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# **1** Preliminary information / Informazioni preliminari

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Date Revision		Notes
06/09/2016	07	- Chapter "Features": new features forZ-PASS2-S-R01
		- Chapter "LEDs signalling": new par. " Z-PASS2-S-R01"
		- New chapter "Ethernet Mode (Z-PASS2-S-R01)"
		- Chapter: "Discovering the IP address": network parameters setting
		- Chapter "Upgrading the firmware by a USB pen": revision
		- Par. "Web Configuration Pages/Administrator pages": changed
		paragraphs: - "Main View"
		- "Network and Services"
		- "Router Configuration" - "FW Upgrade"
		new paragraphs:
		- "VPN Configuration/OpenVPN Client/LED signalling (Z-PASS2-S-R01)"
1		- "VPN Configuration/VPN Box/LED signalling (Z-PASS2-S-R01)"
		- Par. "Web Configuration Pages/User pages"
		changed paragraphs:
		- "Main View" - "Network and Services"
11/01/2017		
11/01/2017	08	- Renamed "Z-PASS2-S-1" $\rightarrow$ ", "Z-PASS2-S-R01"
		- Chapter "Discovering the IP address": discovery working on both LAN
		and WAN interfaces
		- New chapter "Network Redundancy"
		- Paragraph "Main View" revision (also for "User Pages")
		- Paragraph "Network and Services": added "DNS Mode" parameter
		and Network Redundancy parameters; changed some default values
		(also for "User Pages")
		- Paragraph "Real Time Clock Setup": added "Central Europe" time
		zone value
		<ul> <li>Paragraph "VPN Configuration/OpenVPN Client": revision into "VPN Configuration/OpenVPN"; added packet/byte counters description</li> </ul>
		- Paragraph "VPN Configuration/VPN Box": added packet/byte counters
		<ul><li>description</li><li>Paragraph "Mobile Network": added packet/byte counters</li></ul>
		description
		<ul> <li>Paragraph "Router Configuration": Port Mapping parameters no more disabled when "Use Local Addresses" is ON</li> </ul>
		<ul> <li>Paragraph "Users Configuration": added "guest" user credentials</li> </ul>
		- New paragraph "Ethernet Interfaces"
		- New paragraph "Modbus Modules"
		- New paragraph "Data Logs"
		- New paragraph "Guest Pages"
		- StratON FBs and Functions, new paragraphs: GET_ALARMS,
		PUT_ALARM, SET_ALARMS_STAT, FM_WRITE_NCRLF, TXBAPPENDFILE,
		GET_MIN_SINCE2K
		- Chapter Z-NET4: added note to "Remote Control Functions"
01/03/2017	09	- New paragraph "Configuration Management"
01/03/201/	09	- PLC application name shown in the web pages header
		- "Use Local Address through VPN" parameter: "ON" option always
		available
		<ul> <li>Paragraph "Network and Services" (Admin and User): changed default value for "Default Gateway" and "DNS Server" parameters; "Default</li> </ul>
		Gateway" always in the WAN subnet, in LAN/WAN mode; "DHCP on
		LAN" disabled, in LAN/WAN mode

		<ul> <li>OpenVPN, Configuration File: added rules on "dev" and "log" options</li> <li>StratON FBs and Functions, new paragraphs: S7_DB_READ,</li> <li>S7_DB_WRITE</li> </ul>
23/05/2017	10	- Chapter "Features": new features for Z-PASS2-S-IO
23/03/2017	10	- New "LEDs signaling" sub-paragraph for IO HW revision
		- New chapter "Remote Access Disable"
		- New chapter "Auto-APN"
		- Paragraph "Network and Services": added screen-shots for "IO"
		version; added "COM1/Mode" parameter
		- Paragraph "VPN Box": added "License Limit Reached" error reason
		- Paragraph "FW Upgrade": changed "Stop TWS Services" pop-up
		- Paragraph "Configuration Management": added "Save Debug Logs"
		feature
		- Paragraph "Mobile Network": added "APN Mode" parameter
		- New paragraph "Digital I/O Configuration"
		<ul> <li>Paragraph "PPP_CONNECT": changes for "Auto-APN"</li> </ul>
		- StratON FBs and Functions, new paragraphs: PPP_CONNECT_R2,
		VPNBOX_STATUS, WDOG_KEEP_ALIVE, WDOG_SET_TMO
02/08/2017	11	- Chapter "Technical Specifications": added features for Z-PASS2-S-IO
		modem
		- Paragraph "LEDs signaling"/IO: added info about modem "STAT " LED
		- Chapter "VPN": added description of Layer 2 and Layer 3 VPN
		- Paragraph "VPN Configuration/VPN Box": changes related to L2 VPN
		and info about connected user; added L2 VPN figure
		- Deleted paragraph "Updating the StratON application by a USB pen"
		- Chapter "Upgrading the firmware": added notes about LEDs blinking
		- Paragraph "Main View" (admin): updated figure
		- Paragraph "Network and Services": added info about new Web Server
		and File Transfer parameters; updated figures
		- Paragraph "Real Time Clock Setup": updated figure
		- Paragraph "Router Configuration": changed default value for "Allow
		Access through Mobile Public IP Address" parameter
		- Paragraph "Configuration Management": added info about zip
		archive; updated figures
		- Paragraph "Mobile Network": updated figures
		- "Remote Access Disable" $\rightarrow$ "Remote Connection Disable"
06/10/2017	12	- Changed "-R02" $\rightarrow$ "-IO"
		- Chapters "Features", "Technical Specifications": note about GPS
		module and antenna
		- Chapter "Electrical Connections": added sub-paragraph for Z-PASS2-S-
		IO Digital I/Os
		- New sub-paragraph "Z-PASS2-S-IO profiles"
		- Paragraphs "Main View", "Network and Services": updated figures
		- Paragraph "Real Time Clock Setup": added figure with new time zones
		- Paragraph "VPN Box": updated first figure
		- Paragraph "Router Configuration": updated figures
		- Paragraph "Users Configuration": updated figure
		- Paragraph "FW Upgrade": updated figures
		- Paragraph "Configuration Management": added table about save
		option and archive contents; updated figure
		- New sub-paragraph "Factory reset by USB pen"
		- Paragraph "Mobile Network": added info and figure about "GPS
		Location"; updated some figures
		- Paragraph "Digital I/O Configuration": added info and figure about
		"Local Alarm"

		- New paragraph "FW Versions"
		- Deleted "DHCP on LAN" parameter
		- Paragraph "Network and Services" (user): updated figures
30/11/2017	13	- Paragraph "Router Configuration": parameter "Access through Mobile
		Public IP Address" changed to "Mobile Network Firewall"
		- Paragraph "Mobile Network": changes related to "Operator
		Selection" and PIN handling
		- New paragraph "DDNS Configuration"
		- Paragraphs "Main View" and "Guest pages": "RESET" button renamed
		to "RESTART"; updated figures
		- Chapter "Remote Connection Disable": added "Security Level 4 (SMS
		Service)"
		- Paragraph "Digital I/O Configuration": added "Security Level 4 (SMS
		Service)"; updated figures
		- Paragraph "FW Versions": updated figure
		- StratON FBs, new paragraph: SERVICE_CTRL
		- Deleted references to Z-MODEM-3G
18/01/2018	14	- Chapter "Features": added Z-PASS2-S-IO-4G product
		- Chapter "Technical specifications": updated info about modem
		- Removed "None" value of "Security Level / Service Disable"
		parameter.
15/03/2018	15	- Removed CTS signal from COM1 port (Z-TWS4, Z-PASS2-S)
		- Added parts related to Z-TWS4-IO

## 2 Features

Z-TWS4, Z-PASS2-S and S6001-RTU are programmable, communication oriented PLCs.

The Z-TWS4/Z-PASS2-S/S6001-RTU StratON<sup>™</sup> PLC is programmable according to the IEC 61131-3 standard, by means of the StratON development environment.

All three devices provide the following features:

- OpenVPN connectivity
- full configuration by means of an integrated web site
- FW upgrade, that can be performed locally, by means of a USB pen, or remotely, through the web site

Z-PASS2-S and S6001-RTU integrate a 3G HSPA modem.

S6001-RTU is equipped with a rich set of analog and digital inputs/outputs.

Z-PASS2-S, S6001-RTU and Z-TWS4 (when connected to an external modem) can be used as a Router, routing packets between the WAN (Mobile Network) and the LAN (Ethernet).

All three devices are based on a 32bits ARM9 processor, equipped with the Linux operating system (Linux kernel 2.6.28).

Z-PASS2-S-R01 is a new version of the Z-PASS2-S product, providing the following new features:

- the two available Ethernet ports can be configured as two fully separated network interfaces ("LAN" and "WAN"), whereas in the older versions they could only work as ports of an Ethernet switch; the user can choose if the two ports shall work in "LAN/WAN" mode or "Switch" mode, by means of a new configuration parameter ("Ethernet Mode");
- there are 4 more LEDs, providing information about the "Ethernet Mode" and the VPN functionalities.

Z-TWS4-IO is a new version of the Z-TWS4 product, providing the following new features:

- one digital input which can be used to disable remote connection to the device
- one digital output which goes HIGH when the device is remotely accessed
- one digital output which can also be used as a remote command
- one configurable digital input/output, which can also be used as a local alarm
- a new set of LEDs
- COM1 RS232/RS485 mode set by software (configuration parameter), instead of HW DIP switch

Z-PASS2-S-IO is a new version of the Z-PASS2-S product, providing the following new features:

- one digital input which can be used to disable remote connection to the device
- one digital output which goes HIGH when the device is remotely accessed
- one digital input which can also be used as a local alarm
- one digital output which can also be used as a remote command
- two configurable digital inputs/outputs
- a new set of LEDs
- COM1 RS232/RS485 mode set by software (configuration parameter), instead of HW DIP switch
- a new penta-band 3G+ modem, which also features a GPS module

Z-PASS2-S-IO-4G is a new version of the Z-PASS2-S-IO product, providing a new 4G LTE Cat.1 modem, instead of the 3G+ modem.

NOTE 1:

in the following chapters, the term "Device" will be used when describing features or characteristics that are available in all three products.

NOTE 2:

in the following chapters, any reference to 3G modem/connection applies also to 4G modem/connection.

