

FlexiPanels[®] Basic HMI

FP2-V2 Series



Contents

| | |
|---|------------------|
| <u>INTRODUCTION</u> | <u>4</u> |
| <u>BEFORE YOU START</u> | <u>4</u> |
| <u>SAFETY PRECAUTIONS</u> | <u>5</u> |
| <u>PRODUCT OVERVIEW</u> | <u>6</u> |
| INSTALLING FP2-V2 PRODUCTS..... | 6 |
| PANEL GUIDELINES..... | 6 |
| PANEL CUTOUT DIMENSIONS..... | 6 |
| PRODUCT DIMENSIONS | 7 |
| MINIMUM CLEARANCES..... | 7 |
| MOUNTING FP2-V2 PRODUCTS..... | 8 |
| CONNECTING POWER..... | 8 |
| POWER RATING..... | 8 |
| GROUNDING..... | 8 |
| <u>PRODUCT SPECIFICATIONS</u> | <u>9</u> |
| PRODUCT NOMENCLATURE / ORDERING PART NUMBER | 9 |
| <u>DISPLAY SPECIFICATIONS</u> | <u>10</u> |
| <u>CPU, MEMORY AND POWER SUPPLY</u> | <u>10</u> |
| COMMUNICATION INTERFACES | 11 |
| RS232 / RS485 PORT..... | 11 |
| Y TYPE CABLE | 12 |
| ETHERNET PORT | 14 |
| USB DEVICE PORT | 15 |
| USB HOST PORT | 15 |
| SUPPORTED PROTOCOLS | 16 |
| <u>ACCESSORIES</u> | <u>17</u> |

PROGRAMMING CABLE (DOWNLOAD)..... 17

COMMUNICATION CABLE.....17

DEFAULT PRODUCT SETTING.....18

ENVIRONMENTAL SPECIFICATIONS AND APPROVALS.....18

REVISION HISTORY..... 19

NOTES 20

Introduction



FP2-V2 HMI series is suitable for simple applications. Available screen sizes are 4.3" WQVGA and 7" WVGA Color TFT. These HMIs are powered by FlexiSoft® programming software. These products also support the IEC61131-3 logic programming environment which gives a unique edge to these products.

All the products are compliant to EMC directive 2014/30/EU and LVD directive 2014/35/EU and suitable for installation in hazardous locations because they are listed for UL Class I Div. 2.

This user manual gives detailed information regarding the hardware specifications, operating conditions, installation, mounting, and wiring.

Before you start

- FlexiPanels® FP2-V2 series products are general-purpose human machine interface devices, suitable for a variety of simple applications across various industries. However, the manufacturer is not responsible or liable for any indirect or consequential damage resulting from the use of this product.
- The user should check and confirm the suitability of the product before using it in any specific application.
- The diagrams and examples in this manual are included for illustration purposes only. The manufacturer assumes no responsibility or liability regarding actual use based on these diagrams or examples.
- Reproduction of the contents of this manual, in any form (in part or whole), is strictly prohibited.
- Following table shows various symbols that may be used in this manual to provide information regarding safety, precautions, and usage of the product:

| | |
|---|--|
|  | WARNING: Indicates circumstances that may cause an explosion in a hazardous environment, which may lead to injury or death, damage or economic loss |
|  | CAUTION: Indicates specific precautions to be taken by the user during installation, operation and maintenance of the product |
| ATTENTION | ATTENTION: Indicates important information regarding the application and functions of the product |

Safety Precautions

This section of the manual provides information that is critical regarding safety and therefore the user is advised to go through the information in detail before installing the product. Users may contact the manufacturer technical support team for any specific question(s) related to safety.



WARNING: EXPLOSION HAZARD

- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.
 - The substitution of any component may impair suitability for Class I, Division 2.
 - Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or any other means provided with this product.
 - If this product contains batteries, it must only be changed in an area known to be nonhazardous.
-



CAUTION: GENERAL PRECAUTIONS

- Do not use this product for an emergency stop. A separate physical switch, outside the product, must be used for any emergency stop operations.
 - Do not use the external power supply source that does not comply with the specified power requirements of the product, it may cause malfunction or permanent damage to the product.
 - Do not attempt to open, dismantle, or modify the product, doing so will void the warranty.
 - This product is supplied as open-type equipment and it must be mounted within an enclosure, suitably designed for specific environmental conditions.
 - When used in Class I, Division 2 hazardous location, the product must be mounted in a suitable enclosure with a proper wiring method that complies with the governing electrical codes.
 - The USB port is intended for temporary local programming purposes only and not intended for permanent connection. If you connect or disconnect the USB cable with power applied to this product or any other device on the USB network, an electrical arc can occur, which could cause an explosion in hazardous location installations.
 - Make sure that connectors are securely tightened to properly seal the connections against leaks.
 - Do not place the product in direct sunlight. Prolonged exposure to sunlight may degrade the LCD and housing.
-

Product Overview

This section of the manual provides an overview of FP2-V2 series products, its front and back view, installation details, dimensional details, mounting method, and details.

