



USER MANUAL



SENECA s.r.l.

Via Austria, 26 - 35127 - Z.I. CAMIN - PADOVA - ITALY

Tel. +39.049.8705359 - 8705408 Fax. +39.049.8706287

Web site: www.seneca.it

Support: support@seneca.it (IT), support@seneca.it (Other)

UNI EN ISO 9001

Sales: commerciale@seneca.it (IT), sales@seneca.it (Other)

This document is property of SENECA srl. Duplication and reproduction of its are forbidden (though partial), if not authorized. Contents of present documentation refers to products and technologies described in it. Though we strive for reach perfection continually, all technical data contained in this document may be modified or added due to technical and commercial needs; it's impossible eliminate mismatches and discordances completely. Contents of present documentation is anyhow subjected to periodical revision. If you have any questions don't hesitate to contact our structure or to write us to e-mail addresses as above mentioned.

MI002963

Seneca Z-PC Line module: **Z-TWS4**

1. Preliminary information / Informazioni preliminari

WARNING!

IN NO EVENT WILL SENECA OR ITS SUPPLIERS BE LIABLE FOR ANY LOST DATA, REVENUE OR PROFIT, OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR PUNITIVE DAMAGES, REGARDLESS OF CAUSE (INCLUDING NEGLIGENCE), ARISING OUT OF OR RELATED TO THE USE OF OR INABILITY TO USE Z-TWS4, EVEN IF SENECA HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

SENECA, ITS SUBSIDIARIES AND AFFILIATES COMPANY OR GROUP OF DISTRIBUTORS AND SENECA RETAILERS NOT WARRANT THAT THE FUNCTIONS WILL MEET YOUR EXPECTATIONS, AND THAT Z-TWS4, ITS FIRMWARE AND SOFTWARE WILL BE FREE FROM ERRORS OR IT OPERATES UNINTERRUPTED.

SENECA SRL CAN MODIFY THE CONTENTS OF THIS MANUAL IN ANY TIME WITHOUT NOTICE TO CORRECT, EXTEND OR INTEGRATING FUNCTION AND CHARACTERISTICS OF THE PRODUCT.

ATTENZIONE!

IN NESSUN CASO SENECA O I SUOI FORNITORI SARANNO RITENUTI RESPONSABILI PER EVENTUALI PERDITE DI DATI ENTRATE O PROFITTI, O PER CAUSE INDIRETTE, CONSEQUENZIALI O INCIDENTALI, PER CAUSE (COMPRESA LA NEGLIGENZA), DERIVANTI O COLLEGATE ALL' USO O ALL' INCAPACITÀ DI USARE Z-TWS4, ANCHE SE SENECA AVVISATA DELLA POSSIBILITÀ DI TALI DANNI.

SENECA, LE SUSSIDIARIE O AFFILIATE O SOCIETÀ DEL GRUPPO O DISTRIBUTORI E RIVENDITORI SENECA NON GARANTISCONO CHE LE FUNZIONI SODDISFERANNO FEDELMENTE LE ASPETTATIVE E CHE Z-TWS4, IL SUO FIRMWARE E SOFTWARE SIA ESENTE DA ERRORI O CHE FUNZIONI ININTERROTTAMENTE.

SENECA SRL PUO' MODIFICARE IL CONTENUTO DI QUESTO MANUALE IN QUALUNQUE MOMENTO E SENZA PREAVVISO AL FINE DI CORREGGERE, ESTENDERE O INTEGRARE FUNZIONALITA' E CARATTERISTICHE DEL PRODOTTO.

2. Features

Z-TWS4 is a programmable, communication oriented PLC.

The device is based on a 32bits ARM9 processor, equipped with the Linux operating system (Linux kernel 2.6.28).

Two versions are available:

- Z-TWS4 Linux (programmable in "C" language)
- Z-TWS4 StratON PLC (programmable both in IEC61131-3 and in "C" languages)

The Z-TWS4 Linux version is programmable in C using the GNU Compiler Collection (GCC). A Virtual Machine is provided with Ubuntu O.S. and ready to use OpenEmbedded [™] environment; please contact Seneca to get a copy of "Seneca Z-TWS4 environment".

The Z-TWS4 StratON PLC version is programmable according to the IEC61131-3 standard by means of the StratON™ environment.

3. Technical specifications

COMMUNICATION PORTS			
RS 485	Maximum Baud rate 115 Kbps		
	COM 4 (screw terminals 1-2-3)		
	COM 2 (screw terminals 4-5-6 or IDC10 connector)		
	COM1 (removable 4 pin connector, as an alternative to RS232)		
RS 232	Maximum Baud rate 115 Kbps		
	COM 1 (removable 4 pin connector, as an alternative to RS485)		
CAN	CAN bus port 2.0A and 2.0B		
	(screw terminals 10-11-12 or IDC10 connector)		
Ethernet 1 and Ethernet 2	Ethernet 10/100 Mbps		
	Two RJ45 connectors on front-panel		
	Maximum connection length 100 m.		
USB #1 HOST	Plug-in: USB type A		
USB #2 On The Go	Plug-in: micro USB		
	CPU AND MEMORY		
Microprocessor	ARM 9		
Memories	64 Mbytes of RAM		
	1 Gbyte of FLASH		

	64 Kbytes of FeRAM
Slot for external memory	Micro SD card: max 32 Gbytes
	POWER SUPPLY
Power supply	1140 Vdc or 1928 Vac @ 5060 Hz
Consumption	Max 6 W
	ENVIRONMENTAL CONDITIONS
Temperature	055 °C
Humidity	3090 % @ 40 °C not condensing
Storage temperature	-2085 °C
Degree protection	IP20
	CONNECTIONS
Connections	Removable 3 way screw terminals, 5.08 pitch
	Rear IDC10 connector for DIN 46277 rail
	Removable 4 pin connector, two RJ45 connectors, USB and micro USB connectors
	Plug in: micro SD card
	BOX / DIMENSIONS
Dimensions	L:100 mm; H:112 mm; W:35 mm
Case	Nylon 6 with 30% fiberglass field, self extinguishing class V0, black color

4. Connections

Power Supply and Modbus interface are available by using the bus for the Seneca DIN rail, by the rear IDC10 connector or by Z-PC-DINAL1-35 accessory. The following picture shows the meaning of the IDC10 connector pins. Power supply is available only from the rear connector.



