**Minebea intec**
*The true measure*

# MODEL MP30 - 1/8 DIN DIGITAL WEIGHT INDICATOR

- BACKLIGHTED WEIGHT UNITS INDICATOR
- PROGRAMMABLE AUTO-ZERO TRACKING
- TARE AND ZERO FUNCTIONS
- MAX AND MIN READING MEMORY
- PROGRAMMABLE INPUT AND OUTPUT RESPONSE TIMES
- INTEGRATOR/TOTALIZER
- THREE PROGRAMMABLE DIGITAL CONTROL INPUTS
- FOUR SETPOINT ALARM OUTPUTS (W/Plug-in card)
- COMMUNICATION AND BUS CAPABILITIES (W/Plug-in card)
- ANALOG OUTPUT SIGNAL (W/Plug-in card)
- PC SOFTWARE AVAILABLE FOR INDICATOR CONFIGURATION
- NEMA 4X/IP65 SEALED FRONT BEZEL
- UNIVERSAL AC OR 24 V SUPPLY OPTION

- DIRECT INTERFACE TO LOAD CELLS (4 X 350 OHM)
- FAST 20 READINGS/SEC UPDATE RATE
- DUAL RANGE INPUT: ±24 mV OR ±240 mV
- SELECTABLE 5 VDC OR 10 VDC BRIDGE EXCITATION

CE

## GENERAL DESCRIPTION

The MP30 is a high accuracy yet compact digital indicator suitable for simple weighing and control applications. The 5 digit readout employs advanced technology for stable, drift free readout while incorporating features that provide application flexibility now and in the future with field plug-in option cards. Option cards enhance the indicator functions, affording Alarm outputs, Linear DC signal output and two-way Serial Communications.

The weight Indicator has two bipolar input ranges: ±24 mV and ±240 mV. The built-in bridge excitation is of low-drift design and is selectable for 5 VDC or 10 VDC output. The indicator can drive 4, 350 ohm load cells. Calibrating the indicator is easy due to the choice of scaling procedures: Either 1) Apply calibration weights to the weighing system or 2) Directly key-in data based upon known load cell calibration data.

The indicator has a simple five button keypad. The key functions are: Weight display select, Parameter Access, Tare In/Out, Acquire Zero, and Print Ticket. Additionally, three of these keys can be programmed for different functionality.

The indicator provides readout selections of Brutto/Gross Weight, the Net weight and the Tare Weight. The Tare Weight can be acquired automatically by a single key-press or via a keypad direct entry.

The indicator also has a means of recording the Max and Min reading, as well as having a Totalizer feature. The totalizer provides either a free running accumulation of total mass flow; or keeps account of total batch weight when adding individual ingredients.

The indicator has four setpoint outputs, implemented on Plug-in cards. The Plug-in cards provide dual FORM-C relays (5 A), quad FORM-A relays (3 A) or either sinking or sourcing quad open collector logic outputs. The setpoint alarms can be configured in modes to suit a variety of control and alarm requirements.
- High and low absolute, high and low deviation and band acting
- Balanced or unbalanced hysteresis
- On and off delay timers

- Auto reset or latching modes
- Reverse phase output and/or panel indicator
- Selection of alternate list of setpoint values
- Tracks gross or net weight

Plug-in cards also facilitate bus communications. These include RS232, RS485 and DeviceNet. Readout values and setpoint alarm values can be controlled through the bus. Additionally, the indicator has features that allow a remote computer to directly control the outputs of the indicator. This is useful during commissioning phases and diagnostic use. With a communication card installed, set-up software allows configuration from a PC. The configuration data can be saved to a file for later recall.

A linear DC output signal is available as a Plug-in card. The card provides either 20 mA or 10 V signals. The output can be scaled independent of the input range. The output can be used as a control or signal retransmission.

The features of the linear output card are:
- Output tracks either gross or net weight
- Programmable output update times

Once the indicator has been initially configured, the parameter list may be locked out from further modification in its entirety or only the setpoint values can be made accessible.

The indicator has been specifically designed for harsh industrial environments. With NEMA 4X/IP65 sealed bezel and extensive testing of noise effects to CE requirements, the indicator provides a tough and reliable local readout.

⚠ **CAUTION: Read complete instructions prior to installation and operation of the unit.**

⚡ **CAUTION: Risk of electric shock.**

## DIMENSIONS  In inches (mm)

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.4) H x 5.0" (127) W.

1.95 (49.5)

3.80 (96.5)

.10 (2.5)

4.10 (104.1)

1.75 (44.5)

3.60 (91.4)

1.75 (44.5)
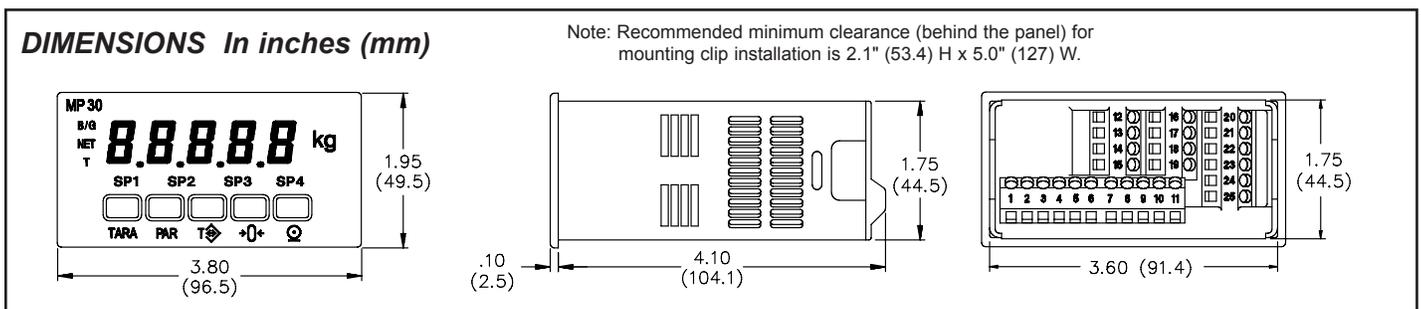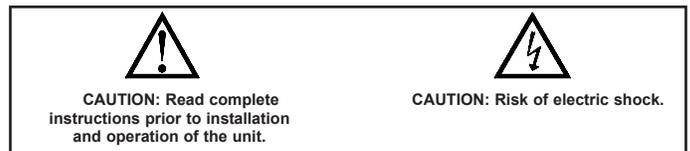
## SPECIFICATIONS

1. **DISPLAY**: 5 digit, 0.56" (14.2 mm) red sunlight readable LEDs, (-19999 to 99999)
2. **POWER**:
   115/230 V Version (MP30/00)
     AC Power: 85 to 250 VAC, 50/60 Hz, 15 VA
     Isolation: 2300 Vrms for 1 min. to all inputs and outputs.
       Working Voltage: 300 V.
   24 V Version (MP30/01)
     DC Power: 11 to 36 VDC, 11 W (derate operating temperature to 40°C if operating <15 VDC and all three plug-in cards are installed)
     AC Power: 24 VAC, ±10%, 50/60 Hz, 15 VA
     Isolation: 500 Vrms for 1 min. to all inputs and outputs.
       Working Voltage: 50 V.
3. **ANNUNCIATORS**:
   **B/G** - Brutto/gross weight display
   **NET** - Net weight display
    **T** - Tare weight display
   **SP1** - setpoint alarm 1 is active
   **SP2** - setpoint alarm 2 is active
   **SP3** - setpoint alarm 3 is active
   **SP4** - setpoint alarm 4 is active
   **Units Label** - software controlled weight units label backlight
4. **KEYPAD**: 5 keys
5. **A/D CONVERTER**: 16 bit resolution
6. **UPDATE RATES**:
   A/D conversion rate: 20/readings sec
   Step response: 200 msec. max. to within 99% of final readout value (digital filter and internal zero correction disabled)**
     700 msec. max. (digital filter disabled, internal zero correction enabled)**
   Display update rate: 1 to 20 updates/sec
   Setpoint output on/off delay time: 0.0 to 3275.0 sec
   Analog output update rate: 0.0 to 10.0 sec
   Max./Min. capture delay time: 0.0 to 3275.0 sec
7. **DISPLAY MESSAGES**:
   "OLOL" - Appears when measurement exceeds + signal range.
   "ULUL" - Appears when measurement exceeds - signal range
   ". . . ." - Appears when display values exceed + display range.
   "- . . ." - Appears when display values exceed - display range.
8. **CONNECTION TYPE**: 4 or 6 wire bridge
9. **COMMON MODE RANGE (**w.r.t. input common): 0 to +5 VDC
   Rejection: 80 db (DC to 120 Hz)
10. **SENSOR INPUTS**:

| Input Range | Accuracy* (18 to 28C) | Accuracy* (0 to 50C) | Impedance | Max Continuous Overload | Resolution |
|---|---|---|---|---|---|
| ±24 mVDC | 0.02% of reading +3 μV | 0.07% of reading +4 μV | 100 Mohm | 16 V | 1 μV |
| ±240 mVDC | 0.02% of reading +30 μV | 0.07% of reading +40 μV | 100 Mohm | 16 V | 10 μV |

   * After 20 minute warm-up. Accuracy is specified in two ways: Accuracy over an 18 to 28°C and 10 to 75% RH environment; and accuracy over a 0 to 50°C and 0 to 85%RH (non-condensing environment). Accuracy over the 0 to 50°C range includes the temperature coefficient effect of the indicator.

