

The **MAX jr Count 4** is a dual-function totalizer and rate indicator in one compact unit. Menu-driven programming simplifies setup procedures, and advanced operation make it the best value for industrial indicator applications.

FEATURES

- ◆ 8 Digit Totalizer with Overflow Indication
- ◆ Add/Subtract or Quadrature Counting
- ◆ 5 Digit Rate Indicator
- ◆ Count Averaging and Time Averaging for Rate
- ◆ Independent Totalizer and Rate Input Calibrators
- ◆ Independent Totalizer and Rate Decimal Points
- ◆ Remote Reset and Stop Count Inputs
- ◆ Solid State or Contact Closure Inputs
- ◆ Non-volatile Totalizer
- ◆ Program Disable Switch

KEY SPECIFICATIONS

- 8 Digits, 0.3" LED Display
- 10 kHz Count Rate
- 0.01% Rate Accuracy
- 5 Decade Input Calibrators
- +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

INDEX TO CONTENTS

Overview	page 2
Specifications	page 3
Operation	pages 4 – 5
Programming	pages 6 – 7
Installation	pages 8 – 9
Applications	pages 10 – 11
Ordering Information	page 12

OVERVIEW...

ENGLISH PROMPTS

- Easy to Read
- Simplifies Programming

METAL ENCLOSURE

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



LED DISPLAY

- 8 Decades with Overflow
- 0.3" High Intensity
- Filtered for High Contrast
- Alphanumeric Prompts

SEALED FRONT PANEL

- NEMA 4 Rated
- Oil and Water Tight
- Chemical Resistant

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

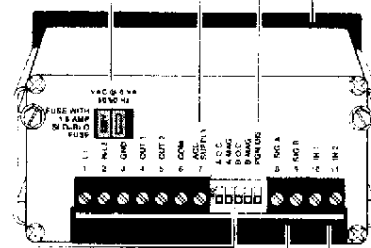
- Inhibits Run/Program Selection
- Prevents Unauthorized Changing of Programming Information

NEOPRENE GASKET

- Seals Front Panel

AC POWER INPUT

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



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.

Totalizer:

Decades:	\pm 8, bidirectional with overflow
Operation:	
Add/Subtract	Input A adds; B subtracts
Bidirectional	Inputs A and B in quadrature
Reset:	Reset to 0
Count Rate:	DC to 10 kHz

Count Calibrator: 0.0001 to 9.9999 common to A and B

Rate Indicator:

Decades:	5 max., with overflow
Operation:	
Add/Subtract	Rate of Input A
Bidirectional	Rate of Input A
Front Panel Reset:	Starts new Rate Measurement
Input Rate:	DC to 10 kHz

Rate Calibrator: 0.0001 to 99999.

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.

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:	50 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 OVF Overflow Indicator
Decimal Point:	(1) each for Totalizer and Rate Displays: Programmable from X.XXXX to XXXXX.

Keyboard: Sealed, tactile response 6 positions

Program Security: Program Disable switch
Front Panel Reset disable

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

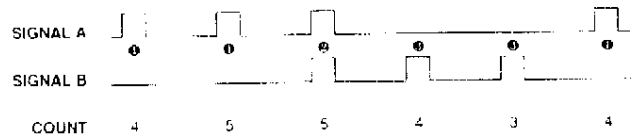
Press  to clear error.

OPERATION...

TOTALIZER

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.



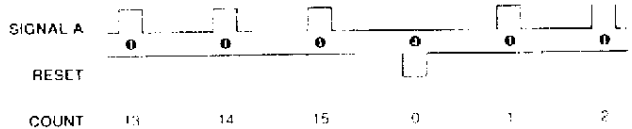
Count sequence for add/subtract operation

COUNT CALIBRATOR

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

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

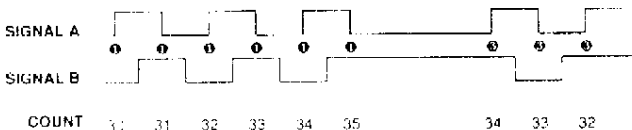
For example, to display "six packs" instead of bottles, set the calibrator to (1 ÷ 6), or 0.1667. If the calibrator value is greater than 1, counting will occur in "bursts" (e.g. ... 2, 4, 6, ...).



