M-Class Quick Startup Guide

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Service Manual for the M Class DSP Audio Console System

Revision: Prelim

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Thank you for purchasing an SAS Radio Broadcast Audio Console System. The was shipped with a default factory configuration that was produced with information and an equipment list furnished at the time of order or factory testing.

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IMPORTANT

The RIO DSP System has been factory configured. Additionally, the software installation CD has a pre loaded configuration specifically for the CHA studio. A setup PC will be required only if you wish to alter the configuration or wish to control and monitor system operation. The system can be wired according to the simple wiring detail of page 5, and the local media audio inputs and outputs wired to the punch blocks as specified in the Input Designation Map and Output Designation Map. A console layout with legends can be found on page 7.

After installation of the SAS Server module onto the SAS setup PC, (refer to section 2 for detailed installation instructions) please copy all of the files from the CDs "SAS Server Module" directory (.1 ini file) to the PCs "c:\program files\Server Module" directory". Similarly, after installing the SAS Router Control Software (RCS) copy all of the files from the CDs "SasRCS" directory (2 mdb files and 1 ini file and 1 exe file) to the PCs "c:\Program Files\SasRCS" directory. These files contain switcher data base files, console configuration files and source/destination alpha label data base files specifically for the CHA Seacrest Studio Console system. The zip file will always contain the factory configuration for this system in case a "start from factory" restore is required. When starting RCS for the first time you **will not have to go through the "Define Switcher Data base**" procedures as outlined in the Software installation section 2.

The Server module is factory configured to connect to the RIO DSP Engine using PC serial COM1. Connect the PC COM port to the DSP Engine RS232A (DB9P male) and start the Server Module Software application. (Refer to section 2 page 1 and 4). Go to FILE, SETUP to change the PC COM port if required. Next, start the Router Control Software (RCS). Connection to the RIO DSP Engine should be established. Refer to Software Installation section 2 for more details.

An Excel spreadsheet has also been included on the software CD that contain the Input and Output designation maps. There are spaces reserved for wiring notes and other system documentation for convenience. The Excel tabs for Source, Destination, Opto and Relays have been printed out and included in the CHA quick start guide for convenient reference. A detailed explanation of these spreadsheets can be found later in the M Class installation manual section 3.

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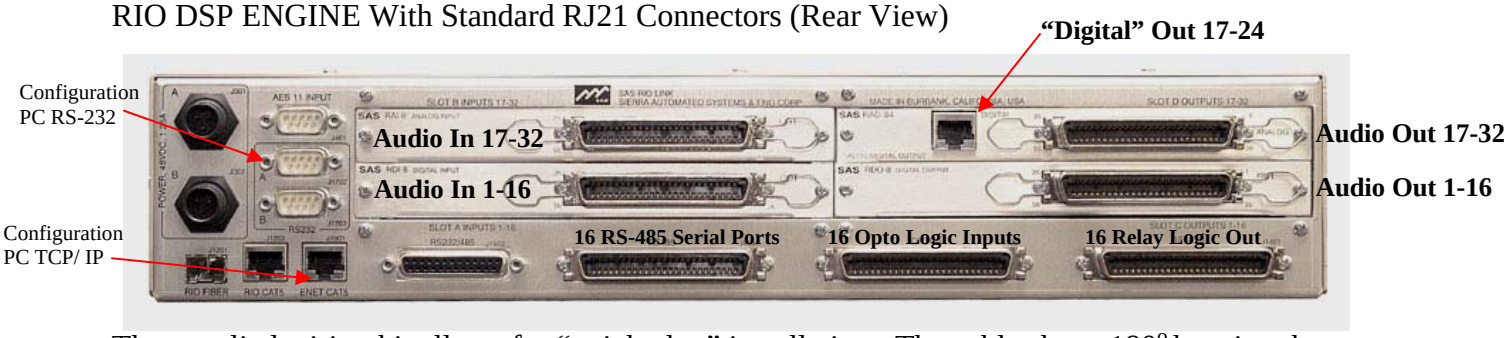
Brief Overview

The RIO DSP Engine and the M-Class Console Control Surface provide a complete Radio Broadcast Audio Console System. It can be thought of as a conventional console with the console control buttons, faders, (Controls) etc separated from the audio signal mixing DSP. The Engine comes standard with RJ21 connectors suitable for using standard CAT 5 25 pair (multi pair) to punch blocks. SAS recommends Krone type punch blocks with the RJ21 connector on each side. The RIO DSP Engine is installed into the equipment bay turret in the control room's furniture. Usually the lower bay that is in close proximity to the punch block area is preferred so that the use of short run cabling from the RIO to the blocks, and subsequently, from the blocks to the local media devices, can be utilized. This greatly increases the efficiency and reduces the installation timeline because everything is in close proximity to the DSP Engine.

The RIO DSP Engine supplied can be fitted with the optional RJ45 user connectors so that the use of "off the shelf" CAT5 network cable can be used. (not shown here) The standard network cabling can be obtained at double the length so that the cable can be cut in half to terminate the cut ends with the required signal connectors such as XLR, ¼" Phone plugs, Banana plugs etc. Installation into an upper bay of the furniture would be preferred so that the DSP Engine is in close proximity of local media devices for short run cabling interconnect.

RIO DSP ENGINE With Standard RJ21 Connectors (Rear View)



The supplied wiring kit allows for "quick plug" installation. The cables have 180^{o} housing that connect to the DSP engine while the 90 ^{o} housing connect to the side of the punch blocks.

RIO DSP ENGINE With RJ32 Cabling to Punch Blocks (Typical)

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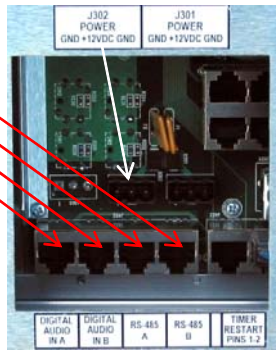
The M Class connector panel is located underneath the M Class console tub in the upper right corner, (from top view). The Control Surface is shipped standard for table top installation and has rubber feet on the bottom of the end bells. The Console was designed for the cabling to exit from the bottom of the tub through the furniture via a grommet hole so that the wiring will not lay across the furniture in table top installations (similar to grommet holes used get PC Monitor cables off of the furniture). The M Class can also be cut into the furniture by removing the lower section of each end bell; simply remove the two (2) Philips head screws on the lower section on each side and the section can be detached from the control surface. Refer to the M Class manual for cut out dimensions. Furniture cut out installations allow for access to the cabling from underneath the furniture. The M Class has a very low profile and cabling can easily be dressed and tied with plenty of leg room for "sit down" operations. The M-Class control surface connects to the RIO DSP Engine using a few simple standard CAT 5 (RJ45 to RJ45) network cables.

M Class Layout
Connector Module Detail

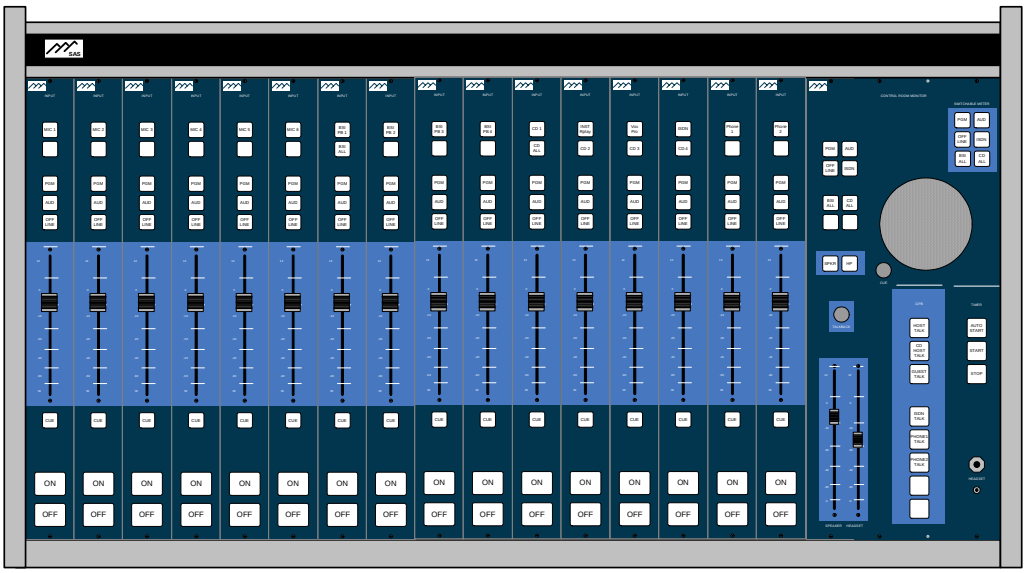
(Console Modules 17-24 and Monitor Module) Connect to 89D block RUB 2 Connector (RS485 Ports 5-9)
(Console Modules 1-16) Connect to 89D block RUB 1 Connector (RS485 Ports 1-4)
n/c (Optional Meter 3)
Connect to RIO DSP RJ45 RAD-84 "Digital"
(Fed with digital outputs 17-24)



RJ45 PinOut	Dig IN A	Dig In B	RS485 A	RS485 B	Timer
Pin 1 Wht/Orn	Meter 1+	Meter 3+	Port1+	Port5+	Restart +
Pin 2 Org	Meter 1-	Meter 3-	Port1 -	Port5 -	Restart -
Pin 3 Wht/Grn	Cue/Spk+	n/c	Port2+	Port6+	n/c
Pin 6 Grn	Cue/Spk-	n/c	Port2-	Port6-	n/c
Pin 5 Wht/Blu	Bop HP +	n/c	Port3+	Port7+	n/c
Pin 4 Blu	Bop HP -	n/c	Port3 -	Port7 -	n/c
Pin 7 Wht/Brn	Meter 2+	Meter 4+	Port4+	Port8+	n/c
Pin 8 Brn	Meter 2 -	Meter 4 -	Port4 -	Port8 -	n/c

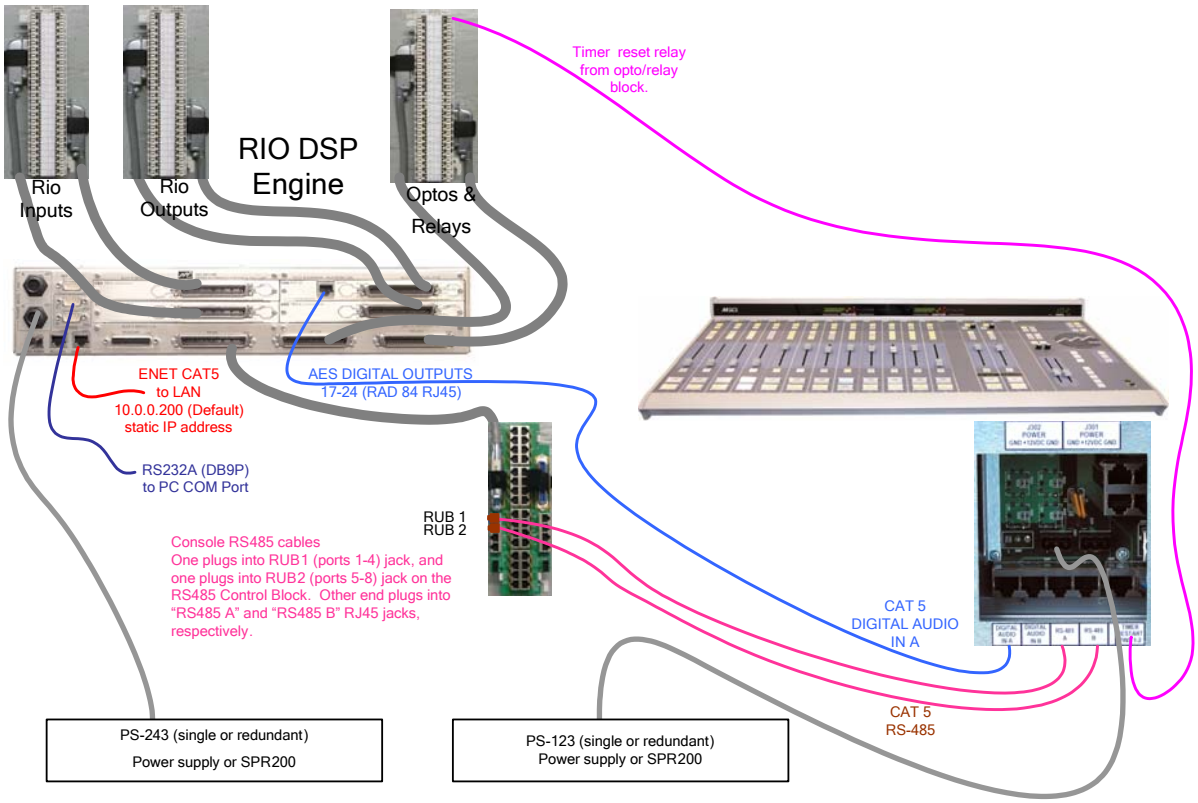
* Sorted by pairs, Pins NOT in order
** Standard RJ45 Pin/Pair wiring

Lower Section of each End Bell can be Removed to drop into a cut out in the furniture
Remove two(2) Philips head screw to detach lower section. Use caution for the cut-out as there is only ¼ " thickness of the end-bell.



