USER MANUAL

R-32DIDO-P

R-32DIDO

MULTIPROTOCOL INDUSTRIAL ETHERNET I/O MODULE

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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, physically and intellectually suitable operators.
Set-up must be performed only after 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 stated requirements.
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Technical specifications are subject to change without notice.

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Document revisions

DATE	REVISION	NOTES	AUTHOR
19/10/2021	0	First revision	MM
09/02/2022	2	Write Multiple Coil" function added to the list of supported functions (chap. 8.1)	MM
09/02/2022	3	Removed references to channels 33 to 64	AZ

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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) (only for R-32DIDO version).

Model	Description	Communication protocols
R-32DIDO	Remote Ethernet I/O with 2 Ethernet ports and 32 digital Inputs/outputs 32 counters (32 bit, Max frequency 50 Hz)	Modbus TCP-IP Modbus RTU Seneca P2P I/O Mirror with broadcast (UDP based)
R-32DIDO-P	Remote Ethernet I/O with 2 Ethernet ports and 32 digital Inputs/outputs	Profinet IO

1.2. COMMUNICATION PORT SPECIFICATIONS

ETHERNET COMMUNICATION PORTS	
Number	2
Type	100 Mbits
Configuration	Switch

RS485 COMMUNICATION PORTS (ONLY R-32DIDO MODEL)	
Number	1
Baudrate	From 1200 to 115200 bit/s configurable
Parity, Data bit, Stop bit	Configurable
Protocol	Can be configured between Modbus RTU Slave or Modbus TCP-IP to Modbus RTU passtrough

USB COMMUNICATION PORT (ONLY R-32DIDO MODEL)	
Number	1
Communication parameters	115200 bit/s, 8 bits, No parity, 1 stop bit, station address 1
Protocol	Modbus RTU Slave

R-32DIDO 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

R-32DIDO-P COMMUNICATION PROTOCOLS SUPPORTED	
Profinet IO	From Ethernet 1 and 2

2. CONNECTION OF THE DEVICES TO A NETWORK (ONLY R-32DIDO MODEL)

2.1. 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 the Easy Setup 2 software.

ATTENTION!

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

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 Easy Setup 2 software even on networks without a DHCP server.

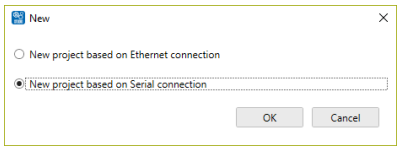
2.2. USING EASY SETUP 2 TO CONFIGURE DEVICES

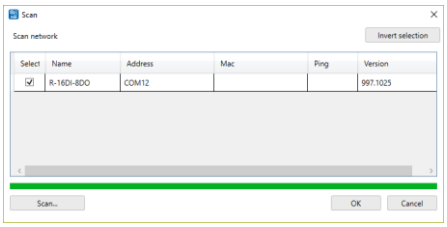
The Easy Setup 2 software allows:

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

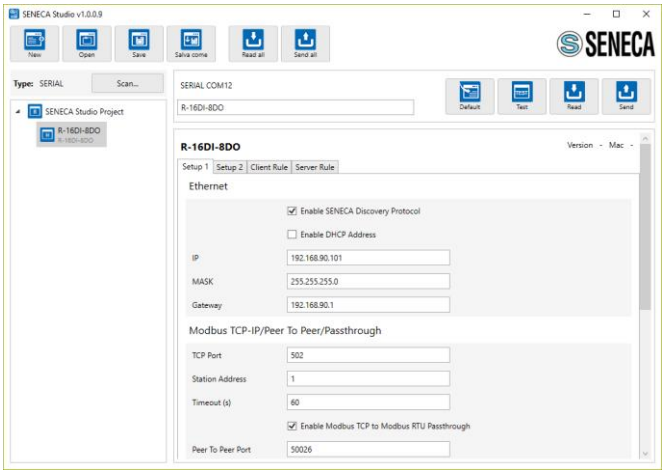
In the case of a first installation we recommend following these steps:

1) Install the Easy Setup 2 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 2.1)
5) Wait for all the device STS LEDs to be on steady.
6) At this point, using Easy Setup 2, 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

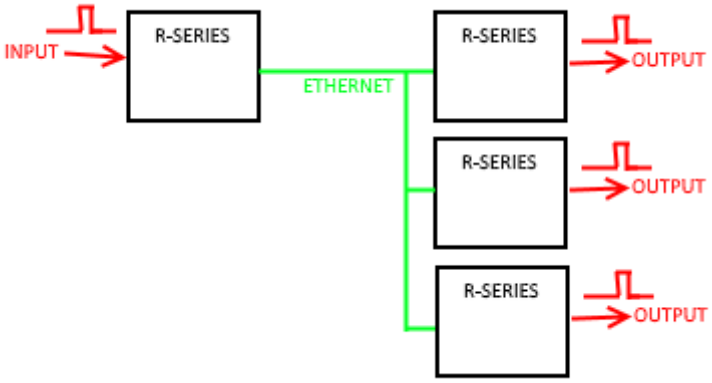
The search software included in Easy Setup 2 works at Ethernet Layer 2 level (through the Seneca Discovery protocol) and it is therefore not necessary to have an Ethernet configuration compatible with the device you are looking for to change its IP. For the general configuration of the device it is necessary to have compatible configuration.

3. I/O COPY USING THE PEER TO PEER FUNCTION WITHOUT WIRING (ONLY R-32DIDO MODEL)

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:

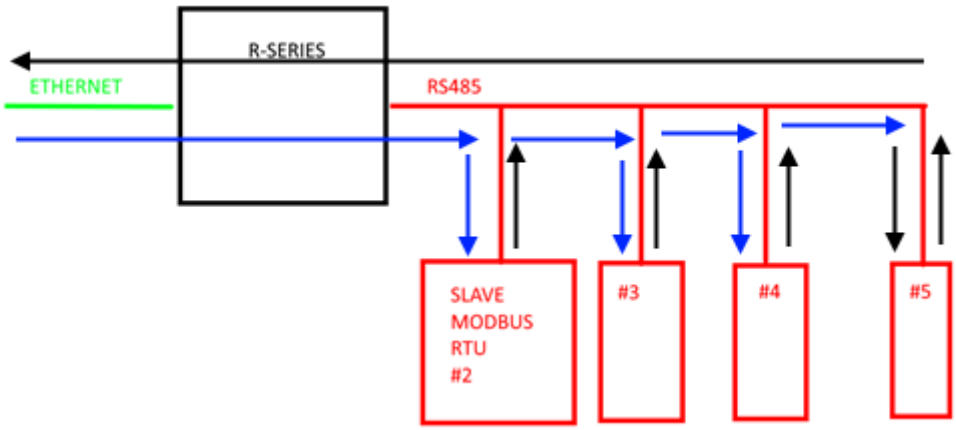


Each R-series device can send and receive a maximum of 32 inputs.

For further information, see chapter 5.2.4.

4. MODBUS PASSTHROUGH (ONLY R-32DIDO MODEL)

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.

5. WEBSERVER (ONLY R-32DIDO MODEL)

5.1. ACCESS TO THE WEB SERVER

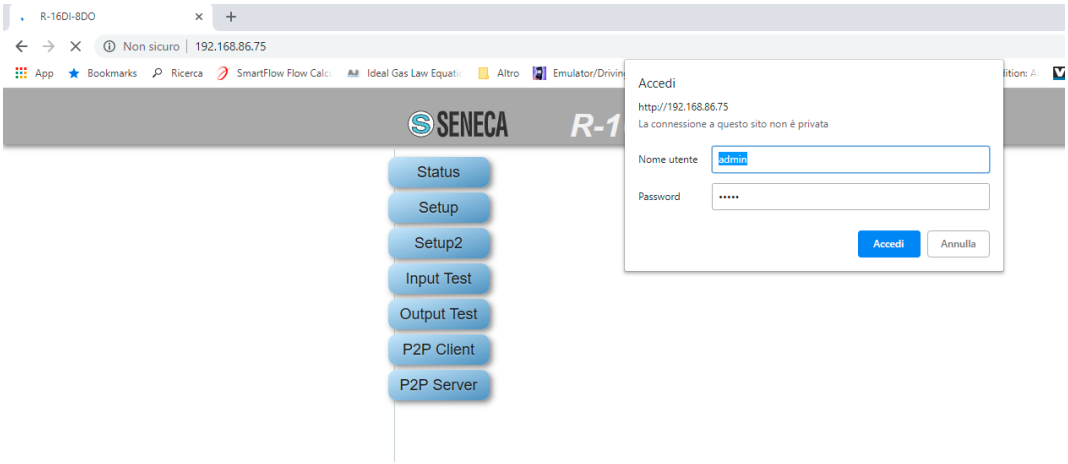
Access to the web server takes place using a web browser and entering the IP address of the device.
To find out the IP address of the device, use the "search" function of the “Easy Setup 2" software (see chapter 10).

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 PARAMETERS TO ACCESS THE WEB SERVER HAVE BEEN LOST, IT IS NECESSARY TO RESET THE FACTORY-SET CONFIGURATION (SEE CHAPTER 7)

5.2. 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 and the device will restart autonomously.
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.

5.2.1. 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)
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 you to enable or disable password protection for reading and writing the configuration (including the IP address) using the Easy Setup 2 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.
IN THE EVENT OF LOSING THE PASSWORD IT WILL BE POSSIBLE TO RETURN THE DEVICE TO THE FACTORY CONFIGURATION (SEE CHAPTER 7)

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 4).

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.

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

CONFIGURATION/WEB SERVER PASSWORD (default: admin)
Sets the password to access the web server and to read/write the configuration (if enabled).

WEB SERVER 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 PASSTHROUGH 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

5.2.2. DIGITAL I/O SETUP SECTION

This section allows the configuration of the digital I/Os present in the device.

DIGITAL I/O MODE (default Input)

Selects whether the selected input will work as an input or output.

DIGITAL INPUT NORMALLY HIGH/LOW (default Normally Low)

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

DIGITAL OUTPUT NORMALLY STATE (default Normally Open)

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

DIGITAL OUTPUT WATCHDOG (default Disabled)

If selected as digital output, it sets the output watchdog mode.
If “Disabled”, it disables the watchdog function for the selected output.
If "Enabled on Modbus Communication" the output goes into "Watchdog state" if there has been no generic Modbus communication within the set time.
If "Enabled on Modbus Digital Output Writing" the output goes into "Watchdog state" if there has been no writing of the output within the set time.

DIGITAL OUTPUT WATCHDOG STATE (default Open)

Sets the value that the digital output must adopt if the watchdog has been triggered.

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

Represents the watchdog time of the digital output in seconds.

