USER MANUAL

PROFINET IO / ETHERNET/IP - MODBUS RTU&TCP GATEWAYS

$SENECA^{\circ} \in$

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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.

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.

Use the concepts, examples and other content at your own risk.

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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ORIGINAL INSTRUCTIONS



Document revisions

DATE	REVISION	NOTES	AUTHOR
16/12/2022	0	First revision for new dualcore cpu Allineato alla revisione firmware 117	MM
26/04/2023	1	Nuove modalità di funzionamento introdotte con la revisione firmware 204	MM
27/04/2023	2	Fix vari	MM
21/07/2023	3	Corretto la segnalazione su capitolo 8: DIAGNOSTICA MODBUS	AZ
24/07/2023	5	Aggiunto supporto a Gateway serie -E	MM
02/02/2024	6	Modifiche per supporto firmware 228 dei Gateway serie -P, VARI FIX	MM

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1. **PRELIMINARY WARNINGS**

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.

SENECA, its subsidiaries, affiliates, group companies, suppliers and distributors do not guarantee that the functions fully meet the customer's expectations or that the device, firmware and software should have no errors or operate continuously.

1.1. **DESCRIPTION**

The Z-KEY-P, R-KEY-LT-P, Z-KEY-2ETH-P products allow to convert data coming from the Modbus serial bus or Modbus TCP-IP Ethernet into the Profinet IO bus or vice versa.

The Z-KEY- E, R-KEY-LT- E, Z-KEY-2ETH- E products allow to convert data coming from the Modbus serial bus or Modbus TCP-IP Ethernet into the Ethernet IP bus or vice versa.

1.2. PROFINET IO PROTOCOL

PROTOCOL	
Type of protocol	Profinet IO, Class A Device, Cyclic Real-time (RT) and Acyclic Data
MEMORY	
Memory size	In Gateway Master and Gateway Slave modes:
	1200 bytes max in reading and 1200 bytes max in writing (-P versions) (20
	slots max)

1.3. ETHERNET/IP PROTOCOL

ETHERNET/IP Adapter, 1 connection read/write
512 bytes max in reading and 512 bytes max in writing (-E versions)



1.4. GATEWAY DEVICES

PRODUCT	ETHERNET PORTS	SERIAL PORT RS232/RS485 CONFIGURABLE	RS485 SERIAL PORT	ISOLATED SERIAL PORTS	PROTOCOL
Z-KEY-P	1	1	1	Yes, both ports	PROFINET-IO
R-KEY-LT-P	1	1	NO	NO	PROFINET-IO
Z-KEY-2ETH-P	2	1	1	Yes, both ports	PROFINET-IO
Z-KEY-E	1	1	1	Yes, both ports	ETHERNET/IP
R-KEY-LT-E	1	1	1	NO	ETHERNET/IP
Z-KEY-2ETH-E	2	1	1	Yes, both ports	ETHERNET/IP

2. ETHERNET PORT

The factory configuration of the Ethernet port is:

STATIC IP: 192.168.90.101 SUBNET MASK: 255.255.255.0 GATEWAY: 192.168.90.1

Multiple devices must not be inserted on the same network with the same static IP.

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

3. FIRMWARE UPDATE

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

The firmware update is made using the appropriate command on the Easy Setup2 software or the webserver.





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

4. **OPERATING MODE**

4.1. "-P" VERSIONS

The Gateway allows you to operate in 3 different modes: *PROFINET IO DEVICE / MODBUS MASTER GATEWAY* PROFINET IO DEVICE / MODBUS SLAVE GATEWAY GATEWAY WITH PORT#1 AND PORT#2 MASTER TAG.

4.1.1. PROFINET IO DEVICE / MODBUS MASTER GATEWAY

This operating mode is the most used and allows you to connect a Profinet IO PLC controller with Modbus RTU/ASCII Slave I/O devices



The Gateway, in the serial part, works as a Modbus master device and in the Ethernet part as a Profinet IO Device.

Modbus requests (read or write commands) are configured in the device and a GSDML file is automatically generated.

Once this file is imported into the PLC development software (e.g. TIA PORTAL) all configured IO will be accessible without any other configuration.

In addition to serial devices it is also possible to connect up to 3 Modbus TCP-IP servers.



4.1.2. PROFINET IO DEVICE / MODBUS SLAVE GATEWAY

This operating mode allows you to connect a Profinet IO PLC controller with a maximum of 1 or 2 devices (based on the number of serial ports available in the gateway) of the Modbus RTU/ASCII Master type (typically of the PLCs).



The gateway provides two different areas of 512 bytes for reading and 512 bytes for writing. Bytes are available from Modbus Holding Register 0 to Holding Register 255 inclusive. The "Modbus Read Area" is only readable by Modbus and only writable by Profinet. The "Modbus Write Area" is only writable by Modbus and only readable by Profinet.





ATTENTION!

THE GATEWAY CREATES TWO DIFFERENT MODBUS AREAS, ONE FOR READING AND ONE FOR WRITING. FOR EXAMPLE IF YOU WRITE BYTES FROM MODBUS THESE WILL END UP IN THE WRITING AREA

AND THEN THEY WILL NOT BE READABLE BY THE MODBUS ITSELF



4.1.3. GATEWAY WITH PORT#1 AND PORT#2 MASTER TAG

This operating mode *is not recommended for use by the customer*, it has been maintained for backward compatibility with previous versions of the gateway and allows you to connect a Profinet IO PLC controller with Modbus RTU/ASCII Slave I/O devices



The Gateway, in the serial part, works as a Modbus master device and in the Ethernet part as a Profinet IO Device.

Differently from the *GATEWAY PROFINET IO DEVICE / MODBUS MASTER* mode, here the Modbus commands are not defined, only the variables (TAGs), subsequently the firmware internally performs an optimization by creating Modbus request commands.

Also in this mode it is possible to define, in addition to the serial devices, up to 3 Modbus TCP-IP servers.

4.2. "-E" VERSIONS

The Gateway allows you to operate in the following mode: GATEWAY ETHERNET/IP ADAPTER / MODBUS MASTER

4.2.1. GATEWAY ETHERNET/IP ADAPTER / MODBUS MASTER

This operating mode allows you to connect an ETHERNET/IP PLC scanner with Modbus RTU/ASCII Slave I/O devices





The Gateway, in the serial part, works as a Modbus master device and in the Ethernet part as a Ethernet /IP Adapter.

Modbus requests (read or write commands) are configured in the device and an EDS file is automatically generated.

Once this file is imported into the PLC development software (e.g. Rockwell STUDIO 5000) all configured IO will be accessible without any other configuration.

In addition to serial devices it is also possible to connect up to 3 Modbus TCP-IP servers.

5. GATEWAY CONFIGURATION

5.1. "-P" GATEWAY CONFIGURATION VIA EASY SETUP 2 AND TIA PORTAL

The easiest method to configure the gateway is through the Easy Setup2 software. For more information, refer to the help in the software.

5.1.1. "PROFINET IO - MODBUS MASTER GATEWAY" CONFIGURATION

You want to connect a Siemens[™] PLC to two Seneca Modbus RTU slave devices: Z-10-D-IN (SLAVE STATION ADDRESS 1) Z-10-D-OUT (SLAVE STATION ADDRESS 2).

In the example we will use the Z-KEY-P product (the steps are exactly the same for the other R-KEY-LT-P and Z-KEY-2ETH devices).

The 10 digital inputs of the Z-10-D-IN are from coil address 1 to coil address 10 of station address #1 The 10 digital outputs of the Z-10-D-OUT are from coil address 1 to coil 10 of Station Address #2

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First we disconnect the PLC from the Ethernet network. Now we use the Easy Setup 2 software selecting the Z-KEY-P product (with SCAN or in manual entry):

Launcher di EASY SETUP 2 [v1.2.7	.7]						-		×		
\frown	1 Sele	1 Seleziona una sorgente di ricerca									
	Ricerca vi	a Ethernet							v		
	2 Cer	ca moduli in ret	e								
	Selezi	Nome	Indirizzo	Mac	Versione	Ping					
		R-KEY-P-HWD [WEB	192.168.85.133	C8:F9:81:11:22:33	200.0	1 ms					
EASY Setup app	2	Z-KEY-P-HWF [PFN]	192.168.90.1	C8:F9:81:0C:2A:E1	1810.204	0 ms					
Cercala su Google Play Store	2 found	4									
	Tation	- IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		Arrest Diff.							
Imposta Lingua	Tutti/Ne	ssuno/inverti P	Agg Agg	oma rvv Assegni	a ir 50	ansiona		erma			
ITALIANO ×		Esci				3	Avant	i .			



At this point the device access password is requested (default: admin):



Once the password has been entered, select the Profinet IO Device / Modbus Master mode Gateway:

SENECA Easy Setup 2 v1.2.7.7			
New Open Save	Save as Read all	Send all	
Type: ETH Scan SENECA Easy Setup 2 Project	ETH 192.168.90.1 CONNECT	ED FW Ver: 204 Open Webserver	Connett
Z-KEY-P-HWF Z-KEY-P-HWF			Minimum Fir
	Ethernet Serial Ports Web	b / Security Modbus TCP-IP COMMANDS IO Mapping Custom devices	
	Ethernet		
	Device Mode	PROFINET v	
		- PROFINET: only the Profinet protocol is active - WFB SFBVFB: only the web server is active	/
	Working Mode	Gateway Profinet IO Device / Modbus Master	· ·
		Select the Z-KEY working mode. It is possible to choose between: - GATEWAY PROFINET IO DEVICE / MODBUS MASTER - GATEWAY PROFINET IO DEVICE / MODBUS SLAVE	
	IP Address	192.168.90.1	
		Sets the device static address. Careful not to enter devices with the same IP address	s into the same network.
	MASK	255.255.255.0	
		Set the mask for the IP network.	

Now let's add the Modbus commands to acquire the inputs and write the outputs, select the COMMANDS section:

SENECA Easy Setup 2 v1.2.7.7										
New Open Save	Exercise Exercise Exercise									
Type: ETH Scan_	ETH 192.168.90.1 CONNECTED FW Ver: 204 Open Websener									
✓ ■ SENECA Easy Setup 2 Project	ZAQVA-HWF									
Z-KEY-P-HWF Z-KEY-P-HWF										
	Ethernet Serial Ports Web / Security Modbus TCP-IP COMMANDS IO Mapping Custom derices									
	COMMANDS									
	Getway Target Modbus Target Resource Target Target Modbus Request Target Modbus Request Target Modbus Number of Target WRITE Mode Target Transmission Find									
	Name To Station Address Registers and the set of the se									
	Add command Permove command Move Up Move Down Duplicate command;									
	Add command Adds a new Command Remove command Remove command									
	Move Up Moves Up a single Command by one position Move Down Moves Down a single Command by one position									
	Dupicate commanity.) Dupicates the selected Commanu(s), by assigning it the inst nee aduless between the available holding registers range									

We add the reading of 10 coil registers relating to the 10 digital inputs of Z-10-D-IN:



COMMANDS					1		1		
Gateway Target Modbus Command Device Name	Target Resource	Target Connected To	Target Modbus Station Address	Target Modbus Request Type	Target Modbus Start Register Address	Number of Modbus Target Registers	Target WRITE Mode	Target Trigger time [ms]	Target Endian Swap
INPUTS CUSTOM		PORT_1	1	READ_COILS	1 (0x 00001)	10	ONLY_ON_DATA_CHANGE	1000	NONE
			/*						

Now let's add the writing of 10 coil registers related to the 10 digital outputs of Z-10-D-OUT:

(COMMANDS											
	Gateway Command Name	Target Modbus Device	Target Resource	Target Connected To	Target Modbus Station Address	Target Modbus Request Type	Target Modbus Start Register Address	Number of Modbus Target Registers	Target WRITE Mode	Target Trigger time [ms]	Target Endian Swap	
1	INPUTS	сизтом	Ì	PORT_1	1	READ_COILS	1 (0x 00001)	10	ONLY_ON_DATA_CHANGE	1000	NONE	1
2	OUTPUTS	CUSTOM		PORT_1	2	WRITE_MULTIPLE_COILS	1 (0x 00001)	10	ONLY_PERIODIC	1000	NONE	
							×		1			

We set the writings in "Only Periodic" so they will always be performed every 1000 ms.

Enter the profinet name of the device:

Ethernet Serial Ports Web / Security Modb	us TCP-IP COMMANDS IO Mapping Custom devices
Web / Security	
Port	80 Sets the communication port for the web server.
User name	admin Sets the user name to access the web server
WEB server and Configuration Password	admin set mine to access the web server and to read/write the configuration (if enabled).
IP Change from Discovery	2
	Selects whether or not the device accepts the IP address change from the Seneca Discovery Device software.
Profinet Name	zrkey-p
	The Profinet name to associate to the device



Let's verify that serial port 1 is configured correctly for slave devices:

RS485 NR 1	modula lei ii commences lei mapping custom dences	7
Modbus Protocol	RTU ~	
	Sets the protocol on the serial between Modbus RTU or Modbus ASCII	
Baud rate	38400 BAUD *	
	Selects the communication speed of the COM #1 serial port (on IDC10 connector).	
Data	8 Bit ~	×
	Sets the number of data bits for the COM #1 serial communication port (on IDC10 connector).	
Share hit		
Stop bit	One	
	Sets the number of stop bits for the COM #1 serial communication port (on IDC10 connector).	
Parity	NONE ~	
	Sets the parity for the COM #1 serial communication port (on IDC10 connector).	
Timeout (ms)	200	
	Sets the timeout (in ms) on Modbus Master mode before making a new call for the COM #1 serial communication port (on IDC10 connector).	
Max Writing Retries Number	3	
	Sets the number of the retries to write a Modbus register into the Modbus Master mode for the COM #1 serial communication port (on IDC10 connector)	
RS485/RS232 NR 2		
10 100/10202 11112		
Modbus Protocol	RTU Ý	
	Sets the protocol on the serial between Modbus RTU or Modbus ASCII	

At this point we export the GSDML file from the "IO Mapping" section:



1 We press the button to calculate the offsets of the readings

- 2 We press the button to calculate the write offsets
- 3 We enter a name to recognize the GSDML file
- 4 We export the GSDML file



ATTENTION!

