INTUITIVE

London Electronics Limited

Thorncote Road, Near Sandy, Bedfordshire SG19 1PU
Tel +44(0)1767 626444 Fax +44(0)1767 626446
www.london-electronics.com help@london-electronics.com

Panel mounting load indicator

Installation & Operating Manual

Model IL4-L
Display-only 'LITE' version

Model IJ4-L
'Junior' version with 2 alarms

- ✓ **Easy setup**
- ✓ **Loadcell Input = 4 or 6 wires**
- ✓ **Display = 3, 4, 5 or 6 digits (configurable)**
- ✓ **10V Excitation at up to 120mA**
- ✓ **10 point linearisation**
- ✓ **Vibration filtering for stable reading**
- ✓ **110-230V AC or 11-30V DC power**

Caution: There is a risk of electrical shock if this instrument is not properly installed

Caution: Risk of danger: Read the whole manual before you install this meter

Software version F04.01

Revision:3
Dated: 3 September 2019

Warranty

We warrant this product against defects in materials or workmanship for a period of three (3) years from the date of purchase.

In the event of a defect during the warranty period, the unit should be returned, freight (and all duties and taxes) prepaid by the Buyer to the authorised distributor from where the unit was purchased.

The Distributor, at its option, will repair or replace the defective unit. The unit will be returned to the Buyer with freight charges prepaid by the distributor.

LIMITATION OF WARRANTY
The foregoing warranty shall not apply to defects resulting from:

1. Improper or inadequate maintenance by the buyer.
2. Unauthorised modification or misuse.
3. Operation outside the environmental specification of the product.
4. Mishandling or abuse.

The warranty set forth above is exclusive and no other warranty, whether written or oral is expressed or implied. We specifically disclaim the implied warranties of merchantability and fitness for a particular purpose.

EXCLUSIVE REMEDIES
The remedies provided herein are the buyer's sole and exclusive remedies.

In no event shall we be liable for direct, indirect, incidental or consequential damages (including loss of profits) whether based on contract, tort or any other legal theory.

Ordering code: IJ4-L-X-X-X

IJ4 = Intuitive Mark 4 'Junior' family
L = Loadcell model
Display colour: **R**=Red, **G**=Green
Power: **AC**=100-240V AC, **DC**=11-30V DC
Mounting: **0** = Standard panel **DIN** = DIN rail mounting

Load Cell display with 2 alarm relays

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Display colour: **R**=Red, **G**=Green
Power: **AC**=100-240V AC, **DC**=11-30V DC
Mounting: **0** = Standard panel **DIN** = DIN rail mounting

Load Cell display only, no outputs

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For ALARMS Functions on the IJ4-L, please see dedicated Alarms Manual

* Need a manual urgently?
You can download manuals from our website

Warnings

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

Where the product is intended for "UL" installations, removal or addition of option boards is not permitted.

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

Connect the meter according to current IEE regulations, IEC61010 & NFPA:70 National Electric Code in USA.

This meter is for Installation class II service only. This means it has exposed electrical and power terminals. You must install it in a suitable fire enclosure which will also protect users from electric shock

We designed this meter for Pollution-Degree 2 environments only.

Power supplies to this equipment must have anti-surge (T) fuses rated at 400mA for 230V supply, 400mA for 110V supply or 2A for DC supplies in the range 11-30VDC. Only Siba fuses in series 189500, c**UL**us listed according to file #E167295 are accepted for this service under the terms of UL listing. A switch or circuit breaker, clearly marked as a disconnecting device, must be included close to the installation.

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

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's front with a soft damp cloth. Only lightly dampen with water. Do not use any other solvents. The behind-panel case may be cleaned with a dry cloth only, use no liquid or solvent on it.

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

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.

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 3 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.

If you return a unit for repair, you must fill in the RMA form on our website, please include a detailed description of the problem, and the name of a contact who we can refer to for any questions. Please mark for the attention of the QA Department.

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 during 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 usually returned with a standard courier service.

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

If you do not agree with these conditions, please return this item in unused, 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. A spare unit could help to avoid these issues.

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.

General Description

This series of meters accepts industrial sensors to allow various physical measurements to be made, such a weight, temperature, pressure, humidity etc. Different models are available for different sensor types.

The main function of this series is to give a numeric readout of the variable being monitored. Most models include an excitation power output, to power the sensor directly.

Meters are programmed using front panel pushbuttons. The buttons may be locked with a rear switch.

Meters have two power supply options : 100-240 VAC or 11-30VDC

These meters are designed to mount into a protective enclosure which will protect users from contact with power and signal wiring.

These units must be installed fully assembled, and must be installed according to local electrical installation rules. When properly installed, they provide ingress protection to IP65 / NMA4X from the front

Safety

Caution: There is a risk of electrical shock if this instrument is not properly installed

Caution: Risk of danger: Read the whole manual before you install this meter

Obey all safety warnings in this manual, and install the meter according to local wiring and installation regulations. Failure to follow these guidelines may cause damage to the meter, connected equipment, or may be harmful to personnel.

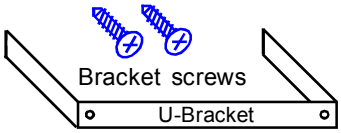
Any moving mechanical device controlled by this equipment must have suitable access guards to prevent injury to personnel if the meter should fail.

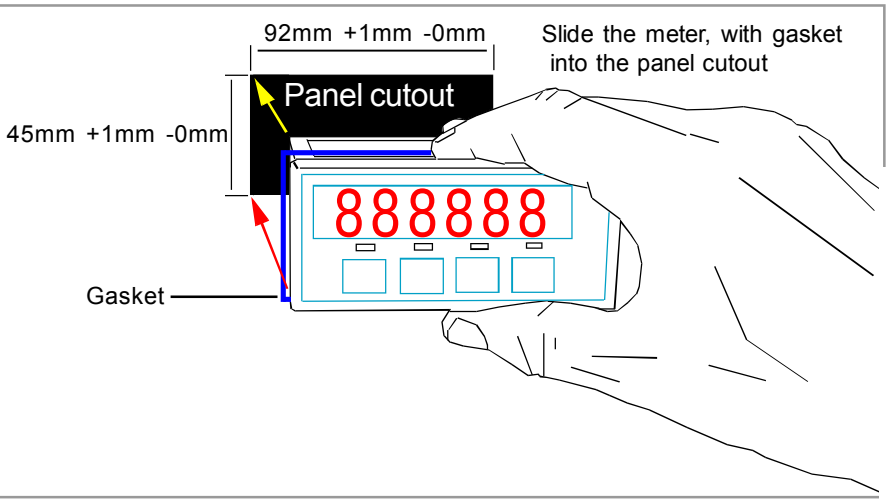
Panel Mounting and Installation - Class II

Install the meters in a suitable protective electrical control enclosure according to local wiring regulations. See specifications for maximum allowable temperature in enclosure. Allow adequate air circulation.

Installing into front of panel

Remove the two rear bracket screws and safely store them and the U-Bracket for later fitting.





Securing into the panel

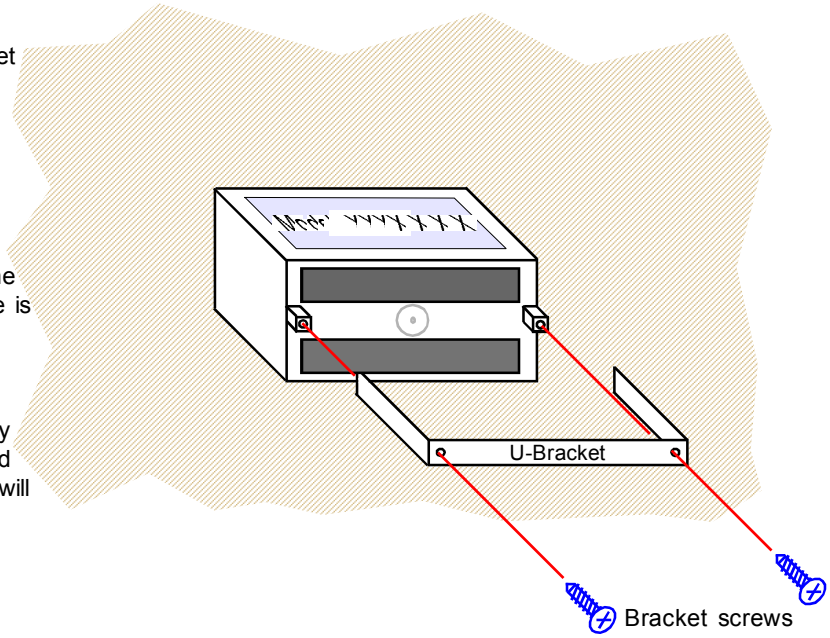
Re-fit the U-Bracket and tighten the bracket screws to firmly clamp the meter in place. Check that the gasket is evenly pinched between the meter's front bezel and the enclosure front

Ventilation

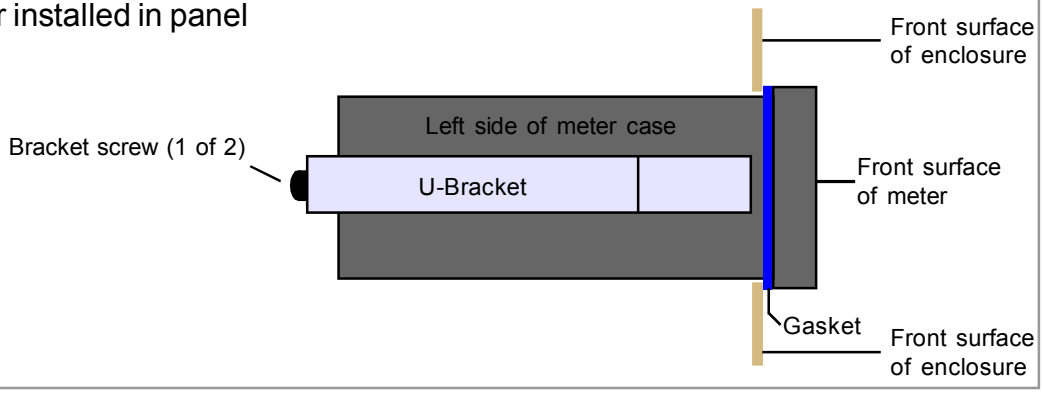
There should be sufficient ventilation in the enclosure to ensure that the meter's case is always kept to less than 60C.

Meter Spacing.

Meters should be spaced apart sufficiently to allow a free flow of ventilation air around the meters, such that no part of the case will exceed 60C



Side view of meter installed in panel



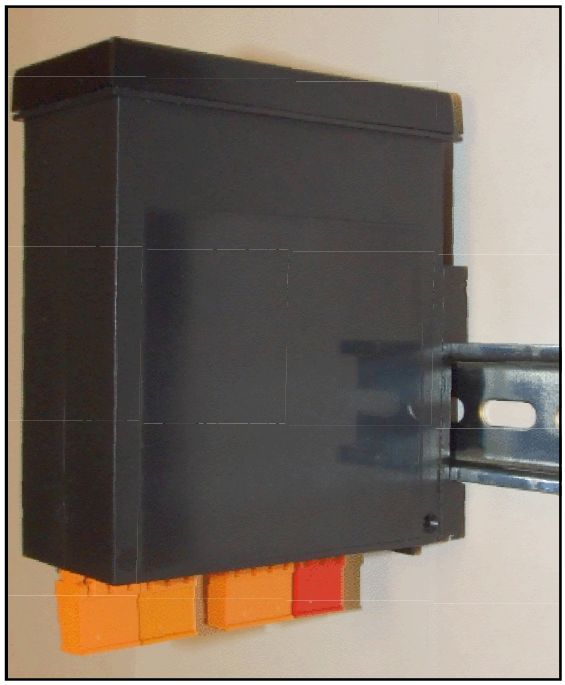
DIN Rail Mounting option

This Series is ideal if you need high precision signal conditioning. Sometimes, it is not necessary to have front panel indication, so in such cases, we offer a DIN rail mounting option, which allows the meter to be installed within a control panel.

Detachable connectors add to the simplicity of installation, and of course the setup method is identical to the panel mounting version, so you don't need to learn a new method.

The display remains active, so you can see at a glance the status of your signals, and programming is simple, using the 4 buttons.

Install the meters in a suitable protective electrical control enclosure according to local wiring regulations. See specifications for maximum allowable temperature in enclosure. Allow adequate air circulation.



Securing into the panel
Use standard top-Hat DIN rail 35 mm x 7.5 mm (EN 50022, BS 5584, DIN 46277-3)

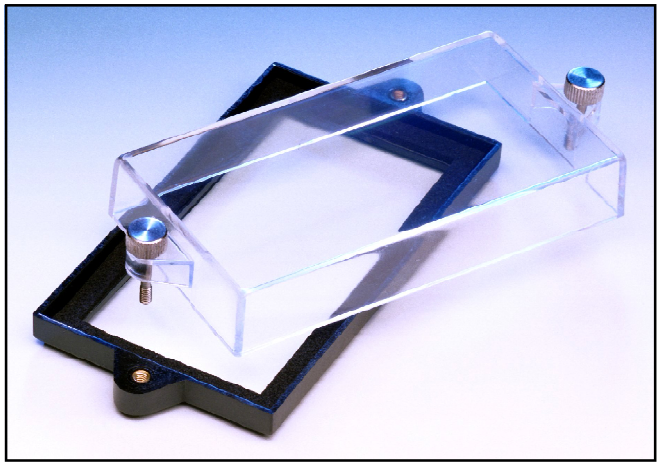
Ventilation
There should be sufficient ventilation in the enclosure to ensure that the meter's case is always kept to less than 60C.

Meter Spacing.
Meters should be spaced apart sufficiently to allow a free flow of ventilation air around the meters, such that no part of the case will exceed 60C

Other mounting options

IP67 SPC4
The SPC4 splashproof cover gives IP67 / NEMA4-X protection for the front of your meter. Ideal for use in harsh wet environments.

Available with optional security tag ports to allow you to fit your own crimped wire tamper-seals, to prevent or indicate unauthorised access (Similar to tags used on electricity meters)



Wall Box
The Wallbox is sealed IP65 all round, and is supplied with the meter installed, for you to wire to, via 3 cable glands. It comes complete with SPC4 splashproof cover.

We also offer a dual version of this enclosure, which can take 2 meters, one above the other.

PCC Series
The PCC series of Portable Carrying cases is ideal for housing your panel meters so that they can be used in the lab. These enclosure come fully wired, with panel meters fitted and with IEC switched power connector plus any input or output connectors, as required.

