S M A R T | W E I G H I N G   S O L U T I O N S

rinstrum

400 Series
K404 Truck Weighing
Digital Indicator
Quick Start Manual

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Table of Contents

1. Introduction

This manual contains information on the installation, calibration and setup of the Indicator.

1.1. Manuals

For more information on the indicator refer to the **Reference Manual** and **Operator Manual**.

1.2. Shipping Contents

The following table identifies the items shipped with indicators. Please check that your packing box contains the specified items.

Standard Indicator	Stainless Steel Indicator
• Digital Weighing Indicator • Operator Manual • Quick Start Manual • Trade Label (plastic) • Panel Mount Template • Function Key Overlay Stickers	• Digital weighing Indicator • Operator Manual • Quick Start Manual • Trade Label (plastic) • Function Key Overlay Stickers • Trade Label (metal foil) • M16 Cable Gland Sealing Plug
Other Items (Optional)	
There are many optional accessories for this indicator. These include: • Mounting options • Power supply options • Expansion modules (additional comms ports, I/O etc) • Opto-link temporary connection • PC based configuration tool	

2. Specifications

Performance	
Resolution	Up to 100,000 divisions, minimum of 0.25μV/division
Zero Cancellation	+/- 2.0mV/V
Span Adjustment	0.1mV/V to 3.0mV/V
Stability/Drift	Zero: < 0.1μV/°C (+ 8ppm of deadload max)
	Span < 8 ppm/°C, Linearity < 20ppm, Noise < 0.2μVp-p
Excitation	7.4 volts for up to 16 x 350 or 32 x 700 ohm load cells (4-wire or 6-wire plus shield)
	Maximum total load cell resistance: 1,000 ohms
A/D Type	24bit Sigma Delta with ±8,388,608 internal counts
Operating Environment	Temperature: –10 to +50°C ambient
	Humidity: <90% non-condensing
	Storage: –20 to +50°C ambient
	ABS - IP65 when panel mounted or with rear boot
	Stainless Steel – IP66 when panel mounted or with rear boot
Digital	
Display	LCD with 4 alpha-numeric displays and LED backlighting:
	• Primary display: 6 x 28.4mm high digits with units and annunciators
	• 2nd display: 9 x 17.6 mm digits with units
	• 3rd display: 8 x 6. 1mm digits
	• 4th display: 4 x 7.6 mm digits
Setup and Calibration	Full digital with visual prompting in plain messages
Digital Filter	Sliding window average from 0.1 to 30.0 seconds
Zero Range	Adjustable from +/- 2% to +/- 20% of full capacity
Power Input	
Standard Power Input	12 to 24VDC (15 VA max) - ON/OFF key with memory feature
Variants AC	Input: 110/240VAC 50/60Hz
M4101	Output: 12VDC 15VA
Features	
Optical Data Communications	Magnetically coupled optical communications support. Optional conversion cable connects directly to a standard RS-232 port.
Correction	10 point linearity correction
Serial Outputs	RS-232 serial port for remote display, network or printer supports.
	RS-485 transmit only for remote display
	Transmission rate: 1200, 2400, 4800, 9600, 19200 or 57600 baud
Assignable function key	Printing, unit switching, manual hold, and totalising
Battery Backed Clock Calendar	Battery life 10 years minimum
Approvals	FCC, CE, C-tick Check trade approvals

3. Warnings

3.1. General

- Indicator not to be subject to shock, excessive vibration or extremes of temperature (before or after installation).
- Inputs are protected against electrical interference, but excessive levels of electro-magnetic radiation and RFI may affect the accuracy and stability.
- For full EMC or for RFI immunity, termination of cable shields and correct earthing of the instrument is essential.
- Indicator and load cell cable are sensitive to excessive electrical noise. Install well away from any power or switching circuits.

3.2. Configuration

- Configuration and calibration can be performed from the front panel, using digital setup. When Full Setup is used, all menu items are accessible and care must be taken to ensure no accidental changes are made to calibration and trade settings.
- Enter a passcode to prevent unauthorised or accidental tampering. If the passcode is lost, the manufacturer should be contacted for further advice.

4. Installation

The following steps are required to set up the indicator.
- Inspect indicator to ensure good condition.
- Use connection diagrams to wire up load cell, power and auxiliary cables as required.
- Insert any accessory modules that are being used.
- Use the drilling template provided for hole locations.
- Connect Power to indicator and press **<POWER>** key to turn the instrument ON.
- Refer to the Instrument Setup section page 14 for information on configuring and calibrating the instrument.
- To turn instrument OFF press and hold **<POWER>** key for three seconds (until display blanks).

4.1. Electrical Safety
- For your protection all mains electrical hardware must be rated for environmental conditions of use.
- Pluggable equipment must be installed near an easily accessible power socket outlet.
- To avoid the possibility of electric shock or damage to the instrument, always switch off or isolate the instrument from the power supply before maintenance is carried out.

4.2. Panel Mount Template
The panel mount template is supplied with the instrument. It shows the location of the rectangular cut-out and the four mounting screws.

4.3. Function Keys
- The Indicator has a definable function key.
- If any of the special functions are to be used on the indicator it is important that the matching function key overlay sticker (supplied) is applied to the keypad.
- Ensure keypad is clean and dry before affixing sticker.

4.4. Optical Communications

A temporary infrared communications link can be established between the instrument and a PC using an optional cable. This connection can be used to transfer setup and calibration information from a PC or to download software upgrades.

The PC end of the cable is a standard USB or female DB9 RS232 connector. The instrument end of the cable attaches to the left side of the instrument display.
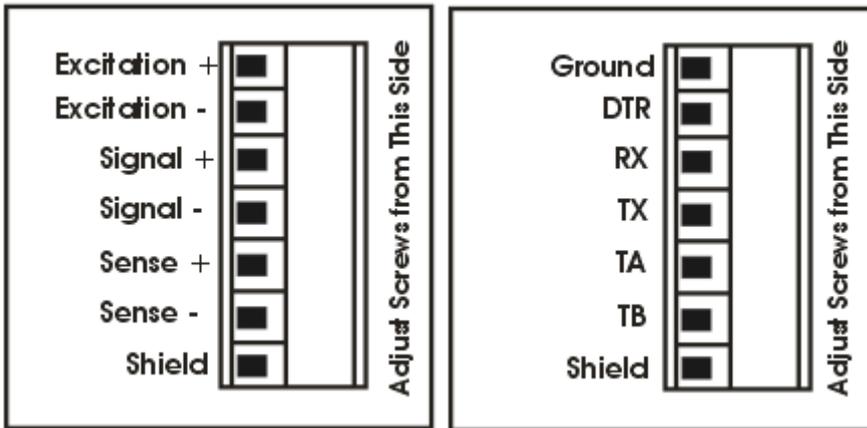
WARNING

The optical coupling head contains a strong magnet and should not be placed near any magnetic storage media (e.g. credit cards, floppy disks etc.)