IT IS ALSO POSSIBLE TO DOWNLOAD A GSDML FILE (Gateway AII) FROM THE <u>WWW.SENECA.IT</u> WEBSITE (IN THE SECTION RELATED TO PROFINET GATEWAYS) AND COMPOSE YOUR OWN CONFIGURATION FROM TIA PORTAL WITHOUT HAVING TO IMPORT THE FILE EACH TIME.



Now let's send the configuration to the device with the "send" button:



We can now move on to configuring the PLC via Tia Portal™:

Creating a new project:

TIA					t pubr	and Dat		_
Vî6	Siemens - C:\Users\Laborato	orio_iot\Docum	entsVAutoma	tion\les	st_Prj\lo	est_Prj		
Pr	ogetto Modifica Visualizza	Inserisci Onli	ne Strumen	ti Tool	l Fine	stra ?		
	Nuovo		li⊂) ± (≃l ±	- B. II.	165	2 🗛 🖉	Collega online	🔊 In
	Apri	Ctrl+O						
÷	Migrazione progetto							
	Chiudi	Ctrl+W						
	Elimina progetto	Ctrl+E		1				
	Salva	Ctrl+5						
	Salva con nome	Ctrl+Maiusc+S						
	Archivia							
	Server di progetti	•						
-	Card Reader/memoria USB	•						
1	File della memory card	•						
	Avvia controllo di base della co	erenza						
	C:\Users\Laboratorio_iot\Docum	nen\Test_Prj						
1	C:\Users\Laboratorio_iot\Docum	n\Progetto2						

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Install the GSD file of the Seneca product:

Siemens - C:\Users\Laboratorio_iot\Documents	s\Automation\Test_Prj\Test_Prj
Progetto Modifica Visualizza Inserisci Online	Strumenti Tool Finestra ?
📑 🔁 🖬 Salva progetto 🚦 🐰 🏥 🛍 🗙 🔄	👔 Impostazioni 🖉 Interrompi collegamento
Navigazione del progetto	Support package
Dispositivi	Gestisci file di descrizione dispositivo
	Avvia Automation License Manager
Es	Visualizza testo di riferimento
	Diritatasha alahali
Test_Prj	
😤 📑 Aggiungi nuovo dispositivo	
🗧 🛗 Dispositivi & Reti	
🕨 🖳 Dispositivi non raggruppati	
🕨 📷 Impostazioni Security	
Funzioni oltre i limiti del PLC	
 Market Control 	

Point to the directory where we previously saved the GSDML file and press INSTALL.

Gestione file di descrizione dispositivo			×								
GSD installati GSD nel progetto											
Percorso di origin C:\Users\Moschin\Desktop\a\ZR-KEY-P											
Contenuto del percorso importato											
🔳 File 🔺	Versione	Lingua	Stato								
GSDML-V2.2-SENECA-prova1-testPippo-20230418.xml	V2.2	Inglese	Non ancora i								
GSDML-V2.2-SENECA-ZKEYP-GATEWAY-20221020.xml	V2.2	Inglese	Non ancora i								
GSDML-V2.2-SENECA-ZKEYP-GATEWAY-20221201.xml	V2.2	Inglese	Già installato								
GSDML-V2.2-SENECA-zrkeyp-10IN10OUT-20230426.xml	V2.2	Inglese	Non ancora i								
GSDML-V2.2-SENECA-ZRKEYP-GATEWAY-20220701.xml	V2.2	Inglese	Già installato								
GSDML-V2.2-SENECA-ZRKEYP-GATEWAY-20221111.xml	V2.2	Inglese	Non ancora i								
GSDML-V2.2-SENECA-zrkeyp-mygsdmltest-20230406.xml	V2.2	Inglese	Non ancora i								
GSDML-V2.2-SENECA-ZRKEYP-testpippo2-20230418.xml	V2.2	Inglese	Non ancora i								
GSDML-V2.2-SENECA-ZRKEYP-testpippoweb-20230418.xml	V2.2	Inglese	Non ancora i								
K			>								
	Cancell	a Installa	Annulla								



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:

avigazione del progetto	ш (Test_Prj → PLC_1 [C	PU 121	12C DC	DCDCJ													
Dispositivi																	🚽 Vista	topologica 🛛 📥 Vis
	📃 📑	H PLC_1 [CPU 12120	:]	•	🖽 🖾	1 🖌 🗄	8 🔢 🔍	±			4	Vist	a generale dispositivi					
											^	-	Modulo	Posto .	Indirizzo I	Indirizzo Q	Tipo	N° di articolo
Test_Prj												-		103				
Aggiungi nuovo dispositivo											=			102				
💼 Dispositivi & Reti														101				
PLC_1 [CPU 1212C DC/DC/DC]						×							 PLC 1 	1			CPU 1212C DC/DC/DC	6ES7 212-1AE40-0XB0
🛐 Configurazione dispositivi													DI 8/DQ 6 1	11	0	0	DI 8/DQ 6	
😟 Online & Diagnostica													AI 2_1	1.2	6467		AI 2	
🕨 🛃 Blocchi di programma			103	102	101		1		2	3				13				
Oggetti tecnologici		Telaio di montagg				SILMENS					1		HSC_1	1 16	100010		HSC	
 Sorgenti esterne 											1		HSC_2	1 17	100410		HSC	
Variabili PLC											1		HSC_3	1.18	100810		HSC	
Tipi di dati PLC						11		CP 2 + 0+ 02			4		HSC_4	1 19	101210		HSC	
Tabella di controllo e di forzamento											2		HSC 5	1 20	101610		HSC	
Backup online													HSC 6	1.21	102010		HSC	
🕨 🔄 Traces													Pulse 1	1 32		100010	Generatore di impulsi (.	
Dati proxy dei dispositivi							_						Pulse 2	1 33		100210	Generatore di impulsi (.	
Informazioni sul programma													Pulse_3	1 34		100410	Generatore di impulsi (
Elenchi di testi di segnalazione PLC													Pulse_4	1 35		100610	Generatore di impulsi (
Moduli locali											1		Interfaccia PROFINET_1	1 X1			Interfaccia PROFINET	
🕨 🔙 Dispositivi non raggruppati											1			2				
 Impostazioni Security 														з				
 Funzioni oltre i limiti del PLC 																		
Dati comuni																		
Informazioni sul documento																		
Lingue & Risorse											~							
Accessi online		< 11			>	100%		•				<					Ш	
ig Card Reader/memoria USB																		

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





PLC_1 [CPU 1212C] 💌 🖽 🖭 📠 🛄 🔍 ± Vista generale dispositivi 🐈 ... Modulo 103 102 101 2 Telaio di montagg. PLC_1
 DI 8/DQ 6_1 AI 2_1 ñ HSC_1 HSC_2 HSC_3 HSC 4 HSC_5 HSC_6 Pulse_1 Pulse_2 > 100% < -Variabile IO Costanti di sistema ienerale Testi ienerale Indirizzi Ethernet Informazioni sul progetto Informazione catalogo Interfaccia collegata a Identification & Mainten. Somme di controllo PN/IE_1 Sottorete nterfaccia PROFINET [X1] Generale Indirizzi Eth Protocollo IP Sincronizzazione dell'ora Modo di funzionamento Imposta indirizzo IP nel progetto • Opzioni avanzate Indirizzo IP: 192 168 . 90 Accesso al server web Maschera di 1 8/DO 6 sottorete 255 12 Utilizza router ontatori veloci (HSC)

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

Move on to "devices and network" view:

On the right select "Hardware Catalogue" and then under "Additional Field Equipment" -> PROFINET IO -> GATEWAY -> Seneca SRL - ZR-KEY-P Gateway-> ZRKEY-P Gateway Agent Master





Drag the device to the network view:

ZKEY_P_AGENT_MS_Test_Array → Disposi	tivi & Reti
Collega in rete	ito HMI 🔽 👯 🖫 🖽 🛄 🔍 ±
PLC_1	ZRKEY-P
CPU 1212C	ZRKEY-P Gatew DP-NORM

Now associate it with the PLC:

Click with the left mouse button on "Not assigned" and then select the PLC:

PLC_1 CPU 1212C	ZRKEY-P ZRKEY-P Gatew DP.NORM Non as detection a IO Controller PLC_1.Interfacia RPOFINET_1
PN/IE_1	

PLC_1 CPU 1212C				4 Sistema IO
PLC_1.PROFINET IO-Syste	PLC_1 CPU 1212C	PLC_1.PR	ZRKEY-P ZRKEY-P Gatew PLC_1 DFINET IO-Syste	DP-NORM



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





Depending on the project it is necessary to set the cycle time (typically 128 ms):

		=	 ZRKEY-P 	0	0			ZRKEY-P Gateway A
.8			PN-IO	0	0 X1			ZRKEY-P
THET			 INPUT ARRAY 2 BYTE_1 	0	1	6869		INPUT ARRAY 2 BYTE
N.			INPUT ARRAY 2 BYTE	0	1.1	6869		INPUT ARRAY 2 BYTE
			 OUTPUT ARRAY 2 BYTE_1 	0	2		6465	OUTPUT ARRAY 2 B
			OUTPUT ARRAY 2 BYTE	0	2.1		6465	OUTPUT ARRAY 2 B
			 global diagnostic read byte_ 	10	3	1		global diagnostic r
			ARRAY 1 BYTE	0	3.1	1		ARRAY 1 BYTE
	DF-NORM		 Port#1 diagnostic modbus d. 	0	4	25		Port#1 diagnostic
		-	ARRAY 4 BYTE	0	4.1	25		ARRAY 4 BYTE
			 Port#2 diagnostic modbus d. 	0	5	69		Port#2 diagnostic
		-	ARRAY 4 BYTE	0	51	69		ARRAY 4 BYTE
		_						
		~						
>	100%	- Y		11				
-P Gateway Agent			🔍 Proprie	età	Infor	mazioni	👔 🖏 Dia	agnostica 🛛 🗆 🖃
Variabila IO								
variablie iO Co	ostanti di sistema 🔰 Testi							
,	 Ciclo IO 							
ul catalogo								
NET[X1]	Tempo di aggiornamento							
net		 Calcola automatica 	mente il tempo di aggiornamento					
zate		Imposta manualme	nte il tempo di aggiornamento					
ll'interfaccia		420.000						
oni Realtime	iempo di aggiornamento:	128.000						ms 💌
	_							
1]		Adegua il tempo di	aggiornamento se viene modificato l'ir	ntervallo	di trasmi	issione		
	Tempo di controllo risposto							
	rempo ur controllo risposta							
	Cicli di angiomamonto							
	accettati senza dati IO:	3						
	Torres di controllo siconeter	384.000						
	iempo ui controllo risposta:	504.000						ms

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



GATEWAY PROFINET – ETHERNET/IP

Z-KEY-P [Z-KEY-P Gateway] 💌 🖽 🖭	: 🛄 💐 ±	Vista generale dispositivi
	<u>*</u>	Modulo
		Z-KEY-P
		- PN-10
A CONTRACTOR OF		
DP-NC	RM	
	Sostituisci dispositivo	7
	Scrivi nome dispositivo nella micro memory card	
	Avvio Device Tool in corso	
	🗶 Taglia Ctrl+X	
	🗓 Copia Ctrl+C	
	Incolla Ctrl+V	
	🗙 Elimina Canc	
	🚚 Vai alla vista topologica	
	🚠 Vaialla vista di rete	
	Compila	
	Carica nel dispositivo	
	🚽 💋 Collega online 🛛 🛛 Ctrl+K	
:Y-P [Z-KEY-P Gateway]	🔊 Interrompi collegamento online 🛛 🤇 Ctrl+M	
enerale Variabile IO Costanti di siste	U Online & Diagnostica Ctrl+D	
enerale	Assegna nome al dispositivo	
Indirizzi	Aggiorna e visualizza operandi forzati	
terfaccia PROFINET [X1]	Riferimenti incrociati	
Generale	Informazioni sui riferimenti incrociati Maiusc+F11	
Indirizzi Ethernet	Visualizza catalogo Ctrl+Maiusc+C	
Opzioni avanzate	➡ Esporta etichette di siglatura per moduli	1
Opzioni dell'interfaccia	Proprietà Alt+Invio	[_]
✓ Impostazioni Realtime Proto	collo IP	
Ciclo IO		
▼ Port 1 [X1 P1]	Indirizzo IP: 192 . 168 . 90 . 48	
Generale	Maschera di sottorete: 255 255 255 0	
Collegamento porta		
Opzioni delle porte	Sincronizza le impostazio	oni di router con lo controller

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



The IO configuration has already been prepared having imported the GSDML project (otherwise if you have imported the generic GSDML file "Gateway All" you must drag the correct number of read/write bytes):

ositivi non raggruppati 🕨 ZRKEY-P [ZRKEY-P Gateway Agent Master] 🛛 🗖 🗖											∎×	
🖉 Vista top								gica	📥 Vista d	li rete	🛿 Vista dispositiv	i
t 🔏 🗄 🛄 🔍 t		Vista generale dispositivi										
		^		**	Мо	dulo	Telaio	Posto	Indirizzo I	Indirizz	Тіро	N
		=			•	ZRKEY-P	0	0			ZRKEY-P Gateway A	Z
						PN-IO	0	0 X1			ZRKEY-P	
10 input 🗕		put			•	INPUT ARRAY 2 BYTE_1	0	1	6869		INPUT ARRAY 2 BYTE	
					INPUT ARRAY 2 BYTE	0	11	6869		INPUT ARRAY 2 BYTE		
		_	-		•	OUTPUT ARRAY 2 BYTE_1	0	2		6465	OUTPUT ARRAY 2 B	
						OUTPUT ARRAY 2 BYTE	0	21		6465	OUTPUT ARRAY 2 B	
					•	global diagnostic read byte_	0	3	1		global diagnostic r	
DP NOPM					•	Port#1 diagnostic modbus d.	. 0	4	25		Port#1 diagnostic	
Dranoran					•	Port#2 diagnostic modbus d.	. 0	5	69		Port#2 diagnostic	
			-									
			Þ									
			-									

In particular, the 10 inputs are available at addresses I68 and I69 while the outputs are located at addresses Q64 and Q65.

