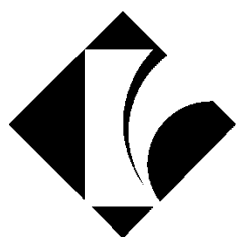


SMART WEIGHING SOLUTIONS



**rinstrum**

**D840/D820**

**Remote Display  
Installation Manual**

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## 1. Specifications

<b>Display</b>	
Display	D840 – Full LED Dot Matrix with up to seven (7) full alpha numeric characters with decimal point at 120 degrees viewing angle. <ul style="list-style-type: none"> <li>• Character size (H x W) – 100mmx60mm (4"x2.4")</li> <li>• 14 x 64 LED matrix at 14 x 8 LEDs per character</li> <li>• Status annunciators for Motion, Centre of Zero and Net</li> <li>• kg, lb, t and g units</li> <li>• 50mm (2") round RED and GREEN traffic lights</li> </ul> D820 – Full LED Dot Matrix with up to six (6) full alpha numeric characters with decimal point at 120 degrees viewing angle. <ul style="list-style-type: none"> <li>• Character size (H x W) – 50mmx46mm (2"x1.8")</li> <li>• 7 x 35 LED matrix at 7 x 5 LEDs per character</li> <li>• Status annunciators for Motion, Centre of Zero and Net</li> <li>• kg or lb units indication</li> </ul>
<b>Performance</b>	
Visibility	D840 – Greater than 30m (100 feet) at 120 degrees viewing angle D820 – Greater than 15m (50 feet) at 120 degrees viewing angle
Update Rate	Dependant on data update rate
Operating Environment	Temperature: –10 to +50°C, -14 to 122°F case temperature Humidity: <90%RH non-condensing Storage: –20 to +60°C, -4 to 140°F ambient
<b>Digital</b>	
Setup	Automatic detection with adjustment via a command string
Memory	Full non-volatile operation
<b>Dimensions</b>	
External Dimensions L x H x D	D840 – 765mmx150mmx80mm (30.1"x5.9"x3.2") D820 – 485mmx150mmx80mm (19.1"x5.9"x3.2")
Display Window L x H	D840 – 515mmx115mm (20.3"x4.5") D820 – 325mmx80mm (12.8"x3.2")
Weight	D840 - 4.6 kg (10.2 lb) D820 - 3.6 kg (8 lb)
<b>Power</b>	
AC Power	D840 - 110-240VAC 50/60Hz 32W MAX D820 - 110-240VAC 50/60Hz 17W MAX
DC Power (option)	D840 - 24VDC (18–36VDC) 30W MAX D820 - 24VDC (18–36VDC) 9 W MAX
<b>Features</b>	
Data Inputs	RS-232 – two wire, receive only RS-485 – two wire, receive only Ethernet (Optional)
Baud Rate	Auto detect 2400 to 19200 baud, Auto Parity and Bit detection
Unit Addressing	Up to 100 addresses supported (0-99)
Display Timeout	5 seconds on data loss (default), adjustable

Traffic lights	Controlled by digital inputs or byte in supported protocol. D840 - Red and Green D820 - show "STOP" for red, "GO" for green and "-----" for both												
Weight Display	D820 six (6) digits plus decimal point, D840 six (6) digits plus decimal point and annunciators or seven (7) plus decimal point for text-based protocols. Weight readings, setup information and errors will be shown. The decimal point will be displayed between digits as a single LED in the D820 and two LEDS in the D840. The decimal point does not affect number of digits displayed.												
Units	Sticker to indicate the measurement units of the displayed reading or shown with annunciators if configured.												
Annunciators	Where the annunciators are supported in the protocol, there are three annunciator conditions. Notes: <ul style="list-style-type: none"> <li>○ Some protocols do not support all annunciators</li> <li>○ Symbols are displayed directly or indicated using labels</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Symbol</th> <th style="text-align: center;">Name</th> <th style="text-align: center;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">→0←</td> <td style="text-align: center;">ZERO</td> <td>Indicated when the indicator is displaying Centre Of Zero.</td> </tr> <tr> <td style="text-align: center;">N</td> <td style="text-align: center;">NET</td> <td>Indicated when the indicator shows NET weight.</td> </tr> <tr> <td style="text-align: center;">~</td> <td style="text-align: center;">MOTION</td> <td>Indicated when the indicator reading is not stable.</td> </tr> </tbody> </table>	Symbol	Name	Description	→0←	ZERO	Indicated when the indicator is displaying Centre Of Zero.	N	NET	Indicated when the indicator shows NET weight.	~	MOTION	Indicated when the indicator reading is not stable.
Symbol	Name	Description											
→0←	ZERO	Indicated when the indicator is displaying Centre Of Zero.											
N	NET	Indicated when the indicator shows NET weight.											
~	MOTION	Indicated when the indicator reading is not stable.											
Brightness Control	Auto Brightness 10 steps (default), adjustable												
Approvals	FCC, CE, C-tick												
NTEP Multi Zero support	Multi zero support only applies to supported indicators and protocols. If the division size is 1x or higher, when the weight display returns to Zero the D840/D820 will also display the trailing zero.  Example: With the count set to 20, an indicator displays 00 at zero load. The D840/D820 will also show 00 at zero as there is no leading zero blanking.  NTEP is the National Type Evaluation Program in the US.												
<b>Optional Accessories</b>													
	Weather Hood												
	Pole mounting plate (RAM and VESA mounting compatible)												

