Analog Display Board

Kamal & Co

Low Cost & Industrial Grade Cabinets

**42, Mambalam High Road,
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Description

The Analog LED Matrix Display board is designed to interpret analog signals, including 4-20 mA, 0-5V, or 0-10V inputs commonly used in industrial contexts. This board utilizes signal conditioning and scaling techniques to convert the incoming analog signals, allowing them to represent specific physical parameters. For instance, a 4 mA input might correspond to 10 RPM, while a 20 mA input could signify 1000 RPM, based on programmed start and end values. The conversion process is facilitated by a microcontroller or processor within the board. The output is then visually presented on an LED matrix display, providing users with real-time information in a clear and programmable format. This versatile display solution is instrumental in monitoring and displaying relevant data in industrial settings, offering a customizable and efficient means of visualizing analog input information.
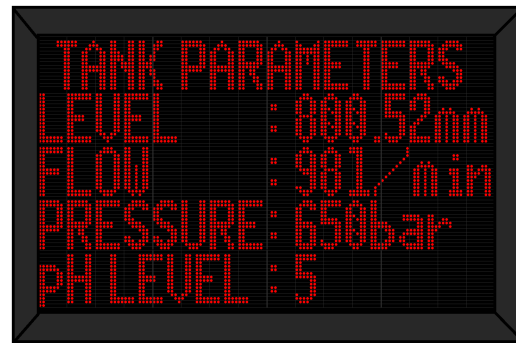
Product Features

Input Options:

- Accepts inputs in three ranges: 4-20 mA, 0-5V DC, and 0-10V DC.

Analog-to-Digital Converter (ADC) Resolution:

- Utilizes a 10-bit ADC providing a resolution of 1024 steps for the 0-5V input range.

Communication Setup:

- Configurable via RS232 or RS485 communication protocols using a proprietary ASCII protocol.

Accuracy:

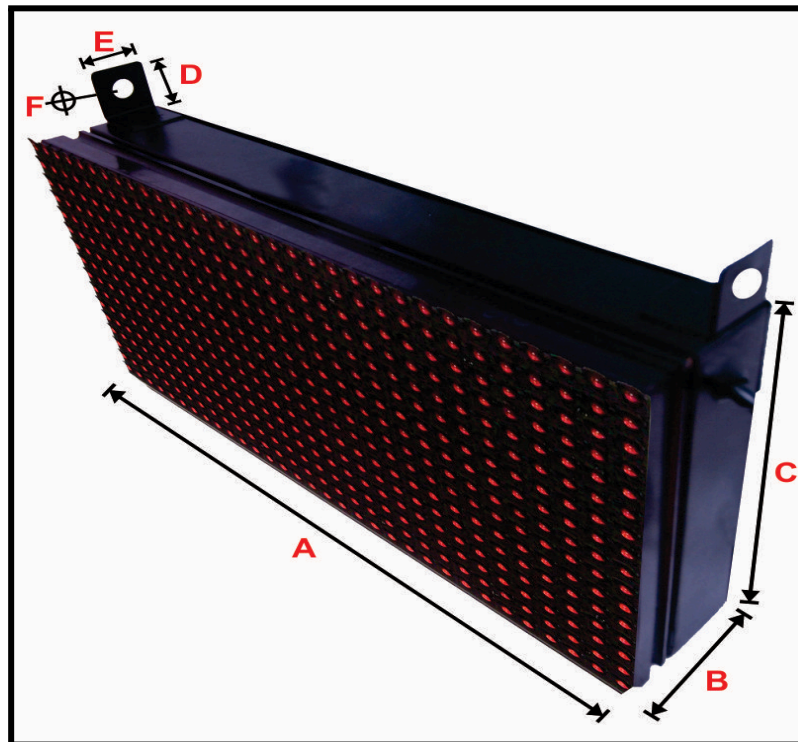- Demonstrates a high level of precision with an accuracy of ±1%.

Data Smoothing:

- Implements data smoothing techniques such as Median and Moving Average filters to enhance the stability and reliability of the measured data.

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Notes and Options.

- Display Characteristics: All units feature a single-colour display with the default supply in vibrant RED, offering excellent brightness suitable for both indoor and outdoor viewing.
- Colour Customization: Alternative colours are available upon request, incurring an extra cost.
- Outdoor Units: For outdoor applications, the cost increases by 18% over the base price to account for additional specifications.
- Customization Options: Titles and fixed designs can be added to meet specific requirements.
- Power Supply: All units operate on a standard 230V AC mains power source, with the option for 110V available upon separate quotation.
- Mounting Flexibility: Two mounting options are provided - top eye bolts for ceiling suspension and side clamps for secure bolting to supports.

