

# MODEL 808

# 6 DIGIT UP/DOWN RATE CONTROLLER With Preset and Limit



IMC, Tucson, Az. 85714



## FEATURES

- 30,000 XTL Control Time Base
- 10,000 Rate Multiplier Combinations
- Uncommitted Input Debouncer
- Built-in Reset-Transfer
- All CMOS Construction
- 20 Signal Routing Combinations
- TTL or CMOS "3T" BCD Output
- 1/4 DIN Aluminum Case
- Counter and Limit Presets



## APPLICATIONS

Rate controller for flow, volume, weight, etc. with Counter Preset (for tare, offset) and digital limit for alarm.

## DESCRIPTION

The 808 is similar to the 818, except that 808 uses the same Main Frame as the 800 which offers Counter Preset and Limit Preset (see Model 800 Description on pages 1 to 3) instead of dual limits as the 818. All the features, flexibility and programming capabilities of the 818 remain the same. In addition, the 808 can be preset to start the count from any point of the full scale including zero. The counter and limit presets are (like in the 800) enabled by a single pulse (on the fly) and can be wired to prevent tampering. If the 808 is used as a Frequency, Speed, RPM or any other mode requiring Reset-Transfer (Counter Clear-Display Hold), the Counter Preset feature should not be used unless it is loaded automatically (at the end of Reset) such as in applications requiring an offset (Tare), or to indicate percentage (+ or -) of deviation from an established point. In this case, the 808 is automatically preset instead of cleared. If the Up/Down Input is Up (High), the 808 will display + % deviation from the preset point. If its Down (Low), it will display - %; ex. 100.00 preset, Up Count Mode, 150 pulses between XFR Pulses at Pin 16A, result: 101.50 or 101.5% from established preset. If in Down Mode, the 808 will display 98.5% of preset value.

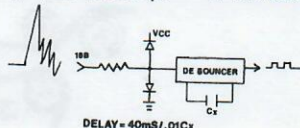
## SPECIFICATIONS

- 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.
- Limit & Preset Load Time ..... 500µs Minimum
- 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 or Limit 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



DELAY = 40mS / .01Cx

## LATCHED OUTPUTS

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

## POWER SUPPLY

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

## 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 (10µs to 10s)

- Outputs ..... CMOS Compatible
- Debouncer Input ..... TTL, CMOS, Open Collector or contact
- Debouncer Input Protection ..... 300 Vrms Maximum for 2 Seconds
- Debouncer 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

## ORDERING INFORMATION

MODEL 808 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)

**PROGRAMMING**

Table 1 shows the 17 permissible combinations with their major results. New applications arise daily. IMC welcomes your valuable suggestions.

**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. Dial + N. connect 16B to 18A.

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 800 Main Frame Description.

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

\*Preset Counter to desired reference value, connect 17A to 20B (Counter Load) 17B to 20A (Display Hold).

**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 800 Main Frame.

2.2.2 Mechanical Input: (De-Bouncer): To Pin 18B Sw. 7 ON, Output at Pin 16A must be externally connect 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.

**TOTALIZER**

- Count and display total.
- Count items and display in dozens, gross, cartons or other packaging units.  
Ex: 144 counts = Display of 1

**TIMER**

- Measure time in seconds, minutes or hours.
- Measure time in custom units.  
Ex: 7.5000 seconds = Display of 100.00%

**RATIO**

- Produce true ratio of two inputs  
Ex: 4000/2 = 2000.0
- Produce a modified ratio to increase reading resolution or indicate draw rate, % of elongation, etc.  
Ex: 2000/4000 = .5000  
Ex: 12345/54321 = 100.00%

**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.  $XFR \geq 20\mu s \leq 200\mu s$ .

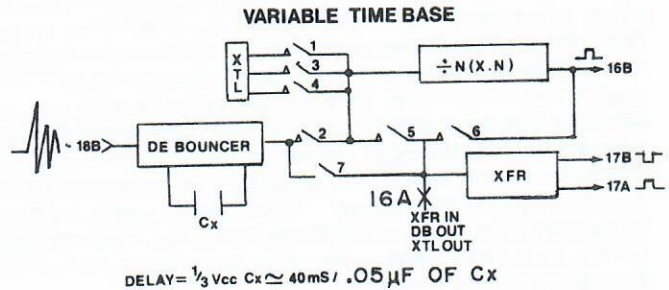
3.1 External Time Base: Apply positive pulse at 16A, externally connect 17B to 20A (Display Hold) and 17A to 21A (Counter Clear). This function does not require any Sw. On.

**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 21A and 17B to 20A converts the 808 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 20A and 21A respectively, CMOS Input at 18A (clock in).



**4. PERCENTAGE CONTROLLER (+ or -)**

By connecting 17B (Display Hold) to 20A and 17A to 20B (Counter Load), the 808 will indicate and control the percentage (%) deviation from a preset value).

Example: Assume 10,000 Hz = 100% (Dial 10000 on Counter Preset Switch), set Timer Base to 1Hz (Dip Switch 4 & 6 On and -N to 1000), connect 17A to 20B & 17B to 20A, apply Frequency input to 18A, connect Up/Down Control (19A) to VCC to find the + % deviation or to Ground to find the - % deviation from 100%, set Limit Switches, as required.

