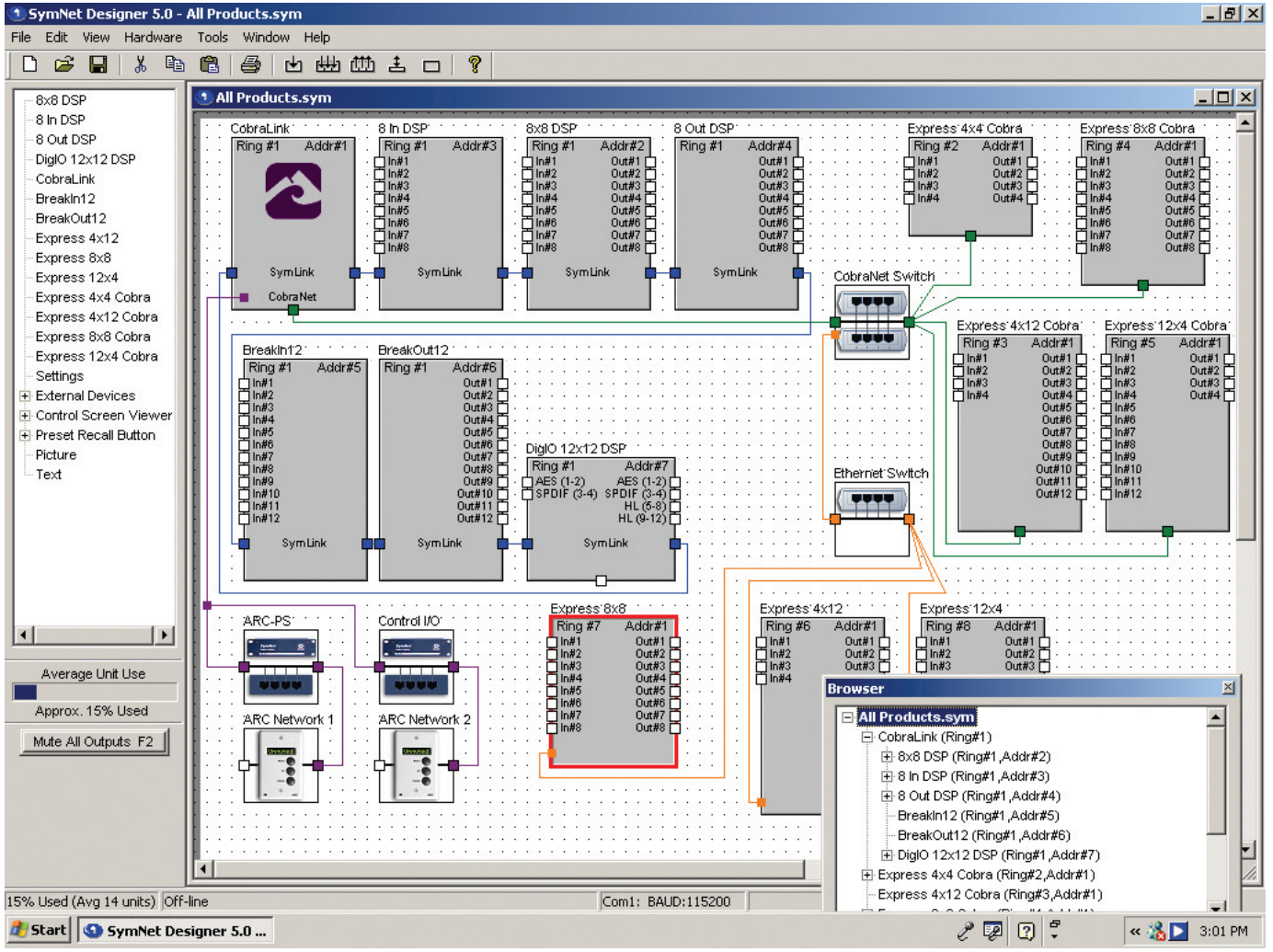
SymNet™ Audio Matrix



Contents

Audio is an extremely important part of life. Whenever people gather, for pleasure or politics, comfort or commerce, entertainment or enterprise, they need to hear the message. For over a quarter of a century Symetrix has designed and produced electronics for the management of audio in a variety of situations. This life's work has culminated in today's SymNet family of products for installed sound applications.

From our original launch we've expanded the SymNet family to the current 21 hardware offerings. Installers choose SymNet because it combines the flexibility and elegance of the SymNet Designer software application with powerful and reliable DSP hardware creating the desired total solution. SymNet is well received by end users for its audio purity and simplicity of operation via a wide variety of SymNet hardware and third party remote controls. Imagine – technology that doesn't get in the way.

SymNets have found their way into a variety of scenarios from boardrooms to Broadway, houses of worship to home theatres, and from major theme parks to major league sports venues. Read on to learn more about the applications and capabilities of the SymNet Audio Matrix - **Engineered by Symetrix**.

Overview

Much of our modern world relies on computers, so why not use computerized tools to control sound systems? Harnessing the power of computers and putting it to work in a sound system provides a contemporary, powerful solution that is easily installed and managed. SymNet is that tool, and it can be described quite simply. It converts mic or line-level analog audio into digital information that is run through sophisticated digital signal processing, better known as DSP. There, in SHARC processors by Analog Devices, the audio is massaged, mixed, and molded by software modules emulating traditional audio processing functions as well as new functions that can only be implemented digitally. Passing through the DSP, the audio is converted back to analog and continues on its journey to amplifiers, speakers, and ultimately - to ears.

Why DSP? Flexibility. An audio DSP can offer unparalleled flexibility in terms of routing and signal processing options. Processing schemes that might have been unworkable with dedicated hardware devices are easily constructed, and controlled, within the DSP. The changing needs of multi-purpose venues are easily accommodated. Completely different system scenarios can be called up at the touch of a button - on a remote control or a computer keyboard. SymNet handles all of this with simple elegance. Future changes in the use or design of the sound system are quickly handled when new functions are added, via software upgrade, as they become available.

An incredible level of control is possible with DSP. SymNet fully supports industry standard AMX and Crestron control systems. In addition, our own series of ARCs (Adaptive Remote Controls) provide cost-effective user control solutions for common applications such as source selection, room combining, and volume control to name just a few. The SymNet Designer 5.0 release includes support for the Motor Mix control surface by CM Labs to provide a hands-on mixing-console-type interface. The Designer also includes a myriad of logic and dynamic-based control modules used to create dynamic equalizers, multichannel duckers, logic-based decision trees, and much more. It supports the ability to build customized user interface pages called Control Screens. After all, the end user is looking for a solution, not a sound system.

Consider the cost savings. A SymNet DSP allows the system designer to think “outside the budget” by providing multiple channels of processing modules, mixers, and routers - all included in the price of a single unit. The discrete hardware equivalent of such a system would be vastly more expensive and require additional rack space and power. Additional savings are realized through reduced wire, connectors, rack prep, and installation time. Plus, SymNet’s extensive security features minimize client down time by keeping unqualified fingers away from crucial system components.

Christian Brothers College High School in Town and Country, MO, USA, is a showplace for modern computer and networking technology. It is also home to a very sophisticated SymNet system that distributes multiple audio sources to over 70 classrooms, a performing arts center, and a number of special-use rooms. SymNet is controlled over the school’s comprehensive data network, much of it wireless. The system was installed by SAVI of St. Louis, MO.

Broadway’s Tony award-winning Hairspray is a combination of terrific acting, outstanding writing, world-class choreography, and memorable music. To help the musicians hear themselves and each other while supporting the singing and dancing, Sound Associates of Yonkers, NY, created a SymNet system to handle in-ear monitoring for the orchestra. Extensive AMX control allows each musician to create a personalized mix, freeing up a monitor engineer, and taking up far less space than a traditional monitor console. SymNet is also currently on the road with a number of off-Broadway touring companies.

SymNet is off to the races at **Happy Valley** and **Shatin Race Tracks** in Hong Kong, China. Installed by Eastern Acoustic Development for the Hong Kong Jockey Club, SymNet routes commentary in 3 languages across the vast architectural spaces using CobraNet transmitted over fiber optic lines. The design also includes AMX touch panels for system control. One of the first SymNet/CobraNet installations, SymNet has run the race reliably for many years.

