



Field Analog Input Outputs.

FIOA-0402-U

### Universal Analog I/O Modules :

- Low cost compact Analog I/O modules with DIN rail mounting
- Programmable inputs allow same modules to accept RTD, Thermocouple, mA, mV and Volts
- 12 bit resolution
- 4 universal analog inputs and 2 analog outputs
- High Speed Modbus RTU (Slave) communication
- User definable Address, Baud rate and Parity through Software Configuration
- 2 wire RS485 port provided on pluggable terminal block
- Can be multi dropped as Modbus Slave on RS485 Network
- Indication for Diagnostics, Power and Communication
- Programming through standard Prizm software .....FREE!!
- CE marked with optional UL / CSA certification

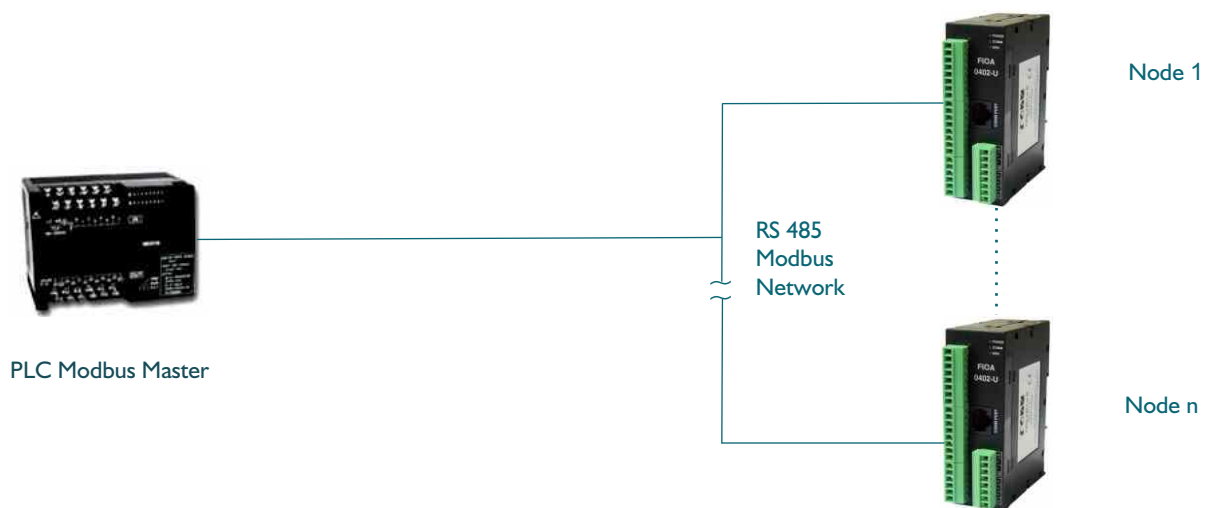
# Possible Applications :

FIOA can be used for various applications in industries. Typical configuration includes the following :

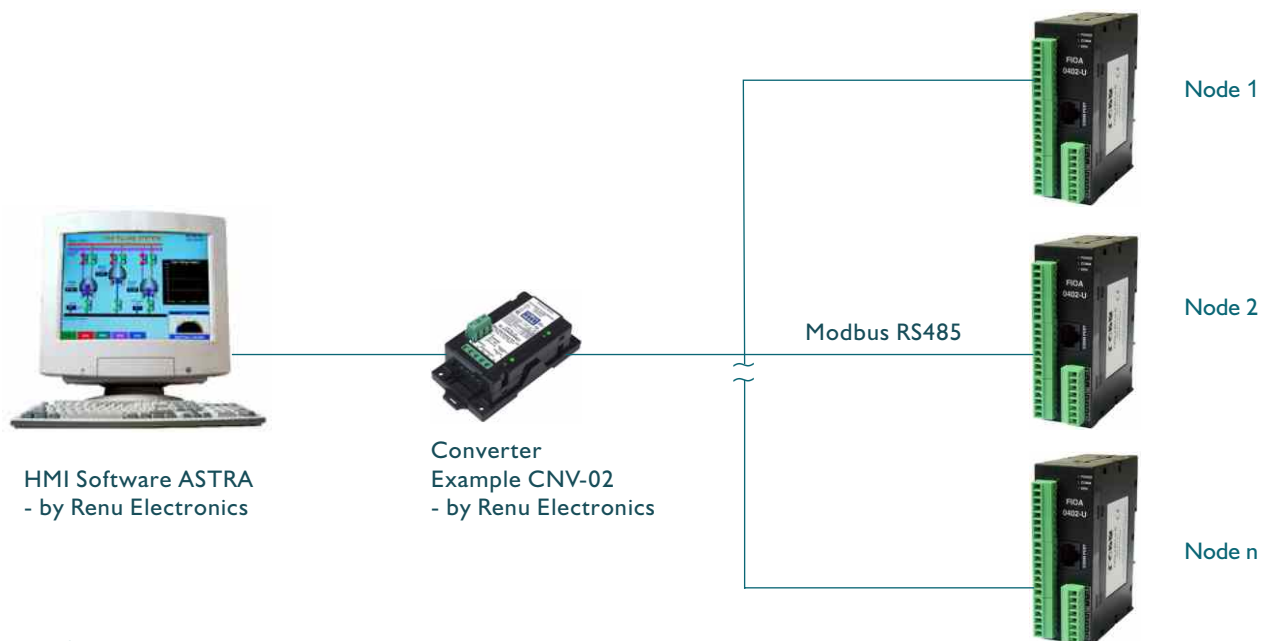
## 1. Add analog I/O to your Controller.



