

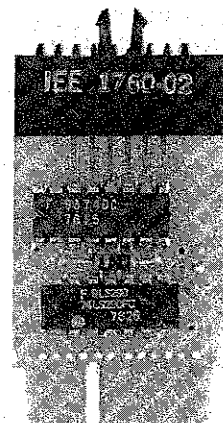
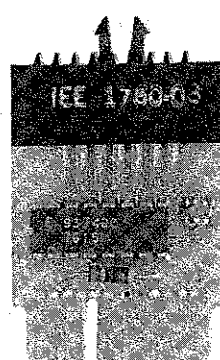


DECODER/DRIVERS

DMD1760
SERIES

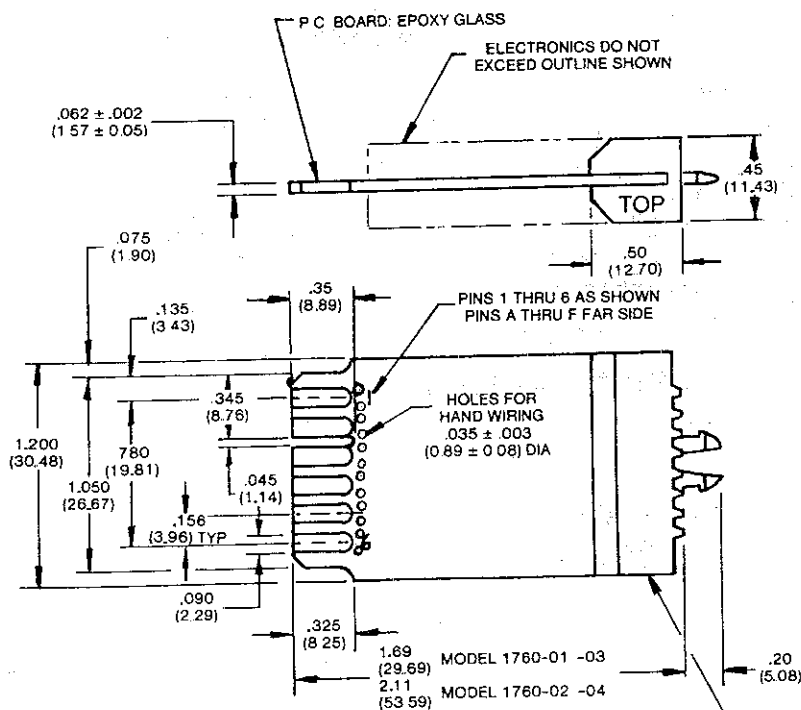
FEATURES

- MOUNTS EASILY ON BACK OF IEE DISPLAY MOUNTING HARDWARE (WIREWRAP TERMINAL MODELS)
- ACCEPTS EITHER FOUR LINE BCD OR SERIAL, PULSE COUNT INPUTS
- ALL MODELS INCORPORATE AN INHERENT MEMORY CAPABILITY
- MODEL DMD 1760-01, -03 DECODER/DRIVER WITH MEMORY
- MODEL DMD 1760-02, -04 DECODER/DRIVER WITH MEMORY AND COUNTER
- DMD1760 SERIES DECODER/DRIVERS ARE DESIGNED TO OPERATE WITH COMMON ANODE LED READOUTS ONLY.



PACKAGE DIMENSIONS

DECODER/DRIVER
DMD1760-01, -03 DMD1760-02, -04



TOLERANCES $xx = \pm .03$ (0.76)
 $xxx = \pm .010$ (0.25)

NOTE: The following connectors can be used with IEE DMD 1760 Series of Decoder/Drivers.

Viking Connector: 2VH6/1AN5 (has pierced tail)
(Use 091-002 polarizing insert)

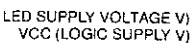
Masterite: S014GR6-DR-H-X (has pierced tail)
(Use 091-0040-000 polarizing insert)

EDAC Inc: 307-012-500-202 (has pierced tail)
(Use polarizing insert #307-240-318)

All dimensions in inches and (millimeters).
Specifications subject to change without notice

DRIVE SYSTEM

DECODER/DRIVER DMD1760-01
WITH LEFT HAND DECIMAL POINT



PIN ASSIGNMENT

SERIES DMH1750 & DMH 1751 SOCKET
AS VIEWED FROM FRONT

A diagram of a rectangular box. Inside the box, there are two vertical columns of dots, one on the left and one on the right. In the center of the box, between the two columns of dots, is a small rectangle.

