

USER MANUAL

**I/O SERIES R-E
I/O SERIES ZE-E
WITH PROTOCOL
ETHERNET/IP™**



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1. INTRODUCTION



WARNING!

This user manual extends the information in the installation manual regarding device configuration.
Refer to the installation manual for further information.



WARNING!

In any case, SENECA s.r.l. or its suppliers shall not be liable for loss of data/revenue or for consequential or incidental damages due to negligence or incorrect/improper management of the device, even if SENECA is well aware of such possible damages.

SENECA, its subsidiaries, affiliates, group companies, suppliers and resellers do not guarantee that the functions will fully meet the customer's expectations or that the device, firmware and software will be error-free or operate continuously.

2. FLEX TECHNOLOGY FOR PROTOCOL SWITCHING



Flex makes it possible to freely change the combination of industrial communication protocols supported by the devices, choosing from a list of available options; development is continuously updated, so for an exhaustive list please refer to the page:

<https://www.seneca.it/flex/>

Some examples of supported protocols are:



The device thus becomes “universal” and compatible with Siemens[™] or Rockwell[™] or Schneider[™] etc. systems...without the need to purchase different hardware.

3. ETHERNET/IP COMMUNICATION PROTOCOL

EtherNet/IP (Ethernet Industrial Protocol) is an open fieldbus based on CIP (Common Industrial Protocol), developed by Rockwell Automation™ and ODVA™ (Open DeviceNet Vendor Association).

In the EtherNet/IP context, the device operates as: EtherNet/IP Adapter

The device accepts connections from an EtherNet/IP Scanner, typically a PLC, an industrial controller, an HMI, or a compatible SCADA system. The scanner can access the device's data via explicit messaging and/or cyclic I/O connections.

4. SERIES R-E DEVICES

The Series R I/O modules are devices designed for flexible wiring requirements, reduced installation space, and high I/O density applications with Ethernet/IP communication.

The devices equipped with two Ethernet ports can be connected in daisy-chain mode (without the use of an external switch) and support fault-bypass mode to ensure the Ethernet connection is maintained even if a module in the chain fails.

4.1. R-32DIDO-E

The device allows the use of 32 digital channels that can be individually configured as input or output. When a digital channel is configured as an input, a 32-bit counter with a value saved in non-volatile memory is also associated with it.

CODE	ETHERNET PORT
R-32DIDO-2-E	2 PORTS 10/100 Mbit (Switch mode)

4.1.1. DIGITAL OUTPUT PROTECTION

The outputs are protected against overload and over-temperature; they cyclically open until the fault is repaired or the output is opened.

The current limit is between 0.6 and 1.2 A.

4.1.2. DIGITAL COUNTER ACQUISITION TIME

The fastest acquisition time for the digital counters is 1 ms

4.1.3. DATA PRODUCED T->O (DEVICE -> SCANNER)

DATA	MEANING	DATA TYPE	BYTE OFFSET
DIN1	Value of digital input 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] LSB
DIN2	Value of digital input 2	BIT	BYTE[0] BIT[1]
DIN3	Value of digital input 3	BIT	BYTE[0] BIT[2]
DIN4	Value of digital input 4	BIT	BYTE[0] BIT[3]
DIN5	Value of digital input 5	BIT	BYTE[0] BIT[4]
DIN6	Value of digital input 6	BIT	BYTE[0] BIT[5]
DIN7	Value of digital input 7	BIT	BYTE[0] BIT[6]
DIN8	Value of digital input 8	BIT	BYTE[0] BIT[7] MSB

DIN9	Value of digital input 9	BIT	BYTE[1] BIT[0] LSB
DIN10	Value of digital input 10	BIT	BYTE[1] BIT[1]
DIN11	Value of digital input 11	BIT	BYTE[1] BIT[2]
DIN12	Value of digital input 12	BIT	BYTE[1] BIT[3]
DIN13	Value of digital input 13	BIT	BYTE[1] BIT[4]
DIN14	Value of digital input 14	BIT	BYTE[1] BIT[5]
DIN15	Value of digital input 15	BIT	BYTE[1] BIT[6]
DIN16	Value of digital input 16	BIT	BYTE[1] BIT[7] MSB
DIN17	Value of digital input 17	BIT	BYTE[2] BIT[0] LSB
DIN18	Value of digital input 18	BIT	BYTE[2] BIT[1]
DIN19	Value of digital input 19	BIT	BYTE[2] BIT[2]
DIN20	Value of digital input 20	BIT	BYTE[2] BIT[3]
DIN21	Value of digital input 21	BIT	BYTE[2] BIT[4]
DIN22	Value of digital input 22	BIT	BYTE[2] BIT[5]
DIN23	Value of digital input 23	BIT	BYTE[2] BIT[6]
DIN24	Value of digital input 24	BIT	BYTE[2] BIT[7] MSB
DIN25	Value of digital input 25	BIT	BYTE[3] BIT[0] LSB
DIN26	Value of digital input 26	BIT	BYTE[3] BIT[1]
DIN27	Value of digital input 27	BIT	BYTE[3] BIT[2]
DIN28	Value of digital input 28	BIT	BYTE[3] BIT[3]
DIN29	Value of digital input 29	BIT	BYTE[3] BIT[4]
DIN30	Value of digital input 30	BIT	BYTE[3] BIT[5]
DIN31	Value of digital input 31	BIT	BYTE[3] BIT[6]
DIN32	Value of digital input 32	BIT	BYTE[3] BIT[7] MSB
COUNT1	Counter with FeRAM backup of digital input 1	Unsigned Integer 32 BIT	BYTE[4]...BYTE[7]
COUNT2	Counter with FeRAM backup of digital input 2	Unsigned Integer 32 BIT	BYTE[8]...BYTE[11]
COUNT3	Counter with FeRAM backup of digital input 3	Unsigned Integer 32 BIT	BYTE[12]...BYTE[15]
COUNT4	Counter with FeRAM backup of digital input 4	Unsigned Integer 32 BIT	BYTE[16]...BYTE[19]
COUNT5	Counter with FeRAM backup of digital input 5	Unsigned Integer 32 BIT	BYTE[20]...BYTE[23]
COUNT6	Counter with FeRAM backup of digital input 6	Unsigned Integer 32 BIT	BYTE[24]...BYTE[27]
COUNT7	Counter with FeRAM backup of digital input 7	Unsigned Integer 32 BIT	BYTE[28]...BYTE[31]
COUNT8	Counter with FeRAM backup of digital input 8	Unsigned Integer 32 BIT	BYTE[32]...BYTE[35]

COUNT9	Counter with FeRAM backup of digital input 8	Unsigned Integer 32 BIT	BYTE[36]...BYTE[39]
COUNT10	Counter with FeRAM backup of digital input 10	Unsigned Integer 32 BIT	BYTE[40]...BYTE[43]
COUNT11	Counter with FeRAM backup of digital input 11	Unsigned Integer 32 BIT	BYTE[44]...BYTE[47]
COUNT12	Counter with FeRAM backup of digital input 12	Unsigned Integer 32 BIT	BYTE[48]...BYTE[51]
COUNT13	Counter with FeRAM backup of digital input 13	Unsigned Integer 32 BIT	BYTE[52]...BYTE[55]
COUNT14	Counter with FeRAM backup of digital input 14	Unsigned Integer 32 BIT	BYTE[56]...BYTE[59]
COUNT15	Counter with FeRAM backup of digital input 15	Unsigned Integer 32 BIT	BYTE[60]...BYTE[63]
COUNT16	Counter with FeRAM backup of digital input 16	Unsigned Integer 32 BIT	BYTE[64]...BYTE[67]
COUNT17	Counter with FeRAM backup of digital input 17	Unsigned Integer 32 BIT	BYTE[68]...BYTE[71]
COUNT18	Counter with FeRAM backup of digital input 18	Unsigned Integer 32 BIT	BYTE[72]...BYTE[75]
COUNT19	Counter with FeRAM backup of digital input 19	Unsigned Integer 32 BIT	BYTE[76]...BYTE[79]
COUNT20	Counter with FeRAM backup of digital input 20	Unsigned Integer 32 BIT	BYTE[80]...BYTE[83]
COUNT21	Counter with FeRAM backup of digital input 21	Unsigned Integer 32 BIT	BYTE[84]...BYTE[87]
COUNT22	Counter with FeRAM backup of digital input 22	Unsigned Integer 32 BIT	BYTE[88]...BYTE[91]
COUNT23	Counter with FeRAM backup of digital input 23	Unsigned Integer 32 BIT	BYTE[92]...BYTE[95]
COUNT24	Counter with FeRAM backup of digital input 24	Unsigned Integer 32 BIT	BYTE[96]...BYTE[99]
COUNT25	Counter with FeRAM backup of digital input 25	Unsigned Integer 32 BIT	BYTE[100]...BYTE[103]
COUNT26	Counter with FeRAM backup of digital input 26	Unsigned Integer 32 BIT	BYTE[104]...BYTE[107]
COUNT27	Counter with FeRAM backup of digital input 27	Unsigned Integer 32 BIT	BYTE[108]...BYTE[111]
COUNT28	Counter with FeRAM backup of digital input 28	Unsigned Integer 32 BIT	BYTE[112]...BYTE[115]

COUNT29	Counter with FeRAM backup of digital input 29	Unsigned Integer 32 BIT	BYTE[116]...BYTE[119]
COUNT30	Counter with FeRAM backup of digital input 30	Unsigned Integer 32 BIT	BYTE[120]...BYTE[123]
COUNT31	Counter with FeRAM backup of digital input 31	Unsigned Integer 32 BIT	BYTE[124]..BYTE[127]
COUNT32	Counter with FeRAM backup of digital input 32	Unsigned Integer 32 BIT	BYTE[128]..BYTE[131]
FREQUENCY 1 [Hz]	Value of the frequency in [Hz] of the signal at input 1	REAL 32 BIT	BYTE[132]...BYTE[135]
FREQUENCY 2 [Hz]	Value of the frequency in [Hz] of the signal at input 2	REAL 32 BIT	BYTE[136]...BYTE[139]
FREQUENCY 3 [Hz]	Value of the frequency in [Hz] of the signal at input 3	REAL 32 BIT	BYTE[140]...BYTE[143]
FREQUENCY 4 [Hz]	Value of the frequency in [Hz] of the signal at input 4	REAL 32 BIT	BYTE[144]...BYTE[147]
FREQUENCY 5 [Hz]	Value of the frequency in [Hz] of the signal at input 5	REAL 32 BIT	BYTE[148]...BYTE[151]
FREQUENCY 6 [Hz]	Value of the frequency in [Hz] of the signal at input 6	REAL 32 BIT	BYTE[152]...BYTE[155]
FREQUENCY 7 [Hz]	Value of the frequency in [Hz] of the signal at input 7	REAL 32 BIT	BYTE[156]...BYTE[159]
FREQUENCY 8 [Hz]	Value of the frequency in [Hz] of the signal at input 8	REAL 32 BIT	BYTE[160]...BYTE[163]
FREQUENCY 9 [Hz]	Value of the frequency in [Hz] of the signal at input 9	REAL 32 BIT	BYTE[164]...BYTE[167]
FREQUENCY 10 [Hz]	Value of the frequency in [Hz] of the signal at input 10	REAL 32 BIT	BYTE[168]...BYTE[171]
FREQUENCY 11 [Hz]	Value of the frequency in [Hz] of the signal at input 11	REAL 32 BIT	BYTE[172]...BYTE[175]

FREQUENCY 12 [Hz]	Value of the frequency in [Hz] of the signal at input 12	REAL 32 BIT	BYTE[176]...BYTE[179]
FREQUENCY 13 [Hz]	Value of the frequency in [Hz] of the signal at input 13	REAL 32 BIT	BYTE[180]...BYTE[183]
FREQUENCY 14 [Hz]	Value of the frequency in [Hz] of the signal at input 14	REAL 32 BIT	BYTE[184]...BYTE[187]
FREQUENCY 15 [Hz]	Value of the frequency in [Hz] of the signal at input 15	REAL 32 BIT	BYTE[188]...BYTE[191]
FREQUENCY 16 [Hz]	Value of the frequency in [Hz] of the signal at input 16	REAL 32 BIT	BYTE[192]...BYTE[195]
FREQUENCY 17 [Hz]	Value of the frequency in [Hz] of the signal at input 17	REAL 32 BIT	BYTE[196]...BYTE[199]
FREQUENCY 18 [Hz]	Value of the frequency in [Hz] of the signal at input 18	REAL 32 BIT	BYTE[200]...BYTE[203]
FREQUENCY 19 [Hz]	Value of the frequency in [Hz] of the signal at input 19	REAL 32 BIT	BYTE[204]...BYTE[207]
FREQUENCY 20 [Hz]	Value of the frequency in [Hz] of the signal at input 20	REAL 32 BIT	BYTE[208]...BYTE[211]
FREQUENCY 21 [Hz]	Value of the frequency in [Hz] of the signal at input 21	REAL 32 BIT	BYTE[212]...BYTE[215]
FREQUENCY 22 [Hz]	Value of the frequency in [Hz] of the signal at input 22	REAL 32 BIT	BYTE[216]...BYTE[219]
FREQUENCY 23 [Hz]	Value of the frequency in [Hz] of the signal at input 23	REAL 32 BIT	BYTE[220]...BYTE[223]
FREQUENCY 24 [Hz]	Value of the frequency in [Hz] of the signal at input 24	REAL 32 BIT	BYTE[224]...BYTE[227]

FREQUENCY 25 [Hz]	Value of the frequency in [Hz] of the signal at input 25	REAL 32 BIT	BYTE[228]...BYTE[231]
FREQUENCY 26 [Hz]	Value of the frequency in [Hz] of the signal at input 26	REAL 32 BIT	BYTE[232]...BYTE[235]
FREQUENCY 27 [Hz]	Value of the frequency in [Hz] of the signal at input 27	REAL 32 BIT	BYTE[236]...BYTE[239]
FREQUENCY 28 [Hz]	Value of the frequency in [Hz] of the signal at input 28	REAL 32 BIT	BYTE[240]...BYTE[243]
FREQUENCY 29 [Hz]	Value of the frequency in [Hz] of the signal at input 29	REAL 32 BIT	BYTE[244]...BYTE[247]
FREQUENCY 30 [Hz]	Value of the frequency in [Hz] of the signal at input 30	REAL 32 BIT	BYTE[248]...BYTE[251]
FREQUENCY 31 [Hz]	Value of the frequency in [Hz] of the signal at input 31	REAL 32 BIT	BYTE[252]...BYTE[255]
FREQUENCY 32 [Hz]	Value of the frequency in [Hz] of the signal at input 1	REAL 32 BIT	BYTE[256]...BYTE[259]
FLAGS	Flags: Bit 0: Fault state Bit 7: External Power	Unsigned integer 16 BIT	BYTE[260]...BYTE[261]

4.1.4. DATA CONSUMED O->T (SCANNER -> DEVICE)

DATA	MEANING	DATA TYPE	BYTE OFFSET
DOUT1	Value of digital output 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] LSB
DOUT2	Value of digital output 2	BIT	BYTE[0] BIT[1]
DOUT3	Value of digital output 3	BIT	BYTE[0] BIT[2]
DOUT4	Value of digital output 4	BIT	BYTE[0] BIT[3]
DOUT5	Value of digital output 5	BIT	BYTE[0] BIT[4]
DOUT6	Value of digital output 6	BIT	BYTE[0] BIT[5]
DOUT7	Value of digital output 7	BIT	BYTE[0] BIT[6]
DOUT8	Value of digital output 8	BIT	BYTE[0] BIT[7] MSB

DOUT9	Value of digital output 9	BIT	BYTE[1] BIT[0] LSB
DOUT10	Value of digital output 10	BIT	BYTE[1] BIT[1]
DOUT11	Value of digital output 11	BIT	BYTE[1] BIT[2]
DOUT12	Value of digital output 12	BIT	BYTE[1] BIT[3]
DOUT13	Value of digital output 13	BIT	BYTE[1] BIT[4]
DOUT14	Value of digital output 14	BIT	BYTE[1] BIT[5]
DOUT15	Value of digital output 15	BIT	BYTE[1] BIT[6]
DOUT16	Value of digital output 16	BIT	BYTE[1] BIT[7] MSB
DOUT17	Value of digital output 17	BIT	BYTE[2] BIT[0] LSB
DOUT18	Value of digital output 18	BIT	BYTE[2] BIT[1]
DOUT19	Value of digital output 19	BIT	BYTE[2] BIT[2]
DOUT20	Value of digital output 20	BIT	BYTE[2] BIT[3]
DOUT21	Value of digital output 21	BIT	BYTE[2] BIT[4]
DOUT22	Value of digital output 22	BIT	BYTE[2] BIT[5]
DOUT23	Value of digital output 23	BIT	BYTE[2] BIT[6]
DOUT24	Value of digital output 24	BIT	BYTE[2] BIT[7] MSB
DOUT25	Value of digital output 25	BIT	BYTE[3] BIT[0] LSB
DOUT26	Value of digital output 26	BIT	BYTE[3] BIT[1]
DOUT27	Value of digital output 27	BIT	BYTE[3] BIT[2]
DOUT28	Value of digital output 28	BIT	BYTE[3] BIT[3]
DOUT29	Value of digital output 29	BIT	BYTE[3] BIT[4]
DOUT30	Value of digital output 30	BIT	BYTE[3] BIT[5]
DOUT31	Value of digital output 31	BIT	BYTE[3] BIT[6]
DOUT32	Value of digital output 32	BIT	BYTE[3] BIT[7] MSB
CMD	Command: 0x0001: resets all counters. 0x0010-0x002F: sets counter to value. CMD_AUX (0x0010 counter 1,...).	Unsigned integer 16 BIT	BYTE[4]...BYTE[5]
CMD_AUX	Command Parameter	Unsigned Integer 32 BIT	BYTE[8]...BYTE[11]

4.1.5. CONNECTION STRING (CONNECTION PATH)

Depending on the configurator, it is possible to enter connection data instead of using the EDS file; in this case the Connection Path is:

20 04 24 00 2C 96 2C 64

CIP interpretation:

20 04 = Class 0x04, Assembly Object

24 00 = Instance 0

2C 96 = Connection Point 0x96 = 150 decimal = O→T / Consuming Assembly

2C 64 = Connection Point 0x64 = 100 decimal = T→O / Producing Assembly

O→T = 12 bytes Assembly 150

T→O = 262 bytes Assembly 100

N.B. these values are valid if the RUN/IDLE headers are disabled in SETUP:

ETHERIP O->T RUN/IDLE HEADER	Disabled	Disabled ▼
ETHERIP T->O RUN/IDLE HEADER	Disabled	Disabled ▼

If they are enabled, 4 bytes must be added to O->T and T->O.

4.2. **R-8AI-8DIDO-E**

The device allows the use of 8 analog input channels and 8 digital channels individually configurable as input or output. Up to 8 32-bit digital counters with non-volatile memory backup are also available.

CODE	ETHERNET PORT
R-8AI-8DIDO-2-E	2 PORTS 10/100 Mbit (Switch mode)

4.2.1. **ANALOG INPUT UPDATE TIME**

The sampling time is configurable from 25 ms to 400 ms for each channel, specifically:

CHANNEL SAMPLING TIME
25 ms
50 ms
100 ms
200 ms
400 ms

To calculate the update time of a channel's value, consider the following example:

By enabling 8 channels and setting the same sampling time of 25 ms, an input is updated every: $25 \times 8 = 200$ ms.

Note (only if thermocouple channels are enabled):

In the case of a thermocouple input, a Burnout check is performed every 10 seconds.

The duration of this check takes 25ms on each enabled thermocouple channel.

For example, with 3 active thermocouples, every 10 seconds the following time is used:

$25\text{ms} \times 3 \text{ channels} = 75 \text{ ms}$ for Burnout evaluation.

4.2.2. DIGITAL INPUT/OUTPUT UPDATE TIME

The update time of the 8 inputs / digital outputs is 2ms (when Fast counter mode is enabled).

4.2.3. DIGITAL COUNTER ACQUISITION TIME

The fastest acquisition time for the digital counters is 2 ms (when Fast counter mode is enabled).



WARNING!

TO OBTAIN MAXIMUM PERFORMANCE ON THE DIGITAL COUNTERS, ENABLE THE “FAST COUNTER” PARAMETER AND DISABLE THE WEBSERVER VIA DIP SWITCH.

4.2.4. DIGITAL OUTPUT PROTECTION

The outputs are protected against overload and over-temperature; they cyclically open until the fault is repaired or the output is opened.

The current limit is between 0.6 and 1.2 A.

4.2.5. MEASUREMENT INPUT IMPEDANCE

For inputs configured in mV or Thermocouple, the impedance is on the order of 100 MOhm; for the 30 V inputs it is approximately 200 KOhm.

4.2.6. DATA PRODUCED T->O (DEVICE -> SCANNER)

DATA	MEANING	DATA TYPE	BYTE OFFSET
DIN1	Value of digital input 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] LSB
DIN2	Value of digital input 2	BIT	BYTE[0] BIT[1]
DIN3	Value of digital input 3	BIT	BYTE[0] BIT[2]
DIN4	Value of digital input 4	BIT	BYTE[0] BIT[3]
DIN5	Value of digital input 5	BIT	BYTE[0] BIT[4]
DIN6	Value of digital input 6	BIT	BYTE[0] BIT[5]
DIN7	Value of digital input 7	BIT	BYTE[0] BIT[6]
DIN8	Value of digital input 8	BIT	BYTE[0] BIT[7] MSB
NOT USED	Not used	BYTE	BYTE[1]..BYTE[3]
COUNT1	Counter with FeRAM backup of digital input 1	Unsigned Integer 32 BIT	BYTE[4]...BYTE[7]

COUNT2	Counter with FeRAM backup of digital input 2	Unsigned Integer 32 BIT	BYTE[8]...BYTE[11]
COUNT3	Counter with FeRAM backup of digital input 3	Unsigned Integer 32 BIT	BYTE[12]...BYTE[15]
COUNT4	Counter with FeRAM backup of digital input 4	Unsigned Integer 32 BIT	BYTE[16]...BYTE[19]
COUNT5	Counter with FeRAM backup of digital input 5	Unsigned Integer 32 BIT	BYTE[20]...BYTE[23]
COUNT6	Counter with FeRAM backup of digital input 6	Unsigned Integer 32 BIT	BYTE[24]...BYTE[27]
COUNT7	Counter with FeRAM backup of digital input 7	Unsigned Integer 32 BIT	BYTE[28]...BYTE[31]
COUNT8	Counter with FeRAM backup of digital input 8	Unsigned Integer 32 BIT	BYTE[32]...BYTE[35]
FREQUENCY 1 [Hz]	Value of the frequency in [Hz] of the signal at input 1	REAL 32 BIT	BYTE[36]...BYTE[39]
FREQUENCY 2 [Hz]	Value of the frequency in [Hz] of the signal at input 2	REAL 32 BIT	BYTE[40]...BYTE[43]
FREQUENCY 3 [Hz]	Value of the frequency in [Hz] of the signal at input 3	REAL 32 BIT	BYTE[44]...BYTE[47]
FREQUENCY 4 [Hz]	Value of the frequency in [Hz] of the signal at input 4	REAL 32 BIT	BYTE[48]...BYTE[51]
FREQUENCY 5 [Hz]	Value of the frequency in [Hz] of the signal at input 5	REAL 32 BIT	BYTE[52]...BYTE[55]
FREQUENCY 6 [Hz]	Value of the frequency in [Hz] of the signal at input 6	REAL 32 BIT	BYTE[56]...BYTE[59]
FREQUENCY 7 [Hz]	Value of the frequency in [Hz] of the signal at input 7	REAL 32 BIT	BYTE[60]...BYTE[63]
FREQUENCY 8 [Hz]	Value of the frequency in [Hz] of the signal at input 8	REAL 32 BIT	BYTE[64]...BYTE[67]
AIN 1	Analog Input 1	REAL 32 BIT	BYTE[68]...BYTE[71]
AIN 2	Analog Input 2	REAL 32 BIT	BYTE[72]...BYTE[75]
AIN 3	Analog Input 3	REAL 32 BIT	BYTE[76]...BYTE[79]

AIN 4	Analog Input 4	REAL 32 BIT	BYTE[80]...BYTE[83]
AIN 5	Analog Input 5	REAL 32 BIT	BYTE[84]...BYTE[87]
AIN 6	Analog Input 6	REAL 32 BIT	BYTE[88]...BYTE[91]
AIN 7	Analog Input 7	REAL 32 BIT	BYTE[92]...BYTE[95]
AIN 8	Analog Input 8	REAL 32 BIT	BYTE[96]...BYTE[99]
FLAGS1	Machine error signaling: Measurement errors Bit = 0 OK Bit = 1 FAIL Bit[15] CJ Err IN7&IN8 Bit[14]=CJ Err IN5&IN6 Bit[13]=CJ Err IN3&IN4 Bit[12]=CJ Err IN2&IN1 Bit[0]=GENERIC FAULT	Unsigned integer 16 BIT	BYTE[100]...BYTE[101]
FLAGS2	Machine error signaling: Measurement errors 2 Bit = 0 OK Bit = 1 FAIL Bit[15]=OVERFLOW IN8 Bit[14]=OVERFLOW IN7 Bit[13]=OVERFLOW IN6 Bit[12]=OVERFLOW IN5 Bit[11]=OVERFLOW IN4 Bit[10]=OVERFLOW IN3 Bit[9]=OVERFLOW IN2 Bit[8]=OVERFLOW IN1 Bit[7]=BURNOUT IN8 Bit[6]=BURNOUT IN7 Bit[5]=BURNOUT IN6 Bit[4]=BURNOUT IN5 Bit[3]=BURNOUT IN4 Bit[2]=BURNOUT IN3 Bit[1]=BURNOUT IN2 Bit[0]=BURNOUT IN1	Unsigned integer 16 BIT	BYTE[102]...BYTE[103]
FLAGS3	Machine error signaling:	Unsigned integer 16 BIT	BYTE[104]...BYTE[105]

	Configuration Dip switch Errors Bit = 0 OK Bit = 1 FAIL Bit[7]=DIP SWITCH ERR IN8 Bit[6]= DIP SWITCH ERR IN7 Bit[5]= DIP SWITCH ERR IN6 Bit[4]= DIP SWITCH ERR IN5 Bit[3]= DIP SWITCH ERR IN4 Bit[2]= DIP SWITCH ERR IN3 Bit[1]= DIP SWITCH ERR IN2 Bit[0]= DIP SWITCH ERR IN1		
NOT USED	Not used	BYTE	BYTE[106]..BYTE[107]
CJ1_2	CJ AIN1-2	REAL 32 BIT	BYTE[108]...BYTE[111]
CJ3_4	CJ AIN3-4	REAL 32 BIT	BYTE[112]...BYTE[115]
CJ5_6	CJ AIN5-6	REAL 32 BIT	BYTE[116]...BYTE[119]
CJ7_8	CJ AIN7-8	REAL 32 BIT	BYTE[120]...BYTE[123]

4.2.7. DATA CONSUMED O->T (SCANNER -> DEVICE)

DATA	MEANING	DATA TYPE	BYTE OFFSET
DOUT1	Value of digital output 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] LSB
DOUT2	Value of digital output 2	BIT	BYTE[0] BIT[1]
DOUT3	Value of digital output 3	BIT	BYTE[0] BIT[2]
DOUT4	Value of digital output 4	BIT	BYTE[0] BIT[3]
DOUT5	Value of digital output 5	BIT	BYTE[0] BIT[4]
DOUT6	Value of digital output 6	BIT	BYTE[0] BIT[5]
DOUT7	Value of digital output 7	BIT	BYTE[0] BIT[6]
DOUT8	Value of digital output 8	BIT	BYTE[0] BIT[7] MSB

NOT USED	Not used	BYTE	BYTE[1]
CMD	Command: 0x0001: resets all counters. 0x0010-0x0017: sets counter to value CMD_AUX (0x0010 counter 1,...)	Unsigned integer 16 BIT	BYTE[2]...BYTE[3]
CMD_AUX	Command Parameter	Unsigned Integer 32 BIT	BYTE[4]...BYTE[7]

4.2.8. CONNECTION STRING (CONNECTION PATH)

Depending on the configurator, it is possible to enter connection data instead of using the EDS file; in this case the Connection Path is:

20 04 24 00 2C 96 2C 64

CIP interpretation:

20 04 = Class 0x04, Assembly Object

24 00 = Instance 0

2C 96 = Connection Point 0x96 = 150 decimal = O→T / Consuming Assembly

2C 64 = Connection Point 0x64 = 100 decimal = T→O / Producing Assembly

O→T = 8 bytes Assembly 150

T→O = 124 bytes Assembly 100

N.B. these values are valid if the RUN/IDLE headers are disabled in SETUP:

ETHERIP O->T RUN/IDLE HEADER	Disabled	Disabled ▼
ETHERIP T->O RUN/IDLE HEADER	Disabled	Disabled ▼

If they are enabled, 4 bytes must be added to O->T and T->O.

4.3. R-SG3-E

R-SG3 is a converter for load cells (strain gauges). The measurement, carried out using the 4- or 6-wire technique, is available via the Modbus TCP-IP server and Modbus RTU slave protocols.

The device is equipped with a new noise filter specifically developed to achieve a fast response time. The device is also fully configurable via the webserver.

CODE	ETHERNET PORT
R-SG3-E	1 PORT 10/100 Mbit

4.3.1. CONNECTION TO THE LOAD CELL

The converter can be connected to the load cell in 4- or 6-wire mode. The 6-wire measurement is preferable for measurement accuracy.

Power to the load cell is supplied directly by the device.

