

*Sterling ProMeasure Systems*

# INSTRUCTION MANUAL

## PRO X NET

The A / E Converter



*Sterling ProMeasure Systems*

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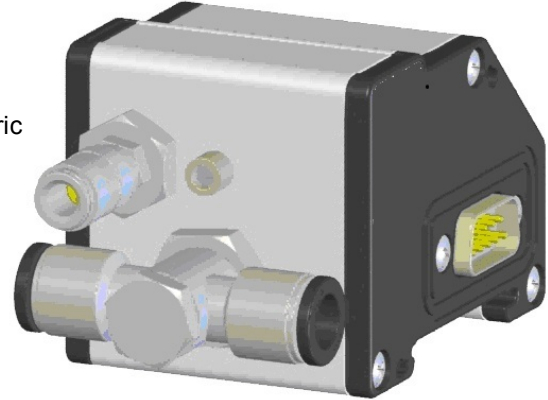
## 1. Introduction

### 1.1 General Information

The ProXNet A/E converter, P.N. PRX.IMBAE1X.NET, is a differential pressure measuring system with piezoelectric sensors and measuring electronics with a USB connection.

This modular expansion allows the connection of up to 64 converters per USB interface and the quick connection and release of all pneumatic air spindles and air rings.

When used with the GageXpress Pro SPC software, a USB PC interface is required (PRX.IMBUSBX.NET). When 6 or more converters are networked, a Power Supply (PRX.IMBPS2X.NET) is required.



### 1.2 Measuring Technology

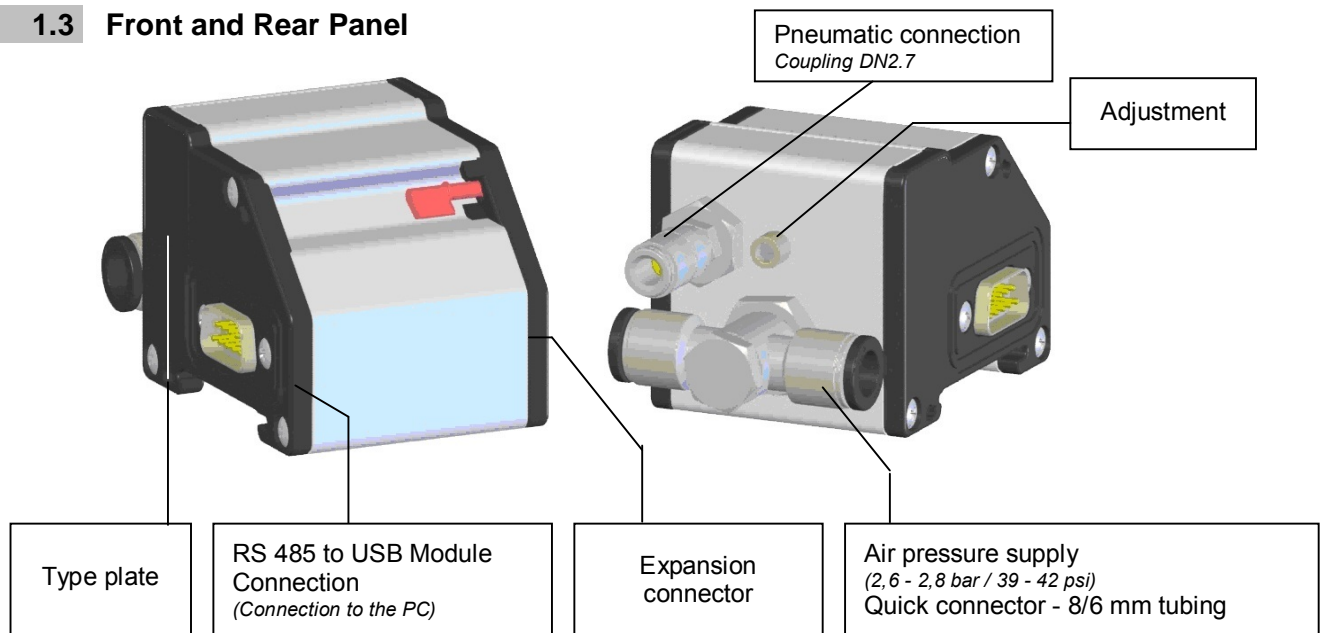
Pneumatic measuring can be effectively used under applicable operating conditions. Robust and effective, air gage heads automatically clean the component during measuring.