   ** The indicator periodically (every 12 seconds) imposes a 500 msec delay to compensate for internal zero drift. If the delay affects applications where step response is critical, it can be defeated. Set the display update to 20/sec to disable. In this case, add a zero error of 0.2% FS to the 24 mV input range over the 0 to 50°C span.

11. **BRIDGE EXCITATION** :
    Jumper Selectable: 5 VDC @ 65 mA max., ±2%
                     10 VDC @ 125 mA max., ±2%
    Temperature coefficient (ratio metric): 20 ppm/°C max.
12. **LOW FREQUENCY NOISE REJECTION**:
    Normal Mode: > 60 dB @ 50 or 60 Hz ±1%, digital filter off
    Common Mode: >100 dB, DC to 120 Hz (w.r.t. earth)
13. **USER INPUTS (Logic Level)**: Three software defined user inputs, jumper selectable for sink/source logic

| INPUT STATE | SINKING INPUTS 22 KΩ pull-up to +5 V | SOURCING INPUTS 22 KΩ pull-down |
|---|---|---|
| Active | $V_{IN}$ < 0.9 VDC | $V_{IN}$ > 3.6 VDC |
| Inactive | $V_{IN}$ > 3.6 VDC | $V_{IN}$ < 0.9 VDC |

  Max. Continuous Input: 30 VDC
  Isolation To Sensor Input Common: Not isolated
  User Inputs are isolated from all option card terminals.
14. **TOTALIZER**:
    Time Base: second, minute, hour, or day
    Time Accuracy: 0.01% typical
    Decimal Point: 0 to 0.0000

Scale Factor: 0.001 to 65.000
Low Signal Cut-out: -19,999 to 99,999
Total: 9 digits, display alternates between high order and low order readouts
15. **CUSTOM LINEARIZATION**:
    Data Point Pairs: Selectable from 2 to 12
    Display Range: -19,999 to 99,999
    Decimal Point: 0 to 0.0000
16. **SERIAL COMMUNICATIONS**: (RS232 or RS485)
    Isolation To Sensor & User Input Commons: 500 Vrms for 1 min.
      Working Voltage: 50 V.   Not Isolated from all other commons.
    Data: 7/8 bits
    Baud: 300 to 19200
    Parity: no, odd or even
    Bus Address: selectable 0 to 99, Max. 32 meters per line (RS485)
    Transmit Delay: Selectable for 2 to 50 msec or 50 to 100 msec (RS485)
17. **ANALOG OUTPUT** :
    Types: 0 to 20 mA, 4 to 20 mA or 0 to 10 VDC
    Isolation To Sensor & User Input Commons: 500 Vrms for 1 min.
      Working Voltage: 50 V.   Not Isolated from all other commons.
    Accuracy: 0.17% of FS (18 to 28°C); 0.4% of FS (0 to 50°C)
    Resolution: 1/3500
    Compliance: 10 VDC: 10 KΩ load min.
                20 mA: 500 Ω load max.
18. **SETPOINT OUTPUT**: Two types of field installable cards
    **Dual Relay Card**:
      Type: Two FORM-C relays
      Isolation To Sensor & User Input Commons: 2000 Vrms for 1 min.
      Contact Rating:
        One Relay Energized: 5 amps @ 120/240 VAC or 28 VDC (resistive load), 1/8 HP @120 VAC, inductive load
        Total current with both relays energized not to exceed 5 amps
      Life expectancy: 100K cycles min. at full load rating. External RC snubber extends relay life for operation with inductive loads
    **Quad Relay Card**:
      Type: Four FORM-A relays
      Isolation To Sensor & User Input Commons: 2300 Vrms for 1 min.
      Contact Rating:
        One Relay Energized: 3 amps @ 250 VAC or 30 VDC (resistive load), 1/10 HP @120 VAC, inductive load
        Total current with all four relays energized not to exceed 4 amps
      Life Expectancy: 100K cycles min. at full load rating. External RC snubber extends relay life for operation with inductive loads
19. **ENVIRONMENTAL CONDITIONS**:
    Operating Temperature Range: 0 to 50°C (0 to 45°C with all three plug-in cards installed)
    Storage Temperature Range: -40 to 60°C
    Operating and Storage Humidity: 0 to 85% max. non-condensing
    Altitude: Up to 2000 meters
20. **CERTIFICATIONS AND COMPLIANCES**:
    **ELECTROMAGNETIC COMPATIBILITY**
    **Immunity to EN 50082-2**

| | | |
|---|---|---|
| Electrostatic discharge | EN 61000-4-2 | Level 3; 8 Kv air |
| Electromagnetic RF fields | EN 61000-4-3 | Level 3; 10 V/m [1] 80 MHz - 1 GHz |
| Fast transients (burst) | EN 61000-4-4 | Level 4; 2 Kv I/O Level 3; 2 Kv power |
| RF conducted interference | EN 61000-4-6 | Level 3; 10 V/rms 150 KHz - 80 MHz |
| Simulation of cordless telephones | ENV 50204 | Level 3; 10 V/m 900 MHz ± 5 MHz 200 Hz, 50% duty cycle |

**Emissions to EN 50081-2**

| | | |
|---|---|---|
| RF interference | EN 55011 | Enclosure class A Power mains class A |

*Notes:*
*1. Self-recoverable loss of performance during EMI disturbance at 10 V/m: Measurement error exceeds unit specifications*
*For operation without loss of performance:*
*Mount unit in a metal enclosure (Buckeye SM7013-0 or equivalent)*
*Route power and I/O cables in metal conduit connected to earth ground.*

21. **CONNECTIONS**: High compression cage-clamp terminal block
    **Wire Strip Length:** 0.35" (9 mm)
    **Wire Gauge Capacity**: One 14 AWG solid or Two 18 AWG
22. **CONSTRUCTION**:This unit is rated for NEMA 4X/IP65 indoor use. IP20 Touch safe. Installation Category II, Pollution Degree 2. One piece bezel/case. Flame resistant. Synthetic rubber keypad. Panel gasket and mounting clip included.
23. **WEIGHT**: 10.4 oz. (295 g)

### Safety Summary

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use this unit to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the unit.

## FRONT PANEL
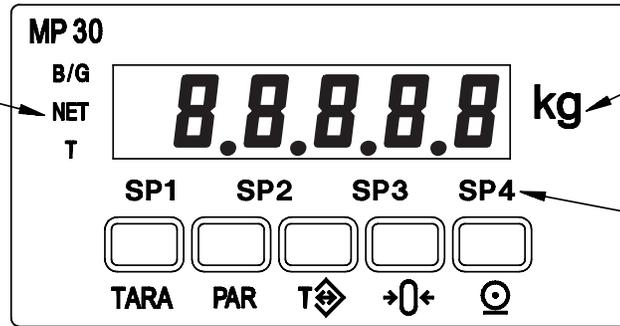


## KEY FUNCTIONS

### TARA KEY FUNCTION

The TARA key selects among the Gross, Net and Tare weight displays. Corresponding panel enunciators illuminate to indicate the selected display. If Tare weight = 0, the indicator prevents selection of Gross and Net weight displays. Within the program menu, this key quits programming and returns to display mode.

### PAR KEY FUNCTION

The PAR key allows access to the configuration parameters. The function of this key can be locked.

Within the program menu, this key stores the active parameter and indexes to the next.

During Digital Tare, this key stores the tare weight value keyed in.

### T⬦ KEY

The T⬦ (Tare In/Tare Out) key both acquires and clears the Tare weight value. The function of this key can be changed by setting the F1 function parameter. For data entry, this key is also used to increment a parameter value.

### →0← KEY

The →0← key (Zero) re-zeros the Basic and Gross readout displays. The function of this key can be changed by setting the F2 function parameter. For data entry, this key is also used to decrement a parameter value.

### ☉ Key

The ☉ key (Print) causes a Print Ticket output. Prints occur regardless of scale motion. The function of this key can be changed by setting the RST function parameter. For data entry, this key is also used to scroll a parameter value by x1000 factor when held with the Tare and Zero keys.

## DISPLAYS

### BASIC WEIGHT DISPLAY

The Basic Weight Display provides a direct indicator readout. The display occurs when the Tare Weight =0.

### BRUTTO/GROSS WEIGHT DISPLAY

This Display indicates the Brutto/Gross weight. It is only possible to select this display mode when Tare > 0, otherwise it is locked out by the indicator. "B/G" illuminates for this display mode.

### NET WEIGHT DISPLAY

This Display indicates the Net weight. It is only possible to select this display mode when Tare > 0, otherwise it is locked out by the indicator. If after the Tare Weight is set > 0, the Net Display is selected by the indicator. "NET" illuminates for this display mode.

### TARE WEIGHT DISPLAY

This Display indicates the Tare weight. When this display is selected, it is possible to directly key-in the Tare Weight value. "T" illuminates for this display mode. It flashes during tare weight key-in entry.