Versions are available to accept 1, 2, 4, 6, 8, 12 or 16 meters

Wiring Advice

This meter uses detachable screw terminal connectors. Refer to the wiring diagram on the following page for the correct positioning of each wire.

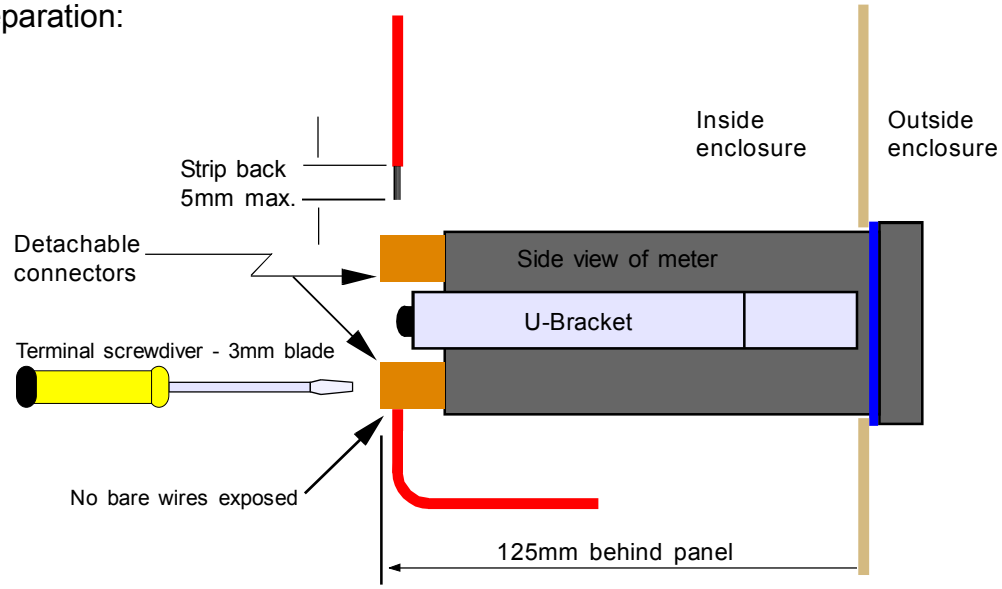
The conductors you use must be suitable for the meter's temperature, current and voltage rating, which is broadly described as follows:-

Cable Temperature Rating
All cables must be rated for operation up to 90C continuous.

Cable gauge and screw tightness
The connectors on this instrument can accept conductors up to 16 gauge AWG / 1.5mm^2 c.s.a. The minimum cross sectional area shall be 22 gauge AWG / 0.5mm^2. Tighten screw terminals to 7.0 lb/in torque / 0.8 Nm torque.

Cable insulation voltage rating
Cables shall have an insulation voltage rating of at least 380V continuous.

Wire preparation:



We recommend multi-strand wire, because it withstands vibration better than single strand cable. Pull the wire firmly after you make the connection to confirm it is tight.

Use screened cable for all signal and control wiring and connect the screen to earth at the destination end only. Route signal cabling away from power cabling and relay switching cabling, to avoid electrical noise interference.

Connections

Connectors and options
Connectors may be present even if output options are not installed. Refer to rating label to see installed options.

Rated 2A 250VAC Resistive
AL1 AL2 not used

Class II Installation

2 Alarm Relays on IJ-4L only

Warning:
Disconnect all power before exposing the rear of the meter

Connector Colour
Red = 95-265 V AC
Black = 11-30V DC

Signal I/P & Excitation **Logic Inputs** **Power**

1 2 3 4 5 6 7 8 9 10 11 12 13

Excitation - Sense- Sig- Sig+ Sense+ Excitation + Alarm Lock Calib'n Lock Common CC.1 CC.2 CC.3 Not used N L

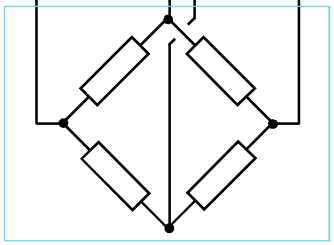
Customer-supplied disconnection and overload protection devices

Fuse Circuit breaker Switch Power

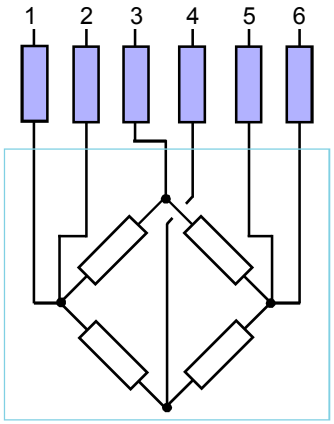
Cable Shield

Remote contacts (5V DC 1mA)

Clean signal Earth

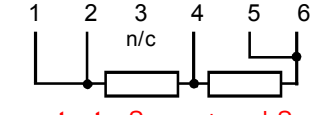


4 wire connection for short cable runs



Cable and/or zener barrier resistance

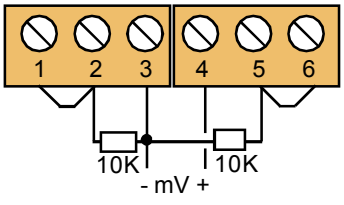
Cable and/or zener barrier resistance must not cause the excitation voltage to drop below 4V. **NB** If using galvanic isolation barriers, connect 10K from terminal 2 to terminal 3 and 10K from terminal 3 to terminal 5 to maintain the input signal within the common mode range of the excitation sense circuit.



Half Bridge connection

Meter must be ordered for 1/2 bridge operation

Millivolt input only?
Link Exc+ to Sense+ and link Exc- to Sense-
Set Sig- to 5V using 2 x 10K resistors.



Looking for high performance?
See application notes on next page, for hints on getting the best performance from your weighing system.

Important - Sense + and Sense - must always be referred to the excitation voltage. Never leave these terminals open.

Installation hints for best performance

This section offers several suggestions which will help you get the best performance from your weighing system.

Loadcells create very small signals which can easily be corrupted by electrical noise. These steps will ensure you get the best possible performance from your meter.

1. Use good quality screened signal cable, with 3 twisted pairs. Belden 8777NH, Belden 9503 and AlphaWire 6010C are good choices, available from many electrical distributors.

2. Even if your loadcell is only a 4 wire device, we recommend you use 6 core cable between the display and the loadcell, and wire as shown in the diagram opposite. This will ensure that any resistance changes in your cabling, caused by changes in temperature, will be cancelled.

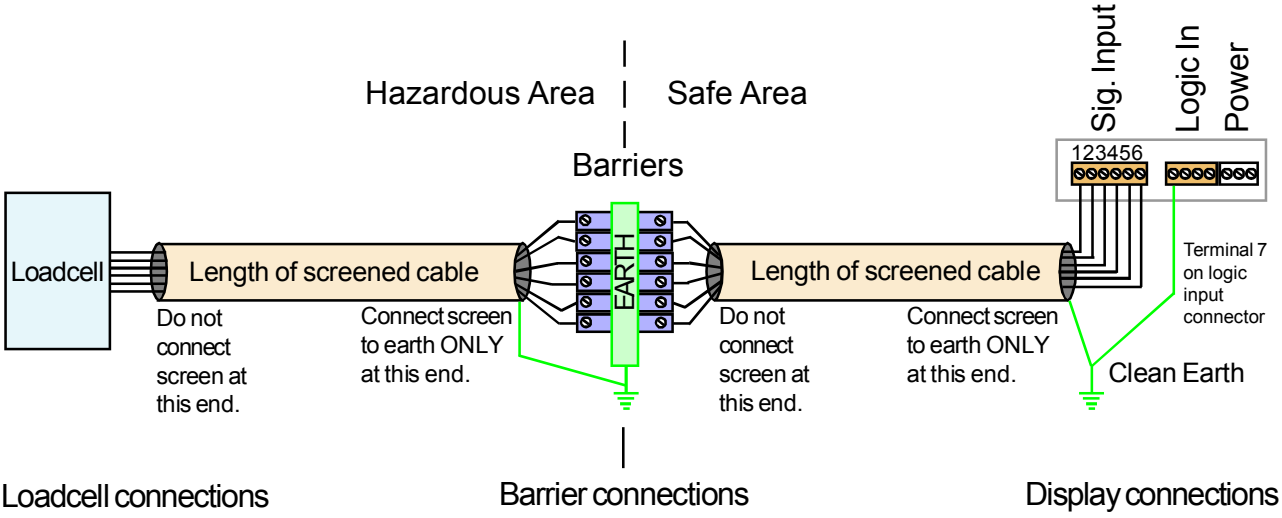
3. Each pair should be dedicated to a signal function as shown opposite, for maximum noise immunity. (One twisted pair for Excitation, one twisted pair for Sense, one twisted pair for Signal) This will ensure that any electrical noise induced in the cable is properly cancelled. Mixing functions carelessly amongst the twisted pairs can actually worsen noise performance.

4. The cable should be routed away from noisy wiring and devices such as power feeds from inverters, discharge-lighting cables, welder cabling etc, and should preferrably be routed in a dedicated low voltage signalling/instrumentation conduit or cable tray.

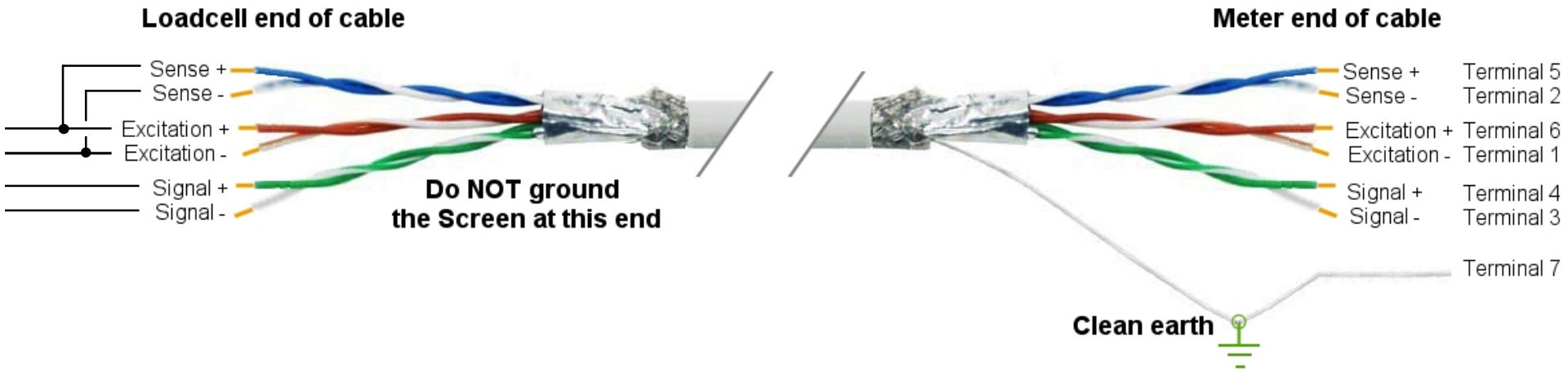
5. Screened cable should be earthed at the display end only.

6. All wires and screens coming out of the screened cable should be kept as short as possible to minimise pickup of noise.

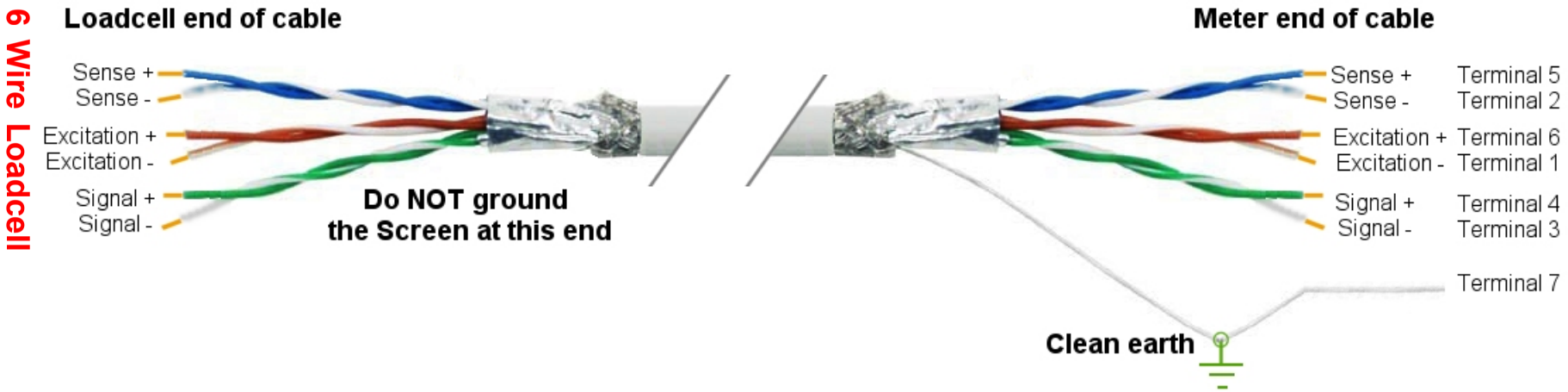
7. If you are using barriers, you should earth your screen as shown below, paying particular care that you do not earth both ends of any run of of cable.**NB** If using galvanic isolation barriers, connect 10K from terminal 2 to terminal 3 and 10K from terminal 3 to terminal 5 on the display's Sig. Input connector to maintain the input signal within the common mode range of the excitation sense circuit.



4 Wire Loadcell



6 Wire Loadcell



Connecting multiple load cells

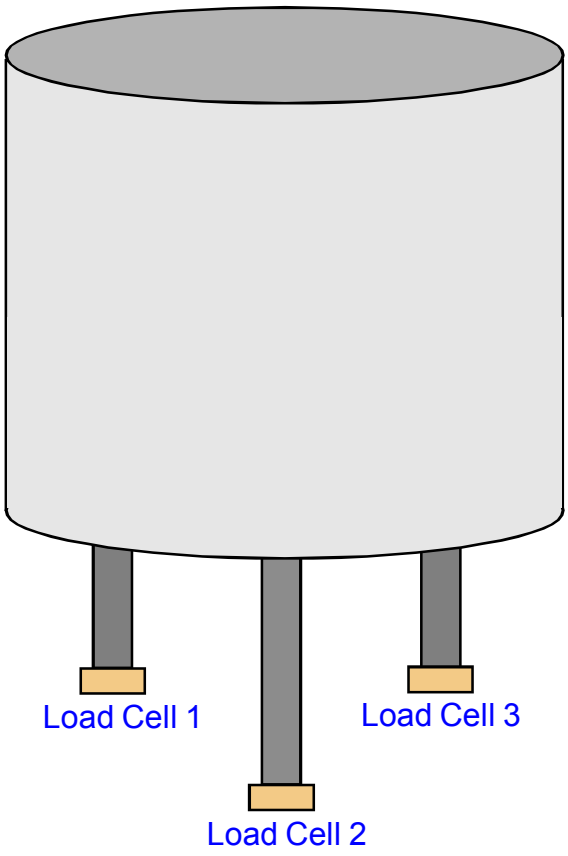
It is common practise to include a load cell in each leg of a supporting structure, to ensure that the weight is measured accurately, regardless of where in the structure the material may be centred.