The high sensitivity allows resolutions up to 0.1  $\mu\text{m}$ .

The design of the ProXNet A/E Converter Module provides compensation for air pressure fluctuations and reduces the influence of external disturbances. Piezoelectric sensors with state-of-the-art electronics provide the industry's highest level of a/e conversion precision and stability.

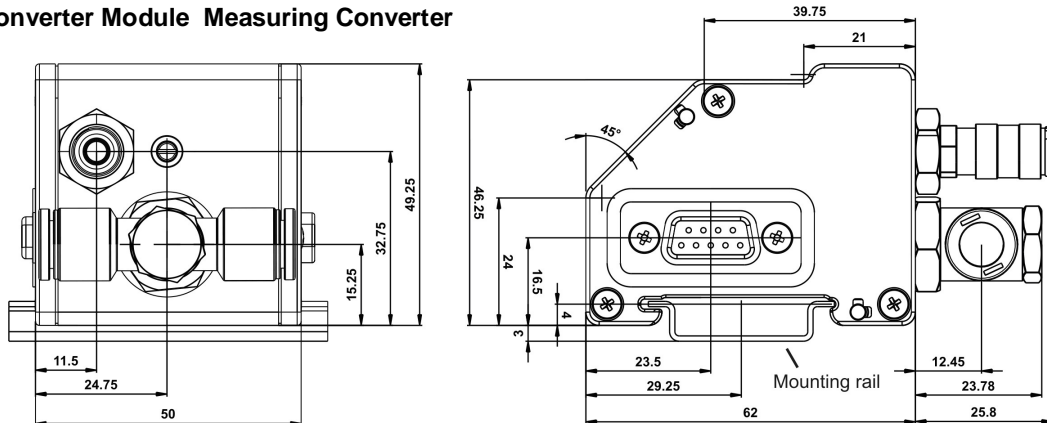
An adjustment in the converter enables matching to different gage heads.

### 1.3 Front and Rear Panel



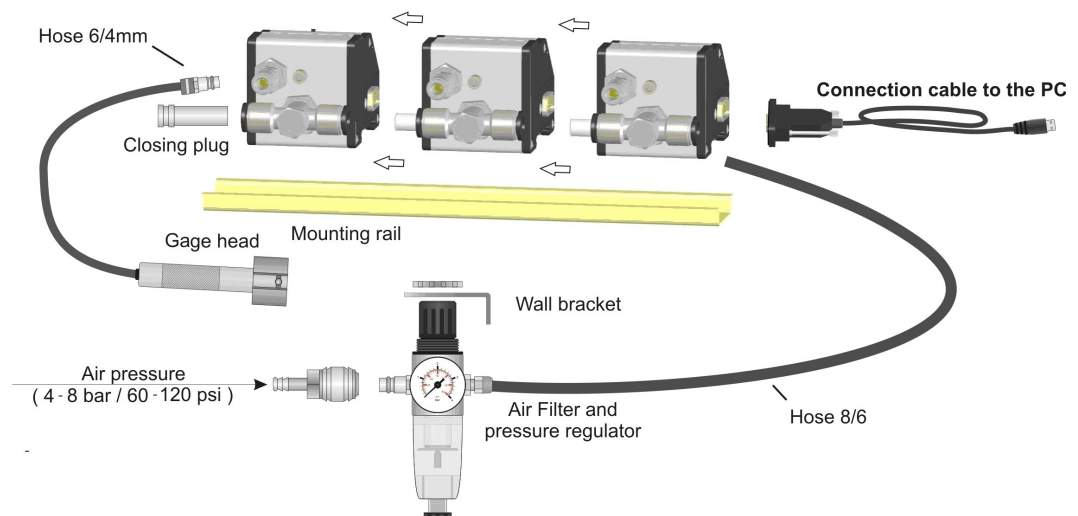
## 1.4 Dimensions

### A/E Converter Module Measuring Converter



Module can be easily clicked onto DIN mounting rails.

