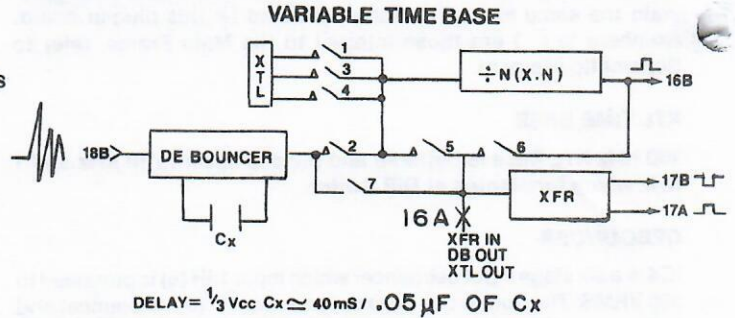


μP COMPATIBLE



FEATURES

- 30,000 XTL Control Time Bases
- 10,000 Rate Multiplier Combinations
- Uncommitted Input De-Bouncer
- Built-in Reset-Transfer
- All CMOS Construction
- 17 Signal Routing Combinations
- TTL or CMOS "3T" BCD Output
- 1/4 DIN Aluminum Case
- Dual Digital Limits



APPLICATIONS

- Rate Controller with "Hi-in-Lo" Limits for Flow, RPM, Frequency, Speed, Volume, etc.

DESCRIPTION

Dual limits with logic outputs, relay outputs, front panel indication, limits set by clearly visible front panel thumbwheels; direct reading rate multiplier by micro dip switches; programmable decimal points; overflow indication, logic and relay, dual programmable input de-bouncers; optional 3T BCD, TTL or CMOS. μp Compatible; input pulse can be divided from 3 to 10,000; (X.0003 to X.9999) internal XTL Oscillator programmable from 0.1Hz to 100 KHz (0.01 Hz - 10 KHz available); internal reset-transfer logic for instant accurate display; 1/2" (13mm) bright display; screw terminals for ease or wiring; all ICs and function boards plug-in, conformally coated; all CMOS (12V) construction for industrial environments; and on; and on; and on. — That's what the 818 is. Its flexibility and capabilities are so numerous that new applications arise daily.

The best thing is to explain how the 818 works to solve your out of the ordinary problems of rate, motor speed, flow, speed, batch, production, etc.

The 818 uses the same Main Frame of the 810 (see pages 9 to 11) and all its features remain the same. What the 818 does different than any other counter including the 810 is its ability to route and manipulate digital signals, see circuit description and programming sections.

SPECIFICATIONS

- Input Frequency dc to .5MHz
- Input Level CMOS Logic "0" < 3V, Logic "1" > 6V
- Count Pulse Width 400ns. Min.
- Hold Pulse Width 3μs Min.
- Reset Pulse Width 3μs Min.
- Up/Down Setup Time 1μs Min.
- Inputs Source Current 250μA Nominal
- Equal Pulse Width 5μs Min.
- Zero Pulse Width 5μs Min.
- Carry Pulse Width 5μs Min.
- Power Requirements 12Vdc ± 10% @ 150mA
- Operating Temperature 0 to + 60 °C
- Storage Temperature -20 to + 80 °C

Notes: Limited to 200Khz when using BCD Output or Limits Output

INPUT DEBOUNCER

Input Source Current 750μA
 Input Capacitance 5pF
 Input-Output Delay 4 Clock Pulses after Last Bounce
 Clock Frequency Vs Cx (internal) f=A/Cx.
 A = 1/3 Vcc. Cx in pF, Ex 50000 pF = 40 mS Delay

LIMITS & LATCH

- Output Logic Level "0" < 3V; "1", > 6V
- Propagation Delay 1μs
- Latch Reset > 1μs
- Latch Reset Source current 250μA

POWER SUPPLY

- Input 115/230 VAC ± 15% 50-60 Hz
- Output 12Vdc ± 10% @ 200mA

RELAYS/TRIACS

- Make Time 3.0mS/.1mS
- Break Time 1.0mS/.1mS
- Maximum Load 1A Resistive

TRISTATE BCD

- Output (CMOS) CMOS Compatible
- Output (TTL) LPTTL 10 Loads
- Output Format 8 Bit (2 Digits) or 24 Bit (6 Digits)
- Input Disable All Six Digits (memory)
- Output Disable 3 Grouped in 2 Digits