Count sequence for add/subtract operation with reset

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. If the reset input is edge sensitive, the counter will reset and continue to count if reset is held active.

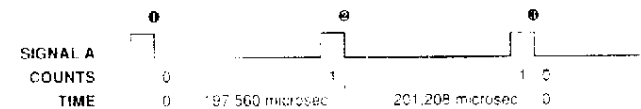


Count sequence for bidirectional operation

RATE INDICATOR

TIME INTERVAL MEASUREMENT

① Measurement begins on the negative edge of Signal A. Input counts are accumulated, and the time between negative edges of the input is measured. ② Frequency is obtained by dividing the number of counts by the time interval. ③ A measurement is completed and a new one begun on the same pulse, so that no input information is lost.

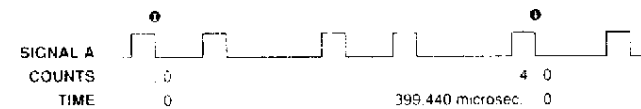


Time Interval Rate

RATE CALIBRATOR

The Rate Calibrator converts the input frequency into engineering units for display. Its value is determined by:

$$\text{Rate Calibrator} = \frac{\text{Displayed Units}}{\text{Input Frequency (Hz)}}$$



Rate with Count Averaging (set to 4)

RATE AVERAGING

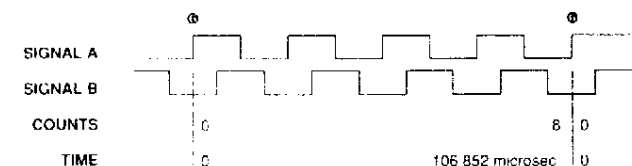
① The minimum number of input pulses required for each measurement can be programmed to provide a smoother rate display when the input pulses are irregularly spaced. ② The minimum measurement period can be set to slow down the display updates when the input frequency is high.



Rate with Time Averaging (set to 2.0 sec)

BIDIRECTIONAL (QUADRATURE AB)

① Rate is measured on Signal A using X2 logic (both edges). When the input is less than a 50% duty cycle, or at very low frequencies, setting the Rate Counts to an even number will reduce rate fluctuations.



Rate with Bidirectional Input

KEYBOARD AND DISPLAY FUNCTIONS

DISPLAY ANNUNCIATORS

- **PGM** turned on in Program Mode
- **OVF** indicates count value has exceeded ± 99999999
- **OVF** also indicates Rate below minimum input frequency

DOWN CURSOR

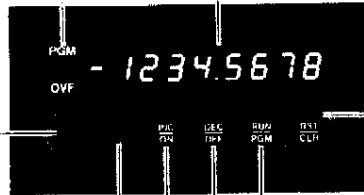
- Alternates Run Mode display between Totalizer and Rate Displays
- Scrolls through Program Mode menu lines (with "wrap around" from last line to first)

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)
- Shifts (selects) Rate Calibrator (line 6) decimal point to the left



PROMPT AND DATA DISPLAY

- Minus sign indication on negative count values
- Selectable Totalizer decimal point
- Selectable Rate Display 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)
- Shifts (selects) Rate Calibrator (line 6) decimal point to the right

NUMERIC DATA ENTRY

BEFORE	KEYPRESS	AFTER
PGM \llcorner 05000		PGM \llcorner 00000

EXPLANATION

The Clear key can be used to zero the data value at any time. (Used only on the Count Calibrator line 4, and Rate Calibrator line 6.)

BEFORE	KEYPRESS	AFTER
PGM \llcorner 00000		PGM \llcorner 00000

The Right cursor selects one of the digits to be changed. The selected digit is highlighted and appears brighter than the other digits.

