

SymNet™ | Network Audio Solutions



Quick Start Guide



ARC-PS (ARC Power Supply)

Quick Start Guide: ARC-PS



Before You Begin




What Ships in the Box

-  An ARC-PS hardware device.
-  One PS-5 switching power supply which provides 15 VDC @ 1.33 amperes.

NOTE: The PS-5 will accept a 100-240 VAC input. A power cable for domestic use is supplied for the PS-5. Export customers should supply the appropriate substitute cable for their locale.

-  This Quick Start Guide.

What You Need to Provide

-  A Windows® PC with 300MHz or higher Pentium® and:
 - + WIN 98SE, ME, 2000 or XP®.
 - + 10-15 MB free storage space.
 - + 1024x768 graphics capability.
 - + 16-bit or higher colors.
 - + CD-ROM drive or Internet connection.
 - + 64MB RAM (WIN 98SE/ME), 128MB RAM (WIN 2000/XP).
-  Shielded twisted pair wire to connect the Modular ARC's RS-485 terminals to the RS-485 port of a SymNet hardware device (Ring x, Address 1).
-  CAT5 cables to connect any ARC(s) to the ARC-PS.

Getting Help

SymNet Designer, the Windows application that controls all SymNet hardware, includes a help module which acts as a complete User's Guide for both hardware (including the ARC-PS) and software.

If you have questions beyond the scope of the help module, contact our Customer Support Group in the following ways:

Tel: +1 (425) 778-7728
8:00 am to 4:30 pm
Monday through Friday,
Pacific Time


Web: <http://www.SymetrixAudio.com>



This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This Class B Digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations
Cet appareil numérique de la classe B respecte toutes les Exigences du Règlement sur le matériel brouilleur du Canada.





Keep up-to-date with the latest version of SymNet Designer™, the Windows® application that controls all SymNet hardware, go to: <http://www.SymetrixAudio.com>

Important Safety Instructions.

- 1 Read these instructions.
- 2 Keep these instructions.
- 3 Heed all warnings.
- 4 Follow all instructions.
- 5 Do not use this apparatus near water. This apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.
- 6 Clean only with dry cloth.
- 7 Do not block any ventilation openings. Install only in accordance with the manufacturer's instructions.
- 8 Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9 This apparatus shall be connected to a mains socket outlet with a protective earthing connection. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10 Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11 Only use attachments/accessories specified by the manufacturer.
- 12 Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over. 
- 13 Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14 Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug cord is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

	CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	
WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE		
AVIS: RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR		

SEE OWNERS MANUAL. VOIR CAHIER D'INSTRUCTIONS.
No user serviceable parts inside. Refer servicing to qualified service personnel.
Il ne se trouve à l'intérieur aucune pièce pouvant être réparée l'utilisateur.
S'adresser à un réparateur compétent.

