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AN ISO/IEC 17025:2017
ACCREDITED CALIBRATION COMPANY

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SMART WEIGHING SOLUTIONS

rinstrum

1203
Weight Transmitter
Installation Manual

For use with Software Versions 1.0 and above

1203-601-120

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"Everything should be made as simple as possible, but not simpler."

- Albert Einstein -

Notes:

Rinstrum - Weight Transmitter Installation Manual Rev 1.2

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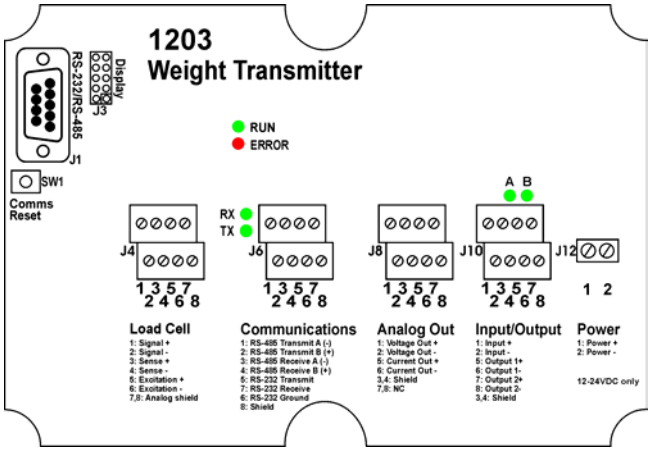
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1. Introduction

The **1203** is a precision digital weight transmitter using the latest Sigma-Delta A/D converter to ensure extremely fast and accurate weight readings.



1.1. Approvals

- C-tick approved. CE approved. UL approval pending.

1.2. Features

- Digital setup and calibration.
- Non-volatile security store (retains Zero / Tare, etc.).
- Outputs both 4-20mA and 0-10V analog.
- Two trip points with output drive and status display via LEDs.
- One opto-isolated configurable input.

7.2. Query Scale mV/V Value

Command	Response	Details
Setup		
S99;		Select All Units
Get mV/V Reading		
MSV?,,6,4;	1.2345<CRLF>	Query Reading

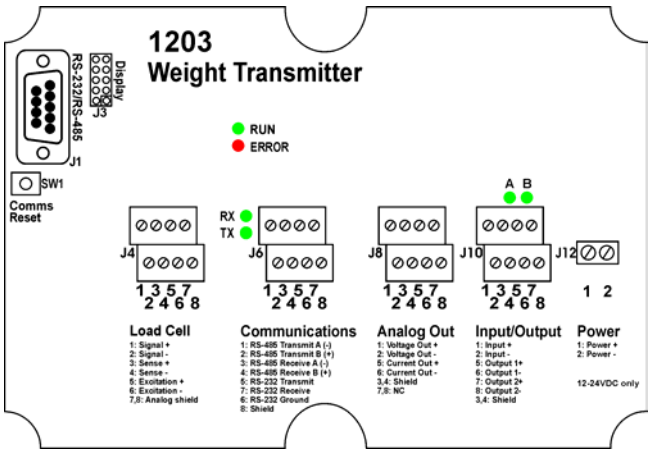
7.3. Force Setpoint Outputs

Command	Response	Details
Setup		
S99;		Select All Units
Choose Outputs		
FCN6;	0<CRLF>	Setpoint A On
FCN7;	0<CRLF>	Setpoint A Off
FCN9;	0<CRLF>	Setpoint A Release
FCN10;	0<CRLF>	Setpoint B On
FCN11;	0<CRLF>	Setpoint B Off
FCN13;	0<CRLF>	Setpoint B Release

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FCN11;	0<CRLF>	Setpoint B Off
FCN13;	0<CRLF>	Setpoint B Release

7. Commands

- This section briefly describes the **ESR**, **MSV?** and **FCN** commands. Refer to the **1203 Weight Transmitter Reference Manual** for complete details on these and all other commands.
- The **1203** Viewer Software or any terminal program (eg. Windows Hyperterminal) can be used to enter commands.

