



**Power Innovations**  
International, Inc.

---

# **EnterprisePlus™**

---

**Enterprise Monitoring and Management  
with Intelligent Power Distribution**

User's Manual



*The EnterprisePlus Series  
of power perfection from  
Power Innovations International*

*The standard for perfect, dependable power.*

---

**EnterprisePlus User's Manual**



## WARRANTY / COPYRIGHT INFORMATION

---

### ***LIMITED WARRANTY***

Power Innovations International, Inc. (hereinafter “Power Innovations”), warrants this product to be free from defects in material and workmanship and, subject to the conditions set forth below, agrees to repair or replace (at Power Innovations’ sole option) any part of the enclosed unit which proves defective for a period of one (1) year from the date of purchase. Spare parts are warranted for ninety (90) days. Replacements parts or units may be new or refurbished and will meet specifications of the original parts or unit.

This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. This warranty is limited to the original purchaser of the product and is not transferable. This warranty covers only Power Innovations-supplied components. Service required as a result of third-party components is not covered under this warranty. Proof of Purchase will be required by Power Innovations to substantiate date of purchase. Such proof of purchase must be an original bill of sale or receipt containing name and address of seller, purchaser, and the serial number of the product.

It is the obligation of the purchaser to have the product shipped, in the original package, freight prepaid, or delivered to the authorized reseller from whom it was purchased or other facility authorized by Power Innovations to render the services provided hereunder. All products returned to Power Innovations for service MUST have prior approval, which may be obtained by calling 801-785-4123. The product will not have been previously altered, repaired, or serviced by anyone other than a service facility authorized by Power Innovations to render such service, the serial number of the product shall not have been

altered or removed. In order to be covered by this warranty, the product will not have been subjected to accident, misuse or abuse or operated contrary to the instructions contained in the User's Manual. Any such conditions will void this warranty.

### ***LIMITATION OF REMEDIES***

Power Innovations International, Inc.'s entire liability and the user's exclusive remedy shall be replacement of the unit if all conditions described under "Limited Warranty" have been met. In no event will Power Innovations International Inc. be liable for any other damages arising out of the use of this unit.

### ***TECHNICAL SUPPORT***

The EnterprisePlus was developed by Power Innovations International, Inc. If there is any question or comment about this product, please feel free to contact:

Power Innovations International Inc.

Tel: (801) 785-4123

Fax: (801) 785-6999

E-mail: [service@power-innovations.com](mailto:service@power-innovations.com)

Web: <http://www.power-innovations.com>

Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies.

Copyright © 2005 by Power Innovations International, Inc.

Version 1.1

# TABLE OF CONTENTS

---

|                                      |           |
|--------------------------------------|-----------|
| <b>FCC INFORMATION.....</b>          | <b>II</b> |
| WARNINGS .....                       | II        |
| TUV SAFETY STATEMENT.....            | III       |
| IMPORTANT SAFETY INSTRUCTIONS.....   | IV        |
| <b>1. INTRODUCTION.....</b>          | <b>5</b>  |
| 1.1 DESCRIPTION .....                | 5         |
| 1.2 FEATURES AND BENEFITS.....       | 7         |
| 1.3 SPECIFICATIONS .....             | 8         |
| 1.4 FRONT AND REAR VIEW .....        | 9         |
| <b>2. INSTALLATION .....</b>         | <b>10</b> |
| 2.1 UNPACKING.....                   | 10        |
| 2.2 HARDWARE INSTALLATION.....       | 10        |
| 2.3 SETUP .....                      | 11        |
| 2.4 CONNECTING MULTIPLE SYSTEMS..... | 13        |
| <b>3. OPERATION .....</b>            | <b>16</b> |
| 3.1 CONSOLE-BASED OPERATION.....     | 16        |
| 3.2 WEB-BASED OPERATION .....        | 19        |
| 3.3 PORT/CONNECTION DEFINITIONS..... | 23        |
| <b>4. CUSTOMER SERVICE .....</b>     | <b>28</b> |
| 4.1 MAINTENANCE.....                 | 28        |
| 4.2 TROUBLESHOOTING .....            | 28        |

