London Electronics Limited

Large display ASCII input RS232/485 remote display

EasyReader Model ER2S

Connection details, scaling and general information
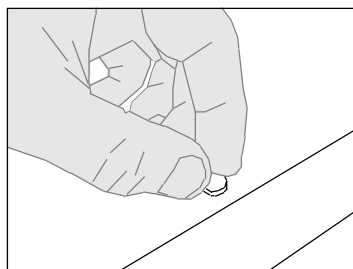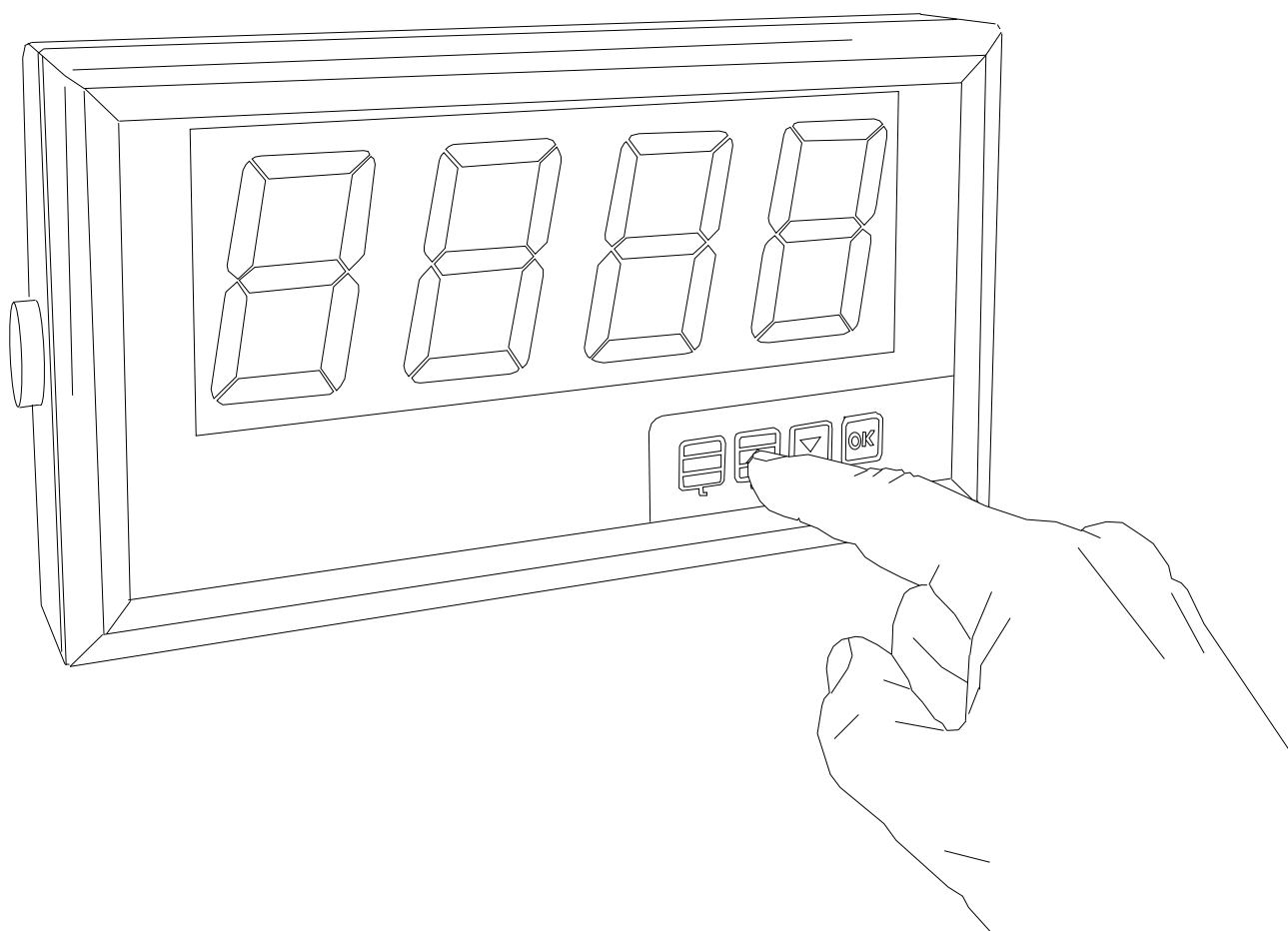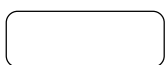

Rear case screws - please note

The rear panel is held in place with finger-screws, which only need to be gently tightened.
Do not use tools to tighten or loosen the screws, as this could cause damage to the internal threads.

Rev. 2

Alphabetic Index

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Introduction

Please contact us if you need help, if you have a complaint, or if you have suggestions to help us improve our products or services for you.

If you contact us about a product you already have, please tell us the full model number and serial number, so that we can give you accurate and fast help.

This product has a 2 year warranty. We will put right or replace any meter which is faulty because of bad workmanship or materials. This warranty does not cover damage caused by misuse or accident.

IMPORTANT

If this equipment is important to your process, you may want to buy a spare to cover possible failure or accidental damage in the future.

This is because at some times, for example during our factory shutdown periods, you may have to to wait several weeks for an equivalent replacement. Or, we may have no stock at the time you urgently need it.

You may also need to pay extra carriage charges if you want a fast, guaranteed courier service. Warranty repairs or replacements are normally returned with a standard courier service.

We do not offer any compensation for losses caused by failure of this instrument.

If you do not agree with these conditions, please return this item now, in unused, clean condition, in its original packaging and we will refund the purchase price, excluding any carriage paid.

We thought you'd prefer to know about possible delays and extra charges now, rather than during a panic.

We always try to improve our products and services, so these may change over time. You should keep this manual safely, because future manuals, for new designs, may not describe this product accurately.

We believe these instructions are accurate, and that we have competently designed and manufactured the product, but please let us know if you find any errors.

Warnings

⚠️

Please carefully read all warnings and ONLY install the meter when you are sure that you've covered all aspects.

*   Connect the meter according to current IEE regulations and separate all wiring according to IEC1010.

*   Power supplies to this equipment must have anti-surge (T) fuses at 125mA for 230V supply, 250mA for 110V supply or 1A for DC supplies in the range 11-30VDC.

*   Check that the model number and supply voltage suit your application before you install the meter.

*   Don't touch any circuitry after you have connected the meter, because there may be lethal voltages on the circuit board.

*   We designed this meter for Pollution-Degree 2 environments only. This means you must install it in a clean, dry environment.

*   Only adjust on-board switches or connections with the power turned off.

*   Make sure all screw terminals are tight before you switch the meter on.

*   Only clean the meter with a soft damp cloth. Only lightly dampen with water. Do not use any other solvents.

Safety First ....Don't assume anything............. Always double check.
*If in doubt, ask someone who is QUALIFIED to assist you in the subject.*

Description

The EasyReader-S accepts numeric serial ASCII data and displays it on a 4 digit LED readout. The digits are 57mm or 102mm high, depending on model.

It can accept a limited range of alphabetic characters - limited by their ability to be represented accurately on a 7 segment type display.

Its string extraction ability allows the display to select defined parts of a data string for display, whilst rejecting surrounding data.