## JUMPER LINK FUNCTIONS

The indicator has three jumper links that must be set prior to operation. These are:

- **Input Range Select**
  Select either ± 24 mVDC or ± 240 mVDC range. Select an input range high enough to avoid input signal overload. Program the input range to match jumper selection.
- **Bridge Excitation Select**
  Select either 5 VDC or 10 VDC bridge excitation.
- **User Input Source or Sink Select**

## BASIC CONNECTIONS



MP30/00: 85-250 VAC
MP30/01: 24 V AC/DC

6-Wire Bridge Input With User Input Sourcing Logic Connection

* For 6-wire load cell connections, the +SEN and -SEN leads may be tied in parallel with the +EXC and -EXC respectively, or the sense leads may be left unconnected.



MP30/00: 85-250 VAC
MP30/01: 24 V AC/DC

4-Wire Bridge Input With User Input Sinking Logic Connection
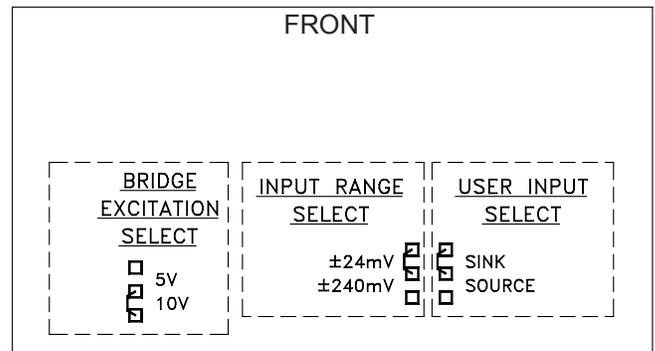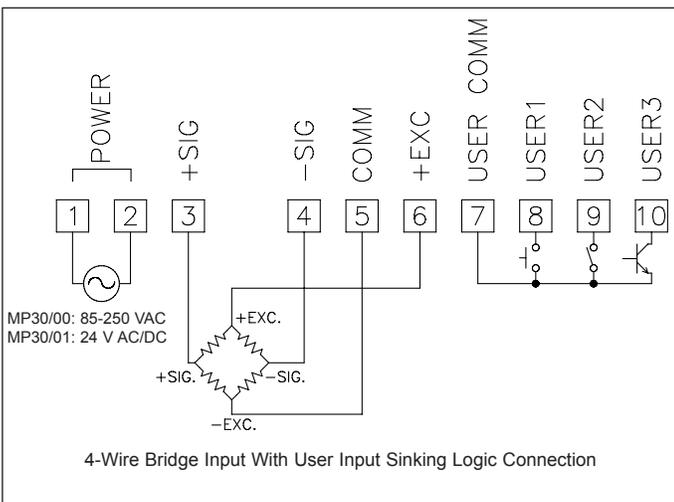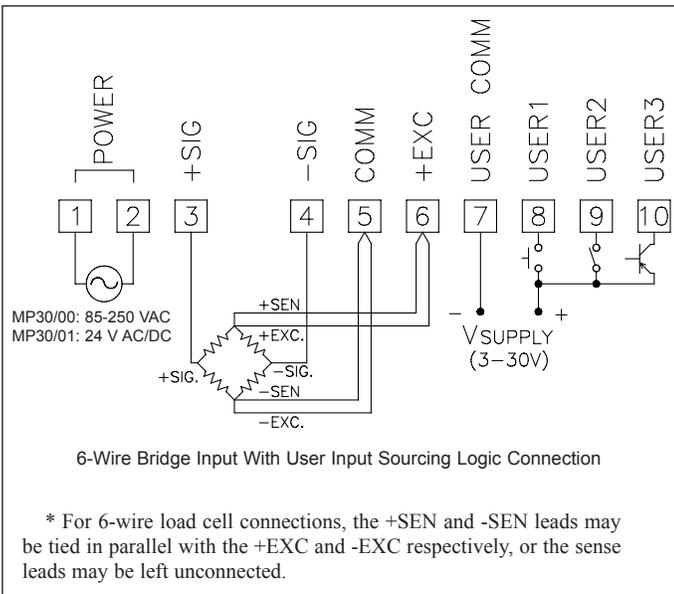
Sensor Input Common is NOT isolated from User Input Common.

### WEIGHT UNITS OVERLAY

The indicator has a backlighted units indicator that can be customized to the application. The backlight is turned on by programming the "b-L It" parameter. Overlays are supplied with the indicator. To install an overlay, remove the unit from the case. Select the label and apply it to the label frame, noting that the label must be aligned accurately. Install the label frame to the display board in the alignment holes located on the right side of the display.

### PLUG-IN CARDS

The MP30 indicator has provisions for inclusion of three plug-in option cards. Connection data is provided with each card. These cards are:
   Setpoint Outputs
   Analog Outputs
   Communication Option
The plug-in cards can be used in any combination, however, it is only possible to use one type of card from each category. Cards can be installed initially, or at a later date as system needs arise.
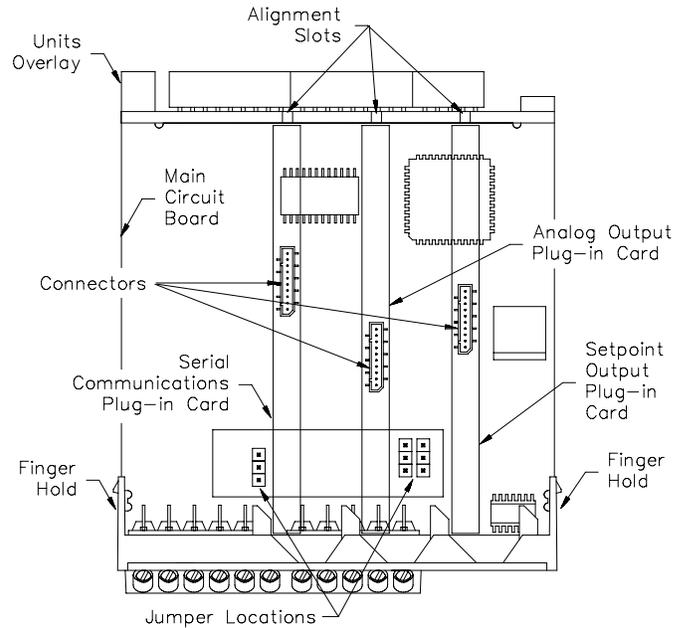


WARNING: Disconnect power to the unit before installing plug-in cards. To install a card, depress the side latches at the finger holds and remove the unit from the rear of the case. Insert the card into the appropriate slot and re-install the unit.

### INPUTS

The indicator has two input ranges: ±24 mV DC or ±240 mV DC. Set the internal jumper link to select the desired range. Select the matching range in programming. Select a range that is high enough to accomodate the bridge output to avoid overload. To allow use of the higher sensitivity 24 mV input range, use 5 V excitation with high output (3 mV/V) bridges. 5 V excitation also reduces bridge power compared to 10 V excitation.

A maximum of four 350 ohm load cells can be driven by the internal bridge excitation voltage.

### DEADLOAD COMPENSATION

In some cases, the combined deadload and liveload output may exceed the range of the 24 mV input. To use this range, the output of the bridge can be offset a small amount by applying a fixed resistor across one arm of the bridge. This shifts the electrical output of the bridge to within the operating range of the indicator. A 100 K fixed resistor shifts the bridge output approximately -10 mV (350 ohm bridge, 10 V excitation).

Apply the resistor across +SIG to signal common. Use a metal film resistor with a low temperature coefficient of resistance.

### SCALING

The indicator has been factory calibrated on both ranges as a basic millivoltmeter. The basic indicator readout can then be post-scaled to read out in weight units. The indicator provides two ways in which to scale the display:

Key-in: Key in the input and display scaling points using known data.
Apply: Apply the actual input value and key in the corresponding display value. The indicator records the input value applied.

For processes that require linearity compensation, up to 12 scaling points can be used for correction. The indicator interprets the last d5Pn parameter as the full scale capacity of the system. This determines the number of leading zeros for display. The scaling range is extended up to five digits of resolution with selectable scale division units. 6-digit readouts are afforded by installing a dummy zero unit label.

### READ RATE

The display readout, max/min reading, setpoint outputs and analog update have independent update rates. The fastest update rate (20 readings/sec) ensures detection of fast events (such as burst testing, pressure, and peak weight, etc.)

## AUTOMATIC ZERO TRACKING

The indicator can be programmed to automatically compensate for zero drift. Drift may be caused by changes in the transducers or electronics, or accumulation of material on weight systems.

Auto-zero tracking operates whenever the readout remains within the tracking band for a period of time equal to the tracking delay time. When these conditions are met, the indicator re-zeroes the readout. After the re-zero operation, the indicator resets and continues to auto-zero track.

The auto-zero tracking band should be set large enough to track normal zero drift, but small enough to not interfere with small process inputs.

For filling operations, the fill rate must exceed the auto-zero tracking rate. This avoids false tracking at the start of the filling operation.

$$\text{Fill Rate} \geq \frac{\text{tracking band}}{\text{tracking time}}$$

Auto-zero tracking is disabled by setting the tracking band parameter = 0.