Installing FP2-V2 products

FP2-V2 series products are designed for front panel mounting. Before installing the products, the user should review the panel guidelines, panel cutout dimensions, product dimensions, and minimum clearances.

Panel Guidelines

The panel must be at least 2mm (12gauges) so that it can provide the required support and proper sealing against water and dust. The panel surface must be flat, without any imperfection, to maintain the adequate seal and IP rating.

The maximum panel thickness allowed is 6mm (± 0.2 mm).

Panel Cutout Dimensions

The panel must be at least 2mm (12gauges) so that it can provide the required support and proper sealing against.

| Model | Height (mm) | Width (mm) |
|-------------|-------------|------------|
| FP2043T-V2 | 80 | 111 |
| FP2043TN-V2 | 80 | 111 |
| FP2070T-V2 | 127 | 175 |
| FP2070TN-V2 | 127 | 175 |

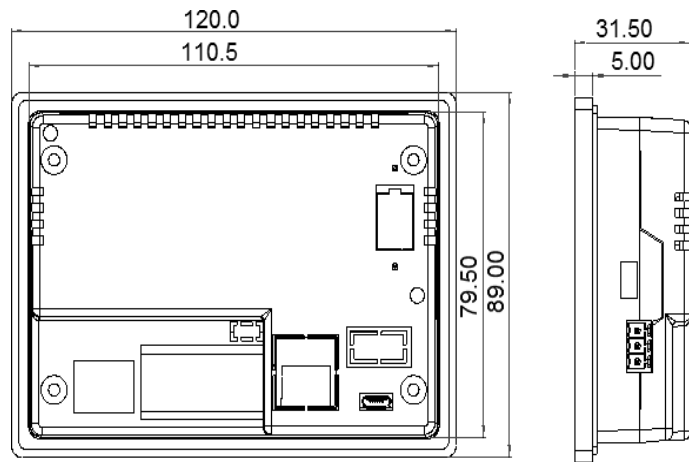
ATTENTION

ATTENTION: Panel cutout

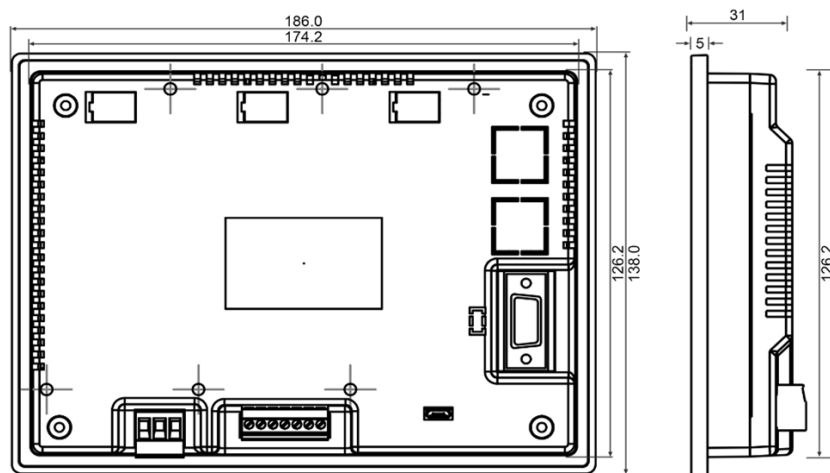
- Before making a panel cutout, disconnect all electrical power from the panel.
 - Make sure that area surrounding the panel cutout is clear.
 - Make sure that metal cutting does not enter any component already installed in the panel.
-

Product Dimensions

This section of the manual provides dimensional details of FP2-V2 series products. All the dimensions shown below are measured in mm.



FP2043-V2



FP2070-V2

Minimum Clearances

Maintain clearance from enclosure walls, wires, and other adjacent devices. Keep 2" space on all sides for adequate ventilation. Plan for adequate space around the product and inside the enclosure for ventilation and cabling. Take into consideration the heat produced by other devices in the enclosure. The ambient temperature around this product must be 0° to 50°C.