5.2.3. SETUP COUNTERS SECTION

COUNTERS FILTER [ms] (default 0)

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

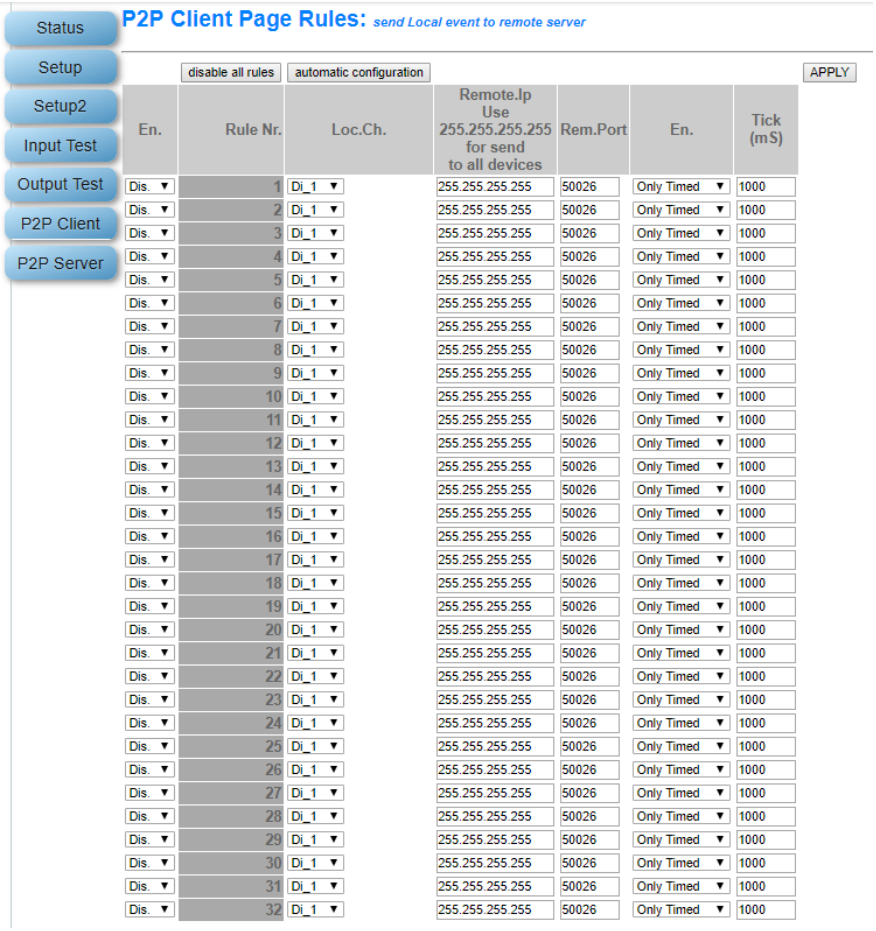
5.2.4. P2P CONFIGURATION

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.

5.2.4.1. 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.

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 to a digital event (change of status).

Tick [ms]

Sets the cyclical sending time of the input status.

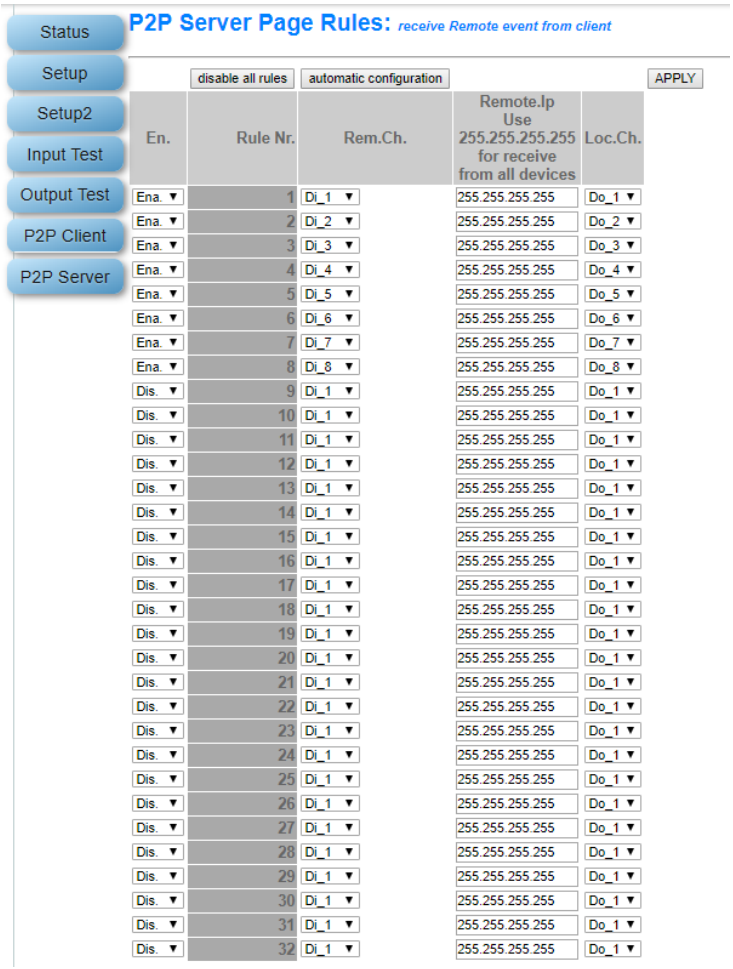
ATTENTION!

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

5.2.4.2. P2P SERVER SECTION



En.	Rule Nr.	Rem.Ch.	Remote.Ip Use 255.255.255.255 for receive from all devices	Loc.Ch.
Ena.	1	Di_1	255.255.255.255	Do_1
Ena.	2	Di_2	255.255.255.255	Do_2
Ena.	3	Di_3	255.255.255.255	Do_3
Ena.	4	Di_4	255.255.255.255	Do_4
Ena.	5	Di_5	255.255.255.255	Do_5
Ena.	6	Di_6	255.255.255.255	Do_6
Ena.	7	Di_7	255.255.255.255	Do_7
Ena.	8	Di_8	255.255.255.255	Do_8
Dis.	9	Di_1	255.255.255.255	Do_1
Dis.	10	Di_1	255.255.255.255	Do_1
Dis.	11	Di_1	255.255.255.255	Do_1
Dis.	12	Di_1	255.255.255.255	Do_1
Dis.	13	Di_1	255.255.255.255	Do_1
Dis.	14	Di_1	255.255.255.255	Do_1
Dis.	15	Di_1	255.255.255.255	Do_1
Dis.	16	Di_1	255.255.255.255	Do_1
Dis.	17	Di_1	255.255.255.255	Do_1
Dis.	18	Di_1	255.255.255.255	Do_1
Dis.	19	Di_1	255.255.255.255	Do_1
Dis.	20	Di_1	255.255.255.255	Do_1
Dis.	21	Di_1	255.255.255.255	Do_1
Dis.	22	Di_1	255.255.255.255	Do_1
Dis.	23	Di_1	255.255.255.255	Do_1
Dis.	24	Di_1	255.255.255.255	Do_1
Dis.	25	Di_1	255.255.255.255	Do_1
Dis.	26	Di_1	255.255.255.255	Do_1
Dis.	27	Di_1	255.255.255.255	Do_1
Dis.	28	Di_1	255.255.255.255	Do_1
Dis.	29	Di_1	255.255.255.255	Do_1
Dis.	30	Di_1	255.255.255.255	Do_1
Dis.	31	Di_1	255.255.255.255	Do_1
Dis.	32	Di_1	255.255.255.255	Do_1

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.

5.2.4.3. P2P CONFIGURATION EXAMPLE

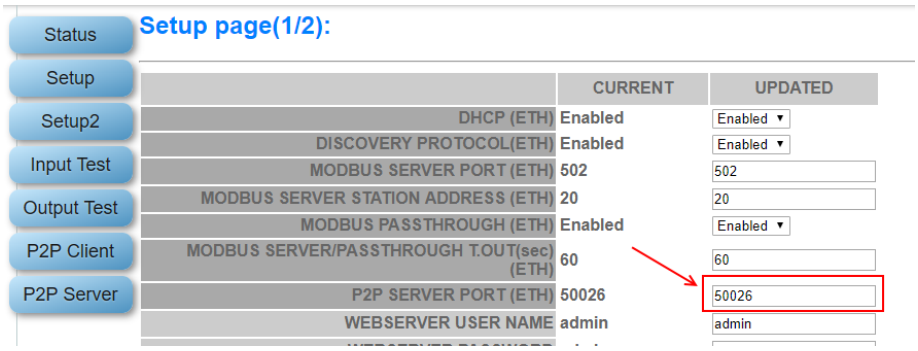
In the following example we have No.2 devices and we want to copy the status of digital input 1 of the first to the digital output of the second.
The IP address of Device 1 is 192.168.1.10
The IP address of Device 2 is 192.168.1.11

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

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.

5.2.4.4. P2P EXECUTION TIME

The switching time depends on the client device model and the server device model in addition to the congestion of the ethernet network.
For example, for the R-16DI8DO model, the switching time of the remote digital output as a response to an incoming event into another R-16DI8DO is about 20 ms (daisy chain connection of 2 devices, 1 set rule).
As regards the analogue models, the refresh time of the digital inputs/outputs and analogue inputs typical of the device must also be considered.

5.3. FW/CONFIGURATION UPDATE SECTION

The "***Configure***" section allows you to save or open a complete configuration of the device.
The "***Firmware***" section allows you to update the device firmware in order to obtain new functions.

ATTENTION!

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

6. USB CONNECTION (R-32DIDO MODEL ONLY)

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: 115200
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 anyway present in the installation of the "Easy Setup 2" software.

7. RESETTING THE DEVICE TO FACTORY CONFIGURATION

It is possible to reset the device to the factory configuration using the following procedure:

1) Remove the device back cover
2) With the device off, set dip switch SW3 dip 1 and 2 to ON
3) Power up the device and wait 10 seconds
4) Turn off the device
5) With the device off, set dip switch SW3 dip 1 and 2 to OFF
6) Power up the device
7) The device has now been reset to the factory configuration

8. SUPPORTED MODBUS COMMUNICATION PROTOCOLS (MODEL R-32DIDO ONLY)

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.

