Vorne Industries

Model 77/712
BCD To Digital 3" Display
User's Manual

MODEL 77/712 BCD TO DIGITAL 3" DISPLAY

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1. INTRODUCTION TO THE 77/712 DISPLAY

1.1 Operation

The model 77/712 accepts parallel or multiplexed BCD information, with either positive or negative true logic, and converts it to a digital display. Hex values (A through F) can also be displayed.

1.2 Display

From 2 to 6 digits with 3.3" high characters.

2. SETTING UP THE DISPLAY FOR YOUR APPLICATION

2.1 Selecting Sink Or Source Inputs

The BCD and strobe inputs can be selected as active low (inputs normally pulled to +V, activated when input is switched to DC ground) or active high (inputs normally pulled to ground, activated when input is switched to +V).

To select active low inputs, connect the +V of your supply to the return line (terminal pin 32), and tie the -V(ground) of your supply to DC ground (terminal pin 6). To select active high inputs, connect the -V (ground) of your supply to the return line (terminal pin 32), and to the DC ground (terminal pin 6). See Section 4.5 Wiring.

2.2 Input Types

Two standard input types are available.

L - Low Voltage
Logic 0	0 - 1.5VDC
Logic 1	3.5 - 9VDC
Input Impedance	680 Ohm
Maximum Leakage Current	2 mA

H - High Voltage
Logic 0	0 - 6.6VDC
Logic 1	9 - 30VDC
Input Impedance	3.3 K Ohm
Maximum Leakage Current	2 mA

3. USING THE DISPLAY

3.1 Data Entry

Up to 6 digits of BCD data can be entered. Each digit is made up of four BCD lines and one strobe line. Data logic and strobe logic are independently user selectable as positive or negative logic via a PC board mounted selector switch. Minimum input time duration is 20 mS. The strobe inputs can be used in four different modes.

1) Constant strobe mode: To select this mode, it is necessary to match the strobe logic with the return line via the PC board mounted selector switch. Positive strobe logic should be selected if the return line is tied to +V, and negative strobe logic should be selected if the return line is tied to ground. In this mode, any BCD data will be instantaneously displayed.

2) Master strobe mode: As long as the master strobe input (terminal pin 31) is held inactive, display digits will ignore any change of BCD input data. If the master strobe is brought to the active level, any data on the inputs will be transfered to the respective display digits until the master strobe is brought inactive again.

3) Independent strobe mode: Each digit can have its own independent strobe. As long as the digit strobe is held inactive, the display will ignore any change of BCD data for that digit. When the data strobe is active, the BCD input data will be transferred directly to the display.

Note: For modes 1,2, and 3 switch #2 of the PC mounted selector switch must be in the off position (parallel mode).

4) Multiplexed mode: In this mode BCD data is entered via pins 1 through 4 of the terminal strip. To display data in this mode, hold all strobe lines inactive until the data to be displayed is present, then the strobe of the selected digit should be pulsed active. This process is repeated for all of the digits on the display. To select this mode, switch #2 of the selector switch should be in the on position.

S1 S2 S3 S4

O 1   2   3   4
N
▲

S1	S2	S3	S4	
	MUX	NEG	NEG	ON
	PAR	POS	POS	OFF
	IN TYP	DATA	STB	
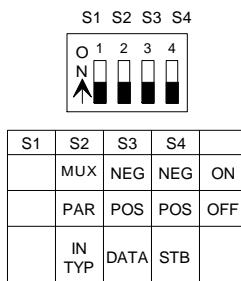
3.2 Data Examples

BCD Data	Character Displayed	Character Displayed
0000	0	F
0001	1	E
0010	2	D
0011	3	C
0100	4	B
0101	5	A
0110	6	9
0111	7	8
1000	8	7
1001	9	6
1010	A	5
1011	B	4
1100	C	3
1101	D	2
1110	E	1
1111	F	0
	(positive logic)	(negative logic)

* See Appendix A

4. WIRING AND SPECIFICATIONS

4.1 Reset

Internally pulled high, active low (contact closure to ground). Requires 10 mS minimum duration signal. Holding the reset line (terminal 5) low forces the display to an all-zero state, and places the unit in a state equivalent to power-up. It is necessary to reset the unit in order to recognize any change in switch settings.

4.2 DC Output Voltage

Either 5.0 or 12.0 Volts DC (regulated), at 100 mA is available at terminal 7 for operating external devices.

4.3 Power Requirements

120VAC ±15% 15 VA. AC hot and neutral are wired to terminals #1 and #2 (polarity not important). Terminal #3 is Earth ground only.

