

# Ethernet Based Analog Input Module

## AIME 4U / AIME 8U

4/8 Universal Analog Input Channels  
DIN-Rail Mount  
MODBUS over TCP/IP  
Built-in Web Pages for Configuration & Settings

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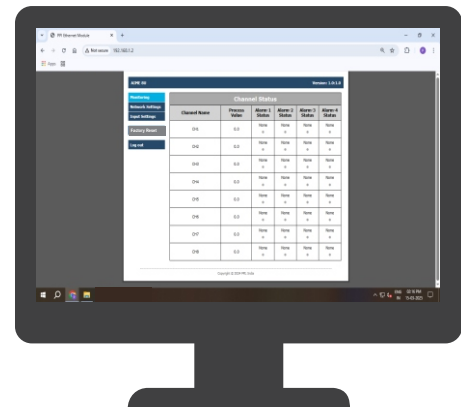
### 8 Channel



### 4 Channel



### Web Pages



## Salient Features

- 4 or 8 Universal Analog Input Channels Support : Thermocouples, RTDs, mA, mV, V
- 16 Bit Sigma-Delta ADC ( $\pm 32,768$  Counts)
- Selectable Channel Update Rates : 45 mS, 79 mS, 146 mS
- Automatic CJC for Thermocouple & LRC for RTD Inputs
- Programmable Scaling for DC Voltage (mV/V) & Current (mA)
- 4 Programmable Soft Alarms per Channel with LED Indicators
- Both 16-bit Signed Integer & 32-bit Floating-point PV Formats for Easy Interfacing with SCADA or PLC Systems
- 3-way Isolation between the Power, Inputs, and Ethernet Port Ensures Signal Integrity & Eliminates Potential Ground Loops
- Direct Integration with MODBUS TCP/IP Networks for Real-time Data Sharing
- Supports up to 2 Simultaneous MODBUS TCP Server Sockets
- Integrated Web Pages for Network Configuration, Channel Setup, and Data Monitoring with Password Protection
- Ethernet Connectivity at 10/100 Mbps with Automatic Detection for Straight-through or Crossover Cables
- Compact DIN-Rail Mount : 22.5(W) X 101(H) X 119(D), mm
- Wide Supply Voltage Range : 18 ~ 32 VDC (24 VDC Nominal)

## General Information

|                      |                                                                                            |
|----------------------|--------------------------------------------------------------------------------------------|
| <b>Product Type</b>  | 4 / 8 Channel DIN-Rail Analog Input Module<br>MODBUS over TCP/IP                           |
| <b>Ordering Code</b> | AIME 4U : 4 Universal Analog Input Channels<br>AIME 8U : 8 Universal Analog Input Channels |
| <b>Quantity</b>      | 1 Unit                                                                                     |

## Typical Applications

- Industrial Process Monitoring & SCADA Integration
- Data Acquisition in Laboratory and R&d Environments
- Remote Temperature and Environmental Monitoring
- Integration with Building Management and Energy Monitoring Systems
- Environmental Monitoring for Utility Plants
- HVAC Monitoring & Control Systems

