

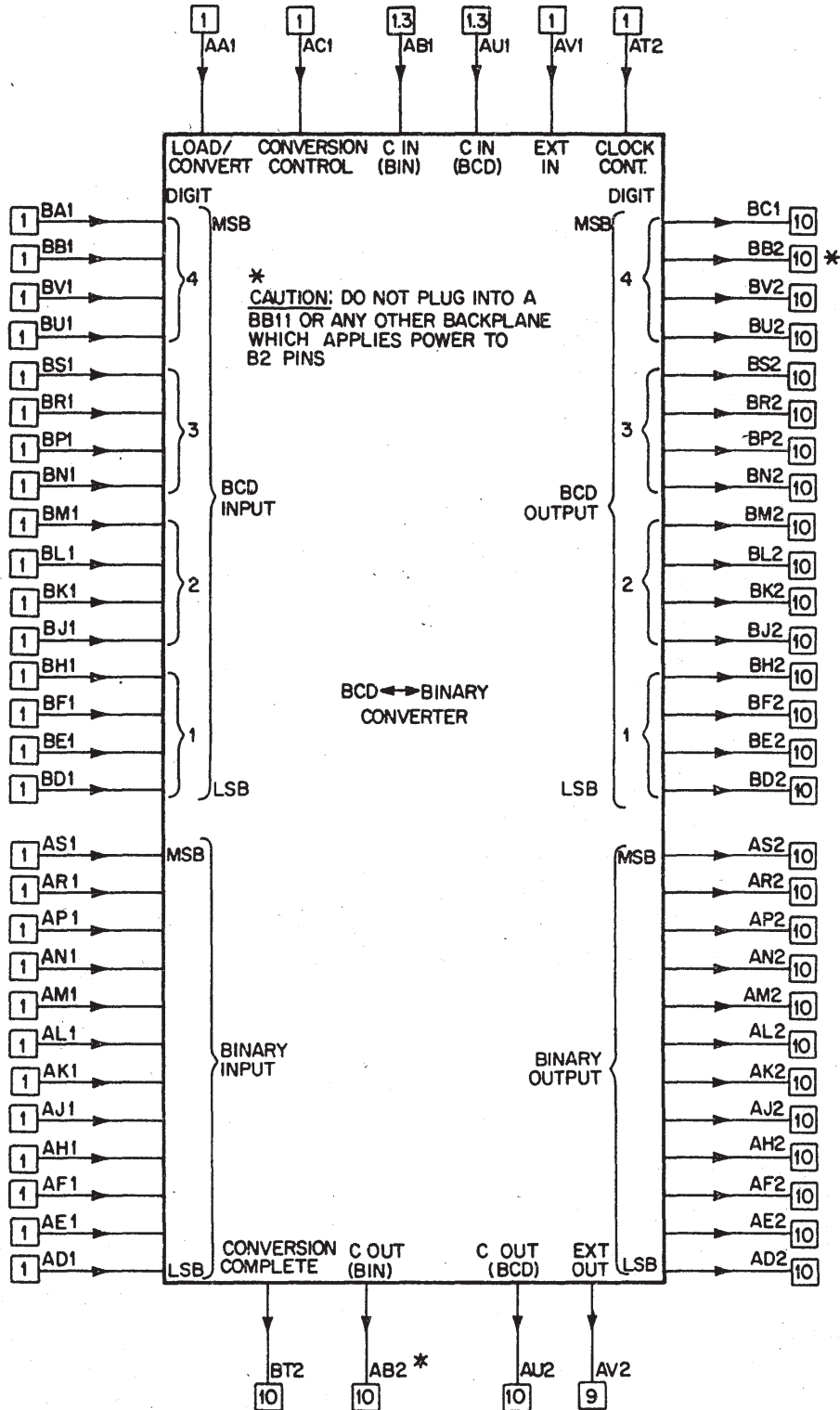
# M230 BINARY TO BCD AND BCD TO BINARY CONVERTER

**NUMERIC**

**M SERIES**

Length: Standard  
Height: Double  
Width: Single

Price:  
**\$105**



Volts  
+5  
GND

Power  
mA (max.)  
860

Pins  
A2  
C2, T1

**\*CAUTION**  
Pins AB2 and BB2 both carry logic signals, not power; therefore do not plug the M230 into a BB11 system unit since the corresponding BB11 pins both carry -15V.

The M230 converts a binary number to its binary coded decimal equivalent or a binary coded decimal number to its binary equivalent.

The maximum number that can be converted from either binary to BCD or BCD to binary is 4095 which is  $7777_8$ . This converter utilizes a counting technique where the count frequency is typically 5 MHz. Therefore, the conversion time for the maximum number  $7777_8$  is typically 0.82 millisec.

The M230 is fully cascadable. When using more than one M230 the  $C_{OUT}$  BIN. must be connected to the  $C_{IN}$  BIN. and the  $C_{OUT}$  BCD must be connected to the  $C_{IN}$  BCD of the next higher significant unit.  $C_{IN}$  BIN. and  $C_{IN}$  BCD of the least significant unit must be made a logic "1".  $C_{OUT}$  BIN. and  $C_{OUT}$  BCD of the most significant unit may be left open.

CONVERSION CONTROL on pin AC1 will cause a Binary to BCD conversion when connected to ground and a BCD to Binary conversion when connected to a logic "1" source. When cascading M230's, connect all CONVERSION CONTROL inputs in parallel.

LOAD/CONVERT on pin AA1 reads the input data when connected to a logic "1" level and starts the conversion when this input is returned to a logic "0" level. When cascading M230's, connect all LOAD/CONVERT inputs in parallel.

CONVERSION COMPLETE on pin BT2 goes High when the conversion process is finished.

EXT. IN on pin AV1 and EXT. OUT on pin AV2 convey conversion finished information between cascaded M230's. This information travels from the most significant M230 to the least significant M230. Therefore, the EXT. IN of the most significant M230 must be connected to a logic "1" source. Each EXT. OUT is connected to the EXT. IN of the next less significant M230. The EXT. OUT of the least significant M230 is left unconnected.

CLOCK CONTROL on pin AT2 of the least significant M230 should be enabled by connecting it to a logic "1" source. All others should be connected to ground.

The following is an ordered summary for operating a single M230:

1. Make the conversion control (pin AC1) a logic "0" for converting Binary to BCD or a logic "1" for converting BCD to Binary.
2. When converting Binary to BCD, connect the Binary number to the BINARY INPUTS and ground the BCD INPUTS. Conversely, when converting BCD to Binary, connect the BCD number to the BCD INPUTS and ground the BINARY INPUTS.
3.  $C_{IN}$  BIN.,  $C_{IN}$  BCD, EXT. IN, and CLOCK CONTROL inputs should be tied to a source of logic "1". The outputs  $C_{OUT}$  BIN.,  $C_{OUT}$  BCD, and EXT. OUT should be left unconnected.
4. Pulse the LOAD/CONVERT input with a positive pulse of 150 nsec. minimum pulse width. There is no limit on the maximum width of this pulse. Conversion begins on the negative going edge of this pulse.
5. When converting Binary to BCD read the BCD OUTPUT for the BCD equivalent. For converting BCD to Binary read the BINARY OUTPUT for the Binary equivalent. The CONVERSION COMPLETE OUTPUT becomes a logic "1" when the conversion is through.