RJ45 adapters for RS-485

How to build RJ45 port adapter for DB9 and XLR connectors

EIA-485, also known as TIA/EIA-485 or RS-485 is a standard protocol for serial communications that defines electrical characteristics of balanced digital multipoint interconnected devices. RS-485 can be effectively implemented for communications over long distances in electrically noisy environments.

RS-485 devices must be set in transmit mode explicitly: this allows RS-485 to implement linear topologies using only two wires. The equipment located along a set of RS-485 wires are interchangeably called nodes, stations and devices.

The recommended arrangement of the connections is a series of point-to-point (multidropped) nodes – i.e. a *line* or *bus*. Ideally, the two ends of the line should be terminated with a resistor, typically 120 Ω for twisted pairs.

Powersoft amplifiers use RJ45 connectors (namely ISO-8877 8P8C modular connector) as RS-485 port, this document explains how to realize adapters for both DB9 connectors – usually used by USB-RS485 converters (see next page) – and XLR plugs to the RJ45 port positioned on the rear panel of Powersoft amplifiers.

Powersoft recommend the use of Ethernet CAT5 straight through – *patch* – cables with pin/pair assignments TIA/EIA-568-B, i.e. T568B.

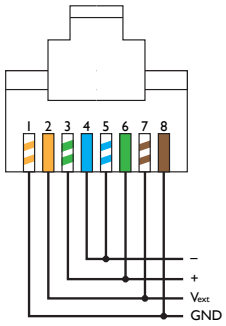

FIGURE 1: Front view of the RJ45 connector with T568 B wiring: RS-485 pinout.

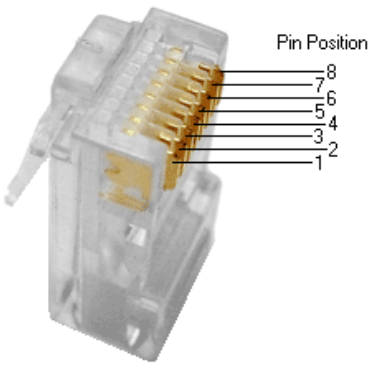

FIGURE 2: RJ45 (8P8C) plug.

DB9 connector	
RJ45 T568B wiring	**DB9 Pin**
WHITE ORANGE / BROWN	5
WHITE BLUE / BLUE	2
WHITE GREEN / GREEN	1

XLR connector	
RJ45 T568B wiring	**XLR Pin**
WHITE ORANGE / BROWN	1
WHITE BLUE / BLUE	2
WHITE GREEN / GREEN	3

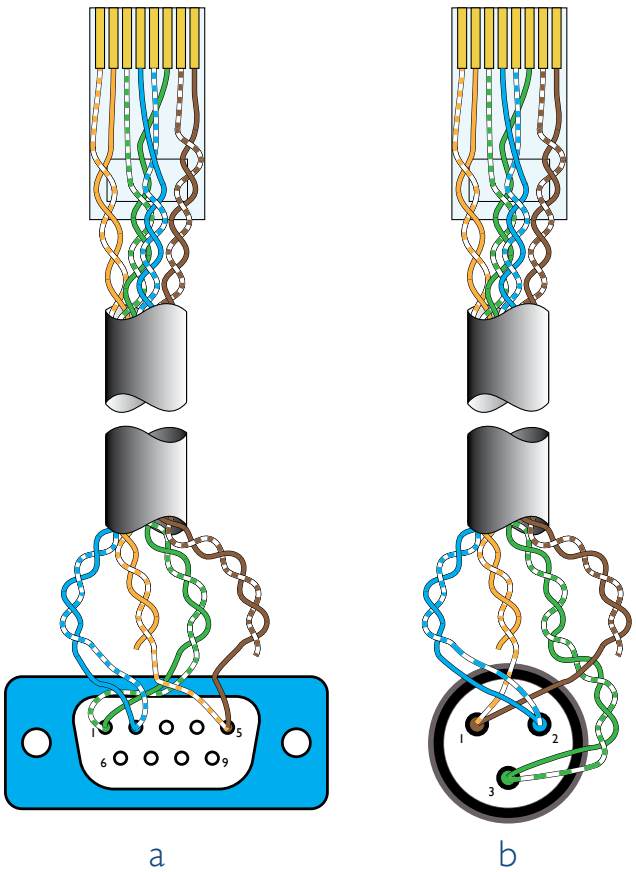

FIGURE 3: Adapters wiring.
a: *DB9 adapter wiring.* b: *XLR adapter wiring.*

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1 USB-RS485 converter

Powersoft amplifiers supporting RS-485 communication protocols can be natively managed through Armonía Pro Audio suite™ on a pc.

In order to implement a RS-485 port on a personal computer, it is possible to plug an USB to RS-485 converter.

Powersoft recommend the use of the SPECTRA USB 2.0 to RS-485 converter, product id #112887 (see FIGURE 4); browse the SPECTRA website (www.spectra.ch) for further information.

FIGURE 4: SPECTRA #112887 USB to RS-485 converter.

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