

PROCON

MODEL 8240



NETWORK SENSOR CLUSTER

5/2/03
Rev 01

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<p style="text-align: center;">PROCON MODEL 8240 NETWORK SENSOR CLUSTER</p>
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The NETWORK Sensor Cluster is a small yet very powerful unit with self contained sensors, local analog signal conditioning, local 16 bit A/D conversion, a microprocessor for linearization and control, plus an option of either RS485 or Ethernet communications interface.

The unit provides the user with direct digital data in scaled engineering units. With the Ethernet option, it has its own IP address, and thus may be directly connected to any standard network and the data is then available anywhere on the network.

A standard model can contain Temperature, Differential Pressure, Barometric Pressure, Humidity, and Air Flow. All of this is in one package and available as one data set from one node.

Numerous clusters can be used in a system to provide monitoring of a large number of different areas. For Ethernet models, since each module has its own IP address, the only practical limits on the system size is the network to which they are attached. For 485 Networks, up to 32 devices can be used on a single network. Also, since each module operates independently, there is no reduction in data collection performance as the system grows.

The following are highlights of some of the main features:

- * STAINLESS STEEL ENCLOSURE
- * ETHERNET INTERFACE, IEEE 802.3, 10BaseT/100BaseTX, RJ-45 CONNECTOR
- * TCP/IP PROTOCOL
- * DUAL 485 PORT CONNECTIONS ARE AVAILABLE FOR DAISY-CHAINING
- * VARIOUS SENSOR CONFIGURATIONS
- * 24VDC INPUT POWER
- * SMALL PACKAGE SIZE (11.5x5.9x2.0 inches)
- * LED INDICATORS

MODELS	
Model Number	Version
8241	Ethernet
8242	RS485

LED INDICATORS

Four discrete LEDs are provided to indicate the current system status, depending on the unit configuration. They are Power, Link, 10BaseT, and 100BaseTX.

Power – Indicates that the module has 24 VAC power.

Link – Indicates that the communications link has been established.
(Ethernet Models Only)

10BaseT – Indicates that the communications link is running at 10BaseT. The LED will flash when data is being transmitted or received. (Ethernet Models Only)

100BaseTX – Indicates that the communications link is running at 100BaseTX. The LED will flash when data is being transmitted or received. (Ethernet Models Only)

INPUTS

BAROMETRIC PRESSURE – The Barometric pressure is measured with an Absolute Pressure sensor. This is a temperature compensated sensor that can read up to 30.55 mmHg.

DIFFERENTIAL PRESSURE – The Differential Pressure is measured with a Differential Pressure sensor. This is a temperature compensated sensor capable of reading positive and negative relative pressures up to 4.00 inH₂O

AIR FLOW – The Air Velocity is measured using an ultra sensitive thermal anemometer sensor system. It can measure air velocities in the range from 30 to 150 FPM.

HUMIDITY – The Relative Humidity is measured using two integrated microsensors. One measures humidity and the other provides for full seamless temperature compensation. This system provides relative humidity over the full 0 to 100% range.

TEMPERATURE – The Temperature is measured with a precision sensor. It provides a very accurate readout over the system range of 0.0 C to 50.0 C.

COMMUNICATIONS

The unit allows for two methods of communications: RS232 and either Ethernet or RS485. The protocol that is used is the same for both RS232 and Ethernet methods, RS485 adds an address field to the command structure. The RS232 port has full access to the Ethernet parameters, so it can be used as the actual interface or it may be used just to configure the Ethernet. Note that the RS232 is not required when using the Ethernet mode, since all configuration may be done through the Ethernet connection, but the RS232 is available as an alternate.

Ethernet:

The Ethernet connection will run on either 10BaseT or 100BaseTX. TCP/IP is used as the network protocol. It uses Port 1025 and has a 2.5 sec timeout.

The interface requires the setting of an IP Address, Subnet Mask and Gateway IP Address. These are handled by the I, S and G Commands (see below). Setting the unit Configuration Switch Position 8 to "ON" forces the unit to use the defaults (IP = 192.168.1.30 , Subnet = 255.255.255.0 and Gateway = 0.0.0.0). This is provided so the user can gain direct control of the Ethernet to configure it. Note that the switch must be turned off and the unit power cycled (or the reset switch depressed) before the new configuration takes affect.

With the Configuration Switch Position 1 "Off", the setup information may be changed via the Ethernet using the I, S and G Commands and after 5 seconds it will automatically reconfigure itself without cycling power or resetting.

Each command sent to the controller will receive a single packet response from the controller. The response will consist of an echo of the incoming command, the command response, and an End of Transmission character. The end of transmission character will be a "*". The following is an example of the "Read" command. The full details of the command will be explained later:

Command sent from host PC:

R001<cr>

Response from XXXX (single packet of data):

R001<cr><lf>
00000<cr><lf>

*

RS232:

The port runs at 115200 Baud, 8 bit, 1 stop and 1 start bit, no parity. It will echo each character as it is sent to the controller and will not include an end of transmission character.

RS485:

This port runs at 57600 Baud, 8 bit, 1 stop and 1 start bit, no parity. This is a half-duplex twisted pair network with up to 32 nodes. The communication protocol is the same as for the other ports, however, an Address field is added between the command start character and the command data.

Protocol:

Since this system does not handle a great deal of data, the link has been optimized to allow the user, through very simple instructions, to control and interrogate the unit. The following section describes the JPC Protocol used by the controller.

The JPC Protocol consists of 10 basic commands:

- R - READ
- W - WRITE
- U - UPLOAD
- Q - QUICKSEND
- I - IP ADDRESS (Ethernet Models Only)
- S - SUBNET MASK (Ethernet Models Only)
- G - GATEWAY ADDRESS (Ethernet Models Only)
- X - CANCEL
- V - VERSION
- Z - ZERO

The data format is standard ASCII and all data are BCD values.

The following is a breakdown of each of the commands and the way they are accessed. The unit will echo all characters that are typed to it. When used with a terminal, this will provide the appropriate display. When used with a computer system, this will provide direct feedback of the fact that unit has accepted the data.

All commands are completed with a carriage return from the computer. All commands will be acknowledged by a carriage return, line feed (\$0D,\$0A). If a command is not valid, the system will respond with "??". All commands are not case sensitive.

READ COMMAND

The READ command is utilized to read from the System any of the gathered data. The command is entered as a letter followed the Identifier, followed by the 2 digit location, followed by a carriage return:

R[Address](Location)(Return)

The 'R' indicates to the Controller that the command is to be a READ command. The Address is only used for the RS-485 port and indicates which device is to be read. The next two digits indicate data location that is to be read. The carriage return indicates that the command is to be activated. The following is a listing of the data locations that may be read:

LOCATION	ACCESS	DESCRIPTION	RANGE
01	R	BAROMETRIC PRESSURE	20.00 to 30.55 inHG
02	R	DIFFERENTIAL PRESSURE	+/- 4.00 inH ₂ O
03	R	AIRFLOW	30.0 to 150.0 FPM
04	R	TEMPERATURE	0 to 50.00 Deg C
05	R	RELATIVE HUMIDITY	0 to 100.0 %RH
06	R	DIFFERENTIAL PRESSURE ZERO OFFSET	+/- 0.050 inH ₂ O
07	R/W	BAROMETRIC PRESSURE DIGITAL FILTER	0-65535
08	R/W	DIFFERENTIAL PRESSURE DIGITAL FILTER	0-65535
09	R/W	AIRFLOW DIGITAL FILTER	0-65535
10	R/W	AIRFLOW TEMPERATURE DIGITAL FILTER	0-65535

Example:

Data Sent (Ethernet)

R01<cr>

Data Returned

R01<cr><lf>
02810<cr><lf>
*

Meaning

Echo of Command Sent
Barometric Pressure is 28.10
End of Packet

Data Sent (RS-232)

R03<cr>

Data Returned

R03<cr><lf>
00510<cr><lf>

Meaning

Echo of Command Sent
Airflow is 51.0 FPM

Data Sent (RS-485)

R2104<cr>

Data Returned

R2104<cr><lf>
02510<cr><lf>

Meaning

Echo of Command Sent
Temperature of module at RS485
address 21 is 25.10 Degrees C

Format – All data is returned in ASCII format with 5 BCD characters. Decimal places are assumed and are not sent with the returned data.

