

# PRODUCT MANUAL

## ***ELECTRONIC DISPLAYS INC.***

135 S. CHURCH STREET

ADDISON, ILL. 60101

***www.electronicdisplays.com***



### SERIAL INTERFACE – RS485

#### PRODUCT PART NUMBER:

ED202 – 117 – 4D – N1 – KYN1 .....2.25” high digits

#### DESCRIPTION:

- 4 Digit serial interface display with RS-485 input from serial keypad.
- EDI supplied keypad with cable to 1<sup>st</sup> and 2nd display
- Field-selectable baud rate and address.
- Terminal block on endplate to wire your RX+ and RX- wires.
- Power: 120VAC @ 60Hz.
- NEMA 1 aluminum enclosure.

#### OPERATION:

This model is designed to receive serial data in an RS485 format and display it. The display is factory set to 1200-Baud; no parity; 1stop bit and 8 data bit. The displays are set at the factory to non-addressable. See appendix C for changing address. The protocol for the keypad is listed in Appendix E of this manual.

If there are any questions or comments regarding this order, please call our toll-free number: 1 - 800 - 367 - 6056

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## Unpacking Instructions:

A copy of these instructions is packed with each unit. Open carefully to avoid scratching the unit's paint and plastic lens or cutting the line cord.

## Mechanical Mounting Instructions:

This unit is equipped with two rivnuts in the top of the unit for mechanical mounting purposes. The bolts that are screwed into these rivnuts are standard 5/16 by 1 1/4" bolts. To avoid damaging the rivnuts, do not tighten these bolts more than 10 ft/lbs.

## Power Requirements:

This unit is equipped with a standard, eighteen-gauge, three-wire line cord that is designed to be plugged into a standard, 120 VAC, 60 Hertz, grounded outlet. The maximum current draw at 120 VAC for ED400-111-4D-N1 is 1 Ampere and for ED225-111-4D-N1 is 3/4 ampere.

## Signal Requirements:

Your unit has serial input interface RS-232, the standard communication format for this unit is 1200 bits per second (baud rate) with one start bit, eight data bits, no parity, and one stop bit per character. The expected sequence of characters is specified in a later section of this manual entitled 'Protocol'.

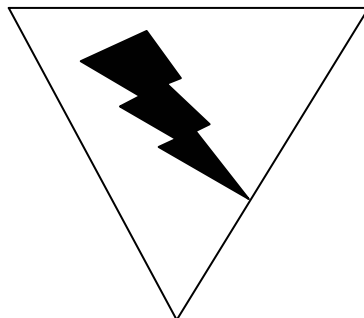
## Label Definitions:

The following page shows some commonly used labels and their definitions.

LABEL	DEFINITION
RX+	Positive side of balanced data line for RS-422 or RS-485 serial input signals
RX-	Negative side of balanced data line for RS-422 or RS-485 serial input signals
AC	Typically 10 to 12 VAC from EDI supplied transformer

## WARNING – SHOCK HAZARD

*Always completely disconnect power from the display before opening the unit. Do not reapply power to the display until the unit has been securely closed.*



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## **Power-up Response:**

Upon power up, the display will show a test pattern until data is received.  
See Appendix C for Diagnostic meaning.

## **Addressing:**

Factory set @ 01. (In order to communicate always use 2 digit address – 01)  
A knockout on the back of the display is available to change the address. See Appendix C for configurations.

## **Protocol:**

See Appendix E.

## **Service:**

There are no parts in your unit classified as 'user serviceable' parts. The plastic or glass cover can be cleaned using a soft cloth and a gentle glass cleaning solution.

## **Warranty:**

The standard warranty for all products is one year on all parts and labor at our facilities. All products are designed and manufactured by Electronic Displays Inc. If you need assistance, please call or FAX us and we will be happy to provide technical assistance. If you feel that your unit needs repair, please call us first and then ship the unit to:

Electronic Displays Inc.  
135 South Church Street  
Unit A  
Addison, Ill. 60101  
Attn: Repair department

Our telephone number is:

(630) 628-0658

Our FAX number is:

(630) 628-0936

## **APPENDIX C**

This program can be run on either a 2 1/4" bar-segment board shown in Figure 1 or on a 4" bar-segment board shown in Figure 2. Each of these boards has two 8-position DIP switches that are used to control the options of the program. One of these DIP switches is labeled the "ADDRESS" switch and the other is labeled the "FUNCTION" switch. With this program, these switches are read on power-up only. In order to change the settings, it is necessary to turn power off and then turn power back on after the settings have been changed. The following pages detail the purpose of each of these switches.

