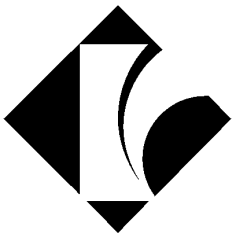
SMART WEIGHING SOLUTIONS



rinstrum

D32x/XD30

Remote Display Manual

D300-601-200

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Table of Contents

1. Introduction

This remote display is a highly visible instrument that is compatible with many digital weight indicators. There is no setup required as this remote display automatically detects the communications protocol being used by the transmitting device.

This manual contains information on the installation of this remote display.

1.1. Approvals

CE, FCC and C-tick approved. +

1.2. Features

The remote display is fitted with an alphanumeric 20mm LCD with super bright LED back lighting display that can be read in all conditions.

1.3. Document Conventions

The following document conventions (typographical) are used throughout this Manual.

Bold	Bold text denotes words and phrases to note.
( )	This symbol denotes one space (used in section 5.3).

2. Specifications

2.1. D32x Version

Approvals		
		C-Tick, CE & FCC
Performance		
Operating Environment		Temperature: –10 to +50°C ambient, Humidity: <90% non-condensing, Storage: -20 to 50 °C ambient, IP65 when panel mounted or IP65 rear boot fitted.
Display		
Display Type		20mm LCD display; LED backlight
Number Digits		6
Digit Size		20mm
Plastic Panel Version		
Unit Dim		160(W) x 75(H) x 30(D) mm
Pack Weight		0.34kg (Panel Mount)
Case Materials		Plastic Version: ABS, Silicon Rubber, Nylon, Acrylic (no halogen used)
Stainless Steel Version		
Unit Dim		200(W) x 115(H) x 30(D) mm
Pack Weight		0.49kg (Panel Mount)
Case Materials		Stainless Steel
Power Input		
Standard Input		4.8 to 24VDC (2.5VA max)
Variants	AC	AC Plug Pack: minimum output 12VDC 0.5A
Features		
Compatibility		Compatibility with most indicators
Setup		Auto-Detecting Setup
Characters		Numeric and semi-alpha characters
Annunciators		3 Annunciators
Serial Input		RS232
Selectable Address		Select between address 01 and 02

2.2. XD30 Version

Approvals		
		C-Tick, CE & FCC
Performance		
Operating Environment		Temperature: –10 to +50°C ambient, Humidity: 100% Storage: -20 to 50 °C ambient IP68 & IP69K
Case Materials		PC + Polyester alloy, PBT
Pack Weight		Basic remote: 2.0kg
Display		
Display Type		20mm LCD display; LED backlight
Number Digits		6
Digit Size		20mm
Power Input		
Standard Input		4.8 to 24VDC (2.5VA max)
Variants	AC	AC Power supply: 110/240VAC 50/60Hz in 12VDC 1.2A out
Features		
Compatibility		Compatibility with most indicators
Setup		Auto-Detecting Setup
Characters		Numeric and semi-alpha characters
Annunciators		3 Annunciators
Serial Input		RS232
Selectable Address		Select between address 01 and 02

3. Warnings and Safety

3.1. 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 operation.

For full EMC or for RFI immunity, termination of the cable shields and correct earthing of the instrument is essential.

Instrument is sensitive to excessive electrical noise and should be installed well away from any power or switching circuits.

3.2. Electrical Safety

For your protection all mains electrical hardware must be rated to the environmental conditions of use.

Pluggable equipment must be installed near an easily accessible power socket outlet.

To avoid the possibility of electric shock or damage to the instrument, always switch off or isolate the instrument from the power supply before maintenance is carried out.

3.3. Cleaning

- To maintain the D32x version, never use harsh abrasive cleaners or solvents. Wipe the instrument with a soft cloth **slightly** dampened with warm soapy water.
- The XD30 has been designed for high-pressure, high temperature (80°C) wash-down environments. However long periods of focused pressure at a close range will damage the casing. Casing is chemical resistant.

4. Installation

4.1. General Setup Information

The following steps are required to set up the remote display.

- Inspect instrument to ensure good condition.
- Ensure mounting options and connectors are available.
- Use connection diagram to wire up power and serial cables as required.
- Then D32x remote display can be panel mounted. Use the "Panel Drilling Template" provided for hole locations. The panel mounting screws are also used to attach desk/wall brackets or the stainless steel rear housing accessories.
- Connect the serial and power cables to the instrument. If using an RS-232 to RS-485 converter, connect the converter between the serial cable and the remote display serial port connector.
- Set the transmitting device to 9600 or 19200 baud and select the preferred output format for that instrument.

4.2. Panel Mounting (D32x Only)

The simplest way to mount the instrument is to use the drill template supplied. The template indicates positions for the drill holes for the two 4mm mounting screws through the panel. Also displayed on the template is the position of the rectangular hole that should be cut to allow for the connection of cables. The drill template supplied with the indicator allows for front or rear machining of the panel.

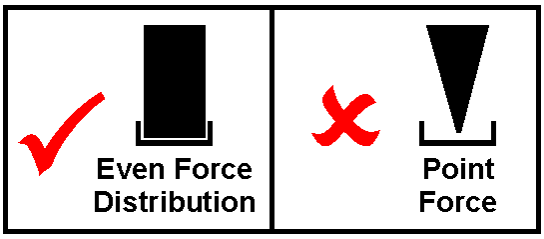
4.3. Cable Connections

4.3.1. D32x Version

All cable connections are made to the rear of the instrument using screwless terminals. Wires must be stripped of insulation by at least 10mm.

To install, carefully depress the orange lever beside the terminal required and push the wire into the hole. Release the lever and pull gently on the wire to ensure it is securely trapped in the terminal. It is not necessary to tin the ends of the wire with solder or to add crimp ferrules to the wires, but these techniques are also compatible with the terminals and may make for a neater job.

Warning: Care should be taken when depressing the levers on the screwless connectors to prevent sideways movement and possible damage. Use only appropriate tools (eg. flathead screwdriver). Do **not** use sharp instruments (eg. pens).



4.3.2. XD30 Version

All cable connections are made to the rear of the instrument using pluggable screw terminals. It is not necessary to tin the ends of the wire with solder or to add crimp ferrules to the wires, however, these techniques are also compatible with the terminals and may ultimately make for a neater job.