7.1. Query Error Status

Command	Response	Details
S99;ESR?;	0000<CRLF>	Select All Units, Query Error

Error Codes

Error	Description	Action
0001	Power Supply Voltage Low	Check Supply
0002	Power Supply Voltage High	Check Supply
0010	Temperature Out of Range	Check Location
0020	User Calibration Resolution Error	Fix Up User Calibration or Scale Build
0040	Positive Sense Error	Check Connection
0080	Negative Sense Error	Check Connection
0100	Setup Information Lost	Re-Enter Setup
0200	Calibration Information Lost	Re-Calibrate
0400	Factory Information Lost (FATAL)	Service
0800	EEPROM Error (FATAL)	Service
1000	A/D Converter Error	Restart/Service
2000	A/D Converter Range Error	Check Connection and Load Cell Output
4000	Communication Bit Error	Check Configuration/ Cabling
8000	ROM Error (FATAL)	Service

The status bits are additive in hexadecimal as follows:
1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - A - B - C - D - E - F
(For example, 2 + 4 = 6 or 4 + 8 = C)

- Two serial outputs allowing communication with external computers, PLCs and remote displays. Serial 1: RS-232 and Serial 2: 4-wire RS-485.
- The **1203** has filtering options available which allow it to be optimised to produce the most accurate readings possible in the shortest time.

1.3. Manuals

- For more information on the **1203** refer to the **1203 Weight Transmitter Reference Manual** and **1203 Display Manual** (available free of charge from www.rinstrum.com).

1.4. Models

- 1203 Weight Transmitter P/No: 1203
- 1203 Weight Transmitter with Display P/No: 1203/D
- 1203 Weight Transmitter - PCB Only P/No: 1203/B

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0080	Negative Sense Error	Check Connection
0100	Setup Information Lost	Re-Enter Setup
0200	Calibration Information Lost	Re-Calibrate
0400	Factory Information Lost (FATAL)	Service
0800	EEPROM Error (FATAL)	Service
1000	A/D Converter Error	Restart/Service
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4000	Communication Bit Error	Check Configuration/ Cabling
8000	ROM Error (FATAL)	Service

The status bits are additive in hexadecimal as follows:
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- Two serial outputs allowing communication with external computers, PLCs and remote displays. Serial 1: RS-232 and Serial 2: 4-wire RS-485.
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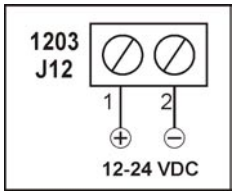
1.4. Models

- 1203 Weight Transmitter P/No: 1203
- 1203 Weight Transmitter with Display P/No: 1203/D
- 1203 Weight Transmitter - PCB Only P/No: 1203/B

2. Specifications

General	
Operating Environment	Temperature –10 to +50°C ambient Humidity: <90% non-condensing
Power Supply	12VDC at 500mA max to 24VDC at 250mA max
Analog Input	
Load Cells	Excitation: 8VDC Connection: 6-wire + shield Available Excitation Current: 150mA (6 x 350Ω load cells)
Analog Output	
Type	Configurable (4-20mA, 0-24mA, 0-20mA, –10-10V, 0-10V, 2-10V, 0-5V, 1-5V, etc)
Isolation	>500V
Impedance	Maximum current-loop impedance: 1000Ω Minimum impedance between voltage outputs 2000Ω
Communications	
Serial Output	RS-485 full duplex and RS-232 full duplex
Capability	Automatic transmit and network
Input / Output	
Input Voltage Range	Active input voltage range: 5-28VDC
Input Current Requirements	1.5mA at 5VDC to 13mA at 28VDC
Load Output	Maximum load on output: 300mA
Voltage Output	Maximum operating voltage on output: 30VDC
Output Protection	Reverse and short-circuit protected

5.10. Power (J12)



Warning:

Use 12-24 VDC only.

Voltages outside this range may cause improper operation or damage.