SymNet Hardware

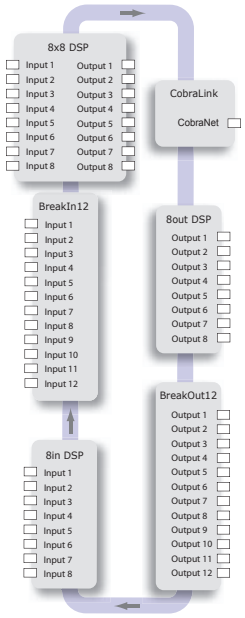
SymNet is a modular system utilizing a variety of hardware I/O configurations, offering many options to the system designer. The hardware falls into 3 groups: **SymLink**, **CobraNet**, and **Express**. This grouping of devices allows the system designer to tailor both features and price points to the client's needs.

All **SymLink** hardware models include the SymLink bus, a proprietary interconnect which supports up to 64 low latency channels of audio and control, freely circulating between a maximum of 16 SymLink devices. These devices are connected to each other in a ring topology using shielded CAT5 cable. In order to support the high speed, low latency bus, SymLink cables are restricted to 10 meters between devices. In practice, the SymLink components are generally located in the same rack. *Models: 8x8 DSP, 8in DSP, 8out DSP, DigIO 12x12 DSP, BreakIn12, BreakOut12, CobraLink.*

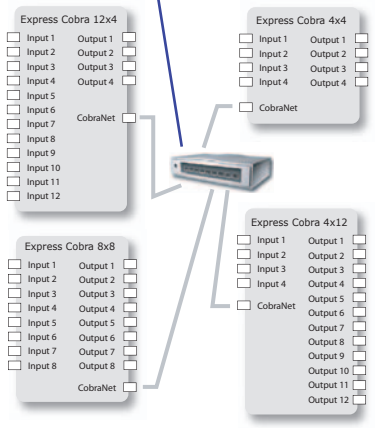
Also included in the SymLink group, used for routing audio over longer distances, CobraLink hardware is used to break out of a SymLink ring and convert the audio format to CobraNet, Peak Audio's multichannel, bidirectional industry standard protocol for networked audio. This hardware allows interconnection of multiple SymLink rings, and provides direct Ethernet access for control of the hardware from a facility's LAN, if so desired.

Express Cobra hardware includes the new 8x8 CobraNet chip from Peak Audio. Its rear panel connections support a split network for separate management of CobraNet audio and Ethernet control over a LAN. Express Cobra hardware is a cost-effective solution for bridging distant hardware units requiring no more than 8 channels of audio in either direction. Express Cobra hardware is also compatible with third party CobraNet-enabled amplification systems or powered speaker enclosures. *Models: Express Cobra 12x4, Express Cobra 8x8, Express Cobra 4x12, Express Cobra 4x4.*

SymNet **Express** hardware is targeted for applications where a single, stand-alone unit is sufficient for all the audio processing required between the microphones and the power amplifiers. These applications typically include houses of worship, school cafetoriums, media rooms, and others where flexible signal processing is required, yet budget limitations must be observed. All three models are addressable over Ethernet and can be mounted on a facility's LAN. *Models: Express 12x4, Express 8x8, Express 4x12.*



A SymLink™ Ring with CobraLink Breakout.



An Express Cobra System.

The SymNet Audio Hardware Modules • *a comparison*

	8x8 DSP	*8in DSP*	*8out DSP*	*BreakIn12*	*BreakOut12*	*CobraLink*	*DigIO 12x12 DSP*	*Express 12x4 Cobra*	*Express 8x8 Cobra*	*Express 4x12 Cobra*	*Express 4x4 Cobra*	*Express 12x4*	*Express 8x8*	*Express 4x12*
DSP processors	4x 66MHz	2x 66MHz	2x 66MHz	-	-	-	2x 66MHz	2x 100MHz SIMD**	2x 100MHz SIMD**	2x 100MHz SIMD**	2x 100MHz SIMD**	2x 100MHz SIMD**	2x 100MHz SIMD**	2x 100MHz SIMD**
Analog audio inputs	8	8	-	12	-	-	-	12	8	4	4	12	8	4
Analog audio outputs	8	-	8	-	12	-	-	4	8	12	4	4	8	12
Digital audio ins	-	-	-	-	-	up to 32	12 *	8	8	8	8	-	-	-
Digital audio outs	-	-	-	-	-	up to 32	12 *	8	8	8	8	-	-	-
Max. Cobra channels	-	-	-	-	-	32/32	-	8/8	8/8	8/8	8/8	-	-	-
Analog/binary control inputs	8	8	8	-	-	-	-	2 pots or 4 switches	2 pots or 4 switches	2 pots or 4 switches	2 pots or 4 switches	2 pots or 4 switches	2 pots or 4 switches	2 pots or 4 switches
Hardware group	SymLink	SymLink	SymLink	SymLink	SymLink	SymLink / CobraNet	SymLink	CobraNet	CobraNet	CobraNet	CobraNet	Express (stand-alone)	Express (stand-alone)	Express (stand-alone)
Relay outputs	3	3	3	-	-	-	-	1	1	1	1	1	1	1
Binary outputs (o.c.)	6	6	6	-	-	-	-	2	2	2	2	2	2	2
RS-485	1	1	1	-	-	1	1	1	1	1	1	1	1	1
RS-232	2	2	2	1	1	2	1	1	1	1	1	1	1	1
Ethernet	-	-	-	-	-	yes	yes	yes	yes	yes	yes	yes	yes	yes

* Direct connections to four channels - HomerLink™ BreakOut required for channels 5-12. ** SIMD - Single Instruction Multiple Data architecture achieves increased performance per MHz in many modules.

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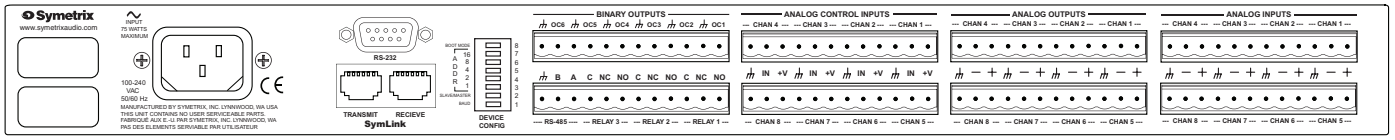
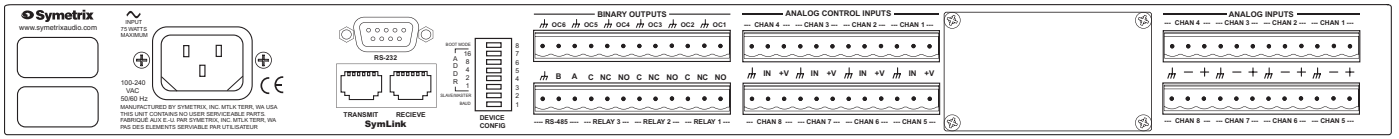
Rear Panels

8x8 DSP



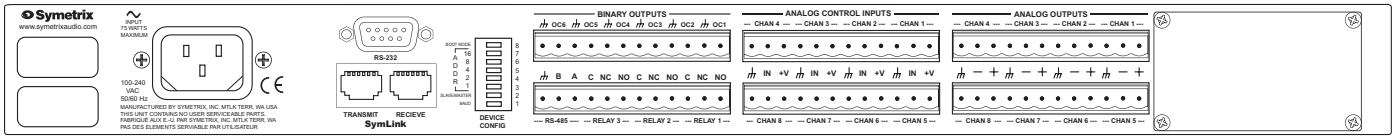
8x8 DSP is the fundamental building block of a SymNet system and provides 8 analog inputs and 8 analog outputs using 4 66 MHz DSP chips. It has 8 analog control inputs, 6 open collector outputs, 3 relay outputs, SymLink, front panel metering, RS-485 and 2 RS-232 ports.

8in DSP



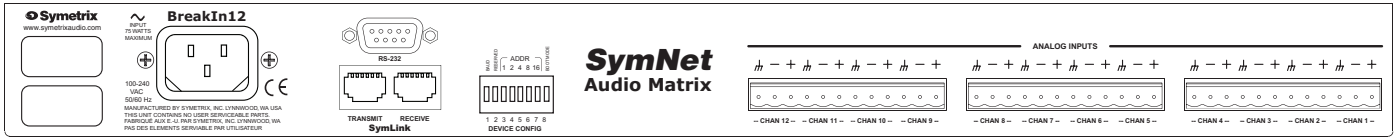
8in DSP adds 8 analog inputs to a SymLink ring using 2 66 MHz DSP chips. It has 8 analog control inputs, 6 open collector outputs, 3 relay outputs, SymLink, front panel metering, RS-485 and 2 RS-232 ports.

