Probiz Controls

## PC-SERIES IO MODULE

# PC-4AO



## FEATURES & BENEFITS

- 4 analog outputs, 0–10 V DC
- Direct speed reference for AHU and pump VFDs
- Drives modulating valves and damper actuators
- Compact 110 × 70 × 70 mm housing for small panels
- Modbus RTU slave on RS485 (B, A, GND)
- Works with PC-CPU-V7 or any third-party Modbus master
- No configuration required — ready to write from the master
- Customer-specific IO configuration available on request
- Failed modules are replaced on site without reprogramming

## APPLICATIONS

| | | | |
|---|---|---|---|
| **AHU VFD Speed** Supply and return fan speed reference | **Control Valves** Chilled / hot water valve modulation | **Pump VFD Speed** Variable-flow pumping control | **Modulating Dampers** Fresh air and return air damper position |

| | | | | |
|---|---|---|---|---|
| **4 AO** Analog outputs | **0–10 V** DC control signal | **Modbus RTU** RS485 slave | **110 × 70** Compact footprint (mm) | **24 V** AC/DC supply |

**0–10 V DC** | **4 AO** | **Modbus RTU** | **RS485**

The PC-4AO is a compact DIN-rail mounted analog output module with 4 analog outputs. It communicates over Modbus RTU on RS485, so it works as an expansion module for the PC-CPU-V7 controller or with any third-party Modbus master. Each output provides a 0–10 V DC control signal for modulating equipment — VFD speed references for AHUs and pumps, chilled water control valves and modulating dampers.

## -TECHNICAL DATA

| OUTPUTS | |
|---|---|
| Analog outputs | 4 |
| Signal type | 0–10 V DC |
| 4–20 mA option | To be confirmed |

| COMMUNICATION | |
|---|---|
| Protocol | Modbus RTU (slave) |
| Interface | RS485 — B, A, GND |
| Baud rate | To be confirmed |
| Compatible masters | PC-CPU-V7, third-party Modbus masters |

| CONFIGURATION | |
|---|---|
| Set-up | No configuration required |
| Custom IO | Customer-specific configuration on request |
| Commissioning | Modbus master utility (e.g. Modscan) via USB-to-RS485, or PC-CPU-V7 over IP |

| POWER | |
|---|---|
| Supply voltage | 24 V AC/DC |
| Power consumption | To be confirmed |

| OPERATING ENVIRONMENT | |
|---|---|
| Operating temperature | 0 °C to 50 °C |
| Operating humidity | 0–95 % RH |

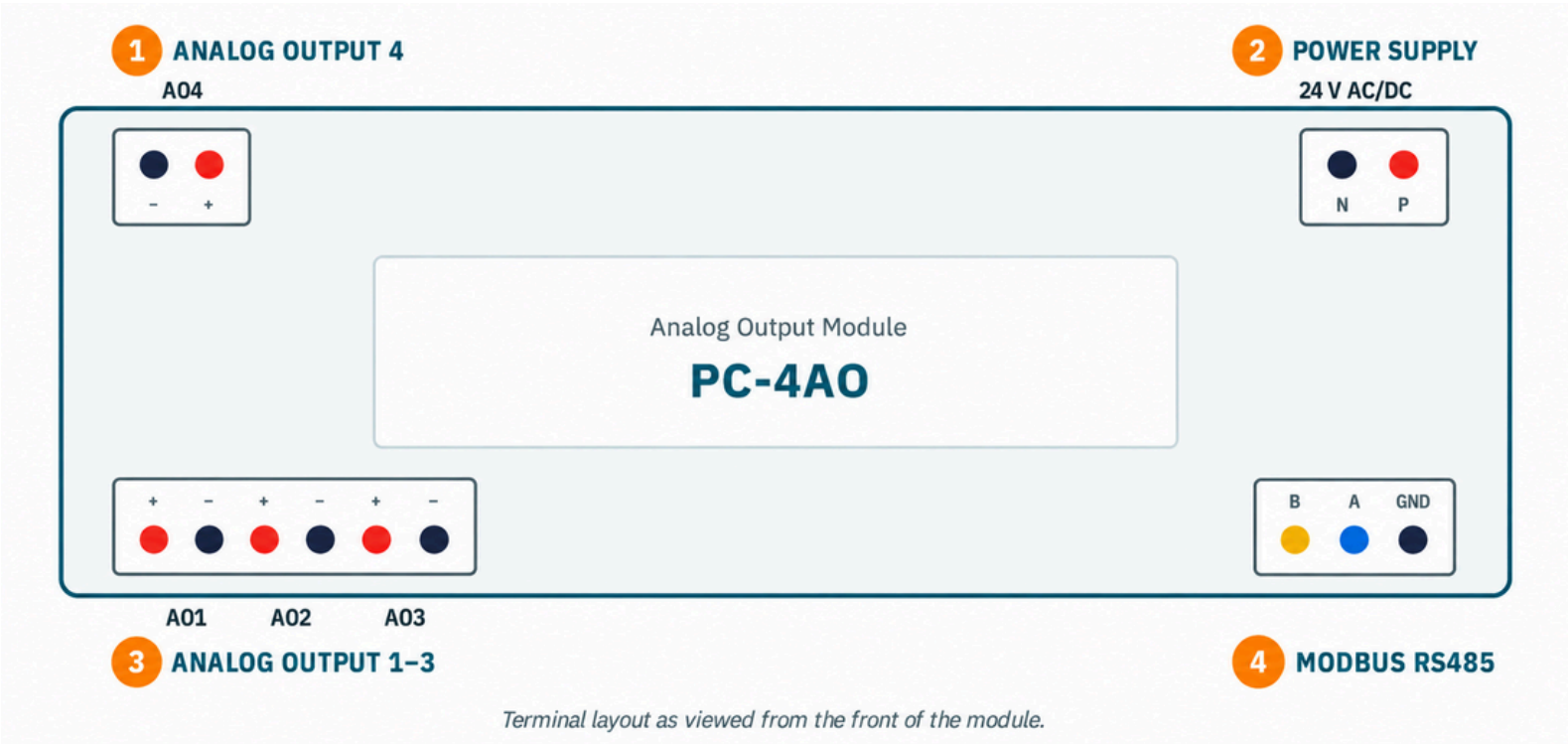
| MECHANICAL | |
|---|---|
| Dimensions (L × W × H) | 110 × 70 × 70 mm |
| Mounting | DIN rail |
| Enclosure | ABS |