5. Connections

5.1. Cable Connections

All cable connections are made to the rear of the instrument using pluggable screw terminals. It is not necessary to tin the ends of the wires with solder or to add crimp ferrules to the wires, however, these techniques are compatible with the terminals.

LOAD CELL CONNECTIONS   COMMS CONNECTIONS

LOAD CELL CONNECTIONS	COMMS CONNECTIONS
Excitation + Excitation - Signal + Signal - Sense + Sense - Shield *Adjust Screws from This Side*	Ground DTR RX TX TA TB Shield *Adjust Screws from This Side*

5.2. DC Power (DC PWR +, DC PWR –)

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

5.3. Load Cell Connection

5.3.1. Load Cell Signals

Very low output scale bases may be used but may induce some instability in the weight readings when used with higher resolutions. Generally speaking, the higher the output, or the lower the number of divisions, the greater the display stability and accuracy.

The instrument can display the millivolt-per-volt reading which can be used to check scale base signal output levels. The instrument may be connected for either 4-wire or 6–wire operation. Use 4-wire when external SENSE connections are not available.

5.3.2. 4-Wire Connection

The minimum connectivity requirements are the connection of four wires (i.e. ±Excitation and ±Signal). Internally the instrument has a precision analog switch that can be used to connect the Sense+ and Sense– lines directly to the Excitation+ and Excitation– lines.

Any addition to the load cell manufacturer's cable length using 4-wire connection is only recommended for short cable runs. Where long additions to cable lengths are needed, a 6-wire extension is required.

The SCALE:BUILD:CABLE option must be set to **4-WIRE** to allow for 4-wire connection.
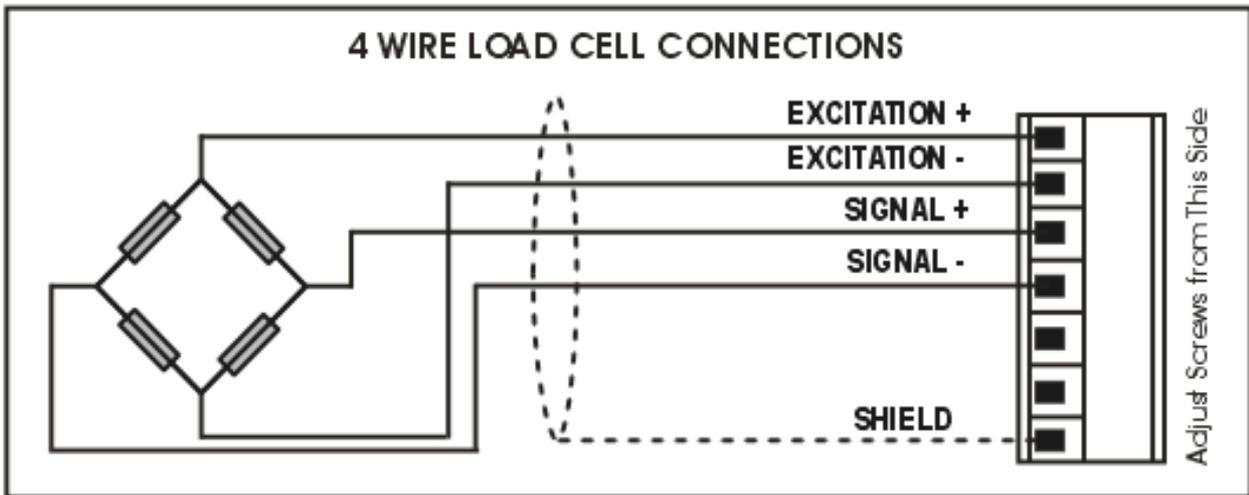
5.3.3. 6-Wire Connection

The excitation and signal lines are connected the same as for a 4-wire installation. The extra two wires (Sense + and –) should be connected to the Excitation + and – lines as close as possible to the load cell itself. Typically these connections are made in a load cell termination box.

The BUILD:CABLE option must be set to **6-WIRE** to allow for true 6-wire connection.

6 WIRE LOAD CELL CONNECTIONS

EXCITATION +
EXCITATION -
SIGNAL +
SIGNAL -
SENSE +
SENSE -
SHIELD

Adjust screws from this side
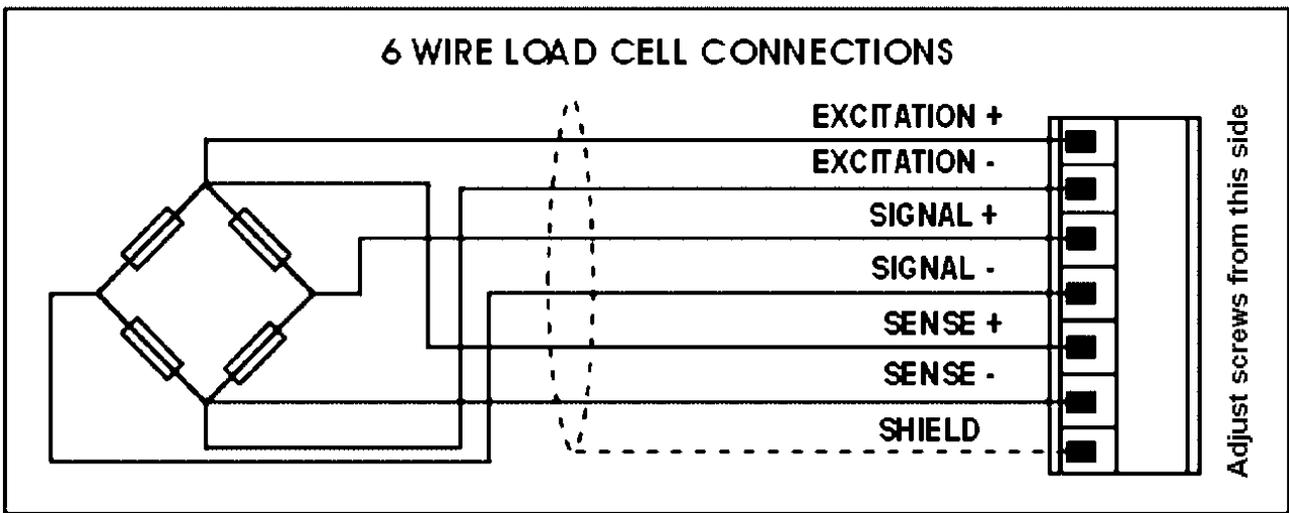
5.4. Auxiliary Connections

This section provides diagrams to illustrate the communication connections.