4.3.2. CONNECTION TO THE 4- OR 6-WIRE LOAD CELL

A load cell can have a four-wire or six-wire cable. A six-wire cable, in addition to the +/- excitation and +/- signal lines, also has the +/- sense lines. It is a common misconception to think that the only difference between 4- and 6-wire load cells is the ability of the latter to measure the actual voltage at the load cell. A load cell is compensated to work within specifications over a certain temperature range (usually -10 to +40 °C). Since cable resistance is a function of temperature, the cable's response to temperature changes must be eliminated. The 4-wire cable is part of the load cell's temperature compensation system. The 4-wire load cell is calibrated and compensated with a certain length of cable connected. For this reason, the cable of a 4-wire load cell must never be cut. The cable of a 6-wire cell, on the other hand, is not part of the load cell's temperature compensation system. The sense lines are connected to the sense terminals of the R-SG3, to measure and regulate the actual voltage at the load cell. The advantage of using this "active" system is the ability to cut (or extend) the 6-wire load cell cable to any length. Note that a 6-wire load cell will not achieve the performance stated in the specifications unless the sense lines are used.

4.3.3. CHECKING LOAD CELL OPERATION

Before starting device configuration, the correctness of the wiring and the integrity of the load cell must be checked.

4.3.3.1. CHECKING WIRING WITH A DIGITAL MULTIMETER

First, using the load cell's manual, check that approximately 5V DC is present between the +Excitation and – Excitation wires. If the cell is 6-wire, check that the same voltage is also measured between +Sense and –Sense. Now leave the cell at rest (without tare) and check that the voltage between the +Signal and –Signal wires is around 0 V.

Now unbalance the cell by applying a compression force, checking that the voltage between the +Signal and - Signal wires increases until full scale is reached (if possible), where approximately the following will be measured:

$5 \times (\text{cell sensitivity}) \text{ mV}$.

For example, if the declared cell sensitivity is 2 mV/V, a value of $5 \times 2 = 10 \text{ mV}$ should be obtained.

Only in the case of bipolar measurement (compression/traction) is it necessary to fully unbalance the cell in traction as well; in this case the same value, but with a negative sign, should be measured between the +Signal and –Signal wires:

$-5 \times (\text{cell sensitivity}) \text{ mV}$.

4.3.4. CONNECTING MULTIPLE LOAD CELLS IN PARALLEL

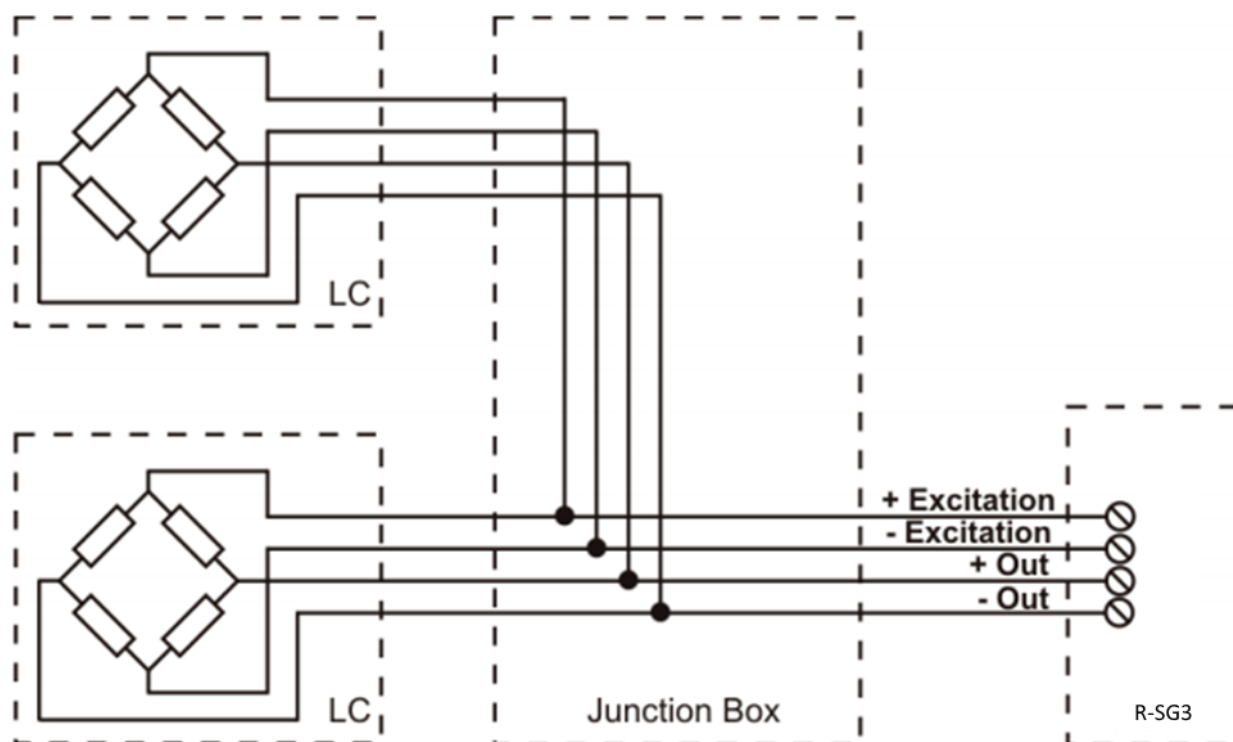
Up to a maximum of 8 load cells can be connected (in any case never going below the minimum 87 Ohm).

It is therefore possible to connect:

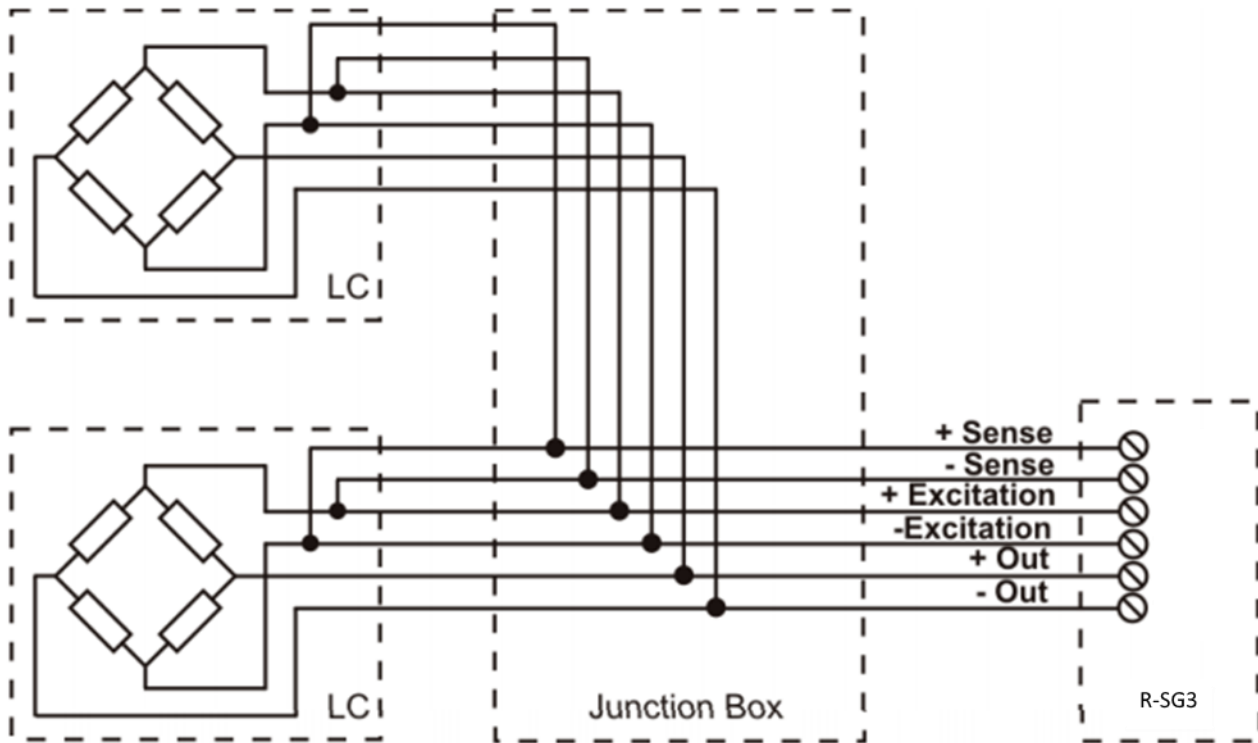
NUMBER OF LOAD CELLS IN PARALLEL	
DECLARED LOAD CELL IMPEDANCE [Ohm]	MAXIMUM NUMBER OF CELLS THAT CAN BE CONNECTED IN PARALLEL
350	4
1000	8

For connecting 4 load cells, Seneca recommends using the SG-EQ4 product.

To connect 2 or more 4-wire cells in parallel using the SG-EQ4 junction box, use the following diagram:



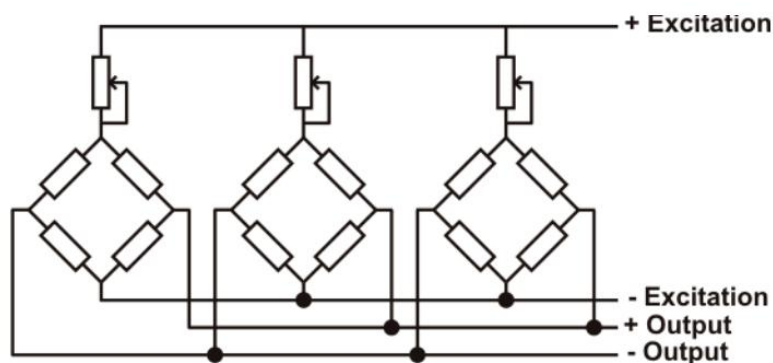
To connect 2 or more 6-wire cells in parallel using the SG-EQ4 Junction Box, use the following diagram:



For further details, refer to the manual of the SG-EQ4 Junction Box accessory.

4.3.5. TRIMMING 4-WIRE LOAD CELLS

The figure below shows a diagram of three trimmed load cells.



A variable resistor, independent of temperature, or a potentiometer typically of 20 Ω is inserted in the + excitation wire of each load cell. There are two ways to trim load cells. The first method is to adjust the potentiometers by trial and error, moving the calibration weights from one corner to another. All potentiometers must be adjusted to set the maximum sensitivity for each cell, turning them all fully clockwise. Then, once the corner with the lowest output has been located, the trimmers of the other cells are adjusted until the same minimum output value is obtained. This method can be very time-consuming, especially for large-scale systems where the use of test

weights at the corners is not very practical. In these cases, the second, more suitable method is to “pre-trim” the potentiometers using a precision voltmeter (at least 4 1/2 digits). The following procedure can be used:

- 1) Determine the exact mV/V ratio of each load cell, as stated on the cell's own calibration certificate.
- 2) Determine the exact excitation voltage supplied by the indicator/meter (for example Z-SG), by measuring this voltage with the voltmeter (for example 10.05 V).
- 3) Multiply the lowest mV/V value found (point 1) by the excitation voltage (point 2).
- 4) Divide the trimming factor calculated in point 3 by the mV/V value of the other load cells.
- 5) Measure and adjust the excitation voltage of the other three load cells via their respective potentiometer. Check the results and make a final adjustment by moving a test load from corner to corner.

4.3.6. DATA PRODUCED T->O (DEVICE -> SCANNER)

DATA	MEANING	TYPE OF DATA	BYTE OFFSET
DIN1	Value of digital input 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] LSB
DIN2	Value of digital input 2	BIT	BYTE[0] BIT[1]
NOT USED	Not used	BYTE	BYTE[1]..BYTE[3]
NET	Net Weight	REAL 32 BIT	BYTE[4]...BYTE[7]
GROSS	Gross Weight	REAL 32 BIT	BYTE[8]...BYTE[11]
TARE	Tare	REAL 32 BIT	BYTE[12]...BYTE[15]
MAX_NET	Maximum Net Weight	REAL 32 BIT	BYTE[16]...BYTE[19]
MIN_NET	Minimum Net Weight	REAL 32 BIT	BYTE[20]...BYTE[23]
ADC_RAW	Raw ADC value	Unsigned Integer 32 BIT	BYTE[24]...BYTE[27]
NUM_PIECES	Number of pieces	Unsigned integer 16 BIT	BYTE[28]...BYTE[29]
STATUS	Status	Unsigned integer 16 BIT	BYTE[30]...BYTE[31]

4.3.7. DATA CONSUMED O->T (SCANNER -> DEVICE)

DATA	MEANING	DATA TYPE	BYTE OFFSET
DOUT1	Value of digital output 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] LSB
DOUT2	Value of digital output 2	BIT	BYTE[0] BIT[1]
CMD	Command:	Unsigned integer 16 BIT	BYTE[2]...BYTE[3]
CMD_AUX	Command Parameter	Unsigned Integer 32 BIT	BYTE[4]...BYTE[7]
FORCE_CFG	Enable new configuration: if the value	Unsigned integer 16 BIT	BYTE[8]...BYTE[9]

	is 0, the configuration is never changed		
DELTA_T		Unsigned integer 16 BIT	BYTE[10]...BYTE[11]
FM		Unsigned integer 8 BIT	BYTE[12]
MT		Unsigned integer 8 BIT	BYTE[13]
MU		Unsigned integer 8 BIT	BYTE[14]
RESOLUTION		Unsigned integer 8 BIT	BYTE[15]
NOISE_FILTER		Unsigned integer 8 BIT	BYTE[16]
FILTER_LEVEL		Unsigned integer 8 BIT	BYTE[17]
AUTOMATIC_TARE		Unsigned integer 8 BIT	BYTE[18]
ADC_SPEED		Unsigned integer 8 BIT	BYTE[19]
CELL		REAL 32 BIT	BYTE[20]...BYTE[23]
FS		REAL 32 BIT	BYTE[24]...BYTE[27]
STD_W		REAL 32 BIT	BYTE[28]...BYTE[31]
NOISE_VAR		REAL 32 BIT	BYTE[32]...BYTE[35]
FILTER_RESP_VEL		REAL 32 BIT	BYTE[36]...BYTE[39]
MAN_RESOLUTION		REAL 32 BIT	BYTE[40]...BYTE[43]
SAMPLE_PIECE_W		REAL 32 BIT	BYTE[44]...BYTE[47]
TARE_W		Unsigned Integer 32 BIT	BYTE[48]...BYTE[51]
DELTA_W		REAL 32 BIT	BYTE[52]...BYTE[55]
IO_MODE1		Unsigned integer 8 BIT	BYTE[56]
IO_FUNC1		Unsigned integer 8 BIT	BYTE[57]
DOUT_MODE1		Unsigned integer 8 BIT	BYTE[58]
DOUT_CONF1		Unsigned integer 8 BIT	BYTE[59]
THRESHOLD1		REAL 32 BIT	BYTE[60]...BYTE[63]
HYSTERESIS1		REAL 32 BIT	BYTE[64]...BYTE[67]
IO_MODE2		Unsigned integer 8 BIT	BYTE[68]
IO_FUNC2		Unsigned integer 8 BIT	BYTE[69]
DOUT_MODE2		Unsigned integer 8 BIT	BYTE[70]
DOUT_CONF2		Unsigned integer 8 BIT	BYTE[71]
THRESHOLD2		REAL 32 BIT	BYTE[72]...BYTE[75]
HYSTERESIS2		REAL 32 BIT	BYTE[76]...BYTE[79]

4.3.8. CONNECTION STRING (CONNECTION PATH)

Depending on the configurator, it is possible to enter connection data instead of using the EDS file; in this case the Connection Path is:

20 04 24 00 2C 96 2C 64

CIP interpretation:

20 04 = Class 0x04, Assembly Object

24 00 = Instance 0

2C 96 = Connection Point 0x96 = 150 decimal = O→T / Consuming Assembly

2C 64 = Connection Point 0x64 = 100 decimal = T→O / Producing Assembly

O→T = 80 bytes Assembly 150

T→O = 32 bytes Assembly 100

N.B. these values are valid if the RUN/IDLE headers are disabled in SETUP:

ETHERIP O->T RUN/IDLE HEADER	Disabled	Disabled ▼
ETHERIP T->O RUN/IDLE HEADER	Disabled	Disabled ▼

If they are enabled, 4 bytes must be added to O->T and T->O.

4.4. R-4AO-8DIDO-E

The devices allow the use of 4 analog output channels (individually configurable in voltage or current) and 8 digital channels individually configurable as input or output. Up to 8 32-bit digital counters with non-volatile memory backup are also available.

CODE	ETHERNET PORT
R-4AO-8DIDO-E	2 PORTS 10/100 Mbit (Switch mode)

4.4.1. ANALOG OUTPUT RESPONSE TIME

The response time of the analog outputs to go from 10% to 90% is 5ms

4.4.2. DIGITAL INPUT/OUTPUT UPDATE TIME

The update time of the 8 digital inputs/outputs is 1ms.

4.4.3. DIGITAL COUNTER ACQUISITION TIME

The fastest acquisition time for the digital counters is 1 ms

4.4.4. DIGITAL OUTPUT PROTECTION

The outputs are protected against overload and over-temperature; they cyclically open until the fault is repaired or the output is opened.

The current limit is between 0.6 and 1.2 A.

4.4.5. DATA PRODUCED T->O (DEVICE -> SCANNER)

DATA	MEANING	DATA TYPE	BYTE OFFSET
DIN1	Value of digital input 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] LSB
DIN2	Value of digital input 2	BIT	BYTE[0] BIT[1]
DIN3	Value of digital input 3	BIT	BYTE[0] BIT[2]
DIN4	Value of digital input 4	BIT	BYTE[0] BIT[3]
DIN5	Value of digital input 5	BIT	BYTE[0] BIT[4]
DIN6	Value of digital input 6	BIT	BYTE[0] BIT[5]
DIN7	Value of digital input 7	BIT	BYTE[0] BIT[6]
DIN8	Value of digital input 8	BIT	BYTE[0] BIT[7] MSB
NOT USED	Not used	BYTE	BYTE[1]...BYTE[3]
COUNT1	Counter with FeRAM backup of digital input 1	Unsigned Integer 32 BIT	BYTE[4]...BYTE[7]
COUNT2	Counter with FeRAM backup of digital input 2	Unsigned Integer 32 BIT	BYTE[8]...BYTE[11]
COUNT3	Counter with FeRAM backup of digital input 3	Unsigned Integer 32 BIT	BYTE[12]...BYTE[15]
COUNT4	Counter with FeRAM backup of digital input 4	Unsigned Integer 32 BIT	BYTE[16]...BYTE[19]
COUNT5	Counter with FeRAM backup of digital input 5	Unsigned Integer 32 BIT	BYTE[20]...BYTE[23]
COUNT6	Counter with FeRAM backup of digital input 6	Unsigned Integer 32 BIT	BYTE[24]...BYTE[27]
COUNT7	Counter with FeRAM backup of digital input 7	Unsigned Integer 32 BIT	BYTE[28]...BYTE[31]
COUNT8	Counter with FeRAM backup of digital input 8	Unsigned Integer 32 BIT	BYTE[32]...BYTE[35]
FREQUENCY 1 [Hz]	Value of the frequency in [Hz] of the signal at input 1	REAL 32 BIT	BYTE[36]...BYTE[39]

FREQUENCY 2 [Hz]	Value of the frequency in [Hz] of the signal at input 2	REAL 32 BIT	BYTE[40]...BYTE[43]
FREQUENCY 3 [Hz]	Value of the frequency in [Hz] of the signal at input 3	REAL 32 BIT	BYTE[44]...BYTE[47]
FREQUENCY 4 [Hz]	Value of the frequency in [Hz] of the signal at input 4	REAL 32 BIT	BYTE[48]...BYTE[51]
FREQUENCY 5 [Hz]	Value of the frequency in [Hz] of the signal at input 5	REAL 32 BIT	BYTE[52]...BYTE[55]
FREQUENCY 6 [Hz]	Value of the frequency in [Hz] of the signal at input 6	REAL 32 BIT	BYTE[56]...BYTE[59]
FREQUENCY 7 [Hz]	Value of the frequency in [Hz] of the signal at input 7	REAL 32 BIT	BYTE[60]...BYTE[63]
FREQUENCY 8 [Hz]	Value of the frequency in [Hz] of the signal at input 8	REAL 32 BIT	BYTE[64]...BYTE[67]
FLAGS		Unsigned integer 16 BIT	BYTE[68]...BYTE[69]

4.4.6. DATA CONSUMED O->T (SCANNER -> DEVICE)

DATA	MEANING	DATA TYPE	BYTE OFFSET
DOUT1	Value of digital output 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] LSB
DOUT2	Value of digital output 2	BIT	BYTE[0] BIT[1]
DOUT3	Value of digital output 3	BIT	BYTE[0] BIT[2]
DOUT4	Value of digital output 4	BIT	BYTE[0] BIT[3]
DOUT5	Value of digital output 5	BIT	BYTE[0] BIT[4]
DOUT6	Value of digital output 6	BIT	BYTE[0] BIT[5]
DOUT7	Value of digital output 7	BIT	BYTE[0] BIT[6]
DOUT8	Value of digital output 8	BIT	BYTE[0] BIT[7] MSB
NOT USED	Not used	BYTE	BYTE[1]...BYTE[3]
AIN 1	Value of analog output 1	REAL 32 BIT	BYTE[4]...BYTE[7]
AIN 2	Value of analog output 2	REAL 32 BIT	BYTE[8]...BYTE[11]
AIN 3	Value of analog output 3	REAL 32 BIT	BYTE[12]...BYTE[15]
AIN 4	Value of analog output 4	REAL 32 BIT	BYTE[16]...BYTE[19]
CMD	Command: 0x0001: resets all counters. 0x0010-0x0017: sets counter to CMD_AUX value (0x0010 counter 1,...)	Unsigned integer 16 BIT	BYTE[20]...BYTE[21]
NOT USED	Not used	BYTE	BYTE[22]...BYTE[23]
CMD_AUX	Command Parameter	Unsigned Integer 32 BIT	BYTE[24]...BYTE[27]

4.4.7. CONNECTION STRING (CONNECTION PATH)

Depending on the configurator, it is possible to enter connection data instead of using the EDS file; in this case the Connection Path is:

20 04 24 00 2C 96 2C 64

CIP interpretation:

20 04 = Class 0x04, Assembly Object

24 00 = Instance 0

2C 96 = Connection Point 0x96 = 150 decimal = O→T / Consuming Assembly

2C 64 = Connection Point 0x64 = 100 decimal = T→O / Producing Assembly

O→T = 28 bytes Assembly 150

T→O = 70 bytes Assembly 100

N.B. these values are valid if the RUN/IDLE headers are disabled in SETUP:

ETHERIP O->T RUN/IDLE HEADER	Disabled	Disabled ▼
ETHERIP T->O RUN/IDLE HEADER	Disabled	Disabled ▼

If they are enabled, 4 bytes must be added to O->T and T->O.

4.5. R-4RTD-8DIDO-E

The devices allow the use of 4 RTD (resistance thermometer) measurement channels and 8 digital channels individually configurable as input or output. Up to 8 32-bit digital counters with non-volatile memory backup are also available.

CODE	ETHERNET PORT
R-4RTD-8DIDO	2 PORTS 10/100 Mbit (Switch mode)

4.5.1. ANALOG INPUT UPDATE TIME

The sampling time is configurable from 25 ms to 400 ms, specifically:

CHANNEL UPDATE TIME
25 ms
50 ms
100 ms
200 ms
400 ms

Since each channel has an independent Analog-to-Digital converter, this set time coincides with the refresh time of each channel.

Therefore, by enabling all 4 channels and setting the same sampling time of 25 ms, an input is updated every 25 ms.

4.5.2. DIGITAL INPUT/OUTPUT UPDATE TIME

The update time of the 8 digital inputs/outputs is 25ms.

4.5.3. DIGITAL COUNTER ACQUISITION TIME

The fastest acquisition time for the digital counters is 25 ms

4.5.4. DIGITAL OUTPUT PROTECTION

The outputs are protected against overload and over-temperature; they cyclically open until the fault is repaired or the output is opened.

The current limit is between 0.6 and 1.2 A.

4.5.5. DATA PRODUCED T->O (DEVICE -> SCANNER)

DATA	MEANING	TYPE OF DATA	BYTE OFFSET
DIN1	Value of digital input 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] LSB
DIN2	Value of digital input 2	BIT	BYTE[0] BIT[1]
DIN3	Value of digital input 3	BIT	BYTE[0] BIT[2]
DIN4	Value of digital input 4	BIT	BYTE[0] BIT[3]
DIN5	Value of digital input 5	BIT	BYTE[0] BIT[4]
DIN6	Value of digital input 6	BIT	BYTE[0] BIT[5]
DIN7	Value of digital input 7	BIT	BYTE[0] BIT[6]
DIN8	Value of digital input 8	BIT	BYTE[0] BIT[7] MSB
NOT USED	Not used	BYTE	BYTE[1]...BYTE[3]
COUNT1	Counter with FeRAM backup of digital input 1	Unsigned Integer 32 BIT	BYTE[4]...BYTE[7]
COUNT2	Counter with FeRAM backup of digital input 2	Unsigned Integer 32 BIT	BYTE[8]...BYTE[11]
COUNT3	Counter with FeRAM backup of digital input 3	Unsigned Integer 32 BIT	BYTE[12]...BYTE[15]

COUNT4	Counter with FeRAM backup of digital input 4	Unsigned Integer 32 BIT	BYTE[16]...BYTE[19]
COUNT5	Counter with FeRAM backup of digital input 5	Unsigned Integer 32 BIT	BYTE[20]...BYTE[23]
COUNT6	Counter with FeRAM backup of digital input 6	Unsigned Integer 32 BIT	BYTE[24]...BYTE[27]
COUNT7	Counter with FeRAM backup of digital input 7	Unsigned Integer 32 BIT	BYTE[28]...BYTE[31]
COUNT8	Counter with FeRAM backup of digital input 8	Unsigned Integer 32 BIT	BYTE[32]...BYTE[35]
FREQUENCY 1 [Hz]	Value of the frequency in [Hz] of the signal at input 1	REAL 32 BIT	BYTE[36]...BYTE[39]
FREQUENCY 2 [Hz]	Value of the frequency in [Hz] of the signal at input 2	REAL 32 BIT	BYTE[40]...BYTE[43]
FREQUENCY 3 [Hz]	Value of the frequency in [Hz] of the signal at input 3	REAL 32 BIT	BYTE[44]...BYTE[47]
FREQUENCY 4 [Hz]	Value of the frequency in [Hz] of the signal at input 4	REAL 32 BIT	BYTE[48]...BYTE[51]
FREQUENCY 5 [Hz]	Value of the frequency in [Hz] of the signal at input 5	REAL 32 BIT	BYTE[52]...BYTE[55]
FREQUENCY 6 [Hz]	Value of the frequency in [Hz] of the signal at input 6	REAL 32 BIT	BYTE[56]...BYTE[59]
FREQUENCY 7 [Hz]	Value of the frequency in [Hz] of the signal at input 7	REAL 32 BIT	BYTE[60]...BYTE[63]
FREQUENCY 8 [Hz]	Value of the frequency in [Hz] of the signal at input 8	REAL 32 BIT	BYTE[64]...BYTE[67]
RTD1	Value of the analog input 1	REAL 32 BIT	BYTE[68]...BYTE[71]
RTD2	Value of the analog input 2	REAL 32 BIT	BYTE[72]...BYTE[75]
RTD3	Value of the analog input 3	REAL 32 BIT	BYTE[76]...BYTE[79]

RTD4	Value of the analog input 4	REAL 32 BIT	BYTE[80]...BYTE[83]
FLAGS1	bit 0: OVERRANGE RTD1 bit 1: OVERRANGE RTD2 bit 2: OVERRANGE RTD3 bit 3: OVERRANGE RTD4 bit 4: BURN RTD1 bit 5: BURN RTD2 bit 6: BURN RTD3 bit 7: BURN RTD4 bit 15: FAIL	Unsigned integer 16 BIT	BYTE[84]...BYTE[85]

4.5.6. DATA CONSUMED O->T (SCANNER -> DEVICE)

DATA	MEANING	DATA TYPE	BYTE OFFSET
DOUT1	Value of digital output 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] LSB
DOUT2	Value of digital output 2	BIT	BYTE[0] BIT[1]
DOUT3	Value of digital output 3	BIT	BYTE[0] BIT[2]
DOUT4	Value of digital output 4	BIT	BYTE[0] BIT[3]
DOUT5	Value of digital output 5	BIT	BYTE[0] BIT[4]
DOUT6	Value of digital output 6	BIT	BYTE[0] BIT[5]
DOUT7	Value of digital output 7	BIT	BYTE[0] BIT[6]
DOUT8	Value of digital output 8	BIT	BYTE[0] BIT[7] MSB
NOT USED	Not used	BYTE	BYTE[1]
CMD	Command: 0x0001: resets all counters 0x0010-0x0017: sets counter to CMD_AUX value (0x0010 counter 1,...)	Unsigned integer 16 BIT	BYTE[2]...BYTE[3]
CMD_AUX	Command Parameter	Unsigned Integer 32 BIT	BYTE[4]...BYTE[7]

4.5.7. CONNECTION STRING (CONNECTION PATH)

Depending on the configurator, it is possible to enter connection data instead of using the EDS file; in this case the Connection Path is:

20 04 24 00 2C 96 2C 64

CIP interpretation:

20 04 = Class 0x04, Assembly Object

24 00 = Instance 0

2C 96 = Connection Point 0x96 = 150 decimal = O→T / Consuming Assembly

2C 64 = Connection Point 0x64 = 100 decimal = T→O / Producing Assembly

O→T = 8 byte Assembly 150

T→O = 86 byte Assembly 100

N.B. these values are valid if the RUN/IDLE headers are disabled in SETUP:

ETHERIP O->T RUN/IDLE HEADER	Disabled	Disabled ▼
ETHERIP T->O RUN/IDLE HEADER	Disabled	Disabled ▼

If they are enabled, 4 bytes must be added to O->T and T->O.

4.6. **R-2AI-6DIDO-E**

The devices allow the use of 2 analog input channels and 6 digital channels individually configurable as input or output. Up to 6 32-bit digital counters with non-volatile memory backup are also available.

