desktop. Click Save.

Open the ExportDevPhysConnCore_Input.csv file on your desktop:

	А	В	С	D	E	F	G	Н	I.	J	K	L	М	N	0	Р
1	DEVICE_ID	DEVICE_MNEMONIC	DEVICE_DESCRIPTION	HD	SD	HD/SD	AUDIO 1	AUDIO 2	AUDIO 3	AUDIO 4	AUDIO 5	AUDIO 6	AUDIO 7	AUDIO 8	RS422	
2																
3																
4																
5																

I have included an Excel spreadsheet called Router Tables. It contains the names and video port numbers for each device, as well as the port type. Typically, the customer will provide this information before you begin configuration.

The audio port numbers related to the video input can be viewed on the NV8144 Cards sheet included in the Support Docs folder, and in the graphic at the top of this document.

They can also be viewed in the NV8144 Port Enumeration sheets found in the appendix of the 8500 Series User Guide.

Use the Router Tables and Port Enumeration sheet provided at the beginning of this tutorial to complete your Core inputs spreadsheet. I would start by copying the Mnumonics, Description, and ports column to the corresponding column in the ExportDevPhysConnCore_Input.csv.

Just paste all the port numbers into the HD column. Then move the port numbers for the SD sources to the SD column. Paste the Machine Control port numbers into the RS422 column. We will not use the HD/SD column for any sources.

	Α	В	С	D	E	F	G	Н	1	J	K	L	М	N	0	
1	DEVICE_I	DEVICE_N	DEVICE_D	HD	SD	HD/SD	AUDIO 1	AUDIO 2	AUDIO 3	AUDIO 4	AUDIO 5	AUDIO 6	AUDIO 7	AUDIO 8	RS422	
2		CAM 1	1 (Std)	1												
3		CAM 2	2 (Std)	2												
4		CAM 3	3 (Std)	3												
5		CAM 4	4 (Std)	4												
6		CAM 5	5 (Std)	5												
7		CAM 6	6 (Std)	6												
8		VTR 101	7 (Std)	7												1
9		VTR 102	8 (Std)	8											1	2
10		VTR 103	9 (Std)	9											:	3
11		VTR 104	10 (Std)	10											4	4
12		VTR 105	11 (Std)	11											!	5
13		VTR 106	12 (Std)	12											(6
14		VTR 107	13 (Std)		13											7
15		VTR 108	14 (Std)		14										8	8
			4 - 10 - D												I .	-

I placed the input type in the Device Description field so we can keep track of the MADI and Unused ports. The MADI, Unused ports, and Tielines are place holders to keep our numbering straight. They will not be assigned to categories or control panel buttons.

Using the port Enumeration Sheet at the top of this document, populate the audio port numbers for all of the disembedder cards.

60	EDIT 7	59 (Std)		59									
61	EDIT 8	60 (Std)		60									
62	GFX 111	61 (Std)	61										
63	GFX 112	62 (Std)	62										
64	GFX 121	63 (Std)	63										
65	SVR 101	64 (Dis)	64		1009	1010	1011	1012	1013	1014	1015	1016	
66	SVR 102	65 (Dis)	65		1025	1026	1027	1028	1029	1030	1031	1032	
67	SVR 103	66 (Dis)	66		1041	1042	1043	1044	1045	1046	1047	1048	
68	SVR 104	67 (Dis)	67		1057	1058	1059	1060	1061	1062	1063	1064	
60	SV/R 105	68 (Die)	68		1073	107/	1075	1076	1077	1078	1070	1080	

We don't populate the audio port for Standard inputs as we cannot disembed or manipulate the audio unless we have the Dynamic Host Pathfinding (DHP) option, but that is for another tutorial.

MADI input port numbers can be assigned to sources assigned to disembedders. For instance, we have a legacy SD Master Control switcher. It has 2 channels of discreet AES audio associated with each of the PGM, PST, and CLN outputs.

These video outputs are connected to inputs 96, 97, and 98. The AES audio is connected to the first 6 MADI inputs of an 8900 AES to MADI converter connected to Port 135. Therefore PGM audio is ports 2017 & 2018, PST audio is 2019 & 2020, and CLN is 2021 & 2022.

96	RF 5	95 (Dis)	95		1505	1506	1507	1508	1509	1510	1511	1512
97	PGM	96 (Dis)		96	2017	2018						
98	PST	97 (Dis)		97	2019	2020						
99	CLN	98 (Dis)		98	2021	2022						
100	UIN 99	99 (Unused)	99									
101	REM 1	100 (Dis)	100		1585	1586	1587	1588	1589	1590	1591	1592
102	REM 2	101 (Dis)	101		1601	1602	1603	1604	1605	1606	1607	1608
103	REM 3	102 (Dis)	102		1617	1618	1619	1620	1621	1622	1623	1624
104	REM 4	103 (Dis)	103		1633	1634	1635	1636	1637	1638	1639	1640
105	REM 5	104 (Dis)	104		1649	1650	1651	1652	1653	1654	1655	1656
106	REM 6	105 (Dis)	105		1665	1666	1667	1668	1669	1670	1671	1672
107	REM 7	106 (Dis)	106		1681	1682	1683	1684	1685	1686	1687	1688
108	REM 8	107 (Dis)	107		1697	1698	1699	1700	1701	1702	1703	1704
109	UIN 108	108 (Unused)	108									
110	REM 9	109 (Dis)		109	1729	1730	1731	1732	1733	1734	1735	1736
110	REM 9	109 (Dis)		109	1729	1730	1731	1732	1733	1734	1735	

If we configure it the way it is shown here, what will happen if we were to route PGM to a destination that REM 9 is currently routed to? The answer is that Audio 1 & Audio 2 would change to the new source (MADI 135 Ch 1 & 2), while Audio 3 – Audio 8 remain from REM 9.

