

Weight Indicator MODEL MSI



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Industrial Weighing Systems

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INSTRUCTION MANUAL

PLEASE READ BEFORE USING INDICATOR

The MSI -I Digital Weight Indicator is designed for general weighing and counting applications. The main features of MSI -I indicators are:

- Full front panel setup and calibration
- Easy to read large 1" (25.4 mm) LCD Display with Backlight
- Weighing Units lb, kg, oz, Parts Counting function
- Auto Zero Tracking selectable
- Stability Indicator, Low Battery Indication
- Over-load and Under-load Indication
- Bidirectional RS232 data Interface
- Weighing Units Conversion through the Keypad
- Supplies enough current for up to 4-350 ohm Load Cells
- Powered by AC/DC Adaptor or NICAD Rechargeable Battery
- Wall Mounting Bracket
- Indicator can be tilted at any angle

GENERAL

Unpack and keep the carton for storing display and/or future transportation.

In the carton you should find this instruction manual with:

- 1 model MSI -I Indicator
- 1 mounting bracket
- 1 AC/DC Adaptor
- 1 circular connector 5 pin for Load Cells OR 1 terminal block (5 positions socket plug)

Load cells should be connected to the Indicator through Circular 5 pin connector on the rear cover (16-5R) or using a 5 positions socket plug:

Pin 1	+excitation	Pin 2	+signal		
Pin 3	-signal	Pin 4	-excitation	Pin 5	shield

A suitable connector is available from Industrial Weighing Systems as an accessory. Connect the load cells/vessel to a ground circuit using at least 12ga wire.

KEY FUNCTIONS

- ON/ZERO**
 1. Turns the scale ON
 2. Sets Zero when in GROSS mode and within zero band range
 3. Turns ON or OFF LCD Backlight (extended press of 6 seconds)
- UNITS**
 1. Weighing unit conversion (selection of enabled units)
- TARE**
 1. Acquires the tare weight to 0 in either GROSS or NET mode.
- GROSS/NET**
 1. Toggles between GROSS and NET weight only if tare have been acquired
In GROSS symbol G lights on, for NET weight symbol Net light is on
- PRINT**
 1. Sends data via RS232 serial port
- OFF**
 1. Turns the scale OFF



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POWER OPTIONS

Operating with the AC/DC adapter

Connect a suitable adapter (input 110VAC-120VAC, 60 Hz output: 12VDC, 300mA) to the input socket at the rear of the indicator and plug into the main AC supply.

Operating with battery power

Unscrew the 8 screws on the back of the indicator. Remove the protective film of the double-sided tape attached to the Rechargeable Battery and secure on the enclosure bottom below the circuit board. Connect the TWO PIN FEMALE connector of the battery to the TWO PIN MALE connector in the upper left corner of the circuit board. Close the back cover of the indicator. A full charging cycle takes about 8 hours with the indicator turned off. The battery will reach full capacity providing about 40 hours of service after 3-5 full charging cycles. During battery operation the Backlight is disabled and Auto Shut Off will occur after about 3 minutes of non-activity (display stable). A suitable Battery Pack is available from Industrial Weighing Systems as an accessory.

SETUP MENU CHART

The indicator has to be recalibrated when any of these settings are changed. Turn the indicator OFF. Remove the lower plug on the left side of the indicator. Insert a screwdriver into the access hole, press and hold in the switch then press and release the ON/ZERO key, when the display shows SETUP release the side switch. The display will show the first menu setting.

To change DATA VALUE press ON/ZERO Key.

To proceed to the next menu setting press TARE Key.

$$\text{Full scale capacity} = \text{Graduations} \times \text{Display division}$$

DISPLAY:

1- XX	selects full-scale graduations where XX is times 100 (i.e. 5=500) (5, 10, 15, 20, 25, 30, 40, 50, 60, 80, 100, 120, 150, 200)
2- oFF	Select Auto zero track band number of divisions (oFF, 0.5, 1, 3)
3- 100	Zero range (1.9% or 100% capacity)
4- 1	Motion Band divisions (1 or 3)
5- 1	Digital Filter -Averaging # of conversions (1,2,4,8,16) Higher averages better stability slower response
CALun	Selects unit for Calibration Lbs or Kgs
dd	Display Division for capacity (1, 2, 5, 10, 20, 50)
dP	Decimal Point Position (0, 0.0, 0.00, 0.000, 0.0000)

To exit the SET-UP menu

Press the TARE key, done will be displayed, turn off the indicator to store.



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OPTIONS MENU CHART

No calibration is needed after making any changes in the OPTION settings. Turn the indicator OFF. Press and hold PRINT key, press and release ON/TARE key. When the display will show SELun release the PRINT key. The display will show the first setting.

To change the STATUS press the PRINT key.

To proceed to the next setting press TARE key.

