SYMETRIX SOLUTIONS: TECH TIP

April 2013

♦Symetrix

ARC-PSe

The Symetrix ARC-PSe provides serial control and power distribution over standard CAT5/6 cable for systems with more than 4 ARCs, or, when any number of ARCs are located long distances from an Integrator Series, Jupiter or SymNet DSP unit. A half-rack form factor conserves rack space, or, if preferred, the ARC-PSe may be surface mounted. All mounting hardware is included. The incoming serial control signal coming from the DSP is received by the ARC-PSe on a RJ-45 input connector, and then power and signal are distributed via 8 RJ-45 output connectors. The use of off-the shelf CAT5/6 cable and RJ-45 connectors reduces installation time and materials costs.

Features:

- Distributes power and data to multiple ARC wall panels via eight RJ-45 connectors over long distances.
- Connects directly to any Integrator Series, Jupiter or SymNet DSP unit using standard CAT5/6 cables.
- Supports flexible 'star' configuration, 'daisy-chain', or a hybrid of the two.
- Versatile half-rack design. All hardware is included to mount 1 or 2 in a single rack space or to surface mount.

ARC-PSe Hook Up Considerations:

1. The ARC-PSe has a total of 833mA available and which is shared across all 8 ports.
2. Each ARC port on the ARC-PSe can use as much as 500mA.
3. When daisy chaining one ARC-PSe to another ARC-PSe it is not necessary to have power on the CAT5/6 cable. In fact, the power is stripped off at the ARC input on the ARC-PSe; however, having power present on the CAT5/6 takes away from the 833mA that are shared amongst all 8 ports. As such, it is recommended that the power pins, 7 and 8, be omitted from the CAT5/6 cable, leaving all 833mA of power for the other 7 ARC ports.
4. The ARC-PSe does not act as a RS-485 repeater. This means no ARC may be farther than 4000 ft. / 1219 m from the host DSP no matter what configuration is used.
5. The ARC Power Calculator is available to assist with ARC network design and determining distance limitations for star and daisy chain ARC network configurations, including ARC-2e and Mod ARC remotes.

   http://www.symetrix.co/wp-content/uploads/2012/02/ARC-Power-Calculator-3.0.xls
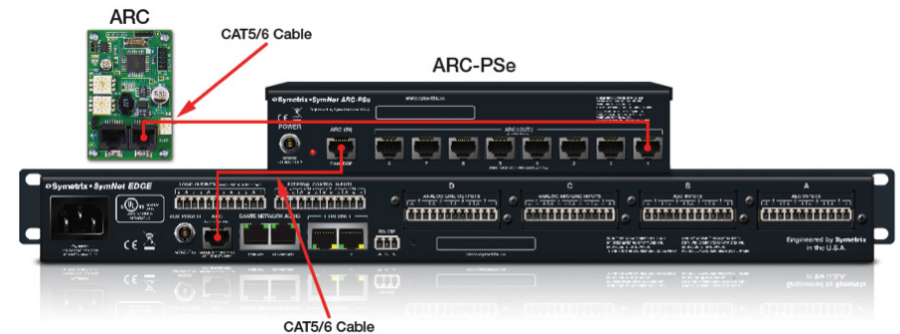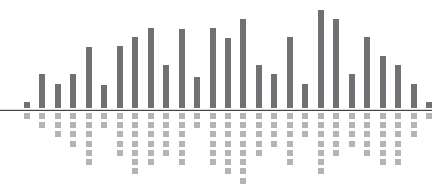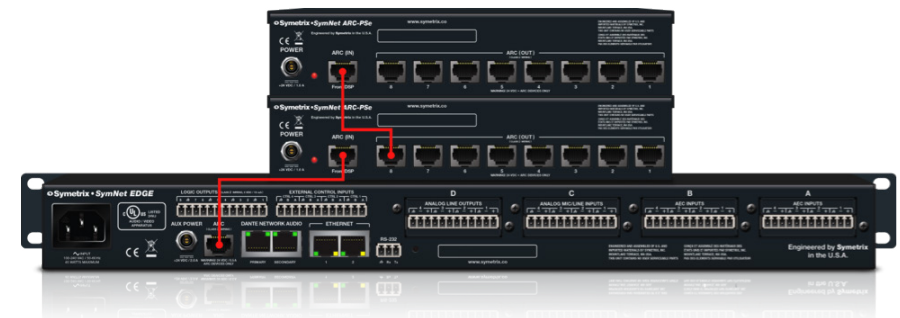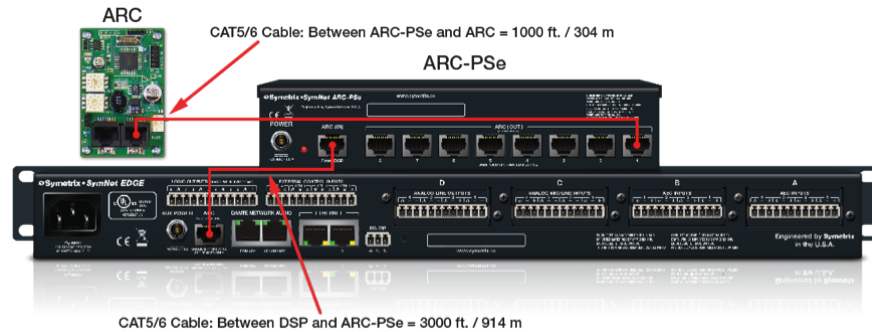
Diagram: ARC-PSe Basic Hook Up