CODE	ETHERNET PORT
R-2AI-6DIDO	1 PORT 10/100 Mbit

4.6.1. **ANALOG INPUT UPDATE TIME**

The sampling time is configurable from 15 samples per second to 240 samples per second for each enabled channel, specifically:

CHANNEL SAMPLING TIME
15 samples/s = 66 ms
30 samples/s = 33 ms
60 samples/s = 16 ms
240 samples/s = 4 ms

To calculate the update time of a channel's value, consider the following example:

By enabling 2 channels and setting the same sampling time of 4 ms, an input is updated every: $4 \times 2 = 8$ ms.

4.6.2. **DIGITAL INPUT/OUTPUT UPDATE TIME**

The update time of all 8 digital inputs/outputs is 2 ms.

4.6.3. **DIGITAL COUNTER ACQUISITION TIME**

The fastest acquisition time for the digital counters is 2 ms

4.6.4. **DIGITAL OUTPUT PROTECTION**

The outputs are protected against overload and over-temperature; they cyclically open until the fault is repaired or the output is opened.

The current limit is between 0.6 and 1.2 A.

4.6.5. DATA PRODUCED T->O (DEVICE -> SCANNER)

DATA	MEANING	DATA TYPE	BYTE OFFSET
DIN1	Value of digital input 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] (LSB)
DIN2	Value of digital input 2	BIT	BYTE[0] BIT[1]
DIN3	Value of digital input 3	BIT	BYTE[0] BIT[2]
DIN4	Value of digital input 4	BIT	BYTE[0] BIT[3]
DIN5	Value of digital input 5	BIT	BYTE[0] BIT[4]
DIN6	Value of digital input 6	BIT	BYTE[0] BIT[5]
NOT USED	Not used	BYTE	BYTE[1]...BYTE[3]
COUNT1	Counter with FeRAM backup of digital input 1	Unsigned Integer 32 BIT	BYTE[4]...BYTE[7]
COUNT2	Counter with FeRAM backup of digital input 2	Unsigned Integer 32 BIT	BYTE[8]...BYTE[11]
COUNT3	Counter with FeRAM backup of digital input 3	Unsigned Integer 32 BIT	BYTE[12]...BYTE[15]
COUNT4	Counter with FeRAM backup of digital input 4	Unsigned Integer 32 BIT	BYTE[16]...BYTE[19]
COUNT5	Counter with FeRAM backup of digital input 5	Unsigned Integer 32 BIT	BYTE[20]...BYTE[23]
COUNT6	Counter with FeRAM backup of digital input 6	Unsigned Integer 32 BIT	BYTE[24]...BYTE[27]
FREQUENCY 1 [Hz]	Value of the frequency in [Hz] of the signal at input 1	REAL 32 BIT	BYTE[28]...BYTE[31]
FREQUENCY 2 [Hz]	Value of the frequency in [Hz] of the signal at input 2	REAL 32 BIT	BYTE[32]...BYTE[35]
FREQUENCY 3 [Hz]	Value of the frequency in [Hz] of the signal at input 3	REAL 32 BIT	BYTE[36]...BYTE[39]
FREQUENCY 4 [Hz]	Value of the frequency in [Hz] of the signal at input 4	REAL 32 BIT	BYTE[40]...BYTE[43]
FREQUENCY 5 [Hz]	Value of the frequency in [Hz] of the signal at input 5	REAL 32 BIT	BYTE[44]...BYTE[47]

FREQUENCY 6 [Hz]	Value of the frequency in [Hz] of the signal at input 6	REAL 32 BIT	BYTE[48]...BYTE[51]
AIN1	Value of the analog input 1 Engineering value	REAL 32 BIT	BYTE[52]...BYTE[55]
AIN2	Value of the analog input 2 Engineering value	REAL 32 BIT	BYTE[56]...BYTE[59]
FLAGS	bit 0: Digital I/O Fault bit 1: Digital VBUS present bit 2: Ain1 Overrange bit 3: Ain2 Overrange	Unsigned integer 16 BIT	BYTE[60]...BYTE[61]

4.6.6. DATA CONSUMED O->T (SCANNER -> DEVICE)

DATA	MEANING	DATA TYPE	BYTE OFFSET
DOUT1	Value of digital output 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] (LSB)
DOUT2	Value of digital output 2	BIT	BYTE[0] BIT[1]
DOUT3	Value of digital output 3	BIT	BYTE[0] BIT[2]
DOUT4	Value of digital output 4	BIT	BYTE[0] BIT[3]
DOUT5	Value of digital output 5	BIT	BYTE[0] BIT[4]
DOUT6	Value of digital output 6	BIT	BYTE[0] BIT[5]
NOT USED	Not used	BYTE	BYTE[1]
CMD	Command to be executed. Supported commands: 256 decimal = set factory default 49568 decimal = reboot device	Unsigned integer 16 BIT	BYTE[2]...BYTE[3]
CMD_AUX	Used for future purposes	Unsigned Integer 32 BIT	BYTE[4]...BYTE[7]

4.6.7. CONNECTION STRING (CONNECTION PATH)

Depending on the configurator, it is possible to enter connection data instead of using the EDS file; in this case the Connection Path is:

20 04 24 00 2C 96 2C 64

CIP interpretation:

20 04 = Class 0x04, Assembly Object

24 00 = Instance 0

2C 96 = Connection Point 0x96 = 150 decimal = O→T / Consuming Assembly

2C 64 = Connection Point 0x64 = 100 decimal = T→O / Producing Assembly

O→T = 8 byte Assembly 150

T→O = 62 byte Assembly 100

N.B. these values are valid if the RUN/IDLE headers are disabled in SETUP:

ETHERIP O->T RUN/IDLE HEADER	Disabled	Disabled ▼
ETHERIP T->O RUN/IDLE HEADER	Disabled	Disabled ▼

If they are enabled, 4 bytes must be added to O->T and T->O.

5. SERIES ZE-E DEVICES

5.1. ZE-2AI-E

CODE	ETHERNET PORT
ZE-2AI-E	1 PORTS 10/100 Mbit

5.1.1. ANALOG INPUTS

The model is equipped with 2 analog inputs (max resolution 16 bit) configurable in current or voltage.

The ADC resolution depends on the set acquisition speed, specifically:

If the channel acquisition speed is < 150 ms, the ADC is set with a resolution of 12 bit

If the channel acquisition speed is >= 150 ms, the ADC is set with a resolution of 16 bit

5.1.2. ANALOG MEASUREMENT SCALING

The measurement value in mV or uA is stored in the AIN1 and AIN2 registers; a scaled measurement is also available.

The scaled measurement is stored in the AIN1 ENG and AIN2 ENG registers.

To scale a measurement, 4 registers are used: AIN start scale, AIN full scale, AIN start scale ENG. and AIN full scale ENG.

For example, we want to scale a 4-20mA input to a value of 0-10000:

The start scale must be 4 mA

The full scale must be 20 mA

The eng. start scale must be 0

The eng. full scale must be 10000

The raw ADC value is stored in the AIN ADC register.

5.1.3. ANALOG MEASUREMENT UPDATE TIME

The acquisition speed per channel is configurable from 10ms to 300ms: the higher the speed of acquisition, the lower the stability of the measurement.

The acquisition time is considered per channel, so there will be a minimum update time of the channel of 20ms.

5.1.4. MEASUREMENT INPUT IMPEDANCE

Voltage input: 227.5 kohm +/- 2%. Current input: 55 ohm +/- 20%.

5.1.5. DATA PRODUCED T->O (DEVICE -> SCANNER)

DATA	MEANING	DATA TYPE	BYTE OFFSET
AIN1	Value of the analog input 1	REAL 32 BIT	BYTE[0]...BYTE[3]
AIN2	Value of the analog input 2	REAL 32 BIT	BYTE[4]...BYTE[7]
FLAGS		Unsigned integer 16 BIT	BYTE[8]...BYTE[9]

5.1.6. DATA CONSUMED O->T (SCANNER -> DEVICE)

DATA	MEANING	DATA TYPE	BYTE OFFSET
CMD	Command: None	Unsigned integer 16 BIT	BYTE[0]...BYTE[1]
NOT USED	Not used	BYTE	BYTE[1]...BYTE[3]
CMD_AUX	Command Parameter	Unsigned integer 32 BIT	BYTE[4]...BYTE[7]

5.1.7. CONNECTION STRING (CONNECTION PATH)

Depending on the configurator, it is possible to enter connection data instead of using the EDS file; in this case the Connection Path is:

20 04 24 00 2C 96 2C 64

CIP interpretation:

20 04 = Class 0x04, Assembly Object

24 00 = Instance 0

2C 96 = Connection Point 0x96 = 150 decimal = O->T / Consuming Assembly

2C 64 = Connection Point 0x64 = 100 decimal = T->O / Producing Assembly

O->T = 8 bytes Assembly 150

T->O = 10 bytes Assembly 100

N.B. these values are valid if the RUN/IDLE headers are disabled in SETUP:

ETHERIP O->T RUN/IDLE HEADER	Disabled	Disabled ▼
ETHERIP T->O RUN/IDLE HEADER	Disabled	Disabled ▼

If they are enabled, 4 bytes must be added to O->T and T->O.

5.2. ZE-4DI-2AI-2DO-E

CODE	ETHERNET PORT
ZE-4DI-2AI-2DO-E	1 PORTS 10/100 Mbit

5.2.1. ANALOG MEASUREMENT UPDATE TIME

The acquisition speed per channel is configurable from 10ms to 300ms: the higher the speed of acquisition, the lower the stability of the measurement.

The acquisition time is considered per channel, so there will be a minimum update time of the channel of 20ms.

5.2.2. MEASUREMENT INPUT IMPEDANCE

Voltage input: 227.5 kohm +/- 2%. Current input: 55 ohm +/- 20%.

5.2.3. DATA PRODUCED T->O (DEVICE -> SCANNER)

DATA	MEANING	DATA TYPE	BYTE OFFSET
DIN1	Value of digital input 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] LSB
DIN2	Value of digital input 2	BIT	BYTE[0] BIT[1]
DIN3	Value of digital input 3	BIT	BYTE[0] BIT[2]
DIN4	Value of digital input 4	BIT	BYTE[0] BIT[3]
NOT USED	Not used	BYTE	BYTE[1]...BYTE[3]
TOT1	Totalizer with FeRAM backup of digital input 1	Unsigned Integer 32 BIT	BYTE[4]...BYTE[7]
TOT2	Totalizer with FeRAM backup of digital input 2	Unsigned Integer 32 BIT	BYTE[8]...BYTE[11]
TOT3	Totalizer with FeRAM backup of digital input 3	Unsigned Integer 32 BIT	BYTE[12]...BYTE[15]
TOT4	Totalizer with FeRAM backup of digital input 4	Unsigned Integer 32 BIT	BYTE[16]...BYTE[19]
COUNT1	Counter with FeRAM backup of digital input 1	Unsigned Integer 32 BIT	BYTE[20]...BYTE[23]
COUNT2	Counter with FeRAM backup of digital input 2	Unsigned Integer 32 BIT	BYTE[24]...BYTE[27]
COUNT3	Counter with FeRAM backup of digital input 3	Unsigned Integer 32 BIT	BYTE[28]...BYTE[31]
COUNT4	Counter with FeRAM backup of digital input 4	Unsigned Integer 32 BIT	BYTE[32]...BYTE[35]
AIN1	Analog Input 1	REAL 32 BIT	BYTE[36]...BYTE[39]

AIN2	Analog Input 2	REAL 32 BIT	BYTE[40]...BYTE[43]
FLAGS		Unsigned Integer 16 BIT	BYTE[44]...BYTE[45]

5.2.4. DATA CONSUMED O->T (SCANNER -> DEVICE)

DATA	MEANING	DATA TYPE	BYTE OFFSET
DOUT1	Digital Output 1	BIT	BYTE[0] BIT[0] LSB
DOUT2	Digital Output 2	BIT	BYTE[0] BIT[1]
NOT USED	Not used	BYTE	BYTE[1]
CMD	Command: 0x0001: resets all counters 0x0002: resets all totalizers 0x0003: resets all counters and totalizers 0x0010-0x0013: sets counter to CMD_AUX value (0x0010 counter 1,...) 0x0020-0x0023: sets totalizer to CMD_AUX value (0x0020 totalizer 1,...)	Unsigned Integer 16 BIT	BYTE[2]...BYTE[3]
CMD_AUX	Command Parameter	Unsigned Integer 32 BIT	BYTE[4]...BYTE[7]

5.2.5. CONNECTION STRING (CONNECTION PATH)

Depending on the configurator, it is possible to enter connection data instead of using the EDS file; in this case the Connection Path is:

20 04 24 00 2C 96 2C 64

CIP interpretation:

20 04 = Class 0x04, Assembly Object

24 00 = Instance 0

2C 96 = Connection Point 0x96 = 150 decimal = O→T / Consuming Assembly

2C 64 = Connection Point 0x64 = 100 decimal = T→O / Producing Assembly

O→T = 8 bytes Assembly 150

T→O = 46 bytes Assembly 100

N.B. these values are valid if the RUN/IDLE headers are disabled in SETUP:

ETHERIP O->T RUN/IDLE HEADER	Disabled	Disabled ▼
ETHERIP T->O RUN/IDLE HEADER	Disabled	Disabled ▼

If they are enabled, 4 bytes must be added to O->T and T->O.

5.3. ZE-SG3-E

The ZE-SG3 device is a converter for load cells (strain gauges).

The measurement, carried out using the 4- or 6-wire technique, is available via the EtherNet/IP protocol, or on a voltage analog output (from 0 to 10V) or current (from 0 to 20 mA).

The devices are equipped with a new noise filter specifically developed to achieve a fast response time.

The device is also fully configurable via the webserver.

CODE	ETHERNET PORT
ZE-SG3	1 PORTS 10/100 Mbit

5.3.1. CONNECTION TO THE LOAD CELL

The converter can be connected to the load cell in 4- or 6-wire mode. The 6-wire measurement is preferable for measurement accuracy.

Power to the load cell is supplied directly by the device.

5.3.2. CONNECTION TO THE 4- OR 6-WIRE LOAD CELL

A load cell can have a four-wire or six-wire cable. A six-wire cable, in addition to the +/- excitation and +/- signal lines, also has the +/- sense lines.

It is a common misconception to think that the only difference between 4- and 6-wire load cells is the ability of the latter to measure the actual voltage at the load cell.

A load cell is compensated to work within specifications over a certain temperature range (usually -10 to +40 °C).

Since cable resistance is a function of temperature, the cable's response to temperature changes must be eliminated.

The 4-wire cable is part of the load cell's temperature compensation system.

The 4-wire load cell is calibrated and compensated with a certain length of cable connected.

For this reason, the cable of a 4-wire load cell must never be cut.

The cable of a 6-wire cell, on the other hand, is not part of the load cell's temperature compensation system.

The sense lines are connected to the sense terminals of the R-SG3, to measure and regulate the actual voltage at the load cell.

The advantage of using this "active" system is the ability to cut (or extend) the 6-wire load cell cable to any length.

Note that a 6-wire load cell will not achieve the performance stated in the specifications unless the sense lines are used.

5.3.3. CHECKING LOAD CELL OPERATION

Before starting device configuration, the correctness of the wiring and the integrity of the load cell must be checked.

5.3.3.1. CHECKING WIRING WITH A DIGITAL MULTIMETER

First, using the load cell's manual, check that approximately 5V DC is present between the +Excitation and – Excitation wires. If the cell is 6-wire, check that the same voltage is also measured between +Sense and –Sense. Now leave the cell at rest (without tare) and check that the voltage between the +Signal and –Signal wires is around 0 V.

Now unbalance the cell by applying a compression force, checking that the voltage between the +Signal and – Signal wires increases until full scale is reached (if possible), where approximately the following will be measured:

$5 \cdot (\text{cell sensitivity}) \text{ mV}$.

For example, if the declared cell sensitivity is 2 mV/V, a value of $5 \cdot 2 = 10 \text{ mV}$ should be obtained.

Only in the case of bipolar measurement (compression/traction) is it necessary to fully unbalance the cell in traction as well; in this case the same value, but with a negative sign, should be measured between the +Signal and –Signal wires:

$-5 \cdot (\text{cell sensitivity}) \text{ mV}$

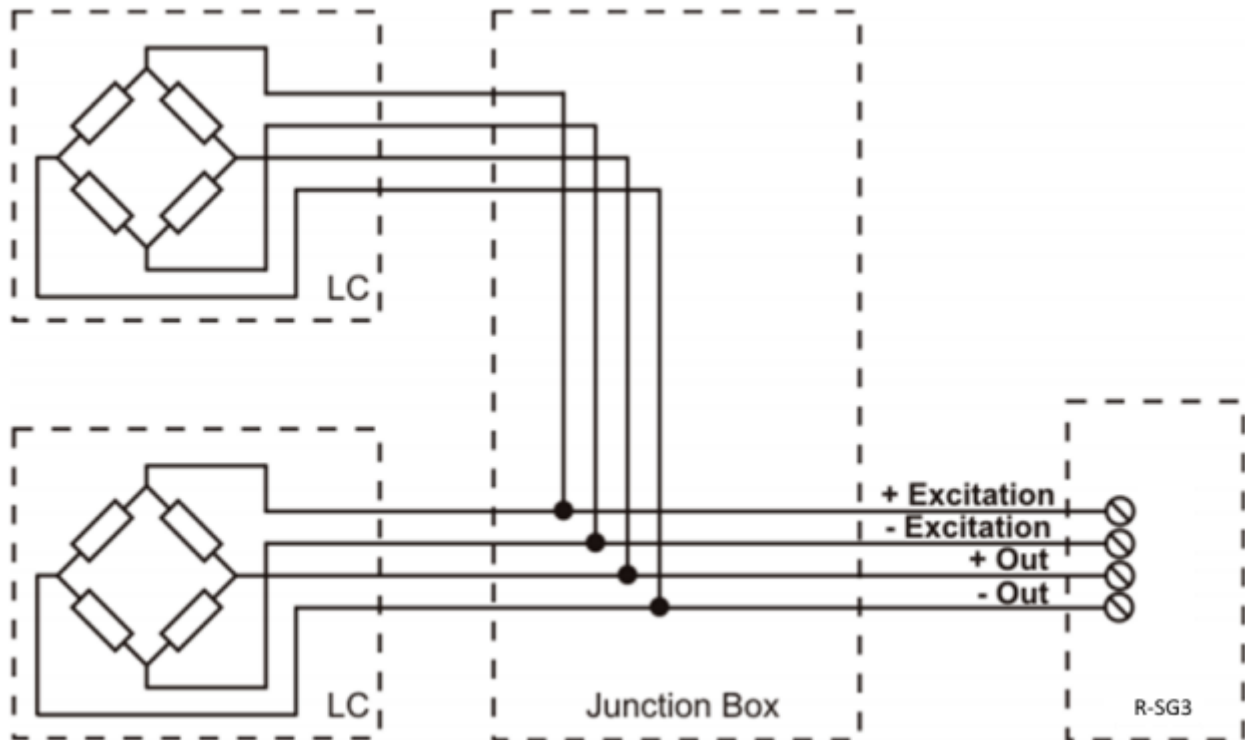
5.3.4. CONNECTING MULTIPLE LOAD CELLS IN PARALLEL

Up to a maximum of 8 load cells can be connected (in any case never going below the minimum 87 Ohm).
It is therefore possible to connect:

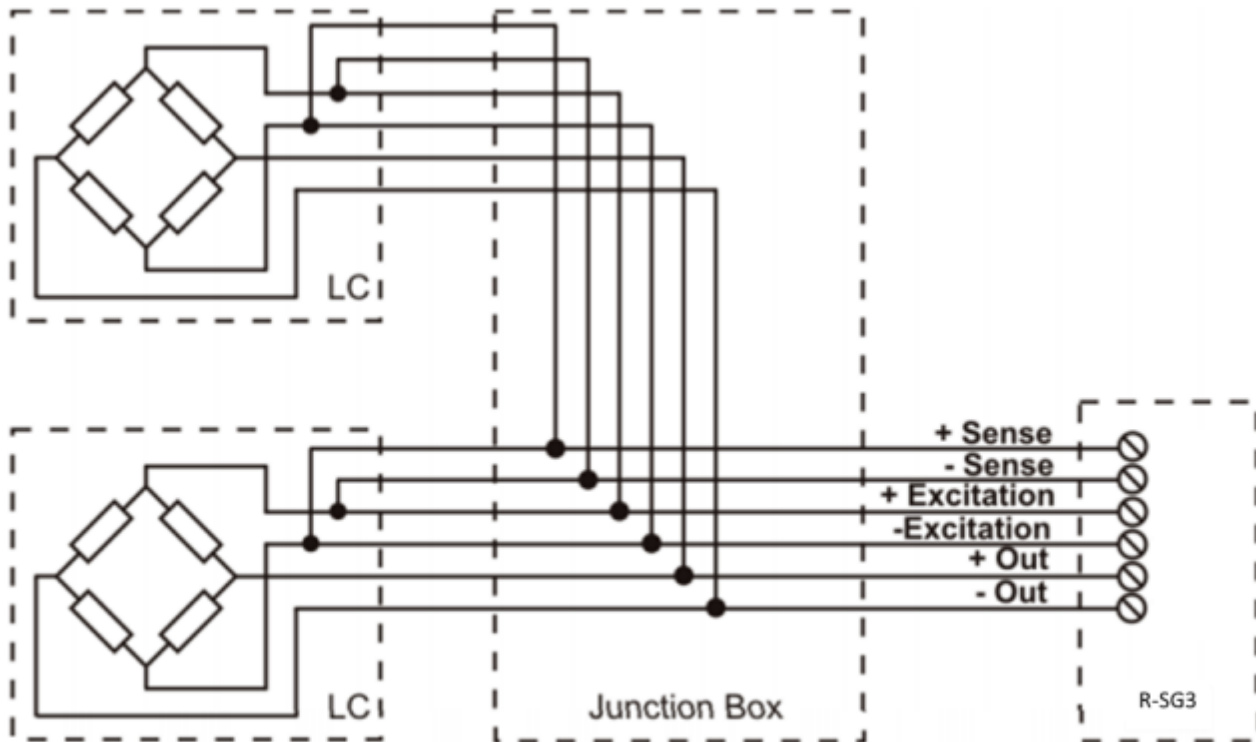
NUMBER OF LOAD CELLS IN PARALLEL	
DECLARED LOAD CELL IMPEDANCE [Ohm]	MAXIMUM NUMBER OF CELLS THAT CAN BE CONNECTED IN PARALLEL
350	4
1000	8

For connecting 4 load cells, Seneca recommends using the SG-EQ4 product.

To connect 2 or more 4-wire cells in parallel using the SG-EQ4 junction box, use the following diagram:



To connect 2 or more 6-wire cells in parallel using the SG-EQ4 Junction Box, use the following diagram:

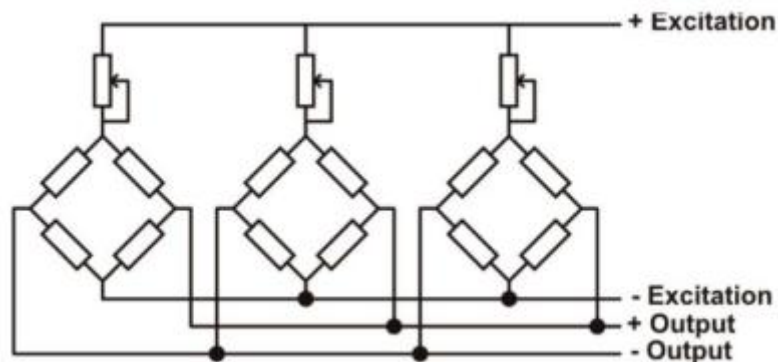


Per maggiori dettagli si rimanda al manuale dell'accessorio Junction Box SG-EQ4.

For further details, refer to the manual of the SG-EQ4 Junction Box accessory.

5.3.5. TRIMMING 4-WIRE LOAD CELLS

The figure below shows a diagram of three trimmed load cells.



A variable resistor, independent of temperature, or a potentiometer typically of 20 Ω is inserted in the + excitation wire of each load cell. There are two ways to trim load cells.

The first method is to adjust the potentiometers by trial and error, moving the calibration weights from one corner to another.

All potentiometers must be adjusted to set the maximum sensitivity for each cell, turning them all fully clockwise. Then, once the corner with the lowest output has been located, the trimmers of the other cells are adjusted until the same minimum output value is obtained.

This method can be very time-consuming, especially for large-scale systems where the use of test weights at the corners is not very practical.

In these cases, the second, more suitable method is to “pre-trim” the potentiometers using a precision voltmeter (at least 4 1/2 digits).

The following procedure can be used:

- 1) Determine the exact mV/V ratio of each load cell, as stated on the cell's own calibration certificate.
 - 2) Determine the exact excitation voltage supplied by the indicator/meter (for example Z-SG), by measuring this voltage with the voltmeter (for example 10.05 V).
 - 3) Multiply the lowest mV/V value found (point 1) by the excitation voltage (point 2).
 - 4) Divide the trimming factor calculated in point 3 by the mV/V value of the other load cells.
 - 5) Measure and adjust the excitation voltage of the other three load cells via their respective potentiometer.
- Check the results and make a final adjustment by moving a test load from corner to corner.

5.3.6. MEASUREMENT INPUT IMPEDANCE

Voltage input: 227.5 kohm +/- 2%. Current input: 55 ohm +/- 20%.

5.3.7. DATA PRODUCED T->O (DEVICE -> SCANNER)

Data	Description	Data Type	Byte Offset
DIN1	Value of digital input 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] LSB
DIN2	Value of digital input 2	BIT	BYTE[0] BIT[1]
NOT USED	Not used	BYTE	BYTE[1]...BYTE[3]
NET	Net Weight	REAL 32 BIT	BYTE[4]...BYTE[7]
GROSS	Gross Weight	REAL 32 BIT	BYTE[8]...BYTE[11]
TARE	Tare	REAL 32 BIT	BYTE[12]...BYTE[15]
MAX_NET	Net Weight Maximum	REAL 32 BIT	BYTE[16]...BYTE[19]
MIN_NET	Net Weight Minimum	REAL 32 BIT	BYTE[20]...BYTE[23]
ADC_RAW	Raw ADC value	REAL 32 BIT	BYTE[24]...BYTE[27]
NUM_PIECES	Number of pieces	Unsigned integer 16 BIT	BYTE[28]...BYTE[29]
STATUS	Status	Unsigned integer 16 BIT	BYTE[30]...BYTE[31]

5.3.8. DATA CONSUMED O->T (SCANNER -> DEVICE)

Data	Description	Data Type	Byte Offset
DOUT1	Value of digital output 1 (least significant bit of the first byte)	BIT	BYTE[0] BIT[0] LSB
DOUT2	Value of digital output 2	BIT	BYTE[0] BIT[1]
NOT USED	Not used	BYTE	BYTE[1]
CMD	Command:	Unsigned Integer 16 BIT	BYTE[2]...BYTE[3]
CMD_AUX	Command Parameter	Unsigned Integer 32 BIT	BYTE[4]...BYTE[7]
FORCE_CFG	Enable new configuration: if the value is 0, the configuration is never changed	Unsigned Integer 16 BIT	BYTE[8]...BYTE[9]
DELTA_T		Unsigned Integer 16 BIT	BYTE[10]...BYTE[11]
FM		Unsigned Integer 8 BIT	BYTE[12]
MT		Unsigned Integer 8 BIT	BYTE[13]

MU		Unsigned Integer 8 BIT	BYTE[14]
RESOLUTION		Unsigned Integer 8 BIT	BYTE[15]
NOISE_FILTER		Unsigned Integer 8 BIT	BYTE[16]
FILTER_LEVEL		Unsigned Integer 8 BIT	BYTE[17]
AUTOMATIC_TARE		Unsigned Integer 8 BIT	BYTE[18]
ADC_SPEED		Unsigned Integer 8 BIT	BYTE[19]
CELL		REAL 32 BIT	BYTE[20]...BYTE[23]
FS		REAL 32 BIT	BYTE[24]...BYTE[27]
STD_W		REAL 32 BIT	BYTE[28]...BYTE[31]
NOISE_VAR		REAL 32 BIT	BYTE[32]...BYTE[35]
FILTER_RESP_VEL		REAL 32 BIT	BYTE[36]...BYTE[39]
MAN_RESOLUTION		REAL 32 BIT	BYTE[40]...BYTE[43]
SAMPLE_PIECE_W		REAL 32 BIT	BYTE[44]...BYTE[47]
TARE_W		Unsigned Integer 32 BIT	BYTE[48]...BYTE[51]
DELTA_W		REAL 32 BIT	BYTE[52]...BYTE[55]
IO_MODE1		Unsigned Integer 8 BIT	BYTE[56]
IO_FUNC1		Unsigned Integer 8 BIT	BYTE[57]
DOUT_MODE1		Unsigned Integer 8 BIT	BYTE[58]
DOUT_CONF1		Unsigned Integer 8 BIT	BYTE[59]
THRESHOLD1		REAL 32 BIT	BYTE[60]...BYTE[63]
HYSTERESIS1		REAL 32 BIT	BYTE[64]...BYTE[67]
IO_MODE2		Unsigned Integer 8 BIT	BYTE[68]
IO_FUNC2		Unsigned Integer 8 BIT	BYTE[69]
DOUT_MODE2		Unsigned Integer 8 BIT	BYTE[70]
DOUT_CONF2		Unsigned Integer 8 BIT	BYTE[71]
THRESHOLD2		REAL 32 BIT	BYTE[72]...BYTE[75]
HYSTERESIS2		REAL 32 BIT	BYTE[76]...BYTE[79]
OUT		Unsigned Integer 8 BIT	BYTE[80]
OUTM		Unsigned Integer 8 BIT	BYTE[81]
AO1		Unsigned Integer 16 BIT	BYTE[82]...BYTE[83]

5.3.9. CONNECTION STRING (CONNECTION PATH)

Depending on the configurator, it is possible to enter connection data instead of using the EDS file; in this case the Connection Path is:

20 04 24 00 2C 96 2C 64

CIP interpretation:

20 04 = Class 0x04, Assembly Object

24 00 = Instance 0

2C 96 = Connection Point 0x96 = 150 decimal = O→T / Consuming Assembly

2C 64 = Connection Point 0x64 = 100 decimal = T→O / Producing Assembly

O→T = 84 bytes Assembly 150

T→O = 32 bytes Assembly 100

N.B. these values are valid if the RUN/IDLE headers are disabled in SETUP:

ETHERIP O->T RUN/IDLE HEADER	Disabled	Disabled ▼
ETHERIP T->O RUN/IDLE HEADER	Disabled	Disabled ▼

If they are enabled, 4 bytes must be added to O->T and T->O.