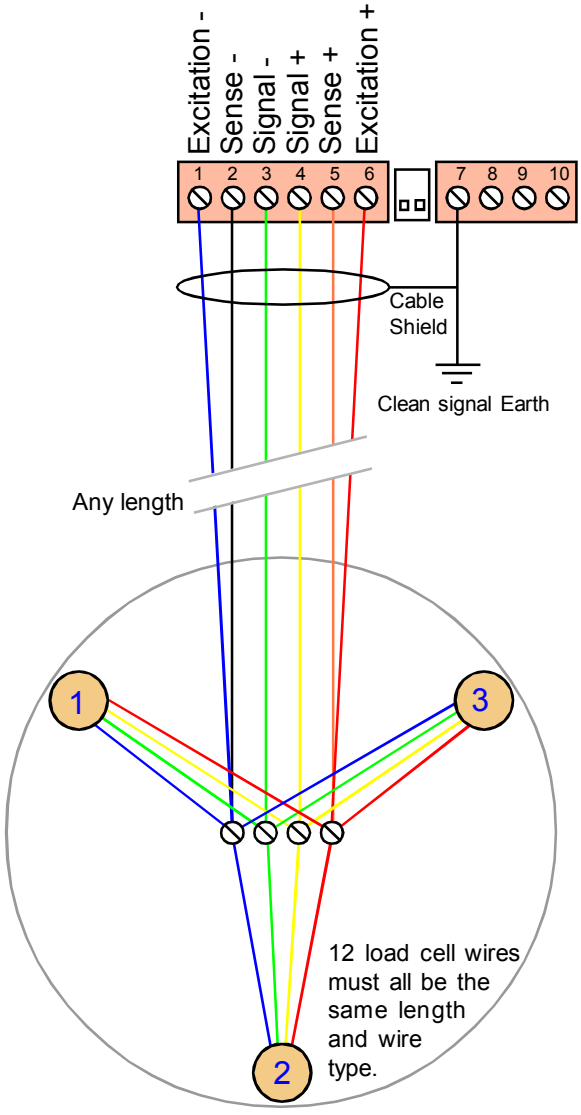
Handy Tip
If you are thinking of designing a circular hopper support structure, a 3 legged support system is ideal as it shares the load on each leg much better than a 4, 5 or 6 legged structure.

Plus there are fewer legs and therefore fewer load cells required. Ensure that the legs are arranged in an equilateral triangle. (120 degree separation)

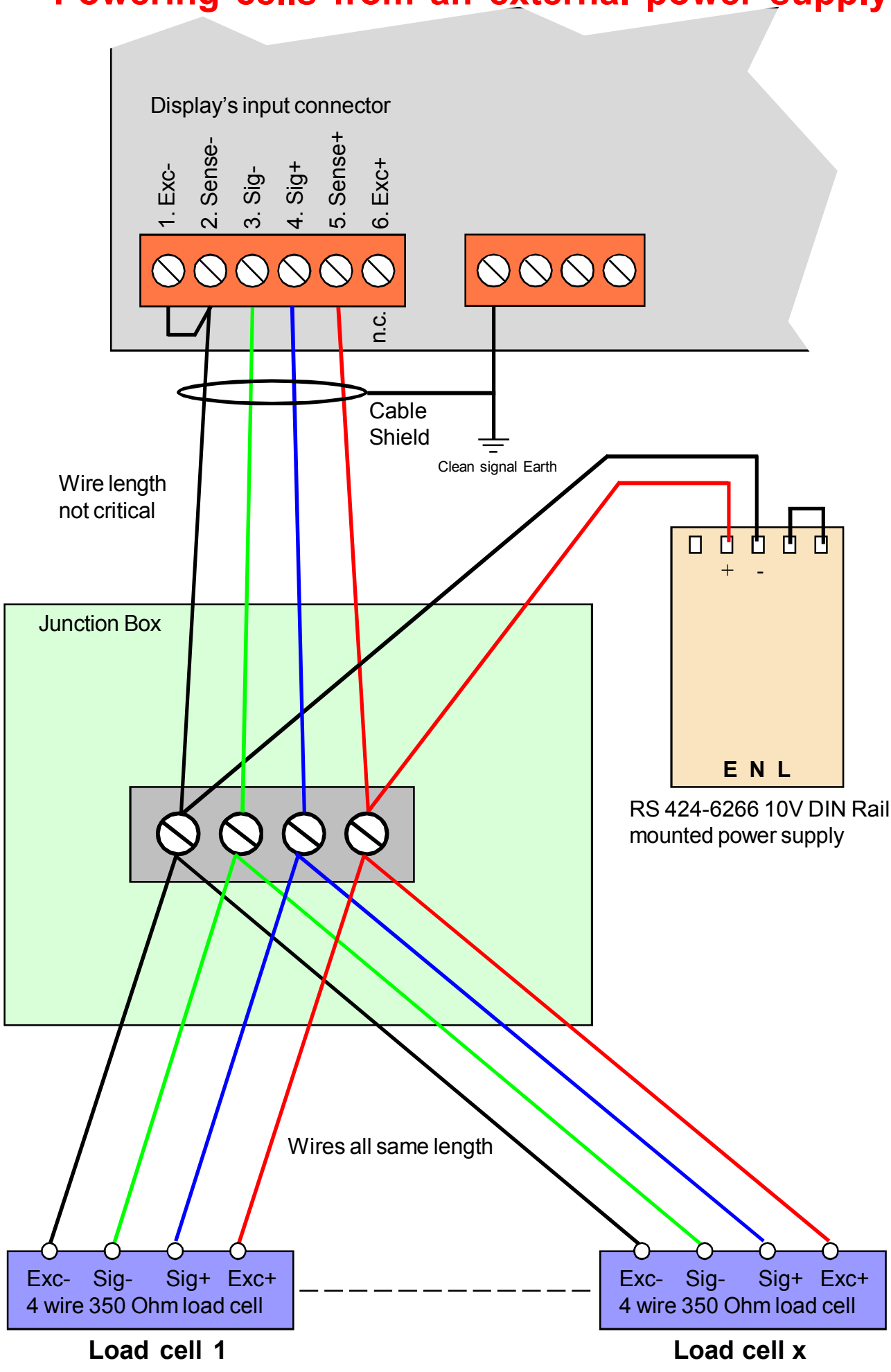
Provided each of your load cells has the same sensitivity, cable length and same resistances (ideally from the same manufacturing batch) you can simply connect them in parallel.

Connect them together in a water-tight junction box.





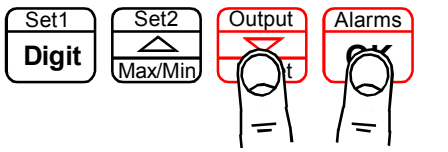
Powering cells from an external power supply



Language Selection for user interface

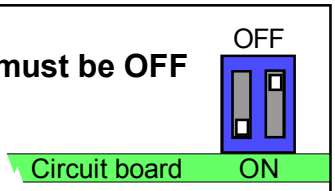
You can select English or French menu prompts.

1

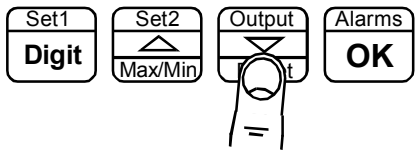


Press together, briefly

Lockout Switch must be OFF



2

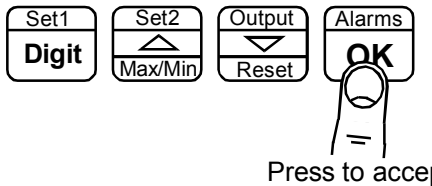


Press to toggle

Display shows

U I En9 (Default)
for User Interface English
or
U I FrA
for User Interface French

3



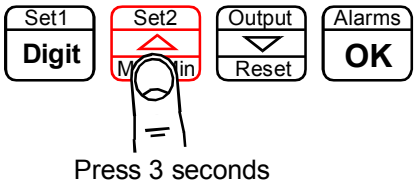
Press to accept

Done!

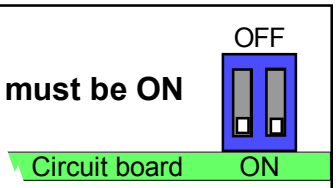
Display Brightness

You can adjust the display brightness at any time, provided the display is locked.

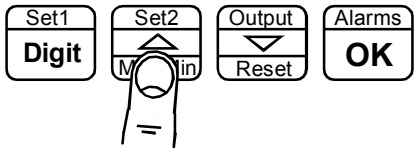
1



Lockout Switch must be ON

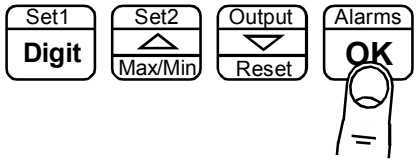


2



Display shows br ıght
Each press of the UP button will select a new brightness level. There are 7 brightness levels to choose from.
(Default = Full brightness)

3



Done!

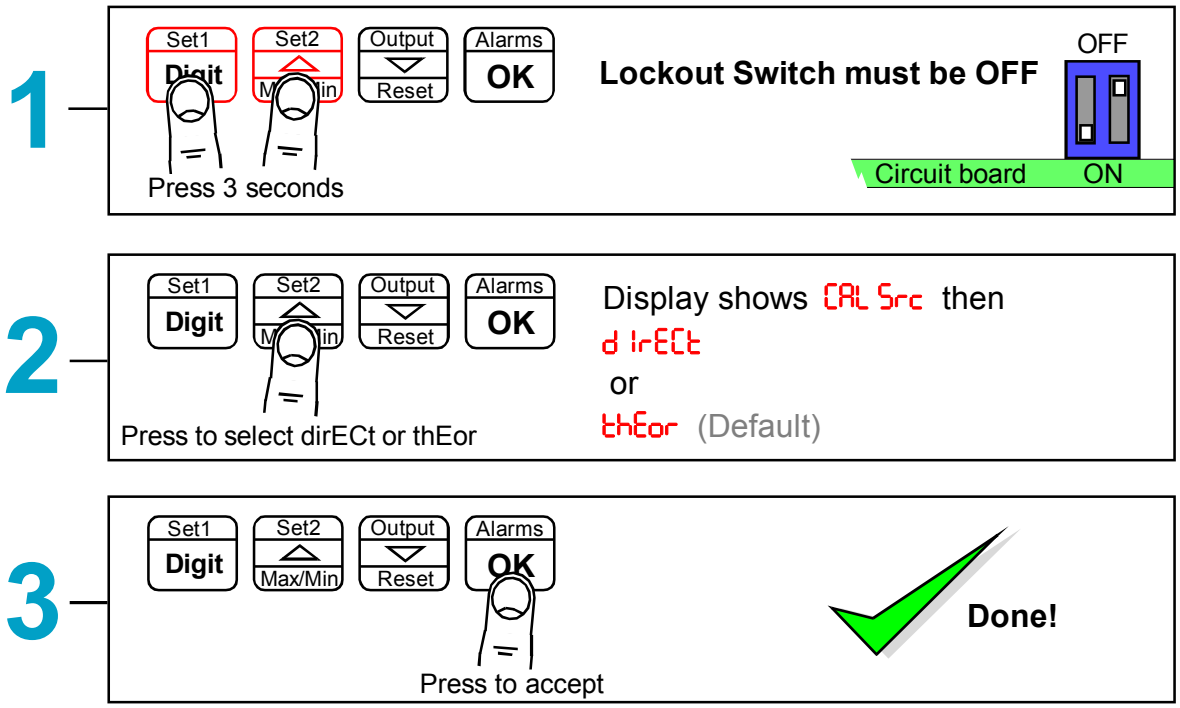
Meter Calibration Modes

You can choose from two main calibration methods.

1. Direct Calibration - this is when you connect the meter to your system and make the meter read what you want it to, at 2 different points. *This is the preferred calibration method, because it allows you to calibrate the system as a whole.*

2. Theoretical Calibration - this is when you type in the sensor's theoretical signal level at the bottom and top of its range and then type in the value the display should show, for each signal level.

How to choose a calibration method:-



Direct Calibration - Full Scale Setting

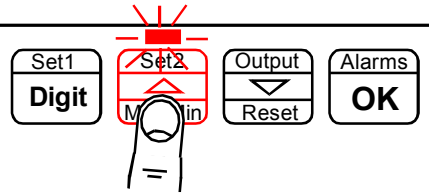
This is when you connect the meter to your system and make the meter read what you want it to, at 2 different points. *This is the preferred calibration method, because it allows you to calibrate the system as a whole.*

How to do direct calibration:-

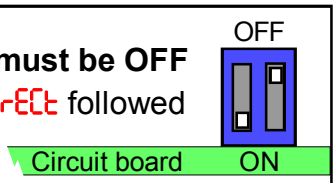
If you have not done so before, please select Direct Calibration mode from the previous page.

First we recommend you set the **FULL SCALE** calibration ...

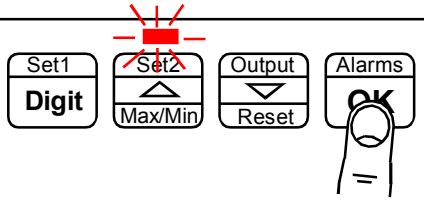
1



Lockout Switch must be OFF
Display shows d rECt followed by SEt H

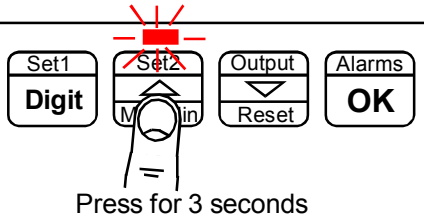


2



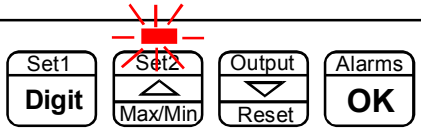
Apply the highest calibration signal you can achieve, ideally 100% of system capacity. You can use less, but you will get better accuracy with higher signals.
Now press OK

3



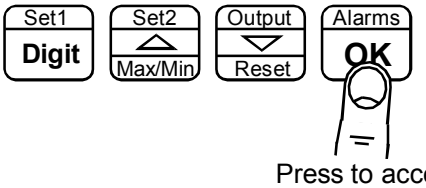
Press Set2 for 3 seconds. You can now set your decimal point position using the UP or DOWN buttons.
Press OK when done.