If **Z-PC-DINAL1-35** accessory is used, the power supply signals and communication signals may be provided by the terminals block into the DIN rail support. In the following figure the meaning and the position of the terminal blocks are shown. The DIP-switch that sets the 120 Ω terminator is used only for CAN communication. GNDSHLD: Shield to protect the connection cables (recommended).



The Z-TWS4 has two RS 485 serial ports for Modbus communication: COM 4 and COM 2. The RS485 connection for COM 2 can be set up by means of the corresponding screw terminals or by the IDC10 connector. To select RS 485 on IDC10 connector, put the SW1 DIP-switch on OFF position.



The Z-TWS4 has a CANopen port available at screw terminals 10-11-12. As an alternative, the connection can be set up on the IDC10 connector. To select CANopen port on IDC10 connector, put the SW1 DIP-switch on ON position.



The Z-TWS4 has a USB HOST type A connector, that can be used as an additional serial port (using a Seneca S117P1, for example) or to connect an external USB memory.



The Z-TWS4 has a USB On The Go connector, with micro-USB plug-in, that can be used to connect to the Z-TWS4 console (for this functionality, a driver supplied by Seneca has to be installed on the PC).



The Z-TWS4 has two ethernet ports with RJ45 connectors on the front panel. The two ports are internally connected in HUB/SWITCH mode. The two ports have the same MAC ID.



Through a removable 4 pin connector, the Z-TWS4 provides a serial RS232 port or, as an alternative, a third RS485 port. In order to select the RS232 port on the 4 pin removable connector, put the SW2 DIP-switch on ON position. To select the RS485 port on the 4 pin removable connector, put the SW2 DIP-switch on OFF position. The cable length for the RS232 interface must be less than 3 meters.



The Z-TWS4 has a plug-in connector for micro SD card placed in the side part of the case. To insert the SD card into the connector, be sure that the SD card is oriented with metal contacts facing towards left (with reference to the figure).

The SD card can have each class.



5. LEDs signalling

LED	STATUS	LED meaning
PWR Green	ON	The module is power on
L1 Red	ON	The module is ready for use
LNK1 Yellow	ON	Ethernet 1 connection detected
	OFF	Ethernet 1 connection absent
ACT1 Green	Blinking	There is data activity (Ethernet 1)

	OFF	There is no data activity (Ethernet 1)
LNK2 Yellow	ON	Ethernet 2 connection detected
	OFF	Ethernet 2 connection absent
ACT2 Green	Blinking	There is data activity (Ethernet 2)
	OFF	There is no data activity (Ethernet 2)

6. Linux console

The Linux console is available on the micro USB port.

To access it, you need to install the "Seneca TWS4 Serial Driver" on your PC (file *seneca-tws4-serial-driver* _*sw2970_000.inf*).

To install the driver on Windows 8/Windows 8.1, you have to follow the instructions given in the next subparagraph.

6.1.1. Installing the serial driver on Windows 8.1

Windows 8 has introduced the mandatory use of certified drivers. Since certification of Seneca drivers is still pending, you need to follow the installation guide below, which applies to Windows 8.1.

If you are using Windows 8.0 version, you must update it to version 8.1, by means of the Microsoft store.

Press WIN (see figure) and R.



In the execute window, type:

	Esegui	×
	Digitare il nome del programma, della cartella, del documento o della risorsa Internet da aprire.	
<u>A</u> pri:	shutdown.exe /r /o /f /t 00	v
	OK Annulla S <u>f</u> oglia	

Then confirm with "OK".

Now a blue screen appears, telling "Select one option".

Click on:

Troubleshooting

Advanced Options

Startup Settings

Reboot.

The PC will reboot showing a new screen.

Press the key corresponding to "Disable Driver Signature Enforcement" option (usually, it is the "7" key).

Once Windows has started, install the driver, by right-clicking on the driver file and selecting the "Install" option.

At the end of the installation, a new window will appear:



Confirm with "Install this driver software anyway".

The Seneca serial driver is now installed.

Once the Seneca serial driver is installed, you can use Hyperterminal or a similar program to access the Linux console.

The COM port shall be configured with the following settings:

Speed: 115200 Bps, 8 data bits, Parity: none, 1 stop bit, Flow Control: none.

oprietà - COM3	2 - X
Impostazioni della porta	
Bit per secondo: 115200	•
Bịt di dati: 8	*
Parità: Nessun	• •
Bit di <u>s</u> top: 1	•
Controllo di flusso: Nessun	0 🔹
	<u>R</u> ipristina
ОК	Annulla Applica

Starting with Windows 7[™], Microsoft[™] don't supply a terminal software; you can use for example Termite[™], free downloadable from:

http://www.compuphase.com/software_termite.htm



To login on the console, type:

root

and then press ENTER

now the console is ready.

6.1.2. Serial peripherals in Linux

Under Linux the serial peripherals are:

RS232/RS485 #0 (COM1) -> /dev/ttymxc0

```
RS485 #1 (COM2) -> /dev/ttymxc1
```

```
RS485 #2 (COM4) -> /dev/ttymxc3
```

USB (COM16) -> /dev/ttyUSB0 (using Seneca S117P1 accessory)

The /dev/spidev3.0 is connected to the FeRAM memory.

6.1.3. Changing the IP address

The IP address is statically configured with the following value:

192.168.90.101

it's possible to change the IP address by means of the "ifconfig" Linux command; for example:

ifconfig eth0 192.168.0.101

this will change the IP address to 192.168.0.101

Please note that, doing so, the change is not permanent, that is when Z-TWS4 is rebooted the default value (192.168.90.101) is set again.

You can change the IP address in a permanent way by means of the Z-TWS4 web configuration pages (see "Web Configuration Pages" chapter).

6.1.4. Read-Only Linux Filesystem

To prevent system files damages, the Linux filesystem comes in read-only mode.

The .ro directories (for example: etc.ro) are read-only; at startup, they will be mounted into a RAM filesystem.

So if you change something in the .ro directories, the changes will be lost at the next reboot.

To store files in a permanent way, you must save them into the /disk or /log directories.

NOTE!!

The /disk and /log directories are mounted with the UBI-FS filesystem. This filesystem is "flash write free" but it needs from 30 seconds to 1 minute (depending on the CPU load) to store the files to the flash. If you need to store the files immediately, you can synchronize the UBI-FS filesystem by typing:

sync

on the console.

6.1.5. Mounting the Linux Filesystem in Read-Write mode

To add new functionalities to the Linux filesystem, it's possible to mount it in R/W mode.