# **3** Technical specifications

C	COMMUNICATION PORTS (Z-TWS4/Z-PASS2-S)		
RS 485	Baud rate: maximum 115 Kbps, minimum 110 bps		
	COM 4 (screw terminals 4-5-6)		
	COM 2 (screw terminals 1-2-3 or IDC10 connector)		
	COM 1 (removable 4 pin connector, as an alternative to RS232)		
RS 232	Baud rate: maximum 115 Kbps, minimum 110 bps		
	COM 1 (removable 4 pin connector, as an alternative to RS485)		
CAN	CAN bus port 2.0A and 2.0B		
	Baud rate: maximum 500 Kbps, minimum 20 Kbps		
	(screw terminals 10-11-12 or IDC10 connector)		
	available only in Z-TWS4		
Ethernet 1 and Ethernet 2	Ethernet 10/100 Mbps		
	Two RJ45 connectors on front-panel		
	Maximum connection length 100 m		
	In Z-PASS2-S-R01/Z-PASS2-S-IO/Z-TWS4-IO, the two ports can work either as LAN/WAN ports (ETH1=LAN, ETH2=WAN) or ports of an Ethernet switch.		
	In Z-TWS4/Z-PASS2-S, the two ports can work only as ports of an Ethernet switch.		
USB #1 HOST	Plug-in: USB type A		
USB #2 HOST	Plug-in: micro USB (available only in Z-TWS4)		
	COMMUNICATION PORTS (S6001-RTU)		
RS 485	Baud rate: maximum 115 Kbps, minimum 110 bps		
	COM 4 (screw terminals 54-55-56)		
	COM 2 (screw terminals 57-58-59)		

RS 232	Baud rate: maximum 115 Kbps, minimum 110 bps
	COM 1 (DB9 male connector)
Optional Bus for future extensions	screw terminals 60-61-62
Ethernet	Ethernet 10/100 Mbps
	RJ45 connector
	Maximum connection length 100 m
USB #1 HOST	Plug-in: USB type A
	CPU AND MEMORY
Microprocessor	ARM 9, 32 bits, 400 MHz
Memories	64 Mbytes of RAM
	1 Gbyte of FLASH
	8 Kbytes of FeRAM, split in 2 partitions (4 Kbytes each) for redundancy
Slot for external memory	Micro SD card: max 32 Gbytes
	I/O CPU (S6001-RTU)
Microprocessor	8 bits, 24 MHz
	3G+ MODEM (Z-PASS2-S/S6001-RTU)
HSPA Modem	14.4 Mbps in downlink, 5.76 Mbps in uplink
Slot for SIM card	Mini SIM with push-push connector
	3G+ MODEM (Z-PASS2-S-IO)
Speed	HSPA+: max 14.4 Mbps DL, max 5.76 Mbps UL
	UMTS: max 384 Kbps (DL), max 384 Kbps (UL)
	EDGE: max 236.8 Kbps (DL), max 236.8 Kbps (UL)
	GPRS: max 85.6 Kbps (DL), max 85.6 Kbps (UL)
GNSS	GPS/GLONASS
	16 GPS channels
	14 GLONASS channels
	Accuracy <1.5m CEP-50 @ Open Sky
Approvals	RoHS Compliant, CE/GCF/Vodafone (Europe), DoC (Russia), FCC/PTCRB/AT&T
	(North America), RCM (Australia), ICASA (South Africa), SRRC/NAL/OFCA
	(China), JATE & TELEC (Japan), NCC (Taiwan), KC/SKT (Korea), IC/Rogers
	(Canada), Anatel (Brazil), NBTC (Thailand)
Slot for mini SIM	(Canada), Anatel (Brazil), NBTC (Thailand) Mini SIM with push-push connector

LTE FDD: max 10 Mbps (DL), max 5Mbps (UL)
LTE TDD: max 8.96 Mbps (DL), max 3.1 Mbps (UL)
DC-HSPA+: max 42Mbps (DL), max 5.76 Mbps (UL)
UMTS: max 384 Kbps (DL), max 384 Kbps (UL)
EDGE: max 296 Kbps (DL), max 236.8 Kbps (UL)
GPRS: max 107 Kbps (DL), max 85.6 Kbps (UL)
GPS/GLONASS/BeiDou/Galileo/QZSS
RoHS Compliant, CE/GCF/Vodafone (Europe), FCC/PTCRB/AT&T/Verizon*
(North America), RCM/Telstra (Australia), JATE/TELEC/DOCOMO* (Japan), NCC
(Taiwan), KC/SKT/KT*/LGU+* (Korea), IC/Rogers (Canada), Anatel (Brazil),
CCC/SRRC/NAL (China)
*= Under Development
Mini SIM with push-push connector
POWER SUPPLY (Z-TWS4/Z-PASS2-S)
1140 Vdc or 1928 Vac @ 5060 Hz
Typical 4 W @ 24 Vdc; Max 6 W
POWER SUPPLY (S6001-RTU)
24 Vac/dc ± 15% @ 50/60Hz
10 VA max , 6 VA typical
ENVIRONMENTAL CONDITIONS (Z-TWS4/Z-PASS2-S)
-20+55 °C
3090 % @ 40 °C not condensing
-20+85 °C
IP20
ENVIRONMENTAL CONDITIONS (S6001-RTU)
-10+65 °C
1090 % not condensing
-40+85 °C
IP20
CONNECTIONS (Z-TWS4/Z-PASS2-S)
Removable 3 way screw terminals, 5.08 pitch
Rear IDC10 connector for DIN 46277 rail

	Removable 4 pin connector
	Two RJ45 connectors
	Type A USB connector and micro USB connector (only in Z-TWS4)
	Plug in: micro SD card
	Two SMA antenna connectors: - for Main and Diversity antennas (only in Z-PASS2-S, Z-PASS2-S-R01) - for 3G and GPS antennas (only in Z-PASS2-S-IO)
	CONNECTIONS (S6001-RTU)
Connections	Removable screw terminals
	DB9 male connector
	RJ45 connector
	Type A USB connector
	Plug in: micro SD card
	Two SMA antenna connectors, for Main and Diversity antennas
	BOX / DIMENSIONS (Z-TWS4/Z-PASS2-S)
Dimensions	Z-TWS4: L: 100 mm; H: 112 mm; W: 35 mm
	Z-PASS2-S: L: 100 mm; H: 112 mm; W: 53 mm
Case	Nylon 6 with 30% fiberglass field, self-extinguishing class V0, black color
	WEIGHT / DIMENSIONS (S6001-RTU)
Dimensions	190 mm x 160 mm x 105 mm
Weight	600 g
5	INPUTS / OUTPUTS (Z-TWS4-IO)
Digital Inputs	Max. number of channels: 2 Voltage: OFF<4V ON>8V; Max. Current (Vout+): 20mA Current absorbed: 3mA at 12VC; 6mA at 24VC
Digital Outputs	Max. number of channels: 3 Voltage (+Vext): 10 – 24VC Max. current delivered: 400mA INPUTS / OUTPUTS (Z-PASS2-S-IO)
Digital Inputs	Max. number of channels: 4 Voltage: OFF<4V ON>8V; Max. Current (Vout+): 20mA Current absorbed: 3mA at 12VC; 6mA at 24VC
Digital Outputs	Max. number of channels: 4 Voltage (+Vext): 10 – 24VC Max. current delivered: 400mA

	INPUTS / OUTPUTS (S6001-RTU) <sup>1</sup>
Analog inputs	4, current, 020 mA
	resolution: 12 bit
	accuracy: += 0.3% of full scale
	input impedance: 50 $\Omega$
Analog outputs	1, current, 020 mA
	1, voltage, 010 Vdc
	resolution: 12 bit
	accuracy: += 0.3% of full scale
	output load: current: <= 500 $\Omega$ , voltage: >= 1 k $\Omega$
Digital inputs	15, PNP, with optoisolation
	ON current > 4 mA, OFF current < 3 mA
Digital outputs	8, SPDT relays
	max peak current: 3 A
	operating current: 2 A
	operating voltage: 250 Vac
	minimum load: 0.5 W
	isolation: 3 kV
Liquid level control inputs	conductive liquid level switch, 2 channels
	adjustable sensitivity

The following table shows which frequency bands are supported by the modem available in Z-PASS2-S, Z-PASS2-S-R01, S6001-RTU, Z-PASS2-S-IO and Z-PASS2-S-IO-4G products.

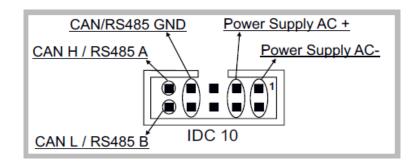
Standard	Frequency/Feature	Z-PASS2-S, Z-PASS2-S- R01, S001-RTU	Z-PASS2-S-IO	Z-PASS2-S-IO-4G
	GSM 850 MHz	ОК	ОК	
<b>CCN</b>	EGSM 900 MHz	ОК	ОК	ОК
GSM	DCS 1800 MHz	ОК	ОК	ОК
	PCS 1900 MHz	ОК	ОК	
	WCDMA 800 MHz		ОК	
	WCDMA 850 MHz		ОК	ОК
WCDMA	WCDMA 900 MHz	ОК	ОК	ОК
	WCDMA 1900 MHz		ОК	
	WCDMA 2100 MHz	ОК	ОК	ОК
	LTE 800 DD			ОК
	LTE 850			ОК
LTE	LTE 900			ОК
LIE	LTE 1800			ОК
	LTE 2100			ОК
	LTE 2600			ОК
	HSDPA	ОК	ОК	
HSPA	HSUPA	ОК	ОК	
пэра	HSPA+		ОК	
	DC-HSPA+			ОК
DRX	Receiver Diversity	ОК		

<sup>&</sup>lt;sup>1</sup> For more detailed information about S6001-RTU I/Os, see S6001-RTU Installation Manual.

## **4** Electrical Connections

### 4.1 Z-TWS4, Z-TWS4-IO, Z-PASS2-S, Z-PASS2-S-R01, Z-PASS2-S-IO

Power Supply and Modbus interface are available by using the bus for the Seneca DIN rail, by the rear IDC10 connector or by <u>Z-PC-DINAL1-35 accessory for Z-TWS4, Z-PC-DINAL2-52.5-17 for Z-PASS2-S</u>. The following picture shows the meaning of the IDC10 connector pins.



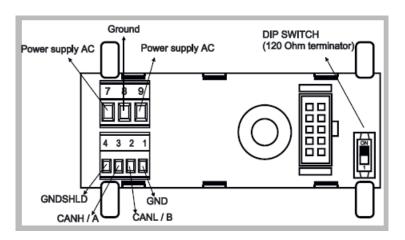
Power supply is available only from the rear connector for Z-TWS4, while:

Z-TWS4-IO can be powered also through 17-18 screw terminals;

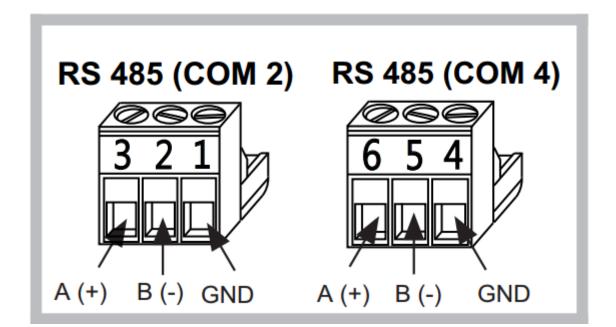
Z-PASS2-S/ZPASS2-S-R01/ZPASS2-S-IO can be powered also through 14-15 screw terminals.

If **Z-PC-DINAL1-35** or **Z-PC-DINAL2-52.5-17** 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  $\Omega$  terminator is used only for CAN communication (<u>Z-TWS4 only</u>).

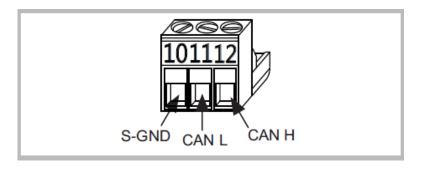
GNDSHLD: shield to protect the connection cables against interference (recommended).



The Device 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. On Z-TWS4, to select RS 485 on IDC10 connector, put the SW1 DIP-switch on OFF position; on Z-PASS2-S, no operation is needed.



