

# Combo Module - 4444

## COMS - 4444

4 AI + 4 AO + 4 DI + 4 DO  
MODBUS over RS485 Serial Interface  
Compact DIN-Rail Mount  
18~32 VDC Operated

**Process Precision Instruments**  
Vasai Road (E), Dist. Palghar - 401210,  
Maharashtra, India

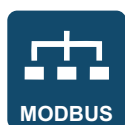
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16 BIT ADC



HI-SPEED



MODBUS



ISOLATION



PC TOOL



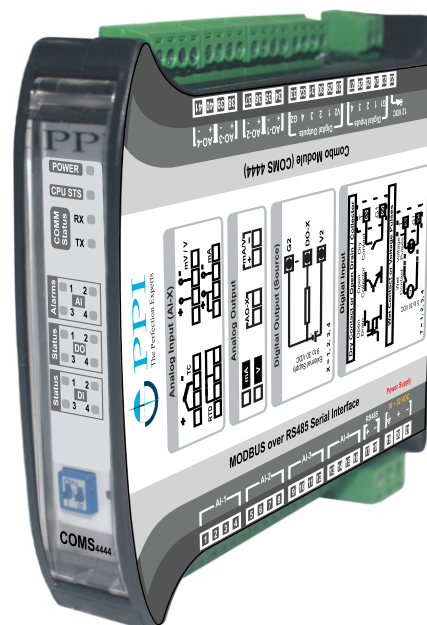
SETUP



COMPACT



DIN RAIL



## Salient Features

### • Analog Inputs

- 4 Universal Channels : Thermocouples, RTD's, Volts, mV, and mA
- 16 Bit Sigma-Delta ADC ( $\pm 32,768$  Counts)
- Automatic CJC for Thermocouple & LRC for RTD Inputs
- User Settable Scalable Range for DC V/mV/mA Inputs
- 4 Programmable Soft Alarms for each Channel
- Process Values Available as both 16-Bit Signed Integer & 32-Bit Single Precision Float
- Fast Channel Update Rate

### • Analog Outputs

- 4 Channels : Current (0-20 mA, 4-20 mA, 0-10 mA) or Voltage (0-5 V, 1-5 V, 0-10 V)
- Programmable Min / Max Counts Corresponding to Signal Low & Signal High Outputs

### • Digital Inputs

- 4 Channels : Input Type Programmable as -
  - (a) Dry Contact **or** Potential-Free Contacts / Open Drain / Open Collector
  - (b) 5 to 30 VDC Wet Contact **or** Voltage Pulses
- Both High / Low Levels & High-to-Low / Low-to-High Transition Status Available

### • Digital Outputs

- 4 Channels (Source) : 9 to 30 VDC @ 75mA per O/P
- 3 Output Modes
  - ❖ On-Off
  - ❖ Re-Triggerable Pulse (Programmable Pulse Time)
  - ❖ Pulse Train (Programmable Pulse-ON/OFF Time)
- Three-way Isolation Eliminates Potential Ground Loops between Power, Inputs / Outputs and RS485 Serial Port
- 2-wire, Half-Duplex, Start-Stop Synchronized RS485 Port
- Industry Standard MODBUS RTU Protocol with Programmable ID, Baud Rate & Parity
- Compact DIN-Rail Enclosure : 22.5(W) X 101(H) X 119(D), mm
- Wide Supply Voltage Range : 18 ~ 32 VDC (24 VDC Nominal)
- Free PC Tool for Easy Configuration and Parameter Settings

## General Information

|                        |                                                                              |
|------------------------|------------------------------------------------------------------------------|
| <b>Product Type</b>    | 4 AI + 4 AO + 4 DI + 4 DO Combo Module<br>MODBUS over RS485 Serial Interface |
| <b>Quantity</b>        | 1 Unit                                                                       |
| <b>Accessories</b>     | (Optional) USB to RS485 Converter                                            |
| <b>Similar Modules</b> | COMS-40C4, COMS-2288                                                         |