To resolve this issue we will pad the remaining Audio channels 3-8 with Silence (Audio 1 associated with SD black), such that all disembedders have the same number of audio channels.

96	RF 5	95 (Dis)	95		1505	1506	1507	1508	1509	1510	1511	1512
97	PGM	96 (Dis)		96	2017	2018	1953	1953	1953	1953	1953	1953
98	PST	97 (Dis)		97	2019	2020	1953	1953	1953	1953	1953	1953
99	CLN	98 (Dis)		98	2021	2022	1953	1953	1953	1953	1953	1953
100	UIN 99	99 (Unused)	99									
101	REM 1	100 (Dis)	100		1585	1586	1587	1588	1589	1590	1591	1592

If these were HD sources then we would have used Silence from HD Black instead. Now when we to route PGM to a destination that REM 9 is currently routed to, the last 6 channels are now silence.

127	UIN 126	126 (Unused)	126		
128	FS 1	127 (Std)		127	
129	FS 2	128 (Std)		128	
130	FS 3	129 (Std)		129	
131	FS 4	130 (Std)		130	
132	FS 5	131 (Std)		131	
133	FS 6	132 (Std)		132	
134	FS 7	133 (Std)		133	
135	FS 8	134 (Std)		134	
136	(MDI 135)	135 (MADI 2017 - 2080)	135		
137	TLOT	136 (Std) Tieline from NV5128 Out 57	136		
138	(TL 02	137 (Std) Tieline from NV5128 Out 58	137		
139		138 (Std) Tieline from NI/5128 Out 59	128		

We have placeholders for the Unused inputs, the MADI inputs, and Tielines:

Important - Do not assign these devices to Categories or Control Panels. They are here to help keep our port numbers aligned with our device names.

When you are done assigning your audio ports to devices, we will import this Input PhysConns sheet into SE Utilities. Before you do, I like to back up my configuration in case things don't go well during the import. Use File, Export to Zip Archive to back up your project.

We are limited to 8 characters, including spaces. Any device names that exceed this will be truncated. Pay attention to any errors message line numbers during import. You can figure out which devices have issues by comparing to the Excel sheet line number. They should only be off by one.

5.6 Importing Physical Connections from Excel

In SE Utilities select Tasks, Import Data File. Under "Data file to import" browse to the ExportDevPhysConnCore_Input.csv file you just completed.

Click the "Devices and their Physical Connections radio button. Select "Core Inputs" in the Level Set pull-down.

Source File	
Data file to import ExportDevPhysConnCore_Input.csv	Browse
Column delimiter	
Column header line number 1	
Data start line number 2	
Target Table(s)	
Target Table Choose one	•
Import Mapping File	
evices and their Physical Connections Level set Core Inputs	•
Messages/Errors	
Create Mapping Update/Review Mapping Cancel	3

Click "Create Mapping".

Because this is our core sources click the Input Radio button at the top of the window.

Source File to Virtual Level Mapping	Output
File Column	Virtual Level
HD	HD, ID: 1
SD	SD, ID: 2
HD/SD	HD/SD, ID: 3
AUDIO 1	AUDIO 1, ID: 14
AUDIO 2	AUDIO 2, ID: 15
AUDIO 3	AUDIO 3, ID: 16
AUDIO 4	AUDIO 4, ID: 17
AUDIO 5	AUDIO 5, ID: 18
AUDIO 6	AUDIO 6, ID: 19
AUDIO 7	AUDIO 7, ID: 20
AUDIO 8	AUDIO 8, ID: 21
RS422	RS422, ID: 30
Save Mapping Next	Previous Cancel

Click Next, then Run Import:

Run condition	
O Undo import on error(s).	
Save import on error(s)	
Test	
Save Mapping Run Import Previous Cancel	2

Close your Input Physical Connections tab if open. The click on Input Phys Conns in the sidebar to re-open it. Select the Core Inputs level set from the pull-down. You should see the devices you assigned in Excel:

Input	iput Physical Connections : Core Inputs ×														
	Select Level Set for Query Core Inputs														
	n In														
De	evice ID	Device	Device Description	HD	SD	HD/SD	AUDIO 1	AUDIO 2	AUDIO 3	AUDIO 4	AUDIO 5	AUDIO 6	AUDIO 7	AUDIO 8	RS422
	1	CAM 1	1 (Std)	1											
	2	CAM 2	2 (Std)	2											
	3	CAM 3	3 (Std)	3											
	4	CAM 4	4 (Std)	4											
	5	CAM 5	5 (Std)	5											
	6	CAM 6	6 (Std)	6											
	7	VTR 101	7 (Std)	7											1
	8	VTR 102	8 (Std)	8											2
			1				1	1				1			

Now we have the inputs defined for the Core router, let's build the destinations. Click on Output Phys Conns in the sidebar. We are going to want to export the "Core HD Out", "Core SD Out", and "Core HD/SD Out" level sets.

