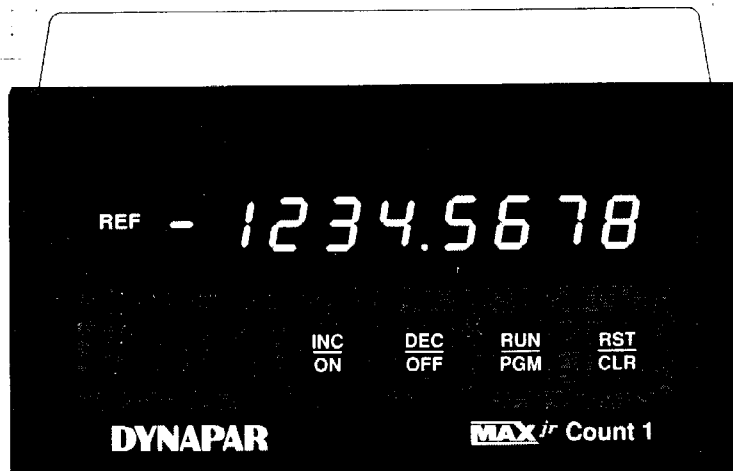




MAX^{jr} Count 1

TOTALIZER and
POSITION INDICATOR



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

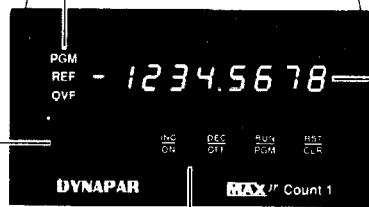
- Easy to Read
- Simplifies Programming

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 mA. available

PROGRAM DISABLE SWITCH

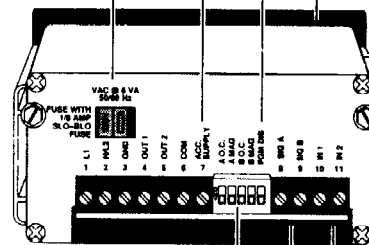
- Inhibits Run/Program Selection
- Prevents Unauthorized Changing of Programming Information

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

SPECIFICATIONS...

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 \pm 25% @ 0 to 125 mA.

Main Counter:

Decades:	\pm 8, bidirectional with overflow
Presets:	1, \pm 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 k Ω typ to Common
Input Current:	0.35 mA min source
Input Response:	50 μ s 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 k Ω typ to +5 VDC
Input Current:	1.5 mA min sink
Input Response:	50 μ s min high and low time (OC) 25 ms min make and break (CC)

Magnetic:

Input High:	+0.1 min to +30 volts peak
Input Low:	-30 min to -0.1 volts peak
Input Impedance:	10 k Ω typ to Common
Input Current:	0.01 mA min sink and source
Input Response:	20 μ s min high and low time

Control Inputs:

Input High:	open or 3.5 min to 30 max VDC
Input Low:	0 min to 1.5 max VDC
Input Impedance:	2.2 k Ω typ to +5 VDC
Input Current:	2.0 mA min sink
Input Response:	25 ms min make and break

Display:

Decades:	\pm 8 decade, 0.3" red LED
Legends:	PGM Program Mode REF Reference Preset OVF Overflow Indicator Programmable from X.XXXX to XXXXX.
Decimal Point:	

Keyboard:

Sealed, tactile response 6 positions

Program Security:

Program Disable switch
Front Panel Reset disable
Reference Preset lock

Diagnostics:

Signal and Control Inputs test
Front Panel test
Display Digits test
Display Segments test

Mechanical:

Enclosure:	Extruded aluminum with molded Valox 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. NonVolatile RAM failure

Press



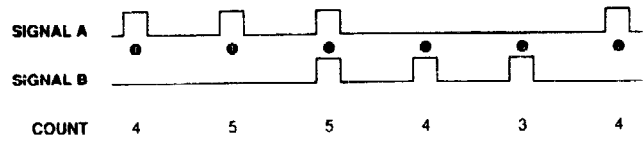
to clear error.

OPERATION...

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 sequence for totalizer operation

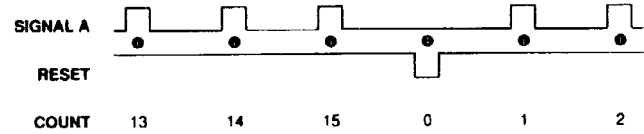
Count Calibrator = 1.0000
Input Operation set to A-b (add/subtract)

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 ÷ 6), or 0.1667. If the calibrator value is greater than 1, counting will occur in "bursts" (e.g. ... 2, 4, 6, ...).