6. Controls

- The **1203** controls consist of a single button (SW1).
- This button:



Version 1.6 and below	Version 1.7 and above
Resets the communication settings as below. (This is not permanent until a save command is sent.)	Sets the **1203** in temporary viewer mode. Press again to exit this mode. Viewer mode has settings as below.

Control	Setting
Baud	9600
Parity	None
Data Bits	8
Stop Bits	1

- A short press of the SW1 button (50ms < t < 2s) sets the RS-232 port in network mode and disables the RS-485 port.
- A long press of the SW1 button (t >= 2s) sets the RS-485 port in network mode and disables the RS-232 port.

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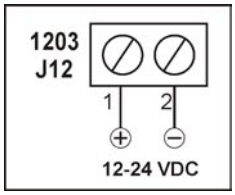
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Power Supply	12VDC at 500mA max to 24VDC at 250mA max
Analog Input	
Load Cells	Excitation: 8VDC Connection: 6-wire + shield Available Excitation Current: 150mA (6 x 350Ω load cells)
Analog Output	
Type	Configurable (4-20mA, 0-24mA, 0-20mA, –10-10V, 0-10V, 2-10V, 0-5V, 1-5V, etc)
Isolation	>500V
Impedance	Maximum current-loop impedance: 1000Ω Minimum impedance between voltage outputs 2000Ω
Communications	
Serial Output	RS-485 full duplex and RS-232 full duplex
Capability	Automatic transmit and network
Input / Output	
Input Voltage Range	Active input voltage range: 5-28VDC
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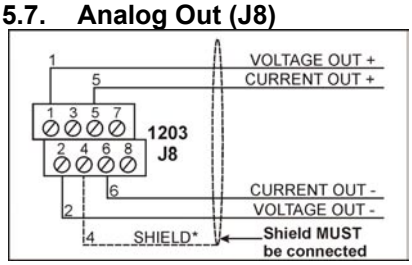
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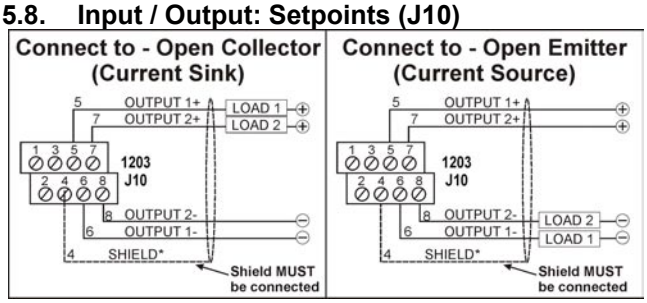
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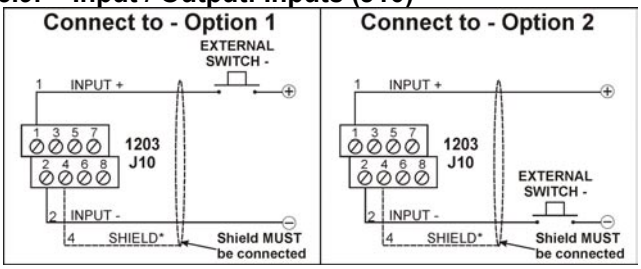
5.7. Analog Out (J8)



5.8. Input / Output: Setpoints (J10)



5.9. Input / Output: Inputs (J10)



*For more information on shielding refer to page 10.

3. Information

3.1. Digital Setup

- Digital setup is carried out entirely using the serial communications links or by using the **1203/S Service Tool** (Display/Keys).

3.2. Setpoints

- Each setpoint provides a simple comparator function that can be modified.
- Target weight, switching direction, hysteresis and logic can be configured.
- Outputs can be forced ON or OFF.

3.3. Remote Input

- Instrument has one remote input that can be configured to perform a variety of operations.

3.4. LEDs

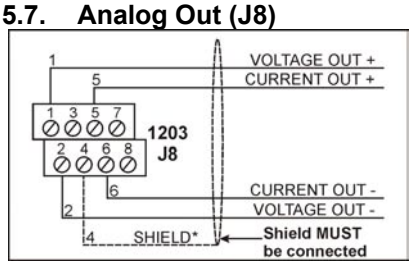
- The flashing **green** LED indicates the **1203** is ON.
- The flashing **red** LED indicates the **1203** is experiencing an error.

