ELECTRONICS

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USER MANUAL

Model:

i1-X WEIGHING INDICATOR

1 Introductions

1.1 Safety precautions

WARNING!

- ▲ Do not use i1-2x Series indicators in hazardous area or in dusty environments.
- ▲ Never flood the Indicator, immerse it in liquid or pour liquids on it.
- ▲ Do not expose indicator to either direct sun light or any heat sources.
- ▲ Do not open the indicator!
  The warranty is void if this stipulation is ignored. The indicator may only be opened by authorized persons.

DANGER!

Electric shock hazard!

- ▲ Always unplug AC adapter before performing any work on the indicator

Hazard of electric shock if the power cable is damaged!

- ▲ Check the power cable for damage regularly. Unplug the power cord immediately if the power cable is damaged.

Disposal

In conformance with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE), this device may not be disposed of in domestic waste. This also applies to countries outside the EU as per their specific regulations.

Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment.

If you have any questions, please contact the responsible authority or the distributor from which you purchased this indicator.

Should this indicator be passed on to other parties (for private or professional use), the content of this regulation must also be related.

The indicator has a rechargeable internal battery. The battery contains heavy metals. Please observe the local regulations on the disposal of environmentally hazardous materials.

1.2 Descriptions

The purpose of this manual is to help the user get to know the indicator's various weighing modes, keys' functions and display indications.

In addition to having all the characteristics of a high precision scale, the indicator has weight unit in kg, gross and net weighing, manual and automatic weight accumulation with serial output, counting functions and 4 set points. The indicator is applicable in either industrial settings or legal for trade applications. It provides the frequently needed ability to transmit and print the data through its serial ports.

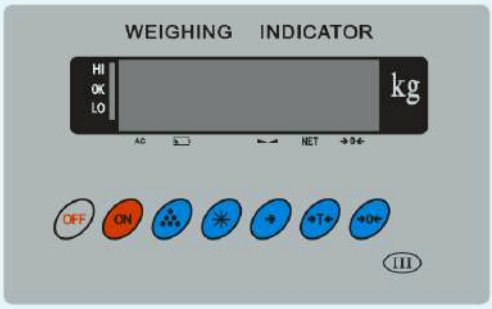
Please carefully follow the instructions to configure the indicator. By taking actions not indicated this manual, one could cause the indicator to not work properly.

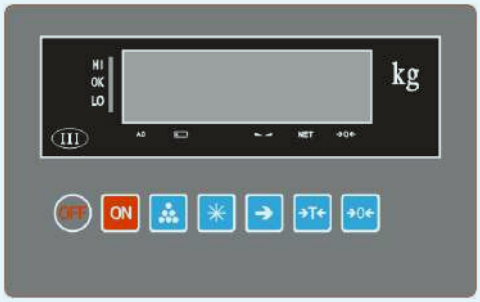
2 Specifications

Accuracy class	III
Maximum number of verification scale intervals	nind = 3000
Load cell excitation voltage	Uexc = 5 V
Minimum input voltage	Umin = 0.5 mV
Minimum input voltage per verification scale interval	Δumin = 1 μV

Minimum/maximum load cell impedance	87 Ω to 1000 Ω
Fraction of mpe	pind = 0.5
Cable connection	4 wires
Maximum number of load cells	4 x 350 Ω load cells 8 x 700 Ω load cells
Display	6-digit 20mm LED High Resolution (×10) display Weight unit in kg
Weighing Modes	Gross and net weight weighing Manual and automatic weight accumulation Set point function
Serial interface	RS232 interface with continuous data output or command protocol Baud rate 1200, 2400, 4800, 9600 Optional RS485 interface
External AC adapter	100-240VAC 50/60Hz
Rechargeable internal battery	**i**1-20: 6V/2.8AH i1-21/21F: 6V/2.8AH i1-22: 6V/2.8AH i1-23: 6V/4AH
Full charge battery operation	**i**1-20: 20 hours i1-21/21F: 20 hours i1-22: 20 hours i1-23: 30 hours
Full charge battery recharge time	12 hours
Operating temperature	–10 °C to +40 °C
Storage temperature	–25 °C to +55 °C
Relative humidity	10% to 85% non-condensing
Housing	**I**1-20: plastic I1-21/21F: stainless steel I1-22: stainless steel i1-23: plastic
Dimensions	**i**1-20: 275 x 160 x 120 mm i1-21/21F: 275 x 160 x 120 mm i1-22: 275 x 160 x 80 mm i1-23: 255 x 170 x 130 mm
Weight	**i**1-20: 1.3 kg i1-21/21F: 1.6 kg i1-22: 1.6 kg i1-23: 1.5 kg

