RJ11 · RS-232 Interface

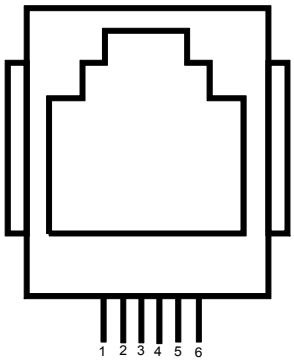
1.0 General

The back panel of the CPP-3794 provides a combination of 9 pin DB connectors and RJ11 connectors for connecting RS-232 serial cables. The 9 pin DB connector is based on an IEEE standard that has existed for a number of years. Typical with standards, it is designed to apply to a large number of interfacing applications. The vast majority of RS-232 applications use only 3 wires, TX, RX, and ground. Two other signal pins, RTS and CD are sometimes used when interfacing to modems and radios, or RS-485 signals.

The IEEE standard also defines a 25 pin DB standard and specifies either a male or female gender connector, depending on the utility of the unit, which can be ambiguous. Several pins in the connector change functionality depending on the gender. As such, a problem is created trying to get the correct connector gender connector matched with signal pins utility. Quiet often, to implement a neat cabling arrangement, a cable must be fabricated to eliminate null modems and connector size changes.

A much more straightforward approach is to use a telephone jack connector. Many years of engineering effort was expended to create the cable jack connections being used in the telephone industry. The connectors are small, very inexpensive, unquestionably reliable, readily available, and easy to fabricate. The connectors, cable and tools required to fabricate cables are universally available.

H2NS installs a 6 pin, RJ11, connector into the CPP rear panel for each RS-232 port. The majority of applications only use four of the 6 pins, which are pins 2,3,4,5. A null modem can be readily implemented by either twisting or not twisting the cable, which is readily detectable because the cable is color coded. **Standard, purchased telephone cables are twisted.** Presented below are the pin assignments set up by H2NS for the RJ11 connector.



1 RTS Output
2 TX+ Output of CPP
3 Gnd (TX- in RS-422/485)
4 Gnd (RX- in RS-422/485)
5 RX+ Input to CPP
6 CD Input

H2NS can also provide RS-232 connectors that are terminated in an RJ11 connector. One of the RS-232 connectors can be connected to an instrument and then connected with an RJ11 cable to the CPP. The wire colors for the 9 pin, DB male and female connectors are given below

Pin	9 Pin Male	9 Pin Female
1	Blu	Wht
2	Yel	Blk
3	Grn	Red
4	Red	Grn
5	Blk	Yel
6	Wht	Blu

2.0 DB9 Pin Connectors on CPP Rear Panel

Several communication ports on the CPP also have female DB9 pin connectors. The pin assignments are given below.

DB9		Signal
1	CGD	Chassis ground
2	TXD	RS-232 serial out
3	RXD	RS-232 serial in
4	TX-	RS-422/485
5	GND	Ground
6	RX+	RS-422/485
7	RX-	RS-422/485
8	RTS	Request To Send RS-232/422/485
9	TX+	RS-422/485

3.0 PC 9 Pin DB

The pin assignments for the 9 pin DB connectors are presented below. The DB9 female to RJ-11 will plug directly into a PC. The pin assignments assume that a standard, twisted telephone cable is used.

RJ-11 to 9Pin DBF to PC

PC-9 Pin	Color	RJ-11 Pin	RJ-11 Signal/Pin @ CPP
1 RTS	Blu	6	1 - CD
2 Rx	Yel	5	2 - Tx
3 Tx	Blk	2	5 - Rx
4			
5 Gnd	Grn	3	3 - Gnd
6			
7			
8 CD	Wht	1	6 - RTS
9			

4.0 API

The output of some of the API instruments can be switch selected to be either a DCE or DTE configuration in regards to pins 2 & 3, Rx & Tx. The rear panel connector is a 9 pin female DB connector. Select the DCE configuration. The proper wiring for the mating 9 pin male DB to RJ-11 is given below. The pin assignments assume that a standard, twisted telephone cable is used.

RJ-11 to 9 Pin DBM to API

API-9 Pin	Color	RJ-11 Pin	RJ-11 Signal/Pin @ CPP
2 Tx	Yel	5	2 – Rx
3 Rx	Blk	2	5 – Tx
5 Gnd	Grn	3	3 – Gnd

5.0 Environics

Environics calibrators have a male 25 pin DB connector for the RS-232 interface connection. The proper wiring for the mating 25 pin female DB to RJ-11 is given below. The pin assignments assume that a standard, twisted telephone cable is used.

RJ-11 to 25 Pin DBF to Environics

ENV-25 Pin	Color	RJ-11 Pin	RJ-11 Signal/Pin @ CPP
2 Tx	Yel	2	5 - Rx
3 Rx	Blk	5	2 - Tx
7Gnd	Grn	3	3 - Gnd

6.0 Forney

Forney instruments have a female 25 pin DB connector. The proper wiring for the mating 25 pin male DB to RJ-11 is given below. Only the three wires are needed. The pin assignments assume that a standard, twisted telephone cable is used.