## Analog Input Channels

## Channel Specifications

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of Channels | 4                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Input Types        | Thermocouples : J, K, T, R, S, B, N, E<br>3-wire RTDs : 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 : 0-20 mA, 4-20 mA                                                                                                                                                                                                                            |
| Accuracy           | <b>Thermocouples</b> : $\pm 0.2\%$ of Reading for J, K, T, E (Excluding CJC)<br>$\pm 0.4\%$ of Reading for R, S, B, N (Excluding CJC)<br><b>CJC</b> : $\pm 1.5\text{ }^{\circ}\text{C}$ (Specified over 18 to 37 $^{\circ}\text{C}$ )<br><b>RTDs</b> : $\pm 0.2\%$ of Reading<br>Lead Resistance Compensation : Maximum 5 $\Omega$ per Lead for 3-wire RTD.<br><b>DC Linear mV / V / mA</b> : $\pm 0.1\%$ of Reading |
| Thermal Drift      | 0.01% of Span per $^{\circ}\text{C}$                                                                                                                                                                                                                                                                                                                                                                                 |
| Resolution         | For Thermocouples & RTDs : 0.1 $^{\circ}\text{C}$<br>For DC Linear Volts / Current : 0.001 / 0.01 / 0.1 / 1 Counts                                                                                                                                                                                                                                                                                                   |
| Range              | Thermocouples & RTDs : Refer Table-1<br>DC Volts / Current : -30000 to +30000 Counts                                                                                                                                                                                                                                                                                                                                 |
| Zero Offset        | User Adjustable over Full Range for Each Channel                                                                                                                                                                                                                                                                                                                                                                     |
| ADC                | 16 Bit ( $\pm 32,768$ Counts), Sigma-Delta ( $\Sigma\Delta$ )                                                                                                                                                                                                                                                                                                                                                        |
| Sampling Time      | 175mS Per Channel                                                                                                                                                                                                                                                                                                                                                                                                    |
| Input Resistance   | Thermocouples / RTDs / mV / V : Greater than 1 M $\Omega$<br>mA : 249 $\Omega$ Precision Shunt                                                                                                                                                                                                                                                                                                                       |
| Input Protection   | ESD : 8KV      EFT : 2KV      Surge : 1KV                                                                                                                                                                                                                                                                                                                                                                            |
| Input Conditioning | First Order Analog R-C Low-Pass Filter + Programmable IIR Digital Filter                                                                                                                                                                                                                                                                                                                                             |
| Isolation          | Three-way Isolation Eliminates Potential Ground Loops between Power, Inputs & RS485 Serial Port<br>1500VAC for 1 second or 250VAC continuous                                                                                                                                                                                                                                                                         |

## Alarms

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

## Analog Output Channels

### Channel Specifications

|                             |                                                                                                                                               |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Number of Channels          | 4                                                                                                                                             |
| Output Types                | Current (Standard) : Selectable 0 to 20 mA, 4 to 20 mA, 0 to 10 mA<br>Voltage (Optional) : Selectable 0 to 5V, 1 to 5V, 0 to 10V              |
| Accuracy                    | Better than $\pm 0.1\%$ of Span                                                                                                               |
| Resolution                  | Better than 14 Bit                                                                                                                            |
| Response Time (Step Change) | 150mS Typical for Output Signal to Attain 98% of the Final Value<br>(Actual response time will change with load type / value)                 |
| Output Burden               | Current : 500 $\Omega$ Maximum      Voltage : 1 K $\Omega$ Minimum                                                                            |
| Isolation                   | Three-way Isolation Eliminates Potential Ground Loops between Power, Outputs & RS485 Serial Port<br>1500VAC for 1 second or 250VAC continuous |
| Scaling (User Programmable) | Programmable Minimum & Maximum Counts (-30,000 to +30,000) Corresponding to Signal Low & Signal High Outputs                                  |
| Fail-Safe Mode              | The Outputs Hold Programmed Signal Level upon Communication Link Failure for More than Programmed Time Period (1 to 300 Sec.)                 |

## Digital Input Channels

### Channel Specifications

|                      |                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of Channels   | 4                                                                                                                                                                                                                                                                                                                                                                                                    |
| Input Types          | Programmable as :<br>(a) Dry Contact <b>or</b> Potential-Free Contacts / Open Drain / Open Collector<br>(b) 5 to 30 VDC Wet Contact / Voltage Pulses                                                                                                                                                                                                                                                 |
| Input Logic Levels   | <ul style="list-style-type: none"> <li>• <b>Dry Contact</b> : Logic Low : Open      Logic High : Close to Ground</li> <li>• <b>Open Drain / Collector</b> : Logic Low : Off-State      Logic High : On-State</li> <li>• <b>Wet Contact</b> : Logic Low : Open      Logic High : Close to Potential</li> <li>• <b>Voltage Pulses</b> : Logic Low : 2VDC max.      Logic High : 5 to 30 VDC</li> </ul> |
| Filter Time Constant | Programmable from 1 to 30000 mS.<br><i>A 'Low to High' or 'High to Low' state change is registered if the changed state persists for at least the set Filter Time Constant. This helps in suppressing noise.</i>                                                                                                                                                                                     |
| Isolation            | Three-way Isolation Eliminates Potential Ground Loops between Power, Inputs & RS485 Serial Port<br>1500VAC for 1 second or 250VAC continuous                                                                                                                                                                                                                                                         |