Now the devices are configured, all that remains is to compile and send the configuration to the PLC.



To compile we select the complete hardware compilation:

Vî₿	Siemens - C:\Users\Mos	chi	n\Desktop\a\ZR-KEY-P\ZR-KE\	Y-P\Z	KEY_	P_AGENT_	MS_Test	_10DIN10DOUT\ZKE	Y_P_AGENT_MS_	_Test_1
Pro	ogetto Modifica Visualizza		Inserisci Online Strument	i Te	ool	Finestra	?			
	🕫 🍽 🔲 Salva progetto 📃			島		ir 💷 🖪		ega online 🛷 Interro	mpi collegamento (online
_										
	Navigazione del progett	0	Ш		ZK	EY_P_AGE	NI_MS_	lest_10DIN10DO	JT → PLC_1 [CF	20 1212
	Dispositivi									
		_		7	⊒ž¢	$\equiv \tilde{e}_{\mathcal{F}}^{b} = \mu \tilde{e}_{\mathcal{F}}^{b}$	19 In	9. 9. 2 00 00		
2					-		me	Indirizzo	Formato visi	ualizz N
2	▼ TO ZKEY P AGENT MS TE	t 1	ODIN10DOUT		1	* "D	IN1"	%168.0	Bool	
.ē	Angiungi puovo dis	0.05	dentro e e e i		2	"D	IN2"	% 68.1	Bool	
naz	Dispositivi & Petr		avo		3	"D	IN3"	%168.2	Bool	
	▼ PLC 11CPU 1212C		ריהכ]		4	- "D	1N4"	%168.3	Bool	
16	Configurazione		Sostituisci dispositivo				N5"	%168.4	Bool	
E	🖳 Online & Diagno		Apri				N6"	%168.5	Bool	
	🔻 🔚 Blocchi di progra		Apri nel nuovo editor				N7"	%168.6	Bool	
	📑 Inserisci nuo		Apri blocco/tipo di dati PLC			F7	N8"	%168.7	Bool	
	💁 Main [OB1]	V	Taglia			Ctrl+X	N9"	%169.0	Bool	
	🕨 🔛 Oggetti tecnolo	ĥ	Соріа			Ctrl+C	N10"	%169.1	Bool	
	🕨 🔚 Sorgenti esterni	ĥ	Incolla			Ctrl+V	DUT1"	%Q64.0	Bool	
	💌 🚂 Variabili PLC	~	Elimina			Cane	DUT2"	%Q64.1	Bool	
	lange de la constractute la constractute la constractute la construcción de la construcci	~	Rinomina			E2	DUT3"	%Q64.2	Bool	
	📑 Aggiungi nuo	-				12	DUT4"	%Q64.3	Bool	
	📲 Tabella delle	ŝ,	Vai alla vista topologica				DUT5"	%Q64.4	Bool	
	🔻 📑 Tipi di dati PLC	ሙ	Vai alla vista di rete				DUT6"	%Q64.5	Bool	_
	📑 Aggiungi nu	*	Compila			•	Hard	lware e software (solta	nto modifiche)	
	🔻 뻱 Tabella di contro		Carica nel dispositivo			•	Hard	lware (soltanto modifi	:he)	-
	📑 Aggiungi nuo	_	Carica backup del dispositivo	onlin	e		Hard	lware (compilazione c	ompleta)	
	畏 Tabella di co	2	Collega online			Ctrl+K	Softv	vare (soltanto modific	he)	
	🔠 Tabella di for	1	Online & Disgnastics	1e		Ctrl+M	Softv	vare (compliazione co vare (recetta ricenza d	imomoria)	
	🕨 🙀 Backup online	6	Online & Diagnostica			Ctri+D	5000	ware (resetta riserva d	(memona)	
	🕨 🔀 Traces	-	Istantanea dei valori attuali							

Then press icon to send the project to the PLC:

_ ₩ A	Siemens - C:	Users\Mosch	nin\Desktop	olalZR-KEY	(-PVZR-KEY	-P\ZI	KEY_	P_AGEN	T_MS_Test	_10DIN	10DOUT\ZKI
P	ogetto Modifica	Visualizza	Inserisci	Online	Strumenti	То	ool	Finestra	?		
	🛉 📑 🔚 Salva pro	ogetto 昌	Х 🗉 🗈	X 🔊	± C ^{al} ±	6		li 🖳	🖣 💋 Coll	ega onlin	ie 🚀 Interro
	Navigazione d	el progetto				◄	Z	Y_P_A	GENT_MS_	Test_1	0DIN10DO
	Dispositivi]						\backslash			
	Ĩ					2	,	₫ <i>1</i>	: 17 Io	I %	Ø °⊳ °C
ž								i \'	Nome	- 1	ndirizzo
8	ZKEY_P_AG	ENT_MS_Test	10DIN10DC	UT		^	1		DIN1"		%168.0
Zio	📑 Aggiung	i nuovo dispo	ositivo				2	SEND	DIN2		%168.1
Ē	📩 Disposit	ivi & Reti					3	JENU	DIN3		%168.2





	Nodi di accesso c	onfigurati di "PLC_1"				
	Dispositivo	Tipo di dispositivo	Posto c	Tipo di inte	rfa., Indirizzo	Sottorete
	PLC_1	CPU 1212C DC/D	1 X1	PN/IE	192.168.90.44	PN/IE_1
		Tino di interfaccia F	GIPC	PN/IE		
		Interfaccia F	G/PC	Broadcom	NetLink (TM) Gigabit Et	hernet 💌 🕅
	Collegamen	to con l'interfaccia/la sotte	vete:	PN/IE 1	Neterik (IIII) digabit et	
	conegamen	to contrintenacciana soci	nete.	110021		• •
			eway:			V
	Selezionare il siste	ema di destinazione:			Visualizza tutti i noo	li compatibili
	Dispositivo	Tipo di dispositivo	Tipo di	interfaccia	Indirizzo	Dispositivo di des.
	plc_1	S7-1200	PN/IE		192.168.90.44	-
-	-	-	PN/IE		Indirizzo di accesso	-
					\sim	
LED lampeggia						
LED lampeggia						Avvia ricerca
LED lampeggia	online:				🗌 Visualizza solo m	<u>Avvia ricerca</u> essaggi di errore
LED lampeggia formazioni sullo stato Dispositivo accessi	online: bile trovato r16di8do				🗌 Visualizza solo m	<u>Avvia ricerca</u> essaggi di errore
LED lampeggia formazioni sullo stato Dispositivo accessi Ricerca terminata. S	online: bile trovato r16di8do Sono stati trovati 1 nc	idi compatibili su 3 nodi a	ccessibili		🗌 Visualizza solo m	Avvia ricerca
LED lampeggia formazioni sullo stato Dispositivo accessi Ricerca terminata. 3 ? Richiamo informazio	online: bile trovato r16di8do Sono stati trovati 1 nc oni sui dispositivi in c	odi compatibili su 3 nodi a orso	ccessibili		🗌 Visualizza solo m	Avvia ricerca
LED lampeggia formazioni sullo stato Dispositivo accessi Ricerca terminata. 5 Richiamo informazi Scansione e richies	online: bile trovato r16di8do Sono stati trovati 1 nc oni sui dispositivi in c ta informazioni concl	di compatibili su 3 nodi a orso use. È stato rilevato 1 prol	ccessibili olema.		🗌 Visualizza solo m	Avvia ricerc

Let's go online to check if there are any errors:

ti		Tool	Fi	nesti	ra 3	_		_		
	٦	1			BT	ø	Collega	online	ø	🕻 Interrompi collegamento online 🛛 🛔 🖪 🗶 😑
		1	est_	Prj	▶ D	isp	ositivi r	non ra	99	

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

Progetto Modifica Visualizza Inserisci Online Strumenti	Tool Finestra ?
🌁 🔁 🔚 Salva progetto 🛛 📇 💥 🗉 🛍 🗙 🏷 ± (주 ± 🖷	🗄 🗓 🌆 🖳 🧖 Collega online 🧭 Interrompi collegamento online 🏭 🖪 🗲
Navigazione del progetto	🛛 🛛 Progetto_1006Z-KeyP 🕨 Dispositivi non raggruppati 🕨 Z-KEY-P (Z-KEY-P 0
Dispositivi	🖉 Vista topologica 👔
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	🔐 Z-KEY-P [Z-KEY-P Gateway] 🔽 🖽 🔛 🕼 🕰 🛄 🔍 生 📑
	<u>^</u>
🔻 🔄 Progetto_1006Z-KeyP 🛛 🗹 🧲	
👻 🚰 PLC_1 [CPU 1212C DC/DC/DC]	
🕨 🕞 Blocchi di programma 🥥	, Cart
. 🕨 🙀 Oggetti tecnologici	Litt
Sorgenti esterne	
🕨 🕞 Variabili PLC 🖉	
🕨 🫅 Tipi di dati PLC	
Tabella di controllo e di forzamento	
Backup online	
🕨 💽 Traces	DP-NORM
🚆 Dati proxy dei dispositivi	
🕨 🕩 🧰 Moduli locali	
🕨 🕅 Periferia decentrata 🛛 🗹	
🔻 🚂 Dispositivi non raggruppati	
Z-KEY-P [Z-KEY-P Gateway]	
🕨 📷 Impostazioni Security	
Funzioni oltre i limiti del PLC	
Dati comuni	
Informazioni sul documento	
Cingue & Risorse	
Accessi online	~



It is also possible to read and write the IO (for debugging purposes) directly from the TIA portal. Then define the variables for the PLC referring to the above addresses:

Weight Siemens - C:\Users\Moschin\Desktop\a\ZR-KEY-P\ZR-KE	Y-P\Z	KEY_I	P_AGE	NT_MS_Test_	10DIN10DOUT	KEY_P_AGEN	T_MS_Test_10D	IN10D	OUT					
Progetto Modifica Visualizza Inserisci Online Strument	ti To	ool I	Finestr	a ?										
📑 📑 🔚 Salva progetto 📑 💥 🛅 🛅 🗙 🍤 🛨 (주 🛨			î 🛄	🖫 💋 Colleg	ga online 🖉 Inte	errompi collegan	nento online 🛛 🖁	2 🖪	*		Sfogl	ia progett	0>	
Navigazione del progetto		ZKE	Y_P_#	GENT_MS_T	est_10DIN10D	DOUT + PLC	_1 [CPU 1212C	DC/D	C/DC])	Variat	ili PLC	Tabel	lla delle variabili standa	ard [60]
Dispositivi													🕢 Variabili	Costar
	-				4									
		1		a dollo varial	bili standard									
T TKEY P AGENT MS Test 100IN1000UT	•	<u> </u>	aben		bill standard	Tipo di dati	Indirizzo		Ditent	Acces	Scrivi	Visibil	Commento	
		1				Bool	%168.0		Riteriz	Acces			commento	
Dispositivi & Reti		2		DINZ		Bool	%168.1							
		3	-	DINB		Bool	%168.2				H			
Configurazione dispositivi		4	-	DIN4		Bool	%168.3				Ä			/
Conline & Diagnostica		5	-	DIN5		Bool	%168.4							
👻 🔜 Blocchi di programma		6	-	DIN6		Bool	%168.5				Ä			
Inserisci nuovo blocco	=	7	-00	DIN7		Bool	%168.6				Ä			
- Main [OB1]		8	-00	DIN8		Bool	%168.7				Ē			
Dggetti tecnologici		9	-00	DIN9		Bool	%169.0				Ā		*	
Sorgenti esterne		10	-00	DIN10		Bool	%169.1	-						
🔻 🚂 Variabili PLC		11		DOUT1		Bool	%Q64.0							
a Mostra tutte le variabili		12	-00	DOUT2		Bool	%Q64.1							
📑 Aggiungi nuova tabella delle variabili		13	-00	DOUT3		Bool	%Q64.2							
🝯 Tabella delle variabili standard [60] 🎽		14	-00	DOUT4		Bool	%Q64.3							
🔻 💽 Tipi di dati PLC		15	-00	DOUT5		Bool	%Q64.4							
💣 Aggiungi nuovo tipo di dati		16	-00	DOUT6		Bool	%Q64.5							
🔻 🤙 Tabella di controllo e di forzamento		17	-00	DOUT7		Bool	%Q64.6							
📑 Aggiungi nuova tabella di controllo		18	-00	DOUT8		Bool	%Q64.7							
🔛 Tabella di forzamento		19	-00	DOUT9		Bool	%Q65.0							
Backup online		20	-00	DOUT10		Bool	%Q65.1							
🕨 🔀 Traces		21		<aggiungi></aggiungi>										
Comunicazione OPC IIA														

And then define a control table:

	Navigazione del progetto			ZKI	Y_P_AGENT_N	MS_Test_10DIN10DC	UT 🕨 PLC_1 [CPU	1212C DC/DC/DC] •	Tabella di cor	ntrollo e di f	orzamento 🕨 Tabel
	Dispositivi								1		
			2	ý	🥐 🖉 📝 I	o 🔊 % % 🐨 *	2h 1				
딡					i Nome	Indirizzo	Formato visua	lizz Valore di controllo	Valore di coman	do 🐬	Commento
e	ZKEY_P_AGENT_MS_Test_10DIN10DOUT		~	1	"DIN1"	%168.0	Bool	FALSE			
zio	Aggiungi nuovo dispositivo			2	"DIN2"	% 68.1	Bool	FALSE			
ä	Dispositivi & Reti			3	"DIN3"	%168.2	Bool	FALSE			
E	PLC_1 [CPU 1212C DC/DC/DC]			4	"DIN4"	%168.3	Bool	FALSE			
l b	Configurazione dispositivi			5	"DIN5"	%168.4	Bool	FALSE			
ž	🖏 Online & Diagnostica			6	"DIN6"	%168.5	Bool	FALSE			
	 Blocchi di programma 	•		7	"DIN7"	%168.6	Bool	FALSE			
	Inserisci nuovo blocco		=	8	"DIN8"	%168.7	Bool	FALSE			
	Main [OB1]	•		9	"DIN9"	%169.0	Bool	FALSE			
	🕨 🏣 Oggetti tecnologici			10	"DIN10"	%169.1	Bool	▼ ■ FALSE			
	Sorgenti esterne			11	"DOUT1"	%Q64.0	Bool	TRUE	TRUE		
	🔻 🔚 Variabili PLC	•		12	"DOUT2"	%Q64.1	Bool	TRUE	TRUE	🗹 🔺	
	🍇 Mostra tutte le variabili			13	"DOUT3"	%Q64.2	Bool	TRUE	TRUE	🗹 🔺	
	💕 Aggiungi nuova tabella delle variabili			14	"DOUT4"	%Q64.3	Bool	TRUE	TRUE	🗹 🔺	
	💥 Tabella delle variabili standard [60]			15	"DOUT5"	%Q64.4	Bool	TRUE	TRUE	🗹 🔺	
	🔻 💽 Tipi di dati PLC	1		16	"DOUT6"	%Q64.5	Bool	TRUE	TRUE	🛛 🗹 🔺	
	📑 Aggiungi nuovo tipo di dati			17	"DOUT7"	%Q64.6	Bool	TRUE	TRUE	🗹 🔺	
	🔻 🛄 Tabella di controllo e di forzamento			18	"DOUT8"	%Q64.7	Bool	TRUE	TRUE	🗹 🔼	
	🚔 Aggiungi nuova tabella di centrollo			19	"DOUT9"	%Q65.0	Bool	TRUE	TRUE	🛛 🗹 🔺	
	Tabella di controllo_1 🚩			20	"DOUTIC	0"%Q65.1	Bool	TRUE	TRUE	🛛 🗹 📥	
	Tabella di forzamento			21		<aggiungi></aggiungi>					
	🕨 📴 Backup online										
	🕨 🔀 Traces		- H		<						
	Comunicazione OPC UA										🔍 Proprietà
	Dati proxy dei dispositivi			6	enerale R	iferimenti incrociati	Compila				
	📴 Informazioni sul programma					in entitiente interociati					
	🔄 Elenchi di testi di segnalazione PLC			ω	🔼 🚺 Visualia	zza tutti i messaggi	~				
	🕨 🧊 Moduli locali	~									
	Periferia decentrata	~		1	Messaggio				Vai a	? Dat	a Ora
	🔻 🛄 Dispositivi non raggruppati			4	Andare onlin	e: la configurazione HW	di PLC 1 è stata modif	icata ma non è ancora co	omnilata	26	04/2023 11:32:09

Here it is now possible to read inputs and force write outputs.

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5.1.2. "PROFINET IO - MODBUS SLAVE GATEWAY" CONFIGURATION

You want to connect a Siemens[™] PLC to another PLC connected to serial port 1. The serial PLC supports the Modbus Master protocol.

In the example we will use the Z-KEY-P product (the steps are exactly the same for the other R-KEY-LT-P and Z-KEY-2ETH devices).

Suppose you want to exchange 10 bytes from the serial PLC to the Siemens PLC and 5 bytes from the Siemens PLC to the serial PLC.

First we disconnect the PLC from the Ethernet network.

Now we use the Easy Setup 2 software selecting the Z-KEY-P product (with SCAN or in manual entry):

Launcher di EASY SETUP 2 [v1.2.7.	7]		-				-		×
	1 Sele	eziona una sorg	ente di ricero	ca					
	Ricerca v	ia Ethernet							
	2 Cer	ca moduli in ret	e						
	Selezi	Nome	Indirizzo	Mac	Versio	ne Ping			
		R-KEY-P-HWD [WEB	192.168.85.133	C8:F9:81:11:	22:33 200.0	1 ms			
EASY Setup app	M	Z-KEY-P-HWF [PFN]	192.168.90.1	C8:F9:81:0C:	2A:E1 1810.2	04 0 ms			
Cercala su Google Play Store	2 found	4							
	LIOUN								
Imposta Lingua	Tutti/Ne	ssuno/Inverti P	rofinet/Web	Aggiorna FW	Assegna IP	Scansiona		Ferma	
ITALIANO v		Esci				3	Avan	ti	

At this point the device access password is requested (default: admin):

Inserire la password		
Z-KEY-P-HWF ETH 192.168.90	0.1 (MAX 6 car.)	
J	Ok	Cancel

Once the password has been entered, select the Profinet IO Device / Master slave Gateway mode:



SENECA Facy Satury 2 v1 2 7 7		
New Open Save	Save as Read all	Send al
Type: ETH Scan	ETH 192.168.90.1 CONNECT	FW Ver: 204 Open Webserver
 SENECA Easy Setup 2 Project 	Z-KEY-P-HWF	
Z-KEY-P-HWF		
	Ethernet Serial Ports We	b / Security Modbus ICP-IP Custom devices
	Device Mode	PROFINET *
		Select the Z-KEY-P communication mode: - PROFINET: only the Profinet protocol is active WER SERVEP: only the way hencer I active
	Working Mode	Gateway Profinet IO Device / Modbus Slave
		Select the 2-KEY working mode. It is possible to choose between: - GATEWAY FAOTINET 10 DEVICE / MODBUS MASTER - GATEWAY FRONTENT 10 DEVICE / MODBUS SAVE
	IP Address	192.168.90.1
		Sets the device static address. Careful not to enter devices with the same IP address into the same network.
	MASK	255.255.255.0
		Set the mask for the IP network.
	Gateway	192.168.90.1
	TCP/IP Port	502
	ici ya ron	Sets the communication port for the Modbus TCP-IP server protocol.
	TCP/IP Timeout	512
		Sets the communication timeout for the Modbus TCP-IP server protocol.

Enter the profinet name of the device:

Ethomat Sarial Bartz Web / Security Made	ULTER IR COMMANDS IN Managing Curtage devices						
Web / Security							
Port	80						
	Sets the communication port for the web server.						
User name	admin						
WEB server and Configuration Password	admin						
·····	Sets the password to access the web server and to read/write the configuration (if enabled).						
IP Change from Discovery	V						
	Selects whether or not the device accepts the IP address change from the Seneca Discovery Device software.						
Profinet Name	zrkey-p						
	The Profinet name to associate to the device						



Check that serial port 1 is configured correctly for the serial PLC:

RS485 NR 1		
Modbus Protocol	RTU ~	
	Sets the protocol on the serial between Modbus RTU or Modbus ASCII	
Baud rate	38400 BAUD 🗸	
	Selects the communication speed of the COM #1 serial port (on IDC10 connector).	
Data	8 Bit v	×
	Sets the number of data bits for the COM #1 serial communication port (on IDC10 connector).	
Stop bit	One ~	
	Sets the number of stop bits for the COM #1 serial communication port (on IDC10 connector).	
Parity	NONE	
	Sets the parity for the COM #1 serial communication port (on IDC10 connector).	
Timeout (ms)	200	
	Sets the timeout (in ms) on Modbus Master mode before making a new call for the COM #1 serial communication port (on IDC10 connector).	
Max Writing Retries Number	3	
	Sets the number of the retries to write a Modbus register into the Modbus Master mode for the COM #1 serial communication port (on IDC10 connector)	
RS485/RS232 NR 2		
Modbus Protocol	RTU v	

Now let's send the configuration to the device with the "send" button:



We can now move on to configuring the PLC via Tia Portal™:



Creating a new project:

Vîa	Siemens - C:\Users\Laborato	orio_iot\Docume	ents \Automation	n\Test_F	Prj\Test	_Prj		
Pr	ogetto Modifica Visualizza	Inserisci Onli	ne Strumenti	Tool	Finestra	2		
F	Apri Migrazione progetto	Ctrl+O	<u>ש + ש + מיי</u>			RT 🔊	Collega online	int 🛃
	Chiudi Elimina progetto	Ctrl+W Ctrl+E		•				
6	Salva Salva con nome Archivia	Ctrl+5 Ctrl+Maiusc+5						
	Server di progetti	•						
	Card Reader/memoria USB File della memory card	> >						
	Avvia controllo di base della co	erenza						
	C:\Users\Laboratorio_iot\Docum C:\Users\Laboratorio_iot\Docum	nen\Test_Prj n\Progetto2						00110

Install the GSD file of the Seneca product:

The Siemens - C:\Users\Laboratorio_iot\Documents\Automation\Test_Prj\Test_Prj					
Progetto Modifica Visualizza Inserisci Online	Strumenti Tool Finestra ?				
🔄 🔄 🔚 Salva progetto 📑 🔏 🖽 💵 🗡 🏹	nline M Interrompi collegamento				
Navigazione del progetto	Support package				
Dispositivi	Gestisci file di descrizione dispositivo				
	Avvia Automation License Manager				
	🔮 Visualizza testo di riferimento				
▼ Test Pri	🛄 Biblioteche globali 🕨				
😤 🎽 Aggiungi nuovo dispositivo					
🗧 🛗 Dispositivi & Reti					
🕨 🔚 Dispositivi non raggruppati					
🕨 📷 Impostazioni Security					
Funzioni oltre i limiti del PLC					
s Maria da Cara					

For the Modbus Slave mode, the GSDML file is generic and can be downloaded from the <u>www.seneca.it</u> website in the gateway section of the key-p series.

Point to the directory where you saved the GSDML file and press INSTALL.



	Gestio	ne file di descrizione dispositivo	_		
	GSD	installati GSD nel progetto			
=	Perco	so di origin C:\Users\Moschin\Desktop\a\ZR-KEY-P\GSDML_NEWGSDI	ML ZRKEY-P 20	23-04-21]
	Cont				
			Versione	Lingua	Stato
		COMILA/2 2-SENEC 4-7KEVP-GATEWAY-AGENT-SLAVE-20230421 vm	V2 2	Inglese	Già inc
1		SDML-V2.2-SENECA-7RKEYP-GATEWAY-20230419 xml	V2.2	Inglese	Già ins
4		DML-V2.2-SENECA-ZRKEYP-GATEWAY-PROFINET-IO-ALL-20230419	V2.2	Inglese	Già ins
			×		
ia	<				>
-				*	
		c	ancella	Installa	Annulla
- 2				A	

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

Vîŝ	Siemens - C:\Users\Laboratorio_iot\Documents\Automation\Test_Prj\Test_Prj
Pr	ogetto Modifica Visualizza Inserisci Online Strumenti Tool Finestra ?
	ኛ 🖪 Salva progetto 🚇 🐰 🗉 🛍 🗙 🥱 ± ርቶ ± 🗟 🗓 🖬 🚇 🥵 💋 Collega online 🖋 Interromp
	Navigazione del progetto
	Dispositivi
	🔻 🔄 Test_Prj
Ę.	🚰 Aggiungi nuovo dispositivo 🧹 👘 👘
¥	Dispositivi & Reti
	🕨 🖳 Dispositivi non raggruppati
	🕨 🔤 Impostazioni Security
	Funzioni oltre i limiti del PLC
	🕨 🙀 Dati comuni
	Informazioni sul documento
	🕨 🐻 Lingue & Risorse
	🕨 🔚 Accessi online
	🕨 i Card Reader/memoria USB



Aggiungi nuovo dispositivo > Nome dispositivo: PLC_1 🛨 🛅 Controllori ~ Dispositivo: SIMATIC \$7-1200 🛨 🛅 CPU CPU 1211C AC/DC/Rly Controllori CPU 1211C DC/DC/DC CPU 1211C DC/DC/Rly CPU 1212C DC/DC/DC CPU 1212C AC/DC/Rly - CPU 1212C DC/DC/DC N° di articolo: 6ES7 212-1AE40-0XB0 6ES7 212-1AD30-0XB0 6ES7 212-1AE31-0XB0 нмі Versione: V4.3 6ES7 212-1AE40-0XB0 \equiv Descrizione: CPU 1212C DC/DC/Rly CPU 1214C AC/DC/Rly Memoria di lavoro 75KB; alimentazione DC24V con DI8 x DC24V SINK/SOURCE, DQ6 x DC24V e CPU 1214C DC/DC/DC Al2 on board; 4 contatori veloci (ampliabili con CPU 1214C DC/DC/Rly signal board digitale) e 4 uscite a impulsi on Sistemi PC board; signal board di ampliamento degli I/O on CPU 1215C AC/DC/Rly board; fino a 3 moduli per la comunicazione seriale; fino a 2 unità di ingressi/uscite per CPU 1215C DC/DC/DC CPU 1215C DC/DC/Rly ampliamento degli I/O; interfaccia di programmazione PROFINET, comunicazione HMI CPU 1217C DC/DC/DC e da PLC a PLC

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 for the PLC (in this case 192.168.90.44) and the PLC subnet:



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MI00585-6-EN



Move on to "devices and network" view:

On the right select "Hardware Catalogue" and then under "Additional Field Equipment" -> PROFINET IO -> GATEWAY -> Seneca SRL -> ZR-KEY-P Gateway -> ZRKEY-P Gateway Agent Slave



Drag the device to the network view:

ZKEY_P_AG	GENT_MS_Test_Array ► Dispositivi & Reti	
🕞 🖁 Collega in i	in rete 🔡 Collegamenti Collegamento HMI	🔽 🕎 📲 🖿 🛄 🍳 ±
PLC_1 CPU 1212C	C ZRKEY-P ZRKEY-P (Non asseg	Gatew DP-NORM
PN/IE_1		

Now associate it with the PLC:


Click with the left mouse button 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) and the timing:



Depending on the project it is necessary to set the cycle time (typically 128 ms):

	> 100	s 💌		•	<					
-P Gateway Ag	ent Mas	iter]					🔍 Proprietà	🚺 Informazioni	🚯 没 Diagnostica	
Variabile IO	Costa	nti di sistema 🛛 T	esti							
ul catalogo	· ·	Ciclo IO								
NET[X1]	Ten	npo di aggiornamente	0							
net			O Calcola	utoma	ticamente il te	empo di aggiorn	amento			
ate			Imposta	manua	Imente il temp	po di aggiornam	ento			
ll'interfaccia ni Realtime		Tempo di aggiorname	nto: 128.000							ms 💌
11			Adegua	il tempo	o di aggiornam	nento se viene n	nodificato l'intervi	allo di trasmissione		
	Ten	npo di controllo rispo	sta							
		Cicli di aggiorname	ento							_
		accettati senza dat	i IO: 3							
		Tempo di controllo rispo	ista: 384.000	_						ms



