The MAX Jr Count 1 is a powerful, easy-to-use counter for length totalizing, item counting, and position indication applications. Menu-driven programming, high performance operation, and built-in diagnostics make it the best value for industrial counting applications.

FEATURES
- 8 Digit with Overflow Indication
- Add/Subtract or Quadrature Counting
- Reset-to-Zero or Set-to-a-Number Operation
- Input Calibrator
- Reference Preset
- Remote Reset and Stop Count Inputs
- Solid State or Contact Closure Inputs
- Non-volatile Counter
- Programmable Preset Lock for Security
- Program Disable Switch

KEY SPECIFICATIONS
- 8 Digits, 0.3" LED Display
- 10 kHz Count Rate
- 5 Decade Input Calibrator
- +12 VDC @ 125 mA Accessory Supply
- 115/230 VAC Operation (10–26 VDC Optional)
- 1/8 DIN Panel Cutout
- 0 to 50°C Operating Temperature

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OVERVIEW...

ENGLISH PROMPTS
- Easy to Read
- Simplifies Programming

METAL ENCLOSURE
- High Strength Aluminum
- Eliminates RFI Emissions
- Improves Noise Immunity

SEALED FRONT PANEL
- NEMA 4 Rated
- Oil and Water Tight
- Chemical Resistant

LED DISPLAY
- 8 Decades with Overflow
- 0.3” High Intensity
- Filtered for High Contrast
- Alphanumeric Prompts

EASY PROGRAMMING
- Tactile Response Keyboard
- Menu Driven Selections
- Automatic Key Repeat

ACCESSORY SUPPLY
- Transducer Power
- Relay Power
- +12 VDC
- 125 mF available

PROGRAM DISABLE SWITCH
- Inhibits Run/Program Selection
- Prevents Unauthorized Changing of Programming Information

AC POWER INPUT
- 115/230 VAC Selectable
(10 - 26 VDC Optional)
- Externally Fused
- Counter and Programming Values are retained indefinitely during power outages

NEOPRENE GASKET
- Seals Front Panel

PANEL MOUNTING STRAPS
- Rugged Aluminum
- Won’t Bend or Vibrate Loose

COUNT INPUT SELECTIONS
- Two Independent Channels
- Programmable for:
  - Contact Closures
  - Open Collector Outputs
  - Magnetic Pickups
  - Active Output Devices

CONTROL INPUTS
- Input 1 is Level Sensitive, Stop Count
- Input 2 is Edge Sensitive Counter Reset

COUNT INPUTS
- Selectable Add/Subtract (A-B) or Bidirectional Quadrature (AB)
- Programmable Debouncing for Low Speed Contact Closure or High Speed Solid State Inputs
## Input Power:
- AC (−S version) 115 nominal, 95 to 130 VAC
- 230 nominal, 190 to 260 VAC
- 50/60 Hz, 6 VA
- DC Option (−D version) 10 to 26 VDC, 0.4 A, max. total

## Accessory Power:
12 VDC ± 25% @ 0 to 125 mA.

## Main Counter:
- Decades: ± 8, bidirectional with overflow
- Presets: 1, ± 8 decade Reference
- Operation:
  - Add/Subtract: Input A adds, B subtracts
  - Bidirectional: Inputs A and B in quadrature
- Reset: Reset to Reference Preset
- Count Rate: DC to 10 kHz

**NOTE:** Input logic for Add/Subtract (A−B) mode is X1; the maximum input frequency is 10 kHz on signals A and B combined. Input logic for Bidirectional (quadrature AB) is X2 (counting on both edges of input A); the maximum input frequency is 5 kHz.

## Calibrator:
0.0001 to 9.9999 common to A and B

## Signal Inputs, A and B:
- **Solid State (current sourcing):**
  - Input High: 3.5 min to 30 max VDC
  - Input Low: 0 min to 1.5 max VDC
  - Input Impedance: 10 kΩ typ to Common
  - Input Current: 0.35 mA min source
  - Input Response: 50 μs min high and low time
- **Open Collector and Contact Closure (current sink):**
  - Input High: open or 3.5 min to 30 max VDC
  - Input Low: 0 min to 1.5 max VDC
  - Input Impedance: 3.3 kΩ typ to +5 VDC
  - Input Current: 1.5 mA min sink
  - Input Response: 50 μs min high and low time (OC)
  - 25 ms min make and break (CC)

## Mechanical:
- Enclosure: Extruded aluminum with molded Vexol bezel
- Overall Size: 1.98"H x 3.78"W x 6.03"D
- Cutout: 1.78"-0/+0.04" x 3.58"-0/+0.04"
- Panel Thickness: 1/16" to 1/4"
- Depth Behind Bezel: 5.68"
- Weight: 1.4 lbs