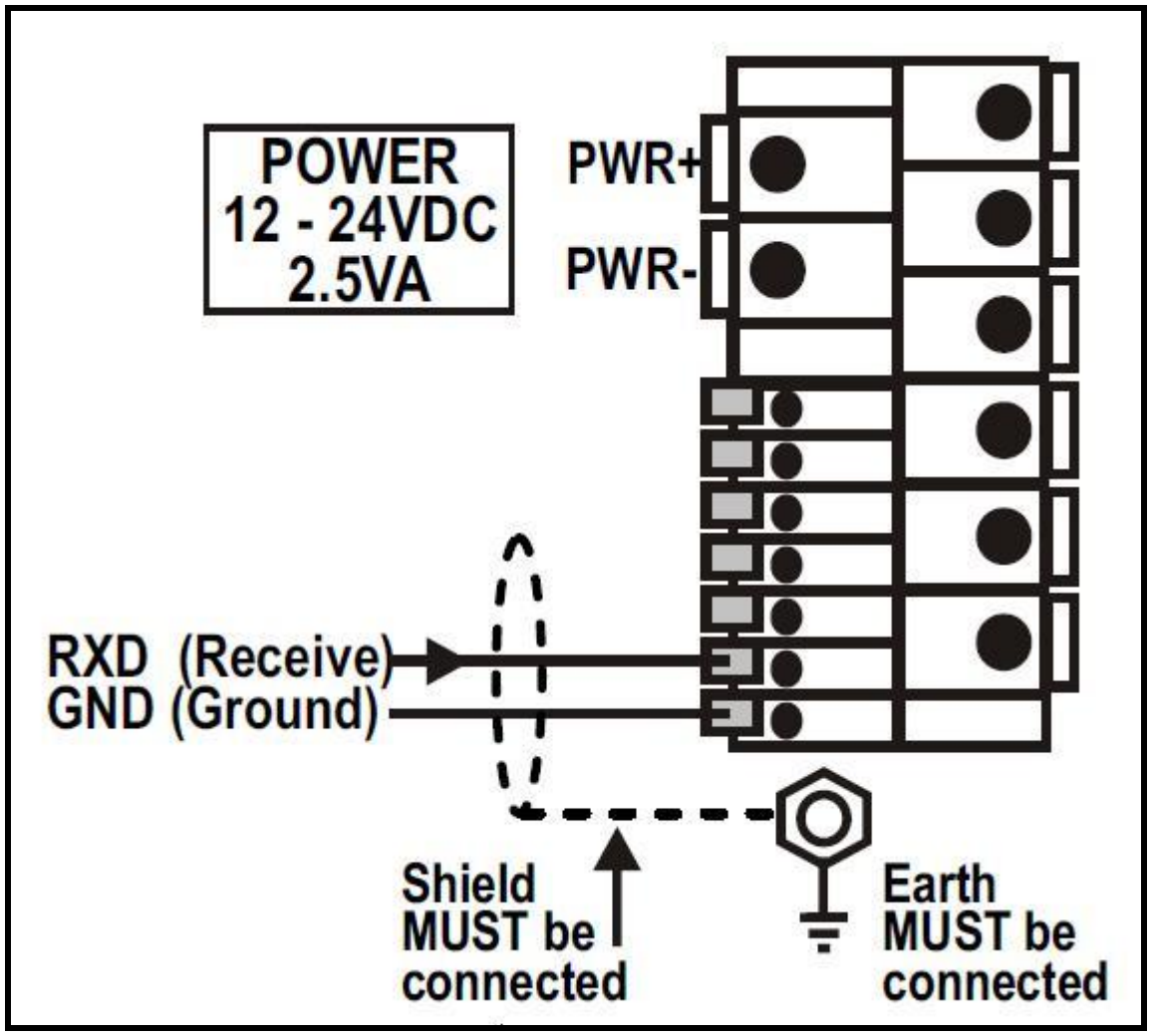
4.4. DC Power

The DC supply need not be regulated, provided that it is free of excessive electrical noise and sudden transients.The instrument can be operated from a high quality plug-pack as long as there is sufficient capacity to drive it.

4.5. D32x RS-232 Serial Auxiliary Connection

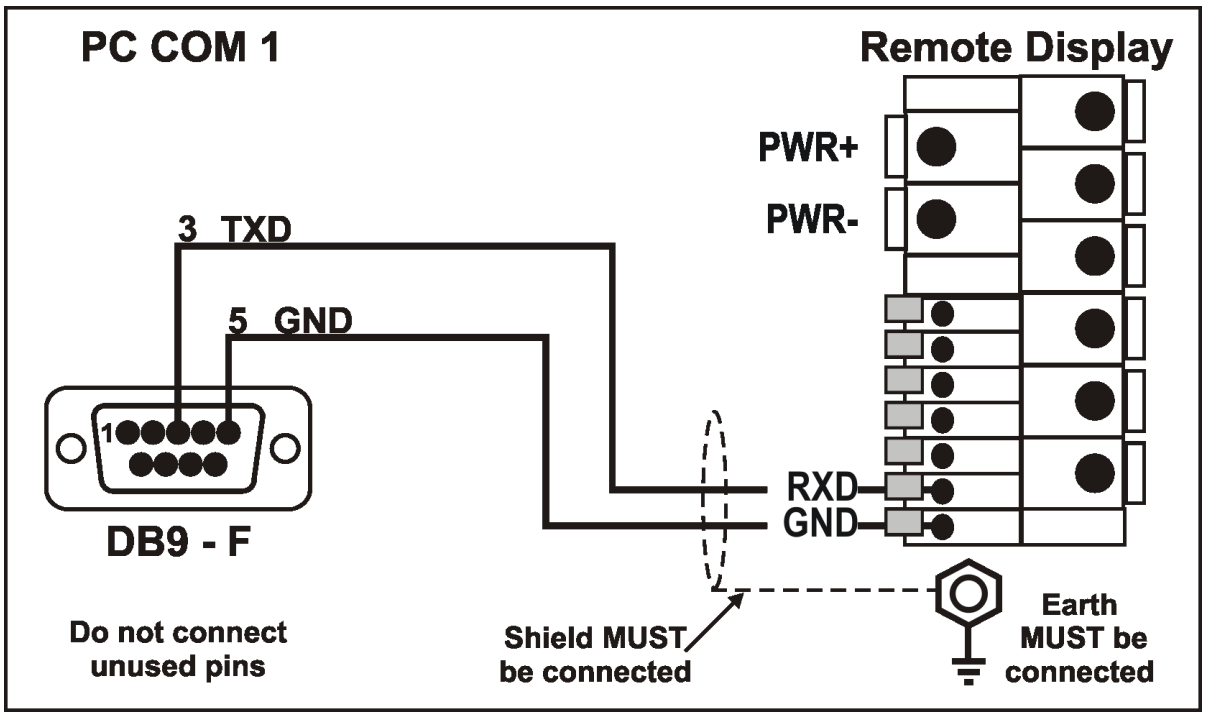
Remote Display

As a minimum the RXD and GND pins need to be connected to TXD and GND on the Indicator.

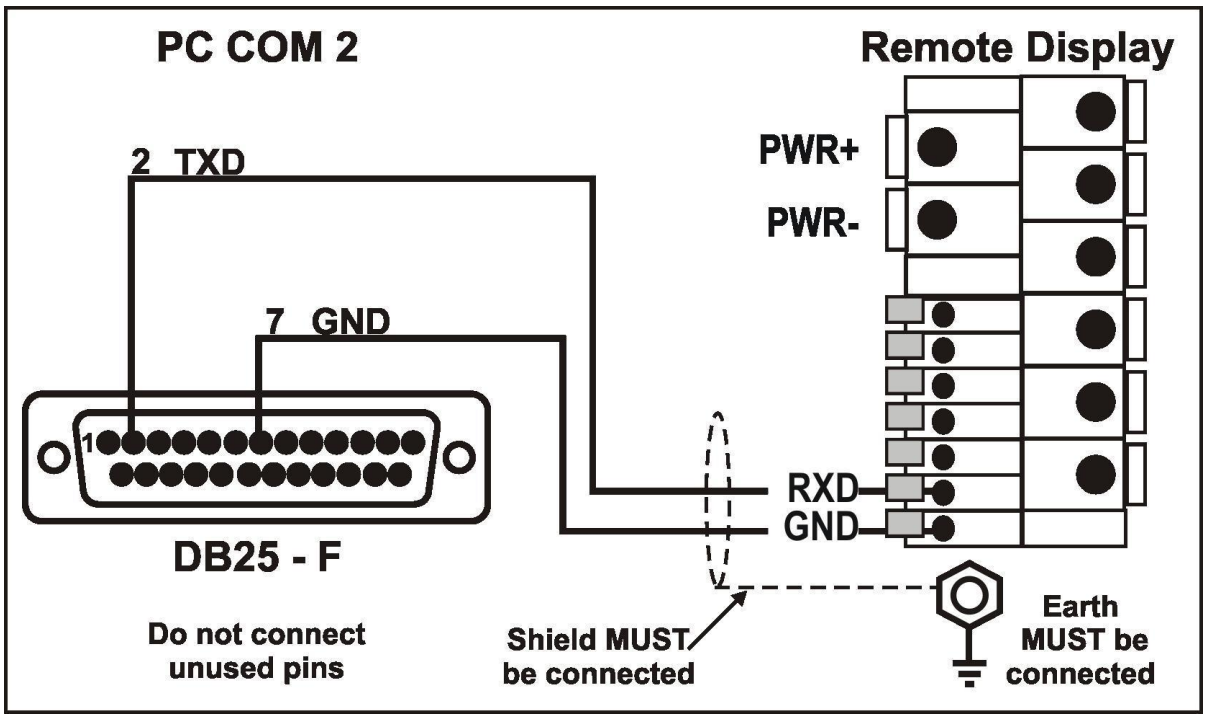


Direct Personal Computer Link

PC COM 1 (DB9)



