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# INDI 00 / INDI 5250

## WEIGHING AND FORCE INDICATOR

Reference manual



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## 1. INTRODUCTION

The electronic weight indicator model INDI 5250 is a compact microprocessor based unit specifically designed for use on systems utilizing strain gauge load cells.

The standard configuration includes:

1. High accuracy analogue to digital converter (max 550.000 internal counts).
2. Front panel with 6 digit LED display plus 5 annunciators and 6 membrane keys with tactile feedback.
3. Non volatile memory for system parameters and calibration data.
4. Flash memory for storage of 10.000 weights (Electronic tally roll or Alibi memory).
5. RS232 serial port for printing weighing data on a serial printer.
6. 2 setpoint outputs 24VDC/100mA, 1 input opto-isolated.
7. All connections to the instrument are made with connectors for quick removal - replacement.
8. The microcontroller technology allows the instrument to perform in software all measuring functions, operator input-output, automatic controls and sequences necessary for the operation of weighing systems.
9. The setting of the unit is done through a guided keyboard operation, enabling the adaptation to operating environment and system requirements.
10. A totaliser and counter is available that may be viewed or printed.

### 1.1. Options

- a) RS485 serial port adapter for remote display, printer or bidirectional communication with a host computer.
- b) Analogue output 0/4 - 20mA or 0-10V, 16 bits resolution (PCB 761) remotely powered.
- c) DC powered 24V.

### 1.2. Extent of supply

#### 1.2.1. The standard supply includes

- The connection plugs for the load cell cable and peripherals.
- 230VAC to 9VDC/700mA main power adapter.
- This manual

#### 1.2.2. Prior to unpacking the equipment, examine the carton for exterior shipping damage and if any notify the carrier immediately.

- Remove the equipment from the carton and plastic bag.
- Inspect extent of supply for any sign of damage.
- Save packaging material.

## **2. INSTALLATION**

### **2.1. Mounting**

The mounting location must be such that the instrument is not subject to excessive vibrations, heat or humidity. Avoid direct sunlight on the front of the instrument. The unit has to be installed at the right height to allow an easy reading of the display and keyboard operation. Panel cut-out for mounting is 136.5mm x 66.5mm.

### **2.2. Wiring**

All connections to the instrument are made through the rear panel connectors. Strain relief are supplied with the connectors. Use load cell cable 6 x 0,5 mm<sup>2</sup> shielded for the sensor. Use 3 x 0,34 mm<sup>2</sup> screened for RS232C connection and 2x0,34 mm<sup>2</sup> twisted pair and shielded for RS485 connection.

**CAUTION : Do not run signal cables together with power cables / Connect the shielding where indicated on the drawing only.**

### **2.3. Power**

The instrument is powered from external power supply (9-15VDC/500mA) or battery. As the instrument is computer controlled it requires clean power for reliable operation. Power supplied should come from a source that is isolated from other process equipment. A mains adapter 9VDC/700mA is recommended for operation.

### **2.4. Load cells**

CONNECTION	Connect according to the junction box drawing
MAX. CABLE	300 meters/ cross sectional area of cable (mm <sup>2</sup> )
UTILIZATION	A -0.25 to 2.0 mV/V range is permitted (dead load inclusive) with GAIN=10mV or a -0.25 to 4.0 mV/V is permitted with GAIN=20mV. The load cells must be chosen so that the input signal to the controller is at least 0,4µV per scale increment. For load cell output less than 0,4µV/digit the controller will still be stable but the full temperature range accuracy is not guaranteed.
CONVERSION	This parameter allows the user to adjust internal speed of the A/D converter.
RATE	It is normally set to 14 for static weighing applications or to 57 for dynamic weighing applications.
LOAD CELL EXCITATION	5VDC, fixed or alternating polarity (SETUP selectable) for 10 load cells of 350 OHM each.

**CAUTION: Do not run signal cables together with power cables. Connect the shielding where indicated on the drawing only. Never use a Megger to check wiring. Never use plastic insulating tape on load cell connections. Be sure the AC power socket outlet is properly protected. For optimum EMC performance, keep the length of shield inside the enclosure as short as possible.**

**3. SPECIFICATIONS**

3.1. Environmental and Electrical Considerations

3.1.1. Ambient temperature

Storage- 10 °C to + 70 °C  
 Operating - 10 °C to + 40 °C  
 No direct sunlight to fall on the equipment.

3.1.2. Humidity

40% to 90% RH (non condensing)

3.1.3. Air

The surrounding air should be dust free and not contain any corrosive gases or materials which could adversely affect the equipment.

3.1.4. Vibration

Severe vibration can affect the accuracy of weighing and damage electric / electronic components.

3.1.5. Protection

IP 54 for front panel.

3.1.6. Electromagnetic fields

Heavy electrical equipment should not be installed close to the weighing equipment

3.1.7. Incoming and outgoing signals

Relays and contactors connected to our equipment must have reliable and effective interference suppression. This also applies to other equipment located within a distance of 3m from our equipment. Cabling must be performed according to normal practice.

3.1.8. Notes

- WELDING on or in the vicinity of weighing equipment is strictly prohibited.
- STATIC loads, caused by thunderstorms, must be prevented from developing by use of reliable lightning conductors.
- ENSURE that the cooling of the equipment is not obstructed.

3.2. Technical Specifications

3.2.1. CPU characteristics

MCU 89C51RD, 64KB Flash ROM, 1KB RAM, 32KB serial EEPROM.

3.2.2. Self diagnostics

Hardware and Software, MCU watchdog. Memory failure, I/O failure, Program check.

3.2.3. Communication

a) SERIAL PORT 1:  
 RS232C Full duplex.  
 2400 baud, 7 data bits/even parity or 8 data bits/no parity printer, weight output.

3.2.4. Display

6 digit LED plus annunciators for NET, NO MOTION, TARE, Setpoint 1, Setpoint 2.

b) SERIAL PORT 2:  
 RS485 half duplex.  
 2400-57600 baud, No or Even Parity, 7 or 8 data bits.  
 Master/Slave protocol, remote printer, EDP output, weight output interface selection.

