

# Pico Pro RS485

- Remotecontrol,alarms,metering,andenvironmental measurements for building automation
- RS485 and/or E-Wi 868 wireless communication
- On-board digital and analog inputs/outputs
- Expansion via SIO Bus
- Standalone solutions and/or integration into Electrex device networks



The **Pico Pro** devices are **Input/Output** devices (digital and/or analog inputs/outputs and/or for environmental parameter sensors) designed to meet the most sophisticated remote control and monitoring applications for **building automation** in the residential, commercial, and industrial sectors in the least invasive way possible. Available in 4 DIN module formats (**Pico Pro D4**) or in a box (**Pico Pro SIO**), they can be used within an Electrex monitoring network and/or in standalone mode for a variety of other applications such as remote control, alarm management, and building automation. **The system is completely versatile and can be expanded** even after installation thanks to the **SIO BUS** and **RS485** port, which allow the addition of digital and/or analog inputs/outputs and/or environmental parameter sensors. Indoor or outdoor installation (suitably protected). Available in wired or wireless (battery-powered) versions to reach difficult areas that transmit data via radio waves at the 868 Mhz frequency to the Electrex Net Coordinator E-Wi 868 Gateways.

## Pico Pro D4 RS485

The **Pico Pro D4 RS485** are **DIN rail modules equipped with an RS485** port with digital and analog inputs/outputs and/or an on-board SIO Bus card. They can contain up to 2 different cards from those shown in the table\* below.



For use within a monitoring network and for various other applications such as remote control, alarms, counting and environmental measurements for building automation. 230Vac power supply (other power supplies on request, see the table\* below). Size 4 DIN modules. Max. weight 100 gr.

## Pico Pro SIO RS485

The **Pico Pro SIO RS485** devices are equipped with an RS485 port and an SIO port with onboard digital and analog inputs/outputs. They can contain up to 2 cards (in addition to the SIO already included), different from those shown in the table\* below.



The SIO Bus port allows you to add digital and/or analog inputs/outputs and/or environmental parameter sensors via Milli Pro I/O and Milli Sensor devices. For use within an Electrex monitoring network and for various other applications such as remote control, alarms, counting and environmental measurements for building automation. Available with 12Vdc or 230V power supply. Gray box dimensions: 125x40x85 mm.

## Pico Pro Node RS485 SIO

The **Pico Pro SIO RS485** are RS485 to SIO Bus interface converters for connecting digital and/or analog inputs/outputs and/or environmental parameter sensors via Milli Pro I/O and Milli Sensor devices.



Equipped with an RS485 port with terminals and a SIO Bus port with RJ45 connector. 12Vdc power supply that can be supplied via the switching power supply code PFTP100-P2 or via the RS485 cable if connected to a Libra. Black box dimensions: 38x73x20 mm.

## Serial communication RS485

All versions of **Pico Pro** are equipped with an RS485 serial port with overvoltage protection. The communication protocol used is the Modbus-RTU "full compliant" suitable for communications with PLC and SCADA programs. The processed data are read as numeric registers composed of mantissa and exponent in IEEE format. A transmission of up to 115,200 bps (default 38,400) with max. 125 requestable registers (equal to approximately 62 parameters) ensure an unsurpassed dialogue speed.

## Pico Pro E-Wi 868 Battery 2DI

The **Pico Pro E-Wi 868 Battery 2DI** is a **battery-powered E-Wi 868 wireless device featuring two opto-isolated digital inputs** for status and/or counting with separate common terminals. The digital inputs are typically used to count externally generated pulses or as remote status indicators. The input circuits are self-powered and require no external power supply. It transmits data via radio waves at a frequency of 868 MHz to the Electrex Net Coordinator E-Wi 868 Gateways. Powered by lithium AA batteries. Gray box dimensions: 130x45x175 mm



## Pico Pro D4 Power supply

All the versions of **Pico Pro** can also be requested in other hardware configurations such as with different power supply:

- Transformer type rated 230/240 Vac (Standard)
- Transformer type rated 110/120 Vac
- Transformer type rated 400/440 Vac
- Switching type: 15÷36Vac / 18÷60Vdc
- Switching type: 9÷24Vac / 9÷36Vdc

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1  
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### Types of built-in inputs/outputs modules of Pico Pro

- **4DI 4COMMON:** 4 digital inputs with separate commons
- **4DO 4COMMON:** 4 digital outputs with separate commons
- **2DI 2DO 4COMMON:** 2 digital inputs and 2 digital outputs with separate commons
- **4AI:** 4 analog inputs -10÷10V (compatible with 0÷10V, 0÷5V, -5÷5V, 4÷20mA)
- **2AO 4-20mA:** 2 analog outputs 4-20mA self-powered for a load up to 250 ohms and powered for higher loads
- **4PT100 or 4PT1000:** for the respective sensors
- **4NTC (on request):** for the respective sensors
- **SIO Bus:** for connecting Milli Pro I/O and Milli Pro Sensor

### Digital Inputs

The **2DI2DO** and **4DI** modules are equipped with **opto-isolated digital inputs with separate commons and a programmable antibounce filter**. The inputs are typically used to count externally generated pulses, such as gas meters (requires a galvanic separator in accordance with ATEX regulations), water meters, units counters, etc. When appropriately programmed, they can also function as remote status indicators (e.g., ON/OFF of machines, switches, etc.). Maximum sampling rate is 500Hz (2ms). External 10-30Vdc power supply required; the Pico Pro E-Wi 868 Battery 2DI instrument, however, is equipped with self-powered inputs.

### Digital Outputs

The **2DI2DO** and **4DO** modules are equipped with opto-isolated digital outputs with separate transistor commons with a capacity of 27 Vdc 27 mA according to DIN 43864. The outputs are programmable as internal alarm outputs (see Alarms) or as remotely controlled output units via serial line and Modbus commands.

### Analog and PT100, PT1000, or NTC Inputs

The **4AI** version is equipped with four analog inputs -10÷10V (compatible with 0÷10V, 0÷5V, -5÷5V, 4÷20mA with 200 ohm resistor). The **4PT100**, **4PT1000**, and **4NTC** versions have four inputs for the respective sensors.

### 4-20mA Analog Outputs

The **2AO4-20mA** version is equipped with two extremely precise and stable 4-20mA or 0-20mA analog outputs, galvanically isolated. Active and self-powered for load resistances up to 250 ohms, while for higher resistances, an external power supply with a 12V DC output (up to 750 ohms) is required. The output signal is updated every 200 mS at most. Each of the two outputs can be linked to any of the detected parameters.

### Relay Output

The **Pico Pro SIO RS485 230V** is equipped with a **2RO24VDC** module with two changeover relay outputs, rated at 250V max., 2A max. (resistive load).

### SIO (Sensor Input Output) Bus Communication

The **Pico Pro SIO RS485** devices by default have an SIO port, while in the **Pico Pro D4** devices it may be added as an internal module (see list). The SIO Bus allows for the integration of additional digital and/or analog inputs/outputs and/or environmental parameter sensors, even after installed, via Milli Pro devices (various combinations of up to 4 Milli Pro devices). The maximum overall distance of the Sensor Bus is 20 m.

### Additional inputs/outputs via Milli Pro I/O (Bus SIO)

The **Pico Pro SIO** support **Milli Pro I/O RJ Box**, expansion modules with digital or analog inputs/outputs equipped with RJ45 ports for quick connection to Electrex devices with SIO BUS. The input and/or output circuits require external power supply (e.g. 12Vdc or 24Vdc). Black box size: 38x73x20 mm.



### Environmental measurements via Milli Pro Sensor (Bus SIO)

The **Pico Pro SIO** support **Milli Pro Sensor environmental sensors**. Up to 4 sensors can be connected to the same Bus with various combinations. Different sensors are available such as Temperature, Humidity, Lux and air quality parameters. The maximum total distance of the SIO Bus is 20 m.