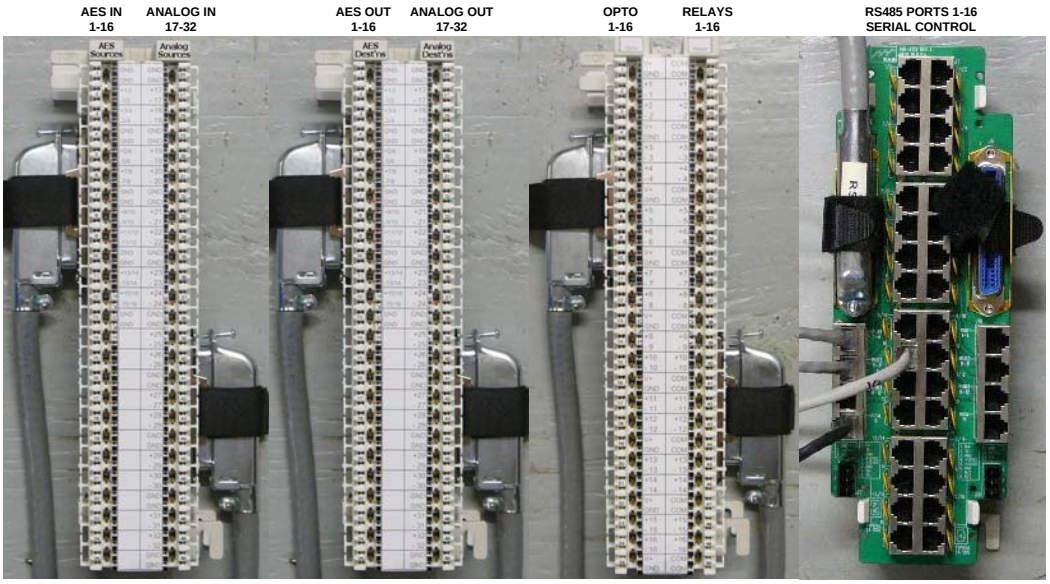
Lift under Bull Nose (like a hood of a car) to access the Connector Module Section (underneath)
Access from underneath if installed into the furniture cutout.

M Class Wiring Detail for the Seacrest Studio, CHA

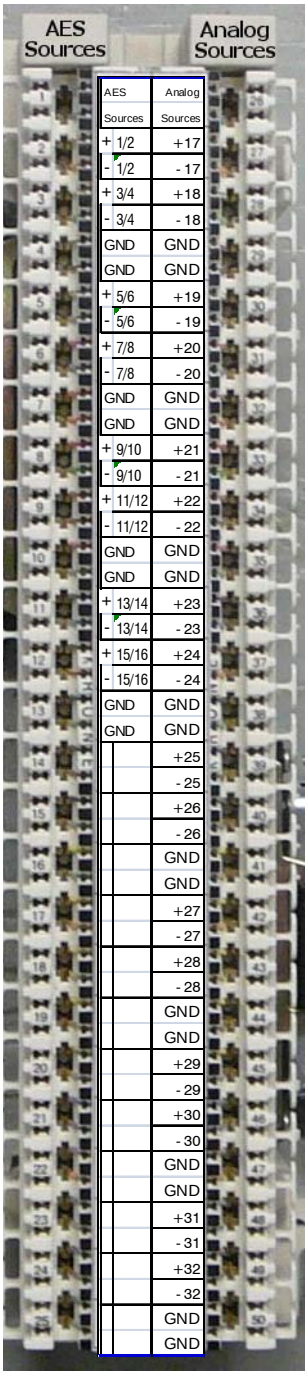


Punch Block Layout as shown

RS485 ports



Punch Block Layout



AES Sources	Analog Sources
+ 1/2	+17
- 1/2	- 17
+ 3/4	+18
- 3/4	- 18
GND	GND
GND	GND
+ 5/6	+19
- 5/6	- 19
+ 7/8	+20
- 7/8	- 20
GND	GND
GND	GND
+ 9/10	+21
- 9/10	- 21
+ 11/12	+22
- 11/12	- 22
GND	GND
GND	GND
+ 13/14	+23
- 13/14	- 23
+ 15/16	+24
- 15/16	- 24
GND	GND
GND	GND
	+25
	- 25
	+26
	- 26
	GND
	GND
	+27
	- 27
	+28
	- 28
	GND
	GND
	+29
	- 29
	+30
	- 30
	GND
	GND
	+31
	- 31
	+32
	- 32
	GND
	GND

AES Dest'ns	Analog Dest'ns
+ 1/2	+17
- 1/2	- 17
+ 3/4	+18
- 3/4	- 18
GND	GND
GND	GND
+ 5/6	+19
- 5/6	- 19
+ 7/8	+20
- 7/8	- 20
GND	GND
GND	GND
+ 9/10	+21
- 9/10	- 21
+ 11/12	+22
- 11/12	- 22
GND	GND
GND	GND
+ 13/14	+23
- 13/14	- 23
+ 15/16	+24
- 15/16	- 24
GND	GND
GND	GND
	+25
	- 25
	+26
	- 26
	GND
	GND
	+27
	- 27
	+28
	- 28
	GND
	GND
	+29
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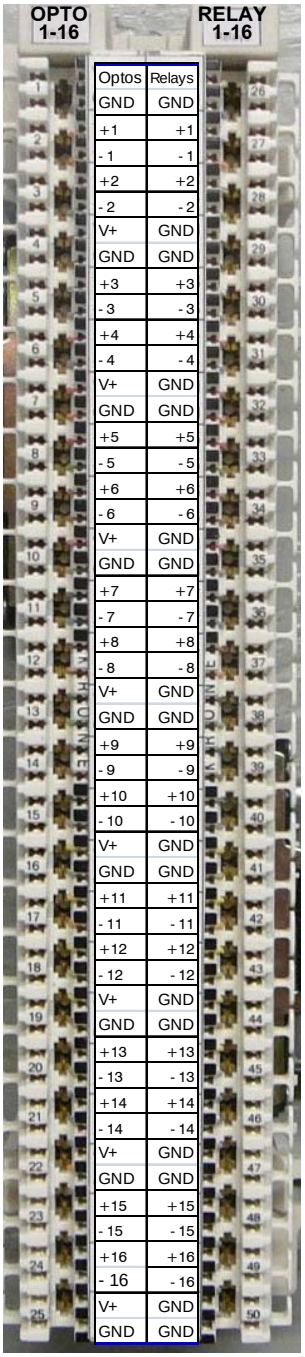
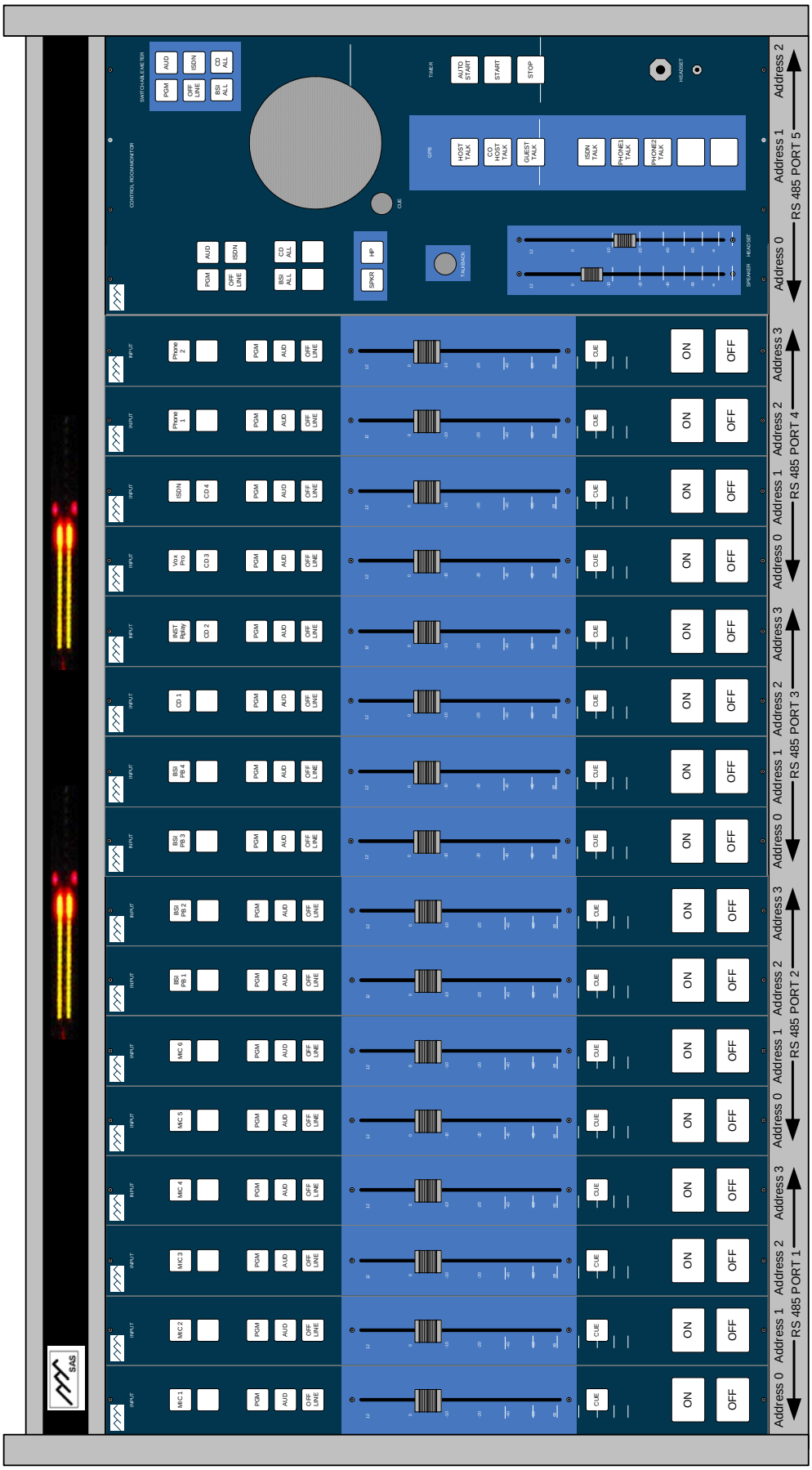
	- 30
	GND
	GND
	+31
	- 31
	+32
	- 32
	GND
	GND



Optos	Relays
GND	GND
+1	+1
- 1	- 1
+2	+2
- 2	- 2
V+	GND
GND	GND
+3	+3
- 3	- 3
+4	+4
- 4	- 4
V+	GND
GND	GND
+5	+5
- 5	- 5
+6	+6
- 6	- 6
V+	GND
GND	GND
+7	+7
- 7	- 7
+8	+8
- 8	- 8
V+	GND
GND	GND
+9	+9
- 9	- 9
+10	+10
- 10	- 10
V+	GND
GND	GND
+11	+11
- 11	- 11
+12	+12
- 12	- 12
V+	GND
GND	GND
+13	+13
- 13	- 13
+14	+14
- 14	- 14
V+	GND
GND	GND
+15	+15
- 15	- 15
+16	+16
- 16	- 16
V+	GND
GND	GND