*Note: The Automatic Zero operation is blocked when the total accumulated zero exceeds the value of the Zero Acquisition Range.*

*Note: The indicator does not have motion detection. Mechanical vibrations coupled to the scale from other machinery may result in false Auto-Zero operations.*

## DIGITAL FILTER

A unique adaptive input filter is used. Whenever the difference between one reading and the next is less than the filter band value, the input is filtered. When the difference exceeds the filter band value, the input is not filtered. This avoids the usual compromise between using a relative high time constant for good noise rejection and using a low time constant filter for quick step response.

## FUNCTION KEYS

The Tare, Zero, and Print keys, in lieu of the standard function, can be programmed for different functions, or no function at all. Additionally, the Tare and Zero keys have second functions. The second function is activated after the primary function if the key is held for 3 seconds.

## MAX AND MIN READING DETECTION *

The indicator records the maximum (max) and minimum (min) process inputs. Conditions such as valve activation, sudden change in material flow rate, etc., can result in false peaks which are not reflective of the true maximum and minimum of the process. In this case, Max and Min capture delay times can be used to prevent the detection of false maximums and minimums.

## TOTALIZER (integrator) *

The totalizer can be used to integrate a time-input product (such as flow). The totalizer accumulates input readings according to the following relation:

$$\text{Total}(n) = \text{Total}(n-1) + [\text{Input}(n) * (\text{scale factor/time base})]$$

    n = nth sample instant (seconds)
    input = input reading (ignore decimal point position)
    scale factor = 0.001 to 65.000
    time base: sec = 1
            min = 60
            hour = 3600
            day = 86,400

When the total exceeds 5 digits, the front panel annunciator "T" flashes. In this case, the indicator continues to totalize up to a 9 digit value. The high order 4 digits and the low order 5 digits of the total are displayed alternately. The letter "**h**" denotes the high order display.

The total decimal point position is independent of the input. A low cut value disables totalization below a set input value. Alarms can be programmed to activate when a set total is reached.

Alternately, the totalizer can also be used to accumulate batch weighing operations. Each time the batch function is executed, the weight is added to the total and then zeroed.

## PARAMETER LOCK MODE

A user input can be used to lock the parameter list. When the user input is active, the indicator is in the protected parameter mode, where it is only possible to access the setpoint values and the security code.

It is possible to lock the parameter list without using a user input as a program lock function. In this case, set the security code to a non-zero value. With a non-zero security value set, press the PAR key to view the programmed setpoint values. The security code requires a matching "key" value to gain access to the full parameter list.

## BASIC OPERATION

### TARE WEIGHT REGISTER

The indicator has a single Tare Weight register. There are two modes in which Tare data is acquired: Pushbutton Tare and Digital Tare.

### PUSHBUTTON TARE

Pushbutton Tare is activated by a single key press of the Tare In/Tare Out Key.

#### Acquire Tare (Tare In):
Tare weight must be cleared, and Basic Weight Displayed.
Place Tare weight on scale.
Allow readout to stabilize.
Press T⬧ key.
Indicator acquires the Tare weight with these actions:
If new Tare weight value >0, indicator displays "**tArE**" and selects Net Weight display.
If new Tare weight < or = 0, indicator rejects Tare weight and displays "**notAr**".

#### Clear tare (Tare Out):
Select Gross or Net Weight display.
Tare weight can be either on or off scale.
Press T⬧ to clear Tare weight
Indicator selects Basic Weight display.

### DIGITAL TARE

Digital Tare allows a direct entry of the Tare Weight.

#### Enter Digital Tare:
Select the Tare Weight display.
Enter the Tare Weight using the Tare, Zero and Print keys. In this mode, they take on data entry functions. Use the Tare key as an increment key and the Zero key as a decrement key.
The "T" annunciator flashes to indicate Tare Weight entry.
Press the PAR key to register the Tare weight value. The indicator selects either Net Weight display (new Tare Weight >0) or Basic weight display (new Tare weight = 0).
Press the TARA key to abort the Tare entry mode.

### PUSHBUTTON ZERO

Pushbutton Zero is activated by a single key press of the Zero Key.

#### To Zero:
Select Basic or Gross Weight display.
Allow readout to stabilize
Press ⭢0⭠ Key to re-zero the Gross Weight. Meter displays "**rESEt**".
*Note: This operation is blocked when the total accumulated zero exceeds the value of the Zero Acquisition Range.*

### PRINT TICKET

A ticket print is activated by a single key press of the Print Key.

#### To Print:
Place weight on scale and allow readout to stabilize.
Press ☺ key.
(Print format is programmable in Module **7-5rt**.)

## AUTOMATIC AND MANUAL ZERO ACQUISITION

There are two means by which the indicator keeps an accurate zero: Automatic and Manual. The indicator saves the new zero state in an identical way in which the Tare Weight is saved. See Tare Weight Entry for details of operation.

### AUTOMATIC ZERO ACQUISITION

In Automatic mode, the indicator automatically re-zeros when the Gross weight falls within a specified amount of scale divisions of zero (given by the Autozero track band parameter) and remains within this band for a specified amount of time (given by the Autozero track time). The indicator continues to track zero in this fashion until the total accumulated zero offset exceeds the Zero Acquisition Range. When exceeded, Autozero tracking is disabled.

*Note: The indicator does not incorporate a means to detect stability. As a result, scale vibration about zero may cause a false Auto-Zero operation.*

**MANUAL ZERO ACQUISITION**

In Manual Zero operation, the Gross weight is zeroed each time the function is executed. The function is activated by a key press or user input transition. If the total accumulated zero offset exceeds the Zero Acquisition Range, the function is disabled. In this case, the indicator must be re-calibrated to the load sensing device, in order to reset the true system zero and hence the accumulated zero offset. The accumulated zero offset itself is reset whenever any of the input scaling parameters are altered.

The indicator displays a brief message $r E5 E t$ whenever a zero operation occurs. The indicator displays $n0$ whenever the total accumulated zero exceeds the value of the Zero Acquisition parameter. In this case, the zero operation is blocked.

## *"B-GNT" Operating Mode*

In the "$b$-$G n t$" operating mode, the Basic, Gross, Net and Tare Weight can be displayed and controlled. In this mode, indicator functions that pertain to Max and Min reading memory and the Totalizer are disabled. This is the default mode.

## *"HILOT" Operating Mode*

In the "$H I L 0 t$" operating mode, the Max, Min and Totalizer indicator functions can be displayed and controlled. In this mode, the Gross, Net and Tare weight displays and control are disabled (Basic display only.). The table lists the correspondence of the display annunciators in this mode.

| Annunciator | Readout |
|---|---|
| B/G | Max reading |
| NET | Min Reading |
| T | Totalizer/Integrator |

**\*** *Only functional in "HILOT" operating mode.*

## SETPOINT ALARMS

The indicator has two setpoint alarm Plug-in cards. Only one of these cards can be installed at a time. These are:

Dual relay, FORM-C

Quad relay, FORM-A

The setpoint alarms can be independently configured for a variety of operating modes. It is also possible to set the alarms to trigger from the totalizer value. Each setpoint alarm can be programmed to trigger from the Brutto/Gross weight or the Net weight. The setpoint alarm figures illustrate the operating modes:

**Setpoint Alarm Values**

When setpoint alarm is programmed as deviation or band acting, the effective trigger point is offset by SP1. In these modes, SP1 acts as a master setpoint, that the other setpoints track.

An alternate list of setpoint values can be stored and recalled as needed. Select the alternate list with a function key or user input and program the setpoint values. This allows for quick changeover for a new process condition.

**Setpoint Alarm Hysteresis and On/Off Time Delay**

Depending on the application, hysteresis or On/Off time delays can be used. When the setpoint is a control output, hysteresis is usually used to control the cycle period. Optionally, time delay can also be employed to ensure minimum On/Off times. This is useful to limit the cycling of mechanical control equipment.

On/Off time delays are effective when the setpoint is used as an alarm output. The time delays can be used to prevent false triggering during process transient events, while hysteresis eliminates output chatter at the switch point.

The hysteresis value can be selected to act in the balanced mode or unbalanced mode. In the balanced mode, the hysteresis action is centered about the trigger point, while in the unbalanced mode the hysteresis acts on one side of the trigger point. When the setpoint is a control output, usually balanced hysteresis is used. This tends to center the oscillation around the setpoint value. For alarm applications, usually unbalanced hysteresis is used. This makes the alarm activate precisely at the trigger value.

**Setpoint Alarm Output Phase and Panel Annunciator**

The output phase (logic) of each setpoint can be reversed. While the front panel indicator follows the output state, it can be programmed to reverse as well; or flash for added emphasis.

| OUTPUT | ON CONDITION |
|---|---|
| RELAY | Energized |

**Setpoint Alarm Reset Modes, Standby Operation**

Each setpoint alarm can be programmed for auto or latching reset modes. Standby operation can be used to prevent the triggering of a low alarm until the process first exceeds the alarm value. This suppresses false alarms during system start-up.