## 2. Multiple FIOA units (Modbus Slaves) connected to Modbus Master



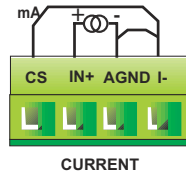
## 3. Data Acquisition Application (SCADA Connectivity)



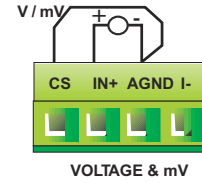
# Typical Wiring Diagrams :

## Analog Inputs

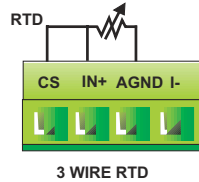
### 1. Current Input Connections:



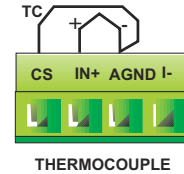
### 2. Voltage Input Connections:



### 3. RTD Input Connections:

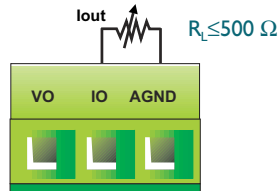


### 4. Thermocouple Input Connections:

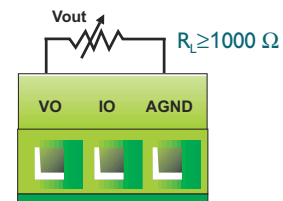


## Analog Outputs

### 1. Current Output Connections:



### 2. Voltage Output Connections:



## Specifications :

### For mVolt inputs :

Uses 0-100 mV input range resolved in 12 bits.  
Total error :  $\pm 0.2\%$  of scale  $\pm 1$  bit.

### For Current inputs :

Uses 0-20mA input range with 4.7 $\Omega$  precision shunt resolved in 12 bits.  
Total error :  $\pm 0.2\%$  of scale  $\pm 1$  bit.

### For Volt inputs :

Uses 0-10V input range resolved in 12 bits.  
Total error :  $\pm 0.2\%$  of scale  $\pm 1$  bit.

### For RTD input :

Uses 3 wire compensation technique. Excitation Current is 0.5mA.  
Power dissipated in RTD is 0.025mW @ 100 $\Omega$ .  
Range supported : -200 to 850 $^{\circ}$ C.

### For Thermocouple Input :

Uses 0-100mV input range resolved into 12 bits.  
Cold junction error is 1 $^{\circ}$  maximum and 0.5 $^{\circ}$  typical.  
Total error : 0.5% of scale  $\pm 1$  bit + CJC error  
Response Time : Worst case 25mSec approx.  
Temperature Drift (for Digital Count) : 60 PPM  
Normalization Factor : 0-99 (Software configurable)

Input Type	Temperature Range	1 Bit Corresponds to
J	-50 to 1200 $^{\circ}$ C	0.43 $^{\circ}$ C
K	-50 to 1373 $^{\circ}$ C	0.61 $^{\circ}$ C
E	-50 to 1000 $^{\circ}$ C	0.32 $^{\circ}$ C
R	-50 to 1769 $^{\circ}$ C	2.04 $^{\circ}$ C
S	-50 to 1769 $^{\circ}$ C	2.31 $^{\circ}$ C
B	0 to 1820 $^{\circ}$ C	3.21 $^{\circ}$ C
N	-50 to 1300 $^{\circ}$ C	0.7 $^{\circ}$ C
T	-50 to 400 $^{\circ}$ C	0.47 $^{\circ}$ C