Digital Filter – When converted to hexadecimal, the Upper byte of the Digital Filter is the Range and the lower byte is the Depth. (See Digital Filter Option). Each analog input has independent digital filter settings.

WRITE COMMAND

The WRITE command allows the user to update the digital filter configuration (See Digital Filter Option). The locations for this data are shown in the table for the READ command.

The following is the format for this command:

W[Address](Location)(Data)(Return)

The command essentially follows the same format as all the previous commands. The 'W' indicates that it is a WRITE command. The Address is only used for the RS-485 port and indicates which device is to be written. The next two characters indicate the location that is to be written to and the last five characters indicate the data value that is to be entered. Again, the data is in BCD and transmitted in an ASCII format. All leading zeros must be included in the command. Note that not all locations can be written to.

Example:

The following example will set the Airflow Digital Filter to 4112. See the Digital Filter Option for details of this setting.

Data Sent (Ethernet)

W1104112<cr>

Data Returned

W1104112<cr><lf>
*

Meaning

Echo of Command Sent
End of Packet

Data Sent (RS-232)

W1104112<cr>

Data Returned

W1104112<cr><lf>

Meaning

Echo of Command Sent

Data Sent (RS-485)

W2104112<cr>

Data Returned

W2104112<cr><lf>

Meaning

Echo of Command Sent to module
at RS485 Address 21.

UPLOAD COMMAND

The Upload command allows the user to read all of the data from locations with a single command. The data will be transmitted as a single block with each location separated by a carriage return, linefeed (\$0D,\$0A).

The following is the format for this command:

U[Address] (Return)

The Address is only used for the RS-485 port and indicates which device is to be read. See the table in the Read Command section for details on the data structure.

QUICKSEND COMMAND

Quicksend is a feature that allows the user to receive an automatic update of all of the system data without any user interaction. When the Quicksend feature is turned ON, the system will automatically send all of the device data every half second. The Quicksend feature is toggled ON and OFF with the Quicksend command.

The following is the format for the 'Q' command:

Q(ID) (RETURN)

See the table in the Read Command section for details on the data structure.

Note: When using RS485, this option is only usable for one cluster at a time.

ZERO COMMAND

The Zero command allows the user to take out any offset in the Differential Pressure reading.

The following is the format for this command:

Z[Address] (Return)

The Address is only used for the RS-485 port and indicates which device is to be written to. The controller will respond with the new zero offset for the Differential Pressure port.

Example:

Data Sent (Ethernet)

Z<cr>

Data Returned

Z<cr><lf>
00012<cr><lf>
*

Meaning

Echo of Command Sent
Zero offset is 0.012 inH₂O
End of Packet

Data Sent (RS-232)

Z<cr>

Data Returned

Z<cr><lf>
-0007<cr><lf>

Meaning

Echo of Command Sent
Zero offset is -0.007 inH₂O

Data Sent (RS-485)

Z02<cr>

Data Returned

Z02<cr><lf>
00009<cr><lf>

Meaning

Echo of Command Sent
Zero Offset of module at
RS485 address 02 is
0.009 inH₂O

The command causes the current pressure value to be used as the zero offset. The fluid lines should be disconnected at the unit prior to using this command.

IP ADDRESS COMMAND

(Ethernet Equipped Models Only)

The IP Address command allows the user to read and set the unit IP Address.

To read the IP address, the following syntax is used:

I (Return)

To set (write) the IP address, the following syntax is used:

Ixxx.xxx.xxx.xxx (Return)

The x's denote the IP address to be written (E.G. I192.168.1.30). NOTE: While the IP address is being written, there should be no communications with the controller. (~ 5 sec).

SUBNET MASK COMMAND

(Ethernet Equipped Models Only)

The Subnet Mask command allows the user to read and write the system Subnet Mask.

To read the Subnet Mask, the following syntax is used:

S (Return)

To write the Subnet Mask, the following syntax is used:

Sxxx.xxx.xxx.xxx (Return)

The x's denote the mask to be written (E.G. S255.255.255.0). NOTE: While the Subnet Mask is being written, there should be no communications with the controller (~ 5 sec).

GATEWAY ADDRESS COMMAND

(Ethernet Equipped Models Only)

The Gateway Address command allows the user to read and write the Gateway IP Address.

To read the Gateway Address, the following syntax is used:

G (Return)

To write the Gateway Address, the following syntax is used:

Gxxx.xxx.xxx.xxx (Return)

The x's denote the Gateway IP address to be written (E.G. G192.168.1.1). NOTE: While the Gateway Address is being written, there should be no communications with the controller (~ 5 sec).

CANCEL COMMAND

The CANCEL command is simply a way to re-establish proper control, should an error occur or an incorrect command be transmitted. For the most part, an incorrect command will simply be ignored and the controller will prepare for an additional command. However, a command may be cancelled midstream by transmitting an 'X' (ASCII). This command does not require a carriage return, nor will it acknowledge with a carriage return. However, it will echo an 'X' to indicate that the CANCEL command has been received.

The command may also be utilized as a clear and/or acknowledgement of the Controller being on line.

VERSION COMMAND

The Version command allows the user to read the Software Version that the unit is running.

To read the Version, the following syntax is used:

V[Address] (RETURN)

The Address is only used for the RS-485 port and indicates which device is to be read.

DIGITAL FILTER OPTION

The analog inputs have the option of an internal digital filter. This filter does an averaging of the readings to minimize jitter in the output. Each analog input has an independent digital filter.

The filter is set using the WRITE Command to locations 9 through 13 (See Write Command). The structure of the data is the composite of the two factors controlling the filter performance (Range and Depth). The data is 16 bits or 65535 counts.

The Range sets the band over which the filter is active. The Range may be set from 0 to 100 counts. This factor determines how the filter reacts to a step change. The Default value is set to 16.

For an input step change larger than the "Range" setting, the digital filter will be automatically bypassed, to allow a faster response time. Any change in the analog input that is less than or equal to the "Range" setting will be filtered, resulting in a "jitter free" sampling.

The Depth sets the number of samples used in the averaging. The setting may be from 1 to 255. The Default value is set to 16.

The Value that is sent to the unit is a decimal representation of the double byte value of Range/Depth. The following is an example of the setting value:

Range Byte	Depth Byte
16 _D	16 _D
10 _H	10 _H
1010 _H	
4112 _D	

The value 04112 is sent to location 09 to set the filter for the airflow digital filter.

VISUAL BASIC SAMPLE CODE

The following code will send the Upload command to the 8240 controller. To utilize the following code, create a new project in Visual Basic 6.0 and add a Command Button, a Textbox, and a Winsock Control to Form1. Then copy the following code to the Form1 Code window and run the program.

```
Private Sub Command1_Click()
On Error Resume Next
Text1.Text = "" ' clear last response
If Winsock1.State = sckClosing Then Winsock1.Close

' Invoke the Connect method to initiate a
' connection.
If Winsock1.State <> sckConnected Then

    Winsock1.Protocol = sckTCPProtocol

    ' Note: to specify a remote host, you can use
    ' either the IP address (ex: "121.111.1.1") or
    ' the computer's "friendly" name
    Winsock1.RemoteHost = "192.168.1.29"
    Winsock1.RemotePort = 1025
    Winsock1.LocalPort = 1025
    Winsock1.Connect
    If Err.Number = 10048 Then ' address in use?-yes
        Winsock1.Close
        Winsock1.LocalPort = 0
        Winsock1.Connect
        Err.Clear
    End If
    While Winsock1.State = sckConnecting 'wait for connection to be established
        DoEvents
    Wend

End If

Winsock1.SendData "XU0" & vbCr ' clear 8240 receive buffer and send upload master
data command

End Sub
```

```
Private Sub Winsock1_Close()  
    Winsock1.Close ' 8240 is closing connection  
End Sub
```

```
Private Sub Winsock1_DataArrival(ByVal bytesTotal As Long)  
    Dim TempString As String ' define temporary string for returned data
```

```
    Winsock1.GetData TempString ' get data from tcp buffer
```

```
    Text1 = Text1 & TempString ' put it in the text box
```

```
End Sub
```

SETTINGS

While most of the configuration of the system is done in software, there are a few switches and jumpers that are used to modify the operation of the hardware.