Console Layout (Legends)



Input Designation Map

Input Chan Num	Module Chan Num	Chan Label *8 character max*	LocalLabel *8 character max*	Linked 0=*Mono*, *1=Stereo*	Hidden 0=No, 1=Yes	Notes *256 character max*	Block and Side	Krone Pair number	
0	0	Undef	Undef			Undefined			
		1	**KRL**	**0**	**1**	**F1-S1 RIOLink: CHA Seacrest**			
1	1	BSI PB1	BSI 1	1	0	AES 1 BSI Automation In	B1L	2	AES Block - 2 channels per pair Ground on pairs 1,4,7,10,13,16,19,22,25
2	2	right		1	1	Right Ch. B	B1L		
3	3	BSI PB2	BSI 2	1	0	AES 2 BSI Automation In	B1L	3	
4	4	right		1	1	Right Ch. B	B1L		
5	5	BSI PB3	BSI 3	1	0	AES 3 BSI Automation In	B1L	5	
6	6	right		1	1	Right Ch. B	B1L		
7	7	BSI PB4	BSI 4	1	0	AES 4 BSI Automation In	B1L	6	
8	8	right		1	1	Right Ch. B	B1L		
9	9	ISDN	ISDN 1	1	0	AES 5 BSI Automation In	B1L	8	
10	10	right		1	1	Right Ch. B	B1L		
11	11	Phone1	Caller 1	0	0	AES 6 Phone 1 on Ch. A	B1L	9	
12	12	Phone2	Caller 2	0	1	Phone 2 on Ch. B	B1L		
13	13	InstRply	InstRply	1	0	AES 7 Instant replay	B1L	11	
14	14	{InstRply		1	1	Right Ch. B	B1L		
15	15			0	0		B1L	12	
16	16			0	0		B1L		
17	17	MIC 1	MIC 1	1	0	Analog 1	B1R	27	Analog Block - single (mono) audio per pair Ground on pairs 26,29,32,35,38,41,44,47,50
18	18	MIC 2	MIC 2	1	1	Analog 2	B1R	28	
19	19	MIC 3	MIC 3	1	0	Analog 3	B1R	30	
20	20	MIC 4	MIC 4	1	1	Analog 4	B1R	31	
21	21	MIC 5	MIC 5	1	0	Analog 5	B1R	33	
22	22	MIC 6	MIC 6	1	1	Analog 6	B1R	34	
23	23	Vox Pro	Vox Pro	1	0	Analog 7 Vox Pro Input	B1R	36	
24	24			1	1	Analog 8 Right Channel	B1R	37	
25	25	CD 1	CD 1	1	0	Analog 9 CD 1 In	B1R	39	
26	26	right		1	1	Analog 10 Right Ch.	B1R	40	
27	27	CD 2	CD 2	1	0	Analog 11 CD 2 In	B1R	42	
28	28	right		1	1	Analog 12 Right Ch.	B1R	43	
29	29	CD 3	CD 3	1	0	Analog 13 CD 3 In	B1R	45	
30	30	right		1	1	Analog 14 Right Ch.	B1R	46	
31	31	CD 4	CD 4	1	0	Analog 15 CD 4 In	B1R	48	
32	32	right		1	1	Analog 16 Right Ch.	B1R	49	

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Output Designation Map

Output Chan Num	Module Chan Num	Chan Label *8 character max*	Local Label *8 character max*	Linked *0=Mono, 1=Stereo, 3=Mono LR Sum*	Hidden *0=No, 1=Yes*	Notes *256 character max*	Block and Side	Krone Pair number			
0	0	Undef	Undef			Undefined		Left			
		1	KRL			F1-S1 RIOLink: CHA Seacrest					
1	1	PGM		1	0	AES PGM Buss Out	B2L	2	AES Block - 2 channels per pair Ground on pairs 1,4,7,10,13,16,19,22,25		
2	2	{ Pgm		1	1		B2L				
3	3	AUD	AUD	1	0	AES AUD Buss Out	B2L	3			
4	4	{ AUD		1	1		B2L				
5	5	OFFL	OFFLINE	1	0	AES OFFLINE Out	B2L	5			
6	6	{A OFFL		1	1		B2L				
7	7	Phone1	Phone 1	3	0	AES Mix Minus to Phone 1	B2L	6			
8	8	Phone 2	Phone 2	3	0	Mix Minus to Phone 2 Ch. B	B2L				
9	9	BSI Rec	BSI Rec	1	0	AES to BSI Record input	B2L	8			
10	10	{BSI		1	1	Right Ch. B	B2L				
11	11	ISDN	ISDN	1	1	AES to ISDN Codec	B2L	9			
12	12	{ISDN		1	1	Right Ch. B.	B2L				
13	13			1	1		B2L	11			
14	14			1	1		B2L				**These are system outputs to MCLASS**
15	15			1	0		B2L	12			and should not be changed
16	16			1	1		B2L			"Digital" RJ45 on RAD 84	AES Out CH. 17-24 Connect to Console DIG IN A
17	17	PGM	PGM	1	0	Analog PGM Buss 1	B2R	27	Analog Block - single (mono) audio per pair Ground on pairs 26,29,32,35,38,41,44,47,50	1+ & 2- org pair	Feeds Meter 1 Left
18	18	{pgm		1	1	PGM Buss Right Ch.	B2R	28			Feeds Meter 1 Right
19	19	Talkback	Talkback	3	0	Talkback Mix Bus (n/c connected digital)	B2R	30		3+ & 6- grn pair	Feeds Monitor Module TB Bus (mono)
20	20	Cue Spkr	Cue Spkr	3	0	Cue Mix Bus (n/c connected digital	B2R	31			Feeds Monitor Module Cue Spkr (mono)
21	21	HP OP	HP OP	1	0	B Op HP Out (n/c connected digital)	B2R	33		5+ & 4- blue pair	Feeds Monitor Module Bop HP Left
22	22	{HP OP		1	1		B2R	34			Feeds Monitor Module Bop HP Right
23	23	Meter2>	Meter2>	1	0	Meter2 feed (n/c connected digital)	B2R	36		7+ & 8- brn pair	Feeds Meter 2 Left
24	24	{mtr2		1	1	Right Ch.	B2R	37			Feeds Meter 2 Right
25	25	MonSpk	MonSpk	1	0	Control Room Monitor Speaker	B2R	39			These are typical system outputs
26	26	{A MonSp		1	1		B2R	40			Usually required
27	27	A HPGst	HPGst	1	0	Guest Headphones	B2R	42			
28	28	{A HPGst		1	1		B2R	43			
29	29	Vox Pro	Vox Pro	1	0	Analog to Vox Pro input	B2R	45			
30	30	right	{A Rem1	1	1	right ch.	B2R	46			
31	31			1	0		B2R	48			
32	32	Cue MIX	Cue MIX	1	1	System Cue Mixing Buss`	B2R	49		No Connection, System CUE Bus Output	

Opto Designation Map

Opto Chan Num	Module Opto Num	Name *8 characters max*	Notes *256 character max*	Type	Salvo	Input	Output	Relay	Block and Side	Krone Pair number	
0	0	Undef	Undefined	0							
	1	KRL	F1-S1 RIOLink: CHA Seacrest								
1	1			0					B3L	2	Opto Block - +5 and Ground on pairs 1,4,7,10,13,16,19,22,25
2	2			0					B3L	3	
3	3			0					B3L	5	
4	4			0					B3L	6	
5	5			0					B3L	8	
6	6			0					B3L	9	
7	7			0					B3L	11	
8	8			0					B3L	12	
9	9			0					B3L	14	
10	10			0					B3L	15	
11	11			0					B3L	17	
12	12			0					B3L	18	
13	13			0					B3L	20	
14	14			0					B3L	21	
15	15			0					B3L	23	
16	16			0					B3L	24	
17	17		*virtual opto, not physical*	0							
18	18		*virtual opto, not physical*	0							
19	19		*virtual opto, not physical*	0							
20	20		*virtual opto, not physical*	0							
21	21		*virtual opto, not physical*	0							
22	22		*virtual opto, not physical*	0							
23	23		*virtual opto, not physical*	0							
24	24		*virtual opto, not physical*	0							
25	25		*virtual opto, not physical*	0							
26	26		*virtual opto, not physical*	0							
27	27		*virtual opto, not physical*	0							
28	28		*virtual opto, not physical*	0							
29	29		*virtual opto, not physical*	0							
30	30		*virtual opto, not physical*	0							
31	31		*virtual opto, not physical*	0							
32	32		*virtual opto, not physical*	0							

Relay Designation Map

Relay Chan Num	Module Relay Num	Name *8 characters max*	Notes *256 character max*	Block and Side	Krone Pair number	
0	0	Undef	Undefined			
	1	KRL	F1-S1 RIOLink: CHA Seacrest			
1	1	A Timer+	*start*	B3R	27	Relay Block - N.O. Closure per pair Ground on pairs 26,29,32,35,38,41,44,47,50
2	2			B3R	28	
3	3			B3R	30	
4	4	A VxP+	VxPro play from cue	B3R	31	
5	5	A VxP-	Vxpro stop	B3R	33	
6	6			B3R	34	
7	7			B3R	36	
8	8			B3R	37	
9	9			B3R	39	
10	10			B3R	40	
11	11			B3R	42	
12	12			B3R	43	
13	13			B3R	45	
14	14			B3R	46	
15	15			B3R	48	
16	16	A Onair		B3R	49	
17	17		*virtual relay, not physical*			
18	18		*virtual relay, not physical*			
19	19		*virtual relay, not physical*			
20	20		*virtual relay, not physical*			
21	21		*virtual relay, not physical*			
22	22		*virtual relay, not physical*			
23	23		*virtual relay, not physical*			
24	24		*virtual relay, not physical*			
25	25		*virtual relay, not physical*			
26	26		*virtual relay, not physical*			
27	27		*virtual relay, not physical*			
28	28		*virtual relay, not physical*			
29	29		*virtual relay, not physical*			
30	30		*virtual relay, not physical*			
31	31		*virtual relay, not physical*			
32	32		*virtual relay, not physical*			

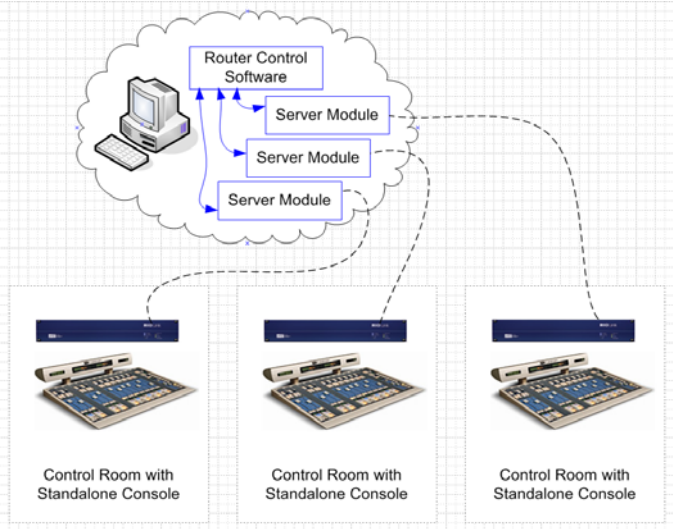
SECTION 2 – Overview and PC (configuration) Software installation

SINGLE RIO CONSOLE SYSTEMS

The simplest installation is a single console on a single RIO. All of the console's ins and outs are provided by the RIO. The RIO can also be connected (full-time or as needed) to a Router Control PC for configuration/management and/or to facilitate PC-based SAS automation functions which we will get into later. Multiple RIOs (and therefore consoles) can be connected to the same Router Control PC; the software's architecture makes it easy to organize and manage the independent system configurations using a graphic user interface.