3.5. 1203 Viewer Software

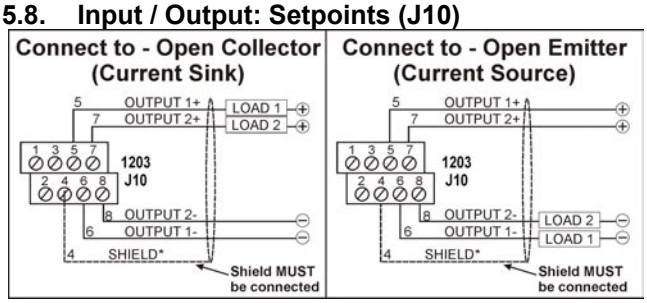
- The **1203** Viewer Software can be used in the setup of the instrument. This software is available by contacting Rinstrum or from the web site at www.rinstrum.com.

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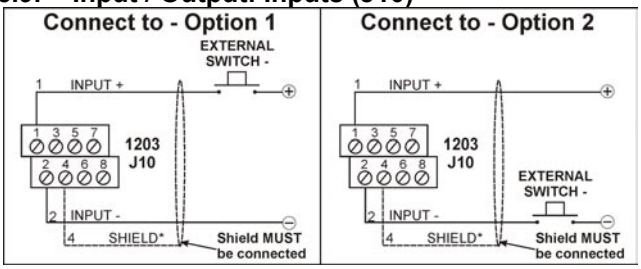
5.7. Analog Out (J8)



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4. Warnings

4.1. General

- Instrument not to be subject to shock, excessive vibration or extremes of temperature (before or after installation).
- Inputs are protected against electrical interference, but excessive levels of electro-magnetic radiation and RFI may affect the accuracy and stability.
- Instrument and load cell cable are sensitive to electrical noise. Install well away from any power or switching circuits.

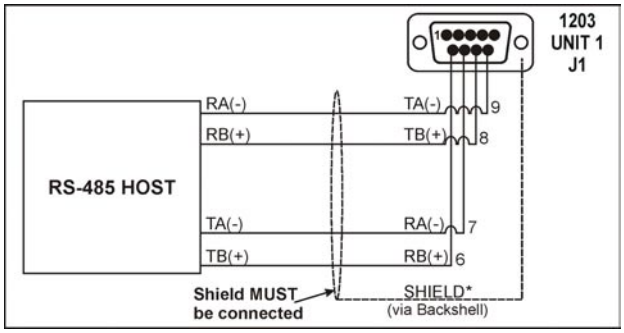
4.2. Power Supply

- DC supply need not be regulated provided it is free of excessive electrical noise and sudden transients.
- Instrument can be operated from high quality plug-pack provided there is sufficient capacity to drive both it and load cells.
- Instrument is constructed to use 12-24 VDC only. Voltages outside this range may cause improper operation or damage.

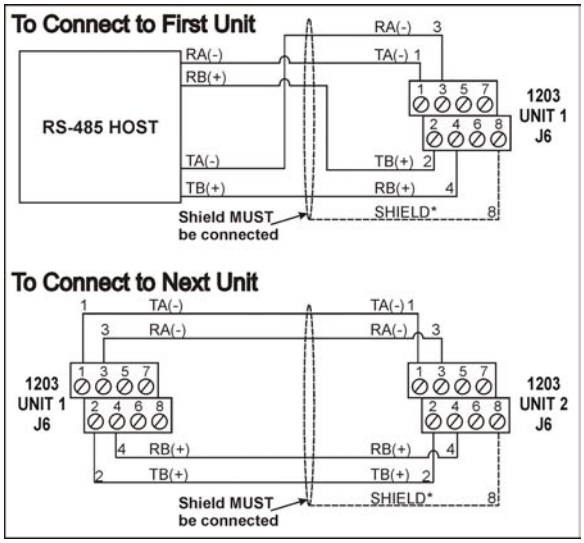
4.3. Load Cell Signals and Scale Build

- Very low output scale bases can be used but may induce some instability in weight readings when used with higher resolutions (ie. higher output/lower number of divisions equals greater display stability/accuracy).