5.4.1. Direct Personal Computer Link (RX, TX GND)

COMMUNICATIONS CONNECTIONS

5   GROUND
        DTR
3 TX   RX
2 RX   TX
        TA
        TB
        SHIELD

DB9 - F

Adjust Screws From This Side
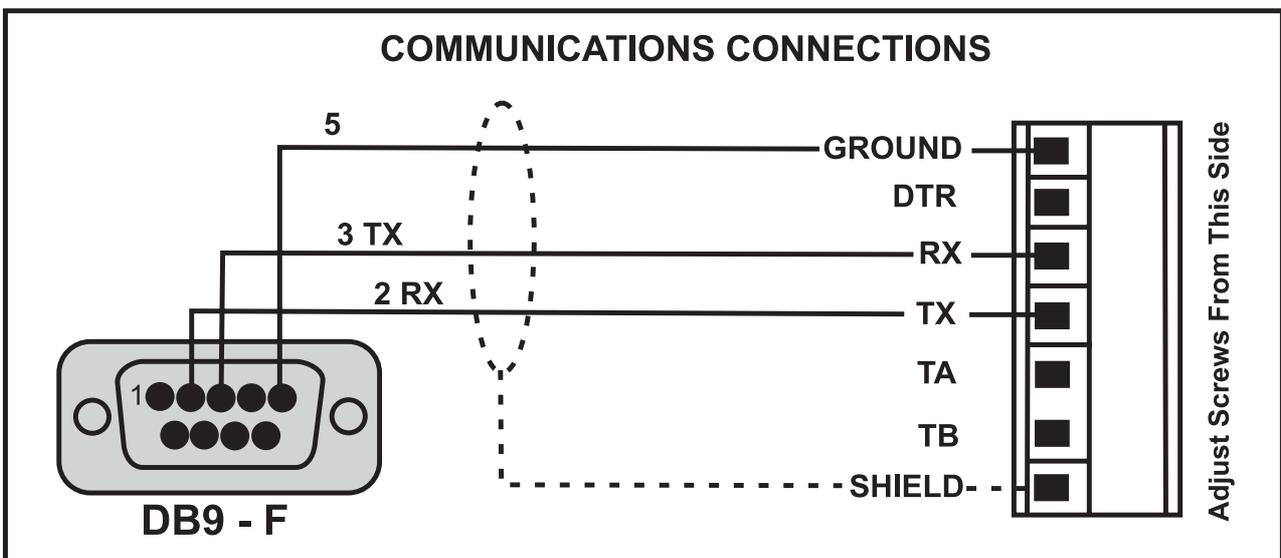
5.4.2. Printer Connections (RXD/TXD, GND and DTR)
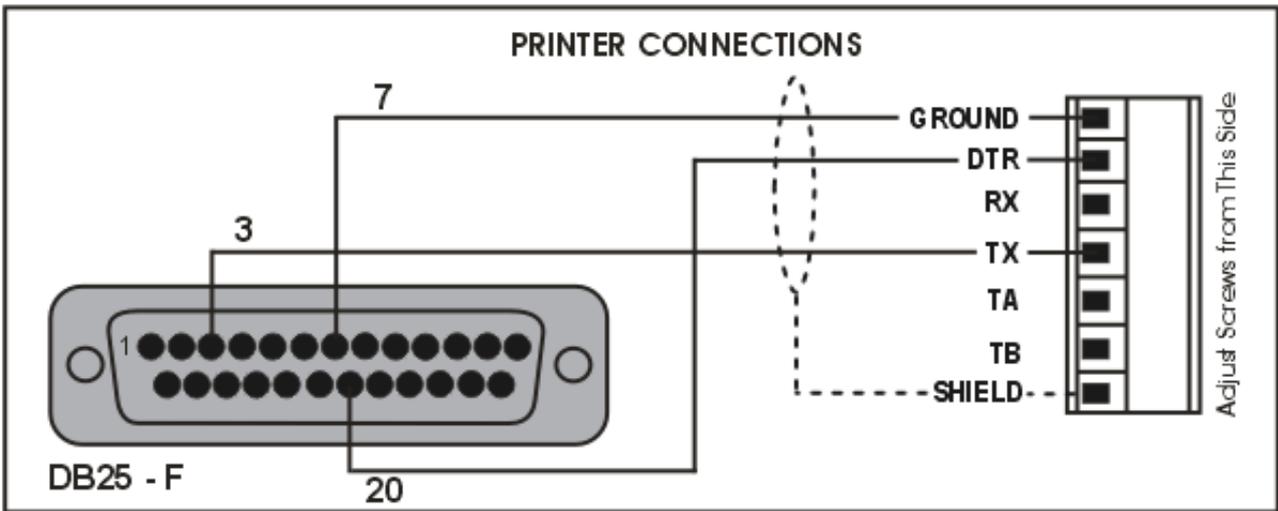
5.4.3. Remote Display using RS232 (TXD, GND)

Refer to documentation supplied with the Remote Display for connection details. Connect RX on the Remote Display with TX on the instrument and connect the RS232 GND signals together.

5.4.4. Remote Display using RS485 (TA, TB)

RS485 is recommended for communicating over distances longer than a few metres. Refer to documentation supplied with the Remote Display for connection details. Connect TA to RA and TB to RB.

5.4.5. Ring Networks: Multiple Instruments to PC (RXD, TXD, GND)

It is possible to connect multiple instruments in a ring network to a PC. Refer to the Reference Manual for wiring diagrams and protocol information.

5.5.   Connecting Shields

To obtain full EMC or for RFI immunity, cable shields MUST be connected and the earth lug on the rear of the instrument must be grounded.

