USER MANUAL

R-16DI-8DO

INDUSTRIAL ETHERNET I/O MODULE

SENECA®

CE

TOMEK ELECTRONICS

ORIGINAL INSTRUCTIONS

Introduction

The content of this documentation refers to products and technologies described in it.
All technical data contained in the document may be changed without notice.
The content of this documentation is subject to periodic review.
To use the product safely and effectively, read the following instructions carefully before use.
The product must be used only for the use for which it was designed and manufactured: any other use is under the full responsibility of the user.
Installation, programming and set-up are allowed only to authorized operators, physically and intellectually suitable.
The set-up must be performed only after a correct installation and the user must follow all the operations described in the installation manual carefully.
Seneca is not responsible for failures, breakages and accidents caused by ignorance or failure to apply the indicated requirements.
Seneca is not responsible for any unauthorized modifications.
Seneca reserves the right to modify the device, for any commercial or construction requirement, without the obligation to promptly update the reference manuals.
No liability for the contents of this document can be accepted.
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There may be errors and inaccuracies in this document that could damage your system, so proceed with caution, the author(s) will not take responsibility for it.
Technical specifications are subject to change without notice.

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Document revisions

DATE	REVISION	NOTES	AUTHOR
19/03/2019	1.0.0.0	First revision	MM
27/03/2019	1.0.0.1	Fix Modbus Registers 40023 Digital OUT	MM
17/04/2019	1.0.0.2	Fix references	MM

TABLE OF CONTENTS

1. *INTRODUCTION*


ATTENTION!
This user manual extends the information from the installation manual to the configuration of the device. Use the installation manual for more information.


ATTENTION!
In any case, SENECA s.r.l. or its suppliers will not be responsible for the loss of data/revenue or consequential or incidental damages due to negligence or bad/improper management of the device, even if SENECA is well aware of these possible damages.
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1.1. DESCRIPTION

The R series is based on devices equipped with two Ethernet switch ports that allow a chain connection to the next Ethernet device (daisy chain), so expensive industrial Ethernet switches are not required and wiring is simplified.
The hardware present in the devices allows the internal switch to work even if the device is faulty or not powered for up to 4 days (LAN function with bypass in case of failure).
Another important function is the possibility of copying inputs on remote outputs of R series products without the aid of a master device (peer 2 peer function).

Model	Description	Communication protocols
R-16DI-8DO	Remote Ethernet I/O with 2 Ethernet ports and 16 digital inputs / 8 digital relays outputs	Modbus TCP-IP Modbus RTU Seneca P2P I/O Mirror with broadcast (UDP based)

1.2. COMMUNICATION PORT SPECIFICATIONS

1.2.1.R-16DI-8DO

ETHERNET COMMUNICATION PORTS	
Number	2
Type	10/100 Mbit
Configuration	Switch

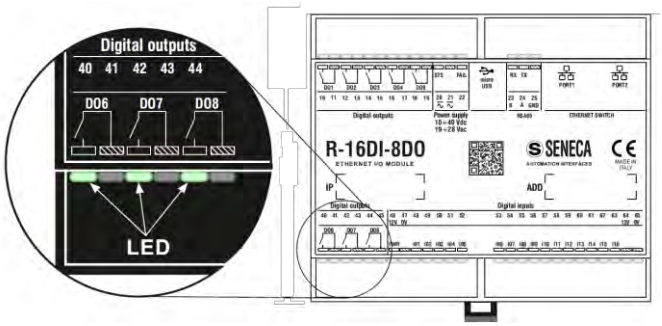
RS485 COMMUNICATION PORTS	
Number	1
Baudrate	From 1200 to 115200 bit/s configurable
Parity, Data bit, Stop bit	Configurable
Protocol	Configurable between Modbus RTU Slave or Modbus TCP-IP to Modbus RTU passthrough

USB COMMUNICATION PORT	
Number	1
Communication parameters	115200 bit/s, 8 bits, No parity, 1 stop bit, station address 1
Protocol	Modbus RTU Slave

COMMUNICATION PROTOCOLS SUPPORTED	
Modbus RTU	From RS485 and USB port
Modbus TCP-IP	From Ethernet 1 and 2
Seneca IO Mirror	From Ethernet 1 and 2

2. LED SIGNALS

2.1. R-16DI-8DO LED

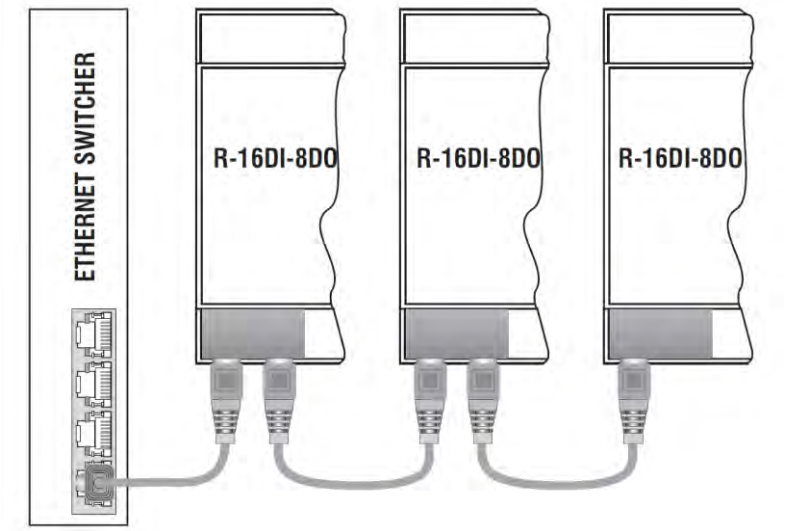


LED SIGNALS ON THE R-16DI-8DO FRONT PANEL		
LED	*STATUS*	*LED MEANING*
PWR	*ON*	Device on and auxiliary power supply present on terminals 46-47 and 64-65
PWR	*OFF*	Device OFF and no auxiliary power supply
I01	*ON*	Status of input 01 ON
I01	*OFF*	Status of input 01 OFF
I02	*ON*	Status of input 02 ON
I02	*OFF*	Status of input 02 OFF
…	*…*	…
I16	*ON*	Status of input 16 ON
I16	*OFF*	Status of input 16 OFF
D01	*ON*	Output 01 activated
D01	*OFF*	Output 01 disactivated
D02	*ON*	Output 02 activated
D02	*OFF*	Output 02 disactivated
…	*…*	…
D08	*ON*	Output 08 activated
D08	*OFF*	Output 08 disactivated
STS	*ON*	IP address set correctly, Seneca Studio can access the device
STS	*FLASHING*	Waiting for an IP address from the DHCP server or IP address conflict detected
FAIL (YELLOW)	*ON*	Outputs in fail status due to exceeded watchdog time
FAIL (YELLOW)	*OFF*	Outputs working correctly
TX	*ON*	Check RS485 port connection
TX	*FLASHING*	Packet transmission on RS485 port
RX	*ON*	Check RS485 port connection
RX	*FLASHING*	Packet reception on RS485 port
ETH TRF (YELLOW)	*FLASHING*	Packet transit on Ethernet port
ETH LNK (GREEN)	*ON*	Ethernet port connected

3. WIRING OF ETHERNET CABLES

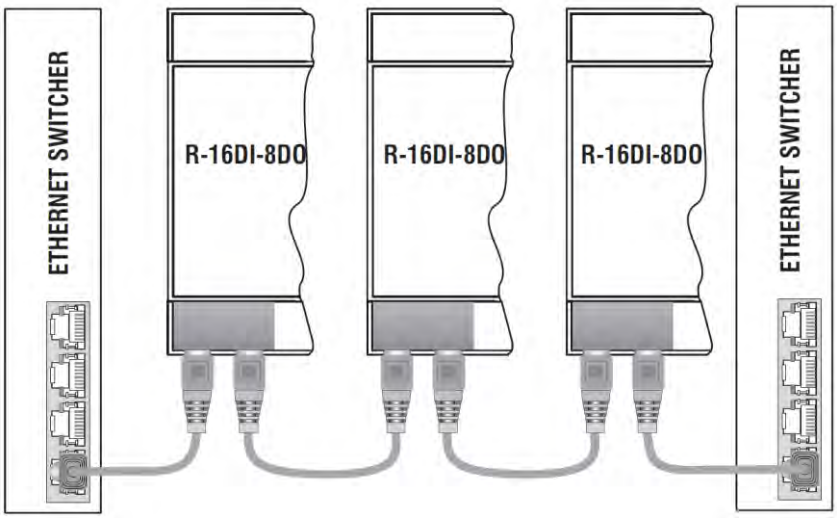
3.1. CHAIN ETHERNET CONNECTION (DAISY CHAIN)

Using the daisy chain connection it is not necessary to use switches to connect the devices.
A connection example of 3 devices is as follows:

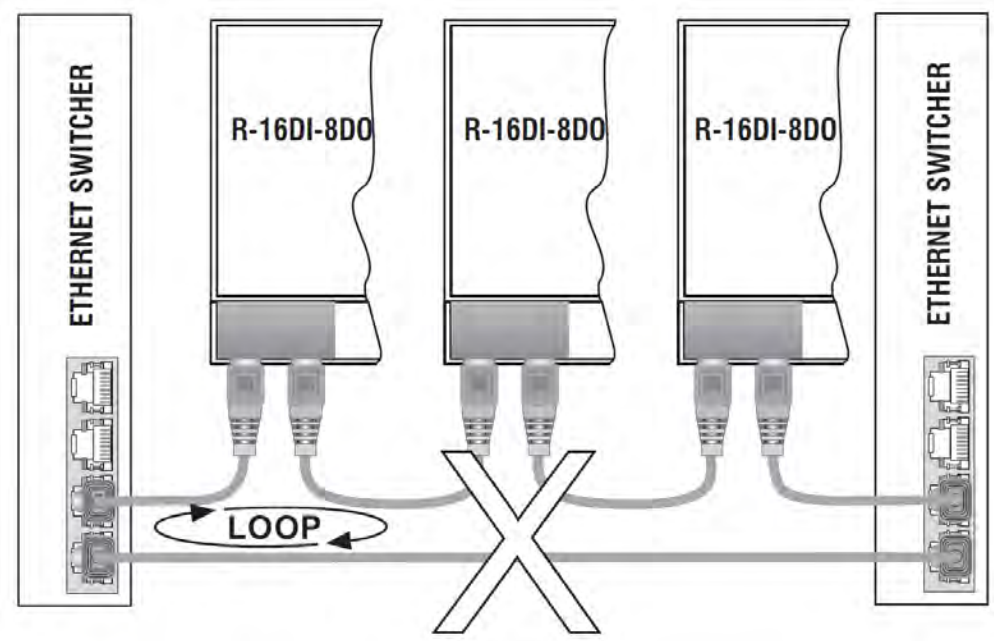


ATTENTION!
IT IS NOT POSSIBLE TO CREATE LOOPS WITH ETHERNET CABLES

If it is necessary to connect the devices to the switches, correct wiring is as follows:

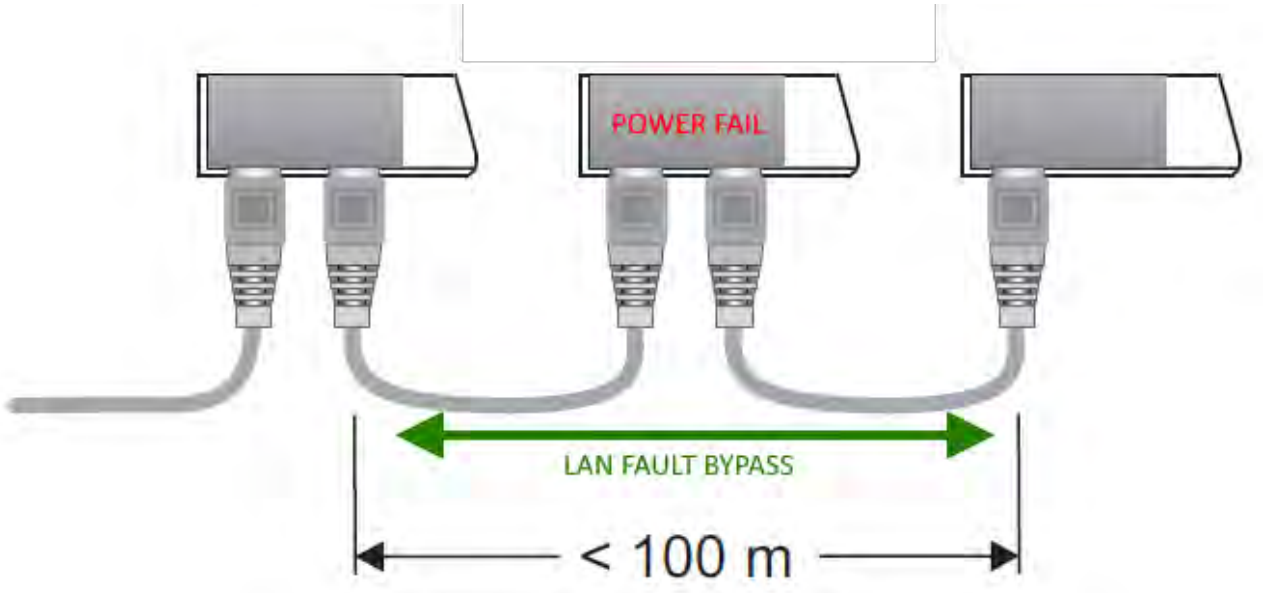


In the Ethernet wiring there must be no loop, otherwise the communication will not work, some examples of incorrect wiring are the following:



3.2. LAN FAULT-BYPASS FUNCTION

The LAN fault-bypass function allows you to keep the connection between the two Ethernet ports of the device ON, in the event of power failure problems.
If a device turns off, the chain is not interrupted and the devices downstream of the switched-off one 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 switched off module is less than 100m.



3.3. POWER SUPPLY

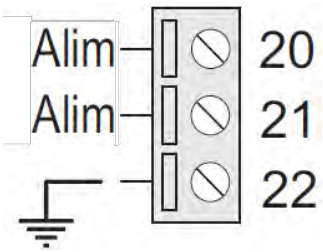
ATTENTION!

The upper power supply limits must not be exceeded, as this might cause serious damage to the module

Switch the module off before connecting inputs and outputs.
To meet the electromagnetic immunity requirements:
- use shielded signal cables;
- connect the shield to a preferential instrumentation earth system;
- separate shielded cables from other cables used for power installations (transformers, inverters, motors, induction ovens, etc...)

The power supply must be connected to terminals 20 and 21.
The supply voltage must be between:
10 and 40Vdc (indifferent polarity), or between 19 and 28 Vac.

19 – 28 Vac 50 – 60 Hz
10 – 40 Vdc
Maximum absorption 3 W



3.4. I/O CONNECTIONS

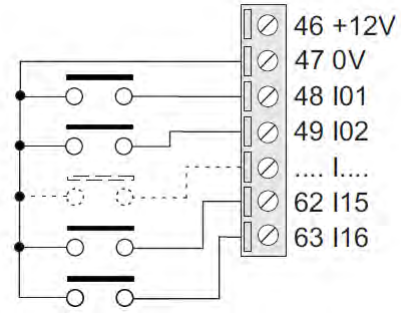
3.4.1.DIGITAL INPUTS

The device has 16 digital inputs. The inputs can also be used as 32-bit counters with retentive values on memory (retentive FeRAM memory).
For each input the Ton, Toff and period frequency measurements are also available.

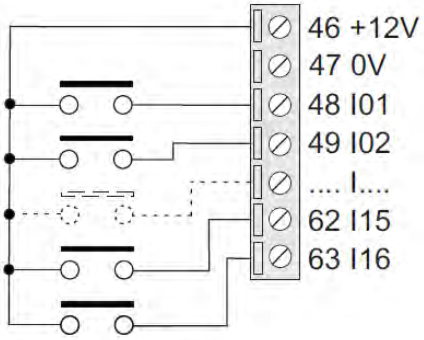
Voltage: OFF/ON threshold: < 8 V; > 9 V
Maximum frequency: 5 kHz, 32-bit retentive counters
Absorbed current: 2.25 mA
Compliant with: IEC6113-2 Type 1 & 3

The figures show the possible connections:

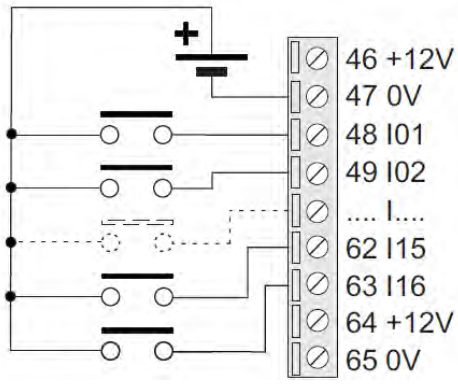
NPN connection (Sink) with power supplied by the device:



PNP connection (Source) with power supplied by the device:



PNP connection (Source) with power supplied externally:

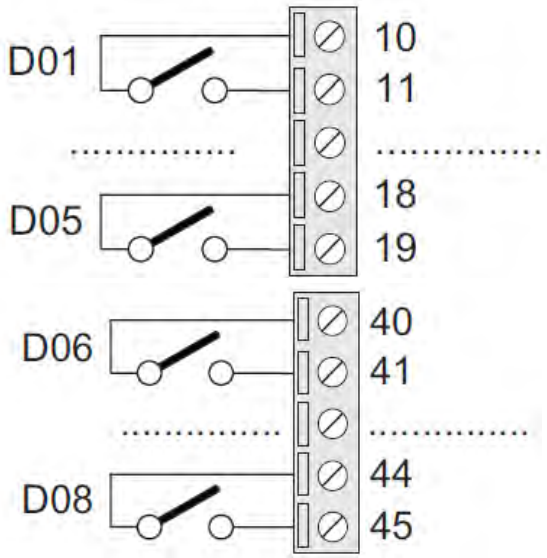


3.4.2.DIGITAL OUTPUTS

The device has 8 digital outputs with clean and isolated contacts between them.

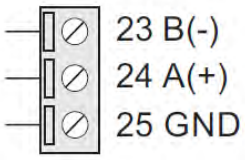
Type: SPST free contact relay
Max voltage/current: 30 V ac-dc / 1 A max

The figures show the internal relay contacts available:



3.5. RS485 PORT

The device has a RS485 port on terminals 23-24-25.
The port can be configured with the Modbus RTU Slave protocol or it is possible to activate the Modbus TCP-IP (Ethernet) to Modbus RTU (serial) operation.



4. CONNECTION OF THE DEVICES TO A NETWORK

4.1. CONNECTION OF THE DEVICE TO A NETWORK

The factory configuration of the IP address is:

Static address: 192.168.90.101

Therefore, multiple devices must not be inserted on the same network with the same static IP.
If you want to connect multiple devices on the same network, you need to change the IP address configuration using Seneca Studio software.

ATTENTION!
DO NOT CONNECT 2 OR MORE FACTORY-CONFIGURED DEVICES ON THE SAME NETWORK, OR THE ETHERNET INTERFACE WILL NOT WORK
(CONFLICT OF IP ADDRESSES 192.168.90.101)

If the addressing mode with DHCP is activated and an IP address is not received within 1 minute, the device will set an IP address with a fixed error:

169.254.x.y

Where x.y are the last two values of the MAC ADDRESS.
This way it is possible to install more I/O of the R series and then configure the IP with the Seneca Studio software even on networks without a DHCP server.

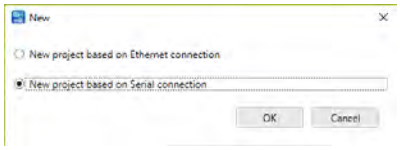
4.2. USE OF SENECA STUDIO TO CONFIGURE DEVICES

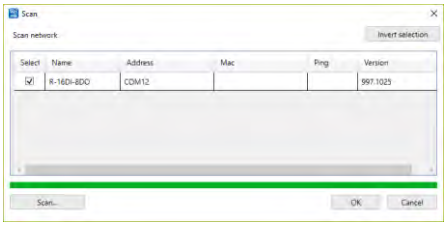
The Seneca Studio software allows:

- Configuring R series devices via the USB port
- Searching and configuring Seneca R-series devices on an Ethernet network

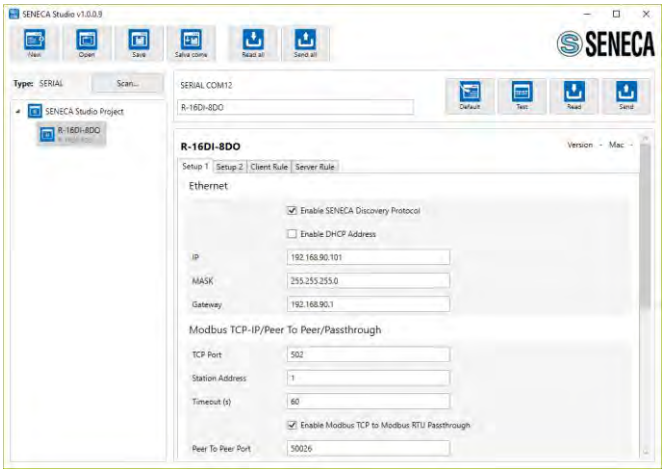
In the case of a first installation we recommend following these steps:

1) Install the Seneca Studio software
2) Power and connect the device to the PC via the USB port





3) Configure the device with the IP address and the desired configuration



4) Install the device

If many devices are installed using the USB port:

1) Power and connect the device to the PC via the USB port
2) Configure the automatic address via DHCP from the search window
3) Install all the devices in the network
4) `If there is no DHCP server in the network, after 1 minute the devices will set a fail IP address (see chapter 4.1)`
5) Wait for all the device STS LEDs to be on steady.
6) At this point, using Seneca Studio, create a new Ethernet project and find all the devices with the "search" button, then reconfigure the devices with the most appropriate work addresses.

In case of many devices using the Ethernet port:

1) Power and connect the first device to the PC via the Ethernet port
2) Perform the search
3) Change the address of the device with IP 192.168.90.101 from the search window
4) Connect the second device in Daisy Chain, search and return to step 2) until all devices are configured

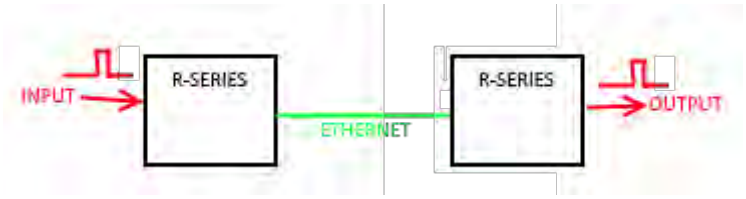
The search software included in Seneca Studio works at Ethernet Layer 2 level (through the Seneca Discovery protocol) and it is therefore not necessary to have an Ethernet configuration compatible with the device you are

looking for to change its IP. For the general configuration of the device it is necessary to have compatible configuration.