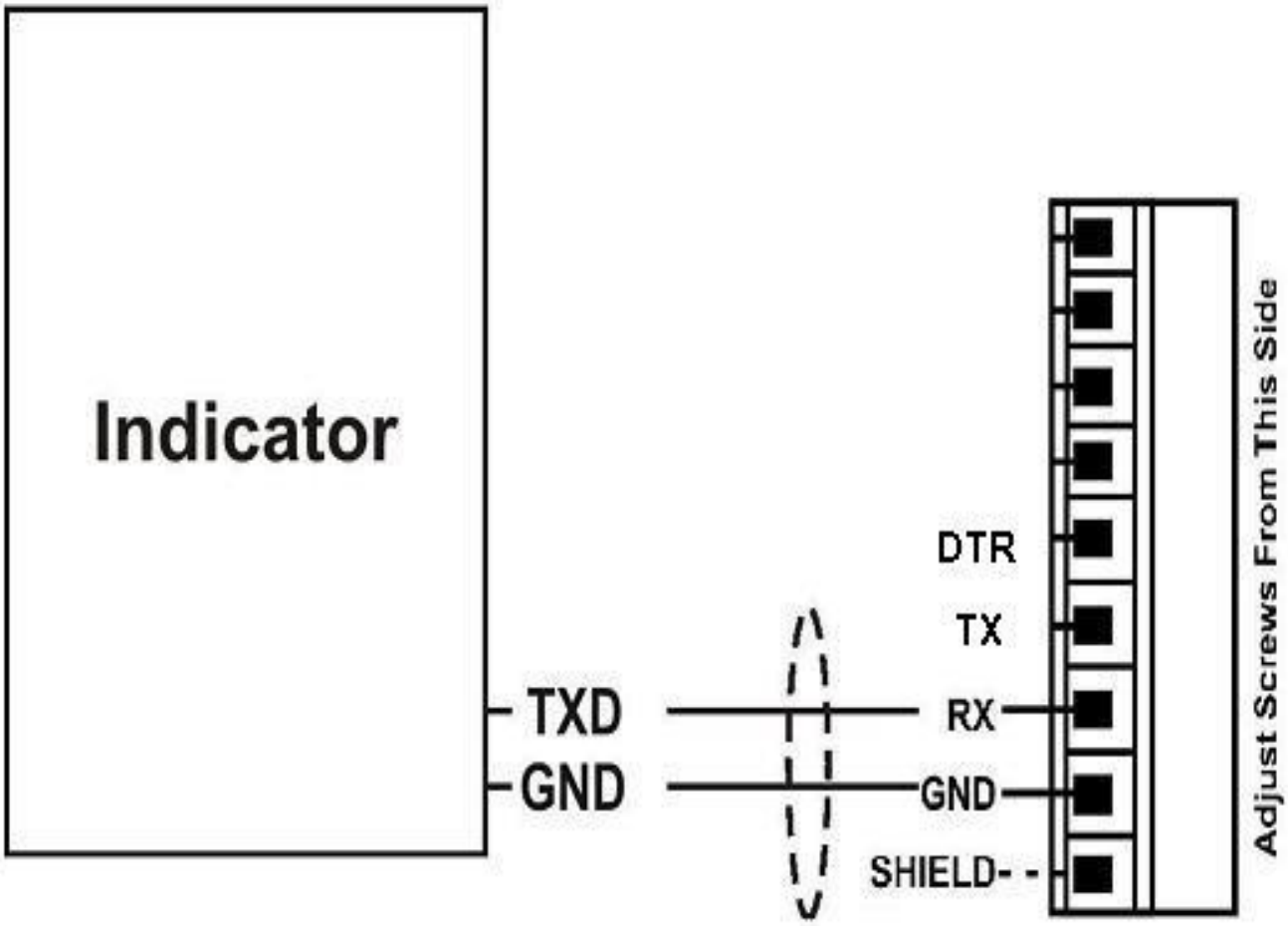
PC COM 2 (DB25)



4.6. XD30 RS-232 Serial Auxiliary Connection

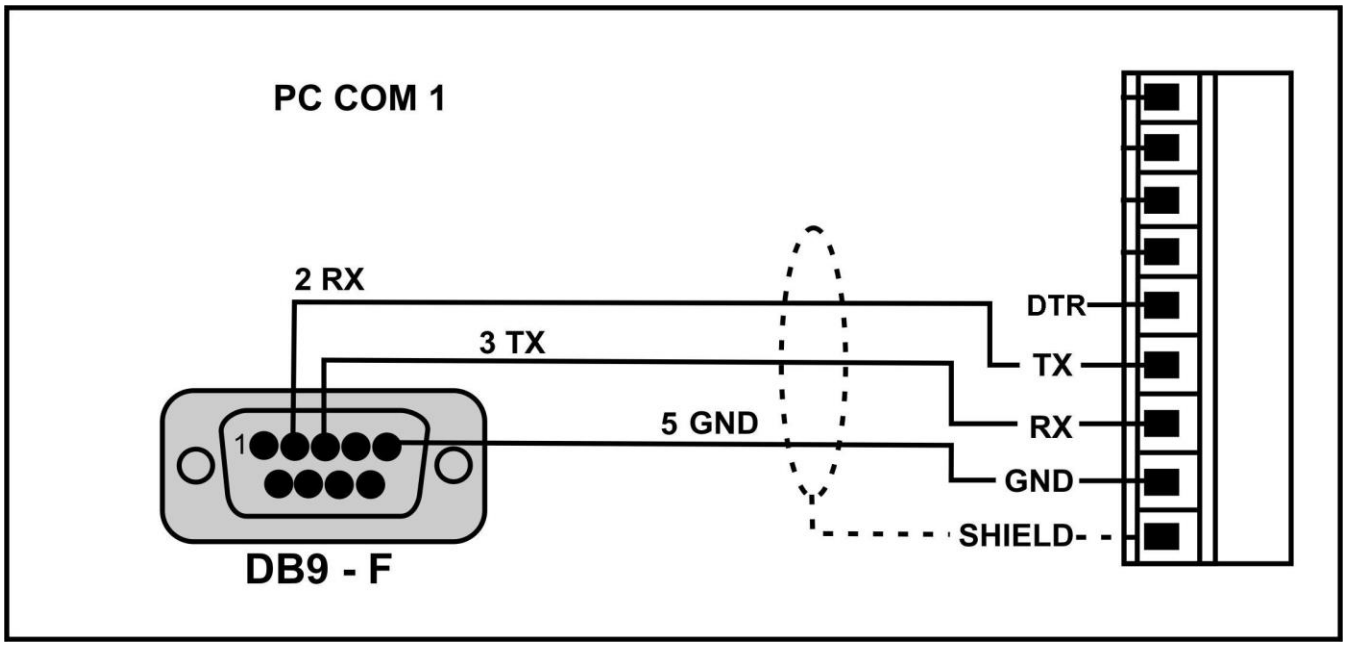
Remote Display

As a minimum the RXD and GND pins need to be connected to TXD and GND on the Indicator.