4.4 Timing Diagram

STROBE

T_{ON}

T_{SETUP} T_{HOLD}

BCD 1-4

$T_{ON} \geq 20 m^S$
$T_{SETUP} \geq 0 m^S$
$T_{HOLD} \geq 0 m^S$
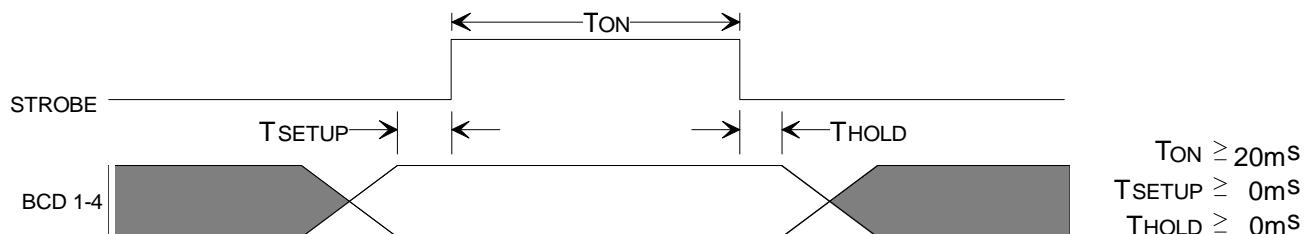
4.5 Wiring

The output Voltage of the device driving the display must be compatible with the ordered input (TTL-9 VDC, 12 VDC - 30 VDC) of the display.

5-30 VOLT DC SOURCE OUTPUT CARD

5-30 VOLT DC USERS SUPPLY

+ -

+V		4) NC
GND		5) RESET
		6) DC GND
		7) +V OUT
		32) RETURN
OUT		31) MST STB
OUT		30) DIG 6 - STB
OUT		29) DIG 6 - D
OUT		28) DIG 6 - C
OUT		27) DIG 6 - B
OUT		26) DIG 6 - A
OUT		5) LSD - STB
OUT		4) LSD - D
OUT		3) LSD - C
OUT		2) LSD - B
OUT		1) LSD - A

OUTPUT DEVICE   VORNE DISPLAY

1) Tie external supply DC ground to Vorne DC ground.

2) Tie external supply DC ground to Vorne Return terminal.

3) Connect source outputs to Vorne inputs.

5-30 VOLT DC SINK OUTPUT CARD

5-30 VOLT DC USERS SUPPLY

+ -

+V		4) NC
GND		5) RESET
		6) DC GND
		7) +V OUT
		32) RETURN
OUT		31) MST STB
OUT		30) DIG 6 - STB
OUT		29) DIG 6 - D
OUT		28) DIG 6 - C
OUT		27) DIG 6 - B
OUT		26) DIG 6 - A
OUT		5) LSD - STB
OUT		4) LSD - D
OUT		3) LSD - C
OUT		2) LSD - B
OUT		1) LSD - A

OUTPUT DEVICE   VORNE DISPLAY

1) Tie external supply DC ground to Vorne DC ground.

2) Tie external supply +V to Vorne Return terminal.

3) Connect sink outputs to Vorne inputs.

CONTACT OUTPUT CARD

5-30 VOLT DC USERS SUPPLY

+ -

| | 4) NC |
	5) RESET
	6) DC GND
	7) +V OUT
	32) RETURN
	31) MST STB
	30) DIG 6 - STB
	29) DIG 6 - D
	28) DIG 6 - C
	27) DIG 6 - B
	26) DIG 6 - A
	5) LSD - STB
	4) LSD - D
	3) LSD - C
	2) LSD - B
	1) LSD - A

CONTACT OUTPUTS   VORNE DISPLAY

1) Tie external supply DC ground to Vorne DC ground and to common of switches.

2) Tie external supply +V to Vorne Return terminal.

3) Connect contact outputs to Vorne inputs.