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

Z-KEY-P [Z-KEY-P Gateway] 💌 🖽 🖾	1 🛄 🔩 ±	Vista generale dispositivi
		A Modulo
		Z-KEY-P
		► PN-IO
DP-NO	RM	
	Sostituisci dispositivo	
	Scrivi nome dispositivo nella micro memory e	card -
	Avvio Device Tool In corso	
	💥 Taglia	Ctrl+X
	📳 Copia	Ctrl+C
	× Elimina	Canc
	🚝 Vai alla vista topologica	
	Vai alla vista di rete	
	Compila	•
	Carica nel dispositivo	
	💋 Collega online	Ctrl+K
Y-P [Z-KEY-P Gateway]	🔊 Interrompi collegamento online 🛛 🖓	Ctrl+M
enerale Variabile IO Costanti di siste	U Online & Diagnostica	Ctrl+D
nerale	Assegna nome al dispositivo	
Indirizzi	Aggiorna e visualizza operandi forzati	
terfaccia PROFINET [X1]	Riferimenti incrociati	Ph
Generale	Maius Maius	c+F11
Indirizzi Ethernet	Visualizza catalogo Ctrl+Mai	usc+C
Opzioni avanzate	Esporta etichette di siglatura per moduli	
Opzioni dell'interfaccia		
▼ Impostazioni Realtime Proto	Relia ID	+Invio
Ciclo IO		
▼ Port 1 [X1 P1]	Indirizzo IP: 102 168 00 4	8
Generale •	192 . 188 . 90 . 4	0
Collegamento porta	Maschera di sottorete: 255 . 255 . 255 . 0	
Opzioni delle porte	Sincronizza le impo	ostazioni di router con IO Controller

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

You said that you want to get the following map:

SERIAL PLC -> Writes 10 Byte on Modbus -> SIEMENS PLC Reads 10 Byte from Profine	t
SIEMENS PLC -> Writes 5 Bytes on Profinet -> SERIAL PLC Reads 5 Bytes from Modbus	;

The IO configuration must therefore be prepared:



NI_SL_Test_Array V Dispositivi non raggruppati V	ZRKET-P [ZRKET-P Ga	teway Agent Slavej						Catalogo nardware	el.
		📑 Vist	ta topolo	gica	📥 Vista	di rete	🛐 Vista dispositivi	Opzioni	
ZRKEY-P Gateway Ag 🗨 📰 🔛 🛄 🔍 生	🔄 🛛 Vista	generale dispositivi							
	<u>^</u> <u>*</u>	. Modulo	Telaio	Posto	Indirizzo I	Indirizz	Tipo N	✓ Catalogo	
	=	 ZRKEY-P 	0	0			ZRKEY-P Gateway A Z	<trova></trova>	iril
.8		PN-IO	0	0 X1			ZRKEY-P	Filtro Profilo: Juttis	T.
aller		 INPUT ARRAY 128 BYTE_1 	0	1	68195		INPUT ARRAY 128 B		-
1×		INPUT ARRAY 128 BYTE	0	11	68195		INPUT ARRAY 128 B		
		 OUTPUT ARRAY 128 BYTE_1 	0	2		64191	OUTPUT ARRAY 12		
		OUTPUT ARRAY 128 BYTE	0	21		64191	OUTPUT ARRAY 12		
			0	3					
			0	4				INPUT ARRAT 128 BYTE	
	-		0	5				INPUT ARRAY 128 BYTE	
	· · · · · ·			6				VRITE	
	-		0	•				OUTPUT ARRAY 128 BYTE	
	•		0	7				OUTPUT ARRAY 128 BYTE	
			0	8				OUTPUT ARRAY 128 BYTE	
								OUTPUT ARRAY 128 BYTE	
								✓ Modulo di intestazione	
								ZRKEY-P Gateway Agent Slave	
								▶ 📺 Sottomoduli	
								_	

Move one 128-byte array for inputs and another 128-byte array for outputs. You will only need 10 bytes for writing and 5 bytes for reading.

Now the devices are configured, all that remains is to compile and send the configuration to the PLC. To compile we select the complete hardware compilation:

Vá	Siemer	ıs - C:\l	Jsers\Mos	chir	\Deskto	p\a\ZR-l	(EY-P\Z	R-KEY-	P\ZK	(EY_	P_AGE	NT_	MS_Test_	10DIN10DOUTZ	KEY_P_AGENT_MS	_Test_1
Р	rogetto	Modifica	Visualizz	а	nserisci	Online	Stru	menti	То	ol	Finestr	а	?			
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	Disp	ositivi														
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E	🔻 🗋 Z	KEY_P_AGE	INT_MS_Te	st_1		OUT			^	1		*DI	N1"	%168.0	Bool	
Zjo		🎙 Aggiungi	i nuovo dis	posi	tivo					2		*DI	N2"	%168.1	Bool	
Ĩ	đ	🛯 Dispositi	vi & Reti							3		*DI	N3"	%168.2	Bool	
L E	- G	PLC_1	PU 1212C							4		וח"	N4"	%168.3	Bool	
5		🛛 🛛 Config	gurazione		Sostituis	ci dispos	itivo						N5"	%168.4	Bool	
2		🞖 Onlin	e & Diagno		Apri								N6"	%168.5	Bool	
		r 🔙 Blocc	hi di progr		Apri nel	nuovo ec	litor						N7"	%168.6	Bool	
_		📑 In:	serisci nuo		Apri bloo	:co/tipo d	i dati PL	.C				F7	N8"	%168.7	Bool	
		=🗖- Ma	ain [OB1]	Ж	Taglia						Ctr	+X	N9"	%169.0	Bool	
		• 🚂 Ogge	tti tecnolo		Copia						Ctr	+C	N10"	%169.1	Bool	
)	🛛 🐻 Sorge	enti estern	Ē	Incolla						Ctrl	+V	DUT1"	%Q64.0	Bool	
		r 📜 Varia	bili PLC	×	Elimina						Ca	nc	DUT2"	%Q64.1	Bool	
		🧠 🍇 M	ostra tutte	^	Rinomin	a						F2	оотз"	%Q64.2	Bool	
		📑 Ag	giungi nu		N		1						DUT4"	%Q64.3	Bool	
		🛛 🕌 Та	bella delle	5	varalla	vista top	ologica						DUT5"	%Q64.4	Bool	
		🛯 💽 Tipi d	i dati PLC	m	varalla	vista di re	ete						DUT6"	%Q64.5	Bool	
		📑 Ag	giungi nu		Compila							•	Hardv	vare e software (so	ltanto modifiche)	
		r 詞 Tabel	la di contre		Carica n	el dispos	itivo					•	Hardv	vare (soltanto mod	lifiche)	-
		📑 Ag	giungi nu		Carica b	ackup de	l dispos	itivo or	nline				Hardv	vare (compilazione	completa) 🧖	
		Щ, Та	bella di co	1	Collega	online					Ctr	+K	Softw	are (soltanto modi	fiche)	
		Б Та	bella di foi	1	Interrom	pi colleg	amento	online			Ctrl	+M	Softw	are (compilazione	completa)	
)	• 📴 Backı	up online	6	Online 8	Diagnos	tica				Ctrl	+D	Softw	are (resetta riserva	a di memoria)	
		🛛 🔜 Trace	s	10.	Istantan	ea deiva	lori attu	uali								

Then press icon to send the project to the PLC:



Via Siemens - C:\U	lsers\Moschi	in\Desktop\a	a\ZR-KEY-P	ZR-KEY-P	ZKEY_P_AG	ENT_MS_Test	_10DIN10DOUT\ZKI
Progetto Modifica	Visualizza	Inserisci (Online St	rumenti	Tool Fines	tra ?	
📑 📑 🗖 Salva proc	netto 🔳	V En fa	× 5+	a+ 🔜	🔟 ira 😐	🛛 🖪 🥑 Colle	ega online 🚿 Interro
			~ -			RT	
Navigazione de	l progetto				ZREY_P_	AGENT_MS_	lest_10DIN10D0
Dispositivi					$ \rangle$		
- Fein				🔲 🔿	- =\$ =\$	ما فقر	4. 4. 4. 00 00
3					\	Man	r i roj rov - >
		1000110000	-			Nome	Indirizzo
ZKEY_P_AGE	NI_MS_lest_		1				%160.0
Regiungi	riuovo aispos ri e poti	auvo			SE SE	ND PROJECT	%168.2
	/I Q REU	-					/0100.2
Caric	amento avanzato		_	_	_	>	4
		Iodi di accesso configui Dispositivo	rati di "PLC_1" Tipo di dispositivo F	osto c Tipo di in	terfa Indirizzo	Sottorete	
		LC_1	CPU 1212C DC/D	1 X1 PN/IE	192.168.90.44	PN/IE_1	
			Tipo di interfaccia PG	S/PC: PN/IE	- Martink (TM) Circhist	-	
		Collegamento con	l'interfaccia/la sottor	ete: PN/IE_1	m NetLink (TM) Gigabit i		
			1° gater	way:			
	s	elezionare il sistema di	i destinazione:		Visualizza tutti i n	odi compatibili 💌	
)ispositivo plc_1 =	Tipo di dispositivo	Tipo di interfaccia PN/IF	Indirizzo	Dispositivo di des	
		-	-	PN/IE	Indirizzo di accesso	-	
	LED lampeggia		\searrow				
						Avaia ricerca	
Info	rmazioni sullo stato onlir	ne:			Visualizza solo	messaggi di errore	
4	Dispositivo accessibile	trovato r16di8do	natibili su 3 nodi ac	ressibili		<u>^</u>	
1 ¹ ?	Richiamo informazioni s	ui dispositivi in corso	atota allocata de la la	cession.			
8	scansione e richiesta in	itormazioni concluse. E	stato rilevato 1 probl	ema.		×	
					<u>C</u> a	rica <u>A</u> nnulla	

Let's go online to check if there are any errors:

ti	Too	ol	Fin	estr	a?	-					
-	6		6		BT	ø	Collega online	2	Interrompi collegamento online	2	
		Te	st_	Prj	► D	isp	ositivi non ra	gg	ppati → r16di8do [R-16DI-8I	00	Ethernet I/O]



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

rogetto Modifica Visualizza Inserisci Online Strumenti T	Tool Finestra ?	
🌁 🔁 🔚 Salva progetto 昌 🐰 🗉 🛍 🗙 🏷 ± (주 ± 🔒	🖥 🔃 🚹 🖳 🙀 💋 Collega online 💋 Interrompi collegamento online 🎄 🕕	×
Navigazione del progetto 🔲 🖣	📢 🔋 Progetto_1006Z-KeyP 🕨 Dispositivi non raggruppati 🕨 Z-KEY-P [Z-KE	Y-P (
Dispositivi	🚽 Vista topologica	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	🗈 🔐 Z-KEY-P [Z-KEY-P Gateway] 🔻 📖 🔡 🎼 🛄 🍳 🛨	
		^
▼ Progetto_1006Z-KeyP		
▼ [] PLC_1 [CPU 1212C DC/DC/DC]		
🕨 🔜 Blocchi di programma 🕒 🔵	• et ?	
. 🕨 🙀 Oggetti tecnologici	2 ^{xxx}	
Sorgenti esterne		
🕨 🕞 Variabili PLC 🔷 🔵		
Tipi di dati PLC		
🕨 🥅 Tabella di controllo e di forzamento		
Backup online		
🕨 🔀 Traces	DP-NORM	
🛄 Dati proxy dei dispositivi		
🕨 🕨 Moduli locali		
🕨 🛅 Periferia decentrata 🛛 🗹		
🔻 🔛 Dispositivi non raggruppati		
🝷 🛄 Z-KEY-P [Z-KEY-P Gateway]		
🕨 🛃 Impostazioni Security		
Funzioni oltre i limiti del PLC		
🕨 🙀 Dati comuni		
Informazioni sul documento		
🐻 Lingue & Risorse		
Accessi online		~

It is also possible to read and write the IO (for debugging purposes) directly from the TIA portal.

Important:

Registers written in Modbus cannot be read by Modbus but only by Profinet Registers read by Modbus cannot be written by Modbus but only by Profinet

Then define the variables for the PLC.