## Environmental:
- Operating Temp: 0 to 50 °C. (32 to 122 °F.)
- Storage Temp: -18 to 85 °C. (0 to 186 °F.)
- Ambient Humidity: 0 to 90% and noncondensing

## Error Codes:
- 2. Low AC line voltage
- 3. Processor time fully utilized
- 4. Input too fast
- 5. NonVolatilie RAM failure

Press [RST CLR] to clear error.
TOTALIZING COUNTER

ADD / SUBTRACT (A–B)

1. The totalizer counts up once for each input pulse of Signal A (add input).
2. The totalizer counts down for each Signal B (subtract input) pulse.
3. When pulses are present on both inputs, the net effect is no count change. Counting occurs on the negative (high–to–low) edge of the inputs.

COUNT CALIBRATOR

Each count is multiplied by the calibrator. To display units other than input pulses, set the calibrator to:

\[
\text{Count Calibrator} = \frac{\text{Displayed Value}}{\text{Input Pulses}}
\]

For example, to display “six packs” instead of bottles, set the calibrator to \((1 \div 6)\), or 0.1667. If the calibrator value is greater than 1, counting will occur in “bursts” (e.g., ... 2, 4, 6, ...).

RESET

1. The counter value is reset by the front panel reset key (if enabled), or when the remote reset input is activated by a switch closure or other source. The reset input is edge sensitive; the counter will reset and continue to count if reset is held active. For totalizer applications, the reset will normally set the count value to zero. However, the Reference Preset can be used to load the totalizer to an alternate value (see below).

POSITIVE INDICATOR

BIDIRECTIONAL (QUADRATURE AB)

1. The position counts up on each edge of Signal A when A "leads" B as shown.
2. The position counts down on each edge of Signal A when B "leads" A.

COUNT CALIBRATOR

Each counting edge is multiplied by the calibrator. To convert the input pulses into units of position, set the calibrator to:

\[
\text{Count Calibrator} = \frac{\text{Displayed Units}}{2 \times \text{Input Pulses}}
\]

For example, if a Rotopulser® provides 300 pulses per foot (12 inches), and a resolution of 0.1 inch is required, the calibrator should be set to:

\[
\text{Count Calibrator} = \frac{120 \text{ (tenths of an inch)}}{2 \times 300 \text{ pulses}} = 0.2000
\]

(The decimal point should be set for one decimal place.)

REFERENCE

1. The position is set to the Reference Preset value by the front panel reset key (if enabled), or when the remote reset input is activated by a switch closure or other source. The reset input is edge sensitive; the counter will reset and continue to count if reset is held active.
KEYBOARD AND DISPLAY FUNCTIONS

**DISPLAY ANNUNCIATORS**
- **PGM** turned on in Program Mode
- **REF** illuminated for Reference Display and Reference Setpoint lines
- **OVF** indicates count value has exceeded ±99999999

**DOWN CURSOR**
- Alternates Run Mode display between Totalizer and Reference
- Scrolls through Program Mode menu lines (with "wrap around" from last line to first)

**RIGHT CURSOR**
- Selects one digit of numeric data for editing
- Chooses one option from multiple choice menu lines

**INCREMENT / ON**
- Increments (adds 1) to the selected digit of numeric data
- Sets Off/On options to On (alternate to Right cursor)

**PROMPT AND DATA DISPLAY**
- Minus sign programmable on Reference Display and Setpoint
- Selectable Totalizer decimal point

**RESET / CLEAR**
- Resets the Totalizer in the Run Mode (if Front Panel Reset is On)
- Clears the numeric data to zero

**RUN / PROGRAM**
- Alternates operation between Run and Program Modes
- Disabled by setting PGM DIS switch to On (up position)

**DECREMENT / OFF**
- Decrements (subtracts 1) from the selected digit of numeric data
- Sets On/Off line to Off (alternate to Right cursor)

NUMERIC DATA ENTRY

<table>
<thead>
<tr>
<th>BEFORE</th>
<th>KEYPRESS</th>
<th>AFTER</th>
<th>EXPLANATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGM 050000</td>
<td></td>
<td>PGM 000000</td>
<td>The Clear key can be used to zero the data value at any time. (Used only on the Reference lines 2 and 3, and Count Calibrator line 5.)</td>
</tr>
<tr>
<td>PGM 000000</td>
<td></td>
<td>PGM 000000</td>
<td>The Right cursor selects one of the digits to be changed. The selected digit is highlighted and appears brighter than the other digits.</td>
</tr>
<tr>
<td>PGM 000000</td>
<td></td>
<td>PGM 100000</td>
<td>The Increment key adds 1 to the digit causing it to count up (0, 1, 2, ... 8, 9, 0, 1, ...). — the Decrement key subtracts one from the digit (2, 1, 0, 9, ...).</td>
</tr>
</tbody>
</table>

**EXPLANATION**

The On key turns on the minus sign when no digit is selected (highlighted). (Used only on the Reference lines 2 and 3.)