<p><u>3.2.5. Keyboard</u> 6 key membrane type with tactile feedback.</p>	<p><u>3.2.6. Approvals</u> EU type approval 10.000 divisions, DK 0199.27 &amp; OIML R76</p>
<p><u>3.2.7. Emc compatibility</u> Approved to EN 45501</p>	<p><u>3.2.8. Accuracy class</u> III</p>
<p><u>3.2.9. Resolution</u> Selectable up to 99.000 dd (in accordance with regulations).</p>	<p><u>3.2.10. Max tare effect</u> - Max</p>
<p><u>3.2.11. Auto zero track</u> Off or 0.5 dd setup selectable.</p>	<p><u>3.2.12. Weight digits</u> 4, 5, 6</p>
<p><u>3.2.13. Weight steps</u> 1, 2, 5, 10, 20, 50, 100, 200</p>	<p><u>3.2.14. Digital filter</u> FIR automatically adjusted to conversion speed, plus post filtering (Rolling average 1, 2, 4, 8, 16, 32 samples).</p>
<p><u>3.2.15. Digital calibration</u> Dead load, Span and scale Parameters via keyboard commands. Calibration may be performed by application of weights or by the mV/V values of the load cell data sheets.</p>	<p><u>3.2.16. Enclosure</u> a) DIMENSIONS 144 (L) x 72 (H) x 132 (D) b) PANEL CUT-OUT 136.5mm x 66.5mm</p>
<p><u>3.2.17. Analog input</u> a) LOAD CELL EXC/TION +5V switched polarity or + 5 VDC with sense b) CONNECTION 6 wire technique. Max 10 load cells 350 Ohm each. c) SIGNAL RANGE -0.25 to 2.0 mV/V (Gain=10), -0.25 to 4.0 mV/V (Gain=20). d) SENSITIVITY min 0,4 <math>\mu</math>V / digit (VSI) approved scales min 0,1 <math>\mu</math>V / digit non-approved scales. e) INPUT AMPLIFIER Input noise 0.3<math>\mu</math>Vp-p. Input bias current 10nA typical.</p>	<p><u>3.2.18. Analogue output</u> a) CURRENT or VOLTAGE Hardware selectable via jumper JP1 or printed circuit board 761 (see drawings LD52**/PCB_A/040). b) CURRENT OUTPUT 0 - 20 mA or 4 - 20 mA. Max load resistance 1K<math>\Omega</math> (line + termination). c) VOLTAGE OUTPUT 0.02 - 10 V. Min load resistance 1K<math>\Omega</math>. d) RESOLUTION Internal 16 bit. External 16 bit or in accordance with regulation. e) LINEARITY Better than 0,01% of FSR.</p>

f) A/D CONVERTER  
 Sigma delta 550.000 internal counts max.  
 Conversion speed 3, 7, 14, 28, 57, 70 Hz (selectable).

g) LINEARITY  
 Within 0,002% of full scale.

h) SPAN TEMP - COEFF  
 $\leq 2 \text{ ppm} / ^\circ\text{C}$

i) ZERO TEMP - COEFF  
 $\leq 2 \text{ ppm} / ^\circ\text{C}$

j) LONG TERM STABILITY  
 0.005 % of full scale per year.

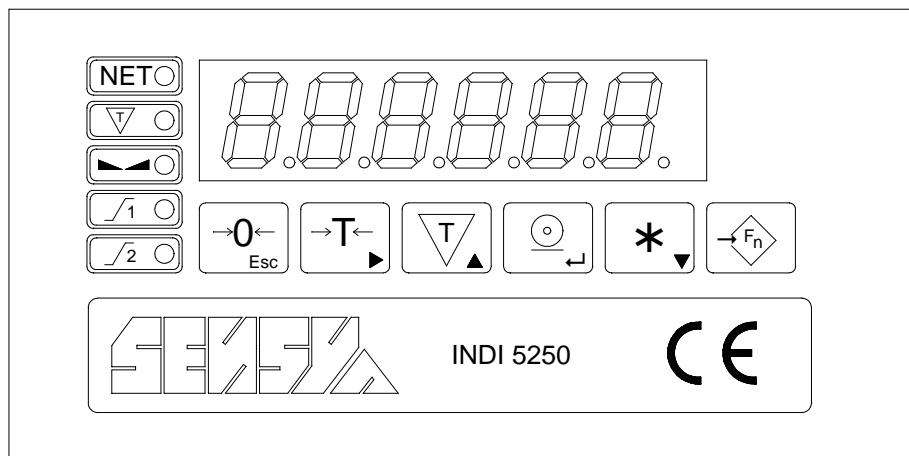
k) DIGITAL INPUT (X1)  
 9-24 VDC positive common opto-isolated to 2.5 KV.  
 Input resistance 3.3 K $\Omega$   
 ON delay 2 msec max. / OFF delay 2msec max.





l) DIGITAL OUTPUT (X2)  
 24VDC  $\pm$  10% transistor (SOURCE) darlington, positive common.  
 Max current 100 mA - leakage current 100  $\mu\text{A}$ .  
 Max off state voltage 30 VDC.  
 ON delay 2 msec max. / OFF delay 2 msec max  
 All outputs opto-isolated to 2.5 KV.

f) THERMAL STABILITY  
 50 PPM/0C typical.

g) SHORT CIRCUIT PROTECTION  
 Yes, 25mA indefinite duration.

#### 4. FRONT PANEL SURVEY



<p><u>4.1. Weight display</u></p>		<p>6 digit LED for the display of measured weight (gross or net), and error messages. Digit height approx. 14mm. OVER-RANGE is indicated by <b>nnnnnn</b> UNDER-RANGE is indicated by <b>u u u u u u</b></p>
<p><u>4.2. Net indicator</u></p>	<p><b>NET</b></p>	<p>It lights up when the scale has been tared and the display is in NET mode.</p>
<p><u>4.3. Tare indicator</u></p>	<p><b>T</b></p>	<p>It indicates that a tare value is being displayed.</p>
<p><u>4.4. Motion detection</u></p>	<p>▲▲</p>	<p>It lights up when the scale is stable.</p>
<p><u>4.5. Centre of zero indicator (leftmost digit)</u></p>	<p>□</p>	<p>It lights up when the scale weight is stable and within 1/4 division of actual zero.</p>
<p><u>4.6. Setpoint 1 status indicator</u></p>	<p>∞<sub>1</sub></p>	<p>It is illuminated when the weight exceeds the setpoint 1 value.</p>
<p><u>4.7. Setpoint 2 status indicator</u></p>	<p>∞<sub>2</sub></p>	<p>It is illuminated when the weight exceeds the setpoint 2 value.</p>
<p><u>4.8. Zero / clear error key</u></p>		<ul style="list-style-type: none"> <li>- It is used to reset the weight display to zero. Zeroing will be effective only if the scale is stable, in gross mode, and the weight is within ± 2% of max weighing capacity.</li> <li>- If an error is present on the display press this key to acknowledge.</li> </ul>
<p><u>4.9. Tare key</u></p>		<ul style="list-style-type: none"> <li>- It is used to tare the scale. Taring will be effective only if the scale is stable and within the max weighing capacity.</li> <li>- If the scale has already been tared pressing the key will cause the tare to be cancelled and the weight display to return to Gross mode.</li> </ul>
<p><u>4.10. Tare recall key</u></p>		<p>Pressing this key will cause the tare memory to be displayed briefly.</p>
<p><u>4.11. Print - accumulate</u></p>		<p>It is used to transmit weight data to peripheral devices via the serial port 1. The transmitted weight will also be accumulated. The weight will be printed only if it is stable and within the weighing range of the indicator. Printing and / or accumulation will take place only if enabled in set up.</p>



4.12. Total key



It is used to display the current accumulated total.

- Press  $\text{X} \downarrow$  again to see the number of weighing.
- Press  $\text{X} \downarrow$  again to end the total display or
- Press  $\text{O} \leftarrow$  to print/delete the total.

(The total function must be enabled in SETUP 1.1)

4.13. Function key



The function menu enables the selection of a number of software utilities, indirectly. Refer to chapter 5 for details.

**5. FUNCTION MENU**

The function menu enables the selection of a number of software programs, indirectly. Press the key  $\blacktriangleright \text{Fn}$ . Display shows Fn 00. Key in the function code desired (using the numeric scroll entry procedure).

5.1. Numeric scroll entry

- $\leftarrow \mathbf{T} \rightarrow \blacktriangleright$  = MOVE ONE DIGIT TO THE RIGHT (CYCLIC)
- $\mathbf{T} \blacktriangle$  = INCREMENT FLASHING DIGIT
- $\text{O} \leftarrow$  = ACCEPT DISPLAYED NUMBER

The corresponding program will be activated.