The front panel comprises of a 4 digit LED display, including decimal points and minus sign.
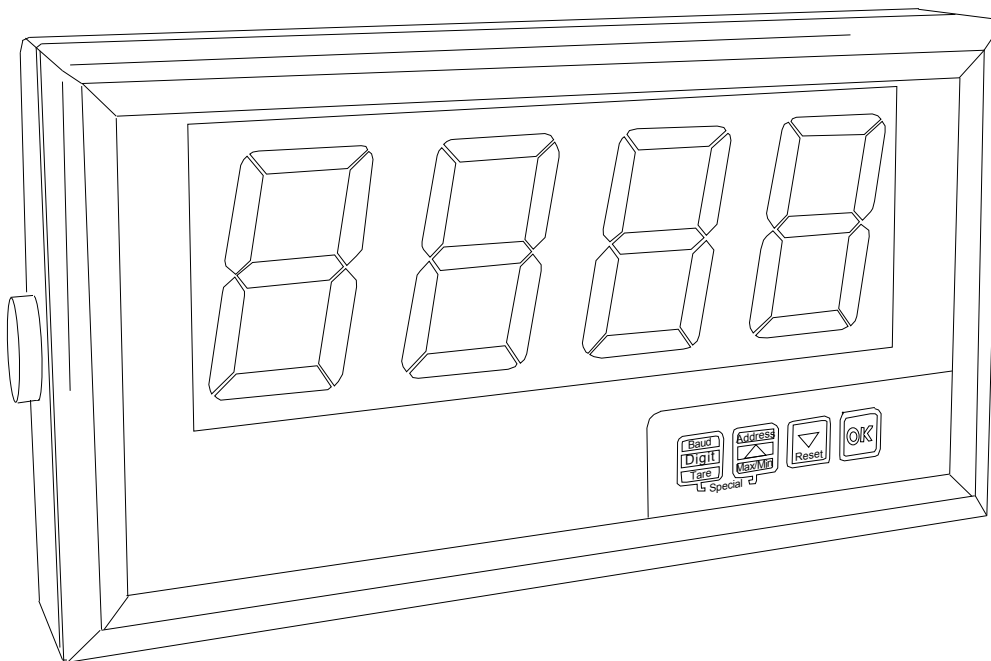
All adjustments are made with front panel pushbuttons.

A lockout connector allows you to disable the front panel programming buttons, to protect settings. An unlocked display won't perform parity checking or addressing. Every character which arrives will be displayed as it arrives - a useful feature for diagnostic tests.

The characters may be made to flash if you include CtrlF in the datastring.

You can change the **brightness** of the display to one of 6 levels. To do this, press the DOWN arrow button for more than 3 seconds and wait until the display brightness suits your environment.

The display will store the chosen brightness level, so that it will return to this brightness if power is lost and re-applied.

Before you start ...

First, please check that the display will suit all the requirements of your application. Page 4 has some important warnings - please check that all warnings are covered.

Next, set the switches on the back of the display to suit the data type you'll be using. See page 6.

Remove the rear screws and slide the case apart. Connect the signal and power cables to the appropriate screw terminal connectors. See page 6 to check that you are using the correct terminals.

Apply power, and confirm that the meter illuminates all segments for a few seconds and then shows the software version "SEr. 1.X" briefly (The X numeral depends on version).

The lockout should be OFF to allow you to change the meter's settings - see connections page.

Set baud rate, address, parity etc. to suit your system. Now, if you send an ASCII character of the correct baud rate, the meter should respond.

With the lockout OFF, the meter will respond immediately to each valid character received, useful for initial diagnostics. However, to operate properly, and to safeguard your settings you must set the lockout to ON - see connections page.

Useful free accessory

The free TERMINAL accessory in Windows is a simple and useful application you can use to generate serial data.

It can be used to check most features of the S1861

Here's how to connect your display to a PC's RS232 port...

For guidance on how to set up TERMINAL, see our dedicated website help pages
http://www.london-electronics.com/terminal.htm
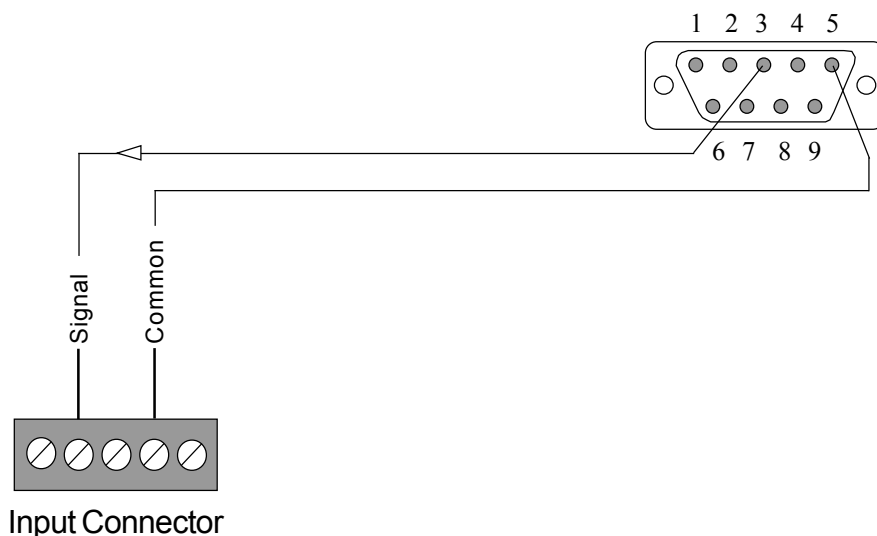
Interior view of a 9 pin D connector, which you can connect to a COM port connector on your PC.

Input Connector

Recognised ASCII Characters

This display is intended mainly to show numeric ASCII characters...

0 to 9 , hex codes 30 to 39
decimal point, hex code 2E (or 2C)
and the minus sign, hex code 2D

You can FLASH the display on and off repeatedly, if you include CTRL F (ASCII 06) in the data string.

Some alphabetic characters can also be shown. Because 7 segment LEDs are limited in what they can display, capital and lower case alphabetic characters will appear the same, and some letters such as K,W and X are unrecognisable.

0		cC		oO	
1		dD		pP	
2		eE		qQ	
3		fF		rR	
4		gG		sS	
5		hH		tT	
6		iI		uU	
7		jJ		vV	
8		kK		wW	
9		lL		xX	
aA		mM		yY	
bB		nN		zZ	

ASCII hex code 20 to 2F (excluding 2C, 2D and 2E) inserts a space.
Two ESCAPE characters, (hex code 1B) will reset the display to its initial power-up condition.

Connections

To access the connectors, you'll need to remove the display from the wall and remove the 4 screws on the rear plate.