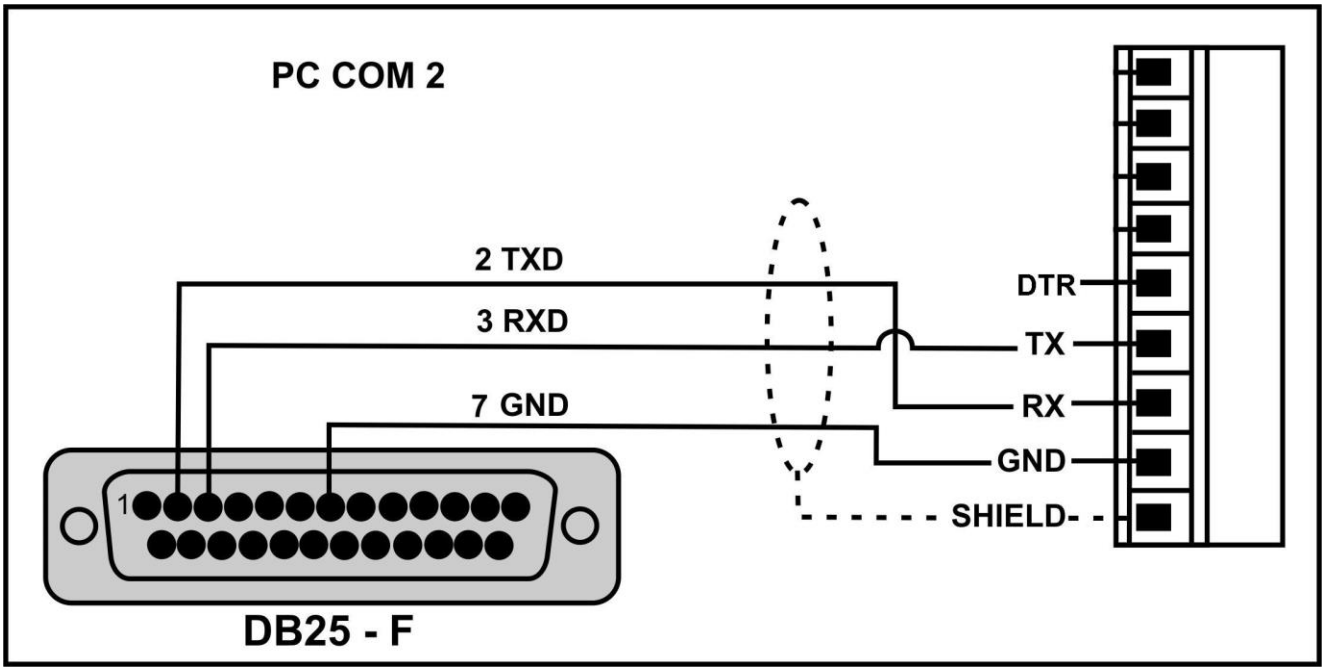


Direct Personal Computer Link

PC COM 1 (DB9)

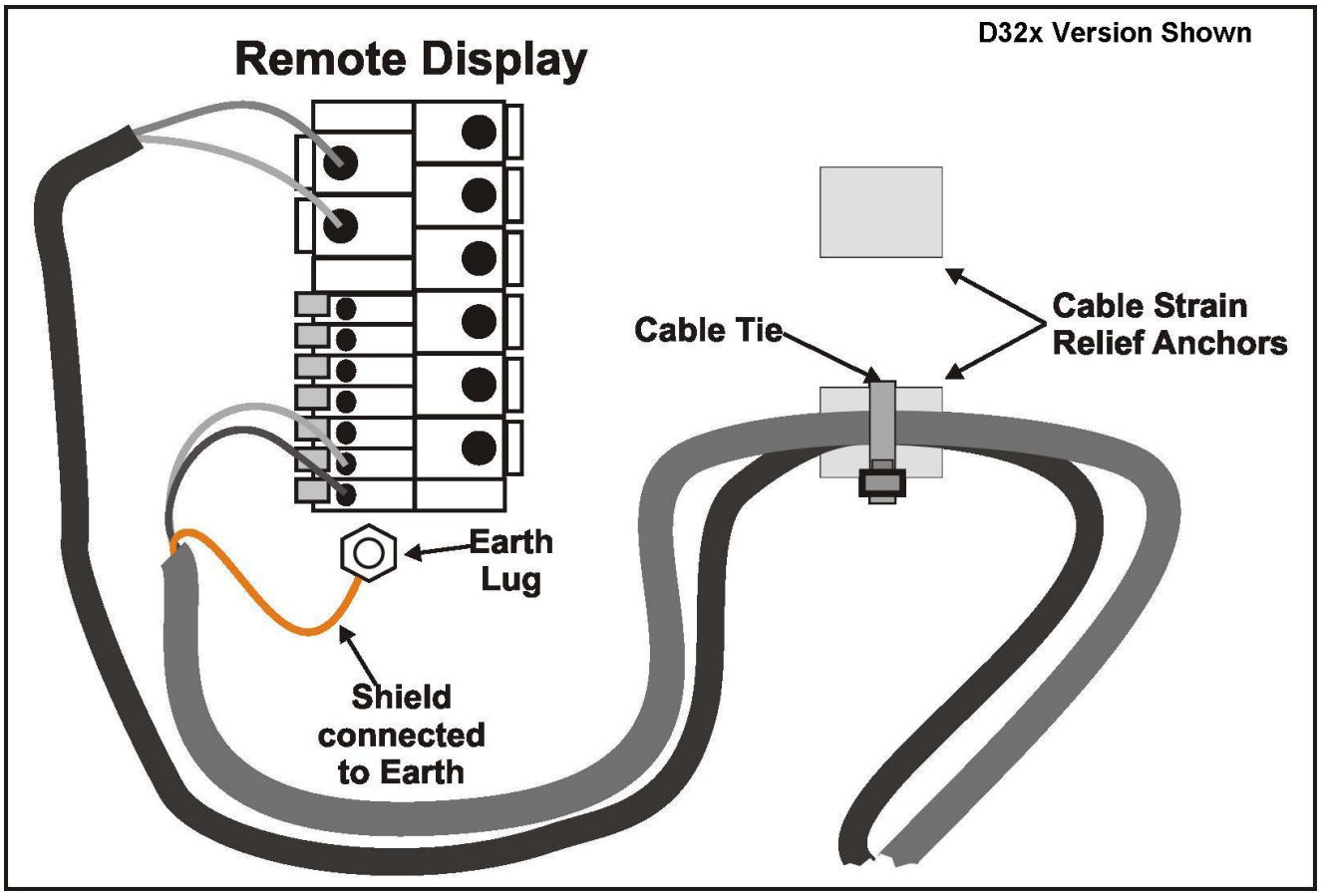


PC COM 2 (DB25)



4.7. Cable Shield Connection and Earthing

To obtain full EMC resistance cable shields MUST be connected to the earth lug/terminal on the rear of the display.



Care should be taken when connecting shields to maximise EMC or RFI immunity and minimise earth loops and cross-talk (interference) between instruments.

For full EMC or for RFI immunity, termination of the cable shields at the earth lug is very important. The earth lug of the instrument must be separately connected to ground potential via a reliable link.

The instrument should only 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.