"PINS NOT USED BY DISPLAY OR DECODER"

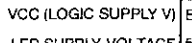
PIN ASSIGNMENT

SERIES DMH1752 SOCKET
AS VIEWED FROM FRONT

PINS NOT USED BY DISPLAY OR DECODER

DRIVE SYSTEM

DECODER/DRIVER DMD1760-02
WITH LEFT HAND DECIMAL POINT



PIN ASSIGNMENT

SERIES DMH1750 & 1751 SOCKET
AS VIEWED FROM FRONT

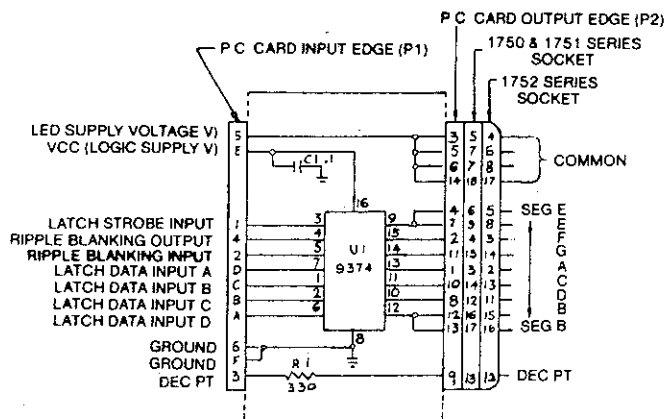
*PINS NOT USED BY DISPLAY OR DECODER

PIN ASSIGNMENT

SERIES DMH1752 SOCKET
AS VIEWED FROM FRONT

"PINS NOT USED BY DISPLAY OR DECODER

DRIVE SYSTEM
DECODER/DRIVER DMD1760-03
 WITH RIGHT HAND DECIMAL POINT



PIN ASSIGNMENT
SERIES DMH1750 & DMH1751 SOCKET
 AS VIEWED FROM FRONT

FUNCTION	PIN NO	PIN NO	FUNCTION
1	1	20	1
2	2	19	2
Seg A	3	18	Common
Seg F	4	17	Seg B
Common	5	16	Seg B
Seg E	6	15	Seg G
Common	7	14	Seg C
Common	8	13	Dec Pt
Seg E	9	12	Seg D
10	10	11	1

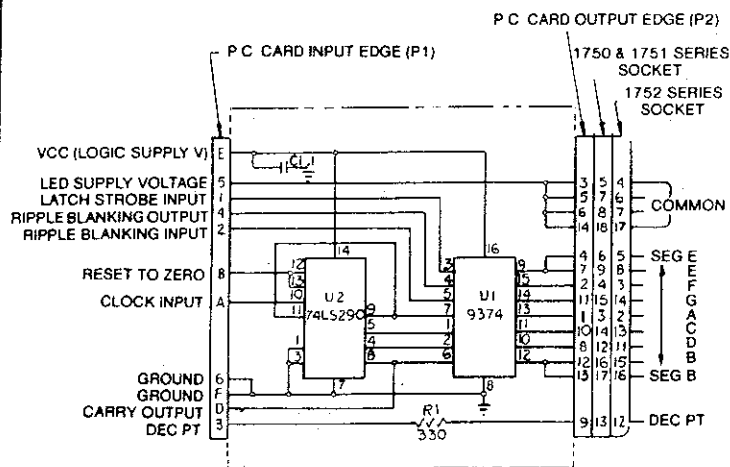
*PINS NOT USED BY DISPLAY OR DECODER

PIN ASSIGNMENT
SERIES DMH1752 SOCKET
 AS VIEWED FROM FRONT

FUNCTION	PIN NO	PIN NO	FUNCTION
1	1	18	1
Seg A	2	17	Common
Seg F	3	16	Seg B
Common	4	15	Seg B
Seg E	5	14	Seg G
Common	6	13	Seg C
Common	7	12	Dec Pt
Seg E	8	11	Seg D
9	9	10	1