|                       |                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of Channels    | 4 / 8                                                                                                                                                                                                                                                                                                                                            |
| Input Types           | Thermocouples : J, K, T, R, S, B, N, E<br>RTDs : 2 / 3-Wire Pt100, Pt1000<br>DC mV : 0 to 80 mV, 0 to 160 mV<br>DC Volts : 0 to 1.25V, 0 to 5V, 1 to 5V, 0 to 10V<br>DC mA : 0 to 20 mA, 4 to 20 mA                                                                                                                                              |
| Accuracy              | <b>Thermocouples</b> : ± 0.2% of reading for J, K, T, E (Excluding CJC)<br>± 0.4% of reading for R, S, B, N (Excluding CJC)<br>CJC : ± 1.5 °C (Specified over 18 to 37 °C)<br><br><b>RTDs</b> : ± 0.2% of reading.<br>Lead Resistance Compensation : Maximum 5Ω per Lead for 3-wire RTD.<br><br><b>DC Linear mV / V / mA</b> : ± 0.1% of reading |
| Thermal Drift         | 0.01% of Span per °C                                                                                                                                                                                                                                                                                                                             |
| Resolution            | Thermocouples & RTDs : 0.1 °C<br>DC Linear mV / V / mA : 0.0001 / 0.001 / 0.01 / 0.1 / 1 Counts                                                                                                                                                                                                                                                  |
| Range                 | Thermocouple & RTDs : Refer Table-1<br>DC Linear mV / V / mA : -30000 to +30000 Counts                                                                                                                                                                                                                                                           |
| Zero Offset           | User Adjustable over Full Range for Each Channel                                                                                                                                                                                                                                                                                                 |
| ADC                   | 16 Bit (± 32,768 Counts), Sigma-Delta (ΣΔ)                                                                                                                                                                                                                                                                                                       |
| Sampling Time         | User Settable as : <ul style="list-style-type: none"><li>• 45 mS per Channel (22 Samples per Second)</li><li>• 79 mS per Channel (12 Samples per Second)</li><li>• 146 mS per Channel (7 Samples per Second)</li></ul>                                                                                                                           |
| Input Resistance      | > 1 MΩ for RTDs / Thermocouples / mV / V Input<br>249 Ω Precision Shunt for mA Input                                                                                                                                                                                                                                                             |
| Common Mode Rejection | > 100dB at 50/60 Hz                                                                                                                                                                                                                                                                                                                              |
| Input Protection      | ESD : 8KV EFT : 2KV Surge : 1KV                                                                                                                                                                                                                                                                                                                  |
| Input Conditioning    | First Order Analog R-C Low-Pass Filter + Programmable IIR Digital Filter                                                                                                                                                                                                                                                                         |

|                         |                                                           |   |                            |
|-------------------------|-----------------------------------------------------------|---|----------------------------|
| Numbers                 | 4, Independent for Each Channel with Front LED Indicators |   |                            |
| Programmable Parameters | Type                                                      | : | Process Low, Process High  |
|                         | Setpoint                                                  | : | Adjustable over Full Range |
|                         | Hysteresis                                                | : | 1 to 3000 Unit Counts      |
|                         | Inhibit                                                   | : | No, Yes                    |

# Ethernet Based Analog Input Module

## Ethernet Port

|                           |                                                                                                                                                                      |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Interface                 | Ethernet 10/100 Base-T (Auto-sensing)                                                                                                                                |
| Connector                 | RJ45 with Integrated Magnetics & 1500V Galvanic Isolation                                                                                                            |
| Auto MDI/MDIX             | Supported (Automatic Detection & Correction for Straight-through or Crossover Cables)                                                                                |
| Speed                     | 10 Mbps / 100 Mbps, Auto-negotiation                                                                                                                                 |
| Link / Activity Indicator | <b>Link LED:</b> Illuminates when a Valid Ethernet Connection is Established<br><b>ACT LED:</b> Blinks to Indicate Network Activity (Data Transmission or Reception) |
| Transmission Mode         | Full duplex / half duplex, auto-negotiation                                                                                                                          |
| Protocol Support          | <b>MODBUS TCP/IP :</b> Supports up to 2 Simultaneous MODBUS TCP Server Sockets<br><b>HTTP :</b> Built-in Web Server for Configuration and Real-time Monitoring       |

## Power Supply & Isolation

|                   |                                                                                                                                                                                                                   |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type              | Switch Mode (SMPS)                                                                                                                                                                                                |
| Power Requirement | 18 ~ 32 VDC, nominal 24 VDC @ <b>60mA Max.</b><br><b>Note :</b> In case of looping multiple modules on one power source, make sure that the power source is capable of supplying minimum 60mA current per module. |
| Isolation         | 1500VAC for 1 second or 250VAC continuous. 3-way Isolation between Power, Inputs & Ethernet Port                                                                                                                  |