### Analog Outputs

Resolution	12 Bit
<b>Load:</b> 4-20 mA 0-10 V DC	Less than 500 $\Omega$ Minimum 1k $\Omega$

## General Specifications :

Power	: 24V DC $\pm 10\%$ , 4W maximum
Operating Temperature	: 0 $^{\circ}$ to 50 $^{\circ}$ C
Storage Temperature	: -20 $^{\circ}$ to 80 $^{\circ}$ C
Humidity	: 10% to 90% (Non condensing)
Mounting	: DIN rail mounting
Size	: 100 W x 70 H x 35 D mm
Immunity to ESD	: Level 3 as per IEC1000-4-2
Immunity to Transients	: Level 3 as per IEC1000-4-4
Immunity to Radiated RF	: Level 3 as per IEC1000-4-3
Immunity to Conducted RF Emissions	: Level 3 as per IEC1000-4-6 : EN55011 CISPR A

Communication Port	: 2 wire RS485, RS232, CMOS logic Signals are available on RJ45 comm port. Same two wire RS485 signals are provided on terminal block
Driver	: Modbus RTU Slave
Baud rate	: 9600, 19.2k, 57.6k or 115.2k (software configurable)
Parity	: Odd, Even or None (software configurable)
Device ID	: 1-255 (Software configurable)

## Basic Operations :

FIOA 0402 U is Analog Input Output Model having 4 Universal Analog inputs and 2 Analog outputs. The Analog inputs can be Voltage (0-10V), Current (0–20 mA, 4–20 mA), mV (0–100 mV, 0–50 mV), RTD (PT 100 Alpha I and Alpha2 constant), Thermocouple (B,R,S,E,J,K,N,T).

Each input channel can be configured independently to work as any of the above type as per configuration made in the PRIZM software. The Analog outputs can be Voltage (0–10 V) or Current (4–20 mA). Output channels also are software configurable to current or voltage. Unit supports standard Modbus RTU (slave) protocol for communicating with master device.

Analog inputs and outputs are isolated from the communication port. Power supply is isolated from all internal circuitry.

Input and Output channels of the FIOA are user configurable and any combination of input types is possible. Prizm Setup Software helps the user to configure the FIOA units and use them as per his requirements.

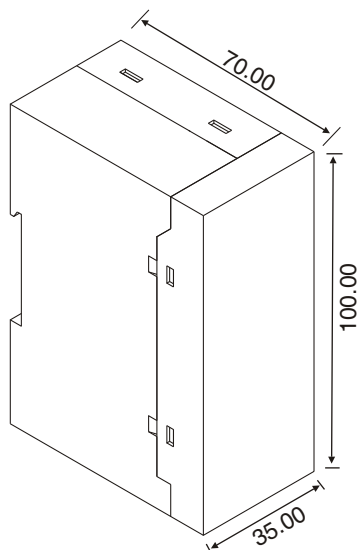
### System requirements for Prizm Setup Software are:

Device	Minimum
IBM compatible PC with Pentium processor	266 MHz Pentium® II or higher Pentium compatible CPU
Operating System	Windows® 2000 and above (except Windows® Vista)
System RAM	At least 64 megabytes (MB) of RAM
Hard disk	150 MB free memory space
VGA Monitor Color settings Resolution	800x600 with 24 bit true color
Mouse	Microsoft® mouse or compatible pointing device

### Other Items required for FIOA configuration:

1. FIOA unit
2. +24VDC regulated power supply
3. Prizm Setup Software
4. FIOA to Device cable
5. Configuration download cable (IBM-005-H-00)

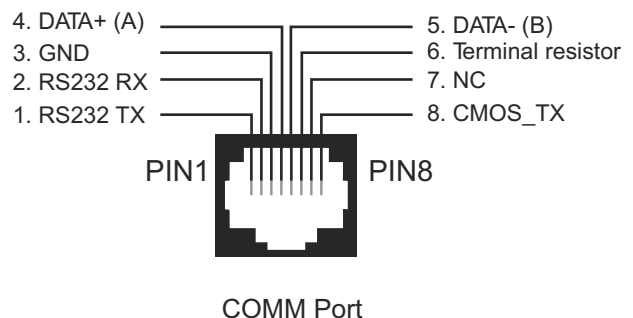
## Dimensions :



All dimensions are in mm.