To exit the function selection, press  $\rightarrow \mathbf{0} \leftarrow$ .

The function menu will not operate if the key  $\blacktriangleright \text{Fn}$  is locked (SETUP 1)

The following functions are available.

Fn 01	EDIT SETPOINTS	<p>The display shows SetP 1 briefly, then the value of setpoint 1. Use the "NUMERIC SCROLL ENTRY" procedure to key in the desired value.</p> <p>The display shows SetP 2 briefly, then the value of setpoint 2. Use the "NUMERIC SCROLL ENTRY" procedure to key in the desired value.</p> <p>After editing setpoint 2 the values are stored in non volatile memory.</p> <p>If key is pressed during setpoint editing the program is aborted and the old values in memory remain unchanged.</p>
Fn 06	HIGH RESOLUTION	<p>The weight display accuracy will be increased 10 times. The display flashes. Press <math>\rightarrow \mathbf{0} \leftarrow</math> to exit and return to normal resolution.</p>
Fn 20 - 23	PRINT TYPE SELECT	<p>The functions are activated only if SETUP 2.8=1</p>
Fn 20	DISABLE SERIAL OUTPUT	

Fn 21	PRINTER OUTPUT	
Fn 22	CONTINUOUS WEIGHT OUTPUT	
Fn 23	DEMAND PRINTER OUTPUT	
Fn 30	ENABLE / DISABLE HOST COMPUTER PROTOCOL OUTPUT (EDP mode)	<p>The display shows Pro . . .</p> <p>Press →0← to disable. The display will show Pro OFF briefly.</p> <p>Or Press →0← to enable. The display will show Pro on briefly.</p> <p>The selection will be lost in power down.</p>
Fn 40	PIN CHANGE	<p>Used to change the current Personal Identification Number that enables access to the calibration procedure. (The unit is factory set so that the PIN is not active ie 000000).</p> <p>The display shows Pin 0 briefly then 000000. Key in the old pin and press Ⓞ←</p> <p>The display shows Pin 1 if the pin was correct else the unit resets. Key in the new Pin and press Ⓞ←</p> <p>The display shows Pin 2. Key in the same Pin for validation and press Ⓞ←</p> <p>The new pin is stored and the display shows PASS briefly. If the two entries are not the same, FAIL is displayed briefly and the program returns with the old pin remaining in memory.</p>
<p><b>WARNING: Make sure you do not forget the code entered. If the code is lost the unit must be returned to the factory to initialize the Pin and a fee will be charged.</b></p>		
Fn 55	VIEW ALIBI MEMORY LOCATION / PRINT 10 NEXT SERIAL NUMBERS	<p>The display shows n 1 2 3 4 where 1234 is the serial number of the last record.</p> <p>Key in the 4 digit serial number desired and / or press Ⓞ←. The display flashes the weight of this record. Press Ⓞ← to print the serial number displayed plus the next nine locations. Press →0← to exit.</p>
Fn 56	PRINT ALL ALIBI MEMORY	<p>Automatically prints a list of the contents of the Alibi memory. The printer must be capable of printing on 80 columns paper compressed mode.</p> <p>Empty locations are printed as - - - - -.</p> <p>Corrupted locations are printed as * * * * *.</p> <p>The program exits when the printout is completed or →0← is pressed.</p>



Fn 57	CHECK ALIBI MEMORY	A checksum is performed on each Alibi memory record. If an error is found Err 57 is displayed. Press →0← to exit. If all is OK, PASS is displayed briefly.
<p><b>Alibi memory functions and storage are executed only if enabled from SETUP (SETUP 2.t=13)</b></p> <p><i>The following functions are for use by maintenance personnel</i></p>		
Fn 48	CALIBRATION NR CHECK	Displays the SEAL status and Calibration number checks Refer to chapter 7.1
Fn 49	SETUP & CALIBRATION	Refer to chapter SETUP AND CALIBRATION
Fn 80	LOAD CELL MV METER	The actual mV/V output of the scale sensors is displayed. To act as a mV/V meter the unit loads default calibration data.
Fn 81	DISPLAY INTERNAL A/D COUNT	The analog to digital converter internal count is displayed.
Fn 82	DISPLAY VERSION – DATE	
Fn 85	ANALOGUE OUTPUT TEST	Display shows C 0 0 0 0 0 . Use the “NUMERIC SCROLL ENTRY” to key in a value from 0-65535 corresponding to 0-24mA or 0-10V. Press Ⓞ↵ to output the value displayed or press →0← to exit.
Fn 86	ROM - RAM TEST	
Fn 90	DISPLAY SEGMENT TEST	
Fn 91	KEYBOARD TEST	Display blanks. The scan code of any key pressed will be shown on the display. Press →0← to exit.
Fn 93	DIGITAL INPUT / OUTPUT TEST	The display shows 0. 1 0 the status of the inputs / outputs. 1 <sup>st</sup> digit displays the status of input 1. The 5 <sup>th</sup> and 6 <sup>th</sup> digit the status of outputs 1 and 2 respectively. Press Ⓞ↵ to activate - deactivate output 1 Press ⚙️▼ to activate - deactivate output 2 Or Press →0← to exit.
Fn 94	PRINT BUFFER TEST	An ASCII file (30 7F) HEX is output to the printer port with error control.

Fn 96	DISPLAY RECEIVED CHARACTERS COM 1 & COM 2	Any character received by COM 1 (RS232C) will be echoed and displayed in ASCII HEX on digits 1&2. Any character received by COM 2 (RS485A) will be echoed and displayed in ASCII HEX on digits 5&6.
Fn 99	SOFT RESET	The system will restart. It is equivalent to a power failure.

## 6. POWER-UP & RUNNING

When the INDI 5250 is powered up a self-test routine is initiated during which the following data is displayed.  
**Do not turn on the meter without having a load cell connected.**

### 6.1. Program Number

The software identification code is displayed briefly D5250.

### 6.2. Program Date

The date of issue of the software version is displayed briefly [e.g. 290999 (day - month - year)]

### 6.3. Display segment test

All display segments are turned on then off for 2 sec.

### 6.4. The display shows the weight on the platform, then ZERO

If this weight is within  $\pm 2\%$  of scale capacity it will be zeroed automatically.

If the scale can not be zeroed Err 15 is displayed. Unload the scale and press **→0←** key to zero the scale.

### 6.5. Power up the printer if one is connected to the INDI 5250

The unit is ready for operation.

If any other error message is displayed refer to Error description chapter 'ERRORS' for details.

Refer to chapter 4 for description of operation of the front panel keys.

## 7. SET UP AND CALIBRATION

In the setup dialogue the following two numeric scroll edit procedures are used:

### 7.1. Single digit edit

**T**▲ = INCREMENT DISPLAYED DIGIT

○◀ = ACCEPT DISPLAYED VALUE

### 7.2. Multi digit edit

→**T**← = MOVE ONE DIGIT TO THE RIGHT (CYCLIC)

**T**▲ = INCREMENT FLASHING DIGIT

○◀ = ACCEPT DISPLAYED NUMBER

To enter the set up & calibration procedure power on the unit.



