

RS485 Module

- ▶ Alarm commands, counting, analog and environmental meas, digital, relay and analog outputs
- ▶ For the data synchronization, log and graph display and alarm notifications must be used in an Electrex monitoring system including a gateway and datalogger



RS485 MODULE

The RS485 Module are devices to be included in an Electrex RS485 monitoring network for adding digital and/or analog inputs/outputs and/or sensors for environmental parameters. Available in two different sizes: 2 DIN rail modules (RS485 Module D2) and 4 DIN rail modules (RS485 Module D4).

RS485 Module D2

The *RS485 Module D2* must be used with an external power supply of 24Vdc (e.g. Switching Power Supply D1 24VDC 400mA code PFTP100-Q2) and can contain up to 2 modules, of different type, among the ones listed in the table below (of which, however, only one of the two types can be self powered, therefore only one for 1DI 2DO Self-Powered or 2AO4-20mA or 2DI 1RO Self Powered). Dimension 2 DIN rail modules. Max. weight 45 gr.



RS485 Module D4



The *RS485 Module D4* must be powered at 230Vac (other power supply versions on request, see table* below) and can contain up to 2 modules, of different type, also self-powered among the ones listed in the table below.

Dimension: 4 DIN rail modules. Max. weight: 100 gr.

*Internal module types for the RS485 Module D2 and D4

- **1DI 2DO:** 1 digital input and 2 digital outputs;
- **1DI 2DO Self-Powered:** 1 self powered digital input and 2 digital outputs;
- **2AO 4-20mA:** 2 analog self-powered 4-20mA outputs for loads up to 250 ohm, power supply needed for higher loads;
- **2DI 1RO Self-Powered:** 2 self-powered digital inputs and 1 relay output rated at 30V 2A (resistive load);
- **2RO24VDC:** 2 relay output rated at 30V 2A (resistive load);
- **2RO230V:** 2 relay output rated at 250V 2A (resistive load);
- **4DI:** 4 digital inputs;
- **4DO:** 4 digital outputs;
- **2DI 2DO:** 2 digital inputs and 2 digital outputs;
- **4AI:** 4 analog inputs -10÷10V (compatible with 0÷10V, 0÷5V, -5÷5V, 4÷20mA);
- **4PT100 or 4PT1000 or 4NTC:** for the relative sensors;
- **I2C:** for connecting environmental sensors Deca Sensor Bus Unit Box (T, TH, TL, THL, THLB, L, B, up to 4 T)

Serial RS485

The **RS485 Module** equipped also with a serial RS485, protected against overvoltage. The protocol used is the Modbus-RTU "full compliant" (suitable for communicating with a PLC or a SCADA). The data are read as numerical registers composed by mantissa and exponent in the IEEE format. The communication speed of the RS485 port is configurable, up to 38.400 bps, with a max. 125 registers requested (equivalent to 62 parameters) with no waiting time between two requests assuring a high speed.

Digital Inputs

The **1DI** or **2DI** or **4DI** modules is equipped with an optically insulated digital input with programmable filter for input glitches. The digital input is set to operate for external pulse count of, example, water meters, gas meters (insulation to meet the ATEX requirements), water meters, quantity count, etc. For the 1DI or the 2DI 1RO the max sampling frequency is 100Hz (5ms), while for the 2DI 2DO and the 4DO 500Hz (2ms). Other user selectable operative modes are ON/OFF state input (example for reading the ON/OFF state of machines and switches) and tariff change input (example for day-night tariff changeover). The digital input requires an external 10-30Vdc power supply.

The **1DI 2DO Self-Powered** and **2DI 1RO Self-Powered** modules instead are provided with self powered digital inputs.

Analog Inputs and PT100 or PT1000 or NTC

The **4AI** module is equipped with 4 analog inputs rated at -10÷10V (compatible with 0÷10V, 0÷5V, -5÷5V, 4÷20mA at 200 ohm). Versions **4PT100** or **4PT1000** or **4NTC** are equipped with 4 inputs for the relative sensors.

Digital Outputs

The **2DO** or **4DO** are equipped with two optically insulated transistor outputs rated 27 Vdc 27 mA according to DIN 43864 standards. The two outputs may be set for the transmission of pulses or alternatively configured as outputs of the internal alarms (see Alarms) or as remote output devices controlled via serial line and Modbus commands.

