Every Control Group

EVD120 *USER MANUAL* VERSION 1.00

Summary [EVD120]

Important

Important

Read these instructions carefully before installing and using the instrument and follow all additional information for installation and electrical connection; keep these instructions close to the instrument for future consultations.
The instrument must be disposed according to the local legislation about the collection for electrical and electronic equipment.

Introduction

[EVD120]

Introduction

EVD120 is a two analog channels and two digital inputs acquisition module.

Each analog channel can work with one of the following kind of probe (universal analog channels):

- PTC/NTC probe
- J/K thermocouple
- 2/3 wires Pt 100 and Pt 1000 probe
- 2/3 wires 4-20 mA passive current transducer
- 0-10/2-10 V and 0-20/4-20 mA active transducer.

The instrument has the following communication ports:

- RS-485 port with MODBUS communication protocol, to allow the connection of the instrument in RS-485 networks with MODBUS communication protocol
- serial port for the communication with the programming key EVKEY.

The case of EVD120 is 3 DIN modules.

Getting started

1 Getting started

1.1 Installing the instrument

On DIN rail; dimensions in mm (in).

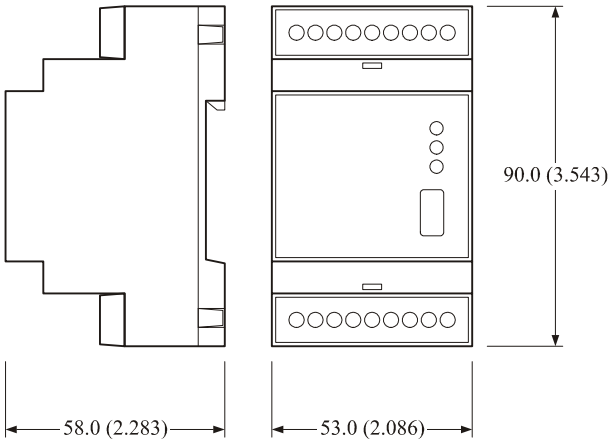


Fig. 1 - Dimensions of EVD120.

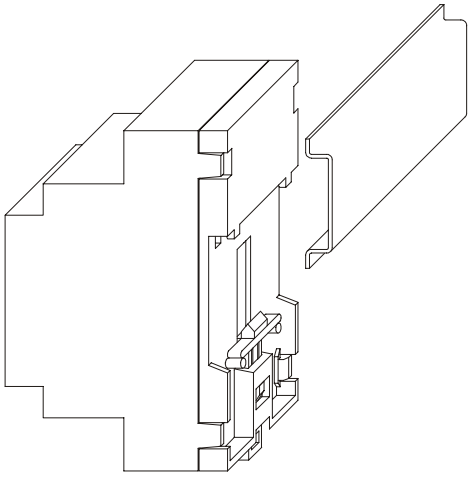


Fig. 2 - Installation of EVD120.

Additional information for installation:

- working conditions (working temperature, humidity, etc.) must be between the limits related in the technical data
- do not install the instrument close to heating sources (heaters, hot air ducts, etc.), devices provided with big magnetos (big speakers, etc.), locations subject to direct sunlight, rain, humidity, dust, mechanical vibrations or bumps
- according to the safety legislation, the protection against electrical parts must be ensured by a correct installation of the instrument; the parts that ensure the protection must be installed so that you can not remove them if not by using a tool.