| STANDARDS & CERTIFICATIONS | |
|---|---|
| Certifications | CE, RoHS |

## -ORDERING INFORMATION

| PART NUMBER | DESCRIPTION |
|---|---|
| **PC-CPU-V7** | SmartNova DDC Controller — Modbus master for PC-series IO modules (ordered separately) |
| **PC-4AO** | PC-series analog output module — 4 AO (0–10 V DC), Modbus RTU RS485, 24 V AC/DC, DIN rail, 110 × 70 × 70 mm |

## - TERMINALS & WIRING




*Terminal layout as viewed from the front of the module.*

P

P

| NO. | GROUP | TERMINALS | SIGNAL | DESCRIPTION |
|---|---|---|---|---|
| 1 | **Analog output** | **AO4: –, +** | 0–10 V DC | Control signal to VFD, valve or damper actuator |
| 2 | **Power supply** | **N, P** | 24 V AC/DC | Module supply input — P: + supply, N: – supply |
| 3 | **Analog outputs** | **AO1–AO3: +, –** | 0–10 V DC | Control signals to VFDs, valves or damper actuators |
| 4 | **Modbus RS485** | **B, A, GND** | Modbus RTU | Connection to an PC-CPU-V7 RS485 port or third-party Modbus master |

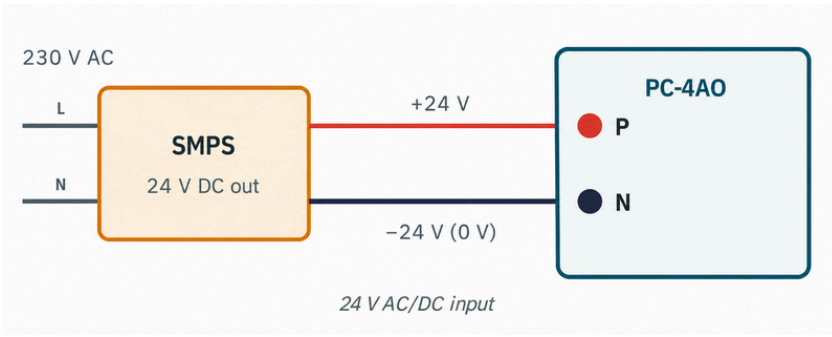
## - IO WIRING

- Connect AO + to the 0–10 V control input and AO – to the signal common of the VFD or actuator.
- Observe polarity — note AO4 terminals are ordered –, + on the top row.
- Use shielded cable for analog signals and keep it away from mains and VFD power wiring.
- Write output values to holding registers 40001–40004 from the Modbus master.