Select the 'Core HD Out" level set and press "Export". It will be named ExportDevPhysConn already. I suggest appending "CoreHD" the name. SE Utils will add "_Output.csv" to the name.

Repeat for "Core SD Out" and "Core HD/SD Out".

Copy just the SD devices to the "Core SD Out", the HD devices to the "Core HD Out", and the HD/SD devices to the Core HD/SD Out spreadsheet.

	А	В	С	D	E	F	G	Н	I	J	К	L	М
1	DEVICE_ID	DEVICE_N	DEVICE_DES	HD	AUDIO 1	AUDIO 2	AUDIO 3	AUDIO 4	AUDIO 5	AUDIO 6	AUDIO 7	AUDIO 8	RS422
2		VTR 101	49 (Emb)	49	769	770	771	772	773	774	775	776	1
3		VTR 102	50 (Emb)	50	785	786	787	788	789	790	791	792	2
4		VTR 103	51 (Emb)	51	801	802	803	804	805	806	807	808	3
5		VTR 104	52 (Emb)	52	817	818	819	820	821	822	823	824	4
6		VTR 105	53 (Emb)	53	833	834	835	836	837	838	839	840	5
7		UOUT 54	54 (Unused)	54									
8		VTR 106	55 (Emb)	55	865	866	867	868	869	870	871	872	6

Using the port Enumeration Sheet at the top of this document, populate the audio port numbers for all of the Embedder cards. Save and repeat for each Core Output spreadsheet.

Import the ExportDevPhysConnCoreHD_Output.csv spreadsheet into SE Utilities as before. This time browse to "ExportDevPhysConnCoreHD_Output.csv" and select the "Core HD Out" level set from the pull-down press "Create Mapping".

Source File							
Data file to import ExportDevPhysConnCoreHD_Output.csv Browse							
Column delimiter ,							
Column header line number 1							
Data start line number 2							
Target Table(s)							
Target Table Choose one							
Import Mapping File							
Devices and their Physical Connections Level Set Core HD Out							
Messages/Errors							
Create Mapping Update/Review Mapping Cancel							

This time we are importing an output level set, so select the "Output" radio button and select "Next":

Source File to Virtual Level Mapping	
Input	Output
File Column	Virtual Level
HD	HD, ID: 1
AUDIO 1	AUDIO 1, ID: 14
AUDIO 2	AUDIO 2, ID: 15
AUDIO 3	AUDIO 3, ID: 16
AUDIO 4	AUDIO 4, ID: 17
AUDIO 5	AUDIO 5, ID: 18
AUDIO 6	AUDIO 6, ID: 19
AUDIO 7	AUDIO 7, ID: 20
AUDIO 8	AUDIO 8, ID: 21
RS422	RS422, ID: 30
Save Mapping Next	Previous Cancel ?

Click "Run Import."

Repeat the import for the "Core SD Out", and "Core HD/SD Out" level sets.

Now we need to create the Input and Output Phys Conns tables for the SDI (NV5128) router's 64x64 SD video level. In this case we will use one level set for both the inputs and the outputs, but we still have to import the inputs and outputs separately.

Start by exporting the SDI Level from the Input and Output Phys Conns windows. Append an SDI to the default names.

Copy the SDI names and port numbers to the ExportDevPhysConnSDI_Input.csv and ExportDevPhysConnSDI_Output.csv worksheets. This time we don't have to worry about audio. It is all embedded.

	А	В	С	D	E
1	DEVICE_ID	DEVICE_M	DEVICE_D	SD	
2		CAM 11		1	
3		CAM 12		2	
4		CAM 13		3	
5		CAM 14		4	
6		CAM 15		5	
7		CAM 16		6	
8		SVR 1		7	
5 6 7 8		CAM 14 CAM 15 CAM 16 SVR 1		4 5 6 7	

Import the ExportDevPhysConnSDI_Input.csv and ExportDevPhysConnSDI_Output.csv worksheets as before, this time using the SDI level set.

5.7 Categories

Categories are used to group sources or destinations together on a control panel. Once you define a category and assign it to a control panel button, you automatically get all of the devices that belong to that category when you press that button.

Categories can contain any device name. However, they are more intuitive when they use a common prefix such as VTR or CAM. Because the devices in your categories may or may not share a common prefix, there are two different ways to configure your categories.

The first way is Category/Index, the second way is Category/Suffix. First let's build a source category named VTR. I find it works better if I have separate source and destination categories. In SE Utilities select Configuration, Categories.

Click "Add Category". Enter "VTR" in the mnemonic field. Type "VTR Inputs" In the description field. Click "Next".

Select "Core Inputs" in the Level Set pull-down. Highlight VTR 101 – VTR 308 by clicking on VTR 101, holding down Shift while clicking on VTR 308. Click "Next", then "Finish".

In the Category tab double-click the VTR category to open it. So far we just added the VTR sources from the Core router. We can also add the VTR sources from the SDI router if we wish.

Sometimes it can be difficult to tell what devices are inputs, and which are outputs. I like to check the device ID to make sure.