4



You can now set the display value you want to see - use DIGIT to select each digit in turn, and the UP or DOWN arrow to increase or decrease each digit's value, as required.

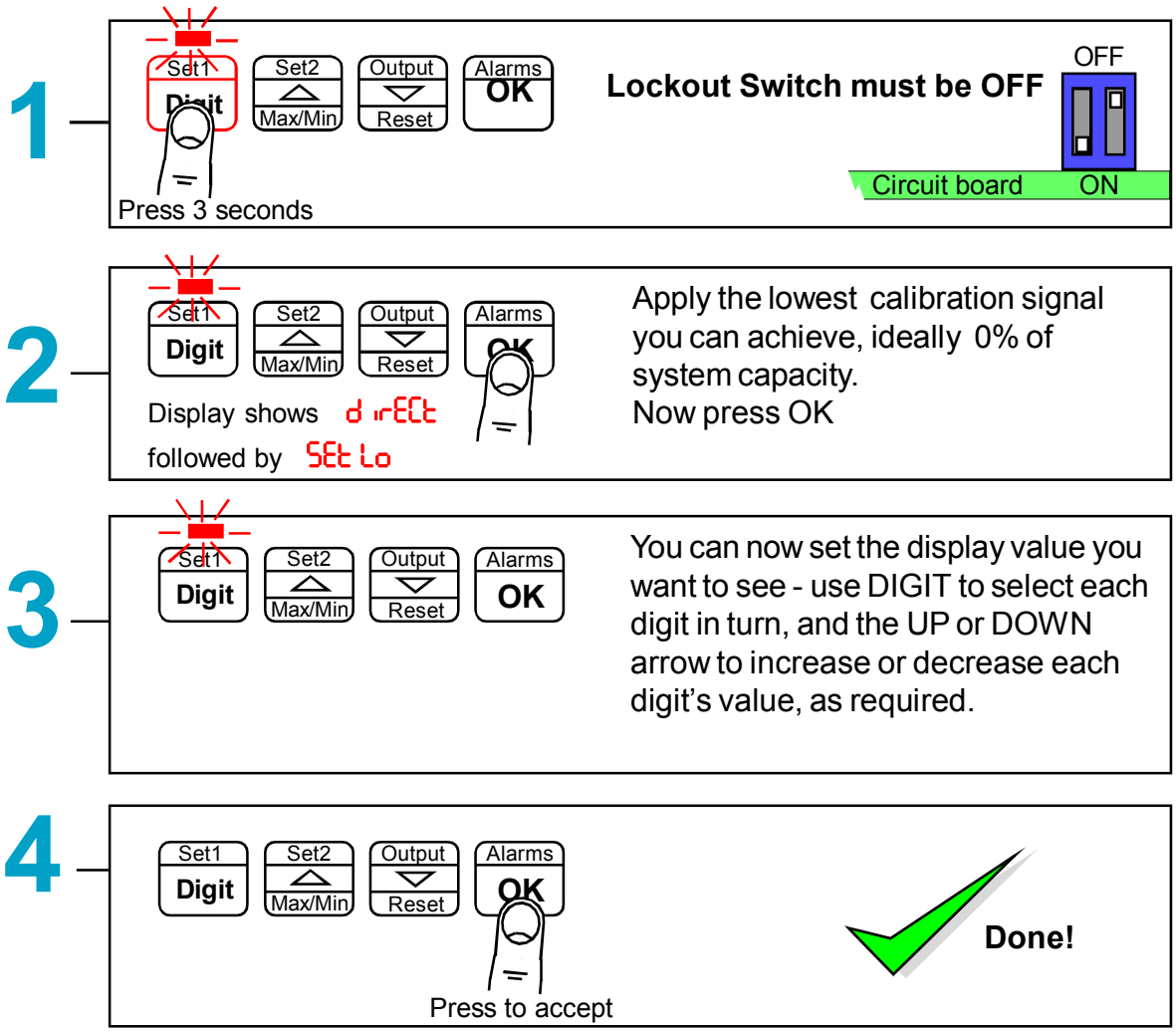
5



Done!

Direct Calibration - Zero Setting

How to calibrate the **ZERO** point.



You can set Zero first, if you prefer, but you will not be able to change the decimal point position in the ZERO calibration step.

This will not be an issue if your zero calibration reading is 0, but may become confusing otherwise.

When you have finished your calibration, please remember to put the calibration lockout switch in its ON position, to protect your settings.

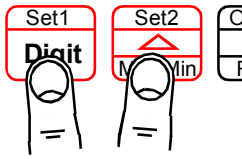
Linearisation with Direct Calibration

If your system is non linear, you can calibrate the meter and correct for this with the lineariser function.

You will need to apply a series of known loads, starting at 0 and working up to full scale. You will then tell the meter what it should read for each applied load. You can use up to 10 points.

First, you must select Direct Calibration Mode (see page on calibration Modes)
Then, proceed as shown below...

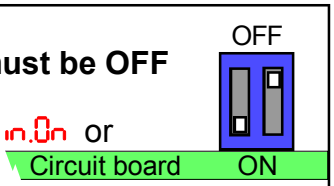
1



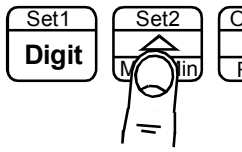
Press together, briefly

Lockout Switch must be OFF

Display will show L in.On or L in.OFF (Default)

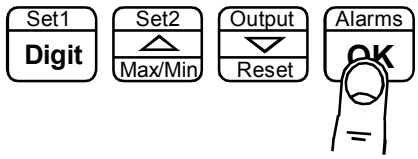


2



If the display shows L in.OFF, press Set2 button briefly so that the display shows L in.On, then press OK

3



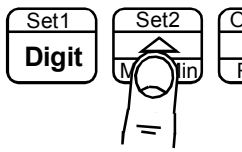
The display will show SEt 00
Ensure no load is applied to the system and press OK.

The display will now show rd 00
You can now tell the meter what it should display for this load.

Select each digit in turn with the DIGIT button, and increase or decrease each digit's value using the UP or DOWN button, until the display is set as required.

You can set the **Decimal Point** position by pressing the Set 2 button for 3 seconds. All decimal points will illuminate, but one will brighter than the others. Use the UP/DOWN buttons to choose a decimal point position and then press OK. Press

4



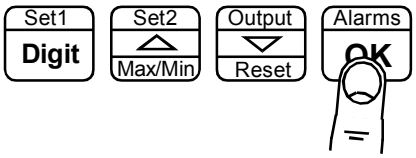
The display will show Add.Pt

Press OK

Continued ...

Linearisation with Direct Calibration - cont'd.

5

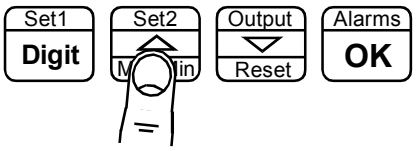


The display will show SEt 01 and will then show the actual mV signal from the loadcells. Apply your 1st known load to the system and press OK.

The display will now show rd 01
You can now tell the meter what it should display for this load.

Select each digit in turn with the DIGIT button, and increase or decrease each digit's value using the UP or DOWN button, until the display is set as required. Press OK when done.

6



The display will show Add.Pt

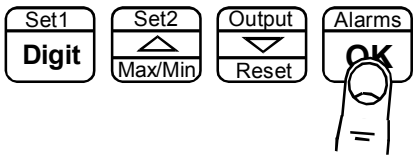
Press OK if you want to Add another calibration point, you will repeat the previous steps, each time incrementing "Set 02" and "rd 02" up to Set 09 and rd 09 which are the last available points.

If you want to finish adding points, press Set2 until the display shows SAVE, and then confirm by pressing OK

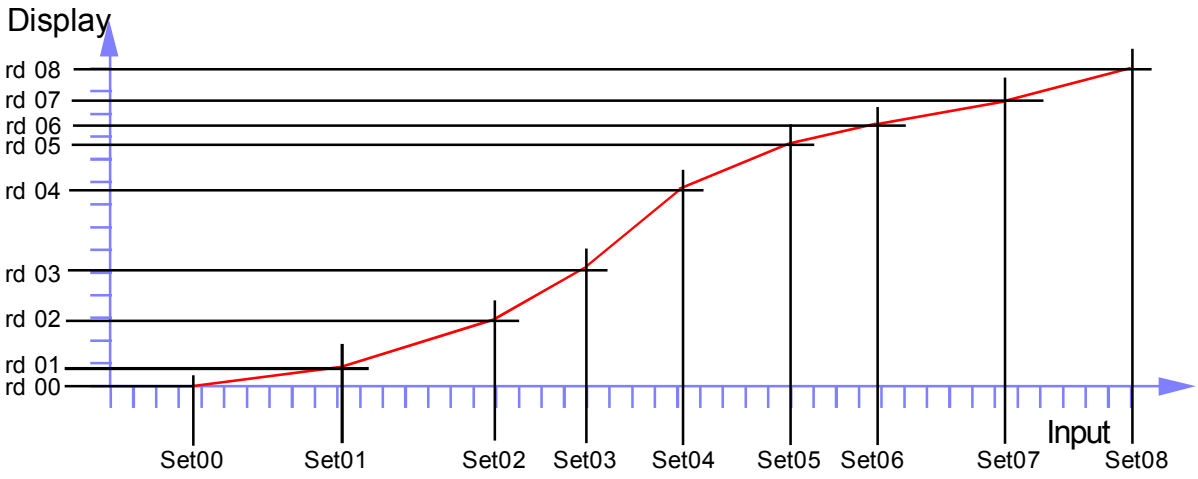
If you want to abort the setup, press Set2 until the display shows no it and then press OK

New Feature: From point "Set02" onwards, you can now see the live load. This allows you to add load up to the point where you see excessive non-linearity. You can then correct the reading for that load as needed.

7



Done!



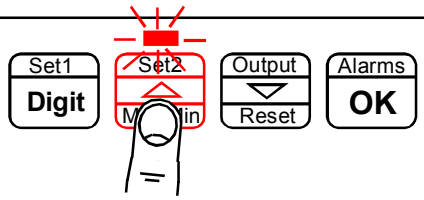
Theoretical Cal. - Decimal Point & Full Scale

This is when you type in the sensor's theoretical signal level at the top and bottom of its range and the value to display, for each signal level.

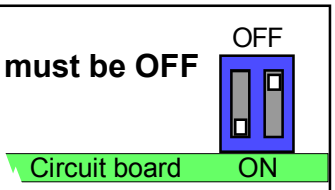
If you have not done so before, please select Theoretical Calibration mode from the **Meter Calibration** page AND choose whether your input is current or voltage.

First we recommend you set the **FULL SCALE** calibration ...

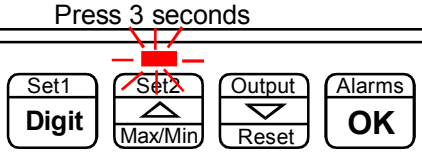
1



Lockout Switch must be OFF

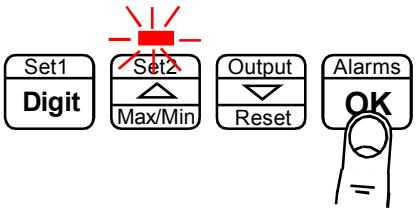


2



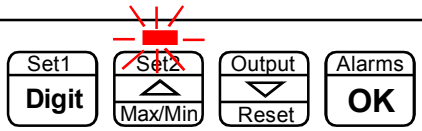
Display shows tHEor

3



You can now specify the maximum input signal. Use DIGIT to select each digit in turn, and the UP or DOWN arrow to increase or decrease each digit's value, as required. eg set 20.0000 if your high input is 20mV

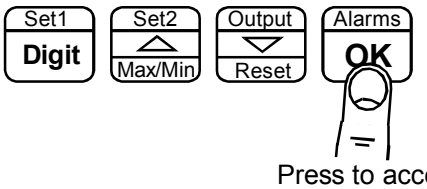
4

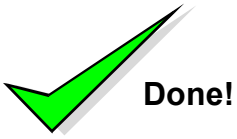


Default scaling is
0-40mv = 0-40.000

Display now shows rdHi briefly. You can now specify the maximum reading and decimal point position. Press Set2 button for 3 seconds to set decimal point position. Use up and down arrows to move the **Decimal Point** and press OK when done. Then, use DIGIT to select each digit in turn, and the UP or DOWN arrow to increase or decrease each digit's value, as required. Set 100.000 if your display range is 0 to 100.000