6. DIP SWITCH



WARNING!

THE DIP SWITCH SETTINGS ARE READ ONLY AT STARTUP. A RESTART IS REQUIRED AFTER EVERY CHANGE.



WARNING!

DEPENDING ON THE MODEL, IT MAY BE NECESSARY TO REMOVE THE REAR COVER OF THE DEVICE TO ACCESS THE DIP SWITCHES

6.1. MEANING OF DIP SWITCHES SW1 FOR THE R-32DIDO-E MODEL

Below is the meaning of the SW1 dip switches for the various firmware revisions:

<i>DIP1</i>	<i>DIP2</i>	<i>MEANING</i>
OFF	OFF	Normal Operation: The device loads the configuration from flash memory.
ON	ON	Restores the device to factory configuration
OFF	ON	Disables access to the Web server
ON	OFF	Reserved



WARNING!

ONCE COMMISSIONING IS COMPLETE, IN ORDER TO INCREASE DEVICE SECURITY, DISABLE THE WEBSERVER VIA THE DIP SWITCHES

6.2. MEANING OF DIP SWITCHES SW1 FOR THE R-SG3-E MODEL

Below is the meaning of the SW1 dip switches:

<i>DIP1</i>	<i>DIP2</i>	<i>MEANING</i>
OFF	OFF	Normal Operation: The device loads the configuration from flash memory.
ON	ON	Restores the device to factory configuration
OFF	ON	Disables access to the Web server
ON	OFF	Reserved



WARNING!

ONCE COMMISSIONING IS COMPLETE, IN ORDER TO INCREASE DEVICE SECURITY, DISABLE THE WEBSERVER VIA THE DIP SWITCHES

6.3. MEANING OF DIP SWITCHES SW1 FOR THE R-8AI-8DIDO-E MODEL

Below is the meaning of the SW1 dip switches:

<i>DIP1</i>	<i>DIP2</i>	<i>MEANING</i>
OFF	OFF	Normal Operation: The device loads the configuration from flash memory.
ON	ON	Restores the device to factory configuration
OFF	ON	Disables access to the Web server
ON	OFF	Reserved



WARNING!

ONCE COMMISSIONING IS COMPLETE, IN ORDER TO INCREASE DEVICE SECURITY, DISABLE THE WEBSERVER VIA THE DIP SWITCHES

6.4. MEANING OF DIP SWITCHES SW1 FOR THE R-4AO-8DIDO-E MODEL

Below is the meaning of the SW1 dip switches:

DIP1	DIP2	MEANING
OFF	OFF	Normal Operation: The device loads the configuration from flash memory.
ON	ON	Restores the device to factory configuration
OFF	ON	Disables access to the Web server
ON	OFF	Reserved



WARNING!

ONCE COMMISSIONING IS COMPLETE, IN ORDER TO INCREASE DEVICE SECURITY, DISABLE THE WEBSERVER VIA THE DIP SWITCHES

6.5. MEANING OF DIP SWITCHES SW1 FOR THE R-4RTD-8DIDO-E MODEL

Below is the meaning of the SW1 dip switches:

DIP1	DIP2	MEANING
OFF	OFF	Normal Operation: The device loads the configuration from flash memory.
ON	ON	Restores the device to factory configuration
OFF	ON	Disables access to the Web server
ON	OFF	Reserved



WARNING!

ONCE COMMISSIONING IS COMPLETE, IN ORDER TO INCREASE DEVICE SECURITY, DISABLE THE WEBSERVER VIA THE DIP SWITCHES

6.6. MEANING OF DIP SWITCHES SW1 FOR THE R-2AI-6DIDO-E MODEL

Below is the meaning of the SW1 dip switches:

DIP1	DIP2	MEANING
OFF	OFF	Normal Operation: The device loads the configuration from flash memory.
ON	ON	Restores the device to factory configuration
OFF	ON	Disables access to the Web server
ON	OFF	Reserved



WARNING!

ONCE COMMISSIONING IS COMPLETE, IN ORDER TO INCREASE DEVICE SECURITY, DISABLE THE WEBSERVER VIA THE DIP SWITCHES

6.7. MEANING OF DIP SWITCHES SW1 FOR THE ZE-2AI-E MODEL

Below is the meaning of the SW dip switches1:

DIP1	DIP2	MEANING
OFF	OFF	Normal Operation: The device loads the configuration from flash memory.
ON	ON	Restores the device to factory configuration
OFF	ON	Disables access to the Web server
ON	OFF	Reserved



WARNING!

ONCE COMMISSIONING IS COMPLETE, IN ORDER TO INCREASE DEVICE SECURITY, DISABLE THE WEBSERVER VIA THE DIP SWITCHES

Below is the meaning of the SW2 dip switches:

DIP1	MEANING
ON	RS232 Activation
OFF	RS485 Activation

6.8. MEANING OF DIP SWITCHES SW1 FOR THE ZE-4DI-2AI-2DO-E MODEL

Below is the meaning of the SW1 dip switches:

DIP1	DIP2	MEANING
OFF	OFF	Normal Operation: The device loads the configuration from flash memory.
ON	ON	Restores the device to factory configuration
OFF	ON	Disables access to the Web server
ON	OFF	Reserved



WARNING!

ONCE COMMISSIONING IS COMPLETE, IN ORDER TO INCREASE DEVICE SECURITY, DISABLE THE WEBSERVER VIA THE DIP SWITCHES

Below is the meaning of the SW2 dip switches:

DIP1	MEANING
ON	RS232 Activation
OFF	RS485 Activation

6.9. MEANING OF DIP SWITCHES SW1 FOR THE ZE-SG3-E MODEL

Below is the meaning of the SW1 dip switches:

DIP1	DIP2	MEANING
OFF	OFF	Baud Rate 9600
OFF	ON	Baud Rate 19200
ON	OFF	Baud Rate 38400
ON	ON	Baud Rate 57600

DIP1	DIP2	DIP3	DIP4	DIP5	DIP6	DIP7	DIP8	MEANING
--	--	OFF	OFF	OFF	OFF	OFF	ON	MODBUS Address #1
--	--	OFF	OFF	OFF	OFF	ON	OFF	MODBUS Address #2
--	--	...	...	...	...	...	...	
--	--	ON	ON	ON	ON	ON	ON	MODBUS Address #63
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Baud and address from EEPROM

Below is the meaning of the SW2 dip switches:

DIP1	DIP2	MEANING
OFF	OFF	Normal Operation: The device loads the configuration from flash memory.
ON	ON	Restores the device to factory configuration
OFF	ON	Disables access to the Web server
ON	OFF	Reserved



WARNING!

ONCE COMMISSIONING IS COMPLETE, IN ORDER TO INCREASE DEVICE SECURITY, DISABLE THE WEBSERVER VIA THE DIP SWITCHES

7. RESTORING THE DEVICE TO FACTORY CONFIGURATION

7.1. PROCEDURE FOR RESTORING DEVICES TO FACTORY CONFIGURATION

The device can be restored to factory configuration via the dip switches.

8. CONNECTING THE DEVICE TO A NETWORK

The factory configuration of the IP address is:

Static address: 192.168.90.101

Therefore, multiple devices with the same static IP must not be placed on the same network.

If you want to connect multiple devices on the same network, it is necessary to change the IP address configuration using the Seneca Discovery Device software.



WARNING!

**DO NOT CONNECT 2 OR MORE DEVICES WITH FACTORY CONFIGURATION ON THE SAME NETWORK, OTHERWISE THE ETHERNET INTERFACE WILL NOT FUNCTION
(IP ADDRESS CONFLICT 192.168.90.101)**

If DHCP addressing mode is enabled and the device does not receive an IP address within 1 minute, the device will set a fixed error IP address:

169.254.x.y

Where x.y are the last two values of the MAC ADDRESS.

This makes it possible to install multiple Series R I/O devices and configure the IP address later using the Seneca Discovery Device software, even on networks without a DHCP server.

9. WEBSERVER

9.1. ACCESS TO THE WEBSERVER

Access to the webserver is via a web browser, by typing the device's IP address directly.
The Seneca Discovery Device software can be used to find out the device's IP address.

On first access, you will be asked for the username and password.
The default values are:

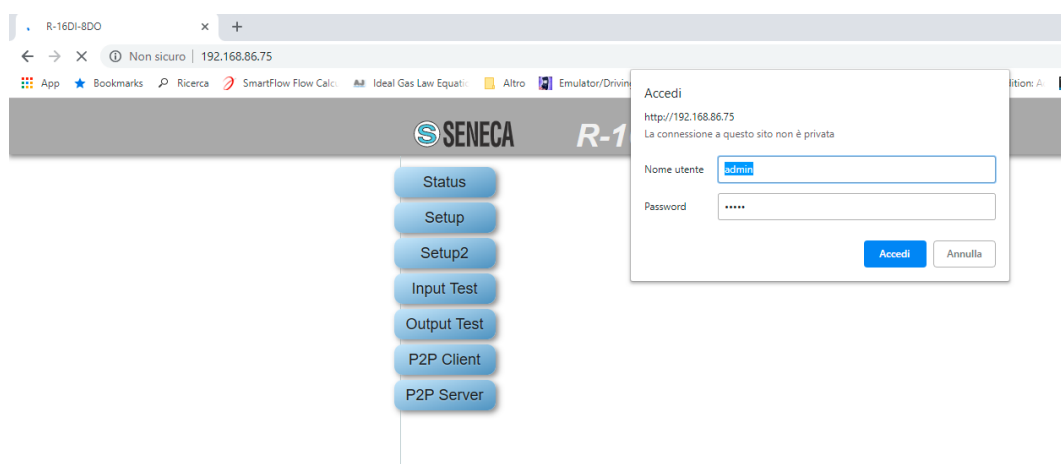
User Name:admin

Password:admin



WARNING!

AFTER THE FIRST ACCESS, CHANGE THE USER NAME AND PASSWORD TO PREVENT UNAUTHORIZED ACCESS TO THE DEVICE.



WARNING!

IF THE WEBSERVER ACCESS PARAMETERS HAVE BEEN LOST, THE DEVICE MUST BE RESTORED TO FACTORY CONFIGURATION



WARNING!

BEFORE ACCESSING THE WEBSERVER, CHECK THE STATUS OF THE DIP SWITCHES

10. DEVICE CONFIGURATION R-32DIDO-E VIA WEBSERVER

10.1. SETUP SECTION

DHCP (ETH) (default: Disabled)

Sets the DHCP client for automatically obtaining an IP address.

IP ADDRESS STATIC (ETH) (default: 192.168.90.101)

Sets the device's static address. Be careful not to place devices with the same IP address on the same network.

IP MASK STATIC (ETH) (default: 255.255.255.0)

Sets the mask for the IP network.

GATEWAY ADDRESS STATIC (ETH) (default: 192.168.90.1)

Sets the gateway address.

PROTECT CONFIGURATION (default: Disabled)

Allows enabling or disabling read/write password protection of the configuration (including the IP address) via the Seneca Discovery Device software. The password is the same one that provides access to the webserver.



WARNING!

IF CONFIGURATION PROTECTION IS ENABLED, IT WILL NOT BE POSSIBLE TO READ/WRITE THE DEVICE CONFIGURATION WITHOUT KNOWING THE PASSWORD.

IF THE PASSWORD IS LOST, THE DEVICE CAN BE RESTORED TO FACTORY CONFIGURATION VIA THE DIP SWITCHES

MODBUS SERVER PORT (ETH) (default: 502)

Sets the communication port for the Modbus TCP-IP server.

MODBUS SERVER STATION ADDRESS (ETH) (default: 1)

Active only if Modbus Passthrough is also active; sets the station address of the ModBUS TCP-IP server.



WARNING!

THE MODBUS SERVER WILL RESPOND TO ANY STATION ADDRESS ONLY IF MODBUS PASS THROUGH MODE IS DISABLED.

MODBUS PASSTHROUGH (ETH) (default: disabled)

Sets the conversion mode from Modbus TCP-IP to serial Modbus RTU.

MODBUS TCP-IP CONNECTION TIMEOUT [sec] (ETH) (default: 60)

Sets the TCP-IP connection timeout for Modbus TCP-IP server and Passthrough mode.

WEBSERVER USERNAME (default: admin)

Sets the username for access to the web server.

CONFIGURATION/WEBSERVER PASSWORD (default: admin)

Sets the password for access to the web server and for reading/writing the configuration (if enabled)

WEBSERVER PORT (default: 80)

Sets the communication port for the web server.

BAUDRATE MODBUS RTU (SER) (default: 38400 baud)

Sets the baud rate for the RS485 communication port.

DATA MODBUS RTU (SER) (default: 8 bit)

Sets the number of bits for the RS485 communication port.

PARITY MODBUS RTU (SER) (default: None)

Sets the parity for the RS485 communication port.

STOP BIT MODBUS RTU (SER) (default: 1 bit)

Sets the number of stop bits for the RS485 communication port.

MODBUS PASSTROUGH SERIAL TIMEOUT (default: 100ms)

Active only if Passthrough mode is enabled; sets the maximum waiting time before sending a new packet from TCP-IP to the serial line. It must be set based on the longest response time of all devices present on the RS485 serial line.

STATION ADDRESS MODBUS RTU (SER) (default: 1)

Defines the station address (slave address) of the device on the Modbus RTU serial line. Each device connected to the network must have a unique address within the allowed range (typically 1÷247).

ETHERIP DEVICE SERIAL NUMBER (default: 1)

Device identifier used for management and recognition within EtherNet/IP communication.

ETHERIP O->T RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Scanner to the Target. Bit 0 indicates the RUN or IDLE state of the device. The device ignores the RUN or IDLE state of the scanner.

ETHERIP T->O RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Target to the Scanner. Bit 0 indicates the RUN or IDLE state of the device.

ETHERIP VENDOR ID (default: 65535)

Allows customizing the Vendor ID that appears in the EDS file.

ETHERIP DEVICE TYPE (default: 0)

Allows customizing the Device Type that appears in the EDS file.

ETHERIP PRODUCT CODE (default: 60000)

Allows customizing the Product Code that appears in the EDS file.

ETHERIP MAJOR REVISION (default: 1)

Allows customizing the Major Revision that appears in the EDS file.

ETHERIP MINOR REVISION (default: 1)

Allows customizing the Minor Revision that appears in the EDS file.

10.2. **DIGITAL I/O SETUP SECTION**

This section allows configuration of the digital I/O present on the device.

DIGITAL I/O MODE (default Input)

Selects whether the selected I/O will function as an input or output

DIGITAL INPUT NORMALLY HIGH/LOW (default Normally Low)

If selected as a digital input, configures whether the input is normally high or low.

DIGITAL OUTPUT NORMALLY STATE (default Normally Open)

If selected as a digital output, configures whether the output is normally open or closed.

DIGITAL OUTPUT WATCHDOG (default Disabled)

If selected as a digital output, sets the watchdog mode of the outputs.

If "Disabled", disables the watchdog function for the selected output

If "Enabled on Modbus Communication", the output goes into the "Watchdog state" condition if there has been no generic Modbus communication within the set time.

If "Enabled on Modbus Digital Output Writing", the output goes into the "Watchdog state" condition if there has been no output write within the set time.

DIGITAL OUTPUT WATCHDOG STATE (default Open)

Sets the value that the digital output must assume in the event the watchdog trips.

DIGITAL OUTPUT WATCHDOG TIMEOUT [s] (default 100s)

Represents the watchdog time of the digital output in seconds.

10.3. **COUNTERS SETUP SECTION**

COUNTERS FILTER [ms] (default 0)

Sets the value in [ms] for filtering all counters connected to the inputs.

10.4. **DIGITAL I/O TEST SECTION**

Here you can read or control the digital inputs and outputs via the web page.

10.5. **COUNTERS TEST SECTION**

In this section you can view the value of the digital counters or set a starting value.

11. R-8AI-8DIDO-E DEVICE CONFIGURATION VIA WEBSERVER

11.1. SETUP SECTION

DHCP (ETH) (default: Disabled)

Sets the DHCP client for automatically obtaining an IP address.

IP ADDRESS STATIC (ETH) (default: 192.168.90.101)

Sets the device's static address. Be careful not to place devices with the same IP address on the same network.

IP MASK STATIC (ETH) (default: 255.255.255.0)

Sets the mask for the IP network.

GATEWAY ADDRESS STATIC (ETH) (default: 192.168.90.1)

Sets the gateway address.

PROTECT CONFIGURATION (default: Disabled)

Allows enabling or disabling read/write password protection of the configuration (including the IP address) via the Seneca Discovery Device software. The password is the same one that provides access to the webserver.



WARNING!

IF CONFIGURATION PROTECTION IS ENABLED, IT WILL NOT BE POSSIBLE TO READ/WRITE THE DEVICE CONFIGURATION WITHOUT KNOWING THE PASSWORD.

IF THE PASSWORD IS LOST, THE DEVICE CAN BE RESTORED TO FACTORY CONFIGURATION

MODBUS SERVER PORT (ETH) (default: 502)

Sets the communication port for the Modbus TCP-IP server.

MODBUS SERVER STATION ADDRESS (ETH) (default: 1)

Active only if Modbus Passthrough is also active; sets the station address of the ModBus TCP-IP server.



WARNING!

THE MODBUS SERVER WILL RESPOND TO ANY STATION ADDRESS ONLY IF MODBUS PASS THROUGH MODE IS DISABLED.

MODBUS PASSTHROUGH (ETH) (default: disabled)

Sets the conversion mode from Modbus TCP-IP to serial Modbus RTU.

MODBUS TCP-IP CONNECTION TIMEOUT [sec] (ETH) (default: 60)

Sets the TCP-IP connection timeout for Modbus TCP-IP server and Passthrough mode.

WEBSERVER USERNAME (default: admin)

Sets the username for access to the web server.

CONFIGURATION/WEBSERVER PASSWORD (default: admin)

Sets the password for access to the web server and for reading/writing the configuration (if enabled)

WEBSERVER PORT (default: 80)

Sets the communication port for the web server.

BAUDRATE MODBUS RTU (SER) (default: 38400 baud)

Sets the baud rate for the RS485 communication port.

DATA MODBUS RTU (SER) (default: 8 bit)

Sets the number of bits for the RS485 communication port.

PARITY MODBUS RTU (SER) (default: None)

Sets the parity for the RS485 communication port.

STOP BIT MODBUS RTU (SER) (default: 1 bit)

Sets the number of stop bits for the RS485 communication port.

MODBUS PASSTROUGH SERIAL TIMEOUT (default: 1000ms)

Active only if passthrough mode is enabled; sets the maximum waiting time before sending a new packet from TCP-IP to the serial line. It must be set based on the longest response time of all devices present on the RS485 serial line.

STATION ADDRESS MODBUS RTU (SER) (default: 1)

Defines the station address (slave address) of the device on the Modbus RTU serial line. Each device connected to the network must have a unique address within the allowed range (typically 1÷247).

FAST COUNTER (default: disabled)

If active, allows acquiring the digital inputs and counters at maximum speed (up to 2 ms sampling). To obtain maximum performance on the counters, it is recommended to disable the webserver via dip switch.

If inactive, the sampling time of the digital inputs and counters may be affected by the load of the clients connected via modbus tcp-ip.

**WARNING!**

TO OBTAIN MAXIMUM PERFORMANCE ON THE DIGITAL COUNTERS, ENABLE THE “FAST COUNTER” FLAG AND DISABLE THE WEBSERVER VIA DIP SWITCH.

ETHERIP DEVICE SERIAL NUMBER (default: 1)

Device identifier used for management and recognition within EtherNet/IP communication.

ETHERIP O->T RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Scanner to the Target. Bit 0 indicates the RUN or IDLE state of the device. The device ignores the RUN or IDLE state of the scanner.

ETHERIP T->O RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Target to the Scanner. Bit 0 indicates the RUN or IDLE state of the device.

ETHERIP VENDOR ID (default: 65535)

Allows customizing the Vendor ID that appears in the EDS file.

ETHERIP DEVICE TYPE (default: 0)

Allows customizing the Device Type that appears in the EDS file

ETHERIP PRODUCT CODE (default: 60000)

Allows customizing the Product Code that appears in the EDS file.

ETHERIP MAJOR REVISION (default: 1)

Allows customizing the Major Revision that appears in the EDS file.

ETHERIP MINOR REVISION (default: 1)

Allows customizing the Minor Revision that appears in the EDS file.

11.2. ANALOG INPUT SETUP SECTION

This section allows configuration of the analog inputs present on the device.



WARNING!

THE DEVICE CAN DETECT THE COLD JUNCTION TEMPERATURE FROM THE INTERNAL SENSORS OR FROM ANALOG INPUT 1 (VIA AN EXTERNAL PT100-TYPE SENSOR). IN THIS CASE ALL READINGS FROM THE INTERNAL SENSORS WILL BE REPLACED BY THE READING FROM ANALOG INPUT 1.

MODE (default +-30V)

Sets the measurement type for the selected input.

You can choose between the following input types:

+/-150mV

+/-30V

+/-20 mA

Thermocouple

PT100 3-wire (only for I' input 1)

TC TYPE (default: J)

In the case of thermocouple measurement, allows selecting the thermocouple type from:

J, K, R, S, T, B, E, N, L

TEMPERATURE UNIT (default: °C)

In the case of thermocouple measurement, allows choosing the temperature unit of measurement in °C or °F.

SAMPLE TIME [ms] (default: 400ms)

Sets the acquisition time of the analog channel.

MOVING FILTER (default: DISABLED)

Enables or disables the 10-sample moving average filter.

MEASURE OFFSET (default: 0 °C)

Allows adding a constant offset to the measurement in [°C/°F/mV/V/mA]; the unit of measurement depends on the measurement type.

ONBOARD COLD JUNCTION (default: ENABLED)

In the case of thermocouple measurement, enables or disables the device's automatic cold junction compensation.

If channel 1 has been configured as the cold junction measurement via PT100, this sensor will be used for compensation instead of the instrument's internal one.

COLD JUNCTION OFFSET (default: 0 °C)

Allows adding a constant offset to the cold junction measurement in [°C/°F].

PT100 MODE (default: AS CJ REFERENCE)

Only for input 1, if 3-wire PT100 measurement is enabled, you can choose whether or not the measurement is used as a reference for the cold junction.

COLD JUNCTION VALUE [°C] (default 0 °C)

In the case of thermocouple measurement, the cold junction temperature can be entered manually.

ANALOG INPUT BURNOUT MODE (default FAIL VALUE)

In the case of thermocouple measurement, selects the behavior in the event of sensor failure:

In the case of "Last Value", the value is held at the last valid value; in the case of "Fail Value", the "Burnout" value is loaded into the registers.

ANALOG INPUT BURNOUT VALUE (default 10000 °C)

In the case of thermocouple measurement, if ANALOG INPUT BURNOUT MODE = "FAIL VALUE" is enabled and the sensor is in a "burn" state, allows setting a value in °C that the measurement register must assume.

ANALOG INPUT UNIT MEASURE (default °C)

In the case of thermocouple measurement, allows setting the unit of measurement of the measurement register among °C, K, °F and mV.

ANALOG INPUT FILTER [samples] (default 0)

Allows setting the moving average filter with the selected number of samples. If the value is "0" the filter is disabled.

ANALOG INPUT START SCALE

Represents the electrical start-of-scale of the analog measurement used for the engineering measurement register.

ANALOG INPUT STOP SCALE

Represents the electrical end-of-scale of the analog measurement used for the engineering measurement register.

ANALOG INPUT ENG START SCALE

Represents the value of the engineering measurement register when the input reaches the value indicated in the ANALOG INPUT START SCALE parameter.

For example, if:

ANALOG INPUT START SCALE = 4mA

ANALOG INPUT STOP SCALE = 20mA

ANALOG INPUT ENG STOP SCALE = -200 meters

ANALOG INPUT ENG START SCALE = 200 meters

With an input of 12 mA, the engineering value will be 0 meters.

ANALOG INPUT ENG STOP SCALE

Represents the value of the engineering measurement register when the input reaches the value indicated in the ANALOG INPUT STOP SCALE parameter.

For example, if:

ANALOG INPUT START SCALE = 4mA

ANALOG INPUT STOP SCALE = 20mA

ANALOG INPUT ENG STOP SCALE = -200 meters

ANALOG INPUT ENG START SCALE = 200 meters

With an input of 12 mA, the engineering value will be 0 meters.

11.3. COUNTERS SETUP SECTION**COUNTERS FILTER [ms] (default 100 ms)**

Sets the filter for the 8 digital counters

11.4. ANALOG TEST SECTION

Here you can view the values of the analog inputs via the web page.

11.5. **DIGITAL I/O SETUP SECTION**

This section allows configuration of the digital I/O present on the device.

DIGITAL I/O MODE (default Input)

Selects whether the selected terminal will function as input, output, or output controlled by an event related to the selected analog input.

DIGITAL INPUT NORMALLY HIGH/LOW (default Normally Low)

If selected as a digital input, configures whether the input is normally high or low.

DIGITAL OUTPUT NORMALLY STATE (default Normally Open)

If selected as a digital output, configures whether the output is normally open or closed.

DIGITAL OUTPUT WATCHDOG (default Disabled)

If selected as a digital output, sets the watchdog mode of the outputs.

If “Disabled”, disables the watchdog function for the selected output

If “Enabled on Modbus Communication”, the output goes into the “Watchdog state” condition if there has been no generic Modbus communication within the set time.

If “Enabled on Modbus Digital Output Writing”, the output goes into the “Watchdog state” condition if there has been no output write within the set time.

DIGITAL OUTPUT WATCHDOG STATE (default Open)

Sets the value that the digital output must assume in the event the watchdog trips.

DIGITAL OUTPUT WATCHDOG TIMEOUT [s] (default 100s)

Represents the watchdog time of the digital output in seconds.

11.6. **COUNTERS TEST SECTION**

In this section you can view the value of the digital counters or set a starting value.

11.7. EVENTS SETUP SECTION

This section allows configuration of events for sending analog values with the P2P protocol.

EVENT AIN MODE (Default: DISABLED)

Represents the event condition for sending packets related to the analog inputs in the P2P protocol.

It can be:

“Disabled”: the analog packet sending event is disabled

“Event when $AIN > HIGH\ THRESHOLD$ ”: the packet sending event occurs when the analog input exceeds the set “High” threshold.

“Event when $AIN < LOW\ THRESHOLD$ ”: the packet sending event occurs when the analog input is below the set “Low” threshold.

EVENT AIN HIGH THRESHOLD (Default: 0)

Threshold value linked to the “High” event.

EVENT AIN LOW THRESHOLD (Default: 0)

Threshold value linked to the “Low” event.

EVENT AIN HYSTERESIS

Hysteresis value for exiting the “event” condition.

For example, if the event is configured in “Event when $AIN > HIGH\ THRESHOLD$ ” mode, when the analog input exceeds the threshold value the packet will be sent; to send the next packet, the analog value must drop below the value ($EVENT\ AIN\ HIGH\ THRESHOLD + EVENT\ AIN\ HYSTERESIS$) and then rise again above the HIGH value.

12. R-SG3-E DEVICE CONFIGURATION VIA WEBSERVER

12.1. SETUP SECTION

DHCP (ETH) (default: Disabled)

Sets the DHCP client for automatically obtaining an IP address.

IP ADDRESS STATIC (ETH) (default: 192.168.90.101)

Sets the device's static address. Be careful not to place devices with the same IP address on the same network.

IP MASK STATIC (ETH) (default: 255.255.255.0)

Sets the mask for the IP network.

GATEWAY ADDRESS STATIC (ETH) (default: 192.168.90.1)

Sets the gateway address.

MODBUS SERVER PORT (ETH) (default: 502)

Sets the communication port for the Modbus TCP-IP server.

MODBUS SERVER STATION ADDRESS (ETH) (default: 1)

Active only if Modbus Passthrough is also active; sets the station address of the ModBus TCP-IP server.



WARNING!

THE MODBUS SERVER WILL RESPOND TO ANY STATION ADDRESS ONLY IF MODBUS PASS THROUGH MODE IS DISABLED.

MODBUS PASSTHROUGH (ETH) (default: disabled)

Sets the conversion mode from Modbus TCP-IP to serial Modbus RTU.

MODBUS TCP-IP CONNECTION TIMEOUT [sec] (ETH) (default: 60)

Sets the TCP-IP connection timeout for Modbus TCP-IP server and Passthrough mode.

WEBSERVER USERNAME (default: admin)

Sets the username for access to the web server.

CONFIGURATION/WEBSERVER PASSWORD (default: admin)

Sets the password for access to the web server and for reading/writing the configuration (if enabled)

WEBSERVER PORT (default: 80)

Sets the communication port for the web server.

BAUDRATE MODBUS RTU (SER) (default: 38400 baud)

Sets the baud rate for the RS485 communication port.

PARITY MODBUS RTU (SER) (default: None)

Sets the parity for the RS485 communication port.

STOP BIT MODBUS RTU (SER) (default: 1 bit)

Sets the number of stop bits for the RS485 communication port.

MODBUS PASSTROUGH SERIAL TIMEOUT (default: 100ms)

Active only if passthrough mode is enabled; sets the maximum waiting time before sending a new packet from TCP-IP to the serial line. It must be set based on the longest response time of all devices present on the RS485 serial line.