BEFORE	KEYPRESS	AFTER
PGM \llcorner 00000		PGM \llcorner 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
PGM \llcorner 10000		PGM \llcorner 10000

EXPLANATION

The Decrement/Off key is used to decrease the number of decimal places (shifts the decimal point to the right). This function is only used on the Rate Calibrator (line 6) when no digit has been selected with the Right cursor.

BEFORE	KEYPRESS	AFTER
PGM \llcorner 10000		PGM \llcorner 10000

The Increment/On key is used to increase the number of decimal places (shifts the decimal point to the left). This function is only used on the Rate Calibrator (line 6) when no digit has been selected with the Right cursor.

PROGRAMMING...

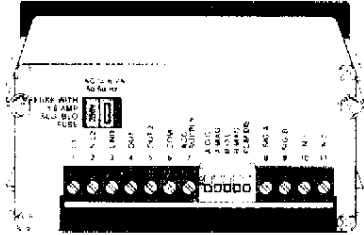
LINE	FUNCTION	DESCRIPTION
RUN MODE		
1	TOTALIZER DISPLAY	Value of input counts displayed with Decimal Point selection (line 3) and multiplied by Count Calibrator (line 4). Totalizer is set to zero when remote reset is activated, or when front panel Reset key is pressed and Panel Reset (line 11) is On.
2	RATE DISPLAY	Rate of Signal A is displayed with the Rate Decimal Point (line 5) and multiplied by the Rate Calibrator value (line 6). The value is blanked: 1) upon power-up; and 2) after the front panel reset key is pressed (if Panel Reset is On); until a rate measurement is completed.
PROGRAM MODE		
Entered by pressing the RUN/PGM Key when the PGM DIS switch is Off (down position).		
3	TOTALIZER D.P.	Selection of Totalizer Display decimal point position is made with the Right cursor. Setting can be 1 to 4 decimal places or none.
4	COUNT CALIBRATOR	Multiplies input pulses to display counts in engineering units. (See editing on page 5.) Note that the Input Operation (line 9) changes the input count logic between X1 (for A-B) and X2 (for quadrature AB).
5	RATE DECIMAL POINT	Selection of Rate Display decimal point position is made with the Right cursor. Setting can be 1 to 4 decimal places or none.
6	RATE CALIBRATOR	Multiplies input frequency to display rate in engineering units. (See editing on page 5.) Note that the Input Operation (line 9) changes the input count logic between X1 (for A-B) and X2 (for quadrature AB).
7	RATE COUNTS	Specifies 1 to 99 as the minimum number of input pulses needed to complete a rate measurement. Input frequency variations can be smoothed by using count averaging.
8	RATE PERIOD	Specifies 0.1 to 9.9 seconds as the minimum period (time) needed to complete a rate measurement. Rate Display updates are limited by the Rate Period and input signal.
9	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.
10	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.
11	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.
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.		
12	INPUTS TEST	Display of active signal and control inputs. The indicators R 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.
13	FRONT PANEL TEST	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.
14	DIGITS TEST	The display shows a constant pattern to verify that each display digit is functioning.
15	SEGMENTS TEST	All display digits and annunciators are illuminated to verify proper operation.

PROGRAMMING...

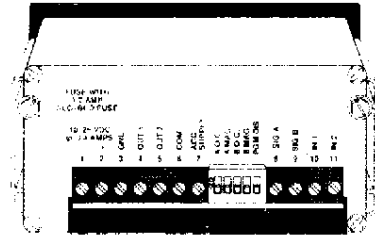
LINE	PROMPTS	DATA	
1	12345678	Totalizer display	resets Totalizer
		selects display line	
2	r 12345	Rate display	blanks rate display and starts a new measurement
		enters Program Mode	leaves Program Mode
FACTORY PROGRAMMING SHOWN IN THIS COLUMN			
3			
4			
		sets data to zero	selects a digit
		subtracts 1 from digit	subtracts 1 from digit
5			
6			
		less decimal places	less decimal places
		more decimal places	selects a digit
7			
8			
9			
10			
11			
			leaves Program Mode
12			
	no inputs active	Signal A low	Signal B low
			Stop Count (In 1) low
			Reset (In 2) low
13			
	no keys pressed	all keys pressed	press each key to test
14		any other pattern indicates a malfunction	
15		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.