303	VTR 1	15
304	VTR 2	16
305	VTR 3	17
306	VTR 4	18
307	VTR 5	19
308	VTR 6	20
309	VTR 7	21
310	VTR 8	22
311	VTR 9	23
312	VTR 10	24
313	VTR 11	25
314	VTR 12	26
315	VTR 13	27
316	VTR 14	28
	i	i i

In this case we can see that the device ID for the VTR sources in the SDI router range from 303-316. Open the VTR category and select "Add Device". Append VTR 1-14 with device IDs 303-316. Be sure not to select any destination VTRs. Click "OK".

Device ID	Device Mnemonic	Index	Suffix 1	Suffix 2	Suffix 3	Suffix 4	Suffix 5	Suffix 6			
7	VTR 101	1									
8	VTR 102	2									
9	VTR 103	3									
10	VTR 104	4									
11	VTR 105	5									
12	VTR 106	6									
13	VTR 107	7									
14	VTR 108	8									
15	VTR 201	9									
16	VTP 202	10									
	Reindex All Hide Index Add Device Edit Device Add Suffix Auto-Fill Suffixes										

If we leave things as they are as Category/Index, an operator would select VTR 101 by pressing "VTR" "1" Take. If we would like the operator to press "VTR" "1" "0" "1" then we need to create suffixes.

Press the "Auto-Fill Suffixes" button. You can either select "Parse by prefix" and enter VTR as the prefix, or you can select "Parse by fill character" and select Space. Press "OK". The suffixes should now be populated:

Device ID	Device Mnemonic	Index	Suffix 1	Suffix 2	Suffix 3	Suffix 4	Suffix 5	Suf 6		
7	VTR 101	1	1	0	1					
8	VTR 102	2	1	0	2					
9	VTR 103	3	1	0	3					
10	VTR 104	4	1	0	4					
11	VTR 105	5	1	0	5					
12	VTR 106	6	1	0	6					
13	VTR 107	7	1	0	7					
14	VTR 108	8	1	0	8					
15	VTR 201	9	2	0	1			\square		
16	V/TP 202	10	2	0	2					
	Reindex All Hide Index Add Device Edit Device Delete Device Add Suffix Auto-Fill Suffixes									

When using Category/Index, the index controls the order the devices are displayed on the control panel. When using Category/Suffixes, the categories are displayed alphabetically by prefix and suffix on the control panels. Keep in mind if you add a device such as SVR 101 to the VTR category, the prefix it is sorted by is VTR, not SVR. This confuses people.

Click "Save and Close".

Now build a category called "Test". Put the SD and HD Bars and Black belonging to the Core Inputs level set and Black and Bars from the SDI router in it.

Category Details								
Set Selected Suffixes			N/A 🔻	N/A 🔻	N/A 🔻	N/A 🔻	N/A 🔻	
Fillers								
Device ID	Device Mnemonic	Index	Suffix 1	Suffix 2	Suffix 3	Suffix 4	Suffix 5	
122	SD BARS	1						
123	SD BLACK	2						T
124	HD BARS	3						Τ
125	HD BLACK	4						T
343	BLACK	5						T
344	BARS	6						Τ
			Reindex All Hide	Index Add Device	Edit Device Dele	te Device Add Suffix	Auto-Fill Suffixes	

In this case Suffixes don't make sense. An Operator would select "Test" "1" Take to route SD Bars to a destination. You also have the option to assign the source directly to a control panel button if you don't like using Category/Index.

It is also possible to manipulate the index instead of using suffixes. Look at what I did with the index on CAM 11 – CAM 16:

Device ID	Device Mnemonic	Index	Suffix 1	Suffix 2	Suffix 3	Suffix 4	Suffix 5	Su (
1	CAM 1	1						Γ
2	CAM 2	2						
3	CAM 3	3						
4	CAM 4	4						
5	CAM 5	5						
6	CAM 6	6						
289	CAM 11	11						
290	CAM 12	12						
291	CAM 13	13						
202	CAM 14	14						
			Reindex All Hid	e Index Add Device	Edit Device De	elete Device Add Sul	fix Auto-Fill Suffixe	s

This is one way to use Category/Index and have it work in a more intuitive way. Some customers just toss everything into categories and use a lookup sheet to know the index. Operators get used to the designations.

Create input and output categories for each prefix type for both routers. It is a good idea to include "All" inputs and outputs categories for the Engineering panel.

When doing this in the real world we often have to think about what each panel will be used for. Some work stations only need to control one destination and a handful of sources, while some control many. We don't want to give an operator access to more than they need. Customers will often build categories for specific control panels, and they don't always use different names. The use of good descriptions is necessary to understand what each category is for.

5.8 Tielines

We want to create Tielines that go from the SDI router outputs 57-64 to Core router inputs 136-143. Our first issue is none of these ports are available when we attempt to create these tielines. That is because the ports were already assigned to devices TL 01 – TL 08.

In order to use these ports it is necessary to delete the port numbers from the tielines on both the SDI Outputs and Core Inputs.