*PINS NOT USED BY DISPLAY OR DECODER

DRIVE SYSTEM
DECODER/DRIVER DMD1760-04
 WITH RIGHT HAND DECIMAL POINT



PIN ASSIGNMENT
SERIES DMH1750 & DMH1751 SOCKET
 AS VIEWED FROM FRONT

FUNCTION	PIN NO	PIN NO	FUNCTION
1	1	20	1
2	2	19	2
Seg A	3	18	Common
Seg F	4	17	Seg B
Common	5	16	Seg B
Seg E	6	15	Seg G
Common	7	14	Seg C
Common	8	13	Dec Pt
Seg E	9	12	Seg D
10	10	11	1

*PINS NOT USED BY DISPLAY OR DECODER

PIN ASSIGNMENT
SERIES DMH1752 SOCKET
 AS VIEWED FROM FRONT

FUNCTION	PIN NO	PIN NO	FUNCTION
1	1	18	1
Seg A	2	17	Common
Seg F	3	16	Seg B
Common	4	15	Seg B
Seg E	5	14	Seg G
Common	6	13	Seg C
Common	7	12	Dec Pt
Seg E	8	11	Seg D
9	9	10	1

*PINS NOT USED BY DISPLAY OR DECODER

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

PARAMETER	UNIT
Continuous Supply Voltage VCC	5.5 VDC
Non-repetitive Peak Supply Voltage tw 100ms	7V
Data input voltage	-0.5 VDC to +5.5VDC
LED supply voltage	7.0 VDC
Storage temperature	-55°C to +125°C
Operating temperature	0°C to +70°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C) SERIES 1760-01, -03

SYMBOL	CHARACTERISTICS	LIMITS			UNITS	CONDITIONS
		MIN	TYP*	MAX		
V _{IH}	Input HIGH Voltage	2.0			V	Guaranteed Input HIGH Voltage for All Inputs
V _{IL}	Input LOW Voltage			0.8	V	Guaranteed Input LOW Voltage for All Inputs
V _{CD}	Input Clamp Diode Voltage			-1.5	V	V _{CC} = MIN, I _{IN} = -12mA, T _A = +25°C
V _{OH}	Output HIGH Voltage RBO	2.4	3.5		V	V _{CC} = MIN, I _{OH} = -40μA
V _{OL}	Output LOW Voltage RBO		0.25	0.4	V	V _{CC} = MIN, I _{OL} = 0.8mA
I _{ON}	Segment Current	12	15	18	mA	V _{CC} = 5.0V, V _{OL} = 3.0V
			14		mA	V _{CC} = 5.0V, V _{OL} = 0.5V
I _{IH}	Input HIGH Current Data		10	40	μA	V _{CC} = MAX, V _{IN} = 2.4V
	RBI & EL		5	20	μA	
	Input HIGH Current			1.0	mA	V _{CC} = MAX, V _{IN} = 5.5V
I _{IL}	Input LOW Current EL & RBI		-0.25	-0.4	mA	V _{CC} = MAX, V _{IN} = 0.4V
	Data (Latch Enable LOW)		-0.25	-0.4	mA	
	Data (Latch Enable HIGH)		±0.01	-0.06	mA	
	RBO (Used as an Input)		-0.7	-1.2	mA	
					mA	
I _{CC}	Power Supply Current	35	35	50	mA	V _{CC} = MAX, V _{IN} = 0.0V, V _{OUT} = 3.0V

Power savings can be obtained by operating the LEDs on a separate supply

V_{LED} = V_F (max) + V_{sat} (Driver)
V_{LED} = LED Supply voltage
V_F (max) = Max fwd voltage of LED
V_{sat} = 0.5V