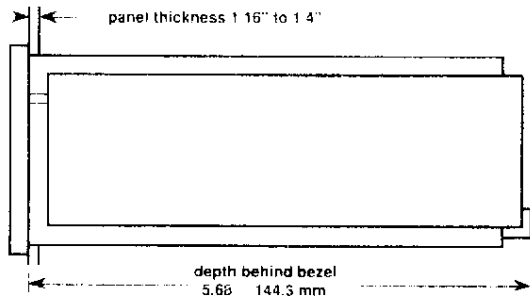
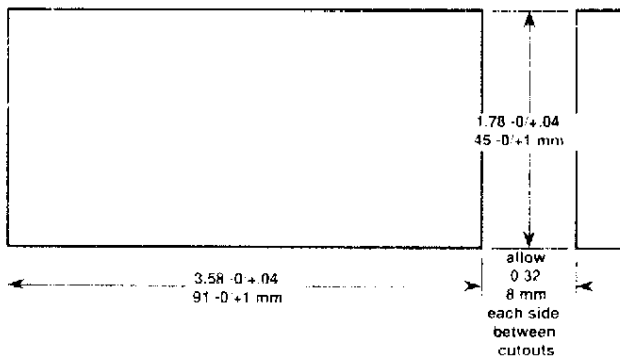
MCJR4-S-00



MCJR4-D-00

A. PANEL MOUNTING

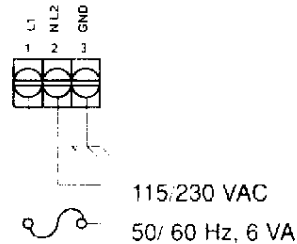
Make a panel cutout as shown. If the installation requires sealing, the adhesive gasket (supplied) may be applied to the bezel side of the panel. Remove the hex washer head screws and slide the panel mounting straps out of the guides. Slide the unit through the panel cutout and insert the straps into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



B. INPUT POWER

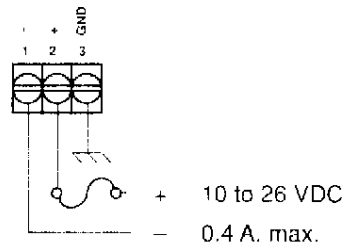
AC POWER (MCJR4-S-00)

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 (MCJR4-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.



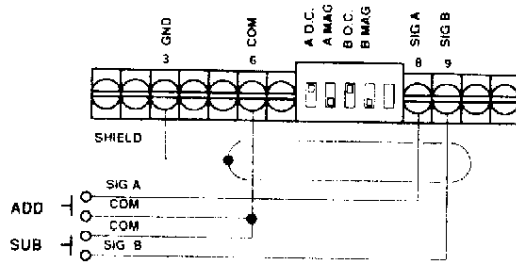
INSTALLATION...

C. COUNT INPUTS

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

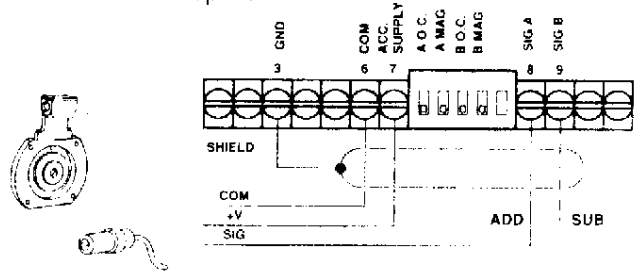
CONTACT CLOSURES

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.