## FCC Information

This equipment has been tested and found to comply with the limits for a class A/B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is used in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

**FCC Caution:** To assure continued compliance, use only shielded interface cable when connecting to computer or peripheral devices. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

### Warnings



- Read this manual carefully before unpacking and operating the EnterprisePlus system(s).
- Follow all operating instructions.
- For safety, obey all warnings within this manual. Failure to do so may void the warranty.
- The EnterprisePlus system must be supplied with an AC power supply, incorporating an earth/ground.

- For hard-wired installations, ensure correct polarity.
- Install the EnterprisePlus system near an AC output to ensure easy access.
- The EnterprisePlus system is intended for installation in a controlled environment.
- DO NOT open the cover, as there are no user serviceable parts inside.
- DO NOT insert any object into any of the ventilation holes or any other opening on the EnterprisePlus system.
- DO NOT PLUG the EnterprisePlus system AC input supply power cord into any of its output receptacles, as this is a safety hazard and may cause irreparable damage to the EnterprisePlus system.
- Use only the AC power cable that is provided.

### **TUV Safety Statement**



#### **CAUTION**

1. The sound pressure level at the operators position according to IEC 704-1:1982 is equal to or less than 70dB(A).
2. This unit should be installed by qualified service personnel.
3. The sum of the leakage current of the EnterprisePlus system and connected equipment should not exceed 3.5mA.
4. The supply outlet should be near the equipment and easily accessible.
5. The EnterprisePlus system contains parts that are potentially hazardous. All repairs should be performed by qualified service personnel.

## Important Safety Instructions



*Read and save these Instructions!*

This manual contains important instructions that should be followed during installation and for maintenance of the EnterprisePlus system.

### CAUTION

Install EnterprisePlus system(s) in a temperature-controlled indoor environment where it is free of conductive contaminants.

Contact with any part of a grounded battery array can result in electric shock. The possibility of such shock can be reduced by removing unnecessary ground paths or connections.

# 1. Introduction

## 1.1 Description

The EnterprisePlus™ system is the most complete and powerful enterprise enabling tool available. The EnterprisePlus is an intelligent power distribution unit and management tool, as well as a comprehensive environmental control device that allows flexible, complete power and environmental monitoring and management for sites of all sizes.

The system consists of a *Monitoring and Control Unit (MCU)* and a *Power Distribution Unit (PDU)* that can be connected locally or remotely.

### Technology and Innovation

The EnterprisePlus utilizes eight (8) power control circuits to control and monitor the connected load. These circuits allow sequencing (turning ON or OFF) of loads during a power up or a shutdown, as well as individualized remote ON/OFF capabilities. More importantly, the EnterprisePlus enables intelligent load shedding so that critical loads can be maintained and managed longer in emergency conditions or for necessary shutdown during power conservation shifts. The EnterprisePlus can also facilitate requests to reduce power use by specified percentages. If loads are changed or degraded, the unit can notify the system administrator of potentially compromising conditions.

## Introduction

### Load Monitoring

The voltage, current, and power of each load is monitored. For systems that require more than eight controlled loads, additional PDUs can be added. The EnterprisePlus MCU allows the monitoring and control of environmental conditions (i.e. temperature, humidity, water levels, fire, smoke, etc.) through a wide range of analog and digital sensor ports. Additional control units can be added to expand digital and analog sensor port capability.

### Managing Point-to-Point Connectivity

The EnterprisePlus provides a flexible means to manage point-to-point connectivity by enabling communication and expandability through RS232, Ethernet, USB, and PC-compatible ports. The EnterprisePlus incorporates a USB port to allow video monitoring or the management of other USB devices. The EnterprisePlus utilizes dual power inputs for system fault tolerance and redundancy, giving the user the ability to disconnect an AC input for maintenance and service of an important feed and/or redundancy protection in the event of an AC input failure.