# PROGRAMMING MENU

The programming menu of the indicator is accessed by pressing the **PAR** key. The menu is organized into modules, which group together parameters which are related in function. Use the arrow keys to select the module, then press **PAR** to enter the module. The **PAR** key stores the selected parameter and simultaneously indexes to the next parameter. *(Note: Since many parameters are dependent on the scale division setting, it is recommended to scale the display first, then set the other parameters.)*

```
DISPLAY
MODE
```

```
Pro
```

| Input Parameters | Function Key Parameters | Program Lock Parameters | Secondary Function Parameters | Totalizer Integrator Parameters | Setpoint Alarm Parameters | Serial Communication Parameters | Analog Output Parameters | Factory Service Operations |
|---|---|---|---|---|---|---|---|---|
| 1-INP | 2-FNC | 3-LOC | 4-SEC | 5-tOt | 6-SPt | 7-Srl | 8-Out | 9-FCS |

---
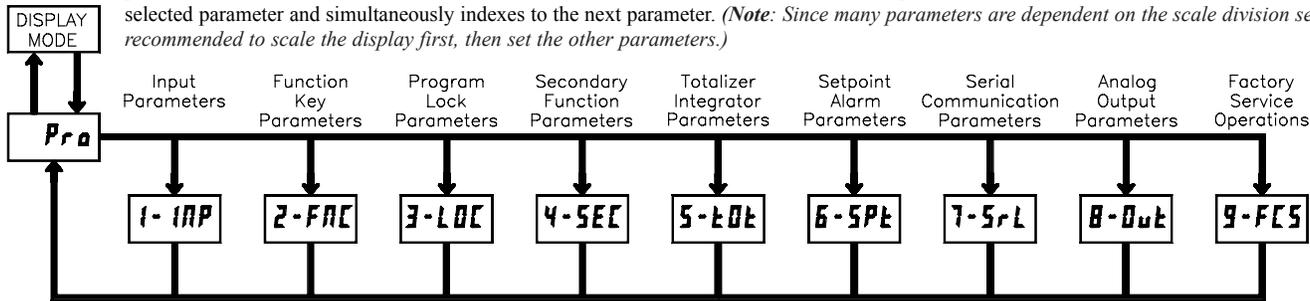
## PARAMETER MODULE 1 - Input Configuration Parameters

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| rRNGE | Input Range | 0.02u - ±24 mV<br>0.2u - ±240 mV | Select the input range Set the input range jumper to match the selection |
| dECPt | Decimal Point Position | 0<br>0.0<br>0.00<br>0.000<br>0.0000 | Select scaled decimal point position |
| round | Scale Divisions | 1 - round by 1<br>2 - round by 2<br>5 - round by 5<br>10 - round by 10<br>20 - round by 20<br>50 - round by 50<br>100 - round by 100 | Select scale divisions |

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| F ILtr | Filter Setting | 0.0 to 25.0 seconds | Sets the digital filter time constant.<br>0 = disabled |
| bRNd | Filter Enable Band | 0 to 250 scale divisions | 0 = filter always on<br>Δ = reading - previous reading<br>filter on : \|Δ\| < band<br>filter off : \|Δ\| > band |
| PtS | Scaling Points | 2 to 12 | Select # of scaling points |
| StYLE | Scaling Style | KEY - key-in data<br>RPLY - apply calibration weights | Select Scaling technique. Procedure resets zero function. |
| INP x | Input Value for Scaling Point x | -19999 to 19999 | Key-in or apply input value for scaling point x. If applied, press PAR to accept signal. Decimal point follows range selected. |
| dSP x | Display Value for Scaling Point x | -19999 to 99999 | Key-in display value for scaling point x. Decimal point follows that assigned. |

---

## PARAMETER MODULE 2 - External Input and Front Panel Function Key Configuration Parameters

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| USr-1<br>USr-2<br>USr-3 | User Input Function | no - no function | User Input #1, #2, and #3 programming. |
| | | PLOC - Lock parameter list | Active = Lock |
| | | rEL - Acquire zero | Active edge = Zero |
| | | ** d-rEL - Select net/gross display | Active = Net |
| | | d-HLd - Hold Display | |
| | | R-HLd - Hold all functions | Active = Hold |
| | | Sync - Synchronize meter readings | Release from active = Synchronize |
| | | * bRt - Store batch readings in totalizer | Active edge = Batch |
| | | * d-tot - Select total display | Active = Total |
| | | * rtot1 - Reset totalizer | Active = Reset |
| | | * rtot2 - Reset and enable totalizer | Active = Enable |
| | | * E-tot - enable totalizer | Active = Enable |
| | | * d-h1 - Select max display | Active = Max |
| | | * r-h1 - Reset, display and enable max reading | Active = Function |
| | | * d-Lo - Select min display | Active = Min |
| | | * r-Lo - Reset, display and enable min reading | Active = Function |
| | | * r-HL - Reset max and min | Active = Reset |
| | | d-LEu - Change display intensity level | Settings = 0, 3, 8, 15 |
| | | L ISt - Select main or alternate setpoint list | Active = Alternate<br>main = Lod-R<br>alternate = Lod-b |
| | | r-1 - Reset setpoint 1 | Maintained Reset |
| | | r-2 - Reset setpoint 2 | Active = Reset |

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| | | r-3 - Reset setpoint 3 | Maintained Reset Active = Reset |
| | | r-4 - Reset setpoint 4 | |
| | | r-34 - Reset setpoint 34 | |
| | | r-234 - Reset setpoint 234 | |
| | | r-RLL - Reset all setpoints | |
| | | Print - Print Request | Maintained Action Active = Print |
| | | ** tArE - Acquire/Clear tare | Active edge = acquire or clear tare |
| F1 | Tare Key | no - No function | Keypad function programming. These keys can be programmed to different functions. Function is executed when key is pressed. Hold key for 3 seconds for second function. |
| F2 | Zero Key | rEL - Acquire zero | |
| rSt | Print Key | d-rEL - No function | |
| Sc-F1 | Second F1 | * bRt - batch totalizer | |
| Sc-F2 | Second F2 | * r-tot - reset totalizer | |
| | | * r-h1 - reset max | |
| | | * r-Lo - reset min | |
| | | * r-HL - reset max and min | |
| | | L ISt - Select main or alternate setpoint list | main = Lod-R<br>alternate = Lod-b |
| | | r-1 - Reset setpoint 1 | Momentary Reset |
| | | r-2 - Reset setpoint 2 | |
| | | r-3 - Reset setpoint 3 | |
| | | r-4 - Reset setpoint 4 | |
| | | r-34 - Reset setpoint 34 | |
| | | r-234 - Reset setpoint 234 | |
| | | r-RLL - Reset all setpoints | |
| | | Print - Print Request | Momentary Action |
| | | ** tArE - Acquire/Clear tare | |

*\* No function in "B-GNT" mode.*
*\*\* No function in "HILOT" mode.*

7

## PARAMETER MODULE 3 - Parameter and Display Lock-out Configuration Parameters

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| b-G | Brutto/Gross Display (B-GNT mode) or Max/Min Display (HILOT mode) | LOC - lockout<br>rEd - display readout | Enables either Gross display or Max/min display depending on the operating mode. |
| tArE | Tare Display (B-GNT mode) or Totalizer Display (HILOT mode) | LOC - lockout<br>rEd - display readout<br>Ent - read and enter value | Enables either Tare display or Totalizer display depending on the operating mode. |
| SP-1 | Setpoint 1 | LOC - lockout | Protected Parameter Mode Options |
| SP-2 | Setpoint 2 | rEd - read only | |
| SP-3 | Setpoint 3 | Ent - read and enter value | |
| SP-4 | Setpoint 4 | | |
| CodE | Security Code | 0 to 250 | Security Code; code ≠ 0 parameters are locked. 222 = universal unlock |

\* - The values entered for these parameters are multiplied by the value entered for Scale Divisions in Module1 to obtain the final values.

## PARAMETER MODULE 4 - Secondary Function Configuration Parameters

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| OPEr | Operating Mode | b-Gnt: Gross, Net, and Tare functions<br>HILOt: Max, Min, and Totalizer functions | B-GNT is the default mode. |
| *HI-t<br>*LO-t | Max Capture Delay Time<br>Min Capture Delay Time | 0.0 to 3275.0 sec | Sets time delay for capturing new max/min values. Helps to avoid false captures. |
| dSP-t | Display Update Rate | 1, 2, 5, 10, 20 updates/second | Affects display rate only. 20/sec disables zero correction (See Specs) |
| 0-rnG | Zero Acquisition Range * | 0 to 4095 scale divisions | Allowable zero range limited to this value. 0 = ¼ scale division 4095 = no limit |
| At-t | Auto-zero Tracking Delay Time | 0 to 250 second | Set delay time long enough to avoid false re-zeros 0 = OFF |
| At-b | Auto-zero Tracking Band * | 1 to 4095 scale divisions | Tracking on: ⎢reading⎢ ≤ band<br>Tracking off: reading = 0 ⎢reading⎢ > band |
| b-LIt | Units Label Backlight | On - Backlight on<br>OFF - Backlight off | Install label |
| dSP-F | Display Format | LEAd0 - Leading zero<br>LEAdb - Leading blank | Sets leading zero or leading blank Display format |

*For "HILOT" operating mode only.*

## PARAMETER MODULE 5 - Totalizer Configuration Parameters

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| dECPt | Totalizer Decimal Point Position | 0<br>0.0<br>0.00<br>0.000<br>0.0000 | Independent of input scaling. |
| tbASE | Totalizer Time Base | SEC<br>_in<br>hour<br>dAY | Set the time base of the totalizer. _in = minutes |