8.1. 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 Multiple Coil (function 15)
- 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

9. MODBUS REGISTER TABLE (R-32DIDO MODEL ONLY)

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)

9.1. R-32DIDO: MODBUS 4X HOLDING REGISTERS TABLE

ADDRESS (4x)	OFFSET (4x)	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
40001	0	MACHINE-ID	-	Device identification	RO	UNSIGNED 16 BIT
40002	1	FW REVISION (Maior/Minor)	-	Fw Revision	RO	UNSIGNED 16 BIT
40003	2	FW REVISION (Fix/Build)	-	Fw Revision	RO	UNSIGNED 16 BIT
40004	3	FW CODE	-	Fw Code	RO	UNSIGNED 16 BIT
40005	4	RESERVED	-	-	RO	UNSIGNED 16 BIT
40006	5	RESERVED	-	-	RO	UNSIGNED 16 BIT
40007	6	BOARD-ID	-	Hw Revision	RO	UNSIGNED 16 BIT
40008	7	BOOT REVISION (Maior/Minor)	-	Bootloader Revision	RO	UNSIGNED 16 BIT
40009	8	BOOT REVISION (Fix/Build)	-	Bootloader Revision	RO	UNSIGNED 16 BIT
40010	9	RESERVED	-	-	RO	UNSIGNED 16 BIT
40011	10	RESERVED	-	-	RO	UNSIGNED 16 BIT

ADDRESS (4x)	OFFSET (4x)	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
40012	11	RESERVED	-	-	RO	UNSIGNED 16 BIT
40013	12	COMMAND_AUX_3H	-	Aux Command Register	RW	UNSIGNED 16 BIT
40014	13	COMMAND_AUX_3L	-	Aux Command Register	RW	UNSIGNED 16 BIT
40015	14	COMMAND_AUX 2	-	Aux Command Register	RW	UNSIGNED 16 BIT
40016	15	COMMAND_AUX 1	-	Aux Command Register	RW	UNSIGNED 16 BIT
40017	16	COMMAND	-	Aux Command Register	RW	UNSIGNED 16 BIT
40018	17	STATUS	-	Device Status	RW	UNSIGNED 16 BIT
40019	18	RESERVED	-	-	RW	UNSIGNED 16 BIT
40020	19	RESERVED	-	-	RW	UNSIGNED 16 BIT
40021	20	DIGITAL I/O	16..1	Digital IO Value [Channel 16…1]	RW	UNSIGNED 16 BIT
40022	21	DIGITAL I/O	32..17	Digital IO Value [Channel 32…17]	RW	UNSIGNED 16 BIT

ADDRESS (4x)	OFFEST (4x)	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
40101	100	COUNTER MSW DIN	1	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40102	101	COUNTER LSW DIN			RW	
40103	102	COUNTER MSW DIN	2	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40104	103	COUNTER LSW DIN			RW	
40105	104	COUNTER MSW DIN	3	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40106	105	COUNTER LSW DIN			RW	
40107	106	COUNTER MSW DIN	4	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40108	107	COUNTER LSW DIN			RW	
40109	108	COUNTER MSW DIN	5	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT

ADDRESS (4x)	OFFEST (4x)	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
40110	109	COUNTER LSW DIN			RW	
40111	110	COUNTER MSW DIN	6	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40112	111	COUNTER LSW DIN			RW	
40113	112	COUNTER MSW DIN	7	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40114	113	COUNTER LSW DIN			RW	
40115	114	COUNTER MSW DIN	8	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40116	115	COUNTER LSW DIN			RW	
40117	116	COUNTER MSW DIN	9	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40118	117	COUNTER LSW DIN			RW	
40119	118	COUNTER MSW DIN	10	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40120	119	COUNTER LSW DIN			RW	
40121	120	COUNTER MSW DIN	11	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40122	121	COUNTER LSW DIN			RW	
40123	122	COUNTER MSW DIN	12	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40124	123	COUNTER LSW DIN			RW	
40125	124	COUNTER MSW DIN	13	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40126	125	COUNTER LSW DIN			RW	
40127	126	COUNTER MSW DIN	14	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40128	127	COUNTER LSW DIN			RW	
40129	128	COUNTER MSW DIN	15	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40130	129	COUNTER LSW DIN			RW	
40131	130	COUNTER MSW DIN	16	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40132	131	COUNTER LSW DIN			RW	

ADDRESS (4x)	OFFEST (4x)	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
40133	132	COUNTER MSW DIN	17	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40134	133	COUNTER LSW DIN			RW	
40135	134	COUNTER MSW DIN	18	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40136	135	COUNTER LSW DIN			RW	
40137	136	COUNTER MSW DIN	19	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40138	137	COUNTER LSW DIN			RW	
40139	138	COUNTER MSW DIN	20	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40140	139	COUNTER LSW DIN			RW	
40141	140	COUNTER MSW DIN	21	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40142	141	COUNTER LSW DIN			RW	
40143	142	COUNTER MSW DIN	22	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40144	143	COUNTER LSW DIN			RW	
40145	144	COUNTER MSW DIN	23	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40146	145	COUNTER LSW DIN			RW	
40147	146	COUNTER MSW DIN	24	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40148	147	COUNTER LSW DIN			RW	
40149	148	COUNTER MSW DIN	25	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40150	149	COUNTER LSW DIN			RW	
40151	150	COUNTER MSW DIN	26	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40152	151	COUNTER LSW DIN			RW	
40153	152	COUNTER MSW DIN	27	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40154	153	COUNTER LSW DIN			RW	
40155	154	COUNTER MSW DIN	28	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT

ADDRESS (4x)	OFFEST (4x)	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
40156	155	COUNTER LSW DIN			RW	
40157	156	COUNTER MSW DIN	29	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40158	157	COUNTER LSW DIN			RW	
40159	158	COUNTER MSW DIN	30	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40160	159	COUNTER LSW DIN			RW	
40161	160	COUNTER MSW DIN	31	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40162	161	COUNTER LSW DIN			RW	
40163	162	COUNTER MSW DIN	32	CHANNEL COUNTER VALUE	RW	UNSIGNED 32 BIT
40164	163	COUNTER LSW DIN			RW	
40165	164	PERIOD	1	PERIOD [ms]	RW	FLOAT 32 BIT
40166	165				RW	
40167	166	PERIOD	2	PERIOD [ms]	RW	FLOAT 32 BIT
40168	167				RW	
40169	168	PERIOD	3	PERIOD [ms]	RW	FLOAT 32 BIT
40170	169				RW	
40171	170	PERIOD	4	PERIOD [ms]	RW	FLOAT 32 BIT
40172	171				RW	
40173	172	PERIOD	5	PERIOD [ms]	RW	FLOAT 32 BIT
40174	173				RW	
40175	174	PERIOD	6	PERIOD [ms]	RW	FLOAT 32 BIT
40176	175				RW	
40177	176	PERIOD	7	PERIOD [ms]	RW	FLOAT 32 BIT
40178	177				RW	
40179	178	PERIOD	8	PERIOD [ms]	RW	FLOAT 32 BIT
40180	179				RW	
40181	180	PERIOD	9	PERIOD [ms]	RW	FLOAT 32 BIT
40182	181				RW	
40183	182	PERIOD	10	PERIOD [ms]	RW	FLOAT 32 BIT
40184	183				RW	
40185	184	PERIOD	11	PERIOD [ms]	RW	FLOAT 32 BIT
40186	185				RW	
40187	186	PERIOD	12	PERIOD [ms]	RW	FLOAT 32 BIT
40188	187				RW	

ADDRESS (4x)	OFFEST (4x)	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
40189	188	PERIOD	13	PERIOD [ms]	RW	FLOAT 32 BIT
40190	189				RW	
40191	190	PERIOD	14	PERIOD [ms]	RW	FLOAT 32 BIT
40192	191				RW	
40193	192	PERIOD	15	PERIOD [ms]	RW	FLOAT 32 BIT
40194	193				RW	
40195	194	PERIOD	16	PERIOD [ms]	RW	FLOAT 32 BIT
40196	195				RW	
40197	196	PERIOD	17	PERIOD [ms]	RW	FLOAT 32 BIT
40198	197				RW	
40199	198	PERIOD	18	PERIOD [ms]	RW	FLOAT 32 BIT
40200	199				RW	
40201	200	PERIOD	19	PERIOD [ms]	RW	FLOAT 32 BIT
40202	201				RW	
40203	202	PERIOD	20	PERIOD [ms]	RW	FLOAT 32 BIT
40204	203				RW	
40205	204	PERIOD	21	PERIOD [ms]	RW	FLOAT 32 BIT
40206	205				RW	
40207	206	PERIOD	22	PERIOD [ms]	RW	FLOAT 32 BIT
40208	207				RW	
40209	208	PERIOD	23	PERIOD [ms]	RW	FLOAT 32 BIT
40210	209				RW	
40211	210	PERIOD	24	PERIOD [ms]	RW	FLOAT 32 BIT
40212	211				RW	
40213	212	PERIOD	25	PERIOD [ms]	RW	FLOAT 32 BIT
40214	213				RW	
40215	214	PERIOD	26	PERIOD [ms]	RW	FLOAT 32 BIT
40216	215				RW	
40217	216	PERIOD	27	PERIOD [ms]	RW	FLOAT 32 BIT
40218	217				RW	
40219	218	PERIOD	28	PERIOD [ms]	RW	FLOAT 32 BIT
40220	219				RW	
40221	220	PERIOD	29	PERIOD [ms]	RW	FLOAT 32 BIT
40222	221				RW	
40223	222	PERIOD	30	PERIOD [ms]	RW	FLOAT 32 BIT
40224	223				RW	
40225	224	PERIOD	31	PERIOD [ms]	RW	FLOAT 32 BIT
40226	225				RW	
40227	226	PERIOD	32	PERIOD [ms]	RW	FLOAT 32 BIT
40228	227				RW	

ADDRESS (4x)	OFFEST (4x)	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
40229	228	FREQUENCY	1	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40230	229				RW	
40231	230	FREQUENCY	2	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40232	231				RW	
40233	232	FREQUENCY	3	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40234	233				RW	
40235	234	FREQUENCY	4	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40236	235				RW	
40237	236	FREQUENCY	5	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40238	237				RW	
40239	238	FREQUENCY	6	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40240	239				RW	
40241	240	FREQUENCY	7	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40242	241				RW	
40243	242	FREQUENCY	8	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40244	243				RW	
40245	244	FREQUENCY	9	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40246	245				RW	
40247	246	FREQUENCY	10	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40248	247				RW	
40249	248	FREQUENCY	11	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40250	249				RW	
40251	250	FREQUENCY	12	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40252	251				RW	
40253	252	FREQUENCY	13	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40254	253				RW	
40255	254	FREQUENCY	14	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40256	255				RW	
40257	256	FREQUENCY	15	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40258	257				RW	
40259	258	FREQUENCY	16	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40260	259				RW	
40261	260	FREQUENCY	17	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40262	261				RW	
40263	262	FREQUENCY	18	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40264	263				RW	
40265	264	FREQUENCY	19	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40266	265				RW	
40267	266	FREQUENCY	20	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40268	267				RW	