## 2. Installation

### 2.1. Introduction

The D840 and D820 are super bright LED displays that feature full alpha numeric characters. These displays are capable of interpreting and displaying formatted weight transmissions from digital weight indicators. Additionally they can be used to display text.

The D840 remote display is capable of displaying up to 7 alpha numeric digits on a LED matrix. *Motion* and *Net* annunciators are graphically shown on the D840 display with the *Centre of Zero* shown as a pointer to a label. Weighing units kg, lb, g and t can also be graphically displayed. The complete annunciator section can also be left or right hand justified of the weight string.

The D820 remote display is capable of displaying up to 6 alpha numeric digits on a LED matrix. The D820 uses indication LEDs and labels to indicate *Motion*, *Centre of Zero* and *Net* which are fixed to the left hand side of the display. Weighing units kg or lb can be shown by the indication LEDs located on the lower left of the display with an optional label.

The serial interface supports RS-232 and RS-485 as standard with an Ethernet option also available. Facilities for automatic selection of data source and baud rate are also standard. The remote displays are individually addressable which allows a single device to send targeted information to multiple displays.

These units are suitable to use in external applications and are designed to an IP65 rating. An optional weather hood is available to minimise effects of direct sunlight. The unit can be mounted on a flat surface with standard brackets or fixed to a pole using the optional mounting plate. The mounting plate also supports RAM and VESA mounting brackets.

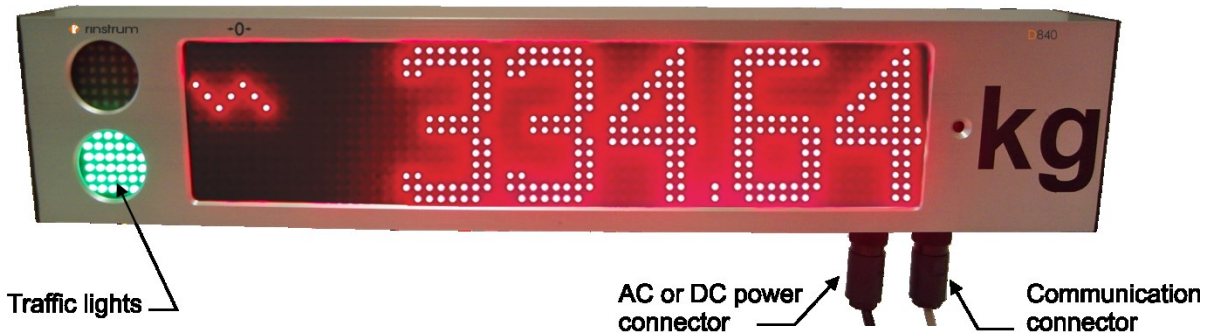


Figure 1 - D840 remote display



Figure 2 - D820 remote display

**2.2. Important**

The D840 and D820 remote display units contain precision electronics and must not be subjected to shock, excessive vibration, or extremes of temperature, either before or after installation.

The serial and power inputs of the displays are protected against electrical interference; however excessive levels of electro-magnetic interference may affect the operation of the instrument. The remote display units should be installed away from any sources of electrical noise and the power and data cables should run separately from other sources of electrical interference.