You can operate the Tare, Peak/Valley and Reset functions remotely with contact closures, or with the front panel buttons. To activate the front panel buttons, you must make permanent connections between the desired function connector and Common

Signal I/P

+Power*
Data +
Data -
Common
Lockout

Screen termination point

Logic I/Ps

Common
Not used
Tare
Peak/Valley
Reset

Earth

Neutral / -
Line /+

Use screened cables for input signal and contact closure logic functions. You can connect your screens to the Screen Termination Point. This point connects directly to the power earth.
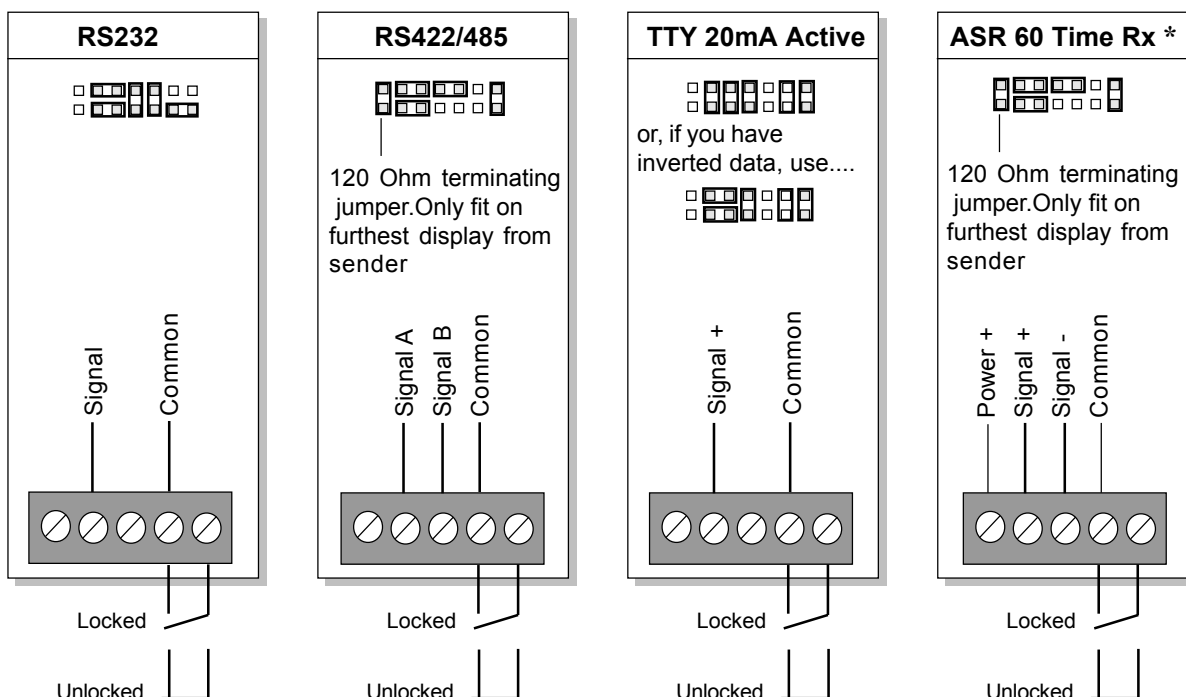
Install signal cables well away from noise-carrying cables and devices, to reduce the chance of interference.

Examples of Input Signal connection for different data types ...

* Power is only available on 2" display versions, to power the ASR60 Atomic Timecode Rx.

RS232	RS422/485	TTY 20mA Active	ASR 60 Time Rx *
	120 Ohm terminating jumper.Only fit on furthest display from sender	or, if you have inverted data, use....	120 Ohm terminating jumper.Only fit on furthest display from sender
Signal / Common	Signal A / Signal B / Common	Signal + / Common	Power + / Signal + / Signal - / Common
Locked / Unlocked	Locked / Unlocked	Locked / Unlocked	Locked / Unlocked

Baud Rate adjustment

Unlock the display - (see connections page) .

Press the BAUD button for a few seconds. The present baud rate will appear.

Default configuration
'1200' Baud
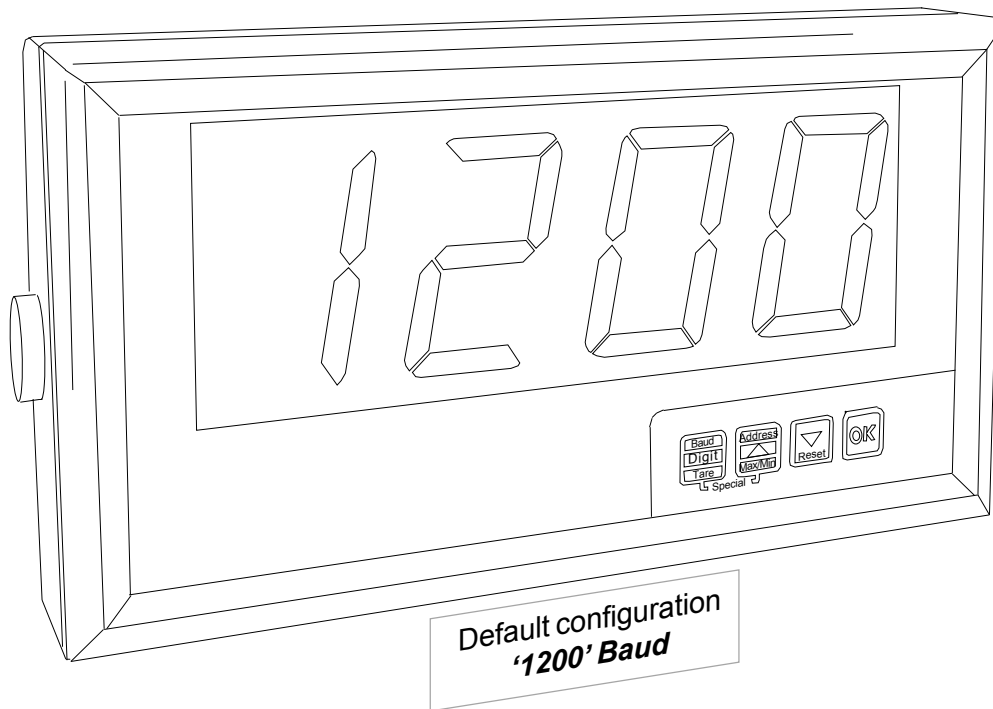
If you want to change the baud rate, press the up or down arrow button. Press the OK button to save your new choice. you can choose from 300, 600, 1200, 2400, 4800 & 9600 baud.

Notes:
Lower baud rates allow longer transmission distances. Approximate limits you can expect for RS232 are shown below...

| Baud	Distance max.
300	800 metres
600	400 metres
1200	200 metres
2400	100 metres
4800	50 metres
9600	25 metres

Differential data transmission modes such as RS422 ou RS485 allow longer distances and better noise rejection. We recommend RS422 or RS485 instead of RS232, if you have that choice.

Remember to lock the display after you have finished your settings.

ADDRESS CONFIGURATION

Unlock the display - (see connections page)
Press the ADDRESS button for a few seconds. The existing address will appear on the display.