## Pinout of COMM Port :

Pinouts of RJ connector is as shown below:



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Field Analog Input Module

FIOA-0800-L

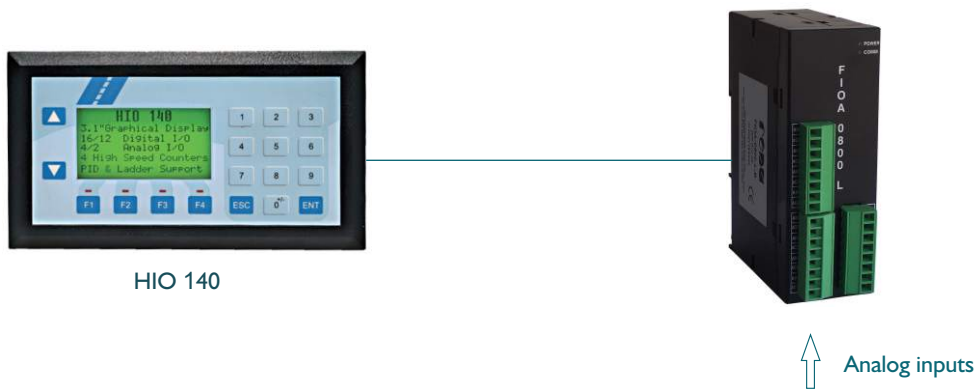
### Analog Input Module :

- Low cost compact Analog Input module with DIN rail mounting
- Programmable inputs allow same module to accept Current (4-20 mA) and Voltage (0-10 VDC) inputs
- 12 bit resolution
- Can accept upto 8 V/I analog inputs
- User definable Address, Baud rate and Parity through DIP Switches
- High Speed Modbus RTU (Slave) communication
- 2 wire RS485 port provided on pluggable terminal block
- Can be multi dropped as Modbus Slave on RS485 Network
- LED Indication for Power and Communication
- Very simple to configure through switches. No programming Software needed.
- CE marked with optional UL / CSA certification

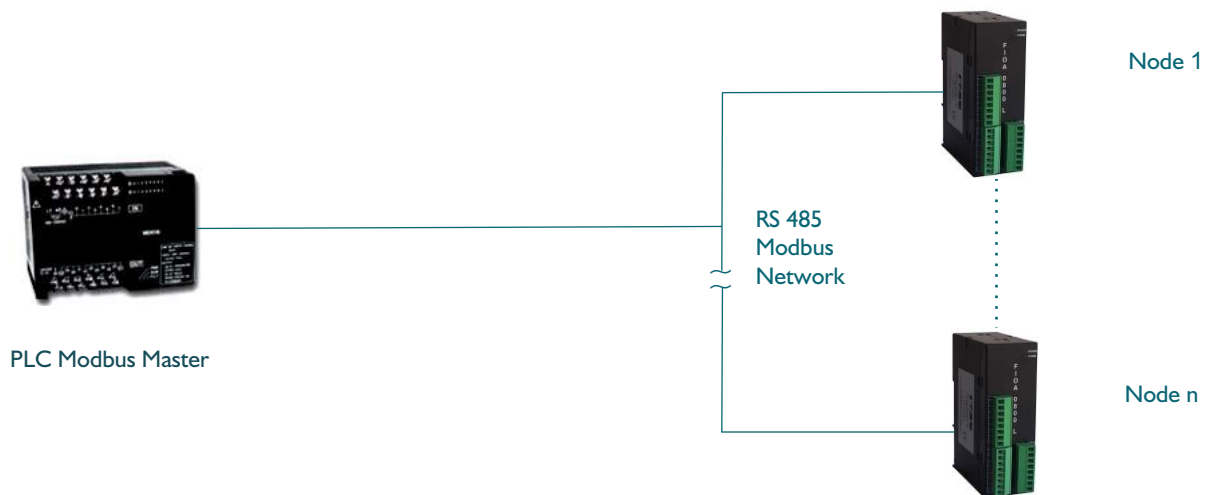
# Possible Applications :

FIOA can be used for various applications in industries. Typical configuration includes the following :