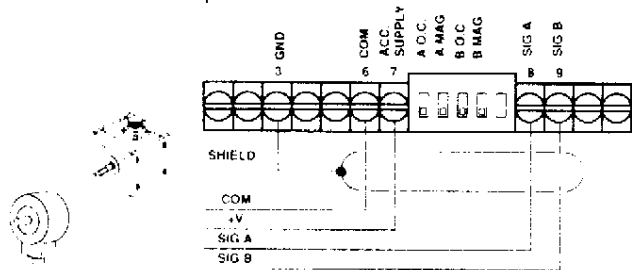
OPEN COLLECTOR DEVICES

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



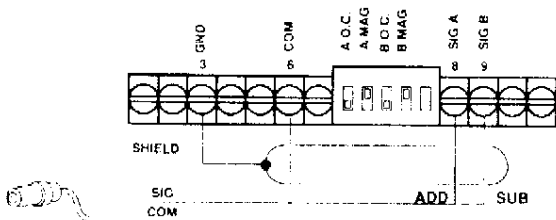
BIDIRECTIONAL TRANSDUCERS

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

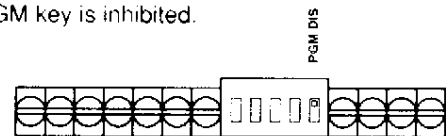
Set switches MAG to the Up position. Program Input Operation for A-B, and Inputs A and B for Hi Speed.



D. PROGRAM DISABLE SWITCH

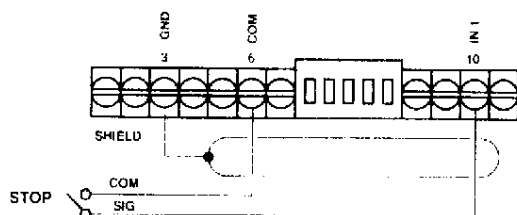
Set the switch to the Up position to prevent unauthorized program changes.

The RUN/PGM key is inhibited.



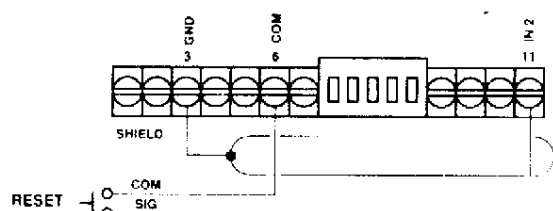
E. STOP COUNT INPUT

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

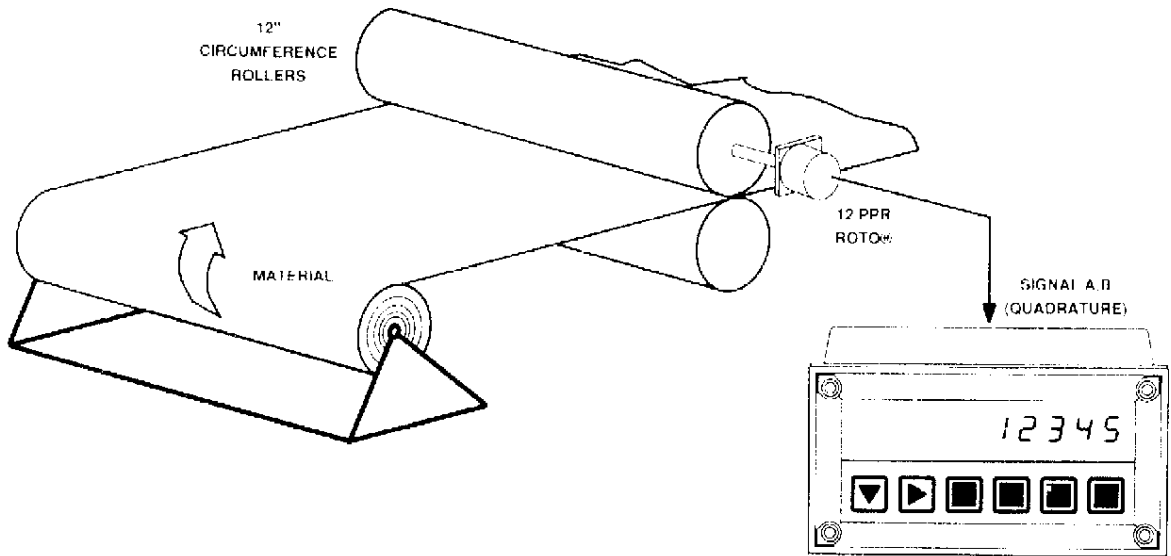


F. RESET INPUT

The Totalizer is reset once for each switch closure and continues to count.