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

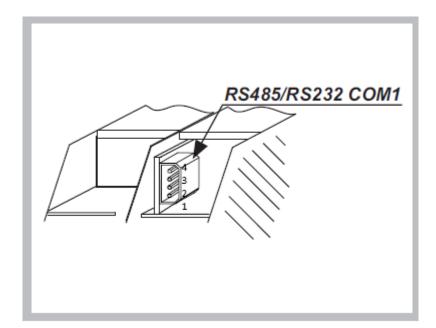


Through a removable 4 pin connector, the Device provides a serial RS232 port or, as an alternative, a third RS485 port. In order to select the RS232 port on the removable 4 pin connector, put the SW2 DIP-switch on ON position; to select the RS485 port on the removable 4 pin connector, put the SW2 DIP-switch on OFF position<sup>2</sup>.

In Z-TWS4-IO/Z-PASS2-S-IO, the mode (RS485/RS232) of this port is set as a parameter in software configuration.

The cable length for the RS232 interface must be less than 3 meters.

<sup>&</sup>lt;sup>2</sup> While in Z-TWS4 the SW2 DIP-switch position can be changed by the user, in Z-PASS2-S the DIP-switch is internal and its position is permanently set in the factory.

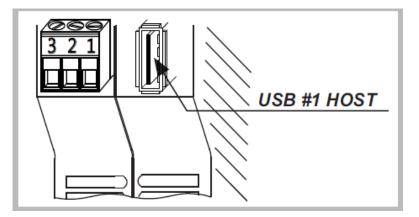


The connector pin-out is given in the following table:

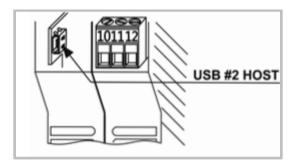
Pin	RS232	RS485
1 (bottom)	-	-
2	Тх	В
3	Rx	А
4 (top)	GND	GND

The Device 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; this is used for FW upgrade (see chapter 15).

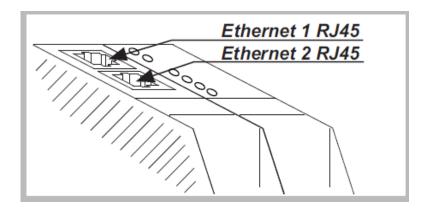
Please note that, on this USB port, the "hotplug" feature is not available; so, after plugging the USB device, it is necessary to power off/on the Z-TWS4/Z-PASS2-S to let it detect the USB device.



The Z-TWS4 also has a second USB HOST connector, with micro-USB plug-in, that can be used to connect a USB device by means of a "Micro USB to USB" adapter; this port is no more available in Z-TWS4-IO.

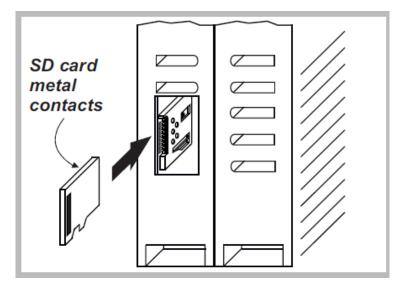


The Device has two Ethernet ports with RJ45 connectors on the front panel. <u>The two ports are internally connected in</u> <u>HUB/SWITCH mode. The two ports have the same MAC Address.</u>

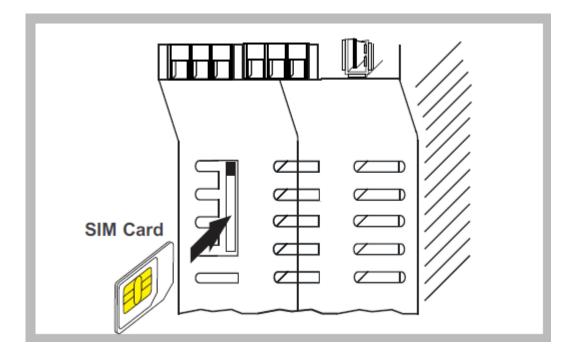


The Device has a plug-in connector for micro SD card placed in the side part of the case. To insert the SD card into the connector, be sure that the SD card is oriented with metal contacts facing towards left (with reference to the figure).

The SD card can be of any class.

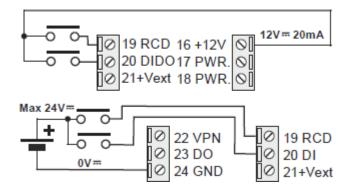


The Z-PASS2-S has a slot for SIM card, placed on the side of the case. Before pushing the SIM card into this slot, please be sure that the SIM card golden contacts are facing towards right (please see the figure below).

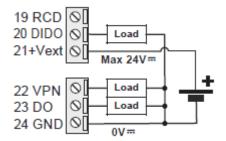


#### 4.1.1 Z-TWS4-IO Digital I/Os

In Z-TWS4-IO, the electrical connections for the Digital Inputs shall be arranged as in the following figures.

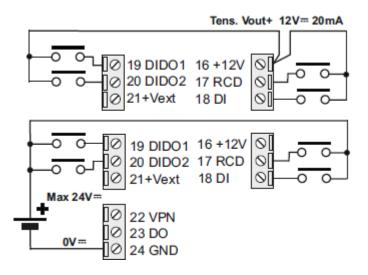


The electrical connections for the Digital Outputs shall be arranged as in the following figure.

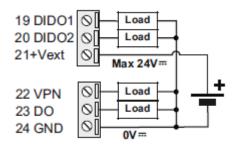


#### 4.1.2 Z-PASS2-S-IO Digital I/Os

In Z-PASS2-S-IO, the electrical connections for the Digital Inputs shall be arranged as in the following figures.

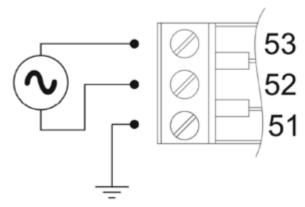


The electrical connections for the Digital Outputs shall be arranged as in the following figure.



### 4.2 S6001-RTU

Power supply must be connected to screw terminals 52 and 53. The supply voltage must be 24  $\pm$  15 % Vac/dc (any polarity).



<u>Upper limits must not be exceeded to avoid serious damage to the device</u>. It is necessary to protect the power supply source against any failure of the device by means of an appropriately sized fuse.

S6001-RTU has two RS485 serial ports (COM2 and COM4) available on removable screw terminals, as specified in the following table.

Signal	COM2	COM4
GND	57	54
В	58	55
Α	59	56

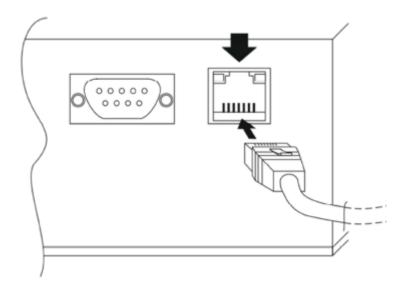
An RS232 serial port with full handshaking signals is available on DB9 male connector on the left side of S6001-RTU. Use the CS-DB9F-DB9F cable<sup>3</sup> to connect RS232 devices. Signals on DB9 connector are listed in the table below.

Pin	Name	Description	IN/OUT
1	DCD	Data carrier detect	In
2	RXD	Receive data	In
3	TXD	Transmit data	Out
4	DTR	Data terminal ready	Out
5	SG	Signal ground	
6	DSR	Data set ready	In
7	RTS	Request to send	Out
8	CTS	Clear to send	In
9	RI	Ring indicator	In

An optional communication bus is available on removable screw terminals 60,61,62, for future extensions.

S6001-RTU has 1 USB port which is an USB HOST with connector type "A", suitable to connect, for example, a mass storage (e.g.: a USB pen) with maximum consumption of 300 mA @ 5 Vdc.

An Ethernet port is available on the left side of S6001-RTU on an RJ45 connector.



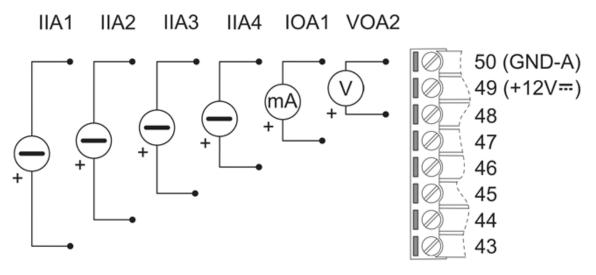
An SD card slot is available, near the optional bus screw terminals; SD cards with storage capacity up to 32 GB can be used.

A SIM card slot, with a push-push connector, is available; 3V mini SIM cards can be used.

Two SMA antenna connectors are available, for Main and Diversity antennas.

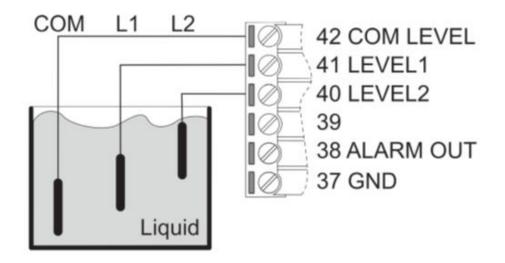
<sup>&</sup>lt;sup>3</sup> The CS-DB9F-DB9F cable is supplied on request.

Analog inputs and outputs are available on screw terminals 43-50, as shown in the following figure and table.



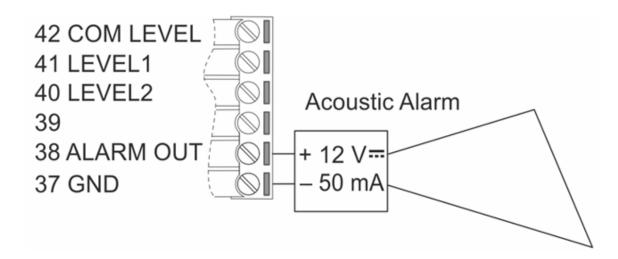
4 analog current inputs (0-20 mA)	Four active sensors are available from 43 to 46 screw terminals. Screw terminal 49 is a supply voltage (+12 Vdc) for passive current sensor.
1 analog current output (0-20 mA)	Available between 47 and 50 screw terminals.
1 analog voltage output (0-10 Vdc)	Available between 48 and 50 screw terminals.

The Liquid Level Inputs are available on screw terminals 40-42, as shown in the following figure.

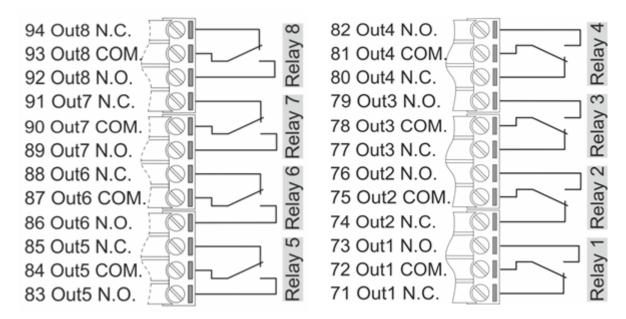


The analog level signals from screw terminals 40, 41, 42 can be used to control the level of liquid in a tank.

The supply voltage (12 Vdc @ 50mA) from screw terminals 38 and 37 can be used to connect, for example, an acoustic alarm. Screw terminal 39 must not be connected.