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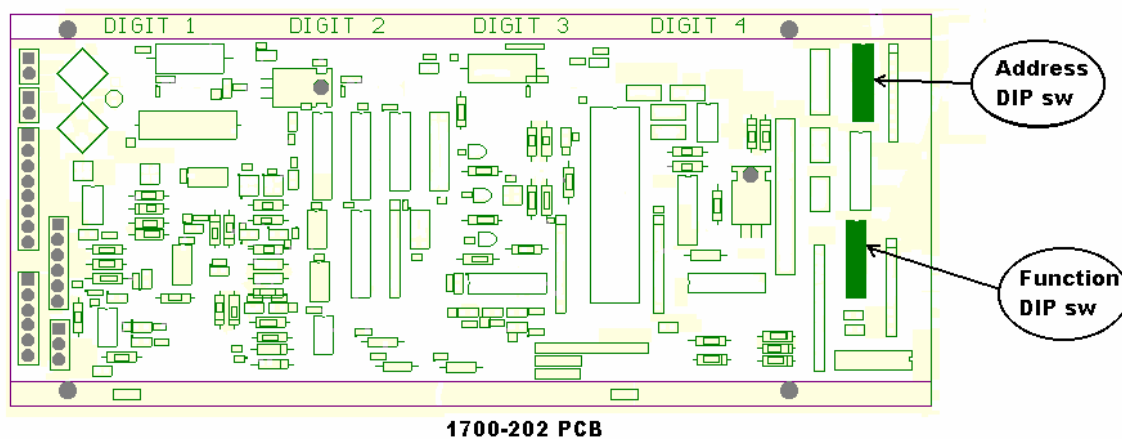


Figure 1

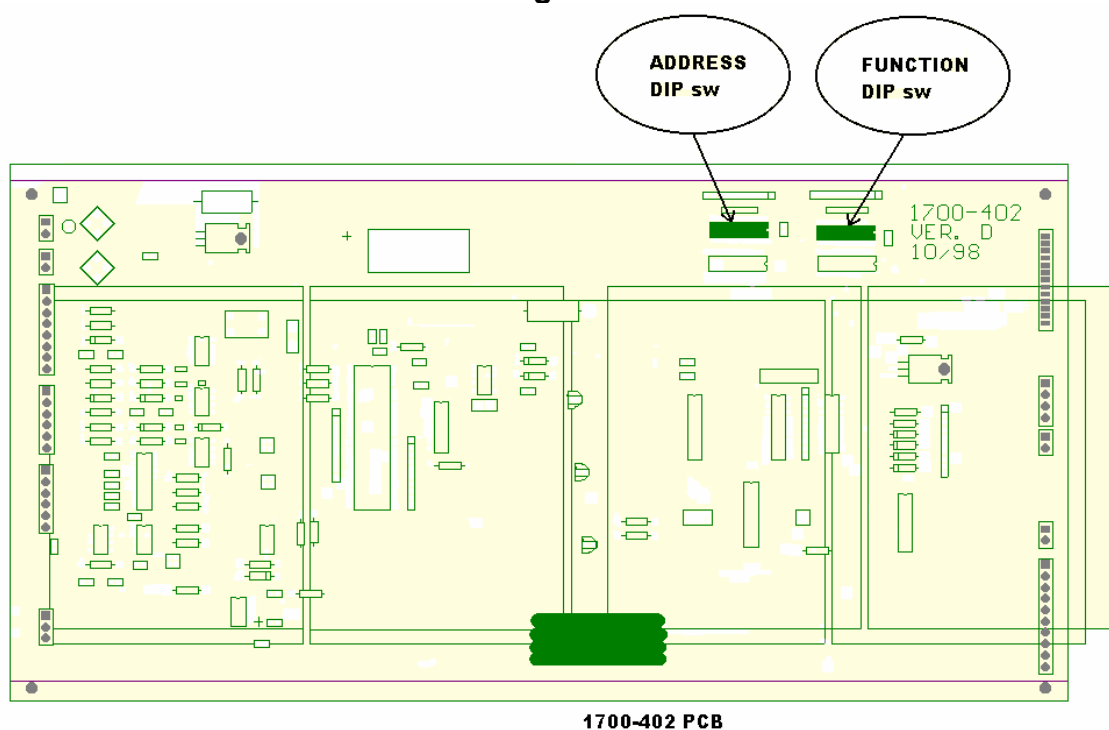


Figure 2

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## “ADDRESS” Switch:

### *Switches 1 through 6:*

Switches 1 through 6 of the “ADDRESS” DIP switch are used in binary fashion to specify the address of the display. Sample settings are shown below in Table 1.