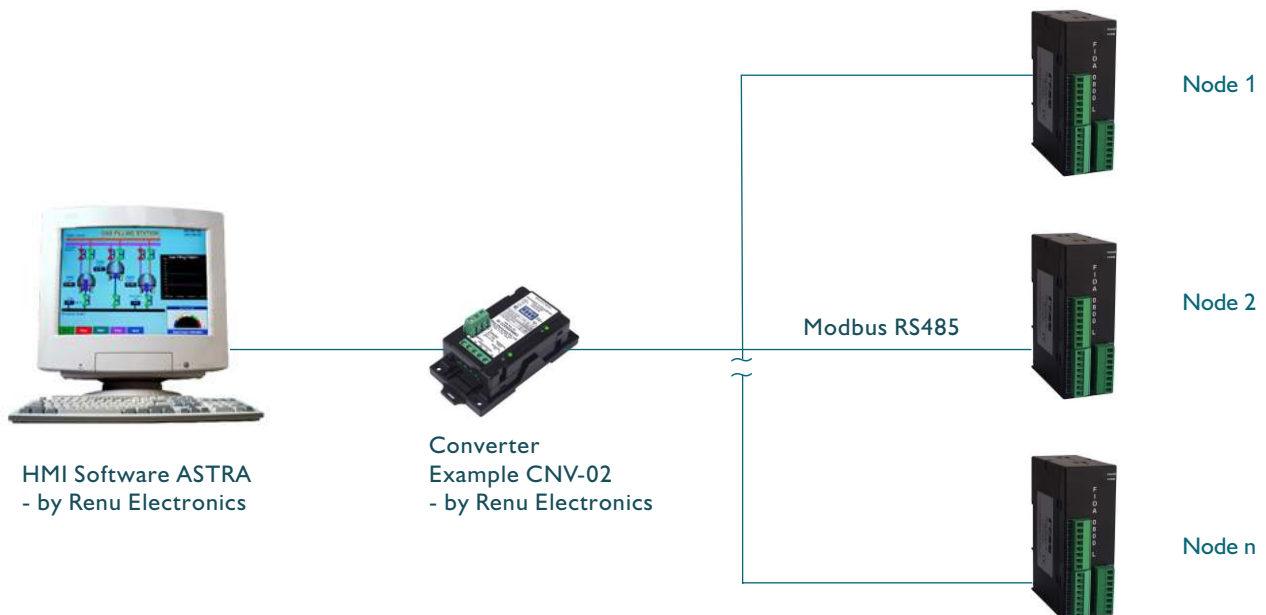
## 1. Add analog inputs to your Controller.



## 2. Multiple FIOA units (Modbus Slaves) connected to Modbus Master



## 3. Data Acquisition Application (SCADA Connectivity)

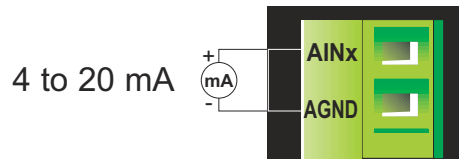


## Typical Wiring Diagrams :

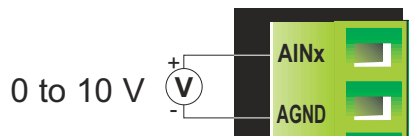
### FIOA-0800-L-B

#### Input Connection:

##### Current Mode connections (4-20 mA)



##### Voltage Mode connections (0-10 VDC)



Note:

AINx: Analog input (x equals to 1 to 8).

AGND: Analog ground. Analog ground for all channels is internally shorted on PCB.

## Specifications :

#### For Current inputs :

Uses 4-20mA input range with 100 E precision shunt resolved in 12 bits.

Total error :  $\pm 0.2\%$  of scale  $\pm 1$  bit.

#### For Voltage inputs :

Uses 0-10VDC input range resolved in 12 bits.

Total error :  $\pm 0.2\%$  of scale  $\pm 1$  bit.