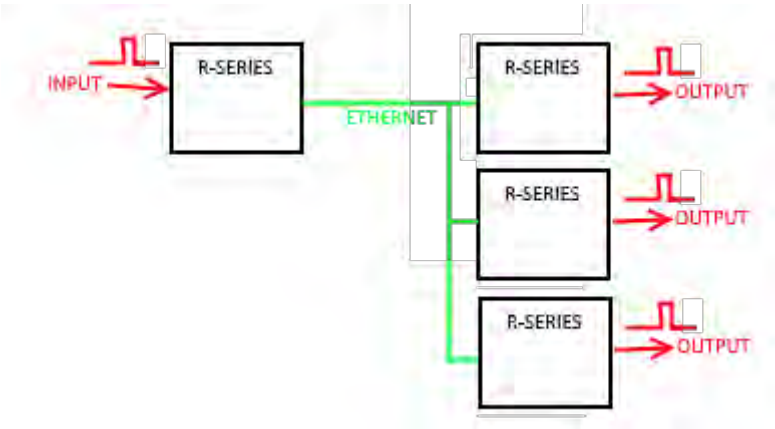
5. I/O COPY USING THE PEER TO PEER FUNCTION WITHOUT WIRING

The "R" series devices can be used to copy and update in real time an input channel on a remote output channel without the aid of a master controller.

For example, a digital input can be copied to a remote digital output device:



Note that no controller is required because the communication is managed directly by the R series devices.
It is possible to make a more sophisticated connection, for example it is possible to copy the inputs to different R-series remote devices (from Device 1 Input 1 to Device 2 Output1, Device 1 Input 2 to Device 3 Output 1 etc. ...)
It is also possible to copy an input to an output of multiple remote devices:

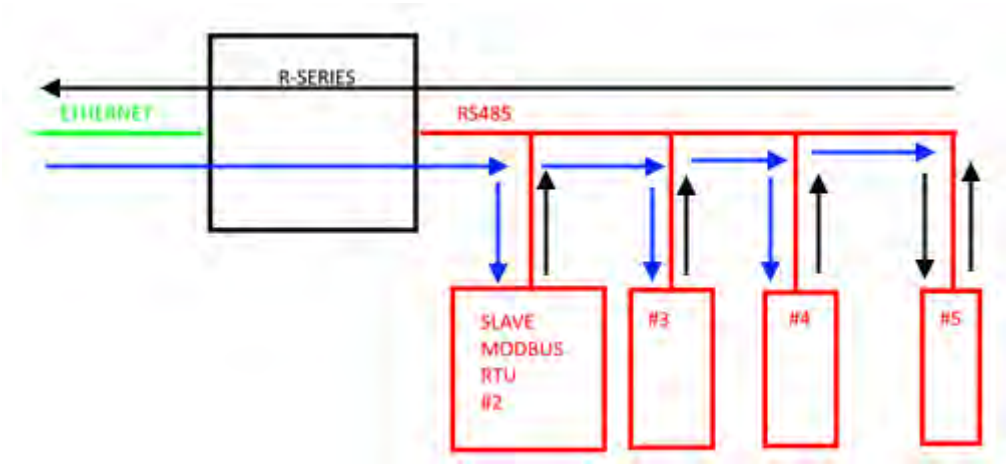


Each R-series device can send and receive a maximum of 32 inputs.

For further information, see chapter 7.3.

6. MODBUS PASSTHROUGH

Thanks to the Modbus Passthrough function it is possible to extend the amount of I/O available in the device via the RS485 port and the Modbus RTU slave protocol, for example by using the Seneca Z-PC series products.
In this mode the RS485 port stops working as Modbus RTU slave and the device becomes a Modbus TCP-IP gateway to Modbus RTU serial:



Each Modbus TCP-IP request with station address other than that of the R series device is converted into a serial packet on the RS485 and, in the case of a reply, it is turned over to TCP-IP.
Therefore, it is no longer necessary to purchase gateways to extend the I/O number or to connect already available Modbus RTU I/O.

7. WEB SERVER

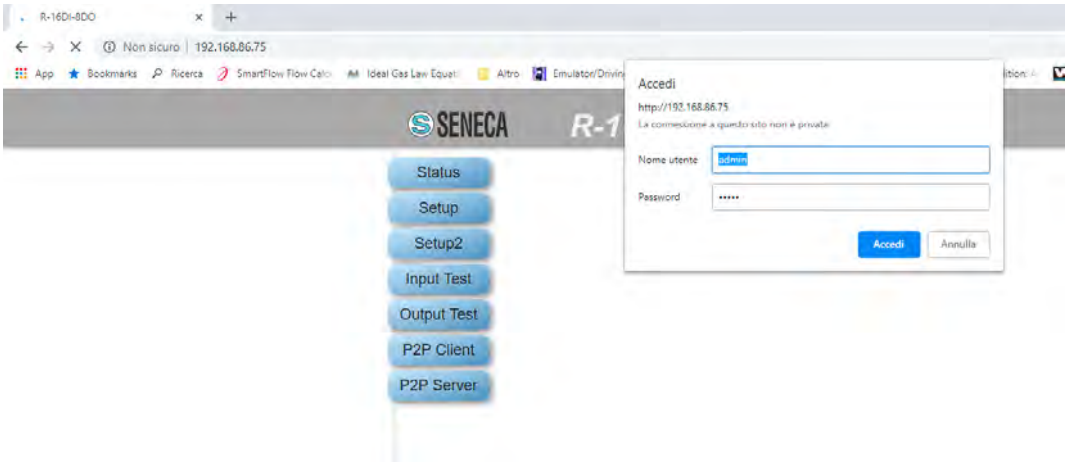
7.1. ACCESS TO THE WEB SERVER

Access to the web server takes place using a web browser and entering the IP address of the device.
To find out the IP address of the device, use the "search" function of the "Seneca Studio" software (see chapter 12).

On first access the user name and password will be requested.
The default values are:

User Name: admin
Password: admin

ATTENTION!
AFTER THE FIRST ACCESS CHANGE USER NAME AND PASSWORD IN ORDER TO PREVENT ACCESS TO THE DEVICE TO UNAUTHORIZED PEOPLE.

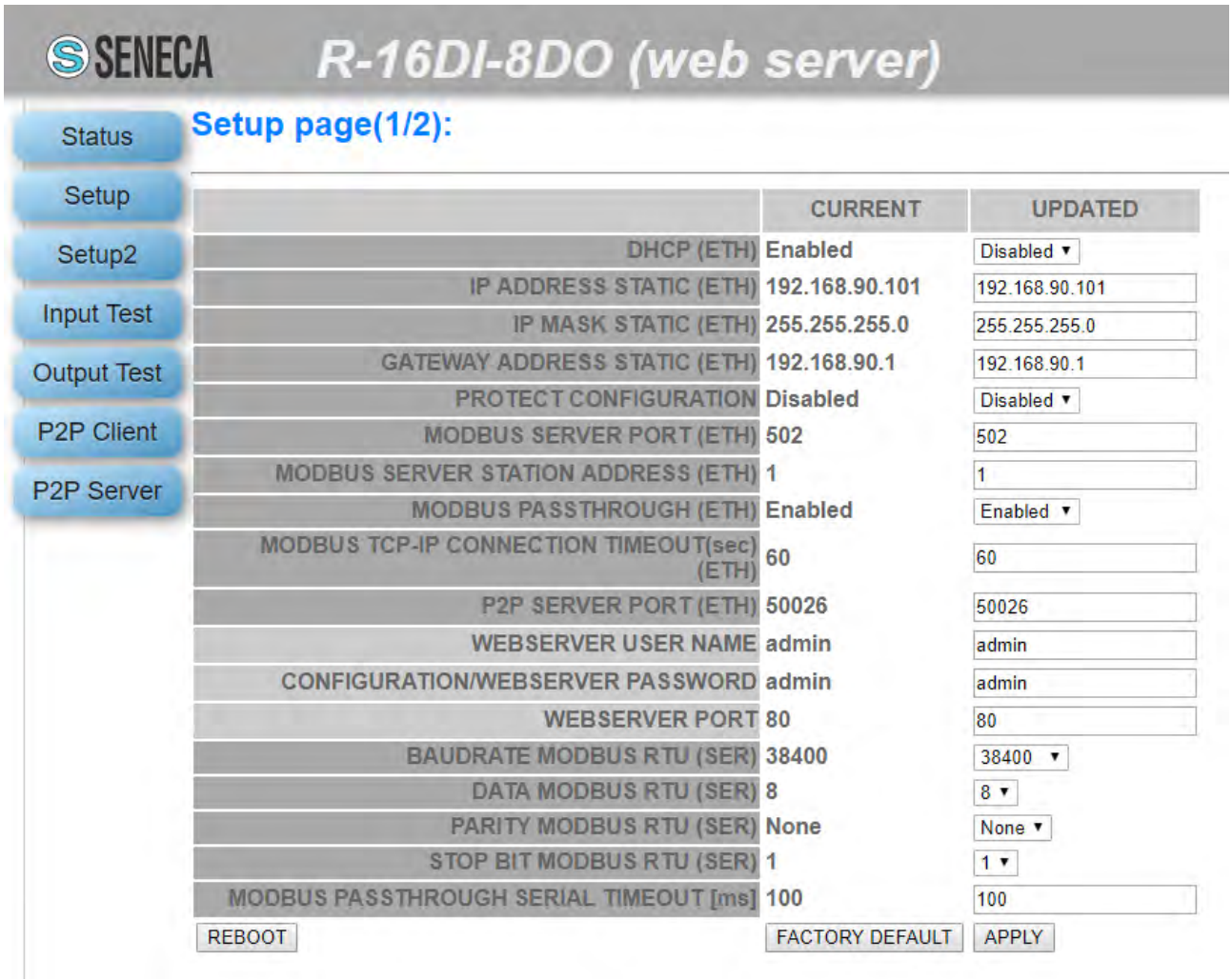


ATTENTION!
IF THE WEB SERVER ACCESS PARAMETERS HAVE BEEN LOST, IT IS NECESSARY TO CONNECT THE DEVICE WITH THE SENECA STUDIO SOFTWARE THROUGH THE USB PORT AND REINSTALL THE DEFAULT CONFIGURATION (SEE CHAPTER 9)

7.2. DEVICE CONFIGURATION

To configure the device, access the web server and select the section you are interested in.
After a modification to the configuration has been made, the changes must be confirmed with the "*APPLY*" button.
The *Reboot* button reboots the device (not necessary in the event of a configuration change).
The *Default* button returns all the page parameters to the default settings.

7.2.1.SETUP SECTION



DHCP (ETH) (default: Disabled)
Sets the DHCP client to get an IP address automatically.

IP ADDRESS STATIC (ETH) (default: 192.168.90.101)
Sets the device static address. Careful not to enter devices with the same IP address into the same network.

IP MASK STATIC (ETH) (default: 255.255.255.0)
Set the mask for the IP network.

GATEWAY ADDRESS STATIC (ETH) (default: 192.168.90.1)
Set the gateway address.

PROTECT CONFIGURATION (default: Disabled)
Allows you to enable or disable password protection for reading and writing the configuration (including the IP address) using the Seneca Studio software or Seneca Discovery Tool. The password is the same one that allows accessing the web server.