The **1DI 2DO Self-Powered** instead is equipped with two optomos outputs rated at max 250V 100mA AC/DC.

Relay Outputs

The **2DI 1RO Self-Powered** and **2RO24VDC** modules are equipped with one or two relay outputs with changeover contact rated at max 30V max 2A (resistive load).

The **2RO230V** instead is equipped with two relay outputs with changeover contact rated at max 250V max 2A (resistive load).

Analog 4-20mA Outputs

The **2AO4-20mA** module is equipped with 2 galvanic insulated analogue outputs 4-20 mA or 0-20 mA providing an extremely high accuracy and signal stability. The outputs are active for resistor loads up to 250 ohm, for higher loads an external power supply (12Vdc) will be needed (up to 750 ohm). The outputs ensure a response time of max. 200 ms. Each output can be associated to any of the parameters.

SI (Sensor Bus I²C)

The **SI module** is used to connect several sensors with various combinations (eg up to 8 parameters between temperature and relative humidity or 1 for temperature, 1 for relative humidity, 1 for luminosity and 1 for air pressure) . The maximum total distance of the Sensor Bus is 20 m.

How to order RS485 Module D2 or D4

Type	Code
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RS485 Module D2 versions (2 DIN rail modules):

RS485 Module D2 24VDC 4DI 4DO	PFAB201-N5P
RS485 Module D2 24VDC 2DI 2DO 2AO4-20mA ...	PFAB201-Q56
RS485 Module D2 24VDC 4AI 2DI 2DO	PFAB201-R5Q
RS485 Module D2 24VDC 2DI 2DO SI	PFAB201-Q5T
RS485 Module D2 24VDC 4DI SI.....	PFAB201-N5T

Possible hardware combinations with 1 or 2 different modules (of which, however, only 1 can be a self-powered type, e.g. only one 1DI 2DO Self-Powered or 2AO4-20mA or 2DI 1RO Self Powered module). Requires external power supply 24Vdc: Switching Power Supply D1 24VDC 400mA.....PFTP100-Q2

RS485 Module D4 versions (4 DIN rail modules):

RS485 Module D4 230V 4DI 4DO	PFAB401-N2P
RS485 Module D4 230V 2DI 2DO 2AO4-20mA	PFAB401-Q26
RS485 Module D4 230V 4AI 2DI 2DO.....	PFAB401-R2Q
RS485 Module D4 230V 2DI 2DO SI.....	PFAB401-Q2T
RS485 Module D4 230V 4DI SI.....	PFAB401-N2T

Possible hardware combinations with 1 or 2 different modules which can be also self-powered type.

Internal power supply 230Vac or other power supplies on request, see building code diagram below.

BUILDING CODE:

PFAB = External Modules | PFAB 4 0 1 - N 2 P

Dimension in DIN modules: 4 = 4 modules |
2 = 2 modules |

Bus type: 1 = RS485 |

Internal modules*:..... Characters for code:

No Module	0
Module 1DI 2DO	1
Module 2DI 1 RO Self Powered	2
Module 2RO24VDC	5
Module 2AO4-20mA	6
Module 2RO230V	8
Module 1DI 2DO Self Powered	E
Module 4DI	N
Module 4DO	P
Module 2DI 2DO	Q
Module 4AI	R
Scheda SI (Sensor Bus I ² C)	T
Scheda 4PT100	U
Scheda 4PT1000	X
Scheda 4NTC	Y

Power Supply:

24Vdc +/- 10% only for Module D2	5
230Vac +/- 10% only for Module D4	2
120Vac +/- 10% only for Module D4	1
400Vac +/- 10% only for Module D4	3
15÷36Vac/18÷60Vdc only for Module D4.....	8
9÷24Vac/ 9÷36Vdc only for Module D4.....	7

* Note: Up to a maximum of 4 inputs of the same type and 4 outputs of the same type can be managed. The 4AI, 4PT100, 4PT1000 and 4NTC are of the same type so they cannot coexist. The SI card can only be inserted in the second slot.

A monitoring system including RS485 Module

The monitoring system example here below includes a gateway (a Kilo net or an Exa net or the Femto ETC net or the Yocto net) which from one side serves as a bridge toward the Ethernet / Internet or the PC and from the other is connected via Rs485 to a subnet of various Electrex devices. The subnet includes energy analyzers but also RS485 Modules which can retrieve open/closed contacts used for alarm notifications as well as analog sensors.