The housing is rated to IP65 with a breather valve located on the underside of the extrusion to prevent condensation build up. This area should not be subject to high pressure water or other fluids else internal damage may occur.

There are no user serviceable parts inside. **Warranty will be void if the housing is opened or either of the seals are broken.** All connections are made at the external sockets located on the bottom, right hand side. Ensure power cable is not connected to a live source before terminating the power connector. Make sure the environment is dry when terminating to prevent moisture ingress into sealed connectors.



**Disconnect power before opening cable connector**

**2.3. Power Connection**

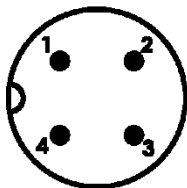
The D840 and D820 remote displays' are available with two different power input variants, AC and DC.

**Note:** The power connection should be performed in accordance with local regulations.

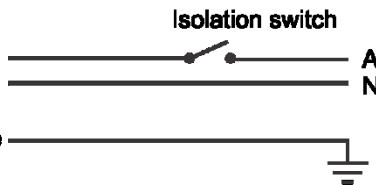
**2.3.1. AC variant**

Use an AC power source of 110-240VAC. The *Protective Earth* pin 4 **MUST** be connected to AC mains earth for both safety and EMC regulation compliance.

**AC Power Connection**



- 1. Active
- 2. Neutral
- 3. N/C
- 4. Protective Earth



Use a power cable of min 0.75mm<sup>2</sup>(AWG 20) to max 2.5mm<sup>2</sup> (AWG 14)

Figure 3 - AC power supply socket connection

**2.3.2. DC variant**

Use a DC power source of nominal 24VDC (18- 36VDC) only. The *Earth* pin 4 **MUST** be connected for both safety and EMC regulation compliance.

**Note:** DC power is not suitable for long cable runs. Be sure to allow for voltage drop in the power cable. Failure to do so may result in the display not operating and/or the power supply to be damaged.

**DC Power Connection**

Use a power cable of 0.75mm<sup>2</sup> (AWG 20)

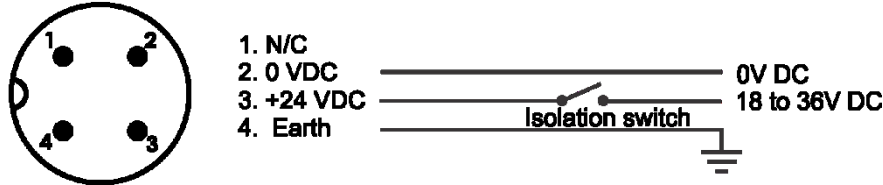


Figure 4 - DC power supply socket connection

**2.4. Communication Connections**

The D840 and D820 remote displays are available with two different communication connection types, RS232/RS485 serial and Ethernet.

On power up the display will attempt to automatically detect one of the communication protocols described in Appendix A. Refer section 2.6 *Setup Command* before connecting an indicator or PC with desired protocol.

**2.4.1. Earthing Requirements for Cable Shields**

Cable shields should ideally be connected to earth at one end for each of the communications options below. As there is no provision for the shield connection at the communications connection end of the display, it is recommended the shield be terminated at the indicator (source) end.

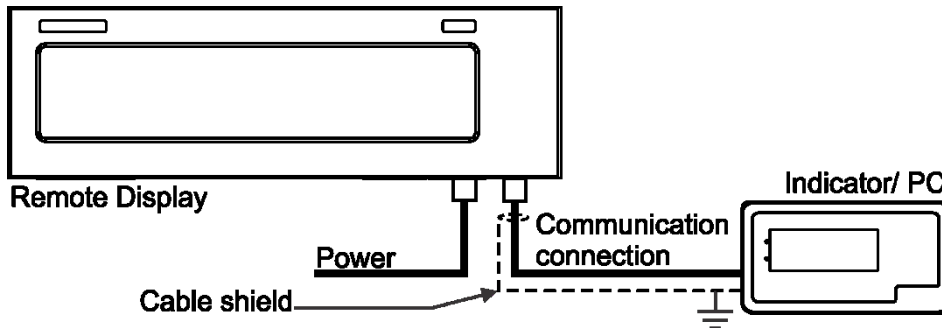


Figure 5 - Shield Earthing

**2.4.2. Serial Connection**

The serial connection is used to transmit data to the remote display.

A shielded data cable should be used to prevent electrical noise interfering with the operation of the unit.