5. Configuration

5.1. Baud (Serial Baud Rate)

Baud rate, parity and data bits are automatically detected. The baud rate can be 9600 or 19200. Parity and data bits supported are:

Parity	Data bits	Examples	Description
(N)one	8	N81, N82	No parity, 8 data bits, 1 or 2 stop bits
(E)ven	7	E71, E72	Even parity, 7 data bits, 1 or 2 stop bits
(O)dd	7	O71, O72	Odd parity, 7 data bits, 1 or 2 stop bits
(M)ark	7	M71, M72	Mark parity, 7 data bits, 1 or 2 stop bits
(S)pace	7	S71, S72	Space parity, 7 data bits, 1 or 2 stop bits

5.2. Delimiters

The instrument responds to any string that ends with the following:

CRLF (ASCII 013, 010), or

ENQ (ASCII 05), or

any string that starts with STX (ASCII 02) and ends with ETX (ASCII 03).

5.3. Address

The instrument has a default address of 01 however the address can be set to 02 on the DX30 by connecting the TXD output to the DTR input, or on the D32X by connecting the 2 pins above RXD. Most protocols are not addressed so this is usually not necessary.

5.4. Formats

The Protocol Table below lists the suggested corresponding manufacturer that each protocol aims to support. Note that compatibility is not guaranteed and manufacturers may change their protocol at any time without advice.

Protocol	Name	Protocol commonly used by indicators from:
1	Ranger A	GSE, HBM, PT, Rinstrum, Systec
2	Ranger B	Rinstrum
3	Ranger C	GSE, HBM, PT and Rinstrum
4	Ranger D	Rinstrum
5	PCMODE	Custom software
6	R series register write	GSE, Rinstrum
7	Avery string #7	Avery L105
8	Gedge C2	Gedge
9	Gedge C3	Gedge
10	AD standard string	A & D
11	AD4531	A & D
12	Toledo continuous	Toledo
13	GSE without COZ	GSE
14	GSE with COZ	GSE
15	Schenck without DP	Schenck
16	Schenck with DP	Schenck
17	Auto control string 1	Auto control
18	Auto control string 2	Auto control
19	Master	GSE, PT and Rinstrum
20	Sartorius	Sartorius
21	Soehnle without DP	Soehnle
22	Soehnle with DP	Soehnle
23	Flintab	Flintab
24	Philips	Philips
25	Condec	UMC, GSE, Rice Lake, Cardinal, Fairbanks, Eaton, Transcell
26	Rice Lake SCT	Rice Lake
27	Systec	Systec

5.4.1. Protocol 1: Ranger A

Character Number	0	1	2	3	4	5	6	7	8	9	10
Description	STX	Sign	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Status	ETX

Function	Description
STX	Start of Transmission Character (ASCII 02H).
Sign	Represents the sign of the weight reading (space for positive, dash (-) for negative. The sign character can be replaced by an **L** which disables the 10 display timeout (ie. forcing the display to lock on).
Weight	These seven characters are a string containing the current weight including the decimal point. If there is no decimal point, then the first character is a space. Examples: (300) with a leading space would represent 300 units. (3.00) Is another acceptable string.
Status	The status character provides information on the weight reading. The characters G/N/U/O/M/E represent Gross/Net/Underload/Overload/Motion/Error, respectively. A space (ASCII 20H) can also be sent. This character may only represent one status at any one time.
ETX	End of Transmission character (ASCII 03H).

5.4.2. Protocol 2: Ranger B

Character Number	0	1	2	3	4	5	6	7	8	9	10
Description	STX	Status	Sign	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Units
Character Number	11	12	13								
Description	Units	Units	ETX								

Function	Description
STX	Start of Transmission Character (ASCII 02H).
Sign	Represents the sign of the weight reading (space for positive, dash (-) for negative.
Weight	These seven characters are a string containing the current weight including the decimal point. If there is no decimal point, then the first character is a space. Examples: (300) with a leading space would represent 300 units. (3.00) Is another acceptable string.
Status	The status character provides information on the weight reading. The characters G/N/U/O/M/E represent Gross/Net/Underload/Overload/Motion/Error, respectively. A space (ASCII 20H) can also be sent. This character may only represent one status at any one time.
Units	A three character string, the first character being a space, followed by the actual units. eg. (kg) or (t). If the weight reading is not stable, the unit string is sent as ( ).
ETX	End of Transmission character (ASCII 03H).

5.4.3. Protocol 3: Ranger C

Character Number	0	1	2	3	4	5	6	7	8	9	10
Description	STX	Sign	Weight	Weight	Weight	Weight	Weight	Weight	Weight	S1	S2
Character Number	11	12	13	14	15	16					
Description	S3	S4	Units	Units	Units	ETX					

Function	Description
STX	Start of Transmission Character (ASCII 02H).
Sign	Represents the sign of the weight reading (space for positive, dash (-) for negative.
Weight	These seven characters are a string containing the current weight including the decimal point. If there is no decimal point, then the first character is a space. Examples: (300) with a leading space would represent 300 units. (3.00) Is another acceptable string, note that when the decimal point is added the leading space is removed.
S1	Can be G/N/U/O/E representing Gross/Net/Underload/Overload/Error, respectively. A space (ASCII 20H) can also be sent. This character may only represent one status at any one time.
S2	Can be M representing motion or a space to represent stable.
S3	Set to Z representing centre of zero or a space to represent non-zero.
S4	Set to one (1) to represent range one in dual-interval and dual range mode, set to two (2) to represent range two in dual-interval and dual range mode, otherwise send a dash (-).
Units	A three character string, the first character being a space, followed by the actual units. eg. (kg) or (t). If the weight reading is not stable, the unit string is sent as ( ).
ETX	End of Transmission character (ASCII 03H).

5.4.4. Protocol 4: Ranger D

Character Number	0	1	2	3	4	5	6	7	8	9
Description	STX	Sign	Weight	Weight	Weight	Weight	Weight	Weight	Weight	ETX

Function	Description
STX	Start of Transmission Character (ASCII 02H).
Sign	Represents the sign of the weight reading (space for positive, dash (-) for negative.
Weight	These seven characters are a string containing the current weight including the decimal point. If there is no decimal point, then the first character is a space. Examples: (300) with a leading space would represent 300 units. (3.00) Is another acceptable string.
ETX	End of Transmission character (ASCII 03H).

5.4.5. Protocol 5: PCMODE

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	STX	Text	Text	Text	Text	Text	Text	Text	Text	SPC	Address(0)	Address(1)	ETX

Function	Description
STX	Start of Transmission Character (ASCII 02H).
Text	These eight (8) characters will be displayed. They may be ASCII characters instead of numbers in which case the display will show text. These eight characters can include a decimal point and a leading minus to indicate sign. Example: (300) would represent 300 units. (- 3.00) a decimal point and minus sign can be used. (CEMENT) text can be sent. A capital L in position 1 will disable the remote display data timeout and can be used to lock the message on the display until new data is sent.
SPC	Space character (ASCII 20H).
Address	A two character field specifying the address of the unit to display the message. Note the unit will respond to its' address or a message for address 00 (broadcast).
ETX	End of Transmission character (ASCII 03H).

5.4.6. Protocol 6: R Series Register Write

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	Address(0)	Address(1)	Command (0)	Command (1)	Register(0)	Register(1)	Register(2)	Register(3)	Colon	Data(0)	Data(1)	Data(2)	Data(3)
Character Number	13	14	15	16	17	18							
Description	Data(4)	Data(5)	Data(6)	Data(7)	Terminator (0)	Terminator (1)							

Function	Description
Address	A two character field specifying the address of the unit to display the message. Note the unit will respond to its' address or a message for address 00 (broadcast).
Command(0-1)	Must be 12 (ASCII 31H, ASCII 32H).
Register(0-3)	Must be 000E (ASCII 30H, ASCII 30H, ASCII 30H, ASCII 45H).
Colon	This byte must be a colon (ASCII 3AH).
Data(0-7)	This is the string to be displayed on the Remote Display and may consist of text and or numbers.
Terminator(0-1)	These two characters signify the end of the signal and are represented by a carriage return and then a line feed or CRLF (ASCII 0DH, ASCII 0AH).