Default address is
'Ad.- -'
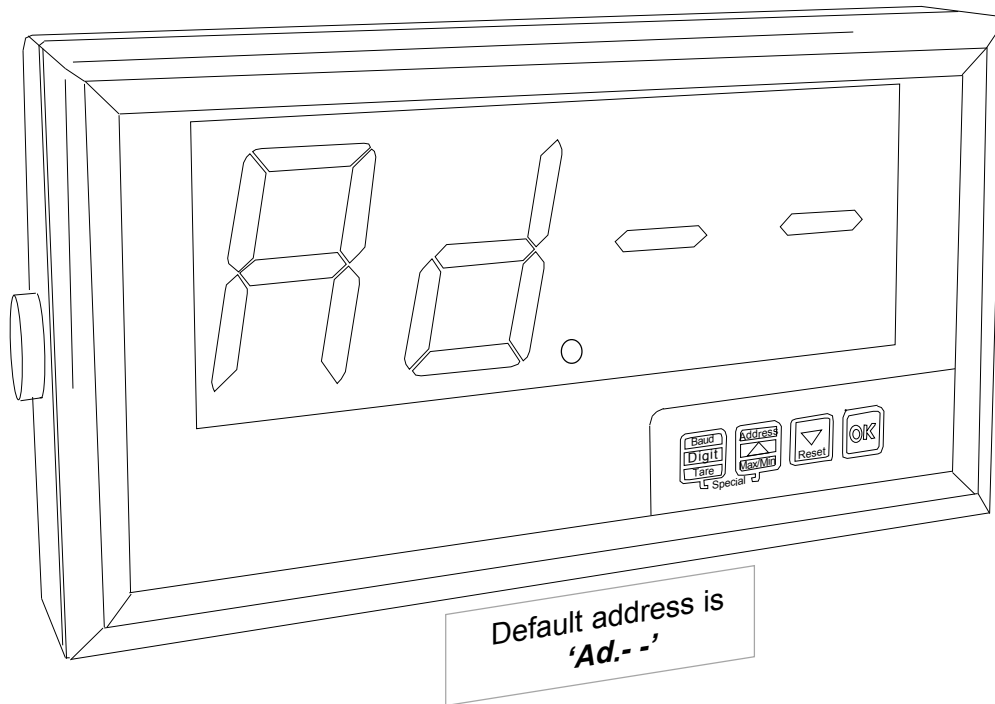
To change the address, press the up or down buttons. Press OK to save your choice.

* If you don't need addressing, please choose *Adr.- -* (*Adr.00* less one)

If you want to address your display, the data should be in this format:- :
<ETX><STX><ADDRESS><DATA><ETX>
<ETX> is ASCII code 03hex or 13hex (XOFF)
<STX> is ASCII code 02hex or 11hex (XON)
<ADDRESS> may be a single character or 2 characters
<DATA> is the numeric ASCII data to be displayed.

Set the termination character to 03 if the <DATA> doesn't include <CR>. The termination character page tells you how to do this.

Adr.-1 to *Adr-E* for 1 character addressing in the range 1-E
eg. <ETX><STX><5><1234><ETX> displays **1234** on an indicator with *Adr.-5.* An indicator with *Adr.-0* responds to **all** single character addresses, and conversely, any indicator with any single character address will display any datastring sent with **address 0**.

Adr.01 to Adr.EF for 2 character addressing in the range 01-EF
eg <ETX><STX><48><2468><ETX> displays **2468** on an indicator with *Adr.48.*
An indicator with *Adr.-00* responds to **all** dual character addresses, and conversely, any indicator with any dual character address will display any datastring sent with **address 00**.
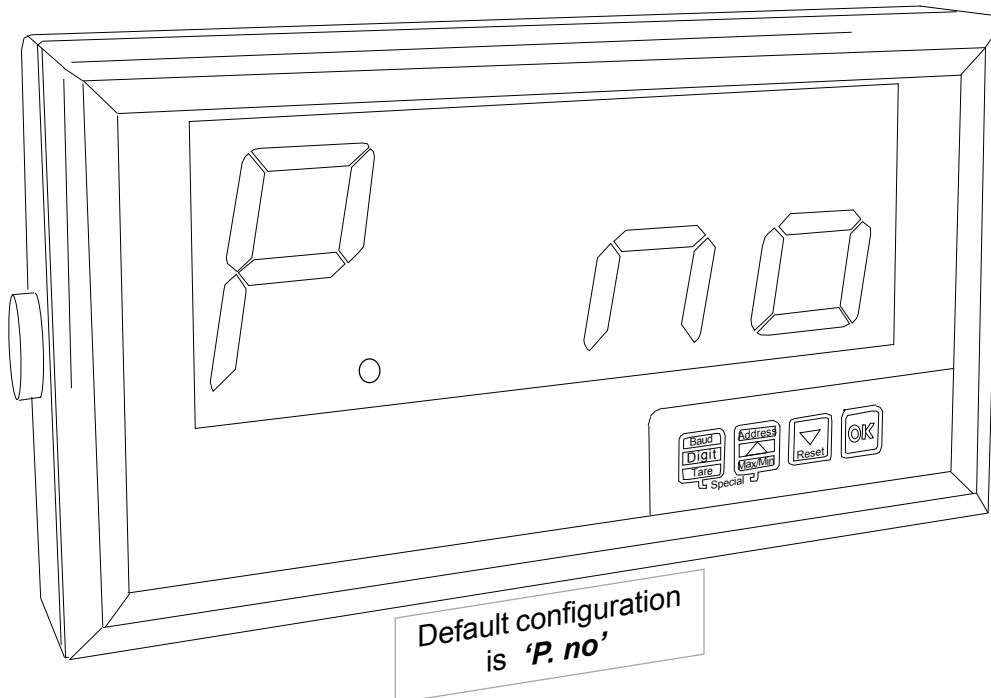
PS: Character addresses A to F are the ASCII codes 3A to 3F as follows-->   : ; < = > ?

Remember to lock the display after you have finished your settings.

PARITY SETTINGS

Unlock the display - (see connections page)

Press the two buttons marked "Special" until you see *'P. no'* or *'P. Ev.'* or *P. od.'*.

Default configuration
is *'P. no'*

'P. no' signifies NO PARITY
'P. Ev.' signifies EVEN PAIRTY
'P. od.' signifies ODD PARITY

Use the UP or DOWN buttons to change the parity setting, to suit your needs. Press OK to save your choice.

If there is a parity error, the display will show 'Err.P' , until a data string with correct parity arrives, or until the Idle timeout occurs

Remember to lock the display after you have finished your settings.

Configuration TIME-OUT

You can use the Time-Out function to create a warning message if data disappears (the data line is idle) for more than a preset time.

You can also disable this function if data will arrive occasionally, for example from an operator's keyboard.

After you set the Parity, and press OK, you will see *'t.o.no'* or *'t.o. 3'* or *'t.o.10'* or *'t.o.30'* or *'t.o.60'*

Defult configuration
is *'t.o.no'*
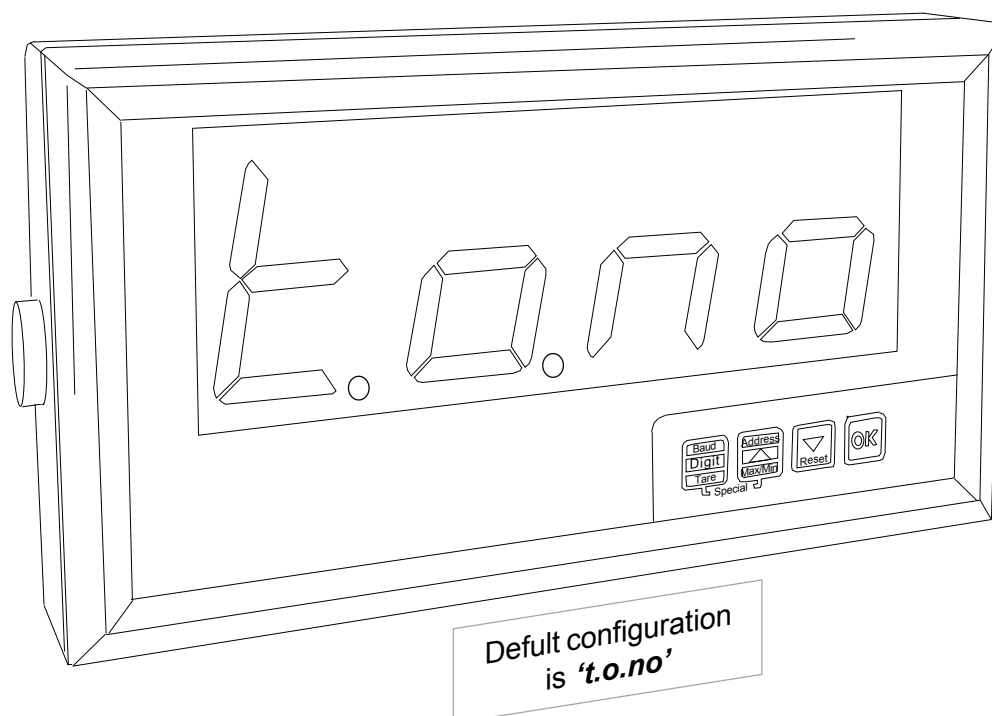
't.o.no'   signifies no time-out testing - the display will always show the last valid data string.
't.o. 3'   signifies that the display will show ------ if no valid data arrives within 3 seconds
't.o.10'   signifies that the display will show ------ if no valid data arrives within 10 seconds
't.o.30'   signifies that the display will show ------ if no valid data arrives within 30 seconds
't.o.60'   signifies that the display will show ------ if no valid data arrives within 60 seconds