To do that, you must type the following command on the Linux console:

mount -o rw,remount /

now every change you make to the ".ro" (e.g.: "/etc.ro") directories will be loaded at the next startup into the "without .ro" (e.g.: "/etc") directories.

NOTE!!

Modifying the system files, it's possible to damage the Z-TWS4.

The Seneca warranty doesn't cover damages due to system files modification.

6.1.6. Useful console commands

The /disk directory can be used by users to store their programs.

Here are some useful commands that console users should know.

To create a directory:

mkdir directoryname

to list the contents of a directory:

ls –l

to copy a file to another directory (that must already exist, e.g.: "./tmp"):

cp filename ./tmp/filename

to move a file:

mv filename ./tmp/

to delete a file:

rm filename

to delete a directory and all its contents:

rm –r directoryname

IMPORTANT!

Under /disk, you can find the StratON Virtual Machine:

t5energy

and other files which are needed for Z-TWS4 proper functioning.

DO NOT REMOVE ANY OF THESE FILES! OTHERWISE, StratON WILL NOT START ANYMORE OR SOME OTHER Z-TWS4 FUNCTIONALITY WON'T WORK.

6.1.7. Launching a custom boot-up script

A custom script file "custom_script" is located in the /disk directory.

This script is launched at every boot; you can edit it, to add some custom commands.

IMPORTANT NOTICE: just add your commands at the end of the script; don't change or delete any lines of the original script, unless you exactly know what you're doing; otherwise, Z-TWS4 proper functioning might be compromised.

6.1.8. Using the /disk directory

The /disk directory uses the UBI-FS filesystem; this filesystem is "flash write free", exploiting a RAM buffer filesystem.

Every 30 seconds or 1 minute (depending on the CPU load) the RAM buffer is written to the FLASH memory.

To force the writing to the flash, you can give the command:

sync

to synchronize the filesystem.

6.1.9. Changing date/time

On the Linux console, you can set a date/time by typing:

```
date -s yyyy.mm.dd-hh:mm
```

for example:

```
date -s 2014.02.24-10:45
```

to store the new date/time, you must then type:

hwclock –w

You can also change the Z-TWS4 date/time from the "Real Time Clock Setup" page (see "Web Configuration Pages" chapter).

6.1.10. Accessing the USB Pen Flash Drive (FAT32)

Inserting a USB pen flash drive (formatted with FAT32 filesystem) into the USB#1 port, you get on the console:

AA - HyperTerminal	
<u>File Modifica Visualizza Chiama Irasferimento ?</u>	
root@mx25:/#	
root@mx20:/#	
FOOLEMX23:7#	
root@mx2J:/#	
root@wx25./#	
root@w25./#	
root@my25./#	
root@mx25:/# sd 0.0.0.0: [sda] Assuming drive cache: write th	rough
sd 0:0:0:0: [sda] Assuming drive cache: write through	l ough
FAT: invalid media value (0x00)	
root@mx25:/#	
Connesso a 02/20/01 V/T1001 115/200 & N-1	

Now you can access the USB drive by changing the directory with the following command:

cd /media/sda1

6.1.11. Accessing the microSD Card (FAT32)

Inserting a microSD or microSDHC card (formatted with FAT32 filesystem) into the slot, you get on the console:

AA - HyperTerminal	
File Modifica Visualizza Chiama Irasferimento ?	
D 🖨 🛯 🕉 🗅 🎦 🖆	
root@mx25:/#	
moot@my25./#	
root@my25:/#	
root@mx25:/#	
root@my25:/#	
root@mx25:/#	
root@mx25:/# FHI: bogus number of reserved sectors	
mant (mu 25, /H ad /madia/much 1/ (m1/	
rootemx23.7# cu /meuid/mmcbik0p1/	
Opperro a 0230-17 V/Ti001 115200 8-NL1	

Now you can access the microSD card by changing the directory with the following command:

cd /media/mmcblk0p1

6.2. WinSCP™

For easy access to the Z-TWS4 filesystem on ethernet, you can use the WINSCP[™] program; you can free download WINSCP[™] from:

http://winscp.net/eng/download.php

You must set the connection as in the following figure (the screenshot shows a connection to the 10.0.0.14 IP address):

Sessione	Sessione		
Sessioni salvate	Nome server		Numero po <u>r</u> ta
Ampiente	10.0.0.14		22 🚔
SSH	Nome <u>u</u> tente	Password	
Preferenze	root		
	Protocollo Protocollo file	SCP •	
			Scegli colore
Opzioni <u>a</u> vanzate			

the password will be requested:

Ricerca host in cor	so
Connessione host i	n corso
Autenticazione in c	orso
Usa nome utente "	root".
Password:	
Password:	
Password:	

type:

root

then press OK

You will get a new window, as in the following screenshot; on the right, you can copy and delete files directly to/from the Z-TWS4.

	🔿 Predefinito 🔹 🕷 🗸			
	/ <radice></radice>		a 🖪 🖬 🖉	20
		i i i i i i i i i i i i i i i i i i i		
me Éstensione Dimensi Tipo Modificato	Nome Éstensione Dimensi	Modificato	Diritti	6
Cartella superi 10/02/2012	r 🔹	01/01/1970	rwxr-xr-x	1
Administrator Cartella di file 09/09/2010	🔒 bin	01/01/1970	rwxr-xr-x	I
Administrator.LAPTO Cartella di file 10/02/2012	a boot	01/01/1970	rwxr-xr-x	
All Users Cartella di file 14/07/2009	s 🎴 dev	03/10/2011 04:15	rwxr-xr-x	I
Default Cartella di file 09/09/2010	ł 🔔 dev.ro	01/01/1970	rwxr-xr-x	
Default User Cartella di file 14/07/2009	s 🔒 disk	03/10/2011 01:24	rwxr-xr-x	
Public Cartella di file 04/03/2011	r 🏭 diskdfl	01/01/1970	rwxr-xr-x	I
Seneca Cartella di siste 04/07/2012	🗿 etc	03/10/2011 04:12	rwxrwxrwt	L
desktop.ini 174 Impostazioni d 14/07/2009	a 🏭 etc.ro	01/01/1970	rwxr-xr-x	-
	👪 home	03/10/2011 04:11	rwxrwxrwt	Ľ
	🏭 home.ro	01/01/1970	rwxr-xr-x	I
	🏭 initrd	01/01/1970	rwxr-xr-x	l
	👪 lib	01/01/1970	rwxr-xr-x	
	👪 log	29/01/2011	rwxrwxrwx	
	🏭 media	03/10/2011 04:13	rwxrwxrwt	
	🏭 mnt	01/01/1970	rwxr-xr-x	
	🏙 proc	01/01/1970	r-xr-xr-x	
	🔐 sbin	01/01/1970	rwxr-xr-x	
	🏭 sys	01/01/1970	rwxr-xr-x	
	🎍 usr	01/01/1970	rwxrwxr-x	
	🏭 var	03/10/2011 04:11	rwxrwxrwt	
m P	4 111		E	

The WinSCP program can also be used as an FTP client to transfer files to/from the Z-TWS4 by means of the FTP protocol; to do that, just select "FTP" instead of "SCP" protocol in the "WinSCP Login" window; the default username and password for Z-TWS4 FTP user are "user", "123456" (see also "Web Configuration Pages" chapter).