4.6 Terminal Strip Identification

| | 1
120
VAC | 2
120
VAC | 3
EARTH
GND | 4
NC | 5
RESET | 6
DC
GND | 7
+V OUT |
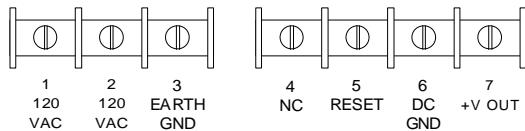
Screw Terminal Strip

TERMINAL #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
		LSD					DIGIT 2					DIGIT 3					DIGIT 4					DIGIT 5					DIGIT 6				MST STB	RTN
BCD VALUE	A	B	C	D	STB	A	B	C	D	STB	A	B	C	D	STB	A	B	C	D	STB	A	B	C	D	STB	A	B	C	D	STB		

BCD Terminals

4.7 Dimensions
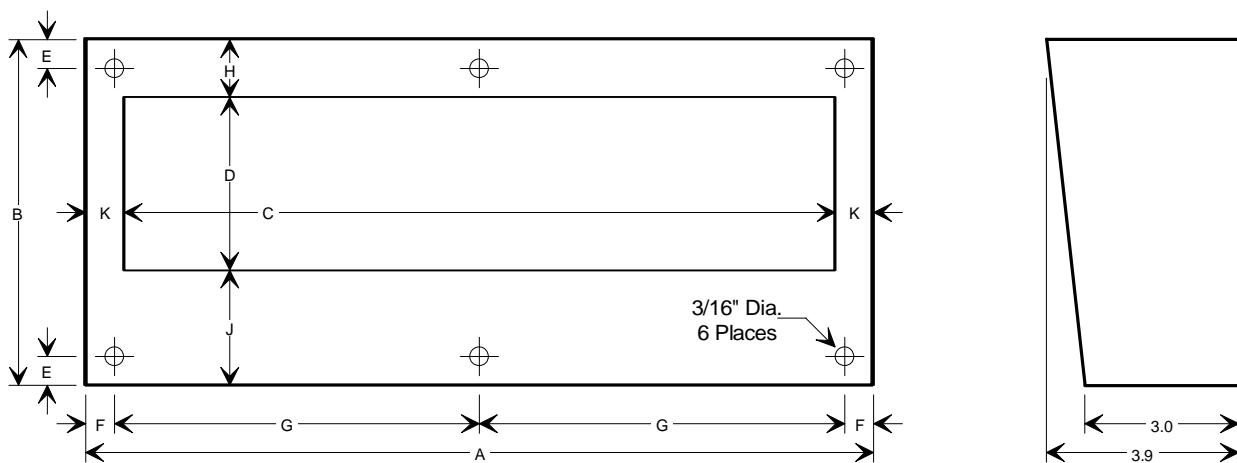
	A	B	C	D	E	F	G	H	J	K
3 digit	10.85	7.10	9.15	3.80	.35	.55	4.87	1.05	2.25	.85
4 digit	13.60	7.10	11.90	3.80	.35	.55	6.25	1.05	2.25	.85
5 digit	16.35	7.10	14.65	3.80	.35	.55	7.63	1.05	2.25	.85
6 digit	19.10	7.10	18.40	3.80	.35	.55	9.00	1.05	2.25	.35

All dimensions in inches.

Bezel Mount

--- Dotted line indicates approximate panel cutout
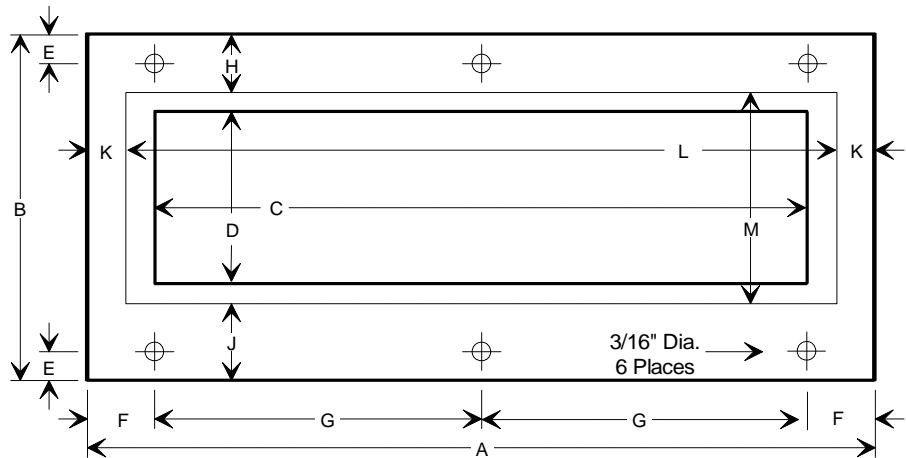
	A	B	C	D	E	F	G	H	J	K	L[*]	M[*]
3 digit	11.75	7.0	9.15	3.80	.30	1.0	4.87	.45	.65	.45	10.85	5.90
4 digit	14.50	7.0	11.90	3.80	.30	1.0	6.25	.45	.65	.45	13.60	5.90
5 digit	17.25	7.0	14.65	3.80	.30	1.0	7.63	.45	.65	.45	16.35	5.90
6 digit	20.0	7.0	18.40	3.80	.30	1.0	9.00	.45	.65	.45	19.10	5.90

All dimensions in inches.
* Dimensions of panel cutout.