*Typical limits are at V_{CC} = 5.0V at T_A = +25°C and with maximum loading

ELECTRICAL CHARACTERISTICS (Ta = 25°C) SERIES 1760-02, -04

SYMBOL	CHARACTERISTICS	LIMITS			UNITS	CONDITIONS
		MIN	TYP**	MAX		
V _{IH}	High-level input voltage	2			V	
V _I	Low-level input voltage			0.8	V	
V _I	Input clamp voltage			-1.5	V	V _{CC} = MIN, I _I = 18mA
V _{OH}	High level output voltage					V _{CC} = MIN, V _{IH} = 2V
		2.7	3.4		V	V _{IL} = V _{IL} max, I _{OH} = 400μA
V _{OL}	Low level output voltage		0.25	0.4	V	V _{CC} = MIN, V _{IH} = 2V, I _{OL} = 4mA
			0.36	0.5	V	V _{IL} = V _{IL} max, I _{OL} = 8mA
I _I	Input current at maximum input voltage			0.1	mA	V _{CC} = MAX, V _I = 7V
				0.4		
				0.8		V _{CC} = MAX, V _I = 5.5V
I _{IH}	High-level input current			20	μA	V _{CC} = MAX, V _{CC} = MAX, V _I = 2.7V
				80		
				160		
I _{IL}	Low level output current			-0.4	mA	V _{CC} = MAX, V _I = 0.4V
				-2.4		
				-1.6		
I _{OS}	Short-circuit output current***	-5		-42	mA	V _{CC} = MAX
I _{CC}	Supply current		44	66	mA	V _{CC} = MAX

For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

**All typical values are at V_{CC} = 5V

T_A = 25°C

***Not more than one output should be shorted at a time

Specifications subject to change without notice

INPUT DATA DESCRIPTION

DECODER/DRIVER DMD1760-01, -03			DECODER/DRIVER DMD1760-02, -04		
FUNCTION	PIN NO. (P1)	DESCRIPTION	FUNCTION	PIN NO. (P1)	DESCRIPTION
latch strobe input	1	When low, the data in the latches follow the data on the latch inputs. When high, the data in the latches are held constant and are unaffected by new data on the latch input	reset input	B	When high resets and holds counter at 0. Must be low for normal counting
latch data inputs ABCD	D C B A	Data on these inputs are entered into the latches under control of the latch strobe input. The binary weights of the inputs are A=1 B=2 C=4, D=8	clock input	A	Each negative-going transition will increment the counter provided that the reset input is low
DP	3	When pulled to ground the decimal point will light. The driver must be capable of sinking 10mA	carry output	D	Will go low when the counter increments from 9 to 0. Should be tied to the clock input of the next most significant stage for a multi-decade counter
RBI	2	When the ripple blanking input and inputs A, B, C & D are low the display will blank and the ripple blanking output (pin 4) will go low	latch strobe input	1	When low data in the latches follow the data in the counter. When high, the data in the latches are held constant, and the counter operates independently
RBO	4	When the RBO pin is used as an input a low will unconditionally blank the display. When used as an output leading zero suppression will be effected	decimal point	3	When pulled to ground the decimal point will light. The external driver must be capable of sinking 10mA
			RBI	2	When the ripple blanking input is low and the counter is at zero the display will blank and the blanking output (pin 4) will go low
			RBO	4	When the RBO pin is used as an input a low will unconditionally blank the display. When used as an output leading zero suppression may be effected

SWITCHING CHARACTERISTICS $V_{CC} = 5V$; $T_a = 25^\circ C$ DECODER/DRIVER DMD1760-02, 04

TABLE II

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
f max	A	Q _A	CL = 15pF, RL = 400Ω	32	42		MHz
t PLH	CLOCK	CARRY			32	48	ns
t PHL					34	50	
t PHL	Set-to-0	Any			26	40	ns
t(H)	Set-up Time HIGH Data to Latch Enable			75			ns
T _H (H)	Hold Time HIGH Data to Latch Enable			0			ns
t _s (L)	Set-up Time LOW Data to Latch Enable			30			ns
t _H (L)	Hold Time LOW Data to Latch Enable			0			ns
t _L (EL)	Latch Enable Pulse Width			85	50		ns

