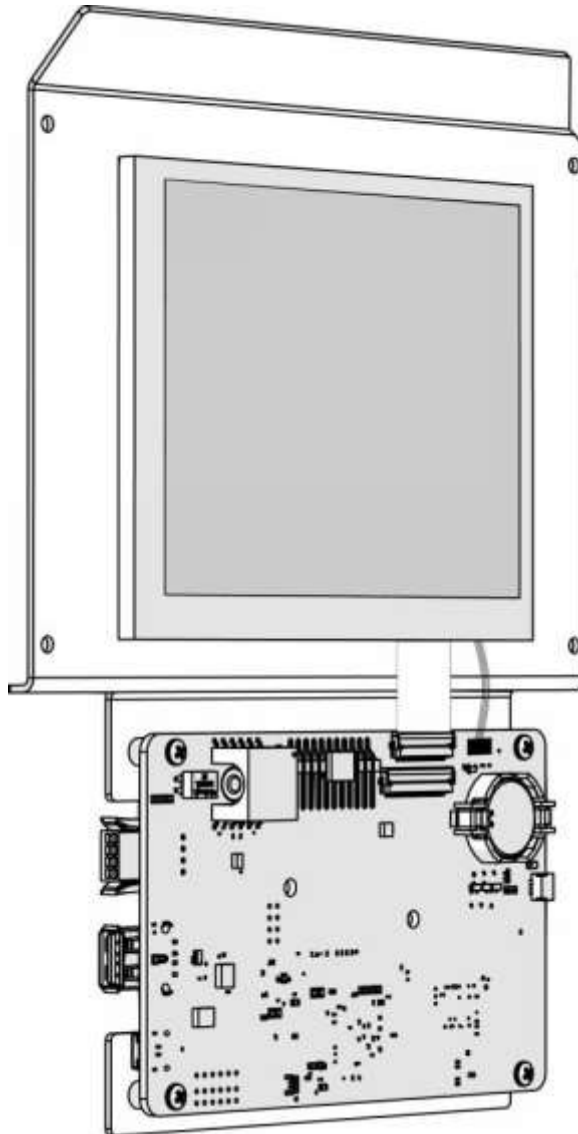


PROFIRE 3100 User Interface Card & Assembly

PF3100-00



The PROFIRE User Interface (UI) Assembly is designed to provide easy interface between operators and the BMS controller.

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1. Introduction

Functional Description

The PF3100 User Interface (UI) card is the primary access point for commissioning and programming the PF3100 system. The UI card is always installed inside a UI enclosure. The UI assembly consists of the UI card, the LCD, and the backplate.

The UI card is designed to be used as part of a PF3100 modular system. For additional information, please refer to the Hardware Guide corresponding to the cards specific to your application.

Model Types

Model Number	Name	Description
PF3100-00A	User Interface - Standalone	Polyester painted steel enclosure, no other cards included.
PF3100-00B	User Interface - Composite with Network Switch Card	Polyester painted steel enclosure, PF3106-00 card included.
PF3100-00C	User Interface - Composite with BMS Controller	Polyester painted steel enclosure, PF3101-00 card included.
PF3100-00D	User Interface - Composite with BMS Controller Card and Network Switch Card	Polyester painted steel enclosure, PF3101-00 card and PF3106-00 card included.
PF3100-00E	User Interface - Composite with BMS Controller Card and Ion Pilot Card	Polyester painted steel enclosure, PF3101-00 card and PF3102-00 card included.
PF3100-00J	User Interface - Composite with Modbus Card	Polyester painted steel enclosure, PF3107-00 card included.
PF3100-00K	User Interface - Composite with BMS Controller Card and Modbus Card	Polyester painted steel enclosure, PF3101-00 card and PF3107-00 card included.
PF3100-00T	User Interface - Composite with Modbus Card and Network Switch Card	Polyester painted steel enclosure, PF3107-00 and PF3106 cards included.
PF3100-00U	User Interface - Composite with BMS Card and IO Expansion Card	Polyester painted steel enclosure, PF3101-00 and PF3113-00 cards included.

2. Certifications

PROFIRE strives to ensure that certifications are updated as quickly as they become available for all of our products.