8out DSP



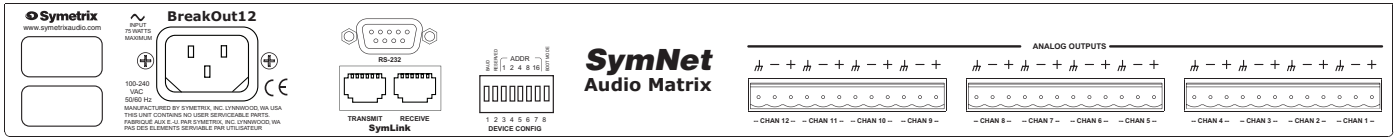
8out DSP adds 8 analog outputs to a SymLink ring using 2 66 MHz DSP chips. It has 8 analog control inputs, 6 open collector outputs, 3 relay outputs, SymLink, front panel metering, RS-485 and 2 RS-232 ports.

BreakIn12



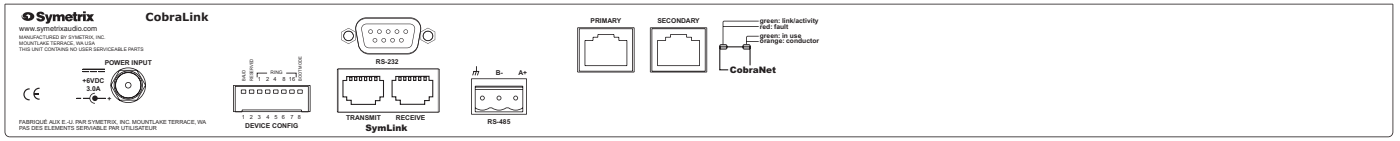
BreakIn12 adds 12 analog inputs to a SymLink ring. It has SymLink and RS-232 ports, front panel metering, but no DSP, control inputs, open collector outputs, or relays.

BreakOut12



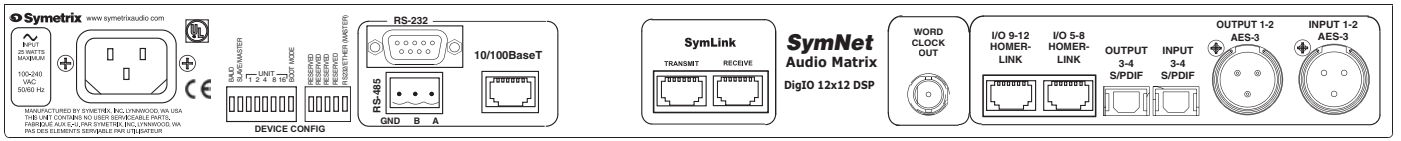
BreakOut12 adds 12 analog outputs to a SymLink ring. It has SymLink and RS-232 ports, front panel metering, but no DSP, control inputs, open collector outputs, or relays.

CobraLink



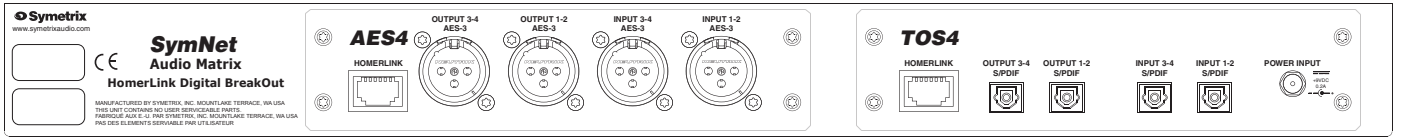
CobraLink adds CobraNet™ capability to a SymNet system. It has SymLink, CobraNet primary and secondary connections, RS-485 and RS-232 ports.

DigIO 12x12 DSP



DigIO 12x12 DSP adds 12 digital audio inputs and outputs to a SymLink ring. It has SymLink, 2 66 MHz DSP chips, Ethernet, 2 HomerLink ports, 2 Channels of AES/EBU I/O, 2 Channels of S/PDIF I/O, Word Clock Output, RS-485 and RS-232 ports.

HomerLink Breakout



HomerLink Breakout is a configurable breakout box for the DigIO 12x12 DSP. AES/EBU or TOSLink I/O may be added in groups of 4 channels each. It has up to 2 HomerLink ports.

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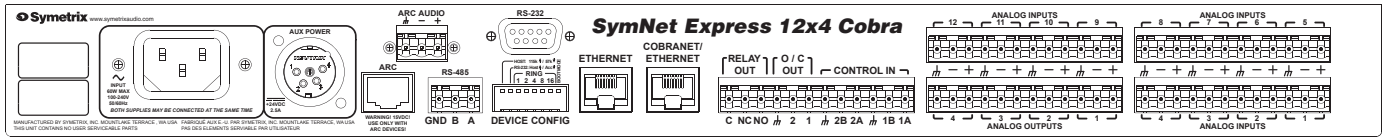
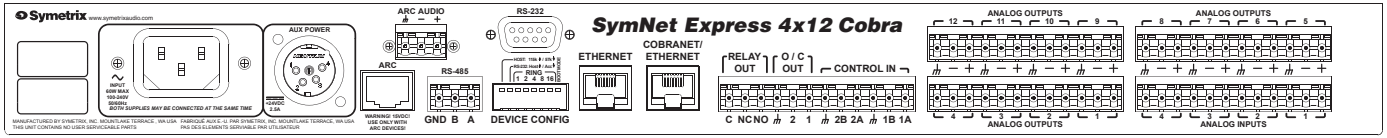
Rear Panels *... continued*

Express 12x4 Cobra



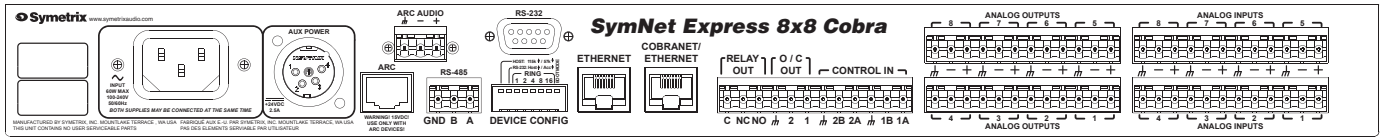
Express 12x4 Cobra has 12 inputs and 4 outputs plus 8x8 CobraNet™ I/O and uses 2 100 MHz SIMD DSP chips. Also on board are Ethernet, 1 ARC port, 2 analog control inputs, 2 open collector outputs, 1 relay output, 1 RS-485 and 1 RS-232 port.

Express 4x12 Cobra



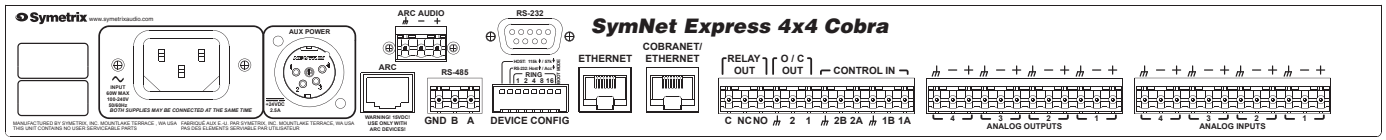
Express 4x12 Cobra has 4 inputs and 12 outputs plus 8x8 CobraNet™ I/O and uses 2 100 MHz SIMD DSP chips. Also on board are Ethernet, 1 ARC port, 2 analog control inputs, 2 open collector outputs, 1 relay output, 1 RS-485 and 1 RS-232 port.

Express 8x8 Cobra



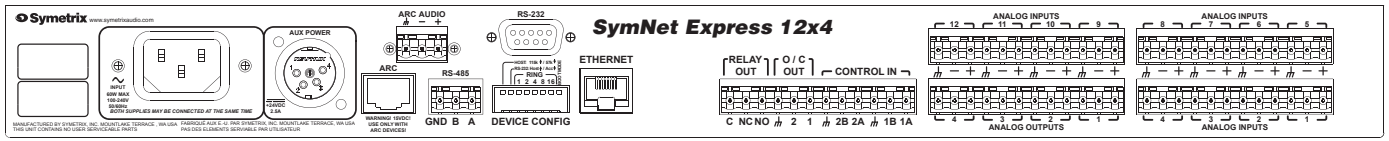
Express 8x8 Cobra has 8 inputs and 8 outputs plus 8x8 CobraNet™ I/O and uses 2 100 MHz SIMD DSP chips. Also on board are Ethernet, 1 ARC port, 2 analog control inputs, 2 open collector outputs, 1 relay output, 1 RS-485 and 1 RS-232 port.