## 1.5 Connections



### Connection cables to the PC :

1. USB allows the direct connection of the A/E Converter Module modules to an USB Port of the Sterling ProMeasure Systems gaging computer.  
On smaller applications of up to 5 A/E Converter Modules, the power can be supplied from the from the USB Port.
2. RS 232 allows the direct connection of the A/E Converter Module modules to a COM port of the PC.  
For the power supply, a AC switching power supply module, a DC 24V power supply module or a Battery Module battery module is available.
3. LAN allows the direct connection of the A/E Converter Module modules to an Ethernet network.  
Power supply please see 2.
4. Wireless Module allows the direct connection of the A/E Converter Module modules to a Wireless LAN network.  
Power supply please see 2.
5. PLC module allows the direct connection of the A/E Converter Module modules to a PLC via Profibus.  
Power supply please see 2.

## 1.6 Technical Data

### Mechanical characteristics

Case	Aluminium and plastic sides
Dimension W x H x D / Weight	50 x 49mm, 25 x 62 mm / 210 g

### Electrical characteristics

Power supply voltage from SPS Bus	+5V
Supply current	< 60mA
Interface	RS485

### Connectors

Electrical connector	9-pin Sub-D male connector
Air pressure supply connection	Quick connector for pneumatic tubing 8/6mm
Main air pressure supply	4 - 8 bar / 60 -120 psi
Air pressure supply of the A/E Converter Module	2.6 - 2.8 bar / 39 - 42 psi
Outlet of measuring air	Quick connector for pneumatic tubing 6/4mm
Connection of gage head	Pneumatic tubing 6/4 mm

### Measuring parameters

Measuring principle	Differential pressure measuring with Piezo sensors
Pneumatic measuring range ( depends on the gage head )	$\pm 80 \mu\text{m}$ / $\pm 0.003$ INCH

### Environmental conditions

Working temperature range	0 - 45°C
Storage temperature range	-30 - 80°C
Type of protection	IP 65 (CEI / IEC 529)

### Electromagnetic compatibility (EMC)

Electromagnetic compatibility (EMC)	Generation of armful interference according to EN50081-2 Resistance to armful interference according to EN50082-2
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## 2. Getting Started

### 2.1 What's Included

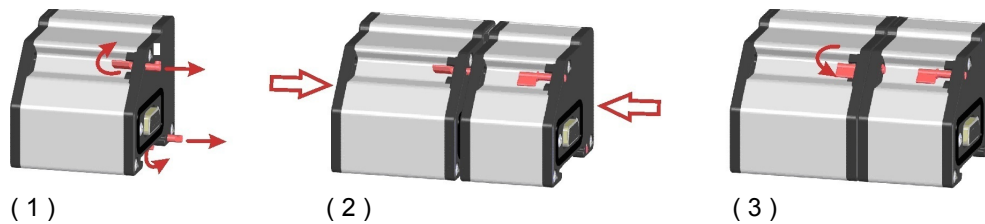
ProXNet A/E Converter Module, 6/4mm tubing connection, gage head plug and instruction manual.

### 2.2 Mounting

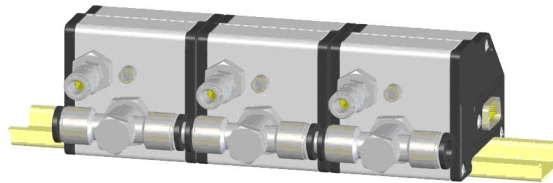
To connect the modules together:

Push the red levers of the modules out and turn them up. (1)

After this the modules have to be plugged together. (2) To lock the modules together turn the red levers down. (3)



The measuring converters can be either mounted on DIN rails or directly on a flat surface.

