Vorne Industries

Model 77/232
Serial Input Numeric 3" Display
User's Manual

1445 Industrial Drive • Itasca, IL 60143-1849 • (630) 875-3600 • Telefax (630) 875-3609

MODEL 77/232 SERIAL INPUT NUMERIC 3" DISPLAY

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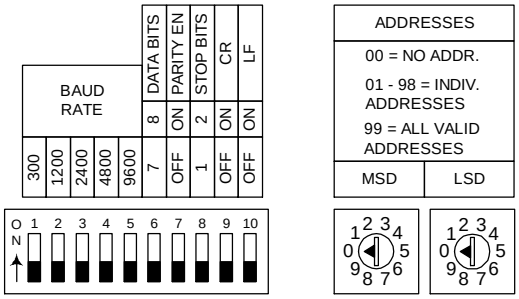
1. INTRODUCTION TO THE 77/232 DISPLAY

1.1 Operation

The 77/232 is a serial input 3.3" character numeric display. It can accept TTL, RS232, RS422, RS485 or Current Loop as serial data types (depending on serial communication module implemented) and display information on a numeric field of 2 to 6 digits. Each display is also capable of retransmitting RS232 or RS485 (depending on communication module), a feature for multidrop applications. Baud rates of 300, 1200, 2400, 4800 and 9600 are dip switch selectable, as are protocol parameters of stop bits, data bits, parity and line terminators. The 77/232 can be set up to work in a line mode (updating the entire display field after receiving a carriage return, a line feed, or a carriage return/line feed combination), or in an immediate mode (updating the display with every new character received). When a baud rate, protocol parameter, or address is changed, the unit must be reset to acknowledge the change. Up to 98 units can be individually addressed on a common data bus through use of internal address dip switches.



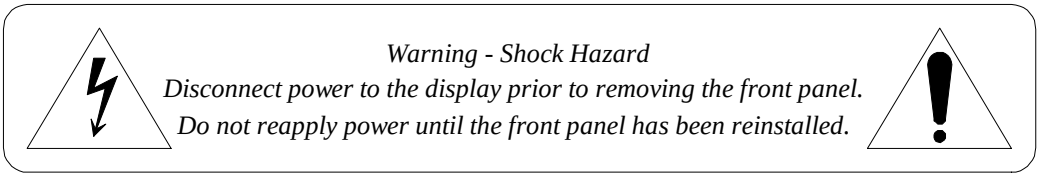
1.2 Display Characters

All ASCII characters that can be represented with 7 segments can be displayed. A space (ASCII 20H) is displayed as a blank. All other literal characters are ignored by the display. Leading zeros are automatically blanked (see Appendix A Character Set).

2. SETTING UP THE DISPLAY FOR YOUR APPLICATION

2.1 Changing User Configurable Functions

All user configurable functions (input board, baud rate, protocol parameters, line terminator, addressing modes) are located on the main logic board of the 77/232. This board is mounted to the front panel of the display and, in order to access it, remove the six #8 screws which hold the front panel to the enclosure.



2.2 Selecting Input/Output Types

Any one of the five available serial types (TTL, RS232, RS422, RS485, or Current Loop) can be active at one time. Exchanging input/output boards selects the serial input and output type. Output types available are RS232, RS485 (also compatable with RS422.)

2.3 Selecting Baud Rates

Baud rates are selectable between 300, 1200, 2400, 4800 and 9600 respectively, via the first 5 positions of a PC mounted, 10 position, in-line dip switch. Only one switch of the first five should be in the on position. This on switch will determine the baud rate.

2.4 Selecting Protocol Parameters

Positions 6-8 of the PC mounted 10 position, in-line dip switch select protocol parameters. Position 6 selects the number of data bits (7 bits when off, 8 bits when on). Position 7 selects parity, and is selectable between none (switch off- no parity bit allowed) and mark (switch on- parity bit received and ignored). Position 8 selects the number of stop bits after the data word (1 stop bit when off, 2 stop bits when on).