ATTENTION!
IF THE CONFIGURATION PROTECTION IS ENABLED IT WILL BE IMPOSSIBLE TO READ/WRITE THE CONFIGURATION OF THE DEVICE WITHOUT KNOWING THE PASSWORD.
IF THE PASSWORD HAS BEEN LOST, THE DEVICE CAN BE RETURNED TO ITS DEFAULT SETTINGS BY CONNECTING IT VIA USB TO THE SENECA STUDIO SOFTWARE (SEE CHAPTER 9)

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, it sets the station address of the modbus TCP-IP server.


ATTENTION!
THE MODBUS SERVER WILL ANSWER ANY STATION ADDRESS ONLY IF THE MODBUS PASSTHROUGH MODE IS DISABLED.

MODBUS PASSTHROUGH (ETH) (default: disabled)
Sets the conversion mode from Modbus TCP-IP to Modbus RTU serial (see chapter 6).

MODBUS TCP-IP CONNECTION TIMEOUT [sec] (ETH) (default: 60)
Sets the TCP-IP connection timeout for the Modbus TCP-IP server and Passthrough modes.

P2P SERVER PORT (default: 50026)
Sets the communication port for the P2P server.

WEBSERVER USER NAME (default: admin)
Sets the user name to access the web server.

CONFIGURATION/WEBSERVER PASSWORD (default: admin)
Sets the password to access the web server and to read/write 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.

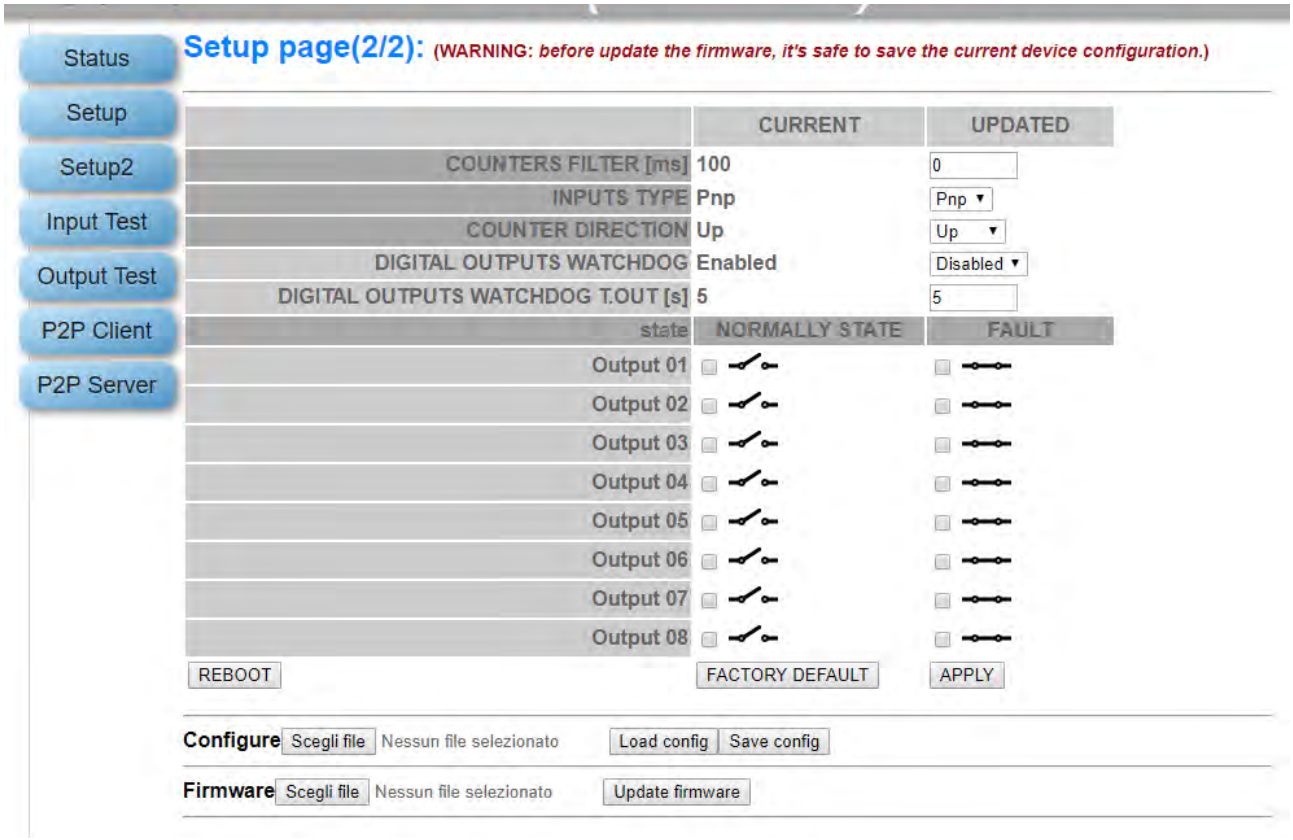
PARITY MODBUS RTU (SER) (default: None)
Sets the parity for the RS485 communication port.

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 activated, sets the maximum waiting time before sending a new packet from TCP-IP to the serial port. It must be set according to the longest response time of all the devices present on the RS485 serial port.


ATTENTION!
THE USB PORT CONFIGURATION PARAMETERS CANNOT BE MODIFIED AND ARE BAUDRATE: 115200
DATA: 8 BIT
PARITY: NONE
STOP BIT: 1
MODBUS RTU PROTOCOL

7.2.2.SETUP 2 SECTION



COUNTERS FILTER (default: 100 ms)
Sets the filtering of the counters, the value is expressed in [ms].
The filter cut-off frequency corresponds to:

$$f_{cut}[Hz] = \frac{1000}{2 * Counters\ Filter\ [ms]}$$

For example, if the filter counter is 100ms the cutting frequency will be:

$$f_{cut}[Hz] = \frac{1000}{2 * Counters\ Filter\ [ms]} = 5\ Hz$$

So all input frequencies greater than 5 Hz will be cut.

INPUTS TYPE (default: Pnp "Source")
Sets the input/counter operating mode to between npn "Sink" and pnp "Source". For further information, see chapter 3.4.1.
COUNTER DIRECTION (default: Up)
Sets the counting mode of the counters "forward", up or back "down".

In the "Up" mode when the counter reaches the value:

$$Max\ Value = 2^{32} - 1 = 4294967295$$

A subsequent increase will return the value to 0.
In the "Down" mode, if the counter value is 0, a subsequent input pulse will return the value to 4294967295.

DIGITAL OUTPUT WATCHDOG (default: Disabled)
Set whether the digital output watchdog is to activated. When enabled, if within the timeout time there has been no communication from the master to the device (Modbus serial communication, TCP-IP or USB or P2P communication) the outputs go into a Fail state. This mode makes it possible to obtain a secure system in the event of a master malfunction and its use is recommended in the case of radio type connections.

DIGITAL OUTPUTS WATCHDOG T.OUT [s] (default: 5 s)
Sets the watchdog time of the digital outputs (valid only if the DIGITAL OUTPUT WATCHDOG parameter is enabled)

NORMALLY STATE/FAULT (default: normally open (N.O.) and Normally closed (N.C.) state in case of fail
They set the states of each of the outputs in normal conditions and in the event of a failure.
In the case of normally open (not energized) writing in the Modbus "Outputs" register with 0 will cause the relay not to energize, otherwise, in the case of normally closed (energized) writing in the Modbus "Outputs" register with 1 will determine the relay not to be energized.
In the case of "fail" the output will go into the selected configuration between not energized or energized .

The "*Configure*" section allows you to save or open a complete configuration of the device (for more information refer to chapter 7.4).

The "*Firmware*" section allows you to update the firmware of the device in order to obtain new features (for more information refer to chapter Errore. L'origine riferimento non è stata trovata.).

7.3. P2P CONFIGURATION

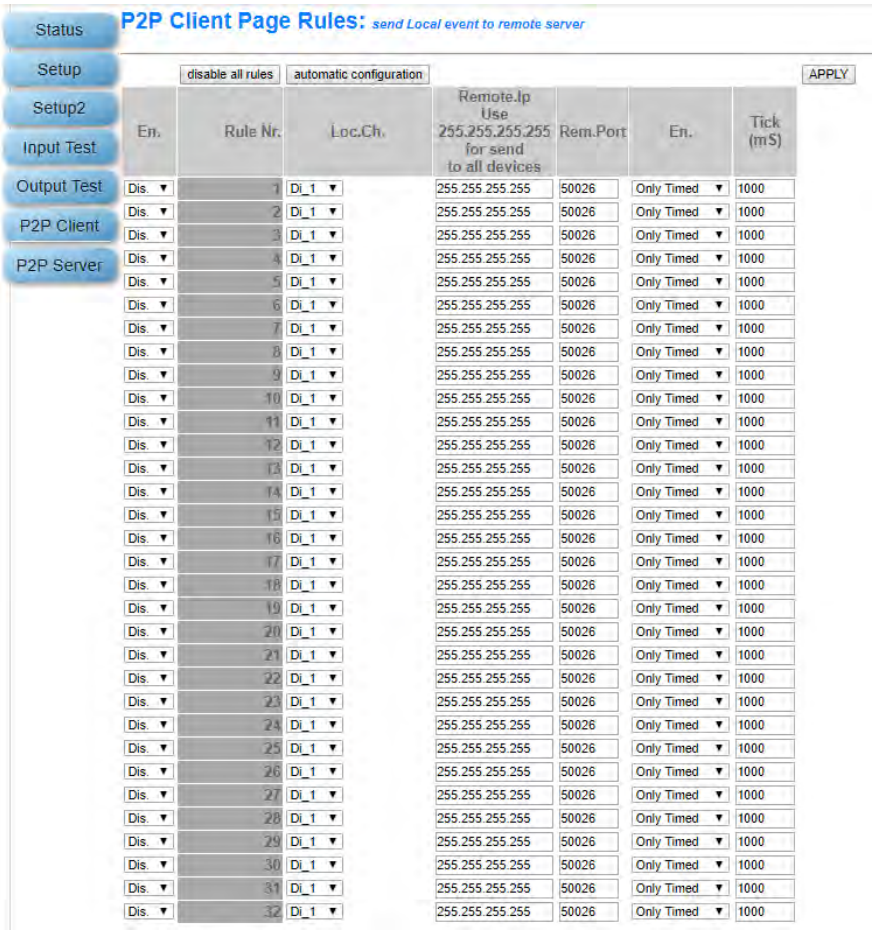
In the P2P Client section it is possible to define which local events to send to one or more remote devices.
This way it is possible to send the status of the inputs to the remote outputs and obtain the input-output replication without wiring. It is also possible to send the same input to several outputs simultaneously.
In the P2P Server section it is instead possible to define which inputs must be copied to the outputs.

The "*Disable all rules*" button places all the rules in a disabled status (default).
The "*APPLY*" button allows you to confirm and then save the set rules in the non-volatile memory.

7.3.1.P2P EXECUTION TIME

The switching time of the remote digital output as a response to an event into another device is about 20 ms (daisy chain connection of 2 devices, 1 rule set).

7.3.2.P2P CLIENT SECTION



The "*Automatic configuration*" button allows you to prepare the rules for sending all the inputs available in the device in use.

En.
Selects whether the copy rule is active or not.

Loc. Ch.
Selects the status of which channel should be sent to the remote device(s).