3 Front Panels





3.1 Status Indicators

Status	Meaning
AC	AC adapter is connected
	Low battery warning 30% of full charge
	Weight is stable
NET	A weight is tare and display net weight
→0←	-1/4 e < weight < 1/4 e
LO	set point A ≤ weight < set point B
OK	set point B ≤ weight < set point C
HI	set point C ≤ weight < set point D
kg	Weight unit in kilogram

3.2 Keypad

Keys	Operation
【OFF】	Switch the indicator off
【ON】	Switch the indicator on
【∴】	Manual weight accumulation
【 * 】	Proceed to next step
【→】	Display weight to X10 resolution
【→T←】	Tare
【→0←】	Zero

3.3 LED Error Code

Code	Meaning
〖 OUEr 〗	Weight > FS + 9d
〖–OUEr 〗	Weight < -20d
〖 Error 〗	Calibration error
〖 "23.12"〗 blink	Low battery warning (<10% of full charge) to recharge the battery

〖**LLLLLL**〗	In zeroing operation,weight<-2%FS
〖**HHHHHH**〗	In zeroing operation,weight>2%FS

4 Basic functions

4.1 Switching on

Press 【ON】 to switch on the indicator. The indicator displays the software version and performs self-tests while displaying self-test patterns.

4.2 Switching off

Press 【OFF】 to switch off the indicator.

4.3 Weight unit

The weight unit is kg.

4.4 Zero

1. The display can be zeroed only when the weight is less than 2% of FS.
2. Unload the platform.
3. Press 【→0←】 to set the zero point and zero the display.
4. The zero status →0← is turned on.

4.5 Tare

4.5.1 Acquire tare

1. Tare can be set only after the display has been zeroed. Check to make sure zero status →0← is turned on.
2. Place the empty container on the platform.
3. Wait until the weight is stable when the stable status ◣◢ is displayed.
4. Press 【→T←】 to set tare and zero the display.
5. The tare status NET is turned on.
6. The indicator switches to in net weight mode.

4.5.2 Remove tare

1. Check that the tare status **NET** is displayed.
2. Press【→**T**←】to remove tare and switch to gross weight mode.

4.6 Simple weighing

1. Place sample on the platform.
2. Wait until the weight is stable when the stable status ◣◢ is displayed.
3. Read the weight of the sample

4.7 Low battery warning

When the battery capacity is less than 30% of full charge, the low battery warning indicator is displayed. When the battery capacity is less than 10% of full charge,The indictor display will blink.After another 1 hours of operation, the indictor will power down. Connect the AC adapter to recharge the battery immediately.

5 Applications

5.1 Manual Accumulation

1. Place sample on the platform.
2. Wait until the weight is stable when the stable status ◣◢ is displayed.
3. Press 【∴】 to manually accumulate the weight and transmitted to RS232 port.
4. The number of accumulation 〖n XXXX〗 is displayed.
5. Unload the sample so that the next sample can be accumulated.

5.1.1 Query accumulated data

Step	Operation	Display	Description
1	Press【 * 】	〖n 1203〗	Display number of samples
2	Press【→T←】	〖H 0〗	Display upper 4 digits of accumulated weight
3	Press【→T←】	〖L 1085〗	Display lower 4 digits of accumulated weight
4	Press【 * 】	〖 0.00〗	Return to weighing mode

5.1.2 Clear accumulation data

Step	Operation	Display	Description
1	Press【 * 】	〖n 1203〗	Display number of samples
2	Press【→0←】	〖 0.00〗	Clear accumulated data, and Return to weighing mode

5.2 Set point

There are 4 set points A, B, C and D and 3 status symbols **LO, OK** and **HI**. These symbols are displayed under the following conditions:

Symbols	Trigger condition
LO	set point A ≤ weight < set point B
OK	set point B ≤ weight < set point C
HI	set point C ≤ weight < set point D

5.2.1 Enter set points

Step	Operation	Display	Description
1	Press【OFF】	〖 0.00〗	Switch off the indicator
2	Press and hold 【→T←】and then press 【ON】	〖 0.00〗	Switch on the indicator to enable set point menu
3	Press【→T←】	〖A000.00〗	Set point A
4	Enter a number	〖A 5.00〗	Use【→】and【→T←】or【→0←】to enter set point A = 5.00
5	Press【 * 】	〖b000.00〗	Set point B
6	Enter a number	〖b 15.00〗	Use【→】and【→T←】or【→0←】to enter set point B = 15.00
7	Press【 * 】	〖C000.00〗	Set point C
8	Enter a number	〖C 30.00〗	Use【→】and【→T←】or【→0←】to enter set point C = 30.00
9	Press【 * 】	〖d000.00〗	Set point D
10	Enter a number	〖d 35.00〗	Use【→】and【→T←】or【→0←】to enter set point D = 35.00
11	Press【 * 】	〖 0.00〗	Return to weighing mode

5.3 High resolution display mode

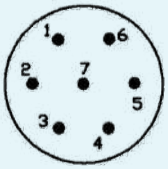
Press【→】to display the weight in X10 resolution for 5 seconds. The last digit of the decimal point will light.