It is convenient to define data types to manage arrays:



Create two data types, one for read and one for write, each of 128 bytes:







Now define the PLC variables using the newly created ones as data type:







This way you created the arrays (albeit beyond our needs): For example the array of reads:

ZKE	ZKEY_P_AGENT_SL_Test_Array > PLC_1 [CPU 1212C DC/DC/DC] > Variabili PLC > Tabella delle variabili standard [39]											
										/ariabili	🗉 Costanti ute	
*	e 🛛) 🗄 🙄 🛍										
	[abella	a delle variabili standard										
-	N	ome	Tipo di dati	Indirizzo	Ritenz	Acces	Scrivi	Visibil	Commento			
1		READ	"Tipo di dati ute	. %168.0								
2	-00	 ArrayRead1 	Array[0127] o	%168.0		V		V				
З		ArrayRead1[0]	Byte	%IB68		~		V				
4	-00	ArrayRead1[1]	Byte	%IB69		V		V				
5	-00	ArrayRead1[2]	Byte	%IB70		v		V				
6	-00	ArrayRead1[3]	Byte	%IB71		V		V				
7	-00	ArrayRead1[4]	Byte	%IB72		V		V				
8	-00	ArrayRead1[5]	Byte	%IB73		v		\checkmark				
9	-00	ArrayRead1[6]	Byte	%IB74		V		\checkmark				
10	-00	ArrayRead1[7]	Byte	%IB75		V		V				
11	-00	ArrayRead1[8]	Byte	%IB76		v		V				
12	-00	ArrayRead1[9]	Byte	%IB77		v		V				
13	-00	ArrayRead1[10]	Byte	%IB78		v		V				
14	-00	ArrayRead1[11]	Byte	%IB79		V		V				
15	-00	ArrayRead1[12]	Byte	%IB80		v		V				
16	-00	ArrayRead1[13]	Byte	%IB81		v		V				
17	-00	ArrayRead1[14]	Byte	%IB82		V		V				
18	-00	ArrayRead1[15]	Byte	%IB83		v		V				
19	-00	ArrayRead1[16]	Byte	%IB84		v		V				
20		ArrayRead1[17]	Byte	%IB85		V		V				
21		ArrayRead1[18]	Byte	%IB86		v		V				
22	-	ArrayRead1[19]	Rute	%IR87	_						7	
									🔍 Pro	prietà	Informazioni	

And then define a control table using the following notation:

Kiemens - C:\Users\Moschin\Desktop\a\ZR-KEY-P\ZR-KEY-P\ZKEY_P_AGENT_SL_Test_Array\ZKEY_P_AGENT_SL_Test_Array

P	rogetto Modifica Visualizza Inserisci Online Strumenti T	loc	Finest	ra?					
1	🌁 📑 🔚 Salva progetto 🛛 📕 🐰 🏥 🛅 🗙 🏹 ± (주 ± 🔒		6 🖳	🙀 💋 Collega online 🖉 Interrompi	collegamento online	🔐 🖪 🖪 🗡	🗧 📘 < Sfoglia	progetto>	a -
	Navigazione del progetto	ZK	EY_P_	AGENT_SL_Test_Array ▶ PLC_1	(CPU 1212C DC/D	C/DC] → Tabella	di controllo e di f	orzamento 🕨	Tabella di c
	Dispositivi								
		1	*						
PLC PLC		-	1	Nome	Indirizzo	Formato visualizz	Valore di controllo	Valore di coman	do 🕖
2	ZKEY P AGENT SL Test Array	1		"READ".ArrayRead1[0]	%IB68	Esadecimale			
zio	Aggiungi nuovo dispositivo	2		"READ".ArrayRead1[1]	%IB69	Esadecimale			
ä	h Dispositivi & Reti	з		"READ".ArrayRead1[2]	%IB70	Esadecimale			
E	PLC_1 [CPU 1212C DC/DC/DC]	4		"READ".ArrayRead1[3]	%IB71	Esadecimale			
b	Configurazione dispositivi	5		"READ".ArrayRead1[4]	%IB72	Esadecimale			
Ē	😨 Online & Diagnostica	6		"READ".ArrayRead1[5]	%IB73	Esadecimale	-		
	🕨 🔜 Blocchi di programma	7		"READ".ArrayRead1[6]	%IB74	Esadecimale			
	🕨 🙀 Oggetti tecnologici	8		"READ".ArrayRead1[7]	%IB75	Esadecimale			
	🕨 🛅 Sorgenti esterne 🦯	9		"READ".ArrayRead1[8]	%IB76	Esadecimale			
	🕨 🔚 Variabili PLC	10		"READ".ArrayRead1[9]	%IB77	Esadecimale			
	Tipi di dati PLC	11		"WRITE".ArrayWrite1[0]	%QB64	Esadecimale	_		
	🔻 🛄 Tabella di controllo e di forzamento	12		"WRITE".ArrayWrite1[1]	%QB65	Esadecimale			
	Aggiungi nuova tabella di controllo	13		"WRITE".ArrayWrite1[2]	%QB66	Esadecimale			
	Tabella di controllo_1	14		"WRITE".ArrayWrite1[3]	%QB67	Esadecimale			
	🗒 Tabella di forzamento 🥄	15		"WRITE".ArrayWrite1[4]	%QB68	Esadecimale 💌	1		
	🕨 🙀 Backup online	16			<aggiungi></aggiungi>		1		
	🕨 🔄 Traces								
	Comunicazione OPC UA								
	Dati proxy dei dispositivi								

The 5 bytes of Profinet writing are the 5 bytes of reading from modbus (3 Modbus Bytes = 6 bytes). The 10 bytes of Profinet readings are the 10 bytes of modbus writing (5 Modbus registers = 10 bytes).



Here it is now possible to read inputs and force write outputs.

Profinet writes in the "Write" arrays are read by Modbus like this:

ZKEY_P_	AGENT_SL_Test_Array > F	LC_1 [CPU 1212C DC/	ontrollo	➡ ModScan32 - ModSca1				
								File Connection Setup View Window Help
≝ ³ ≅ ³	12 10 91 96 17 🕾	00h 1						
i	Nome	Indirizzo	Formato visualizz	Valore di controllo	Valore di comando	9	Comme	10 I I I I I I I I I I I I I I I I I I I
1	"READ".ArrayRead1[0]	%IB68	Esadecimale	16#11				
2	"READ".ArrayRead1[1]	%IB69	Esadecimale	16#22				🖴 ModSca1
3	"READ".ArrayRead1[2]	%IB70	Esadecimale	16#00				Device Id: 1
4	"READ".ArrayRead1[3]	%IB71	Esadecimale	16#00				Address: 0001 MODBUS Point Type Vali
5	"READ".ArrayRead1[4]	%IB72	Esadecimale	16#00				Length: 3 02: HOLDING DECISTED
6	"READ".ArrayRead1[5]	%IB73	Esadecimale	16#00				Lengui. 5 US. HOLDING REGISTER
7	"READ".ArrayRead1[6]	%IB74	Esadecimale	16#00				
8	"READ".ArrayRead1[7]	%IB75	Esadecimale	16#00				
9	"READ".ArrayRead1[8]	%IB76	Esadecimale	16#00				
10	"READ".ArrayRead1[9]	%IB77	Esadecimale	16#00				
11	"WRITE".ArrayWrite1[0]	%QB64	Esadecimale	16#11	16#11	🗹 🔺		MODBUS READ
12	"WRITE".ArrayWrite1[1]	%QB65	Esadecimale	16#22	16#22	🗹 🔺		
13	"WRITE".ArrayWrite1[2]	%QB66	Esadecimale	16#33	16#33		_	
14	"WRITE".ArrayWrite1[3]	%QB67	Esadecimale	16#44	16#44	🗹 📐		
15	"WRITE".ArrayWrite1[4]	%QB68	Esadecimale	16#55	16#55	🗹 🔺		40001: <1122H> 🖌
16		Aggiungi>						40002: <3344H>
								40003: <5500H>
			/					
			PROFINET WRI	re				

Writes from modbus are read by profinet like this:

ZKEY_P_/	AGENT_SL_Test_Array > P	LC_1 [CPU 1212C DC/I	ntrollo	ModScan32 - ModSca1							
							Fil	e Connection	Setup View Windo	w Help	
<u>⇒</u> ⇒	# 19 10 91 90 27 🕾	00h 1							E 5. 5. 5	8 8	
i	Nome	Indirizzo	Formato visualizz	Valore di conti	ollo Valore di comando	9	Comme 🧕	1 🛋 Io 🔤	52 22 64 24	/	-
1	"READ".ArrayRead1[0]	%IB68	Esadecimale	16#AA							\sim
2	"READ".ArrayRead1[1]	%IB69	Esadecimale	16#BB			10	PRESET MULTIF	LE REGISTERS		~
3	"READ".ArrayRead1[2]	%IB70	Esadecimale	16#CC					Address: 0001	-	
4	"READ".ArrayRead1[3]	%IB71	Esadecimale	16#DD					Length: 0005		
5	"READ".ArrayRead1[4]	%IB72	Esadecimale	16#EE	PROFINET READ					A From File	1
6	"READ".ArrayRead1[5]	%IB73	Esadecimale	16#FF	+			0001:	AABB (HEX)		
7	"READ".ArrayRead1[6]	%IB74	Esadecimale	16#99			_	0002:	CCDD (HEX)	To File	
8	"READ".ArrayRead1[7]	%IB75	Esadecimale	16#88				0003-	FFFF (HFX)		
9	"READ".ArrayRead1[8]	%IB76	Esadecimale	16#77				0003.			
10	"READ".ArrayRead1[9]	%IB77	Esadecimale	16#66				0004:	[9988 [HEX]		
11	"WRITE".ArrayWrite1[0]	%QB64	Esadecimale	16#11	16#11	A 1		0005:	7766 (HEX)		
12	"WRITE".ArrayWrite1[1]	%QB65	Esadecimale	16#22	16#22	🗹 🔼					
13	"WRITE".ArrayWrite1[2]	%QB66	Esadecimale	16#33	16#33	A 1					-
14	"WRITE".ArrayWrite1[3]	%QB67	Esadecimale	16#44	16#44	🗹 🔺					
15	"WRITE".ArrayWrite1[4]	%QB68	Esadecimale	16#55	16#55	🗹 🔼				-	
16		<aggiungi></aggiungi>						-			
								Upd	ate Cancel		



5.2. "-E" GATEWAY CONFIGURATION WITH WEBSERVER AND STUDIO 5000 LOGIX DESIGNER ® SOFTWARE

The version used in this chapter of the Studio 5000 software is 35.00.00. First you need to configure the Gateway via the webserver:

Let's configure the basic Ethernet/IP parameters:

In comparison of the product of the	C. Harrison	FURNING .
ETHERIP DEVICE SERIAL NUMBER	1	1
MODBUS TCP-IP CLIENT	DISABLED	DISABLED ¥
STOP MODBUS READING WHEN NO ETHERIP CONNECTION	Disabled	Disabled 🗸
ETHERIP O>T RUNIDLE HEADER	Enabled	Disabled ¥
ETHERIP T->O RUNIDLE HEADER	Disabled	Disabled 🗸
ETHERIP VENDOR ID	65535	65535
ETHERIP DEVICE TYPE	1	0
ETHERIP PRODUCT CODE	60000	60000
ETHERIP MAJOR REVISION	1	1
ETHERIP MINOR REVISION	1	1
ETHERIP DIAGNOSTIC	Disabled	Disabled ¥

Confirm with "APPLY">

Let's configure 1 Modbus Read register and 2 Modbus Write registers:

ne View		CURRENT	UPDATED	
			TAC1	
fodbus				
nds/Tags	TARGET MODBUS DEVICE		CUSTOM V	
ping	TARGET RESOURCE		•	
re Update	TARGET CONNECTED TO		PORT#1 ¥	
se Update	TARGET MODBUS STATION			
raffic Monitor	ADDRESS		1	
	TARGET MODBUS START		1	Equivalent to the address in the Seneca
	REGISTER ADDRESS			documentation : 40001
	TARGET MODBUS REQUEST TYPE		READ HOLDING REGISTER	~
	TARGET REGISTER DATA LENGTH		1	
	TARGET MODBUS PERIODIC TRIGGER (ms)	1000	1000	
	ENDIAN SWAP		NONE	



cal Time View		CURRENT	UPDATED	
letup	MNEMONIC NAME	TAG2	TAG2	
etup Modbus ommands/Tags	TARGET MODBUS DEVICE	CUSTOM	CUSTOM V	
O Mapping	TARGET RESOURCE	an a	~	
rmware Update	TARGET CONNECTED TO	PORT#1	PORT#1 V	
atabase Update	TARGET MODBUS STATION	2	2	
erial Traffic Monitor	TARGET MODBUS START REGISTER ADDRESS	1	1	Equivalent to the addres in the Seneca documentation : 40001
	TARGET MODBUS REQUEST TYPE	WRITE MULTIPLE HOLDING REGISTER	WRITE MULTIPLE HOLDING REGIST	ER 🗸
	TARGET REGISTER DATA		2	
	TARGET MODBUS TRIGGER	WRITE ONLY ON DATA CHANGE	WRITE ONLY ON DATA CHANGE	•
	ENDIAN SWAP	NONE	NONE V	

Now on the "Status" section let's export the EDS file using the "GET EDS FILE" button:



The gateway configuration is complete.

Now in the Studio 5000 software we import the EDS file we have just exported:



In the TOOLS-> EDS Hardware Installation Tool menu:



We select "Register a device description":

Rockwell Automation's Device Wizard			×
Options What task do you want to complete?			
Progeter a device description file(s). This option will add a device(s) to our distabase.			
C Unregister a device. This option will remove a device that has been registered by a Device Description Rile from our database.			
Cleate a device description file. This cycloin creates a new device description file that allows our software to recognize your device.			
C Upload device description file(s) from the device. This option uploads and registers the device description file(s) stored in the device.			
	< Indietro	Avanti >	Annulla



We select the EDS file exported from the webserver:

View file...



< Indietro Avanti > Annulla



Now we insert the Seneca module by right clicking on the Ethernet port and selecting "New Module":





We configure it with the IP address chosen previously:

New Module							×
General*	General						
- Connection - Module Info - Internet Protocol - Port Configuration - Network	Type: Vendor: Pæreft: Name: Description: Module Defin Revision: Bectronic Ki Connections	Z-KEY-E Z-KEY Seneca Local Test tion	E 1.001 Compatible Module Exclusive owner	, a	Ethemet Address Private Network: IP Address: Host Name:	192 168 1	1
				Change			
Status: Creating					ОК	Cancel H	elp



And we confirm with OK:



Having configured the gateway with 1 read register (2 bytes) and 2 write registers (4 bytes) you will have the following:

ZKEYE: I represents the 2 read bytes ZKEYE: O represent the 4 write bytes:





The value read by modbus is visible in the ZKEYE: I bytes



While the writings are commanded by ZKEYE:O:



Where -1 in 2's complement equals byte 255

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6. GATEWAY WEBSERVERS

6.1. "-P" GATEWAY WEBSERVER

6.1.1. WEBSERVER MODE AND PROFINET MODE

The device is normally in Profinet mode; in Profinet mode the device can be configured only through the Easy Setup 2 software.

In order to access the internal webserver it is necessary to put the device in Webserver mode using the Easy Setup2 or Seneca Device Discovery software, it is also possible to change the operating mode by pressing the button following the procedure:

6.1.2. MANUAL PROCEDURE FOR SWITCHING FROM PROFINET MODE TO WEBSERVER MODE AND VICE VERSA

To force webserver mode:

- 1) Turn on the device
- 2) Keep the PS1 button pressed until all LEDs turn off
- 3) Release the button
- 4) The device restarts and the LEDs On Z-KEY-P: PWR and SD/COM On Z-KEY-2ETH-P: PWR and COM On R-KEY-LT-P: PWR and COM flash slowly to show webserver mode

To force Profinet mode:

- 1) Turn on the device
- 2) Keep the PS1 button pressed until all LEDs turn off
- 3) Release the button
- The device restarts and the LEDs On Z-KEY-P: PWR and SD/COM On Z-KEY-2ETH-P: PWR and COM On R-KEY-LT-P: PWR and COM

end flashing slowly to show Profinet mode.