## - RS485 BUS WIRING

- Use shielded twisted-pair cable and daisy-chain modules on the bus.
- Connect B, A and GND to the same terminals on the master and every module.
- Fit 120 Ω termination at both ends of long bus segments.
- Segment length up to 1200 m per TIA/EIA-485, reduced at higher baud rates.

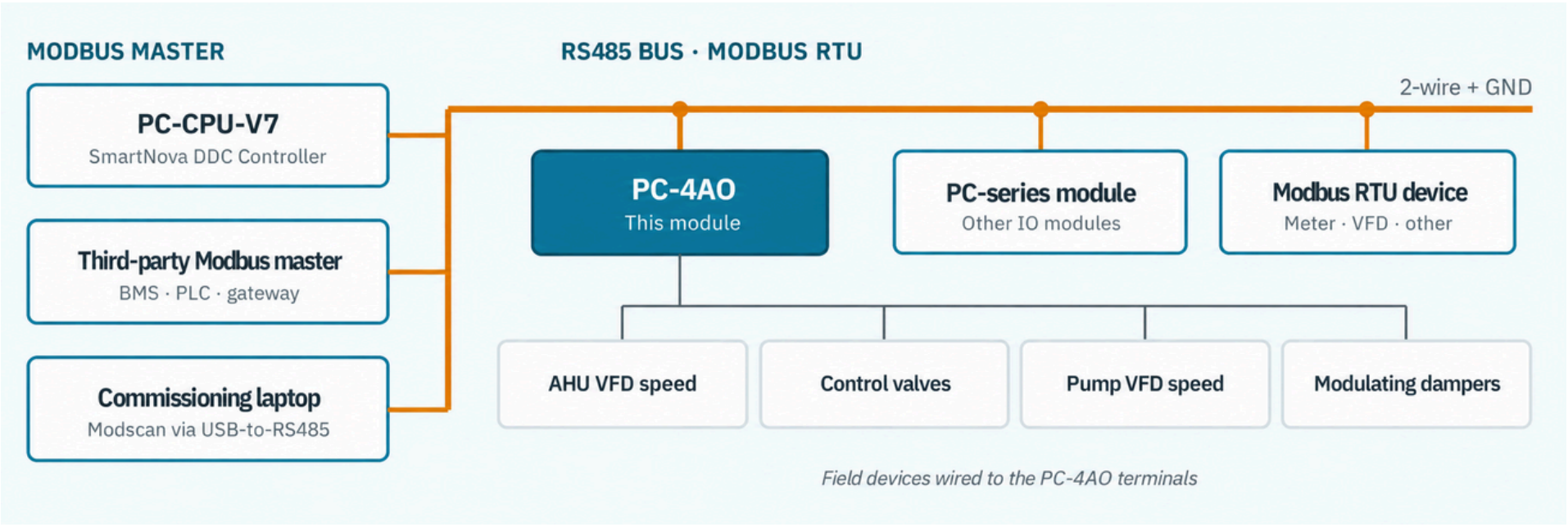
## - POWER SUPPLY WIRING




*24 V AC/DC input*

- Supply from a 24 V AC/DC source, such as a 230 V AC to 24 V DC SMPS.
- Connect + supply to terminal P and – supply to terminal N.
- One SMPS can feed several modules; size it for the total load.