## Physical

|                    |                               |
|--------------------|-------------------------------|
| Mounting           | DIN-Rail                      |
| Overall Dimensions | 22.5(W) X 101(H) X 119(D), mm |
| Terminals          | Screw Type, Pluggable         |
| Weight             | 400 gm, Appx.                 |

## Environmental

|                     |                                                                                                                                                             |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating Ambient   | 0 to 55°C & 5 to 90%RH Non-condensing                                                                                                                       |
| Storage Temperature | -10 to +70°C                                                                                                                                                |
| Atmospheres         | Not Suitable for use in Corrosive or Explosive Atmospheres. The Panel in which the Instrument is Mounted must be free of Electrically Conductive Pollution. |

**TABLE 1**

| Input Type                               | Range (Min. to Max.)                       |
|------------------------------------------|--------------------------------------------|
| 2 / 3-wire, RTD Pt100                    | -199.9 to +850.0 °C / -328.0 to +1562.0 °F |
| 2 / 3-wire, RTD Pt1000                   | -199.9 to +850.0 °C / -328.0 to +1562.0 °F |
| Type J Thermocouple (Fe-K)               | 0.0 to +960.0°C / +32.0 to +1760.0°F       |
| Type K Thermocouple (Cr-Al)              | -200.0 to +1376.0°C / -328.0 to +2508.0°F  |
| Type T Thermocouple (Cu-Con)             | -200.0 to +387.0°C / -328.0 to +728.0°F    |
| Type R Thermocouple (Pt / Pt-Rh13%)      | 0.0 to +1771.0°C / +32.0 to +3219.0°F      |
| Type S Thermocouple (Pt / Pt-Rh10%)      | 0.0 to +1768.0°C / +32.0 to +3214.0°F      |
| Type B Thermocouple (Pt-Rh6% / Pt-Rh30%) | 0.0 to +1826.0°C / +32.0 to +3318.0°F      |
| Type N Thermocouple (NiCrSi / NiSi)      | 0.0 to +1314.0°C / +32.0 to +2397.0°F      |
| Type E Thermocouple (NiCr / Con)         | -200.0 to +1000.0°C / -328.0 to +1832.0°F  |

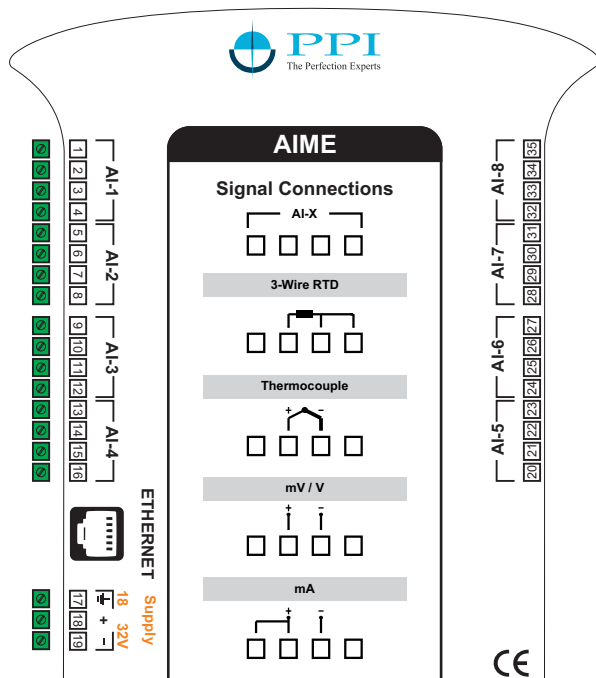
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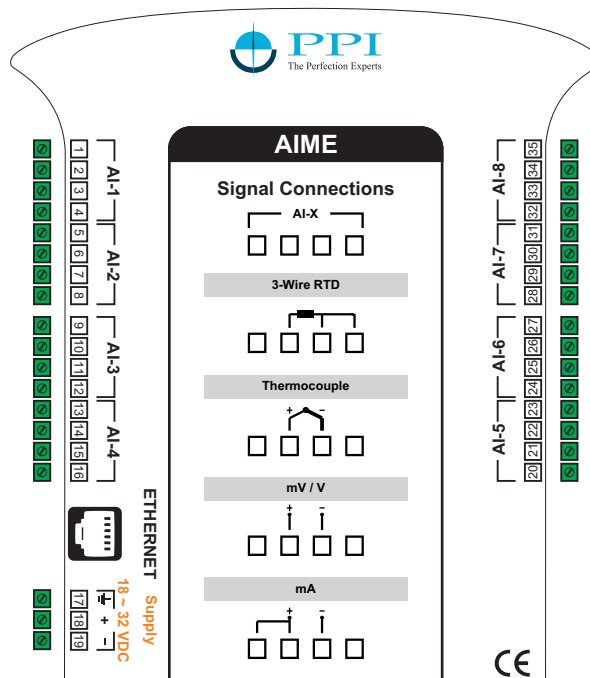
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## Terminations