RJ-11 to 25 Pin DBM to Forney

FOR-25 Pin	Color	RJ-11 Pin	RJ-11Signal/Pin @ CPP
2 Rx	Blk	5	2 -Tx
3 Tx	Yel	2	5 - Rx
7 Gnd	Grn	3	3 - Gnd

8.0 Met One

The Met One sonic anemometer offers a six wire cable carrying the RS-232 signals, power to the sensor, and a shield. The white and green wires are for power and are +12v and ground respectively. Power can be obtained from the rear panel of the CPP. The three RS-232 wires should be installed in a male DB-9 pin connector as presented below. The connector can be plugged directly into the CPP, or plugged into a 9 pin DB female with a standard telephone pigtail connection to the CPP.

MTO-9 Pin DBM to RJ-11 to CPP

MTO-Wire/Signal		DB9M	DB9F	RJ-11 Signal/Pin @ CPP	
Blu or Yel	Tx	3	3	Blk – 2	5 - Rx
Red	Rx	2	2	Yel – 5	2 - Tx
Blk	Gnd	5	5	Grn – 3	4 - Gnd

9.0 Monitor Labs

The Monitor Labs instruments support multidropping on the RS-232 communications lines. This allows all Monitor Labs instruments to be connected to one comm port on the CPP if desired. Only three wires are required to interface with the Monitor Labs instrumentation. The Monitor Labs rear panels have 9 pin DB female connectors. The rear panel wiring is given below.

RJ-11 to 9 Pin DBM to ML

ML-9 Pin DB	Color	RJ-11 Signal/Pin		RJ-11 Signal /Pin @ CPP	
2 Tx	Yel	Tx	2	Rx	5
3 Rx	Blk	Rx	5	Tx	2
5 Gnd	Grn	Gnd	3	Gnd	4

10.0 Rainwise

A 9 pin DB to RJ-11 connector is plugged into the rear of the Rainwise unit. The rear panel of the Rainwise unit has a male, 9 pin DB connector. A standard telephone cable connects the serial port of the Rainwise to the serial port of the CPP. The CPP requires only three wires to communicate with the Rainwise. The wiring for the 9 pin DB connector is defined below.

WS-1000CC Rear - DB-9 pin		DB-9 pin To RJ-11 Color	RJ-11 Signal
1	Gnd	Grn	3 - Gnd
2	TxD	Blk	2 - RxD
3	RxD	Yel	5 - TxD
4	RTS-		
5	CTS-	Jumper pins 4 & 5	
6	DTR-	Jumper pins 6 & 9	
9	DSR-	@ WS-1000CC end	

11.0 Rupprecht & Patashnick

The rear panel connector is a 9 pin female DB connector. The proper wiring for the mating 9 pin male DB to RJ-11 is given below. The pin assignments assume that a standard, twisted telephone cable is used.

9Pin DB To R&P

9 Pin	Color	RJ-11	RJ-11 Signal
2 Tx	Blk	5	2 – Rx
3 Rx	Yel	2	5 - Tx
5 Gnd	Grn	3	3 – Gnd

12.0 Teco

The pin assignments for the 9 pin DB connectors are presented below. The DB9 female to RJ-11 will plug directly into the CPP and a Teco Instrument. The pin assignments assume that a standard, twisted telephone cable is used.

9Pin DB To TECO

9 Pin	Color	RJ-11	RJ-11 Signal@CPP
2 Rx	Yel	2	2 - Tx
3 Tx	Blk	5	5 - Rx
5 Gnd	Grn	3	3 - Gnd

13.0 M&C

The PMA100 has a 9 pin, female DB, RS-232 rear panel connector, labeled X2. A DB 9pin male connector plugs into the PMA100.

9Pin DBM To RJ-11

PMA Pin	Signal	Male DB9	Color	RJ-11
2	Tx	2	Yel	2
5	Gnd	5	Red	4
3	Rx	3	Blk	5

14.0 Siemens UltraMat 6 & 23

The Siemens instruments have a 9 pin female DB rear panel connector for the serial interface. The Siemens units operate RS-485 and are half duplex. The below defines the DB9 male to RJ-11 wiring mating plug to the Siemens units. With this connector wired as indicated below, a standard telephone cable can be used to connect the CPP to the Siemens units. Since the Siemens instruments operate half duplex, the Tx+ and Rx+ and the Tx- and Rx- signals can be tied together if desired. The CPP should be configured for half duplex operation.

DB9 Male to RJ-11

Siemens Signal	DB Pin	RJ-11
Tx+	3	5
Tx-	8	4
Rx+	7	3
Rx-	9	2