CONFIGURATION BIT SWITCH

There is an eight position bit switch on the circuit board that provides the following options:

Switch 1 through 5

These switches determine the RS-485 Address, when used.

Switch 6 - Off

RS-485 Port is enabled.

Switch 6 - ON

The Ethernet Port is enabled.

Switch 7 – Off

RS-485 Twisted Pair Bias resistors are disabled.

Switch 7 – On

RS-485 Twisted Pair Bias resistors are enabled. NOTE: Only one device on the network should have the Bias Resistors enabled

Switch 8 – Off

The TCP/IP configuration for the Ethernet is obtained from the internal programmed registers.

Switch 8 – On

The TCP/IP configuration for the Ethernet is set to the following defaults:

IP address	192.168.1.30
Subnet Mask	255.255.255.0
Gateway	0.0.0.0

RS-485 JUMPER

Jumper J10 is used to enable the terminating resistor when RS-485 is used. NOTE that only the device on the endpoint of the network wiring should have the terminating resistor enabled.

GETTING STARTED

ETHERNET VERSION

Getting started is just a matter of getting the unit from the box to its basic functional condition. The details of hooking it to the actual application hardware and structuring the application software are outside the scope of this section. Here we will just address how to set it up to check that it is working.

The process consists of 9 steps:

- (1) Read the manual**
- (2) Unpack and check for physical damage**
- (3) Wire to power supply**
- (4) Wire RS232 link**
- (5) Configure RS232 Communications**
- (6) Test RS232**
- (7) Wire Ethernet link**
- (8) Configure Ethernet Communications**
- (9) Test Ethernet**

Read the Manual

The manual contains all of the information necessary to setup and operate the unit. A basic understanding of its function and the terminology will prove very helpful.

Unpack and check for physical damage

Unpack and examine the unit. If there is any physical damage do not turn it on. Contact the shipper and file a claim. Then contact the factory for repair or replacement.

Wire to power supply

The unit is powered by 24 VDC. Hook up to an electrically clean 24 VDC source, one free from excessive electrical noise. Insure that a good earth ground is provided. Wire per the wiring diagram in the rear of the manual.

Wire RS232 Communications link

The unit allows for two methods of communications: Ethernet and RS232. The protocol that is used is the same for both methods. The RS232 port has full access to the Ethernet parameters, so it can be used as the actual interface or it may be used just to configure the Ethernet. Note that the RS232 is not required when using the Ethernet mode, since all configuration may be done through the Ethernet connection, but the RS232 is available as an alternate.

While the Ethernet may be addressed directly, the method presented here is a better starting point for the new user. It is easier to use the RS232 port to checkout the unit and then configure it for Ethernet applications than to start on the Ethernet. An experienced user may want to skip this method and address the unit using the default address via the Ethernet and directly reconfigure it from there. That method works very well but will not be used here.

Connect RS232 Input to a PC COM port using a modified 9 pin serial cable. Use a direct cable, not a null modem cable.

Configure RS232 Communications

On the PC, open a terminal emulator program such as Hyperterminal or Teraterm. Set the communication parameters to 115.2kbps, 8 bits, no parity and one stop bit. Select the COM port to which the cable is attached. (Hyperterminal requires the program be restarted after settings are changed.)

Test RS232

Apply power to the device. The power LED will light.

All of the commands listed in the Communications section are now available. No prompt is displayed on the screen. Any of the commands may be used without value to verify that the serial link is working correctly. Line editing is not available in the setup mode. If a typing mistake is made, enter an "X" followed by a carriage return to cancel the command.

Type V (Return).

This should be echoed on the screen followed by the units response of the current version of the software that the unit is running. Work with the other commands a called out in the command section to further test the unit.

Wire Ethernet link

Turn off the power.

Connect the unit to a network hub using a CAT5 patch cable to the RJ-45 connector. This assumes that there is a functional Ethernet network running. If desired this test can be run on a PC by directly connecting to the Ethernet port with a Cross Over cable.

Configure Ethernet Communications

Turn on the unit power.

Three commands are available through the RS232 port that set the configuration of the Ethernet interface. The commands are used to set the unit IP address, the subnet mask and the gateway IP address. The commands are not case sensitive. Each command is a single letter followed by an IP address or mask. The command must be the first character in a line followed by (optionally) a single space and the value to be set. Values must be sent in the dotted quad format. The command is completed with the carriage return (press the enter key). If the command is sent without a value the current setting is displayed.

No prompt is displayed in the COM setup mode. Any of the commands may be used without value to verify that the serial link is working correctly. Line editing is not available in the setup mode. If a typing mistake is made, enter an "X" followed by a carriage return to cancel the command.

The IP address of the Ethernet interface is set using the "I" command. Using the terminal program enter "I" followed by the IP address and a carriage return.

Example:

```
I 192.168.1.28<CR>
```

This command sets the IP address to 192.168.1.28. Set it to the desired network address.

When the command is sent the new address is saved and the Ethernet interface is restarted using the new IP address. The restart process takes about five seconds. If there is any communication on the Ethernet interface when the command is sent it will be interrupted. Communication can continue using the new IP address.

The subnet mask of the Ethernet interface is set using the "S" command. Using the terminal program enter "S" followed by the subnet mask and a carriage return.

Example:

```
S 255.255.255.0<CR>
```

This command sets the subnet mask to 255.255.255.0. Set it to the desired subnet mask

When the command is sent the new mask is saved and the Ethernet interface is restarted

using the new subnet mask. The restart process takes about five seconds. If there is any communication on the Ethernet interface when the command is sent it will be interrupted. Communication will resume if the new mask is compatible with the network mask.

The gateway IP address of the Ethernet interface is set using the “G” command. Using the terminal program enter “G” followed by the gateway IP address and a carriage return.

Example:

```
G 192.168.1.254<CR>
```

This command sets the gateway IP address to 192.168.1.254. Set it to the desired gateway IP address.

When the command is sent the gateway IP address is saved and the Ethernet interface is restarted using the new gateway address. The restart process takes about five seconds. If there is any communication on the Ethernet interface when the command is sent it will be interrupted. Communication will resume when the interface restarts.

Test Ethernet

Turn unit power off.

Remove the RS232 cable.

Turn the unit power on.

The link LED and the 10baseT or 100baseTX LED should be on.

Open a command prompt window and use the PING command to test the Ethernet interface configuration. Use the IP address that you set with the I command.

Example:

```
PING 192.168.1.28<CR>
```

The command should reply with round trip times for the ping reply. If a timeout error occurs check the IP configuration using the COM port.

To further test the commands over the Ethernet, a TCP/IP interface package is necessary. This will allow the unit to do all of the same things that the RS232 link allows, but to do it over the network.

MANUAL REVISIONS

<u>Revision #</u>	<u>Program #</u>	<u>Engineering #</u>	<u>Revisions Made</u>
Rev 01	DT8240CA	DT8240	Origination

LIMITED WARRANTY

WARRANTY: JPC CONTROLS WARRANTS ITS NEW PRODUCTS TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP UNDER THE SERVICE FOR WHICH THEY ARE INTENDED. THIS WARRANTY IS EFFECTIVE FOR TWELVE MONTHS FROM THE DATE OF SHIPMENT.