## Digital Output Channels

### Channel Specifications

|                             |                                                                                                                                                                                                                                               |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of Channels          | 4                                                                                                                                                                                                                                             |
| Output Types                | <b>Sourcing</b> : 9 to 30 VDC (External Supply), each Channel is Current Limited to 75mA                                                                                                                                                      |
| Output Modes (Programmable) | <ul style="list-style-type: none"> <li>• On-Off</li> <li>• Re-Triggerable Pulse with Programmable Pulse-ON Time (0.01 to 300 Seconds)</li> <li>• Pulse Train with Programmable Pulse-ON &amp; Pulse-OFF Time (0.01 to 300 Seconds)</li> </ul> |
| Fail-Safe Mode              | The Outputs Switch to Programmed ON or OFF State upon Communication Link Failure for More than Programmed Time Period (1 to 300 Seconds)                                                                                                      |
| Isolation                   | Three-way Isolation Eliminates Potential Ground Loops between Power, Outputs & RS485 Serial Port 1500VAC for 1 second or 250VAC continuous                                                                                                    |

## General Specifications

### Serial Communication

|                     |                                                     |
|---------------------|-----------------------------------------------------|
| Port                | RS485, 2-wire, Half Duplex, Start-Stop Synchronized |
| Protocol            | MODBUS RTU (Slave)                                  |
| Slave ID            | Settable : 1 to 127                                 |
| Baud Rate           | Settable : 2400, 4800, 9600, 19200 bps              |
| Parity              | Settable : None, Even, Odd                          |
| Max. Units per Loop | 31                                                  |
| Max. Distance       | 1200 Meters                                         |

### Power Supply

|                   |                                                  |
|-------------------|--------------------------------------------------|
| Type              | Switch Mode (SMPS)                               |
| Power Requirement | 18 to 32 VDC, Nominal 24 VDC @ <b>200mA Max.</b> |
| Consumption       | 5 VA Max @ 24 VDC                                |

### Physical

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

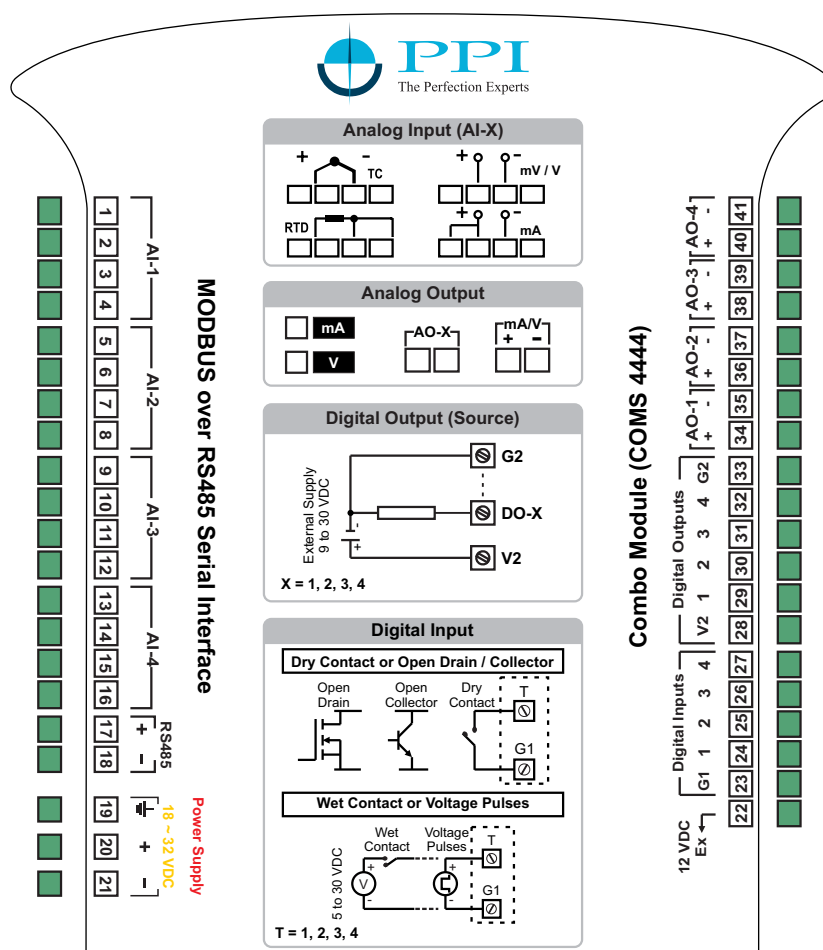
### Environmental

|                     |                                                                                                                                                             |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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**

