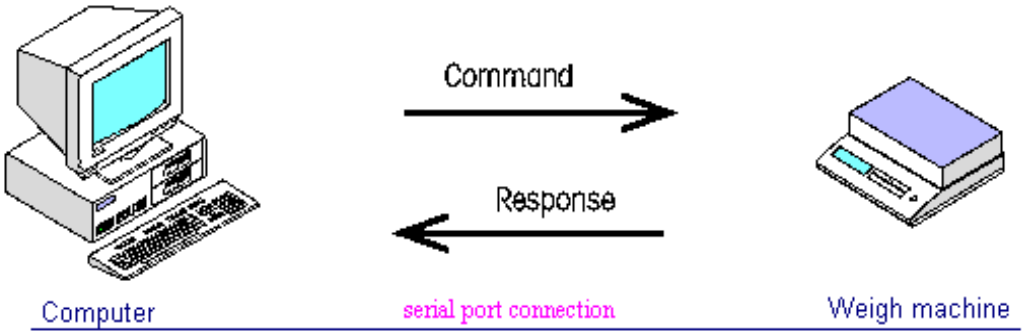
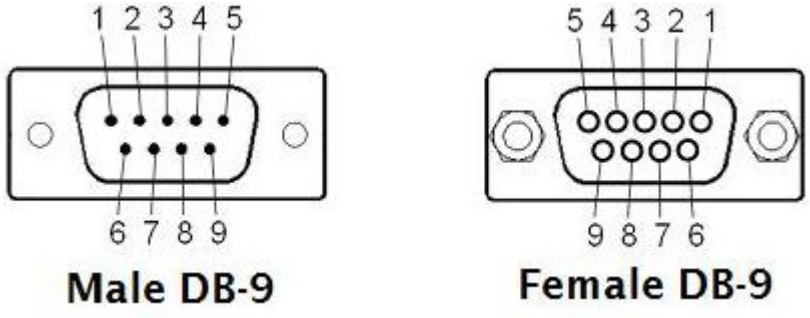
Serial Ports communication and data collecting



A Computer can be connected by the serial ports to many external devices, such as weigh machines, etc. This is almost always accomplished by connecting an RS232 port on your scale indicator to a RS232 communication port on your PC with the appropriate interface cable. The interface cable normally custom made by either your scale supplier or the service technician who is maintaining your scale.
For this purpose, the external device has to have a serial port output, in text format, and the communication protocol of the PC and the device (baud rate, parity value, bit values and stop bit values) have to match.
(See serial ports configuration and the external device manual)
Besides that, the external device (weigh machine) has to be set up to send automatically all the values to the PC, once these are stable.

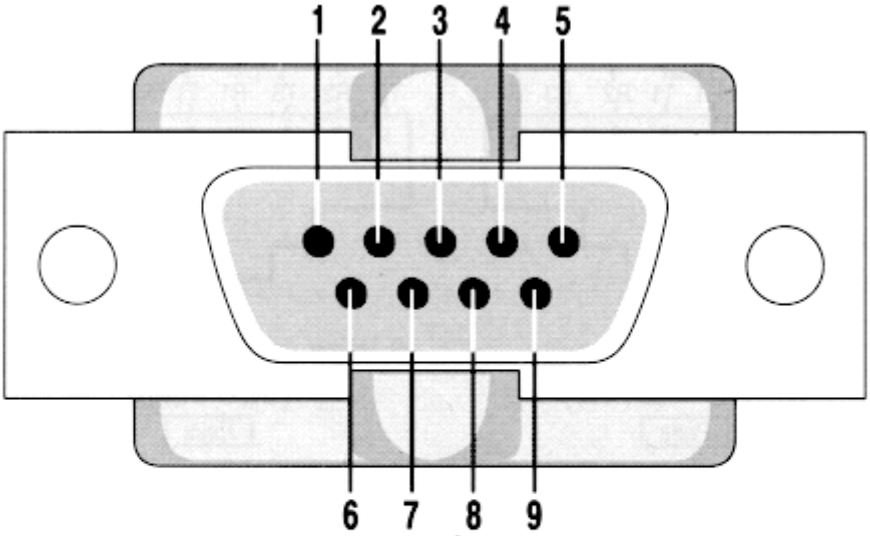
Standard Serial PC connectors

The two types of communication port connectors commonly found on a PC are 9-pin and 25-pin 'D' type connectors. These connectors are normally RS232 ports. Before an interface cable can be made you must specify what type of connector your PC has. The two common connectors are shown below.