Remote IP
Selects the IP address of the remote device to which the status of that input channel is to be sent.

If the channel has to be sent simultaneously to all the devices (broadcast), enter the broadcast address (255.255.255.255) as the IP address.

Remote Port

Selects the communication port for sending the status of the inputs. It must coincide with the *P2P SERVER PORT* parameter of the remote device (see chapter Errore. L'origine riferimento non è stata trovata.).

En

Selects operation in "Only Timed" or "Timed+Event" mode.

In "Only Timed" mode, the status of the inputs is sent on each "tick [ms]" and then refreshed continuously (cyclic sending).

In the "Timed+Event" mode the status of the inputs is sent on an event (state change) and, subsequently, continuously refreshed (cyclical and event sending). If fast copies are needed it is preferable to use this mode and set a refresh time of a few seconds to avoid overloading the network.

Tick [ms]

Sets the cyclical sending time of the input status.

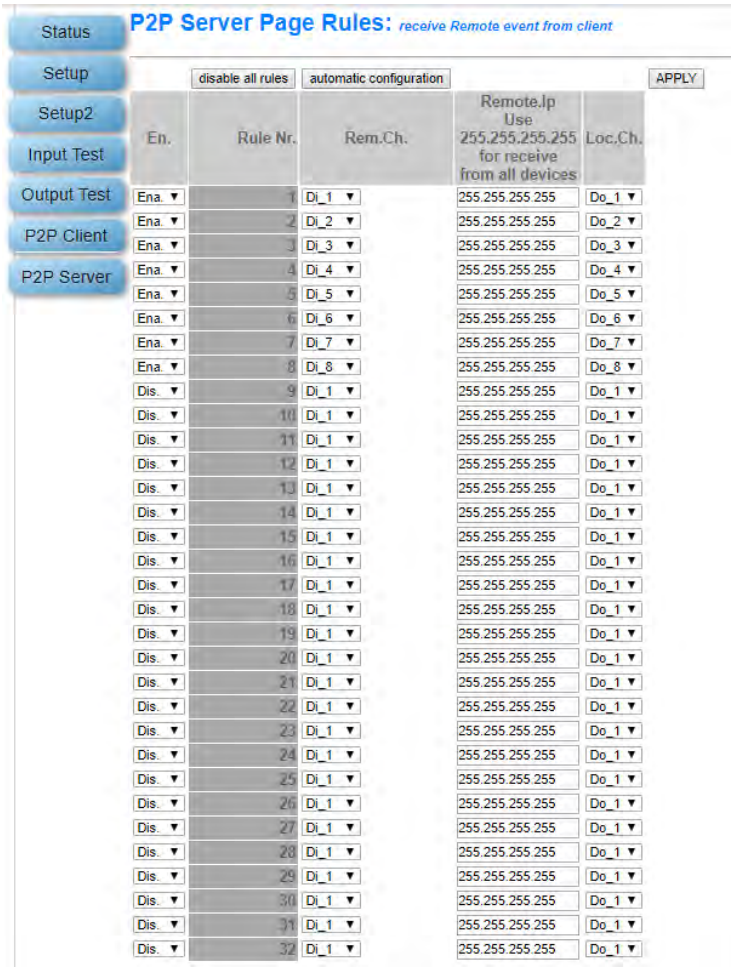

ATTENTION!

IN CASE OF ENABLED WATCHDOG OF DIGITAL OUTPUTS THE RULE'S TICK TIME MUST BE LOWER THAN THE WATCHDOG TIMEOUT SET


ATTENTION!

IT IS ALSO POSSIBLE TO COPY SOME I/O OF THE SAME DEVICE (FOR EXAMPLE, COPY THE I01 INPUT TO D01) BY ENTERING THE IP OF THE DEVICE AS REMOTE IP

7.3.3.P2P SERVER SECTION



The "*Automatic configuration*" button allows you to prepare the rules to receive all the inputs on the outputs of the device in use.

En.
Selects whether the copy rule is active or not.

Rem. Ch.
Selects the status of which remote channel should be received by the local device.

Remote IP
Selects the IP address of the remote device from which to receive the input status.
If the channel must be received simultaneously by all the devices (broadcast), enter the broadcast address (255.255.255.255) as the IP address.

Loc. Ch.
Selects the copy destination of the remote input value.

ATTENTION!

IT IS ALSO POSSIBLE TO COPY SOME I/O OF THE SAME DEVICE (FOR EXAMPLE, COPY THE I01 INPUT TO D01) BY ENTERING THE IP OF THE DEVICE AS REMOTE IP. HOWEVER, THE ETHERNET PORT MUST BE CORRECTLY CONNECTED.

7.3.4.P2P CONFIGURATION EXAMPLE

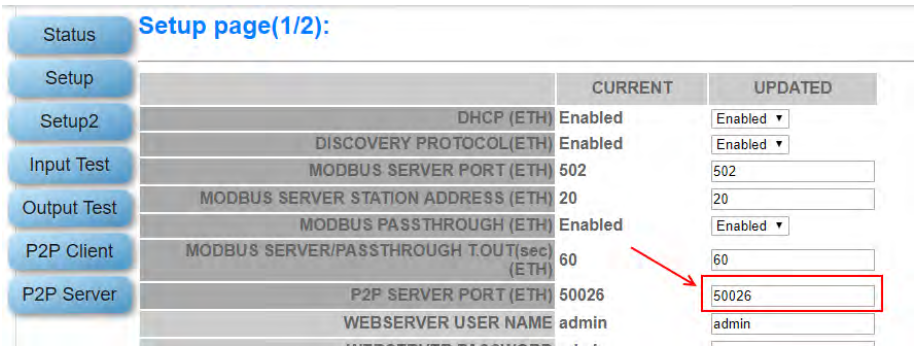
In the following example we have No.2 devices and we want to copy the status of digital input 1 of the first to the digital output of the second.
The IP address of Device 1 is 192.168.1.10
The IP address of Device 2 is 192.168.1.11

Let's move to device 1 with IP address 192.168.1.10 and select the sending of digital input 1 to the remote address 192.168.1.11 of device 2 this way:

DEVICE 1

En.	Rule Nr.	Loc.Ch.	Remote.Ip Use 255.255.255.255 for send to all devices	Rem.Port	En.	Tick (mS)
Ena.	1	Di_1	192.168.1.11	50026	Timed+Event	1000

Now let's move on to device 2 and first configure the P2P server communication port on 50026:



And we now configure the P2P server, the channel to be received from 192.168.1.10 is Di_1 and must be copied to Do_1:

DEVICE 2

En.	Rule Nr.	Rem.Ch.	Remote.Ip Use 255.255.255.255 for receive from all devices	Loc.Ch.
Ena.	1	Di_1	192.168.1.10	Do_1

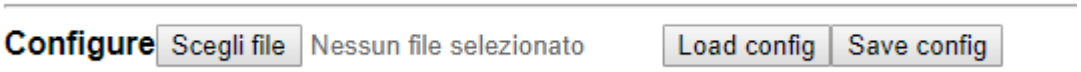
With this configuration, each time digital input 1 of device 1 (192.168.1.10) changes status, a packet will be sent to device 2 (192.168.1.11) which will copy it to digital output 1.
After 1 second, the same packet will be sent cyclically.

7.4. Export/Import a configuration (SETUP 2 SECTION)

Through the web server it is possible to export/import a configuration (including the P2P section).

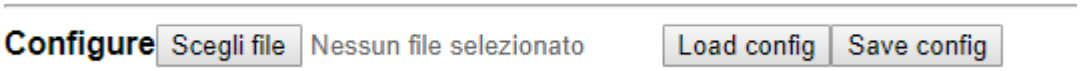
7.4.1.EXPORTING A CONFIGURATION TO FILE

Go to the Setup 2 section and select the file to save, press the "Save config" button



7.4.2.IMPORTING A CONFIGURATION FROM A FILE

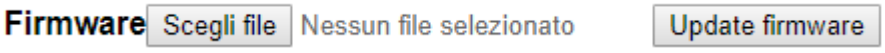
Go to the Setup 2 section and select the file to load, press the "Load config" button



7.5. FIRMWARE UPDATE (SETUP SECTION 2)

In order to improve, add, optimize the functions of the product, Seneca releases firmware updates on the device section on the www.seneca.it website

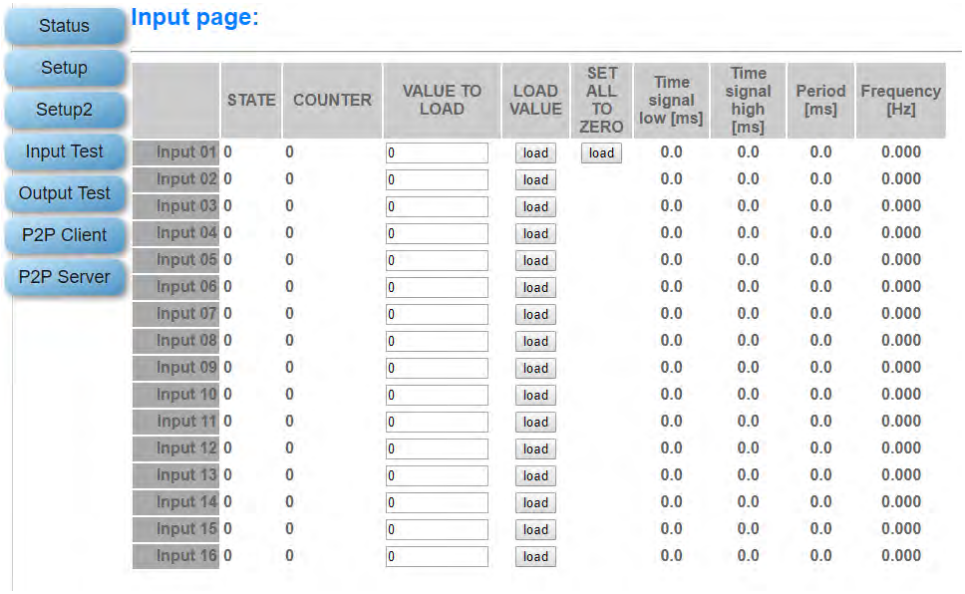
Then select the new firmware file and press the "Update firmware" button



ATTENTION!
NOT TO DAMAGE THE DEVICE DO NOT REMOVE THE POWER SUPPLY DURING THE FIRMWARE UPDATE OPERATION.