The Router Control PC
The router control PC can manage multiple systems, small or large, by having multiple RS232 or TCP/IP connections - one to each RIO DSP Engine. This PC should be a reasonably modern PC with at least one RS232 serial port. We recommend a Windows XP (SP2) machine with a P4 or better, 1G or RAM, and at least 10 G of free hard-drive space. If more than one RIO DPS Engine will be connected, additional horsepower and memory are recommended.

There are two main pieces of software that need to be installed on your router control PC for management and configuration: the Router Control Software, which is the user interface for configuring and managing all of the SAS resources in your plant; and the Server Module software, one of which is installed for each RIO DSP Engine in your plant. The Server Module provides for serial or TCP/IP communication between the RIO and the Router Control Software. If you have three single-RIO systems being managed by the Router Control Software, you will have one instance of the Router Control Software and three instances of the Server Module Software installed on your Router Control PC.



RS232 Serial Connection

A straight-through DB-9 serial cable (only pins 2,3, and 5 matter) connects the RIO's back-panel DB9M connector (labeled J1702 RS232 port A) to an available COM port on the Router Control PC. Connecting all RIO DSP Engines via RS232 will require multiple RS232 COM ports. USB to Serial works well for newer PC's that are not fitted with RS232 serial ports. When connected, the RCS software will recognize the RIO DSP engine and allow you to setup and configure the DSP engine. See Installation of software later on in this section.

Installing and Configuring Standalone Console Systems

Network Connection

The RIO DSP Engines can connect to the computer using a standard LAN network. The engine will default to a static IP address of 10.0.0.200. It does not support DHCP and you may have to manually program the engines IP address to an appropriate address for the LAN domain.

Direct Connect to 10.0.0.0 LAN.

You can connect the RIO DSP engine directly to your LAN if the domain is already a ten dot (10.0.0.x) LAN. You must ensure that no other device is at 10.0.0.200 as this is the default address of the RIO DSP engine. Once you are connected, the RCS software will recognize the RIO DSP Engine and allow you to change the IP address manually with pull down menus if needed. If the system was ordered, tested and setup with multiple RIO DSP engines and LAN information was available, then the factory would set each engines IP address and document this in the quick start up guide specifically for your system.

Changing the DSP Static IP address for 192.168.0.0 domain

If your LAN is a 192 dot (192.168.0.x) LAN, then you must use an IP Hub (not router) or a crossover cable and a single PC or laptop. (Or use a direct RS-232 serial connection as above). This PC will serve as a "setup" PC and you will have to set the computer to a static address of 10.0.0.0 essentially making a small 2 device network. Run the SAS Server Module Software and Router Control Software (RCS) and using simple menus set the IP address of the RIO DSP engine appropriate for the 192 LAN. You will need to choose a 192 dot address that is not used by other devices on the LAN. Once the IP address is changed to the 192 dot address, the computer will no longer be connected to the RIO DSP engine until you put the engine on the 192 dot LAN. (Or change the computer static IP address to a 192 dot address).

Installing and Configuring Standalone Console Systems

Software Installation and SETUP

The Server Module is a software application that runs background or resident. This acts as a translator between the Router Control Software and the DSP Engines. The Server communicates to the DSP Engine by RS232 serial or TCP/IP, and communicates to the Router Control Software via IP.

The Router Control Software (RCS) is the graphical system gateway that allows you to see everything happening in your system, directly control audio routes, edit system, console, and module configurations, change source or destination attributes, and set up extremely powerful router automation events.

Optionally, the RCS or SAS computer can reside on an office LAN or can be directly connected to the internet for remote access. Many clients opt for remote access and allow SAS engineers to log into the system for installation, configuration and troubleshooting guidance. SAS also provides services to regularly log in and check event and error logs, run diagnostics and perform configuration backups.

The following guide will describe the process of installing and setting up the Sever Module, RCS software, for connection to your RIO DSP Engine(s).

Pre-Installation

System requirements

IBM compatible PC with at least a Pentium 4 processor (1GHz or greater)
At least 256 MB RAM. 512M recommended.
Minimum 100 MB available hard disk space.
Windows 2000 SP3 or XP SP1 or higher operating system.
RS-232 connection to the SAS Routing Switcher (57600 Baud).
Network adapter card communicating on a network.

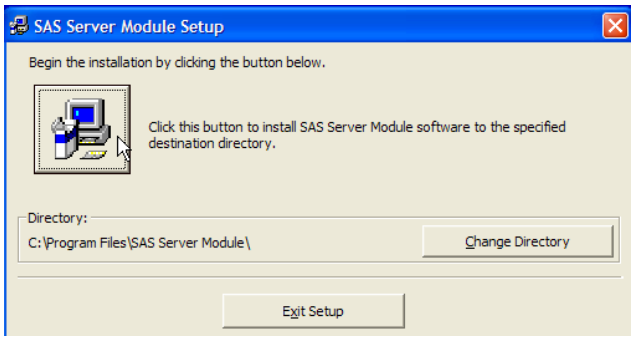
Note: It is recommended that the Computer running the Server Module have a fixed IP address if the Router Control Software or Softpanels will be run on a remote computer.
Note: If Windows 2000 is used, AT LEAST Service Pack 3 for Windows 2000 must be installed.

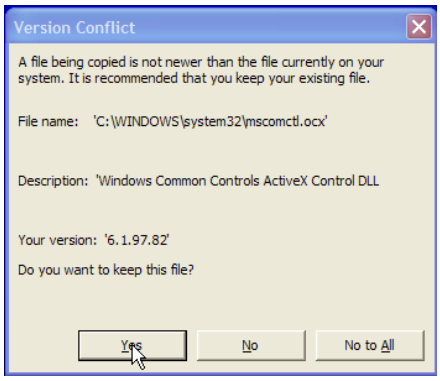
SAS Server Module
Installation

CD:

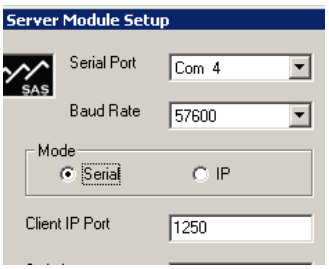
Insert the SAS CD and go to the directory: “D:\Software Installation\SAS Server Module Setup “on the CD Drive. Using Windows Explorer, run setup.exe and follow the prompts on the screen.

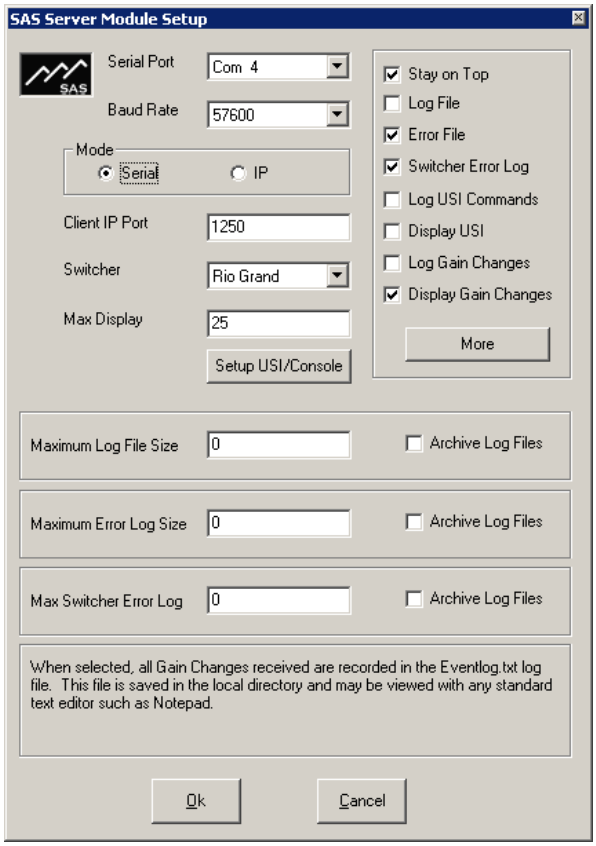
Default choices are recommended. If you have certain VB components on your Router Control PC, you may get one or more version conflict notices. Select yes for each notice to keep your newer file components instead of over-writing them with potentially older files.





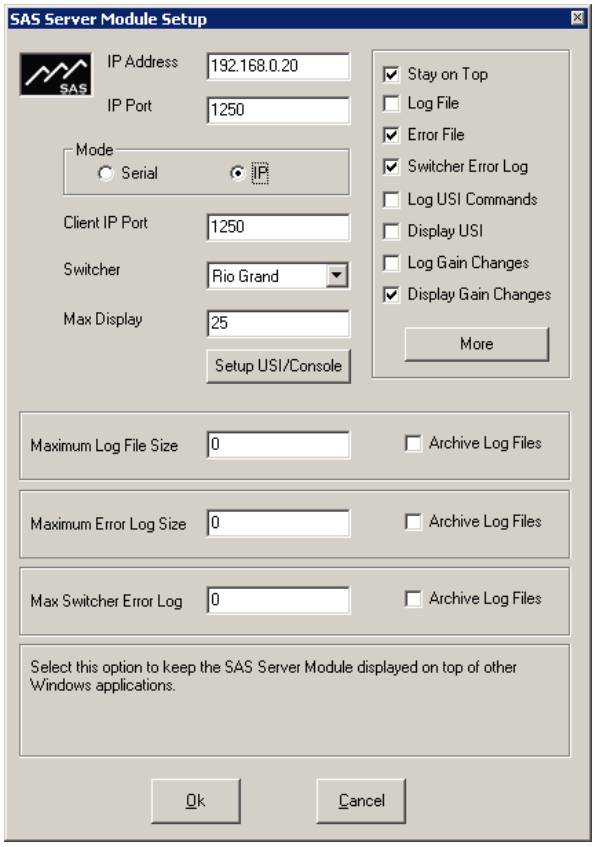
Once the installation is complete the program will be located in the program files\SAS Server Module directory and you can create a shortcut on to the desktop for convenient access. Start the Server Module by clicking on the SASserver.exe file or from the desktop shortcut. Select File, Setup to open the setup window shown. The “Serial Port” field is the PC COM port that is connected to the RIO DSP Engine. “Mode” option is the method to connect to the RIO DSP Engine. When Serial mode is selected, the menu choices above become Serial Port and Baud Rate. Select an available RS232 PC COM port and the baud rate is always set to 57600 for RIO DSP connection. The “Client IP Port” field is the port address used by the Router Control Software (RCS) to get information for this particular RIO DSP Engine.





Installing and Configuring Standalone Console Systems

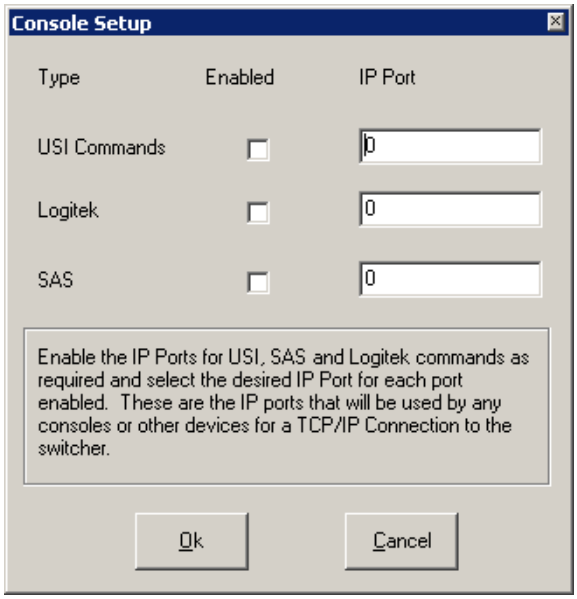
The RCS Software can configure and control numerous routers and RIO DSP Engines. Additional Server Modules and RIO DSP engines can run simultaneously using different COM ports and Client IP Port numbers. The Router Control Software uses the Client IP Port number to identify each DSP Engine.