5



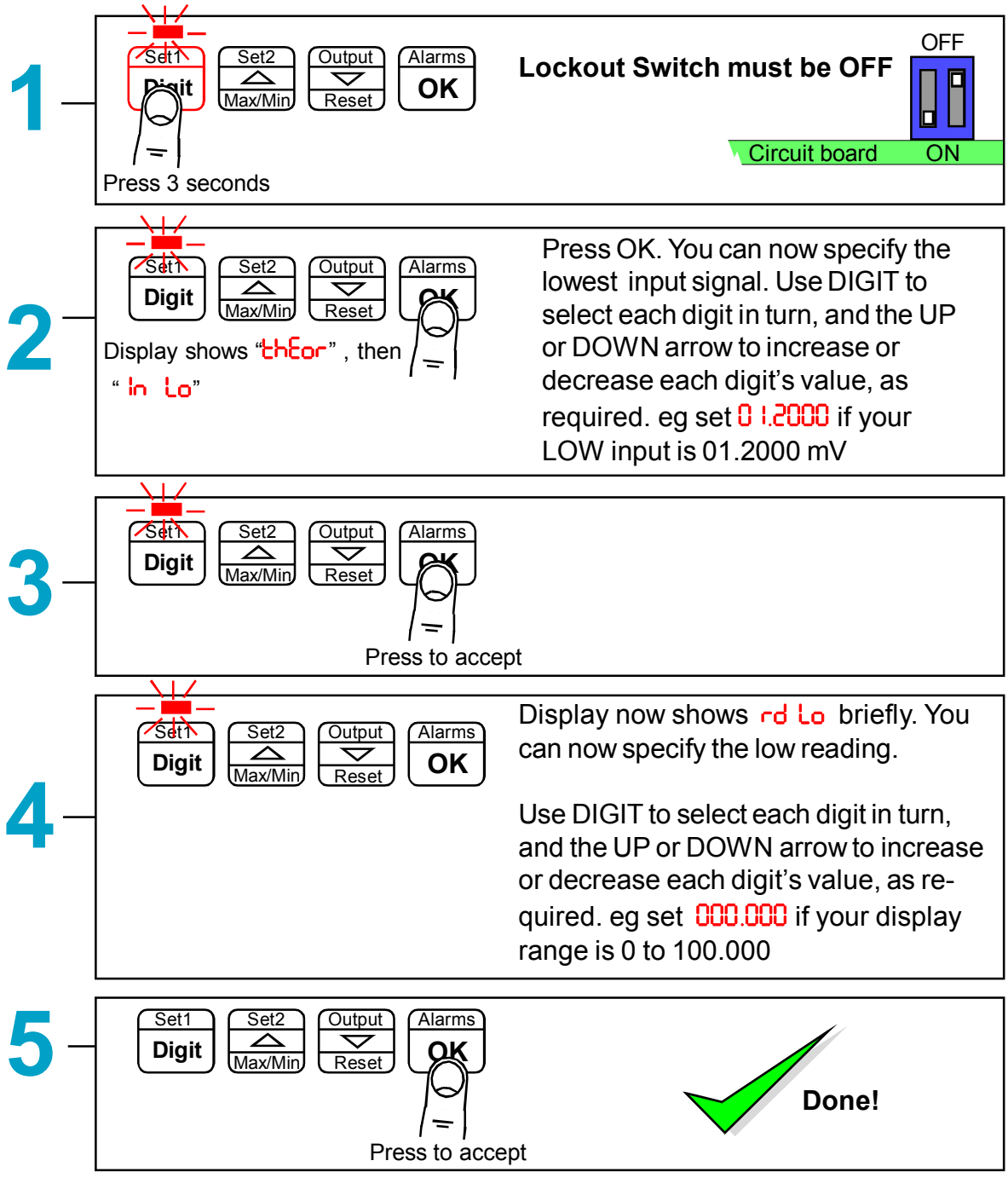


Done!

Theoretical Calibration - Low end calibration

This is when you type in the sensor's theoretical signal level at the top and bottom of its range and the value to display, for each signal level.

If you have not done so before, please select Theoretical Calibration mode from the **Meter Calibration** page.



You can set Zero first, if you prefer, but you will not be able to change the decimal point position in the ZERO calibration step. This will not be an issue if your zero calibration reading is 0, but may become confusing otherwise.

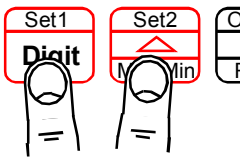
Linearisation with Theoretical Cal.

If your system is non linear, you can calibrate the meter and correct for this with the lineariser function.

With this method, you can enter theoretical values for input signal and display values, without having to connect a sensor.

First, you must select Theoretical Calibration Mode (see page on calibration Modes) Then, proceed as shown below...

1

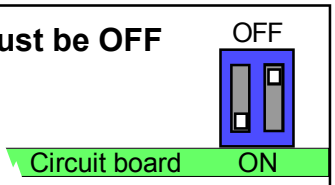


Press together, briefly

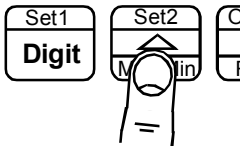
Lockout Switch must be OFF

Display will show

L in.On or L in.OFF

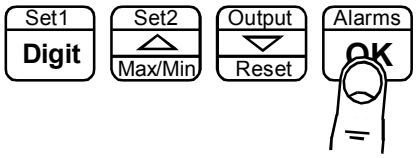


2



If the display shows L in.OFF , press Set2 button briefly so that the display shows L in.On, then press OK

3

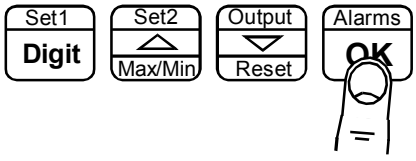


The display will show In 00 followed by an editing screen. Here you can enter your first calibration input signal level using DIGIT button to select each digit in turn. Increase or decrease the value of each digit using the UP or DOWN buttons. Press OK when set.

The display will now show rd 00
You can now tell the meter what it should display for this input signal.

Select each digit in turn with the DIGIT button, and increase or decrease each digit's value using the UP or DOWN button, until the display is set as required. You can set the **Decimal Point** position by pressing the Set 2 button for 3 seconds. All decimal points will illuminate, but one will brighter than the others. Use the UP/DOWN buttons to choose a decimal point position and then press OK. Press

4



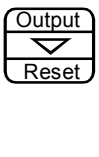
Display will show Add.Pt

Press OK

Continued ...

Linearisation with Theoretical Cal. - cont'd.

5

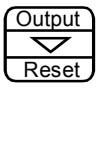


The display will show In 01 followed by an editing screen. Here you can enter your next calibration input signal level using DIGIT button to select each digit in turn. Increase or decrease the value of each digit using the UP or DOWN buttons. Press OK when set.

The display will now show rd 01
You can now tell the meter what it should display for this input signal.

Select each digit in turn with the DIGIT button, and increase or decrease each digit's value using the UP or DOWN button, until the display is set as required. Press OK when done.

6



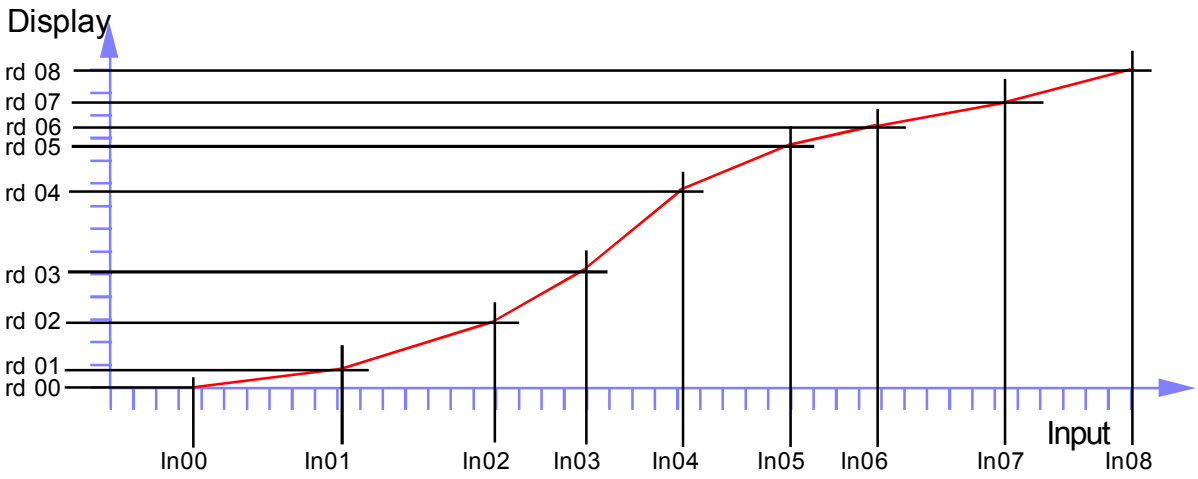
The display will show Add.Pt

Press OK if you want to Add another calibration point, you will repeat the previous steps, each time incrementing **In XX** and **rd XX** up to In 09 and rd 09 which are the last available points.

If you want to finish adding points, press Set2 until the display shows SAVE , and then confirm by pressing OK

If you want to abort the setup, press Set2 until the display shows QUIt and then press OK

Done!



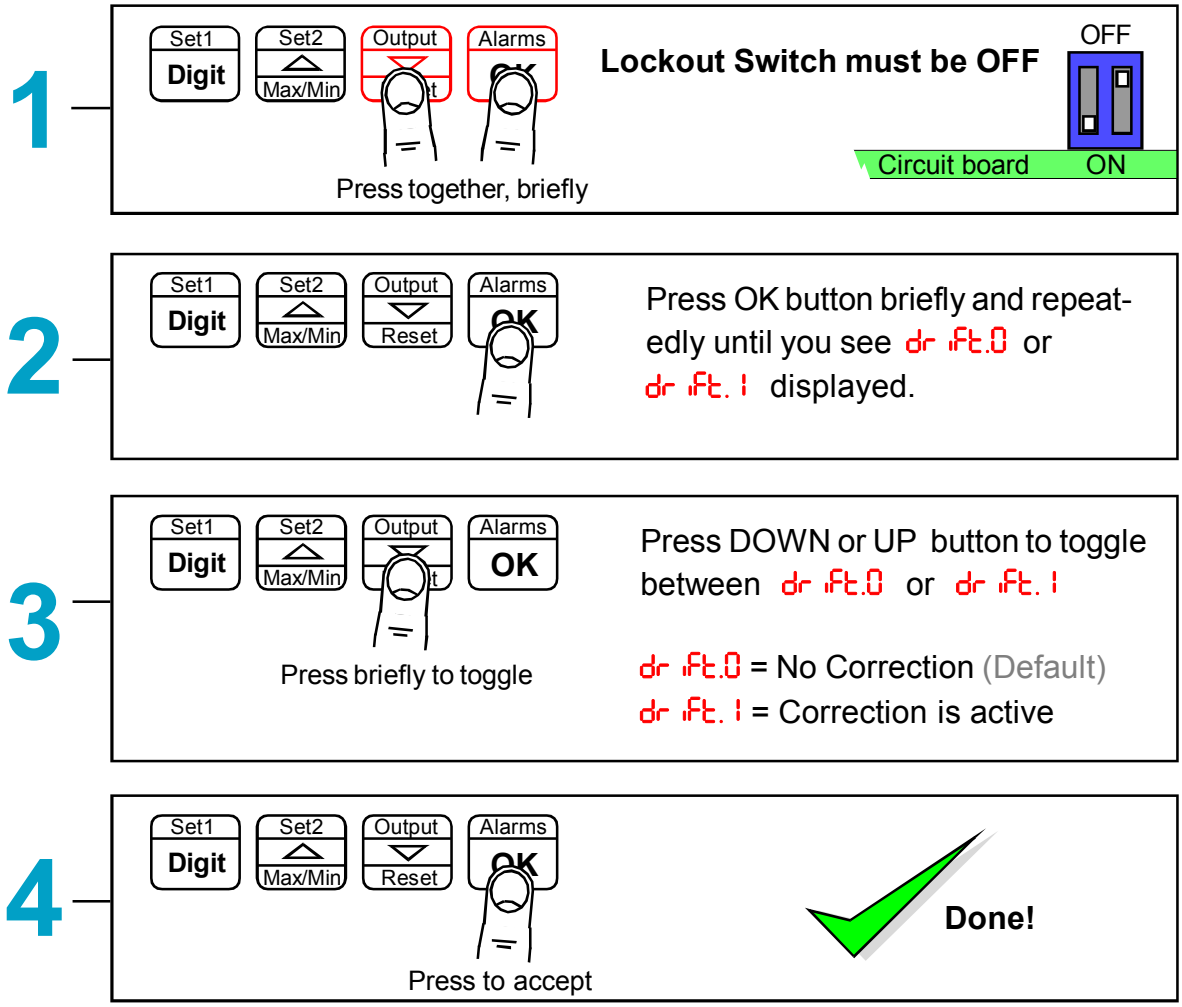
Sensor Drift correction

If your system is normally reading 0, for example as is typical with platform scales or a torque meter, you may find a small amount of sensor drift caused by changes in temperature, ageing etc.

We can automatically correct for slow, long term drift, by comparing your signal to 0 every 30 seconds, and re-calibrating to remove any detected movement.

This does not affect the sensititivity of your system, and is only applied for readings less than 8 least-significant counts.

The corrected value is stored in non-volatile memory, so that any drift trend will be re-applied after you have switched off the meter.



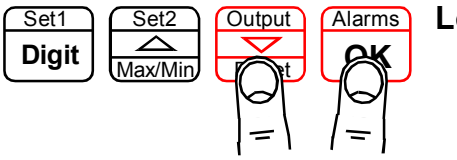
Logic input functions

The three contact closure inputs on the rear of the meter have default functions which are:-

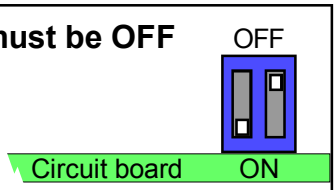
Contact closure 1 = Tare
Contact closure 2 = Peak/Valley display
Contact closure 3 = Reset

You can re-assign these to include :HOLD, Nett/Gross value display

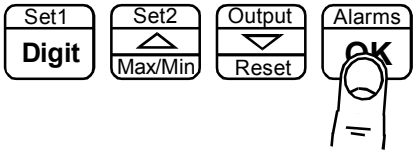
1



Lockout Switch must be OFF



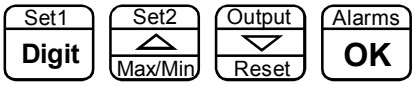
2



Press repeatedly until you see CC.1, followed by the existing function for Contact Closure 1.

After you have set CC.1, you will get the prompt CC.2 to allow you to set Contact Closure 2 function and when you have set CC.2 you will get the prompt CC.3 to allow you to set Contact Closure 3 function

3

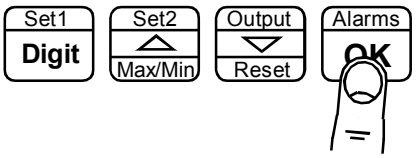


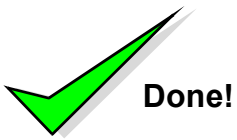
Use UP or DOWN buttons to select from these available functions...

Defaults are:-
CC.1 = tArE
CC.2 = PU
CC.3 = rSt

tArE	= Tare display to 0
PU	= Peak/Valley toggle
rSt	= Reset
Hold	= Freeze display
nEt.Gro	= Nett / Gross display

4





Done!