6.1.3. STEP BY STEP GUIDE FOR THE FIRST ACCESS TO THE WEBSERVER

STEP 1: POWER THE DEVICE AND CONNECT THE ETHERNET PORT, PUT THE DEVICE IN WEBSERVER MODE (SEE CHAPTER 6.1.1)

SENECA DISCOVERY DEVICE SOFTWARE STEP 2

Launch SCAN, select the device and press the "Assign IP" button, set a configuration compatible with your PC, for instance:

😸 AssignIP		×
DHCP		
IP		
192.168.1.101		
Netmask		
255.255.255.0		
Gateway		
192.168.1.1		
	OK	Stop
	OK	Stop

Confirm with OK. Now the device can be reached via Ethernet from your PC.

STEP 5 ACCESS TO THE CONFIGURATION WEBSERVER

ENTER your access credentials: user: admin password: admin

ATTENTION!

THE WEB BROWSERS WHICH HAVE BEEN TESTED FOR COMPATIBILITY WITH THE DEVICE WEBSERVER ARE: MOZILLA FIREFOX AND GOOGLE CHROME. THEREFORE, THE OPERATION WITH OTHER BROWSERS IS NOT GUARANTEED

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6.1.4. WEBSERVER DEVICE CONFIGURATION

For further information on the access to the webserver of a new device, please refer to chapter 6.1.3.

ATTENTION!

THE WEB BROWSERS WHICH HAVE BEEN TESTED FOR COMPATIBILITY WITH THE DEVICE WEBSERVER ARE:

MOZILLA FIREFOX AND GOOGLE CHROME.

THEREFORE, THE OPERATION WITH OTHER BROWSERS IS NOT GUARANTEED

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 WEBSERVER HAVE BEEN LOST, TO ACCESS IT, IT IS NECESSARY TO GO THROUGH THE PROCEDURE TO RESET THE FACTORY-SET CONFIGURATION

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6.1.4.1. WEBSERVER SECTIONS

The Webserver is divided into pages (sections) representing the various gateway functions:

Status

It is the section that displays the values of the configured tags in real time.

Setup

It is the section that allows the device basic configuration.

Setup Modbus Commands / Tags

It is the section that allows you to add/modify the Modbus commands or the tags (i.e. the variables) of the Modbus devices connected to the gateway.

I/O Mapping

In PROFINET IO / MODBUS MASTER GATEWAY mode only this is the section that allows you to export the current configuration into the GSDML file and to remap the bytes relating to the data coming from the Modbus protocol.

Firmware Update

This is the section that allows you to update the device firmware.

Database Update

It is the section that allows you to update the database of Modbus Seneca devices.

Serial Traffic Monitor

It allows to analyse the ModBUS frames of the serials.



6.1.4.2. "STATUS" SECTION

Depending on the selected operating mode, it displays:

PROFINET IO DEVICE / MODBUS MASTER GATEWAY

In the status section it is possible to view the mapping of the bytes associated with the registers coming from Modbus in real time.

PROFINET IO DEVICE / MODBUS SLAVE GATEWAY

In the status section it is possible to view the mapping of the bytes associated with the registers coming from Modbus in real time.

6.1.4.3. "SETUP" SECTION

DHCP (ETH) (default: Disabled)

Sets the DHCP client to get an IP address automatically.

STATIC IP (default: 192.168.90.101)

Sets the device static address. Careful not to enter devices with the same IP address into the same network.

STATIC IP MASK (default: 255.255.255.0)

Sets the mask for the IP network.

STATIC GATEWAY (default: 192.168.90.1)

Sets the gateway address.

WORKING MODE

Sets the operating mode:

TCP-IP PORT (default: 502)

Sets the communication port for the Modbus TCP-IP client protocol.

TCP-IP TIMEOUT [ms] (default 512 ms)

Sets the waiting time for a request to be considered in timeout.

PORT #1 MODBUS PROTOCOL (default RTU)

Sets the protocol on the serial between Modbus RTU or Modbus ASCII

PORT #2 MODBUS PROTOCOL (default RTU)

Sets the protocol on the serial between Modbus RTU or Modbus ASCII

PORT #1 BAUDRATE (default: 38400 baud)

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Selects the communication speed of the COM #1 serial port

PORT #1 DATA BITS (default: 38400 baud)

Selects the communication speed of the COM #1 serial port

PORT #1 PARITY (default: None)

Sets the parity for the COM #1 serial communication port.

PORT #1 STOP BIT (default: 1)

Sets the number of stop bits for the COM #1 serial communication port.

PORT #1 TIMEOUT [ms]

Sets the wait time before defining fail.

PORT #1 WRITING RETRIES (default: 3)

Selects the number of writing attempts to be made on a serial slave before returning an error.

PORT #1 MAX READ NUM

Sets the maximum number of simultaneous serial reading ModBUS registers, the firmware will use this value to optimize the ModBUS readings.

PORT #1 MAX WRITE NUM

Sets the maximum number of simultaneous writing ModBUS registers of the serial, the firmware will use this value to optimize the ModBUS writings.

PORT #2 BAUDRATE (default: 38400 baud) (only for Z-KEY-P and Z-KEY-2ETH-P)

Selects the communication speed of the COM #2 serial port

PORT #2 DATA BITS (default: 38400 baud) (only for Z-KEY-P and Z-KEY-2ETH-P)

Selects the communication speed of the COM #2 serial port

PORT #2 PARITY (default: None) (only for Z-KEY-P and Z-KEY-2ETH-P)

Sets the parity for the COM #2 serial communication port.

PORT #2 STOP BIT (default: 1) (only for Z-KEY-P and Z-KEY-2ETH-P)

Sets the number of stop bits for the COM #2 serial communication port.

PORT# 2 TIMEOUT [ms] (only for Z-KEY-P and Z-KEY-2ETH-P)

Sets the wait time before defining fail.

PORT #2 WRITING RETRIES (default: 3) (only for Z-KEY-P and Z-KEY-2ETH-P)

Selects the number of writing attempts to be made on a serial slave before returning an error.



PORT #2 MAX READ NUM (only for Z-KEY-P and Z-KEY-2ETH-P)

Sets the maximum number of simultaneous reading ModBUS registers of the remote TCP-IP Modbus server, the firmware will use this value to optimize the ModBUS readings.

PORT #2 MAX WRITE NUM (only for Z-KEY-P and Z-KEY-2ETH-P)

Sets the maximum number of simultaneous writing ModBUS registers of the serial, the firmware will use this value to optimize the ModBUS writings.

WEB SERVER AUTHENTICATION USER NAME (default: admin)

Sets the username to access the webserver.

WEB SERVER PASSWORD (default: admin)

Sets the password to access the webserver and to read/write the configuration (if enabled).

WEB SERVER PORT (default: 80)

Sets the communication port for the web server.

IP CHANGE FROM DISCOVERY (default: Enabled)

Selects whether or not the device accepts the IP address change from the Seneca Discovery Device software.

PORT #1 AFTER FAIL DELAY [s]

Sets the number of quarantine seconds after a tag has been declared in fail (i.e. these tags are no longer considered) before being interrogated again.

PORT #2 AFTER FAIL DELAY [s] (only for Z-KEY-P and Z-KEY-2ETH-P)

Sets the number of quarantine seconds after a tag has been declared in fail (i.e. these tags are no longer considered) before being interrogated again.

PROFINET DEVICE NAME

Sets the name of the Profinet peripheral

MODBUS TCP-IP CLIENT

Enables or not the TCP-IP client Modbus

MODBUS TCP-IP SERVER#1...3 PORT

Sets the port for the max 3 remote TCP-IP Modbus servers

MODBUS TCP-IP SERVER#1...3 ADDRESS

Sets the IP address for the max 3 remote TCP-IP Modbus servers

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MODBUS TCP-IP CLIENT TIMEOUT [ms]

Sets the timeout for remote TCP-IP Modbus servers

MODBUS TCP-IP CLIENT WRITING ATTEMPTS

Selects the number of writing attempts to be made on a remote TCP-IP Modbus server before returning an error and activating the quarantine.

MODBUS TCP-IP CLIENT MAX READ NUM

Sets the maximum number of simultaneous reading ModBUS registers of the remote TCP-IP Modbus server, the firmware will use this value to optimize the ModBUS readings.

MODBUS TCP-IP CLIENT MAX WRITE NUM

Sets the maximum number of simultaneous writing ModBUS registers of the remote TCP-IP Modbus server, the firmware will use this value to optimize the ModBUS writings.

SERVER AFTER FAIL DELAY

Sets the number of quarantine seconds after a tag has been declared in fail (i.e. these tags are no longer considered) before being interrogated again.

In addition, a configuration can be exported / imported via the webserver.

6.1.4.4. SAVING A CONFIGURATION ON A FILE

A configuration that includes:

CONFIGURATION TAGS/COMMANDS

It can be saved to a file this way:

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

Scegli file	Nessun file selezionato	Load conf file
Save conf	file	



6.1.4.5. IMPORTING A CONFIGURATION FROM A FILE

A configuration that includes:

CONFIGURATION TAGS/COMMANDS

It can be imported from a file this way:

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

Scegli file	Nessun file selezionato	Load conf file
Save conf	file	



6.1.4.6. "COMMANDS/TAGS" SECTION (ONLY FOR PROFINET IO / MODBUS MASTER GATEWAY MODE)

In this section you can add, edit or delete a tag.

Using the ADD button you can add a new command. Using the MODIFY button it is possible to modify an existing command. Using the DEL button it is possible to delete an existing command.

MNEMONIC NAME

It is the identifying name of the command

TARGET MODBUS DEVICE

It represents the Seneca Modbus device selected from those available in the database. In the case of a non-Seneca device, select CUSTOM.

TARGET RESOURCE

It represents the Seneca device variable you want to add.

TARGET CONNECTED TO

It selects the serial to be used for Modbus serial communication for the specified TAG.

TARGET MODBUS STATION ADDRESS

It selects the station address to use for the command.

TARGET MODBUS START REGISTER

It represents the starting Modbus address of the command (in the case of a Seneca device it is filled in automatically).

TARGET MODBUS REQUEST TYPE

It represents the type of Modbus command to use (Holding Register, Coil etc.). In the case of a Seneca device it is filled in automatically.

TARGET MODBUS TRIGGER

If the command is about writing, it allows you to select the writing technique on the Modbus side: Periodic, or Data change or both.

Periodic: writing is carried out continuously with the set time interval

Data Change: writing occurs only if the command registers change their values.

Periodic or data Change: combines the two previous modes.

TARGET MODBUS WRITE PERIODIC TIME [ms]

It represents the time interval of the periodic reading.



ENDIAN SWAP

Allows you to swap a register read by Modbus, i.e.: NONE: no swap BYTE: shifts the high byte with low byte (for example Modbus reading 0xAABB will be converted to 0xBBAA) WORD: In the case of a data type greater than a Modbus register (e.g. single precision Floating Point registers) it allows you to set which word (register) to use as the most significant part, for example: Register 1 = 0xAABB Register 2 = 0xCCDD will become a single value 0xAABBCCDD if the parameter is NONE, otherwise 0xCCDDAABB if this parameter is active BYTE AND WORD: as in the previous case but there will also be a byte swap, for example: Register 1 = 0xAABB Register 2 = 0xCCDD Will become 0xDDCCBBAA

6.1.4.7. "I/O MAPPING" SECTION

It allows exporting the GSDML file created (in the case of IO / Modbus Master Gateway mode) and to move the contents of the bytes of the read and write buffers.

6.1.4.8. "FIRMWARE UPDATE" SECTION

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

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

6.1.4.9. "DATABASE UPDATE" SECTION

Seneca releases new Database files of its updated ModBUS devices on the Z-KEY-P device section of the <u>www.seneca.it</u> website.

To update the database, select the file and press the "Update Database" button.

The device is already updated at the factory with the most recent database at the time of production

6.1.4.10. "SERIAL TRAFFIC MONITOR"

Allows you to view the serial packets that are in transit. 6.2. "-E" GATEWAY WEBSERVER



6.2.1. STEP BY STEP GUIDE FOR THE FIRST ACCESS TO THE WEBSERVER

STEP 1: POWER THE DEVICE AND CONNECT THE ETHERNET PORT, PUT THE DEVICE IN WEBSERVER MODE (SEE CHAPTER 6.1.1)

SENECA DISCOVERY DEVICE SOFTWARE STEP 2

Launch SCAN, select the device and press the "Assign IP" button, set a configuration compatible with your PC, for instance:

😸 AssignIP		×
DHCP		
IP		
192.168.1.101		
Netmask		
255.255.255.0		
Gateway		
192.168.1.1		
	OK	Stop
	OK	Stop

Confirm with OK. Now the device can be reached via Ethernet from your PC.

STEP 5 ACCESS TO THE CONFIGURATION WEBSERVER

ENTER your access credentials: user: admin password: admin

ATTENTION!

THE WEB BROWSERS WHICH HAVE BEEN TESTED FOR COMPATIBILITY WITH THE DEVICE WEBSERVER ARE: MOZILLA FIREFOX AND GOOGLE CHROME. THEREFORE, THE OPERATION WITH OTHER BROWSERS IS NOT GUARANTEED

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6.2.2. WEBSERVER DEVICE CONFIGURATION

For further information on the access to the webserver of a new device, please refer to chapter 6.1.3.

ATTENTION!

THE WEB BROWSERS WHICH HAVE BEEN TESTED FOR COMPATIBILITY WITH THE DEVICE WEBSERVER ARE:

MOZILLA FIREFOX AND GOOGLE CHROME.

THEREFORE, THE OPERATION WITH OTHER BROWSERS IS NOT GUARANTEED

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 WEBSERVER HAVE BEEN LOST, TO ACCESS IT, IT IS NECESSARY TO GO THROUGH THE PROCEDURE TO RESET THE FACTORY-SET CONFIGURATION

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6.2.2.1. WEBSERVER SECTIONS

The Webserver is divided into pages (sections) representing the various gateway functions:

Status

It is the section that displays the values of the configured tags in real time.

Setup

It is the section that allows the device basic configuration.

Setup Modbus Commands / Tags

It is the section that allows you to add/modify the Modbus commands or the tags (i.e. the variables) of the Modbus devices connected to the gateway.