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Low cost cabinet Sizes and Models						
Model	Digit Height (mm)	No of Digits	Height (mm) C	Width (mm) A	Depth (mm) B	Max Power (W)
ECON-AD-11	140	4	160	320	50	35
ECON-AD-12	140	8	160	640	50	65
ECON-AD-13	140	12	160	960	50	95

Technical Specifications	
VOLTAGE	230 VAC 1 PHASE MAIN POWER
OPERATING TEMP	5 TO 55'C
STORAGE TEMP	0 TO 65'C
RELATIVE HUMIDITY	UP TO 95% RH NON CONDENSING
DISPLAY	FULL MATRIX
LED COLOUR	RED
PROTOCOL	FULL DUPLEX, ASCII CODED,STX-ETX
INTERFACE BY	4-20 mA CURRENT LOOP , 0-5V , 0-10V
RANGE SETTING	RS232/485 COMMUNICATION TX-RX-GND
DATA TRANSFER RATE	9600 BAUD (8,n,1)
SETUP PARAMETERS STORAGE	IN AN EEPROM - NON VOLATILE MEMORY
ADC RESOLUTION	10bit
ACCURACY	± 1%
AVERAGING	MOVING AVERAGE/MEDIAN
ACCESSORIES	POWER CABLE 1 METER RS232 CABLE ANALOG(4-20mA) INPUT CABLE

Electrical Connections.

Connection Details

RS232 Cable

Analog Input Cable
(4-20mA/0-5V/0-10V)
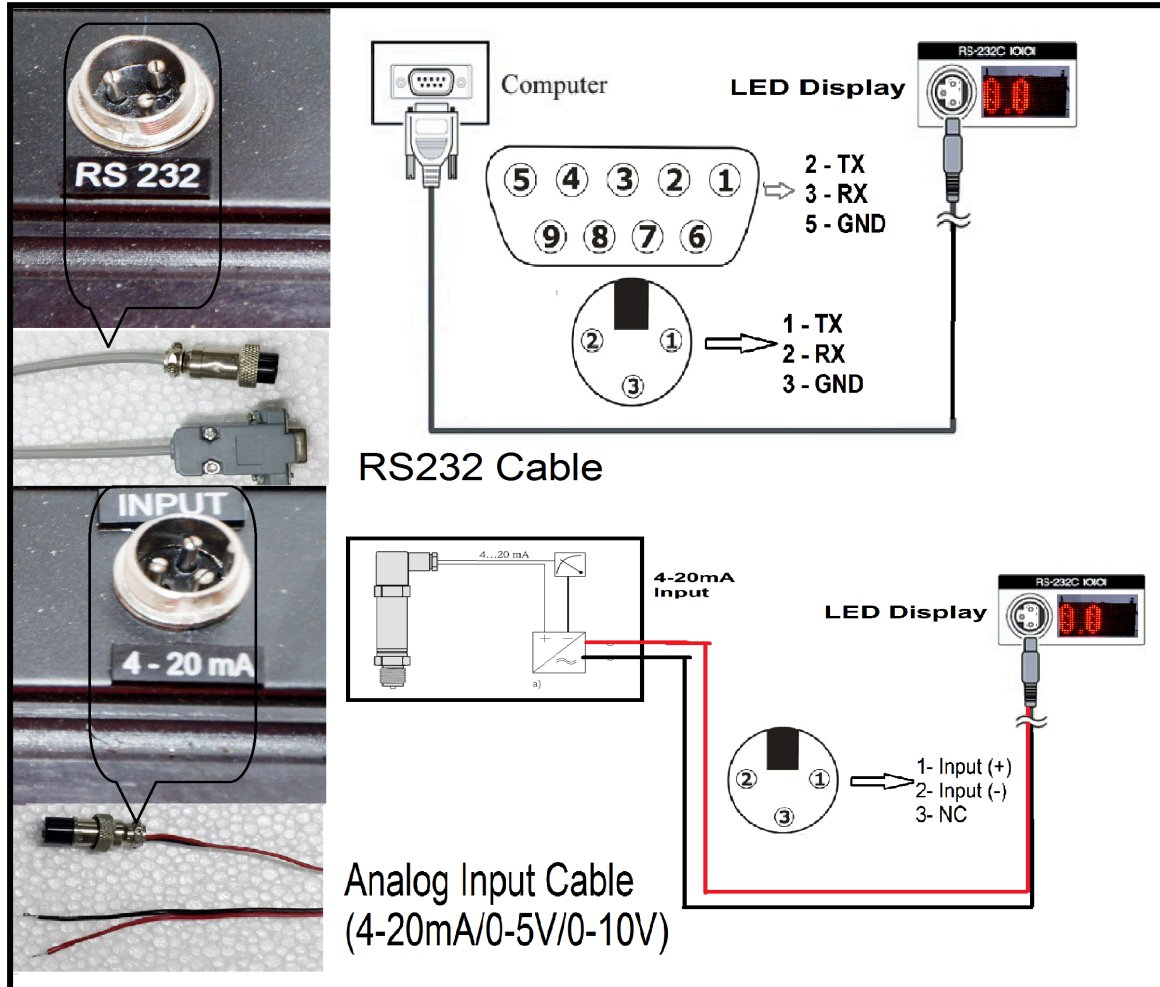
 To connect the 4-20 mA current loop, 0-5V DC, or 0-10V DC to the analog input cable and interface the unit with a computer via RS232 or USB, follow these detailed connection instructions:

Connect Analog Input:
- For the 4-20 mA current loop or voltage signals, use a shielded cable with a minimum of two conductors. Connect the RED wire to the "Positive" terminal of the Current/Voltage input and the BLACK wire to the "Negative" terminal.

Connect to Computer:
- If using RS232, connect the unit to the computer's serial port using an RS232 cable. Ensure the pinout matches between the board and the serial port. Alternatively, if using USB, connect the unit to the computer through a USB to

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RS232 or USB to RS485 adapter.

Serial Port Settings:

- Open a terminal program such as Hyperterminal, TeraTerm, RealTerm, or Putty on the computer. Set the following communication parameters in the terminal program:
  - Baud rate: 9600
  - Data bits: 8
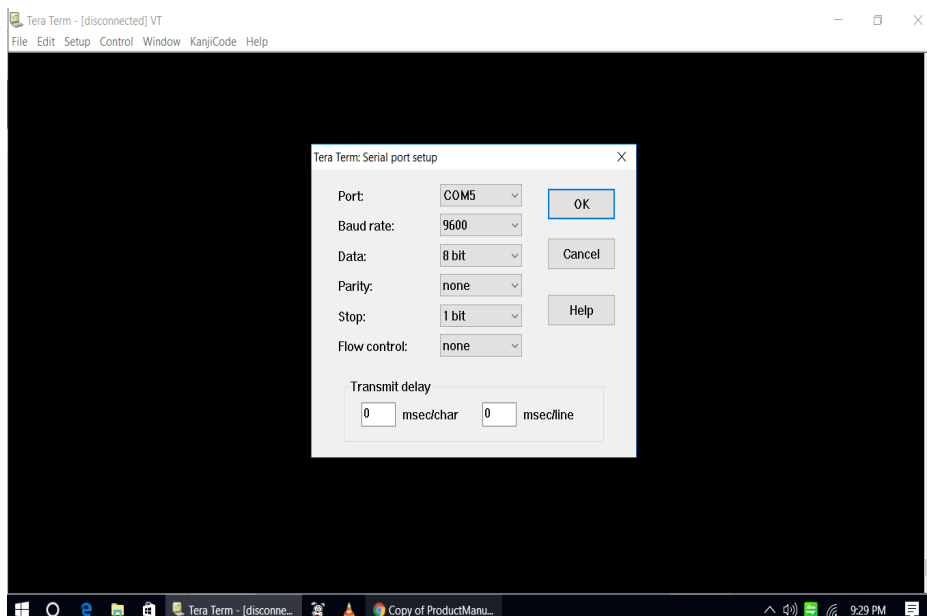 - Parity: None (n)
  - Stop bits: 1

Protocol Settings:

- Using the terminal program, send the protocol settings to the board via RS232 or RS485 communication. This may involve configuring parameters like data format, addressing, or any other settings relevant to the communication protocol used by the board.

Verify Connection:

- Once the settings are configured, verify the connection by sending and receiving test commands or data between the computer and the board. Check for any error messages or unexpected behaviour.

These steps ensure a proper connection between the analog input and the computer, facilitating data communication and configuration of the display board. Always refer to the board's user manual or documentation for specific details regarding the communication protocol and settings.

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Configuration Protocol.

The RS232 / RS485 should be connected to the board and a terminal program like Hyperterminal,TeraTerm ,putty or RealTerm should be used.The Board uses 9600 8,n,1 Setting.

Packet Format

Start of Packet SOP => [
End Of Packet EOP =>]

[ID Command Data CRC]

ID (2 chars) is the ID of the board default is 01
Command (1 char) is the command character which defines the function.
Data (n chars) is the data associated with the command.
CRC (2 chars) is the CRC for the data packet. To ignore CRC, provide XX.