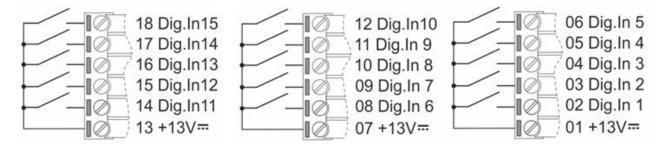


The 8 digital outputs (relays) are available on screw terminals 71-94, as shown in the following figure.



Eight SPDT relays are available to control, for example, external pumps. The operating voltage is 250 Vdc @ 2 A.

The 15 digital inputs are available on screw terminals 1-18, as shown in the following figure.



All digital inputs are PNP type with optoisolation.

# **5** LEDs signaling

# 5.1 Z-TWS4, Z-PASS2-S

LED	Status	Meaning
PWR Green	ON	The module is powered on
RUN Red	Blinking	The module is ready for use
LINK1 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)
LINK2 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)
RX1-2-4 Red	Blinking	Data reception (COM 1-2-4)
	ON	Check the connection (COM 1-2-4)
	OFF	No data reception (COM 1-2-4)
TX1-2-4 Red	Blinking	Data transmission (COM 1-2-4)
	ON	Check the connection (COM 1-2-4)
	OFF	No data transmission (COM 1-2-4)
3G PWR Green (Z-PASS2-S only)	ON	The 3G Modem is powered on
STAT Yellow	ON	Not registered on GSM network
(Z-PASS2-S only)	Slow Blinking	Registered on GSM network
	Fast Blinking	Mobile Network connection active

## 5.2 Z-PASS2-S-R01

LED	Status	Meaning
PWR Green	ON	The module is powered on
RUN Red	Blinking	The module is ready for use
LAN/WAN	ON	The Ethernet ports are working in "LAN/WAN" mode

Yellow	OFF	-
SWITCH Green	ON	The Ethernet ports are working in "Switch" mode
	OFF	-
VPN Yellow	ON	VPN connection is working properly
	Blinking	VPN connection is not working properly
	OFF	VPN functionality is disabled or
		VPN Box/Point-to-Point functionality is enabled but no client is connected or
		VPN Box/Single LAN functionality is enabled but the Device is not configured
		yet
SERV Green	ON	VPN Box "SERVICE" connection is working properly
	Blinking	VPN Box "SERVICE" connection is not working properly
	OFF	VPN Box functionality is disabled
RX1-2-4 Red	Blinking	Data reception (COM 1-2-4)
	ON	Check the connection (COM 1-2-4)
	OFF	No data reception (COM 1-2-4)
TX1-2-4 Red	Blinking	Data transmission (COM 1-2-4)
	ON	Check the connection (COM 1-2-4)
	OFF	No data transmission (COM 1-2-4)
3G PWR Green	ON	The 3G Modem is powered on
STAT Yellow	ON	Not registered on GSM network
	Slow Blinking	Registered on GSM network
	Fast Blinking	Mobile Network connection active
	ON Slow Blinking	Not registered on GSM network Registered on GSM network

### Ethernet Connector LEDS

LED	Status	Meaning
ETH1-2 Green	ON	Ethernet 1-2 connection detected
	OFF	Ethernet 1-2 connection absent
ETH1-2 Yellow	Blinking	There is data activity (Ethernet 1-2)
	OFF	There is no data activity (Ethernet 1-2)

# 5.3 Z-PASS2-S-IO

LED	Status	Meaning
PWR Green	ON	The module is powered on
RUN Green	Blinking	The module is ready for use
DIDO1 Green	ON	Configurable Digital Input/Output 1 state is HIGH
	OFF	Configurable Digital Input/Output 1 state is LOW
DIDO2 Green	ON	Configurable Digital Input/Output 2 state is HIGH
	OFF	Configurable Digital Input/Output 2 state is LOW
DI Green	ON	Digital Input state is HIGH
	OFF	Digital Input state is LOW
DO Green	ON	Digital Output state is HIGH
	OFF	Digital Output state is LOW
RCD Green	ON	Remote Connection is disabled
	OFF	Remote Connection is enabled
VPN Green	ON	VPN connection is working properly
	Blinking	VPN connection is not working properly
	OFF	VPN functionality is disabled or VPN Box/Point-to-Point functionality is enabled but no client is connected or VPN Box/Single LAN functionality is enabled but the Device is not configured yet
LAN/WAN	ON	The Ethernet ports are working in "LAN/WAN" mode
Green	OFF	The Ethernet ports are working in "Switch" mode
SERV Green	ON	VPN Box "SERVICE" connection is working properly
	Blinking	VPN Box "SERVICE" connection is not working properly
	OFF	VPN Box functionality is disabled
RX2-4 Green	Blinking	Data reception (COM 2-4)
	ON	Check the connection (COM 2-4)
	OFF	No data reception (COM 2-4)
TX2-4 Green	Blinking	Data transmission (COM 2-4)
	ON	Check the connection (COM 2-4)

	OFF	No data transmission (COM 2-4)
3G PWR Green	ON	The 3G Modem is powered on
STAT Yellow	Slow blinking (200 ms OFF, 1800 ms ON) Slow blinking (1800 ms OFF, 200 ms ON) Fast blinking (125 ms OFF, 125 ms ON)	Searching for GSM network Registered on GSM network Data transfer is ongoing

### Ethernet Connector LEDS

LED	Status	Meaning
ETH1-2 Green	ON	Ethernet 1-2 connection detected
	OFF	Ethernet 1-2 connection absent
ETH1-2 Yellow	Blinking	There is data activity (Ethernet 1-2)
	OFF	There is no data activity (Ethernet 1-2)

### 5.4 Z-TWS4-IO

LED	Status	Meaning
PWR Green	ON	The module is powered on
RUN Green	Blinking	The module is ready for use
DIDO Green	ON	Configurable Digital Input/Output state is HIGH
	OFF	Configurable Digital Input/Output state is LOW
DO Green	ON	Digital Output state is HIGH
	OFF	Digital Output state is LOW
RCD Green	ON	Remote Connection is disabled
	OFF	Remote Connection is enabled
VPN Green	ON	VPN connection is working properly
	Blinking	VPN connection is not working properly
	OFF	VPN functionality is disabled or
		VPN Box/Point-to-Point functionality is enabled but no client is connected or

		VPN Box/Single LAN functionality is enabled but the Device is not configured yet
LAN/WAN	ON	The Ethernet ports are working in "LAN/WAN" mode
Green	OFF	The Ethernet ports are working in "Switch" mode
SERV Green	ON	VPN Box "SERVICE" connection is working properly
	Blinking	VPN Box "SERVICE" connection is not working properly
	OFF	VPN Box functionality is disabled
RX2-4 Green	Blinking	Data reception (COM 2-4)
	ON	Check the connection (COM 2-4)
	OFF	No data reception (COM 2-4)
TX2-4 Green	Blinking	Data transmission (COM 2-4)
	ON	Check the connection (COM 2-4)
	OFF	No data transmission (COM 2-4)

### Ethernet Connector LEDS

LED	Status	Meaning
ETH1-2 Green	ON	Ethernet 1-2 connection detected
	OFF	Ethernet 1-2 connection absent
ETH1-2 Yellow	Blinking	There is data activity (Ethernet 1-2)
	OFF	There is no data activity (Ethernet 1-2)

## 5.5 S6001-RTU

#### Frontal LEDS

Group	Number	Colour	S	tatus	Meaning
Digital Inputs	1,2,3,4,5,6,7,8	Green	ON	High	
	9,10,11,12,13,14,15		OFF	Low	
Digital Outputs	1,2,3,4,5,6,7,8	Red	ON	Closed	
			OFF	Open	
3G Power Signal	2,3,4,5,6	Yellow	OFF	ON	6 ON = Max
	1	renow	Blinking	ON	1 Blinking = Min
Comm. Port COM2	RX, TX	Red	Blinking	·	RS485 activity
		Red	Fixed ON		Verify connection
Comm. Port COM4	RX, TX	Red	Blinking		RS485 activity
		Red	Fixed ON		Verify connection

Run	1	Red	Blinking	Run	
Level switch	L1, L2	Green	OFF, OFF (value ON, OFF (value ON, ON (value	2 1)	Under min level Between min and max levels Over max level

Following are some further notes about LED behavior:

- at power on, during the bootstrap phase, all LEDS, except for the COM PORT LEDs, are ON; when the system is fully operational, RUN LED is blinking
- when Straton application is not running, all LEDS, except for the COM PORT LEDs, are blinking
- 3G PWR SIG LED 1 is blinking, synchronously with RUN LED, in the following situations:
  - GSM/3G network is not available (or signal level is too low)
  - $\circ \quad \text{SIM is not inserted} \quad$

### Modem LEDS

LED	Status	Meaning
3G PWR Green	ON	The 3G Modem is powered on
STAT Yellow	ON	Not registered on GSM network
	Slow Blinking	Registered on GSM network
	Fast Blinking	Mobile Network connection active

# 6 Discovering the IP address

Z-TWS4/Z-PASS2-S/S6001-RTU devices come out of the factory with the default 192.168.90.101 IP address on the Ethernet network interface.

If this address is changed, *and forgotten*, it can be retrieved by running the "Seneca Device Discovery" (SDD) application, as shown in the following figure:

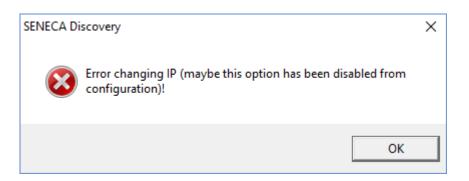
evices	found								
#	IP	Mode	MAC	Ping	Name	Hostname	Firmware	CRC	Comman
€	192.168.85.8	STATIC	C8:F9:81:0C:01:9D	2 ms	Z-KEY	192.168.85.8	110.0	OK	Assign
€	192.168.1.101	STATIC	C8:F9:81:0C:00:07	Different Subnet	Z-KEY	192.168.1.101	112.0	ОК	Assign
€	192.168.84.192	STATIC	C8:F9:81:02:03:5F	2 ms	Z-TWS4	ZTWS4	2940.210	ОК	
€	192.168.85.7	STATIC	C8:F9:81:02:02:85	2 ms	Z-PASS	192.168.85.7	3900.122	OK	
€	192.168.85.6	STATIC	C8:F9:81:11:00:02	2 ms	Z-PASS2-S	192.168.85.6	2940.221	ОК	
€	192.168.84.155	STATIC	00:22:4D:B6:D4:06	2 ms	Cloud BOX	cloud-dev.seneca	7800.106	ОК	
€	192.168.95.101	STATIC	C8:FA:81:16:00:02	Different Subnet	Z-PASS2-S	192.168.95.101	2940.310	ОК	Assign
€	192.168.85.102	STATIC	C8:F9:81:02:01:5B	2 ms	Z-TWS4	ZTWS4	2940.222	ОК	
€	192.168.85.106	STATIC	96:00:00:EA:18:F3	6 ms	S6001-RTU	S6001RTU	2940.310	ОК	Assign
€	192.168.85.200	STATIC	C8:F9:81:02:01:BD	2 ms	Z-TWS4	ZTWS4	2940.220	ОК	
€	192.168.85.69	STATIC	08:00:27:5B:CB:12	1 ms	Cloud BOX	192.168.85.69	7800.106	OK	
_									
	11 devices								

This application shows the IP address, MAC address, FW version and some other useful information, for every Z-TWS4/Z-PASS2-S/S6001-RTU device (and other Seneca products) found in the LAN.