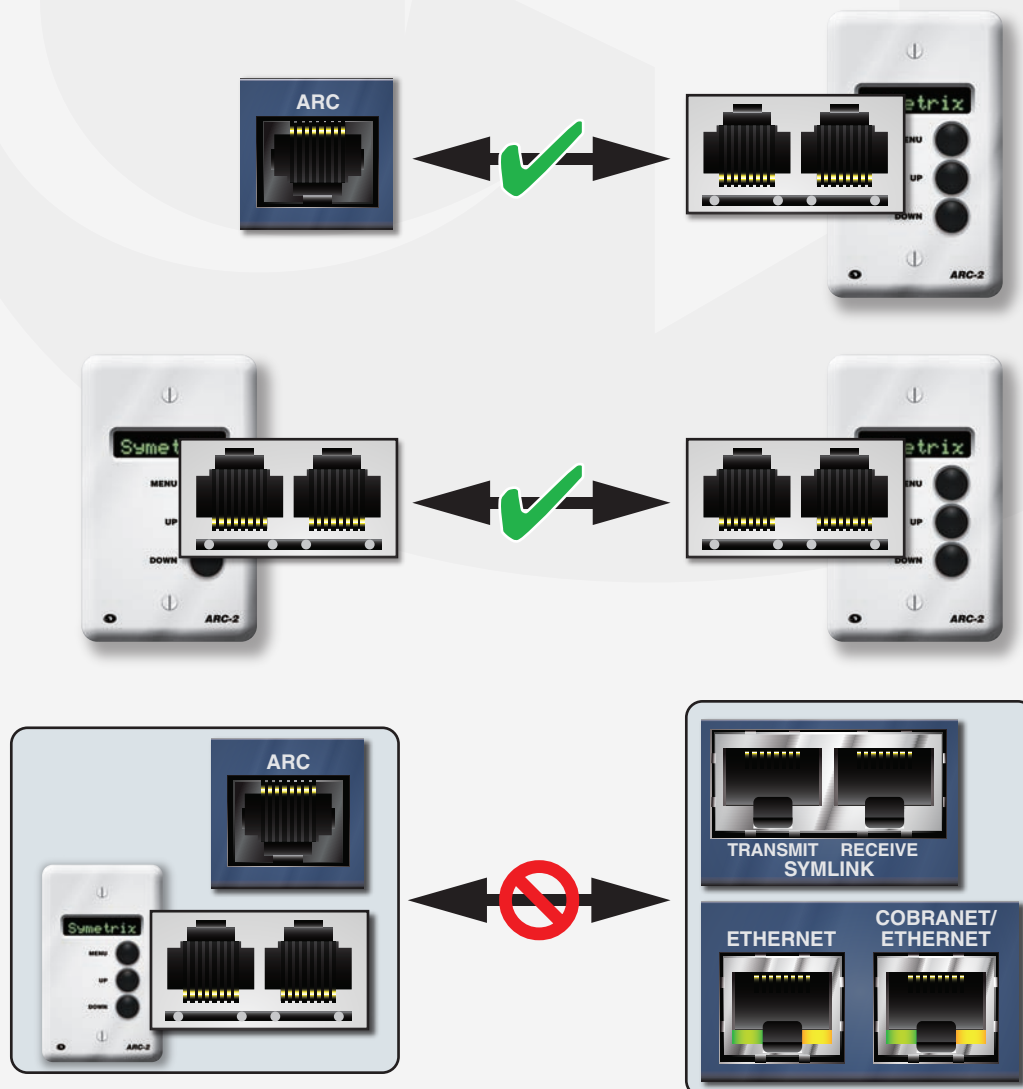
-  **The lightning flash** with arrowhead symbol within an equilateral triangle is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons. The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product (i.e. this Quick Start Guide).
-  **CAUTION:** To prevent electric shock, do not use the polarized plug supplied with the unit with any extension cord, receptacle, or other outlet unless the prongs can be fully inserted.
-  **Power Source:** This Symetrix hardware uses a switching power supply that automatically adjusts to the applied voltage. Ensure that your AC mains voltage is somewhere between 100-240 VAC, 50-60 Hz. Use only the power cord and connector specified for the product and your operating locale. A protective ground connection, by way of the grounding conductor in the power cord, is essential for safe operation. The appliance inlet and coupler shall remain readily operable once the apparatus has been installed.
-  **User Serviceable Parts:** There are no user serviceable parts inside this Symetrix product. In case of failure, customers inside the U.S. should refer all servicing to the Symetrix factory. Customers outside the U.S. should refer all servicing to an authorized Symetrix distributor. Distributor contact information is available online at: <http://www.SymetrixAudio.com>.

! WARNING! !

The RJ-45 connectors labeled “ARC” are only for use with the ARC series of remotes.

DO NOT plug the ARC connectors on Symetrix products into any RJ-45 connector labeled “SYMLINK”, “ETHERNET” or “COBRANET”.

The “ARC” RJ-45 connectors on Symetrix products can carry anywhere from 6 to 24 VDC which can damage SymLink, Ethernet and CobraNet circuitry.





Introduction

SymNet™ is a scalable DSP platform configured by SymNet Designer software and made by Symetrix. Installed in Convention Centers, Sports Arenas, Houses of Worship and many other venues throughout the world, consultants, integrators and end-users rely on the robust stability of the SymNet platform.

SymNet is an open architecture system. This means DSP modules (EQ, compression, etc.) are placed into the design and connected using standard drag-and-drop methods. Various SymNet hardware can be chained together to provide a custom audio solution for the client. SymNet’s main advantage can be summed up in one word: “Options”. Options for DSP processing, options for audio routing and options for control.