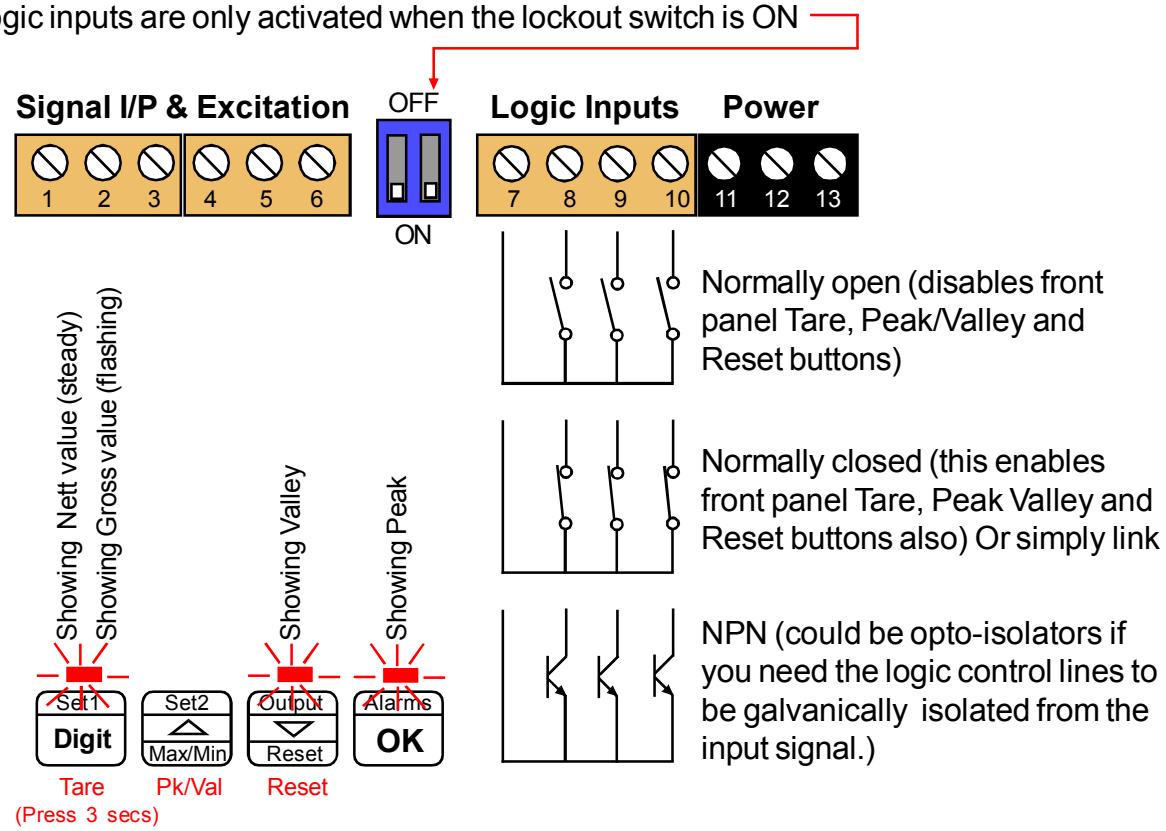
Logic input connections and front buttons

The previous page explained how to select the functions of the 3 logic inputs. You can connect remote contact closures or open NPN collectors to activate these logic inputs.

The logic input provides a 5V DC signal. When you connect this to common, a current of 1mA will flow. Because this is a small signal, we recommend you use switches with gold plated contacts, or self cleaning contacts, for best long term reliability.

The logic inputs are not galvanically isolated from the input signal.

The logic inputs are only activated when the lockout switch is ON



tArE = Tares display to 0. Often used in weighing systems to zero a display prior to making a measurement. Net weight is shown once tared. When a display has been tared the small LED above the Set1 button will be illuminated.

PU = Peak/Valley toggle. Allows you to view the maximum and minimum values which have been displayed since last reset. 0% LED illuminates when showing valley, 100% LED illuminates when showing peak.

rSt = Reset. This clears any tare, peak, valley, alarm latch

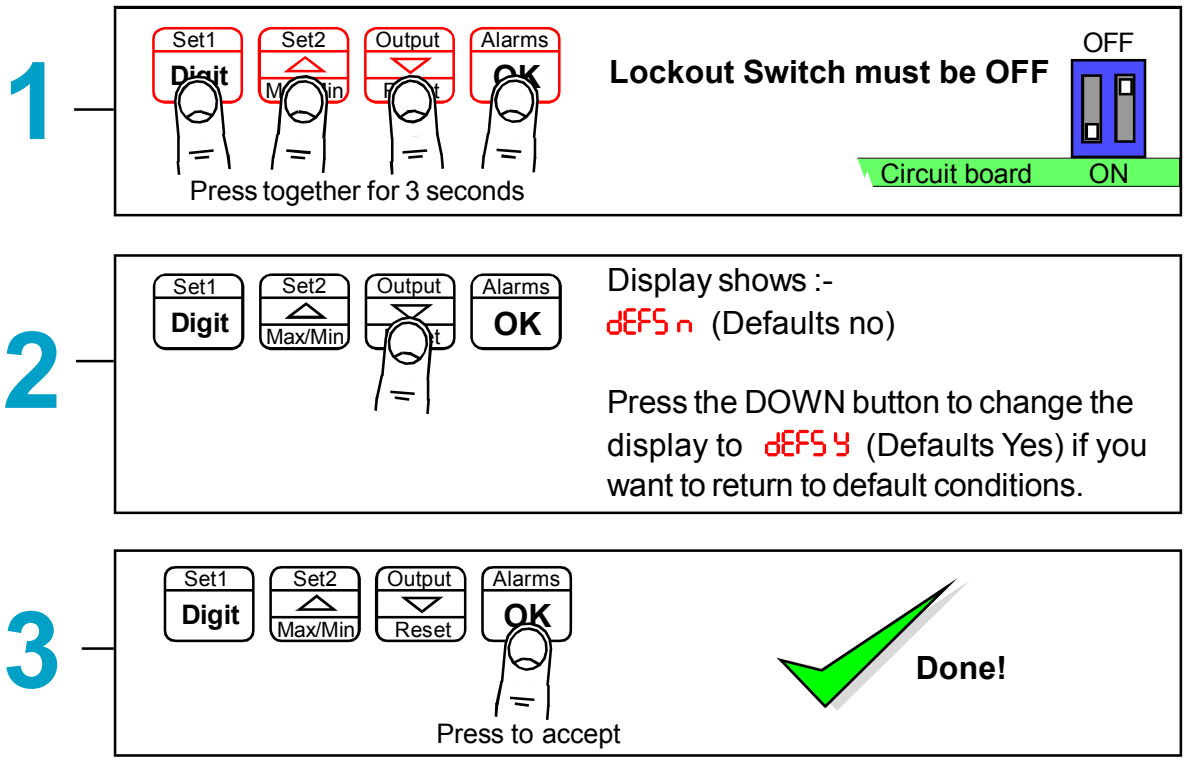
HoLd = Freezes the displayed value and all output states for as long as the Hold input is closed

nEt.Gro = Allows you to toggle between Nett and Gross values on the display

Factory Defaults

You can return the display to its factory default conditions whenever you wish. If you do so, you will permanently loose all your settings and will need to start from the beginning again.

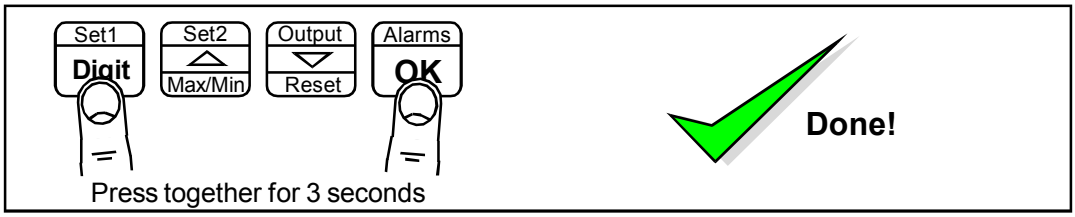
The calibration Audit Counter will NOT be reset, there is no way provided to reset this value, as it is intended as a secure record to indicate whether changes have been made to the display since it was last calibrated..



Calibration audit number

Your display includes a non-resettable counter which increments each time you make a change to the display's calibration. This is useful if you want to check whether a display has been altered since it was last calibrated.

The Calibration audit number starts at CAL 01 up to CAL FF allowing up to 255 alterations to be recorded. Whenever you want to check the calibration audit number, press and hold the 2 outer buttons (Set1 + Alarms) for more than 3 seconds.

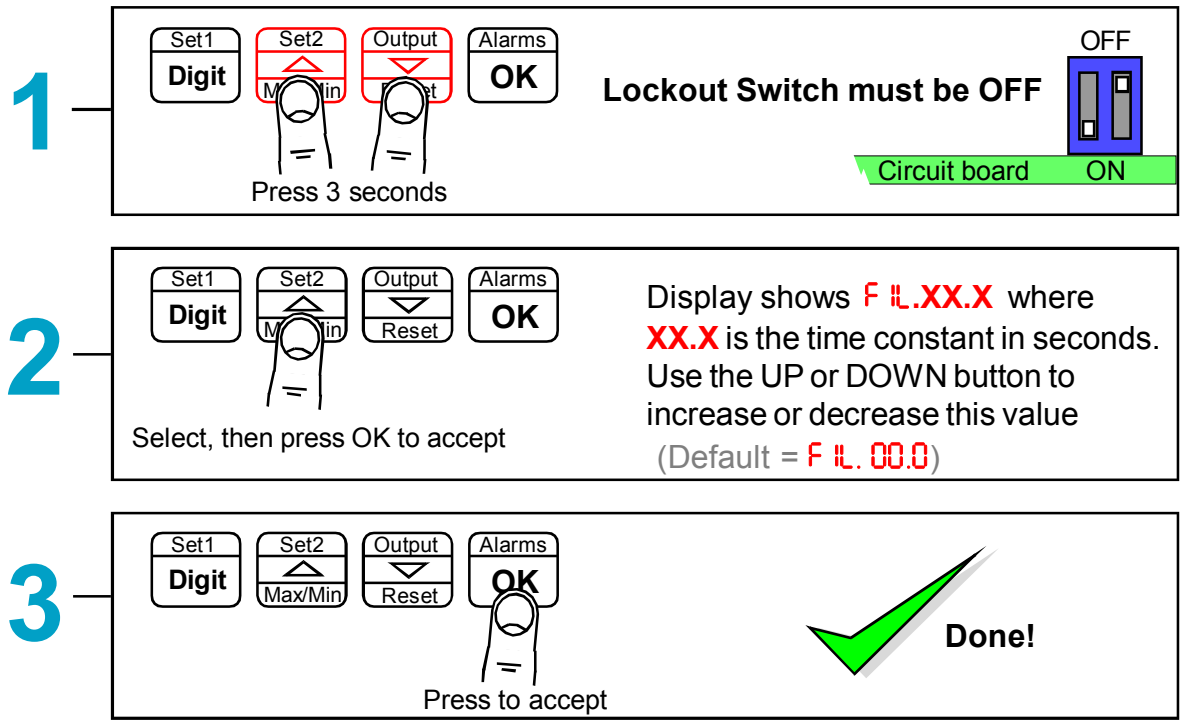


Signal Filtering / Averaging

You can adjust the filtering time constant to reduce the effect of noise or instability on your input signal.

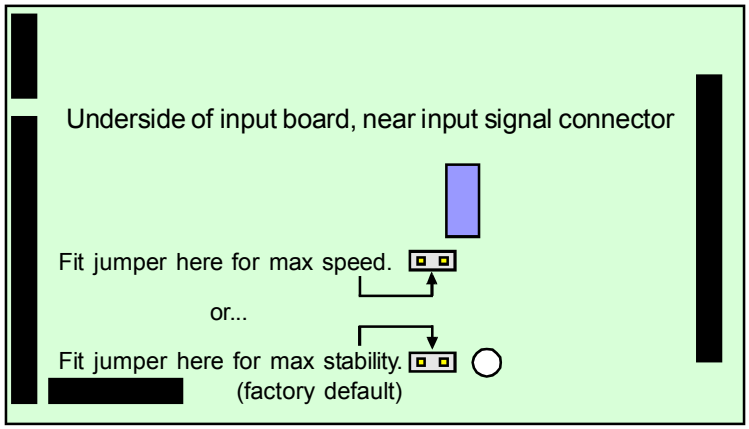
A larger FIL value will give a more stable display, but the response to signal changes will be slower.

Because your output options, such as analogue output, alarm relays and serial output are all derived from the displayed value, they will respond at the same rate as the filtered display.



See also Filter Jump setting if your signal is particularly noisy and you cannot get sufficient smoothing with this filter.

This meter also includes an active filter for removing the effects of vibration. It is shipped with the filter enabled for maximum stability. You can move a push-on jumper switch to change the filter response to maximum speed if you wish. See below.