User Interface Assembly – Hazardous Location Rating

Certification: Class I, Div 2, Groups A, B, C, D, T4 [CSA C22.2#213:2016 Ed.2]

IEC 61508 SIL2, CSA C22.2#61010-1:2012 Ed.3

UL61010-1:2012 Ed.3+R:29Apr2016

ISA 12.12.01:2016 Ed. 7



The board includes the following symbol:



Caution: possibility of electric shock.



Caution: documentation must be consulted in all cases where this symbol is marked.

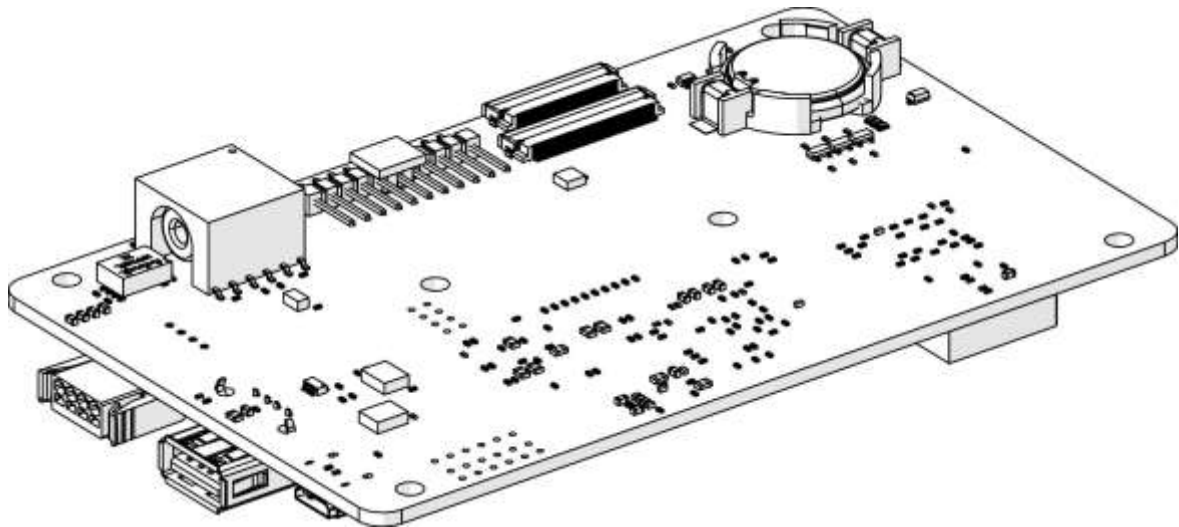
3. Card Information

Card Specifications

The ambient temperature rating for the User Interface card is -40°C (-40°F) to +60°C (+140°F).

Type	Specifications
PFRN Class	<i>Interface</i>
PFRN Power	<i>Power Consumer</i>
PFRN Ports	<i>1 PFRN Port</i>
Voltage Input	<i>36 VDC through PFRN</i>
Current Draw	<i>1 A Maximum</i>
Display	<i>5.7" TFT-LCD VGA Color</i>
Battery - UI Clock	<i>CR2032, Lithium Coin Cell, 3V, 225mAh</i>
Battery Part Number	<i>Panasonic CR2032</i>
Inputs	<i>None</i>
Outputs	<i>None</i>

Card Diagram



Terminal Descriptions

PFRN Connection

The PFRN connection must connect to a BMS UI port either directly, or through a Network or Modbus card. The PFRN port is rated 36V, 1A.

USB Port

The datalogging USB port is used for downloading event log information and firmware updates. Please refer to PROFIRE's Firmware Update Guide (<http://3100.profireenergy.com/pf3100-documentation/>) for detailed instructions on performing a firmware update. The USB should not be inserted or removed unless the area is known to be non-hazardous, as removing or inserting the USB may cause a spark.

Reset Button

The Reset button will reset the internal processor. This can be used if the application freezes during operation.

Battery

The UI uses a battery that provides power to the clock on the user interface. The battery (usually a Panasonic CR 2032 3V non-rechargeable battery, or other electrically compatible battery) should only be changed if the UI is powered down. The battery should not be inserted or removed unless the area is known to be non-hazardous, as removing the battery may cause a spark. The battery should not need to be changed for approximately 5 years.