Overview


The **ARC-PS** is a nineteen (19) inch rack-mountable power supply capable of supplying power and control over CAT5 cable to a maximum of ten ARC Wall Panels. Panels can be connected in a “star” configuration, “daisy-chain”, or a hybrid of the two. RS-485 from a DSP device is connected to the ARC-PS Euroblock connector. The device includes eight (8) RJ-45 connectors for CAT5 cable, and corresponding Euroblock connectors for eight (8) discrete channels of ARC Audio.

Mechanical Data		
Item	Specifications	Remarks
Space Required	1U (WDH: 48.3 cm x 10.2 cm x 4.37 cm / 19 in x 4.0 in x 1.72 in). Depth does not include connector allowance.	Allow at least 1 inch additional clearance for rear panel connections. Additional depth may be required depending upon your specific wiring and connections.
Electrical	100-240 VAC, 50-60 Hz, 15 VDC output, 20 Watts maximum.	No line voltage switching required.
Ventilation	Maximum recommended ambient operating temperature is 30 C / 86 F.	The ventilation should not be impeded by covering the ventilation openings with items such as newspapers, tablecloths, curtains, etc.
Shipping Weight	2.0 kg (4.4 lbs.)	

Rear Panel		
Item	Description	Remarks
POWER INPUT	4 pin XLR jack	Accepts power from a Symetrix PS-5 switching power supply (15 VDC @ 1.33 A).
RS-485	Euroblock	Connects to Ring Master SymNet hardware device or 3rd party RS-485 compatible controller.
REMOTE ARCs	8 x RJ-45	Distributes power and RS-485 data to one or more ARCs per port. (See: ARC Network Design)
ARC AUDIO	Euroblocks	Splits a single analog line level audio signal off of the ARC port. Can be wired to a line level analog input or output jack for remote audio over CAT5.

Remote ARCs

The ARC ports distribute power and RS-485 data to one or more ARCs arranged in one or more chains over standard CAT5 cable. The ARC-PS can support up to ten (10) ARCs total within the guidelines set forth in the ARC Network Design section. (Please see the SymNet Designer online help for information on how to program the ARC.)

 **WARNING:** The RJ-45 connectors labeled “ARC” are only for use with the ARC series of remotes. DO NOT plug the ARC connectors on Symetrix products into any RJ-45 connector labeled “SYMLINK”, “ETHERNET” or “COBRANET. The “ARC” RJ-45 connectors on Symetrix products can carry anywhere from 6 to 24 VDC which can damage SymLink, Ethernet and CobraNet circuitry.

ARC Network Design

The ARC can be powered two ways: (1) over CAT5 via the RJ-45 “ARC” port on ARC-enabled Symetrix products, or (2) by local 6 to 24 VDC power supplied to the ARC’s terminal block connections.

The ARC’s power requirements vary depending on the voltage supplied to it. At 15 VDC, it uses approximately 115 mA, while at 6 VDC it uses approximately 300 mA maximum. As the voltage goes from 15 to 6 VDC, the current requirement increases accordingly.

ARCs can be daisy-chained and fed power over this daisy-chain from the ARC port. However, as the length of the cable increases, so does the resistive line loss, which lowers the voltage available at each subsequent ARC. The actual power drain on each output from an ARC port can vary substantially depending on the number of ARCs and the distance each of them is separated by. In order to assist with system design, Symetrix has available a Microsoft Excel spreadsheet that can help a system designer determine power requirements based upon cable length, number of ARCs and the power supply to be used. This spreadsheet can be downloaded from the SymNet Technical Support pages at: <http://www.SymetrixAudio.com>.

The following table gives some indication of cabling limitations, based on DC power only (the table is only relevant for the RJ-45 ARC port on this specific product): minimum stated distances assume 28 gauge CAT5 cabling, maximum stated distances assume 24 gauge CAT5 cabling.

CABLE LENGTH LIMITATIONS FOR ARC DC POWER OVER CAT5 CABLE

Maximum total cable length (to end of chain)	Number of ARCs in 1 daisy-chain
224-640 ft.	4
276-792 ft.	3
350-1028 ft.	2
486-1396 ft.	1


If power is not distributed over CAT5, each RS-485 chain will be limited to 1000 ft in a star network configuration and 4000 ft in a daisy-chain network configuration. Longer distances may be possible using third party RS-485 extender products.