2.5 Selecting Line Terminator

Positions 9-10 of the PC mounted 10 position, in-line dip switch select the line terminator. The line terminator determines when the 77/232 will update its display. If no line terminator is chosen (both 9 and 10 off), any valid character transmitted to the display will immediately be displayed, starting from the most significant character position.

If one or both of the line terminators (<CR> and <LF>) have been chosen, the display will update in a line mode. The data to be displayed should be transmitted first, followed by the line terminator. The display is updated after the line terminator is received. To select carriage return (ASCII 0DH) as the line terminator switch position 9 should be on. To select line feed (ASCII 0AH) as the line terminator, switch position 10 should be on. To select carriage return line feed as the line terminator (ASCII 0D 0AH), both switch positions 9 and 10 should be on.

2.6 Addressing

Addressing allows multiple 77/232 units to be individually accessed on a common data bus. A set of two PC mounted, ten position, rotary dip switches determine the address. If addressing is not required, the two address switches should be set to 00.

If addressing is required, the display must be configured with an explicit line terminator (see 2.5 Selecting Line Terminator), and all data transmitted to the display must be in the format of two digits of display address, followed by the data to be displayed and ended with the line terminator. Each 77/232 display that is to be used in the address mode must have an address between 01 and 98 set on the two PC mounted rotary dip switches. When this condition is met, the 77/232 will display incoming data only when the transmitted address matches the address set internally in the unit. If it is desired to have a particular display show every set of data transmitted regardless of the transmitted address, set the two address switches to 99. Conversely, if it is desired to have a display show a set of data transmitted regardless of the display address, transmit an address of 99 preceding the data.

3. USING THE DISPLAY

3.1 Data Entry Examples

All examples are for a 3 digit display where the line terminator chosen is a CR (carriage return).

If you are not using addressing: Set the address switches to 00 and reset unit.

Data transmitted	Data displayed
123456<CR>	123
1<CR>	100
<CR>	blank display
123<CR>	123
005<CR>	5

For addressed units: As an example, set the address switches to 01 and reset unit.

Address	Data entered	Data displayed
99	123 <CR>	123
01	<CR>	blank display
01	2 <CR>	200
07	1234 <CR>	200 (same as previous)

4. WIRING AND SPECIFICATIONS

4.1 Reset

Internally pulled high, active low (contact or switch closure to ground). Requires a 10 mS minimum duration signal. A reset places the unit in a state equivalent to power up (ready to receive data) display showing 0. It is necessaey to reset the unit in order to recognize any changes in DIP switch settings.