1.2 Wiring diagram

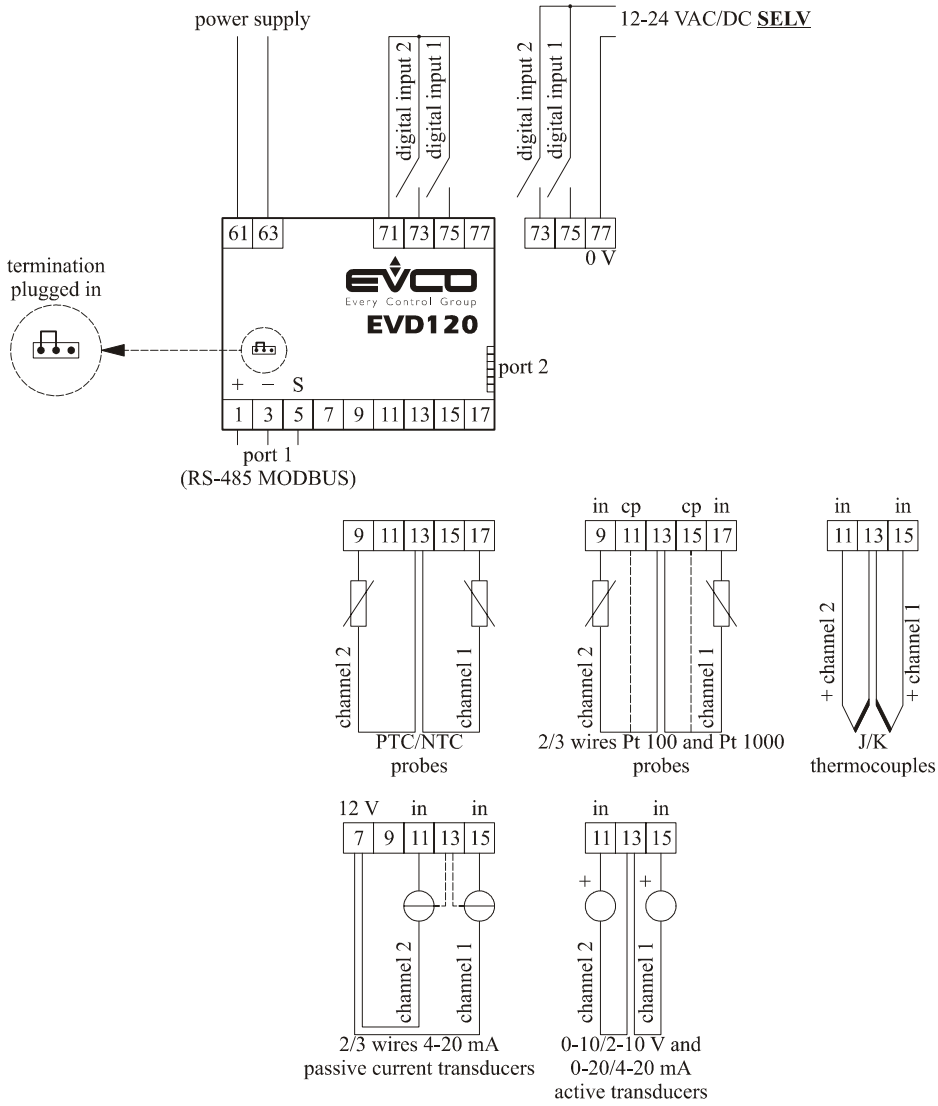


Fig. 3 - Wiring diagram of EVD120.

With reference to the wiring diagram:

- **port 1 is the port for the serial communication (via RS-485, with MODBUS communication protocol)**
- **port 2 is the serial port for the communication with the programming key.**

Additional information for electrical connection:

- do not operate on the terminal blocks with electrical or pneumatic screwers
- if the instrument has been moved from a cold location to a warm one, the humidity could condense on the inside; wait about an hour before supplying it
- test the working power supply voltage, working electrical frequency and working electrical power of the instrument; they must correspond with the local power supply
- disconnect the local power supply before servicing the instrument
- provide the probes with a protection able to protect them against contacts with metal parts or use insulated probes
- do not use the instrument as safety device
- for repairs and information on the instrument please contact Evco sales network.

Programming

[EVD120]

2 Programming

2.1 Preliminary remarks

EVD120 supports the MODBUS communication protocol.

The kind of network EVD120 can work in is RS-485 (look at Fig. 4); for further information on the realization of the network, consult the *Installation manual of RICS for Windows®* (the document is available in the CD of RICS).

According to the standard settings:

- the instrument address has value *247*
- the baud rate has value *9,600 baud*
- the parity has value *even*.

These parameters are hereinafter called “network parameters”.

2.2 Programming an EVD120 having standard network parameters using the software RICS (adding an EVD120 having standard network parameters to an existing and working network of instruments managed by RICS)

Operate as follows:

- make sure the network is made of instruments that support the MODBUS communication protocol; to learn the communication protocol supported by the instruments, consult the *List of compatible instruments and supported communication protocol* (the document is available in the internet site *www.evco.it*)
- make sure the network is made of less than 32 instruments
- make sure no instrument in the network has value *247* as instrument address; to learn the instrument address, consult the instructions (the document is available in the internet site *www.evco.it*)
- make sure the baud rate of the instruments in the network has value *9,600 baud*; to learn the baud rate of the instrument, consult the instructions (the document is available in the internet site *www.evco.it*)
- make sure the parity of the instruments in the network has value *even*; to learn the parity of the instrument, consult the instructions (the document is available in the internet site *www.evco.it*)
- quit RICS
- disconnect the power supply of the instruments in the network
- connect terminal “ + ” of the hardware driver of the last instrument in the network to terminal “ 1 ” of EVD120 (1)
- connect terminal “ -- ” of the hardware driver of the last instrument in the network to terminal “ 2 ” of EVD120 (1)
- connect terminal “ S ” of the hardware driver of the last instrument in the network to terminal “ 3 ” of EVD120 (2)
- to reduce the reflections on the signal transmitted through the cable, plug in the termination of the first and last element of the network

(1) use a twisted pair

(2) pair, as far as possible, the cable to the ones you have already connected

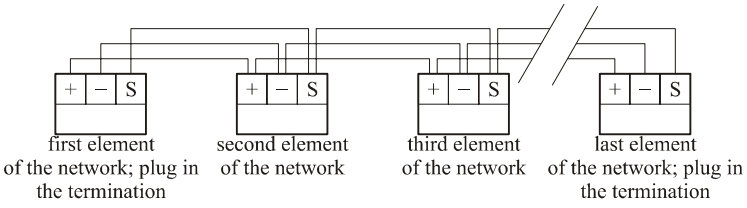


Fig. 4 - Example of RS-485 network.