### 4 Channel Module



### 8 Channel Module



## Web Pages

### Monitoring

AIME BU

Version: 1.0:1.0

Monitoring

Network Settings

Input Settings

Factory Reset

Log out

Channel Status

| Channel Name   | Process Value | Alarm-1 Status | Alarm-2 Status | Alarm-3 Status | Alarm-4 Status |
|----------------|---------------|----------------|----------------|----------------|----------------|
| Machine Temp   | 218.6         | High           | None           | None           | None           |
| Conveyer Speed | 60            | None           | None           | None           | None           |
| Storage-1 Temp | 28.6          | High           | Low            | None           | None           |
| Storage-1 %RH  | 52.8          | High           |                |                |                |
| Storage-2 Temp | 27.9          | High           |                |                |                |
| Storage-2 %RH  | 54.2          | High           |                |                |                |
| Floor_Temp 1   | 31.6          | None           |                |                |                |
| Floor_Temp 2   | 30.9          | None           |                |                |                |

AIME BU

Monitoring

Network Settings

Input Settings

Factory Reset

Log out

### Network Settings

| AIME BU       |                   | Version: 1.0:1.0 |               |  |  |  |
|---------------|-------------------|------------------|---------------|--|--|--|
| Monitoring    | Network Settings  | Input Settings   | Factory Reset |  |  |  |
| Log out       |                   |                  |               |  |  |  |
| NETWORK       |                   |                  |               |  |  |  |
| MAC Address   | 40:84:32:9c:9c:0d |                  |               |  |  |  |
| Host Name     | AIME_BU           |                  |               |  |  |  |
| HTTP Port     | 80                |                  |               |  |  |  |
| DHCP          | Disable           |                  |               |  |  |  |
| IP Address    | 192.168.1.34      |                  |               |  |  |  |
| Gateway       | 192.168.1.1       |                  |               |  |  |  |
| Subnet Mask   | 255.255.255.0     |                  |               |  |  |  |
| DNS           | 8.8.8.8           |                  |               |  |  |  |
| WEB ACCESS    |                   |                  |               |  |  |  |
| MODBUS TCP/IP |                   |                  |               |  |  |  |
| Reboot        |                   |                  |               |  |  |  |

| AIME BU                |                  | Version: 1.0:1.0 |               |  |  |  |
|------------------------|------------------|------------------|---------------|--|--|--|
| Monitoring             | Network Settings | Input Settings   | Factory Reset |  |  |  |
| Log out                |                  |                  |               |  |  |  |
| SIGNAL SAMPLING        |                  |                  |               |  |  |  |
| ADC Sample Time 146 ms |                  |                  |               |  |  |  |
| CHANNEL                |                  |                  |               |  |  |  |
| SENSOR/SIGNAL INPUT    |                  |                  |               |  |  |  |
| ALARM 1                |                  |                  |               |  |  |  |
| ALARM 2                |                  |                  |               |  |  |  |
| ALARM 3                |                  |                  |               |  |  |  |
| ALARM 4                |                  |                  |               |  |  |  |
| Save Load Write        |                  |                  |               |  |  |  |

### Input Settings

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