409	TL 01	Tieline to NV8144 In 136			
410	TL 02	Tieline to NV8144 In 137			
411	TL 03	Tieline to NV8144 In 138			
412	TL 04	Tieline to NV8144 In 139			
413	TL 05	Tieline to NV8144 In 140		1	
414	TL 06	Tieline to NV8144 In 141		1	
415	TL 07	Tieline to NV8144 In 142		1	
416	TL 08	Tieline to NV8144 In 143		1	
361	VTR 1		٩	1	
136	TL 01	136 (Std) Tieline from NV5128			
137	TL 02	137 (Std) Tieline from NV5128			
138	TL 03	138 (Std) Tieline from NV5128			
139	TL 04	139 (Std) Tieline from NV5128			
140	TL 05	140 (Std) Tieline from NV5128			
141	TL 06	141 (Std) Tieline from NV5128			
142	TL 07	142 (Std) Tieline from NV5128			
143	TL 08	143 (Std) Tieline from NV5128			

Now select Configuration, Tielines. Click "Add Tieline". Give the tieline a descriptive name. The description is optional. I use it if the name isn't descriptive enough. The Tieline cost is 1 hop.

Fields labeled in	red are required.
Tieline Name	SDI_Core_TL1
Tieline Descri	SDI to Core Tieline 1
Tieline Cost	1

Click "Next".

Check the NV5128 Video box in the Upstream Physical Levels area. Check the NV8144_Video box in the Downstream Physical Levels area. We can see only the ports not unassigned to devices:

r Info	
Name: SDL_Core_TL1 Cost: 1 Description: SD1 to Core Tieline 1	
- Instram - Cranb	-Downetroam
Prysical Levels Physical Levels 1 1W5128_0dta 2 1W5128_Video 4 1W3144_Audio Levels Levels Levels Physical Levels 1 W5128_Video 6 1 100 100 100 100 100 100 100 1	Pryscal Levels Prysca

Left-click on port 57 and drag a line across to port 136 before releasing the mouse button. Check the SD level boxes on the NV5128 and NV8144:

-Info		
Name: SDI_Core_TL1 C	ost: 1 Description: SDI to Core Tieline 1	
Upstream	I Graph-	Downstream
Physical Levels		Physical Levels
1 NV5128_Data		1 NV5128_Data
2 NV5128_Video		2 NV5128_Video
3 NV8144_Video		3 NV8144_Video
4 NV8144_Audio	INV5128_Video L00 L39 IVVS144_Video 61 140 144 62 141 144	4 NV8144_Audio
NV5128_Video, 57	63 142	NV8144_Video, 136
Levels		Virtual Levels
SD SD		HD HD
		SD SD
		HD/SD
Signal Types		Signal Types
✓ 525i/59.94		1080i/59.94
✓ 625i/50		720p/29.97
		✓ 525i/59.94
		1080i/50
		720p/50
		✓ 625i/50
		1080p/23.98
	V No Conversion	
	Revert to Save Save Save Save	

Click save and close.

Repeat for SDI_Core_TL2 through SDI_Core_TL8.

5.9 Free sources

Free sources are local sources that are used to release tielines. They are defined in the level set the destinations you want to free are in, and are usually a local Black/Silence.

The issue we have because of how we defined our Core Output level sets, is there are no sources in these level sets. We will have to add some to use as our free sources.

First, we need to know what the port numbers are for our HD and SD Black local sources, so we can use them to build our free sources.

HD Black uses port 125 for Video and ports 1985-1992 for Audio. SD Black uses port 123 for Video and ports 1953-1960 for Audio.

Go to Configuration, Input Phys Conns. Select the Core HD Out Level Set from the pull down. Create an input device called FREE_HD and assign it the ports used by HD Black:

N	/9000: SE Util:	s Tutorial 🗙	Input Physical Connections : Core	HD Out ×									
								Select Level	Set for Query	Core HD (Dut 🔻		
١								Ir					
	Device ID	Device	Device Description	HD	AUDIO 1	AUDIO 2	AUDIO 3	AUDIO 4	AUDIO 5	AUDIO 6	AUDIO 7	AUDIO 8	RS422
	417	FREE_HD		125	1985	1986	1987	1988	1989	1990	1991	1992	

Select the Core SD Out Level Set from the Input Phys Conns pull-down, and create a device called FREE_SD:

N	/9000: SE Util:	s Tutorial 🗙	Input Physical Connections : Core	HD Out ×									
								Select Level	Set for Query	Core SD (Dut ▼		
	Desider ID	A.	Desider Description					Ir	1				
	Device ID	Device	Device Description	SD	AUDIO 1	AUDIO 2	AUDIO 3	AUDIO 4	AUDIO 5	AUDIO 6	AUDIO 7	AUDIO 8	RS422
	418	FREE_SD		123	1953	1954	1955	1956	1957	1958	1959	1960	

Select the Core HD/SD Out Level Set from the Input Phys Conns pull-down, and create a device called FREEHDSD:

1	IV9000: SE Util	Tutorial ×	Input Physical Connections : Core	HD Out ×									
								Select Level	Set for Query	Core HD/:	SD Out 🔻		
	Deuise ID	A Device	Device Description					Ir	۱				
	Device ID	Device	Device Description	HD/SD	AUDIO 1	AUDIO 2	AUDIO 3	AUDIO 4	AUDIO 5	AUDIO 6	AUDIO 7	AUDIO 8	RS422
	419	FREEHDSD		125	1985	1986	1987	1988	1989	1990	1991	1992	

Go to Configuration, Level Sets. Double click the Core HD Out Level Set. Define a local source for each virtual level except the Virtual RS422 level:

NV90	00: SE Uti	ls Tutorial 🗴	Level S	iets × Leve	ISet:	Core	e HD Out	×		
	10.1	D. 1. 1								
	evel Set	Details								
	Level Set	Name: Core	HD Out							
	Virtual L	evels				ין ר	Level Set	Detail		
	ID	Mnemonic	Parent ID	Parent Mnemonic			Display Index	Virtual Level	Physical Level	Free Source
							1	HD	NV8144_Video	FREE_HD
	1	HD			ĥ		2	AUDIO 1	NV8144_Audio	FREE_HD
	2	SD			-		3	AUDIO 2	NV8144_Audio	FREE_HD
	3	HD/SD			-		4	AUDIO 3	NV8144_Audio	FREE_HD
	4	AV			Ξ		5	AUDIO 4	NV8144_Audio	FREE_HD
	5	AA					6	AUDIO 5	NV8144_Audio	FREE_HD
	6	AES 1/2					7	AUDIO 6	NV8144 Audio	FREE HD
	7	AES 3/4					8		NV8144 Audio	FREE HD
	8	AES 5/6					0		NV8144 Audio	
	9	AES 7/8					7	PC422		
	10	AES 9/10					10	K5422	NV5128_Dgrg	\sim

Click "Save & Close".

Double click the Core SD Out Level Set. Define a local source for each virtual level except the Virtual RS422 level:

: SE Util	s Tutorial 🗙	Level S	ets × <mark>Leve</mark>	Set:	Cor	e SD Out	×			
vel Set	Details									
vel Set	Name: Core	SD Out								
Virtual L	evels					Level Set	Detail			
ID	Mnemonic	Parent ID	Parent Mnemonic			Display Index	Virtual Level	Physical Level		Free Source
	110	-				1	SD	NV8144_Video	1	FREE_SD
1	HD			-		2	AUDIO 1	NV8144_Audio	Γ	FREE_SD
2	SD			-		3	AUDIO 2	NV8144_Audio		FREE_SD
3	HD/SD			-		4	AUDIO 3	NV8144_Audio		FREE_SD
4	AV			Ξ		5	AUDIO 4	NV8144_Audio	t	FREE_SD
5	AA					6	AUDIO 5	NV8144 Audio	t	FREE SD
6	AES 1/2					7	AUDIO 6	NV8144 Audio	t	EREE SD
7	AES 3/4					0		NV8144 Audio	╀	EPEE CD
8	AES 5/6					•		NV8144_Audio	+	FREE_SU
9	AES 7/8					9	AUDIO 8	NV8144_AU0I0	_	FREE_SD
10	AES 9/10					10	R5422	NV5128_Data		\sim

Click "Save & Close".

Double click the Core HD/SD Out Level Set. Define a local source for each virtual level except the Virtual RS422 level:

: SE Util	ls Tutorial 🗴	Level S	Sets × Leve	elSet:	Cor	e HD/SD C	lut ×		
	Datalla								
verset	Details								
evel Set	Name: Core	HD/SD O	ut						
Virtual L	.evels					Level Set	Detail		
ID	Mnemonic	Parent	Parent			Display Index	Virtual Level	Physical Level	Free Source
		10	Innemonie			1	HD/SD	NV8144_Video	FREEHDSD
1	HD					2	AUDIO 1	NV8144_Audio	FREEHDSD
2	SD	_				3	AUDIO 2	NV8144_Audio	FREEHDSD
3	HD/SD					4	AUDIO 3	NV8144_Audio	FREEHDSD
4	AV			=		5	AUDIO 4	NV8144_Audio	FREEHDSD
5	AA			-		6	AUDIO 5	NV8144_Audio	FREEHDSD
6	AES 1/2					7	AUDIO 6	NV8144_Audio	FREEHDSD
7	AES 3/4	_				8	AUDIO 7	NV8144_Audio	FREEHDSD
8	AES 5/6					9	AUDIO 8	NV8144 Audio	FREEHDSD
9	AES 7/8					10	RS422	NV5128 Data	$-\bigcirc$
10	AES 9/10								

Click "Save & Close".

5.10 Control Panels

There are many types of control panels. I will cover some of the basics on a couple of popular types of panels. There is no one way to configure these panels. The best way is whatever makes the most sense to the customer and his workflow.

Let's begin with an NV9640 LCD button panel. The basic operation is you select a destination. You select a source. You press take.

Select Configuration, Control Panels, "Add Control Panel". Select the NV9640 from the Panel Type pull-down. Enter your panel ID number. Choose a unique ID if you have not assigned IDs to your panels yet. Customers often use room numbers or rack locations for their panel IDs.

Assign a descriptive name for the panel or area it is located. I often use it for the file name when choosing "New".

You can use the default User EnvyUser. Lock and protect privileges are assigned by user. Create additional users if you want to restrict which panels can unlock a lock or protect set by another panel.

There are three choices under Configuration Options:

1) New, named _____ copied from:

2) Existing

3) New (default), named:_____

Let's start with Number 3. You define a new panel and provide a name for the new config file. This is what we will do this time. Number 1 is a new panel based on an existing one. Number 2 is "Existing", and you pick the panel config file to use.

The difference between "New, named" and "Existing" is that you can make changes to "New, named" without affecting other panels that share the template. Changes to "Existing" affect all panels that share that template.

Туре: NV9640 🔻
ID: 343
Name: ENG 9640
User: EnvyUser 🔻
Configuration Options:
New, named: copied from:
C Existing:
New (default), named: ENG 9640

Click "Next".