Count sequence for totalizer operation with reset

Reference Setpoint = 0
Count Calibrator = 1.0000
Input Operation set to A-b (add/subtract)

RESET

④ 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).

POSITION INDICATOR

BIDIRECTIONAL (QUADRATURE AB)

⑤ The position counts up on each edge of Signal A when A "leads" B as shown. ⑥ 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:

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

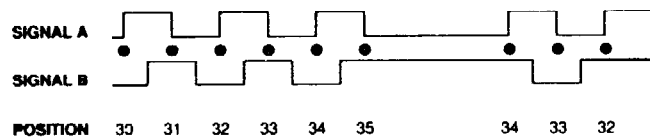
For example, if a Rotopulser® provides 300 pulses per foot (12 inches), and a resolution of 0.1 inch is required, the calibrator should be set to:

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

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

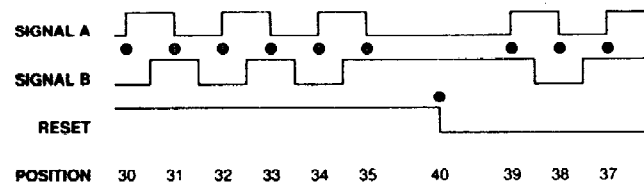
REFERENCE

⑦ 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.



Count sequence for position indication

Count Calibrator = 1.0000
Input Operation set to Bidirectional (quadrature)



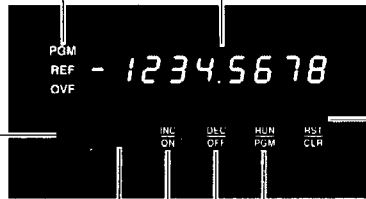
Count sequence for position indication with reference

Reference Setpoint = 40
Count Calibrator = 1.0000
Input Operation set to Bidirectional (quadrature)

KEYBOARD AND DISPLAY FUNCTIONS

DISPLAY ANNUNCIATORS

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



PROMPT AND DATA DISPLAY

- Minus sign programmable on Reference Display and Setpoint
- Selectable Totalizer decimal point

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)

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

BEFORE	KEYPRESS	AFTER	EXPLANATION
PGM cC 05000		PGM cC 00000	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.)
PGM cC 00000		PGM cC 00000	The Right cursor selects one of the digits to be changed. The selected digit is highlighted and appears brighter than the other digits.
PGM cC 00000		PGM cC 10000	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, ...).
BEFORE	KEYPRESS	AFTER	EXPLANATION
PGM REF 00000000		PGM REF -00000000	The On key turns on the minus sign when no digit is selected (highlighted). (Used only on the Reference lines 2 and 3.)
PGM REF -00000000		PGM REF 00000000	The Off key turns off the minus sign when no digit is selected (highlighted). (Used only on the Reference lines 2 and 3.)

PROGRAMMING...

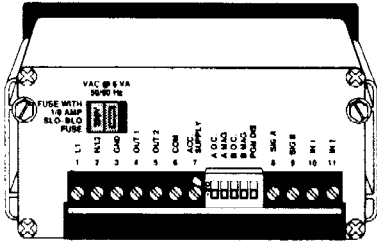
LINE	FUNCTION	DESCRIPTION
RUN MODE		
1	TOTALIZER DISPLAY	Value of input counts displayed with Decimal Point selection (line 4) and multiplied by Count Calibrator (line 5). Totalizer is set to Reference Preset (line 3) when remote reset is activated, or when front panel Reset key is pressed and Panel Reset (line 8) is On.
2	REFERENCE DISPLAY	Value of Reference Preset (line 3). If front Panel Lock (line 9) is Off, the Reference can be edited (see page 5).
PROGRAM MODE		
Entered by pressing the RUN/PGM Key when the PGM DIS switch is Off (down position).		
3	REFERENCE SETPOINT	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.
4	DECIMAL POINT	Selection of Totalizer Display decimal point position is made with the Right cursor. Setting can be 1 to 4 decimal places or none.
5	COUNT CALIBRATOR	Multiplies 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).
6	INPUT OPERATION	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.
7	INPUTS A AND B	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.
8	PANEL RESET	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).
9	PANEL LOCK	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.
DIAGNOSTICS		
These features provide an easily accessible method of checking the operation of the product and external connections for proper operation. The error codes listed on page 3 diagnose additional problems which may not be permanent malfunctions.		
10	INPUTS TEST	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.
11	FRONT PANEL TEST	Display of active keyboard buttons. The indicators r , v , d , P , and C are present when the Right cursor, Increment/On, Decrement/Off, Run/Program, and Reset/Clear keys, respectively, are pressed.
12	DIGITS TEST	The display shows a constant pattern to verify that each display digit is functioning.
13	SEGMENTS TEST	All display digits and annunciators are illuminated to verify proper operation.