Note: When using this protocol the display timeout is disabled, which means that the message will remain on the display until new data is sent.

5.4.7. Protocol 7: Avery String #7

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	STX	Weight(0)	Weight(1)	Weight(2)	Weight(3)	Weight(4)	Weight(5)	Weight(6)	SPC	Units(0)	Units(1)	Units(2)	Units(3)
Character Number	13	14	15	16	17	18	19	20	21	22	23	24	25
Description	Units(4)	SPC	S1	SPC	Con(0)	Con(1)	Con(2)	Con(3)	Con(4)	Con(5)	SPC	Ignore	CR
Character Number	26	27											
Description	LF	ETX											

Function	Description
STX	Start of Transmission Character (ASCII 02H).
Weight	The numbers to be displayed on the remote display. These seven characters can include a decimal point and a leading minus to indicate sign. E.g. (300) with leading spaces would represent 300 units. (3.00) Is another acceptable string, this time with a decimal point instead of one of the characters. (-30.000) Here we have the weight with the sign attached. Note because of the sign and the decimal point only five number characters are sent.
Units	A five character unit string.
SPC	Space character (ASCII 20H).
S1	Can be G or N to indicate Gross or Net respectively.
Con	Consecutive numbers, are not used by the remote display.
CR	Carriage Return character (ASCII 0DH)
LF	Line Feed character (ASCII 0AH)
ETX	End of Transmission character (ASCII 03H).

5.4.8. Protocol 8: Gedge C2

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	STX	Weight(0)	Weight(1)	Weight(2)	Weight(3)	Weight(4)	Weight(5)	Weight(6)	Weight(7)	S1	S2	S3	Ignore
Character Number	13	14	15										
Description	SPC	SPC	ETX										

Function	Description
STX	Start of Transmission Character (ASCII 02H).
Weight(0-7)	The numbers to be displayed on the remote display. These eight characters can include a decimal point and a leading minus to indicate sign. E.g. (00000300) with leading zeroes would represent 300 units. (00003.00) Is another acceptable string, this time with a decimal point instead of one of the characters. (-0003.00) Here we have the weight with the sign attached. Note because of the sign and the decimal point only six number characters are sent.
S1	Can be G or N to indicate Gross or Net respectively.
S2	Can be M or S to indicate Motion or Stable respectively
S3	Can be I,O or U to indicate In scale, Over range or Under range respectively.
SPC	Space character (ASCII 20H).
ETX	End of Transmission character (ASCII 03H).

5.4.9. Protocol 9: Gedge C3

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	STX	Gross(0)	Gross(1)	Gross(2)	Gross(3)	Gross(4)	Gross(5)	Gross(6)	Gross(7)	Tare(0)	Tare(1)	Tare(2)	Tare(3)
Character Number	13	14	15	16	17	18	19	20	21	22	23	24	25
Description	Tare(4)	Tare(5)	Tare(6)	Tare(7)	Net(0)	Net(1)	Net(2)	Net(3)	Net(4)	Net(5)	Net(6)	Net(7)	S1
Character Number	26	27	28	29	30	31							
Description	S2	S3	Ignore	SPC	SPC	ETX							

Function	Description
STX	Start of Transmission Character (ASCII 02H).
Gross	The numbers to be displayed on the remote display When S1 equals G. These eight characters can include a decimal point and a leading minus to indicate sign. E.g. (00000300) with leading zeroes would represent 300 units. (00003.00) Is another acceptable string, this time with a decimal point instead of one of the characters. (-0003.00) Note because of the sign and the decimal point only six number characters are sent.
Tare	Not used by the remote display
Net	The numbers to be displayed on the remote display When S1 equals N. These eight characters can include a decimal point and a leading minus to indicate sign. Examples as for Gross.
S1	Can be G or N to indicate Gross or Net respectively.
S2	Can be M or S to indicate Motion or Stable respectively
S3	Can be I,O or U to indicate In scale, Over range or Under range respectively.
SPC	Space character (ASCII 20H).
ETX	End of Transmission character (ASCII 03H).

5.4.10. Protocol 10: AD Standard String

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	HeaderA(0)	HeaderA(1)	Comma	HeaderB(0)	HeaderB(1)	Comma	Sign	Weight(0)	Weight(1)	Weight(2)	Weight(3)	Weight(4)	Weight(5)
Character Number	13	14	15	16	17								
Description	Weight(6)	Units(0)	Units(1)	CR	LF								

Function	Description
HeaderA	This header can be ST, UN or OL representing stable, unstable and out of scale range.
Comma	Comma (ASCII 2CH).
HeaderB	This second header can be GS - gross weight, NT - Net weight, TR - Tare and PT - Preset Tare. The NET annunciator will be on for Net weight and off for all other weights.
Sign	The sign of the weight reading (plus (+) for positive, dash (-) for negative). It is also used to show the direction of out of scale range: + for overload and – for underload.
Weight	These seven characters are a string containing the current weight including the decimal point. If there is no decimal point, then the last character is a period. Leading zero blanking applies. During overload or underload the weight reading will be spaces. E.g. (000300.) Note the trailing period, this string would represent 300 units. (0003.00) Is another acceptable string, note that when the decimal point is added the period at the end is removed.
Units	A two character unit string. A leading space is used for single character units. Eg. (kg) (t) (lb) (g)
CR	Carriage Return character (ASCII 0DH).
LF	Line Feed character (ASCII 0AH).

5.4.11. Protocol 11: AD4531

Character Number	0	1	2	3	4	5	6	7	8	9	10
Description	Header(0)	Header(1)	Comma	Sign	Weight(0)	Weight(1)	Weight(2)	Weight(3)	Weight(4)	CR	LF

Function	Description
Header	This header can be WT when in normal mode or OL to represent out of scale range.
Comma	Comma (ASCII 2CH).
Sign	The sign of the weight reading (plus (+) for positive, dash (-) for negative). If the unit rests at zero the sign will be a plus. It is also used to show the direction of out of scale range: + for overload and – for underload.
Weight	These five characters are a string containing the current weight including the decimal point. If there is no decimal point, then a preceding zero is used. Leading zero blanking applies. During overload or underload the weight reading will be 99.99 with the sign representing which one it is. E.g. (00300) This string would represent 300 units. (03.00) Shows the string format when a decimal point is added.
CR	Carriage Return character (ASCII 0DH).
LF	Line Feed character (ASCII 0AH).

5.4.12. Protocol 12: Toledo Continuous

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	STX	SW(A)	SW(B)	SW(C)	Weight (0)	Weight (1)	Weight (2)	Weight (3)	Weight (4)	Weight (5)	Tare(0)	Tare(1)	Tare(2)
Character Number	13	14	15	16									
Description	Tare(3)	Tare(4)	Tare(5)	CR									

Function	Description
STX	Start of Transmission Character (ASCII 02H).
SW	SW A, B and C are each a collection of status bits. The relevant bits of the three characters are shown below in tabular form. All other status bits are ignored.
Weight	These six characters are a string containing the current gross or net weight not including the decimal point or a sign.
Tare	Not used by the remote display
CR	Carriage return character (ASCII 0DH).