7. Z-TWS4 "Linux" version

The Z-TWS4 Linux version consists of:

- the Z-TWS4 device with Linux O.S. (Kernel 2.6.28)

- an Open Development environment based on an Ubuntu Virtual machine for "C" code development

NOTE!

Contact Seneca to get the "Seneca Z-TWS4 Development Environment" DVD.

7.1. Seneca Z-TWS4 Development Environment

The Seneca Open Development Environment is a toolchain to write, compile and debug code.

The toolchain is based on a Virtual Machine with Ubuntu Linux O.S..

7.1.1. Running the Ubuntu™ Virtual Machine

The Ubuntu[™] Virtual Machine can be run by means of Oracle[™] VirtualBox[™], which can be free downloaded from:

https://www.virtualbox.org/

To setup the VM in VirtualBox, you have to execute the steps shown in the following pictures.



First, choose a name for the VM and set the O.S. as Linux/Ubuntu.

Cestino	My Computer		Oracle VM VirtualBox Gestore -	
Google	KSLibMan	Tottoise	File Matchina Mato Menos Stochtage Avia Sarta News Stochtage Avia Sarta	
Modbus Poll	STRATON	Dropbox	Enversanti in Virtualizada La per la seria da duata finati visualizza un elenco dele macchene visuali al luo composter. Celenco al momento è vuoto per del ron ha ancora creato macchene visual. Per ceare una nuose macchene visuali, prem il pulante llavera nella bara degli atumenti pricipile passonata nello parte alta della finestra. Prem il tato PI per ottenere auto inmediatamente, o voita unov.untuados.urg per la ultere notze e rifornazion.	
Oracle VM VirtualBox	ТЗОК	TWS4 KEY GEN	Crea macchina vistuale Nome e sistema operativo	
VMware Player	Winscr	STRATON ZIWSAE	Zoagi un romo decetition por la travantacióne interioria. Senderun 11 general de la transa exceluto in trañas. El romo de servej son utilizzato la Virtuadora por identificare aventa machina. Nome: TI/54, Development	
VinMerge	Archivio T (WIN-KTT	Adobe Reader XI	Tore Unav 🔹 🔀 Versore Uburtu 🔹	
modscan32.		erroratet	Nacond desitione Avait Anula	
MODSIM	rebootest			
TWE	TVS4			
HyperTem	Seneca Z-NET3			
	0			→ ★ ► 12 ● 08.30 25/02/2014

Then, you have to set the memory size and tell VirtualBox that the virtual hard-disk is already available in the *ubuntu904desktop.vmdk* file, provided by Seneca.

I 🔊			
iestino My Computer		Oracle VM VirtualBox Gestore - 🗖 🗴	
ioogle hrome	Tottoise	Fie Modelina Ando Nova Separatoria Anna Sartia Nova Separatoria Anna Sartia	
	Dropbox	Bennehmutin in Wirthalboxi La pete insiste da danta fereta valualizza un denza dele macchera vituali kul ba computer. Edenza al manento è vuoto perde i non haracora oreato macchera vituali. Per orare uno macchera vituale, premi i pulsante Revera nela bara degli strumenti principale possanta nello parte alta della firestra. Pere il Sato FII per otterere auto imediatamente, o voita unov. instalbox.urg per la dime notze e informazion.	
cle VM usBox	TW54 KEY GEN	Cree macchina vistuale Dimensione della memoria	
Aware WinSCP	STRATON ZTWS4 E.	Selectora la quantità di menora (FAM) en regultyrite de sarà allocato per la machine intrata. La quantità del statalita. In quantità del statalita. Internationali del statalita.	
Aerge Archivio T (WIN-KTT	Adobe Reader XI	4346 4056346	
an32 driver	entrate	ters Annie	
DSIM reboot.ot			
erTerm Seneca Z-NET3			
	3 🧿 🛐		





Now, you can run the VM, by right-clicking on its icon and choosing "Start".

When Ubuntu starts, you are asked for a username and a password.



For username, type: user

For password, type: 123456



To launch a "Terminal", click on the terminal icon on Ubuntu top bar.



7.1.2. The GCC [™] Compiler

Using the GCC compiler, you can compile C code for the Z-TWS4 board.

7.1.2.1. Writing the first "C" program

Create an empty file by clicking on the desktop with the right mouse button -> Create Document -> Empty file

Rename the file as "first_test.c"

WS4_SVILUPPO_CLIEN	TI - VMware Player File	▼ Virtual Machine ▼ H	lelp 🔻	_ 🗆 X
Applications Places	System 🙋 👔 📧		Wed Aug	1, 6:13 PM 🐗 👔 user 😈
Eile Edit View Go Bo	user ookmarks <u>T</u> abs <u>H</u> elp	- File Browser		
Back Forward	Up Stop	Reload Home	Computer Searc	h
Location: /home/	/user		🤤 100%	Icon View ▼
Places 🔻 🔀				
Desktop File System Retwork Floppy Drive	Desktop	dygraph	Qt4Examples	RNDISdriverwindow S
 Trash tftpboot "first_test.c" selected (0 by 	first_test.c tes)			
🔟 🛛 🛛 user@ubuntu904	ldeskt 📓 user - File	Browser		🔂 🔂
To direct input to this virtual machine,	press Ctrl+G.	6		Vmware //

Double click on the file icon to open gedit editor.

Write the simple "Hello world" program:



7.1.2.2. Compiling the first "C" program

Compile the program by entering the following command into the Virtual Machine Linux console:

arm-angstrom-linux-gnueabi-gcc –o first_test first_test.c

the result is the first_test compiled program.