5.5. Communications: RS-485 Connection (J1)



5.6. Communications: RS-485 Connection (J6)



*For more information on shielding refer to page 10.

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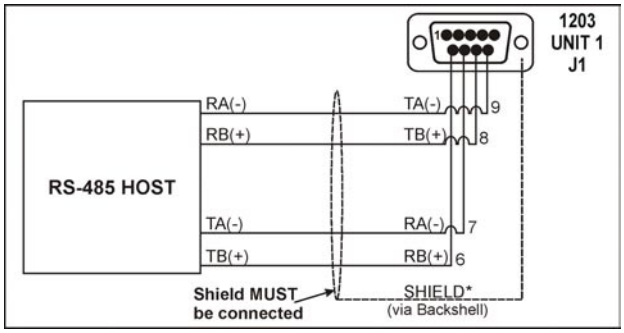
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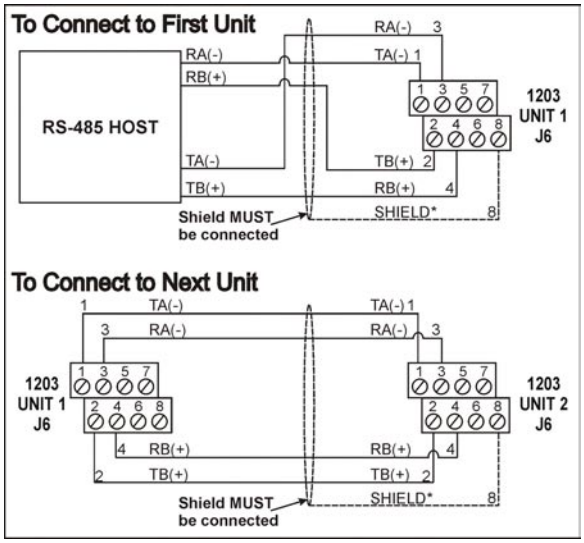
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5.5. Communications: RS-485 Connection (J1)



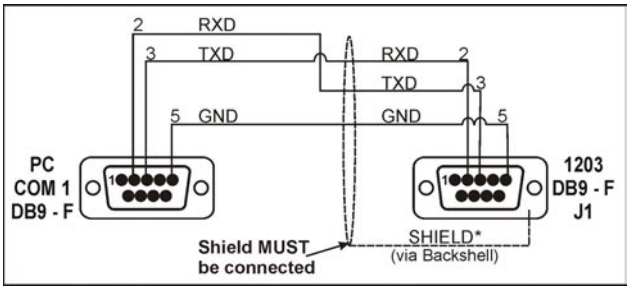
5.6. Communications: RS-485 Connection (J6)



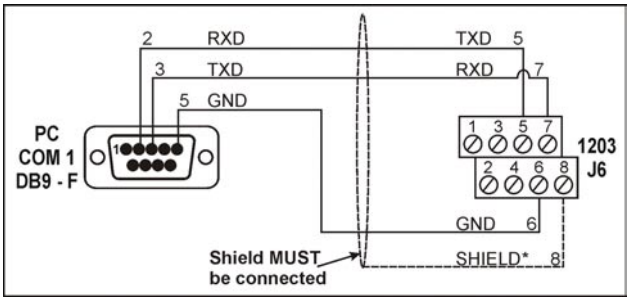
*For more information on shielding refer to page 10.

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5.3. Communications: RS-232 Connection (J1)



5.4. Communications: RS-232 Connection (J6)



*For more information on shielding refer to page 10.

4.4. 6-Wire Connection

- Load Cell Wiring: Use only high quality shielded multi-core cable.
- Separation distance to other cabling to be not less than 150mm.
- Do not bundle load cell cables with power or control-switching cables. Interference can trigger display instability/unreliable operation.

