eco-420/ETH

4.. 20mA

ETHERNET

24V

4/20mA TO ETHERNET/IP CONVERTER
MODBUS TCP

- ☐ MODBUS TCP NETWORK
- ☐ TCP SERVER, UDP, MQTT protocols, etc.
- ☐ Integrated web page function for IP address and parameter configuration.

Connect any 4/20mA sensor (active or passive) to the Ethernet network, to monitor it from anywhere in the world.

APLICATIONS

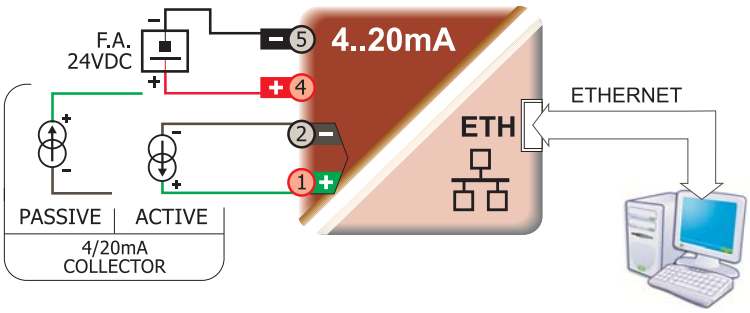
- ☐ Signal measurement for report generation.
- ☐ IoT and Ethernet data acquisition and logging.
- ☐ Isolation of industrial signals over long distances, with safety and reliability.

Rmberg®

MODBUS TCP

EtherNet/IP™

CONNECTION



calibration with generator standard 4/20mA

START OF SCALE

Input 4mA.
Send $01 {"calibrationCH0":0} ---
This will memorize the start of the scale.

END OF SCALE

Input 20mA.
Send $01 {"calibrationCH0":1} ---
It will memorize the end-of-scale reading.

technical characteristics

INPUT

Analogic	**4/20mA** (Passive / Active)
Input impedance	**150Ω**
Protected against overcurrents and transient overvoltages	
Bandwidth	**-3dB 10Hz**

ETHERNET

Protocols	**Modbus TCP** **TCP socket character** **MQTT**
Common rejection mode (CMR)	**120dB (1KΩ)**
Conector interface	**RJ45**
2 status indicators:	
Communication: green ● // Data: yellow ●	
Send/receive cache	**2K**
Response time	**<10msec**

CONFIGURATION

Integrated web page function
IP address, subnet mask, calibration, etc.
Non-volatile **EEPROM** memory
Factory reset **(push button > 3 sec)**

POWER SUPPLY

Power	**24VDC**
Margin	**8.. 32V**
Potency	**3W**
Polarity protection	

ENVIRONMENTAL

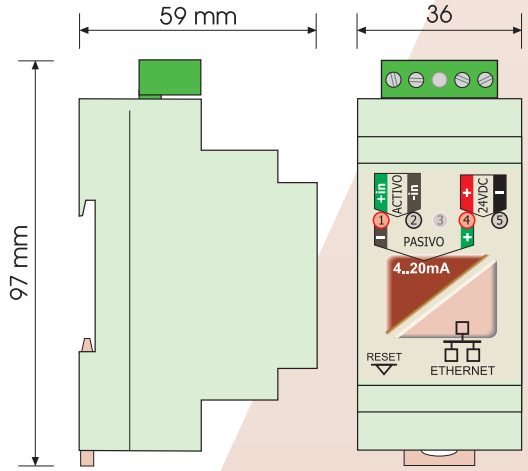
Operating temperature	**-45/+80ºC**
Maximum humidity	**90HR%**

CE

EMC 2014/30/EU (Electromagnetic Compatibility)
DBT 2014/35/EU (Low Voltage Directive) for industrial environments.
Immunity to interference according to EN 61000-6-2.
Emission of disturbances according to EN 61000-6-3.
Installation Category II. Pollution degree 2 EN 61010-1.

PRECISIÓN

Precission	**0,05%**
Resolution A/D	**16 bits**
Conversion speed	**16 samples/sec**
Configurable from	**2 to 100 samples/sec**



FORMAT

IP20 protection
Flammability class **Vo** according to **UL94**
Ergonomic housing. Quick mounting via EN50022 rail.
Material: Polyamide **PA6.6**
Connection:
Analog: screw-in terminals
Connection cable: **≤ 2,5mm², 12AWG 250V/12A**
Network connection: **RJ45 Ethernet**
Weight: **70 g**

CHARACTER COMMUNICATION PROTOCOL

Under working modes such as TCP Server, TCP Client, UDP Mode, Web Socket, etc.:

After a successful connection, commands can be sent and data can be received.

1. Read data command

Send: # 01 (If timed automatic reporting is set, there is no need to send commands, the module will report data at regular intervals)

Reply: {"devName": "98CDAC3FA407", "time": 43545, "ADC": [0], "overrange": [0], actual data": [0]}

Format Description:

The module name 'devName' can be modified on the webpage as needed

The internal time of the 'time' module, measured in mS.