When IP Mode is selected, the menu options above change to IP Address and IP Port. This is the actual RIO DSP Engine IP Address and Port that is defaulted to 10.0.0.200 port 1250 from the factory. The computer must be set to a 10.0.0.x address to initially connect to this engine. Once you are connected, you can use the RCS software to change the RIO DSP engine IP address. For example, your LAN might be 192.168.0.x so you will need to change the RIO IP Address accordingly. If you wish to use IP Mode connection it is best to connect initially with Serial Mode (using a setup PC) and set the RIO to a static IP address suitable for your LAN. This can be done on the bench before installing the DSP Engine. Once that is accomplished, change the Server Module Mode to IP and then fill in the IP Address and IP Port fields of the Server Module to the RIO static IP address and Port.

For the RIO DSP Engine set the "Switcher" field to RIO Grand. All of the other fields can remain in its default selection.

The system is capable of receiving IP strings called USI commands. The USI protocol (User Serial Interface) is a published set of command strings that can be sent to the server module via TCP/IP when the SAS PC running the server module is resident on the LAN. Click the Setup USI/Console button to display the console setup window. For USI commands from a DAW or other automation device or PC, click Enabled and fill in the IP Port field. The Logitek type and SAS type are for interfacing to older legacy consoles and should remain disabled. USI commands can the be sent from any other computer, automation or DAW to the IP Address of the SAS Server computer and the IP Port that was filled in this field.

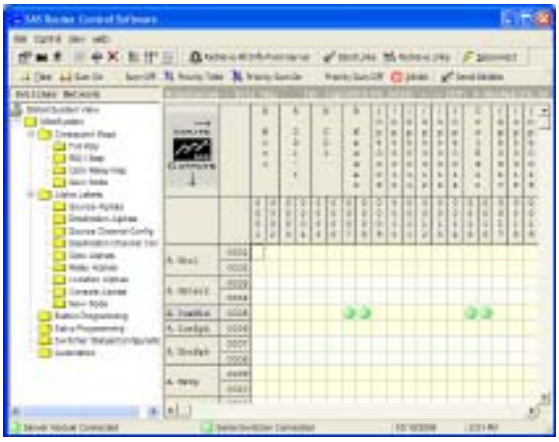


USI Commands can also be sent directly to the static IP address and port of the RIO DSP Engine.

When all of the fields in the Server Module Setup have been programmed, click Ok to save the settings of the Server Module. Once Ok is selected from the Setup screen "Switcher Connection" should appear in the Command History Window followed by several messages received from the SAS Switcher. The SAS Server Module must be running and connected to the RIO DSP Engine for control or configuration from the RCS Software.

SAS Windows Router Control Software

Installation



System requirements

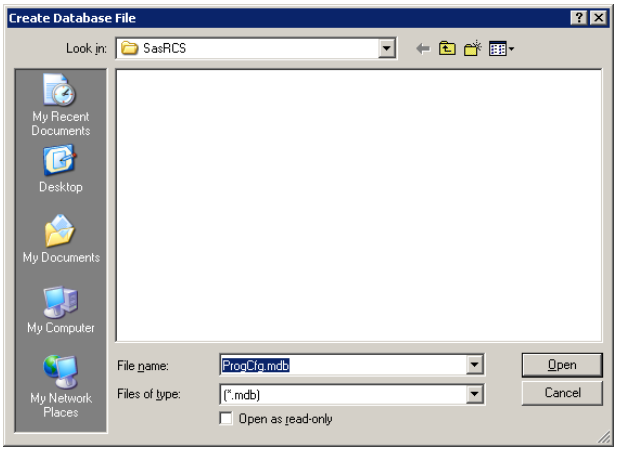
Same as IP Server Module

CD:

Insert the SAS CD and go the directory: “D:\Software Installation\SAS Windows RCS Setup on the CD Drive. Using Windows Explorer, run setup.exe and follow the prompts on the screen.

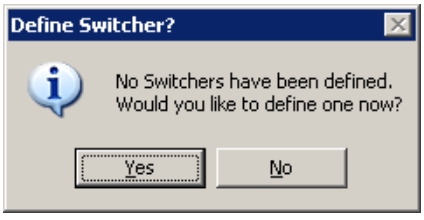
Getting Started

Once installation is complete the program is located in “Program Files\SasRCS. You can create a shortcut to your desktop or run the RCS by clicking the SasRCS.exe file. If the system is pre-configured as documented in the quick start guide, then all data files and switcher definitions will already be defined. You will need to copy the files from the CD SAS Server Module and SasRCS directories to the PC Program Files directories as specified in the quick start guide for your system. Otherwise, the first time RCS is run a window will pop up saying File Not Found. Click Ok.; Create Database file: leave the default name and click “open”.

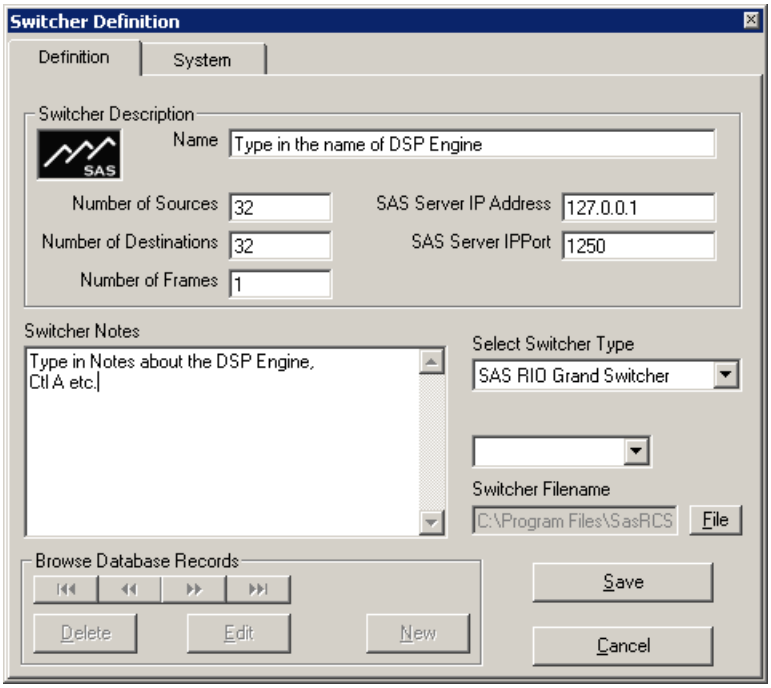


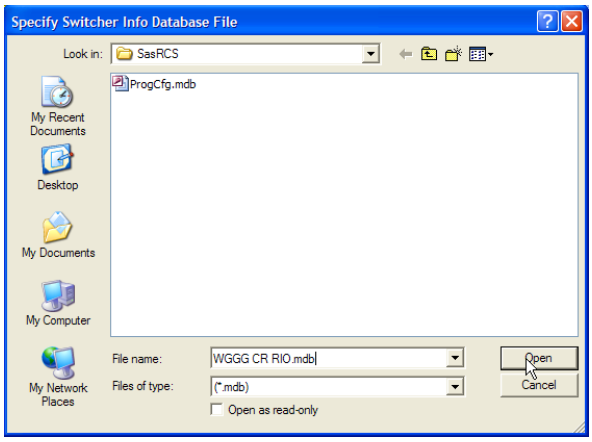
Window Router Control Software window will pop and you will be prompted for username and password. User name: “SASDefault” and the password is “sas”. This is a default username and password and cannot be changed or deleted.

When logged in a Define Switch? Window will pop up. Define Switcher? Click Yes.



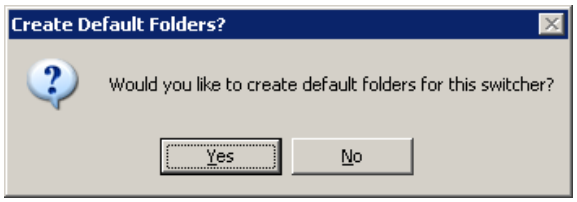
You will get the following screen (on Page 7).





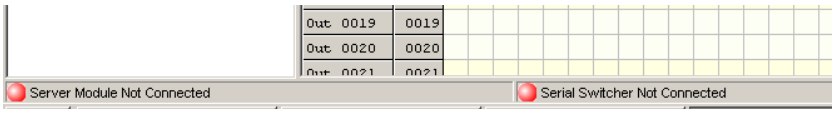
Click File then Open. This will fill in the Switcher filename default for you. Set the fields as shown. SAS RIO Grand for DSP Engine, SAS Server IP Address is the IP address of the Computer that the Server Module is installed and connected to the DSP Engine. If installing and running RCS from the same computer as SAS Server (typically done this way) then you can set the server IP address to PC loopback address of 127.0.0.1. Server IP Port of 1250, (this is the Client IP port that was programmed in the Server Module setup, (make sure they match). The number of sources and destinations is 32 for RIO DSP Engines. You can type in the name of the DSP engine along with any notes suitable. Click Save.

Click yes to create default folders for this switcher.



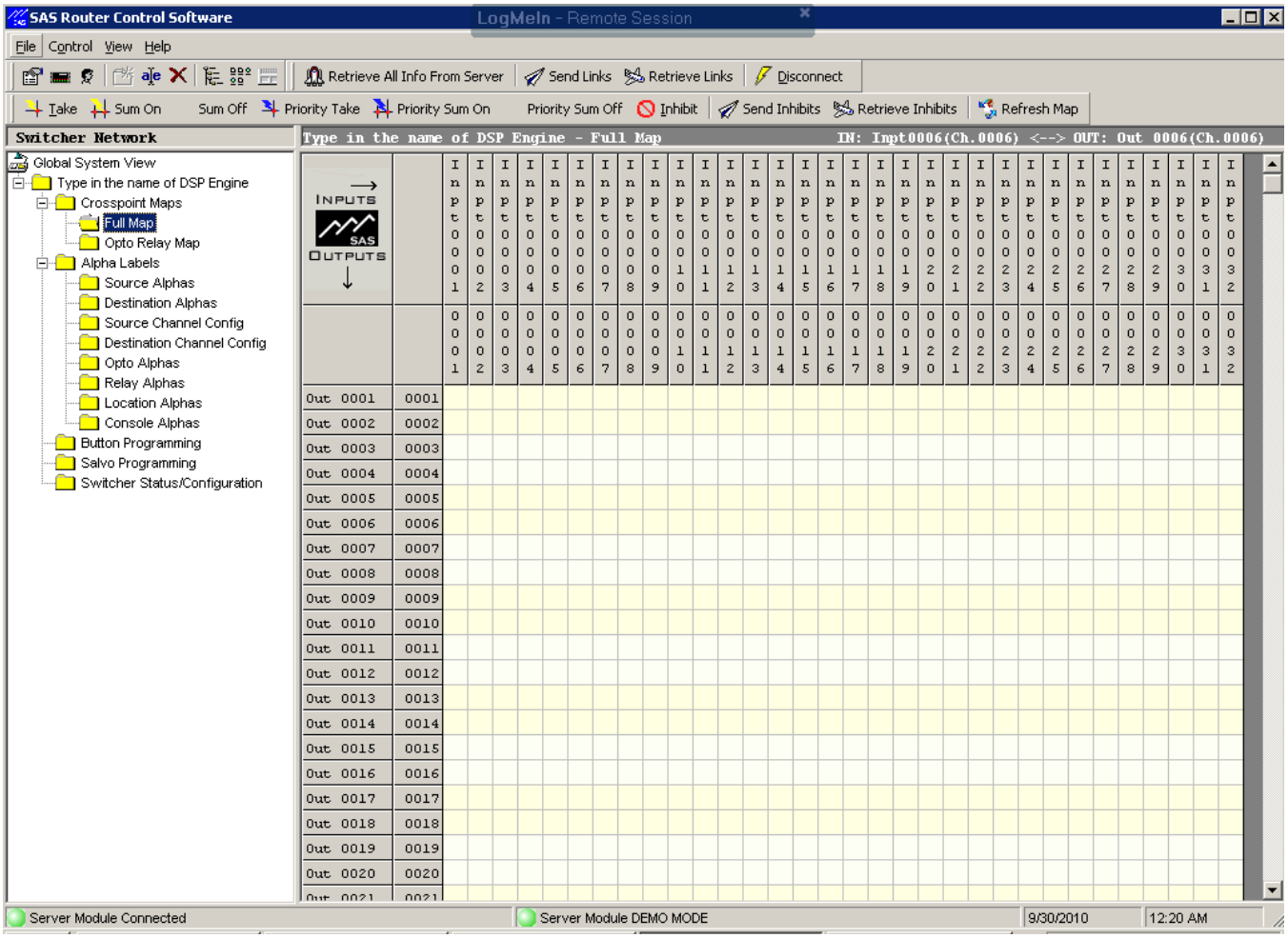
If the Server Module is running the RCS should automatically connect and selecting the Full Crosspoint map should give green dots on the bottom of the screen. Server Module Connected and Serial Switcher Connected, should be green.