### Diagram: Multiple ARC-PSe Connected to One DSP

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## Diagram: ARC-PSe and ARC-2e Mounted Remotely

1. The total length of CAT5/6 is 4000 feet / 1219 meters from the DSP to the ARC remote, which is the limitation of RS-485 data.
2. Power-over-copper cannot travel 4000 feet / 1219 meters down CAT5/6 and power an ARC-2e remote.
3. The ARC-PSe is mounted remotely 3000 feet / 914 meters away from the DSP.
4. The ARC remote is located 1000 feet / 304 meters from the ARC-PSe.
5. This setup provides plenty of power to daisy chain or power additional ARC remotes off the ARC-PSe, all of which are located between 3000-4000 feet / 914-1219 meters from the DSP.

Diagram: ARC-PSe and ARC Networks Located Locally and Remotely
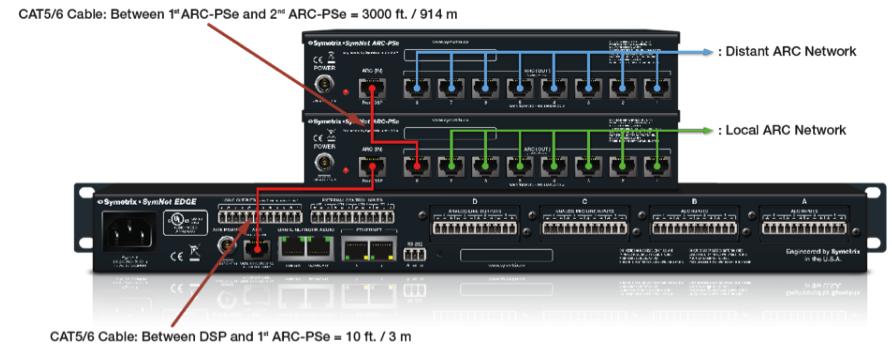