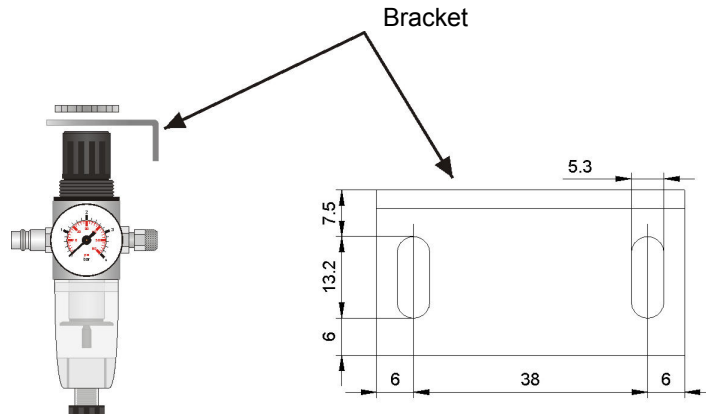


Before plugging several A/E Converter Module modules together, a piece of  $35 \pm 1$ mm of the 8/6mm pneumatic tubing must be placed between the pressure air connections.

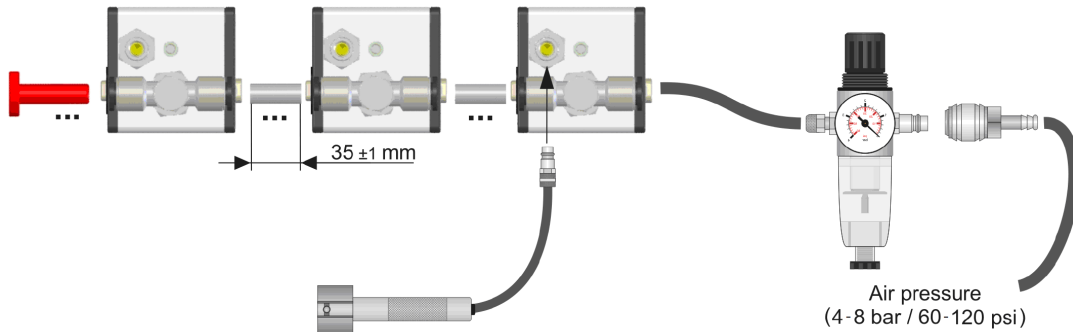
### 2.3 Air filter and Pressure Regulator (PRX.AEFC1XX.NET)

Mount the air filter and the pressure regulator assembly.

**Attention :** For keeping condensed water away from the A/E Converter Module measuring converters the air filter and pressure regulator should be mounted below the A/E Converter Module converters.



### 2.3.1 Connecting the Air Supply



#### Mounting instructions :

1. Cut the pneumatic tubing (8/6 mm) for connection of the A/E Converter Module to the recommended length shown in the picture.
2. Blow the cut tubing piece out so that no dirt particles can reach into the A/E Converter Module.
3. Push the tubing pieces as shown in the picture into the quick connectors of the A/E Converter Module air inputs.
4. Assemble the A/E Converter Module together as shown under 2.2
5. Cut the remaining pneumatic tubing (8/6 mm) to the necessary length to connect the A/E Converter Module converters to the filter/pressure regulator. Mount the pressure regulator below the measuring converter. Push the pneumatic tubing into the quick connector and then into the coupling of the outlet from the filter / regulator and secure by nut.

#### ***Tighten nuts only by hand!***

6. On the last A/E Converter Module the air supply has to be sealed with the delivered plug.
7. Check the air source after the last connection to the air pressure supply.  
*Check before that the air pressure is in the range of 4 - 8 bar (60 - 120 psi), particles < 5µm, oil and water free air pressure.* The connection is done with a DN7.2 coupling.