You can copy the compiled file directly into the Z-TWS4 by executing the command:

scp first_test root@192.168.90.101:/disk

another way is to drag the compiled file out of the Virtual Machine window:



and then copy it to the Windows desktop. From here, you can drag it to the WinSCP program, connected to the Z-TWS4 board on the /disk directory:

			And in case			x
i <u>R</u> e	emoto Aiuto		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
		Predefinito				
-	~ ~ ~ ~			-		0
2		disk	• 🖾 🔹			唱
		/disk				
	Modificato 🔺	Nome Estensi	one Dimensi	Modificato	Diritti	F
ri	11/07/2012	B .		01/01/1970	rwxr-xr-x	r
e	14/09/2010	first_test	6.571	01/08/2012 16:22	rw-rr	r
e	13/09/2010	5.cod	0	03/10/2011 01:24	rw-rr	a a
e	23/03/2012	t5linux80	429.356	01/01/1970	rwxr-xr-x	r
e	04/04/2012					
e	04/04/2012					
e	04/04/2012					
e	04/04/2012					
e	04/04/2012					
e	16/03/2012					
e	04/04/2012					
e	04/04/2012					
e	04/04/2012					
e	04/04/2012					
e	04/04/2012					
e	04/04/2012					
e	08/03/2011					
e	21/02/2011					
e	26/04/2011					
e	09/09/2010					
e	04/03/2011					
	E E	4	10			+
i Sipo	etta 📑 F7 Crea ca	0 B di 425 KiB in 0 di 3 Intella 🗙 F8 Elimina	😭 F9 Proprieta 🥼	F10 Esci SCP	0:03:0	13

7.1.2.3. Running the first "C" program

To run the program, we must add the "executable" flag on the file with the chmod command:

I AA - HyperTerminal	
File Modifica Visualizza Chiama Irasferimento ?	
root@mx25:/#	
rootemx25:/#	
Footemx25.7#	
root@mx25:/#	
root@wx25:/#	
root@mx25:/#	
Footemx25:/#	
Footemx25.7#	
root@my25:/# cd /disk	
root@mx25:/disk# chmod +x first test	
root@mx25:/disk#_	(=)
Connesso a 00:02:53 VT1001 115200 8-N-1	
Conness advers 1100 1100 111 1000	

Now, we can execute the file:

File Modifica Visualizza Chiama Irasferimento ?	
root@mx25:/disk#	
roolemx25:/disk#	
rootamy25;/dick# /first tost	
Hello world!	
root@mx25:/disk#	
	E

8. Z-TWS4 "StratON PLC" version

Z-TWS4 StratON PLC version provides the full support for IEC 61131-3 PLC Standard; an Integrated Development Environment (IDE) is available for Windows[™] and Linux PCs.

The StratON Integrated Development Environment includes several tools such as: a fieldbus configuration tool, an analog signal editor and editors compliant with the five languages of the IEC 61131-3 Standard: Sequential Function Chart (SFC), Function Block Diagram (FBD), Ladder Diagram (LD), Structured Text (ST), Instruction List (IL).

With StratON IDE, it's simple to write, download and debug IEC 61131-3 code.

8.1. Writing, downloading and running the first program

First, we must add the Seneca Library (file SenecaStratonLibrary_sw2960_001.XL5) to the IDE:



Import the Library:





No. Week Help Image: Add I	U	Library Wanater Serves	- a 🗙
Texhologing (a) Texa (b) (b) Texa (b) (b) Texa (b)	File Tools Wizard Help		
	Function and FBs 1/Ds Profiles AS-# Types		
	FTP_GET ("File download by means of FTP protocol ")		Nov
	FTP_PUT ("File upload by means of FTP protocol ") INGET SMS ("Earthen Brock to not a received SMS ")		Bename.
	LINUX_SHELL(*Function Book which executed a command in a Laux theil 1		Delate
Praveten Greenpool Via_INOT Bell_ded 1572007 200_VIA_NOTOT Revisit 1 D77 Revisit 1 D77	11 UNIC AVAILUTE (In concern line and uncerned to concern (In concerned to a place sume " UNIC 2014 (INTERNO Roberts encounced are pint and the second of the second of the second seco		Duke
VIA_INPET BALL des 1 STANOF. BALL des 1 STANOF. BAL	Parameters Description		
Beal, des I TRUDY TORS TORS See 1 I II Beau I III En UNA En UNA	VAR_INEUT		* Store
	Exable : BOUL END VAL VAL OTTT Reacts : INT/ ED_VAL		Read Danges
📲 🔡 💁 🍓 🕺 🚻 🗿 - 16 10 - 10 10 10 10 10 10 10 10 10 10 10 10 10	C		
			- W M

Now, we can save the library:

1	Timmy Manager- Sovera	×
ile Tools Wicard I	ielp	
Open Library	et AS+ Types	
Save Library	ears of FTP protocol ")	New.
Use in SAMA	ins of FTP protocol ")	Demans
Test	ck which executes a command in a Linux shell. ")	Dome
TIME_STNC (* Time av	objectadion by means of NTP protocol (*	
arameters Descaption		n Star Real Darger

Now, run the IDE and open the demo project:



then set the correct target IP address (for example 192.168.90.101 instead of 10.0.0.14); the port must be set to 502:

ettings	Runtime	Compiler	Memory	Download	Debug	On Line Chan
C:\Use	ers\Seneca	\Desktop\	TWS4\Firs	st_Program\E)emo_pro	iject -
Comn	nunication p	arameters				
	10.0.0.14	1100				
	T5 Runtim	e				•
Simul	ation (for al	projects)				
	Aways	start simulat	or in "Cold	d Start" mode	n.,	
Conn	ected to the	e runtime (fo	or all projec	cts)		
	Prompt	pefore stop	ping the a	oplication		
	Prompt	before <u>d</u> own	nload			
	Prompt	before <u>O</u> n L	ine chang	je		
When	n starting th	e runtime (fo	or all proje	cts)		
	Propose	to start in '	Cold Star	" mode		
	Propose	to start wit	h RETAIN	l variables rel	oaded	
Misc.						
	Log use	r actions du	uring test			
				Shov	v log file.	
Alw	ays open th	is tab				

Then press the icon:

ß

to compile the project.

Download the code by pressing the icon:

5**0** |

The project file will be placed into the /disk directory.

This demo will print the "Hello World!" string to the terminal.

9. Updating the firmware by a USB pen

Z-TWS4 firmware can be updated by means of a USB pen drive; this procedure may be used for bugfix or to add new features.