### Alarms

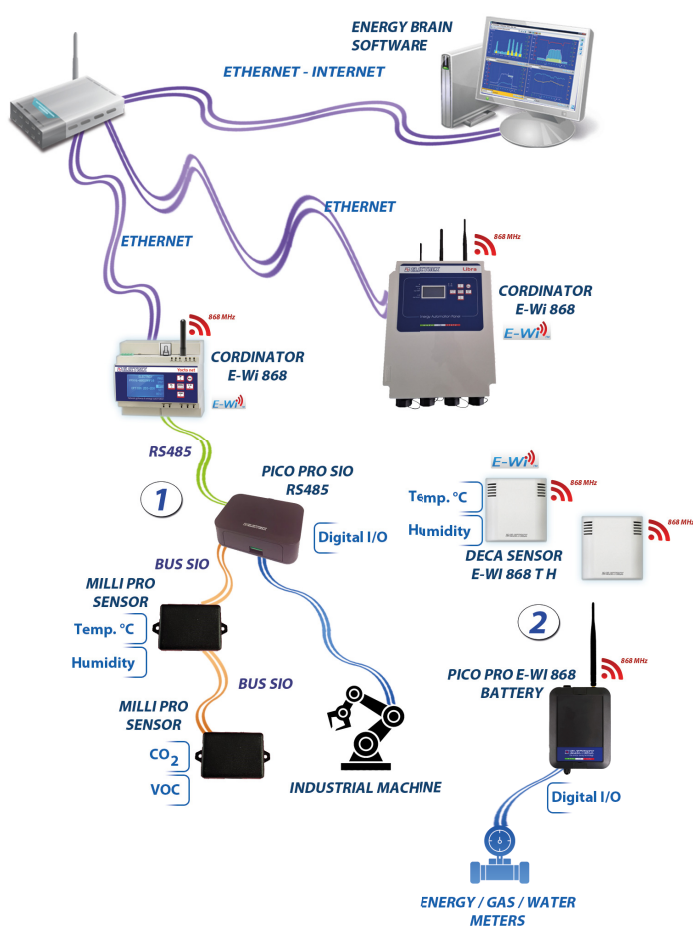
The **Pico Pro** is equipped with **8 alarm channels that can be associated via logical combinations (or/nor/and/nand/xor/xnor) to 8 configurable comparators**; the alarms can be used to drive digital outputs and/or to generate states on Modbus registers. Each comparator can be associated with any of the available parameters (e.g. voltages, currents, power, etc.) and can be configured either as a min/max threshold or as a comparison between two variables (e.g. voltage imbalance). All alarm outputs can also refer to the same parameter to have multiple alarm thresholds. It is possible to set the activation and deactivation delay of each alarm (from 1 second to 99 minutes), the hysteresis (in % of the threshold value) and the polarity of the output contact (NA/NC). The alarm status is always available on the serial line (via Modbus "coils"). Given the numerous combinations available, only a part of the alarms can be programmed via keyboard while they can be completely programmed via Energy Brain Pro software or via serial line via "holding registers" with Modbus protocol.

### Operating time counters

The **Pico Pro** can record the life time of the instrument and are equipped with four operating time partial counters that can be activated by internal alarms through configuration via the Energy Brain software; for example, to manage the operating time of a user/machinery when it is operating, when it is in standby and when it is off. The partial operating time counters can be reset.

The image below shows two Electrex network scenarios with Pico Pro, looking in detail:

**- Network 2:** The Net Coordinator E-Wi 868 series instruments communicate with the Pico Pro E-Wi 868 Battery and the Deca Sensors via radio waves at a frequency of 868 MHz. The Pico Pro E-Wi 868 Battery is equipped with two self-powered digital inputs for counting pulses from gas/water/energy meters, etc. The E-Wi 868 TH Deca Sensors monitor ambient temperature and humidity.



