

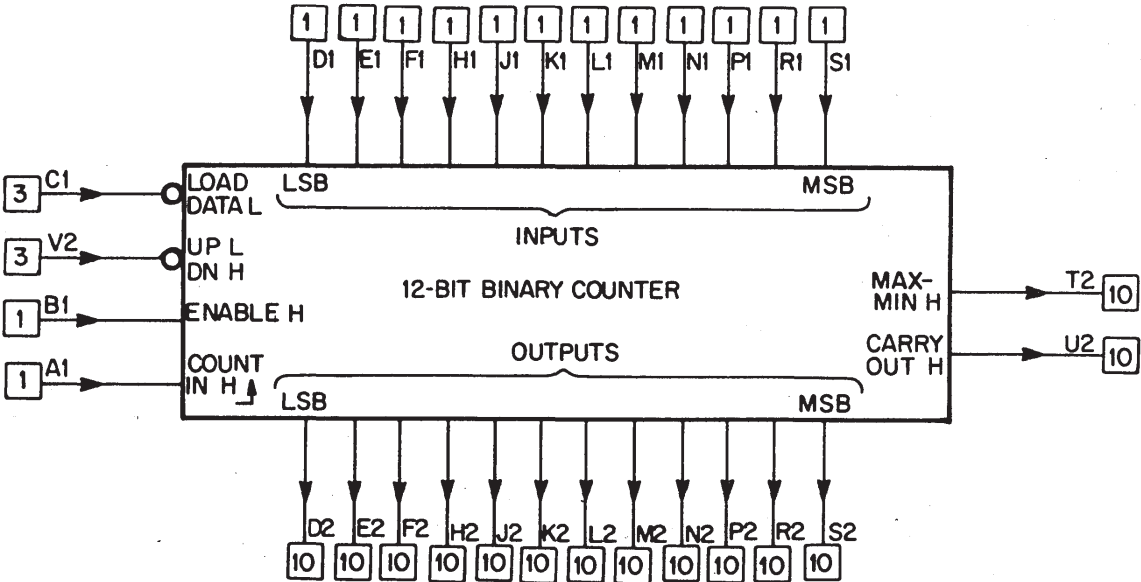
M236

12-BIT BINARY UP/DOWN COUNTER

| |
|----------|
| NUMERIC |
| M SERIES |

Length: Standard
Height: Single
Width: Single

Price:
\$50



| | | |
|-------|-----------|--------|
| Volts | Power | Pins |
| +5 | mA (max.) | A2 |
| GND | 330 | C2, T1 |

The M236 is a 12-bit synchronous binary up/down counter. It has a single control input that can switch the counting mode from up to down without disturbing the contents of the counter. The M236 is fully cascadable and programmable. Cascading simply involves paralleling the respective ENABLE, LOAD DATA, and UP/DOWN signals while one CARRY-OUT signal drives the COUNT IN input of the next M236.

APPLICATIONS

The programmability of the M236 makes it ideal for use as a modulo-N divider. Modification of the count length is easily done by setting the DATA input lines to N and loading each time the count down reaches zero. When counting down the MAX-MIN output goes HIGH when all twelve bits equal zero.

FUNCTIONS

COUNT IN: Counting occurs on a positive transition of the COUNT IN line. This input must remain LOW for at least 50 ns before the count. Time between pulses can be no less than 50 ns. There is no maximum for pulse width or time between pulses. The maximum count frequency is 10 MHz.

ENABLE: The ENABLE input permits counting while it is HIGH, and disables counting while it is LOW. Critical timing factors that must be observed when changing the enabled state are:

1. To enable counting, the ENABLE line must remain HIGH from 70 ns before to 30 ns after the positive transition of the COUNT IN signal.
2. To disable counting, the ENABLE line must go LOW at least 40 ns before the COUNT IN signal goes LOW, and remain LOW until at least 40 ns after the positive transition of the COUNT IN signal.

LOAD DATA: The outputs assume the same state as their associated data inputs, independent of the count, when LOAD DATA goes LOW for at least 50 ns. Loading data overrides all other input signals and may be done at any time. The maximum propagation delay from the LOAD DATA input to any output is 50 ns. The DATA inputs will have no effect upon the outputs within 15 ns after the LOAD DATA line goes HIGH.

UP/DOWN CONTROL: A logic LOW on this line yields an up count. A logic HIGH on this line yields a down count. This control signal may be changed when the COUNT IN signal is HIGH. It must not be changed while the COUNT IN is LOW or during the 40 ns period before the COUNT IN signal goes LOW.

CARRY OUT: When the counter has reached either the maximum up count state (7777 octal) or the minimum down count state (0000 octal), the CARRY OUT signal follows the COUNT IN signal. The maximum delay time from the COUNT IN transition to the CARRY OUT transition is 60 ns.

MAX-MIN: This provides a logic HIGH output when the counter has reached either the maximum up count state (7777 octal) or the minimum down count state (0000 octal). The maximum delay time for this output measured from the positive going edge of the COUNT IN signal is 120 ns. This signal is also used to accomplish look-ahead for very high speed operations.

Cascading: When cascading M236's, the CARRY OUT should be connected to the COUNT IN of the next more significant unit. Also, the respective LOAD DATA, UP/DOWN, and ENABLE signals must be paralleled.