Command	Description	Example
Set Start Value	This command sets the Starting Value corresponding to 4mA / 0 V	[ID S DDDD.DD CRC] Ex: [01S0.0XX] [01S50.0XX]
Set End Value	This command sets the End Value corresponding to 20mA / 5 V / 10V	[ID E DDDD.DD CRC] Ex: [01E120.0XX] [01E250.0XX]
Set Number of Digits to display	This commands decides the total number of digits the board will display.	[ID F D CRC] Ex: 9999 To display 4 Digits [01F4XX]
Set Number of Fraction points to display	This commands decides the total number of fraction points the board will display.	[ID D D CRC] Ex: 9999.9 To display 1 fraction point [01D1XX]

Set Measurement Delay between measurements	This allows delay between measurements in ms.	[ID J ddd CRC] Ex: 1000 ms delay between measurements: [01J1000XX]
Set Filter Type	This allows the board to a filter for analog. If N=0 then No Filter is used so you will see the noise data also. If N=1 then Median Filter is used. If N=2 then Moving Average Filter is used.	[ID K N CRC] Ex: For median filter [01K1XX]
Set Avg Count	This sets the number of readings the Filter uses to average the data. NN can be 00-16.	[ID L NN CRC] Ex:[01L16XX] Will set the Filter to use 16 values.Till the 16 values are accumulated,the board will show the raw unfiltered values.
Set Brightness	This command is used to set the brightness of the led display.Where Brightness can be from 0-9.	[ID B N CRC] Ex: To set minimum brightness [01B1XX]
Set Font	This command is used to set the Font of the led display.Where Font can be from 1-5 (By default only Font 3 is supported)	[ID H N CRC] Ex: To set the first Font [01H1XX]
Set Text Y Offset	This allows positioning the text on the Y Axis.	[ID I Y CRC] Ex:[01I5XX]
Advanced Commands (Do Not use without knowing what they do.)		
Set Resistor Value	This command is used to adjust the Output Value as per input value by setting the resistor value .Default resistor value will be 250 ohms.Increase the Resistor value to Decrease the Output Value increments.Decrease the Resistor value to Increase the Output Value increments.	[ID G DDDD.DD CRC] Ex: [01G250.00XX]

Set Calc Type.	This command is used to the set the calculation type.Calc Type =1 is for 4-20ma measurement with 250 ohm Shunt (can also be used for 1-5v) Calc Type =2 is for 0-5V measurement (can also be used for 0-10V with two 250 ohms voltage divider network)	**[ID C D CRC]** Ex: calc Type 1 for 4-20mA **[01C1XX]** Calc type 2 for 0-5V/0-10V **[01C2XX]**
To Dump current settings	This command is used to check the current settings.	**[ID ZZ CRC]** **Ex:** **[01ZZXX]**

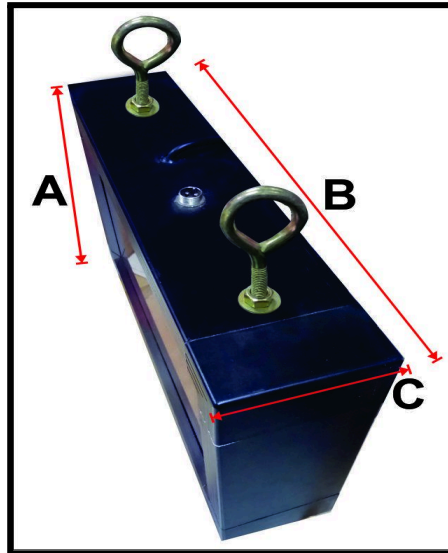| **CRC Calculation** |
|---|
| The CRC is the ASCII Encoded HEX

Ex:

CRC is calculated by XORing all the characters from ID to end of data. STX character [is not included in the CRC.

[01E2000.0169]

byte i, CalcCRC=0;
for(i=1;i<PacketLen-2;i++)
{
CalcCRC = CalcCRC ^ InputText[i];
} |

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Industrial Grade Cabinet Model nos and Dimensions

All Units in mm

Model No	A Height (mm)	B Width (mm)	C Depth (mm)	Digit Height (mm)	No of Digits	Max Power (W)
IC-AD-11	250	410	93	140	4	35
IC-AD-12	250	730	93	140	8	65
IC-AD-13	250	1050	93	140	12	95
IC-AD-22	410	730	93	260	4	125
IC-AD-23	410	1050	93	260	6	185
IC-AD-24	410	1370	93	260	8	245

Heavy Duty Cabinet

❏ The Heavy Duty Cabinets make the LED board more durable and robust.

❏ The cabinets are made from extruded aluminium profiles and moulded corners for better appearance.

- ❏ The front filter used is Perspex / LEXAN ® sheets for UV and robust.
- ❏ The hanging hooks are also heavy and suited for mounting from your support structure.

Contact Information

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