The Off key turns off the minus sign when no digit is selected (highlighted). (Used only on the Reference lines 2 and 3.)
<table>
<thead>
<tr>
<th>LINE</th>
<th>FUNCTION</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TOTALIZER DISPLAY</td>
<td>Value of input counts displayed with Decimal Point selection (line 4) and multiplied by Count Calibrator (line 5). Totalizer is set to Reference Preset (line 3) when remote reset is activated, or when front panel Reset key is pressed and Panel Reset (line 8) is On.</td>
</tr>
<tr>
<td>2</td>
<td>REFERENCE DISPLAY</td>
<td>Value of Reference Preset (line 3). If front Panel Lock (line 9) is Off, the Reference can be edited (see page 5).</td>
</tr>
<tr>
<td>3</td>
<td>REFERENCE SETPOINT</td>
<td>Value of the Reference Preset. The polarity (sign) can be changed with the On and Off keys. The Right cursor can select a digit to be changed with the Increment and Decrement keys.</td>
</tr>
<tr>
<td>4</td>
<td>DECIMAL POINT</td>
<td>Selection of Totalizer Display decimal point position is made with the Right cursor. Setting can be 1 to 4 decimal places or none.</td>
</tr>
<tr>
<td>5</td>
<td>COUNT CALIBRATOR</td>
<td>Multiples input pulses to display counts in engineering units. (See editing on page 5.) Note that the Input Operation (line 6) changes the input count logic between X1 (for A-B) and X2 (for quadrature AB).</td>
</tr>
<tr>
<td>6</td>
<td>INPUT OPERATION</td>
<td>Selects Add/Subtract (A-B) or Bidirectional (quadrature AB) counting with the Right cursor. Add/Subtract (A-B) uses X1 input logic and counts once for each (A or B) input pulse. Bidirectional (quadrature AB) uses X2 logic and counts each edge of Signal A.</td>
</tr>
<tr>
<td>7</td>
<td>INPUTS A AND B</td>
<td>Selects High Speed inputs (from solid state sources) or Contact Closures with the Right cursor. Input frequency is limited to 20 Hz for contact closures.</td>
</tr>
<tr>
<td>8</td>
<td>PANEL RESET</td>
<td>Front Panel Reset of the Totalizer Display (line 1) is enabled by selecting On, or disabled by choosing Off with the Right cursor. The Clear key may still be used for editing (if allowed).</td>
</tr>
<tr>
<td>9</td>
<td>PANEL LOCK</td>
<td>Front Panel editing of the Reference Display (line 2) is disabled by selecting Off, or enabled by choosing On with the Right cursor. Panel Lock does not effect Program Mode editing.</td>
</tr>
<tr>
<td>10</td>
<td>INPUTS TEST</td>
<td>Display of active signal and control inputs. The indicators $A$ and $B$ are given when the Signals A and B, respectively, are driven with a low input. The prompts $1$ and $2$ are given when Inputs 1 and 2, Stop Count and Reset, respectively, are driven with a low input.</td>
</tr>
<tr>
<td>11</td>
<td>FRONT PANEL TEST</td>
<td>Display of active keyboard buttons. The indicators $r$, $i$, $d$, $P$, and $C$ are present when the Right cursor, Increment/On, Decrement/Off, Run/Program, and Reset/Clear keys, respectively, are pressed.</td>
</tr>
<tr>
<td>12</td>
<td>DIGITS TEST</td>
<td>The display shows a constant pattern to verify that each display digit is functioning.</td>
</tr>
<tr>
<td>13</td>
<td>SEGMENTS TEST</td>
<td>All display digits and annunciators are illuminated to verify proper operation.</td>
</tr>
</tbody>
</table>
PROGRAMMING...