Filter Jump value

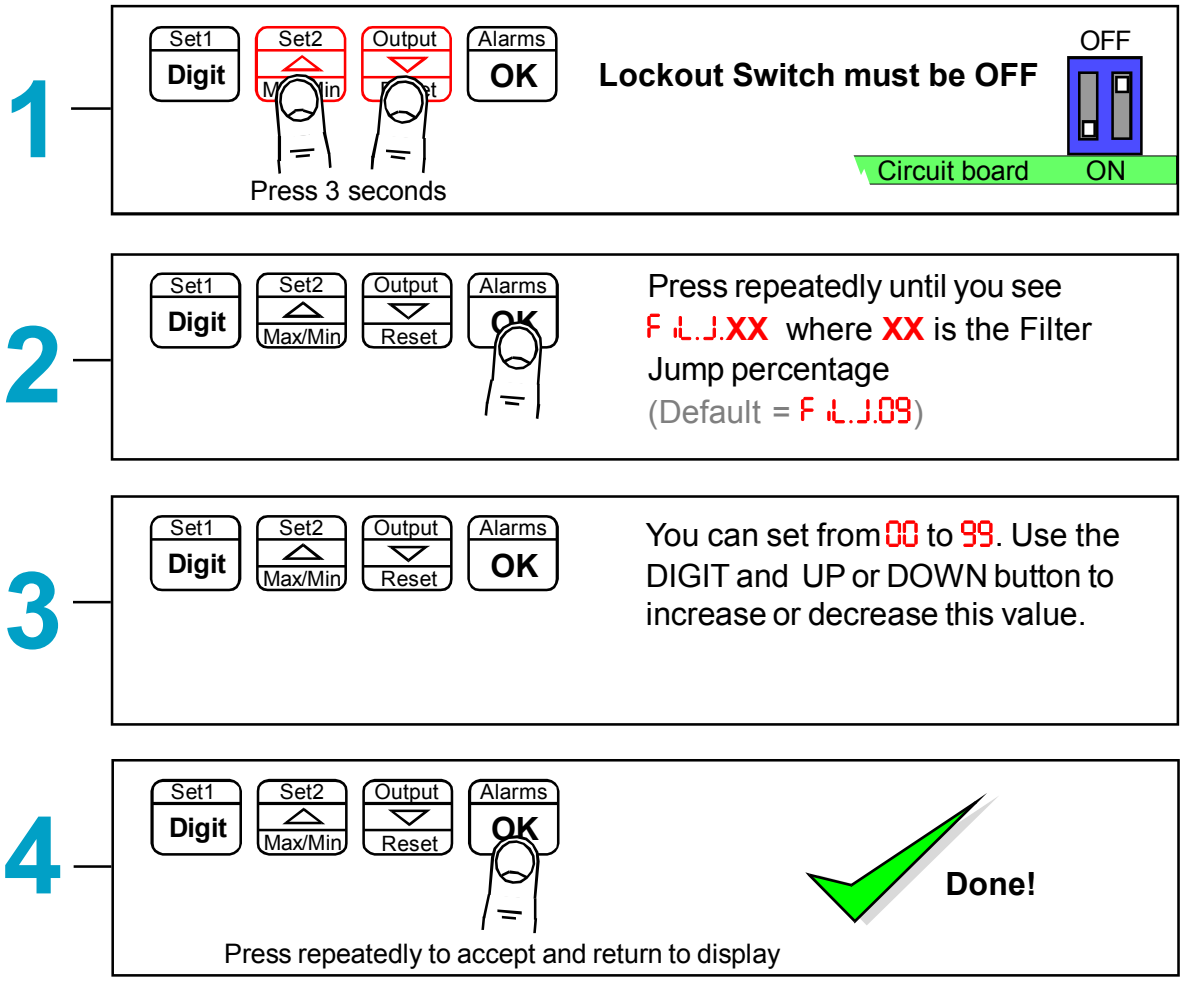
The Filter Jump value allows you to decide how the display will respond to a process step change. It does this by overriding the filtering, if the input signal moves by more than a chosen amount in one conversion. The Filter Jump default value is 10%.

This means that for noise amplitude which has a peak value of less than 10% of the input range, filtering will be applied. Any signal movement greater than 10% of the input range will cause the display to jump immediately to that value, without filtering. After that jump, normal filtering will be re-applied, provided signal movement thereafter is less than 10% per conversion.

Guidance:
For noisy systems, increase the Filter Jump value up to a maximum of 99. Choose a value which gives a good compromise between filtering and response speed.

For reasonably clean signals, a Filter Jump value of around 10 or less will give a good compromise between filtering and response speed to step change inputs.

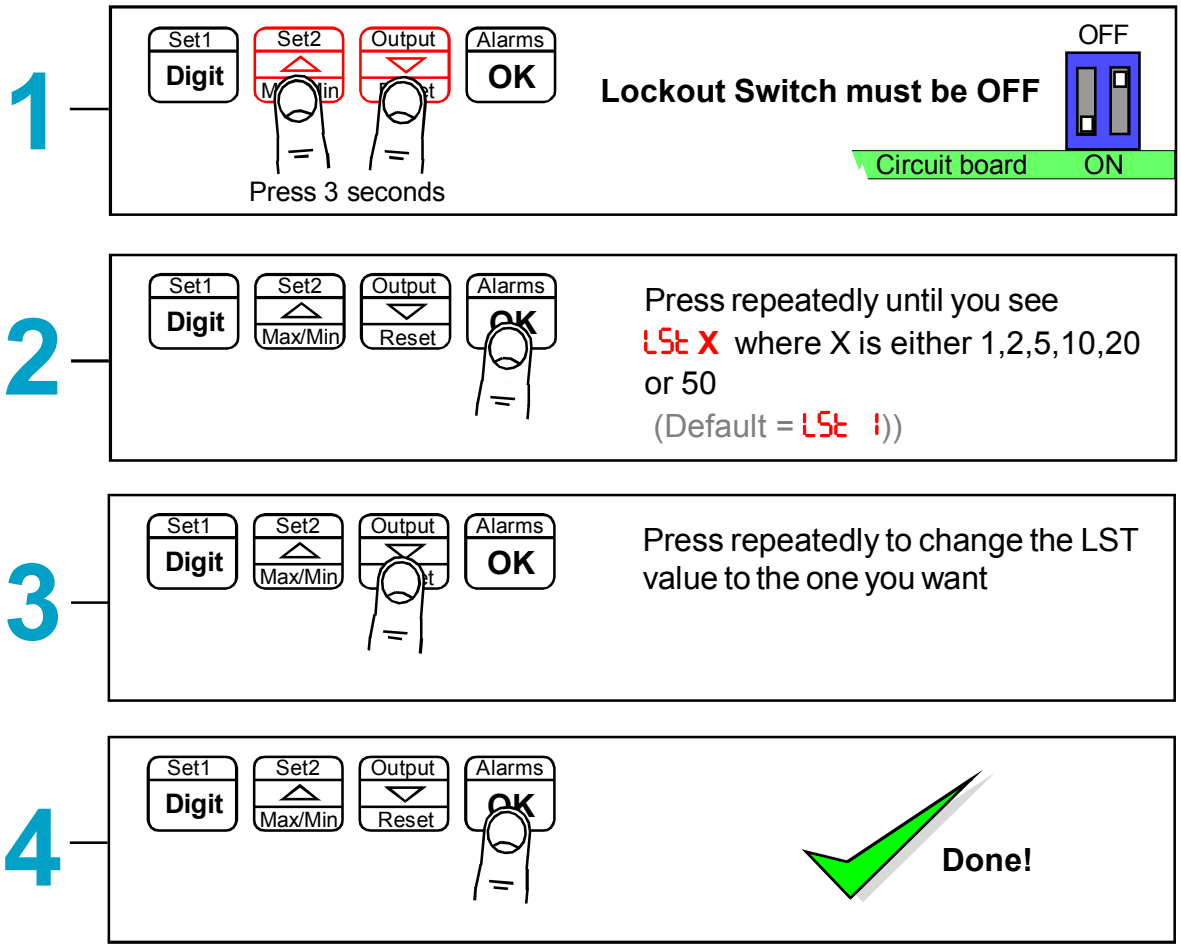
For maximum stability, set FiL.J 99



Last Digit rounding up by 1, 2, 5, 10, 20 or 50

You can adjust the way the display rounds up, which is useful if you want to display a very large number, but do not want jitter on the last digit.

The display can be set to round up to the nearest 1 (no rounding) 2, 5, 10, 20 or 50



Scale Factor adjustment

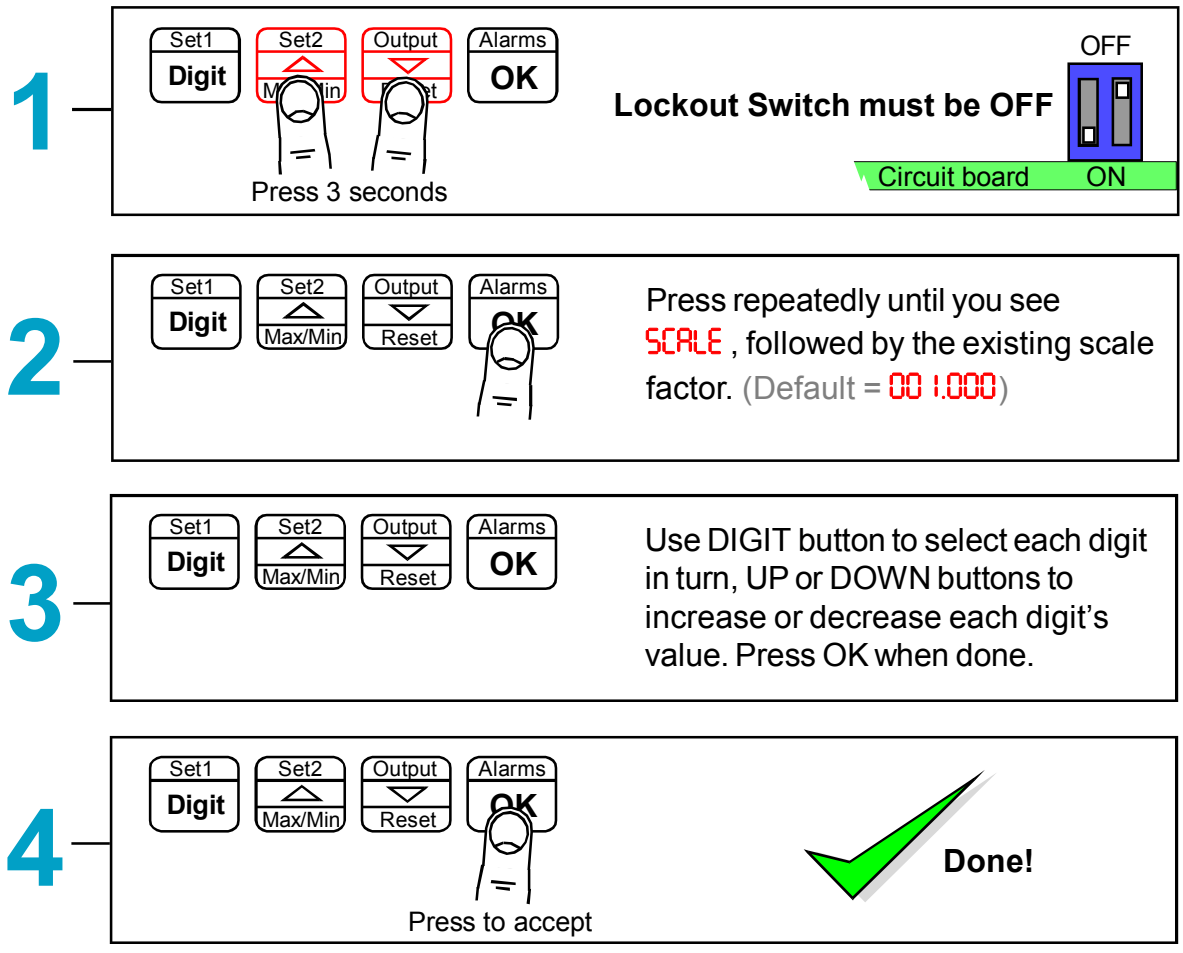
After you have calibrated your meter, you can use the SCALE feature to make fine adjustments to calibration, without affecting the calibration itself.

Examples

1.Changing weight units of measure from kg to pounds
You could also use the SCALE to convert your readout from kg to pounds, without affecting the calibration. Simply set SCALE = 2.205 and your meter which was calibrated in kg will now read in pounds. For converting Pounds to kg, use a Scale of 0.4535

2. Correcting for gravitational variance
Your weighing system was calibrated where gravitational acceleration = 9.812m/s^2 (London) You then move the system to Bankok where gravitational acceleration is reduced to 9.782m/s^2

You can correct for this difference by setting Scale = 9.812 / 9.782 = 1.003, so that a given mass in Bangkok will show the same weight as it did in London. Set Offset = 0.0000
See http://en.wikipedia.org/wiki/Earth%27s_gravity

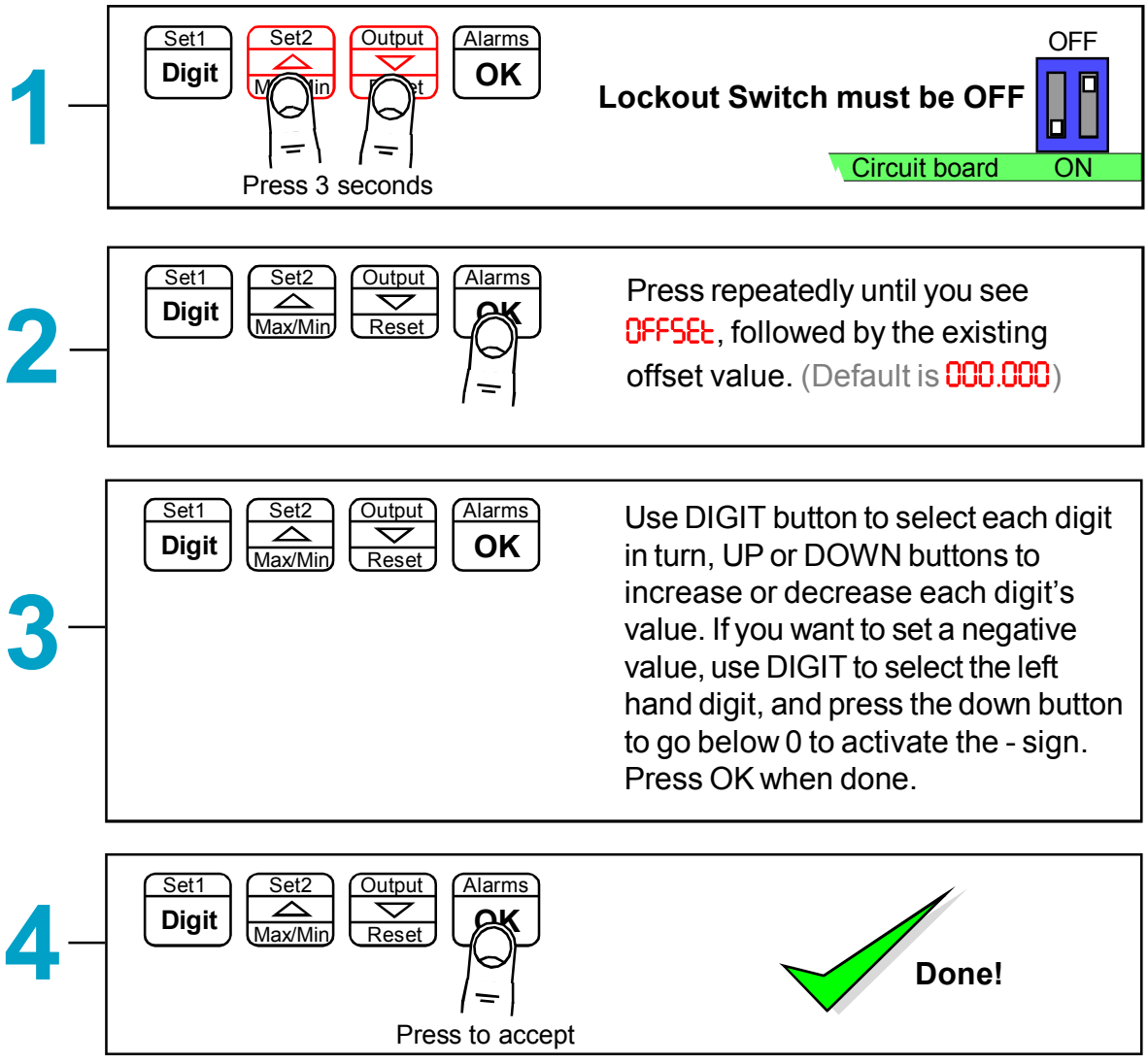


You may want to adjust an offset value also, see separate OFFSET page for this feature.