PROGRAMMING...

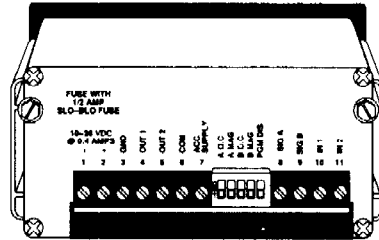
LINE	PROMPTS	DATA	
1		12345678	Totalizer display resets Totalizer
			selects display line
2		0	Reference display editing keys
			enters Program Mode
			leaves Program Mode
3	FACTORY PROGRAMMING SHOWN IN THIS COLUMN		
		00000000	turns "-" sign on
		-00000000	turns "-" sign off
		00000000	selects a digit
		10000000	adds 1 to digit
4		dP off	
		dP 0	
		dP .00	
		dP .000	
		dP .0000	
5		cC 10000	sets data to zero
		cC 00000	selects a digit
		cC 90000	subtracts 1 from digit
		cC 80000	subtracts 1 from digit
6		in_oPA-b	
		in_oPb id	
7		in_Ab.Hi	
		in_Ab.Lt	
8		P_rSt.off	
		P_rSt.on	
9		P_Loc.on	
		P_Loc.off	
			leaves Program Mode
10		inP	no inputs active
		inP A	Signal A low
		inP b	Signal B low
		inP 1	Stop Count (In 1) low
		inP 2	Reset (In 2) low
11		FP	no keys pressed
		FP r idPC	all keys pressed
			press each key to test
12		12345678	any other pattern indicates a malfunction
13		-88888888	segments that do not light are defective

INSTALLATION...

- NOTES:**
1. Installations must be made in accordance with DYNAPAR manual 845 – 130.
 2. For applications which require multiple products operating in parallel, see 845 – 130.
 3. When replacing older products, consult 845 – 130 for information regarding circuitry changes.



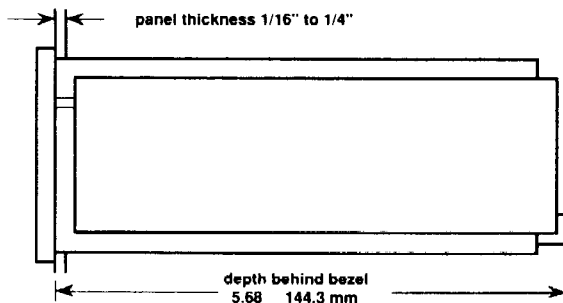
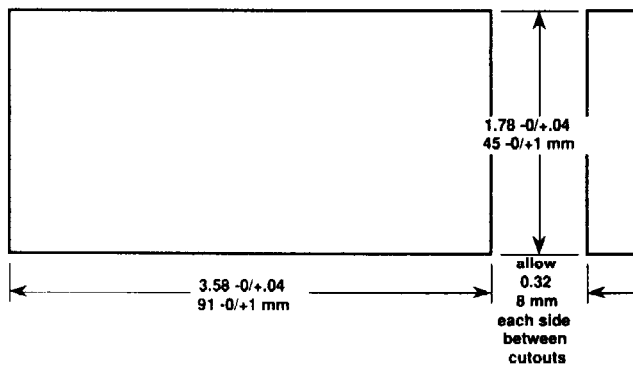
MCJR1-S-00