You need a pen drive formatted with FAT32 file-system.

The procedure is the following:

1) from the zip file downloaded from Seneca website:

TWS4_SW00xxxx_yyy.zip

extract the files:

disk.tar.gz

diskdfl.jffs2.tar.gz

rootfs.jffs2.tar.gz

zlmage_rev2.tar.gz

- 2) Copy the tar.gz files into the root of the USB pen
- 3) Switch off Z-TWS4
- 4) Insert the USB pen into the Z-TWS4 USB#1 port
- 5) Switch on Z-TWS4
- 6) At the boot end (LED L1 ON), remove the USB pen
- 7) Switch off Z-TWS4
- 8) Switch on Z-TWS4

10. Web Configuration Pages

Z-TWS4 can be fully configured by means of a set of web configuration pages.

To access Z-TWS4 configuration site, you have to connect the browser to the Z-TWS4 IP address on port 8080, e.g.:

http://192.168.90.101:8080¹

and, when asked, provide the following credentials:

Username: Admin Password: Admin

¹ The default 80 HTTP port has been left available for customer pages (still under development).

(please note the 'A' uppercase character).

You come to the following page:



In this page, all Z-TWS4 configuration parameters are shown, with their current values.

The "RESET" button can be used to perform Z-TWS4 reboot.

To change the parameter values, you have to go to the "Setup" page.

192.1	68.85.104:8080/setup.php			
NCOA		and the second		
SENECA	Z-TWS4 Setup Firmware Version: SW002490_106	MAC: 02000000000		
p Time Manu	CURRENT	UPDATED		
Time Clock Setup	IP ADDRESS 192.168.85.104	192.168.85.104		
Files Upload	IP MASK 255.255.255.0	255.255.255.0		
Jpgrade	IP ADDRESS 2 DN/DFF OFF	OFF ·		
	IP ADDRESS 2 192.168.100.101	192.168.100.101		
	IP MASK 2 255.255.255.0	255.255.265.0		
	GATEWAY ADDRESS 192.168.85.1	192.168.85.1		
	DNS ADDRESS 192.168.84.113	192.168.84.113		
	WEB ADMIN USERMAME admin	admin		
	WEB ADMIN PASSWORD admin	admin		
	WEB USER USERNAME user	user		
	WEB USER PASSWORD user	user		
	CAN BAUDRATE 250 kbit/s	250 kbit/s •		
	STRATON TCPAP SERVER PORT 502	502		
	STRATON REDUNDANCY ON/OFF	OFF ·		
	STRATON 192.168.85.103	192.168.85.103		
	LICENSE KEY C3A0CACAD000CA	C3A0CACAD0D0CACF		
	WTP ON/OFF ON	ON .		
	PRIMARY NTP SERVER 192.168.84.113	192.168.84.113		
	SECONDARY NTP SERVER pool.ntp.org	pool.ntp.org		
	TIME ZONE GMT+1	GMT+1 •		
	FTP USERNAME tws4	tws4		
	FTP PASSWORD tws4	tws4		
	PPP ONIOFF OFF	OFF .		
	PPP SERIAL PORT COM16	COM16 *		
	GP/(S APH libox.tim.lt	ibox.tim.it		
	GPR5 USERNAME			
	GPRS PASSWORD			
	ALM DWOLL OLL	OFF .		
-				

In the following table, all Z-TWS4 configuration parameters are listed with a brief explanation and the parameter default value for each of them.

Field	Meaning	Default value
IP ADDRESS	IP address	192.168.90.101
IP MASK	Network mask	255.255.255.0
IP ADDRESS 2 ON/OFF	Flag to enable/disable the second	OFF
	IP address	
IP ADDRESS 2	Second IP address	192.168.100.101
IP MASK 2	Second network mask	255.255.255.0
GATEWAY ADDRESS	Default Gateway address	192.168.90.1
DNS ADDRESS	DNS server address	192.168.90.1
WEB ADMIN USERNAME	Username to access the web	Admin
	configuration site (port: 8080)	
WEB ADMIN PASSWORD	Password to access the web	Admin
	configuration site (port: 8080)	
WEB USER USERNAME	Username to access the web user	User
	site (port: 80)	
WEB USER PASSWORD	Passsword to access the web user	User
	site (port: 80)	
CAN BAUDRATE	Baud Rate of the CAN interface;	250 Kbit/s
	possible values are:	
	20/50/100/125/250/500 Kbit/s	
STRATON TCP/IP SERVER PORT	TCP/IP port to connect to the	502
	Straton server	
STRATON REDUNDANCY ON/OFF	Flag to enable/disable the Straton	OFF
	Redundancy functionality	
STRATON REDUNDANCY IP	IP address of the other Z-TWS4	192.168.90.102
ADDRESS	device used for Straton	
	Redundancy	
LICENSE KEY	Key to enable/disable Energy	1122334455667788
	Protocol functionalities in Straton	(dummy value) ²
NTP ON/OFF	Flag to enable/disable time	ON
	synchronization by means of NTP	
	protocol	
PRIMARY NTP SERVER	IP address or FQDN ³ of the	192.168.90.1
	Primary NTP Server	

 ² The correct License Key string is provided by Seneca.
 ³ FQDN: Fully Qualified Domain Name, e.g.: "pool.ntp.org".

SECONDARY NTP SERVER	IP address or FQDN of the	192.168.90.1
	Secondary NTP Server	
TIME ZONE	Time Zone	GMT+1
FTP USERNAME	Username to connect to the Z-	user
	TWS4 FTP site	
FTP PASSWORD	Password to connect to the Z-	123456
	TWS4 FTP site	
PPP ON/OFF	Flag to enable/disable the PPP	OFF
	connectivity (this requires the Z-	
	TWS4 to be connected to a GPRS	
	modem, e.g. Seneca Z-MODEM)	
PPP SERIAL PORT	Serial Port used for PPP	COM1
	connectivity; possible values are:	
	COM1 (RS232) and COM16 (USB)	
GPRS APN	GPRS Access Point Name, as	ibox.tim.it
	given by the Mobile Network	
	Operator	
GPRS USERNAME	Username needed for GPRS	user
	connectivity, as given by the	
	Mobile Network Operator; it may	
	be empty, if authentication is not	
	required	
GPRS PASSWORD	Password needed for GPRS	pass
	connectivity, as given by the	
	Mobile Network Operator; it may	
	be empty, if authentication is not	
	required	
VPN ON/OFF	Flag to enable/disable the VPN	OFF
	connectivity; Z-TWS4 provides an	
	OpenVPN client	
VPN SERVER	IP address or FQDN of the	192.168.90.101
	OpenVPN server	
VPN PORT	UDP Port of the OpenVPN server	1194

In the "Setup" page, you can change any of the above parameters; to apply the changes, press the "Submit" button; this saves the changes and performs the Z-TWS4 reboot.