5.4 Automatic shutdown and power-saving mode

When the power-saving mode is enabled.If you do not operate within 30 seconds, the indicator will enter a power saving mode.The display shows〖- 〗.If you do not operate within 30 minutes, the indicator will automatically shut down.

6 External interfaces

6.1 Load cell connectors



CN1

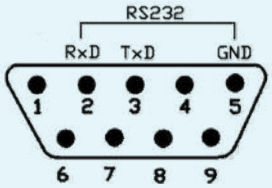
Pin No.	1	2	3	4	5	6	7
Label	+E		+S	–S	-E		GND
Description	+Excitation		+Signal	-Signal	-Excitation		Ground

6.2 RS232 serial interface

6.2.1 RS232 settings

Number of bits	Parity	Number of stop bit
8	No	1

6.2.2 RS232 DB9 connectors

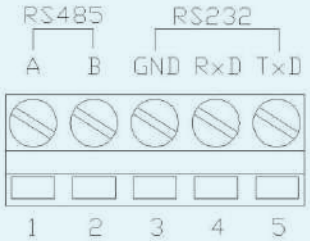


Pin No.	1	2	3	4	5	6	7	8	9
i1-2x DB9	--	RxD	TxD	--	GND	--	--	--	--

6.2.3 Connecting DB9 to PC DB9

i1-2x DB9 Pin No.	PC DB9 Pin No.
2 (RxD)	3 (TxD)
3 (TxD)	2 (RxD)
5 (GND)	5 (GND)

6.2.4 RS232 / RS485 CN5A connectors



Pin No.	1	2	3	4	5	6	7	8	9
CN5A	RS485 A	RS485 B	RS232 GND	RS232 RxD	RS232 TxD				

6.2.5 Connecting CN5A to PC DB9

i1-2x CN5A Pin No.	PC DB9 Pin No.
3 (GND)	5 (GND)
4 (RxD)	3 (TxD)
5 (TxD)	2 (RxD)

6.2.6 Connecting CN5A to a printer

i1-2x CN5A Pin No.	Printer DB25 Pin No.
3 (GND)	7 (GND)
5 (TxD)	2 (RxD)

6.3 RS232 continuous ASCII output

When the indicator address (Adr) is set to 00 or 99, the indicator continuously transmits the weight in RS232 ASCII data format.

LED display format

Digit position	X6	X5	X4	X3	X2	X1
Weight –1234.5	–	1	2	3	4.	5

Adr = 00 output format

Byte No.	1	2	3	4	5	6	7	8	9
Output format	=	X1	X2	X3	X4	X5	X6	X7	S
HEX	3D	35	2E	34	33	32	31	30	2D
Weight –1234.5	=	5	.	4	3	2	1	0	–

Adr = 99 output format

Byte No.	1	2	3	4	5	6	7	8	9
Output format	=	S	X7	X6	X5	X4	X3	X2	X1
HEX	3D	2D	30	31	32	33	34	35	36
Weight -1234.5	=	–	0	1	2	3	4	.	5

6.4 RS232 ASCII commands

When the indicator address (Adr) is set to 01 to 98, Serial communication follows the Modbus ASCII protocol

6.5 Printer format

n = 3, gross = 88.69kg, tare = 29.41kg, net = 59.28kg

```
No:XXXX          No:   3
G:XXXXXXkg       G: 88.69kg
T:XXXXXXkg       T: 29.41kg
N:XXXXXXkg       N: 59.28kg
```

Accumulated weight

```
No:XXXX          No:   3
W:XXXXXXXkg      W:  118.09kg
```

7 Model Numbers

Model	Housing	LCD	IP65
i1-20	Plastic	Red	No
i1-20G	Plastic	Green	No
i1-21	Stainless Steel	Red	No
i1-21G	Stainless Steel	Green	No
i1-21F	Stainless Steel	Red	Yes
i1-21GF	Stainless Steel	Green	Yes
i1-22	Stainless Steel	Red	No
i1-22G	Stainless Steel	Green	No
i1-23	Plastic	Red	No
i1-23G	Plastic	Green	No

8 Services

Services include a full range of technical on site services and workshop repair, preventative maintenance and calibration facilities.

NOTE: Battery is not under warranty