The AD conversion data collected by the ADC module ranges from 0 to 32767. 0=zero point; 32767=full degree.

For example, 4-20mA input: 0=4mA; 32767=20mA; Users can also directly use the converted engineering values.

OverRanger "0 indicates normal, 1 indicates input signal below zero, and 2 indicates input signal above full scale.

The 'practicalData' data is a value obtained by converting the zero point and fullness set by the user on the webpage. Generally, this value can be directly used for general applications.

No need to process the data in the ADC.

You can also read a single set of data:

#01>ADC reply: {"ADC": [32767]}

#01>actual data reply: {"actual data": [20000]}

#01>OverRanger reply: {"overRanger": [0]}

2. Set range

Send: $01 {"range": [0,20]}

Reply:! 01 (cr) indicates successful setting? 01 (cr) indicates a command error

3. Read configuration commands

The configuration parameters of the reading module can also be viewed directly on the webpage.

Send: % 01ReadConfig

Reply: {"version": "V1.0", "rangeStart": 4.000000, "rangeEnd": 20.000000, "dataRate": 1, "setIP": 1, "mac": "EE: 86: B0:52:7F:12", "ipAddress": "192.168.0.7", "gateway": "192.168.0.1", "netmask": "255.255.255.0", "work mode": 0, "localPort": 23, "remoteServerIP": "192.168.0.160", "remotePort": 23, "setQuickUp": 0, "sendTime": 0, "devName": EE86B0527F12 "," setMQTT ": 0," mqttHostURL ":" broker. emqx. io "," contentId ":" EE86B0527F12 "," username ":" "," passwd ":" "," topic ":"/wayjun/sub "," port ": 1883," pubTime ": 1000," subtopic ":"/wayjun/sub "}

4. Set configuration commands

The configuration parameters of the module can also be set directly on the webpage. You can set all or some parameters, and the module will automatically restart after setting.

send out:

%01WriteConfig{"version":"V1.0","rangeStart":4.000000,"rangeEnd":20.000000,"dataRate":1,"setIP":1,"mac":"EE:86:B0:52:7F:12","ipAddress":"192.168.0.7","gateway":"192.168.0.1","netmask":"255.255.255.0","workmode":0,"localPort":23,"remoteServerIp":"192.168.0.160","remotePort":23,"setQuickUp":0,"sendTime":0,"devName":"EE86B0527F12","setMQTT":0,"mqttHostUrl":"broker.emqx.io","clientId":"EE86B0527F12","username":"","passwd":"","topic":"/wayjun/pub","port":1883,"pubTime":1000,"subtopic":"/wayjun/sub"}

You can also set only a single parameter, such as modifying IP:% 01WriteConfig {"ipAddress": "192.168.0.7"}

Reply:! 01 (cr) indicates successful setting? 01 (cr) indicates a command error

Description of supported function codes

03 (0x03) Read hold register

In a remote device, use this function code to read the contents of consecutive blocks in the hold register. The request PDU specifies the starting register address and the number of registers. Address registers from scratch. Therefore, addressing registers 1-16 are 0-15. In the response message, each register has two bytes, with the first byte being the data high bit and the second byte being the data low bit.

Example of function code 03, read input analog quantity, register address 40001:

request			response		
Field Name		hexadecimal	Field Name		hexadecimal
MBAP message header	Transmission identification	01	MBAP message header	Transmission identification	01
		00			00
	Protocol Logo	00		Protocol Logo	00
		00			00
	length	00		length	00
		06			05
	Unit identifier	01		Unit identifier	01
Function code		03	Function code		03
Starting address Hi		00	Byte count		02
Starting address Lo		00	Register value Hi (0x00)		00
Register number Hi		00	Register value Lo (DI7-DI0)		00
Register number Lo		01			

Register address description

Supports registers with function code 03.

Address 4X (PLC)	Address (PC, DCS)	Data content	attribute	Data Explanation
40001	0	Input analog quantity	read-only	Signed integer, AD converted value. 0x0000=zero point; 0x7FFF=Full Degree For example, 4-20mA: 0x0000=4mA; 0x7FFF=20mA;
40002	one	Is it out of range	read-only	Signed integer, 0 represents normal, 1 represents input signal below zero, and 2 represents input signal above full scale.
40003~40004	2~3	Actual engineering value	read-only	The data is a 32-bit floating-point number stored in CDAB order. It is a value obtained by converting the zero point and fullness set by the user on the webpage. For example, if the input signal is 4-20mA, representing a temperature of -20~100 degrees, the zero point can be set to -20 and the full degree can be set to 100. After the setting is completed, the actual engineering value read out is the actual temperature value. Generally, this value can be directly used for general applications. No need to process the data in the 40001 register. Note that some PLCs require swapping of high 16 and low 16 bit SWAPs to read data.
40211	210	Module Name	read-only	High bit: 0x01 Low bit: 0x81