	SMART WEIGHING SOLUTIONS
SMART WEIGHING SOLUTIONS	rınstrum
<b>◆</b> rinstrum	Weight Transmitter Installation Manual For use with Software Versions 1.0 and above 1203-601-120
	SMART WEIGHING SOLUTIONS
SMART WEIGHING SOLUTIONS	rinstrum
<b>◆</b> rinstrum	1203 Weight Transmitter Installation Manual For use with Software Versions 1.0 and above

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

- Albert Einstein -





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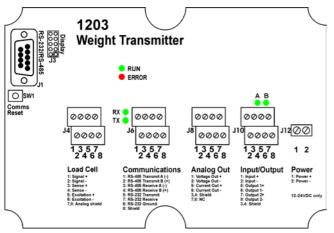
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## 1. Introduction

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

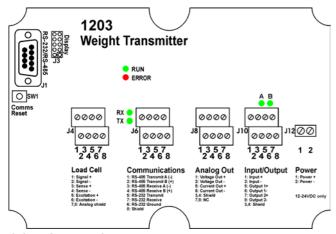
- Digital setup and calibration.
- Non-volatile security store (retains Zero / Tare, etc.).
- Outputs both 4-20mA and 0-10V analog.
- Two trip points with output drive and status display via LEDs.
- · One opto-isolated configurable input.

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- 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 Read	ing	
MSV?,,6,4;	1.2345 <crlf></crlf>	Query Reading

7.3. Force Setpoint Outputs

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

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#### 7.2. Query Scale mV/V Value

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Setup		
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FCN7;	0 <crlf></crlf>	Setpoint A Off
FCN9;	0 <crlf></crlf>	Setpoint A Release
FCN10;	0 <crlf></crlf>	Setpoint B On
FCN11;	0 <crlf></crlf>	Setpoint B Off
FCN13;	0 <crlf></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></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	Fix Up User
	Error	Calibration or Scale
		Build
0040	Positive Sense Error	Check Connection
0800	Negative Sense Error	Check Connection
0100	Setup Information Lost	Re-Enter Setup
0200	Calibration Information Lost	Re-Calibrate
0400	Factory Information Lost	Service
	(FATAL)	
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 eter	ue hite are additive in hovadocim	al aa fallawa.

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)

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0020	User Calibration Resolution	Fix Up User
	Error	Calibration or Scale
		Build
0040	Positive Sense Error	Check Connection
0800	Negative Sense Error	Check Connection
0100	Setup Information Lost	Re-Enter Setup
0200	Calibration Information Lost	Re-Calibrate
0400	Factory Information Lost	Service
	(FATAL)	
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
0000	KOW END (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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- 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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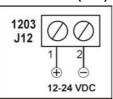
2.	Specifications
General	
Operating Environment Power Supply	Temperature –10 to +50°C ambient Humidity: <90% non-condensing 12VDC at 500mA max to 24VDC at 250mA max
Analog Input	
Load Cells	Excitation: 8VDC Connection: 6-wire + shield Available Excitation Current: 150mA (6 x 350Ω load cells)
Analog Output	
Туре	Configurable (4-20mA, 0-24mA, 0-20mA, -10-10V, 0-10V, 2-10V, 0-5V, 1-5V, etc)
Isolation	>500V
Impedance	$\begin{array}{l} \text{Maximum current-loop impedance:} \\ 1000\Omega \\ \text{Minimum impedance between voltage} \\ \text{outputs } 2000\Omega \\ \end{array}$
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

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Killstrum - Weight Transmitter Installation Manual Nev 1.2		
2. Specifications		
General		
Operating Environment Power Supply	Temperature –10 to +50°C ambient Humidity: <90% non-condensing 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		
Туре	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: $1000\Omega$ Minimum impedance between voltage outputs $2000\Omega$	
Communications		
Serial Output	RS-485 full duplex and RS-232 full duplex	
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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:

0	SW1
Com	nms et

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

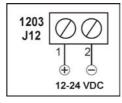
Control	Setting
Baud	9600
Parity	None
Data Bits	8
Stop Bits	1

- 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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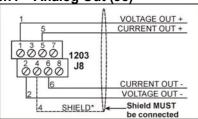
0	SW1
Comms	