1. One ARC-PSe is mounted locally in the rack with the host DSP and local ARC network. The other ARC-PSe is mounted remotely within the proximity of the distant ARC network.
2. Power is not needed on the CAT5/5 cable connecting the two ARC-PSe units together. Each ARC-PSe must be powered with the included Mean Well power supply.
3. ARC-PSe power is shared across all 8 ARC ports. Looking at the local ARC-PSe and the 3000 ft. / 914 m CAT5/6 cable run to the distant ARC-PSe, in order to have maximum available power for the 7 remaining ARC ports reserved for the "local ARC network", pins 7 and 8 may be omitted from the CAT5/6 cable connecting the 1st ARC-PSe (local) to the 2nd ARC-PSe (distant).
4. Any ARC on the "distant ARC network" may be no more than 990 ft. / 301 m from the 2nd ARC=PSe (distant) keeping all ARC remotes located below the 4000 ft. / 1219 m limitation of RS-485 data.
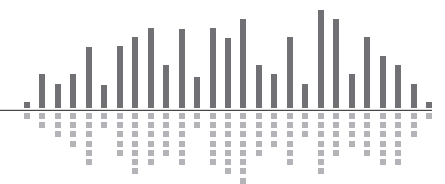
Example:

ARC-PSe and ARC Networks Located Locally and Remotely
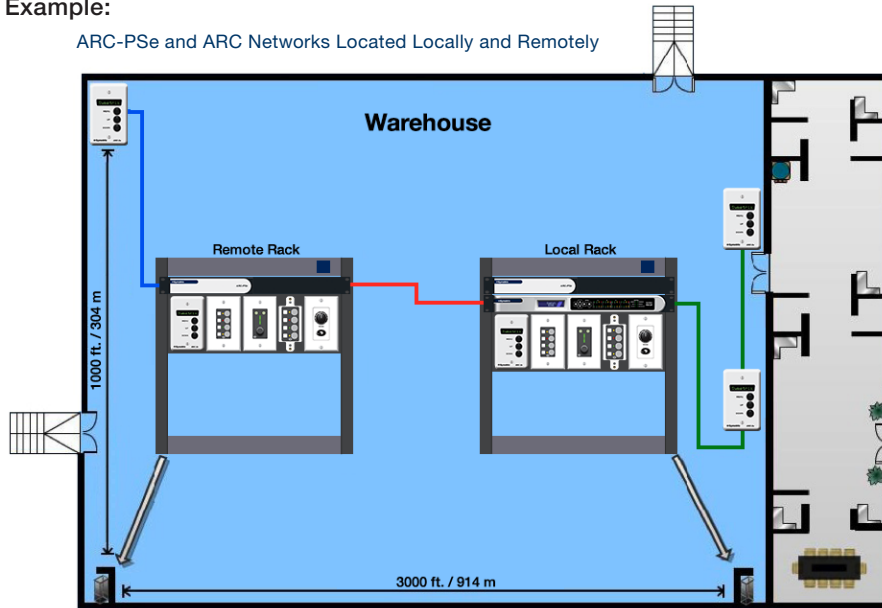
ARC Distance Table:

The following table provides at-a-glance cable length limitations based on DC power (the table is not relevant if only RS-485 is distributed) and assumes 24 gauge CAT5/6 cabling. The lengths for multiple ARCs on a single chain assume equal distance for each cable segment between ARCs. This table is intended for quick reference only. For more detailed configuration scenarios, Symetrix has made available a Microsoft Excel spreadsheet to help system designers determine power requirements based upon cable length, number of ARCs, and the power supply to be used. Minimum distance is based upon the ARC-2e, maximum distance is based upon the ARC-SW4e and/or ARC-K1e.

This spreadsheet can be downloaded from the Symetrix Technical Support pages at:

www.symetrix.co/knowledge-base

Approximate Cable Length Limitations for ARC (e-series) DC Power Over CAT5 Cable	
Number of ARCs in chain	Total cable length (to end of chain)
1	3700 - 4000 ft. / 1127 - 1219 m
2	1300 - 2000 ft. / 396 - 609 m
3	700 - 1300 ft. / 213 - 396 m
4	400 - 950 ft. / 121 - 289 m

Special note: For multiple ARCs on single chain, the listed value is assumed to be the cable length between each device. For example, a value of 600' means 600' between the DSP unit and the first ARC, 600' between the first and second ARCs, etc. The total cable length will be the listed segment length multiplied by the number of ARCs on the chain.