

# FP2070TN-LE2016RP-A0402U

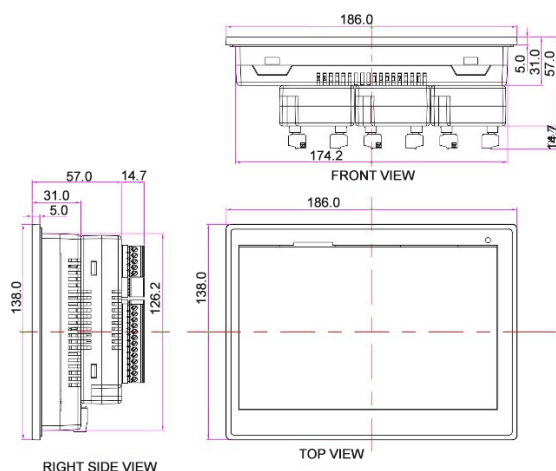
## QUICK START GUIDE



### Product Code

FP2070TN-LE2016RP-A0402U: 800 x 480, WVGA, 7" color TFT with 20 Digital Input, 12 Relay Output and 4 Digital PNP type Output. 4 Analog Input in that 2 are Linear (16 bit resolution) and 2 are Temperature Input (RTD, Thermocouple Etc.) 2 Linear Analog Output (12 bit resolution). With 2 Serial Ports, One USB Type C port & 1 USB Host port and 1 SD card slot. It supports up to 3 Expansions.

### PRODUCT DIMENSIONS

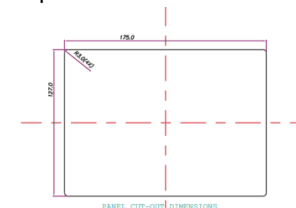


### SPECIFICATIONS

|                                     |                                                                                                                                                                                                                                           |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Power (Base)</b>                 | 24VDC (±15%)                                                                                                                                                                                                                              |
| <b>Power Consumption</b>            | 24V @290mA (Wattage: 6.96W)                                                                                                                                                                                                               |
| <b>Display (Resolution)</b>         | 7" WVGA Color TFT (800 x 480)                                                                                                                                                                                                             |
| <b>Processor</b>                    | 32 bit RISC processor                                                                                                                                                                                                                     |
| <b>Touch Screen</b>                 | Analog Resistive                                                                                                                                                                                                                          |
| <b>LEDs</b>                         | 1                                                                                                                                                                                                                                         |
| <b>RAM</b>                          | 16MB                                                                                                                                                                                                                                      |
| <b>FLASH</b>                        | 16MB                                                                                                                                                                                                                                      |
| <b>User Application</b>             | 8MB                                                                                                                                                                                                                                       |
| <b>Ladder Memory</b>                | 2MB                                                                                                                                                                                                                                       |
| <b>Alarm Memory</b>                 | 1350 Alarms                                                                                                                                                                                                                               |
| <b>Retentive Memory</b>             | 8000 Words                                                                                                                                                                                                                                |
| <b>Keep Memory Registers</b>        | 1000 words                                                                                                                                                                                                                                |
| <b>Data Log</b>                     | 4MB                                                                                                                                                                                                                                       |
| <b>Isolation</b>                    | No                                                                                                                                                                                                                                        |
| <b>Digital Input</b>                | 20                                                                                                                                                                                                                                        |
| <b>Input current</b>                | 24VDC, 5mA (±10 %)                                                                                                                                                                                                                        |
| <b>Analog Input Total Channels</b>  | 4: 2 V/I, 2 Temp input (16 bit resolution)                                                                                                                                                                                                |
| <b>Voltage Input</b>                | 0-10V, 0-5 V (configurable)                                                                                                                                                                                                               |
| <b>Current Input</b>                | 0-20mA, 4-20mA (configurable)                                                                                                                                                                                                             |
| <b>Temperature Input</b>            | RTD, PT-100 ,T/C etc.                                                                                                                                                                                                                     |
| <b>Digital Outputs</b>              | 16 (12 Relay Type & 4 PNP type)                                                                                                                                                                                                           |
| <b>Analog Output Total Channels</b> | 2 (12 bit resolution)                                                                                                                                                                                                                     |
| <b>Output type</b>                  | 0-20 mA, 4-20 mA and 0-10 VDC (configurable)                                                                                                                                                                                              |
| <b>Nominal Load Current</b>         | 250mA/1 point for PNP \ 2A for Relay(24V and 230VAC)                                                                                                                                                                                      |
| <b>Expansion supported</b>          | 3 Expansion Card Can be supported                                                                                                                                                                                                         |
| <b>Language support</b>             | IEC61131-3 (LD, SFC, IL, FBD, ST)                                                                                                                                                                                                         |
| <b>Panel Cutout</b>                 | 127.00(H) x 175.00(W)mm                                                                                                                                                                                                                   |
| <b>Bezel Dimensions</b>             | 138(H) x 186.0(W) x 31.0(D)mm                                                                                                                                                                                                             |
| <b>Communication</b>                |                                                                                                                                                                                                                                           |
| <b>Serial Ports</b>                 | 2 x RS232 /RS485 (1 PBT and 1 RJ45)                                                                                                                                                                                                       |
| <b>USB Device</b>                   | 1 x USB Type C (for upload/download and monitoring)                                                                                                                                                                                       |
| <b>Ethernet</b>                     | Yes                                                                                                                                                                                                                                       |
| <b>SD Card</b>                      | Micro SD [High Capacity (4GB to 32GB)]<br>Speed Class: <br>[While inserting and removing SD card, please make sure to TURN OFF the power to the unit.] |
| <b>Environment &amp; Approvals</b>  |                                                                                                                                                                                                                                           |
| <b>Operating Temperature</b>        | 0 to 50 °C                                                                                                                                                                                                                                |
| <b>Storage Temperature</b>          | -20 to 85 °C                                                                                                                                                                                                                              |
| <b>Relative Humidity</b>            | 10 to 95% non-condensing                                                                                                                                                                                                                  |
| <b>Shock</b>                        | 25g, 11ms, 6 shocks per axis, total 18 shocks (X, Y, Z)                                                                                                                                                                                   |
| <b>Vibration</b>                    | 5~150Hz, 3g peak, (X, Y, Z)                                                                                                                                                                                                               |
| <b>Protection</b>                   | Front Panel Mounting with IP-66 Rating                                                                                                                                                                                                    |
| <b>Approval</b>                     | CE, UL(Class 1 DIV 2) and RoHS Complaint                                                                                                                                                                                                  |
| <b>Online edit</b>                  | Online Edit mode supported                                                                                                                                                                                                                |