STATION ADDRESS MODBUS RTU (SER) (default: 1)

Defines the station address (slave address) of the device on the Modbus RTU serial line. Each device connected to the network must have a unique address within the allowed range (typically 1÷247).

MODBUS SERIAL TIMEOUT [ms] (default: 100)

Defines the maximum waiting time for a device's response in Modbus RTU communication. If no response is received within the set time, the request is considered invalid and the communication is reported as a timeout.

ETHERIP DEVICE SERIAL NUMBER (default: 1)

Device identifier used for management and recognition within EtherNet/IP communication.

ETHERIP O->T RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Scanner to the Target. Bit 0 indicates the RUN or IDLE state of the device. The device ignores the RUN or IDLE state of the scanner.

ETHERIP T->O RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Target to the Scanner. Bit 0 indicates the RUN or IDLE state of the device.

ETHERIP VENDOR ID (default: 65535)

Allows customizing the Vendor ID that appears in the EDS file.

ETHERIP DEVICE TYPE (default: 0)

Allows customizing the Device Type that appears in the EDS file

ETHERIP PRODUCT CODE (default: 60000)

Allows customizing the Product Code that appears in the EDS file.

ETHERIP MAJOR REVISION (default: 1)

Allows customizing the Major Revision that appears in the EDS file.

ETHERIP MINOR REVISION (default: 1)

Allows customizing the Minor Revision that appears in the EDS file.

12.2. LOAD CELL SETUP SECTION***FUNCTION MODE***

Allows configuring the basic operation of the device; it can be set to factory calibration or to calibration with standard weight.

FACTORY CALIBRATION

Used when a load cell with declared sensitivity is available.

In this mode, calibration consists only of acquiring the tare directly in the field with a direct measurement.

If it is not possible to acquire the tare with a direct measurement (for example in the case of an already filled silo) the tare value can be entered manually in the desired unit of measurement (kg, t, etc...).

CALIBRATION WITH STANDARD WEIGHT

Used when a standard weight is available (as close as possible to the full scale of the load cell).

In this mode, calibration consists of acquiring both the tare and the standard weight directly in the field.

MEASURE TYPE

Allows configuring the device's operation between:

BALANCE (UNIPOLAR)

Used when building a scale in which the load cell is only compressed; in this case, maximum resolution of the compression measurement is obtained.

COMPRESSION AND TRACTION (BIPOLAR)

Used when building a measurement system (typically for force) that can either compress or extend the load cell. In this case, it is also possible to set the direction of the force: if compression, the measurement

will have a + sign; if traction, it will have a - sign. A typical use case is linking the direction of the force to the analog output so that, for example, 4 mA corresponds to maximum traction force and 20 mA corresponds to maximum compression force (in this case the cell at rest will output 12 mA).

MEASURE UNIT

Sets the unit of measurement for the weighing in g, Kg, t, etc.

CELL SENSITIVITY

This is the declared cell sensitivity value expressed in mV/V (for most cells it is 2mV/V).

CELL FULL SCALE

This is the full-scale value of the cell expressed in the selected unit of measurement.

STANDARD WEIGHT VALUE

Represents the value of the standard weight that will be used in calibration if the standard weight operating mode has been chosen.

NOISE FILTER

Enables or disables filtering of the measurement.

FILTER LEVEL

Allows setting the measurement filter level according to the following table:

FILTER LEVEL	RESPONSE TIME [ms]
0	2
1	6.7
2	13
3	30
4	50
5	250
6	850
ADVANCED	Configurable

The higher the filter level, the more stable but slower the weight measurement will be.

If the advanced filtering level (Advanced) is selected, the configuration will allow selecting the following parameters:

ADC SPEED Selects the ADC acquisition speed from 4.7 Hz to 960 Hz

NOISE VARIATION This is the variation in ADC points due to noise alone (it represents the measurement uncertainty due to noise), i.e. how much we expect the measurement to vary (the unit of measurement is in raw ADC points).

FILTER RESPONSE SPEED

Represents a parameter related to the filter's response speed; it can vary from 0.001 (Slowest response) to 1 (Fastest response). It represents the process variance.

NET WEIGHT RESOLUTION

This is the resolution with which the net weight value is represented; it can be:

MAXIMUM RESOLUTION

Will represent the net weight with the maximum possible resolution

MANUAL RESOLUTION

Will represent the net weight with the manual resolution (in engineering units) that has been set. For example, by setting 0.1 Kg, the net weight will only be able to vary in multiples of 100g.

AUTOMATIC RESOLUTION

Will represent the net weight with a calculated resolution of approximately 20000 points. Unlike the Maximum or Manual resolution, this setting also acts by limiting the ADC value and therefore affects all measurements.

 WARNING

Note that in “Calibration with standard weight” mode, when using “Manual resolution”, it may happen that the correct standard weight value cannot be perfectly represented:

For example, suppose we have:

Cell full scale of 15000 g

Standard weight 14000 g

Manual resolution 1.5 g

The standard weight value (14000 g) cannot be represented with a resolution step of 1.5 g ($14000/1.5 \text{ g} = 9333.333$ is not an integer value), so it will be represented as: $9333 \cdot 1.5 \text{ g} = 13999.5 \text{ g}$

To avoid this effect, use a resolution for which the value is representable (for example 1 g or 2 g).

SAMPLE PIECE WEIGHT

Sets the weight of a single piece in engineering units for the mode. By setting the net weight of a single item in this register, the converter will be able to indicate the number of pieces present on the scale in the appropriate register according to the relationship:

$$\text{No. of Pieces} = \text{Net Weight} / \text{Sample Piece Weight} —$$

AUTOMATIC TARE TRACKER

Allows enabling or disabling automatic tare zeroing.

ADC VALUE

Allows setting the number of ADC points within which the tare is automatically zeroed.

If, after 5 seconds of stable weighing condition, the ADC value of the net weight deviates by less than this value, a new tare is then acquired.

12.3. I/O SETUP SECTION**DIGITAL I/O MODE**

Configures the device's digital I/O

DIGITAL INPUT

If the n-th I/O is configured as an input, its function can be chosen from:

FUNCTION DIGITAL INPUT

The input is configured as a digital input whose value can be read from the corresponding register.

FUNCTION ACQUIRE TARE

In this mode, if the digital input is activated for more than 3 seconds, a new tare value is acquired (in RAM, so it is lost on restart). This is equivalent to sending command 49594 (decimal) to the command register.

DIGITAL OUTPUT

If the n-th I/O is configured as an output, its function can be chosen from:

DIGITAL OUTPUT MODE

The output can be configured as normally open or as normally closed).

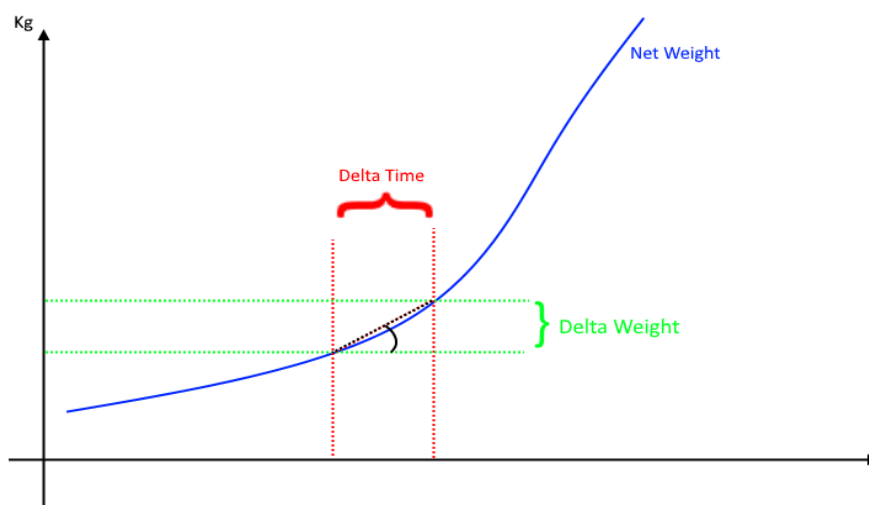
DIGITAL OUTPUT CONFIGURATION

Here you can choose the behavior of the digital output:

STABLE WEIGHT

The stable weighing condition indicates that the net weight measurement is stable if:

The net weight remains within the weight $\Delta_{\text{net_weight}}$ over the time Δ_{time} , i.e. if the slope of the curve traced by the net weight is less than $\frac{\Delta_{\text{net_weight}}}{\Delta_{\text{time}}}$:



You will be asked to enter the Delta Net Weight (Delta Weight) values (in engineering units) and Delta Time (in units of 0.1 seconds).

THRESHOLD AND STABLE WEIGHT

In this mode, the output is activated when the net weight reaches the threshold and the weighing is in a stable weighing condition.

STABLE WEIGHT

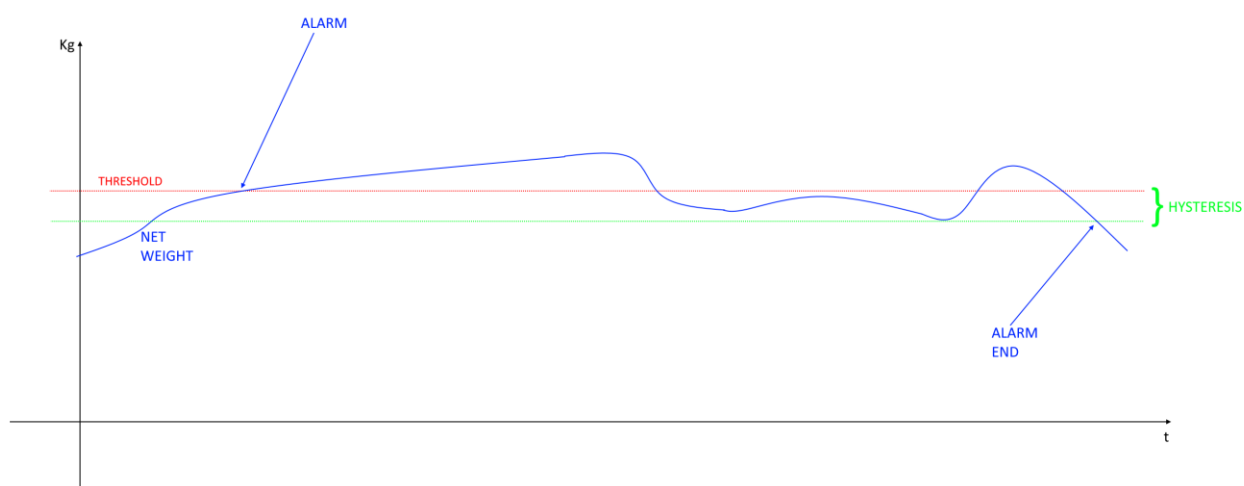
In this mode, the output is activated when the weighing is in a stable weighing condition.

COMMANDABLE FROM MODBUS

In this mode, the output can be controlled from a modbus register.

THRESHOLD WITH HYSTERESIS

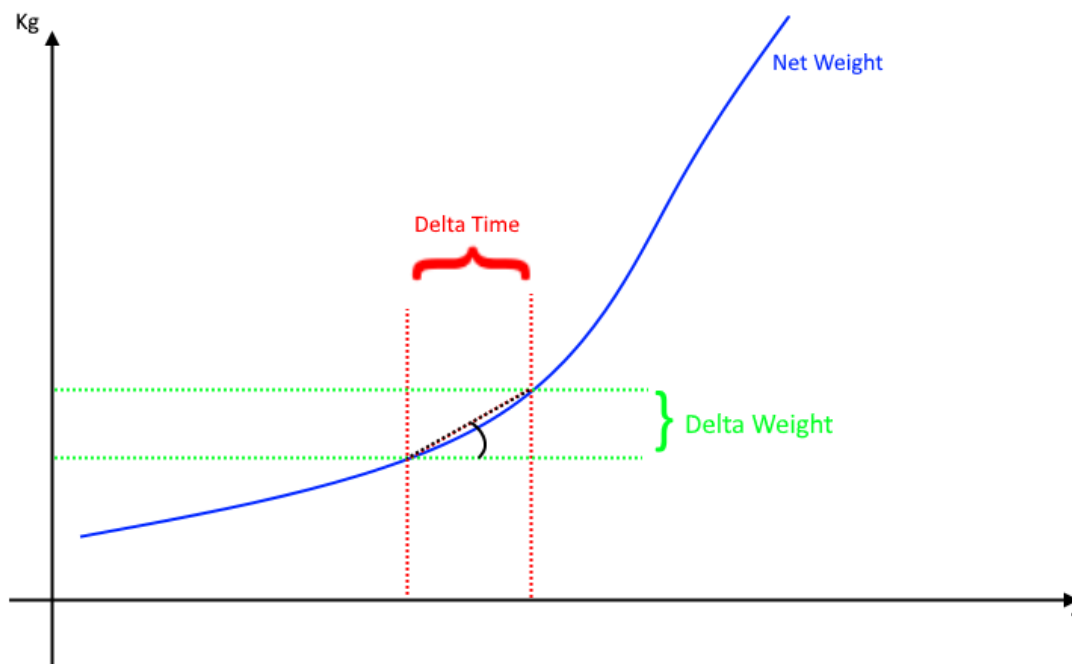
In this mode, the output is activated when the net weight reaches the threshold; the alarm resets when the net weight drops below the Threshold-Hysteresis value:



STABLE WEIGHT CONDITION

The stable weighing condition indicates that the net weight measurement is stable if:

The net weight remains within the weight $\Delta_{\text{net_weight}}$ (DELTA WEIGHT) over the time Δ_{time} (DELTA TIME), i.e. if the slope of the curve traced by the net weight is less than $\frac{\Delta_{\text{net_weight}}}{\Delta_{\text{time}}}$:



12.4. TEST AND LOAD CELL CALIBRATION SECTION

In this section you can calibrate the cell and run tests. For more information on cell calibration, refer to the load cell calibration chapter of this manual.

12.5. LOAD CELL CALIBRATION VIA THE WEBSERVER

To calibrate the load cell, access the “TEST AND LOAD CELL CALIBRATION” section of the webserver. Depending on which of the two modes is chosen, factory calibration or calibration with standard weight, you can proceed with calibration.

12.5.1. CELL CALIBRATION WITH FACTORY PARAMETERS

In cell calibration with factory parameters, there is no need to use a standard weight since reference is made to the parameters acquired at the factory.

The required data are:

- The cell sensitivity
- The cell full scale

For the cell calibration procedure it is necessary to acquire the tare.

The tare can be entered manually in engineering units (if known) or it can be acquired from the field.



WARNING!

TO OBTAIN BETTER MEASUREMENT ACCURACY, ACQUIRE THE TARE FROM THE FIELD

12.5.1.1. MANUAL TARE ENTRY VIA THE WEBSERVER

It is not always possible to acquire the tare value from the field (for example in the case of already full silos); in these cases, the tare weight can be entered in engineering units.

LOAD CELL CALIBRATION

	VALUE
FUNCTION MODE: FACTORY CALIBRATION	
TARE ACQUISITION	
TARE VALUE [g]	50.00000
	MANUAL INSERTION ▼
	750
SET MANUAL TARE (FLASH)	

To acquire the tare value, press the “SET MANUAL TARE (FLASH)” button

12.5.1.2. ACQUIRING THE TARE FROM THE FIELD VIA THE WEBSERVER

- 1) Go to the "Test and Load Cell Calibration" webserver page
- 2) Place the tare on the cell
- 3) Wait for the measurement to stabilize
- 4) Press the "TARE ACQUISITION (FLASH)" button

LOAD CELL CALIBRATION

	VALUE
FUNCTION MODE: FACTORY CALIBRATION	
TARE ACQUISITION	FROM FIELD ▼
TARE ACQUISITION(FLASH) 1°	

12.5.2. CELL CALIBRATION WITH A STANDARD WEIGHT

In cell calibration with a standard weight, you need to have available:

- The cell sensitivity
- The cell full scale
- A standard weight (so that Standard weight + Tare are as close as possible to the cell's full scale)

- 1) Go to the "Test and Load Cell Calibration" webserver page
- 2) Place the tare on the cell
- 3) Wait for the measurement to stabilize
- 4) Press the "TARE ACQUISITION (FLASH)" button
- 5)

LOAD CELL CALIBRATION

FUNCTION MODE: CALIBRATION WITH STANDARD WEIGHT

TARE ACQUISITION(FLASH)	STANDARD WEIGHT ACQUISITION(FLASH)
1°	2°

- 6) Place the Tare+Standard Weight
- 7) Wait for the measurement to stabilize
- 8) Press the "STANDARD WEIGHT ACQUISITION (FLASH)" button

13. R-4AO-8DIDO-E DEVICE CONFIGURATION VIA WEBSERVER

13.1. SETUP SECTION

DHCP (ETH) (default: Disabled)

Sets the DHCP client for automatically obtaining an IP address.

IP ADDRESS STATIC (ETH) (default: 192.168.90.101)

Sets the device's static address. Be careful not to place devices with the same IP address on the same network.

IP MASK STATIC (ETH) (default: 255.255.255.0)

Sets the mask for the IP network.

GATEWAY ADDRESS STATIC (ETH) (default: 192.168.90.1)

Sets the gateway address.

PROTECT CONFIGURATION (default: Disabled)

Allows enabling or disabling read/write password protection of the configuration (including the IP address) via the Seneca Discovery Device software. The password is the same one that provides access to the webserver.



WARNING!

IF CONFIGURATION PROTECTION IS ENABLED, IT WILL NOT BE POSSIBLE TO READ/WRITE THE DEVICE CONFIGURATION WITHOUT KNOWING THE PASSWORD.

IF THE PASSWORD IS LOST, THE DEVICE CAN BE RESTORED TO FACTORY CONFIGURATION

MODBUS SERVER PORT (ETH) (default: 502)

Sets the communication port for the Modbus TCP-IP server.

MODBUS SERVER STATION ADDRESS (ETH) (default: 1)

Active only if Modbus Passthrough is also active; sets the station address of the ModBus TCP-IP server.



WARNING!

THE MODBUS SERVER WILL RESPOND TO ANY STATION ADDRESS ONLY IF MODBUS PASS THROUGH MODE IS DISABLED.

MODBUS PASSTHROUGH (ETH) (default: disabled)

Sets the conversion mode from Modbus TCP-IP to serial Modbus RTU.

MODBUS TCP-IP CONNECTION TIMEOUT [sec] (ETH) (default: 60)

Sets the TCP-IP connection timeout for Modbus TCP-IP server and Passthrough mode.

WEBSERVER USERNAME (default: admin)

Sets the username for access to the web server.

CONFIGURATION/WEBSERVER PASSWORD (default: admin)

Sets the password for access to the web server and for reading/writing the configuration (if enabled)

WEBSERVER PORT (default: 80)

Sets the communication port for the web server.

BAUDRATE MODBUS RTU (SER) (default: 38400 baud)

Sets the baud rate for the RS485 communication port.

DATA MODBUS RTU (SER) (default: 8 bit)

Sets the number of bits for the RS485 communication port.

PARITY MODBUS RTU (SER) (default: None)

Sets the parity for the RS485 communication port.

STOP BIT MODBUS RTU (SER) (default: 1 bit)

Sets the number of stop bits for the RS485 communication port.

MODBUS PASSTROUGH SERIAL TIMEOUT (default: 1000ms)

Active only if passthrough mode is enabled; sets the maximum waiting time before sending a new packet from TCP-IP to the serial line. It must be set based on the longest response time of all devices present on the RS485 serial line.

STATION ADDRESS MODBUS RTU (SER) (default: 1)

Defines the station address (slave address) of the device on the Modbus RTU serial line. Each device connected to the network must have a unique address within the allowed range (typically 1÷247).

ETHERIP DEVICE SERIAL NUMBER (default: 1)

Device identifier used for management and recognition within EtherNet/IP communication.

ETHERIP O->T RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Scanner to the Target. Bit 0 indicates the RUN or IDLE state of the device. The device ignores the RUN or IDLE state of the scanner.

ETHERIP T->O RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Target to the Scanner. Bit 0 indicates the RUN or IDLE state of the device.

ETHERIP VENDOR ID (default: 65535)

Allows customizing the Vendor ID that appears in the EDS file.

ETHERIP DEVICE TYPE (default: 0)

Allows customizing the Device Type that appears in the EDS file

ETHERIP PRODUCT CODE (default: 60000)

Allows customizing the Product Code that appears in the EDS file.

ETHERIP MAJOR REVISION (default: 1)

Allows customizing the Major Revision that appears in the EDS file.

ETHERIP MINOR REVISION (default: 1)

Allows customizing the Minor Revision that appears in the EDS file.

13.2. ANALOG OUTPUT SETUP SECTION

This section allows configuration of the analog outputs present on the device.

MODE (default Voltage)

Sets whether the analog output must operate in voltage (range $\pm 10V$) or current (range 0-20mA).

WATCHDOG MODE (default Disabled)

Sets whether the analog output, in the event of loss of communication with the Modbus client, must load the safety value or not.

WATCHDOG TIMEOUT [s] (default 0)

Sets the time in seconds within which communication with the Modbus master must occur in order to prevent the watchdog from tripping.

WATCHDOG FAIL ENG. VALUE (default 0)

Sets the engineering (scaled) value that the output must assume in the event of a watchdog-related failure. It is also the value that the analog outputs assume at startup.

START SCALE [mV/uA]

Represents the electrical start-of-scale of the analog output used for the engineering measurement register.

STOP SCALE [mV/uA]

Represents the electrical end-of-scale of the analog measurement used for the engineering measurement register.

ENG START SCALE

Represents the value of the engineering register when the output reaches the value indicated in the START SCALE parameter.

For example, if:

START SCALE = 4mA

STOP SCALE = 20mA

ENG STOP SCALE = -200 meters

ENG START SCALE = 200 meters

By writing the engineering value -200 meters to the modbus register, the analog output will be 4 mA.

By writing the engineering value 0 meters to the modbus register, the analog output will be 12 mA.

By writing the engineering value 200 meters to the modbus register, the analog output will be 20 mA.

ENG STOP SCALE

Represents the value of the engineering register when the output reaches the value indicated in the STOP SCALE parameter.

For example, if:

START SCALE = 4mA

STOP SCALE = 20mA

ENG STOP SCALE = -200 meters

ENG START SCALE = 200 meters

By writing the engineering value -200 meters to the modbus register, the analog output will be 4 mA.

By writing the engineering value 0 meters to the modbus register, the analog output will be 12 mA.

By writing the engineering value 200 meters to the modbus register, the analog output will be 20 mA.

13.3. DIGITAL I/O SETUP SECTION

This section allows configuration of the digital I/O present on the device.

DIGITAL I/O MODE (default Input)

Selects whether the selected terminal will function as an input, output, or output controlled by an event related to the selected analog input.

DIGITAL INPUT NORMALLY HIGH/LOW (default Normally Low)

If selected as a digital input, configures whether the input is normally high or low.

DIGITAL OUTPUT NORMALLY STATE (default Normally Open)

If selected as a digital output, configures whether the output is normally open or closed.

DIGITAL OUTPUT WATCHDOG (default Disabled)

If selected as a digital output, sets the watchdog mode of the outputs.

If "Disabled", disables the watchdog function for the selected output

If "Enabled on Modbus Communication", the output goes into the "Watchdog state" condition if there has been no generic Modbus communication within the set time.

If "Enabled on Modbus Digital Output Writing", the output goes into the "Watchdog state" condition if there has been no output write within the set time.

DIGITAL OUTPUT WATCHDOG STATE (default Open)

Sets the value that the digital output must assume in the event the watchdog trips.

DIGITAL OUTPUT WATCHDOG TIMEOUT [s] (default 100s)

Represents the watchdog time of the digital output in seconds.

13.4. **COUNTERS SETUP SECTION**

COUNTERS FILTER [ms] (default 0)

Sets the value in [ms] for filtering all counters connected to the inputs.

13.5. **ANALOG TEST SECTION**

Here you can control the analog outputs via the web page.

13.6. **DIGITAL I/O TEST SECTION**

Here you can read or control the digital inputs and outputs via the web page.

13.7. **COUNTERS TEST SECTION**

In this section you can view the value of the counters or set a starting value.

14. R-4RTD-8DIDO-E DEVICE CONFIGURATION VIA WEBSERVER

14.1. SETUP SECTION

DHCP (ETH) (default: Disabled)

Sets the DHCP client for automatically obtaining an IP address.

IP ADDRESS STATIC (ETH) (default: 192.168.90.101)

Sets the device's static address. Be careful not to place devices with the same IP address on the same network.

IP MASK STATIC (ETH) (default: 255.255.255.0)

Sets the mask for the IP network.

GATEWAY ADDRESS STATIC (ETH) (default: 192.168.90.1)

Sets the gateway address.

PROTECT CONFIGURATION (default: Disabled)

Allows enabling or disabling read/write password protection of the configuration (including the IP address) via the Seneca Discovery Device software. The password is the same one that provides access to the webserver.



WARNING!

IF CONFIGURATION PROTECTION IS ENABLED, IT WILL NOT BE POSSIBLE TO READ/WRITE THE DEVICE CONFIGURATION WITHOUT KNOWING THE PASSWORD.

IF THE PASSWORD IS LOST, THE DEVICE CAN BE RESTORED TO FACTORY CONFIGURATION

MODBUS SERVER PORT (ETH) (default: 502)

Sets the communication port for the Modbus TCP-IP server.

MODBUS SERVER STATION ADDRESS (ETH) (default: 1)

Active only if Modbus Passthrough is also active; sets the station address of the ModBus TCP-IP server.



WARNING!

THE MODBUS SERVER WILL RESPOND TO ANY STATION ADDRESS ONLY IF MODBUS PASS THROUGH MODE IS DISABLED.

MODBUS PASSTHROUGH (ETH) (default: disabled)

Sets the conversion mode from Modbus TCP-IP to serial Modbus RTU.

MODBUS TCP-IP CONNECTION TIMEOUT [sec] (ETH) (default: 60)

Sets the TCP-IP connection timeout for Modbus TCP-IP server and Passthrough mode.

WEBSERVER USERNAME (default: admin)

Sets the username for access to the web server.

CONFIGURATION/WEBSERVER PASSWORD (default: admin)

Sets the password for access to the web server and for reading/writing the configuration (if enabled)

WEBSERVER PORT (default: 80)

Sets the communication port for the web server.

BAUDRATE MODBUS RTU (SER) (default: 38400 baud)

Sets the baud rate for the RS485 communication port.

DATA MODBUS RTU (SER) (default: 8 bit)

Sets the number of bits for the RS485 communication port.

PARITY MODBUS RTU (SER) (default: None)

Sets the parity for the RS485 communication port.

STOP BIT MODBUS RTU (SER) (default: 1 bit)

Sets the number of stop bits for the RS485 communication port.

MODBUS PASSTROUGH SERIAL TIMEOUT (default: 1000ms)

Active only if passthrough mode is enabled; sets the maximum waiting time before sending a new packet from TCP-IP to the serial line. It must be set based on the longest response time of all devices present on the RS485 serial line.

STATION ADDRESS MODBUS RTU (SER) (default: 1)

Defines the station address (slave address) of the device on the Modbus RTU serial line. Each device connected to the network must have a unique address within the allowed range (typically 1÷247).

ETHERIP DEVICE SERIAL NUMBER (default: 1)

Device identifier used for management and recognition within EtherNet/IP communication.

ETHERIP O->T RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Scanner to the Target. Bit 0 indicates the RUN or IDLE state of the device. The device ignores the RUN or IDLE state of the scanner.

ETHERIP T->O RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Target to the Scanner. Bit 0 indicates the RUN or IDLE state of the device.

ETHERIP VENDOR ID (default: 65535)

Allows customizing the Vendor ID that appears in the EDS file.

ETHERIP DEVICE TYPE (default: 0)

Allows customizing the Device Type that appears in the EDS file

ETHERIP PRODUCT CODE (default: 60000)

Allows customizing the Product Code that appears in the EDS file.

ETHERIP MAJOR REVISION (default: 1)

Allows customizing the Major Revision that appears in the EDS file.

ETHERIP MINOR REVISION (default: 1)

Allows customizing the Minor Revision that appears in the EDS file.

14.2. **ANALOG INPUT SETUP SECTION**

This section allows configuration of the analog inputs present on the device.

SENSOR

Sets the type of sensor connected to the input.

You can choose between the following sensors:

PT100
Ni100
PT500
PT1000
Cu50
Cu100
Ni120
Ni1000

SAMPLING TIME

Sets the sampling time of the channel (each channel is independent).

MOVING FILTER

Allows setting whether to enable the 10-sample moving average filter.

CONNECTION WIRES

Allows selecting the type of connection with the sensor: 2, 3, or 4 wires.

WIRES CONNECTION RESISTANCE [Ohm]

Allows selecting the resistance of the connection wires, if any.

UNIT MEASURE

Allows selecting the channel's unit of measurement among °C, K, °F, Ohm.

TEMPERATURE OFFSET

Allows setting a temperature offset for the channel.

FAULT MODE

Allows setting the channel's behavior in the event of a fault, between "Last valid Value" or "Fail value"

FAIL VALUE

Allows setting the channel's fail value.

BURN SENSOR DETECT

Allows enabling or disabling fast detection of the sensor's burn state

BURN SENSOR SAMPLING TIME (s)

Allows setting how often the measurement must be taken to detect the channel's burn state.

ANALOG INPUT START SCALE

Represents the electrical start-of-scale of the analog measurement used for the engineering measurement register.

ANALOG INPUT STOP SCALE

Represents the electrical end-of-scale of the analog measurement used for the engineering measurement register.

ANALOG INPUT ENG START SCALE

Represents the value of the engineering measurement register when the input reaches the value indicated in the ANALOG INPUT START SCALE parameter.

For example, if:

ANALOG INPUT START SCALE = 0 °C

ANALOG INPUT STOP SCALE = 100 °C

ANALOG INPUT ENG STOP SCALE = -200

ANALOG INPUT ENG START SCALE = 200

With an input of 50 °C, the engineering value will be 0.