Express 4x4 Cobra



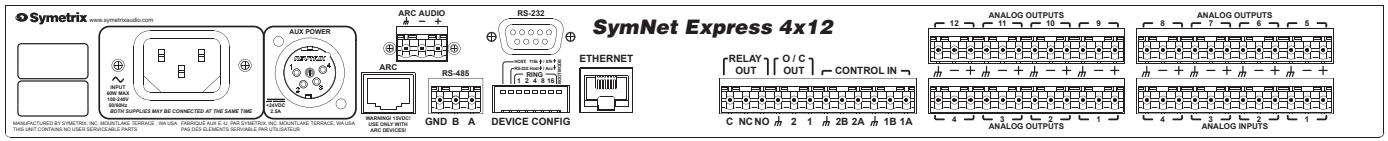
Express 4x4 Cobra has 4 inputs and 4 outputs plus 8x8 CobraNet™ I/O and uses 2 100 MHz SIMD DSP chips. Also on board are Ethernet, ARC port, 2 analog control inputs, 2 open collector outputs, 1 relay output, 1 RS-485 and 1 RS-232 port.

Express 12x4



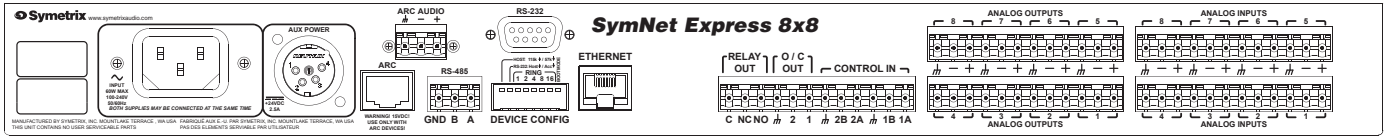
Express 12x4 has 12 inputs and 4 outputs and uses 2 100 MHz SIMD DSP chips. Also on board are Ethernet, 1 ARC port, 2 analog control inputs, 2 open collector outputs, 1 relay output, 1 RS-485 and 1 RS-232 port.

Express 4x12



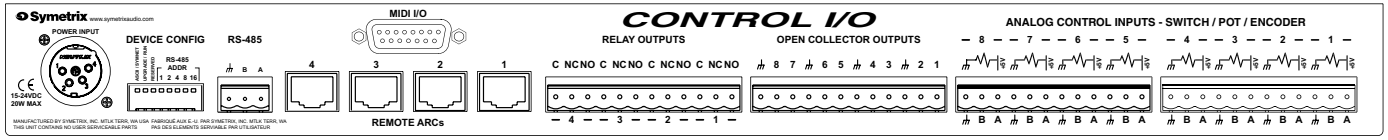
Express 4x12 has 4 inputs and 12 outputs and uses 2 100 MHz SIMD DSP chips. Also on board are Ethernet, 1 ARC port, 2 analog control inputs, 2 open collector outputs, 1 relay output, 1 RS-485 and 1 RS-232 port.

Express 8x8



Express 8x8 has 8 inputs and 8 outputs and uses 2 100 MHz SIMD DSP chips. Also on board are Ethernet, 1 ARC port, 2 analog control inputs, 2 open collector outputs, 1 relay output, 1 RS-485 and 1 RS-232 port.

Control I/O



Control I/O adds more external control options to a SymNet system via its RS-485 port. It has 8 analog control inputs, 8 open collector outputs, 4 relays, 4 ARC ports, MIDI and RS-485. The 8 analog control inputs can support up to 16 switches.

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Specifications

General Specifications	*8x8 DSP*	*8in DSP*	*8out DSP*	*BreakIn12*	*BreakOut12*	*DigIO 12x12 DSP*	***Express** 12x4 Cobra*	***Express** 8x8 Cobra*	***Express** 4x12 Cobra*	***Express** 4x4 Cobra*	***Express** 12x4*	***Express** 8x8*	***Express** 4x12*
Processors	4 x Analog Devices SHARC 21065L @ 66 MHz	2 x Analog Devices SHARC 21065L @ 66 MHz	2 x Analog Devices SHARC 21065L @ 66 MHz	-	-	2 x Analog Devices SHARC 21065L @ 66 MHz	2 x Analog Devices SHARC 21161N @ 100 MHz	2 x Analog Devices SHARC 21161N @ 100 MHz	2 x Analog Devices SHARC 21161N @ 100 MHz	2 x Analog Devices SHARC 21161N @ 100 MHz	2 x Analog Devices SHARC 21161N @ 100 MHz	2 x Analog Devices SHARC 21161N @ 100 MHz	2 x Analog Devices SHARC 21161N @ 100 MHz
Raw processing capacity	264 MIPS, 528 MFLOPS sustained	132 MIPS, 264 MFLOPS sustained	132 MIPS, 264 MFLOPS sustained	-	-	132 MIPS, 264 MFLOPS sustained	200 MIPS, 800 MFLOPS sustained	200 MIPS, 800 MFLOPS sustained	200 MIPS, 800 MFLOPS sustained	200 MIPS, 800 MFLOPS sustained	200 MIPS, 800 MFLOPS sustained	200 MIPS, 800 MFLOPS sustained	200 MIPS, 800 MFLOPS sustained
Analog control inputs	0-10 volts, DC.	0-10 volts, DC.	0-10 volts, DC.	-	-	-	0-5VDC	0-5VDC	0-5VDC	0-5VDC	0-5VDC	0-5VDC	0-5VDC
Recommended external control potentiometer	10k Ohm, linear	10k Ohm, linear	10k Ohm, linear	-	-	-	10k Ohm, linear	10k Ohm, linear	10k Ohm, linear	10k Ohm, linear	10k Ohm, linear	10k Ohm, linear	10k Ohm, linear

Audio Specifications	*8x8 DSP*	*8in DSP*	*8out DSP*	*BreakIn12*	*BreakOut12*	*DigIO 12x12 DSP*	***Express** 12x4 Cobra*	***Express** 8x8 Cobra*	***Express** 4x12 Cobra*	***Express** 4x4 Cobra*	***Express** 12x4*	***Express** 8x8*	***Express** 4x12*
Converter Types	24-bit Sigma Delta	24-bit Sigma Delta	24-bit Sigma Delta	24-bit Sigma Delta	24-bit Sigma Delta	-	24-bit Sigma Delta	24-bit Sigma Delta	24-bit Sigma Delta	24-bit Sigma Delta	24-bit Sigma Delta	24-bit Sigma Delta	24-bit Sigma Delta
Sampling Rate	48kHz +/- 100ppm	48kHz +/- 100ppm	-	48kHz +/- 100ppm		48kHz +/- 100ppm	48kHz +/- 100ppm	48kHz +/- 100ppm	48kHz +/- 100ppm	48kHz +/- 100ppm	48kHz +/- 100ppm	48kHz +/- 100ppm	48kHz +/- 100ppm
Frequency Response	+/-.25dB, 20-20kHz	+/-.25dB, 20-20kHz	+/-.25dB, 20-20kHz	+/-.5dB, 20-20kHz	+/-.5dB, 20-20kHz	+/-.01dB, 20-20kHz	+/-.5dB, 20-20kHz	+/-.5dB, 20-20kHz	+/-.5dB, 20-20kHz	+/-.5dB, 20-20kHz	+/-.5dB, 20-20kHz	+/-.5dB, 20-20kHz	+/-.5dB, 20-20kHz
A/D dynamic range, A-weighted	>113dB	>113dB	-	>111dB	-	-	>110dB	>110dB	>110dB	>110dB	>110dB	>110dB	>110dB
D/A dynamic range, A-weighted	>114dB	-	>114dB	-	>110dB	-	>110dB	>110dB	>110dB	>110dB	>110dB	>110dB	>110dB
Input to output dynamic range	-	-	-	-	-	144dB (SRC disabled), >120dB (SRC enabled)	-	-	-	-	-	-	-
Total THD+Noise @1kHz, -1dBFS	<0.005%	<0.003%	<0.003%	<0.003%	<0.0025%	N/A (SRC disabled), <0.0003% (SRC enabled)	<0.004%	<0.004%	<0.004%	<0.004%	<0.004%	<0.004%	<0.004%
Delay memory	86 seconds	43 seconds	43 seconds	-	-	43 seconds	43 seconds	43 seconds	43 seconds	43 seconds	43 seconds	43 seconds	43 seconds
Input impedance, balanced	6.67k Ohms	6.67k Ohms	--	6.67k Ohms	-	(AES) 110 Ohms	6.67k Ohms	6.67k Ohms	6.67k Ohms	6.67k Ohms	6.67k Ohms	6.67k Ohms	6.67k Ohms
Output impedance, balanced	210 Ohms	-	210 Ohms	-	210 Ohms	(AES) 110 Ohms	210 Ohms	210 Ohms	210 Ohms	210 Ohms	210 Ohms	210 Ohms	210 Ohms
Maximum input level	+24dBu	+24dBu	-	+22dBu	-	0dBfs (24-bit)	+29dBu, with 6dB pad engaged; +23dBu, with no pad	+29dBu, with 6dB pad engaged; +23dBu, with no pad	+29dBu, with 6dB pad engaged; +23dBu, with no pad	+29dBu, with 6dB pad engaged; +23dBu, with no pad	+29dBu, with 6dB pad engaged; +23dBu, with no pad	+29dBu, with 6dB pad engaged; +23dBu, with no pad	+29dBu, with 6dB pad engaged; +23dBu, with no pad
Maximum output level	+24dBu, 100k Ohms	-	+24dBu, 100k Ohms	-	+24dBu, 100k Ohms	0dBfs (24-bit)	+24dBu, 100k Ohms	+24dBu, 100k Ohms	+24dBu, 100k Ohms	+24dBu, 100k Ohms	+24dBu, 100k Ohms	+24dBu, 100k Ohms	+24dBu, 100k Ohms