If needed, you can restore factory default values for all parameters, by pressing the "FACTORY DEFAULT" button.

TTWS4	*		
← → C 🗋 192.1	168.85.104:8080/rtc.php		
S SENECA®	Z-TW\$4 RTC Setup Firmware Version: SW002490_106	MAC: 02000000000	
Setup	CURRENT	ABDV1ED	
Real Time View	YEAR 2014	2014	
VPN Files Upload	MDN/TH February	February •	
FW Upgrade	DAY 24	24	
	HDDR 08	08	
	MINUTE 54	64	
	SECOND 56	56	
		Submit	



If you need to change the Z-TWS4 date/time settings, go to the "Real Time Clock Setup" page above; please note that this makes sense if time synchronization by means of the NTP protocol is not enabled.

2-TWS4		
← → C 🗋 192.1	168.85.104:8080/vpn_files.php	
S SENECA [®]	Z-TWS4 VPN Files Firmware Version: SW002480_106 MAC: 02000000000	
Setup	CA certificate Scegli file Nessun file selezionato	
Real Time Clock Setup	Client certificate Scegli file Messuri file selezionato	
VPN Files Upload	Client key Scegi file Nessun file selezionato	
FW Upgrade	Upload	

= 😂 💁 😨 😫 😻

The above "VPN Files Upload" page lets you load on the Z-TWS4 a set of files needed to establish a secure VPN connection; these are the files containing the Certification Authority (CA) certificate, the client certificate and the client key, respectively⁴.

In this page, you can browse your PC to select these files and send them to the Z-TWS4 by pressing the "Upload" button.

Once the upload is done, the following result page is shown.



- 🋪 🏴 🗊 🌒 17.04 24/02/2014



⁴ For more information about these files and related topics, please refer to the OpenVPN web page ("openvpn.net").

USER MANUAL – Z-TWS4

T Z-TWS4	*		- Ø 🗙
← → C 🗋 192.1	168.85.104:8080/fw_files.php		☆ =
SENECA®	Z-TWS4 FW Upgrade Firmware Version: S	V002490_106 MAC: 02000000000	
Setup	Kernei	Scegli file Nessun file selezionato	
teal Time Clock Setup	Root file system	Scegi file Nessun file selezionato	
VPN Files Upload	Desk Default	Scegi file Nessun file selezionato	
FW Upgrade	Disk	Scepi file Nessun file selezionato	
	Upload		

🛋 🚞 💁 🔽 😻 📖

Finally, the "FW Upgrade" page lets you upgrade essential parts of the Z-TWS4 FW.

Please note that an erroneous use of this functionality can compromise the proper Z-TWS4 functioning; so, use this page only to apply upgrades released by Seneca, with the support of Seneca personnel.

* P = 4V

In this page, you can browse your PC to select the FW files, which should have the following names:

Kernel: zImage_rev2.tar.gz

Root file-system: rootfs.jffs2.tar.gz

Disk Default: diskdfl.jffs2.tar.gz

Disk: disk.tar.gz

You can select one or more files; then, you can start the upload, by pressing the "Upload" button.

Once the upload is done, the following result page is shown:

j 192.168.85.104:8080/fw_upgrade.php	
CA® z-TWS4 FW Upgrade Firmware Version: SW002490_106 MAC: 02000000000	
Upload: dimage, jev2 far.gt. — Star. 2018737 befa — Stored in Riskhmödinage, jev2 far.gt.	
Uplead: roots/jfs2.txr.gz — Size: 22247037 Apples — Sized in rashtmphotopi.tfs2.txr.gz	
Uptoad disktif (hz?bir gr. — Sizer 110600 spise) — Silved in Rashmoldskill (hz?bir gr.	
Upload distarg: — Else 808465 bies — Elsed in Aphrodistarg:	
Upgrade and Reboot Cancel Upgrade	

In this page, you can:

- press the "Upgrade and Reboot" button: this will start the upgrade procedure, which may take some time to be completed; during this time, it is highly recommended that the Z-TWS4 is not switched off; at the end of the procedure, the Z-TWS4 will be automatically rebooted
- press the "Cancel Upgrade" button: this will delete all the uploaded files on Z-TWS4

11. Appendix A: Seneca Function Blocks

To let the users exploit Z-TWS4 features in their IEC 61131-3 programs, Seneca has developed a set of "Function Blocks", supplied with the Seneca library for StratON.

In this appendix, Seneca FBs are listed, providing a description of input/output parameters and some notes for each of them.



FTP GET

The FTP GET FB downloads a file, by means of the FTP protocol.

When first called, the FB runs a process which starts performing the download; on subsequent calls, it only checks if the process has finished its job.

```
The FB has the following input parameters:
- HOST : IP address or host name of the FTP server
- PORT : TCP port for the FTP protocol (normally: 21)
- USERNAME : username for authentication
- PASSWORD : password for authentication
- REM_FILE : name of the file (with path) on the remote server
- LOC_FILE : name of the file (with path) on the local device
- ENABLE : TRUE -> FB is executed
FALSE -> FB is skipped
```



FTP PUT

The FTP PUT FB uploads a file, by means of the FTP protocol.

When first called, the FB runs a process which starts performing the upload; on subsequent calls, it only checks if the process has finished its job.

```
The FB has the following input parameters:
- HOST : IP address or host name of the FTP server
- PORT : TCP port for the FTP protocol (normally: 21)
- USERNAME : username for authentication
- PASSWORD : password for authentication
- REM_FILE : name of the file (with path) on the remote server
- LOC_FILE : name of the file (with path) on the local device
- ENABLE : TRUE -> FB is executed
FALSE -> FB is skipped
```



GET SMS

The GET_SMS FB gets an SMS, previously received, by means of a GSM modem; once read, the SMS is deleted.

When first called, the FB runs a process which starts getting the SMS; on subsequent calls, it only checks if the process has finished its job.