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During the self test routine while all display segments are on (all 8 on the display) press  $\odot \leftarrow$  momentarily followed by  $\rightarrow \mathbf{T} \leftarrow \blacktriangleright$  momentarily.

Display shows ACCESS briefly if PIN is activated.

Key in PIN number and then  $\odot \leftarrow$  to get into the calibration menu.

Display shows SETUP

Use  $\mathbf{T} \blacktriangle$ ,  $\blacktriangledown$  to step through

SET UP	
Par	
CAL	S-CAL
	E-CAL
STORE	
INIT	dialogues if CAL LOCK is off.
A - CAL	

Or

SET UP	
STORE	dialogues if CAL LOCK is on.

While displayed, each dialogue can be accessed with  $\odot \leftarrow$ .

Alternatively the set up & calibration may be accessed with Fn49.

Press  $\rightarrow \mathbf{Fn}$ . The display shows Fn. 00. Use the digit edit procedures above until the display shows Fn 49, then press  $\odot \leftarrow$ .

Press  $\rightarrow \mathbf{0} \leftarrow$  to exit setup & calibration procedure.

If key  $\rightarrow \mathbf{Fn}$  is locked (setup 1 1.8=1) entering setup 2 calibration procedure is possible only at power on during the self test routine while all display segments are on (all 8 on the display) press  $\odot \leftarrow$  momentarily followed by  $\rightarrow \mathbf{T} \leftarrow \blacktriangleright$  momentarily.

The display shows ACCESS etc. Proceed as described under Fn 49.

### 7.3. Calibration Lock (Cal Lock)

To prevent unauthorized calibration a calibration lock facility is provided.

The CAL LOCK facility appears on pins 7, 8 of load cell connector J1 on the rear panel.

If the pins are shorted the calibration is locked and the user may only change the SET UP.

Parameter and Calibration menus can not be accessed.

INDI 5250 units are shipped with CAL LOCK jumper not inserted.

To calibrate the unit follow the instructions below.

- Power up the instrument.
- Allow 10 min for warm up.
- Proceed with set up and calibration as described in the next pages.
- After storage of calibration data insert the CAL LOCK short.
- Seal the unit.

The parts of the enclosure can be sealed by means of either a wire and lead seal or a self-adhesive label. The seal bears the mark of the manufacturer or the mark of the verification officer. The position of the CAL LOCK short maybe checked by performing Fn48.

If the CAL LOCK is inserted the display will show SEALED briefly.

Then the display shows CA.XXYY

Where: XX = Calibration data check characters

YY = Setup data check characters

If the CAL LOCK jumper is not inserted the display will show directly CA.XXYY.

Press **⏪** to continue

The 6 digit Audit Trail Counter is displayed.

Press **→0←** to exit.

The Audit Trail Counter is incremented every time a weight parameter or Calibration is changed regardless if the change was saved in EEPROM or not.

The A.T.CNT (Audit Trail Counter) is provided for Weights & Measures Authorities to check if any calibration attempt has been made since the last inspection.

### 7.3.1. DIALOGUE Par (Scale Parameters)

While in the Par menu use key **T← ▶** to change value, **T▲** to change digit, **⏪** to accept entry and proceed to next step.

Parameters are defined as follows:

2.P	=	Position of decimal point (Nr of decimal digits)	(0-4)	
3.P	=	Display resolution	(1-200)	
4.P	=	Two first digits of weighing range (Max2)	(00-99)	
5.P	=	Digital filter (if x is entry filter averages 2x samples)	(0-5)	
6.P	=	Number of conversions per second	(3, 7, 14, 28, 57, 70)	
7.P	=	No motion samples (if entry is x then samples = 2x)	(1-7)	
8.1	=	Autozero maintenance	0 = NO	1 = YES
8.2	=	Autozero on power up	0 = NO	1 = YES
8.3	=	Dual digital filter (antiflicker)	0 = NO	1 = YES
8.4	=	Clear A/D converter error (Error 05)	0 = NO	1 = YES
8.5	=	Reserved		
8.6	=	Leading zero blank	0 = NO	1 = YES
8.7	=	Load cell amplifier gain adjustment (A/D Gain)	0 = 2 mV/V	1 = 4 mV/V
8.8	=	AC/DC Excitation	0 = AC	1 = DC
8.9	=	Reserved		
8.A	=	Zero range	0 = 2%	1 = 10%
8.b	=	Dual interval or range	0 = interval	1 = range
0.P	=	Dual interval / Range	(00-99)	

The first two digits of the weighing interval or range for which the lower display division will be selected automatically (Max1).

00 = Dual interval / Range not active.

\* Clear A/D converter error (8.4):

If enabled A/D converter errors (due to excessive noise) will be cleared automatically, when the cause is no long present. If not he unit will require operator intervention to acknowledge the error.

\* AC/DC Excitation (8.8):

AC: Switching polarity excitation, at a rate defined by the conversion rate. Switching excitation results in more stable zero.

DC: DC excitation selected for the load cells

7.3.2. DIALOGUE S-CAL (Scale Calibration)

Press  $\odot \leftarrow$  to enter submenu. Press  $\times \blacktriangledown$  or  $\mathbf{T} \blacktriangle$  to scroll through S-CAL, E-CAL.

Press  $\odot \leftarrow$  to enter the displayed dialogue.

DIALOGUE S-CAL (Standard calibration with weights)

Display shows ZERO. Press  $\times \blacktriangledown$  or  $\mathbf{T} \blacktriangle$  to scroll through ZERO, SPAN or press  $\rightarrow \mathbf{0} \leftarrow$  to exit to S-CAL

Press  $\odot \leftarrow$  to enter the displayed dialogue.

ZERO CALIBRATION (Deadload adjustment)

Display shows E Scl a reminder to empty the scale. Wait about 10 sec (depends on digital filter).

Press  $\odot \leftarrow$ . Display counts down for about 10 sec (averages 50 samples) then it displays zero.

Repeat the procedure if the zero point is not accurate.

Press  $\rightarrow \mathbf{0} \leftarrow$  to exit to ZERO.

SPAN CALIBRATION

Display shows xxxxx where xxxxx = Maximum capacity of scale.

Enter calibration weight.

To enter the weight use MULTI DIGIT EDIT procedure:

Display shows Add Id a reminder to load the calibration weight on the platform. After loading, wait about 10 sec (depends on the digital filter).

Press  $\odot \leftarrow$ . Display counts down for about 10 sec. Then it shows the calibration weight.

Repeat the SPAN procedure if the calibration is not accurate. Press  $\rightarrow \mathbf{0} \leftarrow$  to exit to SPAN.

Calibration is complete but factors obtained not protected in case of mains failure. Proceed to STORE menu for permanent storage of calibration data.

DIALOGUE E-CAL (Electronic calibration with mV/V form Load cell data sheets)

Display shows ZERO. Press  $\times \blacktriangledown$  or  $\mathbf{T} \blacktriangle$  to scroll through ZERO, SPAN or press  $\rightarrow \mathbf{0} \leftarrow$  to exit to E-CAL

Press  $\odot \leftarrow$  to enter the displayed dialogue.

Enter the overall mV/V of the deadload (Load cell zero balance + scale deadload).

Display shows weight. Press  $\rightarrow \mathbf{0} \leftarrow$  to exit to ZERO then  $\times \blacktriangledown$

Display shows SPAN. Press  $\odot \leftarrow$ .