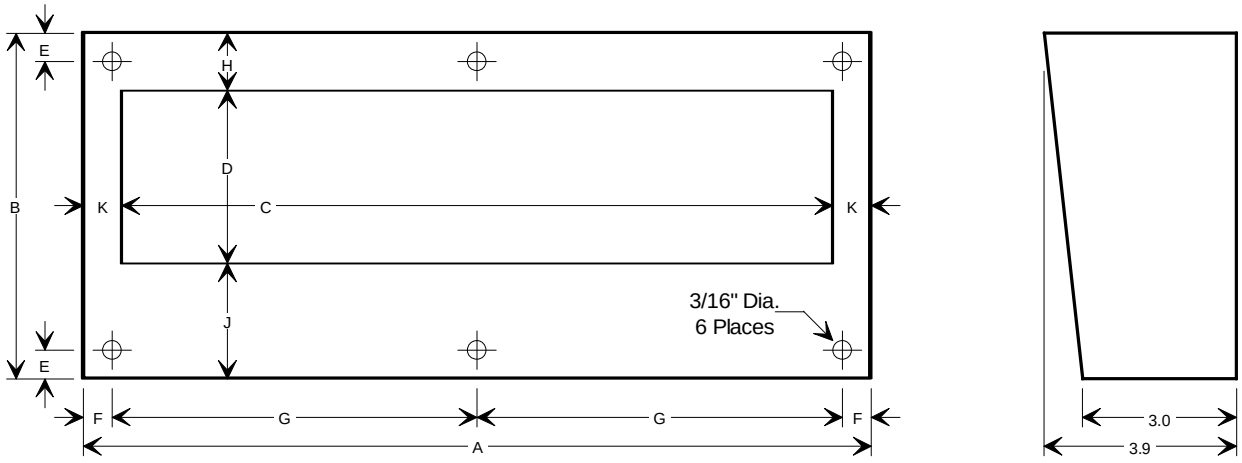
4.2 DC Output Voltage

Either 5.0 or 12.0 Volts DC (regulated), at 100 mA is available at terminal 10 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.

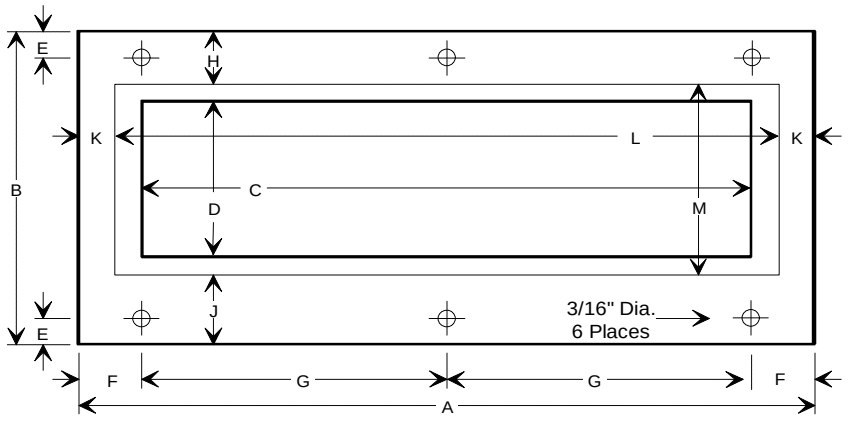
4.4 Dimensions



	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



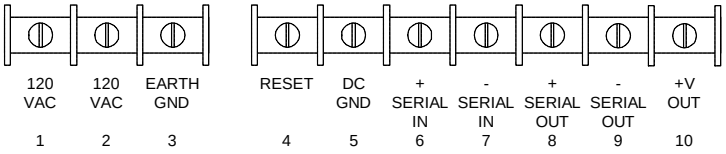
--- Dotted line indicates approximate panel cutout

	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.

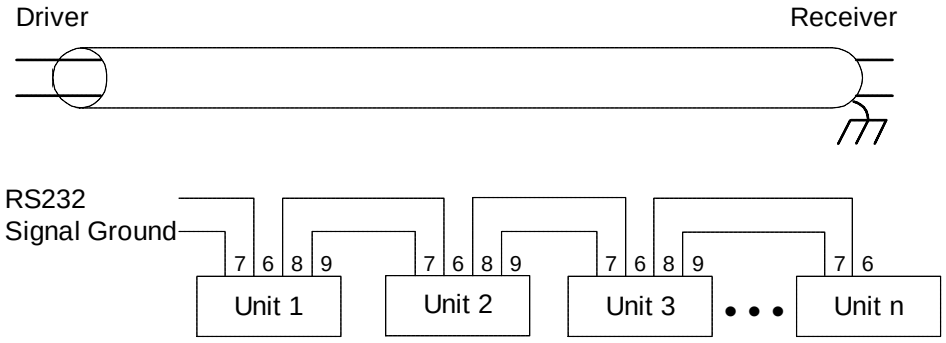
4.5 Wiring

Screw terminal strip, mounted on PC board in enclosure.