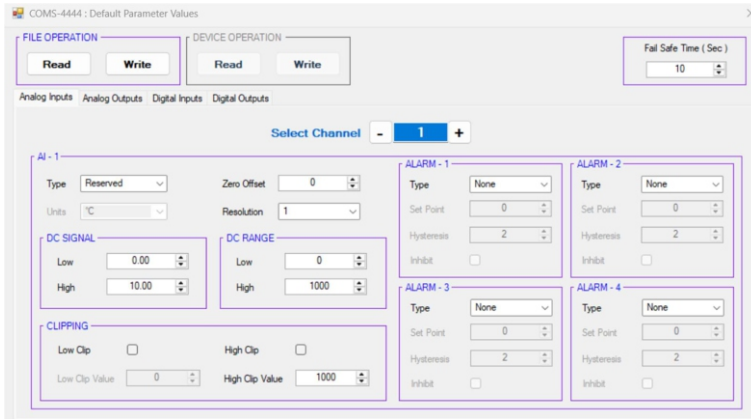
| Input Type                               | Range (Min. to Max.)                      |
|------------------------------------------|-------------------------------------------|
| 2 / 3-wire, RTD Pt100                    | -199.0 to +850.0°C / -328.0 to +1562.0°F  |
| 2 / 3-wire, RTD Pt1000                   | -199.0 to +850.0°C / -328.0 to +1562.0°F  |
| Type J Thermocouple (Fe-K)               | 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 to +1771.0°C / +32.0 to +3219.0°F       |
| Type S Thermocouple (Pt / Pt-Rh10%)      | 0 to +1768.0°C / +32.0 to +3214.0°F       |
| Type B Thermocouple (Pt-Rh6% / Pt-Rh30%) | 0 to +1826.0°C / +32.0 to +3318.0°F       |
| Type N Thermocouple (NiCrSi / NiSi)      | 0 to +1314.0°C / +32.0 to +2397.0°F       |
| Type E Thermocouple (NiCr / Con)         | -200 to +1000.0°C / -328.0 to +1832.0°F   |

## Terminations



## PC Configuration Tool

### Analog Inputs



COMS-4444: Default Parameter Values

FILE OPERATION: Read Write | DEVICE OPERATION: Read Write | Fail Safe Time (Sec): 10