If server module connected is red, then the RCS cannot find the Server Module, check to ensure the IP Client and IP port values are the same in Server setup and RCS switcher definition respectively. If Serial Switcher is red, then the Server Module is not connected to the DSP engine. Check the RS232 serial connection or IP LAN connection. If using IP Mode, ensure the RIO DSP engine has the correct static IP address set. (explained earlier)



When everything is connected select a crosspoint map and click “retrieve all from Switcher” or it might say “retrieve all from Server”. This will upload the factory default configuration from the DSP Engine to the switcher database within the RCS software.

Use the file folders to configure various attributes of the system, such as source names, destination names, switcher status configuration etc.



Section 3 – MClass Console Wiring

The MClass console is typically pre-configured with a standard configuration to keep costs low – and the customer does any desired customization, with factory help available as needed.

The following section describes wiring for a typical factory-default MClass Configuration. This document describes the MClass 20.2 equipped with twelve A/B input faders, two "Flex" faders with source dial-up capability, a monitor and control module with built-in Headphone amp and Cue amp/speaker, two stereo level meters, and a built-in timer. Your console will come with a specific source and destination layout (documented with the console) that may differ slightly from what is presented here, but the basic wiring concepts will be the same.

Figure 1. Simplified block diagram of MClass to RIO wiring

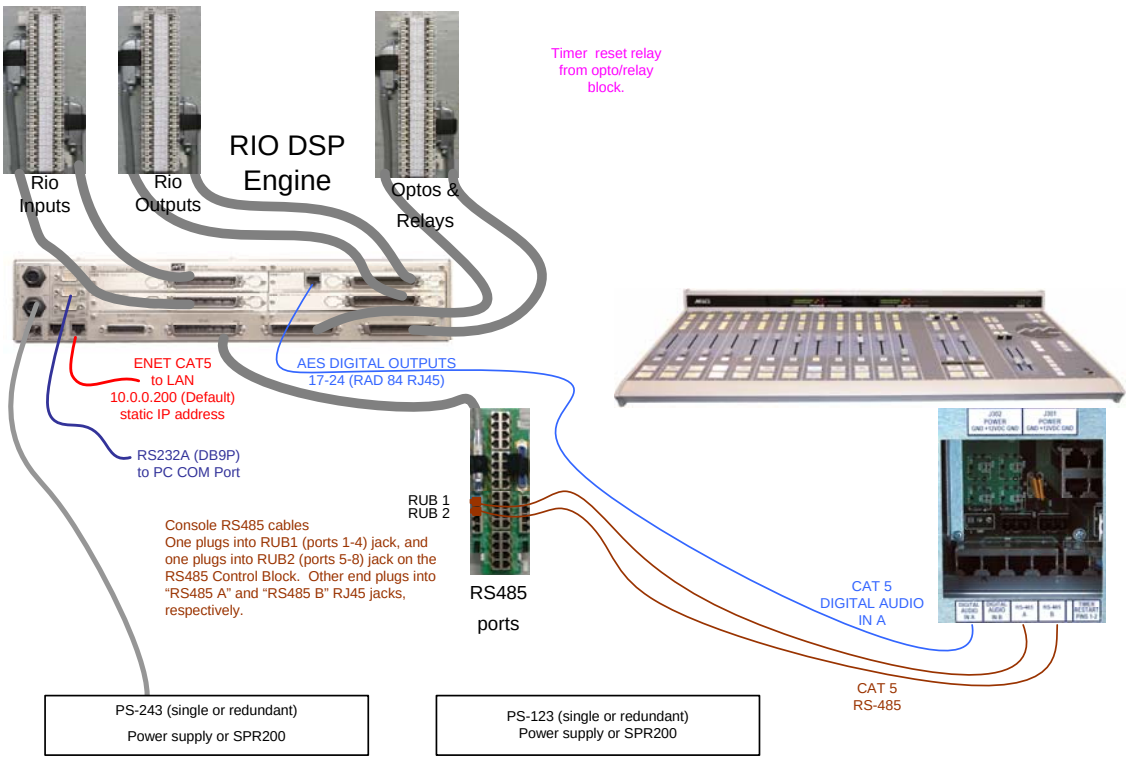
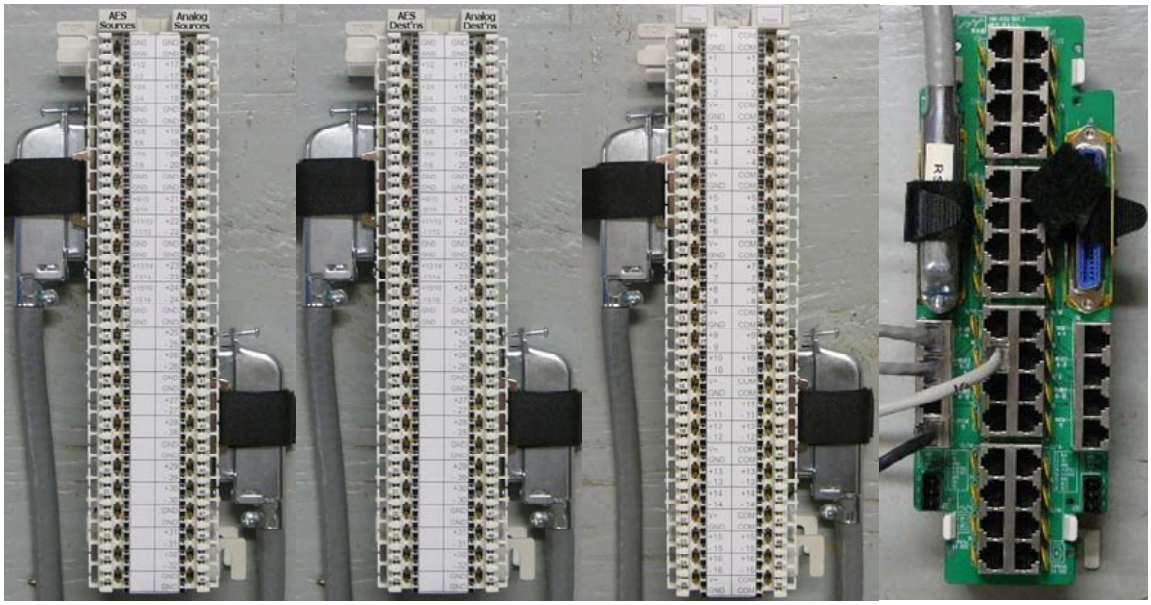


Figure 2. RIO rear panel connections.

The high connection density of the RIO (and 32KD I/O cards) demands an efficient connectorization scheme. RIO audio connections, Optos, Relays, and RS485 control ports are brought out on RJ-21 style (Centronics 50) high-desity connectors. High-quality 25-pair cabling connects the RIO to SAS customized Krone blocks, which also have RJ-21 style connectors. This high-density wiring system maintains Category 5 characteristics all the way to the punch terminals, ensuring maximum performance and noise immunity. One of the benefits of Krone blocks is the built-in patch-bay feature, allowing you to directly patch two connections together if required for bypassing gear or troubleshooting. Each RIO has 7 Centronics-50 pin (Rj-21 style) connectors for audio and control I/O. Supplied cables connect the RIOs to the Krone blocks and 89D2132 block.

Figure 3. Connection blocks



AES and Analog Sources & Destinations Opto/Relay RS485

Krone Block1:

Audio INPUTS to the RIO. This Audio Source block is where playback devices or other audio sources are connected. Connect the lower input card connector (inputs 1-16) on the RIO rear panel to the left connector on the block; the upper input card connector (inputs 17-32) on the RIO goes to the right connector on the Block. Be sure to cinch down the Velcro strain relief belts so the Centronics connectors are kept tight. Typically the RIO is set up with half analog and half AES for audio I/O. AES sources 1-16 go on the left; each AES connection represents two mono-equivalent channels which can be configured as stereo or independent mono signals in the system.
The Analog sources, 17-32, connect to the right side of the block. Stereo sources are connected to adjacent channels, left on the lower-numbered odd channel.

Krone Block 2:

The Audio Destinations block is where you connect equipment that requires an audio feed from the console. The layout is the same as the input block; AES on the left, analog on the right. Connect the lower output card connector (outputs 1-16) on the RIO to left connector on the block, and the upper output card connector (outputs 17-32) on the RIO to right connector on the Block The RAD-84 Analog Output Card on the RIO DSP Engine has 16 analog channel outputs. An RJ45 connector "Digital" provides an AES copy of the first 8 output channels suitable for connection directly into a meter POD or MClass Console for metering, cue and headphones using a standard CAT5 cable.

Krone Block 3

The RIO has 16 Optos and 16 Relays for interfacing with user equipment logic. The Optos cable connects to the left side of the block and the Relays cable connects to the right side. The Opto side of the block has a +5V logic supply brought out along with ground so you can activate the optos conveniently. The relays are rated at 10W (30V max), perfect for controlling external gear or driving a Solid State relay for your On-Air light circuit. Relay 1 is normally connected to the Timer restart function on the MClass console.

RS485 89D Block

SAS Consoles and Control Panels communicate with the RIO via RS485. The RIO has 16 RS485 ports. Each port can handle four devices. Each console module is a device, so a 16 slot console connects to the RIO with four RS485 ports. The 89D-2132 Control Fanout Block shown above makes it convenient to connect RS485 ports to your console and other SAS devices. Connect the RS485 connector on RIO1 to the left side of the 89D2132 block. A "line-lump" power supply is available for the 89D-2132 block – If you ordered one, connect it to the power (3 pin phoenix) connection at the lower left corner.

POWER: The typical configuration uses one power supply (or two for redundant power) for the RIO, and a different supply (or two for redundancy) for the MClass.
If you have redundant supplies you'll use one power supply to feed the 'A' power input of each device and the other to feed the 'B' power input. There's no priority implied by A & B. If practical feed one supply for each device on a different power bus than the other. (or one on UPS power and one on non-UPS power fed by a different breaker)

Standard DC Power Cable for RIO
(SPR200 Cable shown)

Standard Power Supply for MClass
Two can be used for redundancy

Console mounting:
The MClass Console "tub" is designed to be installed on any flat surface, with or without a cutout in the furniture. If you decide to use a cutout in the furniture, the appendix at the end of this guide has cutout dimensions. The lower aluminum side panel (held on by two screws on each side) is removed when "sinking" the console into a furniture cutout.

The MClass Console features a very simplified scheme for connecting it to the RIO DSP Engine. Straight-through CAT5 patch cables deliver RS485 control ports and AES audio (for the built-in meters, Operator Headphone amp, and Cue/Talkback speaker) from the RIO to the Console.

Other RIO connections:

Other RIO DSP Engine Connections.

The RIO comes from the factory with a Grey-hooded DB25 male plugged into J1502 – this connector has a jumper installed that sets the RIO system clock to 44.1kHz. Remove this connector (thus removing the jumper) to set the RIO DSP Engine to operate at 48 kHz.