This figure illustrates an example of possible connections. Also shown are the connecting cables restrained using cable ties fastened by screws into the rear of the unit.
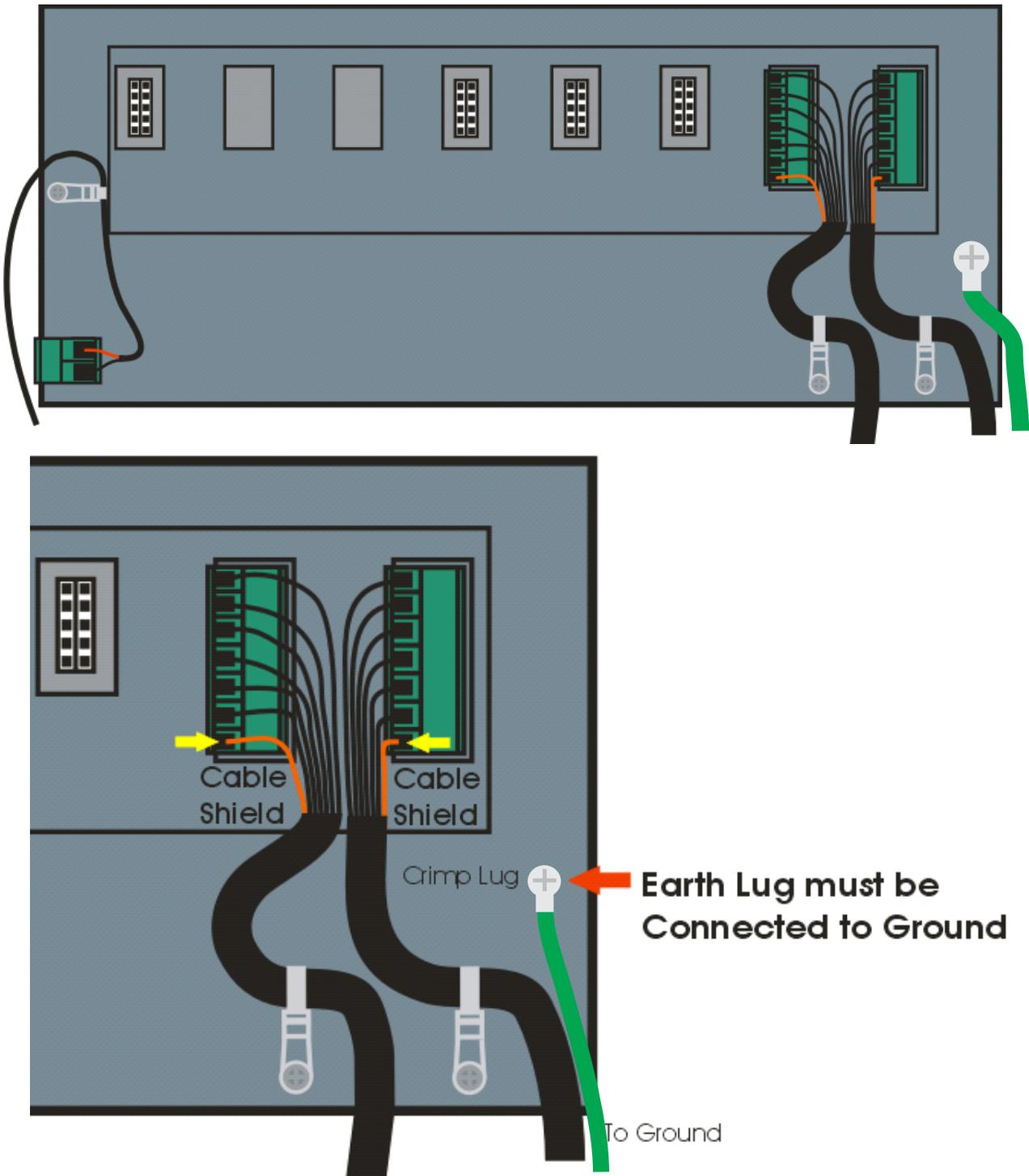
5.5.1.   Cable Shield Connection and Earthing

- Care should be taken when connecting shields to maximise EMC or RFI immunity and minimise earth loops and cross-talk (interference) between instruments.
- For full EMC or for RFI immunity, termination of the cable shields at the earth lug is very important. The earth lug of the instrument must be separately connected to ground potential via a reliable link.
- The AC power module directly connects the earth lug to the Earth Pin on the power supply. In installations where earth is available on the power cable, instrument earthing can be done with this connection.
- The instrument should only be connected to earth via a single reliable link to avoid earth loops.
- Where each instrument is separately earthed, interconnecting cable shields should be connected at one end only.
- **Caution:** Some load cells connect the cable shield directly to the load cell (and therefore the scale base). Connection of the load cell cable shield in this situation may be site specific.

6. Legal Sealing Details

6.1. Trade Label

A trade label showing scale and instrument information is usually required. This can be placed on the front of the instrument:
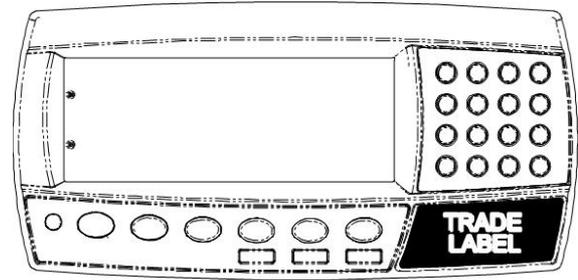
6.2. Lead Seals
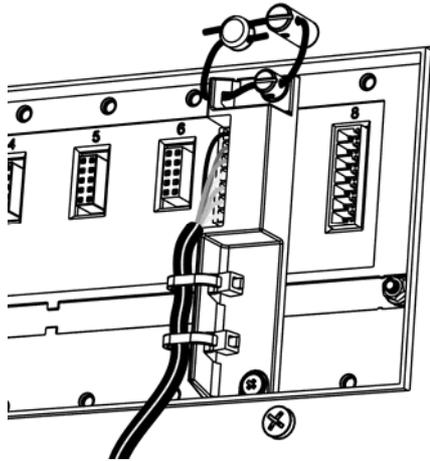
Figure 1: Lead seal on rear of instrument.
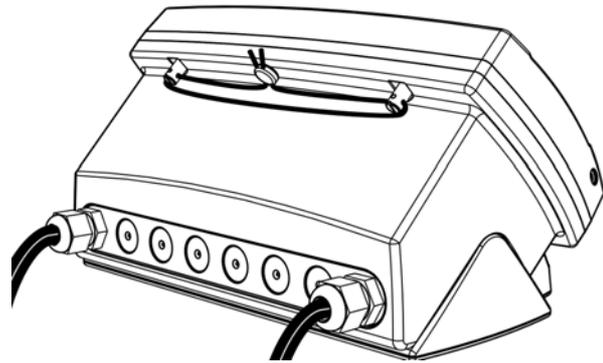
Figure 2: Lead Seal on boot

6.2.1. Destructible Sticker Seals
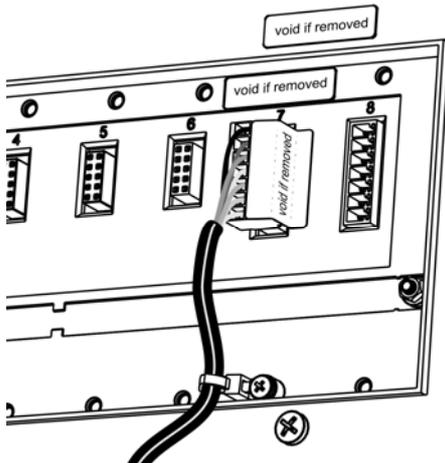
Figure 3: Destructible sticker seal on rear
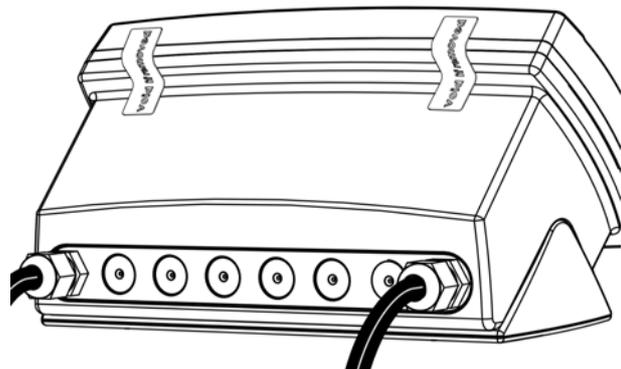
Figure 4: Destructible sticker seal on boot.