Disclaimer: From time to time we test the compatibility of our own products with those of third parties. While we are happy to share with our customers the results of our own studies as well as other possibly unsubstantiated information regarding these third party products, it is the policy of Symetrix, Inc. to neither endorse, recommend nor support products manufactured and/or supplied by third parties. The responsibility of choosing third party products which are compatible with Symetrix products rests solely with the qualified contractor, consultant or system designer.

ARC PORT PINOUT (both Grounds and Powers required for specified distance)

Pin #	Function
1	Audio (+)
2	Audio (-)
3	Common Ground
4	RS-485 Data (A)
5	RS-485 Data (B)
6	Common Ground
7	Power (+V)
8	Power (+V)

Note: The ARC Audio lines may be grounded at the Symetrix Rack-mount device and the ARC wall panel to provide additional distance.

 **WARNING:** When designing a system, one must be careful not to double power any ARCs. If all pins on the CAT5 connections are used, power can travel over the CAT5 cable and reach any ARC on that particular chain. So, power over CAT5 could potentially come from the originating ARC port or from an ARC that is powered locally and then daisy chained via CAT5 to other ARCs. In general, it is recommended to use only one type of connector on the ARCs, either the RJ-45s (with CAT5 cable) or the terminal blocks

ARC Audio

ARC Audio provides a means to take a single balanced analog audio line and either inject it into or pick it off an RS-485 network’s CAT5 cable run. An ARC Audio port on a Symetrix device may be wired to a nearby device’s analog input or output. This provides a means of easily running a single audio channel to or from a remote source or destination. The ARC-MIC and ARC-XLR make use of ARC Audio to transport audio signals back to a Symetrix rack mount unit.

Note 1: The original Menu ARC remote (simply named “ARC”) does not support ARC Audio lines and will ground the audio lines if connected.

Note 2: To avoid the possible grounding, mixing, or shorting of the ARC Audio lines, it is recommended to home run any ARC devices making use of the ARC Audio lines so that only one ARC device is on each chain.

Limits of ARC Audio

ARC Audio is a simple analog audio signal travelling the same cable as the RS-485 data and power. As such, the usual audio signal cautions apply. Avoid running parallel to other power lines or near any other sources of EMI or RFI. Most CAT5 is unshielded and is susceptible to interference and noise. We provide here the following information on ARC Audio's performance and limitations:

Line-level Balanced Audio:

Professional line level balanced signals can also be sent over up to approximately 1500 feet of CAT5 without significant degradation.

All unbalanced signals should be avoided completely.

Mic-level Audio:

Unbuffered condenser or dynamic microphones should generally be avoided, though it may be possible to achieve decent quality with cable runs of less than 50 feet using a fairly hot microphone level with a noise gate or expander in to clean up the signal. This technique does not provide much flexibility within the system design, and therefore is not recommended.

Frequency response:

Frequency response can roll-off due to the capacitance of a long cable run. The amount of roll-off is highly dependent on source impedance (the output impedance of what is supplying the signal). Most pro audio devices have low output impedances (200 Ohms or less) and do not suffer significant roll-off (approximately -1 dB at 20 kHz with 1500 feet of CAT5). A device with a 600 Ohm output impedance could cause some audible roll-off (-3 dB at 10 kHz), but should be of sufficient quality for speech signals.

Data Noise:

With an unbuffered mic and long cables, data noise may be audible as a "motorboat" sound. Experimenting with RS-485 termination and baud rate may improve the sound somewhat.