### Security

Security in the EnterprisePlus has been carefully addressed to allow programmable or remote lockout with multiple levels of IP and password protection. The display allows total

monitoring and assessment of all functions. The same user friendly display is replicated in the remote management software screens accessible via a Web page.

#### Full Remote and Local Monitoring, Management, and Control Options

The EnterprisePlus can be controlled locally or be remotely monitored and managed via a network connection, an IP address, or a dial-up connection. A comprehensive, easy-to-understand, and secure Web page provides vital information from the EnterprisePlus. The EnterprisePlus also sends SNMP TRAP, email, and mobile phone notifications.

#### Expandability

Multiple units can be linked together to accommodate more sensors and/or outputs. Up to four (4) *Monitoring and Control Units* may be linked together with up to eight (8) PDUs linked to each *Monitoring and Control Unit*.

### 1.2 Features and Benefits

- Enhanced facility security
- Comprehensive environmental administration
- Extensive power management
- System security
- Exclusive revolutionary design
- Expandable and programmable
- Flexible port configuration
- Multi-mode communications
- Unsurpassed IP-based Web-page communications and control

## Introduction

- Supports SNMP
- Multi-processor control (6)
- Comprehensive display
- Modular design
- Flexible horizontal or vertical mountable power distribution units (PDUs)

## 1.3 Specifications

|                                    | Monitoring and Control Unit (MCU)         | Power Distribution Unit (PDU) |
|------------------------------------|---|-------------------------------|
| <b>Monitoring and Control Unit</b> |   |                               |
| Digital outputs                    | 8   | NA                            |
| Digital inputs                     | 8   | NA                            |
| Analog inputs                      | 8   | NA                            |
| RS232 ports for UPQ control        | 2   | NA                            |
| Link ports                         | 2   | NA                            |
| Ports                              | 1-RS232, 1-USB, 1-Aux, 1-10baseT Ethernet | 1-10/100 Ethernet             |
| Auxiliary power input              | Yes                                       | NA                            |
| Expandability                      | 3 additional units                        | 7 additional units            |
| <b>Power Distribution Unit</b>     |   |                               |
| Input and output Voltage           | NA  | 120V                          |
| Input current                      | NA  | 20 Amps                       |
| Output current                     | NA  | 15 Amps                       |
| Number of AC inputs                | NA  | 2                             |
| Number of power outlets            | NA  | 8                             |
| Mounting options                   | Rack/Universal                            | Rack/Universal                |
| <b>Protection</b>                  |   |                               |
| Overload                           |   | Yes                           |
| Short circuit                      |   | Yes                           |
| Suppression                        |   | Yes                           |
| <b>Environment</b>                 |   |                               |
| Ambient operating temperature      | 0° to 40°C / 32° to 104°F                 |                               |
| Relative humidity                  | 0 to 95% non-condensing                   |                               |
| <b>Warranty</b>                    |   |                               |
|                                    | 1 year parts and labor                    |                               |
| <b>Physical</b>                    |   |                               |
| WxDxH in inches                    | 16.8 x 7.63 x 1.75                        | 16.8 x 6.13 x 1.75            |
| WxDxH in cm                        | 42.7 x 19.4 x 4.4                         | 42.7 x 15.6 x 4.4             |
| Weight in pounds/Kg                | 5.5 / 2.5                                 | 6.6 / 3.0                     |

## 1.4 Front and Rear View



## 2. Installation

### 2.1 Unpacking

The EnterprisePlus system is packed in a specially designed carton to protect it from damage during shipping. To transport or ship the unit, use the original box. Therefore, SAVE THE BOX!

- The contents of the carton include:
  - The EnterprisePlus system
  - The User's Manual
  - AC power cable (use only the cable provided)
  - Setup CD
- Unpack the EnterprisePlus system from the carton and inspect the unit for any signs of damage that may have occurred during transit. If any damage is visible please contact Power Innovations within 48 hours.