Moreover, by clicking on the "Assign" button, it is possible to change the network configuration parameters of a device, as shown in the following figure:

Assign IP	x
	IP
Static IP	192.168.95.101
Netmask	Gateway
255.255.255.0	192.168.95.1
Assign	Cancel

For security reasons, this feature can be disabled on the Device (see paragraph 16.1.2); in this case, the following error message is shown, after clicking on the "Assign" button".



The SDD can be easily installed by running the installer program available at the following link:

http://www.seneca.it/products/sdd

NOTE:

- when the Device is working in "Switch" mode, the IP Address shown by the SDD is the same regardless of the Ethernet port which the PC running the SDD is connected to;

- when the Device is working in "LAN/WAN" mode, the IP Address shown by the SDD is the LAN IP Address when the PC is connected to the LAN port, the WAN IP Address when the PC is connected to the WAN port; moreover, the network configuration parameter changes apply to the relevant port.

## 7 FTP/SFTP access

To easily access the Device by means of FTP/SFTP, you can use the WINSCP<sup>™</sup> program; you can free download WINSCP<sup>™</sup> from:

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

You must set the connection as in the following figure (the screenshot shows a connection to the 192.168.85.106 IP address):

	WinSCP Login	? 🗙
Sessione Sessioni salvate Creazione log Ambiente	Sessione Nome server 192.168.85.106	Numero poţta
- Cartelle - SFTP - SCP Connessione	Nome utente Passwo user •••••• File chiave privata	
- Proxy - Tunnel SSH - Scambio chiave - Autenticazione	Protocollo Protocollo file SFTP V VC	onsenti SCP (allback
└─ Bug Preferenze ✔ Opzioni avanzate		Scegli cglore
Informazioni Lang	uages Accedi	Salva Chiudi

The credentials (username and password) are those ("user", "123456") set for the "FTP USER" (see "Users Configuration" web page in paragraph 16.1.6).

After clicking the "Access" button, you will get a new window, as in the following screenshot; on the right, you can copy and delete files directly to/from the Device.

Amministratione         Cartella superil.         20/10/2014 17.43.39         r         Operation	<b>b</b>			log - user@192.	168.85.106 - WinSCP					- 🗆 🗙
Decement       • ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	Locale Seleziona File Comandi Sessione Opz	zioni Remoto Aiuto								
Decement       • ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	🏚 🗏 🖄 🗸 🕋 😫 📣 📖 🖉 😤 🐁		Predefinito -	· 🦉 🗸						
Marking         Dimensi         Type         Modification         Attr           Come         Extensione <sup>®</sup> Dimensi         Modification         Attr         More         Dimensi         Modification         More         Dimensi         More         Dimensi         Modification         More         Dimensi         Modification         More         Dimensi         Modification         More         Dimensi         More         Dimensi         More         Dimensi         More         Dimensi         More         Dimensi         More         Dimensi					100.000		A DA 19.			
Extensione       Dimensi       Tipo       Modificato       Attr         numministratione       Cartella sinte       20/0204       17.43.39       r       0       0.00/01/97010       now xr xr.       root         Butchoff Folder       Cartella difie       111/12013       07.44.2       0       0.00/01/97010       now xr xr.       root         Butchoff Folder       Cartella difie       20/0204       13.81.53       0       0.00/01/97010       now xr xr.       root         Bog 14/2 - Etc MIT Timezones mispleced       Cartella difie       0.00/0204       10.75.5       0.00/0204       0.07.2014       13.81.83       oh         Codays       Cartella difie       0.00/0204       10.75.5       0.00/0204       0.07.2014       10.77.2013       13.13.43       oh         Freezcale       Cartella difie       0.00/0204       10.70.2014       13.93.3       oh       nome       16       05/11/2014       15       now now work       root         Mahudi       Cartella difie       0.07/02014       10.70.2014       13.93.4       oh       nome       16       05/11/2014       15       now now work       root         Mahudi       Cartella difie       0.07/02014       13.93.4       oh	-						ar en les			
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Amministratione         Cartela difie         69/11/2014 09/413         Cord         09/11/2014 15         morecovers         rot           Buetooth Folder         Cartela difie         27/06/2014 15.8.25         Cord         09/11/2014 15         morecovers         rot           Bug 1/47-4tc (MT Timezones misplaced         Cartela difie         27/06/2014 15.8.25         Cord         09/11/2014 15         morecovers         rot           Codeys         Cartela difie         65/02/2014 12.428         Cord         09/11/2014 15         morecovers         rot           Codeys         Cartela difie         12/00/2014 174.31         and         mino         16         05/11/2014 15         morecovers         rot           Freescale         Cartela difie         12/09/2014 173.31         and         more         16         05/11/2014 15         morecovers         rot         16         16         16         16         16         16         16         16         16         16         16<	Nome Estensione	Dimensi Tipo	Modificato	Attr '		Dimensi	Modificato	Diritti	Proprietario	
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Progetti _ZNET4_TWS5       Cartella di file       05/11/2014       12.06.19         Seneca       Cartella di file       26/03/2014       10.09.45         SMCom       Cartella di file       21/03/2014       08.83.04         Standards       Cartella di file       21/03/2014       08.83.04         Standards       Cartella di file       22/03/2014       08.83.04         Tutorials       Cartella di file       22/03/2014       06.83.20.4         TWS3       Cartella di file       21/07/2014       42.04.5         Visu3       Cartella di file       06/06/2014       07.37.59         Visual Studio 2008       Cartella di file       27/10/2014       4.5.70.2         Visual Studio 2008       Cartella di file       27/10/2014       4.5.70.2         Visual Studio 2010       Cartella di file	Progetti_ZNET4									
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TWS3       Cartella di file       17/07/2014       14.20.45         TWS5       Cartella di file       06/06/2014       07.37.59         Video       Cartella di file       06/06/2013       19.31.43       sh         Visual Studio 2008       Cartella di file       27/10/2014       14.57.02       visual Studio 2010       Cartella di file       27/10/2014       14.57.02         Visual Studio 2010       Cartella di file       27/10/2014       14.57.02       visual Studio 2010       Cartella di file       27/10/2014       14.57.02       visual Studio 2010       Cartella di file       27/10/2014       14.57.02       visual Studio 2010       Cartella di file       27/10/2014       14.57.02       visual Studio 2010       Cartella di file       27/10/2014       14.57.02       visual Studio 2010       Cartella di file       27/10/2014       14.57.02       visual Studio 2010       Cartella di file       27/10/2014       14.57.02       visual Studio 2010       Cartella di file       27/10/2014       14.57.02       visual Studio 2010       Cartella di file       27/10/2014       14.57.02       visual Studio 2010       Cartella di file       27/10/2014       14.57.02       visual Studio 2010       Cartella di file       27/10/2014       15.01.57.57.57.57.57.57.57.57.57.57.57.57.57.										
TWS5       Cartella di file       06/06/2014       07.37.59         Wideo       Cartella di file       03/12/2013       19.31.43       sh         Visual Studio 2008       Cartella di file       27/10/2014       14.57.02       v         Visual Studio 2010       Cartella di file       27/10/2014       14.33.32       v         8d 93.891 Bin 0 di 40       0 Bid 4.747 Bin 0 di 6       0 Bid 4.747 Bin 0 di 6										
Video       Cartella di file       03/12/2013       19.31.43       sh         Visual Studio 2008       Cartella di file       27/10/2014       14.57.02         Visual Studio 2010       Cartella di file       27/10/2014       14.33.22         49 39.391 Bin 0d 40       Øla 4.7478 in 0d 6            P F2 Rinomina [2] F4 Modifica 😫 F5 Copia (2) F5 Copia (2) F7 Crea cartella 🕆 F8 Elimina [2] F9 Porprieta [1] F10 Eci       Bild 4.7478 in 0d 6	Ju TWS3									
Visual Studio 2008         Cartella di file         27/10/2014         14.57.02         Image: Cartella di file         27/10/2014         14.33.2         Image: Cartella di	Ju TWS5									
Visual Studio 2010         Cartella di file         27/10/2014 14.33.32         O           8d 93 891 Bin 0 d 40         0 Bid 4.747 Bin 0 d 6         0 Bid 4.747 Bin 0 d 6           /* F2 Rimomina []* F4 Modifica 📸 F5 Copia []\$* F6 Sposta []* F7 Crea cartella 🗙 F8 Elimina []* F9 Proprietà [].* F10 Esci         0 Bid 4.747 Bin 0 d 6	📄 Video			sh						
d 93 939 18 in 0 d 40 Ø F2 Rimomina 📝 F4 Modifica 📸 F5 Copia 🎲 F6 Sposta 💣 F7 Crea cartella 🗙 F8 Elimina 🐨 F9 Proprietà 🧵 F10 Esci	🐌 Visual Studio 2008									
🖉 F2 Rinomina 📝 F4 Modifica 📸 F5 Copia 🍰 F6 Sposta 📸 F7 Crea cartella 🗙 F8 Elimina 🎬 F9 Proprietà 🧵 F10 Esci	J Visual Studio 2010	Cartella di file	27/10/2014 14.33.32		·					
	) B di 93.891 B in 0 di 40				0 B di 4.747 B in 0 di 6					
A SETE-3 ( 000	🤌 F2 Rinomina 📝 F4 Modifica 📸 F5 Copia 🟥	🛔 F6 Sposta 💣 F7 Crea cartel	lla 🔀 F8 Elimina 😁 F9	Proprietà 🧵 F10 Esci						
								۵	SFTP-3	0.00.37

The WinSCP program can be used both as an FTP or SFTP client to transfer files to/from the Device; just select "FTP" or "SFTP" protocol in the "WinSCP Login" window; normally, it's better to use SFTP, since it provides a secure (i.e. encrypted) service.

# 8 StratON PLC

Z-TWS4/Z-PASS2-S/S6001-RTU StratON PLC provides the full support for IEC 61131-3 PLC Standard; an Integrated Development Environment (IDE) is available for Windows<sup>™</sup> PCs.

The StratON IDE includes several tools such as: a fieldbus configuration tool, an analog signal editor and program 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

To let the PLC developer easily create StratON applications for Seneca CPUs, the following libraries are available:

- a Function Block (FB) and Functions library, which provides some frequently used functionalities, particularly related to communication and data transfer tasks, compiled in the CPU firmware; the direct use of these FBs and functions is targeted at skilled PLC developers (a detailed description of the FBs and Functions is given in chapter 17);
- a "Profiles" library, which provides access to the CPU I/Os by means of "profiled" variables; this is needed for S6001-RTU and Z-PASS2-S-IO CPUs;

• a "User Defined Function Block" (UDFB) library, in ST language, which simplifies the use of the above FBs, providing a simpler and "higher level" access to their functionalities.

Furthermore, two project templates are available for Z-PASS2-S and S6001-RTU CPUs, respectively.

An installer program, called *"Seneca StratON Package setup"*, is available which automatically installs the above Seneca libraries and templates. The installer can also be used to install the StratON IDE and Z-NET4 <u>SW</u> (see chapter 18).

The installer is available at the following link:

http://www.seneca.it/products/seneca-straton-package

If, for some reasons, the installer can't be run, the above libraries and templates can be installed manually as described in the following sub-paragraph.

#### 8.1.1 Seneca libraries and templates installation

The following steps are needed to integrate the Seneca libraries and templates in the StratON IDE.