4.8 Accessing the Logic Board

All user accessable functions and wiring points are located on the main logic board of the 77/712. For access, remove the six #8 screws which hold the front panel to the rest of the enclosure.

Warning - Shock Hazard
Disconnect power to the display prior to removing the front panel.
Do not reapply power until the front panel has been reinstalled.
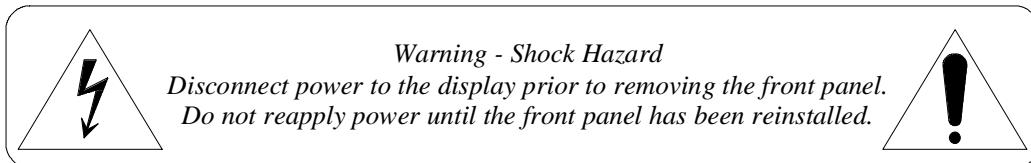
5. APPENDICES

Appendix A Character Set
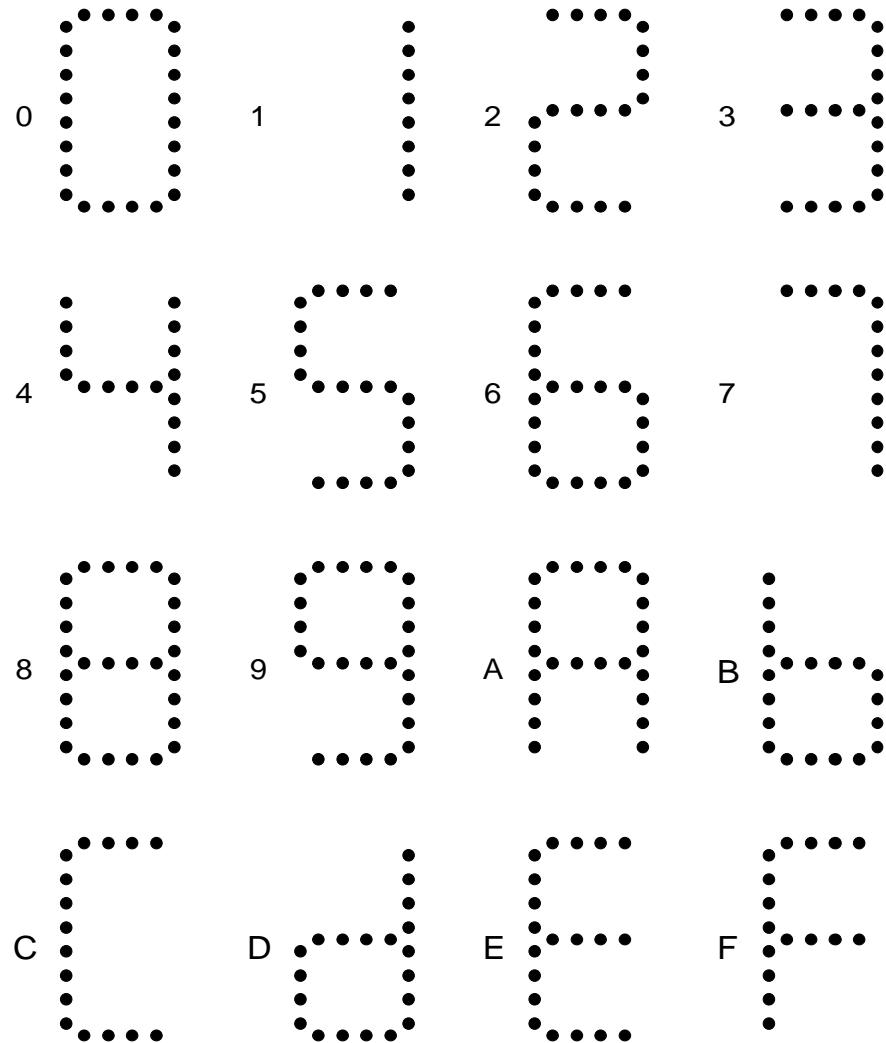
Vorne Industries Incorporated
1445 Industrial Drive
Itasca, IL 60143-1849
Tel: (630) 875-3600
Fax: (630) 875-3609