- operate the remaining connections related in paragraph *1.2*
- connect the power supply of the instruments in the network
- start RICS [3] [4] .

(3) gain access to RICS with the account of the administrator or of the installer

(4) the availability of the functions of EVD120 depends on the RICS version; consult the *List of compatible instruments and supported communication protocol* (the document is available in the internet site *www.evco.it*)

Keep operating as follows:

1. Quit possible dialog boxes.
2. Right-click on the desktop, then use the quick menu to choose **Add Device**.
   A new picture will be shown.
3. Right-click on the picture, then use the quick menu to choose **Setup**.
   The dialog box **Setup Device** will be shown.
4. Click the card **Network**, then digit *247* in the pop-up menu **Address**.
5. Choose **OK**.
6. Right-click on the picture, then use the quick menu to choose **Examine** > **Parameters**.
   The dialog box **Parameters** will be shown.
7. Change the configuration parameters according to your requirements.
8. Change the instrument address.
9. Quit the dialog box **Parameters**.
10. Switch off/on the power supply of EVD120.
11. Repeat steps 3, 4 and 5.

2.3 Programming an EVD120 having standard network parameters using the software Params Manager

Operate as follows:

- make sure Params Manager is installed in the Personal Computer and the connection between the serial interface and the Personal Computer works; for further information on the installation of Params Manager and on the realization of the connection between the serial interface and the Personal Computer, consult the *User manual of Params Manager* (the document is available in the CD of RICS and in the internet site *www.evco.it*)
- make sure the serial interface supports the MODBUS communication protocol; to learn the communication protocol supported by the serial interfaces, consult the *User manual of Params Manager* (the document is available in the CD of RICS and in the internet site *www.evco.it*)
- quit Params Manager
- connect terminal " + " of the RS-485 output of the serial interface to terminal " 1 " of EVD120
- connect terminal " -- " of the RS-485 output of the serial interface to terminal " 2 " of EVD120
- connect terminal " S " of the RS-485 output of the serial interface to terminal " 3 " of EVD120
- switch on the power supply of EVD120
- start Params Manager.

Keep operating as follows:

1. Choose **Program setup**.
   The dialog box **Setup** will be shown.
2. Use the pop-up menu **COM port** to choose the COM number of the Personal Computer where you have connected the serial interface.
3. Use the pop-up menu **External HW/Protocol** to choose *DIRECT*.
4. Use the pop-up menu **Baud rate** to choose *9600*.
5. Use the pop-up menu **Parity** to choose *Even*.
6. Click the card **Device Settings**, then use the pop-up menu **Protocol** to choose *MODBUS (DIRECT)*.
7. Digit *247* in the text field **Address**.
8. Choose **Apply**.
   The frame **Information** will be shown.
9. Choose **OK**, then **Exit**.
10. Start Params Manager again.
11. Choose **Link source device**.
    The dialog box **Source device map** will be shown.
12. Change the configuration parameters according to your requirements.
13. Change the instrument address.

14. Choose **Exit**, then **Exit** again.
15. Switch off the power supply of EVD120.
16. Disconnect terminals “1”, “2” and “3” of EVD120 from the RS-485 output of the serial interface.

2.4 Restoring well-known network parameters of EVD120 temporarily using the programming key EVKEY (in order to change them using the software Params Manager)

Operate as follows:

- make sure to have the programming key EVKEY
- switch on the power supply of EVD120 and wait 4 s at least since the power supply has been switched on
- connect EVKEY to port 2 of EVD120: the LED of EVKEY will shed green light

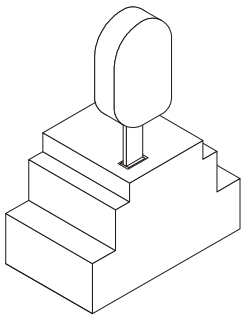


Fig. 5 - Connecting EVKEY to port 2 of EVD120.

- press the button of EVKEY 1 s: LED *Prog* of EVD120 will flash and the LED of EVKEY will shed green light and red light alternatively.

The temporary network parameters are the following ones:

- the instrument address has value *248*
- the baud rate has value *9,600 baud*
- the parity has value *even*.

Keep operating as follows:

- disconnect EVKEY from port 2 of EVD120
- operate as related in paragraph *2.3* without switching off the power supply of EVD120 before having changed its network parameters and holding in consideration the instrument address has value *248* (step 7.) [5] .