**Communications Connection (Serial)**

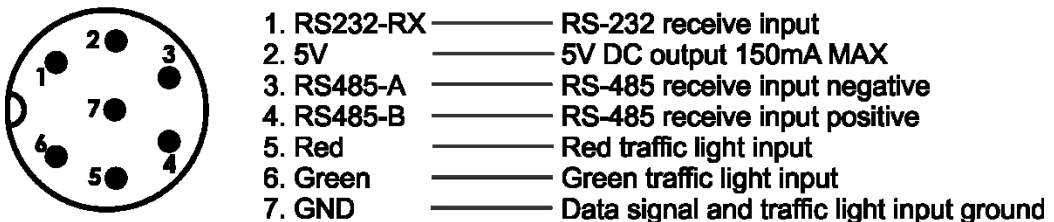


Figure 6 - Serial socket connections

**Notes:**

- Pin 2 provides a 5V DC supply at a maximum current draw of 150mA. This supply can be used by clean contacts on relays or switches to operate the traffic lights.
- GND pin (7) is serial/digital input ground, NOT shield or power ground.



◆ **Baud Rate and Parity**

Baud Rate, Parity and Data Bits are automatically detected. The baud rate can be 2400, 4800, 9600 or 19200. Parity and Data Bits supported are as follows:

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

◆ **RS-232 Receive Only**

RS232 is not recommended for long cable runs or electrically noisy environments.

**Communications Connection (Serial)**

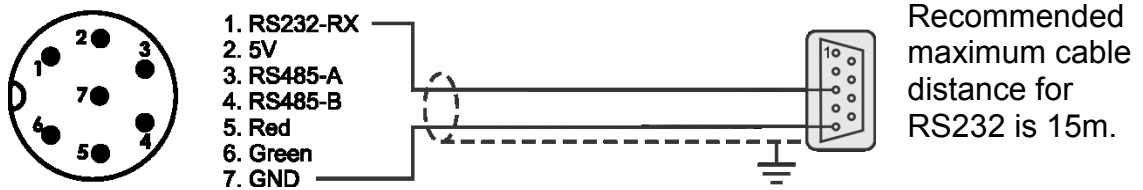


Figure 7 - RS232 Socket connection

◆ **RS-485 Receive Only**

RS485 is the preferred serial connection for long cable runs. Multi-dropping is supported. A 120Ω resistor is provided for termination.

**Communications Connection (Serial)**

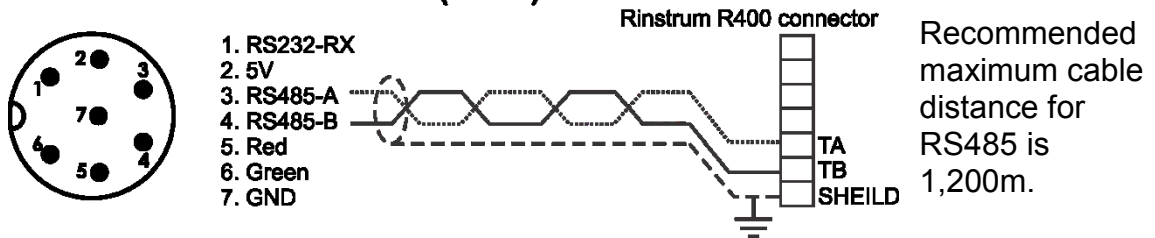


Figure 8 - RS485 Socket connection

**2.4.3. Ethernet (Optional)**

Confirm the display has the Ethernet option fitted by taking note of the connection label located on the underside near the data input socket. The optional Ethernet connection has DHCP enabled by default. Confirm the site requirements for IP addressing with site IT personnel before configuring the display. Site Networking Security conflicts will cause set-up and operation issues.

If installing the display on an industrial network without a DHCP server, it is recommended you configure and test the display prior to installing on site and connecting to the industrial network.

◆ **Configure IP Address**

You will require the Lantronix Device Installer to setup and configure the Ethernet option. You can download the Lantronix device installer from here:

[http://ltxfaq.custhelp.com/app/answers/detail/a\\_id/644](http://ltxfaq.custhelp.com/app/answers/detail/a_id/644)

Install it onto your PC; connect your PC and the Remote to the same network. Do a broadcast search using the Lantronix Device Installer to find the display on the network. Use the MAC address located on the serial number label of the display.