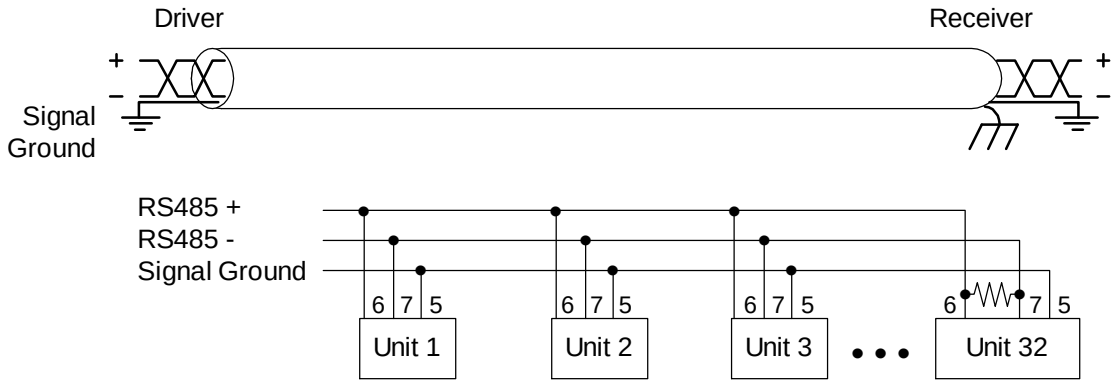
4.6 RS232 Serial Transmission

Maximum length of transmission is 70 feet. We recommend using shielded cable with shield grounded at the receiver end.