Choose from one of these options with the UP or DOWN button. Press OK to save your choice.

The TARE and PEAK/VALLEY inputs will be inactive during a timed-out period

Remember to lock the display after you have finished your settings.

EJECT data configuration

If you have a complex data string and want to display a certain part of it, you can use the 'EJECT' function to define how many characters to eject.

The characters which will be lost will be between the string terminator, for example <CR>, and the data you want to display.

Default configuration
is *'EJ.00'*
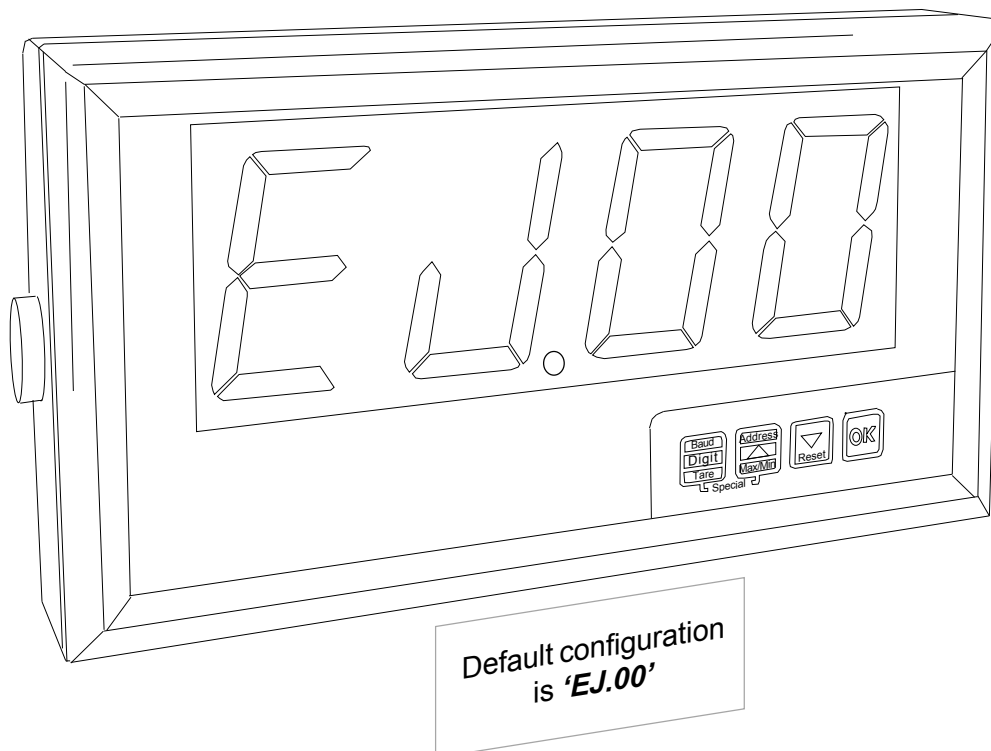
After the Idle setting on the previous page, the display will show *'EJ.XX'* where XX correponds to the number of characters to lose.

Use the UP or Down buttons to select the number of characters to eject, in the range 00 to 24. Press OK to save your choice.

For example if your string is <STX>7768*2505_TY456<CR><ETX> and you want to display the characters 2505, you'll want to lose the characters _TY456 (6 characters).

So for this application you would set *'EJ.06'*

Remember to lock the display after you have finished your settings.

DISPLAY configuration

In the previous example, we wanted to display the value 2505.

If the characters on the left (7768* in the example) are to be ignored, we can do this by telling the display to show only 4 characters.

Here's how we set the number of displayable characters ...

Default configuration is *'dSP. 5'*
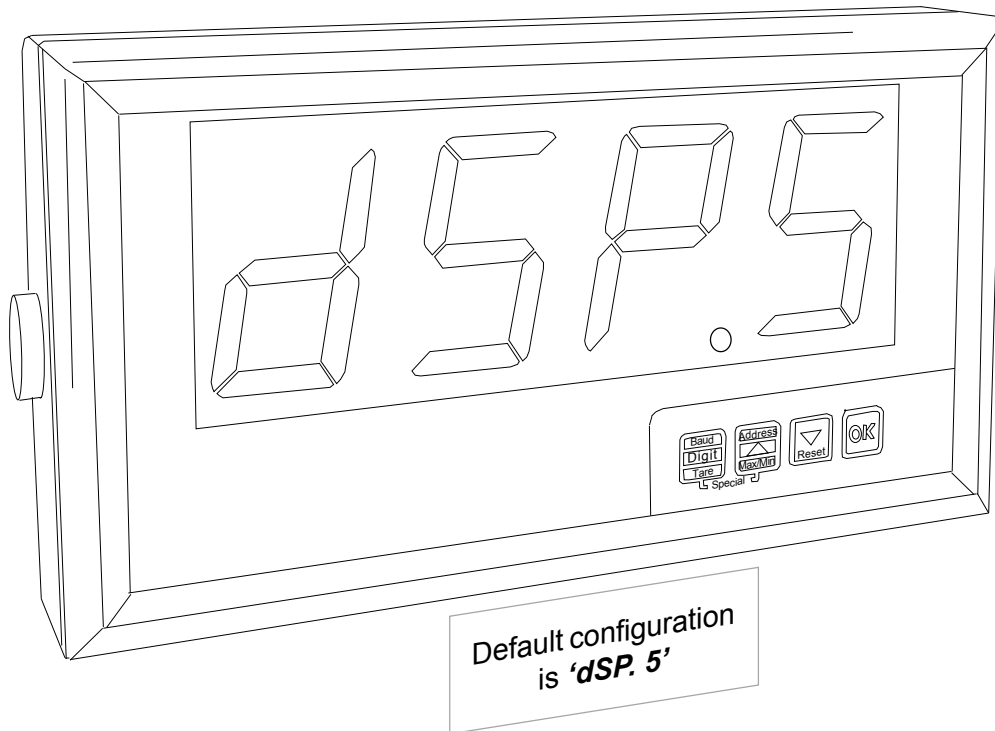
After you set the Lose function, on the previous page, the display will show *'dSP.3'* or *'dSP.4'* or *'dSP.5' (dSP means 'display')*

You can select either 3, 4, or 5 digits, if you press the up or down button.
In our previous example, we'd choose *'dSP.4'*

Press OK to save your choice.