I/O Mapping

This is the section that allows you to export the current configuration into the EDS file and to remap the bytes relating to the data coming from the Modbus protocol.

Firmware Update

This is the section that allows you to update the device firmware.

Database Update

It is the section that allows you to update the database of Modbus Seneca devices.

Serial Traffic Monitor

It allows to analyse the ModBUS frames of the serials.



6.2.2.2. "STATUS" SECTION

In the status section it is possible to view the mapping of the bytes associated with the registers coming from Modbus in real time and to export the EDS file from the current configuration.

6.2.2.3. "SETUP" SECTION

DHCP (ETH) (default: Disabled)

Sets the DHCP client to get an IP address automatically.

STATIC IP (default: 192.168.90.101)

Sets the device static address. Careful not to enter devices with the same IP address into the same network.

STATIC IP MASK (default: 255.255.255.0)

Sets the mask for the IP network.

STATIC GATEWAY (default: 192.168.90.1)

Sets the gateway address.

WORKING MODE

Sets the operating mode:

TCP-IP PORT (default: 502)

Sets the communication port for the Modbus TCP-IP client protocol.

TCP-IP TIMEOUT [ms] (default 512 ms)

Sets the waiting time for a request to be considered in timeout.

PORT #1 MODBUS PROTOCOL (default RTU)

Sets the protocol on the serial between Modbus RTU or Modbus ASCII

PORT #2 MODBUS PROTOCOL (default RTU)

Sets the protocol on the serial between Modbus RTU or Modbus ASCII

PORT #1 BAUDRATE (default: 38400 baud)

Selects the communication speed of the COM #1 serial port

PORT #1 DATA BITS (default: 38400 baud)

Selects the communication speed of the COM #1 serial port

PORT #1 PARITY (default: None)

Sets the parity for the COM #1 serial communication port.



PORT #1 STOP BIT (default: 1)

Sets the number of stop bits for the COM #1 serial communication port.

PORT #1 TIMEOUT [ms]

Sets the wait time before defining fail.

PORT #1 WRITING RETRIES (default: 3)

Selects the number of writing attempts to be made on a serial slave before returning an error.

PORT #1 MAX READ NUM

Sets the maximum number of simultaneous serial reading ModBUS registers, the firmware will use this value to optimize the ModBUS readings.

PORT #1 MAX WRITE NUM

Sets the maximum number of simultaneous writing ModBUS registers of the serial, the firmware will use this value to optimize the ModBUS writings.

PORT #2 BAUDRATE (default: 38400 baud) (only for Z-KEY-E and Z-KEY-2ETH-E)

Selects the communication speed of the COM #2 serial port

PORT #2 DATA BITS (default: 38400 baud) (only for Z-KEY-E and Z-KEY-2ETH-E)

Selects the communication speed of the COM #2 serial port

PORT #2 PARITY (default: None) (only for Z-KEY-E and Z-KEY-2ETH-E)

Sets the parity for the COM #2 serial communication port.

PORT #2 STOP BIT (default: 1) (only for Z-KEY-E and Z-KEY-2ETH-E)

Sets the number of stop bits for the COM #2 serial communication port.

PORT #2 TIMEOUT [ms] (only for Z-KEY-E and Z-KEY-2ETH-E)

Sets the wait time before defining fail.

PORT #2 WRITING RETRIES (default: 3) (only for Z-KEY-E and Z-KEY-2ETH-E)

Selects the number of writing attempts to be made on a serial slave before returning an error.

PORT #2 MAX READ NUM (only for Z-KEY- E and Z-KEY-2ETH- E)

Sets the maximum number of simultaneous reading ModBUS registers of the remote TCP-IP Modbus server, the firmware will use this value to optimize the ModBUS readings.

PORT #2 MAX WRITE NUM (only for Z-KEY- E and Z-KEY-2ETH- E)



Sets the maximum number of simultaneous writing ModBUS registers of the serial, the firmware will use this value to optimize the ModBUS writings.

WEB SERVER AUTHENTICATION USER NAME (default: admin)

Sets the username to access the webserver.

WEB SERVER PASSWORD (default: admin)

Sets the password to access the webserver and to read/write the configuration (if enabled).

WEB SERVER PORT (default: 80)

Sets the communication port for the web server.

IP CHANGE FROM DISCOVERY (default: Enabled)

Selects whether or not the device accepts the IP address change from the Seneca Discovery Device software.

PORT #1 AFTER FAIL DELAY [s]

Sets the number of quarantine seconds after a tag has been declared in fail (i.e. these tags are no longer considered) before being interrogated again.

PORT #2 AFTER FAIL DELAY [s] (only for Z-KEY- E and Z-KEY-2ETH- E)

Sets the number of quarantine seconds after a tag has been declared in fail (i.e. these tags are no longer considered) before being interrogated again.

MODBUS TCP-IP CLIENT

Enables or not the TCP-IP client Modbus

MODBUS TCP-IP SERVER#1...3 PORT

Sets the port for the max 3 remote TCP-IP Modbus servers

MODBUS TCP-IP SERVER#1...3 ADDRESS

Sets the IP address for the max 3 remote TCP-IP Modbus servers

MODBUS TCP-IP CLIENT TIMEOUT [ms]

Sets the timeout for remote TCP-IP Modbus servers

MODBUS TCP-IP CLIENT WRITING ATTEMPTS

Selects the number of writing attempts to be made on a remote TCP-IP Modbus server before returning an error and activating the quarantine.

MODBUS TCP-IP CLIENT MAX READ NUM

Sets the maximum number of simultaneous reading ModBUS registers of the remote TCP-IP Modbus server, the firmware will use this value to optimize the ModBUS readings.



MODBUS TCP-IP CLIENT MAX WRITE NUM

Sets the maximum number of simultaneous writing ModBUS registers of the remote TCP-IP Modbus server, the firmware will use this value to optimize the ModBUS writings.

SERVER AFTER FAIL DELAY

Sets the number of quarantine seconds after a Modbus command has been declared in fail (i.e. This command is no longer executed) before being interrogated again.

ETHERIP O->T RUN/IDLE HEADER

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

ETHERIP T->O RUN/IDLE HEADER

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

ETHERIP VENDOR ID

It allows to customise the Vendor ID in the EDS file.

ETHERIP DEVICE TYPE

It allows to customise the Device Type in the EDS file.

ETHERIP PRODUCT CODE

It allows to customise the Product Code in the EDS file.

ETHERIP MAJOR REVISION

It allows to customise the Major Revision in the EDS file.

ETHERIP MINOR REVISION

It allows to customise the Minor Revision in the EDS file.

DIAGNOSTIC

It allows you to activate or not the 9 bytes of Modbus diagnostics. The diagnostic bytes are inserted at the end of the reading area.

STOP MODBUS READING WHEN NO ETHERNET IP CONNECTION

If the connection with the PLC is lost, the device stops polling the Modbus registers and therefore allows any safety timeouts to be triggered on the outputs.

In addition, a configuration can be exported / imported via the webserver.


6.2.2.4. SAVING A CONFIGURATION ON A FILE

A configuration that includes:

CONFIGURATION TAGS/COMMANDS

It can be saved to a file this way:

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

Scegli file	Nessun file selezionato	Load conf file		
Save conf	file			

6.2.2.5. IMPORTING A CONFIGURATION FROM A FILE

A configuration that includes:

CONFIGURATION TAGS/COMMANDS

It can be imported from a file this way:

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

Scegli file	Nessun file selezionato	Load conf file
Save conf	file	



6.2.2.6. "COMMANDS/TAGS" SECTION

In this section you can add, edit or delete a tag.

Using the ADD button you can add a new command. Using the MODIFY button it is possible to modify an existing command. Using the DEL button it is possible to delete an existing command.

MNEMONIC NAME

It is the identifying name of the command

TARGET MODBUS DEVICE

It represents the Seneca Modbus device selected from those available in the database. In the case of a non-Seneca device, select CUSTOM.

TARGET RESOURCE

It represents the Seneca device variable you want to add.

TARGET CONNECTED TO

It selects the serial to be used for Modbus serial communication for the specified TAG.

TARGET MODBUS STATION ADDRESS

It selects the station address to use for the command.

TARGET MODBUS START REGISTER

It represents the starting Modbus address of the command (in the case of a Seneca device it is filled in automatically).

TARGET MODBUS REQUEST TYPE

It represents the type of Modbus command to use (Holding Register, Coil etc.). In the case of a Seneca device it is filled in automatically.

TARGET MODBUS TRIGGER

If the command is about writing, it allows you to select the writing technique on the Modbus side: Periodic, or Data change or both.

Periodic: writing is carried out continuously with the set time interval

Data Change: writing occurs only if the command registers change their values.

Periodic or data Change: combines the two previous modes.

TARGET MODBUS WRITE PERIODIC TIME [ms]

It represents the time interval of the periodic reading.



ENDIAN SWAP

Allows you to swap a register read by Modbus, i.e.: NONE: no swap BYTE: shifts the high byte with low byte (for example Modbus reading 0xAABB will be converted to 0xBBAA) WORD: In the case of a data type greater than a Modbus register (e.g. single precision Floating Point registers) it allows you to set which word (register) to use as the most significant part, for example: Register 1 = 0xAABB Register 2 = 0xCCDD will become a single value 0xAABBCCDD if the parameter is NONE, otherwise 0xCCDDAABB if this parameter is active BYTE AND WORD: as in the previous case but there will also be a byte swap, for example: Register 1 = 0xAABB Register 2 = 0xCCDD Will become 0xDDCCBBAA

6.2.2.7. "I/O MAPPING" SECTION

Allows you to move the contents of the bytes of the read and write buffers.

6.2.2.8. "FIRMWARE UPDATE" SECTION

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

ATTENTION!

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

6.2.2.9. "DATABASE UPDATE" SECTION

Seneca releases new Database files of its updated Modbus devices on the device section of the <u>www.seneca.it</u> website.

To update the database, select the file and press the "Update Database" button.

The device is already updated at the factory with the most recent database at the time of production

6.2.2.10. "SERIAL TRAFFIC MONITOR"

Allows you to view the serial packets that are in transit.



7. SUPPORTED MODBUS COMMUNICATION PROTOCOLS

The Modbus communication protocols supported are:

- Modbus RTU/ASCII master (from #1 and #2 serial ports)
- Modbus RTU/ASCII slave (from #1 and #2 serial ports)
- Modbus TCP-IP Client (from the Ethernet port) up to 3 remote TCP-IP Modbus Servers

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

7.1. SUPPORTED MODBUS FUNCTION CODES

The following Modbus functions are supported:

- Read Coils (function 1)
- Read Discrete Inputs (function 2)
- Read Holding Registers (function 3)
- Read Input Registers (function 4)
- Write Single Coil (function 5)
- Write Single Register (function 6)
- Write multiple Coils (function 15)
- Write Multiple Registers (function 16)

ATTENTION!

All 32-bit variables are contained in 2 consecutive Modbus registers All 64-bit variables are contained in 4 consecutive Modbus registers

8. MODBUS DIAGNOSTICS

Diagnostics management takes the timeout or exceptions to the Modbus requests into account. 9 Bytes are made available for diagnostics:

GLOBAL DIAGNOSTIC READ BYTE (1 byte) PORT#1 DIAGNOSTIC MODBUS DEVICE ADDRESS (4 byte) PORT#2 DIAGNOSTIC MODBUS DEVICE ADDRESS (4 byte)

ATTENTION!

The diagnostic bytes are inserted at the end of the configured reading area

In particular the BIT have the following meaning:

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If the BYTE[0] is 1 -> At least one device is in fail

The other bytes indicate which station address on the serials is in fail for the serial port 1 or 2;

On BYTE[1], BYTE [2], BYTE [3], BYTE [4] The first 4 Modbus addresses of the failing devices in Modbus port 1 from lowest to highest address are shown

On BYTE[5], BYTE [6], BYTE [7], BYTE [8] The first 4 Modbus addresses of the failing devices in Modbus port 2 from lowest to highest address are shown

For example if devices with the following station address are connected to serial port #1: 1, 8, 15, 24 and the station 15 and 24 are in fail it will be:

BYTE [0]-> 1 BYTE[1] -> 15 BYTE[2] -> 24 BYTE [3]-> 0 BYTE [4]-> 0

9. **RESETTING THE DEVICE TO ITS FACTORY CONFIGURATION**

The factory configuration removes all configured commands and resets all parameters to default.

To reset the device to the factory configuration it is necessary to follow the procedure below:

Z-KEY-P/E / Z-KEY-2ETH-P/E:

- 1) Remove power from the device
- 2) Turn dip switches 1 and 2 to ON
- 3) Power up the device and wait at least 10 seconds
- 4) Remove power from the device
- 5) Turn dip switches 1 and 2 to OFF
- 6) At the next restart the device will have loaded the factory configuration

R-KEY-LT-P/E:

- 1) Remove power from the device
- 2) Turn 2 SW2 dip switches to ON
- 3) Power up the device and wait at least 10 seconds
- 4) Remove power from the device
- 5) Turn 2 SW2 dip switches to OFF.
- 6) At the next restart the device will have loaded the factory configuration

10. EXCEL TEMPLATES (ONLY "-P" MODELS)

Excel templates are available on the Seneca website (www.seneca.it Profinet series Gateway section).



A	CCESS FROM MODBU	S SERIAL OR TCP/IP	TARGET MODBUS CONFIGURATION					Export CGI file		
TAG NR	GATEWAY TAG NAME	GATEWAY MODBUS REGISTER ADDRESS 1ST REGISTER → ENTER 1 ETC	TARGET MODBUS REGISTER TYPE	TARGET MODBUS DATA TYPE	TARGET CONNECTED TO	TARGET MODBUS START REGISTER (1ST HOLDING -> ENTER 1 1ST INPUT-> 1 etc)	TARGET MODBUS SLAVE ADDRESS	WRITE MODE	WRITE TMO [ms]	Import CGI Bie SS SENECA®
1	EXAMPLE	1	HOLDING REGISTER	16BIT UNSIGNED	RS485 #1	1	1	DATA CHANGE	500	
2										
3										
4										
5										
6										
7										