Analog Inputs | Analog Outputs | Digital Inputs | Digital Outputs

Select Channel: - 1 +

AI - 1

Type: Reserved | Zero Offset: 0 | Resolution: 1 | Units: °C

DC SIGNAL

Low: 0.00 | High: 10.00

DC RANGE

Low: 0 | High: 1000

CLIPPING

Low Clip: ☐ | High Clip: ☐ | Low Clip Value: 0 | High Clip Value: 1000

ALARM - 1

Type: None | Set Point: 0 | Hysteresis: 2 | Inhibit: ☐

ALARM - 2

Type: None | Set Point: 0 | Hysteresis: 2 | Inhibit: ☐

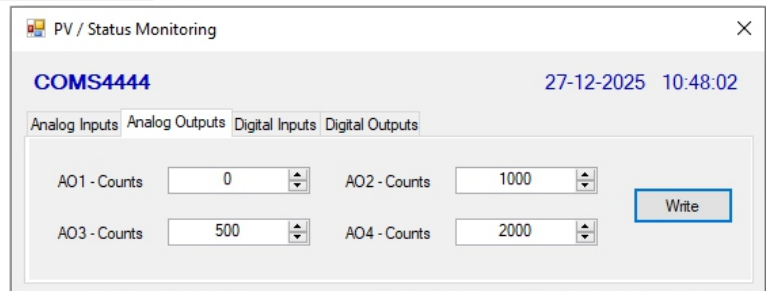
ALARM - 3

Type: None | Set Point: 0 | Hysteresis: 2 | Inhibit: ☐

ALARM - 4

Type: None | Set Point: 0 | Hysteresis: 2 | Inhibit: ☐

### Analog Outputs



PV / Status Monitoring

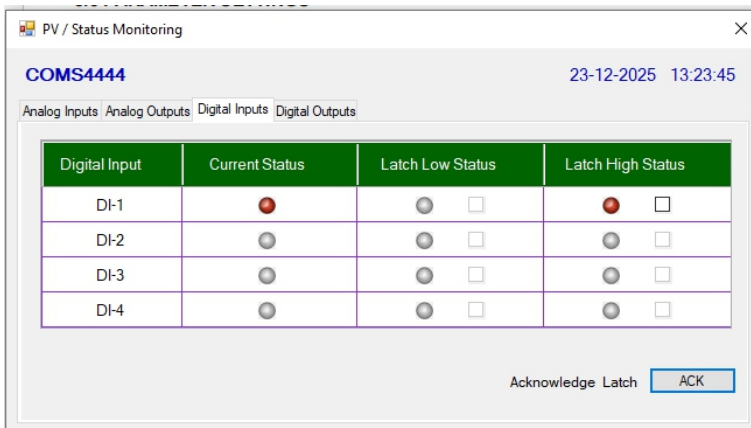
COMS4444 | 27-12-2025 10:48:02

Analog Inputs | Analog Outputs | Digital Inputs | Digital Outputs

AO1 - Counts: 0 | AO2 - Counts: 1000 | AO3 - Counts: 500 | AO4 - Counts: 2000

Write

### Digital Inputs



PV / Status Monitoring

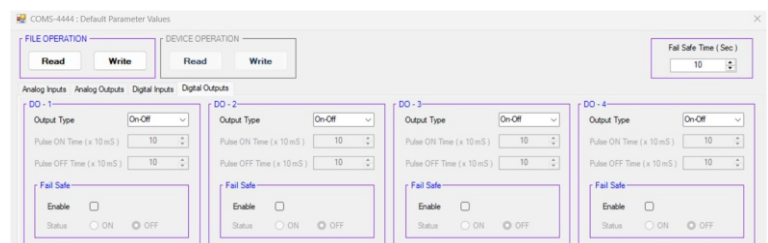
COMS4444 | 23-12-2025 13:23:45

Analog Inputs | Analog Outputs | Digital Inputs | Digital Outputs

| Digital Input | Current Status                   | Latch Low Status                               | Latch High Status                                         |
|---------------|----------------------------------|------------------------------------------------|-----------------------------------------------------------|
| DI-1          | <input checked="" type="radio"/> | <input type="radio"/> <input type="checkbox"/> | <input checked="" type="radio"/> <input type="checkbox"/> |
| DI-2          | <input type="radio"/>            | <input type="radio"/> <input type="checkbox"/> | <input type="radio"/> <input type="checkbox"/>            |
| DI-3          | <input type="radio"/>            | <input type="radio"/> <input type="checkbox"/> | <input type="radio"/> <input type="checkbox"/>            |
| DI-4          | <input type="radio"/>            | <input type="radio"/> <input type="checkbox"/> | <input type="radio"/> <input type="checkbox"/>            |

Acknowledge Latch ACK

### Digital Outputs



COMS-4444: Default Parameter Values

FILE OPERATION: Read Write | DEVICE OPERATION: Read Write | Fail Safe Time (Sec): 10

Analog Inputs | Analog Outputs | Digital Inputs | Digital Outputs

DO - 1

Output Type: On-Off | Pulse ON Time (x 10 mS): 10 | Pulse OFF Time (x 10 mS): 10

Fail Safe

Enable: ☐ | Status: ☐ ON ☒ OFF

DO - 2

Output Type: On-Off | Pulse ON Time (x 10 mS): 10 | Pulse OFF Time (x 10 mS): 10

Fail Safe

Enable: ☐ | Status: ☐ ON ☒ OFF

DO - 3

Output Type: On-Off | Pulse ON Time (x 10 mS): 10 | Pulse OFF Time (x 10 mS): 10

Fail Safe

Enable: ☐ | Status: ☐ ON ☒ OFF

DO - 4

Output Type: On-Off | Pulse ON Time (x 10 mS): 10 | Pulse OFF Time (x 10 mS): 10

Fail Safe

Enable: ☐ | Status: ☐ ON ☒ OFF

## Process Precision Instruments (An ISO 9001 : 2008 Company)

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