‘ADDRESS’ DIP SWITCHES						POWER-UP DISPLAY	ADDRESS
SW 6	SW 5	SW 4	SW 3	SW 2	SW 1		
OFF	OFF	OFF	OFF	OFF	OFF	A64	64
OFF	OFF	OFF	OFF	OFF	ON	A01	01
OFF	OFF	OFF	OFF	ON	OFF	A02	02
OFF	OFF	OFF	OFF	ON	ON	A03	03
OFF	OFF	OFF	ON	OFF	OFF	A04	04
OFF	OFF	OFF	ON	OFF	ON	A05	05
OFF	OFF	OFF	ON	ON	OFF	A06	06
OFF	OFF	OFF	ON	ON	ON	A07	07
OFF	OFF	ON	OFF	OFF	OFF	A08	08
OFF	OFF	ON	OFF	OFF	ON	A09	09
...							
OFF	OFF	ON	ON	ON	OFF	A14	14
OFF	OFF	ON	ON	ON	ON	A15	15
OFF	ON	OFF	OFF	OFF	OFF	A16	16
OFF	ON	OFF	OFF	OFF	ON	A17	17
...							
OFF	ON	ON	ON	ON	OFF	A30	30
OFF	ON	ON	ON	ON	ON	A31	31
ON	OFF	OFF	OFF	OFF	OFF	A32	32
ON	OFF	OFF	OFF	OFF	ON	A33	33
...							
ON	ON	ON	ON	OFF	ON	A61	61
ON	ON	ON	ON	ON	OFF	A62	62
ON	ON	ON	ON	ON	ON	A63	63

**Table 1**

### *Switches 7 AND 8:*

Switches 7 AND 8 of the “ADDRESS” DIP switch are used to specify the baud rate. Available options are shown below in Table 2.

‘ADDRESS’ DIP SWITCHES		POWER-UP DISPLAY	BAUD rate
SW 8	SW 7		
OFF	OFF	3	1200
OFF	ON	4	2400
ON	OFF	5	4800
ON	ON	6	9600

**Table 2**

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## “FUNCTION” Switch:

*Switches 1, 2, and 3:*

“FUNCTION” switches 1, 2, and 3 are used to define the serial input protocol. Not all combinations of these switches have been assigned at this time. The combinations that have been defined are shown in Table 3.

‘FUNCTION’ DIP			POWER-UP DISPLAY	PROTOCOL
SW 3	SW2	SW1		
OFF	OFF	OFF	-0	Non-addressable without LZB
OFF	OFF	ON	-1	Non-addressable with LZB
OFF	ON	OFF	-2	2-digit addressable flexible without LZB
OFF	ON	ON	-3	2-digit addressable flexible with LZB
ON	OFF	OFF	-4	2-digit addressable decimal-locator without LZB
ON	OFF	ON	-5	2-digit addressable decimal-locator with LZB

**Table 3**

## NOTES:

‘LZB’ is “leading zero blanking. When it is enabled, leading zero’s (except the least significant digit) are shown as blanks.

‘Flexible’ indicates that the ‘number’ can include digits, a decimal point, and a minus sign. This protocol also allows for space characters.

‘Decimal-locator’ indicates that the ‘number’ must not include the decimal point character. The last digit in the ‘number’ is an indication of where the decimal point (if any) should be placed.

*Switches 4 and 5:*

*These switches are not currently in use and should be left in the OFF position.*

*Switches 6, 7, and 8:*

*These switches are used to specify how big the display is in digits. These switches are interpreted as shown in Table 4.*

‘FUNCTION’ DIP			POWER-UP DISPLAY	DISPLAY SIZE
SW 8	SW 7	SW 6		
OFF	OFF	OFF	U02	1 or 2 digits
OFF	OFF	ON	U04	3 or 4 digits
OFF	ON	OFF	U06	5 or 6 digits
OFF	ON	ON	U08	7 or 8 digits
ON	OFF	OFF	U10	9 or 10 digits
ON	OFF	ON	U12	11 or 12 digits
ON	ON	OFF	U14	13 or 14 digits
ON	ON	ON	U16	15 or 16 digits