Specifications *... continued*

Audio Specifications *... continued*

	8x8 DSP	*8in DSP*	*8out DSP*	*BreakIn12*	*BreakOut12*	*DigIO 12x12 DSP*	***Express** 12x4 Cobra*	***Express** 8x8 Cobra*	***Express** 4x12 Cobra*	***Express** 4x4 Cobra*	***Express** 12x4*	***Express** 8x8*	***Express** 4x12*
Mic pre-amp EIN (equivalent input noise), 22-22kHz, A-weighted	-129dBu, typical	-129dBu, typical	-	-128dBu, typical	-	-	-129dBu, typical	-129dBu, typical	-129dBu, typical	-129dBu, typical	-129dBu, typical	-129dBu, typical	-129dBu, typical
Phantom power (per input)	+48v, 10ma	+48v, 10ma	-	+48v, 10ma	-	-	+48v, 10ma	+48v, 10ma	+48v, 10ma	+48v, 10ma	+48v, 10ma	+48v, 10ma	+48v, 10ma
Input CMR, 60 Hz	>70dB	>70dB	-	>70dB	-	-	>70dB	>70dB	>70dB	>70dB	>70dB	>70dB	>70dB
Channel separation, 1kHz	>100dB, in thru out	>102dB	>105dB	>110dB	>112dB	-	>100dB, in thru out	>100dB, in thru out	>100dB, in thru out	>100dB, in thru out	>100dB, in thru out	>100dB, in thru out	>100dB, in thru out
Physical / Electrical Specs	*8x8 DSP*	*8in DSP*	*8out DSP*	*BreakIn12*	*BreakOut12*	*DigIO 12x12 DSP*	***Express** 12x4 Cobra*	***Express** 8x8 Cobra*	***Express** 4x12 Cobra*	***Express** 4x4 Cobra*	***Express** 12x4*	***Express** 8x8*	***Express** 4x12*
Size (width x depth x height)	48.3 x 21.6 x 4.37cm (19.0 x 8.5 x 1.72 inches)	48.3 x 21.6 x 4.37cm (19.0 x 8.5 x 1.72 inches)	48.3 x 21.6 x 4.37cm (19.0 x 8.5 x 1.72 inches)	48.3 x 26.7 x 4.37cm (19.0 x 10.5 x 1.72 inches)	48.3 x 26.7 x 4.37cm (19.0 x 10.5 x 1.72 inches)	48.3 x 26.7 x 4.37cm (19.0 x 10.5 x 1.72 inches)	48.3 x 27.4 x 4.37cm (19.0 x 10.8 x 1.72 inches)	48.3 x 27.4 x 4.37cm (19.0 x 10.8 x 1.72 inches)	48.3 x 27.4 x 4.37cm (19.0 x 10.8 x 1.72 inches)	48.3 x 27.4 x 4.37cm (19.0 x 10.8 x 1.72 inches)	48.3 x 27.4 x 4.37cm (19.0 x 10.8 x 1.72 inches)	48.3 x 27.4 x 4.37cm (19.0 x 10.8 x 1.72 inches)	48.3 x 27.4 x 4.37cm (19.0 x 10.8 x 1.72 inches)
Shipping Weight	6 kg (12 lbs)	6 kg (12 lbs)	6 kg (12 lbs)	6 kg (12 lbs)	6 kg (12 lbs)	6 kg (12 lbs)	6 kg (12 lbs)	6 kg (12 lbs)	6 kg (12 lbs)	6 kg (12 lbs)	6 kg (12 lbs)	6 kg (12 lbs)	6 kg (12 lbs)
Power Requirements	100 to 120 VAC, 50-60 Hz, 75W or 200 to 240 VAC, 50-60 Hz, 75W.	100 to 120 VAC, 50-60 Hz, 75W or 200 to 240 VAC, 50-60 Hz, 75W.	100 to 120 VAC, 50-60 Hz, 75W or 200 to 240 VAC, 50-60 Hz, 75W.	100 to 120 VAC, 50-60 Hz, 75W or 200 to 240 VAC, 50-60 Hz, 75W.	100 to 120 VAC, 50-60 Hz, 75W or 200 to 240 VAC, 50-60 Hz, 75W.	100 to 240 VAC, 50-60 Hz, 25W.	100 to 240 VAC, 50-60 Hz, 60W.	100 to 240 VAC, 50-60 Hz, 60W.	100 to 240 VAC, 50-60 Hz, 60W.	100 to 240 VAC, 50-60 Hz, 60W.	100 to 240 VAC, 50-60 Hz, 60W.	100 to 240 VAC, 50-60 Hz, 60W.	100 to 240 VAC, 50-60 Hz, 60W.

Common System-wide Specifications

RS-232 host serial I/O	*RS-485 serial I/O*	*Sample rate*	*SymLink cable*	*HomerLink cable*	*Maximum devices per SymLink ring*	*Maximum SymLink rings*	*Maximum stored presets*
115.2 kbaud or 57.6 kbaud, 8-bit, no parity	38.4 kbaud, 8-bit, no parity	48 kHz, +/- 100ppm	Shielded CAT5, maximum device to device length = 10 meters	Unshielded CAT5, maximum length = 100 meters	16	31	1000

HomerLink BreakOut (AES4) *		**HomerLink BreakOut (TOS4) ***		**CobraLink**		**Control I/O**	
AES-3 inputs	2	TOSLINK inputs	2	Maximum audio input channels	32	Analog or binary control inputs	8 (for pots or encoders) *or* 16 (for switches)
AES-3 ouputs	2	TOSLINK outputs	2	Maximum audio output channels	32	Open collector outputs	8
Interconnect cable	CAT5	Interconnect cable	CAT5	Dynamic range	144dB	Control relays	4
				RS-485	1	RS-485	1
Power	none	Power	External supply (included), 100 to 120 VAC, 50-60 Hz, or 220 to 240 VAC.	RS-232	1	ARC ports	4
Physical	48.3 cm x 15.7 cm x 4.37 cm (19 in x 6.18 in x 1.72 in)	Physical	48.3 cm x 15.7 cm x 4.37 cm (19 in x 6.18 in x 1.72 in)	Physical	48.3 x 21.6 x 4.37cm (19.0 x 8.5 x 1.72 inches)	Physical	48.3 x 15.6 x 4.37cm (19.0 x 6.1 x 1.72 inches)
				Power	External supply (included), 100 to 120 VAC, 50-60 Hz, 20W or 200 to 240 VAC, 50-60 Hz, 20W.	Power	External supply (included), 100 to 120 VAC, 50-60 Hz, 20W or 200 to 240 VAC, 50-60 Hz, 20W.