Mounting FP2-V2 Products

FP2-V2 series products must be installed on the front panel, using the clamp accessories shipped with the product. Before mounting, make sure that the sealing gasket is properly positioned. This gasket forms a compression type seal. Do not use sealing compounds. Then, place the unit in the panel cutout and tighten the mounting screws evenly (torque 0.4Nm) to maintain water and dust resistance.

ATTENTION ATTENTION: Mounting FP2-V2 on Panel

- Do not push the LCD display when pushing the unit into the panel as it may damage the display.
-

Connecting Power

FP2-V2 series requires a 24VDC isolated power supply. Follow the steps mentioned below to connect the power:

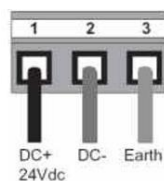
- Make sure that terminal is not connected to a power source
- Secure the 24VDC power wires
- Secure the functional earth ground wire to the functional earth ground terminal screw on the terminal block
- Apply 24VDC power to the terminal

Power Rating

| Unit | Voltage | Current | Wattage |
|-------------|---------|---------|---------|
| FP2043T-V2 | 24VDC | 130mA | 3.12W |
| FP2043TN-V2 | 24VDC | 150mA | 3.6W |
| FP2070T-V2 | 24VDC | 200mA | 4.8W |
| FP2070TN-V2 | 24VDC | 230mA | 5.52W |

Grounding

The optimum method for grounding electronic equipment is to ground it separately from other high-power systems and to ground more than one unit of electronic equipment with a single-point ground. Following marked terminal is provided with the unit for grounding:

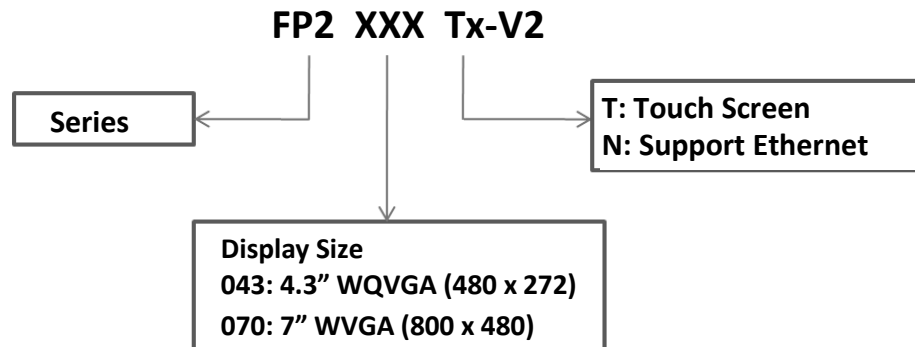


Product Specifications

This section of the manual provides detailed specifications of FP2-V2 series products, ordering part numbers, operating conditions, environment, and approvals.

Product Nomenclature / Ordering Part Number

FP2-V2 series has 2 models, depending on display size and each model has two variants, based on Ethernet. Detail part number or ordering information is as follows:





| Model | Description |
|-------------|--|
| FP2043T-V2 | 2 Serial ports [#] (1 RS232, 1 RS485), 1 USB Device, 1 USB Host |
| FP2043TN-V2 | 2 Serial ports [#] (1 RS232, 1 RS485), 1 USB Device, 1 USB Host, 1 Ethernet |
| FP2070T-V2 | 2 Serial ports (RS232 / RS485), 1 USB Device, 1 USB Host |
| FP2070TN-V2 | 2 Serial ports (RS232 / RS485), 1 USB Device, 1 USB Host, 1 Ethernet |

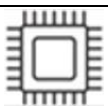



[# **Note:** FP2043-V2 support one DB9 port that supports RS232 and RS485 levels on different pins. "Y" type cable can be used for separate RS232 and RS485 levels simultaneously.]