DISPLAY

On kg	Kilogram unit is shown or selectable on display
Off kg	Kilogram unit is not shown or selectable on display
On Lb	Pounds unit is shown or selectable on display
Off Lb	Pounds unit is not shown or selectable on display
On oz	Ounces unit is shown or selectable on display
Off oz	Ounces unit is not shown or selectable on display
On PC	Parts counting function is enabled
Off PC	Parts counting function is disabled

Auto off-O	Auto Shut -Off disabled
Auto off-3	Auto Shut -Off after about 3 minutes (battery only)

Pr P	Configuration for interface with PC (computer) or dot matrix printer.
Pr L	Configuration for interface with Eltron label printers. Create a label and save it in the printer's memory under file name "W"

Transmission options, selects when data will be sent out via serial port to computer or printer

PrO d	On demand
PrO S	On stability
PrOC	Continuous

To exit from the OPTION MENU turn the indicator OFF.



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OPERATION

Stand still symbol  will be referred to as **StSt**

Turning the indicator ON Press ON/ZERO key and release it.

All LCD segments should turn ON for a display check followed by setting the weight to zero. Some of the symbols will be illuminated:

Gross weight symbol **G** center of zero symbol **>0<** standstill symbol **StSt**

Now the scale is ready for use.

Setting to Zero To reset the scale to zero press ON/ZERO key and release it.

If the scale is in GROSS (symbol G) mode and within the zero band range the display will be re-zeroed and the center of zero symbol **>0<** light will be on.

Setting Tare

Place your container on the scale, wait for the standstill symbol **StSt** press TARE and release. The display will show zero, the container weight will be stored, the **Net** symbol will appear in the display and the net weight will be displayed in the following operations. The display shows container weight as a negative number after removing the container and the load from the platform. Press TARE key to zero the scale.

Gross/Net Mode

To switch the display from gross (G) to net (Net) mode wait for the standstill symbol **StSt** and press and release the GROSS/NET key. If tare weight has been acquired the net value will be the difference between the gross weight and the tare weight.

Unit Conversion

To switch to another unit wait for the standstill symbol **StSt**, press and release the UNIT key.

Counting Function

In GROSS (G) mode reset the scale to zero by pressing ON/ZERO key.

Press and release UNIT key until counting mode is reached, symbol PC appears in the right side of the display and sampling numbers 10,20,50, 100 will be cycling.

Place sample pieces (10,20,50 or 100) on the scale, press ON/ZERO key when samples = display count then release. The display will show busy (DO NOT remove the samples) wait until the scale returns to counting mode before removing samples. The larger number of samples will give better accuracy.

To see the weight of the items on the scale during counting mode press and release the GROSS/NET key. The display will show the weight and will return to the counting mode. To return to the weighing mode press and release UNIT key.

Backlight

To turn the Backlight ON or OFF press and hold the ON/ZERO key for about 6 seconds.



CALIBRATION

Calibration Weight must be between 1% and 100% of the full-scale capacity.

Turn the scale ON and warm it up for at least ten minutes. Remove both plugs on the left side of the indicator, insert a screwdriver into lower access hole, press and hold the switch inside for about 2-3 seconds until the display shows CAL then release the switch. The displayed number (dead load) must be between 16000 and 24000.

1: If needed adjust the dead load potentiometer via a small flat screwdriver through the upper hole on the left side of the indicator. When the display value is within tolerance, proceed to step 2.

2: Press the ON/ZERO key and release it.

The display will show ZErO (zero calibration), followed by a number with one flashing digit.

3: Place your calibration weight on scale

4: Adjust the displayed value to the calibration weight used for setting span.

ON/ZERO key sets the numeric value of the flashing digit

PRINT key will shift to the next digit, Keep pressing PRINT to circle around if required.

When display value = calibration weight, press and release the TARE key.

The display will show busy, wait until donE appears then the display will automatically return to the weighing mode.

5: Re-install both plugs into the holes on the left side of the indicator.

LINEARITY CALIBRATION

Turn the scale ON and warm it up for at least ten minutes. Remove both plugs on the left side of the indicator, insert a screwdriver into lower access hole, press and hold the switch inside for about 2-3 seconds until the display shows CAL then release the switch. The displayed number (dead load) must be between 16000 and 24000.

A: If needed adjust the dead load potentiometer via a small flat screwdriver through the upper hole on the left side of the indicator. When the display value is within tolerance, proceed to step 2.

B: Press and hold PRINT key until Lin 1 appears on the display and release PRINT.

C: Place a weight equal to 30%-50% of full-scale capacity on the platform, press the TARE key when Lin b appear in the display.

D: Display will show Lin 2, double the load on the platform, press the TARE key when Lin b appear in the display. Wait until display will show the Dead Load Number again.

Go to Calibration procedure 1 above OR press and release TARE key to return to the weighing mode.

ZERO ADJUSTMENT

Zero adjustment has been done at the factory .If the adjustment has been disturbed due to handling or shipping, remove the upper plastic plug on the left side of the indicator.

If EEE displayed, turn off indicator, adjust potentiometer counterclockwise 1-2 turns.

If 88888 displayed, turn off indicator, adjust potentiometer clockwise 1-2 turns.

Turn the indicator ON, if zero appears in the display verify SET-UP and do a calibration.