First, we must add the Seneca FB Library (file *SenecaStratonLibrary.XL5*) to the IDE, using the "Library Manager" tool:

Library Manager - User		- 🗆 🗙
<u>F</u> ile <u>T</u> ools <u>W</u> izard <u>H</u> elp		
Function and FBs 1/Os Profiles AS-i Types		
		<u>N</u> ew
		<u>R</u> ename
Parameters Description		<u>D</u> elete
	^	<u>S</u> tore
		Reset <u>C</u> hanges
	~	
< >>		

Select the "File / Open Library" option and enter the "Seneca" name to create the new Seneca library.

Open Libr	ary	×
Seneca		OK
ProfDP PRP QBF Registers Registers (typed) Selectors Selectors Standard Strings TCP-IP Text buffers Timers UDP User Select a library in the list or enter name for creating a new library.		Cancel

Then, import the Library (menu "Tools / Import"):

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File Home Condi	vidi Visu	alizza						^ ?
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🔄 🄄 🔻 🕇 🚺 « Pr	ogetti_in_cor	so → Z-TWS4 → FW → LIBRERIE_	STRATON		~ ¢	Cerca in LIE	RERIE_STRATON	,c
☆ Preferiti	Nome	*	Ultima modifica	Тіро		Dimensione		
📃 Desktop	🥘 linux_s	hell.XL5	13/07/2011 11.34	File XL5		1 KB		
📜 Download	📄 READN	1E_Seneca.txt	10/01/2014 15.01	Documer	nto di testo	1 KB		
😵 Dropbox	🥘 Seneca	_rev1.XL5	18/11/2013 08.04	File XL5		1 KB		
🔛 Risorse recenti	🥘 Seneca	_rev2.XL5	10/01/2014 14.35	File XL5		2 KB		
퉬 TWS4	🧾 Seneca	_rev3.XL5	31/01/2014 17.41	File XL5		12 KB		
퉬 Work	🧾 Seneca	_rev6a.XL5	24/06/2014 14.22	File XL5		17 KB		
	🧾 Seneca	_rev6c.XL5	09/09/2014 11.30	File XL5		17 KB		
🖳 Questo PC	🧾 Seneca	_TWS4_TWS11.XL5	21/05/2014 17.29	File XL5		14 KB		
膧 Desktop	🧾 Seneca	StratonLibrary_sw2960_000.XL5	10/01/2014 14.35	File XL5		2 KB		
📗 Documenti	🧾 Seneca	StratonLibrary_sw2960_001.XL5	31/01/2014 17.41	File XL5		12 KB		
🗼 Download	Seneca	StratonLibrary_sw2960_002.XL5	24/06/2014 14.22	File XL5		17 KB		
📄 Immagini	Seneca	StratonLibrary_sw2960_003.XL5	09/09/2014 11.30	File XL5		17 KB		
🔰 Musica 📃								
📔 Video								
📥 OS (C:)								
👝 Disco rimovibile 🗸								
12 elementi 1 elemento :	selezionato 1	6,2 KB						:==

	_	
🛐 Library Manager - Seneca File Tools Wizard Help		
CAIN_CFG (* Configure Analog Inputs (Z-MINIRTU, Z-TWS11) *)	<b>^</b>	New
CREATE_DIR (* Set counter (Z-MINIRTU, Z-TWS11) *) CREATE_DIR (* Create a directory (Z-MINIRTU, Z-TWS11) *)		Rename
BOATETIME CFG (* Configure date/time (Z-MINIRTU, Z-TWSTI) *)		
DATETIME_GET (* Get current date/time (Z-MINIRTU, Z-TWS11) *)		Delete
DATETIME_SET (* Set current date/time (Z-MINIRTU, Z-TWS11) *)		
DIN_DOUT_CFG (* Configure Digital Inputs/Outputs (Z-MINIRTU, Z-TWS11) *)		
FM_WRITE_NCRLF (* Write a string to a file without adding CR/LF *)     FTD_CET (* Cla download house of FTD_cetact) (7 TMC4 7 PACC2 C, 7 MMUDTH, 7 TMC41, CC201 PTU) *)		
FTP_GET (* File download by means of FTP protocol (Z-TWS4, Z-PASS2-S, Z-MINIRTU, Z-TWS11, S6001-RTU) *) FTP PUT (* File upload by means of FTP protocol (Z-TWS4, Z-PASS2-S, Z-MINIRTU, Z-TWS11, S6001-RTU) *)		
TT _ OF ( The apload by means of the proceeding and a set way, 24 AS323, 24 Mininter, 24 Wart, 3000 Mittor) (		
FTPSRV CFG READ (* Get the FTP server configuration (Z-MINIRTU, Z-TWS11) *)		
GET_ALARMS (* Retrieve alarms with the specified status from the DB. *)		
GET_MIN_SINCE2K (* Get the number of minutes since year 2000 *)		
GET_SMS (* Get a received SMS (Z-TWS4, Z-PASS2-S, Z-MINIRTU, S6001-RTU) *)		
BHTTP_POST (* Send an HTTP POST request (Z-MINIRTU, Z-TWS11) *)		
IP_CFG (* Configure IP parameters (Z-MINIRTU, Z-TWS11)*) IP CFG READ (* Read current IP configuration (Z-MINIRTU, Z-TWS11)*)		
ILINUX_SH_ASYNC (* Execute a command in a Linux shell, in asynchronous mode (Z-TWS4, Z-PASS2-S, S6001-RTU) *)		
INUX_SHELL (* Execute a command in a Linux shell (Z-TWS4, Z-PASS2-S, S6001-RTU) *)		
MODEM_CTRL (* Execute a generic AT command (Z-TWS4, Z-PASS2-S, S6001-RTU) *)		
MODEM_ONOFF (* Power on/off the Modem (Z-MINIRTU) *)		
MODEM_RESET (* Execute a modem reset (Z-TWS4, Z-PASS2-S, Z-MINIRTU) *)		
TP_CFG (* Configure NTP (Z-MINIRTU, Z-TWS11) *)     TO STATUS (* Get the NTP configuration (Z-MINIRTU, Z-TWS11) *)		
PLAY_WAVE (* Execute an audio PCM file (Z-MINIRTU, Z-TWSTI) *)		
PPP_CONNECT (* PPP connection setup/release (Z-TWS4, Z-PASS2-S, Z-MINIRTU, S6001-RTU) *)		
PPP_STATUS (* PPP connection status (Z-TWS4, Z-PASS2-S, Z-MINIRTU, Z-TWS11, S6001-RTU) *)		
PUT_ALARM (* Store an alarm into the DB. *)		
RESET (* Reset the device (Z-MINIRTU, Z-TWS11) *)		
SEND_MAIL (* Send an e-mail (Z-TWS4, Z-PASS2-S, Z-MINIRTU, Z-TWS11, S6001-RTU) *) SEND_SMS (* Send an SMS (Z-TWS4, Z-PASS2-S, Z-MINIRTU, S6001-RTU) *)		
SET ALARMS_STAT (* Set the status of the specified alarms in the DB. *)		
TIME SYNC (* Time synchronization by means of NTP protocol (Z-TWS4, Z-PASS2-S, Z-MINIRTU, Z-TWS11, S6001-RTU) *)		
TOT_SET (* Set totalizer value (Z-MINIRTU, Z-TWS11) *)		
TXBAPPENDFILE (* Append a Text Buffer to a file *)		
WEBSRV_CFG (* Configure the web server (Z-MINIRTU, Z-TWS11)*)		
WEBSRV_CFG_READ (* Get the web server configuration (Z-MINIRTU, Z-TWS11) *)	*	
Parameters Description		
Parameters Description	^	Store
Parameters Description	^	Store Reset Changes
Parameters Description	^	Reset Changes
Parameters Description	^	
Parameters Description	^	Reset Changes
Parameters Description	^	Reset Changes
Parameters Description	^	Reset Changes
Parameters Description	^	Reset Changes
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Parameters Description	^	Reset Changes
Parameters Description	~	Reset Changes
Parameters Description	~	Reset Changes

Save the library (menu "File / Save Library").

The procedure to add the "Profiles library" to the IDE is identical to the one just explained; the only difference is that the *SenecaStratonProfiles.XL5* file shall be selected (instead of the *SenecaStratonLibrary.XL5* file).

Now that the "low-level" FBs are available, we have to install the UDFB library.

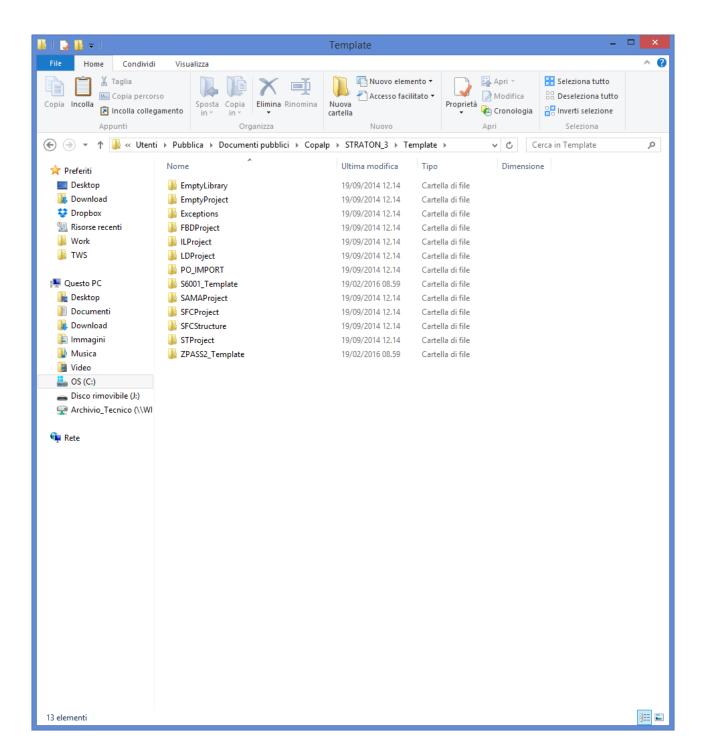
The UDFB library is provided as a zip file, containing the following folders:

- TWS\_MISC
- ZPASS2\_Template
- S6001\_Template

The *TWS\_MISC* folder shall be copied into the following directory: *C:\Users\Public\Documents\Copalp\STRATON\LIBS* 

🔐 l ⊋ 🚻 🗢 l		LIBS			×
File Home Condividi Visu	alizza				^ 🕐
Copia Incolla Copia Incolla Appunti	Sposta Copia in v in v Crganizza	Nuova elemento • Nuova cartella Nuovo	Proprieta Apri • Proprieta	Seleziona tutto Deseleziona tutto Inverti selezione Seleziona	
					0
<ul> <li>Work</li> <li>TWS</li> <li>Questo PC</li> <li>Desktop</li> <li>Download</li> <li>TWS</li> <li>Questo PC</li> <li>Desktop</li> <li>Documenti</li> <li>Download</li> <li>Immagini</li> <li>Musica</li> <li>Video</li> <li>S OS (C:)</li> </ul>	slica > Documenti pubblici > Copa	Ilp → STRATON_3 → LIBS Ultima modifica 19/09/2014 12.14 19/09/2014 12.14 19/09/2014 12.14 25/11/2015 09.11		a in LIBS Dimensione	Q
_ Disco rimovibile (J:) ♀ Archivio_Tecnico (\\WIN-KTTN7I ♀ Rete					
4 elementi					:== <b></b>

The *ZPASS2\_Template* and *S6001\_Template* folders shall be copied into the following directory: *C:\Users\Public\Documents\Copalp\STRATON\Template* 



## 8.1.2 Creating a project for Seneca CPUs

Run the StratON IDE and create a new project based on a template, as in the following figure:

ß	Project wizard	×
Roject From template XML Import Library Automation script		
		8-8- 8-8- 8-8-
Creates a new projec	t using a template	<b>^</b>
New project		
Destination folder :	C:\Users\Spagiari\Desktop\TWS4\StratonExamples V	
Name:	zpass2s	
Comment:	First project for Z-PASS2-S CPU	
	Next Cancel Help	2

Select the "ZPASS2\_Template" (or "S6001\_Template") in the template list.