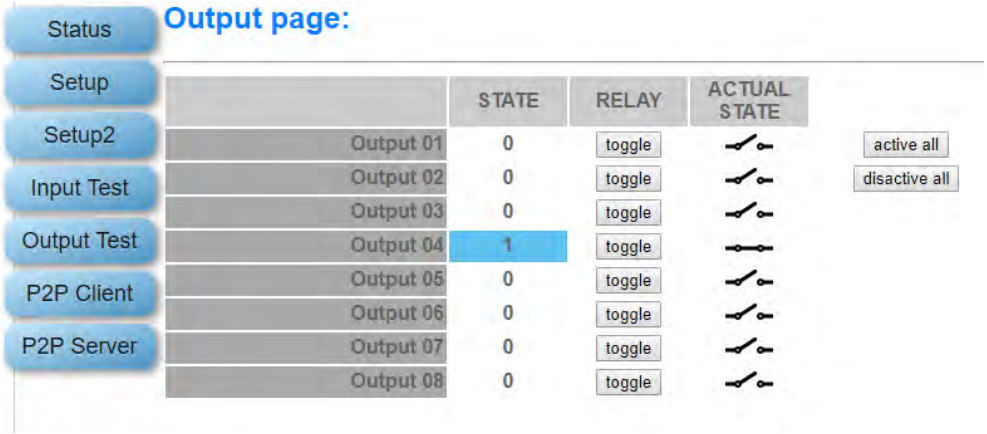
7.6. STATE OF I/O IN THE WEB SERVER

In the web server it is possible to see the status of the inputs, counters and relative calculations as frequency, Ton, ... in the INPUT TEST section:



	STATE	COUNTER	VALUE TO LOAD	LOAD VALUE	SET ALL TO ZERO	Time signal low [ms]	Time signal high [ms]	Period [ms]	Frequency [Hz]
Input 01	0	0	0	load	load	0.0	0.0	0.0	0.000
Input 02	0	0	0	load		0.0	0.0	0.0	0.000
Input 03	0	0	0	load		0.0	0.0	0.0	0.000
Input 04	0	0	0	load		0.0	0.0	0.0	0.000
Input 05	0	0	0	load		0.0	0.0	0.0	0.000
Input 06	0	0	0	load		0.0	0.0	0.0	0.000
Input 07	0	0	0	load		0.0	0.0	0.0	0.000
Input 08	0	0	0	load		0.0	0.0	0.0	0.000
Input 09	0	0	0	load		0.0	0.0	0.0	0.000
Input 10	0	0	0	load		0.0	0.0	0.0	0.000
Input 11	0	0	0	load		0.0	0.0	0.0	0.000
Input 12	0	0	0	load		0.0	0.0	0.0	0.000
Input 13	0	0	0	load		0.0	0.0	0.0	0.000
Input 14	0	0	0	load		0.0	0.0	0.0	0.000
Input 15	0	0	0	load		0.0	0.0	0.0	0.000
Input 16	0	0	0	load		0.0	0.0	0.0	0.000

In the Output Test section it is, instead, possible to see and control the states of the outputs:



	STATE	RELAY	ACTUAL STATE	
Output 01	0	toggle		active all
Output 02	0	toggle		disactive all
Output 03	0	toggle		
Output 04	1	toggle		
Output 05	0	toggle		
Output 06	0	toggle		
Output 07	0	toggle		
Output 08	0	toggle		

8. USB CONNECTION

The front USB port allows a simple connection using the Modbus RTU slave protocol, the communication parameters for the USB port cannot be modified:

Baud rate: 38400
Address of the Modbus RTU station: 1
Data Bit: 8
Stop bit: 1

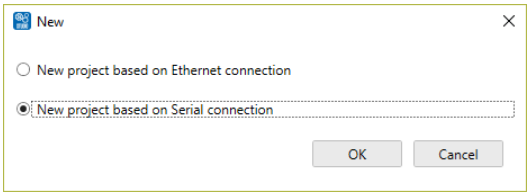
Drivers for Windows PC can be downloaded from the device's web page.
The drivers are still present in the "Seneca Studio" software installation.

9. RESETTING THE DEVICE WITH A LOST PASSWORD VIA USB PORT

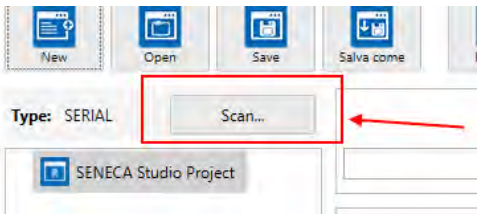
For security reasons, if the password is lost, it is possible to return the device to the factory configuration only using the USB connection.

Follow the procedure below:

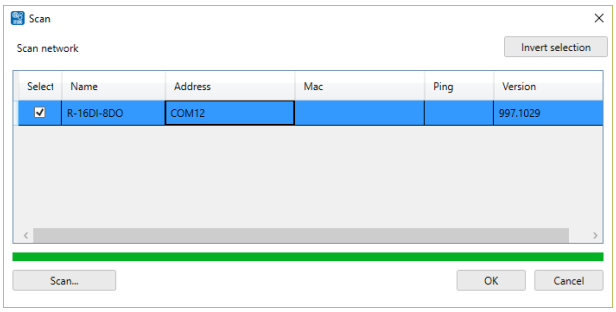
1) Connect the device to the Seneca Studio software via the USB port
2) Select the Serial connection with OK



3) Press the "Search" button

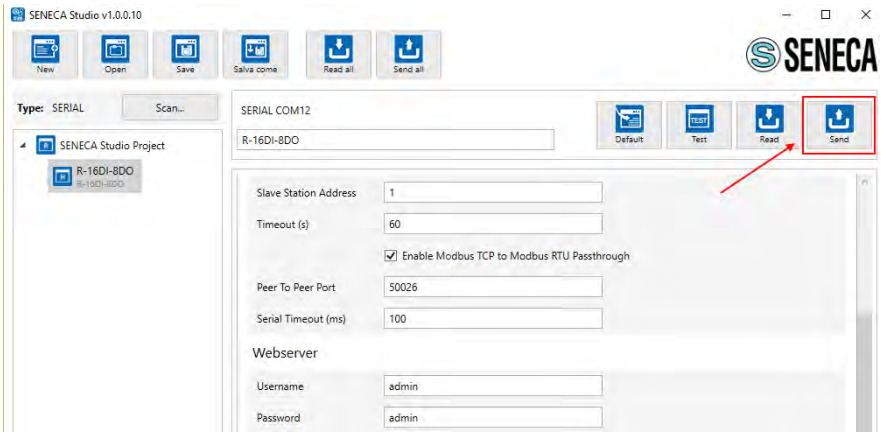


4) Add the device to the project with OK



5) At this point, for security reasons, it is not possible to read the current configuration without knowing the password but it is possible to overwrite it

6) Send the new configuration and the new username/password login credentials.



10. SUPPORTED MODBUS COMMUNICATION PROTOCOLS

The Modbus communication protocols supported are:

- Modbus RTU Slave (from the RS485 and USB ports)
- Modbus TCP-IP Server (from Ethernet ports) 8 clients max

For more information on these protocols, see the website:
http://www.modbus.org/specs.php.

10.1. SUPPORTED MODBUS FUNCTION CODES

The following Modbus functions are supported:

- Read Holding Register (function 3)
- Read Coil Status (function 1)
- Write Coil (function 5)
- Write Single Register (function 6)
- Write Multiple registers (function 16)


ATTENTION!
All 32-bit values are contained in 2 consecutive registers


ATTENTION!
Any registers with RW* (in flash memory) can be written up to 10000 times
The PLC/Master Modbus programmer must not exceed this limit

11. MODBUS REGISTER TABLE

The following abbreviations are used in the register tables:

MS = More significant
LS = Less significant
MSW = 16 most significant bits
LSW = 16 least significant bits
RO = Register in read-only
RW = Read/write register
RW * = Register in reading and writing contained in flash memory, writable a maximum of 10000 times.
Unsigned 16 bit = unsigned integer register, can take values from 0 to 65535
Signed 16 bit = signed integer register can take values from -32768 to +32767
Float 32 bits = Single-precision floating point register with 32 bits (IEEE 754) https://en.wikipedia.org/wiki/IEEE_754
BIT = Boolean registry, can be 0 (false) or 1 (true)

11.1. R-16DI-8DO: MODBUS 4X HOLDING REGISTERS TABLE (FUNCTION CODE 3)

ADDRESS (4x)	OFFSET ADDRESS (4x)	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
40001	0	MACHINE-ID	-	DEVICE IDENTIFICATION	RO	UNSIGNED 16
40002	1	FIRMWARE REVISION	-	FIRMWARE REVISION	RO	UNSIGNED 16

ADDRESS (4x)	OFFSET ADDRESS (4x)	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
40017	16	COMMAND	-	COMMAND REGISTER	RW	UNSIGNED 16
40018	17	DIGITAL INPUT [16…1]	[1…16]	DIGITAL INPUTS [16… 1] THE LEAST SIGNIFICANT BIT IS RELATIVE TO I01 EXAMPLE: 5 decimal = 0000 0000 0000 0101 binary => I01 = High, I02 = LOW, I03 = HIGH, I04… I16 = LOW	RO	UNSIGNED 16

40019	18	RESERVED	-	RESERVED	RO	UNSIGNED 16
40020	19	RESERVED	-	RESERVED	RO	UNSIGNED 16
40021	20	RESERVED	-	RESERVED	RO	UNSIGNED 16
40022	21	RESERVED	-	RESERVED	RO	UNSIGNED 16
40023	22	DIGITAL OUT [8…1]	[8…1]	DIGITAL OUTPUTS [8… 1] THE LEAST SIGNIFICANT BIT IS RELATIVE TO D01 EXAMPLE: 5 decimal = 0000 0000 0000 0101 binary => D01=High, D02=LOW, D03=HIGH, D04…D08=LOW	RW	UNSIGNED 16

ADDRESS (4x)	***OFFSET ADDRESS (4x)***	***REGISTER***	***CHANNEL***	***DESCRIPTION***	***W/R***	***TYPE***
40101	100	RESET_COUNTER [1..16]	16..1	RESET A BIT OF THE i-TH COUNTER THE LEAST SIGNIFICANT BIT RELATES TO COUNTER 1 EXAMPLE: 5 decimal = 0000 0000 0000 0101 binary => Resets the value of counters 1 and 3	RW	UNSIGNED 16
40102	101	RESERVED	-		RW	UNSIGNED 16
40103	102	COUNTER	1	LSW	RW	UNSIGNED 32
40104	103			MSW	RW	
40105	104	COUNTER	2	LSW	RW	UNSIGNED 32
40106	105			MSW	RW	
40107	106	COUNTER	3	LSW	RW	UNSIGNED 32
40108	107			MSW	RW	
40109	108	COUNTER	4	LSW	RW	UNSIGNED 32
40110	109			MSW	RW	
40111	110	COUNTER	5	LSW	RW	UNSIGNED 32
40112	111			MSW	RW	
40113	112	COUNTER	6	LSW	RW	

40114	113			MSW	RW	UNSIGNED 32
40115	114	COUNTER	7	LSW	RW	UNSIGNED 32
40116	115			MSW	RW	
40117	116	COUNTER	8	LSW	RW	UNSIGNED 32
40118	117			MSW	RW	
40119	118	COUNTER	9	LSW	RW	UNSIGNED 32
40120	119			MSW	RW	
40121	120	COUNTER	10	LSW	RW	UNSIGNED 32
40122	121			MSW	RW	
40123	122	COUNTER	11	LSW	RW	UNSIGNED 32
40124	123			MSW	RW	
40125	124	COUNTER	12	LSW	RW	UNSIGNED 32
40126	125			MSW	RW	
40127	126	COUNTER	13	LSW	RW	UNSIGNED 32
40128	127			MSW	RW	
40129	128	COUNTER	14	LSW	RW	UNSIGNED 32
40130	129			MSW	RW	
40131	130	COUNTER	15	LSW	RW	UNSIGNED 32
40132	131			MSW	RW	
40133	132	COUNTER	16	LSW	RW	UNSIGNED 32
40134	133			MSW	RW	