### 2.2 Hardware Installation

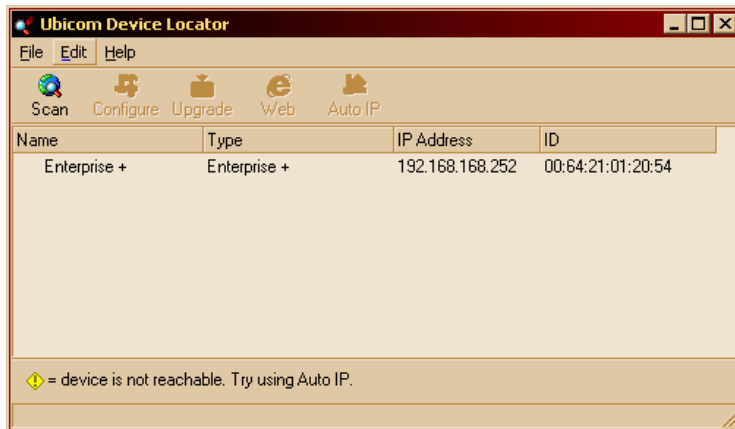
- Power Check
  - Check the power requirement label on the rear panel of the EnterprisePlus system; ensure that the voltage and frequency of the AC supply is correct for the system.
  - Check that the power connection cable is correct for the AC supply socket.

- Placement of the EnterprisePlus system - The unit is designed to be installed in a protected environment and must not be used in the following settings:
  - Environments where the temperature or humidity is outside those recommended (see the Specifications section).
  - Locations where there is excessive moisture, dust and corrosion.
  - Locations that are exposed to a heat source or direct sunlight.
- Pre-checks and operating the EnterprisePlus system
  - Make sure that the EnterprisePlus system is OFF, and no load is connected to the output outlets.
  - Connect the power cable to the AC inlet at the rear of the EnterprisePlus system.
  - Turn ON the power from the front of the EnterprisePlus system.
  - Turn on the equipment power switch. The equipment is now fully powered by the EnterprisePlus system.
  - The EnterprisePlus system is now fully operational.

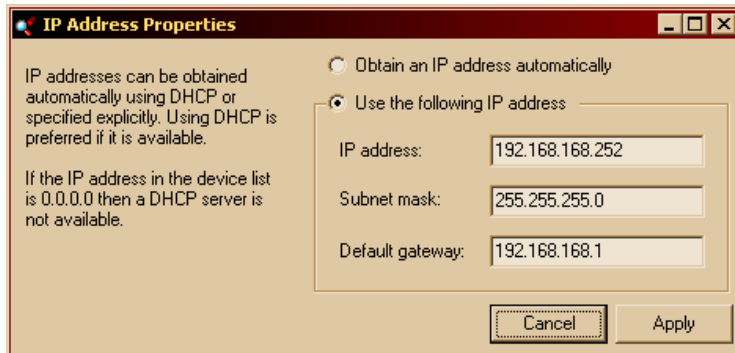
### 2.3 Setup

After completing the hardware installation, run SETUP.EXE from the Setup CD to configure the IP address of the EnterprisePlus system. The screen will display a list of available devices as follows:

## Installation

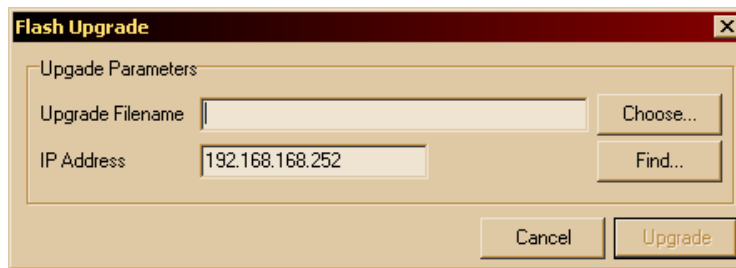


Select the appropriate EnterprisePlus then select the *Configure* option to set the IP address as follows:



Select *Apply* to accept the configuration.