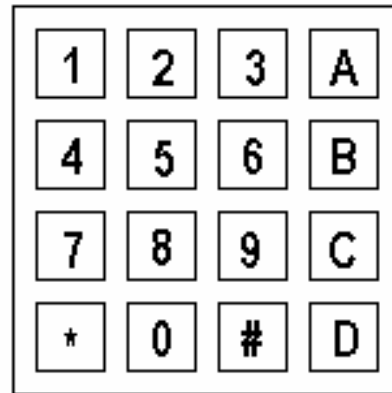
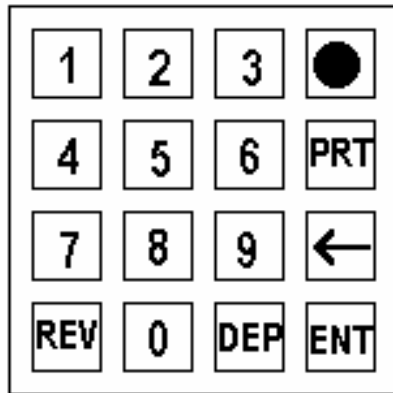
**Table 4**

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## APPENDIX E

### PROTOCOL FOR NUMERIC DISPLAYS:

Figure 1 below shows the layout of the older style keypads. Figure 2 below shows the layout of the newer style keypads. Note that the lettering differs between the keypads but the characters generated are the same on a position by position basis. Table 1 below and on the next page details what



characters are generated.

**Figure 1**

**Figure 2**

#### Common ASCII Characters:

Here are some definitions of characters commonly used by EDI programs:

CHAR	VALUE (decimal)	DEFINITION / USE
<STX>	2	This is the standard ASCII character for 'start-of-text', also known as a 'Control B'. It must be the first character in every message. If you are using an older style EDI keypad, the key labeled '●' will send this character. If you are using a newer style EDI keypad, the key labeled 'A' will send this character.
<ETX>	3	<i>This is the standard ASCII character for 'end-of-text', also known as a 'Control C'. It must be the last character in every most messages. If you are using an older style EDI keypad, the key labeled 'ENT' will send this character. If you are using a newer style EDI keypad, the key labeled 'D' will send this character.</i>

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CHAR	VALUE (decimal)	DEFINITION / USE
<LF>	10	<i>This is the standard ASCII character for ‘line-feed’, also known as a ‘Control J’. It must be the last character in a few messages for some programs. If you are using an older style EDI keypad, the key labeled ‘PRT’ will send this character. If you are using a newer style EDI keypad, the key labeled ‘B’ will send this character. <b>Note:</b> This key is not used in this application. If it is pressed, the display will do nothing.</i>
<CR>	13	<i>This is the standard ASCII character for ‘carriage-return’, also known as a ‘Control M’. It must be the last character in a few messages for some programs. If you are using an older style EDI keypad, the key labeled ‘←’ will send this character. If you are using a newer style EDI keypad, the key labeled ‘C’ will send this character. <b>Note:</b> This key is not used in this application. If it is pressed, the display will do nothing.</i>
‘0’ – ‘9’	48 - 57	These are the standard ASCII decimal digit characters used as data, and when needed, as addresses in messages. If you are using either style EDI keypad, the keys labeled ‘0’ through ‘9’ will send these characters.
‘*’	42	This is the standard ASCII character for an asterisk. For the older EDI keypad, the key that represents an asterisk is labeled ‘REV’. For the new EDI keypad, the key is labeled ‘*’. <b>Note:</b> This key is not used in this application. If it is pressed, the display will do nothing.
‘_’	45	This is the standard ASCII character for a dash or minus sign. On the older EDI keypad, the key that represents a dash is labeled ‘DEP’. On the new EDI keypad, the key is labeled ‘#’. <b>Note:</b> This key is not used in this application. If it is pressed, the display will do nothing.

**Table 1**



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## Example Messages:

**1. If you wish to display '1234' on a display that is non-addressable, press the following sequence of keys:**

'●' '1' '2' '3' '4' 'ENT' (older style)

'A' '1' '2' '3' '4' 'D' (newer style)

Both of these sequences consist of six keys.

**2. If you wish to display '123' on a display that has an address of '01', press the following sequence of keys:**

'●' '0' '1' '1' '2' '3' 'ENT' (older style)

'A' '0' '1' '1' '2' '3' 'D' (newer style)

Both of these sequences consist of seven keys.