## General Specifications :

Power	: 24V DC $\pm 10\%$ , 2W maximum	Communication Port	: 2 wire RS485 terminal block
Operating Temperature	: 0° to 50°C	Communication Protocol	: Modbus RTU Slave
Storage Temperature	: -20° to 80°C	Baud rate	: 9600, 19.2k, 57.6k or 115.2k (DIP Switch Selectable)
Humidity	: 10% to 90% (Non condensing)	Parity	: Odd, Even or None (DIP Switch Selectable)
Mounting	: DIN rail mounting	Device ID	: 1-64 (DIP Switch Selectable)
Dimensions	: 100 W x 70 H x 35 D mm		
Immunity to ESD	: as per IEC61000-4-2		
Immunity to Fast Transients	: as per IEC61000-4-4		
Immunity to Radiated electromagnetic field	: as per IEC61000-4-3		
Immunity to Conducted disturbances	: as per IEC61000-4-6		
Surge	: as per IEC61000-4-5		
Radiated emission	: as per EN61000-6-4		

## Basic Operations :

FIOA 0800 L is Analog Input Model that accepts 8 Voltage or Current Analog inputs .

The Analog inputs can be Voltage ( 0-10VDC), Current ( 4 – 20 mA) .

Each input channel can be configured independently to work as Voltage or Current as per configuration through switches.

Unit supports standard Modbus RTU (slave) protocol for communicating with master device.

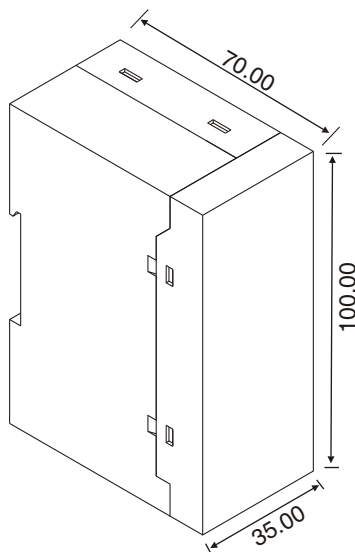
Analog inputs are isolated from the communication port . Power supply is also isolated from all internal circuitry.

Input of the FIOA are user configurable and any combination of input types is possible. Selectable DIP Switches help the user to configure the FIOA units and use them as per application requirements.

### Setup required for FIOA configuration:

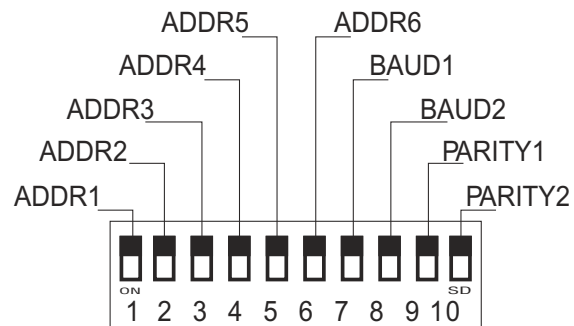
1. FIOA unit
2. +24VDC regulated power supply
3. FIOA to Device cable

## Dimensions :

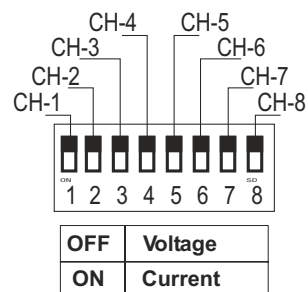


All dimensions are in mm.

## Comm Port Settings :



### MODE SELECTION FIOA-0800-L-B



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FIOA-0800-R  
(PT1000 Inputs)



FIOA-0800-RP  
(PT100 Inputs)

### RTD Input Module :

- Low cost compact RTD Input modules with DIN rail mounting
- FIOA-0800-R accepts eight RTD PT1000 type inputs  
FIOA-0800-RP accepts eight RTD PT100 type inputs
- 12 bit resolution
- User definable Address, Baud rate and Parity through Switches
- High Speed Modbus RTU (Slave) communication
- 2 wire RS485 port provided on pluggable terminal block
- Can be multi dropped as Modbus Slave on RS485 Network
- LED Indication for Power and Communication
- Very simple to configure through DIP switches. No programming Software needed.