(5) if you switch off the power supply of EVD120 before having changed its network parameters, you will restore its not well-known network parameters

2.5 Learning/Programming the instrument address of EVD120 using the programming key EVKEY

2.5.1 Learning the instrument address of EVD120 using the programming key EVKEY

Operate as follows:

- make sure to have the programming key EVKEY
- switch on the power supply of EVD120 and wait 4 s at least since the power supply has been switched on
- connect EVKEY to port 2 of EVD120: the LED of EVKEY will shed green light

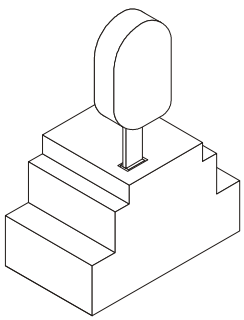
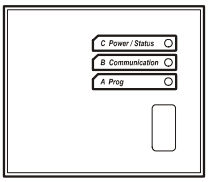
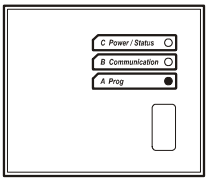


Fig. 5 - Connecting EVKEY to port 2 of EVD120.

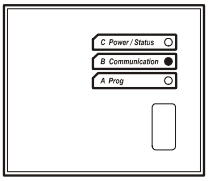
- press the button of EVKEY 1 s: LED *Prog* of EVD120 will flash and the LED of EVKEY will shed green light and red light alternatively
- press and release the button of EVKEY: the LED of EVD120 will go out; if the LED of EVKEY sheds green light consider value 0, if it sheds red light consider value 1 (6)



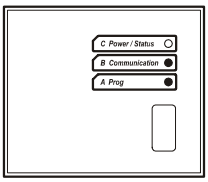
- press and release the button of EVKEY: LED *Prog* of EVD120 will light up; if the LED of EVKEY sheds green light consider value 0, if it sheds red light consider value 2 (6)



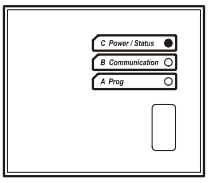
- press and release the button of EVKEY: LED *Communication* of EVD120 will light up; if the LED of EVKEY sheds green light consider value 0, if it sheds red light consider value 4 (6)



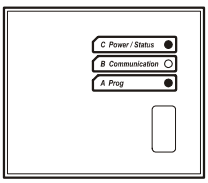
- press and release the button of EVKEY: LED *Communication* and LED *Prog* of EVD120 will light up; if the LED of EVKEY sheds green light consider value 0, if it sheds red light consider value 8 (6)



- press and release the button of EVKEY: LED *Power/Status* of EVD120 will light up; if the LED of EVKEY sheds green light consider value 0, if it sheds red light consider value 16 (6)

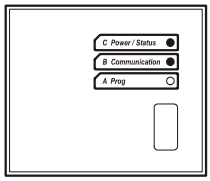


- press and release the button of EVKEY: LED *Power/Status* and LED *Prog* of EVD120 will light up; if the LED of EVKEY sheds green light consider value 0, if it sheds red light consider value 32 (6)

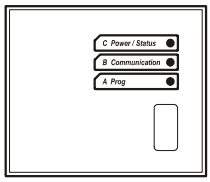


(6) the value to consider is not the instrument address; the instrument address is the sum of all the values to consider in the procedure

- press and release the button of EVKEY: LED *Power/Status* and LED *Communication* of EVD120 will light up; if the LED of EVKEY sheds green light consider value 0, if it sheds red light consider value 64 (6)



- press and release the button of EVKEY: all the LED of EVD120 will light up; if the LED of EVKEY sheds green light consider value 0, if it sheds red light consider value 128 (6)



- press and release the button of EVKEY: the procedure will be quitted, LED *Prog* of EVD120 will flash and the LED of EVKEY will shed green light
- disconnect EVKEY from port 2 of EVD120
- switch off/on the power supply of EVD120
- **the instrument address is the sum of all the values to consider in the procedure.**

To quit the procedure early operate as follows:

- disconnect EVKEY from port 2 of EVD120
- switch off/on the power supply of EVD120.

2.5.2 Programming the instrument address of EVD120 using the programming key EVKEY

Operate as follows:

- operate as related in paragraph *2.5.1*
- to the steps “if the LED of EVKEY sheds green light consider value ... , if it sheds red light consider value ... ”, press the button of EVKEY 4 s: the LED of EVKEY will change colour (7)

To continue the procedure operate as follows:

- press and release the button of EVKEY.

To save the modification operate as follows:

- after the step “if the LED of EVKEY sheds green light consider value 0, if it sheds red light consider value 128”, press and release the button of EVKEY: all the LED of EVD120 will flash
- press the button of EVKEY 4 s: the procedure will be quitted, LED *Prog* of EVD120 will flash and the LED of EVKEY will shed green light (8)
- disconnect EVKEY from port 2 of EVD120
- switch off/on the power supply of EVD120.

To quit the procedure early operate as follows:

- disconnect EVKEY from port 2 of EVD120
- switch off/on the power supply of EVD120.