RS-485 Termination

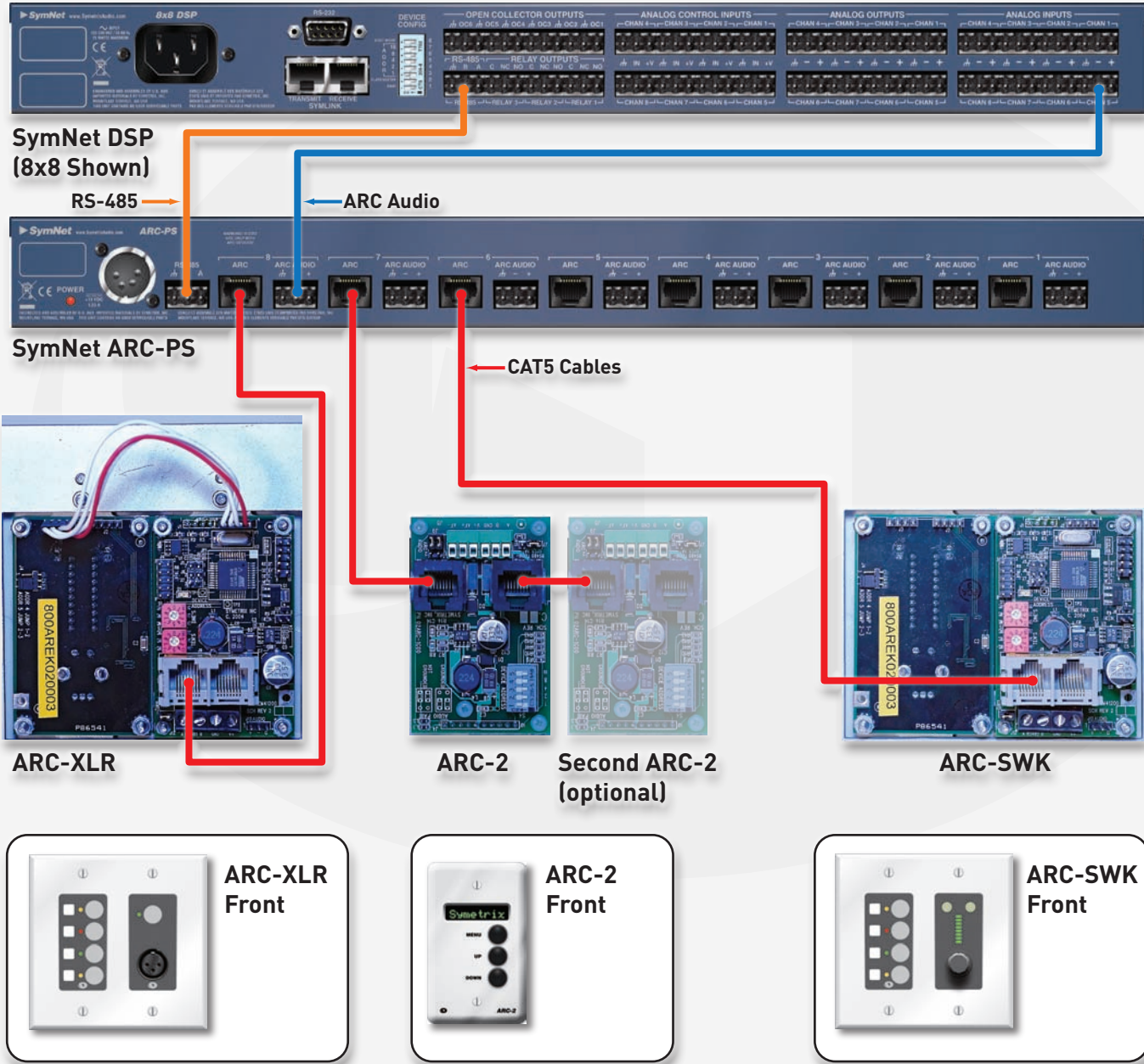
The ARC-PS features an RS-485 termination jumper. Jumper J9 on the PCB directly behind the RS-485 terminal block connector enables and disables termination. Terminated and open positions are labeled on the PCB silkscreen. For maximum signal integrity, follow the termination guidelines below:

RS-485 TERMINATION GUIDELINES	
Daisy-chain length	Termination
0 - 200 ft.	No termination required
200 - 1000 ft. (if powering over CAT5)	Terminate at the ARC
> 1000 ft. (or if not powering over CAT5)	Terminate at the ARC-PS, Control I/O or DSP device and at the furthest ARC device

