

2-Wire/4-Wire Application Using Raven M4x Blade

Traditionally, most 2-wire to 4-wire applications required the use of passive or active hybrid circuits. While these perform the basic function required, they were typically mediocre in performance with regard to isolation and trans-hybrid loss. Passive hybrids also have inherent audio loss by virtue of their design. To mitigate these issues, particular attention by the installer was required to ensure that 600 ohm impedance matching was as nearly perfect as possible, especially on the 2-wire side in order to avoid poor and often unacceptable isolation. Occasionally, even when impedance matching was “perfect” issues still existed due to poor line conditions such as might exist with leased telephony lines. To overcome these issues the user would often add an H-Pad circuit to provide improved isolation but at the expense of audio loss and of course the time and expense involved with adding the H-Pad. In response to these issues, Raven Electronics has devised a **simplex*** 2-wire to 4-wire communications configuration using its M4x Blade providing excellent isolation and no loss even if the 2-wire line is not of good quality.

This configuration can also be used in conjunction with N-way 4-wire bridges where multiple 4-wire circuits are bridged to one another and to the 2-wire resource.

***Note** that the Reference to simplex means that transmit audio and receive audio are both carried on the same 2-wire line or wire pair, but that transmit or receive occurs only at one time and not simultaneously. This configuration will not work for applications requiring simultaneous transmit and receive or full duplex communications. This application can be used for 2-wire simplex base stations being controlled from a 4-wire console system. For those applications requiring duplex 2-wire communication, contact Raven Electronics Applications Engineering at 775-858-2400 and enter 2.

Equipment requirements include:

- Any Raven 47800 Series M4x Blade equipped with at least one model Z476-151 Dual 4-wire module not used in another configuration.
- Raven or customer supplied PTT to COR loopback/2-wire cable for the 2-wire port.
- Raven or customer supplied CAT-5 cable for the 4-wire port.

To configure the M4x for a simplex 2-wire/4-wire application, perform the following steps.

- Install the Raven M4x software included with the unit on the computer on which you will configure the unit. Skip this step if the software has been previously installed.
- Connect power to the blade and connect the USB cable between the blade and the computer. Start the software and connect the software to the Blade.
- Create a standard bridge and select two ports, one for your 4-wire port and the other for your 2-wire port. We recommend selecting ports in module pairs such ports 1 & 2, 3 & 4, 5 & 6, or 7 & 8. Depending on the model of Blade purchased not all ports may be available. For this example select ports 1 & 2, since ports 1 & 2 will always be available on any model.
- Make a note that port 1 is your 4-wire port and port 2 is your 2-wire port.

- It is not necessary to make any port settings adjustment on port 1. Select port 2 from the components tree menu and select the Audio Delays tab. From this tab change the Receive Audio Holdoff setting to 50 MS and the Transmit Audio Holdoff setting to 50 MS. Next select the Muting tab.
- From the Muting tab check the box for “Mute receive audio when COR is detected on this port.” Next select the Interface Settings tab.
- From the Interface Settings tab, change the 4-wire Input Impedance from 600 ohms to High Impedance. Next select the Keying Tab.
- From the Keying tab check the box for “PTT is asserted when the trigger is reached.” Stay on the Keying tab and select the button labeled “Key-Up Triggers.”
- From Key-up Triggers change the trigger from “Always Trigger” to “On VOX.” Click Done and save when prompted.
- Close the port 2 settings and save if prompted.
- Save the configuration to the M4x Blade firmware.
- Power down the M4x Blade and return power to reset the Blade.

Connection to the Blade is per the diagram below showing an RJ-45 adaptor box available at most electrical outlet or home improvement stores. See also photo of adaptor box on page 3.

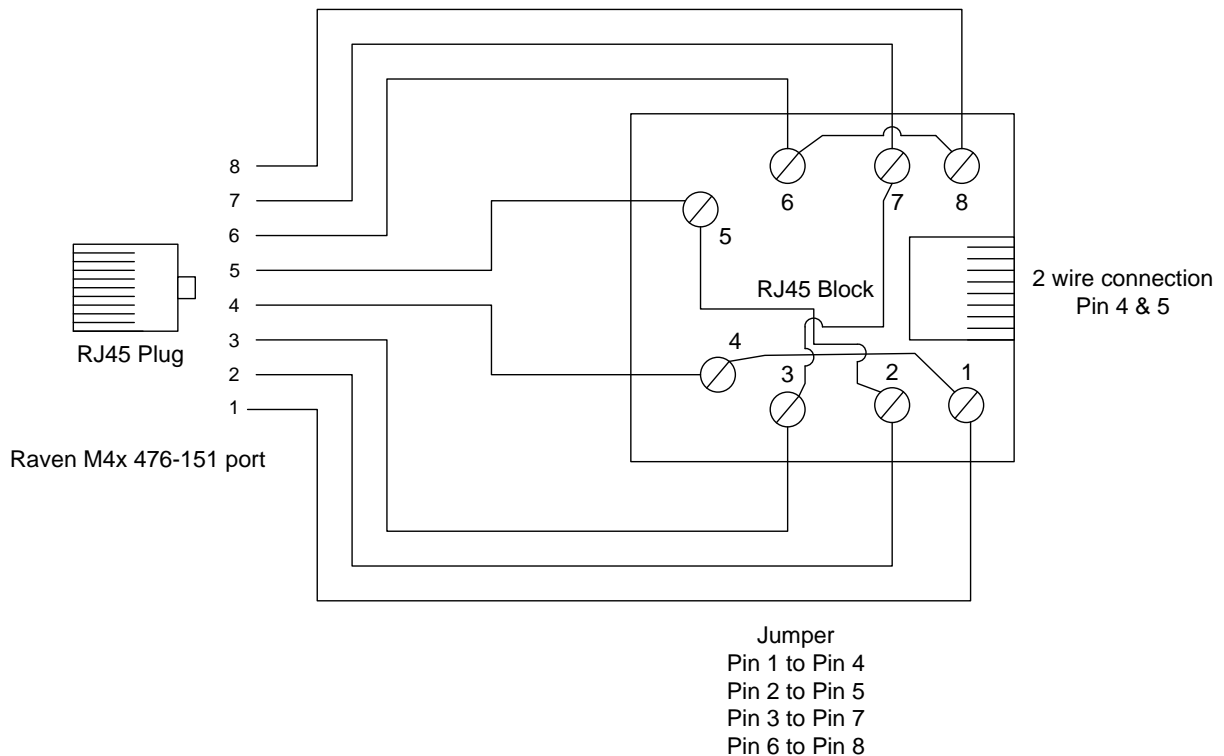




Photo of RJ-45 Adaptor Box