(7) do not assign the instrument address the following values: 0, 248, 249, 250, 251, 252, 253, 254 or 255; if you assign the values 0 or 255, LED *Power/Status* of EVD120 will flash and the LED of EVKEY will shed red light

(8) if you press and release the button of EVKEY, the procedure will be quitted without saving the modification

2.6 Copying the configuration parameters of EVD120 in the programming key EVKEY using the software Params Manager

Operate as follows:

- make sure to have the programming key EVKEY
- switch on the power supply of EVD120 and wait 4 s at least since the power supply has been switched on
- connect EVKEY to port 2 of EVD120: the LED of EVKEY will shed green light

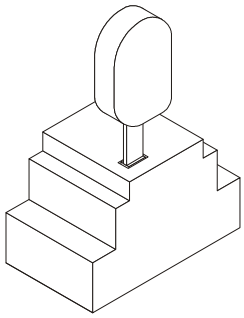


Fig. 5 - Connecting EVKEY to port 2 of EVD120.

- press the button of EVKEY 1 s: LED *Prog* of EVD120 will flash and the LED of EVKEY will shed green light and red light alternatively.
- operate as related in paragraph *2.3* till step 12 inclusive holding in consideration the instrument address has value *248* (step 7.).

Keep operating as follows:

1. Choose **Store to key**.
   The configuration parameters of EVD120 will be copied in EVKEY; during the copy the LED of EVKEY sheds red light.
2. Wait the LED of EVKEY finishes shedding red light [9] .
3. Choose **Exit**, then **Exit** again.
4. Switch off the power supply of EVD120.
5. Disconnect EVKEY from port 2 of EVD120.
6. Disconnect terminals “1”, “2” and “3” of EVD120 from the RS-485 output of the serial interface.

(9) the copy of the configuration parameters takes 10 s at most; if in this time EVKEY does not signal the operation has successfully been completed (or the LED of EVKEY finishes shedding red light to shed green light again), it takes to switch off the power supply of EVD120, disconnect EVKEY from port 2 of EVD120 and repeat the copy

2.6.1 Copying the configuration parameters of EVD120 in the programming key EVKEY using the software Params Manager (in order to program several EVD120 that are different of the instrument address)

Operate as follows:

- operate as related in paragraph *2.6* making sure parameter *Enable AutoIncremental Address Key* has value 1.

The first EVD120 programmed with the procedure related in paragraph *2.7* will have the same configuration parameters of the EVD120 used to copy the configuration parameters in EVKEY; the second EVD120 programmed with the procedure related in paragraph *2.7* will have the same configuration parameters of the EVD120 used to copy the configuration parameters in EVKEY but parameter instrument address (its value will be increased of one unit); the third EVD120 programmed with the procedure related in paragraph *2.7* will have the same configuration parameters of the EVD120 used to copy the configuration parameters in EVKEY but parameter instrument address (its value will be increased of two units) and so on.

2.7 Reading the configuration parameters of EVD120 from the programming key EVKEY

Operate as follows:

- make sure to have the programming key EVKEY
- switch off the power supply of EVD120
- connect EVKEY to port 2 of EVD120
- switch on the power supply of EVD120 and wait 4 s at least since the power supply has been switched on: LED *Prog* of EVD120 will flash and the LED of EVKEY will shed green light
- press the button of EVKEY 4 s: the configuration parameters of EVKEY will be copied in EVD120; during the copy the LED of EVKEY sheds red light [10]
- wait the LED of EVKEY finishes shedding red light [9]
- switch off the power supply of EVD120
- disconnect EVKEY from port 2 of EVD120.

(10) the copy of the configuration parameters in EVD120 is only allowed if the firmwares of the instruments coincide; if they do not coincide, LED *Power/Status* and *Prog* of EVD120 will flash and the LED of EVKEY will shed red light.

Configuration parameters

3 Configuration parameters

3.1 Preliminary remarks

Configuration parameters are visible using one of the following software:

- RICS
- Params Manager.

3.2 Configuration parameters

TEXT FIELD	MIN.	MAX.	U.M.	DEF.	ANALOG CHANNELS
Celsius Fahrenheit	0	1	- - -	0	unit of measure temperature (11) 0 = °C 1 = °F
Enable Probe 1	0	1	- - -	1	enabling the analog channel 1 1 = YES
Enable Probe 2	0	1	- - -	1	enabling the analog channel 2 1 = YES
Probe kind 1	0	14	- - -	1	kind of probe analog channel 1 (12) 0 = PTC 1 = NTC 2 = J 3 = K 4 = reserved 5 = 3 wires Pt 100 6 = 2 wires Pt 100 7 = reserved 8 = reserved 9 = 3 wires Pt 1000 10 = 2 wires Pt 1000 11 = 4-20 mA 12 = 0-20 mA 13 = 2-10 V 14 = 0-10 V
Probe kind 2	0	14	- - -	1	kind of probe analog channel 2 (12) 0 = PTC 1 = NTC 2 = J 3 = K 4 = reserved 5 = 3 wires Pt 100 6 = 2 wires Pt 100 7 = reserved 8 = reserved 9 = 3 wires Pt 1000

(11) if parameters “Probe kind 1” and/or “Probe kind 2” have value 8, 9, 10 or 11, parameter “Celsius Fahrenheit” will have no effect

(12) switch off/on the power supply of the instrument after the modification of the parameter

