AVIOM®

RS-232/422 Pinout Information

Aviom® Pro64® products can use Virtual Data Cables™ to transmit and receive user control data over RS-232 and/or RS-422. (RS-422 is not supported on every Pro64 product.)

The following table shows the pinout of the RS-232/422 jack. Note that in the pinout table, some transmit/receive functions (abbreviated as Tx/Rx) are different for RS-232 versus RS-422.

Pin	Function
1	No Connect
2	−Rx (RS-232), −Tx (RS-422)
3	−Tx (RS-232), −Rx (RS-422)
4	+Rx (RS-422)
5	Ground
6	+Tx (RS-422)
7	No Connect
8	No Connect
9	Ground

DB9 cables are available with male-to-male, female-to-female, and male-to-female connectors. Aviom's RS-232/422 port uses a male DB9 connector and therefore requires a cable with a female connector. The format of the connector at the other end of the cable (male/female) is dependent upon the equipment being connected to. However, connection to other equipment will usually require a female-to-female cable.

There are many different types of DB9 cables available, but Aviom selected a pinout for our DB9 connector that would allow both RS-232 and RS-422 connections to be made with off-the-shelf cables. A "null modem" cable should be used in RS-232 mode. Unfortunately, there are several different types of cables referred to as null modem cables. A true null modem

cable crosses pins 2 & 3, 4 & 6, and 7 & 8. Pin 5 will be connected straight through, but pins 1 and 9 will not (though pin 1 will be connected to pin 6 at each end). An example of this type of cable is the L-Com® CSNULL9FF-XA (where X = cable length).

An example of the type of null modem cable that should be avoided is the L-Com CSNULL9FF-X (where X = cable length). This is a straight-through cable with the exception of pins 2 and 3, which are crossed.

A true null modem cable is required for the interaction of the RS-422 termination on pin 4 of the connector with the RS-232 signals. On an RS-232 connector, pins 3, 4, and 7 are outputs; pins 1, 2, 6, and 8 are inputs. In a standard null modem cable, pin 4 at one end of the cable will drive pins 1 and 6 at the other end. With a 100 ohm resistor across pins 3 and 4 on the Aviom DB9 connector, pin 3 (RS-232 −Tx) will drive pins 1 and 6 at the other end of the cable through the 100 ohm resistor. This isn't a problem for most modern RS-232 implementations as these signals are ignored and both are inputs.
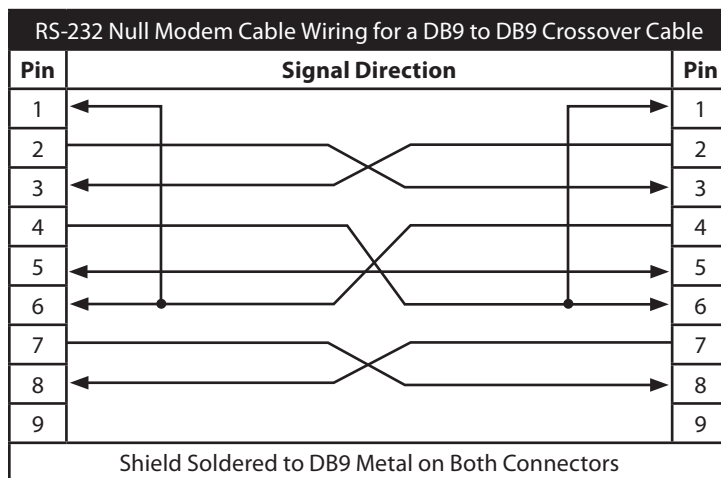
Although there is no standard DB9 pinout for RS-422, ours requires a straight-through cable to be used between Aviom and Yamaha® RS-422 ports for control. An example of this type of cable is the L-Com CRMN9FF-X (where X = cable length).

If a problem is encountered with RS-232 operation, there are two things that can be done:

1. Try another brand of null modem cable.
2. Cut the wire in the cable going to pin 4. It isn't needed for RS-232 operation.

✓ Note: The Aviom RS-232 port does not support the CD, DTR, DSR, RTS, CTS, or RI signals.

The following table showing the connections for a null modem DB9 to DB9 crossover cable can be used when making your own cable.

Pin	Signal Direction	Pin
RS-232 Null Modem Cable Wiring for a DB9 to DB9 Crossover Cable		
1		1
2		2
3		3
4		4
5		5
6		6
7		7
8		8
9		9
Shield Soldered to DB9 Metal on Both Connectors		

RS-232 requires a null modem cable wired as a crossover cable. RS-422 uses a straight-through cable. This table shows the pinout for RS-232 crossover cable wiring and can be used when creating a custom cable. Note that pins 1 and 6 are tied together on both sides of a crossover cable.