To upgrade the firmware, select the *Upgrade* option and enter the firmware file name as follows:



The EnterprisePlus system can be accessed through a browser by specifying the configured IP address as follows:



## 2.4 Connecting Multiple Systems

The EnterprisePlus system is designed to handle up to four (4) *Monitoring and Control Units*. Each *Monitoring and Control Unit* will support up to eight (8) PDUs. All of these units can be controlled through one IP address. The following steps explain how to connect multiple units.

## Installation

### Connecting Additional Monitoring and Control Units

Additional *Monitoring and Control Units* can be linked together by connecting a standard Ethernet cable from the *Comm Link* port of one unit to the *Comm Link* port of another unit. The *Comm Link* ports are highlighted in the following picture:



Each unit has two (2) *Comm Link* ports. It does not matter which port is used to connect additional units.

### Connecting Additional PDUs

Additional PDUs can be linked together by connecting a standard Ethernet cable from the *Link In* port of one unit to the *Link Out* port of another unit.

The *Link Out* port from the first unit must be connected to the *Link In* port of the second unit and so forth up to eight units.





## 3. Operation

The EnterprisePlus system can be controlled from the front panel of the unit or through the use of a Web page.

### 3.1 Console-based Operation



The front panel contains sensor status LEDs, a button for system power ON/OFF control, an input button to select the input power source, display, two selection buttons, and eight ON/OFF buttons and status LEDs for output power control.

#### System Power Control

The main power of the system is controlled by a momentary switch in the center section of the front panel. Press the power button to turn the system power ON or OFF. The display will illuminate whenever the system is powered ON.



### Input Power Source Control

The *Selected Input* LEDs indicate which power source is powering the system (A or B). The *Available Inputs* LEDs indicate which power source is available (A and/or B).

The input power source button is a momentary switch in the center section of the front panel to switch the AC power source from A to B or from B to A. The system will not switch to a power source that is not available.



### Display and Selection

The display shows the current (amps) that the selected output receptacle (1 to 8) is using. The *Selection* buttons allow the user to toggle between outlets one (1) through eight (8), the total load, and the sensor status. The display shows the total current (amps) when the *Total Load* LED is illuminated.



## Operation

### Output Power Control

There are eight power control buttons to control the output receptacles. Pressing the numbered button will toggle the power ON or OFF for the corresponding outlet.



### Output Status LEDs

The *Outlet Status* LEDs display the power status of each outlet. The *Network Control* LEDs display which outlet is selected by the *Selection* buttons to display the current (amps).

When the green *Outlet Status* LED is illuminated it means that the power outlet is powered ON and there is power to the outlet. When the green LED is not illuminated it means that the power outlet is OFF and there is no power to the outlet.

When the amber *Network Control* LED is illuminated it means that the power outlet has been selected to show the present current (amp) on the display.

### Sensor Status LEDs

The *Analog* and *Digital Status* LEDs display the threshold status defined for analog input sensors A1 to A8 and digital

input sensors D1 to D8. The *Sensor Connected* LEDs illuminate when a sensor is connected to the port.



When an *Analog* and/or a *Digital Status* LED is illuminated it means that a threshold has been met (as defined through the Web page). The color of the LED will be as follows:

- Green – minimum
- Red – maximum
- Amber – selected for monitoring on the display

### 3.2 Web-based Operation

The EnterprisePlus is designed to be configured and monitored from both the front panel and via Web page. After setting up the EnterprisePlus, as defined in the Installation section, the system can be accessed through a browser by specifying the configured IP address as follows:



## Operation

This will provide access to the Web page as follows:



Depending on how the browser window is sized, the system will be displayed in different formats. The Web page has been designed to represent the actual EnterprisePlus system as if it were being operated at the console.

From the *Connections* panel on the left side of the screen, select the *Monitoring and Control Unit* to manage. A list of available units will be displayed.