Display Specifications

FP2-V2 series products support high-quality color TFT display range.

| | |
|---|---|
|  | Size: 4.3" WQVGA Color TFT with 4-wire analog resistive touch screen Resolution: 480 x 272pixels Brightness: 400cd/m ² Backlight life: 30,000Hrs. |
|  | Size: 7" WVGA Color TFT with 4-wire analog resistive touch screen Resolution: 800 x 480pixels Brightness: 350cd/m ² Backlight life: 30,000Hrs. |

CPU, Memory and Power Supply

| | |
|---|--|
|  | CPU: 32-bit RISC Processor |
|  | RAM: 16MB |
| User Application | 8MB |
| Flash | 16MB |
| Ladder Memory | 2MB |
| Alarm Memory | 1350 Alarms |
| Retentive Memory | 8000Words |
| Keep Memory | 1000Words |
| Data Log | 4MB |
|  | Power supply: 24VDC(+20%, -15%) |
|  | RTC: Built-in, Date & Time function |

Communication Interfaces

This section of the manual gives detailed information regarding various communication interfaces supported by FP2-V2 series products, including communication interfaces between FP2-V2 with any third-party device, interfaces for programming and monitoring.

RS232 / RS485 Port

FP2043-V2 has one DB9 female port that supports RS232(COM1) and RS485(COM2) signal levels on different pins.



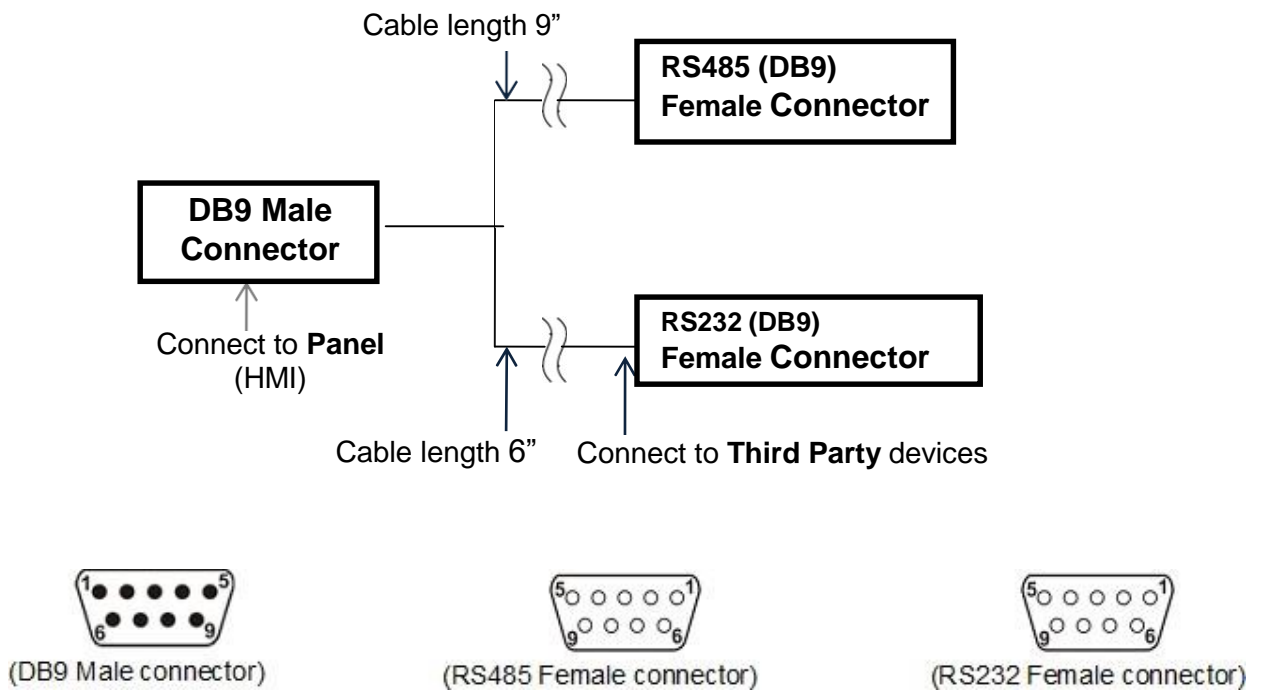
DB9 pin connector

| Pin number | Signal |
|------------|------------|
| 1 | TX+(RS485) |
| 2 | TXD(RS232) |
| 3 | RXD(RS232) |
| 4 | RX+(RS485) |
| 5 | GN |
| 6 | NC |
| 7 | NC |
| 8 | TX-(RS485) |
| 9 | RX-(RS485) |

[Note: Special “Y” cable can be provided, if both the ports are to be used simultaneously.]
[REPL Part# EC-Y-FP]

Y Type Cable

Special “Y” cable for the FP unit (two communication levels on one port).