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JPC CONTROLS IS NOT LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

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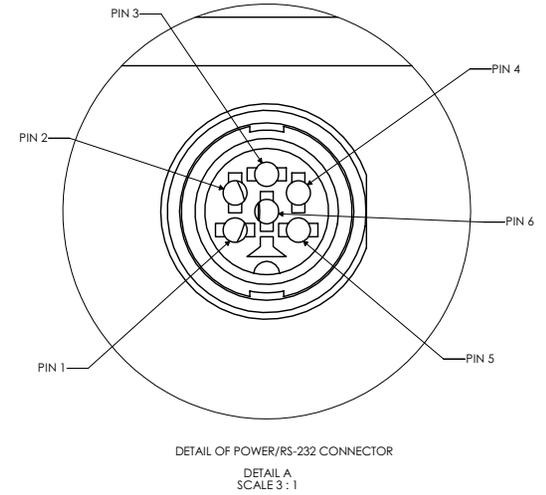
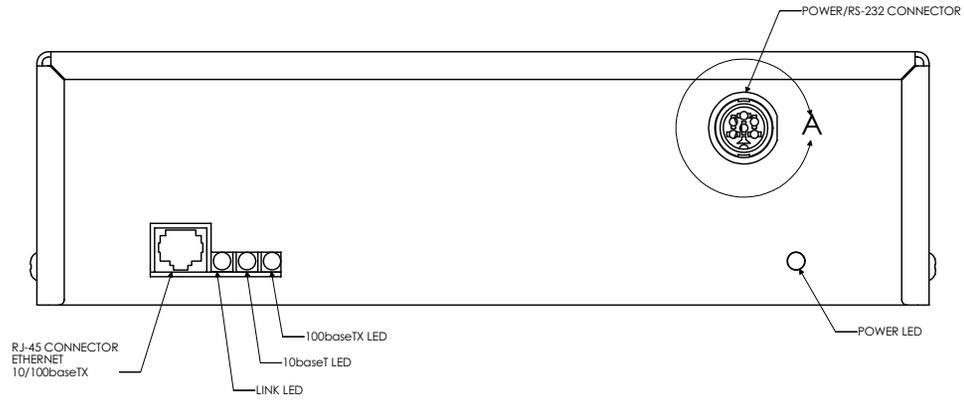
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SPECIFICATIONS

Procon 8240 Sensor Cluster

BAROMETRIC PRESSURE RANGE	20.00 TO 30.55 mmHg ± 1%
DIFFERENTIAL PRESSURE RANGE	-4.00 TO 4.00 inH ₂ O ± 1%
TEMPERATURE RANGE	0 TO 50 DEGREES C ± 0.1 C
HUMIDITY RANGE	10.0 TO 90.0 %RH ± 2%
AIR FLOW RANGE	30.0 TO 150.0 FPM ± 5%
SETUP MEMORY	EEPROM, All Parameters
MEMORY RETENTION	10 Years w/o Power
OPERATING RANGE	0 to 50 Degrees C
STORAGE RANGE	-40 to 60 Degrees C
CONSTRUCTION	Enclosure – Stainless Steel
SIZE	7.09 x 3.94 x 1.56 inches 180 x 100 x 40 mm (HxWxD)
WEIGHT	≤ 2 Lbs. (0.90 kg)
CONNECTIONS	Power – Circular, Twist Lock RS-232 – Circular, Twist Lock Pressure – Female Luer Temperature – ½” NPT Air Flow – ½” NPT Ethernet – RJ-45

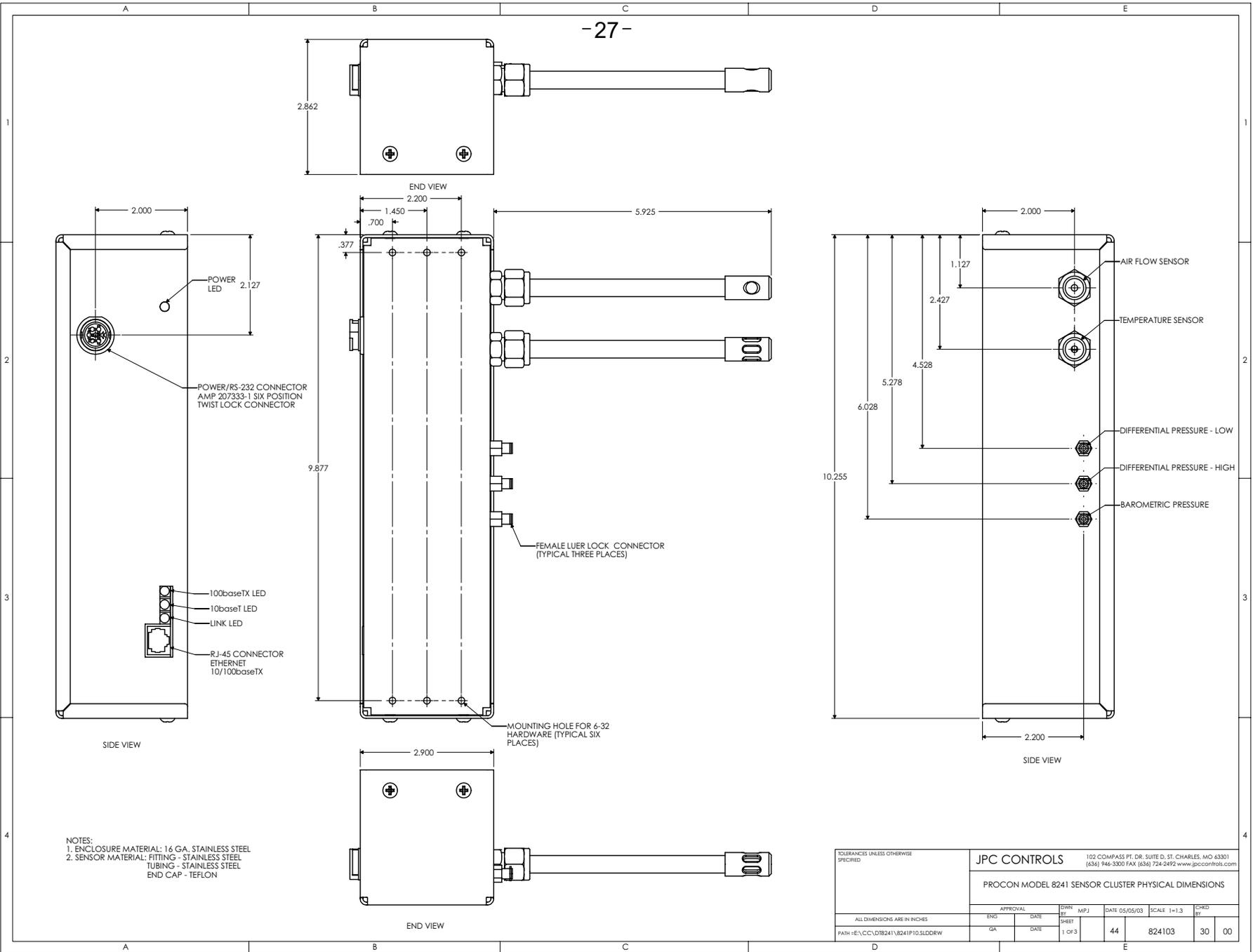
POWER	24VDC, 100 mA
POWER CONSUMPTION	2.4 W



- POWER/RS-232 CONNECTOR
- 1 - RS-232 COM
 - 2 - RS-232 TxD
 - 3 - RS-232 RxD
 - 4 - 24 VDC +
 - 5 - 24 VDC -
 - 6 - EARTH GROUND