SD Card

An SD card is used for programming the operating system on the User Interface. Please refer to PROFIRE's PFNIX Software Update Guide (<http://3100.profireenergy.com/pf3100-documentation/>) for detailed instructions on

programming and updating PFNIX software. The SD card should not be inserted or removed unless the area is known to be non-hazardous, as doing so may cause a spark.

Boot Switch

The boot switch is a mechanism used to recover a corrupted operating system. It allows the user to recover the operating system (PXFNIX) via an installable SD card.

4. LCD Information

General Specifications

General Specifications	
Display Area	115.2mm (4.5 inches) H 86.4mm (3.4 inches) V
Diagonal Size of Display	14cm (5.7 inches)
Display Color	262,144 colors
Pixel	640 pixels (H) 480 pixels (V)
Module Size	144mm (5.7 inches) W 104.6mm (4.11 inches) H 12.3mm (0.48 inches) D
Weight	150 grams (0.33 pounds)
Power Supply Voltage	LCD panel signal processing board: 3.3V LED driver: 12.0V
Backlight	LED backlight built in LED driver
Power Consumption	At the maximum luminance control, checkered flag pattern. TBD W

LCD Electrical Specifications

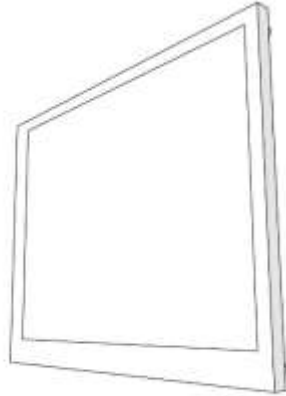
LCD Panel

Parameter	Symbol	Min.	Typ.	Max.	Unit	
Power Supply Voltage	VCC	3.00	3.3	3.6	V	
Power Supply Current	ICC	-	(130)	TBD	mA	
Permissible Ripple Voltage	VRPC	-	-	100	mVp-p	
Logic input voltage for display signals	High	VDH	0.7VCC	-	VCC	V
	Low	VDL	0	-	0.3VCC	V

LED Driver

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	VDD	10.8	12	13.2	V
Power Supply Current	IDD	-	(255)	(315)	mA