Key in the overall mV/V value (calculated from the load cell data sheet), corresponding to a calibration weight equal to the max capacity of the scale and press  $\odot \leftarrow$

The entered value is used to complete the span factor after which the weight in the scale is displayed.

Press  $\rightarrow 0 \leftarrow$  to exit to SPAN.

EXAMPLE:

Assume a scale of Max= 30/60kg, e=0.010/0.020kg, with 4 load cells of rated capacity 50kg-2mV/V each and the dead load is 1.940kg.

Load cell data:

L/C1: 1.9793 mV/V output at 50kg and zero balance: 0.0257 mV/V.

L/C2: 1.9392 mV/V output at 50kg and zero balance: 0.0276 mV/V.

L/C3: 1.9577 mV/V output at 50kg and zero balance: 0.0553 mV/V.

L/C4: 1.9640 mV/V output at 50kg and zero balance: -0.0022 mV/V.

LC RATED OUTPUT average =  $(1.9793 + 1.9392 + 1.9577 + 1.9640) / 4 = 1.9600$  mV/V

LC OUTPUT AT SCALE MAX =  $1.9600 * 60 / 4 * 50 = 0.5880$  mV/V

L/C ZERO BALANCE average =  $[0.0257 + 0.0276 + 0.0553 + (-0.0022)] / 4 = 0.0266$  mV/V

SCALE DEADLOAD =  $1.9600 \text{ mV/V} * \frac{1.940 \text{ kg}}{(4 * 50 \text{ kg})} = 0.0190$  mV/V

OVERALL DEADLOAD = L/C ZERO BALANCE + SCALE DEADLOAD = 0.0456 mV/V

Enter the value of 0.0456 for the dead load calibration and 0.5880 for span calibration.

7.3.3. DIALOGUE STORE (Save in EEPROM)

Press  $\odot \leftarrow$  to permanently save all the calibration data.

Program exits calibration and reinitializes. (Up to 100000 storage cycles allowed).

7.3.4. DIALOGUE SET UP (Operational Parameters)

Press  $\odot \leftarrow$  to enter submenu. Press  $\mathbf{T} \blacktriangle$  or  $\mathbf{X} \blacktriangledown$  to scroll through SETUP1, SETUP2, SETUP3, SETUP4, SETUP5. Press  $\odot \leftarrow$  to enter the displayed dialogue.

- SETUP 1 Operational memory parameters
- SETUP 2 Serial port 1 parameters
- SETUP 3 Serial port 2 parameters
- SETUP 4 Reserved
- SETUP 5 SETPOINT parameters

While in a SETUP dialogue use key  $\mathbf{T} \blacktriangle$  to change the displayed value and key  $\odot \leftarrow$  to accept entry and proceed to the next step or press  $\mathbf{X} \blacktriangledown$  to proceed to the previous step. Press  $\rightarrow 0 \leftarrow$  to exit to setup.

SET UP 1 (OPERATIONAL PARAMETERS)

- 1.1. Totalizing memory                    0 = NO 1 = YES                    Enables the totalizing of printed weights.
- 1.2. Dual key operation                  Reserved
- 1.3. Key  $\rightarrow 0 \leftarrow$                     LOCK 0 = NO 1 = YES
- 1.4. Key  $\rightarrow \mathbf{T} \leftarrow \blacktriangleright$                 LOCK 0 = NO 1 = YES
- 1.5. Key  $\mathbf{T} \blacktriangle$                         LOCK 0 = NO 1 = YES
- 1.6. Key  $\odot \leftarrow$                          LOCK 0 = NO 1 = YES
- 1.7. Key  $\mathbf{X} \blacktriangledown$                         LOCK 0 = NO 1 = YES
- 1.8. Key  $\rightarrow \mathbf{Fn}$                         LOCK 0 = NO 1 = YES





**SET UP 2 (SERIAL PORT 1 PARAMETERS)**

2.t	Print Type:	00	Port disabled	
		01	Ticket	Date-time, Indicated weight.
		02	Weight output	Continuous transmission of weight
		03	Demand	Print demand by transmitting scale
				Address code
		13	Alibi memory	Alibi memory enable. Alibi memory location, gross weight
2.L	Page length		Ticket length in linefeeds.	
2.r	Paper reverse		Number of reverse linefeeds before printout.	
2.A	Left margin		Number of spaces from left margin.	
2.F	Page header		Number of line feeds before printout.	
2.E	Line termination	0=LF	1=CRLF	2=LFCR
2.1	Printer model	0 = FANFOLD	1 = SLIP TM-295	
2.2	Reserved			
2.3	Print below min. capacity	0 = NO	1 = YES	
2.4	Reserved	0 = NO	1 = YES	
2.5	Reserved	0 = NO	1 = YES	
2.6	Wait unload	0 = NO	1 = YES	
2.7	Printer error control	0 = NO	1 = YES	
2.8	Operator print type change	0 = NO	1 = YES	
	(Fn 20-30)			
2.d	Data bits serial channel 1:	17 = 7 data bits/even parity	08 = 8 data bits/no parity	

**NOTES:** Baud rate is default to 2400.  
Set printer error control 2.7=0 for communication with a PC.

**SET UP 3 (SERIAL PORT 2 PARAMETERS)**

3.t	Instrument communication type:	00	Disabled	
		01	Continuous weight output	
		02	EDP protocol output	
		03	Printer protocol output	
		65-89	Master/slave protocol address	
3.1	Timeout control	0 = NO	1 = YES	
3.2	Handshake	0 = NO	1 = YES	
3.3	Operator disable	0 = NO	1 = YES	
3.4	Host enquiry	0 = NO	1 = YES	
3.5	Remote keyboard commands	0 = NO	1 = YES	
3.6	Reserved	0 = NO	1 = YES	
3.7	Reserved	0 = NO	1 = YES	
3.8	Debug	0 = NO	1 = YES	
3.b	Baud rate serial channel 2:	24 = 2400 b/s	38 = 38400 b/s	
		96 = 9600 b/s	57 = 57600 b/s	
		19 = 19200 b/s		
3.d	Data bits serial channel 2:	17 = 7 data bits/even parity	08 = 8 data bits/no parity	
		18 = 8 data bits/even parity		



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SET UP 4 (RESERVED)

SET UP 5 (SETPOINT PARAMETERS)

5.6	Net / Gross	0 = Net	1 = Gross
5.7	Operation	0 = Normally open	1 = Normally closed

7.3.5. DIALOGUE INIT (Installation of Default Parameters)

Loads default calibration data for checking purposes. The weight display will act as a mV/V meter of the Load cell output. Press →0← to exit the init mode and restart the instrument. Press ✕ ▾ to exit but remain in the set up and calibration menu. Be aware that the default parameters and calibration constants will remain in memory. If a subsequent StorE operation is performed previous calibration data will be lost.