Under Panel Options select XY Mode. Check the "Jump Back After Source Selection" box and the "Jump Back After Destination Selection". You can move the default buttons around to suit the customer.

Button Layout - NV9640 : C:\Users\vhonsvic	CtrlSysConfigs\SE Utils Ti	utorial\configs\ENG 9640.640		
Multi-Destination 1 Display 2	Page Up			Take
4	Page Down			Info
Click a line 6 to edit 7 Current Page: Default 8	Break Away			Menu
Button Definitions Button Type: Menu	Button Color:	Panel Options		A
Button Caption Menu	Blue	Default Mode: Release Mode:	XY Mode	
	on all subsequent child	Default Destination: Preset Monitor:	None None	

Sources and destinations (devices) can be assigned in several ways. First, you can assign the device directly to a button on the main page, or to a navigation page. You could also assign the categories you created earlier to buttons.

The difference between Navigation pages and Categories is that Navigation pages have to have every button assigned manually. This gives you a lot of flexibility for layout, but it can be a lot of work. Categories automatically assign the devices to buttons either by index number, or alphabetically when suffixes are used.

In our example we will assign several source categories to the top row, and several destinations to the middle row. The method is to click on a button, then use the Menu pull-down to assign the button type.

In our case we will select Category. You can press a "C" to jump to that point in the pull-down list. Use the Src Category and the Dst Category pull-downs to assign the first 8 categories as shown below:

Control Panels × Panel: ENG 9640 ×										
Button Layout - NV9640 : C:\Users\vhonsvic	CtrlSysCon	ifigs\SE U	Itils Tutor	ial\config	s\ENG 964	0.640				
Multi-Destination 1 Display 2	Page Up	AUX IN	САМ	CNV	Edit In	FS	GFX	MUX	REM IN	Take
4	Page Down	EDIT OUT	MON	SVR OUT	SW OUT	SWR	TST	тх	VTR OUT	Info
Click a line 6 to edit 7 Current Page: Default 8	Break Away									Menu
Button Definitions Button Type: Category	Button	Color:	P	anel Optic Defa	ons ault Mode	:	XY Mode	9	•	
VTR OUT	on all subse	e mis puu I equent ch	nild	Rele Defa Pres	ease Mode ault Destir set Monito	e: nation: or:	Normal None	Release	• •	
Dst Category: VTR OUT: 14	Use g page devic	to select es.	TIX I	Stat XY I	tus Monito Data Rout	r: ing Mo	None Automat	ic	 ▼ 	

The number shown after the colon in the source and destination names is the SQL ID. It can be useful when you have more than one device with the same name.

We can set a default destination for this panel using the pull-down. Because we have tielines we should add a Free Source button. We could also add a couple of source buttons to the bottom row such as SD Black, SD Bars, HD Black, HD Bars.

rButton Layout - NV9640 ; C:\Users\vhonsvic\CtrlSvsConfigs\SE Utils Tutorial\configs\ENG 9640.640											
Nulti-Destination 1 Display 2	Page Up	AUX IN	САМ	CNV	Edit In	FS	GFX	MUX	REM IN	Take	
3 4 5		EDIT OUT	MON		SW OUT	SWR	TST	тх			
Click a line 6 to edit 7 Current Page: Default 8		SD BLACK	SD BARS	HD BLACK	HD BARS				Free Source		

At this point we have enough to make this panel work. We can make navigation pages for the source and Destination categories if we have too many to fit on one page. There is no one way to configure these panels, so experiment with the menus!

NV9601

Next let's program an NV9601 panel. It uses Category/Index method to make routes. Go to Configuration, Control Panels and press "Add Control Panel".

Select the NV9601 from the Panel Type pull-down. Make sure a unique ID is assigned to the NV9601. To see what ID is assigned to a NV9601 panel, apply power without a network connection.

You should see "ACQ IP" and the Panel ID in the display. If you need to change the ID press the Page Up button to access the menu. Press the leftmost button under the display to select the ID menu. Use the keypad to set a new ID. Press the Rightmost button under the display to save the changes.

Reconnect the network cable.

In this example I have named the panel NV9601. If I were in a facility I would want to use names that would help me locate the panel, like ENG or EDIT 1.

Control Panels × Outputs Physical Connections : SDI × NV9000: SE Utils Tutorial × Add Control Panel ×
Type: NV9601 ▼
ID: 123
Name: NV9601
User: EnvyUser
Configuration Options:
New, named: copied from:
C Existing:
New (default), named: NV9601

Click "Next".

Set a default destination such as MON 102.

C	Control Panels × Outputs Physical Connections : SDI × NV9000: SE Utils Tutorial × Add Control Panel × Panel: NV9601 ×																	
	Button Layout - NV9601 : C:\Users\vhonsvic\CtrlSysConfiqs\SE Utils Tutorial\configs\NV9601.601 Multi-Destination 1																	
	Display													Cat	Cat	Cat		
		Click a line to edit										Page up			Cat	Cat	Cat	
	Right-Click to view salvos									7 8	Page Down			Cat	Cat	Cat		
	Take			Sel	Sel					Cat								

You will notice the 10 pre-defined Category buttons. The Categories have not been assigned yet, but the indexes have. If you click on each Cat button you will see the indexes have been assigned similar to a phone keypad.