### PANEL CUTOUT DIMENSIONS

Panel Cutout Dimensions: 127.00(H) x 175.00(W) mm  
Panel Thickness: Maximum 6mm  
Mounting Clamps: 4

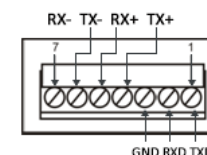


### COMMUNICATION

This section provides information regarding communication interfaces supported by this product.

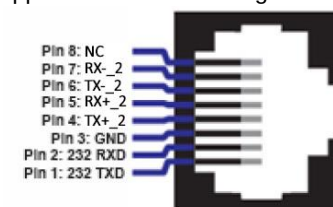
#### COM1

FP2070TN-LE2416RP-A0402U has one terminal block port, which support RS232 / RS485 signal levels.  
Program Upload/Download Supported On RS232 Port



#### COM2

FP2070TN-LE2416RP-A0402U: FP has a RJ45 Port Which Support RS232/RS485 Signal Levels.



#### USB Host Port/ USB Slave Port/ Ethernet Port

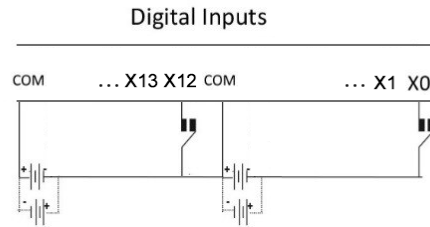
1. USB Host, compliant with USB 2.0 specification.
2. USB Host used: Standard USB Type a Female connector.
3. USB Slave used: Micro USB Type B Female connector.
4. Ethernet port used: Standard shielded RJ-45 female jack with in-built speed and link activity indication LEDs.
5. 10 / 100 Mbps support.  
Default IP Address: 192.168.0.254  
Default Subnet Activity Mask: 255.255.255.0



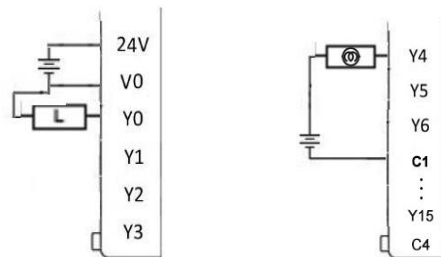
For more Information, visit  
[www.renuelectronics.com](http://www.renuelectronics.com)

## WIRING DIAGRAMS

### Digital Input

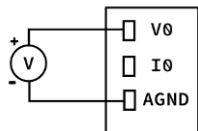


### Digital Output

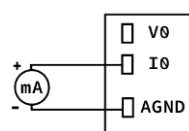


### Analog Input

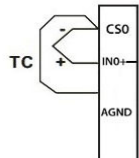
#### Voltage Input



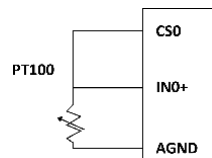
#### Current Input



### Thermocouple

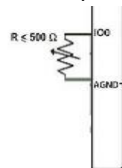


### RTD

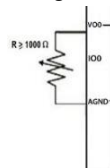


### Analog Output

#### Current Output



#### Voltage Output



## DATA FORMAT

### Channel Type Selection Values Table

Use the following values in the Input and output channel type select register to configure the corresponding channel to particular type.