ADDRESS (4x)	OFFEST (4x)	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
40269	268	FREQUENCY	21	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40270	269				RW	
40271	270	FREQUENCY	22	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40272	271				RW	
40273	272	FREQUENCY	23	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40274	273				RW	
40275	274	FREQUENCY	24	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40276	275				RW	
40277	276	FREQUENCY	25	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40278	277				RW	
40279	278	FREQUENCY	26	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40280	279				RW	
40281	280	FREQUENCY	27	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40282	281				RW	
40283	282	FREQUENCY	28	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40284	283				RW	
40285	284	FREQUENCY	29	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40286	285				RW	
40287	286	FREQUENCY	30	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40288	287				RW	
40289	288	FREQUENCY	31	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40290	289				RW	
40291	290	FREQUENCY	32	FREQUENCY [Hz]	RW	FLOAT 32 BIT
40292	291				RW	

9.2. R-32DIDO: TABLE OF MODBUS REGISTERS 0x COIL STATUS

ADDRESS (0x)	ADDRESS (0x) OFFSET	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
1	0	DIGITAL I/O	1	DIGITAL I/O	RW	BIT
2	1	DIGITAL I/O	2	DIGITAL I/O	RW	BIT
3	2	DIGITAL I/O	3	DIGITAL I/O	RW	BIT
4	3	DIGITAL I/O	4	DIGITAL I/O	RW	BIT
5	4	DIGITAL I/O	5	DIGITAL I/O	RW	BIT
6	5	DIGITAL I/O	6	DIGITAL I/O	RW	BIT
7	6	DIGITAL I/O	7	DIGITAL I/O	RW	BIT
8	7	DIGITAL I/O	8	DIGITAL I/O	RW	BIT
9	8	DIGITAL I/O	9	DIGITAL I/O	RW	BIT
10	9	DIGITAL I/O	10	DIGITAL I/O	RW	BIT
11	10	DIGITAL I/O	11	DIGITAL I/O	RW	BIT
12	11	DIGITAL I/O	12	DIGITAL I/O	RW	BIT
13	12	DIGITAL I/O	13	DIGITAL I/O	RW	BIT
14	13	DIGITAL I/O	14	DIGITAL I/O	RW	BIT
15	14	DIGITAL I/O	15	DIGITAL I/O	RW	BIT
16	15	DIGITAL I/O	16	DIGITAL I/O	RW	BIT
17	16	DIGITAL I/O	17	DIGITAL I/O	RW	BIT
18	17	DIGITAL I/O	18	DIGITAL I/O	RW	BIT
19	18	DIGITAL I/O	19	DIGITAL I/O	RW	BIT
20	19	DIGITAL I/O	20	DIGITAL I/O	RW	BIT
21	20	DIGITAL I/O	21	DIGITAL I/O	RW	BIT
22	21	DIGITAL I/O	22	DIGITAL I/O	RW	BIT
23	22	DIGITAL I/O	23	DIGITAL I/O	RW	BIT
24	23	DIGITAL I/O	24	DIGITAL I/O	RW	BIT
25	24	DIGITAL I/O	25	DIGITAL I/O	RW	BIT
26	25	DIGITAL I/O	26	DIGITAL I/O	RW	BIT
27	26	DIGITAL I/O	27	DIGITAL I/O	RW	BIT
28	27	DIGITAL I/O	28	DIGITAL I/O	RW	BIT
29	28	DIGITAL I/O	29	DIGITAL I/O	RW	BIT
30	29	DIGITAL I/O	30	DIGITAL I/O	RW	BIT
31	30	DIGITAL I/O	31	DIGITAL I/O	RW	BIT
32	31	DIGITAL I/O	32	DIGITAL I/O	RW	BIT

9.3. R-32DIDO: TABLE OF MODBUS REGISTERS 1x INPUT STATUS (FUNCTION CODE 2)

ADDRESS (0x)	ADDRESS (0x) OFFSET	REGISTER	CHANNEL	DESCRIPTION	W/R	TYPE
10001	0	DIGITAL I/O	1	DIGITAL I/O	RW	BIT
10002	1	DIGITAL I/O	2	DIGITAL I/O	RW	BIT
10003	2	DIGITAL I/O	3	DIGITAL I/O	RW	BIT
10004	3	DIGITAL I/O	4	DIGITAL I/O	RW	BIT
10005	4	DIGITAL I/O	5	DIGITAL I/O	RW	BIT
10006	5	DIGITAL I/O	6	DIGITAL I/O	RW	BIT
10007	6	DIGITAL I/O	7	DIGITAL I/O	RW	BIT
10008	7	DIGITAL I/O	8	DIGITAL I/O	RW	BIT
10009	8	DIGITAL I/O	9	DIGITAL I/O	RW	BIT
10010	9	DIGITAL I/O	10	DIGITAL I/O	RW	BIT
10011	10	DIGITAL I/O	11	DIGITAL I/O	RW	BIT
10012	11	DIGITAL I/O	12	DIGITAL I/O	RW	BIT
10013	12	DIGITAL I/O	13	DIGITAL I/O	RW	BIT
10014	13	DIGITAL I/O	14	DIGITAL I/O	RW	BIT
10015	14	DIGITAL I/O	15	DIGITAL I/O	RW	BIT
10016	15	DIGITAL I/O	16	DIGITAL I/O	RW	BIT
10017	16	DIGITAL I/O	17	DIGITAL I/O	RW	BIT
10018	17	DIGITAL I/O	18	DIGITAL I/O	RW	BIT
10019	18	DIGITAL I/O	19	DIGITAL I/O	RW	BIT
10020	19	DIGITAL I/O	20	DIGITAL I/O	RW	BIT
10021	20	DIGITAL I/O	21	DIGITAL I/O	RW	BIT
10022	21	DIGITAL I/O	22	DIGITAL I/O	RW	BIT
10023	22	DIGITAL I/O	23	DIGITAL I/O	RW	BIT
10024	23	DIGITAL I/O	24	DIGITAL I/O	RW	BIT
10025	24	DIGITAL I/O	25	DIGITAL I/O	RW	BIT
10026	25	DIGITAL I/O	26	DIGITAL I/O	RW	BIT
10027	26	DIGITAL I/O	27	DIGITAL I/O	RW	BIT
10028	27	DIGITAL I/O	28	DIGITAL I/O	RW	BIT
10029	28	DIGITAL I/O	29	DIGITAL I/O	RW	BIT
10030	29	DIGITAL I/O	30	DIGITAL I/O	RW	BIT
10031	30	DIGITAL I/O	31	DIGITAL I/O	RW	BIT
10032	31	DIGITAL I/O	32	DIGITAL I/O	RW	BIT

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

The search and modification of a device can be performed directly in the Easy Setup 2 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.

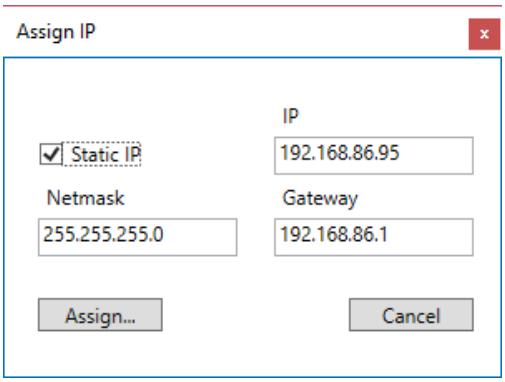
When in the R series device the STS LED is on steady, it is possible to obtain the IP address which has been set using the "Seneca Discovery" tool too.

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 layer 2 level and it is therefore not necessary to have an Ethernet configuration compatible with the device you are looking for.

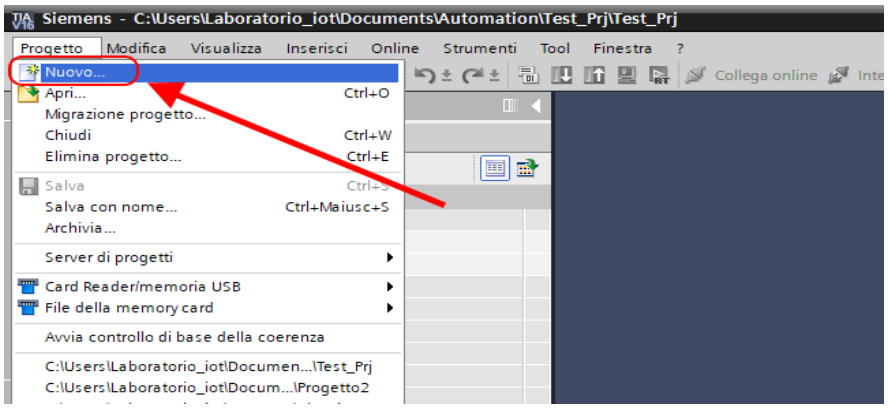
11. PROFINET IO (R-32DIDO-P MODEL ONLY)

Type of protocol: Class A Device, Cyclic Real-time (RT) and Acyclic Data

The device has been tested using the following PLCs:
SIEMENS S7 1200 and 1500 (Tia Portal 16)
CODESYS Runtime 3.5 (Codesys 3.5)

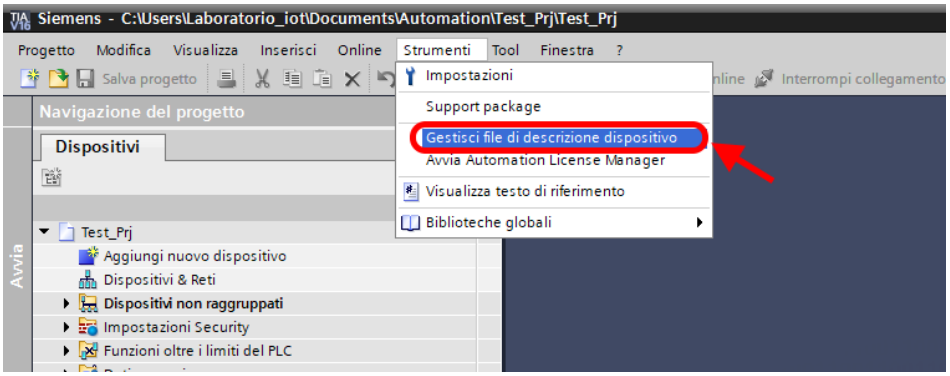
11.1. STEP BY STEP CREATION OF A PROJECT WITH SIEMENS PLC (TIA PORTAL 16)

Creating a new project:

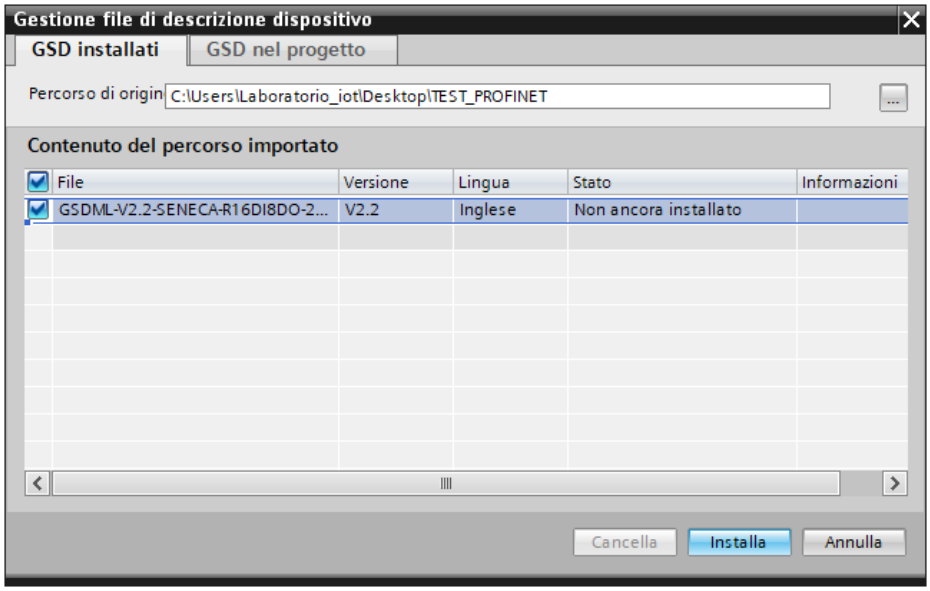


11.1.1. INSTALLING THE GSD FILE

Install the GSD file of the Seneca product:



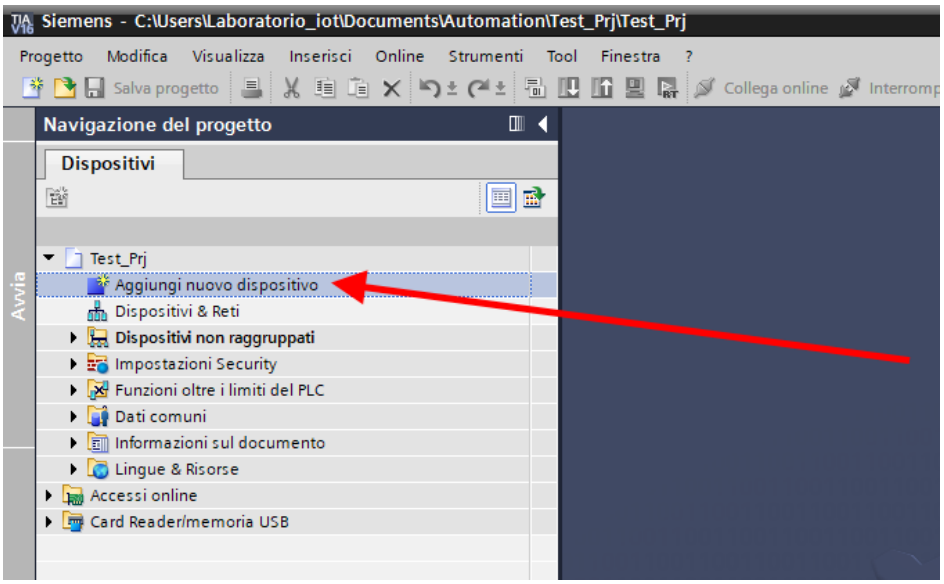
Point to the directory where the file is and press OK, then the list of GSD files in the folder will appear:

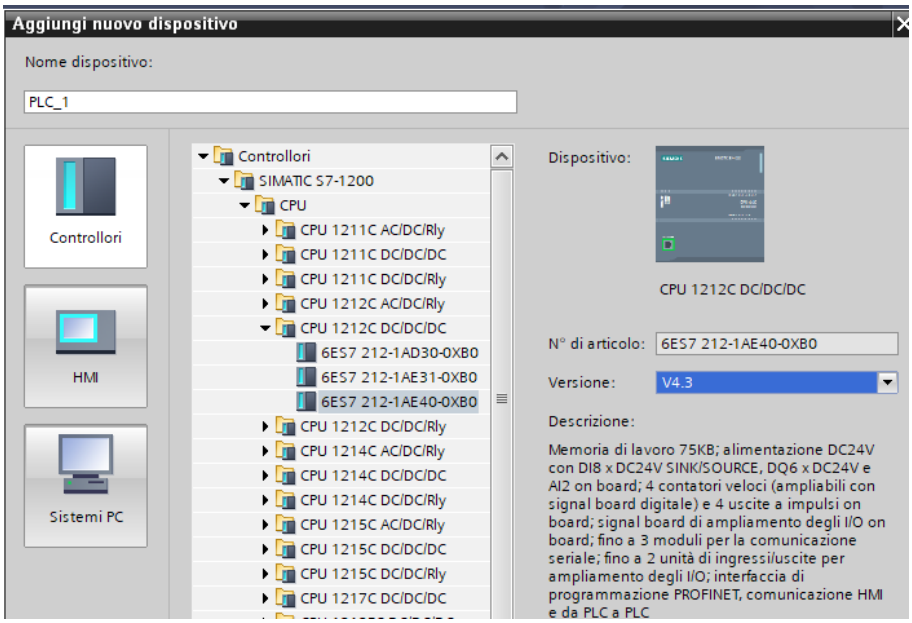


Click on "install".

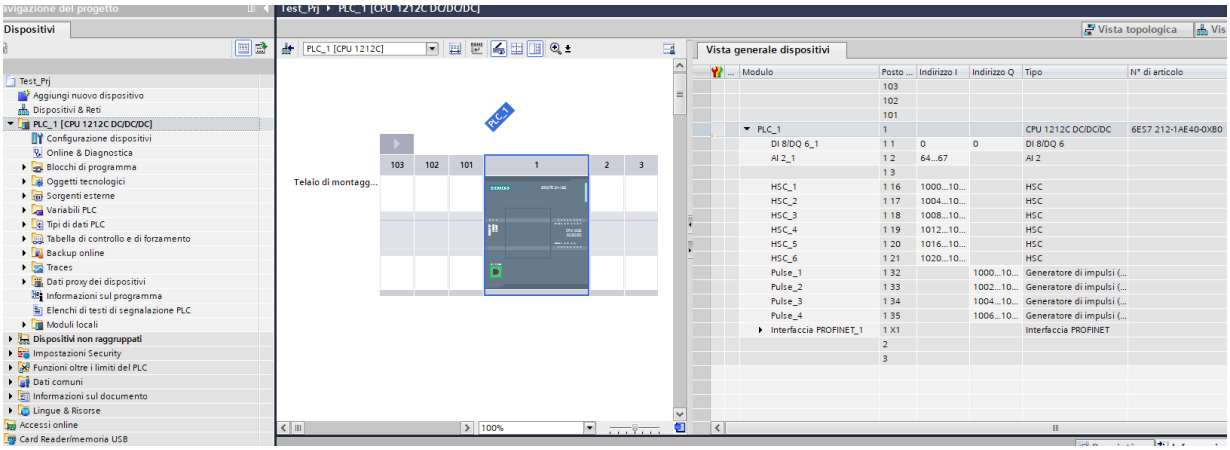
11.1.2. INSERTION OF THE SIEMENS PLC IN THE PROJECT

Now insert the Siemens PLC (in our example a SIEMATIC S7 1200), click on "Add new device ...":

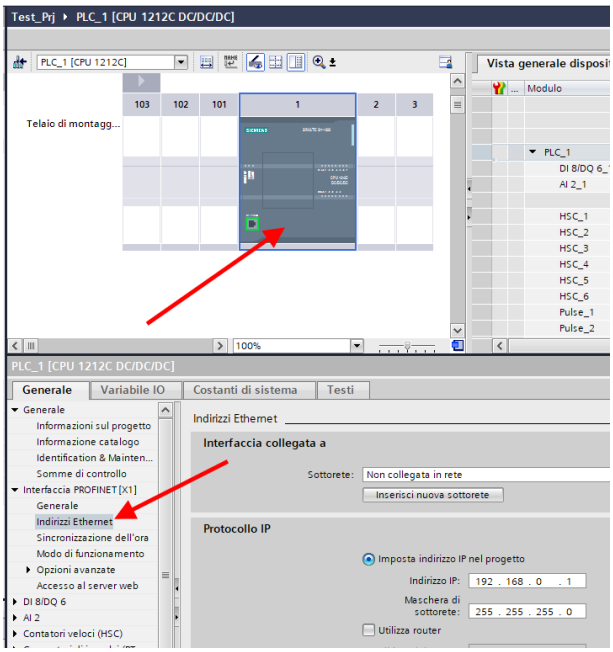




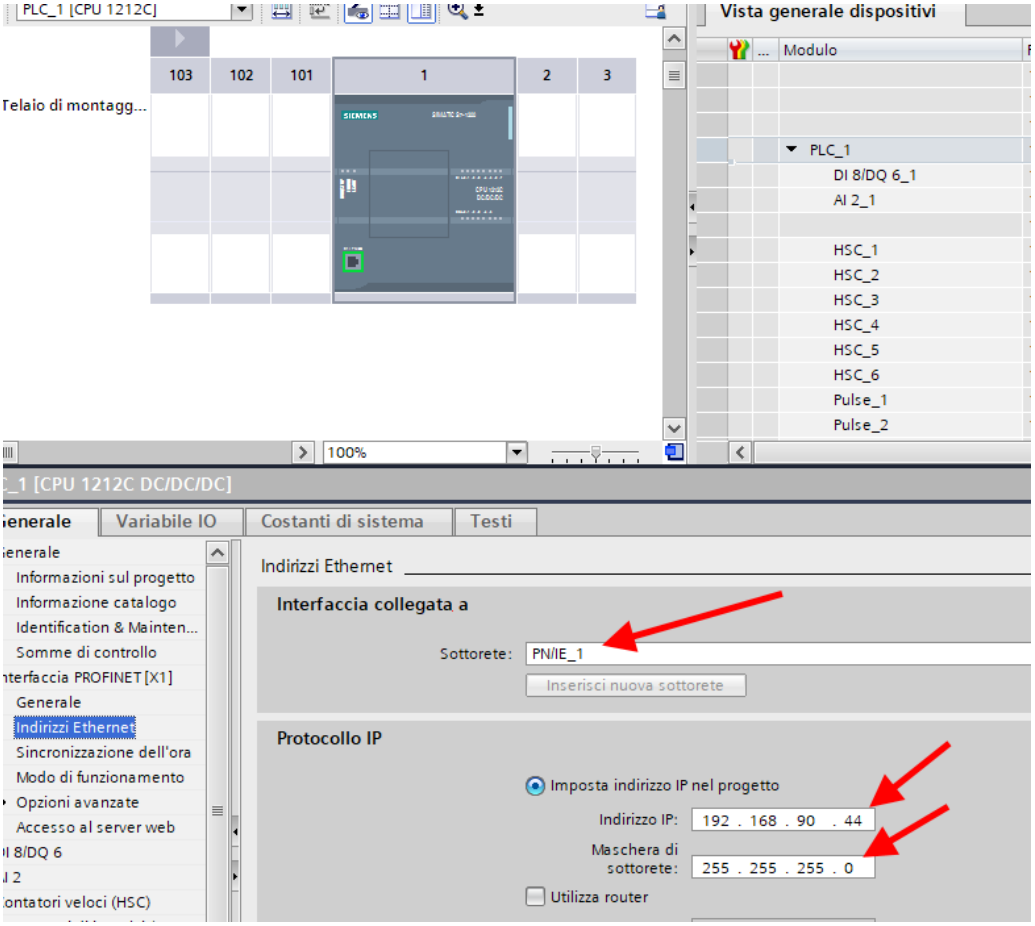
Confirm and the PLC will be added to the rack:



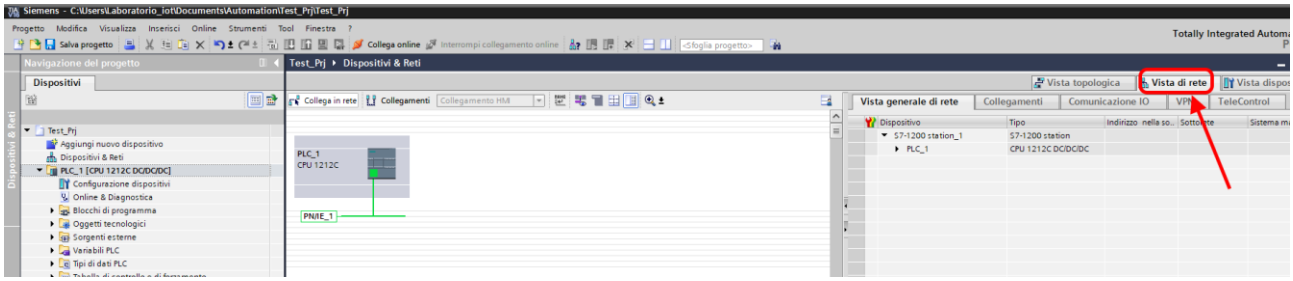
Now click on the PLC and select Profinet interface -> Ethernet addresses



Set the IP you want (in this case 192.168.90.44) and the PLC subnet:

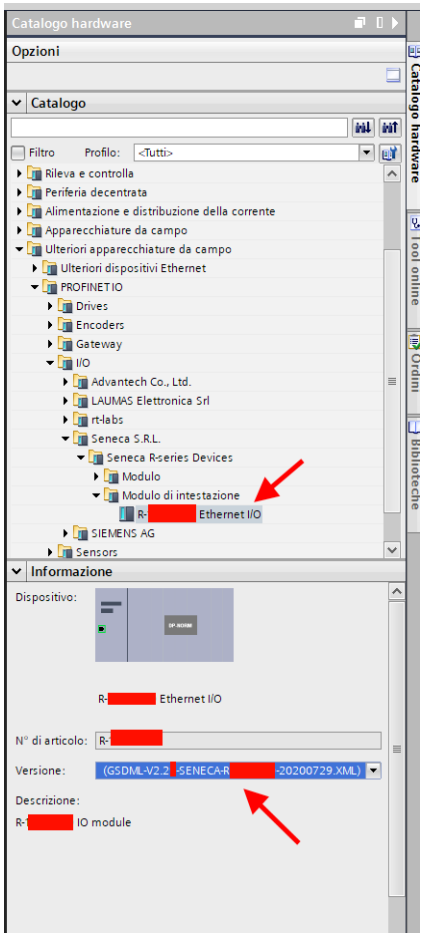


Move on to the network view:

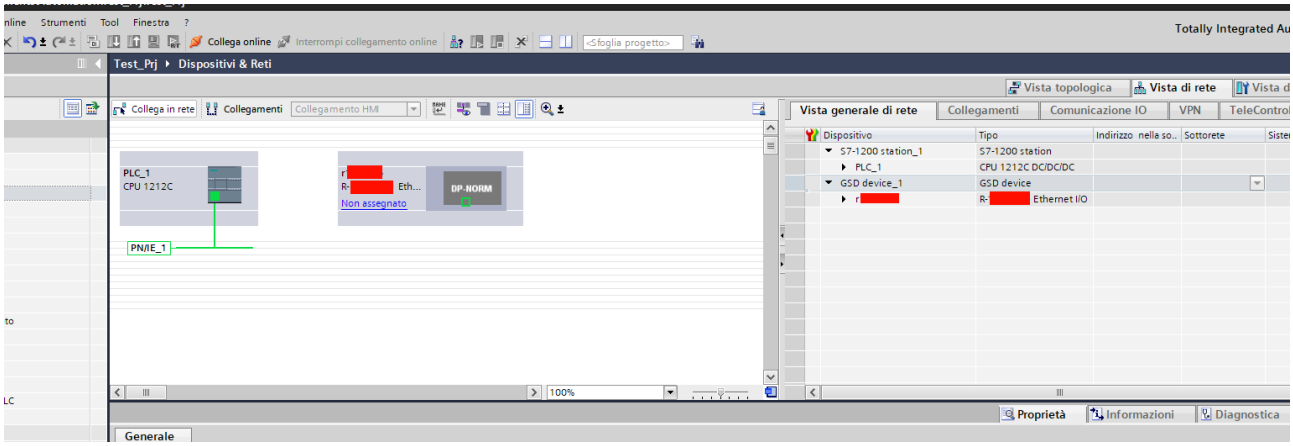


11.1.3. INSERTION OF THE PROFINET SENECA IO

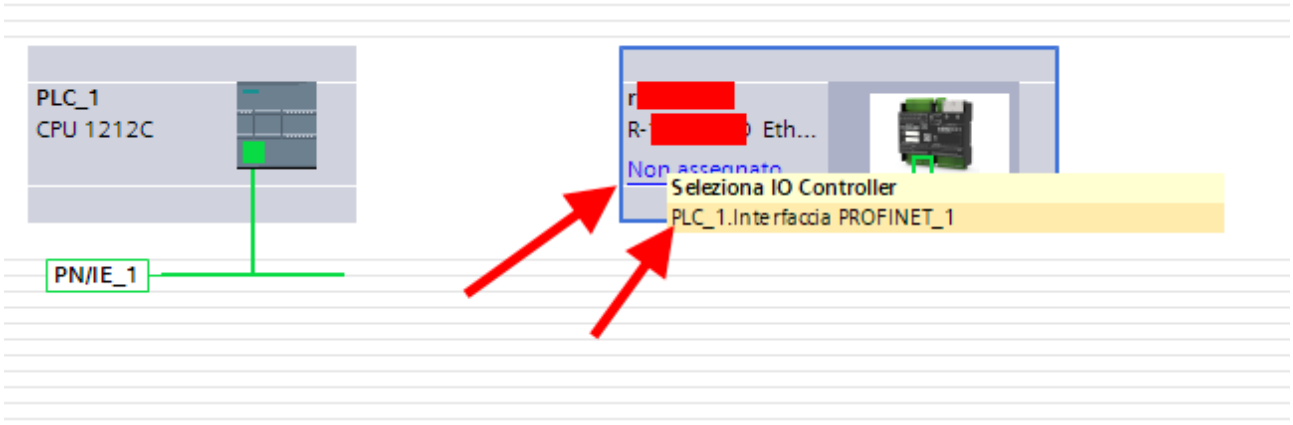
On the right, select "Hardware Catalogue" and then under "Additional Field Device" -> PROFINET IO -> I/O -> Seneca R-Series-> Header module (in the example an R-16DI-8DO device is shown):

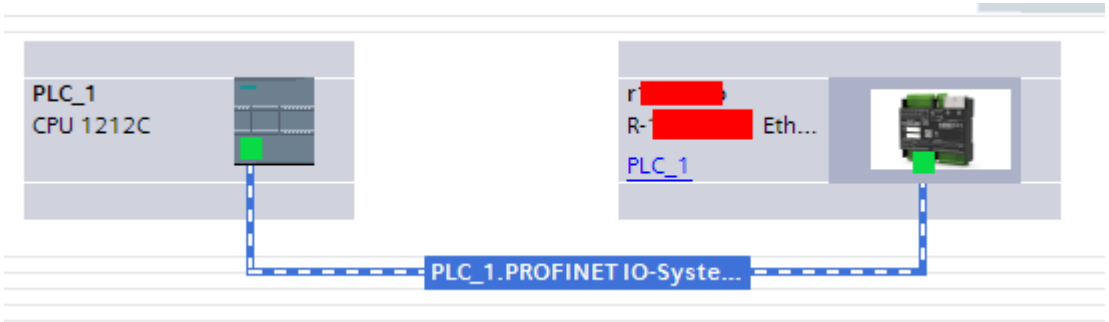


Drag the device to the network view:

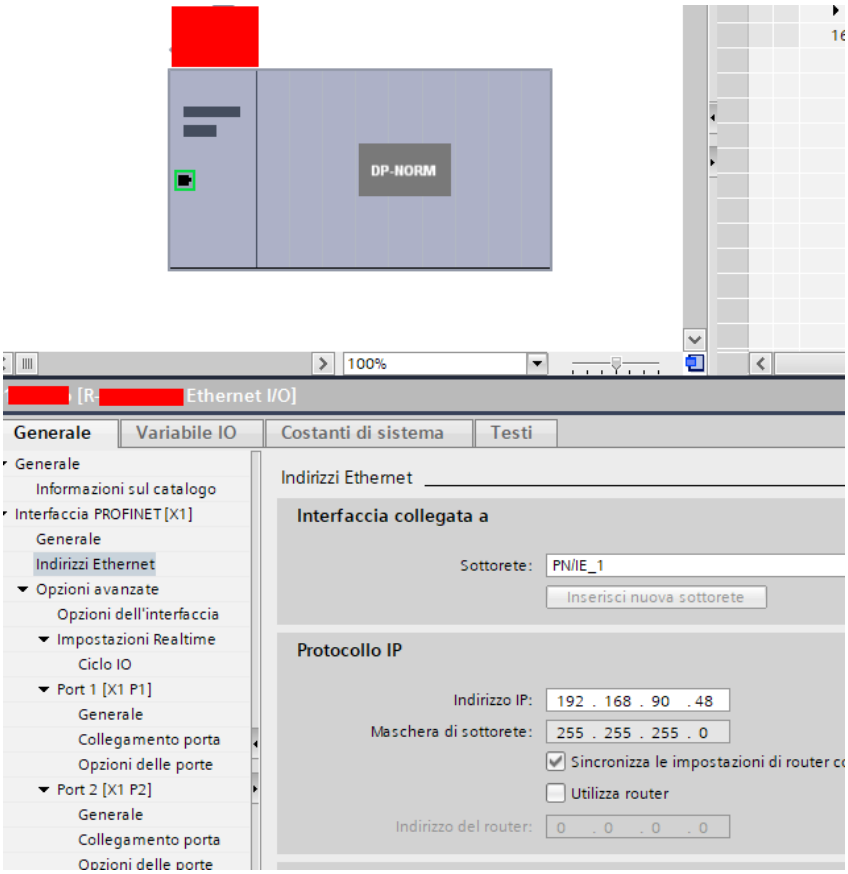


Now associate it to the PLC by clicking with the left mouse on "Not assigned" and then select the PLC:

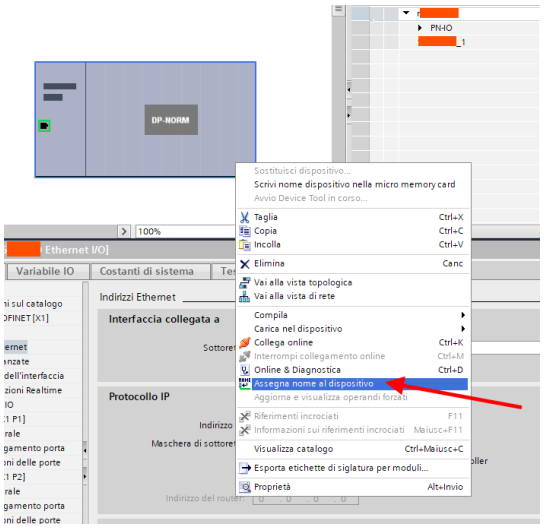




Click twice on the Seneca device and configure the IP address here too (for example 192.168.90.48):



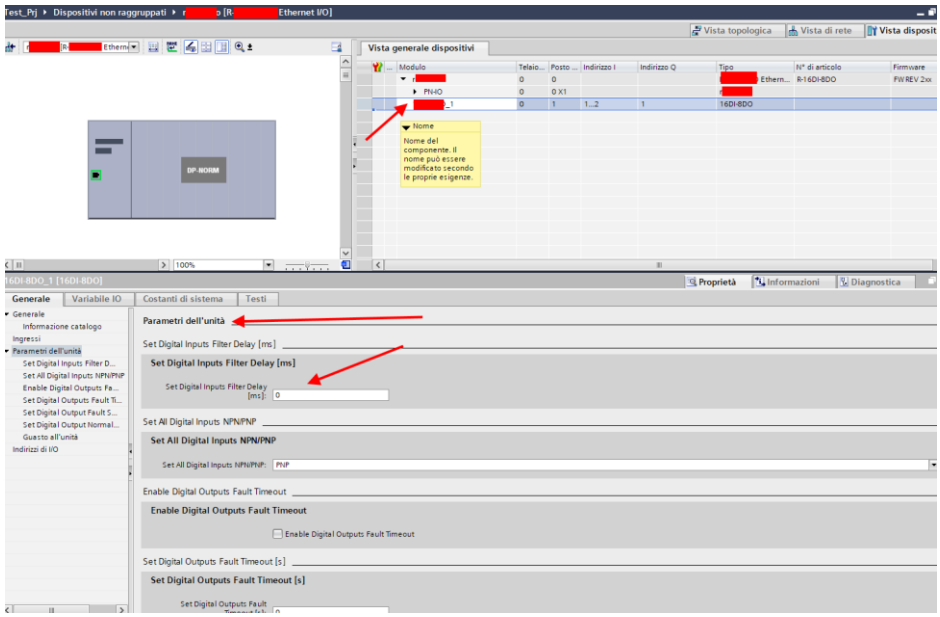
In Profinet the devices are identified by their name, so right click on the Seneca device and select "Assign device name"



Scan the network with "Update list" and set (if necessary) the device name with "Assign name".

11.1.4. CONFIGURATION OF THE PARAMETERS OF THE SENECA IO

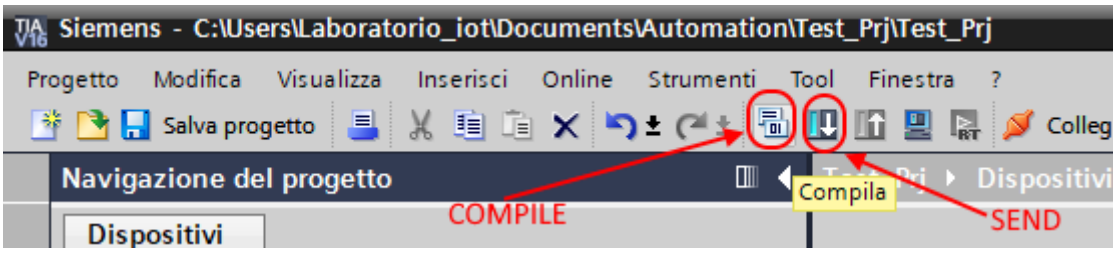
It is also possible to directly configure the device IO without any external software.
To configure the device, click on the IO so that the "Unit parameters" appear:



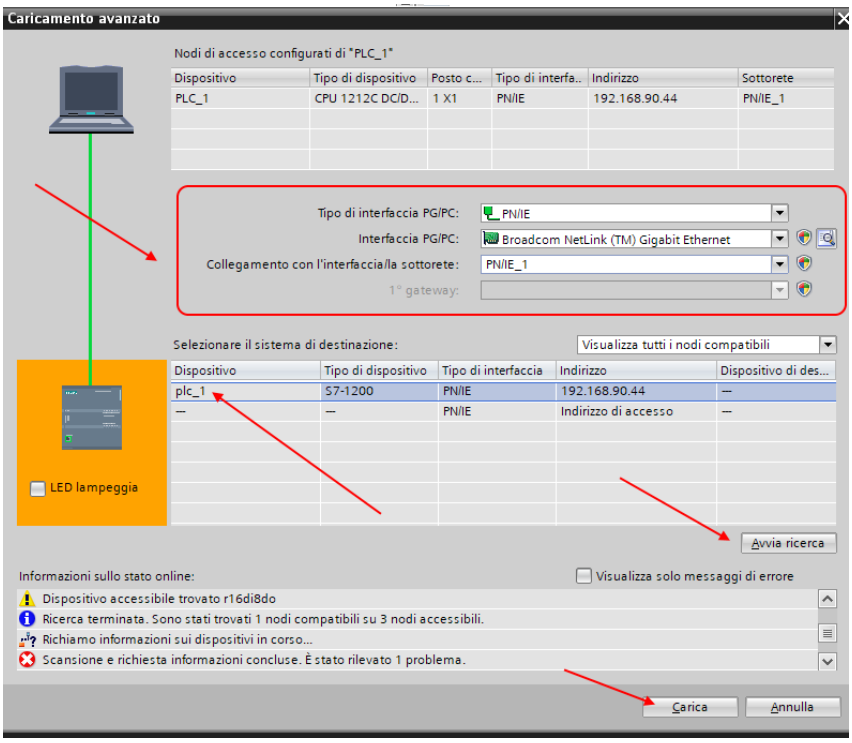
At the next start, the PLC will send the desired configuration to the device.

11.1.5. COMPILATION AND SENDING OF THE PROJECT TO THE SIEMENS PLC

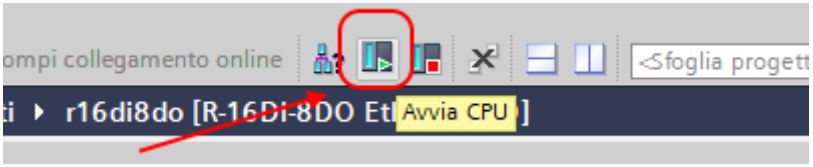
Now that the devices are configured, all that remains is to compile and send the configuration to the PLC.
The first icon compiles while the second sends the project:



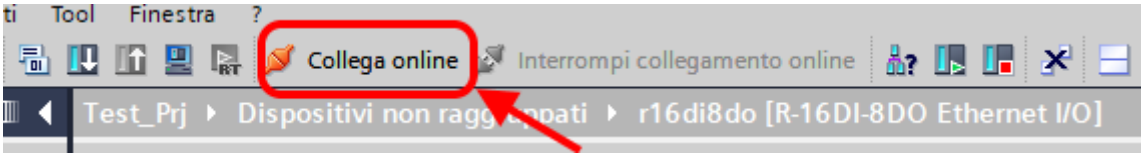
Before sending the project to the PLC, you are asked to select the ethernet interface and start the search, in order to select the PLC and press "Load".



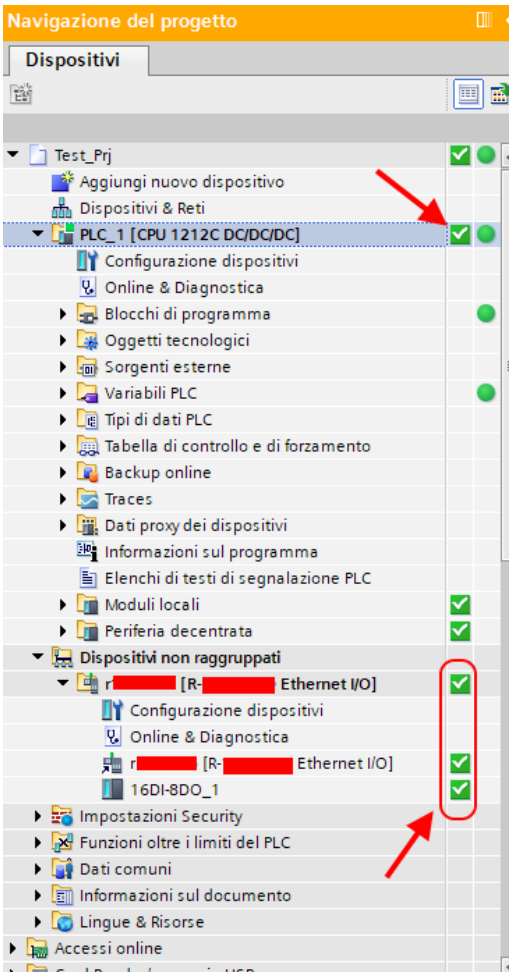
Once the project has been sent, RUN the PLC:



And go ON-Line so as to check if there are any errors:

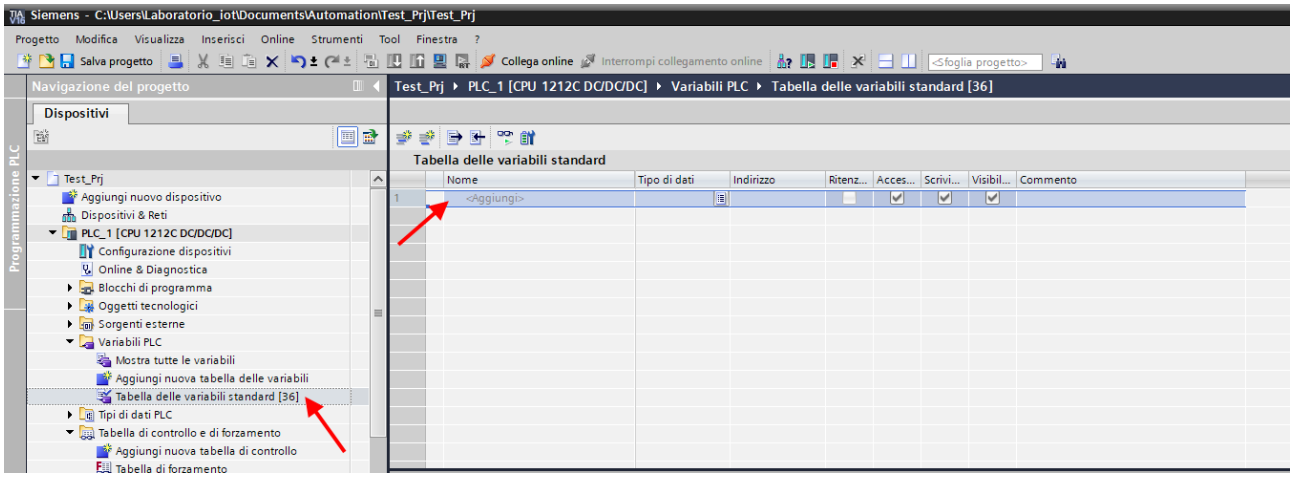


If everything is correct you will get a green icon next to the Seneca device:



11.1.6. READING AND WRITING OF THE SENECA IO FROM TIA PORTAL

It is also possible to read and write the Seneca IO (for debugging purposes) directly from the TIA portal. Define the PLC tags directly in the "standard tag table":



Now let's add the variables related to the IO, the addresses are shown here:

So:

Bytes I1 to I4 contain the inputs (bit 0 is IO1, bit 1 is IO2 etc ...)

Bytes Q1 to Q4 contain the outputs (bit 0 is IO1, bit 1 is IO2 etc ...), obviously only the outputs are writable.

Below is the default mapping of available IOs:

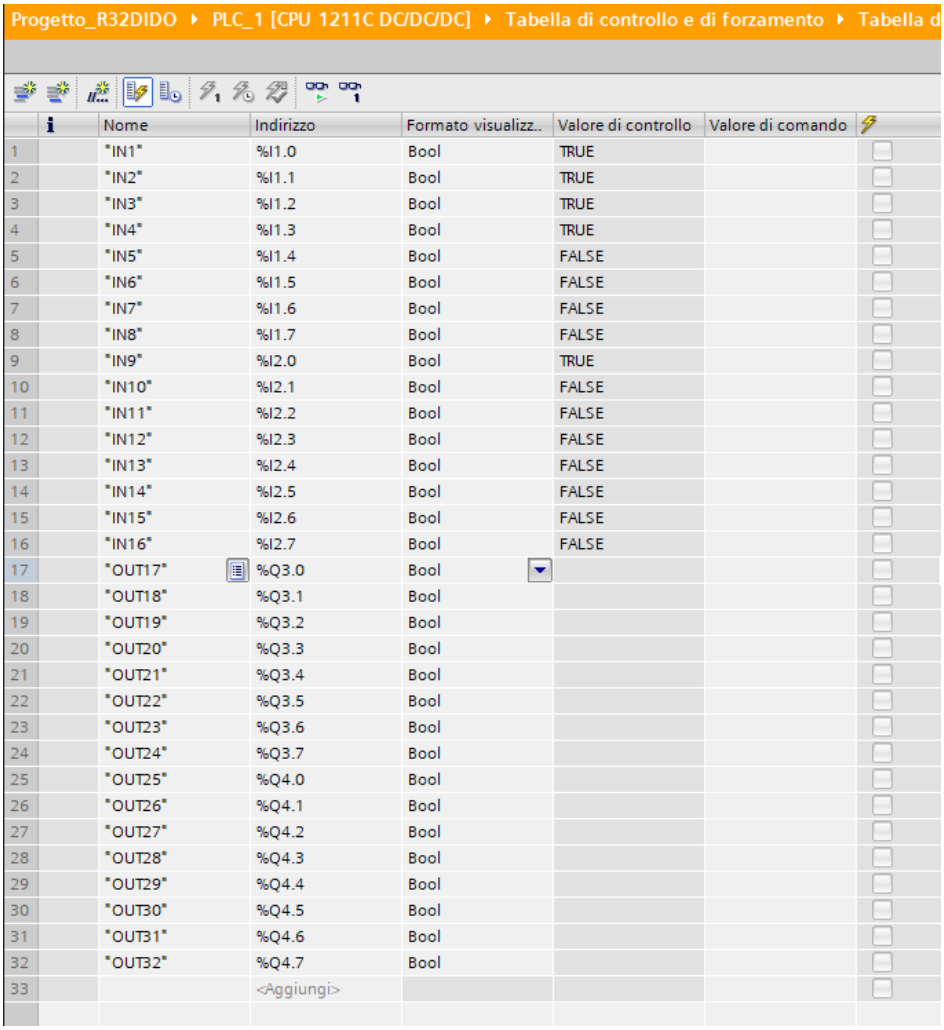
INPUT/OUTPUT	*DEFAULT ADDRESS IO CONFIGURED AS AN INPUT*	*DEFAULT ADDRESS IO CONFIGURED AS AN OUTPUT*
IO1	I1.0	Q1.0
IO2	I1.1	Q1.1
IO3	I1.2	Q1.2
IO4	I1.3	Q1.3
IO5	I1.4	Q1.4
IO6	I1.5	Q1.5
IO7	I1.6	Q1.6
IO8	I1.7	Q1.7
IO9	I2.0	Q2.0
IO10	I2.1	Q2.1
IO11	I2.2	Q2.2
IO12	I2.3	Q2.3
IO13	I2.4	Q2.4
IO14	I2.5	Q2.5
IO15	I2.6	Q2.6
IO16	I2.7	Q2.7
IO17	I3.0	Q3.0
IO18	I3.1	Q3.1
IO19	I3.2	Q3.2
IO20	I3.3	Q3.3
IO21	I3.4	Q3.4
IO22	I3.5	Q3.5
IO23	I3.6	Q3.6
IO24	I3.7	Q3.7
IO25	I4.0	Q4.0
IO26	I4.1	Q4.1
IO27	I4.2	Q4.2
IO28	I4.3	Q4.3
IO29	I4.4	Q4.4
IO30	I4.5	Q4.5
IO31	I4.6	Q4.6
IO32	I4.7	Q4.7

So if, for example, I need 16 inputs and 16 outputs, I can use the Booleans from I1.0 to I2.7 for the inputs (which will therefore be found in the IO1 ... IO16) and the Booleans from Q3.0 to Q4.7 for the outputs (which will then be found in the IO17 ... IO32).

ATTENTION!

An IO configured as an input cannot be controlled as an output.
An IO configured as an output cannot be read as an input.

Always following our example (16 inputs and 16 outputs) we define the 16 inputs and 16 outputs in the standard variables table:

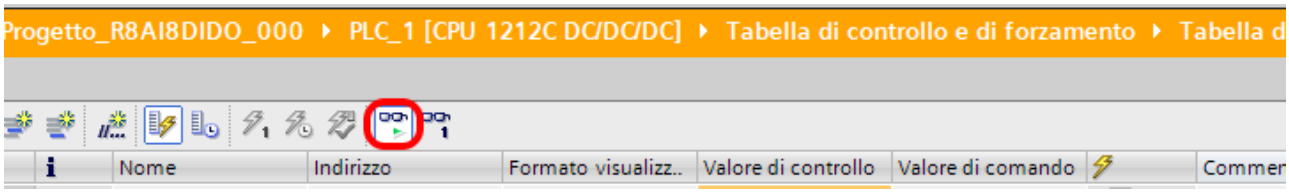


Progetto_R32DIDO ▸ PLC_1 [CPU 1211C DC/DC/DC] ▸ Tabella di controllo e di forzamento ▸ Tabella d

	Nome	Indirizzo	Formato visualizz..	Valore di controllo	Valore di comando
1	"IN1"	%I1.0	Bool	TRUE	
2	"IN2"	%I1.1	Bool	TRUE	
3	"IN3"	%I1.2	Bool	TRUE	
4	"IN4"	%I1.3	Bool	TRUE	
5	"IN5"	%I1.4	Bool	FALSE	
6	"IN6"	%I1.5	Bool	FALSE	
7	"IN7"	%I1.6	Bool	FALSE	
8	"IN8"	%I1.7	Bool	FALSE	
9	"IN9"	%I2.0	Bool	TRUE	
10	"IN10"	%I2.1	Bool	FALSE	
11	"IN11"	%I2.2	Bool	FALSE	
12	"IN12"	%I2.3	Bool	FALSE	
13	"IN13"	%I2.4	Bool	FALSE	
14	"IN14"	%I2.5	Bool	FALSE	
15	"IN15"	%I2.6	Bool	FALSE	
16	"IN16"	%I2.7	Bool	FALSE	
17	"OUT17"	%Q3.0	Bool		
18	"OUT18"	%Q3.1	Bool		
19	"OUT19"	%Q3.2	Bool		
20	"OUT20"	%Q3.3	Bool		
21	"OUT21"	%Q3.4	Bool		
22	"OUT22"	%Q3.5	Bool		
23	"OUT23"	%Q3.6	Bool		
24	"OUT24"	%Q3.7	Bool		
25	"OUT25"	%Q4.0	Bool		
26	"OUT26"	%Q4.1	Bool		
27	"OUT27"	%Q4.2	Bool		
28	"OUT28"	%Q4.3	Bool		
29	"OUT29"	%Q4.4	Bool		
30	"OUT30"	%Q4.5	Bool		
31	"OUT31"	%Q4.6	Bool		
32	"OUT32"	%Q4.7	Bool		
33		<Aggiungi>			

Now compile, send the project and go online with the PLC.

Once online, press the glasses icon to update the status of the variables.



Under the "Control value" column you can read the I/O value in real time.

To control the outputs, it is necessary to enter "TRUE" or "FALSE" in the "Command value" column and then press the icon with the lightning bolt to order the writing. Note the status of the LED relating to the commanded output.

In the "Control value" column, the status of the outputs is also read in real time.