ANALOG INPUT ENG STOP SCALE

Represents the value of the engineering measurement register when the input reaches the value indicated in the ANALOG INPUT STOP SCALE parameter.

For example, if:

ANALOG INPUT START SCALE = 0 °C

ANALOG INPUT STOP SCALE = 100 °C

ANALOG INPUT ENG STOP SCALE = -200

ANALOG INPUT ENG START SCALE = 200

With an input of 50 °C, the engineering value will be 0.

14.3. COUNTERS SETUP SECTION

COUNTERS FILTER [ms] (default 0)

Sets the value in [ms] for filtering all counters connected to the inputs.

14.4. ANALOG TEST SECTION

Here you can view the values of the analog inputs via the web page.

14.5. DIGITAL I/O SETUP SECTION

This section allows configuration of the digital I/O present on the device.

DIGITAL I/O MODE (default Input)

Selects whether the selected terminal will function as an input, output, or output controlled by an event related to the selected analog input.

DIGITAL INPUT NORMALLY HIGH/LOW (default Normally Low)

If selected as a digital input, configures whether the input is normally high or low.

DIGITAL OUTPUT NORMALLY STATE (default Normally Open)

If selected as a digital output, configures whether the output is normally open or closed.

DIGITAL OUTPUT WATCHDOG (default Disabled)

If selected as a digital output, sets the watchdog mode of the outputs.

If "Disabled", disables the watchdog function for the selected output

If "Enabled on Modbus Communication", the output goes into the "Watchdog state" condition if there has been no generic Modbus communication within the set time.

If "Enabled on Modbus Digital Output Writing", the output goes into the "Watchdog state" condition if there has been no output write within the set time.

DIGITAL OUTPUT WATCHDOG STATE (default Open)

Sets the value that the digital output must assume in the event the watchdog trips.

DIGITAL OUTPUT WATCHDOG TIMEOUT [s] (default 100s)

Represents the watchdog time of the digital output in seconds.

14.6. **DIGITAL I/O TEST SECTION**

Here you can read or control the digital inputs and outputs via the web page.

14.7. **COUNTERS TEST SECTION**

In this section you can view the value of the digital counters or set a starting value.

15. R-2AI-6DIDO-E DEVICE CONFIGURATION VIA WEBSERVER

15.1. SETUP SECTION

DHCP (ETH) (default: Disabled)

Sets the DHCP client for automatically obtaining an IP address.

IP ADDRESS STATIC (ETH) (default: 192.168.90.101)

Sets the device's static address. Be careful not to place devices with the same IP address on the same network.

IP MASK STATIC (ETH) (default: 255.255.255.0)

Sets the mask for the IP network.

GATEWAY ADDRESS STATIC (ETH) (default: 192.168.90.1)

Sets the gateway address.

PROTECT CONFIGURATION (default: Disabled)

Allows enabling or disabling read/write password protection of the configuration (including the IP address) via the Seneca Discovery Device software. The password is the same one that provides access to the webserver.



WARNING!

IF CONFIGURATION PROTECTION IS ENABLED, IT WILL NOT BE POSSIBLE TO READ/WRITE THE DEVICE CONFIGURATION WITHOUT KNOWING THE PASSWORD.

IF THE PASSWORD IS LOST, THE DEVICE CAN BE RESTORED TO FACTORY CONFIGURATION

MODBUS SERVER PORT (ETH) (default: 502)

Sets the communication port for the Modbus TCP-IP server.

MODBUS SERVER STATION ADDRESS (ETH) (default: 1)

Active only if Modbus Passthrough is also active; sets the station address of the ModBus TCP-IP server.



WARNING!

THE MODBUS SERVER WILL RESPOND TO ANY STATION ADDRESS ONLY IF MODBUS PASS THROUGH MODE IS DISABLED.

MODBUS PASSTHROUGH (ETH) (default: disabled)

Sets the conversion mode from Modbus TCP-IP to serial Modbus RTU.

MODBUS TCP-IP CONNECTION TIMEOUT [sec] (ETH) (default: 60)

Sets the TCP-IP connection timeout for Modbus TCP-IP server and Passthrough mode.

WEBSERVER USERNAME (default: admin)

Sets the username for access to the web server.

CONFIGURATION/WEBSERVER PASSWORD (default: admin)

Sets the password for access to the web server and for reading/writing the configuration (if enabled)

WEBSERVER PORT (default: 80)

Sets the communication port for the web server.

BAUDRATE MODBUS RTU (SER) (default: 38400 baud)

Sets the baud rate for the RS485 communication port.

DATA MODBUS RTU (SER) (default: 8 bit)

Sets the number of bits for the RS485 communication port.

PARITY MODBUS RTU (SER) (default: None)

Sets the parity for the RS485 communication port.

STOP BIT MODBUS RTU (SER) (default: 1 bit)

Sets the number of stop bits for the RS485 communication port.

MODBUS PASSTROUGH SERIAL TIMEOUT (default: 100ms)

Active only if passthrough mode is enabled; sets the maximum waiting time before sending a new packet from TCP-IP to the serial line. It must be set based on the longest response time of all devices present on the RS485 serial line.

STATION ADDRESS MODBUS RTU (SER) (default: 1)

Defines the station address (slave address) of the device on the Modbus RTU serial line. Each device connected to the network must have a unique address within the allowed range (typically 1÷247).

ETHERIP DEVICE SERIAL NUMBER (default: 1)

Device identifier used for management and recognition within EtherNet/IP communication.

ETHERIP O->T RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Scanner to the Target. Bit 0 indicates the RUN or IDLE state of the device. The device ignores the RUN or IDLE state of the scanner.

ETHERIP T->O RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Target to the Scanner. Bit 0 indicates the RUN or IDLE state of the device.

ETHERIP VENDOR ID (default: 65535)

Allows customizing the Vendor ID that appears in the EDS file.

ETHERIP DEVICE TYPE (default: 0)

Allows customizing the Device Type that appears in the EDS file

ETHERIP PRODUCT CODE (default: 60000)

Allows customizing the Product Code that appears in the EDS file.

ETHERIP MAJOR REVISION (default: 1)

Allows customizing the Major Revision that appears in the EDS file.

ETHERIP MINOR REVISION (default: 1)

Allows customizing the Minor Revision that appears in the EDS file.

15.2. **ANALOG INPUT SETUP SECTION**

This section allows configuration of the analog inputs present on the device.

ANALOG INPUT MODE (default 0-30V)

Sets the measurement type for the selected input.

You can choose between the following input types:

0-30V

0-20 mA

SAMPLING TIME

The sampling time can be chosen from 15 samples per second to 240 samples per second. If 2 channels are enabled, the acquisition time of the two inputs must be multiplied by x2.

ANALOG MOVING FILTER (default DISABLED)

Allows enabling or disabling the 10-sample moving average filter.

OUT OF SCALE FAULT MODE

Sets whether, when the input is out of scale, the fault values must be loaded or not.

OUT OF SCALE FAULT VALUE

Fault value to be loaded if the “OUT OF SCALE FAULT MODE” parameter is enabled.

ANALOG INPUT START SCALE

Represents the electrical start-of-scale of the analog measurement used for the engineering measurement register.

ANALOG INPUT STOP SCALE

Represents the electrical end-of-scale of the analog measurement used for the engineering measurement register.

ANALOG INPUT ENG START SCALE

Represents the value of the engineering measurement register when the input reaches the value indicated in the ANALOG INPUT START SCALE parameter.

For example, if:

ANALOG INPUT START SCALE = 4mA

ANALOG INPUT STOP SCALE = 20mA

ANALOG INPUT ENG STOP SCALE = -200 meters

ANALOG INPUT ENG START SCALE = 200 meters

With an input of 12 mA, the engineering value will be 0 meters.

ANALOG INPUT ENG STOP SCALE

Represents the value of the engineering measurement register when the input reaches the value indicated in the ANALOG INPUT STOP SCALE parameter.

For example, if:

ANALOG INPUT START SCALE = 4mA

ANALOG INPUT STOP SCALE = 20mA

ANALOG INPUT ENG STOP SCALE = -200 meters

ANALOG INPUT ENG START SCALE = 200 meters

With an input of 12 mA, the engineering value will be 0 meters.

15.3. DIGITAL I/O SETUP SECTION

This section allows configuration of the digital I/O present on the device.

DIGITAL I/O MODE (default Input)

Selects whether the selected terminal will function as an input, output, or output controlled by an event related to the selected analog input.

DIGITAL INPUT NORMALLY HIGH/LOW (default Normally Low)

If selected as a digital input, configures whether the input is normally high or low.

DIGITAL OUTPUT NORMALLY STATE (default Normally Open)

If selected as a digital output, configures whether the output is normally open or closed.

DIGITAL OUTPUT WATCHDOG (default Disabled)

If selected as a digital output, sets the watchdog mode of the outputs.

If "Disabled", disables the watchdog function for the selected output

If "Enabled on Modbus Communication", the output goes into the "Watchdog state" condition if there has been no generic Modbus communication within the set time.

If “Enabled on Modbus Digital Output Writing”, the output goes into the “Watchdog state” condition if there has been no output write within the set time.

DIGITAL OUTPUT WATCHDOG STATE (default Open)

Sets the value that the digital output must assume in the event the watchdog trips.

DIGITAL OUTPUT WATCHDOG TIMEOUT [s] (default 100s)

Represents the watchdog time of the digital output in seconds.

15.4. **COUNTERS SETUP SECTION**

COUNTERS FILTER [ms] (default 0)

Sets the value in [ms] for filtering all counters connected to the inputs.

15.5. **ANALOG TEST SECTION**

Here you can view the values of the analog inputs via the web page.

15.6. **DIGITAL I/O TEST SECTION**

Here you can read or control the digital inputs and outputs via the web page.

15.7. **COUNTERS TEST SECTION**

In this section you can view the value of the digital counters or set a starting value.

16. ZE-2AI-E DEVICE CONFIGURATION VIA WEBSERVER

16.1. SETUP SECTION

DHCP (default: Disabled)

Sets the DHCP client for automatically obtaining an IP address.

STATIC IP ADDRESS WHEN DHCP DISABLED (default: 192.168.90.101)

Sets the device's static address. Be careful not to place devices with the same IP address on the same network.

STATIC IP MASK WHEN DHCP DISABLED (default: 255.255.255.0)

Sets the mask for the IP network.

STATIC GATEWAY ADDRESS WHEN DHCP DISABLED (default: 192.168.90.1)

Sets the gateway address.

MODBUS SERVER TCP/IP PORT (default: 502)

Sets the communication port for the Modbus TCP-IP server.

MODBUS SERVER TCP/IP TIMEOUT [ms] (default: 100)

Defines the maximum idle time (expressed in milliseconds) on the server-side Modbus TCP/IP connection. If no communication from the client is detected within the set time, the connection is closed automatically.

ANALOG INPUTS SAMPLE TIME [ms] (default: 150)

Defines the sampling time of the analog inputs, expressed in milliseconds.

Indicates the interval between two successive acquisitions of the analog signal by the device.

INPUT TYPE ANALOG [n] (default: Voltage [mV])

Selects the type of signal associated with analog input 1. The selection must be consistent with the type of signal applied to the input.

The available options are:

- "Voltage [mV]": voltage input.
- "Current [uA]": current input.

BEGIN SCALE ANALOG [n] (default: 0)

Defines the initial value of the input signal scale for analog channel 1, expressed in millivolts (mV).

Represents the minimum value of the electrical signal used for measurement conversion and scaling.

END SCALE ANALOG [n] (default: 30000)

Defines the final value of the input signal scale for analog channel 1, expressed in millivolts (mV). Represents the maximum value of the electrical signal used for measurement conversion and scaling.

BEGIN SCALE ENG. ANALOG [n] (default: 0)

Defines the initial value of the engineering scale associated with analog input 1.

Represents the minimum value of the physical quantity (e.g. temperature, pressure, level, etc.) corresponding to the minimum value of the input signal.

END SCALE ENG. ANALOG [n] (default: 30000)

Defines the final value of the engineering scale associated with analog input 1. Represents the maximum value of the physical quantity (e.g. temperature, pressure, level, etc.) corresponding to the maximum value of the input signal.

PORT [n] RS485 BAUDRATE (default: 38400 baud)

Sets the baud rate for the RS485 communication port.

PORT [n] RS485 PARITY (default: None)

Sets the parity for the RS485 communication port.

PORT [n] RS485 STOP BITS (default: 1 bit)

Sets the number of stop bits for the RS485 communication port.

PORT [n] RS485 TIMEOUT [ms] (default: 100)

Defines the maximum waiting time for receiving a response on RS485 serial Port 1. If no response is received from the device within the set time, the request is considered invalid.

PORT [n] RS485 MODBUS ADDRESS (default: 1)

Defines the station address (slave address) of the device on the Modbus RTU serial line. Each device connected to the network must have a unique address within the allowed range (typically 1÷247).

WEBSERVER PORT (default: 80)

Sets the communication port for the web server.

WEB SERVER AUTHENTICATION USER NAME (default: admin)

Sets the username for access to the web server.

WEB SERVER AUTHENTICATION USER PASSWORD (default: admin)

Sets the password for access to the web server and for reading/writing the configuration (if enabled)

PASSTHROUGH (default: Enabled)

Sets the conversion mode from Modbus TCP-IP to serial Modbus RTU.

TCP/IP SERVER MODBUS DEVICE ADDRESS (default: 1)

Active only if Modbus Passthrough is also active; sets the station address of the ModBus TCP-IP server.

**WARNING!**

THE MODBUS SERVER WILL RESPOND TO ANY STATION ADDRESS ONLY IF MODBUS PASS THROUGH MODE IS DISABLED.

ETHERIP DEVICE SERIAL NUMBER (default: 1)

Device identifier used for management and recognition within EtherNet/IP communication.

ETHERIP O->T RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Scanner to the Target. Bit 0 indicates the RUN or IDLE state of the device. The device ignores the RUN or IDLE state of the scanner.

ETHERIP T->O RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Target to the Scanner. Bit 0 indicates the RUN or IDLE state of the device.

ETHERIP VENDOR ID (default: 65535)

Allows customizing the Vendor ID that appears in the EDS file.

ETHERIP DEVICE TYPE (default: 0)

Allows customizing the Device Type that appears in the EDS file

ETHERIP PRODUCT CODE (default: 60000)

Allows customizing the Product Code that appears in the EDS file.

ETHERIP MAJOR REVISION (default: 1)

Allows customizing the Major Revision that appears in the EDS file.

ETHERIP MINOR REVISION (default: 1)

Allows customizing the Minor Revision that appears in the EDS file.

16.2. **REAL TIME VIEW SECTION**

This screen shows the instantaneous (live) values read and calculated by the device, without the need for Modbus queries or external tools.

DHCP

IP assignment status (active/inactive).

ACTUAL IP ADDRESS

The device's current IP.

ACTUAL IP MASK

Current subnet mask.

ACTUAL GATEWAY ADDRESS

Configured gateway.

ANALOG [n]

Raw value of channel [n] (e.g. mV or internal unit).

ANALOG ENG. [n]

Value of channel [n] scaled in engineering units.

16.3. **FIRMWARE UPDATE SECTION**

This page allows uploading a new firmware version to the device via the web interface.

17. ZE-4DI-2AI-2DO-E DEVICE CONFIGURATION VIA WEBSERVER

17.1. SETUP SECTION

DHCP (default: Disabled)

Sets the DHCP client for automatically obtaining an IP address.

STATIC IP ADDRESS WHEN DHCP DISABLED (default: 192.168.90.101)

Sets the device's static address. Be careful not to place devices with the same IP address on the same network.

STATIC IP MASK WHEN DHCP DISABLED (default: 255.255.255.0)

Sets the mask for the IP network.

STATIC GATEWAY ADDRESS WHEN DHCP DISABLED (default: 192.168.90.1)

Sets the gateway address.

MODBUS SERVER TCP/IP PORT (default: 502)

Sets the communication port for the Modbus TCP-IP server.

MODBUS SERVER TCP/IP TIMEOUT [ms] (default: 100)

Defines the maximum idle time (expressed in milliseconds) on the server-side Modbus TCP/IP connection. If no communication from the client is detected within the set time, the connection is closed automatically.

ANALOG INPUTS SAMPLE TIME [ms] (default: 150)

Defines the sampling time of the analog inputs, expressed in milliseconds. Indicates the interval between two successive acquisitions of the analog signal by the device.

INPUT TYPE ANALOG [n] (default: Voltage [mV])

Selects the type of signal associated with analog input 1. The selection must be consistent with the type of signal applied to the input.

The available options are:

- "Voltage [mV]": voltage input.
- "Current [uA]": current input.

BEGIN SCALE ANALOG [n] (default: 0)

Defines the initial value of the input signal scale for analog channel 1, expressed in millivolts (mV). Represents the minimum value of the electrical signal used for measurement conversion and scaling.

END SCALE ANALOG [n] (default: 30000)

Defines the final value of the input signal scale for analog channel 1, expressed in millivolts (mV). Represents the maximum value of the electrical signal used for measurement conversion and scaling.

BEGIN SCALE ENG. ANALOG [n] (default: 0)

Defines the initial value of the engineering scale associated with analog input 1.

Represents the minimum value of the physical quantity (e.g. temperature, pressure, level, etc.) corresponding to the minimum value of the input signal.

END SCALE ENG. ANALOG [n] (default: 30000)

Defines the final value of the engineering scale associated with analog input 1. Represents the maximum value of the physical quantity (e.g. temperature, pressure, level, etc.) corresponding to the maximum value of the input signal.

DIGITAL INPUT TYPE (default: NPN)

Selects the operating mode of the digital inputs.

Allows configuring the connection type between NPN or PNP depending on the type of sensor or device connected to the inputs.

FILTER TIME DIGITAL INPUT [n] [ms] (default: 100)

Defines the filter time applied to digital input [n], expressed in milliseconds.

The filter is used to eliminate any signal noise or bouncing (debouncing), ensuring a stable reading of the input state.

FAIL MODE DIGITAL OUTPUTS (default: Disabled)

Defines the state assumed by the digital outputs in the event of a communication timeout.

Allows setting a predefined behavior for the outputs (e.g. ON, OFF, or safe state) when a fault condition occurs, configurable via the "DIGITAL OUTPUT [n] STATE WHEN IN FAIL" parameter.

FAIL TIMEOUT DIGITAL OUTPUTS [s] (default: 5)

Defines the delay time before the digital outputs enter the fail condition.

If the error condition persists beyond the set time, fail mode is activated.

DIGITAL OUTPUT [n] STATE WHEN IN FAIL (default: 5)

Defines the state assumed by digital output [n] in the event of a device or communication fail condition.

- Not excited: output deactivated
- Excited: output activated

PORT [n] RS485 BAUDRATE (default: 38400 baud)

Sets the baud rate for the RS485 communication port.

PORT [n] RS485 PARITY (default: None)

Sets the parity for the RS485 communication port.

PORT [n] RS485 STOP BITS (default: 1 bit)

Sets the number of stop bits for the RS485 communication port.

PORT [n] RS485 TIMEOUT [ms] (default: 100)

Defines the maximum waiting time for receiving a response on RS485 serial Port 1. If no response is received from the device within the set time, the request is considered invalid.

PORT [n] RS485 MODBUS ADDRESS (default: 1)

Defines the station address (slave address) of the device on the Modbus RTU serial line. Each device connected to the network must have a unique address within the allowed range (typically 1÷247).

WEBSERVER PORT (default: 80)

Sets the communication port for the web server.

WEB SERVER AUTHENTICATION USER NAME (default: admin)

Sets the username for access to the web server.

WEB SERVER AUTHENTICATION USER PASSWORD (default: admin)

Sets the password for access to the web server and for reading/writing the configuration (if enabled)

PASSTHROUGH (default: Enabled)

Sets the conversion mode from Modbus TCP-IP to serial Modbus RTU.

TCP/IP SERVER MODBUS DEVICE ADDRESS (default: 1)

Active only if Modbus Passthrough is also active; sets the station address of the ModBus TCP-IP server.

**WARNING!**

THE MODBUS SERVER WILL RESPOND TO ANY STATION ADDRESS ONLY IF MODBUS PASS THROUGH MODE IS DISABLED.

ETHERIP DEVICE SERIAL NUMBER (default: 1)

Device identifier used for management and recognition within EtherNet/IP communication.

ETHERIP O->T RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Scanner to the Target. Bit 0 indicates the RUN or IDLE state of the device. The device ignores the RUN or IDLE state of the scanner.

ETHERIP T->O RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Target to the Scanner. Bit 0 indicates the RUN or IDLE state of the device.

ETHERIP VENDOR ID (default: 65535)

Allows customizing the Vendor ID that appears in the EDS file.

ETHERIP DEVICE TYPE (default: 0)

Allows customizing the Device Type that appears in the EDS file

ETHERIP PRODUCT CODE (default: 60000)

Allows customizing the Product Code that appears in the EDS file.

ETHERIP MAJOR REVISION (default: 1)

Allows customizing the Major Revision that appears in the EDS file.

ETHERIP MINOR REVISION (default: 1)

Allows customizing the Minor Revision that appears in the EDS file.

17.2. REAL TIME VIEW SECTION

This screen shows the instantaneous (live) values read and calculated by the device, without the need for Modbus queries or external tools.

DHCP

IP assignment status (active/inactive).

ACTUAL IP ADDRESS

The device's current IP.

ACTUAL IP MASK

Current subnet mask.

ACTUAL GATEWAY ADDRESS

Configured gateway.

ANALOG [n]

Raw value of channel [n] (e.g. mV or internal unit).

ANALOG ENG. [n]

Value of channel [n] scaled in engineering units.

DIGITAL INPUT [n]

Current value of input [n] (LOW, HIGH).

TOTALIZER [n] (default: 0)

Current value of totalizer [n]. By entering a new value in the dedicated field and pressing the SET button, the totalizer will be updated with the set value.

COUNTER [n] (default: 0)

Current value of counter [n]. By entering a new value in the dedicated field and pressing the SET button, the counter will be updated with the set value.

DIGITAL OUTPUT [n]

Current value of output [n] (NOT EXCITED, EXCITED).

GET EDS FILE

By pressing the button, the .EDS file generated based on the device's current configuration is downloaded. The file can be used for configuring and integrating the device into compatible automation systems.

17.3. [FIRMWARE UPDATE SECTION](#)

This page allows uploading a new firmware version to the device via the web interface.

18. ZE-SG3-E DEVICE CONFIGURATION VIA WEBSERVER

18.1. SETUP SECTION

DHCP (ETH) (default: Disabled)

Sets the DHCP client for automatically obtaining an IP address.

IP ADDRESS STATIC (ETH) (default: 192.168.90.101)

Sets the device's static address. Be careful not to place devices with the same IP address on the same network.

IP MASK STATIC (ETH) (default: 255.255.255.0)

Sets the mask for the IP network.

GATEWAY ADDRESS STATIC (ETH) (default: 192.168.90.1)

Sets the gateway address.

MODBUS TCP-IP PORT (ETH) (default: 502)

Sets the communication port for the Modbus TCP-IP server.

MODBUS SERVER STATION ADDRESS (ETH) (default: 5)

Active only if Modbus Passthrough is also active; sets the station address of the Modbus TCP-IP server.



WARNING!

THE MODBUS SERVER WILL RESPOND TO ANY STATION ADDRESS ONLY IF MODBUS PASS THROUGH MODE IS DISABLED.

MODBUS PASSTHROUGH (ETH) (default: disabled)

Sets the conversion mode from Modbus TCP-IP to serial Modbus RTU.

MODBUS TCP-IP CONNECTION TIMEOUT [sec] (ETH) (default: 5)

Sets the TCP-IP connection timeout for Modbus TCP-IP server and Passthrough mode.

WEBSERVER USERNAME (default: admin)

Sets the username for access to the web server.

CONFIGURATION/WEBSERVER PASSWORD (default: admin)

Sets the password for access to the web server and for reading/writing the configuration (if enabled)

WEBSERVER PORT (default: 80)

Sets the communication port for the web server.

BAUDRATE MODBUS RTU (SER) (default: 38400 baud)

Sets the baud rate for the RS485 communication port.

DATA MODBUS RTU (SER) (default: 8 bit)

Sets the number of bits for the RS485 communication port.

PARITY MODBUS RTU (SER) (default: None)

Sets the parity for the RS485 communication port.

STOP BIT MODBUS RTU (SER) (default: 1 bit)

Sets the number of stop bits for the RS485 communication port.

MODBUS PASSTROUGH SERIAL TIMEOUT (default: 1000ms)

Active only if passthrough mode is enabled; sets the maximum waiting time before sending a new packet from TCP-IP to the serial line. It must be set based on the longest response time of all devices present on the RS485 serial line.

STATION ADDRESS MODBUS RTU (SER) (default: 1)

Defines the station address (slave address) of the device on the Modbus RTU serial line. Each device connected to the network must have a unique address within the allowed range (typically 1÷247).

MODBUS SERIAL TIMEOUT [ms] (default: 100ms)

Maximum waiting time for the response from the Modbus slave device on the serial line (RS485/RS232). If no response arrives within this interval, the communication is considered to be in timeout.

ETHERIP DEVICE SERIAL NUMBER (default: 1)

Device identifier used for management and recognition within EtherNet/IP communication.

ETHERIP O->T RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Scanner to the Target. Bit 0 indicates the RUN or IDLE state of the device. The device ignores the RUN or IDLE state of the scanner.

ETHERIP T->O RUN/IDLE HEADER (default: Disabled)

This option adds a 32-bit header to each class 1 packet sent from the Target to the Scanner. Bit 0 indicates the RUN or IDLE state of the device.

ETHERIP VENDOR ID (default: 65535)

Allows customizing the Vendor ID that appears in the EDS file.

ETHERIP DEVICE TYPE (default: 0)

Allows customizing the Device Type that appears in the EDS file

ETHERIP PRODUCT CODE (default: 60000)

Allows customizing the Product Code that appears in the EDS file.

ETHERIP MAJOR REVISION (default: 1)

Allows customizing the Major Revision that appears in the EDS file.

ETHERIP MINOR REVISION (default: 1)

Allows customizing the Minor Revision that appears in the EDS file.

18.2. LOAD CELL SETUP SECTION**FUNCTION MODE**

Allows configuring the basic operation of the device; it can be set to factory calibration or to calibration with standard weight.

FACTORY CALIBRATION

Used when a load cell with declared sensitivity is available.

In this mode, calibration consists only of acquiring the tare directly in the field with a direct measurement. If it is not possible to acquire the tare with a direct measurement (for example in the case of an already filled silo), the tare value can be entered manually in the desired unit of measurement (kg, t, etc...).

CALIBRATION WITH STANDARD WEIGHT

Used when a standard weight is available (as close as possible to the full scale of the load cell).

In this mode, calibration consists of acquiring both the tare and the standard weight directly in the field.

MEASURE TYPE

Allows configuring the device's operation between:

BALANCE (UNIPOLAR)

Used when building a scale in which the load cell is only compressed; in this case, maximum resolution of the compression measurement is obtained.

COMPRESSION AND TRACTION (BIPOLAR)

Used when building a measurement system (typically for force) that can either compress or extend the load cell. In this case, it is also possible to set the direction of the force: if compression, the measurement will have a + sign; if traction, it will have a - sign. A typical use case is linking the direction of the force to the analog output so that, for example, 4 mA corresponds to maximum traction force and 20 mA corresponds to maximum compression force (in this case the cell at rest will output 12 mA).

MEASURE UNIT

Sets the unit of measurement for the weighing in g, Kg, t, etc.

CELL SENSITIVITY

This is the declared cell sensitivity value expressed in mV/V (for most cells it is 2mV/V).

CELL FULL SCALE

This is the full-scale value of the cell expressed in the selected unit of measurement.

STANDARD WEIGHT VALUE

Represents the value of the standard weight that will be used in calibration if the standard weight operating mode has been chosen.

NOISE FILTER

Enables or disables filtering of the measurement.

FILTER LEVEL

Allows setting the measurement filter level according to the following table:

FILTER LEVEL	RESPONSE TIME [ms]
0	2
1	6.7
2	13
3	30
4	50
5	250
6	850
ADVANCED	Configurable

The higher the filter level, the more stable but slower the weight measurement will be.

If the advanced filtering level (Advanced) is selected, the configuration will allow selecting the following parameters:

ADC SPEED *Selects the ADC acquisition speed from 4.7 Hz to 960 Hz*

NOISE VARIATION *This is the variation in ADC points due to noise alone (it represents the measurement uncertainty due to noise), i.e. how much we expect the measurement to vary (the unit of measurement is in raw ADC points).*

FILTER RESPONSE SPEED

Represents a parameter related to the filter's response speed; it can vary from 0.001 (Slowest response) to 1 (Fastest response). It represents the process variance.

NET WEIGHT RESOLUTION

This is the resolution with which the net weight value is represented; it can be:

MAXIMUM RESOLUTION

Will represent the net weight with the maximum possible resolution

MANUAL RESOLUTION

Will represent the net weight with the manual resolution (in engineering units) that has been set.
For example, by setting 0.1 Kg, the net weight will only be able to vary in multiples of 100g.

AUTOMATIC RESOLUTION

Will represent the net weight with a calculated resolution of approximately 20000 points. Unlike the Maximum or Manual resolution, this setting also acts by limiting the ADC value and therefore affects all measurements.

 WARNING

Note that in “Calibration with standard weight” mode, when using “Manual resolution”, it may happen that the correct standard weight value cannot be perfectly represented:

For example, suppose we have:

Cell full scale of 15000 g

Standard weight 14000 g

Manual resolution 1.5 g

The standard weight value (14000 g) cannot be represented with a resolution step of 1.5 g ($14000/1.5 \text{ g} = 9333.333$ is not an integer value), so it will be represented as: $9333 \cdot 1.5 \text{ g} = 13999.5 \text{ g}$

To avoid this effect, use a resolution for which the value is representable (for example 1 g or 2 g).