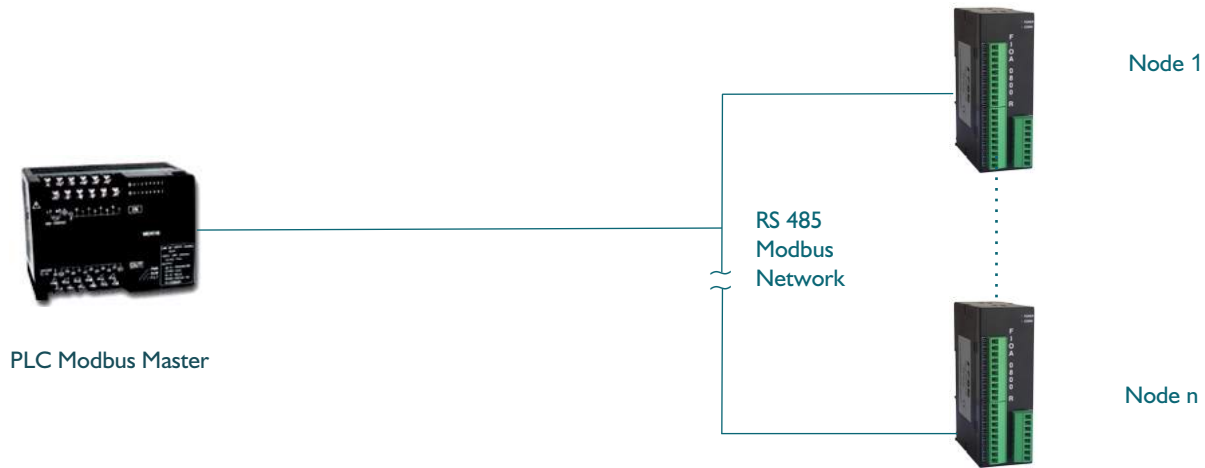
# Possible Applications :

FIOA can be used for various applications in industries. Typical configuration includes the following :

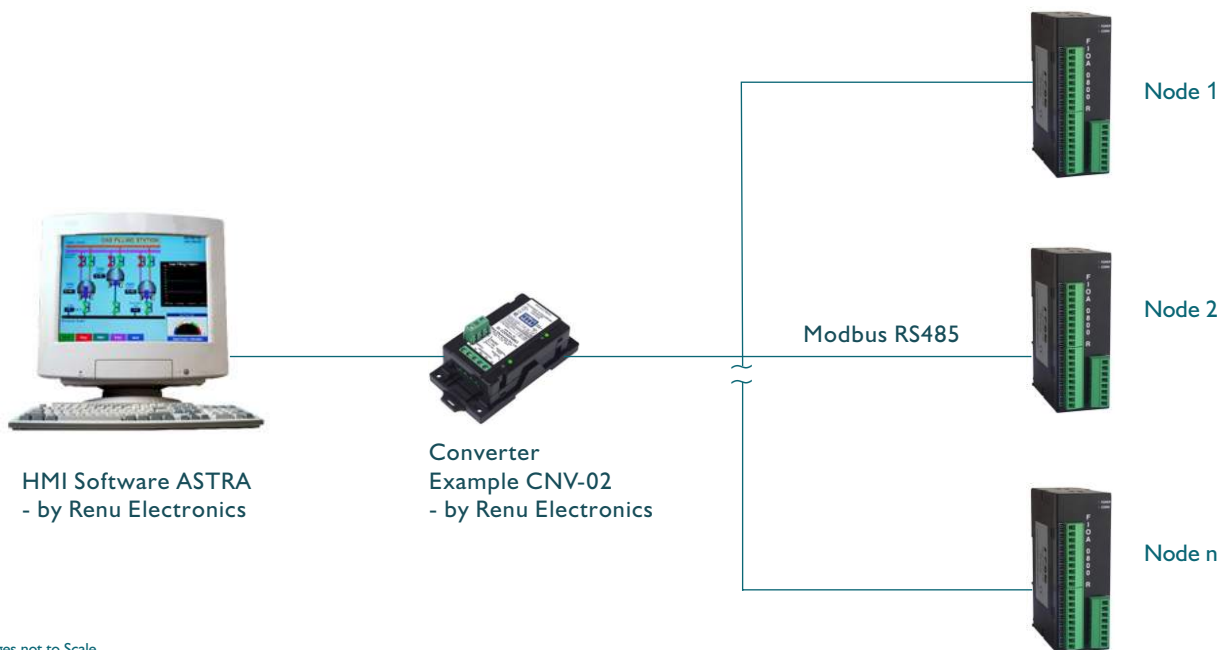
## 1. Connect RTD directly to your Controller.