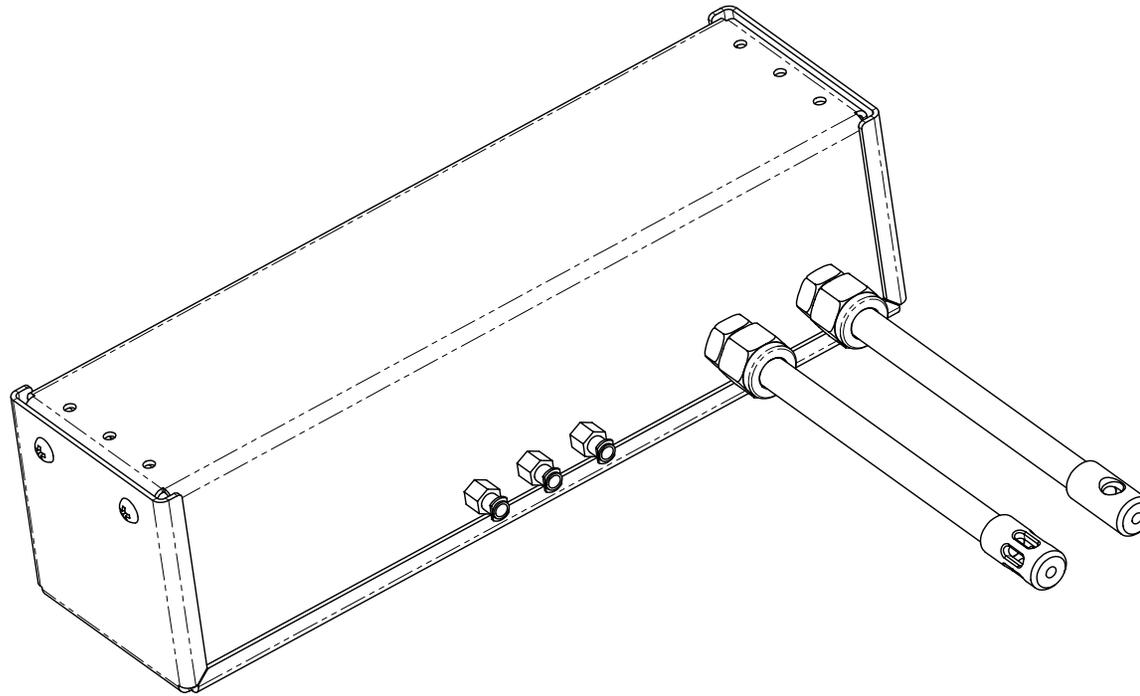
GENERAL NOTES:
1. MATING CONNECTOR FOR AMP 207333-1 TWIST LOCK CONNECTOR IS AMP 207332-1 HOUSING WITH AMP 207438-3 CRIMP CONTACTS AND AMP 207314-1 CORD GUARD.

TOLERANCES UNLESS OTHERWISE SPECIFIED	JPC CONTROLS		102 COMPASS PT. DR. SUITE D, ST. CHARLES, MO 63301 (636) 946-3300 FAX (636) 724-2492 www.jpcccontrols.com				
	PROCON MODEL 8241 SENSOR CLUSTER WIRING DIAGRAM						
	APPROVAL		EDN	AMP	DATE	SCALE	CHKD
ALL DIMENSIONS ARE IN INCHES		ENG	DATE	SHEET	1=1	BT	
PATH: F:\CC\DRM41\8241-WIRING-REV5.DDDRW		GA	DATE	1 OF 1	12	824104	30 00



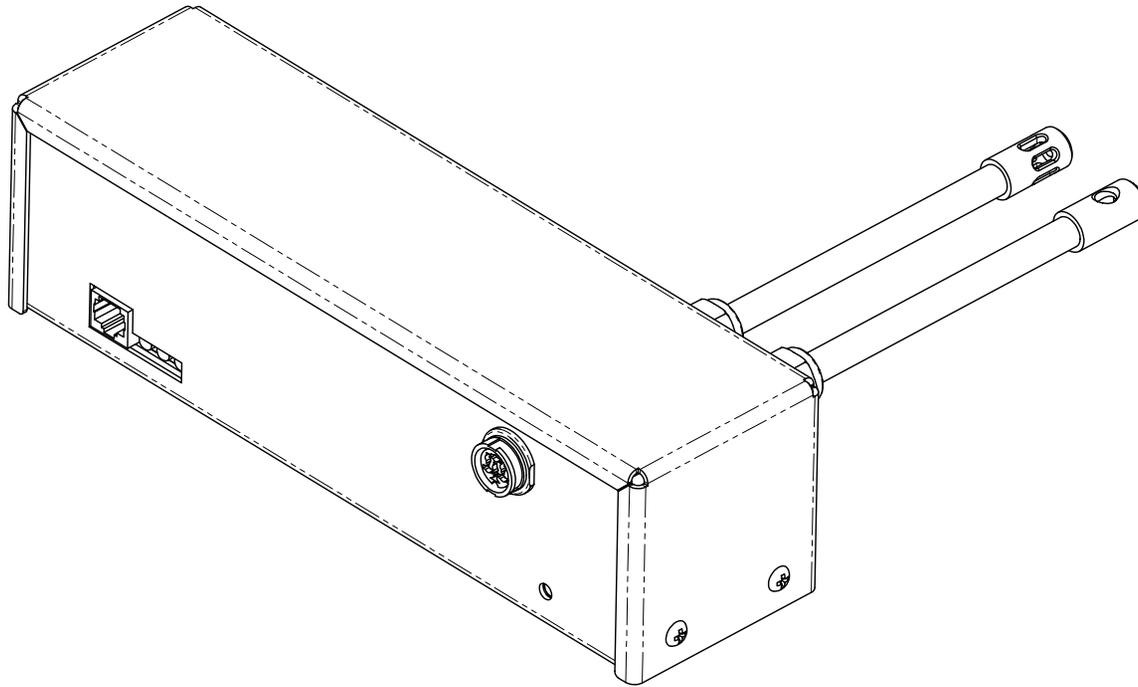
NOTES:
 1. ENCLOSURE MATERIAL: 1/4 GA. STAINLESS STEEL
 2. SENSOR MATERIAL: FITTING - STAINLESS STEEL
 TUBING - STAINLESS STEEL
 END CAP - TEFLON

TOLERANCES UNLESS OTHERWISE SPECIFIED		JPC CONTROLS		102 COMPASS PT. DR., SUITE D, ST. CHARLES, MO 63301 (636) 946-3300 FAX (636) 724-2492 www.jpcccontrols.com	
PROCON MODEL 8241 SENSOR CLUSTER PHYSICAL DIMENSIONS					
APPROVAL		OWN	MPJ	DATE 05/05/03	SCALE 1=1.3
ENG	DATE	BY	DATE	CSRD	BY
GA			44	824103	30 00
ALL DIMENSIONS ARE IN INCHES		SHEET 1 OF 3			
PATH =E:\C.C.\DIR8241\8241P10.SLDDRW					



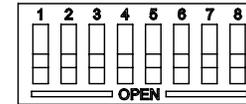
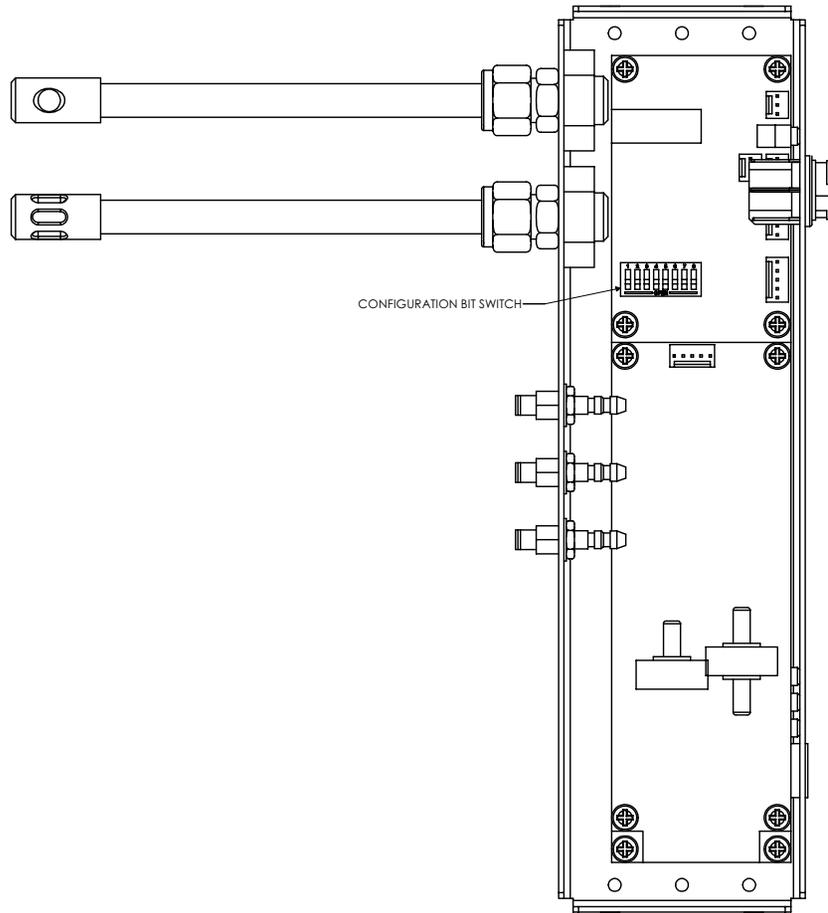
ISOMETRIC VIEW