SAMPLE PIECE WEIGHT

Sets the weight of a single piece in engineering units for the mode. By setting the net weight of a single item in this register, the converter will be able to indicate the number of pieces present on the scale in the appropriate register according to the relationship:

$$\text{No. of Pieces} = \text{Net Weight} / \text{Sample Piece Weight} —$$

AUTOMATIC TARE TRACKER

Allows enabling or disabling automatic tare zeroing.

ADC VALUE

Allows setting the number of ADC points within which the tare is automatically zeroed.

If, after 5 seconds of stable weighing condition, the ADC value of the net weight deviates by less than this value, a new tare is then acquired.

18.3. I/O SETUP SECTION**DIGITAL I/O MODE**

Configures the device's digital I/O

DIGITAL INPUT

If the n-th I/O is configured as an input, its function can be chosen from:

FUNCTION DIGITAL INPUT

The input is configured as a digital input whose value can be read from the corresponding register.

FUNCTION ACQUIRE TARE

In this mode, if the digital input is activated for more than 3 seconds, a new tare value is acquired (in RAM, so it is lost on restart). This is equivalent to sending command 49594 (decimal) to the command register.

DIGITAL OUTPUT

If the n-th I/O is configured as an output, its function can be chosen from:

DIGITAL OUTPUT MODE

The output can be configured as normally open or as normally closed).

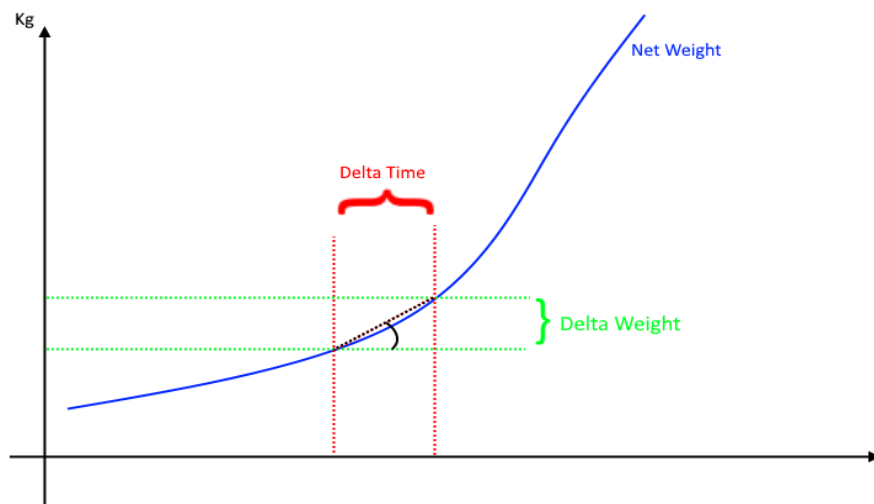
DIGITAL OUTPUT CONFIGURATION

Here you can choose the behavior of the digital output:

STABLE WEIGHT

The stable weighing condition indicates that the net weight measurement is stable if:

The net weight remains within the weight $\Delta_{\text{net_weight}}$ over the time Δ_{time} , i.e. if the slope of the curve traced by the net weight is less than $\frac{\Delta_{\text{net_weight}}}{\Delta_{\text{time}}}$:



You will be asked to enter the Delta Net Weight (Delta Weight) values (in engineering units) and Delta Time (in units of 0.1 seconds).

THRESHOLD AND STABLE WEIGHT

In this mode, the output is activated when the net weight reaches the threshold and the weighing is in a stable weighing condition.

STABLE WEIGHT

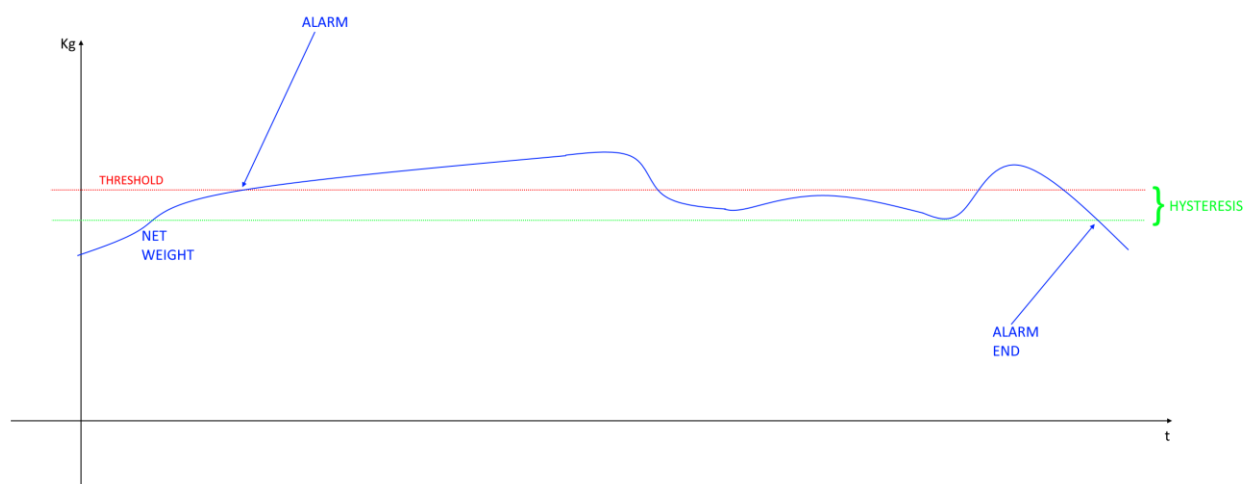
In this mode, the output is activated when the weighing is in a stable weighing condition.

COMMANDABLE FROM MODBUS

In this mode, the output can be controlled from a modbus register.

THRESHOLD WITH HYSTERESIS

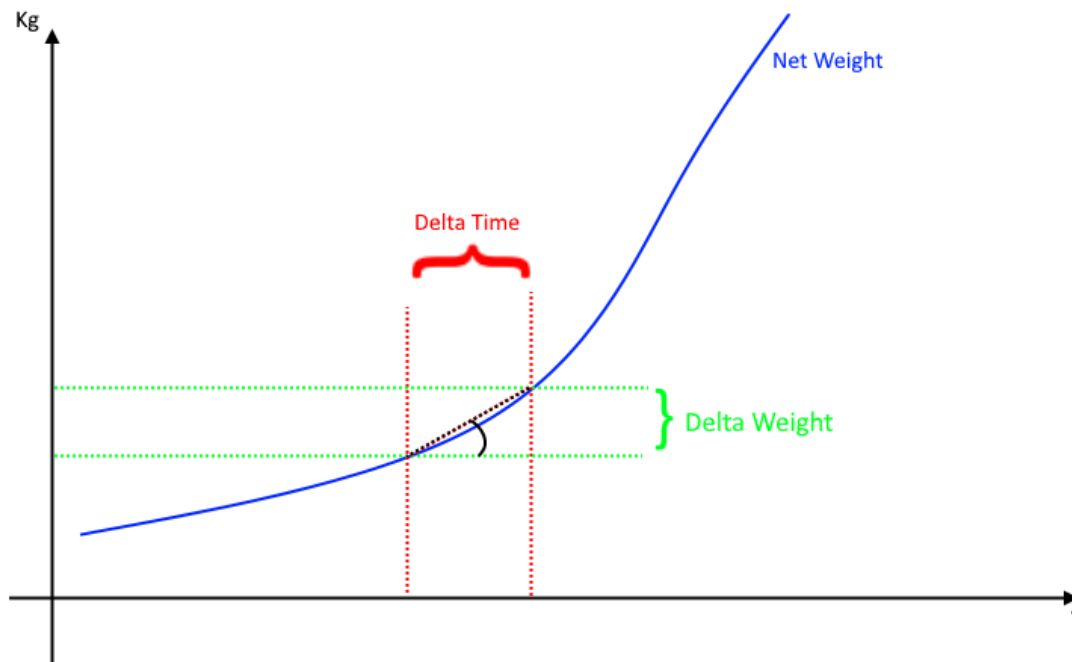
In this mode, the output is activated when the net weight reaches the threshold; the alarm resets when the net weight drops below the Threshold-Hysteresis value:



STABLE WEIGHT CONDITION

The stable weighing condition indicates that the net weight measurement is stable if:

The net weight remains within the weight $\Delta_{\text{net_weight}}$ (DELTA WEIGHT) over the time Δ_{time} (DELTA TIME), i.e. if the slope of the curve traced by the net weight is less than $\frac{\Delta_{\text{net_weight}}}{\Delta_{\text{time}}}$:



18.4. TEST AND LOAD CELL CALIBRATION SECTION

In this section you can calibrate the cell and run tests. For more information on cell calibration, refer to the load cell calibration chapter of this manual.

18.5. LOAD CELL CALIBRATION VIA THE WEBSERVER

To calibrate the load cell, access the “TEST AND LOAD CELL CALIBRATION” section of the webserver. Depending on which of the two modes is chosen, factory calibration or calibration with standard weight, you can proceed with calibration.

18.5.1. CELL CALIBRATION WITH FACTORY PARAMETERS

In cell calibration with factory parameters, there is no need to use a standard weight since reference is made to the parameters acquired at the factory.

The required data are:

- The cell sensitivity
- The cell full scale

For the cell calibration procedure it is necessary to acquire the tare.

The tare can be entered manually in engineering units (if known) or it can be acquired from the field.



WARNING!

TO OBTAIN BETTER MEASUREMENT ACCURACY, ACQUIRE THE TARE FROM THE FIELD

18.5.1.1. MANUAL TARE ENTRY VIA THE WEBSERVER

It is not always possible to acquire the tare value from the field (for example in the case of already full silos); in these cases, the tare weight can be entered in engineering units.

LOAD CELL CALIBRATION

	VALUE
FUNCTION MODE: FACTORY CALIBRATION	
TARE ACQUISITION	
TARE VALUE [g]	50.00000
	MANUAL INSERTION ▼
	750
SET MANUAL TARE (FLASH)	

To acquire the tare value, press the “SET MANUAL TARE (FLASH)” button

18.5.1.2. ACQUIRING THE TARE FROM THE FIELD VIA THE WEBSERVER

- 1) Go to the "Test and Load Cell Calibration" webserver page
- 2) Place the tare on the cell
- 3) Wait for the measurement to stabilize
- 4) Press the "TARE ACQUISITION (FLASH)" button

LOAD CELL CALIBRATION

	VALUE
FUNCTION MODE: FACTORY CALIBRATION	
TARE ACQUISITION	FROM FIELD ▼
TARE ACQUISITION(FLASH)	



18.5.2. CELL CALIBRATION WITH A STANDARD WEIGHT

In cell calibration with a standard weight, you need to have available:

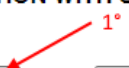
- The cell sensitivity
- The cell full scale
- A standard weight (so that Standard weight + Tare are as close as possible to the cell's full scale)

- 1) Go to the "Test and Load Cell Calibration" webserver page
- 2) Place the tare on the cell
- 3) Wait for the measurement to stabilize
- 4) Press the "TARE ACQUISITION (FLASH)" button
- 5)

LOAD CELL CALIBRATION

FUNCTION MODE: CALIBRATION WITH STANDARD WEIGHT

TARE ACQUISITION(FLASH)	STANDARD WEIGHT ACQUISITION(FLASH)
-------------------------	------------------------------------




- 6) Place the Tare+Standard Weight
- 7) Wait for the measurement to stabilize
- 8) Press the "STANDARD WEIGHT ACQUISITION (FLASH)" button

19. UPDATE OF THE FIRMWARE AND SAVING/OPENING A CONFIGURATION

The firmware update can be performed via the webserver, in the appropriate section.
Using the webserver, you can save or open a saved configuration.

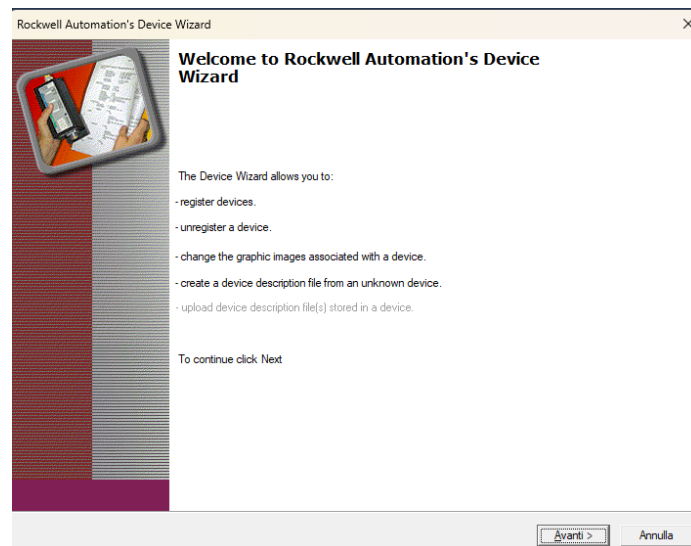
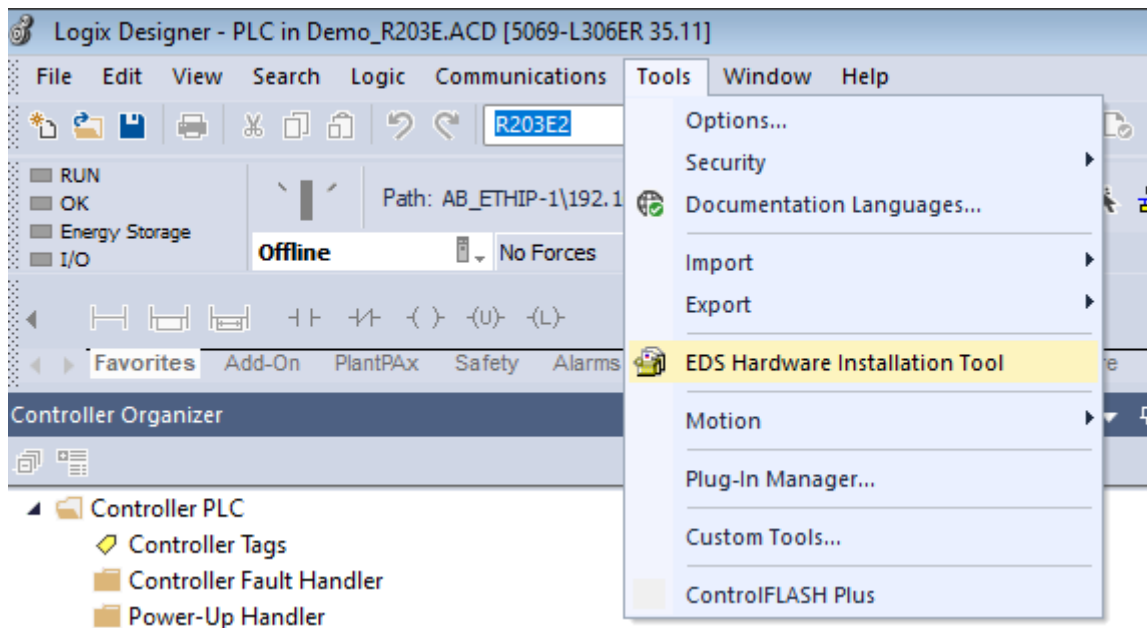


WARNING!

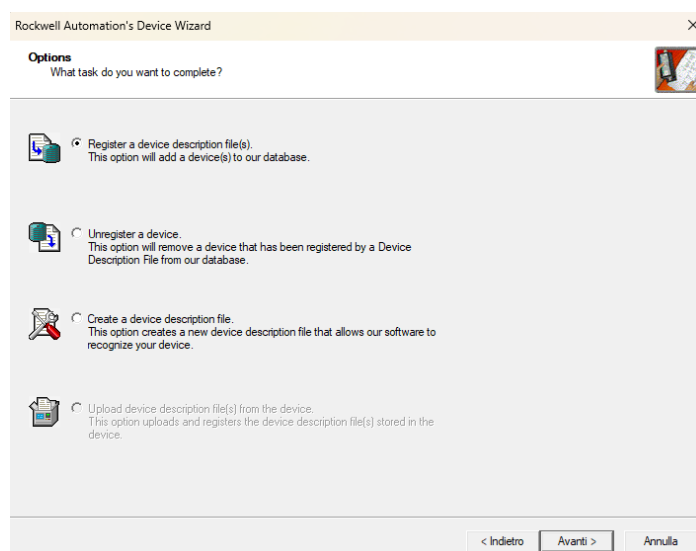
TO AVOID DAMAGING THE DEVICE, DO NOT REMOVE POWER DURING THE FIRMWARE UPDATE OPERATION.

20. CREATING A PROJECT WITH AN ALLEN BRADLEY/ROCKWELL PLC (RS-LOGIX5000 / STUDIO 5000 LOGIX DESIGNER 35.00.00)

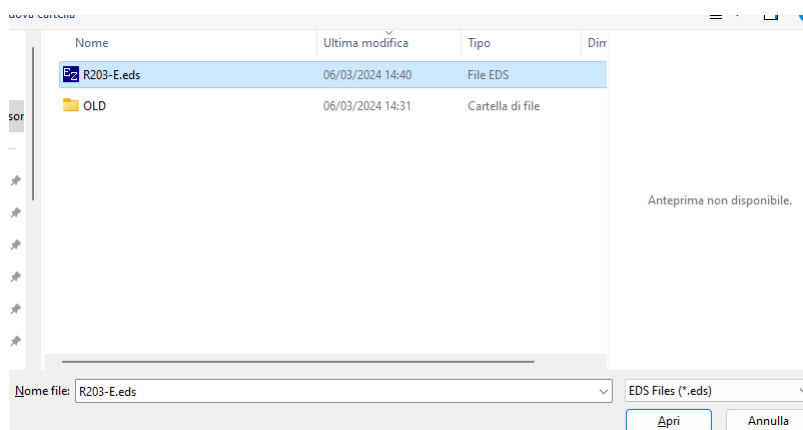
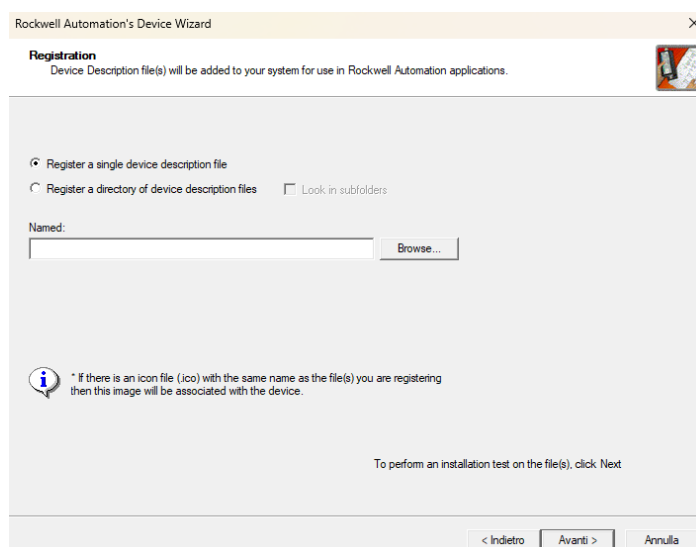
Once the PLC has been added to the project, we import the device's EDS file (the EDS file can be downloaded from the Seneca website, in the device's section, or from the device's own webserver) via the Tools-> EDS Hardware Installation Tool menu:



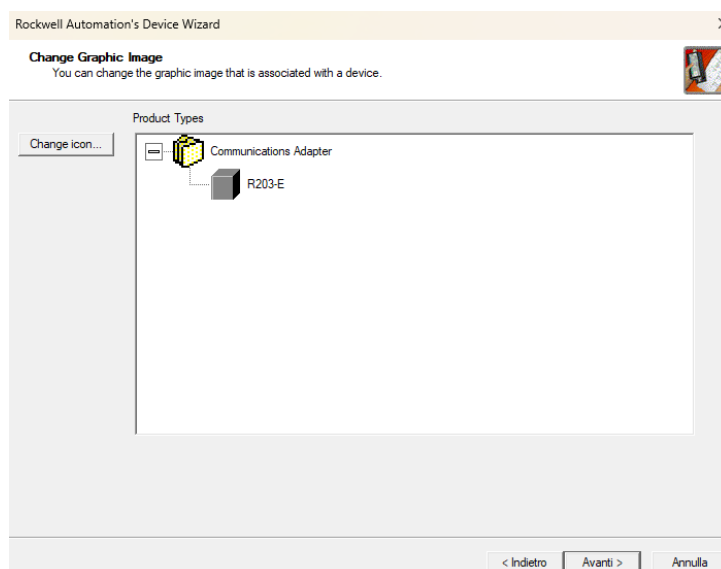
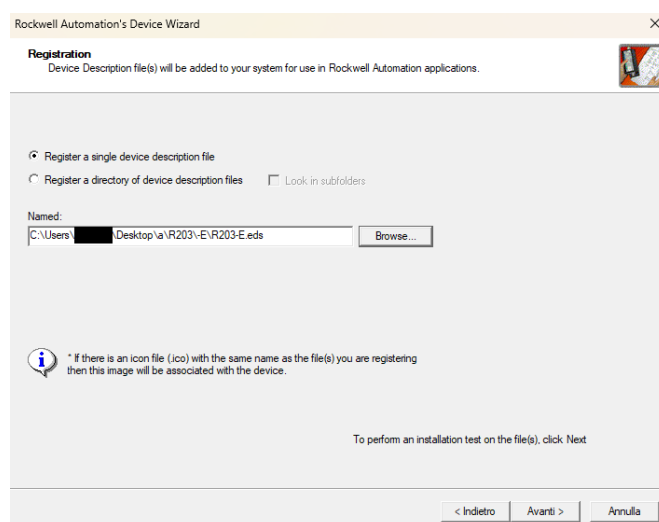
Press "Next", and select Add a new device:



We choose to register a single device and select the device's eds file.

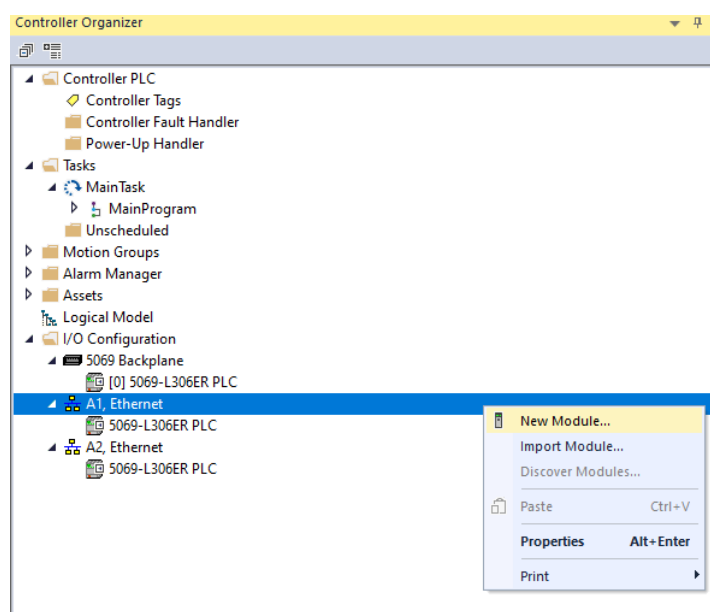


Select “Open” and then “Next”:

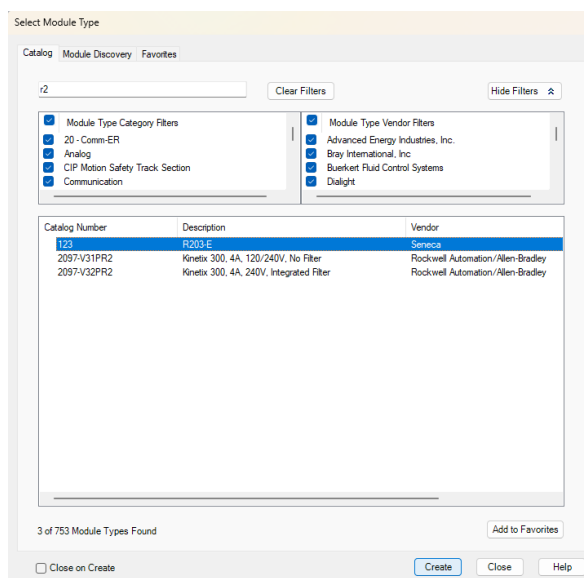


At this point the device has been added to the device database.

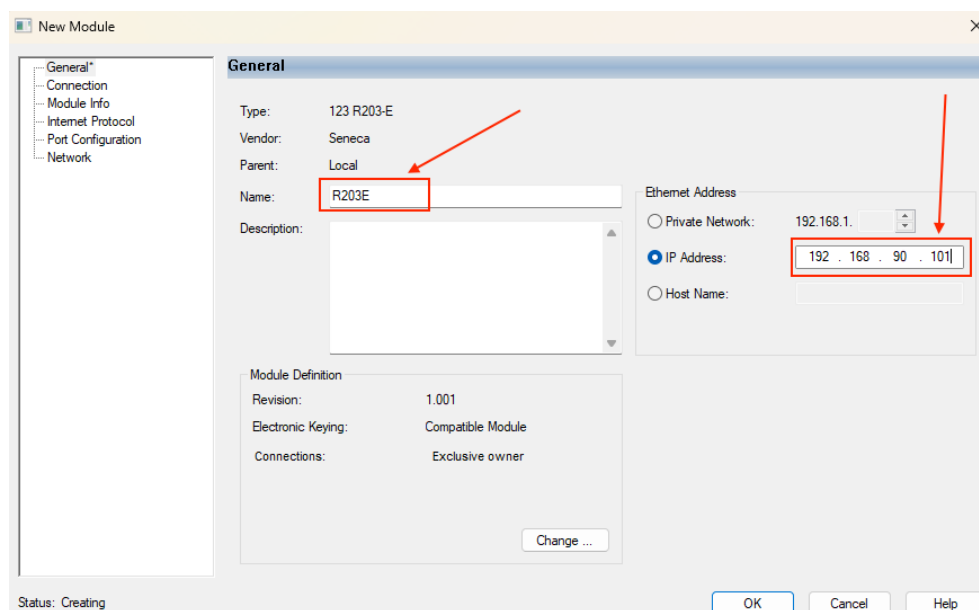
Now move the mouse over the Ethernet port of the PLC connected to the device and right-click to select “New Module...”:



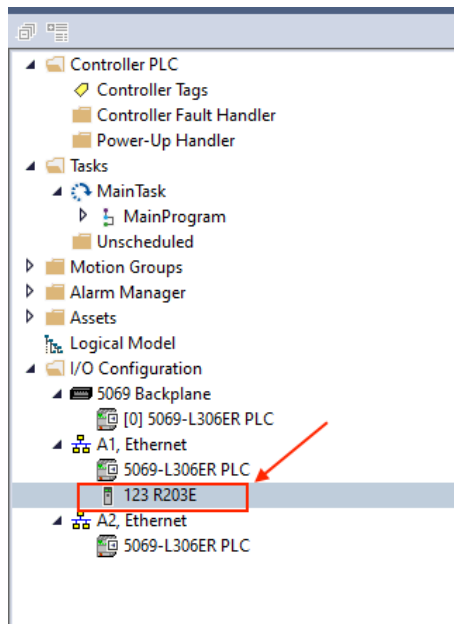
Now select the device:



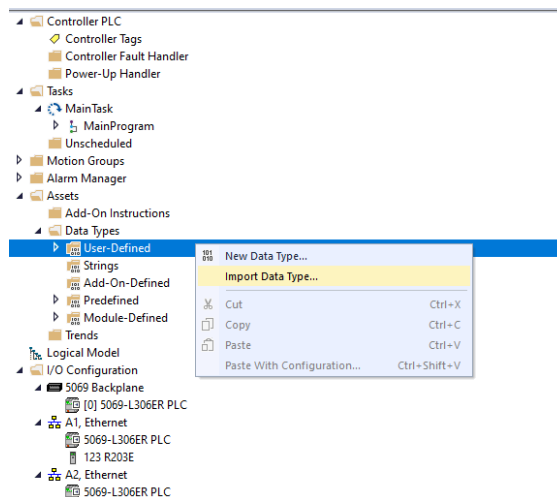
Give the device a name and enter its IP address:

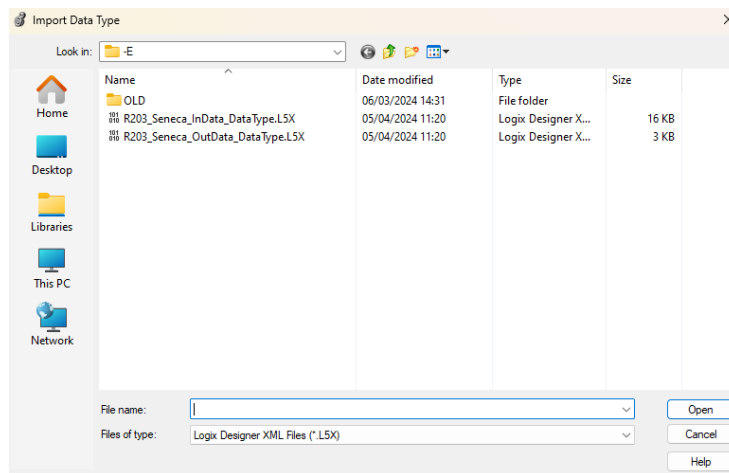


By confirming with OK, the device is added:

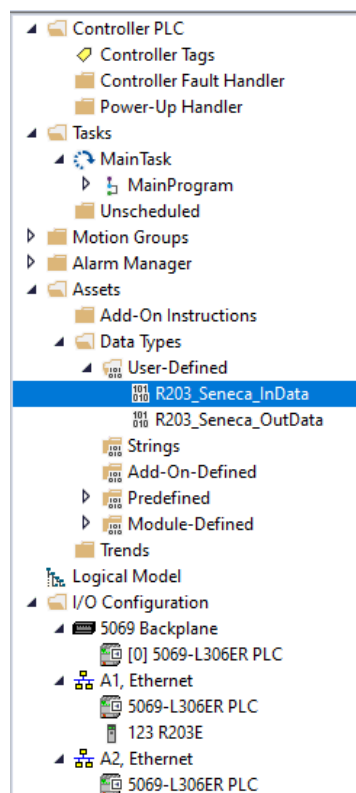


To simplify acquiring the measurements and sending writes to the device, we import the User Data Defined types relating to the device (available on the Seneca website):