ADDRESS (4x)	***OFFSET ADDRESS (4x)***	***REGISTER***	***CHANNEL***	***DESCRIPTION***	***W/R***	***TYPE***
40201	200	INT MEASURE TLOW	1	Full measure of Tlow in [ms]	RO	UNSIGNED 16
40202	201	INT MEASURE TLOW	2	Full measure of Tlow in [ms]	RO	UNSIGNED 16
40203	202	INT MEASURE TLOW	3	Full measure of Tlow in [ms]	RO	UNSIGNED 16
40204	203	INT MEASURE TLOW	4	Full measure of Tlow in [ms]	RO	UNSIGNED 16
40205	204	INT MEASURE TLOW	5	Full measure of Tlow in [ms]	RO	UNSIGNED 16
40206	205	INT MEASURE TLOW	6	Full measure of Tlow in [ms]	RO	UNSIGNED 16

40207	206	INT MEASURE TLOW	7	Full measure of Tlow in [ms]	RO	UNSIGNED 16
40208	207	INT MEASURE TLOW	8	Full measure of Tlow in [ms]	RO	UNSIGNED 16
40209	208	INT MEASURE TLOW	9	Full measure of Tlow in [ms]	RO	UNSIGNED 16
40210	209	INT MEASURE TLOW	10	Full measure of Tlow in [ms]	RO	UNSIGNED 16
40211	210	INT MEASURE TLOW	11	Full measure of Tlow in [ms]	RO	UNSIGNED 16
40212	211	INT MEASURE TLOW	12	Full measure of Tlow in [ms]	RO	UNSIGNED 16
40213	212	INT MEASURE TLOW	13	Full measure of Tlow in [ms]	RO	UNSIGNED 16
40214	213	INT MEASURE TLOW	14	Full measure of Tlow in [ms]	RO	UNSIGNED 16
40215	214	INT MEASURE TLOW	15	Full measure of Tlow in [ms]	RO	UNSIGNED 16
40216	215	INT MEASURE TLOW	16	Full measure of Tlow in [ms]	RO	UNSIGNED 16

ADDRESS (4x)	***OFFSET ADDRESS (4x)***	***REGISTER***	***CHANNEL***	***DESCRIPTION***	***W/R***	***TYPE***
40233	232	INT MEASURE THIGH	1	Full measure of Thigh in [ms]	RO	UNSIGNED 16
40234	233	INT MEASURE THIGH	2	Full measure of Thigh in [ms]	RO	UNSIGNED 16
40235	234	INT MEASURE THIGH	3	Full measure of Thigh in [ms]	RO	UNSIGNED 16
40236	235	INT MEASURE THIGH	4	Full measure of Thigh in [ms]	RO	UNSIGNED 16
40237	236	INT MEASURE THIGH	5	Full measure of Thigh in [ms]	RO	UNSIGNED 16

40238	237	INT MEASURE THIGH	6	Full measure of Thigh in [ms]	RO	UNSIGNED 16
40239	238	INT MEASURE THIGH	7	Full measure of Thigh in [ms]	RO	UNSIGNED 16
40240	239	INT MEASURE THIGH	8	Full measure of Thigh in [ms]	RO	UNSIGNED 16
40241	240	INT MEASURE THIGH	9	Full measure of Thigh in [ms]	RO	UNSIGNED 16
40242	241	INT MEASURE THIGH	10	Full measure of Thigh in [ms]	RO	UNSIGNED 16
40243	242	INT MEASURE THIGH	11	Full measure of Thigh in [ms]	RO	UNSIGNED 16
40244	243	INT MEASURE THIGH	12	Full measure of Thigh in [ms]	RO	UNSIGNED 16
40245	244	INT MEASURE THIGH	13	Full measure of Thigh in [ms]	RO	UNSIGNED 16
40246	245	INT MEASURE THIGH	14	Full measure of Thigh in [ms]	RO	UNSIGNED 16
40247	246	INT MEASURE THIGH	15	Full measure of Thigh in [ms]	RO	UNSIGNED 16
40248	247	INT MEASURE THIGH	16	Full measure of Thigh in [ms]	RO	UNSIGNED 16

ADDRESS (4x)	***OFFSET ADDRESS (4x)***	***REGISTER***	***CHANNEL***	***DESCRIPTION***	***W/R***	***TYPE***
40265	264	INT MEASURE PERIOD	1	Full measure of the Period in [ms]	RO	UNSIGNED 16
40266	265	INT MEASURE PERIOD	2	Full measure of the Period in [ms]	RO	UNSIGNED 16
40267	266	INT MEASURE PERIOD	3	Full measure of the Period in [ms]	RO	UNSIGNED 16
40268	267	INT MEASURE PERIOD	4	Full measure of the Period in [ms]	RO	UNSIGNED 16

40269	268	INT MEASURE PERIOD	5	Full measure of the Period in [ms]	RO	UNSIGNED 16
40270	269	INT MEASURE PERIOD	6	Full measure of the Period in [ms]	RO	UNSIGNED 16
40271	270	INT MEASURE PERIOD	7	Full measure of the Period in [ms]	RO	UNSIGNED 16
40272	271	INT MEASURE PERIOD	8	Full measure of the Period in [ms]	RO	UNSIGNED 16
40273	272	INT MEASURE PERIOD	9	Full measure of the Period in [ms]	RO	UNSIGNED 16
40274	273	INT MEASURE PERIOD	10	Full measure of the Period in [ms]	RO	UNSIGNED 16
40275	274	INT MEASURE PERIOD	11	Full measure of the Period in [ms]	RO	UNSIGNED 16
40276	275	INT MEASURE PERIOD	12	Full measure of the Period in [ms]	RO	UNSIGNED 16
40277	276	INT MEASURE PERIOD	13	Full measure of the Period in [ms]	RO	UNSIGNED 16
40278	277	INT MEASURE PERIOD	14	Full measure of the Period in [ms]	RO	UNSIGNED 16
40279	278	INT MEASURE PERIOD	15	Full measure of the Period in [ms]	RO	UNSIGNED 16
40280	279	INT MEASURE PERIOD	16	Full measure of the Period in [ms]	RO	UNSIGNED 16

ADDRESS (4x)	*OFFSET ADDRESS (4x)*	*REGISTER*	*CHANNEL*	*DESCRIPTION*	*W/R*	*TYPE*
40297	296	INT MEASURE FREQ	1	Full measure of the frequency in [Hz]	RO	UNSIGNED 16
40298	297	INT MEASURE FREQ	2	Full measure of the frequency in [Hz]	RO	UNSIGNED 16
40299	298	INT MEASURE FREQ	3	Full measure of the frequency in [Hz]	RO	UNSIGNED 16

40300	299	INT MEASURE FREQ	4	Full measure of the frequency in [Hz]	RO	UNSIGNED 16
40301	300	INT MEASURE FREQ	5	Full measure of the frequency in [Hz]	RO	UNSIGNED 16
40302	301	INT MEASURE FREQ	6	Full measure of the frequency in [Hz]	RO	UNSIGNED 16
40303	302	INT MEASURE FREQ	7	Full measure of the frequency in [Hz]	RO	UNSIGNED 16
40304	303	INT MEASURE FREQ	8	Full measure of the frequency in [Hz]	RO	UNSIGNED 16
40305	304	INT MEASURE FREQ	9	Full measure of the frequency in [Hz]	RO	UNSIGNED 16
40306	305	INT MEASURE FREQ	10	Full measure of the frequency in [Hz]	RO	UNSIGNED 16
40307	306	INT MEASURE FREQ	11	Full measure of the frequency in [Hz]	RO	UNSIGNED 16
40308	307	INT MEASURE FREQ	12	Full measure of the frequency in [Hz]	RO	UNSIGNED 16
40309	308	INT MEASURE FREQ	13	Full measure of the frequency in [Hz]	RO	UNSIGNED 16
40310	309	INT MEASURE FREQ	14	Full measure of the frequency in [Hz]	RO	UNSIGNED 16
40311	310	INT MEASURE FREQ	15	Full measure of the frequency in [Hz]	RO	UNSIGNED 16
40312	311	INT MEASURE FREQ	16	Full measure of the frequency in [Hz]	RO	UNSIGNED 16

ADDRESS (4x)	*OFFSET ADDRESS (4x)*	*REGISTER*	*CHANNEL*	*DESCRIPTION*	*W/R*	*TYPE*
40401	400	FLOAT TLOW	1	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32
40402	401			Floating point measure of Tlow in [ms] (MSW)	RO	
40403	402	FLOAT TLOW	2	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32

40404	403			Floating point measure of Tlow in [ms] (MSW)	RO	
40405	404	FLOAT TLOW	3	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32
40406	405			Floating point measure of Tlow in [ms] (MSW)	RO	
40407	406	FLOAT TLOW	4	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32
40408	407			Floating point measure of Tlow in [ms] (MSW)	RO	
40409	408	FLOAT TLOW	5	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32
40410	409			Floating point measure of Tlow in [ms] (MSW)	RO	
40411	410	FLOAT TLOW	6	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32
40412	411			Floating point measure of Tlow in [ms] (MSW)	RO	
40413	412	FLOAT TLOW	7	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32
40414	413			Floating point measure of Tlow in [ms] (MSW)	RO	
40415	414	FLOAT TLOW	8	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32
40416	415			Floating point measure of Tlow in [ms] (MSW)	RO	
40417	416	FLOAT TLOW	9	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32
40418	417			Floating point measure of Tlow in [ms] (MSW)	RO	
40419	418	FLOAT TLOW	10	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32
40420	419			Floating point measure of Tlow in [ms] (MSW)	RO	
40421	420	FLOAT TLOW	11	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32
40422	421			Floating point measure of Tlow in [ms] (MSW)	RO	
40423	422	FLOAT TLOW	12	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32
40424	423			Floating point measure of Tlow in [ms] (MSW)	RO	
40425	424	FLOAT TLOW	13	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32

40426	425			Floating point measure of Tlow in [ms] (MSW)	RO	
40427	426	FLOAT TLOW	14	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32
40428	427			Floating point measure of Tlow in [ms] (MSW)	RO	
40429	428	FLOAT TLOW	15	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32
40430	429			Floating point measure of Tlow in [ms] (MSW)	RO	
40431	430	FLOAT TLOW	16	Floating point measure of Tlow in [ms] (LSW)	RO	FLOAT 32
40432	431			Floating point measure of Tlow in [ms] (MSW)	RO	

ADDRESS (4x)	*OFFSET ADDRESS (4x)*	*REGISTER*	*CHANNEL*	*DESCRIPTION*	*W/R*	*TYPE*
40465	464	FLOAT THIGH	1	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40466	465			Floating point measure of Thigh in [ms] (MSW)	RO	
40467	466	FLOAT THIGH	2	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40468	467			Floating point measure of Thigh in [ms] (MSW)	RO	
40469	468	FLOAT THIGH	3	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40470	469			Floating point measure of Thigh in [ms] (MSW)	RO	
40471	470	FLOAT THIGH	4	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40472	471			Floating point measure of Thigh in [ms] (MSW)	RO	
40473	472	FLOAT THIGH	5	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40474	473			Floating point measure of Thigh in [ms] (MSW)	RO	

40475	474	FLOAT THIGH	6	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40476	475			Floating point measure of Thigh in [ms] (MSW)	RO	
40477	476	FLOAT THIGH	7	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40478	477			Floating point measure of Thigh in [ms] (MSW)	RO	
40479	478	FLOAT THIGH	8	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40480	479			Floating point measure of Thigh in [ms] (MSW)	RO	
40481	480	FLOAT THIGH	9	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40482	481			Floating point measure of Thigh in [ms] (MSW)	RO	
40483	482	FLOAT THIGH	10	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40484	483			Floating point measure of Thigh in [ms] (MSW)	RO	
40485	484	FLOAT THIGH	11	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40486	485			Floating point measure of Thigh in [ms] (MSW)	RO	
40487	486	FLOAT THIGH	12	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40488	487			Floating point measure of Thigh in [ms] (MSW)	RO	
40489	488	FLOAT THIGH	13	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40490	489			Floating point measure of Thigh in [ms] (MSW)	RO	