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| SCFAC | Totalizer Scale Factor | 0.000 to 65.000 | |
| Locut | Low Cut Value | -19999 to 99999 | Input < locut disables totalizer |
| P-UP | Power Up Reset | nO - do not reset buffer<br>rSt - reset buffer | Resets totalizer buffer at indicator power-up |

## PARAMETER MODULE 6 - Setpoint Parameters

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| SPSEL | Select Setpoint | | Select setpoint for configuration |
| Act-n | Action for Setpoint | OFF - setpoint is disabled<br>Ab-HI - absolute high, balanced hysteresis<br>Ab-LO - absolute low, balanced hysteresis<br>AU-HI - absolute high, unbalanced hysteresis<br>AU-LO - absolute low, unbalanced hysteresis<br>* dE-HI - deviation high, unbalanced hysteresis<br>* dE-LO - deviation low, unbalanced hysteresis<br>* bAnd - band outside, unbalanced hysteresis<br>** totLo - Lower totalizer absolute high, unbalanced<br>** totHI - Upper totalizer absolute high, unbalanced | Select operating action for setpoint See Figures for operation<br><br>Deviation and Band operation is relative to SP1.<br><br>*Not available for SP1<br><br>** Totalizer has 9 digit capacity. Select to trigger on the upper or lower portion of the number. Only applies to "HILOT" mode. |

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| SP-n | Setpoint Value | -19999 to 99999 | Main or alternate, as selected |
| trG-n | Trigger Source | b-G - Brutto/Gross weight<br>nEt - Net weight | For b-Gnt mode only. |
| HYS-n | Hysteresis | 1 to 65000 | |
| tOn-n<br>tOF-n | On Time Delay<br>Off Time Delay | 0.0 to 3275.0 sec | |
| out-n | Output Logic | nor - Normal<br>rEu - Reversed | |
| rSt-n | Reset Action | AUto - Automatic Reset<br>LAtC1 - Latch w/immediate reset<br>LAtC2 - Latch w/delayed reset | See Reset Mode Figure |
| Stb-n | Standby Operation | nO - Disable standby<br>YES - Enable standby | Power-up standby operation. |
| LIt-n | Output Panel Light | OFF - Always off<br>nor - On when output on<br>rEu - Reverse from nor<br>FLASH - Flashes when output is on | |

## PARAMETER MODULE 7 - Serial Communications Parameters

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| bRUd | Baud Rate | 300<br>600<br>1200<br>2400<br>4800<br>9600<br>19200 | Set baud rate to match other equipment.<br><br>Set to 9600 for PC configuration software. |
| dRER | Number of Data Bits | 7<br>8 | 8 = No parity |
| PRr | Parity Bit | Odd<br>EUEN<br>NO | Possible Combinations:<br>8, N, 1<br>7, O, 1<br>7, E, 1<br>7, N, 2 |
| Rddr | Node Address | 0 to 99 | Unique address for each indicator. Set to 0 for PC configuration software. |
| Rbru | Abbreviated Output | NO - ID characters printed<br>YES - ID characters suppressed | Select full or abbreviated transmission |

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| UN IE | Line Print Units Suffix | NO - None<br>G - Grams<br>KG - Kilograms<br>Ib - Pounds<br>oz - Ounces<br>E - Tons<br>0 - False zero<br>0G - Zero and grams<br>0KG - Zero and kilograms<br>0Lb - Zero and pounds<br>0oz - Zero and ounces | Select weight units for line print. |
| OPE | Print Options | YES - Enter sub-menu<br>NO - Disables parameter<br>**GroSS - Brutto/Gross weight<br>**ERrE - Tare weight<br>NEE - Net weight<br>*EoE - Totalizer values<br>*H ILO - Max and Min values<br>SPNE - Setpoint values | Sub-menu to select parameters for inclusion on print ticket. |

*- Not in "B-GNT" mode*
** - Not in "HILOT" mode.*

## PARAMETER MODULE 8 - Analog Output Parameters

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| EYPE | Select Analog Output Type | 0-20 - 0 to 20 mA<br>4-20 - 4 to 20 mA<br>0-10 - 0 to 10 V | |
| RS IN | Output Source Assignment | b-G - Brutto/Gross weight<br>*H I - Max reading<br>*LO - Min reading<br>*EoE - Totalizer value<br>NEE - Net weight | Select source of linear output signal.<br>If totalizer, scaling limited to lower 5 digits. |

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| RN-LO | Display Scale Value Low | -19999 to 99999 | Low = 0 mA/ 4 mA/ 0 V<br>High = 20 mA/ 10 V<br>For reverse acting, reverse scale high and scale low |
| RN-H I | Display Scale Value High | | |
| udE | Update Time | 0.0 to 10.0 sec | 0.0 = Instant updates |

*- Not in "B-GNT" mode*

## PARAMETER MODULE 9 - Factory Service Function Parameters

| DISPLAY | PARAMETER | RANGE AND UNITS | DESCRIPTION/ COMMENTS |
|---|---|---|---|
| d-LEu | Display Intensity Level | 0 to 15 | 0 = dimmest<br>15 = brightest |
| CodE | Factory Service Access Code | 48 - Calibration<br>66 - Restore Factory Defaults | All other codes result in exit. |

The basic indicator is factory calibrated for both the high and low mV input ranges. In the application, the user scales the basic mV to units of weight (Input Scaling). To re-calibrate the complete weighing system (load cells and indicator together) with calibration weights, execution of the Input Scaling procedure suffices. It generally is not necessary to re-calibrate the input of basic indicator.

In the case of using known data from load cells where the mV readings are directly keyed-in, then the input can be re-calibrated. Calibration reference accuracy of 0.01% in the 20 and 200 mV ranges is required.

Calibration of the indicator is divided into two parts: the Input Calibration and Analog Output calibration.

### Input Calibration

*Note: This procedure affects the basic indicator mV input calibration. As a result, it may require the indicator to be rescaled using calibration weights.*

From the CRL display, select the input or output for calibration:
0.02    20 mV input (Set 20 mV range jumper)
0.2    200 mV input (Set 200 mV range jumper)

| DISPLAY | ACTION |
|---|---|
| 0.00u or 0.0u | Apply 0 mV between + and - SIG inputs, with -SIG tied to common, wait 10 seconds, press PAR |
| 0.02u or 0.2u | Apply +20 or +200 mV to + and - SIG inputs, with -SIG tied to common, wait 10 seconds, press PAR |

### Output Calibration

The Analog Output signal is re-calibrated by setting the end points of each range. These end points correlate with Analog Output scaling parameters AN-LO and AN-HI. Calibration meter accuracy of 0.05% in the 10 VDC and 20 mA ranges is required.

| DISPLAY | ACTION |
|---|---|
| 0.0 R | Use Tare and Zero keys to set mA output to 0.00 mA. Press PAR to accept. |
| 4.0 R | Use Tare and Zero keys to set mA output to 4.00 mA. Press PAR to accept. |
| 20.0 R | Use Tare and Zero keys to set mA output to 20.00 mA. Press PAR to accept. |
| 0.0u | Use Tare and Zero keys to set volt output to 0.00 V. Press PAR to accept. |
| 10.0u | Use Tare and Zero keys to set volt output to 10.00 V. Press PAR to accept. |

# PARAMETER VALUE CHART     Code_____

## 1- ɪɴP - Input Parameters

| DISPLAY | PARAMETER | FACTORY SETTING | USER SETTING |
|---------|-----------|-----------------|--------------|
| rAɳ9E | INPUT RANGE | 0.02u | _____ |
| dECPt | DISPLAY RESOLUTION | 000.00 | _____ |
| round | SCALE DIVISIONS | 000.01 | _____ |
| FıLtr | FILTER SETTING | 0000.0 | _____ |
| bAɳd | FILTER ENABLE BAND | 00002 | _____ |
| PtS | SCALING POINTS | 2 | _____ |
| StYLE | SCALING STYLE | ʸEY | _____ |
| ıɳP 1 | INPUT VALUE 1 | 00.000 | _____ |
| dSP 1 | DISPLAY VALUE 1 | 000.00 | _____ |
| ıɳP 2 | INPUT VALUE 2 | 20.000 | _____ |
| dSP 2 | DISPLAY VALUE 2 | 100.00 | _____ |
| ıɳP 3 | INPUT VALUE 3 | 0.000 | _____ |
| dSP 3 | DISPLAY VALUE 3 | 0.00 | _____ |
| ıɳP 4 | INPUT VALUE 4 | 0.000 | _____ |
| dSP 4 | DISPLAY VALUE 4 | 0.00 | _____ |
| ıɳP 5 | INPUT VALUE 5 | 0.000 | _____ |
| dSP 5 | DISPLAY VALUE 5 | 0.00 | _____ |
| ıɳP 6 | INPUT VALUE 6 | 0.000 | _____ |
| dSP 6 | DISPLAY VALUE 6 | 0.00 | _____ |
| ıɳP 7 | INPUT VALUE 7 | 0.000 | _____ |
| dSP 7 | DISPLAY VALUE 7 | 0.00 | _____ |
| ıɳP 8 | INPUT VALUE 8 | 0.000 | _____ |
| dSP 8 | DISPLAY VALUE 8 | 0.00 | _____ |
| ıɳP 9 | INPUT VALUE 9 | 0.000 | _____ |
| dSP 9 | DISPLAY VALUE 9 | 0.00 | _____ |
| ıɳP 10 | INPUT VALUE 10 | 00.00 | _____ |
| dSP 10 | DISPLAY VALUE 10 | 0.00 | _____ |
| ıɳP 11 | INPUT VALUE 11 | 0.000 | _____ |
| dSP 11 | DISPLAY VALUE 11 | 0.00 | _____ |
| ıɳP 12 | INPUT VALUE 12 | 0.000 | _____ |
| dSP 12 | DISPLAY VALUE 12 | 0.00 | _____ |