RS232 DB9 (9 pins) connector female on PC side

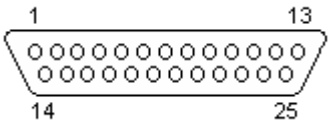
RS232 DB9 male Serial port pin out



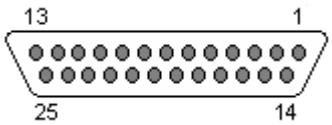
Pin	Signal	Pin	Signal
1	Data Carrier Detect	6	Data Set Ready
2	Received Data	7	Request to Send
3	Transmitted Data	8	Clear to Send
4	Data Terminal Ready	9	Ring Indicator
5	Signal Ground		

RS232 DB25 Serial port pin out

RS232 DB25 at the PC



RS232 DB25 male at the PC

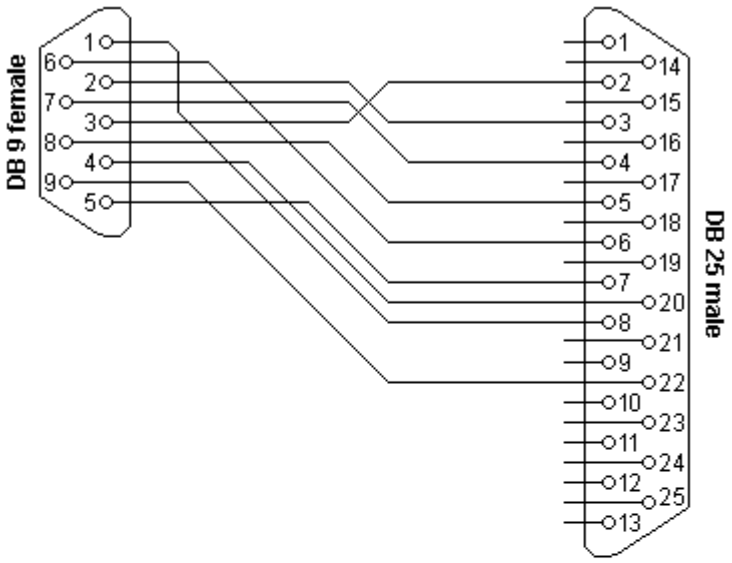


RS232 DB25 female at the external instrument

Pin	Name	Direction	Description
1	GND		Shield Ground
2	TXD	⟶	Transmit Data
3	RXD	⟵	Receive Data
4	RTS	⟶	Request to Send
5	CTS	⟵	Clear to Send
6	DSR	⟵	Data Set Ready
7	GND		System Ground
8	CD	⟵	Carrier Detect
9	–	–	RESERVED
10	–	–	RESERVED
11	STF	⟶	Select Transmit Channel
12	S.CD	⟵	Secondary Carrier Detect
13	S.CTS	⟵	Secondary Clear to Send
14	S.TXD	⟶	Secondary Transmit Data
15	TCK	⟵	Transmission Signal Element Timing
16	S.RXD	⟵	Secondary Receive Data
17	RCK	⟵	Receiver Signal Element Timing
18	LL	⟶	Local Loop Control
19	S.RTS	⟶	Secondary Request to Send
20	DTR	⟶	Data Terminal Ready
21	RL	⟶	Remote Loop Control
22	RI	⟵	Ring Indicator
23	DSR	⟶	Data Signal Rate Selector
24	XCK	⟶	Transmit Signal Element Timing
25	TI	⟵	Test Indicator

If the PC has a RS232 DB9 (9 pin) connector and the external instrument a RS232 DB25 (25 pin) connector, a DB9 to DB25 cable has to be used for the connection or a DB25 to DB9 converter

RS232 DB9 to DB25 converter



DB9 - DB25 conversion

DB9	DB25	Function
1	8	Data carrier detect
2	3	Receive data
3	2	Transmit data
4	20	Data terminal ready
5	7	Signal ground
6	6	Data set ready
7	4	Request to send
8	5	Clear to send
9	22	Ring indicator

Male and female DB9 connectors for Serial ports

RS232 DB9 to DB25 connectors

These cables can be used up to distances of 10 meters maximum. For longer distances than 10 meters a shielded cable should be used.

A standard PC comes normally with 1 or 2 Serial ports already installed, but most of the latest PC's come without any Serial port installed, but several USB ports instead
On that case, an USB to RS232 adaptor must be installed, which will convert an USB port into one or several virtual Serial RS232 DB9 ports

Example of some commercial USB to RS232 adaptors

USB to RS232 adaptor

USB to 4 x RS232 adaptor

USB to 16 x RS232 adaptor