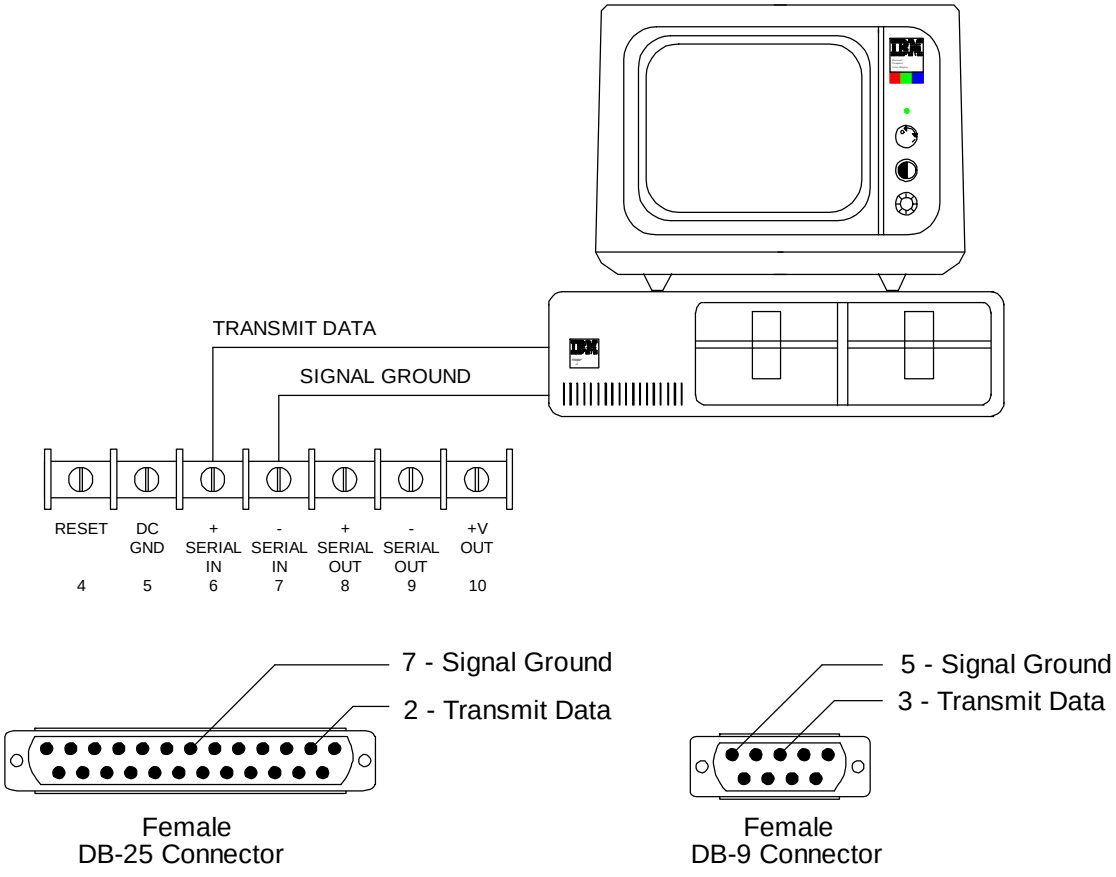
4.7 RS485 Serial Transmission

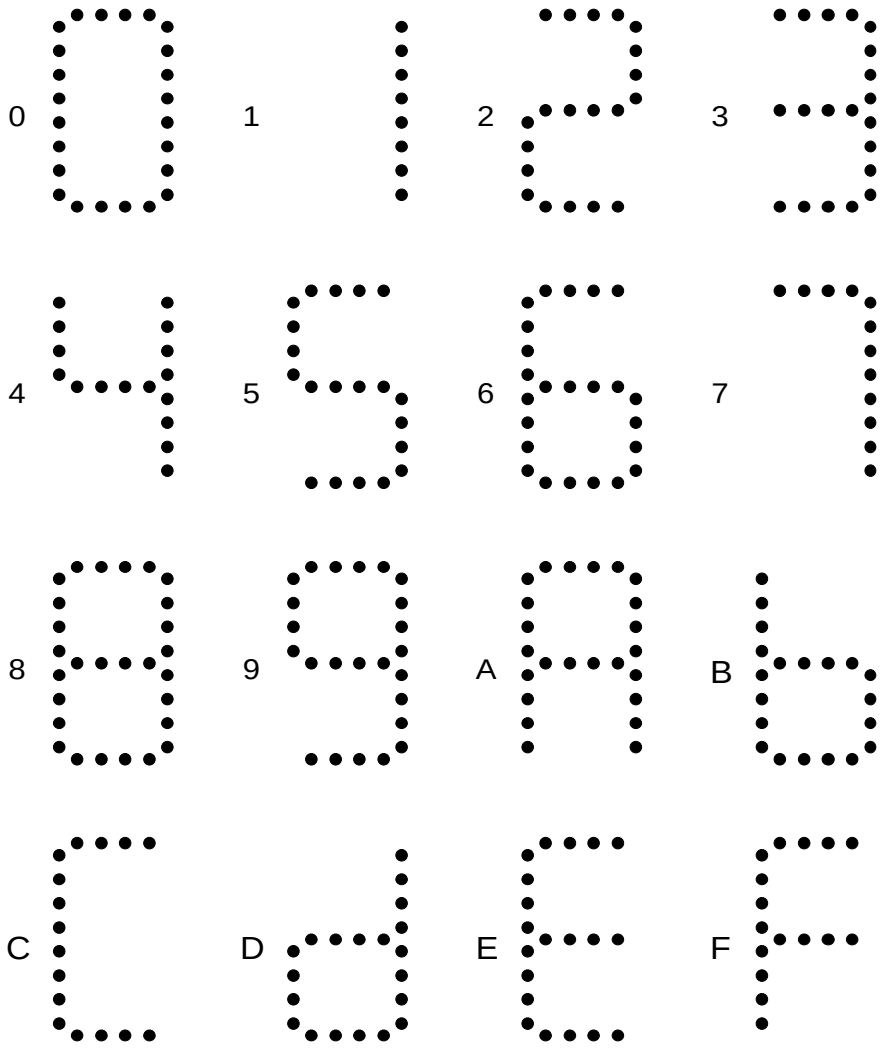
Maximum length of transmission is 4000 feet. We recommend using a three wire cable with shield grounded at the receiver end. Add a 120 Ohm resistor across Serial (+) and Serial (-) as a line terminator at each end of the transmission line.



4.8 Wiring to a PC

All serial output, such as the output from a personal computer (IBM PC or compatible), must match the communications standard of the serial input of the display.

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