40491	490	FLOAT THIGH	14	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40492	491			Floating point measure of Thigh in [ms] (MSW)	RO	
40493	492	FLOAT THIGH	15	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40494	493			Floating point measure of Thigh in [ms] (MSW)	RO	
40495	494	FLOAT THIGH	16	Floating point measure of Thigh in [ms] (LSW)	RO	FLOAT 32
40496	495			Floating point measure of Thigh in [ms] (MSW)	RO	

ADDRESS (4x)	*OFFSET ADDRESS (4x)*	*REGISTER*	*CHANNEL*	*DESCRIPTION*	*W/R*	*TYPE*
40529	528	FLOAT PERIOD	1	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40530	529			Floating point measure of the Period in [ms] (MSW)	RO	
40531	530	FLOAT PERIOD	2	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40532	531			Floating point measure of the Period in [ms] (MSW)	RO	
40533	532	FLOAT PERIOD	3	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40534	533			Floating point measure of the Period in [ms] (MSW)	RO	
40535	534	FLOAT PERIOD	4	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40536	535			Floating point measure of the Period in [ms] (MSW)	RO	

40537	536	FLOAT PERIOD	5	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40538	537			Floating point measure of the Period in [ms] (MSW)	RO	
40539	538	FLOAT PERIOD	6	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40540	539			Floating point measure of the Period in [ms] (MSW)	RO	
40541	540	FLOAT PERIOD	7	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40542	541			Floating point measure of the Period in [ms] (MSW)	RO	
40543	542	FLOAT PERIOD	8	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40544	543			Floating point measure of the Period in [ms] (MSW)	RO	
40545	544	FLOAT PERIOD	9	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40546	545			Floating point measure of the Period in [ms] (MSW)	RO	
40547	546	FLOAT PERIOD	10	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40548	547			Floating point measure of the Period in [ms] (MSW)	RO	
40549	548	FLOAT PERIOD	11	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40550	549			Floating point measure of the Period in [ms] (MSW)	RO	
40551	550	FLOAT PERIOD	12	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40552	551			Floating point measure of the Period in [ms] (MSW)	RO	

40553	552	FLOAT PERIOD	13	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40554	553			Floating point measure of the Period in [ms] (MSW)	RO	
40555	554	FLOAT PERIOD	14	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40556	555			Floating point measure of the Period in [ms] (MSW)	RO	
40557	556	FLOAT PERIOD	15	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40558	557			Floating point measure of the Period in [ms] (MSW)	RO	
40559	558	FLOAT PERIOD	16	Floating point measure of the Period in [ms] (LSW)	RO	FLOAT 32
40560	559			Floating point measure of the Period in [ms] (MSW)	RO	

ADDRESS (4x)	***OFFSET ADDRESS (4x)***	***REGISTER***	***CHANNEL***	***DESCRIPTION***	***W/R***	***TYPE***
40593	592	FLOAT FREQUENCY	1	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32
40594	593			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40595	594	FLOAT FREQUENCY	2	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32
40596	595			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40597	596	FLOAT FREQUENCY	3	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32

40598	597			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40599	598	FLOAT FREQUENCY	4	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32
40600	599			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40601	600	FLOAT FREQUENCY	5	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32
40602	601			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40603	602	FLOAT FREQUENCY	6	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32
40604	603			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40605	604	FLOAT FREQUENCY	7	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32
40606	605			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40607	606	FLOAT FREQUENCY	8	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32
40608	607			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40609	608	FLOAT FREQUENCY	9	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32

40610	609			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40611	610	FLOAT FREQUENCY	10	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32
40612	611			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40613	612	FLOAT FREQUENCY	11	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32
40614	613			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40615	614	FLOAT FREQUENCY	12	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32
40616	615			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40617	616	FLOAT FREQUENCY	13	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32
40618	617			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40619	618	FLOAT FREQUENCY	14	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32
40620	619			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40621	620	FLOAT FREQUENCY	15	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32

40622	621			Floating point measure of the Frequency in [Hz] (MSW)	RO	
40623	622	FLOAT FREQUENCY	16	Floating point measure of the Frequency in [Hz] (LSW)	RO	FLOAT 32
40624	623			Floating point measure of the Frequency in [Hz] (MSW)	RO	

11.2. R-16DI-8DO: TABLE OF MODBUS REGISTERS 0x COIL STATUS (FUNCTION CODE 1)

ADDRESS (0x)	*OFFSET ADDRESS (0x)*	*REGISTER*	*CHANNEL*	*DESCRIPTION*	*W/R*	*TYPE*
1	0	DIGITAL INPUT	1	DIGITAL INPUT	RO	BIT
2	1	DIGITAL INPUT	2	DIGITAL INPUT	RO	BIT
3	2	DIGITAL INPUT	3	DIGITAL INPUT	RO	BIT
4	3	DIGITAL INPUT	4	DIGITAL INPUT	RO	BIT
5	4	DIGITAL INPUT	5	DIGITAL INPUT	RO	BIT
6	5	DIGITAL INPUT	6	DIGITAL INPUT	RO	BIT
7	6	DIGITAL INPUT	7	DIGITAL INPUT	RO	BIT
8	7	DIGITAL INPUT	8	DIGITAL INPUT	RO	BIT
9	8	DIGITAL INPUT	9	DIGITAL INPUT	RO	BIT
10	9	DIGITAL INPUT	10	DIGITAL INPUT	RO	BIT
11	10	DIGITAL INPUT	11	DIGITAL INPUT	RO	BIT
12	11	DIGITAL INPUT	12	DIGITAL INPUT	RO	BIT
13	12	DIGITAL INPUT	13	DIGITAL INPUT	RO	BIT
14	13	DIGITAL INPUT	14	DIGITAL INPUT	RO	BIT
15	14	DIGITAL INPUT	15	DIGITAL INPUT	RO	BIT
16	15	DIGITAL INPUT	16	DIGITAL INPUT	RO	BIT

ADDRESS (0x)	OFFSET ADDRESS (0x)	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
33	32	DIGITAL OUT	1	DIGITAL OUTPUT	RW	BIT
34	33	DIGITAL OUT	2	DIGITAL OUTPUT	RW	BIT
35	34	DIGITAL OUT	3	DIGITAL OUTPUT	RW	BIT
36	35	DIGITAL OUT	4	DIGITAL OUTPUT	RW	BIT
37	36	DIGITAL OUT	5	DIGITAL OUTPUT	RW	BIT
38	37	DIGITAL OUT	6	DIGITAL OUTPUT	RW	BIT
39	38	DIGITAL OUT	7	DIGITAL OUTPUT	RW	BIT
40	39	DIGITAL OUT	8	DIGITAL OUTPUT	RW	BIT

ADDRESS (0x)	OFFSET ADDRESS (0x)	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
101	100	COUNTER RESET	1	COUNTER RESET	RW	BIT
102	101	COUNTER RESET	2	COUNTER RESET	RW	BIT
103	102	COUNTER RESET	3	COUNTER RESET	RW	BIT
104	103	COUNTER RESET	4	COUNTER RESET	RW	BIT
105	104	COUNTER RESET	5	COUNTER RESET	RW	BIT
106	105	COUNTER RESET	6	COUNTER RESET	RW	BIT
107	106	COUNTER RESET	7	COUNTER RESET	RW	BIT
108	107	COUNTER RESET	8	COUNTER RESET	RW	BIT
109	108	COUNTER RESET	9	COUNTER RESET	RW	BIT
110	109	COUNTER RESET	10	COUNTER RESET	RW	BIT
111	110	COUNTER RESET	11	COUNTER RESET	RW	BIT
112	111	COUNTER RESET	12	COUNTER RESET	RW	BIT
113	112	COUNTER RESET	13	COUNTER RESET	RW	BIT
114	113	COUNTER RESET	14	COUNTER RESET	RW	BIT
115	114	COUNTER RESET	15	COUNTER RESET	RW	BIT
116	115	COUNTER RESET	16	COUNTER RESET	RW	BIT

11.3. R-16DI-8DO: TABLE OF MODBUS REGISTERS 1x INPUT STATUS (FUNCTION CODE 2)

ADDRESS (1x)	OFFSET ADDRESS (1x)	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
10001	0	DIGITAL INPUT	1	DIGITAL INPUT	RO	BIT
10002	1	DIGITAL INPUT	2	DIGITAL INPUT	RO	BIT
10003	2	DIGITAL INPUT	3	DIGITAL INPUT	RO	BIT
10004	3	DIGITAL INPUT	4	DIGITAL INPUT	RO	BIT
10005	4	DIGITAL INPUT	5	DIGITAL INPUT	RO	BIT
10006	5	DIGITAL INPUT	6	DIGITAL INPUT	RO	BIT
10007	6	DIGITAL INPUT	7	DIGITAL INPUT	RO	BIT
10008	7	DIGITAL INPUT	8	DIGITAL INPUT	RO	BIT
10009	8	DIGITAL INPUT	9	DIGITAL INPUT	RO	BIT
10010	9	DIGITAL INPUT	10	DIGITAL INPUT	RO	BIT
10011	10	DIGITAL INPUT	11	DIGITAL INPUT	RO	BIT
10012	11	DIGITAL INPUT	12	DIGITAL INPUT	RO	BIT
10013	12	DIGITAL INPUT	13	DIGITAL INPUT	RO	BIT
10014	13	DIGITAL INPUT	14	DIGITAL INPUT	RO	BIT
10015	14	DIGITAL INPUT	15	DIGITAL INPUT	RO	BIT
10016	15	DIGITAL INPUT	16	DIGITAL INPUT	RO	BIT

12. SEARCH AND MODIFICATION OF THE DEVICE IP WITH SENECA DISCOVERY TOOL

The search and modification of a device can be performed directly in the Seneca Studio software.
If Seneca devices that are not part of the R series are also used, it is more convenient to set the addresses with a single software.

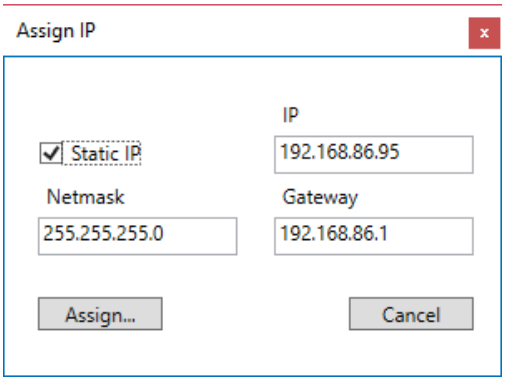
When in the R series device the STS LED is on steady, it is possible to obtain the IP address which has been set using the "Seneca Discovery" tool too.

The software can be downloaded from:

https://www.seneca.it/en/linee-di-prodotto/software/easy/sdd

Pressing the "search" button starts the search for all Seneca devices present in the network even if with IP addresses not compatible with the current PC configuration:

It is now possible to change the address by pressing the "Assign" button:



The software works at Ethernet Layer 2 level and it is therefore not necessary to have an Ethernet configuration compatible with the device you are looking for.