The default parameters are as follows:

Par	1.P = 5	8.1-8.8 = 11100110
	2.P = 4	8.9 = 0
	3.P = 1	8.A = 0
	4.P = 40	8.b = 0
	5.P = 2	0.P = 00
	6.P = 14	
	7.P = 2	

DEADLOAD=0 mV/V~0,0000 on weight display

SPAN=2 mV/V~2,0000 on weight display

SET UP 1	SET UP 2	SET UP 3	SET UP 4	SET UP 5	A-CAL
1.1 = 0	2.t = 06	3.t=00	4.t = 00	5.6 = 0	A.1 = 0
1.2 = 0	2.L = 01	3.1=0		5.7 = 0	A.2 = 0
1.3 = 0	2.r = 00	3.2=0			A.3 = 0
1.4 = 0	2.A = 00	3.3=0			A.4 = 0
1.5 = 0	2.F = 00	3.4=0			A.5 = 0
1.6 = 0	2.E = 0	3.5=0			A.6 = 0
1.7 = 0	2.1= 0	3.6=0			A.7 = 0
1.8 = 0	2.2 = 0	3.7=0			A.8 = 1
	2.3 = 0	3.8=0			
	2.4 = 0	3.b = 24			
	2.5 = 0	3.d = 18			
	2.6 = 0				
	2.7 = 0				
	2.8 = 0				
	2.d = 17				

7.3.6. DIALOGUE ACAL (D/A Analogue output calibration)

Used to set the analogue output parameters and calibrate the output if a calibration other than the standard is required. The analogue output option is designed to interface the INDI 5250 unit to weighing automation systems. It consists of a D/A converter (with voltage or current output) galvanically isolated. The output is capable of driving 20mA into 1KΩ load. The circuit may be operated as current output (0 - 20 mA, 4 - 20 mA, 0 - 24 mA) or voltage output (0-10V). The selection of the operating mode is done hardware by means of jumper JP1 on PCB 761 (Factory set to 0 - 20 mA mode) and parameter A.4 below.



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The output maybe operated with standard calibration where 0 on the weight display is output as 0 mA or 4 mA and max on the display is output as 20mA. Also a user calibration is available where 0 on the display is output at the user defined value (Zero) and max on the display is output at the user defined value (FULL). User defined calibration also applies to the voltage output mode.

A.1	Calibration Standard/User	0=Standard (20mA on max)	1=User Zero & Span	defined
A.2	Reserved			
A.3	Scale error output	0=Low (0 mA)	1=High (24mA)	
A.4	Current / Voltage	0=Current	1=Voltage	
A.5	Net / Gross	0=Net weight	1=Gross weight	
A.6	0-20 / 4-20	0=0-20mA	1=4-20mA	
A.7	Resolution	0=Display	1=Internal	
A.8	Operation	0=Disabled	1=Enabled	

Dialogue ACAL continues below only if A.1 = 1.

Display shows Zero briefly.

Then display shows 0 XX.XXX. Key in the D/A output in mA or Volt (depending on A.4) using the "NUMERIC SCROLL ENTRY" procedure to define the D/A output for zero weight indication.

Press  $\odot \leftarrow$  to the zero output and go to FULL.

Or Press  $\rightarrow \mathbf{0} \leftarrow$  to escape from D/A calibration

Display shows FULL briefly.

Then the display shows F XX.XXX. Key in the D/A output in mA or Volt (depending on A.4) using the "NUMERIC SCROLL ENTRY" procedure. The program ends after the definition of FULL.

To select current or voltage output the jumper JP1 on PCB 761 should be placed in the proper position (see drawings LD52\*\*/PCB\_A/040).

CONNECTION :Pin 1 = Current output (+)  
Pin 2 = Voltage output (+)  
Pin 3 = Common (current or voltage)  
Pin 4 = power in (+)  
Pin 5 = power in (-)

Connect Pins 1 & 3 for current output

Connect Pins 2 & 3 for voltage output

An external power supply 24VDC is required for the analog output operation.

### ADJUSTMENT OF D/A VOLTAGE

If adjustment of the output 0-10V is necessary:

1. Place jumper JP1 on PCB (761) for voltage output.
2. Power up the unit and enter SETUP menu to set ACAL parameters as follows:  
A.1=1 A.2=0 A.3=0 A.4=1 A.5=0 A.6=0 A.7=1 A.8=1  
Skip D/A calibration and save this SETUP with a STORE operation.
3. Use Fn 85. Display shows C00000. Enter the value 65535.
4. Measure with a voltmeter the voltage at pins 2 (+) and 3 (-) the analogue output connector (J4). Record the value.
5. Exit Fn 85 and re-enter SETUP menu to define Zero of D/A (value 00.000) and the Full value calculated as:

$$\text{Full} = \frac{100}{\text{Measured voltage (in volts)}}$$

## 8. SERIAL COMMUNICATION PORT 1 (RS232C)

The port is used to connect to serial printers or personal computers. Data output and handshake requirements are defined by SETUP 2.

TYPE Asynchronous serial ASCII, full duplex.

PROTOCOL 2400 baud, 7 data/even parity or 8 data/no parity, 1 stop bit.

HANDSHAKE DTR BUSY per character for fanfold printers or REQUEST PAPER END STATUS for EPSON TM-295 slip printer.

CONNECTION DB9 male on rear panel (J1)  
 Tx = Pin 3  
 Rx / DTR = Pin 2  
 GND = Pin 5  
 SHIELD = metal case of D-type  
 Cable: 3 conductor shielded max distance 15m

DATA The data output of serial port 1 is selectable via SETUP 2, and maybe one of printer output, continuous weight output, or demand weight output.

### 8.1. Printer output (SETUP 2 2.t=01)

The data to be printed, printer type and paper dimensions is defined in SETUP 2

### 8.2. Continuous weight output (SETUP 2 2.t=02)

The indicated weight and status information is transmitted continuously. No handshake is required.

#### DATA BLOCK COMPOSITION STATUS, POLARITY, WEIGHT, SYNC (P+123.45CR)

BYTE	NAME	DESCRIPTION
1	WEIGHT STATUS	Bit0 0=NORMAL 1=NO WEIGHT DISPLAY Bit1 0=GROSS 1=NET Bit2 0= 1=AUTO ZERO Bit3 0=WITHIN RANGE 1=OUT OF RANGE Bit4 0=NO STANDSTILL 1=STANDSTILL Bit5 0=NORMAL 1=UNDER MIN. WEIGHING RANGE Bit6 ALWAYS 1 TO OBTAIN PRINTABLE CHARACTERS Bit7 ZERO OR PARITY
2 3-8	POLARITY WEIGHT DIGITS	"+" OR "-" 6 DIGITS INCLUDING DECIMAL POINT IF ANY
9	SYNC	CR (0d hex) FOR SYNCHRONISATION



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### 8.3. Print on demand (SET UP 2 2.t=03)

The weight data is transmitted every time a character is received from the connected peripheral.  
The demand character is programmed in SETUP 3 3.t., "INSTRUMENT COMMUNICATION TYPE" e.g. "1"  
49d or 31 hex.

### 8.4. Alibi transmit (SET UP 2 2.t=13)

The purpose of the Alibi memory is to produce an accurate non modifiable record for each weight transmission to a host computer so that the scale weight may be incorporated in a weighing protocol / delivery note, printed by the host computer.

The alibi record consists of unique serial number and the weight. Only gross weights may be stored.

The record is transmitted in the form:

1234 012340 kgG

The following function programs are available:

Fn 55 to view the Alibi memory records.

Fn 56 to print all the records.

Fn 57 to checksum the memory.

## **9. SERIAL COMMUNICATIONS PORT 2 (RS485A)**

The port is used for connection with Host computer, remote printer, remote display etc.

The mode of operation is selected in SETUP 3.