### System Power Control

Click the power button to turn the system power ON or OFF.



### Input Power Source Control

The *Selected Input* LEDs indicate which power source is powering the system (A or B). The *Available Inputs* LEDs indicate which power source is available (A and/or B).

Click the select button to switch the AC power source from A to B or from B to A. The system will not switch to a power source that is not available.



### Display and Selection

The display shows the current (amps) that the selected output receptacle (1 to 8) is using. Click the *Selection* buttons to toggle between outlets one (1) through eight (8), the total load, and the sensor status. The display shows the total current (amps) when the *Total Load* LED is illuminated.



## Operation

### Output Power Control

There are eight power control buttons to control the output receptacles. Click the numbered button to toggle the power ON or OFF for the corresponding outlet.



### Output Status LEDs

The *Outlet Status* LEDs display the power status of each outlet. The *Network Control* LEDs display which outlet is selected by the *Selection* buttons to display the current (amps).

When the green *Outlet Status* LED is illuminated it means that the power outlet is powered ON and there is power to the outlet. When the green LED is not illuminated it means that the power outlet is OFF and there is no power to the outlet.

When the amber *Network Control* LED is illuminated it means that the power outlet has been selected to show the present current (amp) draw on the display.

### Sensor Status LEDs

The *Analog* and *Digital Status* LEDs display the threshold status defined for analog input sensors A1 to A8 and digital input sensors D1 to D8. The *Sensor Connected* LEDs illuminate when a sensor is connected to the port.



When an *Analog* and/or a *Digital Status* LED is illuminated it means that a threshold has been met (as defined through the Web page). The color of the LED will be as follows:

- Green – minimum
- Red – maximum
- Amber – selected for monitoring on the display

### Configuration

Click the Configuration option to setup and define other features and functions of the EnterprisePlus system.

### 3.3 Port/Connection Definitions

The EnterprisePlus system is designed to handle eight (8) digital output sensors, eight (8) digital input sensors, and eight (8) analog input sensors. The sensors connect to the rear of the *Monitoring and Control Unit* with a standard Ethernet cable.



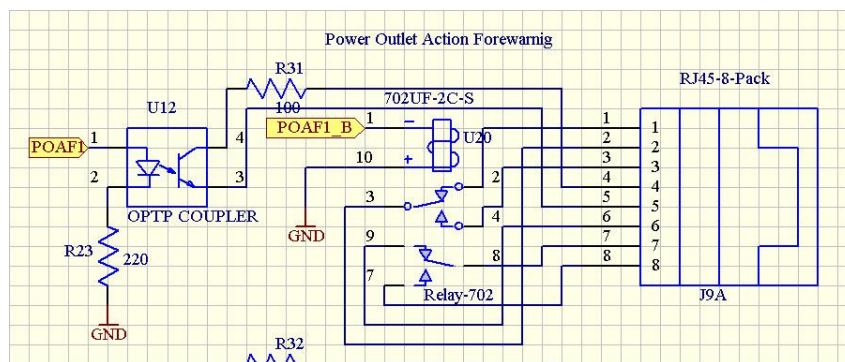
## Operation

### Digital Output Sensors

The *Digital Output Sensors* are designed to send an ON or OFF signal by the Enterprise Plus system.



Following is a diagram of the port:

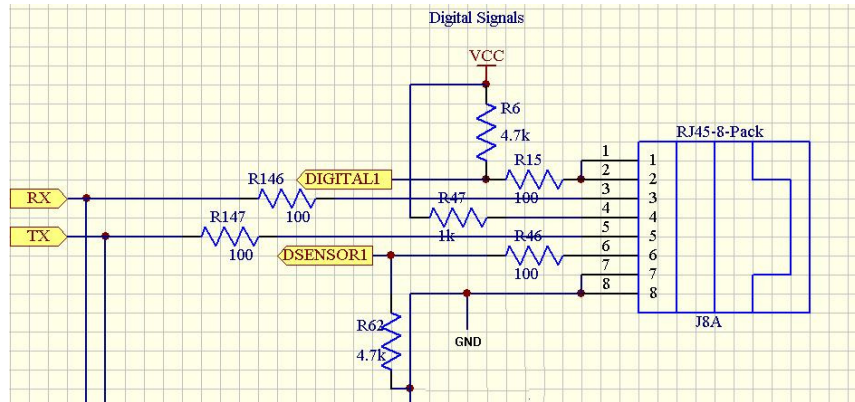


### Digital Input Sensors

The *Digital Input Sensors* are designed to receive an ON or OFF signal to be processed by the Enterprise Plus system.



Following is a diagram of the port:



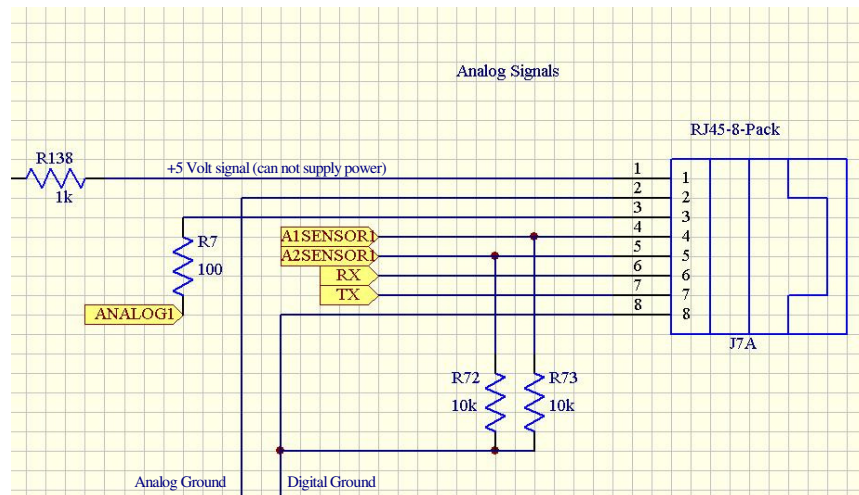
## Operation

### Analog Input Sensors

The *Analog Input Sensors* are designed as intelligent sensors that can send analog information to be processed by the Enterprise Plus system.



Following is a diagram of the port:



### Auxiliary Ports

The EnterprisePlus system has multiple auxiliary ports to handle many expansion options. The *Monitoring and Control Unit* provides an RS232, a USB port, an Aux port, and a 10baseT Ethernet port. The PDU provides a 10/100 Ethernet port.

## 4. Customer Service

There are no user serviceable parts inside. DO NOT remove the cover or attempt to service the EnterprisePlus system. High voltage inside the system is always present even when it has been shutdown and unplugged. Unauthorized service will VOID the warranty.

### 4.1 Maintenance

The unit is designed for maintenance-free operation, thus requiring very little attention from the User. The minimal service requirements to ensure trouble free operation are as follows:

1. Vacuum dust buildup that may gather on the vents.
2. Wipe the cover with a damp cloth.

### 4.2 Troubleshooting

Due to its unique design, the unit must be serviced by authorized personnel only. If the EnterprisePlus system fails to operate properly or has automatically shutdown, turn off the power and review the following checklist. Be prepared to answer the following questions before asking for assistance:

1. Is the AC supply power rating correct?
2. Is the power connecting cable connection loose?
3. Turn ON the power again, does the EnterprisePlus system return to normal operation?

4. Did a power failure occur just after or before the malfunction was noted?
5. What was the status of the indicators at the time of the malfunction? Also, upon restarting the EnterprisePlus system?
6. Were any changes made to the EnterprisePlus system or the equipment attached to the unit?
7. Did an overload condition occur? If so, remove non-critical loads from the unit and go through the restart procedure. In addition, check the fuse or breaker on the rear panel.

*If the ENTERPRISEPLUS system fails to operate normally after carrying out these checks, contact Power Innovations International, Inc.*