Electronic Indicator
Operating Manual Non-Analog Digital Display
3 Programmable Presets and 3 Programmable Ratios

Extra-Large Number Display
Incremental Measuring Mode
SPC Cables USB, MTI, RS232
Measuring System in English or Metric
Travel Reverse
Auto Off
Floating Zero
Rotating Bezel
Internal and External Serial Numbers
T.I.R. with Low & High Storage Recall
Power with Batteries

Additional Power Through AC Jack or Data Output
Programmable Lock Combination
User Tolerance Settings (high & low)
Up to 4 User Changeable Resolutions
Inch/Metric Display Conversion
Large LCD Display
Maximum Reading Hold
Display/Freeze Reading Hold
Minimum Reading Hold
Absolute/Preset Measuring Mode
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CHOICE OF THREE POWER SOURCES

1. Batteries
The lithium battery used in this indicator is an IEC standard, type CR2450. The indicators are shipped with the batteries installed.

Note: This indicator has an AUTO-OFF feature to conserve battery life. After 10 minutes of “no activity” (no key presses or spindle movement), the gage will turn itself off. This feature may be disabled if continuous operation is desired; see AUTO-OFF On/Off instructions in this book.

Installing Batteries
Using a narrow screwdriver, gently pry under the tab on the left side of plastic bezel and slide out the battery tray as you turn the indicator face side down.
Insert two batteries, “+” side up, into tray cavities, then slide the tray back into its bezel slot, taking care that the batteries stay in proper position.

2. AC Adapter
First insert the mini-plug into the socket on the lower right side of the bezel, then plug the adapter into a wall outlet.

3. Data I/O Connector
Power also may be provided through the data I/O connector, for special fixturing or applications where the indicator is integrated with another piece of equipment. A ripple-free 5 VDC regulated voltage source is required.
# BUTTON FUNCTIONS

<table>
<thead>
<tr>
<th>Key</th>
<th>Function Controlled</th>
</tr>
</thead>
</table>
| **OFF/MODE** | *Off* – turns indicator off  
*- MODE* – controls absolute numbers & display setup |
| **ON/CLR**   | *On* – turns indicator on  
*CLR* – resets the *Lock Toggle*, *Data I/O Type*, *gage resolution*, and *Display* setup mode |
| **HOLD**     | Allows you to hold the value on the display according to the specified Mode (*MAX*, *MIN*, *FRZ*)                                               |
| **IN/MM**    | Controls the display units (default is English)                                                                                                |
| **2ND**      | Controls the *Lock Toggle*, *Data I/O Type*, *gage resolution*, *Travel Reverse*, *Auto Off* and *Display* setup mode                           |
| **TOL**      | Controls *Low*, *High* and *On* tolerance settings                                                                                           |
**SUMMARY CHART FOR DIGITAL BUTTON ACTIONS**

Button actions should occur on the press of the button whenever possible. Some button presses will have the action occur on the release of the button press. For example, when the ‘ON/CLR’ button is used to clear the display, the action is to happen on the release of the button. When the ‘ON/CLR’ button is used as the 2nd function in a sequence of button pushes, the action can be on the press of the button. Whenever a button press requires a continuous press to scroll through some selection process, the action of the button needs to be on the release of the button.

<table>
<thead>
<tr>
<th>BUTTON</th>
<th>PRIMARY</th>
<th>SUBSIDIARY</th>
<th>2ND FUNCTION</th>
<th>3RD FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOLD</td>
<td>• Toggle on/off</td>
<td>• Select hold type (MAX, MIN, FRZ)</td>
<td>• Enter setting process for ratios*</td>
<td>• Enter resolution select process*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• press and hold to step through</td>
<td></td>
<td>(2ND, ON/CLR, HOLD)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Apply function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN/MM</td>
<td>• Toggles between</td>
<td>• Toggles travel reverse (normal/re</td>
<td>• Resets to factory default settings</td>
<td>• Verify data out put</td>
</tr>
<tr>
<td></td>
<td>inches, millimeters</td>
<td>verse)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>and X</td>
<td></td>
<td>• (2ND, ON/CLR, IN/MM)</td>
<td></td>
</tr>
<tr>
<td>2ND</td>
<td>• Enables 2ND functions</td>
<td>• Move function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOL</td>
<td>• Toggles tolerance</td>
<td>• Select high or low to view or set</td>
<td>• Enter preset setting process*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>on or off</td>
<td>numbers*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Change function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ON/CLR</td>
<td>• Turn gage on</td>
<td>•Clears/resets display to ‘0’ or</td>
<td>• Enables 3RD function</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>spindle position, or ‘abs’ number</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>or ‘abs’ +/spindle position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OFF/MODE</td>
<td>• Turns gage off</td>
<td>• Select measurement mode (INCR, ABS</td>
<td>• Toggles auto-off on and off</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TIR) press and hold to step through selection</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: apply, move and change are automatically active when in preset, lock and tolerance setting modes. Apply and change are automatically active when in resolution set mode.*
DISPLAY-OPERATING PROMPTS & CONDITIONS