## 2- FɳC - External Input and Function Key Parameters

| DISPLAY | PARAMETER | FACTORY SETTING | USER SETTING |
|---------|-----------|-----------------|--------------|
| USr-1 | USER INPUT 1 | ɳO | _____ |
| USr-2 | USER INPUT 2 | ɳO | _____ |
| USr-3 | USER INPUT 3 | ɳO | _____ |
| F1 | TARE KEY FUNCTION | tAr | _____ |
| F2 | ZERO KEY FUNCTION | rEL | _____ |
| rSt | PRINT KEY FUNCTION | Prınt | _____ |
| Sc-F1 | 2nd TARE KEY FUNCTION | ɳO | _____ |
| Sc-F2 | 2nd ZERO KEY FUNCTION | ɳO | _____ |

## 3- LOC - Parameter Lockouts

| DISPLAY | PARAMETER | FACTORY SETTING | USER SETTING |
|---------|-----------|-----------------|--------------|
| 8-6 | BRUTTO/GROSS DISPLAY | rEd | _____ |
| tArE | TARE DISPLAY | Ent | _____ |
| SP-1 | SETPOINT 1 | LOC | _____ |
| SP-2 | SETPOINT 2 | LOC | _____ |
| SP-3 | SETPOINT 3 | LOC | _____ |
| SP-4 | SETPOINT 4 | LOC | _____ |
| CodE | SECURITY CODE | 00000 | _____ |

## 4- SEC - Secondary Function Parameters

| DISPLAY | PARAMETER | FACTORY SETTING | USER SETTING |
|---------|-----------|-----------------|--------------|
| OPEr | MOPERATING MODE | b-6ɳt | _____ |
| *Hı-t | MAX CAPTURE DELAY TIME | 0000.0 | _____ |
| *LO-t | MIN CAPTURE DELAY TIME | 0000.0 | _____ |
| dSP-t | DISPLAY UPDATE TIME | 2 | _____ |
| O-rɳ6 | ZERO ACQUISITION RANGE | 00060 | _____ |
| At-t | AUTO-ZERO TRACKING DELAY TIME | 00000 | _____ |
| At-b | AUTO-ZERO TRACKING BAND | 00001 | _____ |
| b-Lıt | UNITS LABEL LIGHT | Oɳ | _____ |
| dSP-F | DISPLAY FORMAT | LEAdO | _____ |

## 5- tOt - Totalizer Parameters

| DISPLAY | PARAMETER | FACTORY SETTING | USER SETTING |
|---------|-----------|-----------------|--------------|
| dECPt | TOTALIZER DECIMAL POINT | 000.00 | _____ |
| tbASE | TOTALIZER TIME BASE | _ ıɳ | _____ |
| SCFAC | TOTALIZER SCALE FACTOR | 01.000 | _____ |
| Locut | TOTALIZER LOW CUT VALUE | -199.99 | _____ |
| P-UP | TOTALIZER POWER-UP RESET | ɳO | _____ |

## 7- SrL - Serial Communication Parameters

| DISPLAY | PARAMETER | FACTORY SETTING | USER SETTING |
|---------|-----------|-----------------|--------------|
| bAUd | BAUD RATE | 9600 | _____ |
| dAtA | WORD LENGTH | 8 | _____ |
| PAr | PARITY | ɳO | _____ |
| Addr | ADDRESS | 00000 | _____ |
| Abru | ABBREVIATED | ɳO | _____ |
| Uɳıt | PRINT UNITS | ʸ6 | _____ |
| 6roSS | PRINT BRUTTO/GROSS | ʸES | _____ |
| tArE | PRINT TARE WEIGHT | ʸES | _____ |
| ɳEt | PRINT NET WEIGHT | ʸES | _____ |
| *tot | PRINT TOTAL | ɳO | _____ |
| *HıLO | PRINT MAX and MIN | ɳO | _____ |
| SPɳt | PRINT SETPOINT VALUES | ɳO | _____ |

## 8- Out - Analog Output Parameters

| DISPLAY | PARAMETER | FACTORY SETTING | USER SETTING |
|---------|-----------|-----------------|--------------|
| tYPE | ANALOG TYPE | 4-20 | _____ |
| ASıɳ | ANALOG ASSIGNMENT | b-6 | _____ |
| Aɳ-LO | ANALOG LOW SCALE VALUE | 000.00 | _____ |
| Aɳ-Hı | ANALOG HIGH SCALE VALUE | 100.00 | _____ |
| udt | UPDATE TIME | 0000.0 | _____ |

## 9- FCS Factory Setting Parameters

| DISPLAY | PARAMETER | FACTORY SETTING | USER SETTING |
|---------|-----------|-----------------|--------------|
| d-LEu | DISPLAY INTENSITY LEVEL | 3 | _____ |

*- Appears only in "HILOT" operating mode.*

10

## ɓ-SPt - Setpoint Parameters

| DISPLAY | PARAMETER | FACTORY SETTING | USER SETTING | DISPLAY | PARAMETER | FACTORY SETTING | USER SETTING |
|---|---|---|---|---|---|---|---|
| ACt-1 | ACTION FOR SETPOINT | OFF | _____ | ACt-3 | ACTION FOR SETPOINT | OFF | _____ |
| SP-1 | SETPOINT VALUE (main) | 000.00 | _____ | SP-3 | SETPOINT VALUE (main) | 000.00 | _____ |
| | SETPOINT VALUE (alternate)* | 000.00 | _____ | | SETPOINT VALUE (alternate)* | 000.00 | _____ |
| Src-n | SETPOINT SOURCE | ɓ-ɓ | _____ | Src-3 | SETPOINT SOURCE | ɓ-ɓ | _____ |
| HYS-1 | SETPOINT HYSTERESIS | 000.02 | _____ | HYS-3 | SETPOINT HYSTERESIS | 000.02 | _____ |
| tON-1 | ON TIME DELAY | 0000.0 | _____ | tON-3 | ON TIME DELAY | 0000.0 | _____ |
| tOF-1 | OFF TIME DELAY | 0000.0 | _____ | tOF-3 | OFF TIME DELAY | 0000.0 | _____ |
| out-1 | OUTPUT LOGIC | nor | _____ | out-3 | OUTPUT LOGIC | nor | _____ |
| rSt-1 | RESET ACTION | AUto | _____ | rSt-3 | RESET ACTION | AUto | _____ |
| Stb-1 | STANDBY OPERATION | NO | _____ | Stb-3 | STANDBY OPERATION | NO | _____ |
| Lit-1 | OUTPUT PANEL LIGHT | nor | _____ | Lit-3 | OUTPUT PANEL LIGHT | nor | _____ |

| DISPLAY | PARAMETER | FACTORY SETTING | USER SETTING | DISPLAY | PARAMETER | FACTORY SETTING | USER SETTING |
|---|---|---|---|---|---|---|---|
| ACt-2 | ACTION FOR SETPOINT | OFF | _____ | ACt-4 | ACTION FOR SETPOINT | OFF | _____ |
| SP-2 | SETPOINT VALUE (main) | 000.00 | _____ | SP-4 | SETPOINT VALUE (main) | 000.00 | _____ |
| | SETPOINT VALUE (alternate)* | 000.00 | _____ | | SETPOINT VALUE (alternate)* | 000.00 | _____ |
| Src-2 | SETPOINT SOURCE | ɓ-ɓ | _____ | Src-4 | SETPOINT SOURCE | ɓ-ɓ | _____ |
| HYS-2 | SETPOINT HYSTERESIS | 000.02 | _____ | HYS-4 | SETPOINT HYSTERESIS | 000.02 | _____ |
| tON-2 | ON TIME DELAY | 0000.0 | _____ | tON-4 | ON TIME DELAY | 0000.0 | _____ |
| tOF-2 | OFF TIME DELAY | 0000.0 | _____ | tOF-4 | OFF TIME DELAY | 0000.0 | _____ |
| out-2 | OUTPUT LOGIC | nor | _____ | out-4 | OUTPUT LOGIC | nor | _____ |
| rSt-2 | RESET ACTION | AUto | _____ | rSt-4 | RESET ACTION | AUto | _____ |
| Stb-2 | STANDBY OPERATION | NO | _____ | Stb-4 | STANDBY OPERATION | NO | _____ |
| Lit-2 | OUTPUT PANEL LIGHT | nor | _____ | Lit-4 | OUTPUT PANEL LIGHT | nor | _____ |

* Select alternate list to program these values.

## TROUBLESHOOTING

As part of the start-up procedure, the indicator performs a series of internal self tests. If one or more of the diagnostic tests fails, indicator operation is disabled and an error message is displayed. Press the TARA key to acknowledge the error.