- 1: 3.t = 00 Disable.
- 2: 3.t = 01 Continuous weight output
- 3: 3.t = 02 EDP protocol output
- 4: 3.t = 03 Printer protocol output
- 5: 3.t = 65 - 89 Master / Slave operation

TYPE Asynchronous serial ASCII, half duplex.

PROTOCOL 2400 to 57600 baud, 1 start, 7 or 8 data, 1 Even parity, 1 stop bit. Factory set to 2400 baud, 1 start, 7 data, even parity, 1 stop bits.

CONNECTION DB9 female on rear panel. (J3).

A = Pin 6

B = Pin 7

Termination resistor 120R connected by sorting pins 8 and 9.

SHIELD= metal case of D-type

Cable 2 conductor twisted pair and shielded max distance 1000m.

**9.1. Continuous weight output (SETUP 3.t = 01)**

The indicated weight and status information is transmitted continuously. No handshake is required.

**DATA BLOCK COMPOSITION  
STATUS, POLARITY, WEIGHT, SYNC (P+123.45CR)**

BYTE	NAME	DESCRIPTION
1	WEIGHT STATUS	Bit0 0=NORMAL 1=NO WEIGHT DISPLAY Bit1 0=GROSS 1=NET Bit2 0= 1=AUTO ZERO Bit3 0=WITHIN RANGE 1=OUT OF RANGE Bit4 0=NO STANDSTILL 1=STANDSTILL Bit5 0=NORMAL 1=UNDER MIN. WEIGHING RANGE Bit6 ALWAYS 1 TO OBTAIN PRINTABLE CHARACTERS Bit7 ZERO OR PARITY
2	POLARITY	"+" OR "-"
3-8	WEIGHT DIGITS	6 DIGITS INCLUDING DECIMAL POINT IF ANY
9	SYNC	CR (0d hex) FOR SYNCHRONISATION

**9.2. EDP protocol output (SETUP 3.t = 02)**

This mode is used to transmit the data printed to a host computer. Transmission will begin after completion of printing. ACK / NAK handshake or no handshake may be used.

The host must reply with ACK (06 h) if it received the data correctly or NAK (15 h) to enable retransmissions.

**DATA BLOCK COMPOSITION**

STX = (02 h) = start of text character  
 DATA = Printable ASCII data identical to the data printed.  
 ETX = (03 h) = End of text character.  
 BCC = Block check character. (XORSUM of all data characters STX, ETX inclusive)

**HANDSHAKE**

ENQ (05 h) from host within 5 sec of protocol initialisation.  
 ACK (06 h) from host within 5 sec after the end of transmission.  
 Or NAK (15 h) from host within 5 sec after the end of transmission to enable retransmissions of the block. The number of repeats is unlimited.

**ERRORS**

Err 30 : Host not ready  
 Err 33 : Host not Acknowledge

*Refer to Error chapter for details on error response.*

**SETUP REQUIREMENTS**      3.t = 02

3.1 = TIME OUT CONTROL    0 = No            1 = Yes  
 3.2 = HANDSHAKE            0 = No            1 = Yes  
 3.3 = OPERATOR DISABLE    0 = No            1 = Yes  
 3.4 = HOST ENQUIRY        0 = No            1 = Yes

TIME OUT CONTROL	The INDI 5250 checks the on line status of the interface and reports an error if failure is detected.
HANDSHAKE	The INDI 5250 will check for reception of ACK / NAK character after transmission.
OPERATOR DISABLE	The operator will be prompted to disable further transmission if an error occurs, if SETUP 3 3.3 = 1. Transmission will be enabled again after a power on reset. If SETUP 3 3.3 = 0 only the current transmission will be aborted.
HOST ENQUIRY	The INDI 5250 waits for ENQ (05h) character before it begins transmission.

9.3. Remote printer output (SETUP 3.t = 03)

Used to transmit the data printed on the local printer to a remote printer. No handshake is required.

9.4. Master / Slave operation

Used to connect several INDI 5250 units in a local network. To a higher level computer which acts as the master.

Refer to INDI 5250 MSP SERIAL INTERFACE for details.

**10. ERRORS**

If an error occurs during the operation, it will be displayed in the form Err xx, where xx is the Error code. Program is halted. Press **→0←** momentarily to acknowledge the error and proceed as indicated in the error operator response. Errors may occur during set up, programming, power up and during operation.

ERROR DISPLAY	POSSIBLE CAUSE	ACTION TO BE TAKEN
Err 01	SYSTEM ROM : Faulty EPROM	Contact manufacturer
Err 02	DATA RAM : Faulty RAM	Contact manufacturer
Err 04	CALIBRATION DATA : Faulty EEPROM	Contact manufacturer
Err 05	SCALE or A/D CONVERTER	Check scale, cable, connectors, contact manufacturer
Err 06	LOW INPUT VOLTAGE	Check power supplied to the instrument
Err 07	DATA MEMORY CORRUPTED . Extreme power supply transient . Some input data has not yet been programmed, or the totalisers have not been cleared.	Input all operational data and clear totalisers
Err 15	System has been initialised due to power failure or soft reset.	Zero scale
Err 20	PRINTER IS NOT ON-LINE Either not connected or out of paper or failed	Check printer, cables
Err 26	No paper for EPSON TM295 printer	Supply with paper
Err 30	Protocol not ready. Computer not connected or communication link failed.	Check computer, cables. Press P to retry or O to abort

Err 33	Protocol not Acknowledge. No correct response has been received from host computer.	Check computer, cables. Press P to retry or O to abort
Err 55	Alibi memory full	Acknowledge the error. The unique identification number will reset to 0000
Err 56	Alibi memory in NET mode (only gross).	Printout aborted
Err 57	Alibi memory corrupted	The Alibi memory can not be cleared but next records will be corrected
Err 67	Corrupted totaliser	Print, clear totaliser
Err 69	TOTALISER OVERFLOW. Because totalisers have not been cleared for long time.	Print / clear totalisers Overflow is not critical, but remember that 1 total capacity must be added to the indication, each time an overflow occurs.

**To exit from error display press →0←.**

## **11. DIGITAL SET POINT OUTPUTS**

The SET POINT option is designed for interfacing INDI 5250 units with weighing automation systems. It contains two opto-isolated outputs that can be operated as weight set points.

The set points are programmed using the program Fn 1

The two set points are programmed in sequence. When both set points have been edited the program returns to the weight display mode.

The SET POINT may be activated by the net weight value (SETUP 5.6=0) or by the gross weight value (SETUP 5.6=1).

SET POINT outputs may be operated as normally open if SETUP 5.7=0 or normally closed if SETUP 5.7=1

SET POINT outputs may be activated for test purpose using Fn 93.

The technical characteristics of the outputs are described in the “Technical Specifications” chapter.

An opto isolated 24VDC input is reserved.

## **12. MAINTENANCE**

The unit does not require any routine maintenance. It may be necessary to perform periodic checks of the calibration of the scale due to mechanical reasons. The frequency of the calibration checks depends on the application condition and on the required measuring accuracy.

It may happen that, in exceptional conditions, the unit locks on a wrong memory location and it is not possible to restart because the keyboard is not operative.

To restart it is necessary to switch the power OFF then ON again.



## 12.1. Service

### 12.1.1. There are no serviceable parts

The unit may be repaired by trained personal only. The user may check load cell connection and power supply.