6.2.2. Electronic Seal

The value of the calibration counter (shown on power up and entry/exit in the set up menus) should be written on the scale certification/sealing sticker.

7. Instrument Setup

7.1. Calibration Counter

Within Setup there are a number of critical steps that can affect the calibration and/or legal for trade performance of the instrument. If any of these steps are altered, the trade certification of the scale could be voided.

The instrument provides a built-in calibration counter to monitor the number of times the critical steps are altered. The value of a counter is stored within the instrument and can only be reset at the factory. Each time a critical step is altered, the counter will increase. Whenever the instrument is powered up, or setup mode is entered/exited, the current value in the counter is briefly displayed (e.g. C00010).

The value of the counter is written on the tamperproof trade label on the front of the indicator for trade-certified applications and functions as an electronic seal. If any legal for trade settings are changed on the instrument, the current value of the calibration counter will be different from the recorded value and the seal is broken.

7.1.1. Trade Critical Settings

Trade critical settings can affect calibration and/or legal for trade performance. Each time a trade critical setting is altered, the calibration counter will be incremented by one.

7.2. Access Full Setup

Full Setup provides access to configure and calibrate the instrument. All items in all menus will be enabled in Full Setup.

> **WARNING: Care should be taken to avoid inadvertently altering the Build or Calibration settings.**

Ensure the instrument is on.	
• Press and hold the **<POWER>** and end **<F₃>** keys simultaneously for two seconds.	⓪ **+** 𝑓₃

7.3. Access Safe Setup

Safe Setup restricts access to the trade critical settings (marked with ⊗).

Ensure the instrument is on.	
• Press and hold the **<POWER>** and **<ZERO>** keys simultaneously for two seconds.	⓪ **+** ZERO
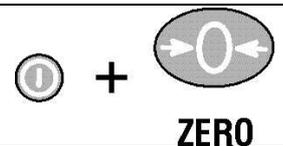
7.4. Exit Full or Safe Setup

To save settings, exit setup and return to the normal weighing mode using one of the following methods:

- Press the **<POWER>** key once.
- Press the **<POWER>** and **<ZERO>** keys together for two seconds.
- Press **<POWER>** and **<F₃>** key together for two seconds

Warning: If the power is interrupted while in setup, unsaved settings will be lost.

7.5. Using Menus

Level 1	Level 2	Level 3	Level 4	Level 5

Example:

> **GEN.OPT**
> └ **PCODE**
>   └ **SAFE.PC**

7.6. Settings

MENU	DESCRIPTION	
GEN.OPT	**General Options Menu**	
└ **LANG**...............	**Operator language**	*(**ENGLISH**, GERMAN, DUTCH, FRENCH, POLISH, ITALIAN, SPANISH)*
└ **DATE.F**	**Date Format**	*(**DD.MM.YY**, DD.MM.YYYY, MM.DD.YY, MM.DD.YYYY, YY.MM.DD, YYYY.MM.DD)*
└ **PCODE**	**Pass Codes**	
└ **SAFE.PC**..........	**Safe setup Passcode**	*(**0** .. 999999)*
└ **FULL.PC**	**Full setup Passcode**	*(**0** .. 999999)*
└ **OP.PC**	**Operator Passcode**	*(**0** .. 999999)*
└ **KEY.LOC**	**Key Lock Options**	
└ **P**......................	**Power key lock**	*(**AVAIL**, LOCKED)*
└ **ZERO,**	**Zero Key**	*(**AVAIL**, OPER.PC, SAFE.PC, LOCKED)*
TARE,		
GR_NET,		
F1, F2, F3,		
CLOCK,		
VIEW,		
REPORT,		
TOTAL,		
ID,		
TARGET,		
ACC,		

MENU	DESCRIPTION	
PR.MOD,		
PR.SEL,		
NUM.PAD		
ALIBI		
└ DISP	Display Options	
└ B.LIGHT	Backlight operation	(**ON**, OFF)
└ FREQ	Display update frequency	(**10Hz**, 5Hz, 3.3Hz, 2Hz, 1Hz)
└ AUX.DSP	Auxiliary display function	(**OFF**, TIME)
└ ID.NAME	User String Names	
└ NAME 1 -		
NAME 3	User ID string names	(Maximum 6 characters)
└ POWER	Power options	
└ AUT.OFF	Auto-off	(**NEVER**, 1 min, 5 min, 10 min, 60 min)
└ START	Pause on Start-Up	(**OFF**, ON)
└ USR.DEF	User defaults (all items except SCALE menu items)	
H.WARE	Hardware Menu	
└ ALLOC	Check hardware allocation and use	
└ LC.HW	Loadcell Hardware Menu	
└ MVV	mV/V test	
└ OL.CNT	Overload count	
└ OL.CLR	Clear overload count	
└ SER1.HW,		

MENU	DESCRIPTION	
SER 2.HW	Serial Hardware Menus	
└ BAUD ....Baud rate	(_1200_ , _2400_ , _4800_ , **_9600_** , _19200_, _57600_)
└ PARITY ....Port parity	(**NONE**, EVEN, ODD)
└ DATA ....Number of data bits	(**_8_** , _7_)
└ STOP ....Number of stop bits	(**_1_** , _2_)
└ DTR..................DTR Enable	(**OFF**, ON)
└ TERM ....RS485 Termination Enable	(**OFF**, ON)
└ RING ....Ring Network Enable	(**OFF**, ON) (SER 2 only)
└ ETH.HW		
└ DHCP ....Port parity	(OFF, **ON**)
└ IP ....IP Address	(Ip Address xxx.xxx.xxx.xxx)
└ NET.MSK ....Network mask	(Ip Address xxx.xxx.xxx.xxx)
└ G.WAY ....Default gateway	(Ip Address xxx.xxx.xxx.xxx)
└ DNS.1...............Primary Name Server	(Ip Address xxx.xxx.xxx.xxx)
└ DNS.2...............Secondary Name Server (Ip Address xxx.xxx.xxx.xxx)
└ ETH.DEF   Ethernet Module Defaults (does not affect indicator settings)
└ IO.HW Input/Output Hardware Menu	
└ FRC.OUT ....Force outputs test	
└ TST.IN...............Chck inputs test	
└ DB.1.8 -	
DB.25.32 Input Debounce Menu's	
└ DBNC.1 -	
DBNC 32......Settings for inputs test	(1..250 ms Default: 50ms)
└ DSD.HW DSD Hardware Menu	