- Indicator ready for 2nd or 3rd function key entry sequences
- Indicator is in preset number setting function for ABS or tolerance high or low numbers
- Preset indicators
- Ratio indicators
- Displays **IN** for English (inch), or **MM** for Metric Measuring Units.
- Display counts up with inward spindle movement for **INCR** and **ABS** measurement modes.
- Display counts down with spindle movement for **INCR** and **ABS** measurement modes.
- Menu selection items under hold or tolerance areas
- **AUTO-off** is enabled to conserve battery life.
- Negative reading indicator. No sign is displayed for positive readings.
- Features and presets numbers are locked
- For Total Indicator Runout (**TIR**), travel direction is ignored. Peak (**MAX**) and valley (**MIN**) values are available.
- **FRZ** indicates the indicator ready for 2nd or 3rd function key entry sequences.
- **MIN** and **MAX** indicate the minimum and maximum values, respectively.
- **LOW** and **HIGH** indicate the low and high tolerance settings.
- **IN** and **MM** indicate the measuring units, respectively.
OPERATING INSTRUCTIONS

Power On/Off
To turn the unit on, press and hold ON/CLR until indicator turns on. To turn off, press OFF/MODE.

Auto-Off Toggle
To turn the Auto-Off function on or off, press the 2ND button (2ND ICON should appear on the display). Press the OFF/MODE.

An hour glass appears at the left side of the display if AUTO OFF is active. If AUTO OFF is active the indicator will power off in 10 minutes with no activity (button press or spindle movement).

Travel Reverse Toggle
To change count direction:
Press 2ND button, then press the IN/MM button.
Note: When arrow is pointed down ▼, the display counts down with inward spindle movement for INCR and ABS.

When the arrow is pointed up ▲, display counts up with inward spindle movement. For most applications this is the normal setting.
OPERATING INSTRUCTIONS

Change Units
To change the display units, press the IN/MM button.

Default unit of measure is set at the factory for English or metric scales.

Hold Mode
Allows you to hold the value on the display according to the specified mode.

Press HOLD to toggle hold mode on and off.

MAX – Holds and displays the highest reading attained.

MIN – Holds and displays the lowest reading attained.

FRZ – Holds and displays the reading displayed when HOLD is engaged.

To select type of HOLD (MAX, MIN, FRZ): Press HOLD until desired feature is flashing, then release HOLD.

Note: Pressing ON/CLR button resets indicator to spindle position except in FRZ; resets to zero
OPERATING INSTRUCTIONS

Tolerance On/Off
Press TOL to toggle tolerance mode on and off. If no tolerances are programmed into the gage, then tol is displayed to indicate an invalid tolerance setting and the HIGH and/or LOW icons flash on and off.

When the tolerance settings are incorrect (high, low, or both) the corresponding icon or icons will flash.

Tolerance Settings
Continuously press the TOL button to activate the tolerance menu (LOW, HIGH, ON) and view the low and high tolerance settings.

If no preset tolerance number is set into the gage then zero will be displayed.

When viewing low or high, that icon will flash.
OPERATING INSTRUCTIONS

Set High Tolerance Number
To change to high tolerance settings:
Press 2ND button (2ND icon should appear on
the display). Press the TOL (CHANGE) button. High icon will be flashing.

Use the secondary function buttons, CHANGE and MOVE to set your tolerance setting. After
you have set your high tolerance setting, press APPLY to store numbers to memory.

Set Low Tolerance Number
To change to low tolerance settings: Press
2ND button (2ND icon should appear on the
display). Press the TOL (CHANGE) button. Low icon will be flashing.

Use the secondary function buttons, CHANGE and MOVE to set your tolerance setting. After
you have set your low tolerance setting, press APPLY to store numbers to memory.

Note: once high and low tolerances are set,
the numeric readings will flash when your
readings are out of tolerance.

The LOW or HIGH icon will flash indicating if the reading is under or over the tolerance.
OPERATING INSTRUCTIONS

Absolute /Preset Mode
Press and hold the OFF/MODE button. Until the ▲ icon appears above the ABS lettering, release the OFF/MODE button. If no preset number is stored in indicator ABS will show on display.

To change to absolute number (preset number), press 2ND button; 2ND icon should appear on the display. Press the TOL (CHANGE) button.

To step through PRESET 1 2 3 press the MOVE (2ND) button.

Use the secondary function buttons, CHANGE and MOVE, to set your absolute number. Press MOVE until the +/- or digit to be set is blinking.