## 2. Multiple FIOA units (Modbus Slaves) connected to Modbus Master

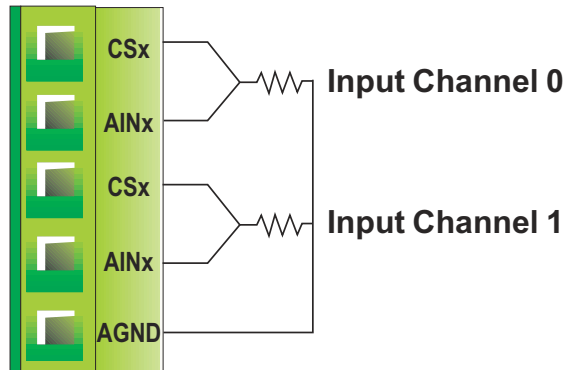


## 3. Data Acquisition Application (SCADA Connectivity)



## Typical Wiring Diagram :

### RTD (PT1000) / RTD (PT100)



#### Note:

CSx: Current source(x equals to 1 to 8)

AINx: Analog input(x equals to 1 to 8)

AGND: Analog ground. Analog ground for all channels is internally shorted on PCB

Connect RTD PT1000 as shown in the above diagram between the points CS, AIN and AGND

### Specifications of RTD (PT1000):

Uses 3 wire compensation technique.

Excitation Current is 0.1mA.

Power dissipated in RTD is 0.010mW @ 1000 .

Range supported : -200 to 850°C

### Specifications of RTD (PT100):

Uses 3 wire compensation technique.

Excitation Current is 0.5mA.

Power dissipated in RTD is 0.025mW @ 100 .

Range supported : -200 to 850°C

### General Specifications :

Power	: 24V DC $\pm$ 10%, 2W maximum	Communication Port	: 2 wire RS485 terminal block
Operating Temperature	: 0° to 50°C	Communication Protocol	: Modbus RTU Slave
Storage Temperature	: -20° to 80°C	Baud rate	: 9600, 19.2k, 57.6k or 115.2k (DIP Switch Selectable)
Humidity	: 10% to 90% (Non condensing)	Parity	: Odd, Even or None (DIP Switch Selectable)
Mounting	: DIN rail mounting	Device ID	: 1-64 (DIP Switch Selectable)
Dimensions	: 100 W x 70 H x 35 D mm		
Immunity to ESD	: as per IEC61000-4-2		
Immunity to Fast Transients	: as per IEC61000-4-4		
Immunity to Radiated electromagnetic field	: as per IEC61000-4-3		
Immunity to Conducted disturbances	: as per IEC61000-4-6		
Surge	: as per IEC61000-4-5		
Radiated emission	: as per EN61000-6-4		

## Basic Operations :

FIOA-0800-R is an Analog Input Model that accepts eight PT1000 inputs .

FIOA-0800-RP is an Analog Input Model that accepts eight PT100 inputs .

Units support standard Modbus RTU (slave) protocol for communicating with master device.

Analog inputs are isolated from the communication port .

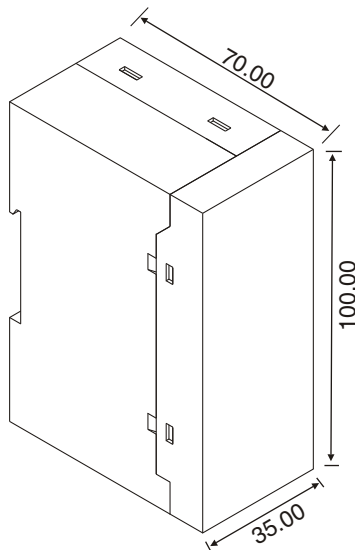
Power supply is also isolated from all internal circuitry.

Selectable DIP Switches help the user to configure the communication parameters of FIOA unit and use them as per application requirements.

### Setup required for FIOA configuration:

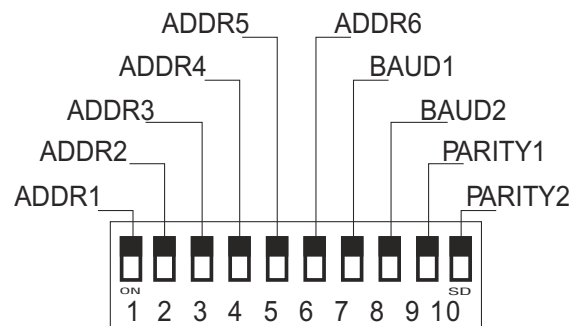
1. FIOA unit
2. +24VDC regulated power supply
3. FIOA to Device cable

## Dimensions :



All dimensions are in mm.

## Comm Port Settings :



## Models :

Model	Type of Input	No. of Channels
FIOA-0800-R	RTD (PT1000)	8
FIOA-0800-RP	RTD (PT100)	8



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