SW A Bits 0,1 and 2			
Bits			**Decimal Point Location**
0	**1**	**2**	
0	0	0	XXXX00
1	0	0	XXXXX0
0	1	0	XXXXXX
1	1	0	XXXXX.X
0	0	1	XXXX.XX

SW B Bits 0,1,2,3 and 4	
Status Bits	**Function**
Bit 0	Gross = 0, Net = 1
Bit 1	Sign, Positive = 0, Negative = 1
Bit 2	Out of Range = 1 (overload or underload)
Bit 3	Motion = 1
Bit 4	lb = 0, kg = 1 (see also SW C)

SW C Bits 0,1 and 2			
Bits			**Units**
0	**1**	**2**	
0	0	0	lb or kg, selected by SW B bit 4
1	0	0	grams (g)
0	1	0	tons (t)

5.4.13. Protocol 13 GSE Without COZ

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	Weight(0)	Weight(1)	Weight(2)	Weight(3)	Weight(4)	Weight(5)	Weight(6)	Weight(7)	SPC	Units(0)	Units(1)	Units(2)	Units(3)
Character Number	13	14	15	16	17	18	19	20	21	22			
Description	Units(4)	SPC	Mode(0)	Mode(1)	Mode(2)	Mode(3)	Mode(4)	S1	CR	LF			

Function	Description
Weight	The numbers to be displayed on the remote display. These eight characters can include a decimal point and a leading minus to indicate sign. E.g. (300) would represent 300 units. (3.00) Is another acceptable string, this time with a decimal point instead of one of the characters. (- 3.00) Note because of the sign and the decimal point only six number characters are sent.
Units	A five character unit string. Trailing spaces are used. Eg. (kg) (lb) (t)
Mode	Gross, Net or Tare with trailing spaces. Used to actuate the Net annunciator
S1	M = Motion, S = Stable, O = Overload or Underload, E = Error
CR	Carriage return character (ASCII 0DH).
LF	Line feed character (ASCII 0AH).
SPC	Space character (ASCII 20H).

5.4.14. Protocol 14: GSE With COZ

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	Weight(0)	Weight(1)	Weight(2)	Weight(3)	Weight(4)	Weight(5)	Weight(6)	Weight(7)	SPC	Units(0)	Units(1)	Units(2)	Units(3)
Character Number	13	14	15	16	17	18	19	20	21	22	23		
Description	Units(4)	SPC	Mode(0)	Mode(1)	Mode(2)	Mode(3)	Mode(4)	S1	S2	CR	LF		

Function	Description
Weight	The numbers to be displayed on the remote display. These eight characters can include a decimal point and a leading minus to indicate sign. E.g. (300) would represent 300 units. (3.00) Is another acceptable string, this time with a decimal point instead of one of the characters. (- 3.00) Note because of the sign and the decimal point only six number characters are sent.
Units	A five character unit string. Trailing spaces are used. Eg. (kg) (lb) (t)
Mode	Gross, Net or Tare with trailing spaces. Used to actuate the Net annunciator
S1	M = Motion, S = Stable, O = Overload or Underload, E = Error
S2	Z = Centre of Zero, Space for not centre of zero
CR	Carriage return character (ASCII 0DH).
LF	Line feed character (ASCII 0AH).
SPC	Space character (ASCII 20H).

5.4.15. Protocol 15: Schenk Without DP

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	STX	Ignore	Ignore	Ignore	Sign	Net(0)	Net(1)	Net(2)	Net(3)	Net(4)	Tare(0)	Tare(1)	Tare(2)
Character Number	13	14	15	16	17	18	19	20	21	22	23		
Description	Tare(3)	Tare(4)	Tare(5)	Tare(6)	Tare(7)	Tare(8)	SPC	S1	S2	LF	CR		

Function	Description
STX	Start of Transmission Character (ASCII 02H).
Sign	Represents the sign of the weight reading (space for positive, dash (-) for negative.
Net	The numbers to be displayed on the remote display. E.g. (300) would represent 300 units.
Tare	Not used by the remote display.
SPC	Space character (ASCII 20H).
S1	ASCII character (0-F) with values as shown in the table below
S2	ASCII character (0-F) with values as shown in the table below
LF	Line feed character (ASCII 0AH).
CR	Carriage return character (ASCII 0DH).

S1 Bit	S1 Status
0	Tare=0, preset Tare=1 Only used in Net mode.
1	Motion = 0, Stable=1
2	Not COZ=0, COZ=1
3	Gross=0, Net=1

S2 Value	S2 Status
0	Units = kg
1	Units = g
3	Units = T
5	Weight longer than string, Display will be blanked.

5.4.16. Protocol 16: Schenk With DP

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	STX	Ignore	Ignore	Ignore	Sign	Net(0)	Net(1)	Net(2)	Net(3)	Net(4)	Net(5)	Tare(0)	Tare(1)
Character Number	13	14	15	16	17	18	19	20	21	22	23	24	25
Description	Tare(2)	Tare(3)	Tare(4)	Tare(5)	Tare(6)	Tare(7)	Tare(8)	Tare(9)	SPC	S1	S2	LF	CR

Function	Description
STX	Start of Transmission Character (ASCII 02H).
Sign	Represents the sign of the weight reading (space for positive, dash (-) for negative.
Net	The numbers to be displayed on the remote display. These six characters include a decimal. E.g. (300.0) with leading spaces would represent 300 units.
Tare	Not used by the remote display.
SPC	Space character (ASCII 20H).
S1	ASCII character (0-F) with values as shown in the table below
S2	ASCII character (0-F) with values as shown in the table below
LF	Line feed character (ASCII 0AH).
CR	Carriage return character (ASCII 0DH).

S1 Bit	S1 Status
0	Tare=0, preset Tare=1 Only used in Net mode.
1	Motion = 0, Stable=1
2	Not COZ=0, COZ=1
3	Gross=0, Net=1

S2 Value	S2 Status
0	Units = kg
1	Units = g
3	Units = T
5	Weight longer than string, Display will be blanked.

5.4.17. Protocol 17: Auto Control String 1

Character Number	0	1	2	3	4	5	6
Description	STX	Address	Weight(0)	Weight(1)	Weight(2)	Weight(3)	ETX

Function	Description
STX	Start of Transmission Character (ASCII 02H).
Address	A single character field specifying the address of the unit to display the message. The address is fixed as 1 for this string so the unit must be set to address 1 to display this string.
Weight	The numbers to be displayed on the remote display. These four characters can include a decimal point and a leading minus to indicate sign. E.g. (300) with leading space would represent 300 units. (3.00) Is another acceptable string, this time with a decimal point instead of one of the characters. (-3.0) Here we have the weight with the sign attached. Note because of the sign and the decimal point only two number characters are sent.
ETX	End of Transmission character (ASCII 03H).

5.4.18. Protocol 18: Auto Control String 2

Character Number	0	1	2	3	4	5	6	7	8	9	10
Description	STX	Address	Text(0)	Text(1)	Text(2)	Text(3)	Text(4)	Text(5)	Text(6)	Text(7)	ENQ

Function	Description
STX	Start of Transmission Character (ASCII 02H).
Address	A single character field specifying the address of the unit to display the message. The address is fixed as 2 for this string so the unit must be set to address 2 to display this string.
Text	These eight (8) characters will be displayed. They may be ASCII characters instead of numbers in which case the display will show text. These eight characters can include a decimal point and a leading minus to indicate sign. Example: (300) would represent 300 units. (- 3.00) a decimal point and minus sign can be used. (CEMENT) text can be sent.
ENQ	Used as end of transmission character (ASCII 05H).

5.4.19. Protocol 19: Master

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	Byte(0)	Byte(1)	Byte(2)	Byte(3)	Byte(4)	Byte(5)	Byte(6)	Byte(7)	Colon	Byte(8)	Byte(9)	Byte(10)	Byte(11)
Character Number	13	14	15	16	17	18	19	20	21	22	23	24	25
Description	Byte(12)	Byte(13)	Byte(14)	Byte(15)	Byte(16)	Byte(17)	Byte(18)	Byte(19)	Byte(20)	Byte(21)	Byte(22)	Byte(23)	Byte(24)
Character Number	26	27	28	29	30								
Description	Byte(25)	Byte(26)	Byte(27)	CR	LF								

Function	Description
Byte	Byte 0-7 contains header information, byte 8-24 contains the master LCD data.
Colon	This byte must be a colon (ASCII 3AH).
CR	Carriage return character (ASCII 0DH).
LF	Line feed character (ASCII 0AH).