### 2.4 Connecting the gage heads

**In order to connect the pneumatic gage heads the A/E Converter Module converters are delivered inclusive a DN2.7 fitting suitable for a pneumatic tubing 6/4 mm.**

The pneumatic tubing of the gage head is pressed onto the fitting and fastened by the nut.

#### ***Tighten the nuts only by hand!***

*To save compressed air the gage heads should be parked in a bore.*

Connect the air pressure supply by mounting the coupling DN7.2 then adjust the pressure regulator to 2.6 - 2.8 bar / 39 - 42 psi.



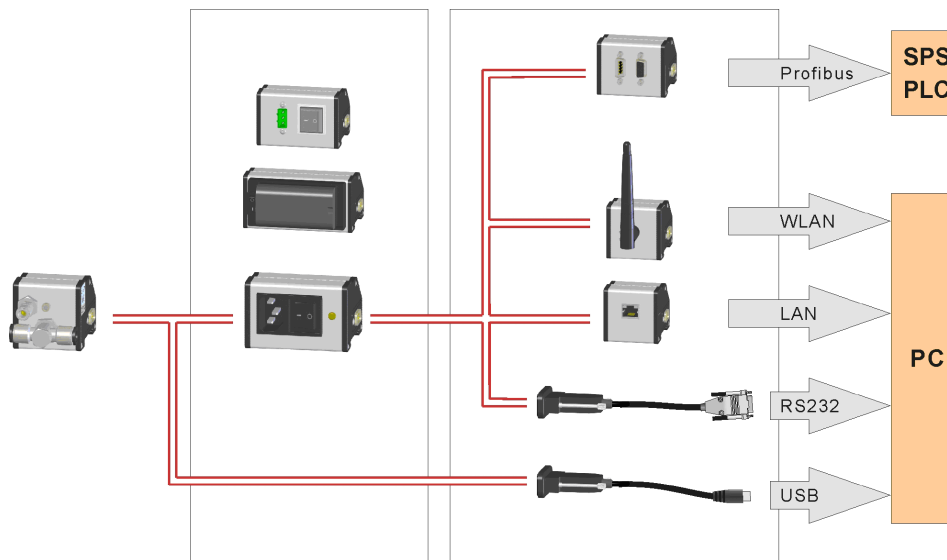
## 2.5 Electrical Connection

### Connection to the PC :

1. USB cable allows the direct connection of the A/E Converter Module modules to a PC USB port of the with the PRX.IMBUSX.NET module.  
On smaller applications of up to 5 A/E Converter Modules, the power can be supplies by the computer USB port. On applications with 6 or more A/E Converter Modules, an power supply is required (PRX.IMBPS2X.NET).
2. RS 232 cable allows the direct connection of the A/E Converter Module modules to a COM port of the PC (PRX.PCUSBX.NET).  
For the power supply an AC switching power supply module (PRX.IMBPS2X.NET) or a DC 24V power supply module (PRX.IMBDC1X.NET) or a battery module (PRX.IMBBMX.NET) is required.
3. LAN allows the direct connection of the A/E Converter Module modules to an Ethernet network.
4. Wireless Module allows the direct connection of the A/E Converter Module modules to a Wireless LAN network.

### Connection to a PLC :

1. PLC module allows the direct connection of the IMBus to a PLC.
2. For the power supply an AC switching power supply module (PRX.IMBPS2X.NET) or a DC 24V power supply module (PRX.IMBDC1X.NET) or an Battery Module (PRX.IMBBMX.NET) is required.