Offset adjustment

After you have calibrated your meter, you can use the OFFSET feature to make fine additions or subtractions to the reading, without affecting the calibration itself.

For example if your weighing structure is altered after calibration and you want to subtract the effect of 37kg of extra metalwork which was welded to the hopper, you can easily do this by entering a value of -37 in the offset value.



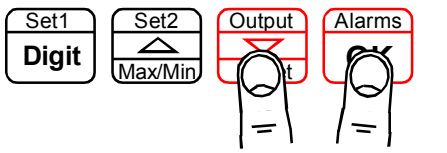
You may want to adjust a SCALE FACTOR value also, without affecting calibration. See the separate SCALE page for this feature.

Menu timeout adjustment

The display has a default timeout of 60 seconds, to allow you sufficient time to refer to the manual between key operations.

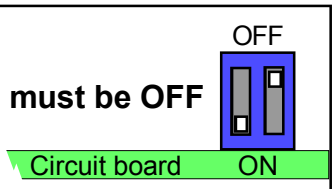
You can make this period shorter, if you wish, once you become more familiar with the setup method.

1

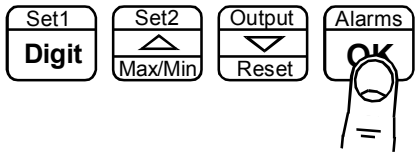


Press together, briefly

Lockout Switch must be OFF



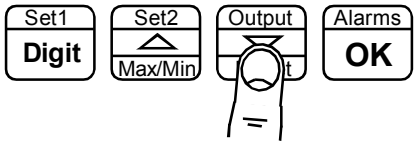
2



Press repeatedly until you see dLAY. **XX** where **XX** is the delay in seconds. Choices are ...

dLAY. 10
dLAY. 20
dLAY. 30
dLAY. 60 (default)

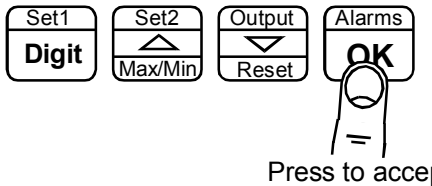
3



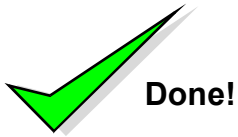
Press briefly to toggle

Press DOWN or UP button briefly and repeatedly to choose from dLAY. 10 or dLAY.20 or dLAY.30 or dLAY.60

4



Press to accept

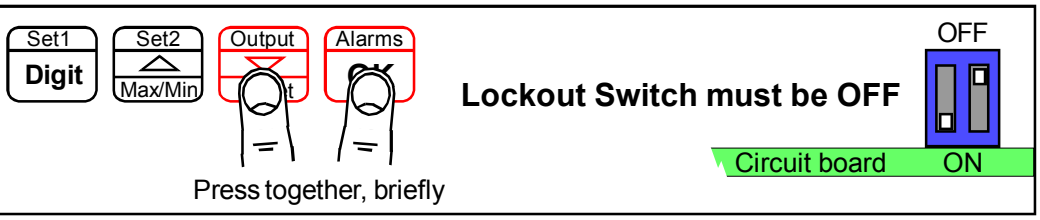


Done!

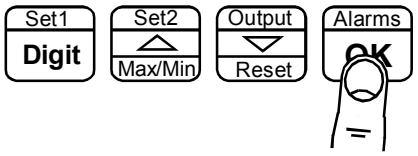
Reverse Display function (mirror image)

If you need to be able to see a reflection of the display in a mirror or other reflective surface, for example in a simple heads-up system, or for drivers reversing into a bay, using mirrors only, you can set the display to show as a mirror image.

1



2



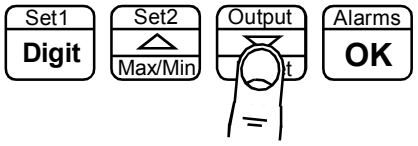
Press OK button briefly and repeatedly until you see

rEU.d 0 (Default)

or

rEU.d 1

3

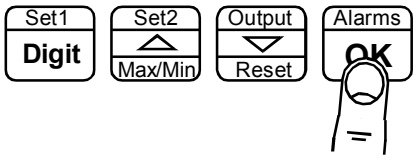


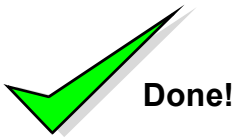
Press DOWN or UP button briefly and repeatedly to choose from

rEU.d 0 (normal display) or

rEU.d 1 (mirror image display)

4





Done!

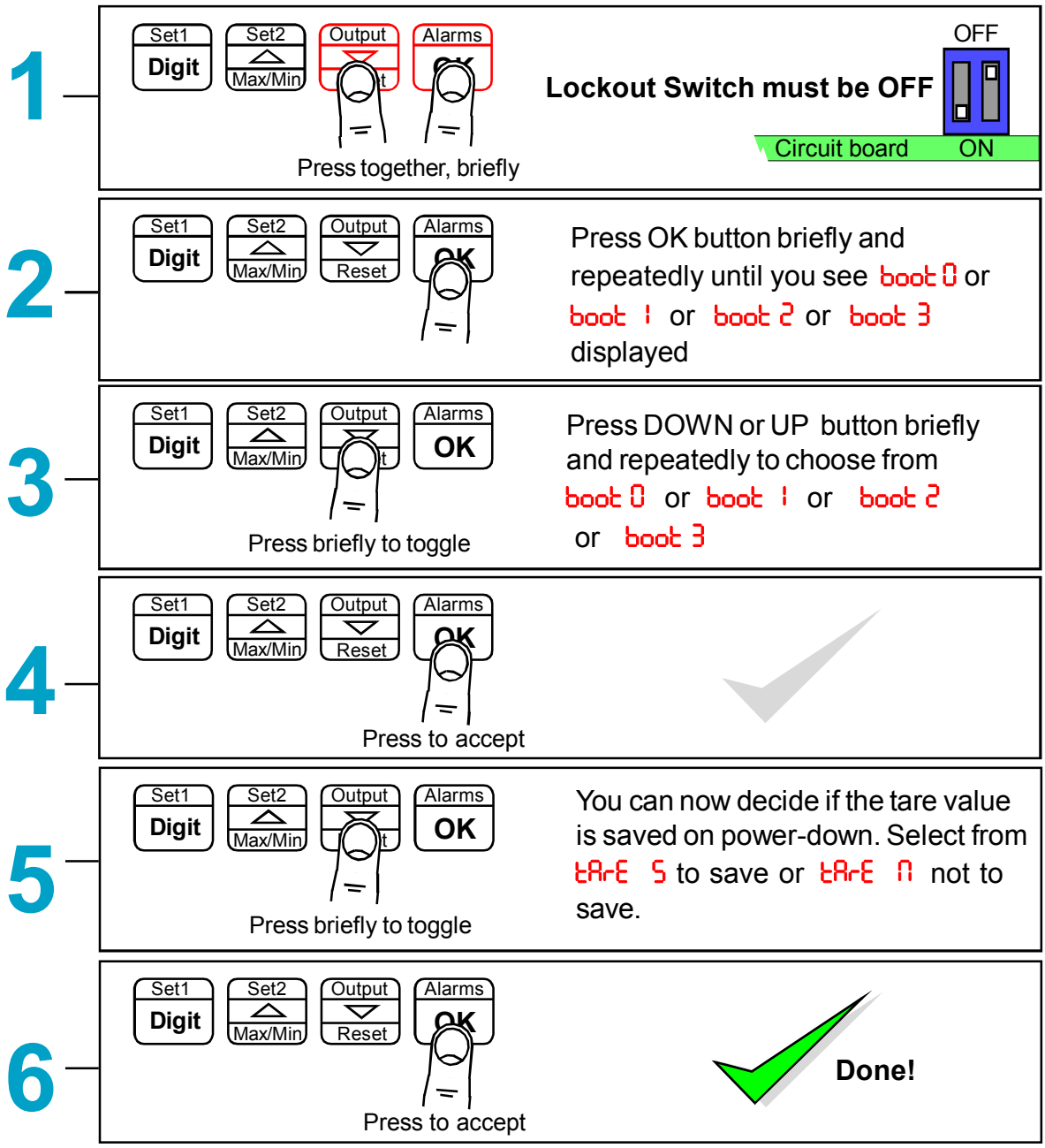
Example of normal display format displaying the number 876543

Example of Mirror Reverse display format displaying the number 876543

Bootup routine and Tare save choices

When you switch on your meter, it can be set to power up with 3 possible summary message combinations. The choices are:-

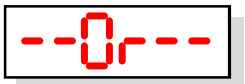
boot 0	=	Segment test, followed by a full summary of software revision, calibration audit number, model number, installed options.
boot 1	=	Segment test followed by model number (Default)
boot 2	=	No summary, meter displays the measurement value immediately power is applied.
boot 3	=	All segments illuminate permanently, until a button is pressed



You can trigger the full summary message whenever you want, without having to power the meter off, by pressing and holding the 2 outer buttons (Set1 + Alarms) for more than 3 seconds.

Error codes and fault finding

1. Under Range. The meter is being asked to display a value which is more negative than its limit of -199999



2. Over Range. The meter is being asked to display a value which is higher than its limit of 999999

If no loadcell is connected to the display, you will see one of these fault codes.

In addition, these fault codes could be displayed because the signal is too negative, too positive, or because there is a wiring error, or because the display's scaling has been adjusted to give excessive sensitivity, or because there is a fault in the display.

a. Measure the input signal on terminals 3(-) and 4(+)and confirm that it is between -40mV DC and +40mV DC. You can temporarily force the display's input signal to 0mV by wiring a link between terminal 3 and terminal 4, but keep the loadcell connected in addition to this link, as the display needs to see a full bridge at its input

b. Measure the excitation voltage on terminals 1(-) and 6(+) and confirm that it is between 9.5 and 10.5V DC. If it is less than 9.5V, remove the plug-in connector and measure the voltage directly on pins 1 and 6 with the connector removed. If it is still less than 9.5V, and if the meter has not been purposefully modified to give lower excitation, then there is most likely a fault with the display and it should be returned to us for the attention of our QA Manager, with a report of what you found, for repair.

c. Measure the sense voltage on terminals 2(-) and 5(+) and confirm that it is between 4 and 10.5V DC. If it is not, please confirm that you have connected terminal 1 to terminal 2 and terminal 5 to terminal 6, either at the meter end of the loadcell cable or at the loadcell end.

d. Measure the voltage between terminal 2(-) and terminal 3(+) It should be half of the voltage you measured in step 3. If it is not, there is most likely a wiring error between the display and the loadcell, or the loadcell is faulty. Check the wiring according to the installation instructions for the loadcell and the display. If that appears to be correct, measure the resistance of the four loadcell branches according to the loadcell manufacturer's specifications.

e. If steps 1 to 4 were satisfactory, the problem may be caused by the scaling being too sensitive. If you are happy to do so, it is a simple matter to reset the display's scaling to the factory default conditions. Put the lockout switch off and press all 4 buttons together for around 3 seconds until the display shows "dEFS n" press the UP button once so the display shows "dEFS Y". Now press the OK button and the display will be reset to factory defaults.

If still no success, please return the display to us for the attention of our QA Manager, with a report of what you found, for repair.

Waste Electrical Electronic Equipment (WEEE)

In Europe, this equipment must be disposed of in accordance with European Parliamentary Directive 2002/96/EC

This directive encourages recycling and the reduction of waste materials in the environment.

This means it must be sent to an approved recycling plant if you want to dispose of it.

It must not be thrown away with general rubbish.

WEEE Waste Recycling

If you are unable to dispose of this item locally, you may send it to us for recycling.

Conditions:

1. We will only accept items of our manufacture.

2. You must pay for the transport of the goods to us.

3. We will only accept items if they include a signed declaration by an authorised person in your organisation, stating that :-

    i. The item is safe to handle and has no contaminants which may be harmful to health.

    ii. You wish us to dispose of or destroy the item(s)

Equipment Specifications

Bezel size	48mm high by 96 mm wide (1/8 DIN)
Panel Cutout	45 mm high by 92 mm wide
Case Depth	125 mm including connectors
Weight	300 grammes
Case Material	Black polycarbonate
Connectors	Detachable Screw Terminal connectors
Environmental	Storage Temperature range -20 to +70C, non condensing Operating temperature range 0 to 50C, non condensing Front sealed IP65. Optional cover SPC4 for IP67
Power	100-240 VAC, 45 to 60Hz or 11-30 VDC optional
Burden	10VA maximum
Input Signals (bipolar)	4 or 6 wire loadcell up to +/-40mV (+/- 100mV option)
Input Resistance	>10 Megohms
Accuracy	+/-0.05% of range. Allow 30 minutes after switch-on, for thermal stabilisation.
Span tempco	25 ppm/Degree Celsius
Zero Tempco	30 ppm/Degree Celsius
5V Excitation voltage	5VDC nominal rated at 40mA. Must connect to Sense.
10V Excitation voltage	10VDC nominal rated at 120mA. Must connect to Sense.
Excitation Sense	Ratiometric, 4V absolute minimum allowed after line drops
Filtering / smoothing	Selectable time constants of 0 to 25 seconds. A/D is preceded by an active low pass filter with 7Hz cutoff point.
A/D conversion	Sigma-Delta 10 conversions per second, 50/60Hz rejection Resolution 1 in 400 000 max. over full range
Display update rate	10 readings per second.
Display Range (max)	-199999 to +199999, depending on available signal level.

Record of Revisions

1 May 2016	Series released
6 Feb 2017	Active filter jumper setttings added
3 September 2019	Removed reference to output options

Notes

Notes

Declaration of CE Conformity

Declaration Reference	: INTUITIVE Mk4
Issue Date	: 3 October 2015
Products Covered	: INTUITIVE Mk2 series
Title	: DOC-INTUITIVE4

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

EN61326-1:2013

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

EN61010-1:2010

RoHS 2
2011/65/EU

CE

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 at the meter end of the cable.

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

J.R.Lees Director