The FB has the following input parameters:

- SERIAL_PC	ORT :	name	of the	seria	l port	which	the	GSM r	noder	ıis	CO	nnec	cted	to;
		on Z-'	TWS4, t	the on	ly supp	ported	valu	les ai	re:					
		COM1	: RS-23	32 por	t									
		COM16	: USB p	port										
- TIMEOUT	:	timeo	ut, in	secon	ds									
- ENABLE	:	TRUE	-> FB	is ex	ecuted									
		FALSE	-> FB	is sk	ipped									
The FB has	the :	follow	ing out	put p	aramete	ers:								
- RESULT	: -1,	, in c	ase of	any f	ailure									
	0	, if ti	he prod	cess i	s stil	l runni	ing							
	1,	, if t	he prod	cess h	as suco	cessful	lly f	finisł	ned a	nd	an	SMS	has	been

found

2, if timeout has expired 3, if the process has successfully finished but no SMS has been found - SENDER : SMS sender (only if RESULT=1) - DATETIME : Date/time of SMS reception (only if RESULT=1) - TEXT : SMS text (only if RESULT=1)

Please note that the GET_SMS FB can't be successfully executed while the PPP connection is active.



LINUX_SHELL

Seneca FB for access to the Linux Shell. Max 200 command line characters. For access to the output use ">> output.txt"

Shell_cmd : string command Enable : if true execute the shell command Result : 1 OK; 0 PAUSE; other FAULT

Usage Example:

"ls >> output1.txt"

create the directory list into output1.txt



MODEM CTRL

The MODEM_CTRL FB sends a generic AT command to the GSM modem and receives the corresponding response.

When first called, the FB runs a process which starts sending the command;

on subsequent calls, it only checks if the process has finished its job. The FB has the following input parameters: - SERIAL PORT : name of the serial port which the GSM modem is connected to; on Z-TWS4, the only supported values are: COM1 : RS-232 port COM16: USB port - COMMAND : AT command to be executed - TIMEOUT : timeout, in seconds : TRUE -> FB is executed - ENABLE FALSE -> FB is skipped The FB has the following output parameters: - RESULT : -1, in case of any failure 0, if the process is still running 1, if the process has successfully finished (NOTE: this only means that the command was successfully sent and the response was successfully received; it does not necessarily mean that the AT command was successfully executed; in other words, it is up to the application to tell if the response means success or failure) 2, if timeout has expired - RESPONSE : the response to the AT command, as sent by the modem; it can contain more lines, separated by a '\' character; if the whole response is longer than 255 characters, it will be truncated.

Please note that the MODEM_CTRL FB can't be successfully executed while the PPP connection is active.



PPP CONNECT

The PPP_CONNECT FB performs PPP connection setup or release, by means of a GPRS modem.

When first called, it runs a process which starts the connection setup or release; on subsequent calls, it only checks if the process has finished its job.

The FB has the following input parameters:

- CONNECT	: TRUE -> connection setup
	FALSE -> connection release
- SERIAL PORT	: name of the serial port which the GPRS modem is connected to;
—	on Z-TWS4, the only supported values are:
	COM1 : RS-232 port
	COM16: USB port
- GPRS APN	: GPRS Access Point Name (as given by the mobile operator)
- USERNAME	: username required for authentication (it can be empty, if
authenticatior	n is not required)
- PASSWORD	: password required for authentication (it can be empty, if
authenticatior	n is not required)
- TIMEOUT	: timeout, in seconds
- ENABLE	: TRUE -> FB is executed
	FALSE -> FB is skipped

When CONNECT=FALSE, SERIAL_PORT, GPRS_APN, USERNAME and PASSWORD parameters can be empty.

The FB has the following output parameters:
- RESULT : -1, in case of any failure
 0, if the process is still running
 1, if the process has successfully finished
 2, if timeout has expired.
- LOCAL_IP : IP address assigned to the PPP network interface (only if
RESULT=1, with CONNECT=TRUE)
- REMOTE_IP : IP address of the remote host (set as default gateway) (only if
RESULT=1, with CONNECT=TRUE)



SEND MAIL

The SEND MAIL FB sends an e-mail, by means of the SMTP/SMTPS protocol.

When first called, the FB runs a process which starts sending the e-mail; on subsequent calls, it only checks if the process has finished its job.

```
The FB has the following input parameters:
- SMTP HOST
               : IP address or host name of the SMTP/SMTPS server
- SMTP PORT
                : TCP port for the SMTP/SMTPS protocol (normally: 25, for SMTP;
465, for SMTPS)
                : if cryptography (SSL) shall be used (FALSE -> SMTP, TRUE ->
- CRYPTO ON
SMTPS)
- AUTH ON
                : if authentication shall be executed
- AUTH USERNAME : username for authentication
- AUTH PASSWORD : password for authentication
- FROM
                : e-mail sender
- то
                : e-mail recipient
- SUBJECT
                : e-mail subject
- TEXT
                : e-mail text
- ATTACH FILE
                : name of the file (with path) to be attached to the e-mail (it
can be empty)
- ENABLE
                : TRUE -> FB is executed
                  FALSE -> FB is skipped
The FB has the following output parameter:
```

- RESULT : -1, in case of any failure
 0, if the process is still running
 1, if the process has successfully finished.



SEND SMS

The SEND SMS FB sends an SMS, by means of a GSM modem.

When first called, it runs a process which starts sending the SMS; on subsequent calls, it only checks if the process has finished its job.

The FB has the following input parameters:

 SERIAL_PORT : name of the serial port which the GSM modem is connected to; on Z-TWS4, the only supported values are: COM1 : RS-232 port COM16: USB port
 SC_NUM : SMS Service Center (as given by the mobile operator) (it can be empty, if the SC number is already set on the modem)
 TO_NUM : recipient number SMS_BODY : SMS text
 TIMEOUT : timeout, in seconds
 ENABLE : TRUE -> FB is executed FALSE -> FB is skipped
 The FB has the following output parameter:
 RESULT : -1, in case of any failure
 0, if the process is still running
 1, if the process has successfully finished
 2, if timeout has expired.

Please note that the SEND_SMS FB can't be successfully executed while the PPP connection is active.

GTIME_SYN	C C D TIME SYNC ("Time synchronization by means of NTP protocol")
	IN
	ENABLE:BOOL
	OUT
	RESULT:INT

TIME SYNC

The TIME SYNC FB performs time synchronization, by means of the NTP protocol.

When first called, the FB runs a process which starts performing the synchronization; on subsequent calls, it only checks if the process has finished its job.

The FB has the following input parameter:

- ENABLE : TRUE -> FB is executed FALSE -> FB is skipped