Home (/Customers/servlet/servlet.Integration?lid=01r70000000Emgf&ic=1&linkToken=VmpFPSxNakF4T1Mwd05DMHlNbFF5TURvME5UbzFPQzQzTkRG

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RS-232 Conversion to DB-9 and RS-422/485 Pinout

Reference Guide

Document Date: November 2018

This document describes the connectors, wiring and adapters related to RS-232, RS-422 and RS-485, as well as their conversion to DB-9 using devices provided by Savant Systems, LLC.

Serial Control Adapters

Serial adapters provide the installer with the ability to connect the RJ-45 serial port of a Savant controller to a DB-9 serial port on an external device using Cat5/5e/6 cable, without the need to manually arrange wiring based on device pinout or specifications. The image below shows the pre-built adapters available through the Savant Store. These pre-built adapters are color coded based on their specifications (see below).

NOTE: Savant Support recommends using the 'B' Standard for Cat5/5e/6 cabling.
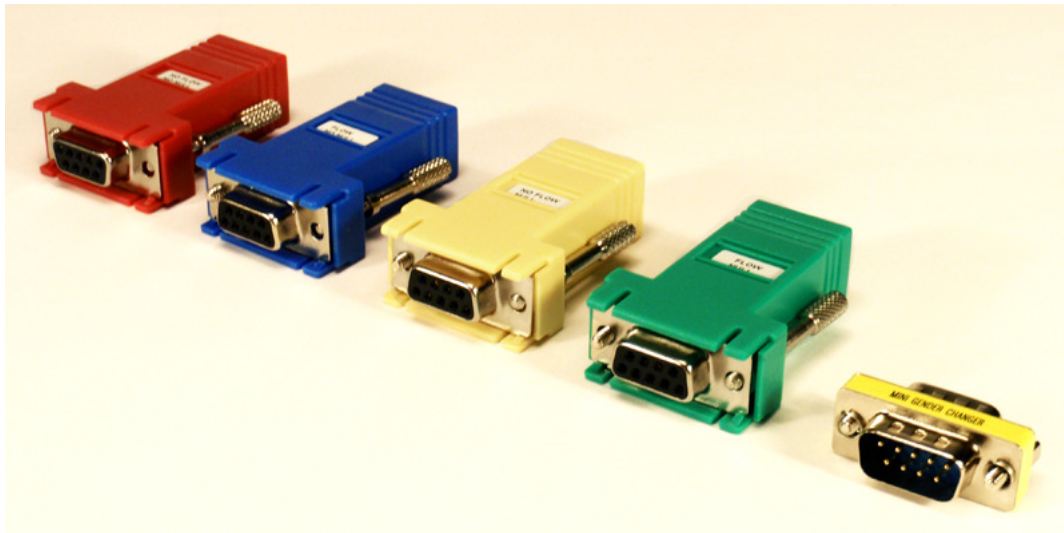
See the table below for the four color-coded RJ-45 to DB-9 adapter types and the DB-9 gender changer.

Adapter Color	Serial Type
Red	No flow and no null (straight)
Blue	Flow and no null (straight)
Yellow	No flow and null
Green	Flow and null
Gold	DB-9 mini gender changer (Female to Male)

When viewed in RacePoint Blueprint, most device's Savant Profiles will specify which color adapter is required for interfacing with the component (see example below). In cases where the adapter type is not known or not specified by the Profile, refer to the sections below for information on building a custom adapter to meet the component's requirements.

To determine which adapter to use In Blueprint:

1. Inspect the device to be controlled via RS-232
2. In the **Show** drop-down menu, select **Control Ports**.
3. Select **RS-232**, **RS-422**, or **RS-485** depending on the component

The following information will be shown:
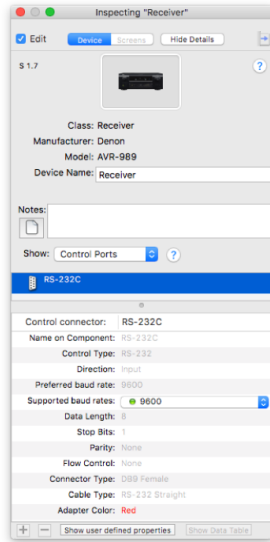
- Name of Component
- Control Type
- Direction
- Preferred Baud Rate
- Supported Baud Rates
- SATA Length
- Stop Bits
- Parity
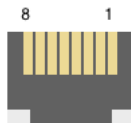- Flow Control
- Connector Type
- Cable Type
- Adapter Color

Conversion Definitions and Diagrams

DB-9 Connector Pin Definitions

A DB-9 connector has 9 pins arranged in two rows, with one row on top of the other. The top row has 5 pins and the lower row has 4 pins. This interface is commonly used for RS-232 serial applications.
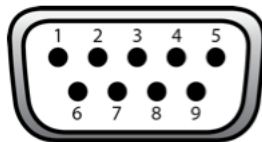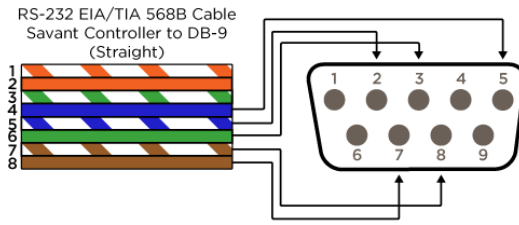

RS-232 Wiring Controller RJ-45 (RS-232) Plug Pinouts

1 (Not Used for RS-232)	5 RXD (RS-232)
2 (Not Used for RS-232)	6 TXD (RS-232)
3 (Not Used for RS-232)	7 CTS (RS-232) ports 1 and 2 only
4 GND (RS-232)	8 RTS (RS-232) ports 1 and 2 only

⚠️ **Important!** If RJ-45 to DB-9 adapters being used are not supplied by Savant, be sure to terminate any wires required for communication/control within the adapter. Ensure that all wires required for communication/control are not terminated within the connector. Also, ensure that the unused wires in the connector are cut to prevent potential electrical shorts.