Start by assigning your source and Destination categories to these buttons. Each button can have both a source and Destination categories assigned. You have additional blank buttons for more categories, and other functions.

There are some additional buttons we should assign to make the panel more functional. The first is Src/Dst Mode, Menu, Info, XY/MD, Clear Preset, Free Source.

[Butt	rButton Layout - NV9601 : C:\Users\vhonsvic\CtrlSysConfigs\SE Utils Tutorial\configs\NV9601.601 Multi-Destination 1																	
Mer	าน	XY MD	Display 2 3										Src/Dsl Mode	ALX IN PCIN	Care Swidur	514 944		
			Click a line 4 to edit 5								Page up			eskin Eoir Gur	rs TST	orx rx		
	Right-Click 7 to view salvos 8								Page Down			MUX	REM IN	SVR IN SVR QUT				
Tak	(e	Clear Preset		Sel	Sel	Sel	Sel	Sel	Sel	Sel	Sel			Free Src		VTR IN		

We could also add a couple of source buttons such as SD Black, SD Bars, HD Black, HD Bars.



This Panel now has enough functionality assigned to it to begin using in XY mode. Press "Save and Close".

NV9605

It was because of this panel that we built the additional output level sets. Go to Configuration, Control Panels and press "Add Control Panel".

Select the NV9605 from the Panel Type pull-down. Make sure a unique ID is assigned to the NV9605 panel. To see what ID is assigned to a NV9605 panel, apply power without a network connection.

NV9000: SE Utils Tutorial × Control Panels × Add Control Panel ×
Type: NV9605 🔹
ID: 212
Name: NV9605
User: EnvyUser 🔻
Configuration Options:
◯ New, named: copied from:
C Existing:
New (default), named: NV9605

If you need to change the ID press the lit button in the upper right corner. Use buttons 0-9 to change the ID. Press the button in the upper right corner again to get the Save/Cancel options. Save the new ID and connect the Network cable.

Enter the ID and Panel Name. Click "New (default), named:" and enter the file name. I usually just use the panel name. Click "Next".

Button Layout - NV9605 : C	HUsers/whonsvic/CtrlSysConfigs/SE Utils To /TR 10: JTR 10: JTR 20: JTR 20:	Itoriallconfigs\NV9605.605 						
Button Definitions		Panel Options						
Button Type:	Source 🔻	Panel Behavior Model Limited XY						
Level Set Filter:	None 💌	Release Mode: Normal Release Default Destination: VTR 101: 145						
Source Device 1:	VTR 101: 7	Status Monitor: None						
Source Device 2:	None	Data Routing Model: Automatic						
		Default Name Set: System Name: 0						
Outputs	Inputo							
OUTPUT 1 OUTPUT 2 OUTPUT 3 OUTPUT 4	INPUT 1 INPUT 2 INPUT 3 INPUT 4 INPUT 5 INPUT 6 INPUT 7 INPUT 8	Hide Sources not configured on this panel						

I assigned my VTRs as sources and destinations to this panel. I made VTR 101 my default destination. You may notice there is no Take button on this panel. You select a destination, and then you select a source.

You can create multiple pages of sources and destinations, as well as have multiple Name Sets. This panel also has Input GPIs to trigger salvos, and Output GPIs that can trigger relay closures based on router status.

5.11 Writing your Configuration to the Control System

Click on System Management, and click on the top of the tree. Click "Write Configuration". Once it is done writing you will need to restart each controller for the changes to take effect.

In this screenshot you can see I only have one controller, and it is online and healthy.

File System Window Help												
Configuration	MU0000: SE Utile Tutorial *											
Tasks	Castralias Curaman											
Views	Controller Summary											
System Management	Controller IP Address		Health Status		Activity Status							
- W IA/2000: SE Unix Tutorial	192.168.1.1		Healthy		ACTIVE							
System Log N/9000												
Bystein Log N75000	Controller 1 Faulte											
Control Panels NV9000	Controller 1 Paulos											
Tieline Status NV9000												
	Router Summary											
	The second secon	Denter Henry	Control Datat	Davides Chate	Comm C	Anton (Augulable Links)	1.11.2					
	1	NU/5128	192 168 1 5	Router State	Comm S	(Available Links)	Controller 1					
	2	NV8144	192.168.1.11	Running	Online (2)	Controller 1					
	Panel Summary											
	Total Connected Panels			On Controller 1								
	1			1								
	Diternal Interface Summary											
	External alternate Summary											
	Configured Port		Protocol		License							
	License Summary											
	License			On Controller 1								
	Countral			On Controller 1								
	DYNAMIC UPDATE		CONFIGURATION	MAN	AGEMENT		ALLINTE BLANCE					
						START CONTROLLER 1	REBOOT CONTROLLER 1					
			READ CONFIGUR		RESTART							
			FROM NV900	0	CONTROLLER 1	STOP	SHUTDOWN					
	DY	(NAMIC UPDATE				CONTROLLER 1	CONTROLLER 1					
	~	TO										
		0006/14			\prec	START CONTROLLER 2	REBOOT CONTROLLER 2					
			WRITE CONFIGUR	ATION	RESTART							
			TO NV9000		CONTROLLER 2	STOP	SHUTDOWN					
						CONTROLLER 2	CONTROLLER 2					

You will need to install a tieline license on each of your controllers and reboot Windows for it to take effect. At this point you should be ready to begin testing your system.