4.5. 4-Wire Connection

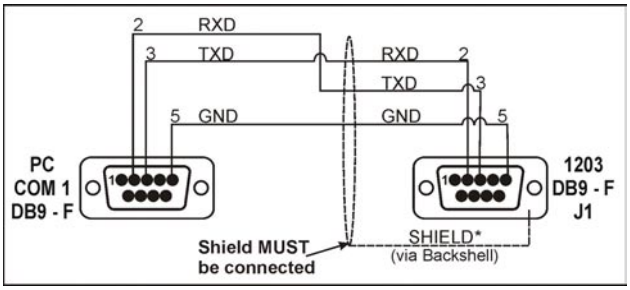
- Instrument not fitted with auto-sensing of load cell excitation.
- Terminals 3 & 5 and 4 & 6 on the load cell connector (J4) must be joined by wire bridge.

4.6. Serial Ports

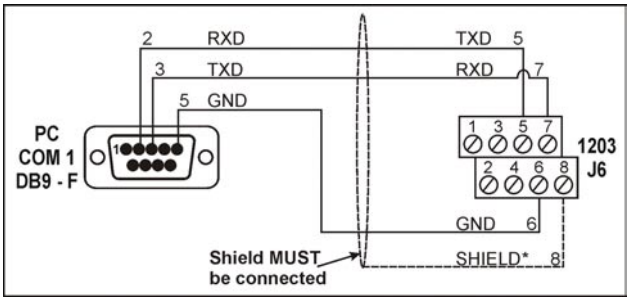
- Serial ports not completely independent. Commands cannot be sent to **1203** on both ports simultaneously.
- **Serial 1 - RS-232 Port:** Terminals 5 to 7 of communications connector (J6) connected directly to pins 2, 3 & 5 of the DB9 connector (J1).
- **Serial 2 - RS-485 Port:** Supports 4-wire full duplex RS-485 only (ie. 2-wire half-duplex communications not supported).
  Terminals 1 to 4 of the communications connector (J6) connected to pins 6 to 9 of DB9 connector (J1). (J6.1-J1.9, J6.2-J1.8, J6.3-J1.7 and J6.4-J1.6).
- **Multi-Drop Networking:** End devices in multi-drop RS-485 network may need termination resistors to balance network loadings. Resistors are built into **1203** (enable/disable using digital setup).

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5.3. Communications: RS-232 Connection (J1)



5.4. Communications: RS-232 Connection (J6)



*For more information on shielding refer to page 10.

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4.4. 6-Wire Connection

- Load Cell Wiring: Use only high quality shielded multi-core cable.
- Separation distance to other cabling to be not less than 150mm.
- Do not bundle load cell cables with power or control-switching cables. Interference can trigger display instability/unreliable operation.

4.5. 4-Wire Connection

- Instrument not fitted with auto-sensing of load cell excitation.
- Terminals 3 & 5 and 4 & 6 on the load cell connector (J4) must be joined by wire bridge.

4.6. Serial Ports

- Serial ports not completely independent. Commands cannot be sent to **1203** on both ports simultaneously.
- **Serial 1 - RS-232 Port:** Terminals 5 to 7 of communications connector (J6) connected directly to pins 2, 3 & 5 of the DB9 connector (J1).
- **Serial 2 - RS-485 Port:** Supports 4-wire full duplex RS-485 only (ie. 2-wire half-duplex communications not supported).
  Terminals 1 to 4 of the communications connector (J6) connected to pins 6 to 9 of DB9 connector (J1). (J6.1-J1.9, J6.2-J1.8, J6.3-J1.7 and J6.4-J1.6).
- **Multi-Drop Networking:** End devices in multi-drop RS-485 network may need termination resistors to balance network loadings. Resistors are built into **1203** (enable/disable using digital setup).