APPLICATIONS...



LENGTH and WEB SPEED

The application above totalizes material usage and also monitors the web speed. Since the material draw will be stopped and started periodically, a bidirectional input is required. The rollers which couple the drive to the material have a 12 inch circumference. A Rotopulser's resolution of 12 PPR allows the material usage to be displayed inches, feet, yards, or metric units. The time interval rate measurement is still accurate to 0.01%, regardless of input resolution.

PGM *dP OFF*

TOTALIZER D.P.

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

PGM *cC 05000*

COUNT CALIBRATOR

For inches, the value is [12 inches / 24 pulses] = 0.5000 , for footage, [1 foot / (2 x 12 pulses)] = 0.0417 .

PGM *r dP 0*

RATE DECIMAL POINT

Top line speed is 20 inches/sec. To monitor the web speed to 0.1 inches/sec accuracy, set the rate decimal point to 1 decimal place.

PGM *rC 10000*

RATE CALIBRATOR

At 20 inches/sec, the input frequency is: (20 ips x 12 ppr x 1 rev / 12 inches) = 20 Hz. To display 20.0 inches/sec, set the rate calibrator to: (200 tenth-inches per second ÷ 20 Hz) = 10.000 .

PGM *r-CCtS 01*

RATE COUNTS

The count averaging is left at the factory programmed value of 1.

PGM *r-PEr 10*

RATE PERIOD

The time averaging is left set to 1.0 seconds, which sets the display update rate.

PGM *in-opbid*

INPUT OPERATION

The count mode should be set to Bidirectional for quadrature inputs. (Note that the input logic used is X2 — i.e. counting occurs on both edges of Signal A.)

PGM *in-Rb.H1*

INPUTS A AND B

Since the input is a solid state device, Signals A and B are programmed for high speed operation.

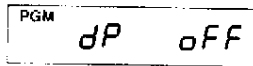
PGM *P-rSt.on*

PANEL RESET

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

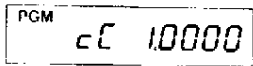
PRODUCTION RATE and TOTAL

The application below indicates the production rate and totals the number of boxes produced. The varying number of workers putting boxes on the conveyor results in production rates between 30 and 300 boxes per minute. The rate averaging features are used to provide a stable rate display throughout that range.



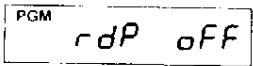
TOTALIZER D.P.

The decimal point is left off so that the totalizer displays boxes.



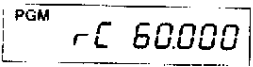
COUNT CALIBRATOR

The sensor provides 1 pulse per box, so the Count Calibrator is set to: (1 box = 1 pulse) = 1.0000 .



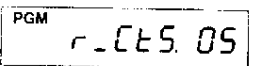
RATE DECIMAL POINT

To display production rate in boxes/min, the decimal point is left off.



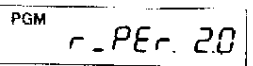
RATE CALIBRATOR

At a rate of 60 boxes/min, the input frequency is calculated by as:
 (60 boxes/min x 1 min/60 sec x 1 pulse/box) = 1 pulse/sec = 1 Hz.
 The Rate Calibrator is set to: (60 boxes/min ÷ 1 Hz) = 60.0000 .



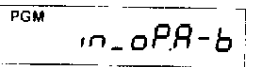
RATE COUNTS

At its slowest rate of 30 boxes/min (or 0.5 Hz), the rate display would update every 2 seconds and shown any input changes. Setting the minimum number of counts to 5 averages irregular box spacings.



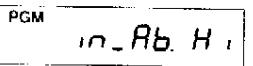
RATE PERIOD

At the fastest rate of 300 boxes/min, the minimum time of 2.0 seconds slows down the rate display updates.