Installing and Configuring Standalone Console Systems

RS485 connections:

RS485 serial ports are used to communicate from the Console Control Surface to the DSP Engine. Essentially, “keyboard and mouse” commands are sent from the control surface for button and fader messages and the DSP engine sets parameters accordingly to operate as a Radio Broadcast Console. The DSP Engine provides 16 RS-485 serial ports and each port is capable of servicing up to 4 controllers, either console controllers or other ancillary controllers such as remote ON/OFF/Cough panels, TP series button panels used for HP selectors, monitor selectors etc., and intercom control and Talk back panels. Each controller, (console fader or turret) has its own serial port and address and it is this port address that is used to identify and program each controller. All of the buttons on each input console fader module are programmable to functions such as Input A/B selects, Output Program Buss selects, Cue and Talk Back (IFB). The On and Off buttons are system buttons and are not programmable. The buttons on turret controllers are programmable to functions such as HP Input selectors, Intercom Talks, (to destination), and even relays to remote start other DC controlled devices such as CD players, Instant Replays, DAWs etc.

The 89D block is a breakout panel from the RIO DSP engine RJ21 (50 pin) connector to individual RJ45 connectors. Each RJ45 provides a port and power suitable for connection to all turret and intercom type controllers. Each of these controllers wires back to the 89D block with one (1) simple standard CAT5 network cable.

The console control surface provides its own power and uses the RUB1-4 and RUB5-8 connectors to bring the first 8 ports to the console tub via 2 RJ45 connectors with no power from the 89D block. When a console control surface is connected using RUB1-4 and RUB5-8, then the next available RS485 port is port 9 which starts at J1 9/10 RJ45 connector. See the 89D breakout below.

The SAS 89D Block Layout

89D Block Detail

RS 485 Serial Ports to Turret Panels and Other SAS serial controllers. Power and Data to Each turret/controller.
J1 (All ports, Port 1-16)

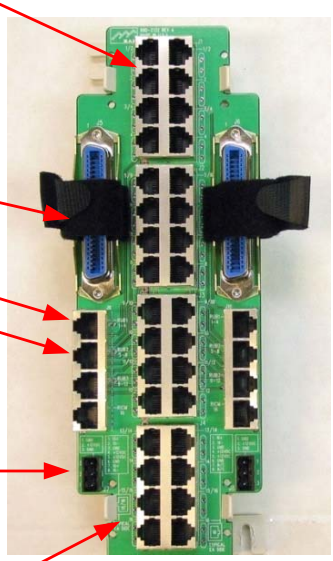
J1 PinOut	1 / 2	2
Pin 1 Wht/Orn	Port1+	Port2+
Pin 2 Org	Port1 -	Port2 -
Pin 3 Wht/Grn	Gnd	Gnd
Pin 6 Grn	Gnd	Gnd
Pin 5 Wht/Blu	+12 v	+12v
Pin 4 Blu	+12 v	+12 v
Pin 7 Wht/Brn	Port2+	n/c
Pin 8 Brn	Port2 -	n/c

To RIO DSP Engine, RS485

Console Controller RS-485 Serial Ports
To Console Controllers, Rubicon/SL/Mclass
When Connected, cannot use ports of J1
For other turret or serial controllers. (same RS-485 ports)

J9 PinOut	RUB1-4	RUB5-9
Pin 1 Wht/Orn	Port1+	Port5+
Pin 2 Org	Port1 -	Port5 -
Pin 3 Wht/Grn	Port2+	Port6+
Pin 6 Grn	Port2-	Port6-
Pin 5 Wht/Blu	Port3+	Port7+
Pin 4 Blu	Port3 -	Port7 -
Pin 7 Wht/Brn	Port4+	Port8+
Pin 8 Brn	Port4 -	Port8 -

+12 V DC In Pin 2
Gnd Pin 1,3



Pin Out Typical for all J1 1/2 thru 16

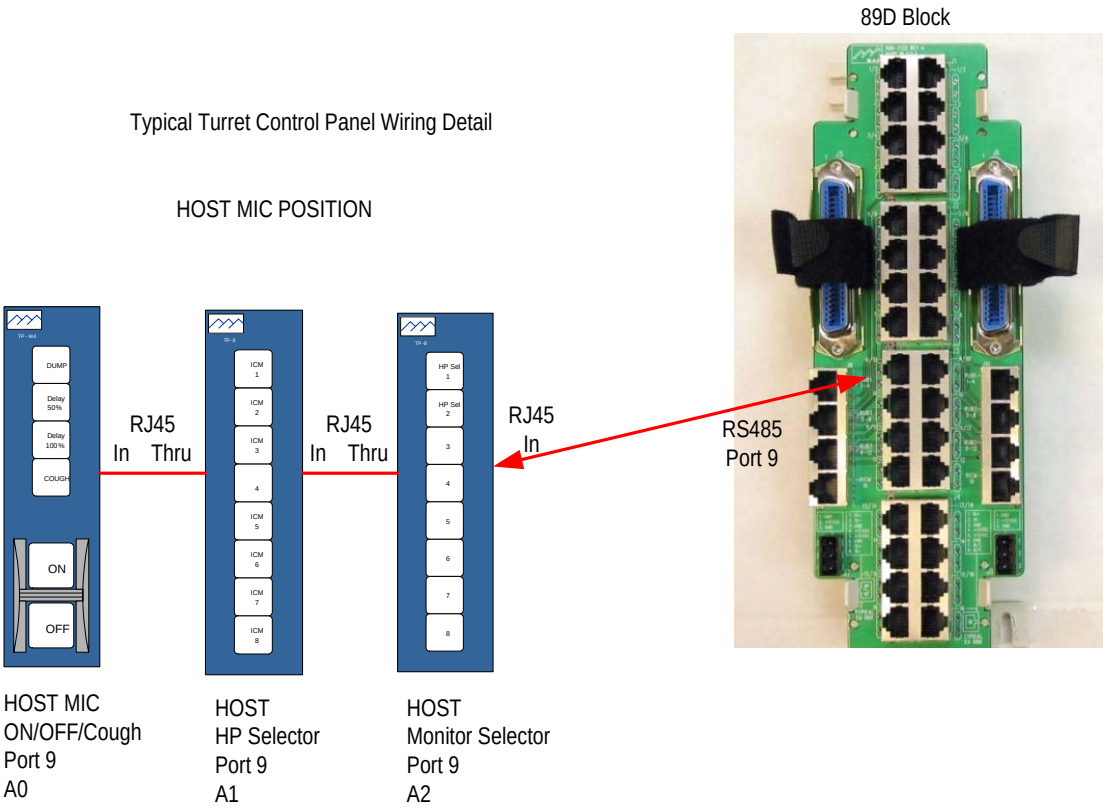
J1 PinOut	15/16	16
Pin 1 Wht/Orn	Port15+	Port16+
Pin 2 Org	Port15 -	Por16 -
Pin 3 Wht/Grn	Gnd	Gnd
Pin 6 Grn	Gnd	Gnd
Pin 5 Wht/Blu	+12 v	+12v
Pin 4 Blu	+12 v	+12 v
Pin 7 Wht/Brn	Port16+	n/c
Pin 8 Brn	Port16 -	n/c

Remote ON/OFF/Cough, TP Button Turret Panel Detail

Many optional panels are available for Host/CoHost and guest microphone positions to allow remote control of their microphone channel. Remote ON/OFF/Cough are connected to the system via RS-485 serial ports and interconnect directly from the 89D block with a standard CAT5 network cable. Each panel is set to an address from 0-3 and are all connected in a daisy chain fashion from an RS485 serial port.

DipSwitch 1 (DS1) on each turret panel sets the addresses and power options for the modules. Switch positions 1 and 2 set the address, 7 and 8 set the pass-thru power mode. 3-6 should be OFF.

Panel	pos1, pos2	pos7, pos8
Addr 0	OFF, OFF	ON , ON
Addr 1	ON , OFF	ON , ON
Addr 2	OFF, ON	ON , ON
Addr 3	ON , ON	ON , ON



The RS485 cat5 cable connects to the 89D block as shown above, and is connected in a daisy-chain fashion to up to three more panels

Rubicon M-Class Installation

The Rubicon M Class console from Sierra Automated Systems is a Console / Control Surface comprised of several independent modules housed in a common mainframe. Available modules are:

-MIPM M Class Input Module, 4 faders
-MCCM Console Control Module, includes Monitor, Cue, Talkback, Gen purpose Buttons and Meter Select Buttons
-MRIM Router Input Module, 2 faders with Rotary Encoder and LED Alpha Display
-MICOM-8A M Class Intercom Module, 8 Buttons plus Encoder and Alpha Display
-TP Mods Assorted Accessory Button Panels

The Rubicon M Class is wired through an access hole in the bottom panel of the console, located in the right rear under the Console Control Module. All user connections are made to this location. Reference the M Class Wiring and Connector Description Drawing attached. The wires will typically be brought up through an access hole in the desktop under this area. There is enough clearance under the rear panel of the console for the wires to exit above the desktop if desired. The Side Panels are a unique two-piece design: the lower piece may be removed to allow thru-desk mounting of the M Class Console. Thru-desk mounting requires a large rectangular hole in the desktop and provides an even lower profile installation!

Console Power is typically provided by a SAS PS-12-3 power supply. Two supplies may be used to provide full redundancy. The PS-12-3 provides 12 VDC at 3 Amps. Connect the power supply to J301 and/or J302.

The Modules communicate to an SAS System, RIO or 32KD, using CAT 5 wiring, RJ-45 connections, T568B wiring standard, accessible thru the Rubicon M Class bottom panel. The wires will connect to the SAS System either thru RJ-45 connectors to the RIO Rear Panel, or to blocks which are wired to either RIO chassis RS-485 ports or to DRC module RS-485 ports. Available blocks are SAS Model 89D-2132 with RJ-45s or Krone punch style block. Both the RIO connector adapter and the 89D-2132 block provide convenient RJ-45 connections with 4 RS-485 ports per connector (4 wire pairs). The physical communication is via SAS standard RS-485 protocol, with 4 faders/module slots per port (per wire pair). Therefore one RJ-45 connector (4 pair) supports up to 16 module slots. Each MIPM 4 fader Input Module requires one RS-485 port (one wire pair): each fader will reside at one Port/Address, four Addresses for each Port. Each MCCM Console Control Module requires one RS-485 port: Monitor controls are programmed at Address 0; General Purpose Buttons are programmed at Address 1; Address 2 is not used; and Meter Assignment controls are programmed at Address 3.

Installing and Configuring Standalone Console Systems

The Rubicon M Class Meters, Headphones, Cue and Talkback Audio are connected with Digital AES-3 format Audio. Connector J402-DIG AUDIO IN A provides four AES inputs to the M Class Console; Meter 1, Meter 2, Headphones and Cue/Talkback. Each Audio Meter displays Average Audio Level (VU) with a bar and Peak Audio Level (PPM) with a dot. The built in Headphone Amplifier drives the ¼" and 1/8" jacks on the front panel. The Cue Speaker input is mono and is carried on one channel (R) of an AES 3 Digital 2 Channel signal. The Talkback to console operator audio is also mono and is carried on the other channel (L) of the Cue/Talkback AES 3 signal. The signals are in the order (T568B wiring):
Meter 1 – Talkback/Cue – Headphone – Meter 2.

The meter bridge area also provides a Timer. The Timer is controlled via front panel controls for Start and Stop. A logic input is provided for Remote 'Auto Start'. Auto Start allows the Timer to Start and count up whenever a programmed event occurs, such as a Mic being turned On. When the AUTO button is On, and if a closure is received on the logic input the Timer will Start and count up. This logic input should be connected to a RIO relay. The Relay Number is programmed in the Console Configuration screens of the Router Control Software. The Timer/Logic Input connector is wired with a CAT 5 cable that is normally punched down to relay outputs from a RIO chassis.

Console Configuration
Each console is configured based on the complement of modules installed. For example, three MIPM Input Modules provide 12 faders and require 3 RS-485 ports. Add one MCCM Console Control Module, which requires 1 RS-485 port and 4 RS-485 ports are required. One User RJ-45 connector, J402-RS-485A will be used. Internal Console wiring and Port Assignment are explained below:

Input Module RS-485 Assignment
Each Input Module has one RS-485 port on an RJ-45 connector which includes power and ground. All user RS-485 Data and Power connections to the M Class Console are made to the MCCM Console Control Module. User connections of System RS-485 are made to J402-RS-485-A and B. J402-RS485-A provides data ports 1 thru 4 and J402-RS-485-B provides data ports 5 thru 8. These RS-485 data connections are distributed to the console modules, along with Power and Ground, via connectors J401-1 thru 8. The data circuits of J401-1 thru 7 are connected from J402- RS-485-A and B, ports 1 thru 7. When configuring the console, input modules are typically connected to ports 1, 2, 3... etc from Left to Right (as the operator sits at the console). Auxiliary modules may also be connected to these data ports as required. Port 8 is connected per below.