MENU	DESCRIPTION	
└ AUTO.C	**Auto clear old records**	*(OFF, **ON**)*
└ DSD.STR	**Custom DSD record string**	*(Maximum 20 characters)*
SCALE	**Scale menu**	
└ **BUILD**	**Scale Guide menu**	
└ TYPE................	**Range type**	*(**SINGLE**, DUAL.I, DUAL.R)*
└ CABLE..............	**6-WIRE or 4-WIRE**	*(**6 WIRE**, 4 WIRE)*
└ DP	**Decimal Point position**	*(**000000** .. 0.00000)*
└ CAP1...............	**Scale Capacity - Range/Interval 1**	*(100 ..999999 Default: 3000)*
└ E1	**Scale Resolution - Range/Interval 1**	*(**1**, 2, 5, 10, 20, 50, 100)*
└ CAP2...............	**Scale Capacity - Range/Interval 2**	*(100 ..999999 Default: 6000)*
└ E2	**Scale Resolution - Range/Interval 2**	*(1, **2**, 5, 10, 20, 50, 100)*
└ UNITS	**Scale Units**	*(None, **kg**, lb, t, g, Oz, N, ARROW U)*
└ HI.RES	**x10 Expanded mode**	*(**OFF**, ON)*
└ **OPTION**		
└ USE.................	**Trade Use**	*(**INDUST**, OIML, NTEP)*
└ FILTER.............	**Averaging**	*(0.01s..30.00s Default: 1.0s)*
└ MOTION...........	**Motion Detection**	*(OFF, **0.5d – 1.0t** .. 5.0d – 0.2t)*
└ Z.RANGE	**Range of Zero (%)**	*(**-2 .. 2**, -1 .. 3,-10 .. 10, -20 .. 20)*
└ Z.TRACK	**Zero Tracking**	*(**OFF**, SLOW, FAST)*
└ Z.INIT	**Zero on Startup**	*(**OFF**, ON)*
└ Z.BAND............	**Band of Zero**	*(**0** .. fullscale)*
└ EXT.EX	**External excitation**	*(**OFF**, ON)*
└ R.ENTRY	**Rear button menu entry**	*(**OFF**, ON)*
└ TOT.OPT	**Totalising Option**	*(**DISP**, GROSS, NET)*

MENU	DESCRIPTION

└ **CAL**
   └ **ZERO** ....**Calibrate Zero**

   └ **SPAN** ....**Calibrate Span**
   └ **ED.LIN** ....**Set Linearisation**
   └ **CLR.LIN** ....**Clear Linearisation**
   └ **DIR.ZER**...........**Direct mV/V Zero Calibration**
   └ **DIR.SPAN** ....**Direct mV/V Span Calibration**
   └ **DEF.CAL**...........**Default Calibration (also resets all scale settings to defaults)**

└ **QA**
   └ **QA.OPT** ....**QA Enable**   *(**OFF**, ON)*
   └ **QA YEAR**.........**QA Expiry Date**   *(2000-01-01 To 2099-12-31)*
   └ **QA MONTH**.......**QA Expiry Date**   *(2000-01-01 To 2099-12-31)*
   └ **QA DAY** ....**QA Expiry Date**   *(2000-01-01 To 2099-12-31)*

FUNC   **Function menu**
 └ **NUM**......................**Number of special functions**   *(_**1**_ .. 8_)*
 └ **SF1 – SF8**   **Function menu**
   └ **TYPE**.................**Type**   *(**NONE**, PRINT, SINGLE, TEST,UNITS, HOLD, REM.KEY, BLANK, REPORT, HI.RES, SC.EXIT, TRUCK)*
   └ **KEY** ....**Key selection**   *(**NONE**, F3, IO1 .. IO32)*
   └ **PRT.OUT** ....**Print: printout**   *(**NONE**, PRINT.1, PRINT.2)*
   └ **TOTAL** ....**Print: totalising**   *(**NONE**, ADD, UNDO, CKR.ALL, CLR.SESS)*
   └ **CLR.ASK** ....**Print: Prompt for Clear** *(**NO**, YES)*
   └ **AUTO** ....**Print: Automatic Print**   *(**NO**, YES)*

MENU	DESCRIPTION	
└ IL.TYPE..............	**Print: Interlock type**	(**NONE**, MOTION, I.LOCK, RET.Z)
└ I.LOCK	**Print: Interlock**	(**0** .. Fullscale)
└ CLR.TOT..........	**Print: Action on Totals by Print Key**	(**NO**, ASK, CLEAR)
└ MODE	**Units: Mode**	(**kg/lb**, CUSTOM)
└ UNIT.................	**Units: Alternative unit**	(**NONE**, N, ARROW U, P, L, ARROW L)
└ U.STR	**Units: Alternative unit string**	(4 character string)
└ AUT.OUT	**Single: Auto Output**	(**AUTO.1**, AUTO.2)
└ BLANK..............	**Blank: Blanking function**	(**DASH**, BLANK)
└ FUNC	**Remote Key: Function to trigger**	
SER.NET	**Network Menu**	
└ ADDR....................	**Network address**	(**1**..31)
└ NUM......................	**Number of Networks**	(**1**..2)
└ TYPE................	**Protocol type**	(**NONE**, PROTOCOL.B, SIMPLE, BARCODE)
└ SERIAL............	**Serial port**	(**SER1A**, SER2A, SER3A)
└ RESP	**Respond to simple protocol commands**	(**NONE**, OK)
SER.AUT	**Automatic Output Menu**	
└ NUM......................	**Number of Serial outputs**	(**-1-** .. -2-)
└ TYPE.................	**Frequency** (**NONE**, SINGLE, AUTO.LO, AUTO.HI, AUT.TRC)	
└ SERIAL.............	**Serial port** (**SER1A**, SER1B, SER2A, SER2B, SER3A, SER3B)	
└ FORMAT...........	**Format** (**FMT.A**, FMT.B, FMT.C, FMT.D, FMT.E, FMT.F, FMT.REG, FMT.TRC,CUSTOM)	
└ SOURCE...........	**Weight type**	(**GROSS**, NET, GR.or.NT)
└ EV.AUTO	**Custom format string**	(Token string used with CUSTOM transmissions)
PRINT	**Print Menu**	
└ NUM......................	**Number of printouts**	(_**1**_ .. _2_)