* HomerLink BreakOuts are available in five configurations: 800HLA4 - 4 channel AES-3 BreakOut, 800HLA8 - 8 channel AES-3 BreakOut, 800HLAT - 4 channel AES-3 and 4 channel S/PDIF Optical BreakOut, 800HLT8 - 8 channel S/PDIF Optical BreakOut, 800HLT4 - 4 channel S/PDIF Optical BreakOut

SymNet Designer Software

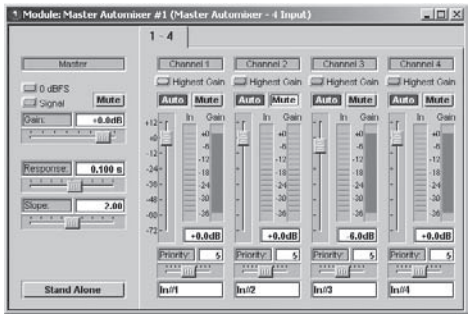
SymNet Designer is the Windows software used to create designs (routing information and DSP settings) that are then downloaded and stored in nonvolatile memory in the SymNet hardware devices. SymNet Designer uses CAD technology allowing the user to construct digital audio processes in block diagram format. The combination of 'drag and drop' software with modular hardware offers the greatest degree of flexibility and creativity when executing everything from simple to sophisticated design concepts.

Site Files are quickly downloaded to the target hardware with a single button press. Once this is done, parameter changes such as volume, muting/unmuting, and EQ can be made in real time from SymNet Designer and/or from external control devices using a straightforward external control protocol. Once the design has been downloaded into nonvolatile hardware memory, the PC is no longer required and may be disconnected if so desired.

A **Site** is a specific signal routing scheme for connecting various DSP modules and external control devices - analogous to using an analog patch bay to connect a core mixer to external signal processing devices – only faster and with more imagination!

A **Site File Archive** is a protected memory cache within the hardware devices themselves. When changes to the site are required it is not necessary to have the original site file on your PC. All you need is a copy of the version of SymNet Designer under which the site file was created. (All versions are available for a quick and free download from our web site at www.symetrixaudio.com.) When you need to make site adjustments or routing changes a simple upload procedure 'unzips' the site file to your PC.

The list of **Digital Signal Processing Modules** has become quite extensive. Each module handles some aspect of audio or control processing, and groups of modules are easily organized into audio chains on the design grid. Double-clicking on any module



The four input automixer.

reveals the controls for that module. Available modules include mixers, automixers, matrixes, filters, feedback fighters, compressor/limiters, gates, crossovers, routers, delays, and more.

Control Modules include over 50 modules for the design of very adaptable and intelligent control systems to control both audio DSP processes and binary control outputs. Complex decision making logic, sequenced events, and many custom functions can be implemented with these modules.

Control Screens are custom interface pages that include designer selected controls such as faders, buttons, meters, etc. In use they save time during system setup and live operation. Control screens can also be tied to the advanced security scheme allowing end user access to selected controls while preventing unauthorized operation of other controls.

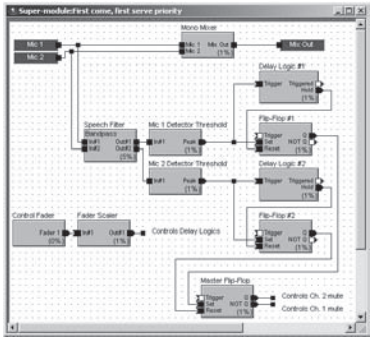
Super-modules allow complex multiprocessor DSP module designs to be created, labeled and represented as a single module on screen. Super-modules can be placed repeatedly in one or more designs and password protected to allow distribution without revealing design details. Control Screens can be associated with specific Super-modules allowing the designer to organize and control which parameters are user accessible and which are not.

Presets are snapshots of DSP module or Super-module parameter settings. Beginning with version 4.0 of SymNet Designer, up to 1000 presets may be stored and recalled from SymNet Designer or external controllers.

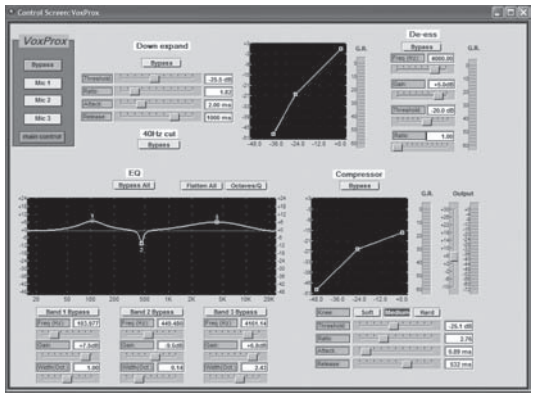
SymNet Designer DSP and Control Modules *(v5.0)*

Module Description	*Number of Modules*
Mixers and Matrixes	64
Automixers	6
Combiners	16
Filters and EQs	63
Dynamics	14
Delays	6
Routers	34
Signal Generators	6
Meters and Analyzers	15
Control Modules	
Control Inputs	17
Control Processes	10
Control Logic	15
Control Accessories	8
Control Outputs	1-10 *
Super-modules	user defined
SymLink Bus Sends & Returns*	64 channels per ring
Control Screen Viewer	user defined
Presets	1000
External Devices (graphic symbols)	17
Pictures	user bit maps
Text	user defined

* hardware dependent



A first serve priority Super-module.



A user generated control screen.

The **Event Scheduler** may be used to initiate preset changes and/or trigger contact closures using the internal real-time clock. Any given event may be initiated from a weekly or annual calendar. Automatic adjustment for daylight saving time (DST) is supported.

User Control of almost every SymNet parameter, including preset recall, is possible using multiple means as configured from SymNet Designer. Choose from analog control voltages, binary contact closures, analog potentiometers, or internal control signals (generated from within any SymNet DSP unit).

Third party media control units such as those from Crestron and AMX communicate via SymNet's RS-232 port, while our own series of ARCs (Adaptive Remote Controls) use SymNet's RS-485 port.

SymNet™
Engineered by Symetrix

ARCs (Adaptive Remote Controls)

The true test of a sound system isn't how it looks, or even necessarily how it sounds, but rather, how easily end-users can control it to suit their needs. With that in mind, Symetrix has developed the ARC series of wall panels for easy user interaction with SymNet. These 5 units serve a variety of scenarios including source selection, level control, paging, room combining, and more. Furthermore, they can be mixed and matched within a system or venue to provide each room with a unique command set, tailored specifically to that environment.

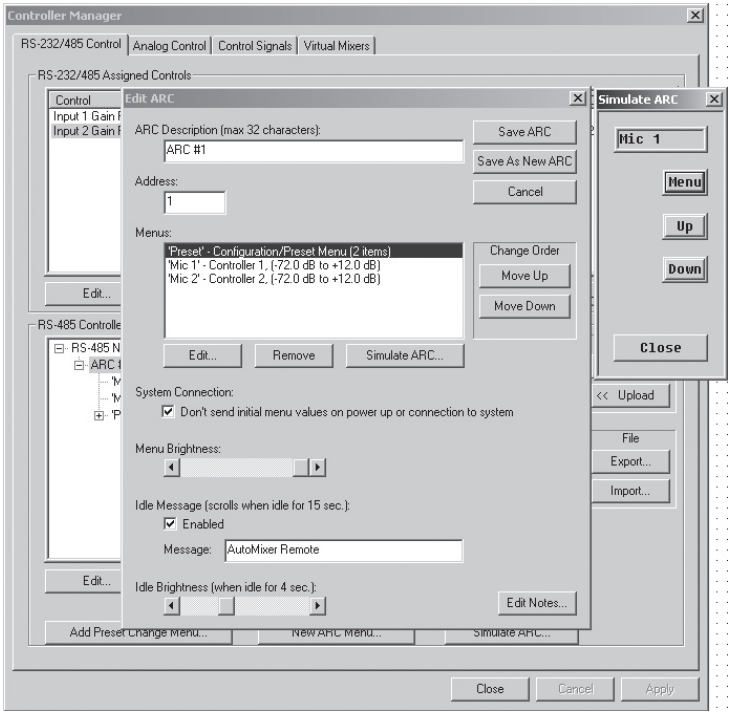
One important consideration when evaluating external control options is the ease with which the controls are integrated into the system. With most projects, time and money are factors that deserve serious consideration. Third party control systems can add expense and require extensive expertise to implement. The ARC series of control panels are all programmed from within SymNet Designer. Everything necessary to program and activate the remotes is contained within the remotes themselves and the commands entered through SymNet Designer. All control parameters are stored in the SymNet hardware as part of the site file so they can be easily accessed and modified should the user's needs change.