The decimal point, if it appears in your data string, is not considered as a character, but the minus or negative sign - is considered as a character. This is why we have 5 characters available, to allow negative numbers up to -1999 to be displayed

Remember to lock the display after you have finished your settings.

Termination Character configuration

This function is useful if the data string is complex and includes clearly identifiable characters which you can use as a reference point for identifying wanted data characters. Perhaps the best known termination character is the Carriage Return (identified by the code ASCII HEX 0d)

Consider the following string :

:<STX>55555_ABTOL_NETT_386.9Kg_SER02345<CR><ETX>

Let's say you want to display 386.9   Let's also assume that the part SER02345 can vary in length,.

You could specify the letter K as your termination character, provided it always appears in this position relative to the data of interest.

K is represented by 4B in ASCII hex. Here's how we would set the display to use K as the termination character....

After the 'Display' setting on the previous page, you will see *'C.r. XX'* where XX corresponds to the HEX code of the character you want to use as the termination character.

Default configuration is *'C.r. 0d'*
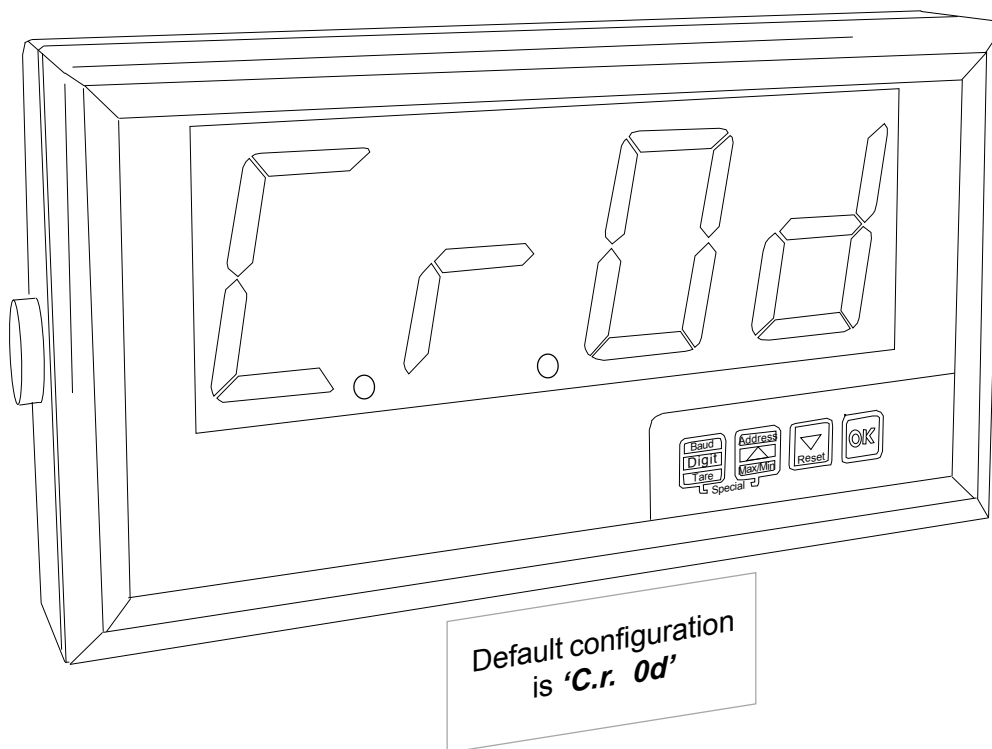
Use the UP and Down buttons to set the character's HEX value.
(In our example of using a letter K, which is HEX 4B, this would be *'C.r. 4b'*).

When your setting is correct, press OK to save your choice.

Remember to lock the display after you have finished your settings.

Peak and Valley memory

The EasyReader-S continuously compares new incoming data with previous data and stores the minimum and maximum values in Peak and Valley memories. You can view these values by making a remote contact closure, or by pressing a button on the front panel of the display.

Front panel button viewing of peak and valley.
1) Connect the Peak/Valley terminal to the Common terminal - see connection page
2) Lock the display - see connection page
3) Press the UP arrow to sequentially view peak, valley and actual input values.

How to view the peak and valley with a remote contact closure
1) Lock the display - see connection page
2) Make a momentary contact closure between the Peak/Valley terminal and Common to sequentially view peak, valley and actual input values.

Tare Command

If you want to force the display to 0, regardless of the actual incoming data value, you can do so with the tare function. This is most often used in weighing applications.

Front panel Tare command
1) Connect the Tare terminal to the Common terminal - see connection page.
2) Lock the display - see connection page.
3) Press the front panel Tare button to tare the display to 0.

Tare command by remore contact closure
1) Lock the display -see connection page.
2) Make a momentary contact closure between the Tare terminal and Common to reset the display to 0.

Reset Command

The reset command clears the Peak, Valley tare and latched alarm registers.

Front panel Reset command
1) Connect the Reset terminal to the Common terminal - see connection page.
2) Lock the display - see connection page.
3) Press the front panel Reset button to reset the peak/valley and tare.