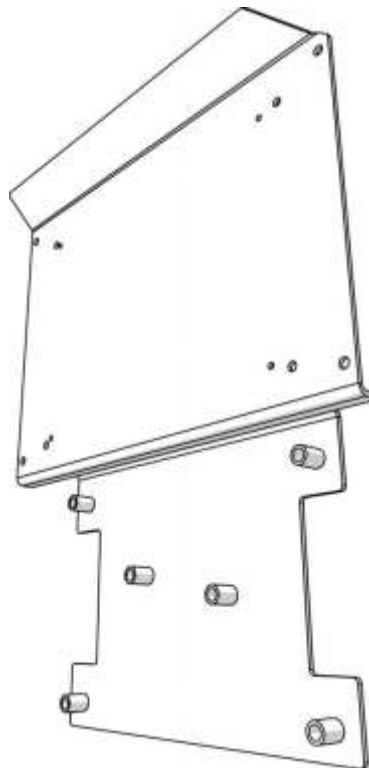
LCD Diagram



5. Backplate

LCD Backplate

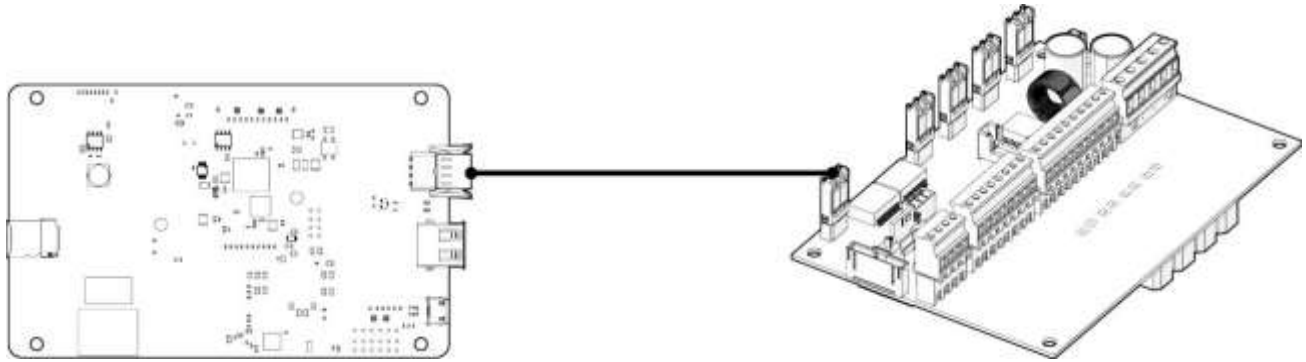
The backplate is made of 304 stainless steel and is 23.95cm (9.43 inches) in height, 18.26cm (7.19 inches) in width, and 2.64cm (1.04 inches) in depth.



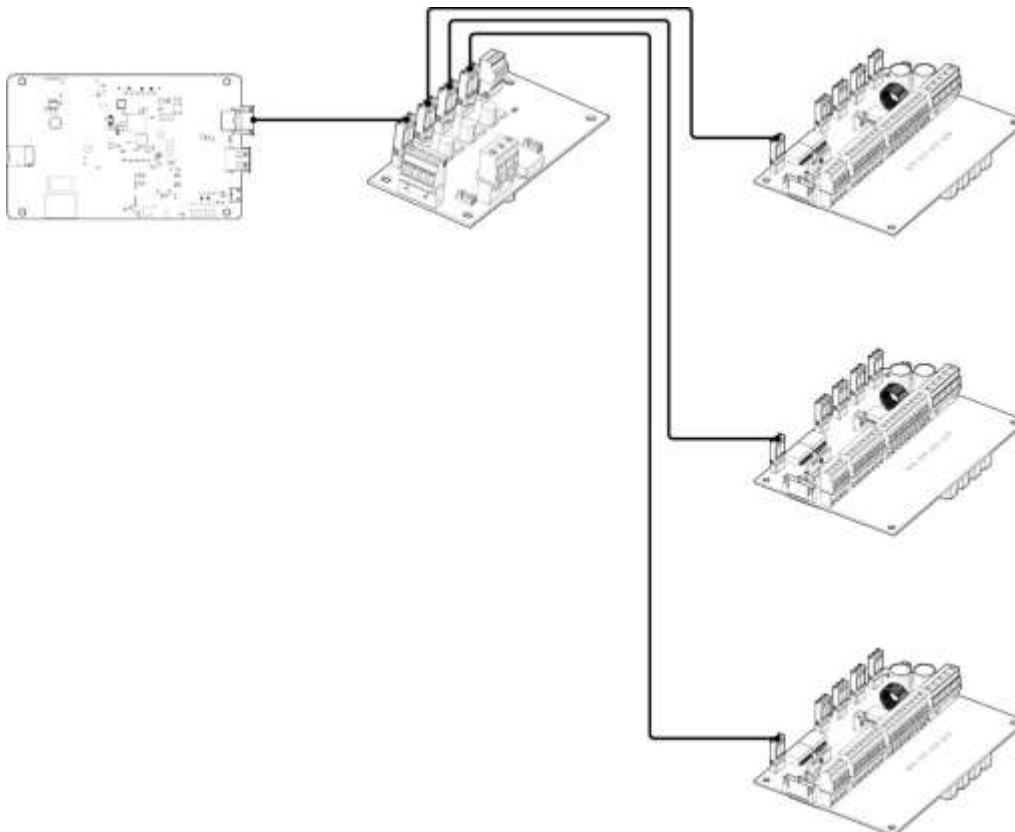
6. Wiring Diagrams

The following diagrams outline the connection of the PFRN to the BMS. They also indicate the connection through a Network or Modbus card to multiple Burner Management Systems.