Refer to the error table below for the cause and remedy for the fault detected. For further technical assistance, contact technical support at the appropriate company numbers listed.

| Error Code | Problem | Remarks |
|---|---|---|
| Err 1 | Internal hardware fault | A fault of the microprocessor and/or the input circuit has been detected. Return indicator for repair. |
| Err 2 | Parameter list memory fault | One or more of set-up parameters has changed value due to possible electrical glitch or loss of power during parameter save operation. (during "End" display) Verify all set-up parameters, exit parameter set-up mode and cycle power to indicator to clear error. If error remains, return indicator for repair. |
| Err 3 | Calibration memory fault | Verify calibration accuracy of indicator. If out of tolerance, re-calibrate the indicator. Otherwise, to clear error, enter and exit parameter set-up mode and cycle power to indicator. If error remains, return indicator for repair. |
| Err 4 | Analog output calibration memory fault | Verify calibration accuracy of analog output. To clear error, enter and exit parameter set-up mode and cycle power to indicator. If error remains, replace analog output card. |
| Err 5 | Defective keypad | The indicator has detected one of the keypad switches is defective. Inspect keypad for signs of damage or sticking. Cycle power to indicator to clear error. If error remains, return indicator for repair. |

## Installation Environment

The indicator should be installed in a location that does not exceed the maximum operating temperature and provides good air circulation. The minimum vertical clearance to allow proper ventilation is 1". Placing the unit near devices that generate excessive heat should be avoided. Be sure to keep it away from heat sources (ovens, furnaces, etc.), away from direct contact with caustic vapors, oils, steams, or any other process by-products that may affect proper operation.

Continuous exposure to direct sunlight may accelerate the aging process of the bezel. The bezel should be cleaned only with a soft cloth and neutral soap product. Do NOT use solvents.

Do not use tools of any kind (screwdrivers, pens, pencils, etc.) to operate the keypad of the unit.

## EMC GUIDELINES

The indicator has been designed and tested to meet the requirements of EMC Directive 89/336/EEC. However, successful installations depend upon several factors. These include cable routing, termination of cable shields, associated equipment, etc.

## Installation

The indicator meets NEMA 4X/IP65 requirements for indoor use when properly installed. The unit is intended to be mounted into an enclosed panel. Prepare the panel cutout to the dimensions shown in the Dimensions drawing. Remove the panel latch and cardboard sleeve from the unit and discard the cardboard sleeve. Slide the panel gasket over the rear of the unit to the back of the bezel. The unit should be installed fully assembled. Insert the unit into the panel cutout. While holding the unit in place, push the panel latch over the rear of the unit so that the tabs of the panel latch engage in the slots on the case. The panel latch should be engaged in the forward most slot possible. To achieve a proper seal, tighten the latch screws evenly until the unit is snug in the panel (Torque to approximately 7 in-lbs [79N-cm]). Do not over-tighten the screws.

This application uses the MP30 indicator to monitor the weight of a liquid storage tank. The indicator is connected directly to 4 - 350 ohm load cells, using the internal 10 VDC excitation source. The average sensitivity of the load cells are 2.1 mV/V. This yields a full scale output of approximately 21 mV which is within the maximum input of 24 mV of the indicator's low range.

Calibration of the indicator can consist of any two arbitrary scale points. In this application, the low scaling point was determined by metering in 1,000 liters of liquid into the tank and the high scaling point, 10,000 liters. For this application, the indicator scaling values are:

| Parameter | Value |
|-----------|-------|
| $INP\ 1$ | 1.728 mV |
| $dSP\ 1$ | 1,000 ltr |
| $INP2$ | 20.750 mV |
| $dSP2$ | 10,000 ltr |

The indicator registers the output of the load cells at these points and corresponds them to the readout display values.

A four output relay setpoint card is installed. Two of the relays provide HI and LO level alarm outputs. These alarms are programmed to trigger on the Gross liquid weight of the tank.

The remaining alarm outputs are used for a simple loss-of-weight filling application. One is programmed as a low-acting alarm, triggering on the Net liquid weight. Each filling operation is started with a Tare Out / Tare In sequence. This opens the filling valve and when the target setpoint is reached, the valve is shut off. The valve remains off until a tare operation is repeated, thereby restarting the filling operation. The fourth output is connected in series with the fill output to disable filling during the interval of the Tare Out and Tare In operation.

A Linear DC Output plug-in option card is also installed. This card provides either 10 V or 20 mA conditioned and scaled output for remote sensing and logging of the tank level.
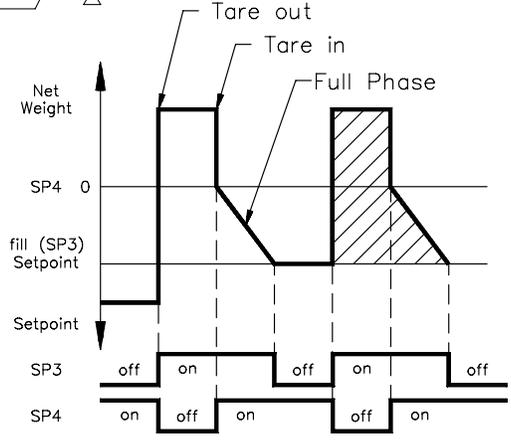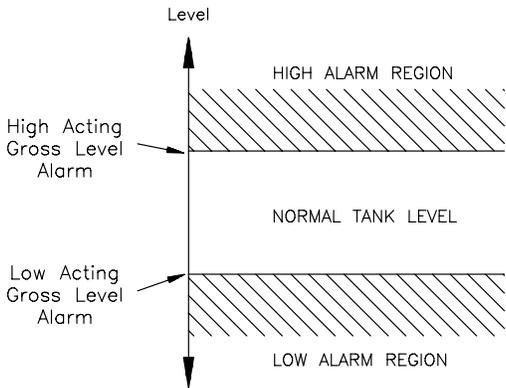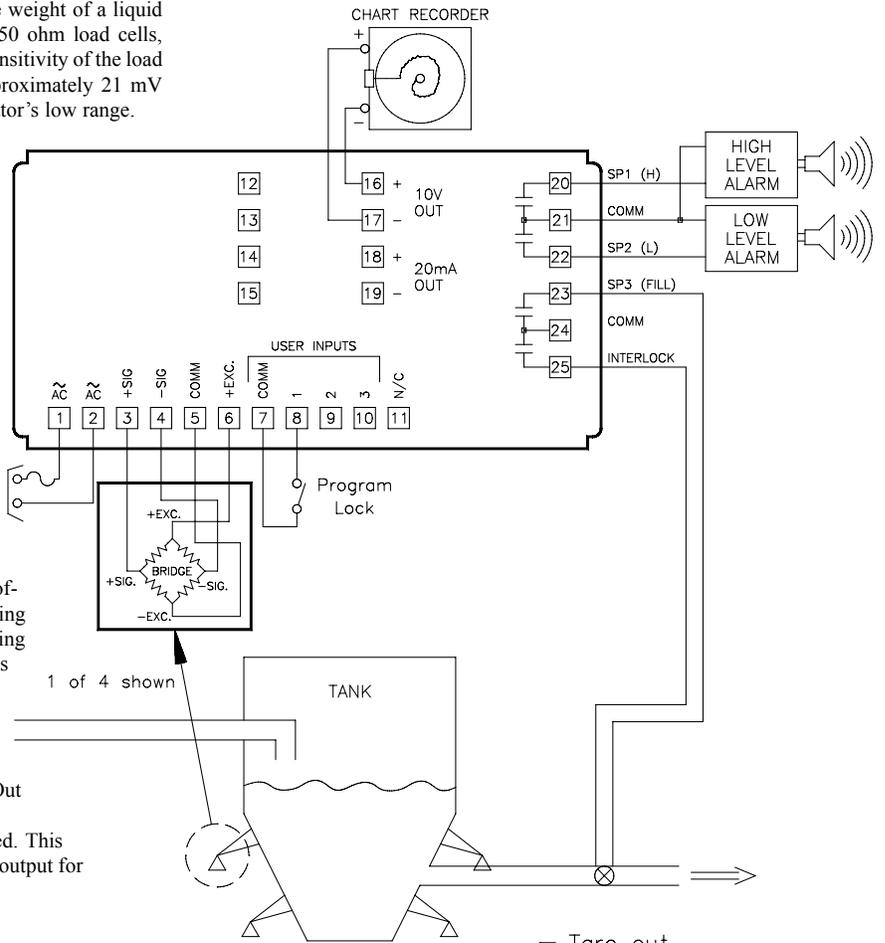
## MODEL INFORMATION

| Product | Product Name | Product Number |
|---------|-------------|----------------|
| Weight Indicator (85 - 250VAC Power) | MP30/00 | 9408-800-30001 |
| Weight Indicator (24V Power) | MP30/01 | 9408-800-30011 |
| Dual Relay Option Card | MP30/11 | 9408-800-30111 |
| Quad Relay Option Card | MP30/10 | 9408-800-30101 |
| Linear Output Option Card | MP30/20 | 9408-800-30201 |
| RS232 Comm Option Card | MP30/31 | 9408-800-30311 |
| RS485 Comm Option Card | MP30/32 | 9408-800-30321 |
| DeviceNet Comm Option Card | MP30/40 | 9408-800-30401 |
| PC Set-up Software | MP30/50 | 9408-800-30501 |