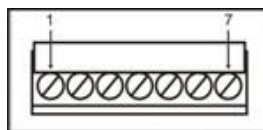


| Pin number | Signal | Pin number(RS485) | Pin number(RS232) |
|------------|--------|-------------------|-------------------|
| 1 | TX+ | 1 | 1 |
| 2 | TXD | 2 | 2 |
| 3 | RXD | 3 | 3 |
| 4 | RX+ | 4 | 4 |
| 5 | SG | 5 | 5 |
| 6 | NC | 6 | 6 |
| 7 | NC | 7 | 7 |
| 8 | TX- | 8 | 8 |
| 9 | RX- | 9 | 9 |

ATTENTION ATTENTION: DB9 port

- The 4.3" models have only one DB9 port that supports RS232 and RS485 signal levels on different pins.
- If the user wants to connect different devices, on RS232 and RS485 levels, simultaneously with 4.3" HMI, then he must use 'Y' type cable.

FP2070-V2 has one terminal block port (COM1) and one DB9 female port (COM2). Both com ports support RS232 / RS485 signal levels.



Terminal Port
(COM1)

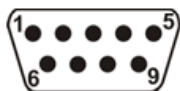
| Pin number | Signal |
|------------|--------|
| 1 | RX- |
| 2 | TX- |
| 3 | RX+ |
| 4 | TX+ |
| 5 | GND |
| 6 | RXD |
| 7 | TXD |



DB9 pin connector
(COM2)

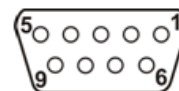
| Pin number | Signal |
|------------|------------|
| 1 | TX+(RS485) |
| 2 | TXD(RS232) |
| 3 | RXD(RS232) |
| 4 | RX+(RS485) |
| 5 | GN |
| 6 | NC |
| 7 | NC |
| 8 | TX-(RS485) |
| 9 | RX-(RS485) |

RS232 MALE



RS232 pinout

RS232 FEMALE



| Pin number | Signal | | Pin number | Signal |
|------------|--------|-------|------------|--------|
| 2 | TXD | ===== | 2 | RXD |
| 3 | RXD | ===== | 3 | TXD |
| 5 | GND | ===== | 5 | GND |

2-wire RS485 pinout

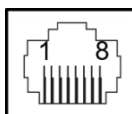
| Signal | Pin number | Signal |
|---------------|------------|----------------|
| A (TX+ / RX+) | 1 | TX+ |
| B (TX- / RX-) | 4 | RX+ |
| GND | 5 | GND and Shield |
| | 8 | TX- |
| | 9 | RX- |

4-wire RS485 pinout

| Pin number | Signal | Pin number | Signal |
|------------|--------|------------|----------------|
| YELLOW | RX+ | 1 | TX+ |
| GREEN | TX+ | 4 | RX+ |
| BLACK | GND | 5 | GND and Shield |
| WHITE | RX- | 8 | TX- |
| BLUE | TX- | 9 | RX- |

Ethernet Port

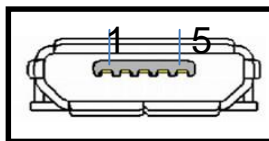
FP2-V2 series support Ethernet port as an ordering option. It's having standard shielded RJ45 female jack with built-in speed and indication LED'S.



| Pin number | Signal |
|------------|--------|
| 1 | TX+ |
| 2 | TX- |
| 3 | RX+ |
| 4 | NC |
| 5 | NC |
| 6 | RX- |
| 7 | NC |
| 8 | NC |

USB Device Port

FP2-V2 products support one Micro USB compliant with USB 2.0 specification port for programming and monitoring.



| Pin number | Signal |
|------------|--------|
| 1 | VCC |
| 2 | D- |
| 3 | D+ |
| 4 | NC |
| 5 | GND |

USB Host Port

FP2-V2 products support one USB Host compliant with USB 2.0 specification port. USB Host can handle only USB memory stick devices and can source current up to 150mA only.

The connector used: Standard USB Type a Female connector.

| Pin number | Signal |
|------------|--------|
| 1 | VCC |
| 2 | D- |
| 3 | D+ |
| 4 | GND |

Currently USB Host can be used for Upload and Download of Application/ Firmware only. Upload and Download of Data Logging or Recipe over USB is not supported.