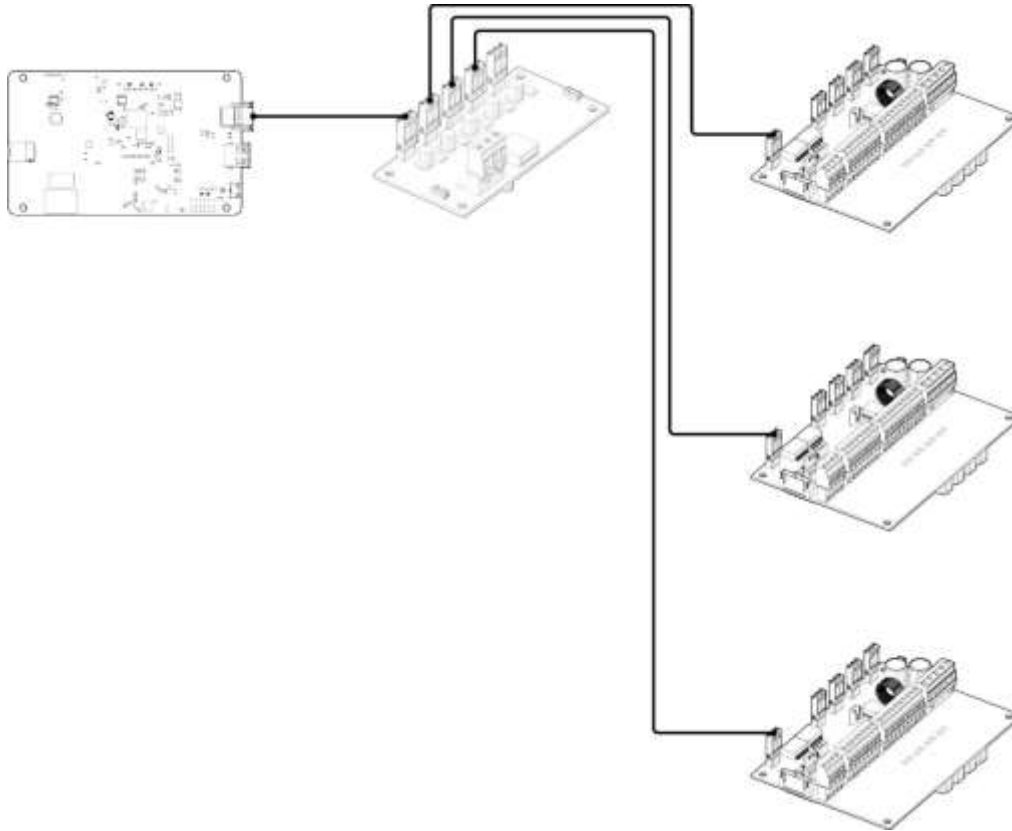
UI Connection to PFRN of BMS



UI Connection to BMS through Modbus Card



UI Connection to BMS through Network Card

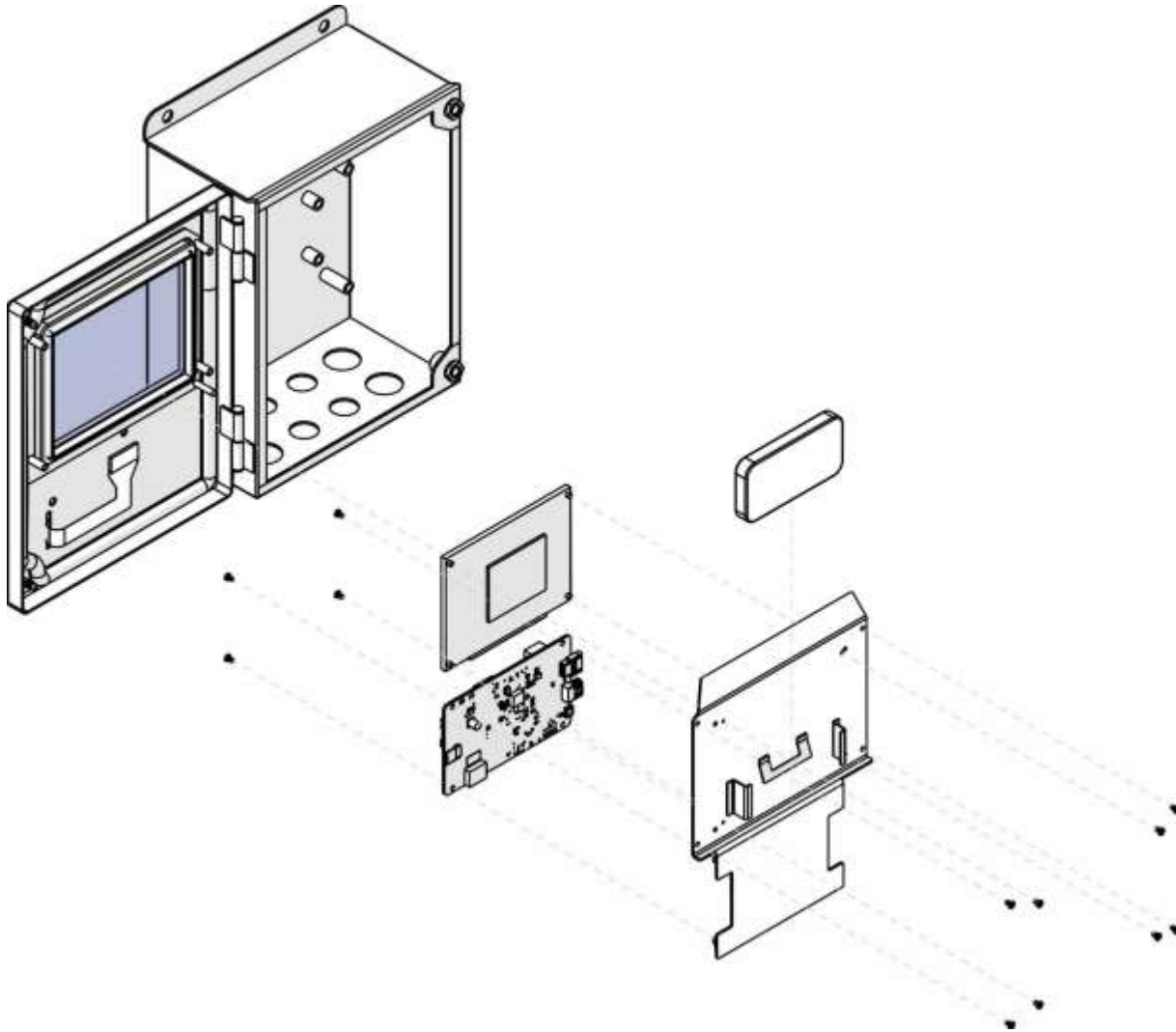


Wiring Specifications

Cat-5/6 Ethernet wire connects the UI to the BMS/Network Card. External fuses must be installed according to the local code. Wire gauge size must also be selected in accordance with local codes.

7. Mounting Instructions

1. Mount the UI card and screen to the aluminum back plate using the supplied screws (#4-40) as pictured below. Please note the orientation of the card.
2. Mount the sub assembly to the enclosure door using the supplied screws.
3. Drop the desiccant pack into the desiccant holder.



8. Enclosure Specifications

The UI card can be mounted in a fire-proof enclosure that is safe for the area of operation (e.g. – hazardous/non-hazardous.) The UIX enclosure described below is an example:

Specifications	UIX Enclosure
Dimensions	<i>Height 30.9cm (12.15 inches) Width 23.4cm (9.23 inches) Depth 13.4cm (5.28 inches)</i>
Hazloc Rating	<i>Class I Div 2, IP66</i>
Mounting	<i>Channel Bar or Direct Mount</i>
Enclosure Construction	<i>Poly Painted Steel</i>
Operating Temperature	<i>-40°C (-40°F) to 60°C (140°F)</i>
Storage Temperature	<i>-40°C (-40°F) to 60°C (140°F)</i>

9. Instructions for Use

The User Interface (UI) Card is designed to be used with a certified BMS controller as part of the PF3100 platform. The UI hosts an application that allows the operator to commission the PF3100 Burner Management System. The UI can display status information about the appliance including alarms, temperatures, and setpoints, amongst many other items.

The UI is required to commission the system, but it is not required to run the system. When the UI is not connected to the BMS appliance, it is referred to as “headless operation.” This means that the system will run even if the UI is not working, although obviously this is not optimal.