Their simple, straightforward appearance belies the sophisticated control behind the panel. They all communicate over RS-485, a fast and flexible communications protocol. Using this powerful technology, command sets can be assigned to specific ARCs and can range from a simple selector switch to a preset change that reconfigures the whole system for an alternate application. A single preset used for room combining, for example, will not only sum the two rooms' speakers, but prioritize a source, change room EQ, even change delay settings if the size of the room so dictates.

All ARCs can be daisy-chained over CAT5 wire delivering power and control to each unit. These are most often interfaced with the ARC-PS, a power supply intended to drive as many as 10 ARCs. In addition to the dual RJ-45 connectors, rear panel terminal strips are also provided for bare wire connection and local powering, when desired.

ARC Audio

What is ARC Audio? It's a single balanced channel of audio included in the CAT5 wire used to connect ARCs to SymNets. This channel can carry a microphone signal into SymNet from a remote paging station, or send a mono feed to a remote location.



No special tools are required to program the ARC remotes because you program directly from within SymNet Designer. Configure and test your system's remote controls in minutes instead of days. Procure DSP and control hardware from a single vendor.

ARC (Shown with optional brushed aluminum faceplate - black and white are standard.)

The SymNet ARC Modules • *a comparison*

Device / Feature	**ARC**	**ARC-K1**	**ARC-SW4**	**ARC-SWK**	**ARC-MIC**
ARC-AUDIO support	No	Yes	Yes	Yes	Yes
Text menus	Yes	No	No	No	No
Number of Encoders	0	1	0	1	0
Number of Switches	3	0	4	4	5
Discrete LEDs	0	0	4	4	5
10-segment LED Bargraphs	0	1	0	1	0
RS-485	Yes	Yes	Yes	Yes	Yes
RJ-45 daisy-chain	Yes	Yes	Yes	Yes	Yes
Nonvolatile data memory	4KB	2KB	2KB	2KB	2KB

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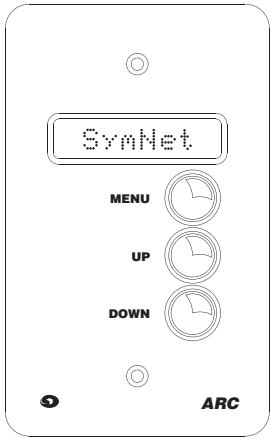
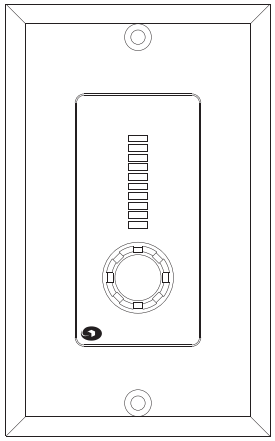
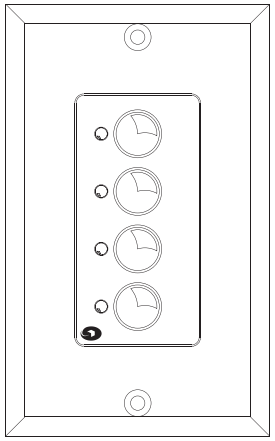


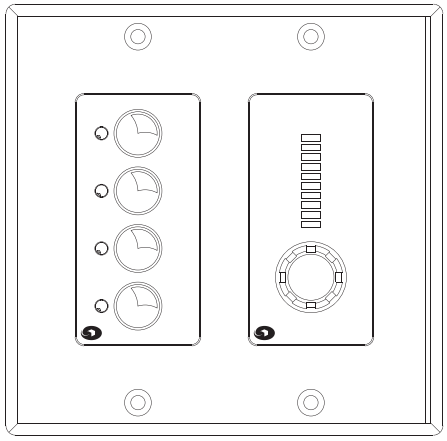
The original **ARC** is still the most powerful of the series. It supports up to 12 SymNet system menu items including such functions as volume, source selection, room combining, etc. The 8-character multi brightness backlit display provides an intuitive description of which control is being addressed. The programming of an ARC from SymNet Designer is very straightforward, saving time and money when compared to third-party control systems.



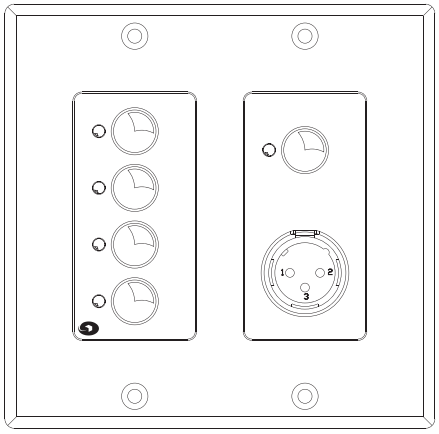
The **ARC-K1** includes a push-button encoder with 10-segment LED bargraph, generally intended for volume control. ARC-K1 is capable of handling as many as 10 different functions that are accessed by pressing the encoder button in, selecting the desired control, pressing again and changing the value. The LED provides user feedback for the position of the control. It mounts into a single gang electrical box and fits into standard Decora faceplates.



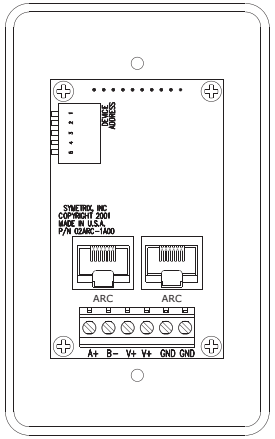
The **ARC-SW4** includes 4 switches with 2 color LEDs indicating the state of the associated switch. Typically, an SW4 would be used for preset selection, but the buttons can be assigned to almost any SymNet function and so the control can easily be configured to specialized applications. It mounts into a single gang electrical box and fits into standard Decora faceplates.

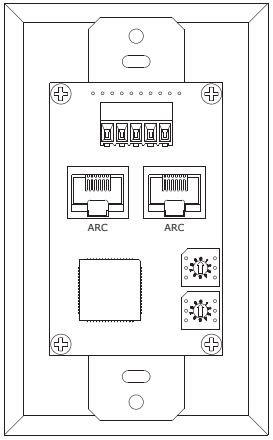


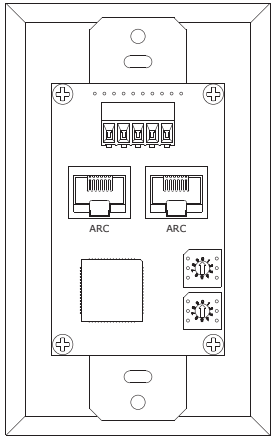
The **ARC-SWK** combines an ARC-K1 and ARC-SW4 in one, dual-gang panel, and includes a cost advantage over purchasing them separately. Intended for room combining, or more comprehensive control applications, the SWK is a complete solution for switched controls like preset changes or room combinations, and variable controls like microphone or BGM volumes. SWK fits standard Decora faceplates.

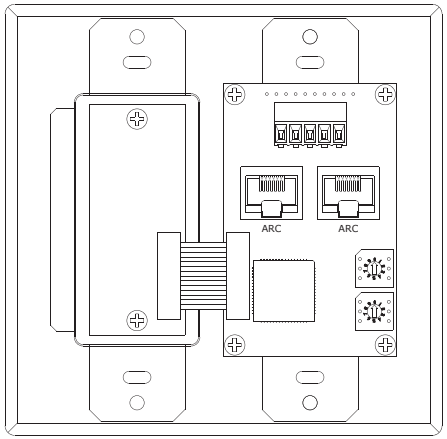


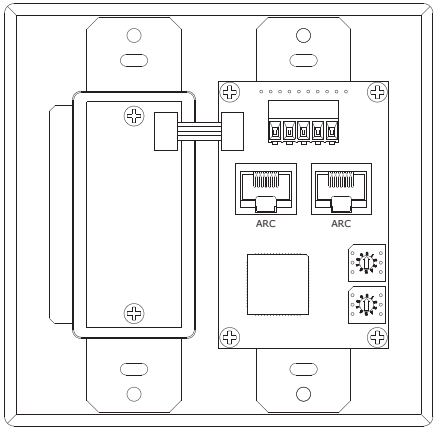
The **ARC-MIC** creates a simple paging station for a SymNet system. The buttons with associated LEDs for zone selection, a Push-to-Talk button and an XLR microphone input make this wall remote an easy add-in where paging functionality is required. The microphone signal is carried by the ARC audio channel over the CAT5 cable connected to SymNet. The ARC-MIC mounts into a dual gang electrical box and fits into standard dual Decora faceplates.