MCCM Console Control Module RS-485 Assignment
The RS-485 for the MCCM Console Control Module functions (Monitor, General Purpose Buttons, Meter Assignment) may be assigned to any RS-485 data port, 1 through 7, by RJ-45 data cable. The MCCM RS-485 is connected by default to J401 connector 8. To connect J401-8 to the port required, simply connect an RJ-45 thru cable from J401-8 to J401-'required port'. e.g. If the configuration requires the MCCM Console Control Module data to be connected to System RS-485 Port 4, then connect the RJ-45 data cable

from J401-8 to J401-4. If it is required to connect the MCCM RS-485 to J402-RS-485-B-Port 8 install jumpers J406 & J407 on the MCCM printed circuit above connector J403-2 ; these jumpers will connect J401-8 directly to J402-4 RS-485 B port 8.

Console XL Configuration Spreadsheet

A Spreadsheet is included on the CD software disc from SAS which details channel locations within the RIO or 32KD system. If equipment and configuration information was supplied at the time purchase or system/factory testing, the system will be pre-configured as such and documented in the quick start reference guide specifically for this system. The most important tabs are the Source, Destination, Opto and Relay layout sheets. This is where the planning and wiring information of every ancillary device to and from the system is performed. Here you can plan for analog or digital I/O and use the notes section for system and wiring information such as cable numbers etc. Block numbers are already filled in for SAS supplied wiring kits.

This system tool is utilized initially by the systems engineering department at SAS and exports data to the system for a default configuration. It is important that the configuration spread sheet be kept up to date with changes that are made manually on the RCS configuration software computer as the SAS database and the XL data base are not linked after leaving the factory.

The Configuration Spreadsheets, explained

The following diagrams show the source and destination tabs of a typical configuration spreadsheet. The information supplied will be initially programmed for a default configuration if equipment and other system information was supplied.

Figure 4. Input Designation Map

Input Chan Num	Module Chan Num	Chan Label *8 character max*	LocalLabel *8 character max*	Linked 0=*Mono*, *1=Stereo*	Hidden 0=No, 1=Yes	Notes *256 character max*	Block and Side	Krone Pair number	
0	0	Undef	Undef			Undefined			
		1	**KRL**	**0**	**1**	**F1-S1 RIOLink: CHA Seacrest**			
1	1	BSI PB1		1	0	AES 1 BSI Automation In	B1L	2	AES Block - 2 channels per pair Ground on pairs 1,4,7,10,13,16,19,22,25
2	2	right		1	1	Right Ch. B	B1L		
3	3	BSI PB2	BSI 2	1	0	AES 2 BSI Automation In	B1L	3	
4	4	right		1	1	Right Ch. B	B1L		
5	5	BSI PB3	BSI 3	1	0	AES 3 BSI Automation In	B1L	5	
6	6	right		1	1	Right Ch. B	B1L		
7	7	BSI PB4	BSI 4	1	0	AES 4 BSI Automation In	B1L	6	
8	8	right		1	1	Right Ch. B	B1L		
9	9	ISDN	ISDN 1	1	0	AES 5 BSI Automation In	B1L	8	
10	10	right		1	1	Right Ch. B	B1L		
11	11	Phone1	Caller 1	1	0	AES 6 Phone 1 on Ch. A	B1L	9	
12	12	Phone2	Caller 2	1	1	Phone 2 on Ch. B	B1L		
13	13	InstRply	InstRply	1	0	AES 7 Instant replay	B1L	11	
14	14	{InstRply		1	1	Right Ch. B	B1L		
15	15			0	0		B1L	12	
16	16			0	0		B1L		
17	17	MIC 1	MIC 1	1	0	Analog 1	B1R	27	Analog Block - single (mono) audio per pair Ground on pairs 26,29,32,35,38,41,44,47,50
18	18	MIC 2	MIC 2	1	1	Analog 2	B1R	28	
19	19	MIC 3	MIC 3	1	0	Analog 3	B1R	30	
20	20	MIC 4	MIC 4	1	1	Analog 4	B1R	31	
21	21	MIC 5	MIC 5	1	0	Analog 5	B1R	33	
22	22	MIC 6	MIC 6	1	1	Analog 6 Vox Pro Input	B1R	34	
23	23	Vox Pro	Vox Pro	1	0	Analog 7 Vox Pro Input	B1R	36	
24	24			1	1	Analog 8 Right Channel	B1R	37	
25	25	CD 1	CD 1	1	0	Analog 9 CD 1 In	B1R	39	
26	26	right		1	1	Analog 10 Right Ch.	B1R	40	
27	27	CD 2	CD 2	1	0	Analog 11 CD 2 In	B1R	42	
28	28	right		1	1	Analog 12 Right Ch.	B1R	43	
29	29	CD 3	CD 3	1	0	Analog 13 CD 3 In	B1R	45	
30	30	right		1	1	Analog 14 Right Ch.	B1R	46	
31	31	CD 4	CD 4	1	0	Analog 15 CD 4 In	B1R	48	
32	32	right		1	1	Analog 16 Right Ch.	B1R	49	

The chart is fairly self explanatory. Source Channels 1-16 are AES inputs to the system, eight stereo or dual-mono AES sources – Channels 17-32 are analog inputs to the system The system is typically a mix of mono and stereo sources. A stereo source (analog or digital) requires a channel of audio for left and a channel of audio for right while a mono source requires one channel of audio. Adjacent channels can be “linked” as stereo sources and will switch in stereo pairs to a similarly programmed stereo output. Adjacent

channels are 1 and 2, 3 and 4, etc. only and are treated as Left and Right respectively. Channels 2 and 3 for example cannot be linked as a stereo channel as these are out of the boundary of adjacent pairs. The system will map odd channel sources (left) to odd channel outputs and even channel sources (right) to even channel outputs for a stereo mapping. A mono source to a stereo output will put the mono to both sides while a stereo source to a mono destination will sum Left and Right (odd and even channel sources) to the output. If the adjacent channels are "unlinked" then the 2 channels are treated as mono sources.

The Krone blocks have numbered pairs from 1-25 on the left side of the block and 26-50 on the right. The block side and pair numbers for each source are included in the chart above.

For Example, the AES connection for inbound Phone audio is on inputs 11/12, which is punched down to Audio Block 1 (inputs) Left side, on the ninth pair of the block. Although this is a digital AES input, both channels can still be treated as 2 individual mono sources if they are programmed as "unlinked". The AES simply delivers two (2) channels of audio in one (1) cable.

The analog connection for MIC 3 (a mono, line-level input from a pre-amp) is connected to Audio Block 1 Right side, on the 30th pair of the block.

Figure 5. Output Designation Map

Output Chan Num	Module Chan Num	Chan Label *8 character max*	Local Label *8 character max*	Linked *0=Mono, 1=Stereo, 3=Mono LR Sum*	Hidden *0=No, 1=Yes*	Notes *256 character max*	Block and Side	Krone Pair number			
0	0	Undef	Undef			Undefined		Left			
		1	KRL			F1-S1 RIOLink: CHA Seacrest					
1	1	PGM		1	0	AES PGM Buss Out	B2L	2	AES Block - 2 channels per pair Ground on pairs 1,4,7,10,13,16,19,22,25		
2	2	{ Pgm		1	1		B2L				
3	3	AUD	AUD	1	0	AES AUD Buss Out	B2L	3			
4	4	{ AUD		1	1		B2L				
5	5	OFFL	OFFLINE	1	0	AES OFFLINE Out	B2L	5			
6	6	{A OFFL		1	1		B2L				
7	7	Phone1	Phone 1	3	0	AES Mix Minus to Phone 1	B2L	6			
8	8	Phone 2	Phone 2	3	0	Mix Minus to Phone 2 Ch. B	B2L				
9	9	BSI Rec	BSI Rec	1	0	AES to BSI Record input	B2L	8			
10	10	{BSI		1	1	Right Ch. B	B2L				
11	11	ISDN	ISDN	1	1	AES to ISDN Codec	B2L	9			
12	12	{ISDN		1	1	Right Ch. B.	B2L				
13	13			1	1		B2L	11			
14	14			1	1		B2L				
15	15			1	0		B2L	12			These are system outputs and can't be changed
16	16			1	1		B2L			"Digital" RJ45 on RAD 84	AES Out CH. 17-24 Connect to Console DIG IN A
17	17	PGM	PGM	1	0	Analog PGM Buss 1	B2R	27	Analog Block - single (mono) audio per pair Ground on pairs 26,29,32,35,38,41,44,47,50	1+ & 2- org pair	Feeds Meter 1 Left
18	18	{pgm		1	1	PGM Buss Right Ch.	B2R	28			Feeds Meter 1 Right
19	19	Talkback	Talkback	3	0	Talkback Mix Bus (n/c connected digital)	B2R	30		3+ & 6- grn pair	Feeds Monitor Module TB Bus (mono)
20	20	Cue Spkr	Cue Spkr	3	0	Cue Mix Bus (n/c connected digital	B2R	31			Feeds Monitor Module Cue Spkr (mono)
21	21	HP OP	HP OP	1	0	B Op HP Out (n/c connected digital)	B2R	33		5+ & 4- blue pair	Feeds Monitor Module Bop HP Left
22	22	{HP OP		1	1		B2R	34			Feeds Monitor Module Bop HP Right
23	23	Meter2>	Meter2>	1	0	Meter2 feed (n/c connected digital)	B2R	36		7+ & 8- brn pair	Feeds Monitor Module Meter 2 Left
24	24	{mtr2		1	1	Right Ch.	B2R	37			Feeds Monitor Module Meter 2 Right
25	25	MonSpk	MonSpk	1	0	Control Room Monitor Speaker	B2R	39			These are typical system outputs
26	26	{A MonSp		1	1		B2R	40			Usually required
27	27	A HPGst	HPGst	1	0	Guest Headphones	B2R	42			
28	28	{A HPGst		1	1		B2R	43			
29	29	Vox Pro	Vox Pro	1	0	Analog to Vox Pro input	B2R	45			
30	30	right	{A Rem1	1	1	right ch.	B2R	46			
31	31			1	0		B2R	48			
32	32	Cue MIX	Cue MIX	1	1	System Cue Mixing Buss`	B2R	49		No Connection, System CUE Bus Output	

Destination Channels 1-16 are AES outputs from the system (eight stereo or dual mono AES outs) – Channels 17-32 are analog outputs from the system.

The Krone blocks have numbered pairs from 1-25 on the left side of the block and 26-50 on the right. The block side and pair numbers for each destination are included in the chart above.

For Example, the AES connection for outbound AUD bus audio is on outputs 3 and 4, a stereo pair left and right respectively, which is punched down to Block 2 (outputs) Left side, on pair 3 of the block. AES is two (2) channel so the stereo pair is delivered using 1 digital pair. The digital outputs can also be treated as 2 individual mono channels. For example, outputs 7 and 8 are feeding the phones on 1 AES pair of wires (block 2 pair 6). These outputs are treated as 2 channel mono signals and do not have to be locked as a stereo pair. Any source can be mapped to output 7 or 8 as a mono feed. If a stereo source is selected, a mono sum will be constructed on the output.l

This spreadsheet also shows the outputs that feed the RAD 84 “Digital” output RJ45 connector. This connector combines 4 AES signals (4 pairs of the RJ45 connector) for a simple interconnect to the M Class monitor module section. These are system outputs and cannot be changed unless the “Digital” connector is not used. The “Digital” connector delivers PGM1 to Meter1, TB, Cue Speaker and Board Operator Headphone signals to the monitor module “DIG IN A” connector using a standard off the shelf CAT5 Ethernet cable.