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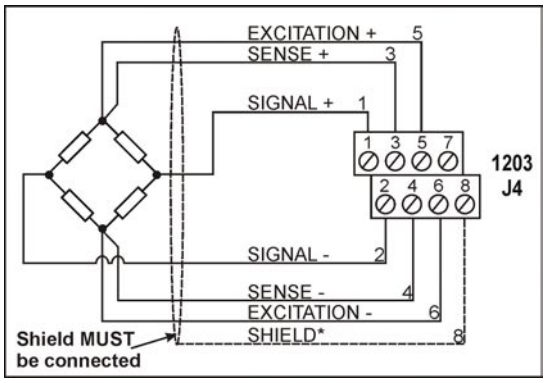
IMPORTANT NOTICE

4.7. Cable Shield Connection and Earthing

- Care should be taken when connecting shields to maximise EMC immunity and minimise earth loops and cross-talk (interference) between instruments.
- For EMC immunity, termination of the load cell shield at the **1203** end is important (ie. with connection to the **1203** case via the shield connection).
- **1203** enclosure is directly connected to the shield connections on the terminal blocks.
- **1203** should be connected to earth via a single reliable link to avoid earth loops.
- Where each instrument is separately earthed, interconnecting cable shields should be connected at one end only.
- Caution: Some load cells connect the cable shield directly to the load cell (and therefore the scale base). Connection of the shield in this situation may be site specific.
- Instrument complies with relevant EMC standards provided case ground connection is correctly made. Resistance measured between **1203** case and nearest earth point should be less than 2 ohms.

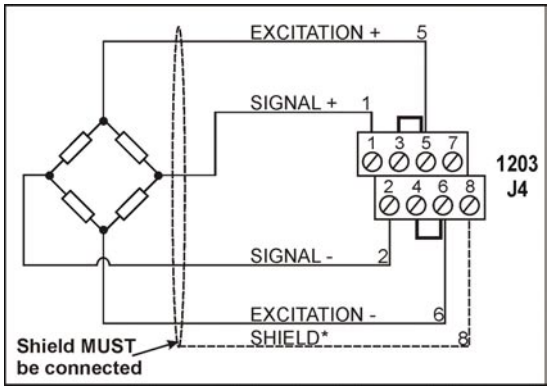
5. Connections

5.1. Load Cell: 6-Wire Connection (J4)



Note: Sense lines MUST be connected.

5.2. Load Cell: 4-Wire Connection (J4)



*For more information on shielding refer to page 10.

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IMPORTANT NOTICE

4.7. Cable Shield Connection and Earthing

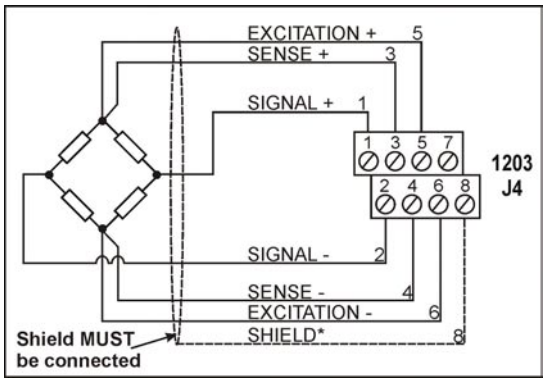
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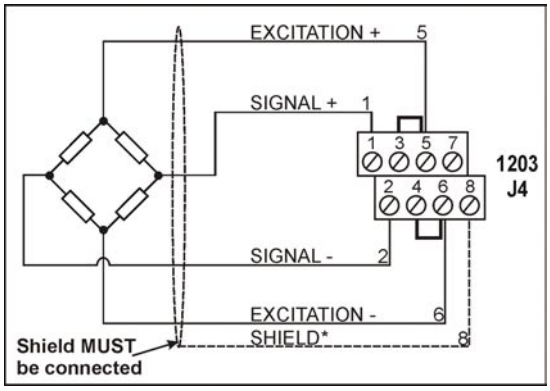
5. Connections

5.1. Load Cell: 6-Wire Connection (J4)



Note: Sense lines MUST be connected.

5.2. Load Cell: 4-Wire Connection (J4)



*For more information on shielding refer to page 10.

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