Select the correct device and click "Assign IP". Enter in a valid IP address within the allowable range of the network and select "Assign". New IP address will be assigned to the device. When complete the device will be shown on table with new IP address and status "Online". For further information use the Help within the software.

Data to be displayed is sent as Serial over Ethernet, so any supported protocols can be used for the data format.

**Note:** The display listens on port 10001. Use this port with the assigned IP to connect to the display.

**Communications Connection (Ethernet)**

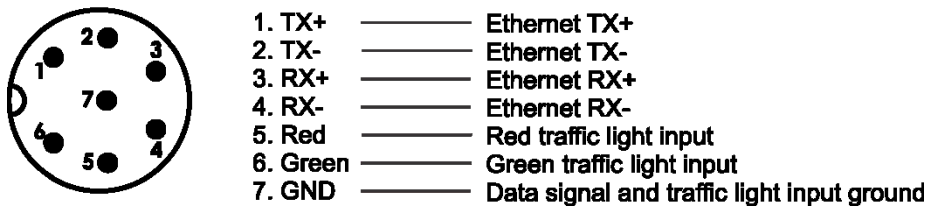


Figure 9 - Ethernet socket connections

**2.5. Traffic Light Control**

The traffic lights can be controlled by a control character in the supported protocols (refer Appendix A for supported protocols) or by digital inputs available on the communication connection socket. If the traffic light is set by serial communication, the digital input control of the traffic lights will be ignored until the power is cycled.

**Note:** D820 does not have dedicated traffic lights but will display "STOP" for Red, "GO" for Green and "-----" for both Red and Green inputs.

**2.5.1. From Internal 5V DC Source (Serial communications connection variant only)**

For remote operation of the traffic lights it is recommend using a twisted pair multi core cable with one pair for the data and another two pairs for the traffic light control to minimise interference. The switch contact will short the 5V on pin 2 to either pin 5 for RED and/or pin 6 for GREEN as per the diagram below.

**Communications Connection (Serial)**

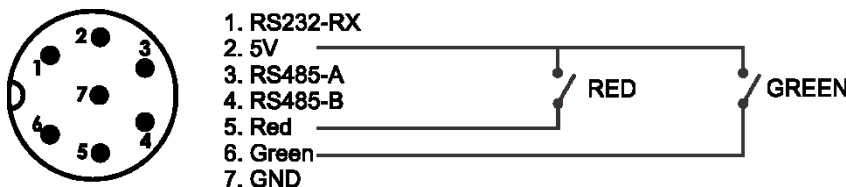


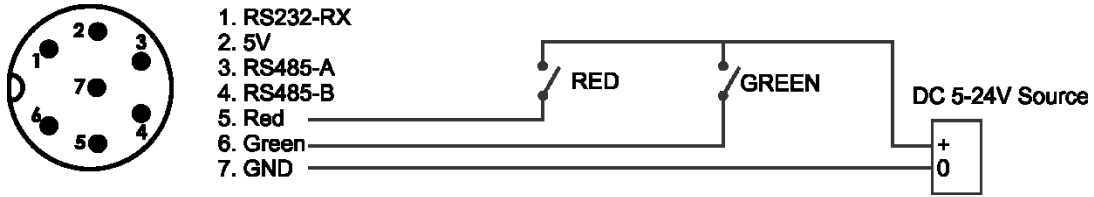
Figure 10 - Driving traffic lights from internal 5VDC source

**2.5.2. From an External DC Source (Serial and Ethernet communications connection variants)**

To control the traffic lights from a remote DC power supply the following connections are required. It is recommend using a twisted pair multi core cable with one pair for the data and another two pairs for the traffic light control to minimise interference. The DC power supply 0VDC needs to be connected to pin 7 GND on the

communications connector. The 5-24VDC supply is then run through the switching control device before been connected to pins 5 for RED and/or 6 for GREEN as per the diagram below.

