

RS-232-C Specifications

Connector Pinouts

Line	Designation	From	Pin Allocation				
			9 Pin D	25 Pin D	15 Pin ¹ D	RJ11 ²	RJ12 ²
	Frame Ground	-		1	1		
TxD	Transmit Data	DTE	3	2	2	2	4
RxD	Receive Data	DCE	2	3	3	1	3
RTS	Request to Send	DTE	7	4	4	3	5
CTS	Clear to Send	DCE	8	5	5		
DSR	Data Set Ready	DCE	6	6	6		
GND	Signal Ground	-	5	7	7	4	1
DCD	Data Carrier Detect	DCE	1	8	8		
DTR	Data Terminal Ready	DTE	4	20	11		
RI	Ring Indicator (often not used)	DCE	9	22	9		

¹ = No standard exists, pinouts shown are those used by some Allen Bradley equipment.

² = No standard exists, pinouts shown are those used by some Direct Logics equipment.

Electrical Specifications

Parameter	Limit	In Practice
Absolute Max Input Voltage	±25V	
Input Voltage Threshold	±3V	Often 0 to 3V
Input Impedance	3-7 KΩ	
Output Voltage Loaded	±5 to ±15 V	
Max Output short circuit current	±500mA	Often ±10mA
Min Output Impedance	300 Ω	
Max Output Slew Rate	30 V/μSec	
Max Data Rate	20 K Baud	Often 115.2 K Baud
Max Range	50 feet	See table on right

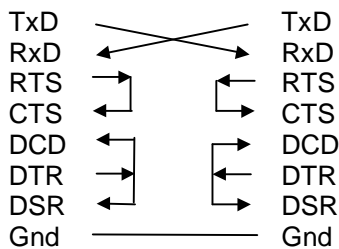
Range Limits in Practice³

Baud	Max Range
110	900 M
300	850 M
600	750 M
1200	500 M
2400	250 M
4800	150 M
9600	75 M
19200	< 75 M

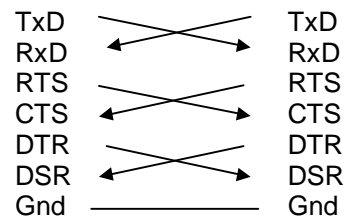
³ = These limits are achievable only with good quality cable and in the absence of electrical noise and earth loops.

Null Modem Cables

Handshaking Looped Back



Handshaking Crossed Over



Notes:

- DCE Stands for Data Communication Equipment. All modems and a few printers are DCE. DCE devices usually have a **female** socket (i.e. the cable used to connect to a DCE port will require a male connector).
- DTE Stands for Data Terminal Equipment. All computers, terminals and most other devices are DTE. DTE devices usually have a **male** socket.
- On the TxD line a mark (1) is a **negative** voltage. When the TxD line is idle, it is in the mark (1) state.
- On all handshaking lines, the line is a **positive** voltage when it is asserted.
- Transmission of each byte is preceded by a single space (0) bit to synchronise the receiver's clock.
- Transmission of each byte is followed by one or more stop bits. Stop bits are mark (1) characters and are indistinguishable from the idle state of the line.