MENU	DESCRIPTION	
└ HEADER................Header		*(String)*
└ FOOTER................Footer		*(String)*
└ PAGE	**Print Page Options**	
└ WIDTH ....Page width		*(**0** .. 250)*
└ HEIGHT............Page Height		*(**0** .. 250)*
└ PG.END ....Page End String	*(Token String)*	
└ SPACE	**Print Margin Options**	
└ TOP ....Blank lines at the top		*(**0** .. 10)*
└ LEFT ....Blank characters on the left		*(**0** .. 10)*
└ BOTTOM..........Blank lines at the bottom		*(**0** .. 10)*
└ PRINT.1 - PRINT.N	**Print Out Menus**	
└ TYPE.................Printout type		*(**NONE**, DOCKET, REPORT)*
└ FORMAT..........Format		*(**FMT.A**, FMT.B, CUSTOM)*
└ SERIAL	Serial port	*(**SER1A**, SER2A, SER3A)*
└ NAME................Name		*(6 character string)*
└ CUSTOM	**Custom Print Format Strings**	
└ PRN.KEY .....Docket: Docket printout string		
└ EV.D.NEW....Docket: New docket string		
└ EV.D.END ....Docket: End of docket string		
└ EV.WI ....Docket: Weigh In		
└ EV.WO.1 ......Docket: Weigh Out 1 with Preset Tare		
└ EV.WO.2 ......Docket: Weigh Out 2 with Weigh in		
└ EV.D.WO .....Docket: End of Docket with Weigh Out		
└ REP.ST ....Report: Start of report string		
└ REP.PR ....Report: Each product in a report string		

MENU	DESCRIPTION	
└ REP.END	**Report: End of report string**	
SETP	**Setpoint Menu**	
└ **NUM**......................	**Number of Setpoints**	*(_**1**_ .. _8_)*
└ **SETP1 – SETP8**	**Setpoint Menu**	
└ **TYPE**.................	**Type of setpoint**	*(**NONE**, ON, OVER, UNDER, COZ, ZERO, NET, MOTION, ERROR, LGC.AND, LGC.OR, LGC.XOR, SC.REDY, SC.EXIT)*
└ **OUTPUT**	**Output**	*(**NONE**, I01 .. IO32)*
└ **LOGIC**..............	**Logic control**	*(**HIGH**, LOW)*
└ **ALARM**	**Setpoint Alarm**	*(**NONE**, SINGLE, DOUBLE, FLASH)*
└ **SOURCE**...........	**Weight type**	*(**GROSS**, NET, GR.or.NT, ALT.GR, ALT.NET, ALT.G.or.N.)*
└ **HYS**..................	**Hysteresis**	*(**0** .. 999999)*
└ **MASK**	**Mask for logic setpoints**	(**0** .. 16777215)
└ **DLY.ON**	**Delay for logic setpoints**	(**0.00**s .. 10.00s)
└ **HLD.OFF**	**Delay for logic setpoints**	(**0.00**s .. 10.00s)
└ **RDY.TIM**	**Ready time for scale entry**	(**0.000**s .. 60.000s)
END		
└ **END**	**Save and Close**	

8. Accessory Modules

8.1. General

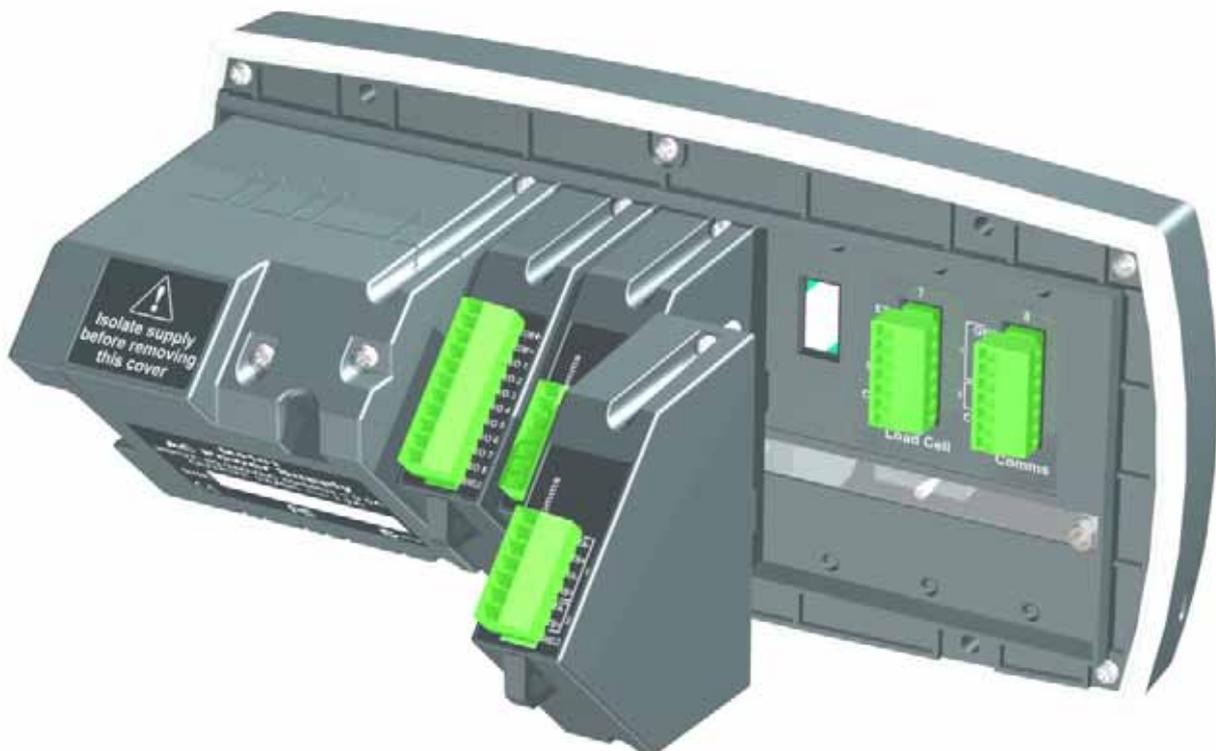There are many accessory modules which can be used with the Indicator.

CAUTION

Instrument should be switched off before connecting or disconnecting accessory modules.

Accessory modules provide additional features such as:

- Power supply options
- Additional communications ports
- TCP/IP Communications over Ethernet
- Digital inputs and outputs
- Additional memory

Refer to the specific module manual for wiring details.

8.2. Inputs

There are several accessory modules which provide inputs. Examples are M4301and M4302. Some modules provide I/O which can be inputs or outputs depending on configuration.

8.2.1. Configuration

The instrument has up to 8 special functions. The type of each function is chosen from a list of options. The key which triggers each function can be chosen.

1. Ensure module is connected and instrument is switched on.

2. Enter safe setup (or full setup) and go to the FUNC (special function) menu.

3. FUNC:NUM: The instrument can use up to 8 special functions. This option specifies the number of special functions used.

4. FUNC:SF*x*: Select the special function to configure.

5. FUNC:SF*x*:TYPE: Select the type of special function from the list. For example, a PRINT or COUNT key could be specified.

6. FUNC:SFx:KEY: Select the input or button. The I/O range for each module is given in the module manual. For example, M4301 is IO1 to IO8 and M4302 is IO17 to IO20.