**Communications Connection (Serial)**



**Communications Connection (Ethernet)**

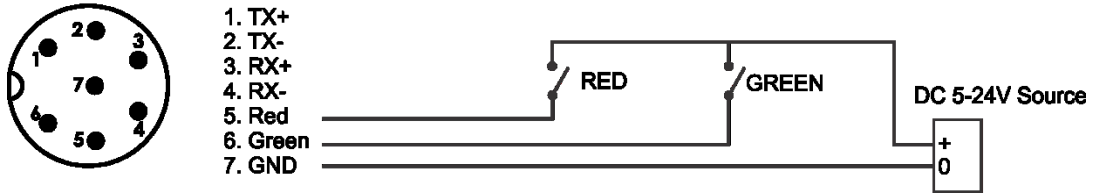


Figure 11 - Driving traffic lights from external DC source

**2.6. Setup Command**

The display will auto-detect the Baud, Parity Bits and Protocol on start-up when the string is being streamed to it. Once the display has accepted its input configuration it will display the string. There is a list of settings that are configurable if the default values are not suitable. These settings can be altered with a setup command string which is required to be streamed to the display instead of the indicator protocol prior to installation.

The adjustable settings in the command string are as follows;

Character Number	0	1	2	3	4	5	6	7	8	9
Description	STX	Annunciator position	Address Hi	Address Lo	Time Out Hi	Time Out Low	Brightness	Save/Reset	Weight	ETX

Function	Description
STX	Start of Transmission Character (0x02)
Annunciator position	0x30 - Left hand annunciators 0x31 - Right hand annunciators 0x32 - Left hand with units 0x33 - Right hand with units Default: 0x30
Address Hi	MSB of the address value Adjustment range: 0x30 to 0x39 Default: 0x30
Address Lo	LSB of the address value Adjustment range: 0x30 to 0x39 Default: 0x31
Time Out Hi	MSB of the Time out value, in seconds Adjustment range: 0x30 to 0x39 Default: 0x30
Time Out	LSB of the Time out value, in seconds

Low	Adjustment range: 0x30 to 0x39 Default: 0x35
Brightness	Brightness value, 0x30 = MAX 0x39 = MIN 0x3A = Auto Detect Adjustment range: 0x30 to 0x39 or 0x3A Default: 0x3A
Save/Reset	Save or reset to default settings 0x56 = save modified settings Any other value = restore to default
ETX	End of Transmission character (0x03)

### 2.6.1. Sending the Setup Command

#### ◆ **Rinstrum Remote Display Configurator**

Use the *Rinstrum remote display configurator* software to configure D840 and D820 remotes. The instructions for configuration can be found inside the software.

#### ◆ **Alternative Methods**

The command can be streamed from a PC running terminal software such as RealTerm, HyperTerminal or similar. Alternatively you can use the custom string format in the Rinstrum R400 series indicators to send the string (this method cannot be used for displays with Ethernet option).

Process:

- Remove power to the display.
- Connect serial input of the display to your PC or R400 indicator.  
(For displays with Ethernet option, follow the instructions in section 2.4.3)
- Setup the command string in the program/indicator by referring the previous table as a guide.
- Stream (Auto.Lo in the R400 series) the string out to the display.
- Apply power to the display. The display will go through its normal start up messages.
- Message --OK-- is displayed once the configuration is complete.
- Stop sending the Setup Command sequence and remove serial cable from PC/indicator.
- Connect the Serial/Ethernet cable to your primary device and initiate required data stream.
- Apply power to remote.
- Unit is ready for operation with the new configuration settings.

**Examples:**

- To change the Unit Address from the default value 01 to 35:  
0x02,0x30,0x33,0x35,0x30,0x35,0x3A,0x56,0x03
- To change the Time-Out value to 0 seconds (thus disabling):  
0x02,0x30,0x33,0x35,0x30,0x30,0x3A,0x56,0x03
- To use the default values, only byte 8 will be read, all others ignored:  
0x02,0x30,0x30,0x30,0x30,0x30,0x30,0x30,0x03

## 2.7. Mounting Options

Two stainless steel mounting brackets are used to mount the unit on a flat surface. These brackets are bolted to rear of the housing using the shake-proof nuts provided. The outer mounting holes are 8mm in diameter.