VARIABLE TIME BASE

- Time Base 100 KHz Crystal Oscillator
- Time Base Accuracy ± 0.005%
- Time Base Stability ± 0.001%/°C
- Frequency Ranges 100 KHz, 10 KHz, 1 KHz any one (Switch Selectable) Divided By Any Number Between 3 and 9999 (X.0003 to X.9999) (10 μs to 10 s)

- Outputs CMOS Compatible
- Debounce Input TTL, CMOS. Open Collector or contact
- Debounce Input Protection ... 300 Vrms Maximum for 2 Seconds
- Debounce Delay Int. OSC X1 Through 4096
- Display Hold Conditioner Input CMOS, Open Collector or Contact
- Display Hold Conditioner Frequency Response 1 MHz
- Function Selectability Internal DipSwitch

Tucson, Az. 85714

B	GND.	40K	10K	100K	100K	100K	100K	1K	4K	1	4	100	400	10	40	17	18	19	20	21	22	23	24	25	26	27	28	29	30
A	+12Vdc	20K	80K	O.D.2H&T	O.D.3TT&HT	800K	200K	8K	2K	8	2	800	200	80	20	FOUT/CLK-IN	CTR CLR	CTR UP/DN	CTR CLR	LIMITS "IN"	LO LIM. LATCH	CARRY	HI LIM. LO	HI LIM. HI	HI LIM. HI	HI LIM. HI	HI LIM. HI	HI LIM. HI	HI LIM. HI
MOD. #											S/N #					CLK. OUT	DPLY. HLD OUT	DEBOUNCER	CTR. HOLD	DPLY. HOLD	CTR. LOAD	L. RESET	LO LIM. HI	BCD 8	BCD 4	BCD 2	BCD 1	BCD 0	LATCH

DATE: _____

CIRCUIT DESCRIPTION — CONNECTIONS

Since the 818 uses the 810 Main Frame, all basic connections remain the same except for those affected by this plug-in board. Numbers in () are those internal to the Main Frame, refer to Schematic Diagram.

XTL TIME BASE

100 KHz XTL Base is buffered and divided down to 10 KHz and 1 KHz which terminates at DIP Switch.

DEBOUNCER

IC4 is a six stage input debouncer which input 18B (5) is protected to 300 VRMS. The output can be taken at point "G" (no debounce) and jumpered to "H" or its debounced output can be programmed for a delay (make or break) by means of C7: X4, X16, X4096 means that the input signal, at these points is being delayed by multiples of four internal clock pulses of the de-bouncer. The debouncer frequency is set by C7. The delay is equal to about 40mS/5000PF of C7. So with C7 @ 5000PF X4 = 40mS (for most contact applications) X16 = 160mS and so on; so the input debouncer can be used to create a very long delay of the input pulse or as a contact debouncer only. By jumping A-G to H, the signal is presented to Dip Switch 6 for subsequent routing. (Unless otherwise specified C7 = 50,000PF and "H" is connected to C by the factory.)

RESET-TRANSFER

This circuit upon receiving a positive pulse at its input transfers the data from the register (Main LSI on 810 Bd.) to the display, and clears the register's content beginning a new cycle.

DIVIDE BY "N" (X.003 thru X.9999)

The four Micro Rotary Dip Switches give direct reading of the programmed divide by number, IC3 divides the input frequency and its output terminates at Dip Switch and at Edge Connector.

FUNCTION	SWITCH POSITIONS "ON"							IN	OUT
	1	2	3	4	5	6	7		
1.1 External Variable Time Base CMOS Input								16A	17A & 17B
1.2 External Variable Time Base Debouncer								16A	17A & 17B
2.1.1 XTL Timer 1mS Resolution									16A
2.1.2 XTL Timer 100µS Resolution									16A
2.1.3 XTL Timer 10µS Resolution									16A
2.1.4 XTL Timer Variable 3mS-9.999 Seconds									16B
XTL Timer Variable .3mS-.9999 Seconds									16B
XTL Timer Variable 30µs-99.99mS									16B
2.2.1 Direct Counter/Timer									18A
2.2.2 Mechanical Input Debouncer								18B	16A
2.2.3 - N Input To Counter								16A	16B
2.2.4 Mechanical Input to - N to Center								18B	16B
3.1 External Time Base to XFR								16A	17A & 17B
3.2.1 Fixed Internal Time Base									17A & 17B
3.2.2 Variable Internal Time Base .3mS-.9999S									17A & 17B
Variable Internal Time Base 3mS-9.999S									17A & 17B
Variable Internal Time Base 30µS-99.99mS									17A & 17B
3.2.3 Variable External Time Base								18B	17A & 17B

ORDERING INFORMATION

MODEL 818 X X X

BCD
 0 No BCD
 1 TTL BCD
 2 CMOS BCD
 0 Standard

POWER SUPPLY/RELAYS
 0 . . . No. Power Supply (12 Vdc only)
 1 . . . 12 Vdc and Relays
 2 . . . A.C. Power Only (115/230 Vac)
 3 . . . A.C. Power and Relays
 4 . . . 12 Vdc and Triacs
 5 . . . A.C. Power and Triacs
 X . . . Special (Specify)

Table 1 shows the 18 permissible combinations with their major results. New applications arise daily. IMC welcomes your valuable suggestions.