Press the CHANGE button to reverse the +/- sign or change the value of the blinking digit. Repeat until the desired number is entered. Press APPLY to store absolute number to memory.
OPERATING INSTRUCTIONS

Lock Toggle
When the **LOCK** is on, a key icon is displayed. When the **LOCK** is on, all of the setting modes are disabled, and all 2nd and 3rd functions are disabled except the lock/unlock sequence.

Press the **2ND** button (**2ND** icon should appear on the display). Press **ON/CLR**. Press **TOL**. A key symbol will appear on the display when features are locked.

Lock Combination
Press the **2ND** button (**2ND** icon should appear on the display), then press **ON/CLR**. Continuously press **TOL** until **000** appears on the display.

Use the **CHANGE** and **MOVE** button to set your lock combination. After you have set your 3 digit lock combination press **APPLY**. A key symbol will appear on the display and your 3 digit combination is stored in memory.

**WARNING:** To change functions after the indicator has been locked with a combination, the correct combination must be applied.

Please contact the factory if the Lock Combination is lost.
OPERATING INSTRUCTIONS

Reset to Factory Defaults
This will set all features and functions back to the factory default settings.

Press the 2ND button (2ND icon should appear on the display), followed by ON/CLR, then press IN/MM.

Note: Factory defaults cannot be reset if the LOCK feature is on.

Verify Data I/O Type
To view the Data I/O Type Output, press the 2ND button. The 2ND icon will appear on the display. Press ON/CLR. Press 2ND. Format information is displayed on the LCD.

All digits of the display are turned off; characters displayed represent data modes as RS-232, MITUTOYO serial output, USB or BYPASS mode.

To exit: Repeat button sequence.
OPERATING INSTRUCTIONS

Set Gage Resolution
For the change resolution feature: Press 2ND, press ON/CLR, then press HOLD.

After that, each press of the CHANGE Button (TOL) steps through the available resolution options: .001”, .0005”, .0001” or .00005” *

*This resolution only available on a .00005” resolution gage.

Press the APPLY button to store the resolution setting. Display returns to measuring mode at desired resolution, but does not change displayed value.

TIR Mode
Total Indicator Runout (TIR) mode ignores travel direction, instead measuring the difference between peak and valley (MAX and MIN) values. To enter TIR Mode, continuously press the OFF/MODE button until the diamond icon appears above the TIR function. In TIR mode, the Freeze (FRZ) is the only hold function available.

To view the Peak (MAX) Value or the Valley (MIN) Value, use the HOLD button. Press HOLD button down until the MIN or MAX is displayed. The difference between the MIN and MAX Values equals the TIR Value.
OPERATING INSTRUCTIONS

Ratio Mode
Press 2ND, ON/CLR, and OFF/MODE to turn the ratio feature on and off.

Continue pressing the OFF/MODE button to step through the three ratio positions.

If no ratios have been set previously, the display will show NONE. The gage will not operate until a ratio is entered or you exit the ratio feature.

In this case, a ratio of 2.000 will display 2 inches on the indicator for every 1 inch of travel, or 2mm on the display for every 1mm of travel.

There are three ratio settings that be stored. For the ratio feature to work properly, the current ratio must be set to a value other than NONE. Use the MOVE, CHANGE and APPLY buttons to program or change ratio.
CUSTOM APPLICATIONS

Custom LCDs and graphics can be provided for almost any application. We can help you design a gage for your exacting requirements.

Keypads and features can be customized to meet most needs. For example, a gage can be programmed for T.I.R. only, or a gage can be programmed so only selected features are available.

With our programmable software and flexible microchip, the possibilities are limited only by your imagination.

Custom hardware is available to fit your specifications. For example, a gage can be made without a return spring or a custom spring. Special length stems, threaded stems, backs, and contact points, are also available.

Digital Indicators are available in the following travels and resolutions:

<table>
<thead>
<tr>
<th>Range/Travel</th>
<th>Resolution (operator changeable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>.250&quot;</td>
<td>.0001&quot;/.002mm; .00005&quot;/.001mm</td>
</tr>
<tr>
<td>.600&quot;</td>
<td>.0005&quot;/.01mm; .0001&quot;/.002mm; .00005&quot;/.001mm</td>
</tr>
<tr>
<td>1.0&quot;</td>
<td>.0005&quot;/.01mm; .0001&quot;/.002mm; .00005&quot;/.001mm</td>
</tr>
<tr>
<td>2.0&quot;</td>
<td>.001&quot;/.02mm; .0005&quot;/.01mm; .0001&quot;/.002mm</td>
</tr>
<tr>
<td>4.0&quot;</td>
<td>.001&quot;/.02mm; .0005&quot;/.01mm; .0001&quot;/.002mm</td>
</tr>
</tbody>
</table>