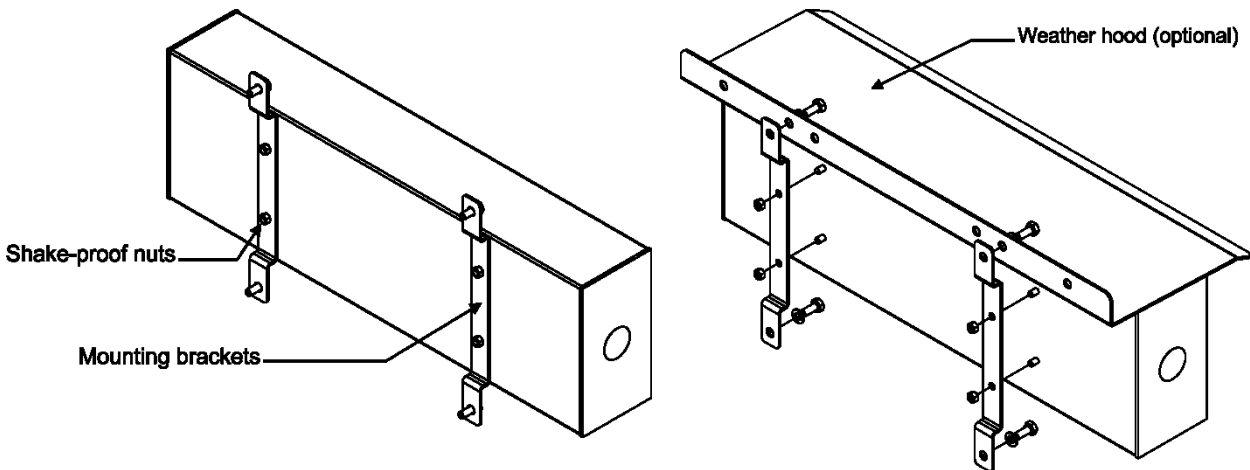


Figure 12 - Mounting brackets and optional weather hood

### 2.7.1. Wall Mounting

For wall mounting it is recommended that:

- 6mm or 1/4" bolts and washers be used as a minimum.
- Both Brackets are to be used with mounting hole centres at 250mm (9.8") wide and 200mm (7.9") high. Fit top bolts first to support display.

### 2.7.2. Weather Hood (Optional)

The optional weather hoods can be used to minimise effects of direct sunlight. The Weather Hood mounting holes line up with the wall mounting holes on the brackets for easy fitment.

**Note:** It is recommended when fitting the optional weather hood the two bottom bolts are loosely installed first to support the remote.

### 2.7.3. Optional Mounting Plate

The optional mounting plate supports VESA, RAM and pole mounting.