TOLERANCES UNLESS OTHERWISE SPECIFIED:		JPC CONTROLS		102 COMPASS PT. DR. SUITE D, ST. CHARLES, MO 63301 (636) 946-3300 FAX (636) 724-2492 www.jpcccontrols.com		
PROCON MODEL 8241 SENSOR CLUSTER PHYSICAL DIMENSIONS						
APPROVAL		OWN	MPJ	DATE	SCALE	CHRD
ENG	DATE	SH	SHEET	05/05/03	1=1	BY
GA	DATE	2	OF 3	44	824103	30 00
PATH = E:\CC\1\8241P10.SLDDRW						



ISOMETRIC VIEW

TOLERANCES UNLESS OTHERWISE SPECIFIED		JPC CONTROLS		102 COMPASS PT. DR. SUITE D, ST. CHARLES, MO 63301 (636) 946-3300 FAX (636) 734-2492 www.jpcccontrols.com	
PROCON MODEL 8241 SENSOR CLUSTER PHYSICAL DIMENSIONS					
APPROVAL		DRN	MPJ	DATE	SCALE
ENG	DATE	BY		05/05/03	1:1
ALL DIMENSIONS ARE IN INCHES		SHEET		44	824103
GA	DATE	3 OF 3			30 00
PATH "E:\CC\LD\8241\8241P10.SLDORW					



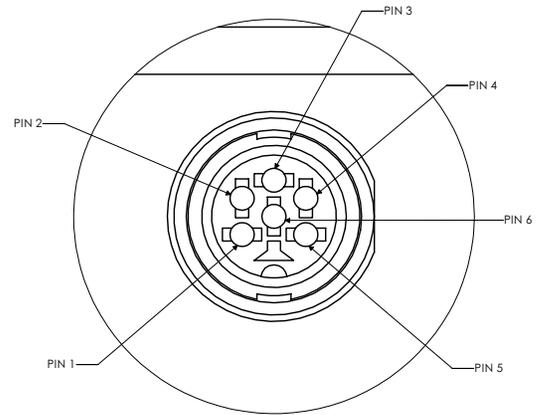
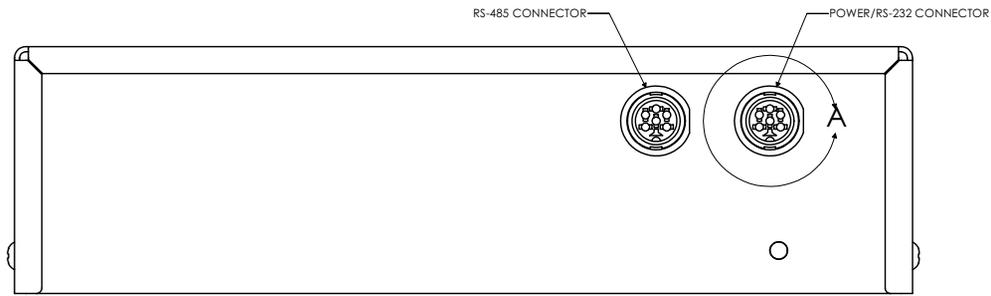
DETAIL OF CONFIGURATION BIT SWITCH

CONFIGURATION BIT SWITCH SETTINGS

SWITCH POSITIONS 1 THROUGH 7 - NOT APPLICABLE TO THIS UNIT
 SWITCH POSITION 8 - OPEN (TCP/IP CONFIGURATION FOR ETHERNET IS OBTAINED FROM INTERNAL PROGRAMMED REGISTERS)

SWITCH POSITION 8 - CLOSED (TCP/IP CONFIGURATION FOR THE ETHERNET IS SET TO THE FOLLOWING DEFAULTS:
 IP ADDRESS 192.168.1.30
 SUBNET MASK 255.255.255.0
 GATEWAY 0.0.0.0)

TOLERANCES UNLESS OTHERWISE SPECIFIED		JPC CONTROLS		102 COMPASS PT. DR. SUITE D, ST. CHARLES, MO 63301 (636) 946-3300 FAX (636) 724-2492 www.jpcccontrols.com	
PROCON MODEL 8241 SENSOR CLUSTER CONFIGURATION BIT SWITCH SETTINGS					
APPROVAL		DWN BY		DATE 05/06/03	
ENG	DATE	MPJ	MPJ	SCALE	1=1
ALL DIMENSIONS ARE IN INCHES		SHEET		CHKD BY	
PATH =E:\CC\08241\8241-SWITCH-REV05LDRW		1 OF 1		BY	
QA	DATE	19	824105	30	00



DETAIL OF AMP 207333-1 SIX POSITION TWIST LOCK CONNECTOR

DETAIL A
SCALE 3 : 1

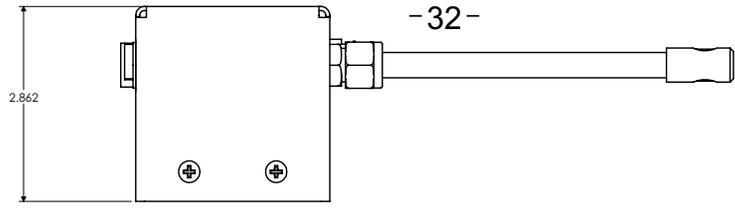
RS-485 CONNECTOR
1 - IN -
2 - IN +
3 - IN COM
4 - OUT -
5 - OUT +
6 - OUT COM

POWER/RS-232 CONNECTOR
1 - RS-232 COM
2 - RS-232 TXD
3 - RS-232 RXD
4 - 24 VDC +
5 - 24 VDC -
6 - EARTH GROUND

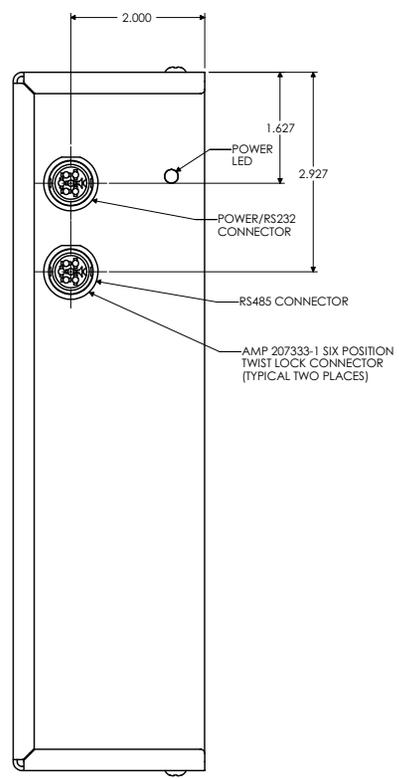
GENERAL NOTES:
1. MATING CONNECTOR FOR AMP 207333-1 TWIST LOCK CONNECTOR IS AMP 207332-1 HOUSING WITH AMP 207438-3 CRIMP CONTACTS AND AMP 207314-1 CORD GUARD.