Contact Closure RESET
1) Lock the display - see connection page.
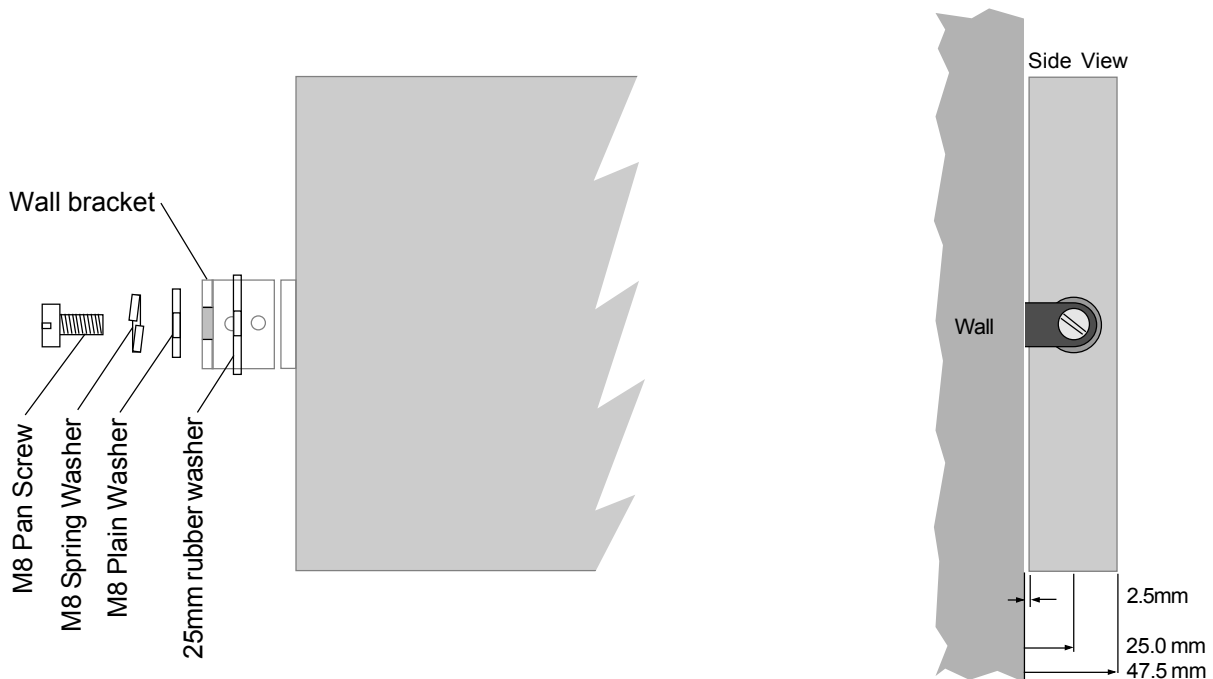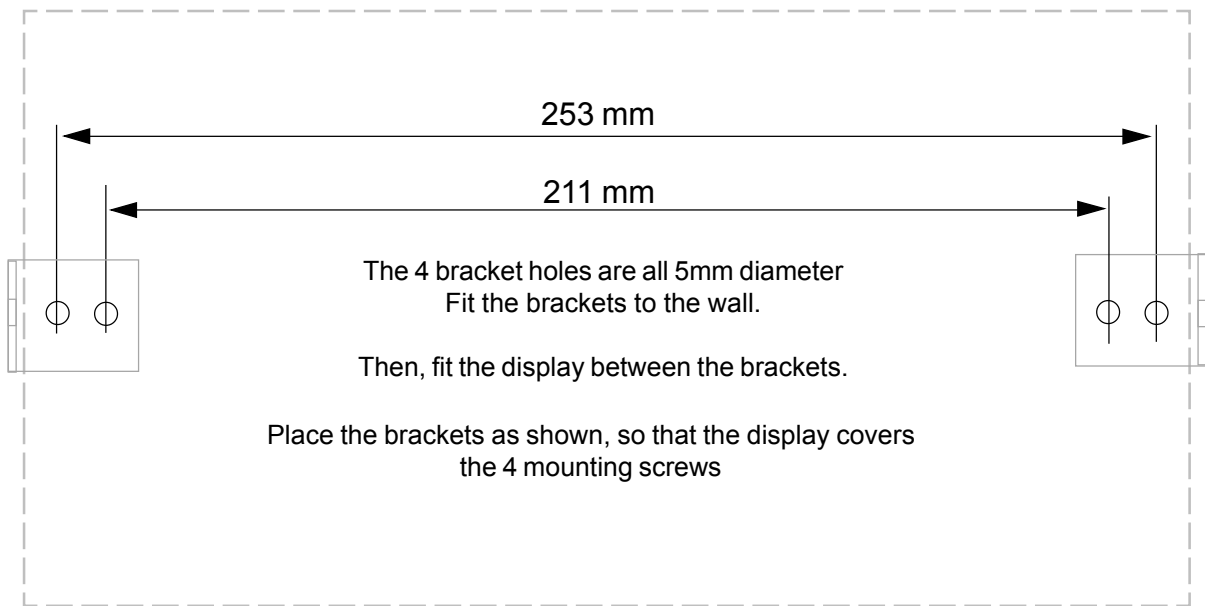2) Make a momentary contact closure between the Reset terminal and Common to reset the peak/valley and tare.

How to Mount your display

1. Wall Mounting

Wall mount your EasyReader display in a clean, dry environment.

Drill 4 holes in your wall, spaced as you see in this diagram...

The mounting screws you use should have a diameter between 3.4 and 4.6 mm and should be suitable for the material of the wall. You may need to use wall plugs or other screw accessories, if the wall material is not suitable to take screws directly.

253 mm

211 mm

The 4 bracket holes are all 5mm diameter
Fit the brackets to the wall.

Then, fit the display between the brackets.

Place the brackets as shown, so that the display covers
the 4 mounting screws

Wall bracket

M8 Pan Screw

M8 Spring Washer

M8 Plain Washer

25mm rubber washer

Side View

Wall

2.5mm

25.0 mm

47.5 mm

Route cables neatly away from the display. If the cables may become damaged in the environment, protect them with suitable conduit or trunking.

How to Mount your display ... continued

1. Suspension Mounting

Suspension mount your EasyReader display in a clean, dry environment.

The mounting screws you use should have a diameter between 3.2 and 3.8 mm and should be suitable for the supporting material. You may need to use screw plugs or other screw accessories, if the material is not suitable to take screws directly.

Mount the brackets first, then fit the display to the brackets.
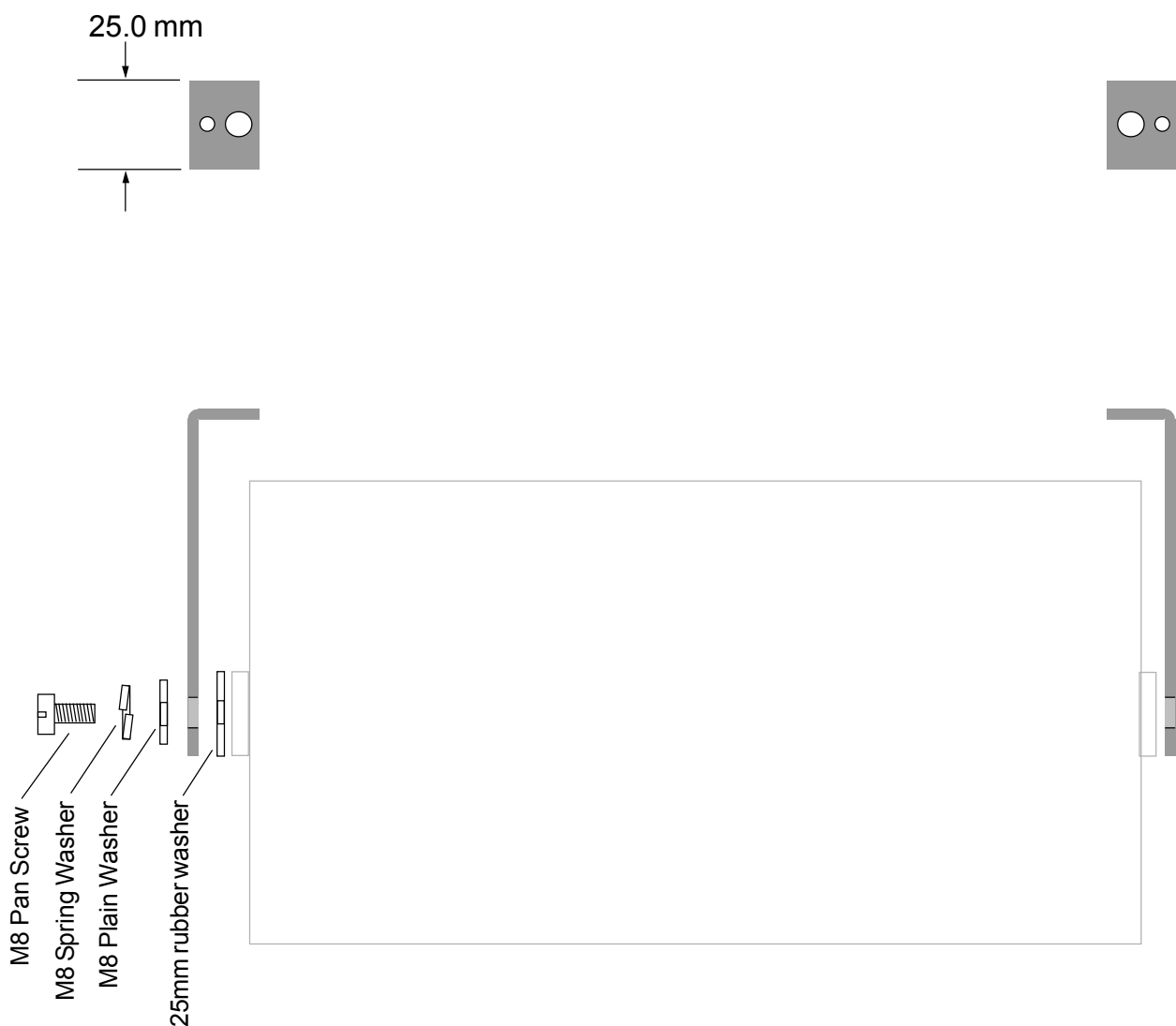
25.0 mm

M8 Pan Screw

M8 Spring Washer

M8 Plain Washer

25mm rubber washer

Route cables neatly away from the display. If the cables may become damaged in the environment, protect them with suitable conduit or trunking.