Supported Protocols

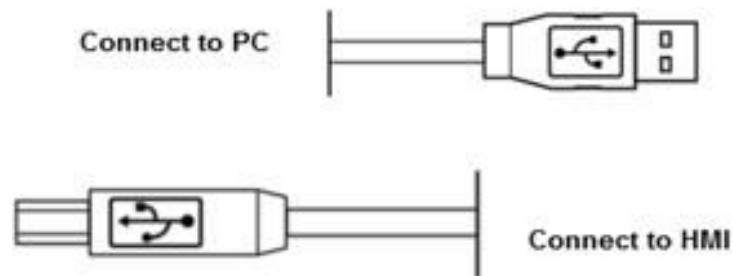
| Model | |
|-----------------------------------|----------------------------------|
| Allen Bradley DF1 | Modbus RTU (Unit as Slave) |
| Panasonic FP Series | Modbus /TCP Master (Client) |
| Baldor | Modbus / TCP Server (Slave) |
| Danfoss Drive | Omron Host Link |
| Delta PLCs | Omron Inverter Memobus |
| Fatek PLCs | Siemens Micromaster Driver (USS) |
| FlexiLogics Slave Driver | Siemens Step-7 Micro |
| FlexiLogics Master Driver | Siemens Profinet PLCs |
| G9SP Safety Controller | Toshiba (Link Port) Series PLCs |
| GE SNP | Toshiba Inverters PLCs |
| GE SNP-X | Toshiba T series |
| Idec PLCs | Toshiba PLC Ethernet Driver |
| Keyence KV Series | Twido PLCs |
| LG Master K Series PLC | Unitlelway PLCs |
| LG Master-K 300S | Universal Serial Driver (ASCII) |
| Mitsubishi FX | Tri PLC |
| Mitsubishi Q Series PLCs (Serial) | AB PLC EPIC PCCC |
| Modbus ASCII (Unit as Master) | Logix 5000 PLCs |
| AB PLCs | Universal Ethernet Driver(ASCII) |
| Modbus RTU (Unit as Master) | |

Accessories

Programming Cable (Download) Micro USB

Part number: PC-USBAB-00-Micro

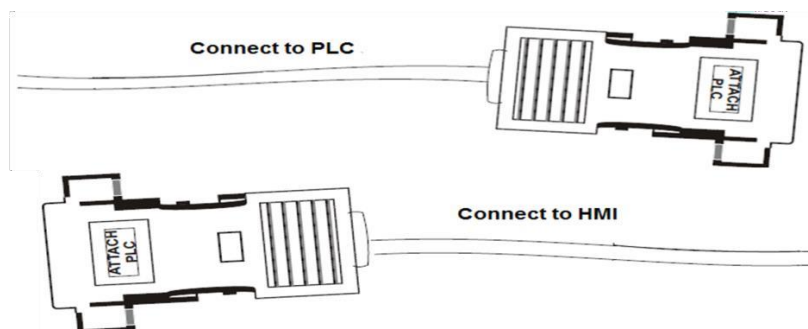
[**Note:** PC-USBAB-00: 2M cable, PC-USBAB-05: 5M cable, PC-USBAB-10: 10M cable]



Communication Cable RS-232

Part number: IBM0909-1-00

[**Note:** IBM0909-1-00: 2M cable, IBM0909-1-05: 5M cable, IBM0909-1-10: 10M cable]



Default Product Setting

| | |
|------------------|--------------------------------------|
| Network Setting | Static |
| Default IP | 192.168.0.254 |
| Brightness | Full Scale |
| Beeper | On |
| Default Language | English |
| RTC Settings | Current Date/Month/Year Current Time |

Environmental Specifications and Approvals

| Feature | Specifications |
|-----------------------|---|
| Operating Temperature | 0°C~50°C |
| Storage Temperature | -20°C~85°C |
| Relative Humidity | 10 to 95% non-condensing |
| Shock | IEC 60068-2-27 25g, 11ms, 6 shocks per axis, total 18 shocks (X, Y, Z) |
| Vibration | 5 to 150Hz, 3G, peak (X, Y, Z) |
| Protection | IP66 for front panel mounting |
| CE | Yes |
| UL | Yes (Class I Division 2) |
| RoHS | Yes |

Revision History

| Revision | Description | Date | Prepared by | Approved by |
|----------|----------------------|------------|-------------|-------------|
| 1.0 | Initial Release | 01/09/2020 | PM | KK |
| 1.1 | Updated Power Supply | 08/09/2020 | PM | KK |
| 1.2 | Updated IP Rating | 01/06/2021 | PM | KK |

The manufacturer reserves the right to change or discontinue specifications and features without prior notice.

NOTES