TOLERANCES UNLESS OTHERWISE SPECIFIED		JPC CONTROLS		102 COMPASS PT. DR. SUITE D, ST. CHARLES, MO 63301 (636) 946-3300 FAX (636) 724-2492 www.jpcccontrols.com	
PROCON MODEL 8242 SENSOR CLUSTER WIRING DIAGRAM					
APPROVAL		DRN BY	MP J	DATE	1+1
ENG	DATE	SHEET			SCALE 05/06/03
ALL DIMENSIONS ARE IN INCHES		GA	DATE	1 OF 1	12
PATH = E:\CC\DT8242\8242-WIRING-REV0.SLDRAW					824201
					30 00

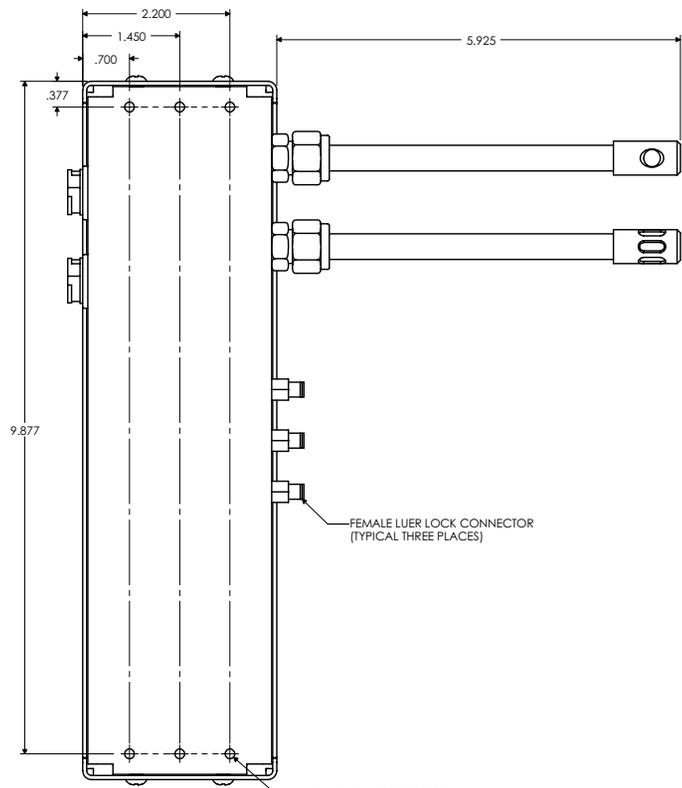
- 32 -



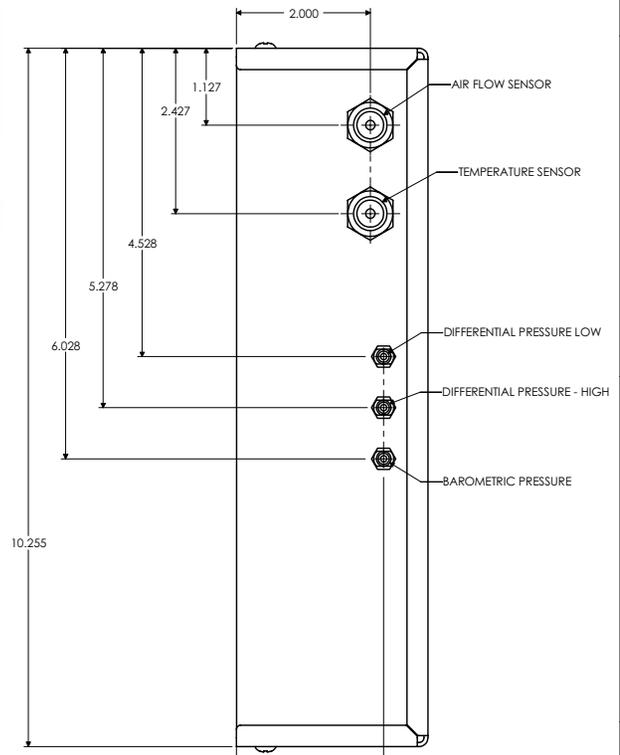
END VIEW



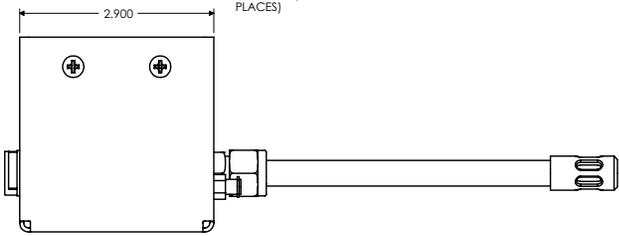
SIDE VIEW



TOP VIEW



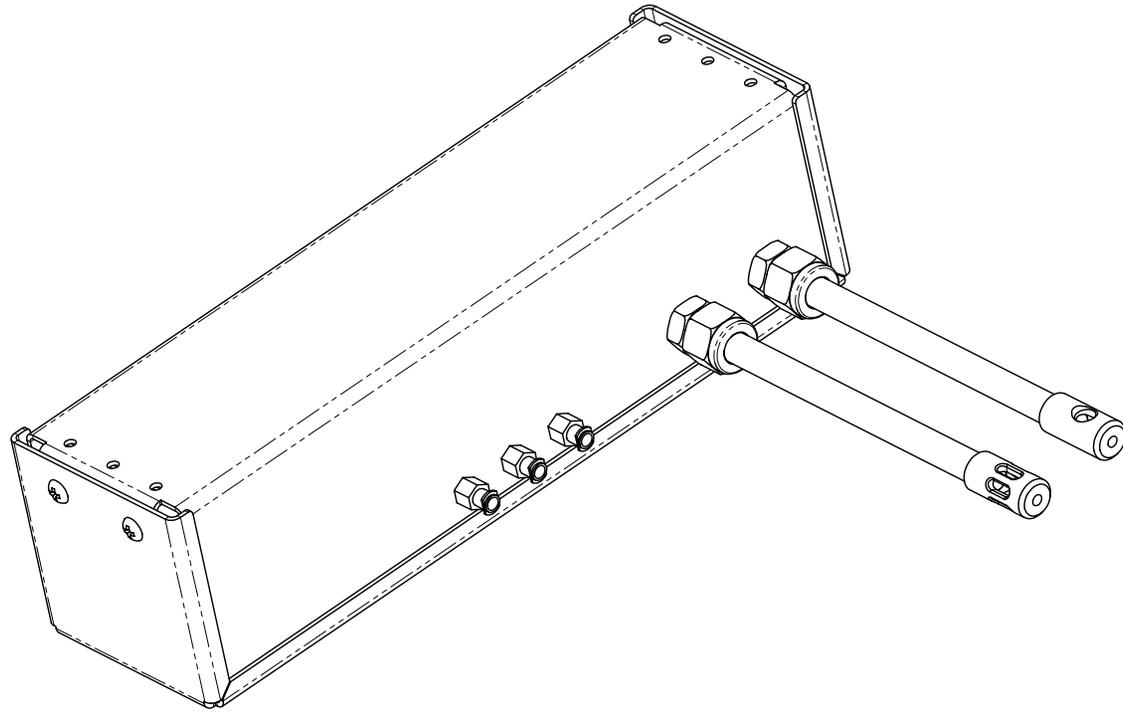
SIDE VIEW



END VIEW

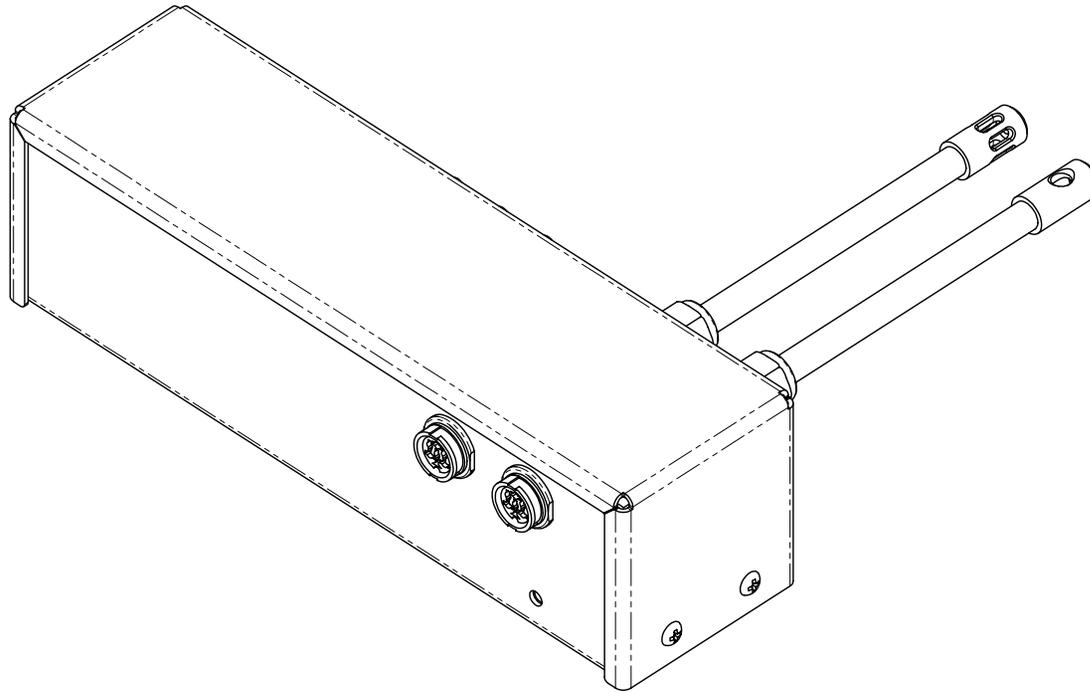
- NOTES:
 1. ENCLOSURE MATERIAL: 16 GA. STAINLESS STEEL.
 2. SENSOR MATERIAL: FITTING - STAINLESS STEEL
 TUBING - STAINLESS STEEL
 END CAP - TEFLON

TOLERANCES UNLESS OTHERWISE SPECIFIED		JPC CONTROLS		102 COMPASS PT. DR. SUITE D, ST. CHARLES, MO 63301 (636) 946-3300 FAX (636) 724-2492 www.jpcccontrols.com	
PROCON MODEL 8242 SENSOR CLUSTER PHYSICAL DIMENSIONS					
APPROVAL		ENGR	DATE	DWN BY	M/P/J
ALL DIMENSIONS ARE IN INCHES		GA	DATE	SHEET	SCALE
PATH = E:\CC\DR8242\8242P10.SLDDRW		1 OF 3	44	824200	30 00



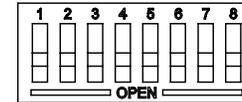
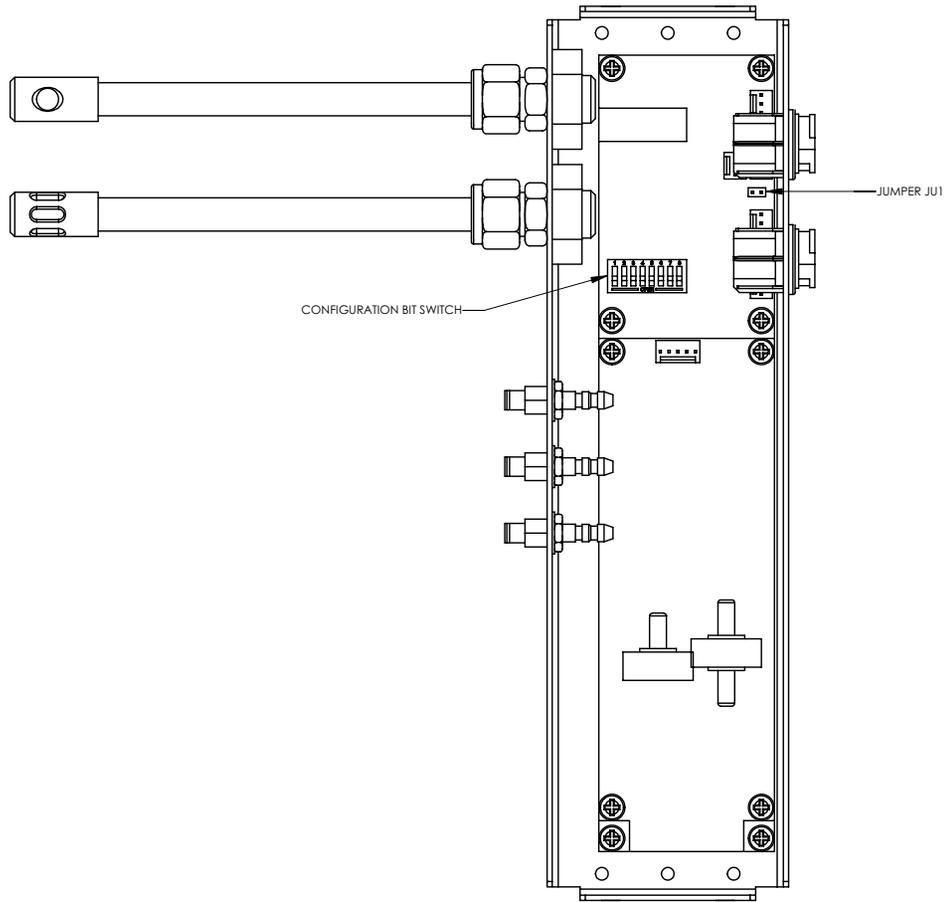
ISOMETRIC VIEW

TOLERANCES UNLESS OTHERWISE SPECIFIED		JPC CONTROLS		102 COMPASS PT. DR. SUITE D, ST. CHARLES, MO 63301 (636) 946-3300 FAX (636) 724-6492 www.jpccontrols.com	
PROCON MODEL 8242 SENSOR CLUSTER PHYSICAL DIMENSIONS					