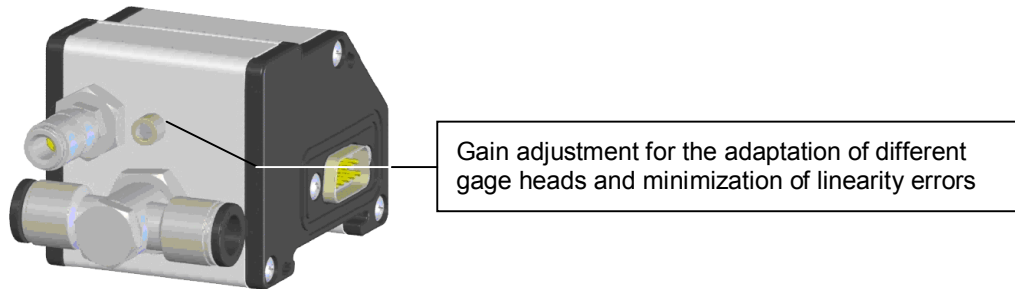


### 3. Gain Adjustment on the A/E Converter

#### 3.1 Gain Adjustment Review

The A/E Converter is equipped with a gain adjustment enabling the adaptation of a wide range of pneumatic gage heads and the minimization of linearity errors. **The default setting of the gain adjustment is suitable for gage heads with jet diameters of 0.8 mm - 1 mm.** On gage heads with smaller or bigger jets and on very small or very big gaps the A/E Converter can be optimal adapted by the adjustment screw.

For gain adjustment please follow the following procedure.



**Note :** *Before performing adjustment or calibration, please check that the regulator has 2.6 - 2.8 bar / 39 - 42 psi pressure on its output.*

#### 3.2 GageXpress Pro SPC Software Gain Adjustment on the A/E Converter

Adjustment with MIN/MAX masters using GageXpress Pro SPC gaging software.

1. In GageXpress PRO go to F3 **Set-Probes** and to view the raw data displays. Adjust till the display values of the MIN and MAX Master counts are laying approximately symmetrically around 0. The values shown are for example only and may not be seen with an actual gage.

**Example :**

<i>Display on MAX Master</i>	=	-3280
<i>Display on MIN Master</i>	=	3450

2. Perform a gage calibration before beginning measurement operation. Go to **F2 Mastering**. Using the MIN master in the first event, master the gage. Next select the MAX master and master the gage in the second event.

### 3.3 Gain Adjustment - A/E Converter – With ProX200 Column

#### Adjustment with 2 masters on ProX200 Column.

1. Turn the encoder clockwise (CW) to select the **CALIBRATION** menu and then push the encoder button to access the menu.
2. Select the **Adjust** function by turning the encoder (“AdJuSt” flashes) and then push the encoder button to access the function.
3. Turn the encoder to select the measuring input (**P1 - P8**) with the corresponding measuring converter, on which the adjustment is to be performed. The two-digit numeric display shows the selected measuring input.
4. Insert the pneumatic gage head into the MIN and MAX Master one after the other. The respective measurement value (“raw value”) is indicated on the six-digit numeric display.
5. Adjust the restrictor till the indicated values of the MIN and MAX Master are laying approximately symmetrically around 0.

**Example :**      *Display on MAX Master =        0.4573*  
                    *Display on MIN Master =      - 0.4600*

6. Push the encoder button to exit the setup menu (**Adjust** function). **ProX200 Column** gage automatically returns to the measuring mode.
7. **Perform a gage calibration before beginning measurement operation.**  
(Make sure that two master values have been programmed in the gage – please refer to the **ProX200 Column** Gage Instruction Manual and the Programming Reference Card for further information).

*If a third master is available you can optimize linearity as shown below. Take care to perform the above detailed adjustment with 2 masters before you continue.*

1. Perform a gage calibration.
2. Measure the middle (third) master and compare the measuring value with the master size.
  - ◆ *If the measuring value and master size are identical the adjustment is optimal adjusted.*
  - ◆ *If the measuring value is different than the master size, the adjustment has to be changed. For this leave the gage head inside the master and change the adjustment till the measuring value is equal to the master size.*
3. After changing the adjustment, repeat the points 1 and 2 until the difference between the measuring value and the middle master's size is zero.

**Note :** *Before performing adjustment or calibration, please check that the correct air pressure value is set at the pressure regulator's output.*

END OF MANUAL