					10 = 2 wires Pt 1000 11 = 4-20 mA 12 = 0-20 mA 13 = 2-10 V 14 = 0-10 V
Probe1 Offset	-25.0	25.0	(13)	0.0	offset analog channel 1
Probe2 Offset	-25.0	25.0	(13)	0.0	offset analog channel 2
DigitalFilter probe 1	0	6	- - -	3	reading speed analog channel 1 (0 = fast ... 6 = slow) (12)
DigitalFilter probe 2	0	6	- - -	3	reading speed analog channel 2 (0 = fast ... 6 = slow) (12)
MinTarI 1	-1500.0	1500.0	points	0.0	minimum value of the range of the transducer of the analog channel 1 corresponding to 0/4 mA or 0/2 V
MinTarI 2	-1500.0	1500.0	points	0.0	minimum value of the range of the transducer of the analog channel 2 corresponding to 0/4 mA or 0/2 V
MaxTarI 1	-1500.0	1500.0	points	100.0	maximum value of the range of the transducer of the analog channel 1 corresponding to 20 mA or 10 V
MaxTarI 2	-1500.0	1500.0	points	100.0	maximum value of the range of the transducer of the analog channel 2 corresponding to 20 mA or 10 V
Saturation Configuration 1	0	3	- - -	0	values the signal of the transducer of the analog channel 1 saturates (or finishes being converted by the instrument) 0 = function not enabled 1 = below “MinTarI 1” and above “MaxTarI 1” 2 = below 0.0 and above 100.0 3 = below 0.0 and above 1000.0
Saturation Configuration 2	0	3	- - -	0	values the signal of the transducer of the analog channel 2 saturates (or finishes being converted by the instrument) 0 = function not enabled 1 = below “MinTarI 2” and above “MaxTarI 2” 2 = below 0.0 and above 100.0 3 = below 0.0 and above 1000.0

(13) the unit of measure depends on parameters “Celsius Fahrenheit” (°C or °F) and “Probe kind 1” or “Probe kind 2” (temperature or variable of the range of the transducer).

TEXT FIELD	MIN.	MAX.	U.M.	DEF.	DIGITAL INPUTS
Polarity Digital Input 1	0	1	- - -	0	kind of contact digital input 1 0 = NO (input active if you close the contact) 1 = NC (input active if you open the contact)
Polarity Digital Input 2	0	1	- - -	0	kind of contact digital input 2 0 = NO (input active if you close the contact) 1 = NC (input active if you open the contact)

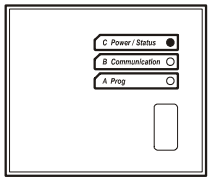
TEXT FIELD	MIN.	MAX.	U.M.	DEF.	SERIAL COMMUNICATION (MODBUS)
Address	1	247	- - -	247	instrument address (12)
Baud rate	0	3	- - -	2	baud rate (12) 0 = 2,400 baud 1 = 4,800 baud 2 = 9,600 baud 3 = 19,200 baud
Parity	0	2	- - -	2	parity (12) 0 = none 1 = odd 2 = even

TEXT FIELD	MIN.	MAX.	U.M.	DEF.	PROGRAMMING
Enable AutoIncremental Address Key	0	1	- - -	1	enabling the function of automatic increase (of one unit) of the instrument address (parameter “Address”) during the copy of the parameter set from the programming key to the instrument

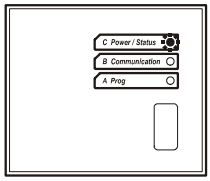
Signals

4 Signals

4.1 LED Power/Status



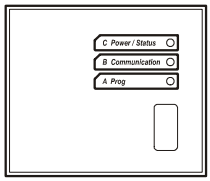
If it is lit, the instrument will be supplied.



If it flashes, an analog channel 1 error and/or an analog channel 2 error will be running.

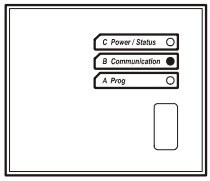
Remedies:

- look at parameters “Probe kind 1” and/or “Probe kind 2”
- check the integrity of the probe
- check the connection instrument-probe
- check the variable read by the probe.

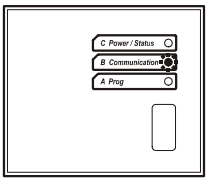


If it is out, the instrument will not be supplied.

4.2 LED Communication (on port 1)



If it is mainly lit, the serial communication will correctly be running.



If it flashes, the instrument will read some data but it will not be the recipient.

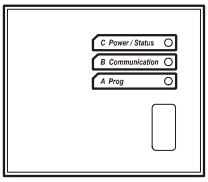
Remedies:

- look at parameters “instrument address” of the instruments of the RS-485 network.

If it is mainly out, the instrument will read some not correct data.

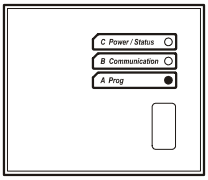
Remedies:

- look at parameters “baud rate” and “parity” of the instruments of the RS-485 network.



