# UP/DOWN COUNTER/CONTROLLER WITH PRESET AND LIMIT

**MODEL 800**

## MAIN FRAME

## FEATURES

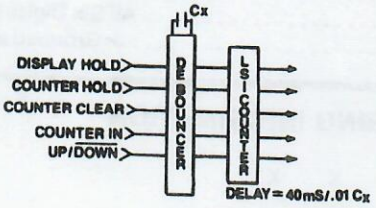
- Up/Down CMOS Counter
- 6 Digit 1/2" (13mm) Display
- Programmable Decimal Points
- Latchable Preset
- Latchable Limit
- Latchable Overflow
- 3T BCD TTL or CMOS
- Schmitt Trigger/Debouncer
- Relay Outputs
- Splash Proof Cover
- 1/4" DIN Aluminum Case

## DESCRIPTION

The 800 Main Frame consists of a Mother Board where the LSI 6 Decade Up/Down Counter, IC and supporting hardware are located; a six decade Display Board with high efficiency LEDs; a Preset/Limit Board where the Thumbwheel Switches and Decimal Point Selector are located and two connectors, one connector is reserved for the "3T" BCD Buffer and the other for Functional Options such as Timer, Clock, AMP/Hour, WATT/Hour, Rate Converter, Frequency, RPM, etc. In addition, an Internal Power Supply converts 115/230 VAC to 12Vdc for the high noise immunity system, Relays, when specified, are also contained on this board.

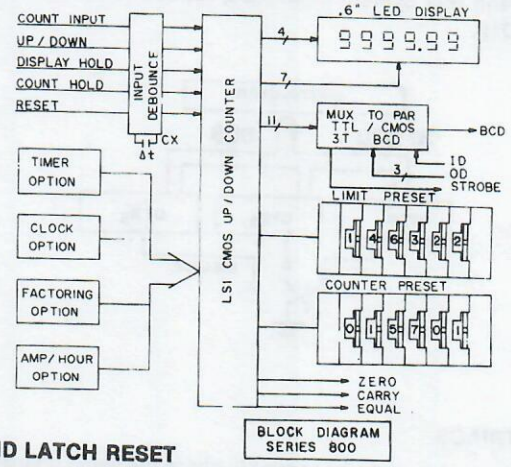
The 800 Model has provisions for presetting the counter and setting an "equal" limit. Both preset and limit are entered by thumbwheel switches in conjunction with LOAD push-buttons, all on the front panel. Alternatively, they can be loaded by externally controlling the appropriate pins at the Mother Board Edge-Connector.

The front panel indicator shows when a limit has been exceeded. Latched output (logic and relay) are provided for the equal, carry (overflow), and zero pulses. An overflow condition is indicated by an all-decimal points display readout. The latch function can be reset or disabled by depressing the front panel LATCH RESET push-button or by leaving the corresponding pin on the edge-connector open.



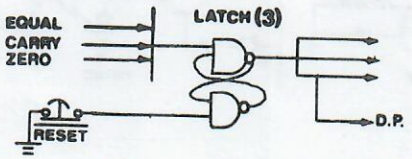

### INPUT DEBOUNCER

A Five-stage input debouncer interfaces mechanical contacts with the main LSI Counter. It debounces both "make" and "break" contacts. Its delay is selectable either at the factory or by field-installation of an internal capacitor. Debounce is used on the following signals; display hold, counter hold, counter clear, count input and up/down control. When the debouncer is not required, the absence of the capacitor allows the instrument to respond at its maximum input signal speed capability. (The time delay associated with the debounding function limits the input signal speed.) When the debouncer is not used, an integral Schmitt Trigger provides hysteresis on the count input to improve noise immunity and reduce the possibility of double-triggering on slow-rising pulses.



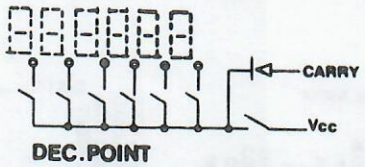

### LATCH AND LATCH RESET

Latch and latch reset are standard functions on all models. They provide the user with information on when a process has exceeded a predetermined limit or maximum count — even when the equipment is unattended. It latches the equal, carry (overflow) and zero pulses converting them into levels to indicate when they have occurred. The latch function operates regardless of the direction of the count. The latch function can be disabled by leaving the "latch reset" pin disconnected. The function can be ordered in a tamper-proof configuration.