7. Other options may appear depending on the type of function chosen.

8.2.2. Testing and debugging

Test functions are provided in the HD.WARE:IO.HW menu:

1. HD.WARE:IO.HW:TST.IN (Test Inputs) allows the inputs of each module to be tested. Use the **<UP>** and **<DOWN>** keys to move between modules.

2. HD.WARE:ALLOC (Hardware Allocation) checks the configuration of each item of hardware. Use the **<UP>** and **<DOWN>** keys to move between hardware items.

See also the Troubleshooting section in the module manual.

8.3. Outputs

There are several accessory modules which provide outputs. Examples are M4301 and M4401. Some modules provide I/O which can be inputs or outputs depending on configuration.

8.3.1. Configuration

The instrument has up to 8 setpoint outputs. The type of each setpoint is chosen from a list of options. The physical output used for each setpoint can also be chosen.

1. Ensure module is connected and instrument is switched on.

2. Enter safe setup (or full setup) and go to the SETP (Setpoint) menu.

3. SETP:NUM: The instrument can use up to 8 setpoint outputs. This option specifies the number of setpoints used.

4. SETP:SETP*x*: Select the specific output to configure.

5. SETP:SETP*x*:TYPE: Select the setpoint type from the list. For example, an OVER or ERROR setpoint could be specified.

6. SETP:SETP*x*:OUTPUT: Select the physical output. The I/O range for each module is given in the module manual. For example, M4301 is IO1 to IO8.

7. Other options may appear depending on the type of setpoint chosen.

8.3.2. Testing and Debugging

Test functions are provided in the HD.WARE:IO.HW menu:

1. HD.WARE:IO.HW :FRC.OUT (Force Outputs) allows outputs to be manually switched on. The **<UP>** and **<DOWN>** keys change the output and the **<+/->** key switches the outputs on and off.

2. HD.WARE:ALLOC (Hardware Allocation) checks the configuration of each item of hardware. Use the **<UP>** and **<DOWN>** keys to move between hardware items.

See also the Troubleshooting section in the module manual.

8.4. Ethernet Module

Ethernet connectivity is provided via the M4221 accessory module.

8.4.1. Configuration

Configuration parameters are divided into hardware (e.g. IP address, network mask or default gateway) and application (e.g. print format, auto transmit format or networking) settings.

1. Ensure module is connected and instrument is switched on.

2. Enter safe setup (or full setup) and go to the HDWARE: ETH.HW (Ethernet Hardware) menu.

3. HDWARE:ETH.HW: Configure settings for the module. DHCP is often sufficient; however you should obtain correct settings from your network administrator.

4. Application Settings: These settings are identical to the communication module discussed in Section 1.1.

5. As with other serial modules, it is necessary to configure a function (networking, printing or auto-outputs) on the indicator to communicate via SER.3A or SER.3B.

   a. SER.3A can be accessed via TCP port 2222 on the module. This port allows only one simultaneous connection as it is bi-directional

   b. SER.3B can be accessed via TCP port 2223 on the module. This port allows up to 10 simultaneous connections, as it is transmit only (data is sent from the indicator to the PC).

8.4.2. Testing and debugging

The current IP configuration can be found under the Acc menu for the module. PC network tools such as "ping" and "telnet" in addition to the viewer software can be used to establish a connection to the indicator over the network. See also the Troubleshooting section in the module manual.

9. Error Messages

9.1.   Overview

Error messages may be displayed to warn of operation outside of the acceptable limits. Short messages (XXXXXX) will appear as a single message. Longer messages (XXXXXX) (YYYYYY) will appear on the display in two parts, first the (XXXXXX) part, then the (YYYYYY) part.

9.2.   Weighing Errors

These messages show status messages or errors that may occur during normal weighing operation.

Error	Description	Resolution
(U.LOAD) (O.LOAD)	The weight is below the minimum allowable weight reading or above the maximum allowable weight reading. WARNING: Overloading may damage mechanical scale elements.	Change the weight. Check loadcell connections. Check for damaged loadcell.
(ERROR) (RANGE)	The weight reading is beyond the limit set for Zero operation. The operation of the **\<ZERO\>** key is limited in the setup during installation.	Increase the Zero Range (Z.RANGE) or use the **\<TARE\>** key instead.
(ERROR) (MOTION)	Scale motion has prevented a **\<ZERO\>**, **\<TARE\>** or **\<PRINT\>** operation from occurring.	Try the operation again once the scale is stable.
(ERROR) (ADC)	An error with the ADC has prevented a **\<ZERO\>** or **\<TARE\>** operation from occurring.	Ensure loadcell cabling is correct.

9.3.   Setup Errors

These messages show status messages or errors that may occur during the instrument setup.

Error	Description	Resolution
(ENTRY) (DENIED)	When accessing setup, more than three attempts have been made with the incorrect passcode.	Turn the instrument off. When the instrument is turned back on, enter the correct passcode to access setup.
(WR DENIED) (RD DENIED)	The instrument may be in Safe Setup and an item that needs Full Setup has been selected for editing.	Access Full Setup to access this item.

9.4. Calibration Errors

Following are a list of the possible error messages that may be displayed to warn of failed or incorrect calibration:

Error	Description	Resolution
(FAILED) (BAND)	An attempt has been made to calibrate with a weight or signal which is not in the valid range.	Check weights and retry.
(FAILED) (ERROR)	An attempt has been made to calibrate while the scale signal is not valid.	Check loadcell connection and the 4-wire/6-wire setting.
(FAILED) (TIMEOUT)	For an unknown reason, the calibration was unable to complete.	Retry.
(FAILED) (RES)	An attempt has been made to calibrate the scale to a resolution which is too high for the instrument.	Check weights and retry.
(FAILED) (TOO CLOSE)	An attempt has been made to add a linearisation point too close to zero, span or another linearisation point.	Check weights and retry.

9.5. Diagnostic Errors

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

Error	Description	Resolution
(E0001)	The power supply voltage is too low.	Check supply
(E0002)	The power supply voltage is too high.	Check supply
(E0004)	Positive sense voltage out or range.	Check scale connections. Check SCALE:BUILD:CABLE setting.
(E0008)	Negative sense voltage out or range.	Check scale connections. Check SCALE:BUILD:CABLE setting.
(E0010)	Temperature is outside of allowable limits	Check location
(E0020)	Module Error	Replace Module
(E0200)	The calibration information has been lost.	Re-calibrate
(E0400)	The factory information has been lost.	Return for Service
(E0800)	Application settings have been set to defaults.	Check and re-enter application settings
(E2000)	ADC Out of Range Error. This may be caused from a broken load cell cable.	Check SCALE:BUILD:CABLE setting. Check load cell cable, wiring, etc.
(E4000)	The runtime information has been lost.	Check Zero and Tare settings.

Notes:

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