### 12.1.2. Load cells

Load cells are reliable and very rarely present errors. Check input and output resistance, and resistance between any terminal and shield. Check load cell connection and cable.

### 12.1.3. Power supply

Check 9-15VDC power supply & resettable fuse F4 on PCB 801.

### 12.1.4. Setpoint outputs

Check 24VDC power supply & resettable fuse F3 on PCB 801.

SENSY maintains a fully trained staff of field service engineers who provide:

- Technical assistance by telephone.
- Application assistance on-site or by telephone.
- Trouble shooting on-site.
- Warranty (replacement) or spare parts assistance.
- Training on-site or at out service centre.
- Equipment updates to our latest configuration.

Our engineers will check repair, mechanical, electrical, electronic, wiring and calibration errors.



### 13. APPENDIX A : INSTALLATION SET UP & CALIBRATION RECORD

If no calibration is required by the customer, the INDI00 will have to be systematically calibrated in mV/V. In all cases, with or without calibration option, a control is mandatory before sending. Since the RS232 output is present in the standard version, this one will be systematically activated.

**Remember :** The number of digits and the "mobility" must make it possible to have 40.000 points of resolution at least.

**Examples :** Load cells 1...2 mV/V → in mV/V ; 2mV/V → 2,00000 Load cell 500 kN → 500.00 by 0.01

PAR SCALE PARAMETERS	NO OF DISPLAY DIGITS	POSITION OF DEC. POINT	DISPLAY RESOLUTION	TWO FIRST DIGITS OF W. RANGE	DIGITAL FILTER	NO OF CONVERSION (p/s)	NO MOTION SAMPLES	AUTO ZERO MAINTENANCE	AUTO ZERO ON POWER UP	DUAL DIGITAL FILTER	CLEAR CONV A/D ERROR	RESERVED	LEADING ZERO BLANK	LOADCELL AMP. GAIN ADJUSTMENT
	1.P	2.P	3.P	4.P	5.P	6.P	7.P	8.1	8.2	8.3	8.4	8.5	8.6	8.7
	(6)	(5)	(1)	(40)	(2)	(14)	(2)	(0)	(0)	(1)	(0)	(0)	(1)	(1)

AC/DC EXCITATION	RESERVED	ZERO RANGE 2% / 10%	DUAL INT OR RANGE	DUAL INT OR RANGE
8.8	8.9	8.A	8.b	0.P
(0)		(1)	(0)	(00)

CALIBRATION	DEAD LOAD	SPAN	USED MASS
	CP =	Value to be displayed (DISP1)	CM = Value to be displayed (DISP2)

SETUP 1 OPERATION	TOTAL-SING MEMORY	DUAL KEY OPERATION	KEY LOCK	KEY LOCK	KEY LOCK	KEY LOCK	KEY LOCK	KEY LOCK
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)

SET UP 2 PRINTER	PRINT TYPE	PAGE LENGTH	PAPER REVERCE	LEFT MARGIN	PAGE HEADER	LINE TERMIN.	PRINTER MODEL	RESERVED	PRINT BELOW MIN CAPACITY	RESERVED	RESERVED	WAIT UNLOAD	PRINTER ERROR CONTROL	OPERATOR PRN TYPE CHANGE	DATA BITS SERIAL CHANNEL 1	
	2.t	2.c	2.L	2.r	2.A	2.F	2.E	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.d
	(02)	(65)	(01)	(00)	(00)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(17)

SETUP 3 PROTOCOL	INSTRUMENT COMM. TYPE	TIMEOUT CONTROL	HAND SHAKE	OPERATOR DISABLE	HOST ENQUIRY	REMOTE KBD COMMANDS	RESERVED	RESERVED	DEBUG	BAUD RATE SERIAL CHANNEL 2	DATA BITS SERIAL CHANNEL 2
	3.t	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.b	3.d
	(01)	(00)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(24)	(8)

SETUP 4	RESERVED
	4.t
	(0)

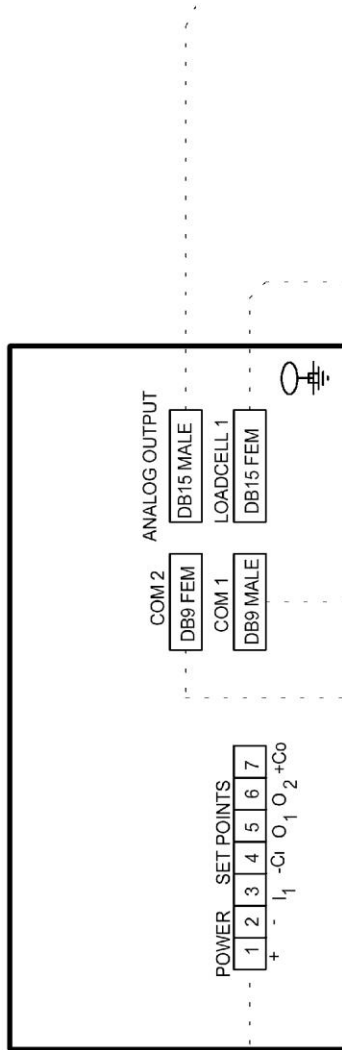
SETUP 5 SER.	NET/ GROSS	OPERATION NO / NC					
	5.1	5.2	5.3	5.4	5.5	5.6	5.7
	(0)	(0)	(0)	(0)	(1)	(0)	(1)

DIALOGUE ACAL	CALIBRATION STAND-ARD / USER	RESERVED	SCALE ERROR OUTPUT	CURRENT/ VOLTAGE	NET/ GROSS	0-20/4-20	RESOLUTION	OPERATION
	A.1	A.2	A.3	A.4	A.5	A.6	A.7	A.8
	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)

( ) : Default

SENSY CONTROL	
Date :	
BCI N° :	Customer :
Display serial n° :	
Load cell associated :	
Operator :	
Verificator :	
Test sensitivity :	mV/V
Net reading (preliminary taring of the resistance of calibration) :	

## 14. ANNEXE B : REAR PANEL CONNECTORS



PIN	DESCRIPTION
1	POWER 9 - 15 VDC
2	
3	INPUT 1
4	INP. COMMON (-)
5	OUTPUT 1
6	OUTPUT 2
7	OUT. COMMON (+)

PIN	DESCRIPTION
6	A
7	B
8	TERMINATION RESISTOR (120R)
9	
D-TYPE METAL CASE	SHIELD

SHORT PINS 8&9  
FOR TERMINATION  
RESISTOR (120R)  
CONNECTION

PIN	DESCRIPTION
2	RX OR DTR
3	TX
5	GND

PIN	DESCRIPTION
1	-EXCITATION
2	-SENSE
3	+SENSE
4	+EXCITATION
5	-SIGNAL
6	+SIGNAL
D-TYPE METAL CASE	SHIELD
7-8	CALIB. ENABLE

NOTE : CALIBRATION IS DISABLED WHEN PINS 7 & 8  
AT LOADCELL CONNECTOR ARE SHORT CIRCUITED.  
AFTER CALIBRATING THE UNIT , PLACE JUNCTION AT PINS  
7 & 8 OF THE DB15FEM CONNECTOR FOR THE L/C.

PIN	DESCRIPTION
1,9	IOUT+
2,10	VOUT+
3,11	IOUT- OR VOUT-
4,12	POWER IN +24 VDC
5,13	POWER IN GND
D-TYPE METAL CASE	SHIELD