DB-9 to RS-232 CAT5 Savant Controller Connections (Straight)

RS-232 EIA/TIA 568A Cable — Savant Controller to DB-9 (Straight)

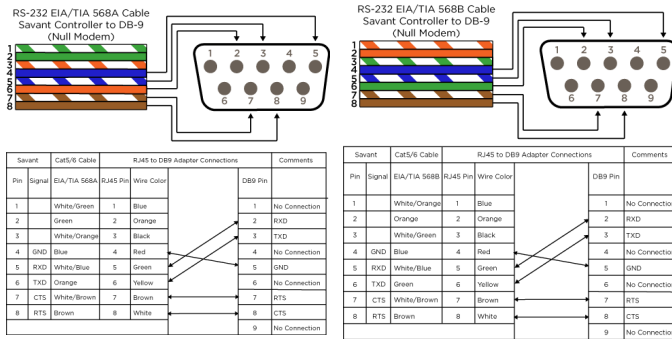| Savant Pin	Signal	Cat5/6 Cable EIA/TIA 568A	RJ45 Pin	Wire Color	DB9 Pin	Comments
1		White/Green	1	Blue	1	No Connection
2		Green	2	Orange	2	RXD
3		White/Orange	3	Black	3	TXD
4	GND	Blue	4	Red	4	No Connection
5	RXD	White/Blue	5	Green	5	GND
6	TXD	Orange	6	Yellow	6	No Connection
7	CTS	White/Brown	7	Brown	7	RTS
8	RTS	Brown	8	White	8	CTS
					9	No Connection

RS-232 EIA/TIA 568B Cable — Savant Controller to DB-9 (Straight)

Savant Pin	Signal	Cat5/6 Cable EIA/TIA 568B	RJ45 Pin	Wire Color	DB9 Pin	Comments
1		White/Orange	1	Blue	1	No Connection
2		Orange	2	Orange	2	RXD
3		White/Green	3	Black	3	TXD
4	GND	Blue	4	Red	4	No Connection
5	RXD	White/Blue	5	Green	5	GND
6	TXD	Green	6	Yellow	6	No Connection
7	CTS	White/Brown	7	Brown	7	RTS
8	RTS	Brown	8	White	8	CTS
					9	No Connection

DB-9 to RS-232 CAT5 Savant Controller Connections (Null Modem)

RS-232 EIA/TIA 568A Cable — Savant Controller to DB-9 (Null Modem)

Savant Pin	Signal	Cat5/6 Cable EIA/TIA 568A	RJ45 Pin	Wire Color	DB9 Pin	Comments
1		White/Green	1	Blue	1	No Connection
2		Green	2	Orange	2	RXD
3		White/Orange	3	Black	3	TXD
4	GND	Blue	4	Red	4	No Connection
5	RXD	White/Blue	5	Green	5	GND
6	TXD	Orange	6	Yellow	6	No Connection
7	CTS	White/Brown	7	Brown	7	RTS
8	RTS	Brown	8	White	8	CTS
					9	No Connection

RS-232 EIA/TIA 568B Cable — Savant Controller to DB-9 (Null Modem)

| Savant Pin	Signal	Cat5/6 Cable EIA/TIA 568B	RJ45 Pin	Wire Color	DB9 Pin	Comments
1		White/Orange	1	Blue	1	No Connection
2		Orange	2	Orange	2	RXD
3		White/Green	3	Black	3	TXD
4	GND	Blue	4	Red	4	No Connection
5	RXD	White/Blue	5	Green	5	GND
6	TXD	Green	6	Yellow	6	No Connection
7	CTS	White/Brown	7	Brown	7	RTS
8	RTS	Brown	8	White	8	CTS
					9	No Connection

RS-422/485 Pinouts

RS-422 and RS-485 are generally connected to the endpoint device via screw-down terminals which are marked so as to match wiring on both sides. It is also possible that RS-422 and RS-485 may have a custom connector with a custom pinout. There is no standard wiring for RS-422/485, so the pinout shown in the next table should be used simply as a reference when connecting to an RS-422/485 device.

NOTE: Referring to the manufacturer's protocol documentation is always the best practice in any case where the device pinout or correct wiring is in question.

In some instances, only two wires are used (- and +) out of the 4 (TX-, TX+, RX-, RX+). When this is the case, the TX- and TX+ could be wired together, allowing the ability to transmit but no feedback. Alternatively, the TX- could be connected to the RX- and the TX+ to the RX+, creating a - and + line. Some manufacturers use A and B to represent their wires, instead of - or +. If this is the case, some trial and error may be required to determine which wire maps to A and which maps to B.

Controller RJ-45 (RS-422/485) Plug Pinouts
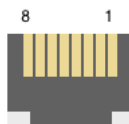
1 RX+ (RS-422/485)	5 (Not Used for RS-422/485)
2 RX- (RS-422/485)	6 TX- (RS-422/485)
3 TX+ (RS-422/485)	7 (Not Used for RS-422/485)
4 GND (RS-422/485)	8 (Not Used for RS-422/485)

Troubleshooting Serial (RS-232/422/485) Ports

For guidelines and procedures related to troubleshooting serial communication, refer to the article below:
RS-232 Serial Communication Troubleshooting (/Customers/apex/cx_knowledge2#!/articles?url=RS232-Adapter-
Troubleshooting-1423469836883)