Template:	ZPASS2_Template			~
		Previous	Next	Help

Now, as you can see in the following figure, in the *Main* program a *ZMODEM\_MNG* UDFB instance is already available, which lets you easily control the Z-PASS2-S/S6001-RTU modem.

5	STRATON - zpass2s	- đ 🗙
File Edit View Insert Project Tools Wi	ndow Help	
😂 🖬 ¥ 🛃 🕹 🗞 🖎 X 👒 🏷	^ へ   語   調 圭 % 🤨 🛆 匹 🗊 😁 📷 🔎	
Workspace	Main	
🗄 – 🗿 zpass2s		<ul> <li>Type Dim. Attrib. Syb. Init value</li> </ul>
Exception programs	Template utilize blocco gestione modern	B 🗋 Main
Programs	0	Inst_ZMODEM_MNG ZMODEM
	D Inst ZMODEM MVG	MDM_MNG_ON_OFF BOOL
<ul> <li>Watch (for debugging)</li> </ul>	Inst_ZMODEM_MNG	MDM_MNG_PPP_ON BOOL
Soft Scope	ZMODEM_MING	MDM_MNG_BUSY BOOL
Initial values		MDM_MNG_PPP_OK BOOL
Binding Configuration	T MDM_INNO_PPP_ON PPP_OK MDM_INNO_PPP_OK box bm X GPRS_APN BUSY MDM_INNO_BUSY	MDM_MNG_PWR_OK BOOL
	User User ALL ERAME ERA	MDM_MNG_ERR BOOL
Types	La pass PASSWORD RESULT MOM_MNG_RESULT	MDM_MNG_RESULT INT
in types	SIGLEV MOM_MNG_SIGLEV	MDM_MNG_SIGLEV INT
	->> REG NOM_MNG_REG	MDM_MNG_REG BOOL
	P MOM_MNG_OPID	MDM_MING_OFID STRING(50)
	- H MUM_MAS_IP	MORI, MING, QIL, QFF         BOOL           MORI, MING, PIPP ONI         BOOL           MORI, MING, PIPP ONI         BOOL           MORI, MING, PIPP, OK         BOOL           MORI, MING, PIPR, OK         BOOL           MORI, MING, PESULT         NIT           MOM, MING, RES         BOOL           MOM, MING, REG         BOOL           MOM, MING, POPO         STRING(15)           Hef         BOOL
		Global variables
	0	
		Variables, Proserves
	-	(A)
	0	🗄 🎦 (Used)
	SD.	🐵 🔚 (Project)
		🗄 📴 Advanced
	1	🗉 🛄 Aithmetic
	1st	Anays     Asinterface
	5. Se	Ac-metrace     Acnet
		Booleans
	12	B CANbus
		CANopen
		E Clock
		e Competitions
		III D Conversions
		Counters
		DNP3
	c	Finhedded HMI     Blocks, Sovist Defre ENUM Gradies
	Build	Blocks, Sovist   Units   ENUM   Grones /
	County -	,,,,,,
	Build, Cross references Runtime, Call stack, Breakpoints, Diotal sampling trace, Promot, HMI	
Ready		OffLine 192.168.90.101:502 💋 0,0 206 x 18 0,0 100% 🚲

Set the correct target IP address (for example 192.168.85.106); normally, the port shall be set to 502:

	Project settings		×
C:\Users\Sp	Communication Settings	×	
General Runtime Compiler Debugging Advanced (All)	T5 Runtime         192.168.85.106:502         192.168.85.103:1100         192.168.85.103:502         192.168.85.104:502         192.168.85.105:502         192.168.85.106:502         192.168.85.106:502         192.168.85.33:502         192.168.90.101:502	OK Cancel Browse Help	:502
			Cancel

Then press the icon:

ß

to compile the project.

Download the code by pressing the icon:

## الكر

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

If the Straton project is not based on "ZPASS2\_Template"/"S6001\_Template", the Seneca UDFB library can still be used, as described in the following.

In the Straton IDE, go to the "Project Settings" window, shown below (menu "Project/Settings"):

Project settings									
C:\Users\Spagiari\Documents\Progetti_ZNET4_STEP3\s6001_default\s6001_default									
General Runtime Compiler Debugging Advanced (AII)	Name         Image: Communication parameters         Image: Cycle time         Image: Cycle time      <	Value         192.168.85.104:502         2000 ms         Release         No         Disabled         V4 - 2016/01/22 12:32         Edit         Edit							
	Communication parameters for On Line connection to the Double click to edit	e runtime. OK Cancel							

Click on "Libraries / Edit..."; the following window is shown:

Libraries	×
	Add Remove Close Help
Standard: FBD_WITH_ENENO INTCOUNTERS SAMA TWS_MISC	Add

Select the "TWS\_MISC" library and click on "Add".

Libraries	×
C:\Users\Public\Documents\Copalp\STRATON_3\Libs\TWS_MISC	Add Remove Close Help
Standard: FBD_WITH_ENENO INTCOUNTERS SAMA	Add

Finally, click on "Close".

Now, the UDFB library is available in the project, as shown in the following figure:

•		STRATON - s6001_default
ile Edit View Insert Project Too		
3 🖬 🕑 👍 🗴 🗞 🖎 🥆	지 () 이 이 () () () () () () () () () () () () ()	
Vorkspace	main	B1
- 🥑 s6001_default		∧ 🝸 Name Type Dim. Attrib. Syb. Init value User Tag
Exception programs		main (*main program*)
C pOnBadIndex		🗉 🖓 Global variables
P pOnDivZero	THE	Z_TARGET STRING(10) Z-PAS
- DishutDown		7 MITEX BOOL
st pStartup	2	Z_MITEXBOOL Z_MODEMBOOL Z_MODEMBOOL Z_SPPPP m BOOL
Graphic		Z_MUTEX BOOL Z_MOCEM BOOL
Programs	kin l	Z MODEM BOOL
main ("main program")		Z_bPPPon BOOL
Recipe	20	Z bPolitiaccBOOL
Signals		Z bRedMO BOOL
Soft Scope		Z_MPPpin BOOL  Z_MPRiss.BOOL  Z_MPRiss.BOOL  Z_NseqUO.BOOL  U  AMA_CARP.MT  MO_A_CARP.MT  MO_A_CARP.MT  MO_A_CARP.MT  MO_A_CARP.MT  MO_A_CARP.NT  MO_A_CARP.NT  MO_A_CARP.NT  MO_A_CARP.NT
Spy		M0 AU CUR1 INT
String Tables		
Initial values		
- Seldbus Configurations		
- Mar Fieldbus Configurations		M0_ALCUR4 INT
		M0_AO_CUR UINT UNT
- 1/0s		Z_isheqiko.         BOOL           Z_isheqiko.         BOOL           Z_isheqiko.         BOOL           Ma A_CAR2 NT         Image: Annotation of the second o
- in 170s		M0_A0_EL BYTE
		M0_AI_ĒLE BYTE
Variables		<
- E Types		🕫 📴 Registers (typed)
		📧 📴 Selectors
		🕫 🧫 Seneca
		🕫 📴 Standard
		🗉 📴 Strings
		III CONTRACTOR CONTRACTOR IN CONTRACTOR CONTRACTOR IN CONTRACTOR CONT
		🗉 🛄 Text buffers
		III 📴 Timers
		III III IIII IIII IIIIIIIIIIIIIIIIIIII
		19 📮 20ML
		E D TWS_MISC
		ZFTP.GET
		as ZTIP PUT
		ZP_UPDATE
		all ZMAIL SEND
		and Extended to the second sec
		36 ZMODEN_MNG
		a zwote my
		age Zandolar of a
		▼ 25M5_5END
	c	
	< > IO Drivers main	Blocks_Soviet Cenne_ENUM
	Build	
	1000	
	Build, Cross references Runtime Call stack Breakpoints Digital sampling trace Prompt HMI	
	LIF Dung, Cross references ( numme), Car Stack ( Breakpoints ) Digital sampling trace ( Prompt ) HMI/	Offline 192.158.85.104:502
adv.		

If the Straton project has been built using the Seneca Z-NET4 SW (see chapter 18), the *TWS\_MISC* is already included, so the above procedure is not needed.

In particular, when using S6001-RTU CPU, Z-NET4 SW provides a simple way to create the base Straton project; in fact, all the variables corresponding to the CPU I/Os will be inserted in the project, as shown in the following figure.

🝸 Name	Value	Туре	Dim.	Attrib.	Syb.	Init value	User	Tag	Descript
M0_AI_CUR1	5	INT							_ZNE \land
M0_AI_CUR2	8	INT							_ZNE
M0_AI_CUR3	2	INT							_ZNE
M0_AI_CUR4	14	INT							_ZNE
M0_AO_CUR	0	INT							_ZNE
M0_AO_VOLT	0	INT							_ZNE
M0_AO_ELEC_SENS	0	BYTE							_ZNE
M0_AI_ELEC_LEVEL	0	BYTE							_ZNE
M0_ADC_ERROR_STATUS	0	INT							_ZNE
M0_ADC_CRC_ERR_CNT	0	UINT							_ZNE
M0_DI_01	FALSE	BOOL							_ZNE
M0_DI_02	FALSE	BOOL							_ZNE
M0_DI_03	FALSE	BOOL							_ZNE
M0_DI_04	FALSE	BOOL							_ZNE
M0_DI_05	FALSE	BOOL							_ZNE
M0_DI_06	FALSE	BOOL							_ZNE
M0_DI_07	FALSE	BOOL							_ZNE
M0_DI_08	FALSE	BOOL							_ZNE
M0_DI_09	FALSE	BOOL							_ZNE
	FALSE	BOOL							
s									*

For more information about Straton IDE and related tools, please refer to StratON tutorials and on-line help.

### 8.1.3 Z-PASS2-S-IO profiles

Two Straton I/O profiles are available for Z-PASS2-S-IO CPU.

The first profile, named "ZPASS\_DIO", provides variables corresponding to the available Digital I/Os, as shown in the following figure.