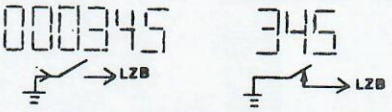

### DECIMAL POINTS

Any one of six decimal points can be selected by a dip-switch on the switchboard. Only one decimal point can be on at a time. Otherwise, the LSI Chip will be damaged. An automatic all D.P. Condition indicates overflow and occurs during the 999999 → 000000 or 000000 → 999999 transition.




### LEADING ZERO BLANKING (LZB)

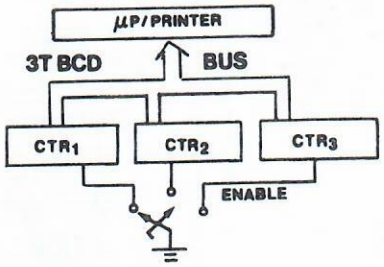
Leading zero blanking is produced by a low state at the LZB input. Its purpose is to facilitate reading of the display and reduce power drain.



# MODEL 800

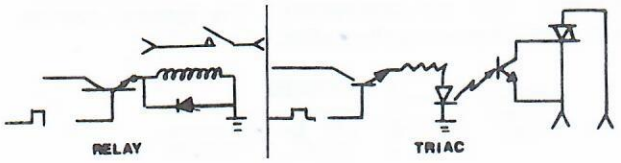
### TRISTATE BCD OUTPUT

The tristate BCD output option is available for either CMOS or TTL Interfaces. It is equipped with an input disable control (memory) and three output disable lines. The latter can be grouped in 8-bit format (2 digits) or full 24-bit (6 digits) format. A Strobe Line is also available to indicate when data has been transferred to all six latches. The tristate BCD Option can be provided as a factory-installed option or it can be installed in the field at the 44-pin edge connector on the Mother Board. It terminates at the main 60-Pin Edge Connector. This option is ideal for Microprocessor and Bus System Interfaces, (Strobe terminates at Pin 28B [BCD-D1]).



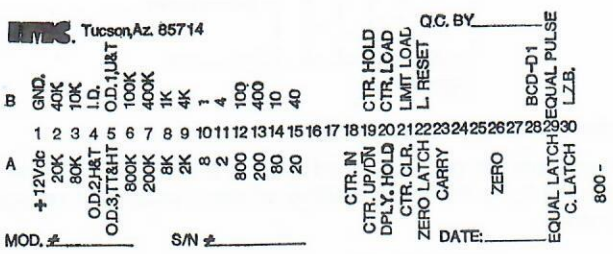

### RELAYS/TRIACS

The optional relays and power supply share the same board when both are ordered, although they can be ordered separately. The relays are single-pole, single-throw type. They are factory wired for "normal open" or "normal closed". The contacts are rated at 1A, resistive load at 115/230 Vac. The triacs are zero crossing type and optoisolated to 1000 V AC/DC. **Note:** Use external arc suppression when driving inductive loads with relays or triacs.




### POWER SUPPLY

The power supply provides a 12-Vdc ±5% output at 200mA. The output is sufficient to power any instrument in the 800 Series. The unit has a split primary for either 115 or 230 Vac, 50-60-Hz input. Input regulation must be within ±10%. Its isolation is greater than 1200V RMS.




## SPECIFICATIONS

- Input Frequency ..... dc to 1MHz
- 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 ..... 500µs 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 Limit Output

### INPUT DEBOUNCER

Input Source Current ..... 750µA
Input Capacitance ..... 5pF
Input-Output Delay ..... 4 Clock Pulses after Last Bounce
Clock Frequency Vs Cx ..... = A/Cx.
A = 1/3 Vcc. Cx in pF, Ex 10000 pF = 40 mS Delay

### 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% @ 200mA

### RELAYS/TRIACS

Make Time ..... 1.0mS/.1mS
Break Time ..... 0.5mS/.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

### ORDERING INFORMATION

MODEL 800 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)

See Page 29 for Mechanical Specifications.