| Input Channel Type  | Value | Input Channel Type | Value |
|---------------------|-------|--------------------|-------|
| Voltage: 0 to 10V   | 1     | S Type             | 12    |
| Voltage: 0 to 5V    | 6     | E Type             | 13    |
| Current: 4 to 20 mA | 2     | J Type             | 14    |
| Current: 0 to 20mA  | 3     | K Type             | 15    |
| RTD: ALPHA1         | 7     | N Type             | 16    |
| B Type              | 10    | T Type             | 17    |
| R Type              | 11    |                    |       |

| Output Channel Type | Value |
|---------------------|-------|
| Voltage: 0 to 10V   | 2     |
| Current: 4 to 20 mA | 5     |
| Current: 0 to 20mA  | 6     |

### Configuration Registers for Analog Input

| CH No. | Configuration Register | Input Register | Input Error Register | Universal / Linear |
|--------|------------------------|----------------|----------------------|--------------------|
| CH-0   | MW0071                 | XW0001         | MW0090               | Linear             |
| CH-1   | MW0072                 | XW0003         | MW0090               | Linear             |
| CH-2   | MW0087                 | XW0005         | MW0090               | Temp               |
| CH-3   | MW0088                 | XW0007         | MW0090               | Temp               |

#Linear (V and I) #Temp (RTD, T/C)

### Configuration Registers for Analog Output

| CH No. | Configuration Register | Current Register | Voltage Register |
|--------|------------------------|------------------|------------------|
| CH-0   | MW0073                 | YW0002           | YW0001           |
| CH-1   | MW0089                 | XW0004           | YW0003           |

### Data Output Format for Analog Input

For, Voltage Input (0 to 10V)

| Voltage input | Count |
|---------------|-------|
| 0             | 0     |
| 2.5V          | 16383 |
| 5V            | 32767 |
| 7.5V          | 49150 |
| 10V           | 65535 |

Voltage Input (0 to 5V)

| Voltage input | Count |
|---------------|-------|
| 0             | 0     |
| 1.5V          | 16383 |
| 2.5V          | 32767 |
| 3.75V         | 49150 |
| 5V            | 65535 |

For, Current Input (0 to 20mA)

| Current input | Count |
|---------------|-------|
| 0             | 0     |
| 5mA           | 16383 |
| 10mA          | 32767 |
| 15mA          | 49150 |
| 20mA          | 65535 |

Current Input (4 to 20mA)

| Current input | Count |
|---------------|-------|
| 4mA           | 0     |
| 8mA           | 16383 |
| 12mA          | 32767 |
| 16mA          | 49150 |
| 20mA          | 65535 |

### RTD, T/C type and range table

| Input Type | Temp. Range   | Input Type | Temp. Range    |
|------------|---------------|------------|----------------|
| Alpha1     | -200 to 850°C | J Type     | -200 to 1200°C |
| B Type     | 100 to 1800°C | K Type     | -200 to 1300°C |
| R Type     | 0 to 1700°C   | N Type     | -270 to 1300°C |
| S Type     | 0 to 1700°C   | T Type     | -200 to 350°C  |
| E Type     | 0 to 600°C    |            |                |

### Note:

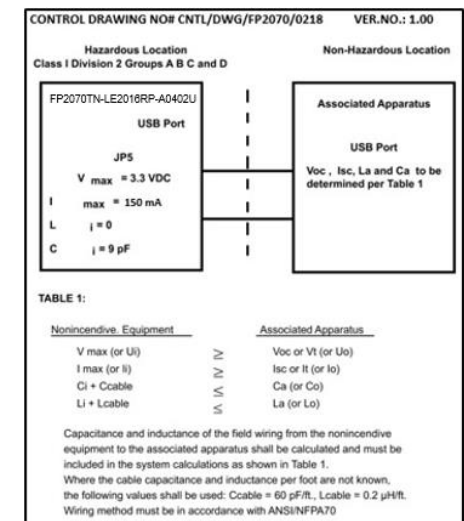
RTD PT100 Alpha1 constant= 0.00385

Accuracy for Voltage, Current and RTD: 0.2% of full scale @25° C

Accuracy for T/C =0.5% of full scale @25° C

### Data Output Format for Analog Output

| I(4 to 20mA)  |       | I(0 to 20mA)  |       | V(0 to 10V)    |       |
|---------------|-------|---------------|-------|----------------|-------|
| Current input | Count | Current input | Count | Voltage Output | Count |
| 4mA           | 0     | 0             | 0     | 0              | 0     |
| 8mA           | 1024  | 5mA           | 1024  | 2.5V           | 1024  |
| 12mA          | 2048  | 10mA          | 2048  | 5V             | 2048  |
| 16mA          | 3072  | 15mA          | 3072  | 7.5V           | 3072  |
| 20mA          | 4095  | 20mA          | 4095  | 10V            | 4095  |



## REVISION HISTORY

| Rev. | Description                         | Date       |
|------|-------------------------------------|------------|
| 1.0  | First Draft                         | 15/03/2023 |
| 1.1  | Some changes done in Specifications | 14/07/2023 |
| 1.2  | Changes in specification            | 20/10/2023 |
| 1.3  | Analog Input diagrams updated       | 06/11/2023 |

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