APPROVAL		DRN	DATE	SCALE	CHD
ENG	DATE	BY	MPJ	1=1	BY
QA	DATE	2 OF 3	44	824200	30 00
PATH=E:\C\C\078242\8242P10.SLDDRW					



ISOMETRIC VIEW

TOLERANCES UNLESS OTHERWISE SPECIFIED		JPC CONTROLS		102 COMPASS PT. DR. SUITE D, ST. CHARLES, MD 63301 (636) 946-3300 FAX (636) 724-2492 www.jpccontrols.com	
PROCON MODEL 8242 SENSOR CLUSTER PHYSICAL DIMENSIONS					
APPROVAL		DRN	AMPJ	DATE	SCALE
ENG	DATE	BY		05/06/03	1=1
ALL DIMENSIONS ARE IN INCHES		SHEET		44	824200
PATH: E:\CC\DTB242\8242P10.SLDDRW		3 OF 3			30 00



DETAIL OF CONFIGURATION BIT SWITCH

CONFIGURATION BIT SWITCH SETTINGS

- SWITCH POSITIONS 1 THROUGH 5 - RS-485 ADDRESS
- SWITCH POSITION 6 - OPEN (RS-485 PORT IS ENABLED)
- SWITCH POSITION 6 - CLOSED (NOT APPLICABLE TO THIS UNIT)
- SWITCH POSITION 7 - OPEN (RS-485 TWISTED PAIR BIAS RESISTORS ARE DISABLED)
- SWITCH POSITION 7 - CLOSED (RS-485 TWISTED PAIR BIAS RESISTORS ARE ENABLED)
- SWITCH POSITION 8 - OPEN (NOT APPLICABLE TO THIS UNIT)
- SWITCH POSITION 8 - CLOSED (NOT APPLICABLE TO THIS UNIT)

NOTE:
INSTALL JUMPER JU1 FOR ENDPOINT MODULES
IN RS-485 NETWORK ONLY.

TOLERANCES UNLESS OTHERWISE SPECIFIED		JPC CONTROLS		102 COMPASS PT. DR. SUITE D, ST. CHARLES, MO 63301 (636) 946-3300 FAX (636) 724-2492 www.jpccontrols.com							
				PROCON MODEL 8242 SENSOR CLUSTER CONFIGURATION BIT SWITCH SETTINGS							
APPROVAL		ENGR	DATE	DWN	MPI	DATE	OS/DA/CS	SCALE	1=1	CRD	BY
ALL DIMENSIONS ARE IN INCHES		GA	DATE	1 OF 1		19		824201		30	00
PATH = E:\CC\078242\8242_SWITCH-REV15.DRW											