Quick Start Guide: ARC-PS

Basic Hook Up Diagram

ARC-PS Basic Hook Up Diagram



The Symetrix Limited Warranty

Symetrix, Inc. expressly warrants that the product will be free from defects in material and workmanship for eighteen (18) months from the date the product is shipped from the factory. Symetrix's obligations under this warranty will be limited to repairing or replacing, at Symetrix's option, the part or parts of the product which prove defective in material or workmanship within eighteen (18) months from the date the product is shipped from the factory, provided that the Buyer gives Symetrix prompt notice of any defect or failure and satisfactory proof thereof. Products may be returned by Buyer only after a Return Authorization number (RA) has been obtained from Symetrix. Buyer will prepay all freight charges to return the product to the Symetrix factory. Symetrix reserves the right to inspect any products which may be the subject of any warranty claim before repair or replacement is carried out. Symetrix may, at its option, require proof of the original date of purchase (dated copy of original retail dealer's invoice). Final determination of warranty coverage lies solely with Symetrix. Products repaired under warranty will be returned freight prepaid via United Parcel Service by Symetrix, to any location within the Continental United States. Outside the Continental United States, products will be returned freight collect.

The foregoing warranties are in lieu of all other warranties, whether oral, written, express, implied or statutory. Symetrix, Inc. expressly disclaims any IMPLIED warranties, including fitness for a particular purpose or merchantability. Symetrix's warranty obligation and buyer's remedies hereunder are SOLELY and exclusively as stated herein.

This Symetrix product is designed and manufactured for use in professional and studio audio systems and is not intended for other usage. With respect to products purchased by consumers for personal, family, or household use, **Symetrix expressly disclaims all implied warranties, including but not limited to warranties of merchantability and fitness for a particular purpose.**

This limited warranty, with all terms, conditions and disclaimers set forth herein, shall extend to the original purchaser and anyone who purchases the product within the specified warranty period.

Symetrix does not authorize any third party, including any dealer or sales representative, to assume any liability or make any additional warranties or representation regarding this product information on behalf of Symetrix.

This limited warranty gives the buyer certain rights. You may have additional rights provided by applicable law.

Note: Some Symetrix products contain embedded software and may also be accompanied by control software intended to be run on a personal computer. Said software is specifically excluded from this warranty.

Limitation of Liability

The total liability of Symetrix on any claim, whether in contract, tort (including negligence) or otherwise arising out of, connected with, or resulting from the manufacture, sale, delivery, resale, repair, replacement or use of any product will not exceed the price allocatable to the

product or any part thereof which gives rise to the claim. In no event will Symetrix be liable for any incidental or consequential damages including but not limited to damage for loss of revenue, cost of capital, claims of customers for service interruptions or failure to supply, and costs and expenses incurred in connection with labor, overhead, transportation, installation or removal of products, substitute facilities or supply houses.

Servicing Your Symetrix Product

If you have determined that your Symetrix product requires repair services and you live outside of the United States please contact your local Symetrix dealer or distributor for instructions on how to obtain service. If you reside in the U.S. then proceed as follows.

Return authorization

At the Symetrix factory, Symetrix will perform in-warranty or out-of-warranty service on any product it has manufactured for a period of three (3) years from date of discontinued manufacture.

Before sending anything to Symetrix, please contact our Customer Service Department for a return authorization (RA) number. The telephone number is +1 (425) 778-7728. Additionally support is available via the web site: <http://www.SymetrixAudio.com>.

In-warranty repairs

To get your Symetrix product repaired under the terms of the warranty:

1. Call us for an RA number (have the serial number, shipping and contact information and description of the problem ready).
2. Pack the unit in its original packaging materials.
3. Include your name, address, daytime telephone number, and a brief statement of the problem.
4. Write the RA number on the **outside** of the box.
5. Ship the unit to Symetrix, freight prepaid. We do not accept freight collect shipments.

Just do these five things, and repairs made in-warranty will cost you only one way freight charges. We'll pay the return freight.

If you don't have the factory packaging materials, we recommend using an oversize box. Wrap the unit in a plastic bag, surround it with bubble-wrap, and place it in the box surrounded by Styrofoam peanuts. Be sure there is enough clearance in the box to protect the rack ears. We won't return the unit in anything but Symetrix packaging for which we will have to charge you. If the problem is due to operator misuse or error, you will have to pay for both parts and labor. In any event, if there are charges for the repair, you will pay for the return freight. All charges will be COD unless you have made other arrangements (prepaid, Visa or Mastercard).

Out-of-warranty repairs

If the warranty period has passed, you'll be billed for all necessary parts, labor, packaging materials, and freight charges. Please remember, you must call for an RA number before sending the unit to Symetrix.





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Engineered by **Symetrix™**

SymNet ARC-PS Quick Start Guide

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