1. EXTERNAL VARIABLE RATE EVENT CONTROLLER

- 1.1 CMOS compatible signal input, Sw. 5 ON, Pulse Input at 16A, Results: Convert dozens to boxes, gallons to barrels, liters to tankers, etc.
- 1.2 Mechanical contact or CMOS Input Switch 2 ON, pulse input at 18B, Results same as 1.1; on both instances the +N Output at 16B should be externally connected to 18A (counter input) other connections as per 810 Main Frame Description.

2. TIME CONTROLLER

- 2.1 **Internal XTL Clock**
 - 2.1.1 1mS Resolution; Sw. 4 & 5 ON, Pin 16A should be externally connected to Counter Input (18A).
 - 2.1.2 100µS Resolution; Sw. 3 & 5 ON, Pin 16A should be connected to 18A.
 - 2.1.3 10µS Resolution; Sw. 1 & 5 ON; Pin 16A should be connected to 18A.
 - 2.1.4 Variable Resolution; either Sw. 4, 3 or 1 on (only one); dial desired "Divide By" Number on Micro Dip Sw. Output at Pin 16B must be externally connected to Pin 18A (counter input).
- 2.2 **External Time Clock**
 - 2.2.1 Direct: Apply CMOS Compatible Pulses to Pin 18A (Counter Input) refer to 810 Main Frame.
 - 2.2.2 Mechanical Input: (De-Bouncer): To Pin 18B Sw. 7 ON, Output at Pin 16A must be externally connected to 18A.
 - 2.2.3 Variable CMOS Compatible: Sw. 5 ON Input Pulses at Pin 16A, Dial Desired "Divide By" Number, Output at Pin 16B externally connected to 18A.
 - 2.2.4 Variable Mechanical: Sw. 2 ON Input Pulses at 18B, Dial desired "Divide By" Number, Output at 16B to Pin 18A.

3. AUTO TRANSFER (Time Base)

A positive pulse at Pin 16A generates a negative pulse at 17B normally used for updating the display (Display Hold) and a positive pulse at 17A normally used to clear the counter or presetting the counter.

- 3.1 External Time Base: Apply positive pulse at 16A, externally connect 17B to 20B (Display Hold) and 17A to 20A (Counter Clear). This function does not require any Sw. On.

3.2 Internal Fixed Time Base:

3.2.1 **1mS Fixed:** Switches 4 and 5 ON, a 1mS Time Base from XTL is used to drive the Auto XFR Pins 17B and 17A should be connected per 3.1 above. Of course, if Sw. 3 or 1 is used instead of 4, the time base would be 0.1mS or 0.01mS; but, the display will jitter excessively.

3.2.2 **Internal Variable Time Base:** Either Sws. 1, 3 or 4 On and 6 On, and the "Divide By" Switches at desired setting, connecting 17A to 20A and 17B to 20B converts the 818 to a **Variable Time Base Frequency-RPM-Rate Controller**. In all there are up to 30,000 possible combinations from 10µS to 10S in 10µS increments. The Time Base is available at Pin 16B and 16A for other uses, if required.

3.2.3 **External Variable Time Base:** Switches 2 and 6 ON, Input at 18B (Debouncer) either direct (without delay) by connecting "H" to "G" internally or through Debouncer and then setting the desired "Divide By" value. The Outputs at 17B and 17A should be externally connected to 20B and 20A respectively.

Since the outputs of the Reset-Transfer Circuit are uncommitted, the flexibility of the 818 is extended. This, however, means that they must be externally connected to the "Counter Clear" and "Display Hold" Inputs respectively (17A to 20A Counter Clear and 17B to 20B Display Hold).

All other connections must be made as described on the label and as explained under "Connections" on pages 10 and 11 of Model 810, where applicable.

All inputs and outputs are CMOS Compatible except for the Debouncer's Input which accepts contact closure, CMOS and is input protected up to 300V RMS.