MCJR1-D-00

A. PANEL MOUNTING

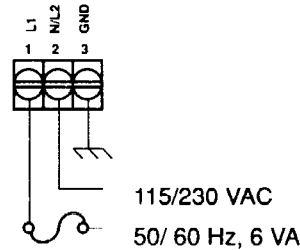
Make a panel cutout as shown. If the installation requires sealing, the adhesive gasket (supplied) may be applied to the bezel side of the panel. Remove the hex washer head screws and slide the panel mounting straps out of the guides. Slide the unit through the panel cutout and insert the straps into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



B. INPUT POWER

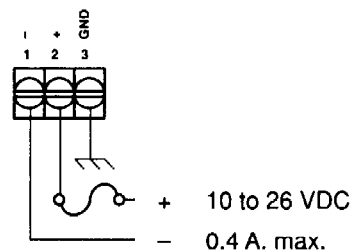
AC POWER (MCJR1-S-00)

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.



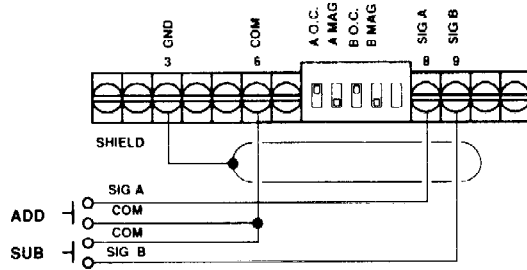
INSTALLATION...

C. COUNT INPUTS

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

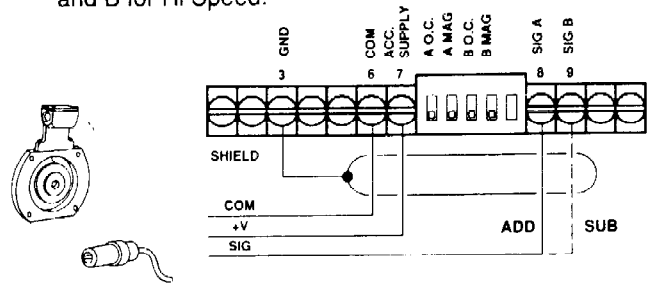
CONTACT CLOSURES

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



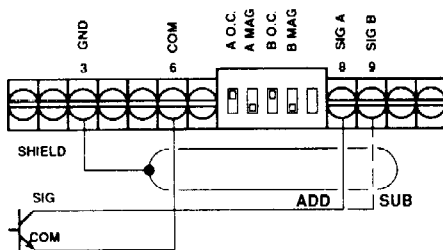
UNIDIRECTIONAL TRANSDUCERS

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



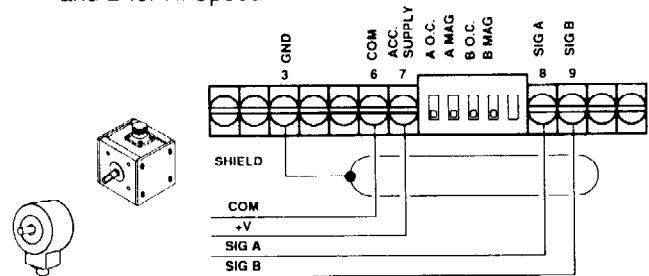
OPEN COLLECTOR DEVICES

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



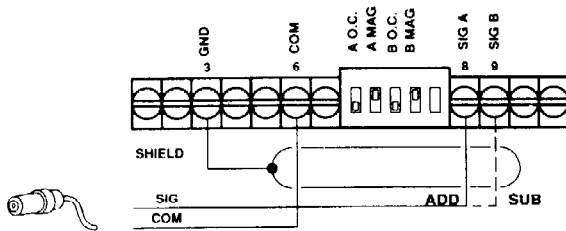
BIDIRECTIONAL TRANSDUCERS

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



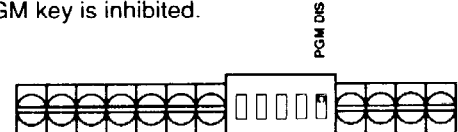
MAGNETIC (SINE WAVE OUTPUT) DEVICES

Set switches MAG to the Up position. Program Input Operation for A-B, and Inputs A and B for Hi Speed.