SymNet Installations *... A Partial Listing*

1st Baptist Church • Salinas, CA USA
Apollo Theatre • New York, NY, USA
Arco Arena • Sacramento, CA, USA
Astra Zeneca Auditorium • Helsinki, Finland
Auberge St-Antoine • Old Quebec city, PQ, Canada
Beijing Police Force Training School • Beijing, China
Bradesco Bank • São Paulo, Brazil
Caisse de Depot Boardroom • Montreal, PQ, Canada
Calvary Chapel • Santa Ana, CA, USA
Calvary Church • Peterborough, Ontario, Canada
Casino Nova Scotia Hotel • Halifax, Nova-Scotia, Canada
Changchun Hotel • Changchun, China
Christ Church Cathedral • Vancouver, BC, Canada
Cirque de Soleil - 'O' Show - Bellagio Hotel • Las Vegas, NV, USA
Citadel Theater • Edmonton, Alberta, Canada
City Theater of Lahti • Lahti, Finland
Club Medusa • Seattle, WA, USA
Coliseo Roberto Clemente • San Juan, Puerto Rico
Concordia University • Montreal, PQ, Canada
Conrad International Hotel Bangkok • Bangkok, Thailand
Diao Yu Tai Nationality Guesthouse • Beijing, China
Edmonton Arts Bar and Theater • Edmonton, Alberta, Canada
Empire Theater • Belleville, Ontario, Canada
Evangel Family Church • Singapore
Eve • Milwaukee, WI, USA
Faith Lutheran Church • Marietta, GA, USA
Fu Nan Tang of Jimei Institute • Xiamen, China
Garvaren • Ljungby, Sweden
Genesis Audio Oy • Helsinki, Finland
Genting Casino: First World Hotel • Kuala Lumpur, Malaysia
Grand Hall, Shan Tau Unversity • Shan Tau, China
GuangDong NanHai Electric Power Office • Guang Dong, China
Hairspray • New York, NY, USA
Hallen • Motala, Sweden
Hang Zhou Theatre • Hang Zang, China
Heaven Disco Kuala Lumpur • Malaysia
Hebron Pentecostal • Markham, Ontario, Canada
Holy Cross Lutheran Church • Jenison, MI, USA
Hong Kong Jockey Club - Happy Valley & Shatin Race Tracks • Hong Kong, China
Hotel Mortagne • Montreal, PQ, Canada
Hotel Sofitel • Montreal, PQ, Canada
HUS Hospital Auditorium • Helsinki, Finland
IBM International Training Center • La Hulpe, Belgium
Iglesia Bautista Bethel • Canovanas, Puerto Rico

Kuaffman Stadium – Kansas City, MO, USA. SymNet is installed in Kauffman Stadium, home of the Kansas City Royals Baseball Club. Durell LLC installed and maintains the system designed by Wrightson, Johnson, Haddon & Williams, Inc. The 3 Ring SymNet system feeds roughly 213 speakers and uses CobraNet™ transmitted via fiber optic lines to distribute audio to 40,000 Royals fans.

Hometronics, Dallas, TX, USA, is one of the country's top installers of home theater and media room systems. Hometronics packages SymNet with top tier audio and video products to provide the ultimate home theater experience, using SymNet for loudspeaker processing - crossover, equalization, and time delays.

IKEA Store • Toronto, Ontario, Canada
Ilmarinen Head Office Auditorium • Helsinki, Finland
Indianapolis Motor Speedway • Indianapolis, IN, USA
Itaú Bank • São Paulo, Brazil
Jaraguá Hotel • São Paulo, Brazil
Jia Xing Theatre • Jia Xing, China
Johnston Church • Des Moines, IA, USA
Jubilee Auditorium • Calgary, Alberta, Canada
Kauffman Stadium - KC Royals • Kansas City, MO, USA
KunMing International Conference Center • KunMing, China
L'Oreal Headquarters • Brussels, Belgium
Living Sanctuary Church • Singapore
Mandalay Bay Mall • Las Vegas, Nevada, USA
Mr. Team Production - Rental House • Bangkok, Thailand
National Bank of Canada • Montreal, PQ, Canada
Ocean Park • Hong Kong, China
One World Casino Genting • Malaysia
PEI Legislature • Charlottetown, Prince Edward Island, Canada
Prime Minister Ban-Harn Hall of Fame • Bangkok, Thailand
Princess Cruise Line • Pacific Ocean
Santa Anita Racetrack • Arcadia, CA, USA
Satakunta Polytechnic Auditorium • Pori, Finland
Seattle City Hall - Council Chambers • Seattle, WA, USA
Shepherd of the Hills Church • Los Angeles, CA, USA
Skamania Lodge • Stevenson, WA, USA
Sony Center Forum • Berlin, Germany
Studio Pasila • Helsinki, Finland
Surrey Arts Center • Surrey, BC, Canada
Teatro Oliver • Arecibo, Puerto Rico
Teatro Zinzani • Seattle, WA, USA
The Canadian Parliament • Ottawa, Ontario, Canada
The San Francisco Hilton • San Francisco, CA, USA
The SF Museum of Modern Art • San Francisco, CA, USA
The Shark Club • Kirkland, WA, USA
Theatre of YueYang Papter Group Co Ltd • Wu, China
University of Hamburg • Hamburg, Germany
University Of Malaysia, Penang • Malaysia
University of Wyoming • Laramie, WY, USA
Vertigo Mystery Theatre • Calgary, Alberta, Canada
Warren Theater • Wichita, KS, USA
Wenzhou International Convention and Exhibition Centre • Wenzhou, China
West Vancouver Aquatic Center • Vancouver, BC, Canada
Xinjiang Communist Party Committee's Meeting Room • Xinjiang, China
Yuan Jia Guan Stadium • Chongqing, China

More Information • Contact Us

If you're interested in learning more about the SymNet family of products we are more than happy to be of help. Here are some easy ways to get as much information as you may need:

- **Install SymNet Designer**

From our web site (www.symetrixaudio.com) download the latest version of SymNet Designer to your PC. Install and launch the application and use the comprehensive online help module (F1) to answer your questions about SymNet hardware devices and the SymNet Designer Windows application itself.

- **Explore Our Web site**

In the SymNet section of our site there are a number of helpful items you can browse or download. They include:

  - Application Files
  - Frequently Asked Questions
  - A User Forum
  - Web Links to Third Parties
  - Print Format User Guides
  - RS-232 Serial Control Protocol
  - Technical Bulletins
  - AutoCad Drawings

- **Call Us**

(425) 778-7728
(8:00 AM - 4:30 PM, Pacific Time)

- **E-mail Us**

sales@symetrixaudio.com

Christian Life Center - Stockton, CA, USA. CCI Solutions of Olympia, WA designed and installed a large SymNet system in the Christian Life Center, a 5,000 seat house of worship. SymNet is deployed as the speaker management system, processing the feeds to all five main speaker clusters, four delay rings and the distributed speaker systems. SymNet's comprehensive preset capability is controlled from the front of house to configure the system according to the format of each service.

The sound system at the **Three Rivers Convention Center in Kennewick, WA, USA** was designed by Michael R.Yantis Associates, Inc. of Seattle, WA and installed by Evco Sound and Electronics of Spokane, WA. This multi room convention center incorporates a large distributed background music system routed throughout the facility with integrated paging into all zones. CobraNet was used to expand the I/O count and the venue utilizes 40 ARC wall panels to control the system.

At Symetrix, meticulous design and aggressive technical support go hand in hand. We understand that one without the other is only half the solution. While it's true that our products have made us quite a few friends over the years, we accept that every day is a new challenge, and we refuse to rest on our laurels. We spend a great deal of time speaking with dealers, installers, consultants, and end users in order to understand what it is they look for in a quality sound system. We work to respond to their requests in order to prove ourselves in situations where our customers have put their own reputations on the line - the ultimate demonstration of their trust in us.

The products are important. That much is certain, but until we purvey our products exclusively to robots and machines, we will still be interfacing with people and their questions. We offer full-time support for all of our products online and on the phone, from 8:00 PM until 4:30 PM, Pacific Time. Our dedicated staff of humans is available to answer questions before the sale, during an installation, and when the system is in use. In most cases it is people who operate sound systems. We think it is only right to provide knowledgeable and helpful people to support them.

Symetrix

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sales@symetrixaudio.com
www.symetrixaudio.com