LINE | PROMPTS | DATA |
--- | --- | --- |
1 | Totalizer display 12345678 | resets Totalizer |
2 | selects display line | editing keys |
3 | Reference display | enters Program Mode |
4 | PGM 00000000 | leaves Program Mode 10000000 |
5 | turns "−" sign on | turns "−" sign off |
6 | selects a digit | adds 1 to digit |
7 | dP on | dP 00 |
8 | cE 10000 | cE 00000 |
9 | sets data to zero | selects a digit |
10 | cE 00000 | cE 90000 |
11 | cE 80000 | subtracts 1 from digit |
12 | P_rStOn | subtracts 1 from digit |
13 | P_rStOff | leaves Program Mode |
14 | P_LocOn | P_LocoFF |
15 | P_iN 1 | P_iN 2 |
16 | no inputs active | Signal A low |
17 | Signal B low | Stop Count (In 1) low |
18 | Reset (In 2) low | Press each key to test |
19 | FP | all keys pressed |
20 | FP r dPC | press each key to test |
21 | any other pattern indicates a malfunction |
22 | segments that do not light are defective |
A. PANEL MOUNTING

Make a panel cutout as shown. If the installation requires scaling, the adhesive gasket (supplied) may be applied to the bezel side of the panel. Remove the hex washer head screws and slide the panel mounting straps out of the guides. Slide the unit through the panel cutout and insert the straps into the guides. Tighten the screws to secure the unit to the panel.

B. INPUT POWER

**AC POWER (MCJR1–S–00)**

Select 115/230 VAC (nominal) operation with a slotted screwdriver through the cutout. Connect AC power (hot) to terminal 1 through a 1/8 A Slo-Blo fuse, and AC return (neutral) to terminal 2. Connect terminal 3 to Building Ground.

**DC POWER (MCJR1–D–00)**

Connect 10 to 26 VDC to terminal 2 through a 1/2 A Slo-Blo fuse, and DC Common to terminal 1. Connect terminal 3 to Building Ground.
C. COUNT INPUTS

NOTE: For Add/Subtract (A–B) operation, use Signal A to count Up and Signal B to count down.

CONTACT CLOSURES
Set switches O.C. to the Up position. Program Input Operation for A–B, and Inputs A and B for Lo Speed.

UNIDIRECTIONAL TRANSUCERS
Set switches O.C. and MAG to the Down position. Program Input Operations for Bidirectional, and Inputs A and B for Hi Speed.

OPEN COLLECTOR DEVICES
Set switches O.C. to the Up position. Program Inputs A and B for Hi Speed.

BIDIRECTIONAL TRANSUCERS
Set switches O.C. and MAG to the Down position. Program Input Operations for Bidirectional, and Inputs A and B for Hi Speed.

MAGNETIC (SINE WAVE OUTPUT) DEVICES
Set switches MAG to the Up position. Program Input Operation for A–B, and Inputs A and B for Hi Speed.

D. PROGRAM DISABLE SWITCH
Set the switch to the Up position to prevent unauthorized program changes. The RUN/PGM key is inhibited.

E. STOP COUNT INPUT
The Totalizer is inhibited from counting as long as the switch is closed.

F. RESET INPUT
The Totalizer is reset once for each switch closure and continues to count. The Reference Preset is loaded into the Totalizer.
APPLICATIONS...

ADD / SUBTRACT TOTALIZING

The application above totalizes parts production. At various times, it is desired to accumulate either total parts, just rejects (bad parts), or just good parts. These requirements are accommodated by having separate sensors for raw parts and bad parts. Total production can be realized by turning off the "bad parts" sensor; rejects can be counted by turning off the "raw parts" sensor. Good parts counting would use both sensors (net good parts = raw parts – bad parts). The items below detail how the MAXtr Count 1 can be programmed for this application.

**REFERENCE PRESET**
The Reference Preset is set to 0 so that parts totalizing begins anew after each shift, day, or other production period; also, when changing between total parts vs. good parts vs. bad parts.

**DECIMAL POINT**
The decimal point is left off so that the totalizer displays units equal to whole parts.

**COUNT CALIBRATOR**
The totalizer should display one count per part. Since the totalizer counts once for each part passing a sensor, the calibrator is set to (1 count / 1 pulse per part) = 1.0000.

**INPUT OPERATION**
The counting mode uses independent add and subtract inputs. (Note that the input logic used is X1 — i.e. 1 count per input pulse.)

**INPUTS A AND B**
Since the input sensors are solid state devices, Signals A and B are programmed for high speed operation. If the input rates (frequency) will be less than 20 counts per second (Hz), the inputs could be programmed for contact closures as well.

**PANEL RESET**
For operators to clear the totalizer after a production period (shift, day, etc.), the front panel reset is enabled.

**PANEL LOCK**
The operators should not be able to alter the Reference Preset, so that function is disabled.
POSITIONING WITH REFERENCE

The application below reads the position of a drilling table and displays it to the machine operator. Although one axis is shown, the application could be extended to provide two axis, X–Y position information. In order to calibrate the table position, the table is moved to the left stop (mechanical travel limit), where a limit switch performs the referencing function.