5.4.20. Protocol 20: Sartorius

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	Ignore	Ignore	Ignore	Ignore	Ignore	Ignore	Sign	SPC	Weight(0)	Weight (1)	Weight (2)	Weight (3)	Weight (4)
Character Number	13	14	15	16	17	18	19	20	21				
Description	Weight (5)	Weight (6)	Weight (6)	SPC	Units(0)	Units(1)	Units(2)	CR	LF				

Function	Description
Sign	Represents the sign of the weight reading (+ for positive, dash (-) for negative.
Weight	The numbers to be displayed on the remote display. E.g. (300) would represent 300 units.
Units	A three character unit string. Trailing spaces are used. Eg. (kg) (lb) (t).
SPC	Space character (ASCII 20H).
LF	Line feed character (ASCII 0AH).
CR	Carriage return character (ASCII 0DH).

5.4.21. Protocol 21: Soehnle Without DP

Character Number	0	1	2	3	4	5	6	7	8	9	10
Description	S1	Weight(0)	Weight (1)	Weight (2)	Weight (3)	Weight (4)	ESC	Ignore	Units	CR	LF

Function	Description
S1	N = Net, M = Net + COZ, O = COZ
Units	0 = motion, 1 = grams, 2 = kilograms.
Weight	The numbers to be displayed on the remote display. E.g. (300) would represent 300 units.
ESC	Escape character (ASCII 1BH).
CR	Carriage return character (ASCII 0DH).
LF	Line feed character (ASCII 0AH).

5.4.22. Protocol 22: Soehnle With DP

Character Number	0	1	2	3	4	5	6	7	8	9	10	11
Description	S1	Weight (0)	Weight (1)	Weight (2)	Weight (3)	Weight (4)	Weight (5)	ESC	Ignore	Units	CR	LF

Function	Description
S1	N = Net, M = Net + COZ, O = COZ
Units	0 = motion, 1 = grams, 2 = kilograms.
Weight	The numbers to be displayed on the remote display. E.g. (300.0) would represent 300 units.
ESC	Escape character (ASCII 1BH).
CR	Carriage return character (ASCII 0DH).
LF	Line feed character (ASCII 0AH).

5.4.23. Protocol 23: Flintab

Normal Operation:

Character Number	0	1	2	3	4	5	6	7	8	9	10
Description	S1	S2	Sign	Weight	Weight	Weight	Weight	Weight	Weight	CR	LF

Function	Description
S1	B = Gross, N = Net
S2	# = Motion, Space = Stable
Sign	Represents the sign of the weight reading (space for positive, dash (-) for negative.
Weight	The numbers to be displayed on the remote display.The weight value is 5 digits plus an optional decimal point. If a decimal point is not used then the weight field shortens to only 5 characters. This means the overall string is 1 character shorter
CR	Carriage return character (ASCII 0DH).
LF	Line feed character (ASCII 0AH).

Overload / Underload:

Character Number	0	1	9	10
Description	O	L	CR	LF

5.4.24. Protocol 24: Philips

Character Number	0	1	2	3	4	5	6	7	8	9	10
Description	STX	Ignored	S1	Ignored	SPC	SPC	Weight(0)	Weight(1)	Weight(2)	Weight(3)	ETX

Function	Description
S1	0 = Motion, 1 = COZ, 2 = Stable
SPC	Space character (ASCII 20H).
Weight	The numbers to be displayed on the remote display. E.g. (300) would represent 300 units.
STX	Start of Transmission character (ASCII 02H).
ETX	End of Transmission character (ASCII 03H).

5.4.25. Protocol 25: Condec

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Description	STX	Sign	Weight(0)	Weight(1)	Weight(2)	Weight(3)	Weight(4)	Weight(5)	Weight(6)	Units	S1	S2	CR	LF

Function	Description
STX	Start of Transmission Character (ASCII 02H).
Sign	Represents the sign of the weight reading (space for positive, dash (-) for negative.
Weight(0-6)	These seven characters are a string containing the current weight including the decimal point. If there is no decimal point, then the first character is a space. Leading zero suppression is applied. Examples: (300) will display as “300” (0030.00 will display as “30.00”
Units	L = Lb, K = kg
S1	G = Gross, N = Net
S2	Space = OK, M = Motion, O = Overload/Underload
CR	Carriage return character (ASCII 0DH).
LF	Line feed character (ASCII 0AH).

5.4.26. Protocol 26: Rice Lake SCT

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	Status(0)	Status(1)	Comma	Mode(0)	Mode(1)	Comma	Weight(0)	Weight(1)	Weight(2)	Weight(3)	Weight(4)	Weight(5)	Weight(6)
Character Number	13	14	15	16	17	18							
Description	Weight(7)	Comma	Unit(0)	Unit(1)	CR	LF							

Function	Description
Status	US = Motion, ST = Stable, OL = Overload, UL = Underload
Mode	Gross(GS), Net (NT) Used to actuate the Net annunciator
Weight	The numbers to be displayed on the remote display. These eight characters can include a decimal point and a leading minus to indicate sign. E.g. (300) would represent 300 units. (3.00) Is another acceptable string, this time with a decimal point instead of one of the characters. (- 3.00) Note because of the sign and the decimal point only six number characters are sent.
Units	A two character unit string. Leading spaces are used. If no units two spaces are sent. Eg. (kg) (lb) (t) (g) ( )
Comma	Comma character (ASCII 2CH).
CR	Carriage return character (ASCII 0DH).
LF	Line feed character (ASCII 0AH).

5.4.27. Protocol 27: Systec

Character Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Description	Status(0)	Status(1)	Weight(0)	Weight(1)	Weight(2)	Weight(3)	Weight(4)	Weight(5)	Weight(6)	Weight(7)	Weight(8)	Weight(9)	SPC
Character Number	13	14	15	16									
Description	Unit(0)	Unit(1)	CR	LF									

Function	Description
Status	SD = Motion, S_ = Stable
Weight	The numbers to be displayed on the remote display. These eight characters can include a decimal point and a leading minus to indicate sign. E.g. (300) would represent 300 units. (3.00) Is another acceptable string, this time with a decimal point instead of one of the characters. (- 3.00) Note because of the sign and the decimal point only six number characters are sent.
SPC	Space character (ASCII 20H)
Units	A two character unit string. Leading spaces are used. If no units two spaces are sent. Eg. (kg) (lb) (t) (g) ( )
CR	Carriage return character (ASCII 0DH).
LF	Line feed character (ASCII 0AH).

6. Diagnostic Errors

The instrument continually monitors the condition of the internal circuits. Any faults or out-of-tolerance conditions are shown on the display as an **E** type error message.

In the table below the following terms are used:

Check: This item can be checked on site by service personnel.

Return for Service: The instrument must be returned to the manufacturer for factory service.

Error	Description	Resolution
(E0001)	The power supply voltage is too low.	Check supply
(E0002)	The power supply voltage is too high.	Check scale / cables
(E0004)	Communications data error (usually self-correcting).	Check transmission format, baud rate, stop bits & parity
(- - - - - -)	Communications timeout (more than 1.5 seconds since the last valid communication from the master, usually self-correcting).	Check scale / cables

The **E** type error messages are additive. For example if power supply voltage is too low and a communications data error occurs, the resulting error message will be **E0005** (0001 + 0004).

Notes:

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Remote Display Installation Manual – Software Version 4.x

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