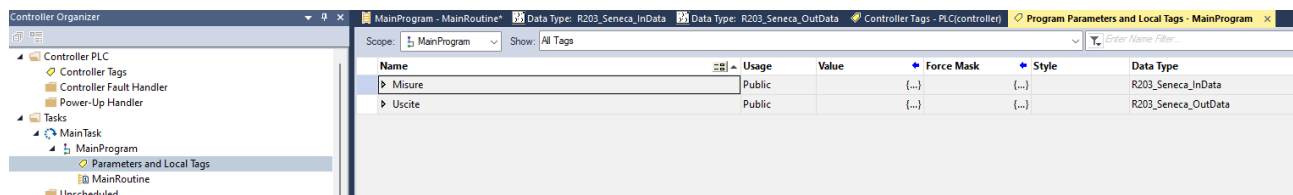




InData will represent the measurements coming out of the device to the PLC; OutData are the tags that allow commands to be sent to the device:

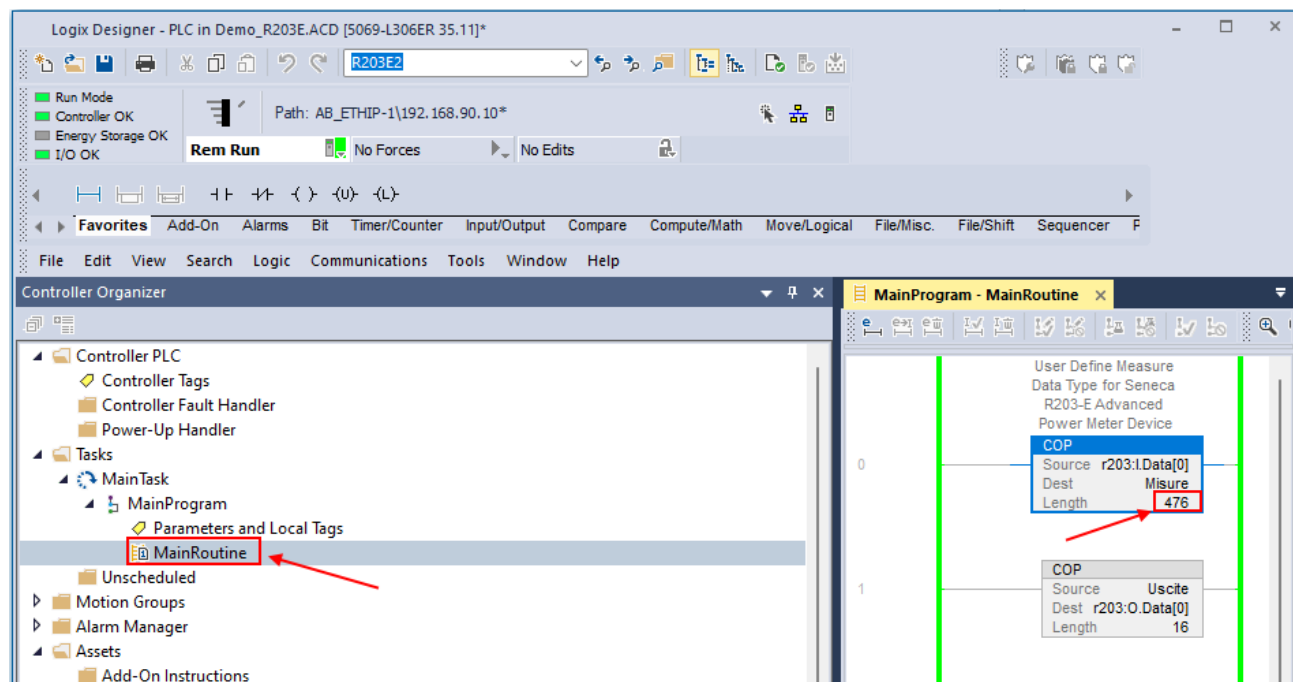


Now we define the “Misure” (Measurements) and “Uscite” (Outputs) structures with data type “Seneca_InData” and “Seneca_OutData” respectively:



Name	Usage	Value	Force Mask	Style	Data Type
Misure	Public	{...}	{...}	{...}	R203_Seneca_InData
Uscite	Public	{...}	{...}	{...}	R203_Seneca_OutData

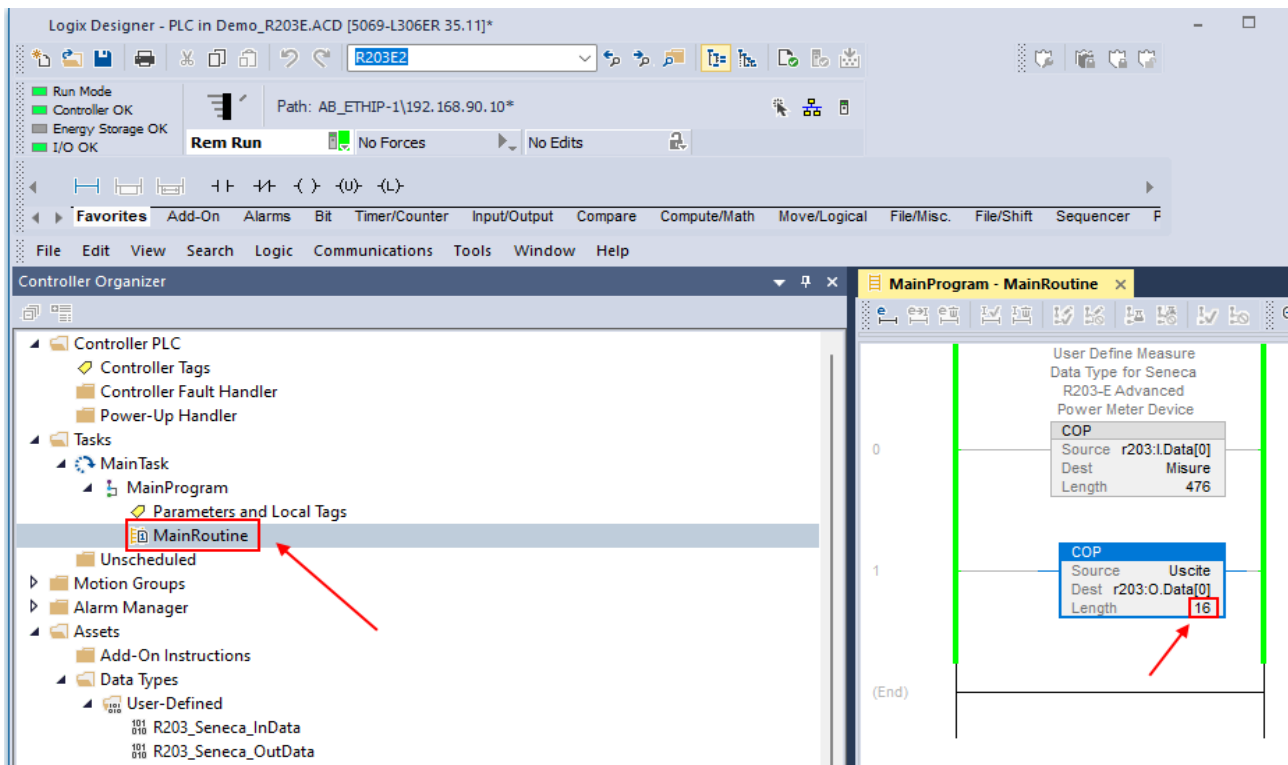
At this point we define a program that copies the incoming measurements from the device into the Seneca_InData structure:



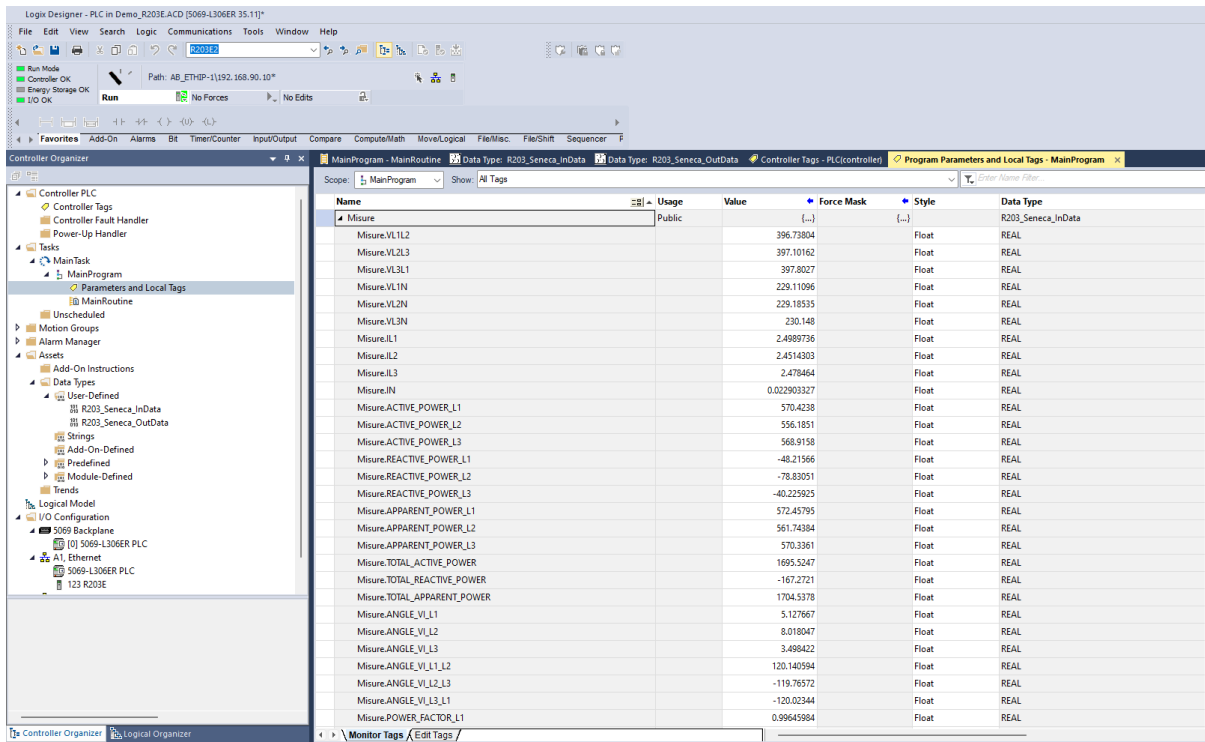
The screenshot shows the Logix Designer interface with the MainRoutine program selected in the Controller Organizer. The program is a User Define Measure Data Type for Seneca R203-E Advanced Power Meter Device. It contains two COP (Copy) instructions:

- COP 0:** Source: r203:I.Data[0], Dest: Misure, Length: 476.
- COP 1:** Source: Uscite, Dest: r203:O.Data[0], Length: 16.

And then we copy the values we will command in the Seneca_OutData structure into the data sent to the device:

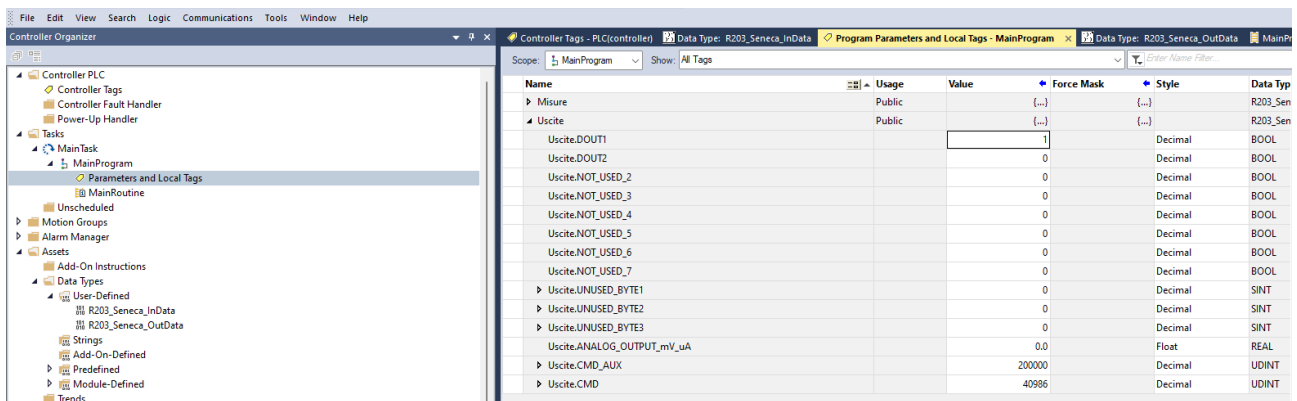


Now we compile, put the PLC into “Program” mode, and download the program to the PLC.
We put the PLC into “RUN” mode and check the measurements:



Name	Usage	Value	Force Mask	Style	Data Type
Misure	Public		[...]	[...]	R203_Seneca_InData
Misure.VL1L2		396.73804		Float	REAL
Misure.VL2L3		397.10162		Float	REAL
Misure.VL3L1		397.8027		Float	REAL
Misure.VL1N		229.11096		Float	REAL
Misure.VL2N		229.18535		Float	REAL
Misure.VL3N		230.148		Float	REAL
Misure.IL1		2.4989736		Float	REAL
Misure.IL2		2.4514303		Float	REAL
Misure.IL3		2.478464		Float	REAL
Misure.IN		0.022903327		Float	REAL
Misure.ACTIVE_POWER_L1		570.4238		Float	REAL
Misure.ACTIVE_POWER_L2		556.1851		Float	REAL
Misure.ACTIVE_POWER_L3		568.9158		Float	REAL
Misure.REACTIVE_POWER_L1		-48.21566		Float	REAL
Misure.REACTIVE_POWER_L2		-78.83051		Float	REAL
Misure.REACTIVE_POWER_L3		-40.225925		Float	REAL
Misure.APPARENT_POWER_L1		572.45795		Float	REAL
Misure.APPARENT_POWER_L2		561.74384		Float	REAL
Misure.APPARENT_POWER_L3		570.3361		Float	REAL
Misure.TOTAL_ACTIVE_POWER		1695.5247		Float	REAL
Misure.TOTAL_REACTIVE_POWER		-167.2721		Float	REAL
Misure.TOTAL_APPARENT_POWER		1704.5378		Float	REAL
Misure.ANGLE_VL1_L1		5.127667		Float	REAL
Misure.ANGLE_VL1_L2		8.018047		Float	REAL
Misure.ANGLE_VL1_L3		3.498422		Float	REAL
Misure.ANGLE_VL2_L1_L2		120.140594		Float	REAL
Misure.ANGLE_VL2_L2_L3		-119.76572		Float	REAL
Misure.ANGLE_VL3_L1_L1		-120.02344		Float	REAL
Misure.POWER_FACTOR_L1		0.99645984		Float	REAL

We can also control the digital outputs, for example by activating DOUT1:



Name	Usage	Value	Force Mask	Style	Data Type
Misure	Public		[...]	[...]	R203_Seneca_InData
Uscite	Public		[...]	[...]	R203_Seneca_OutData
Uscite.DOUT1		1		Decimal	BOOL
Uscite.DOUT2		0		Decimal	BOOL
Uscite.NOT_USED_2		0		Decimal	BOOL
Uscite.NOT_USED_3		0		Decimal	BOOL
Uscite.NOT_USED_4		0		Decimal	BOOL
Uscite.NOT_USED_5		0		Decimal	BOOL
Uscite.NOT_USED_6		0		Decimal	BOOL
Uscite.NOT_USED_7		0		Decimal	BOOL
Uscite.UNUSED_BYTE1		0		Decimal	SINT
Uscite.UNUSED_BYTE2		0		Decimal	SINT
Uscite.UNUSED_BYTE3		0		Decimal	SINT
Uscite.ANALOG_OUTPUT_mV_uA		0.0		Float	REAL
Uscite.CMD_AUX		200000		Decimal	UDINT
Uscite.CMD		40986		Decimal	UDINT

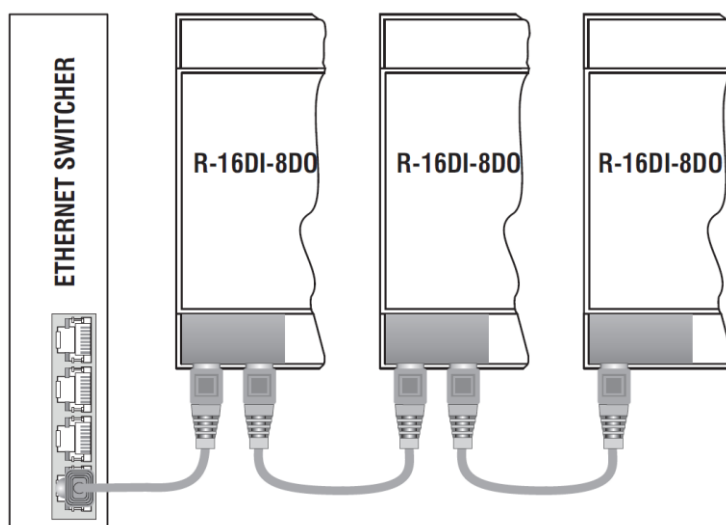
CMD and CMD AUX can be used to send commands to the device.

21. CABLE WIRING FOR MODELS WITH DUAL ETHERNET PORT

Models with a dual Ethernet port can be connected in a daisy chain and take advantage of the Lan Fault Bypass.

21.1. CHAINED ETHERNET CONNECTION (DAISY CHAIN)

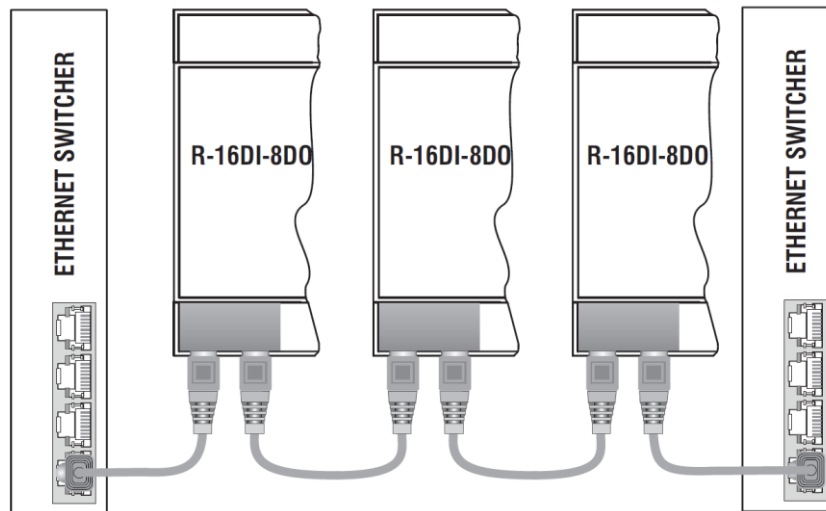
When using the daisy chain connection, it is not necessary to use switches to connect the devices. An example (in this case on the R-16DI-8DO) of connecting 3 devices is as follows:



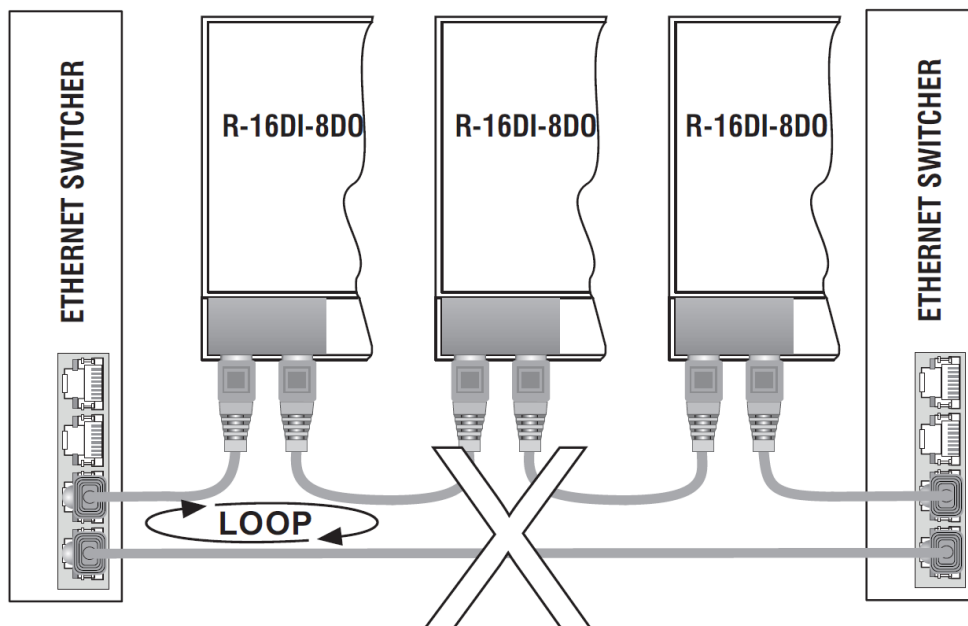
WARNING!

IT IS NOT POSSIBLE TO CREATE LOOPS WITH THE ETHERNET CABLES

If it is necessary to connect the devices to switches, correct wiring is as follows:



There must be no loops in the Ethernet wiring, otherwise communication will not work; some examples of incorrect wiring are as follows:



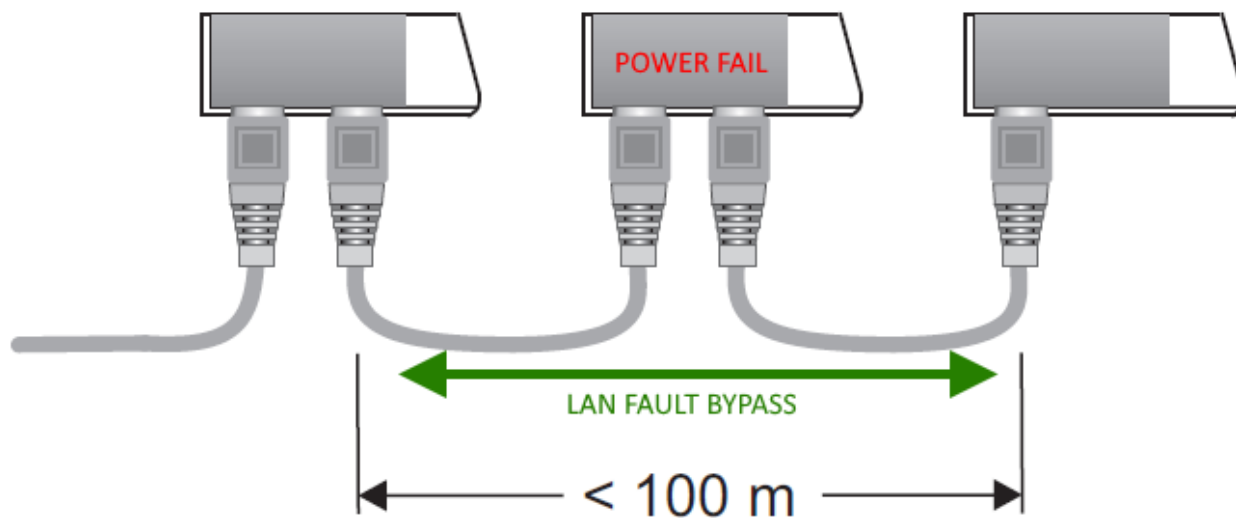
21.2. LAN FAULT-BYPASS FUNCTION

The lan fault-bypass function makes it possible to keep the connection between the device's two Ethernet ports active in the event of problems or loss of power.

If a device turns off, the chain is not interrupted and the devices downstream of the one that is off will still be accessible.

This function has a limited duration: the connection remains active for a few days, typically 4.

The Lan fault-bypass function requires that the sum of the lengths of the two cables connected to the powered-off module be less than 100m.



22. FINDING AND CHANGING THE DEVICE'S IP WITH THE SENECA DISCOVERY DEVICE TOOL

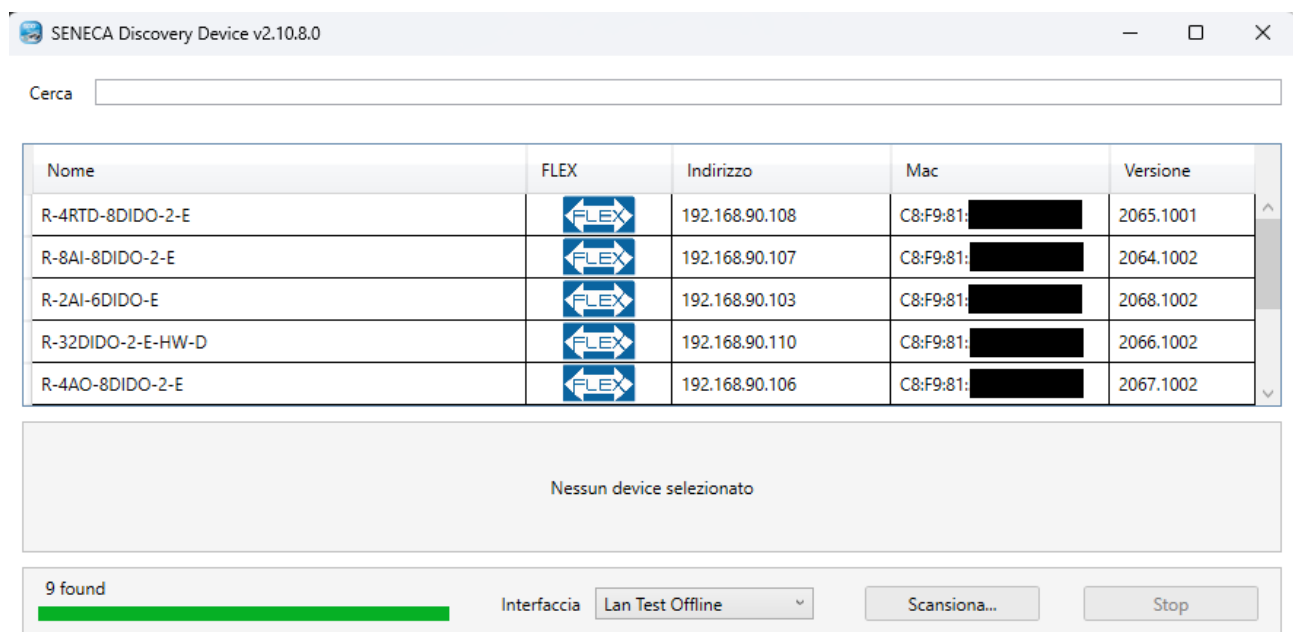
Finding and changing a device's IP can be done using the Seneca Discovery Device software. If Seneca devices not belonging to the R series are also used, it is more convenient to set the addresses with a single piece of software.

When the STS LED on the R series device is steadily lit, the IP address that has been set can also be obtained by using the "Seneca Discovery Device".

The software can be downloaded from:

<https://www.seneca.it/en/linee-di-prodotto/software/easy/sdd>

By pressing the "search" button, a search is started for all Seneca devices present on the network, even those with IP addresses not compatible with the PC's current configuration:



SENECA Discovery Device v2.10.8.0

Cerca

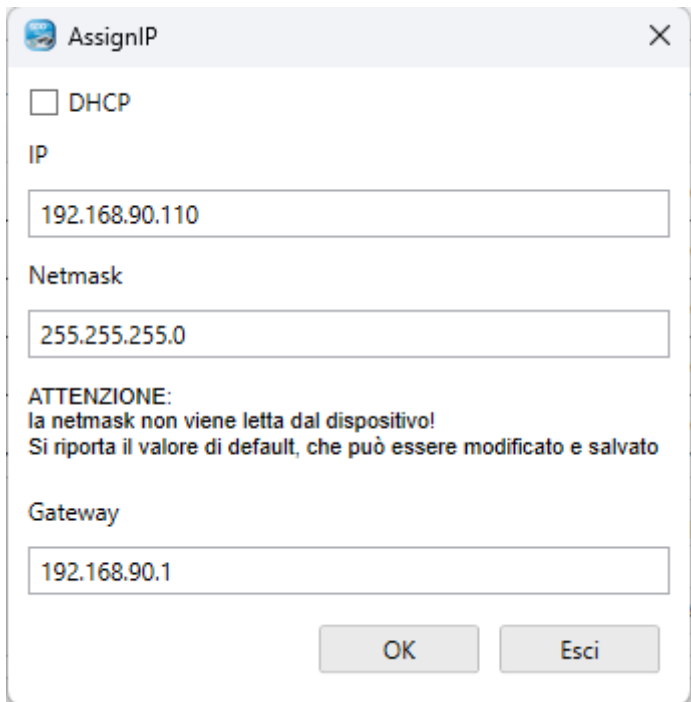
Nome	FLEX	Indirizzo	Mac	Versione
R-4RTD-8DIDO-2-E		192.168.90.108	C8:F9:81: [REDACTED]	2065.1001
R-8AI-8DIDO-2-E		192.168.90.107	C8:F9:81: [REDACTED]	2064.1002
R-2AI-6DIDO-E		192.168.90.103	C8:F9:81: [REDACTED]	2068.1002
R-32DIDO-2-E-HW-D		192.168.90.110	C8:F9:81: [REDACTED]	2066.1002
R-4AO-8DIDO-2-E		192.168.90.106	C8:F9:81: [REDACTED]	2067.1002

Nessun device selezionato

9 found 

Interfaccia Lan Test Offline Scansiona... Stop

The address can now be changed by pressing the “Assign” button:



AssignIP

☐ DHCP

IP

192.168.90.110

Netmask

255.255.255.0

ATTENZIONE:
la netmask non viene letta dal dispositivo!
Si riporta il valore di default, che può essere modificato e salvato

Gateway

192.168.90.1

OK Esci

The software works at layer 2, so it is not necessary to have an Ethernet configuration compatible with the device being searched for.