If EEE or 88888 appear repeat above steps.



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PRINTING

Option Menu shows available configurations and transmission options for serial communication. The MSI is equipped with a bi-directional serial RS-232 compatible interface for communication.

To send data via serial port wait for standstill symbol **StSt** and then press the PRINT key. Connection is made using 9 pin DB-9 connector:

Pin 1 –CD	Pin 2 -TXD	Pin 3 –RXD	Pin 4 -N/ A	Pin 5 –Ground
pin 6 –DSR	Pin7-RQS	Pin8-CTS	Pin 9- N/A	
Baud Rate: 9600	Start Bit: 1	Data Bits: 8	Stop Bit: 1	Parity: None

A suitable cable is available from Industrial Weighing Systems as an accessory.

RS-232. Commands

Only the characters shown here (ASCII format) are acceptable by the MSI -1 indicator.

Z same as pressing ZERO key

U same as pressing UNITS key

T same as pressing TARE key

G same as pressing GROSS/NET key

P same as pressing PRINT key

Commands sent to the indicator from PC must be terminated by CR/CRLF.

Serial Data Format

<sp> = space

<STX>

Start

<POL>

Polarity <sp> = positive

<-> = negative

<WEIGHT>

Weight data

<UNIT>

Lbs, Kgs, OZ, PC

<STAT>

<sp> = stable <#> = motion

<CR>

carriage return

<LF>

Line feed

Data sent from MSI is always terminated by CR/LF

ERROR MESSAGES

LobAt low battery indication, recharge the battery or check the power supply.

EEE Applied load exceeds unit's capacity .

Remove the excessive load or Zero Adjustment might be needed

88888 Load cells are not connected.

Connect load cells to the indicator or Zero Adjustment might be needed.

----- The scale has been underloaded.

Dead load is less than it should be or Zero Adjustment might be needed.

Err 1 The setup resolution is too high. Check the capacity and the output of the Load cell. Err 2

Go to setup, using SETUP MENU CHART on page 2.

Err 3 Calibration weight is less than 1% of full capacity

TROUBLE SHOOTING

Symptom: The indicator cannot be turned on

Cause: Battery is drained or power cord is not properly connected

Remedy: Charge the battery fully or check the power supply connections

Symptom: Stability indicator erratic

Cause: Disturbances exceed the stability criteria

Remedy: Verify the source of interference, which affect the scale and remove it.

Symptom: RS-232 not working Cause: Cable connection

Remedy: Check cable connection

For other symptoms, causes or remedies consult with your local dealer.



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SERVICE INFORMATION

For service assistance Ph: 613-786-0016 Cell: 613-921-0397 or E-mail info@iwsystems.ca

For warranty service please send product, copy of your invoice and description of defect to:
Industrial Weighing Systems
9 Richmond St. Picton, ON Canada K0K 2T0

SPECIFICATIONS

Display Digits 5-1/2 Digit LCD, 1" /25.4mm digits
Weighing Units Kg (kilograms), Lb (pounds), oz (ounces)
Internal Resolution Up to 130,000 counts
Display Resolution Up to 20,000 counts,
Selectable Display Division 1,2,5,10,20 or 50,
Selectable Decimal Point 0 to 4 places,
Load Cell Excitation 5 VDC, 4 x 350 ohm Load Cells
Analog Input Range from 0.5 mV/V to 3.0 mV/V
Analog Sensitivity 0.5uV/grad min., 1uV/grad recommended
Conversion Rate 20/sec, nominal
Calibration Push-button Software
Overload Limit 102% of selected Display Resolution Tare Range To Capacity by Subtraction
Key Functions ON/ZERO, OFF, UNITS, TARE, GROSS/NET, PRINT
Operating Temperature -10° to +40°C (14° to 104°F)
Power AC/DC Adapter 12VDC, 300mA or Ni-Cad Rechargeable Battery Pack
Dimensions 8.6"x 5"x 2.9"
Weight Approx.4.4lb/2kg

The specification may be changed without prior notice.

LIMITED WARRANTY

The indicator is warranted to the original retail purchaser for a period of one year from the date of invoice against defects in materials and/or workmanship. During the warranty period we will repair or, at our option, replace free of charge the defective product, when used under normal conditions.

The product has to be returned to us, freight and insurance prepaid and securely packaged. Adjustment of any internal components by other than a factory authorized technician, or damage caused through negligence, abuse, accident, misuse, unreasonable use, improper service, force, foreign material inside of the product, exposure to corrosive materials or other causes not arising out of defects in material or workmanship voids warranty coverage. The manufacturer shall be the sole judge of all alleged non-conformities.

Except as provided above, no other express or implied warranty is given by the manufacturer.

Manufacturers role and exclusive liability is limited to repair or replacement of such products. The manufacturer shall not be liable for any loss, inconvenience, or damage, including without limitation direct, indirect, special, incidental or consequential damages, resulting from use or inability to use a product, any breach of warranty or any act of omission of the manufacturer, its officers or agents.
As warranty legislation varies from state to state and country to country, please refer to your local dealer for details.