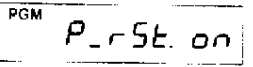
INPUT OPERATION

This application uses only the Add (Signal A) input. (Note that the input logic used is X1 – 1 count/pulse.)



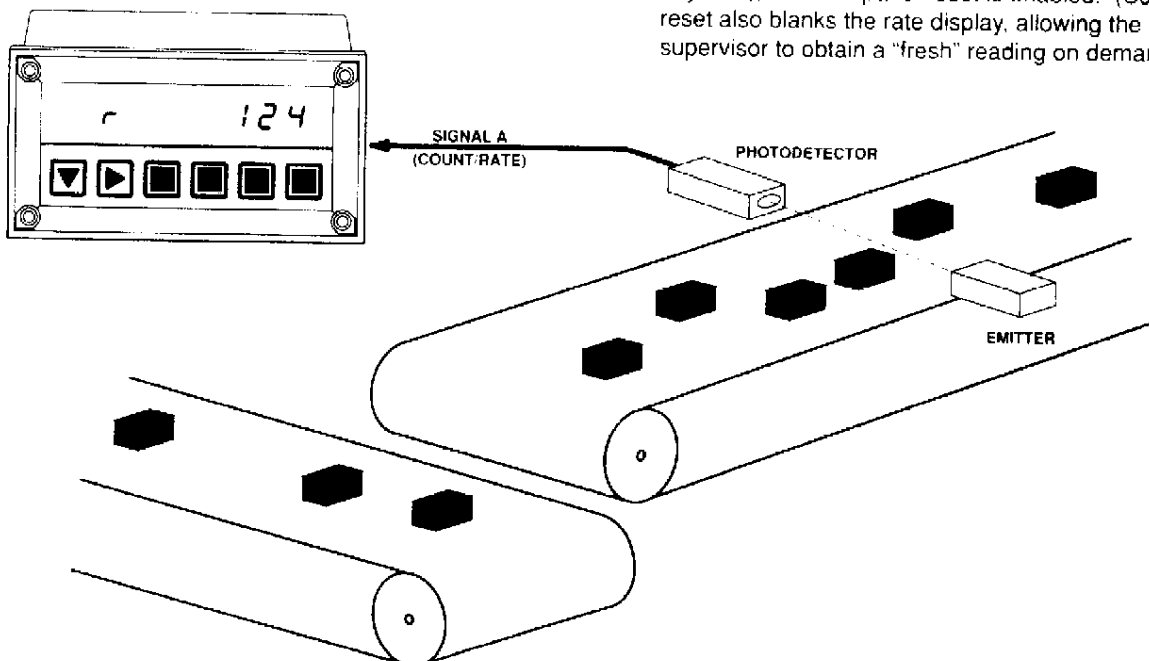
INPUTS A AND B

Since the input is a solid state device, Signals A and B are programmed for high speed operation.

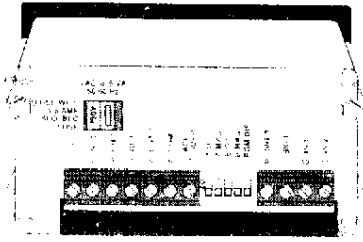


PANEL RESET

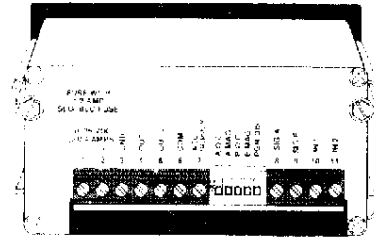
For operators to clear the totalizer after a production period (shift, day, etc.), the front panel reset is enabled. (Using the front panel reset also blanks the rate display, allowing the operator or supervisor to obtain a "fresh" reading on demand.)



ORDERING INFORMATION...



Model No.: MCJR4-S-00
Totalizer Rate Indicator
115-230 VAC Operation



Model No.: MCJR4-D-00
Totalizer/Rate 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.

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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