If it is out, the serial communication will not be running.

4.3 LED Prog



If it is lit or if it flashes, the programming of the instrument will be running.

Technical data

5 Technical data

5.1 Technical data

Box:

self-extinguishing grey.

Frontal protection:

IP 40.

Connections:

- screw terminal blocks (power supply, inputs and port for the serial communication)
- 6 poles connector (port for the communication with the programming key).

Working temperature:

from 0 to 55 °C (32 to 131 °F, 10 ... 90% of relative humidity without condensate).

Power supply:

230 VAC, 50/60 Hz, 1.5 VA (approximate).

Analog channels:

2 (analog channel 1 and analog channel 2) for:

- PTC/NTC probes
- J/K thermocouples
- 2/3 wires Pt 100 and Pt 1000 probes
- 2/3 wires 4-20 mA passive current transducers
- 0-10/2-10 V and 0-20/4-20 mA active transducers

(universal analog channels).

Digital inputs:

2 (digital input 1 and digital input 2) for NO/NC contact (free of voltage, 12 V 5 mA approximate).

Working range:

- from -50 to 150 °C (-50 to 300 °F) for PTC probe
- from -40 to 110 °C (-40 to 230 °F) for NTC probe
- from -100 to 800 °C (-140 to 1,450 °F) for J thermocouple
- from -100 to 1,300 °C (-140 to 2,350 °F) for K thermocouple
- from -100 to 650 °C (-140 to 1,200 °F) for 2/3 wires Pt 100 probe
- from -100 to 650 °C (-140 to 1,200 °F) for 2/3 wires Pt 1000 probe.

Resolution:

- 0.1 for 2/3 wires 4-20 mA passive current transducers and for 0-10/2-10 V and 0-20/4-20 mA active transducers
- 0.1 °C/1 °F otherwise.

Serial ports:

- port for the serial communication (via RS-485, with MODBUS communication protocol)
- port for the communication with the programming key.

User manual of EVD120.

Version 1.00 of November 2006.

File EVD120_user_manual_eng_v1.00.pdf.

PT.

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MODBUS/JBUS IMPLEMENTATION TABLE

Applied to the following products:

EVD120

File name: ModBUS_PRJ314AA06_v1.02.pdf

Version: 1.02

Date of release: 12^{h} December 2006

1 INTRODUCTION

This document describes the resources of the device that can be accessed via the serial port. The protocol is MODBUS RTU/JBUS.

2 LIST OF DEVICES

This document applys to :

Device Name/Family	Notes
EVD120M7	

3 ADDRESSING CONVENTIONS

Please note that according to MODBUS specs:

- the first register is called register 1
- register x must be read ad address x-1

According to JBUS:

- the first register is called register 0
- register x must be read ad address x

The JBUS convention (zero based) has been used in this document, addresses are shown in hexadecimal with the leading symbol $.

4 IMPLEMENTED MODBUS FUNCTION CODES

Command	Function Code	Notes
READ HOLDING REGISTERS	$03	Maximum 30 registers at once
WRITE SINGLE REGISTER	$06	
WRITE MULTIPLE HR	$10	Maximum 30 registers at once
READ AND WRITE MULTIPLE HR	$17	Maximum 30 registers at once

Holding register addresses table:

Description		Address (zero based)	Access	Notes
DIGITAL INPUTS				
	Digital inputs register	$0101	R	Bit0 = Digital input 1 Bit1= Digital input 2
PROBES				
	Probe 1 (1)	$0201	R	1 decimal digit
	Probe 2 (1)	$0202	R	1 decimal digit

(1) Probes

Reserved Value	Meaning
$8000	Probe failure
$8001	Data not available

Description	Address (zero based)	Access	Notes
PARAMETERS			
Meas. unit (0 = Celsius, 1 = Fahrenheit)	$0601	R/W	
Modbus nodes address	$0610	R/W	
Baud Rate	$0611	R/W	
Parity	$0612	R/W	
Enable Auto-incremental address	$0613	R/W	
Kind of digital input 1 (0 = NO, 1 = NC)	$061F	R/W	msk $0001 = digital In 1 msk $0002 = digital In 2
Probe 1 configuration	$0620	R/W	bit0 = Enable bit1..3 = reserved bit4..7 = Digital filter (2) bit8..11 = probe kind (3) bit12..15 = reserved
Probe 1 offset	$0621	R/W	Default 0
Min range of linear input 1 (corresponding to 0/4 mA or 0/2 V)	$0622	R/W	Default 0
Max range of linear input 1 (corresponding to 20 mA or 10 V)	$0623	R/W	Defailt 1000
Kind of saturation of linear input 1	$0624	R/W	0 = no saturation 1 = saturation on min and max range of linear input 1 2 = saturation on 0, 1000 3 = saturation on 0, 10000
Probe 2 configuration	$0630	R/W	bit0 = Enable bit1..3 = reserved bit4..7 = Digital filter (2) bit8..11 = probe kind (3) bit12..15 = reserved
Probe 2 offset	$0631	R/W	Default 0
Min range of linear input 2 (corresponding to 0/4 mA or 0/2 V)	$0632	R/W	Default 0

	Max range of linear input 2 (corresponding to 20 mA or 10 V)	$0633	R/W	Default 1000
	Kind of saturation of linear input 2	$0634	R/W	0 = no saturation 1 = saturation on min and max range of linear input 2 2 = saturation on 0, 1000 3 = saturation on 0, 10000
INFO				
	Firmware ID	$FF08	R	
	Firmware Variation/revision	$FF09	R	

(2) Digital filter: 3 is the default value.