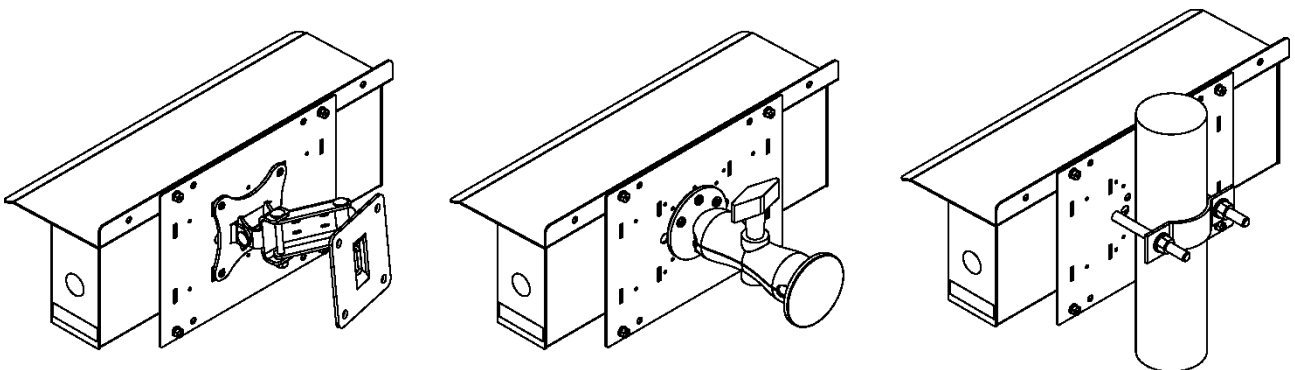


Figure 13 - VESA, RAM and Pole mounting examples

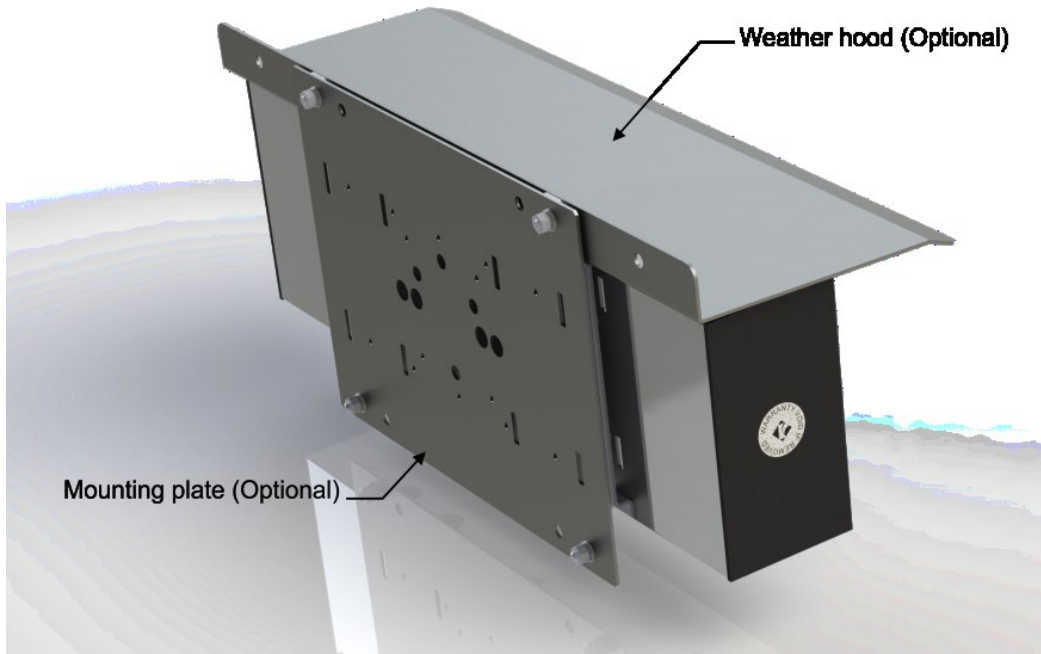


Figure 14 - Optional mounting plate

### 3. Error Messages

Error	Description
↓ ↓	Underweight - the weight is below the minimum allowable weight reading. Check indicator.
↑ ↑	Overweight - The weight is above the maximum allowable weight reading. Check indicator
ERROR	Error - The indicator is reporting an error. Check indicator
--/--	No valid data from indicator and unit has timed out. Check serial /Ethernet input, confirm protocol/baud/data-bits are supported then power cycle remote to reset.

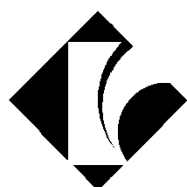
## Appendix A : Supported Protocols

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 notice.

Protocol	Name	Serial Traffic light support	Unit display support	NTEP multi zero support	Protocol commonly used by indicators from:
1	Ranger A	Yes	No	Yes	Rinstrum, GSE, HBM & PT
2	Ranger B	Yes	Yes	Yes	Rinstrum
3	Ranger C	Yes	Yes	Yes	Rinstrum GSE, HBM & PT
4	Ranger D	Yes	No	Yes	Rinstrum
5	PCMODE	Yes	No	No	Custom software
6	R series register write	No	No	No	Rinstrum & GSE
7	Avery string #7	No	No	Yes	Avery L105
8	Gedge C2	No	No	No	Gedge
9	Gedge C3	No	No	No	Gedge
10	A&D standard string	No	Yes	No	A & D
11	AD4531	No	No	No	A & D
12	Toledo continuous	No	Yes	Yes	Toledo
13	GSE without COZ	No	Yes	Yes	GSE
14	GSE with COZ	No	Yes	Yes	GSE
15	Schenck without DP	No	No	No	Schenck
16	Schenck with DP	No	No	No	Schenck
17	Auto control string 1	No	No	No	Auto control PC Software
18	Auto control string 2	No	No	No	Auto control PC software
19	Sartorius	No	No	No	Sartorius
20	Soehnle without DP	No	No	No	Soehnle
21	Soehnle with DP	No	No	No	Soehnle
22	Flintab	No	No	No	Flintab
23	Philips	No	No	No	Philips
24	Condec	No	Yes	Yes	UMC, GSE, Rice Lake, Cardinal, Fairbanks, Eaton, Transcell
25	Bilanciai DS410	No	No	No	Bilanciai
26	Systec	No	No	No	Systec

Refer **Remote Display Protocol Manual** for detailed protocol descriptions.

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