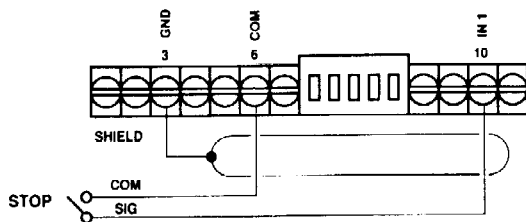
D. PROGRAM DISABLE SWITCH

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



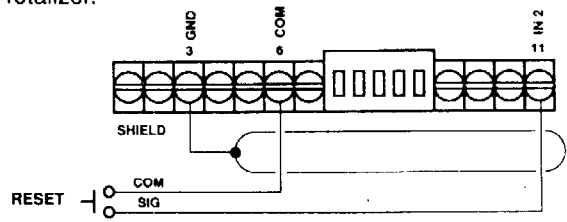
E. STOP COUNT INPUT

The Totalizer is inhibited from counting as long as the switch is closed.



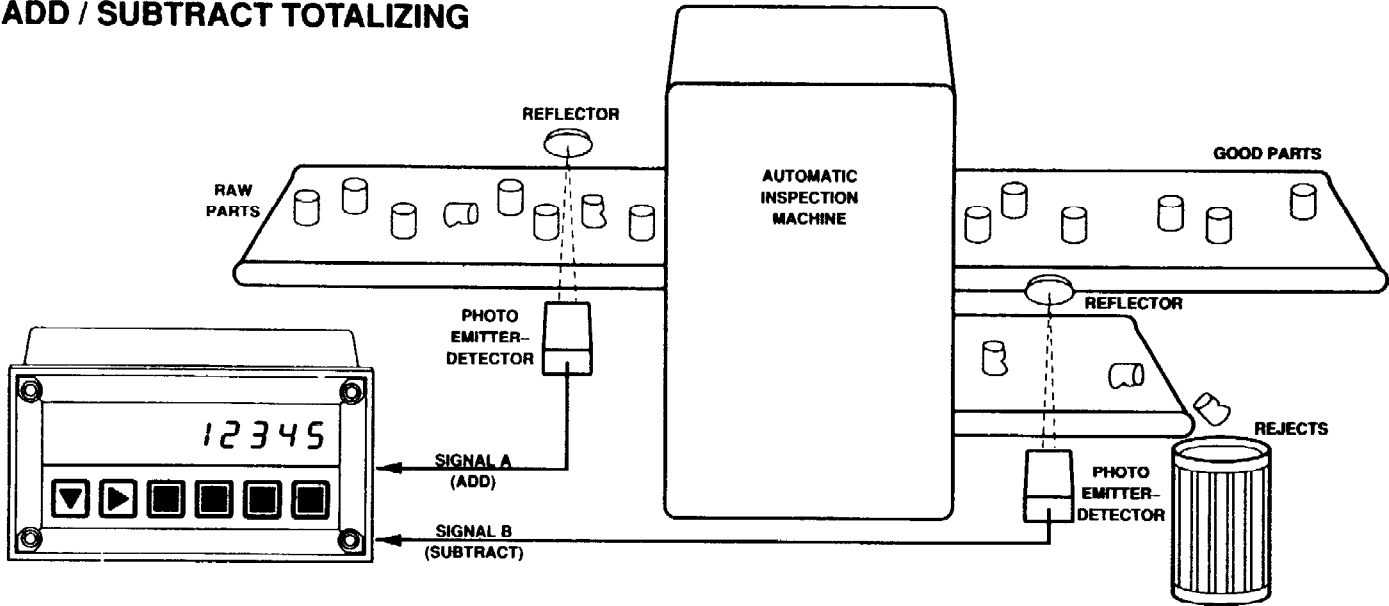
F. RESET INPUT

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 MAXjr Count 1 can be programmed for this application.

PGM REF 00000000

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.

PGM dP OFF

DECIMAL POINT

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

PGM cC 10000

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 .

PGM in_oPR-b

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.)

PGM in_Ab.H.

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.

PGM P_rSt.on

PANEL RESET

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

PGM P_Loc.on

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.

PGM REF - 10.000

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.

PGM dP .000

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.