(3) Probe kind

Value	Meaning
0	PTC
1	NTC
2	TC J
3	TC K
4	Reserved
5	Pt 100 3 wires
6	Pt 100 2 wires
7	Rerserved
8	Rerserved
9	Pt 1000 3 wires
10	Pt 1000 3 wires
11	4-20 mA
12	0-20 mA
13	2-10 V
14	0-10 V

PAY ATTENTION:

ALL THE ADDRESSES NOT MENTIONED EXPRESSLY IN THIS DOCUMENT MUST BE CONSIDERED RESERVED. IF YOU DO NOT RESPECT THIS CONDITION, YOU COULD ALTER THE OPERATION OF THE INSTRUMENT.

ULTERIORI HOLDING REGISTER PER USO INTERNO

FOTOGRAFIA SULLO STATO DELLO STRUMENTO:

Tramite questi Holding Register è possibile eseguire una fotografia statica sul funzionamento dello strumento; in tale fotografia vengono riportati i valori misurati dalle sonde, il minimo e il massimo assunto da entrambe dal momento del precedente rinfresco, all'attuale lettura, lo stato degli ingressi digitali e degli allarmi, la traccia di una loro eventuale attivazione o disattivazione precedente.
E' possibile inoltre monitorare una eventuale informazione aggiuntiva da rilevare, tramite il cosiddetto "variation register": tale holding register contiene una serie di flag che vengono alzati nel momento in cuivi è una qualunque variazione sul funzionamento dello strumento (per esempio se i parametri non vengono mai modificato non ha senso perdere tempo a monitorarli tutti: è più comodo leggere di continuo un flag che monitorizza una loro possibile modifica).

Description	Address (zero based)	Access	Notes
PARAMETERS			
Kind of list	$0500	R	
Variation register 1	$0501	R/W	(*) Reading this holding register, memory will be update.
Other flags	$0502	R/W	
Current probe 1 value	$0503	R	
Current probe 2 value	$0504	R	
Probe 1 value memory	$0505	R	
Probe 2 value memory	$0506	R	
Min probe 1 value	$0507	R	
Max probe 1 value	$0508	R	
Min probe 2 value	$0509	R	
Max probe 2 value	$050A	R	
Current digital inputs	$050B	R	msk $0001: current digital input 1 msk $0002: current digital input 2
Digital inputs memory	$050C	R	msk $0001: digital input 1 msk $0002: digital input 2
Digital input memory min max	$050D	R	msk $0001: memo digital input 1 max msk $0002: memo digital input 2 max msk $0100: memo digital input 1 min msk $0200: memo digital input 2 min
Current status of alarm	$050E	R	msk $0001: current probe failure 1 msk $0002: current probe failure 2 msk $0004: current calibration error

	Alarm memory	$050F	R	msk $0001: probe failure 1 msk $0002: probe failure 2 msk $0004: calibration error
	Alarm memory min max	$0510	R	msk $0001: probe failure 1 max msk $0002: probe failure 2 max msk $0004: calibration error max msk $0100: probe failure 1 max msk $0200: probe failure 2 max msk $0400: calibration error max
	Periodical request counter init	$0511	R/W	Time for periodical request counter; this value will be adjust with a random time between 0 and 7.
	Cold junction current value (in °C)	$0512	R	
	UNUSED 1	$0513	R	
	UNUSED 2	$0514	R	
	UNUSED 3	$0515	R	
	Photo counter	$0516	R	
	Refresh counter	$0517	R	when this counter become null, instrument's status memory will be updated. Reading this holding register, memory will be update.
	UNUSED 4	$0518	R	
	UNUSED 5	$0519	R	
	UNUSED 6	$051A	R	
	UNUSED 7	$051B	R	
	UNUSED 8	$051C	R	
	Periodical request counter	$051D	R/W	Counter for periodical request; when this counter become null, bit 4 in the variation register become 1.
	Refresh status memory command	$0480	W	write 1 to refresh status memory; writing 1, status memory will be updated.

(*)

bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0

bit0, bit1: allways 0;

bit2, bit3: reserved;

bit4: periodical request by timer;

bit5: some variation occurred;

bit6: reset occurred;

bit7: internal status changed

bit8: alarm status changed

bit9: analogical input changed

bit10: digital input changed

bit11: analogical output changed

bit12: digital input changed

bit13: parameters value changed

bit14:set point or other internal settings changed

bit 15: reserved