Version 1.6 and below	Version 1.7 and above
Resets the	Sets the 1203 in
communication settings	temporary viewer mode.
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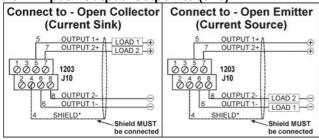
Control	Setting
Baud	9600
Parity	None
Data Bits	8
Stop Bits	1

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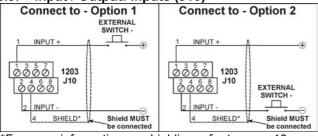
#### 5.7. Analog Out (J8)



5.8. Input / Output: Setpoints (J10)



5.9. Input / Output: Inputs (J10)

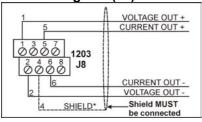


\*For more information on shielding refer to page 10.

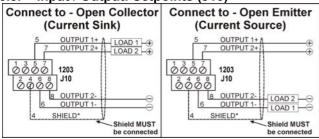
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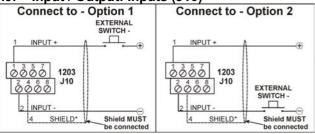
5.7. Analog Out (J8)



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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# 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 plugpack 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).

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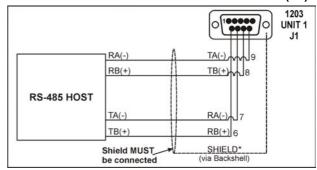
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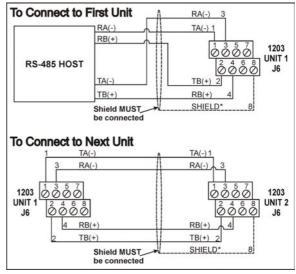
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#### 5.5. Communications: RS-485 Connection (J1)



## 5.6. Communications: RS-485 Connection (J6)

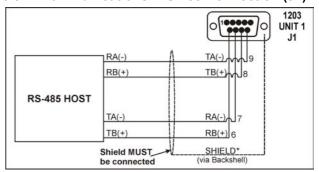


\*For more information on shielding refer to page 10.

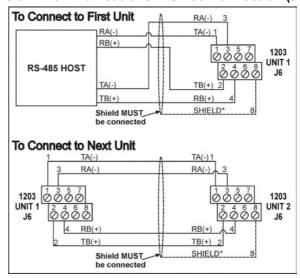
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#### 5.5. Communications: RS-485 Connection (J1)

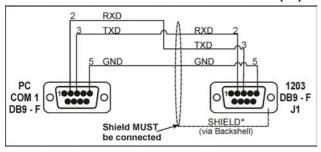


#### 5.6. Communications: RS-485 Connection (J6)

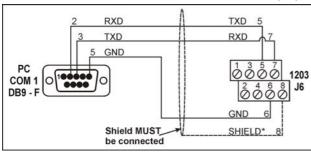


\*For more information on shielding refer to page 10.

# 5.3. Communications: RS-232 Connection (J1)



#### 5.4. Communications: RS-232 Connection (J6)

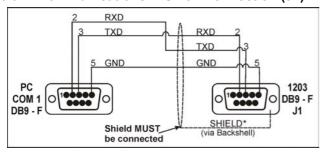


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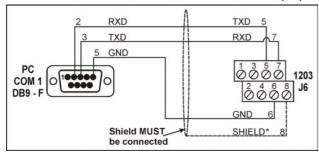
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#### 5.3. Communications: RS-232 Connection (J1)



#### 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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# 4. 6-Wire Connection

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- **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).
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  - 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).

#### **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.

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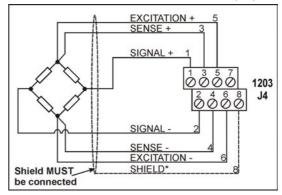
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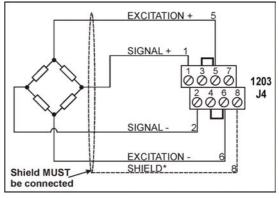
#### 5. Connections

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



Note: Sense lines MUST be connected.

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



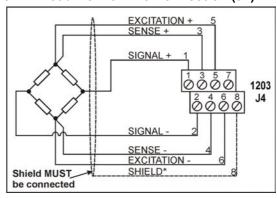
\*For more information on shielding refer to page 10.

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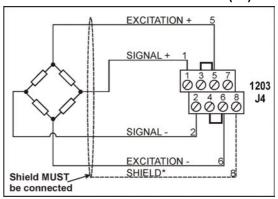
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