Specifications

ASCII data input
Choice of RS422, RS485, RS232 or 20mA TTY passive and active. Numeric in the range -1999 to 9999

Baud rates
Choice of 300, 600, 1200, 2400, 4800, or 9600

Data makeup
7 data bits, with parity or 8 bits without parity
1 start bit, 1 or more stop bits.

Parity
Selectable - none, even or odd

Addresses
Selectable
a. Unaddressed
b. Single character 0 to F
c. 2 characters 00 to FF

Display update rate
1 update per datastring received

Idle timeout
Can be set not to timeout, or to show ------ after 3, 10 ,30 or 60 seconds without valid data arriving.

Termination character
Normally set for <CR> (Hex 13) but can be set for any HEX ASCII value

Programme memory
EEPROM non volatile memory, 10 year storage. No batteries.

Dimensions
95mm high by 240 mm wide on 57mm digit version
95mm high by 240 mm wide on 102mm digit version
Case depth 75 mm

Weight
57   mm digit version :- 1500 gramms typically
102 mm digit version :- 2500 gramms typically

Case material
PVCu black

Connectors
Detachable screw terminal types, within the enclosure
Cables enter the case via compression glands

Temperature
Storage -20 to +70, operating 0 to +50 °C

Power
95-265 VAC or 11-30 VDC to special order.

Consumption
8 Watts maximum

Fault Finding

Problem	Possible cause and solution
The indicator accepts data and updates each time data arrives, but the data has an offset. Fopr example, you know the data value is 100, but the display show 82	1. A tare offset may be present. Solution : Disconnect the unit. Make a contact closure between Reset and common. Send data, and press the front panel Reset button. The displayed data value should now match the transmitted value. 2. Check that the data Lose and Display values are correct.
The display shows odd illegible characters	1. The baud rate may be wrong. Check the sending device's baud rate and adjust the display's baud rate to match. 2. Connections may be transposed. If data is RS422 or RS485, transpose your connections on Data + and Data - terminals You may need to invert your data using the data-invert jumpers.

Modifications and revisions

Revisions and modifications may be made from time to time, for several reasons

1)   if users ask for new options to be included in the functions.
2)   if users ask for functions to be modified in some way
3)   when errors in the manual are corrected
4)   when errors in the programme software are corrected
5)   whenever the product is otherwise improved or developed

29 Sept 2003   Product released with SEr1.0 software
25 March 2004   Added wiring and jumper record sheet to page 20

Wiring and jumper record

For future reference, record all the jumper positions and wiring colours you used in your installation.
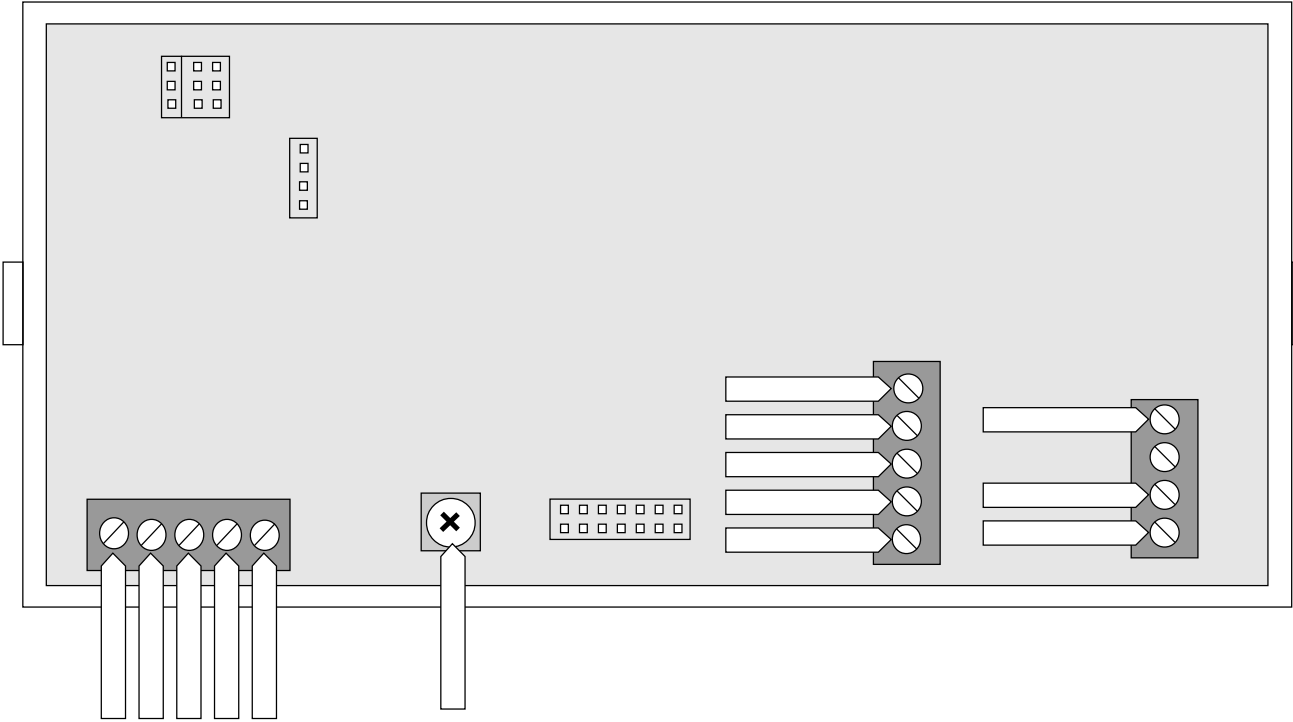
Declaration of Conformity

Declaration Reference : INTUITIVE
Issue Date   : 9 October 1998 revised 31 July 2003
Products Covered   : INTUITIVE series
Title   : DOC-INTUITIVE

This is to confirm that the Product covered by this declaration have been designed and manufactured to meet the limits of the following EMC Standard :

EN61326-1:1997

and has been designed to meet the applicable sections of the following safety standards

EN61010-1:2001

Conditions

The meters are permitted a worst case error of 1% of A/D range during electro-magnetic disturbance, and must recover automatically when disturbance ceases without the need for human intervention, such as resetting, power-down etc.

The meters covered by this certificate must be installed in adherence to the following conditions :-

Signal cabling shall be routed separately to power carrying cabling (includes relay output wiring)
All signal cabling shall be screened. The screen shall only be terminated to the power earth terminal.

Declared as true and correct, for and on behalf of London Electronics Ltd.

J.R.Lees   Director

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