f max = maximum count frequency

t PLH = propagation delay time, low-to-high-level output

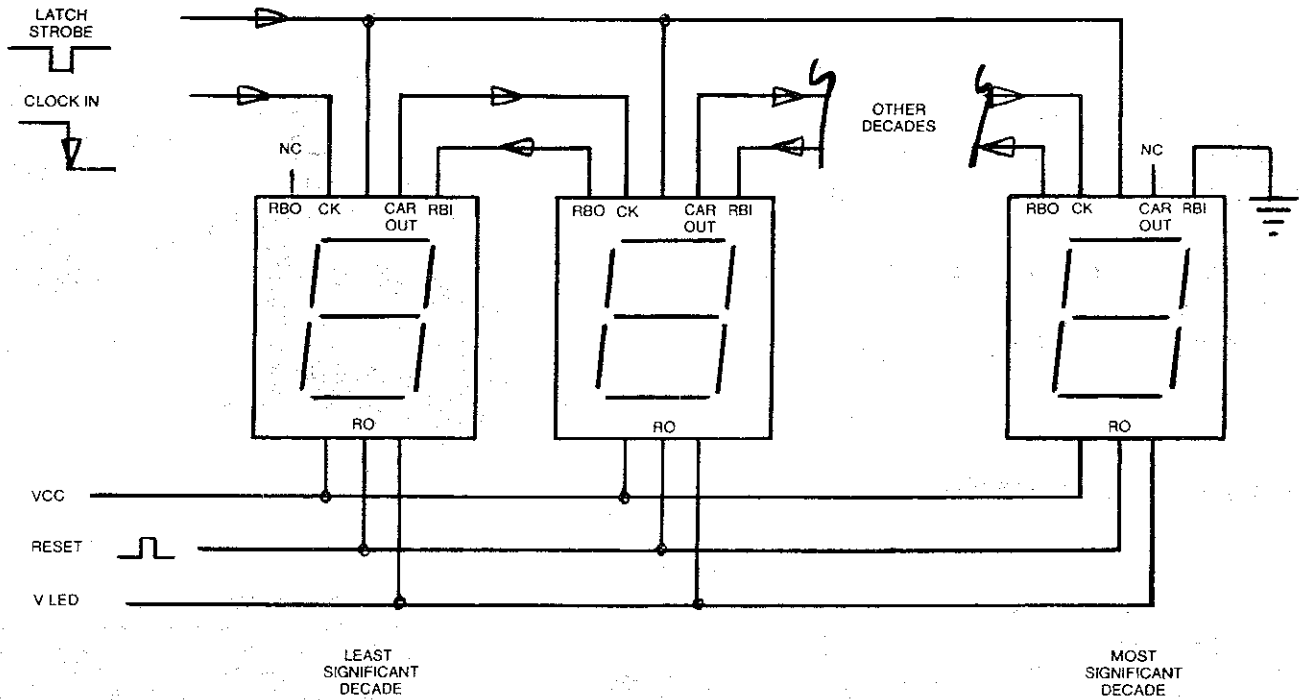
t PHL = propagation delay time, high-to-low-level output

Set-up time: t_s is defined as the time required for the logic level at the Data Input prior to the Enable transition from LOW to HIGH in order for the latch to recognize and store the new data

Hold time: t_H is defined as the minimum time following the Enable transition from LOW to HIGH that the logic level must be maintained at the data input in order to ensure continued recognition. A negative Hold Time indicates that the correct logic level may be released prior to the Enable transition from LOW to HIGH and still be recognized

Specifications subject to change without notice

TYPICAL APPLICATION DECADE COUNTER CHAIN
SERIES DMD1760-02, -04



TRUTH TABLE
SERIES DMD1760-01,-03

FUNCTION	LATCH INPUTS					RBI	RBO	DISPLAY
	D	C	B	A	STB			
Latched	X	X	X	X	H	*	H	STABLE
0	L	L	L	L	L	L	L	NONE
0	L	L	L	L	L	H	H	0
1	L	L	L	H	L	X	H	1
2	L	L	H	L	L	X	H	2
3	L	L	H	H	L	X	H	3
4	L	H	L	L	L	X	H	4
5	L	H	L	H	L	X	H	5
6	L	H	H	L	L	X	H	6
7	L	H	H	H	L	X	H	7
8	H	L	L	L	L	X	H	8
9	H	L	L	H	L	X	H	9
10	H	L	H	L	L	X	H	10
11	H	L	H	H	L	X	H	11
12	H	H	L	L	L	X	H	12
13	H	H	L	H	L	X	H	13
14	H	H	H	L	L	X	H	14
15	H	H	H	H	L	X	H	15
X	X	X	X	X	X	X	L**	BLANK

*The RBI will blank the display only if a binary zero is stored in the latches

**RBO used as an input overrides all other input conditions