| Functional characteristics                                                    |                                         |                        |
|-------------------------------------------------------------------------------|-----------------------------------------|------------------------|
| RS485 serial port                                                             | Galvanically insulated                  |                        |
|                                                                               | 2.400 to 38.400 bps programmable speed  |                        |
|                                                                               | Built-in over-voltage protection        |                        |
|                                                                               | Modbus-RTU protocol, full compliant     |                        |
| 868MHz radio transmission and reception with E-Wi protocol (external antenna) | Baud rate                               | 19.200 bps             |
|                                                                               | Transmission                            | up to 14dBm            |
|                                                                               | Reception                               | -109dBm                |
| Communication via SIO Bus port:                                               | Max. number of devices on the same bus: | 4                      |
|                                                                               | Max. bus length                         | 20 m                   |
| Standards                                                                     | Safety                                  | CEI EN 61010-1,class 2 |
|                                                                               | E.M.C.                                  | CEI EN 61326-1A        |

|                                                |                                                                                               |            |
|------------------------------------------------|-----------------------------------------------------------------------------------------------|------------|
| Digital Input<br>(separate common terminals):  | Galvanically insulated                                                                        |            |
|                                                | Programmable functionality: external pulse count, ON/OFF state detection , tariff change-over |            |
|                                                | Programmable 10/100 Hz filter for input glitches<br>(500Hz for versions 2DI 2DO and 4DI)      |            |
|                                                | External powered needed                                                                       | 10-30Vdc   |
|                                                | Current absorbed                                                                              | 2 ... 10mA |
| Analog inputs                                  | -10÷10V, 0÷10V, 0÷5V, -5÷5V                                                                   |            |
|                                                | 4÷20mA with 200 ohm resistor                                                                  |            |
| Digital Output<br>(separate common terminals): | Galvanically insulated                                                                        |            |
|                                                | Programmable function: weighted pulse outputs, alarm signaling, control outputs               |            |
|                                                | NPN compliant with DIN 43864<br>(max 27Vdc, 27mA)                                             |            |
|                                                | Or Self-Powered version with a solid state relay (opto-mos)<br>(max 250V 100mA ac/dc)         |            |
| Relay output                                   | with changeover contact, max. 30Vdc 2A<br>(resistive load)                                    |            |
|                                                | Programmable functions: alarm signaling, remote control                                       |            |

| PICO PRO                                     |               |
|----------------------------------------------|---------------|
| TYPE                                         | CODE          |
| <i>Pico Pro Node RS484 SIO</i>               |               |
| PICO PRO NODE RS485 12VDC SIO                | PFATR01-Z4B-B |
| <i>Pico Pro D4 RS485</i>                     |               |
| PICO PRO D4 RS485 230-240V 4DI 4DO           | PFAP401-NC2C  |
| PICO PRO D4 RS485 230-240V 2DI 2DO 2AO4-20mA | PFAP401-Q62C  |
| PICO PRO D4 RS485 230-240V 4AI 2DI2DO        | PFAP401-RQ2C  |
| PICO PRO D4 RS485 230-240V 2DI2DO SIO        | PFAP401-QZ2C  |
| PICO PRO D4 RS485 230-240V 4AI SIO           | PFAP401-RZ2C  |
| <i>Pico Pro SIO RS485</i>                    |               |
| PICO PRO SIO RS485 12VDC 4DI4DO              | PFAPM0C-NP4G  |
| PICO PRO SIO RS485 12VDC 2DI2DO 2AO          | PFAPM0C-Q64G  |
| PICO PRO SIO RS485 12VDC 2DI2DO 4AI          | PFAPM0C-QR4G  |
| PICO PRO SIO RS485 12VDC 8DI                 | PFAPM0C-NN4G  |
| PICO PRO SIO RS485 12VDC 8DO                 | PFAPM0C-PP4G  |
| PICO PRO SIO 230V 2DI6DO 2RO                 | PFAPT0C-QCHG  |
| <i>Pico Pro E-Wi 868 Battery</i>             |               |
| PICO PRO E-WI 868 BATTERY 2DI LOW POWER      | PFAPUHL-F0GG  |





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4

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