## - SYSTEM ARCHITECTURE




*Field devices wired to the PC-4AO terminals*

## - MODBUS COMMUNICATION

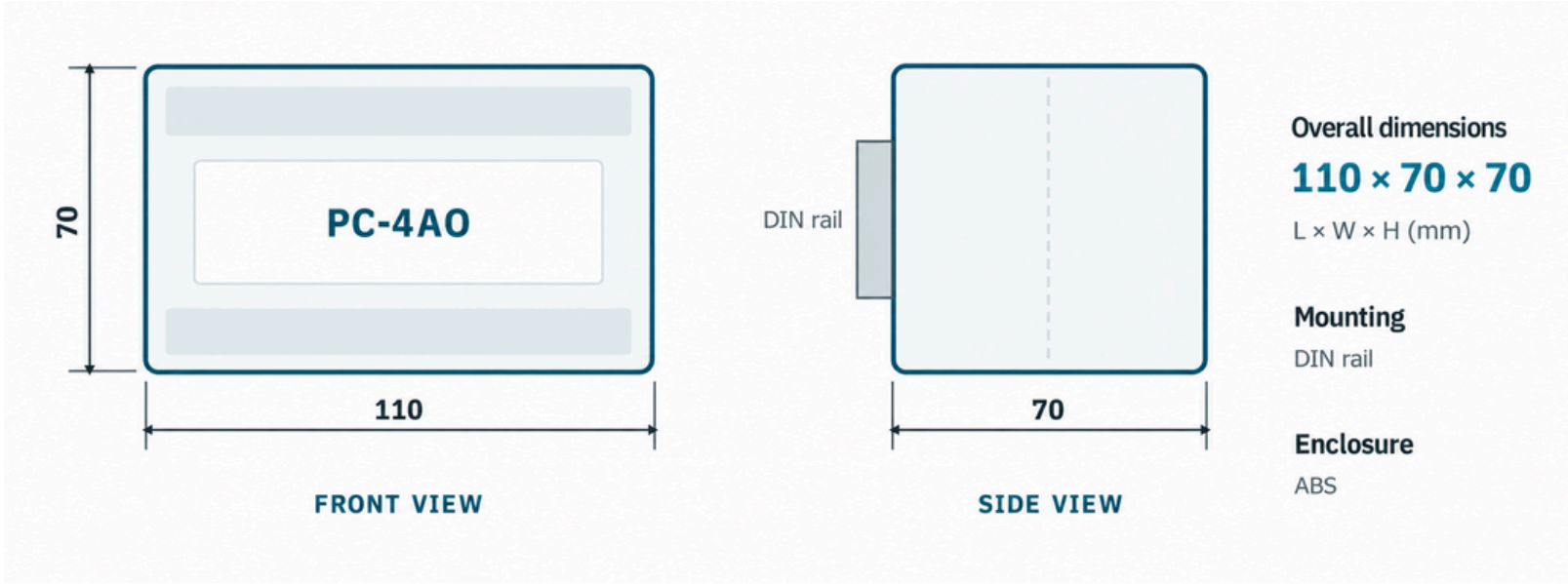
| COMMUNICATION SETTINGS | |
|---|---|
| Protocol | Modbus RTU, slave |
| Physical layer | RS485, 2-wire + GND |
| Baud rate | To be confirmed |
| Default slave address | To be confirmed |
| Data format | To be confirmed |
| Function codes | 03, 06 |

MODBUS REGISTER MAP

| NO. | IO POINT | ADDRESS | TYPE | ACCESS |
|---|---|---|---|---|
| 1 | AO-1 (0–10 V) | 40001 | Holding register | R/W |
| 2 | AO-2 (0–10 V) | 40002 | Holding register | R/W |
| 3 | AO-3 (0–10 V) | 40003 | Holding register | R/W |
| 4 | AO-4 (0–10 V) | 40004 | Holding register | R/W |

Addresses use the standard Modbus 4x notation, as listed in the module address details. Register scaling for output values to be confirmed.

## - DIMENSIONS




## - INSTALLATION

- Mount on DIN rail inside a control panel or enclosure.
- Leave space around the unit for ventilation and cable access.
- Isolate the power supply before wiring or servicing.
- Route RS485 and analog output cables away from power and VFD wiring.
- A failed module can be replaced on site and the system resumes without re-programming.

## - COMMISSIONING

- Mount the module and connect the 24 V AC/DC supply.
- Wire AO1–AO4 to the 0–10 V inputs of VFDs, valves or dampers as per the wiring drawing.
- Connect RS485 B, A, GND to the PC-CPU-V7 port or Modbus master.
- Write output values using the Modbus register map.
- Verify outputs with Modscan over USB-to-RS485 or through PC-CPU-V7 over IP.

## - SYSTEM REQUIREMENTS

- PC-CPU-V7 controller or any third-party Modbus master
- Modbus master utility (e.g. Modscan) for commissioning
- USB-to-RS485 converter for commissioning over serial
- 24 V AC/DC power supply
- DIN rail mounting inside a control panel

## - SAFETY INFORMATION

- Installation, wiring and maintenance must be carried out by qualified personnel in line with local electrical regulations.
- Disconnect all power before connecting or removing terminal wiring.
- Install inside a closed control panel, protected from dust, water and direct sunlight.
- Operate only within the supply voltage and environmental limits stated in this datasheet.
- Observe ESD precautions when handling the unit.
- Dispose of the product as electronic waste in accordance with local e-waste regulations.

## - SERVICES & SUPPORT

**Technical support** | **Installation & setup** | **Maintenance** | **Application support**

**Hardware support** | **Warranty**

PROBIZ CONTROLS

## PC-SERIES IO MODULE

# PC-4AO




**Probiz Controls by Probiz Automation**

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