PGM cC 0.4167

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:

$$cC = 500 \text{ (thousandths inch)} \div (2 \times 600 \text{ pulses/rev}) = 0.4167$$

PGM in_oPbid

INPUT OPERATION

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

PGM in_Ab.HI

INPUTS A AND B

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

PGM P_rStoFF

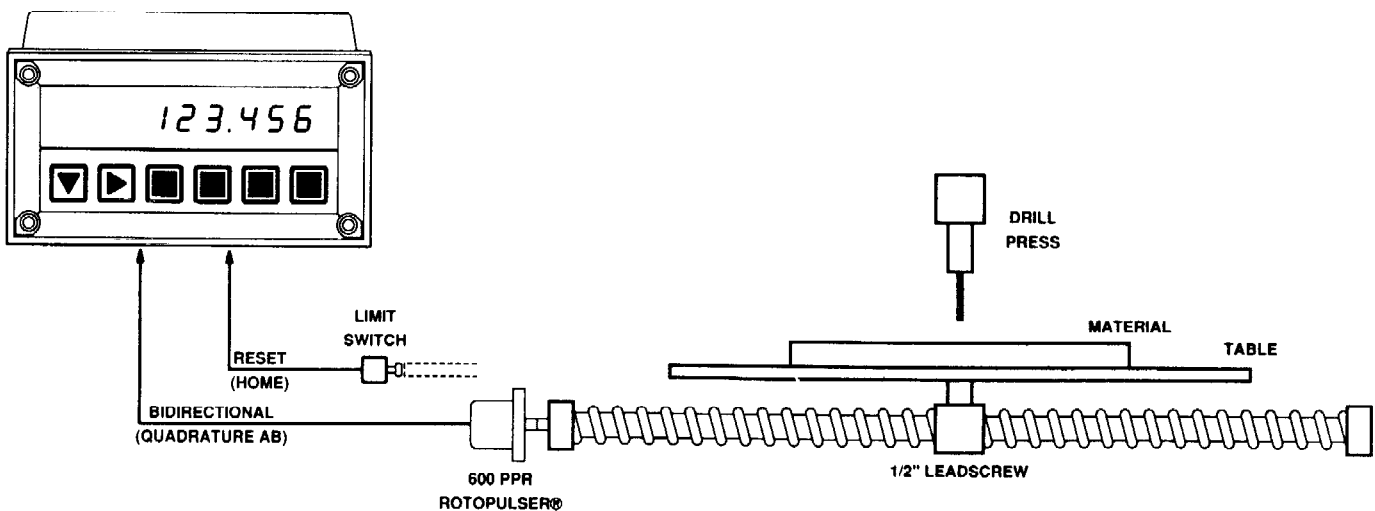
PANEL RESET

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

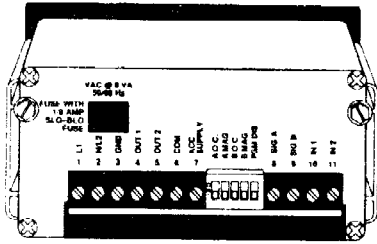
PGM P_Loc.on

PANEL LOCK

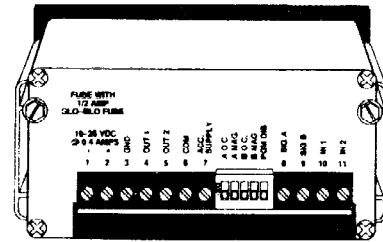
The operators would not normally alter the Reference Preset.



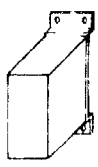
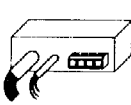
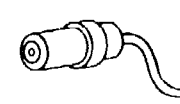

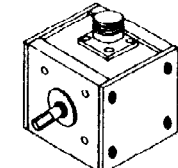
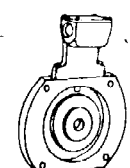
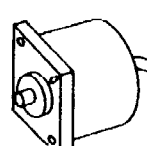
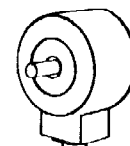
ORDERING INFORMATION...



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



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

PANA MOUNT ACCESSORIES		TRANSDUCERS	
		Series 52 Magnetic Pickups 	Series 53 Zero-Speed Pickups 
MODEL DESCRIPTION	PKG	Series 31 QUBE Roto-pulsers® 	Series 76/77 Roto-pulsers® 
PM21S Dual Differential Receiver with Transducer Supply	A	Series 40 Rotopulsers® 	Series 60 Roto-pulsers® 
PM28S Dual Universal Input Amp and Supply	A		
PM64S Analog to Frequency Converter	A		
HFDQ4 HighFrequency Quadrature ÷ 4 Module	B		

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 not 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
2. Name of responsible person
3. Purchase order number
4. Return shipping instructions