Detailed instructions for specific uses of the user interface application itself may be found in the following documents:

- PF3100 Quick User Guide
- PF3100 Software Setup Guide
- PF3100 Firmware Update Guide
- PF3100 User Manual.

These documents can be found at the following link:

<http://3100.profireenergy.com/pf3100-documentation/>

10. Preventative Maintenance & Inspection

In order to ensure that the User Interface card works correctly and efficiently, the following maintenance and inspection procedures should be followed:

- Confirm that the PFRN cable is connected securely.
- Ensure that all wires are connected correctly.
- Routinely check for corrosion.
- Minimize copper wire exposure.
- Wires must not be frayed or worn, and all insulation must be intact.
- Ensure that no moisture or condensation is apparent on the board or within the enclosure.
- Check that the board does not show any sign of mechanical damage (e.g. – damage from impact from a dropped item such as a screw driver).
- Check that the board does not show any sign of electrical damage. This means that no components should be burnt or damaged in any way.
- Check that an SD card is not present in the UI during normal operation. The SD card is only used to update the application and should not be installed during normal operation.
- Ensure that the battery is not corroded and replace if necessary, when safe to do so.
- Visually check that the LCD screen is operating correctly.
- Check that the keypad buttons operate correctly, and that the ribbon cable connection is attached securely. The keypad can be tested by following the instructions for UI testing as listed below.
- Confirm that the temperature of the board is within ambient temperature operating limits.
- Confirm that the enclosure is secured.
- Check that the device is not subject to excessive vibration.
- Routine inspections should be performed on all equipment. If any abnormality is found, corrective actions should be taken. If the abnormality cannot be corrected, contact PROFIRE as soon as possible.
- A qualified technician should perform any tests necessary to confirm that the equipment is still in a safe condition. The board may be tested for correct operation in a safe environment as follows:
 - Power the UI down.
 - Hold the Multi Button.
 - Power the UI up and keep holding the Multi button until the boot screen appears.
 - Select the UI test.
 - Run the UI test. This will check the screen, LEDs, RTC, and keypad.
 - Upon completion: the user will be prompted to update the PFNIX version. If testing only, do not update the PFNIX version, simply decline the request.

Cleaning

If the card becomes dirty it can be cleaned with compressed air. Do NOT use solvents, cleaners, or liquids to clean the board. Caution must be exercised when cleaning the board in order to prevent damage from ESD (electrostatic discharge).

11. Important Safety Information

Before installing the PF3100 User Interface assembly, please review the list of warnings below. Product use in a manner not specified by PROFIRE is not recommended. Failure to observe the following warnings may result in death, electrocution, property damage, product damage, government fines, or malfunction of the product itself.

Warning: Explosion Hazard

- Do not disconnect while circuit is live unless area is known to be non-hazardous or equivalent.
- Substitution of components may impair suitability for specified zones.
- Do not service unless the area is known to be non-hazardous.
- Do not open when energized.
- Installation and use must conform to the directions in this guide.

Installation Warnings

- Ensure that the PF3100 enclosures are securely closed each time after opening the enclosure. This protects the internal circuitry from moisture damage and other environmental concerns. Moisture damage is not covered by the product warranty.
- Do not connect wires or handle the device when powered.
- Do not disassemble or modify the assembly in any way. The board is not field repairable and must be sent back to PROFIRE for replacement if damaged.
- Installation of the card should be performed according to the local electrical code by a capable electrician using de-energized wire. Live modifications should NOT be performed.

Other Warnings

- Equipment MUST be installed with a PF3100 controller.
- Do not remove or install the battery while the system is live, or if the area is known to be hazardous.
- Do not remove or install a USB stick if the area is known to be hazardous.
- Equipment must be housed inside a fire-proof enclosure that is suitable for the environment and can only be accessed with the use of a tool.
- Evaluation for the UI card as part of the system assembly is required after final installation.
- P3 terminal can only be connected to keypads that are considered a simple apparatus, or alternatively connects to Sytek Enterprises Inc. P-MS-RR5NEO-006-SPA-14.12.18 Rev 1.4 keypad.
- Display and keypad shall be installed in factory. Not for field connection.

12. PROFIRE Contact Information

If you have any concerns or questions about this product, please contact PROFIRE as follows:

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