REFERENCE PRESET

The Reference Preset is set to –10,000 inches. The travels stops at a position where the drill bit is ten inches past the table. As the table is returned, the position will indicate 0 when the drill bit is at the table edge.

DECIMAL POINT

The decimal point is set to display 3 digits to the right of the decimal point. Position indication is then resolute to 1/1000th inch.

COUNT CALIBRATOR

The leadscrew pitch is 1/2 inch, and the Rotopulser® resolution is 600 count/rev. With X2 logic for the quadrature input, the calibrator should be set to:

\[ \text{cC} = \frac{500 \text{ (thousandths inch)}}{2 \times 600 \text{ pulses/rev}} = 0.4167 \]

INPUT OPERATION

The counting mode should be set to Bidirectional for position applications. (Note that the input logic used is X2.)

INPUTS A AND B

Since the input sensors are solid state devices, Signals A and B are programmed for high speed operation.

PANEL RESET

Panel reset is normally Off, because position calibration is done by running the table to the reference position limit switch.

PANEL LOCK

The operators would not normally alter the Reference Preset.
ORDERING INFORMATION...

Model No.: MCJR1-S-00
Totalizer/Position Indicator
115/230 VAC Operation

Model No.: MCJR1-D-00
Totalizer/Position Indicator
10 – 26 VDC Operation

### PANAMOUNT ACCESSORIES

<table>
<thead>
<tr>
<th>MODEL DESCRIPTION</th>
<th>PKG</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM21S Dual Differential Receiver</td>
<td>A</td>
</tr>
<tr>
<td>with Transducer Supply</td>
<td></td>
</tr>
<tr>
<td>PM28S Dual Universal Input Amp and Supply</td>
<td>A</td>
</tr>
<tr>
<td>PM64S Analog to Frequency Converter</td>
<td>A</td>
</tr>
<tr>
<td>HFDQ4 High Frequency Quadrature + 4 Module</td>
<td>B</td>
</tr>
</tbody>
</table>

### TRANSDUCERS

<table>
<thead>
<tr>
<th>SERIES DESCRIPTION</th>
<th>PKG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series 52 Magnetic Pickups</td>
<td></td>
</tr>
<tr>
<td>Series 53 Zero-Speed Pickups</td>
<td></td>
</tr>
<tr>
<td>Series 31 QUBE Roto-pulsers®</td>
<td>A</td>
</tr>
<tr>
<td>Series 76/77 Roto-pulsers®</td>
<td></td>
</tr>
<tr>
<td>Series 40 Roto-pulsers®</td>
<td>A</td>
</tr>
<tr>
<td>Series 60 Roto-pulsers®</td>
<td></td>
</tr>
</tbody>
</table>

### WARRANTY

Standard products manufactured by the Company are warranted to be free from defects in workmanship and material for a period of one year from the date of shipment, and products which are defective in workmanship or material will be repaired or replaced, at the option of the Company, at no charge to the Buyer. Final determination as to whether a product is actually defective rests with the Company. The obligation of the Company hereunder shall be limited solely to repair and replacement of products that fall within the foregoing limitations, and shall be conditioned upon receipt by the Company of written notice of any alleged defects or deficiency promptly after discovery within the warranty period, and in the case of components or units purchased by the Company, the obligation of the Company shall exceed the settlement that the Company is able to obtain from the supplier thereof. No products shall be returned to the Company without its prior consent. Products which the Company consents to have returned shall be shipped F.O.B. the Company's factory. The Company cannot assume responsibility or accept invoices for unauthorized repairs to its components, even though defective. The life of the products of the Company depends, to a large extent, upon the type of usage thereof, and THE COMPANY MAKES NO WARRANTY AS TO FITNESS OF ITS PRODUCTS FOR SPECIFIC APPLICATIONS BY THE BUYER NOR AS TO PERIOD OF SERVICE UNLESS THE COMPANY SPECIFICALLY AGREES OTHERWISE IN WRITING After the Proposed Usage Has Been Made Known to It.

The foregoing warranty is exclusive and in lieu of all other warranties expressed or implied, including, but not limited to any warranty of merchantability or of fitness for a particular purpose.

**SERVICE:** If this product requires service, call DYNAPAR for an Return Material Authorization (RMA) number.
pack it in a sturdy carton and ship prepaid to: Service Dept. at the address below.

**Include:**
1. Description of problem
3. Purchase order number
2. Name of responsible person
4. Return shipping instructions