T	Name	🛆 Туре	Dim. Attrib.	Syb. Init va	ilue User Tag
	🕀 🗋 Main				
	🗉 🚮 Global varia	bles			
	DI1	BOOL			
	DI2	BOOL			
	DI3	BOOL			
	DI4	BOOL			
	DO1	BOOL			
	DO2	BOOL			
	DO3	BOOL			
	DO4	BOOL			
	🚽 RETAIN var	iables			

It should be noted that four "DIx" variables and four "DOx" variables are declared, corresponding to the maximum number of inputs and outputs possibly available; the Digital I/O configuration (see paragraph

16.1.11) determines which of these variables are actually handled by the PLC; for example, if DIDO1 is set as an input and DIDO2 as an output, DI3 and DO4 will be handled while DI4 and DO3 will not be used.

Moreover, while the variables corresponding to the inputs are updated by the PLC regardless of their function modes, only the variables corresponding to the outputs set as "General Output" will actually affect the digital outputs.

The second profile, named "ZPASS\_GPS", provides variables corresponding to the information given by the GPS module, as shown in the following figure.

🍸 Name	Туре	Dim.	Attrib.	Syb.	Init value	User	Tag
🗆 📄 Main							
GPS_LAT	LREAL						
GPS_LONG	LREAL						
GPS_HDOP	LREAL						
GPS_ALT	LREAL						
GPS_FIX	BYTE						
GPS_COG	LREAL						
GPS_SPKM	LREAL						
GPS_SPKN	LREAL						
GPS_DATE	STRING(6)						
GPS_NSAT	BYTE						
GPS_ERROR	INT						
GPS_UTC	STRING(10)						
🗉 🚮 Global variables							
🛃 RETAIN variables							

In particular, the *GPS\_ERROR* variable tells if the other variables contain valid and updated values or not, in the following way:

- GPS\_ERROR = 0 GPS fixed; variables contain updated values
- GPS\_ERROR = -1 GPS not fixed; variables contain not updated, possibly invalid, values
- GPS\_ERROR = -2 some error has occurred; variables contain invalid values

### 8.1.4 Z-TWS4-IO profile

The "ZPASS\_DIO" profile is available also for Z-TWS4-IO, providing variables corresponding to the available Digital I/Os, as shown in the following figure.

7	Name	Туре	Dim. Attrib.	Syb. Init v	alue User Tag	Desc
		nain program <sup>*</sup>	*)			
	🗉 🚮 Global v	ariables				
	DI3	BOOL				
	DI4	BOOL				
	DO1	BOOL				
	DO2	BOOL				
	DO3	BOOL				
	DO4	BOOL				
	🛃 RETAIN	variables				
	<					>

It should be noted that two "DIx" variables and four "DOx" variables are declared, corresponding to the maximum number of inputs and outputs possibly available; the Digital I/O configuration (see paragraph 16.1.11) determines which of these variables are actually handled by the PLC; for example, if DIDO1 is set as an input and DIDO2 as an output, DI3 and DO4 will be handled while DI4 and DO3 will not be used.

Moreover, while the variables corresponding to the inputs are updated by the PLC regardless of their function modes, only the variables corresponding to the outputs set as "General Output" will actually affect the digital outputs.

## 8.2 Energy Management Protocols

The StratON soft-PLC installed on Z-TWS4/Z-PASS2-S/S6001-RTU supports the following "Energy Management" protocols:

- IEC 60870-5-101 (Master/Slave)
- IEC 60870-5-104 (Master/Slave)
- IEC 61850 (Master/Slave)

The activation of these protocols is license-based.

Please contact Seneca to get more information about getting the license for Energy Management protocols.

## 8.3 StratON Redundancy

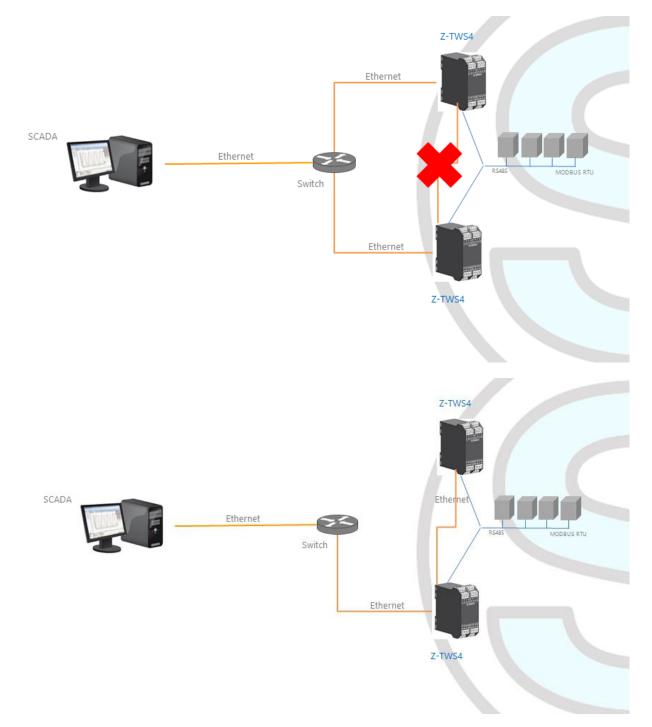
#### WARNING!

At the date of this manual, the "StratON Redundancy" functionality is still in a "Beta version"; this means that the proper operation of this functionality is not guaranteed for every kind of application; please contact Seneca for further information.

The StratON PLC provides a "Redundancy" functionality:

when this feature is enabled, two CPUs (Z-TWS4 or Z-PASS2-S or S6001-RTU) run the same StratON application; the two CPUs connect each other via the Ethernet, in order to keep variables, state-machines etc. synchronized between them; in each moment, only one of the two CPUs actually runs the application and drives the fieldbus; if, for any reason, that CPU stops running, the application execution is handed over to the second CPU.

When the redundancy is used, some care must be taken when connecting the devices, in order to avoid Ethernet loops; the Ethernet connections shall be set up as shown in the following figures.



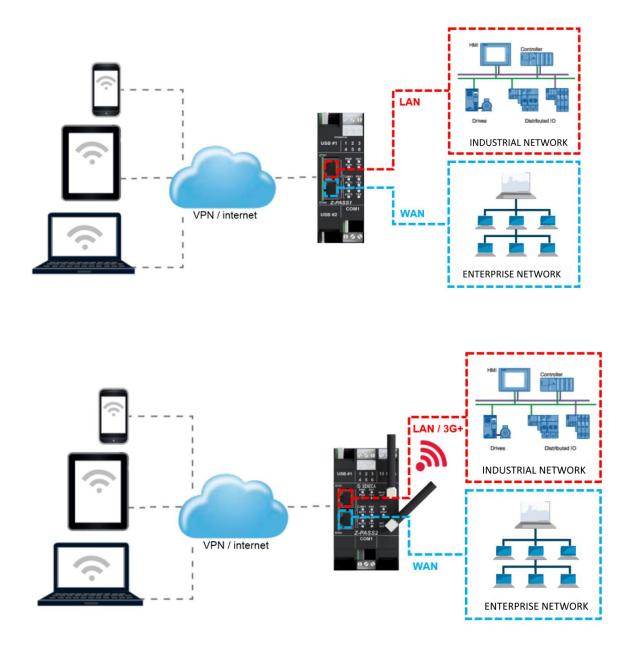
Please see paragraph 16.1.2 for a description of the configuration parameters related to StratON Redundancy.

# 9 Ethernet Mode (Z-PASS2-S-R01/Z-PASS2-S-IO/Z-TWS4-IO)

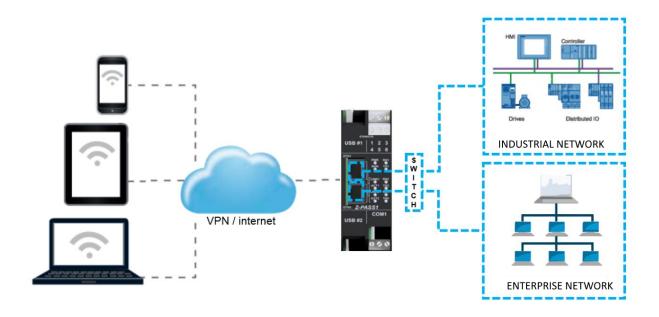
In Z-PASS2-S-R01/Z-PASS2-S-IO/Z-TWS4-IO products, the two available Ethernet ports can be configured as two fully separated network interfaces ("LAN" and "WAN") or, as in the older versions, they can work as

ports of an Ethernet switch; the user can choose between the "LAN/WAN" mode and the "Switch" mode, by means of a configuration parameter ("Ethernet Mode") (see paragraph 16.1.2).

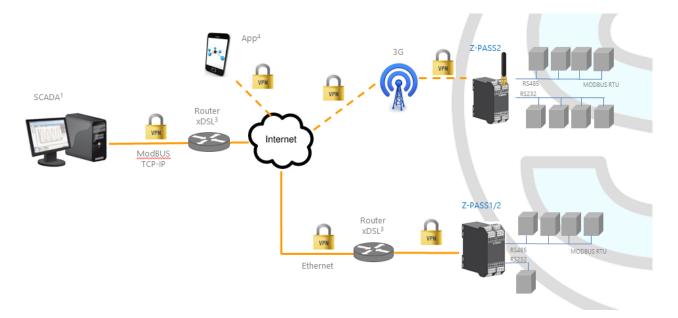
The "LAN/WAN" mode is needed when the "industrial" network connected to the LAN interface (comprising e.g. HMI and PLC devices) shall be separated from the "enterprise" network connected to the WAN interface (comprising enterprise PCs and servers); when the Device is remotely accessed through the WAN interface, only devices connected to the LAN interface can be reached, while access to machines lying in the enterprise network is forbidden; this is depicted in the following two figures.



When this separation is not needed or when the Internet access is achieved only through the mobile (3G+) interface, the "Switch" mode still lets the Device be used as an Ethernet switch, as shown in the following figure.



# **10 VPN**



Z-TWS4/Z-PASS2-S/S6001-RTU support the standard OpenVPN protocol.

The main advantages that come from using a VPN are:

- secure connections, since transported data are encrypted;
- the ability to establish connections without interfering with the corporate LAN;
- no need to have a static/public IP address on the WAN side;
- remote configurability by a built-in Web Server.

Two "VPN modes" are available, named "OpenVPN" and "VPN Box", respectively.

The "OpenVPN" mode can be used when the Device shall be installed in an already existing VPN. In this case, an OpenVPN server shall be available and the certificate and key files for the Device client shall be provided by the VPN administrator; the files can be uploaded to the Device using the "VPN configuration" page of Device Web Server.

If the VPN infrastructure does not exist yet, the advisable choice is to adopt the "VPN Box" solution, developed by Seneca. The "VPN Box" is an hardware appliance (or a virtual machine) which lets the user easily setup two alternative kinds of VPN:

- "Single LAN" VPN
- "Point-to-Point" VPN

In the "Single LAN" VPN, all devices and PCs (and associated local subnets) configured into VPN are always connected in the same network. In this scenario any PC Client can connect to any Device and to other machines which lie in the Device LAN, but also any device/machine can connect to any other remote device/machine which belongs to the same VPN network. This VPN architecture puts some constraints on the device sub-networks definition, in fact all VPN clients must have a different IP address and different local LAN, to avoid conflicts. The software named "VPN BOX Manager" configures VPN BOX and will help you to avoid errors defining local subnets.

In the "Point-to-Point" VPN, a client PC, in a given moment, can perform a single connection, on demand, to only one Device (and to machines which lie in the Device LAN) at time. Furthermore, devices can't communicate each other. The advantage of this architecture is that the same sub-network can be used in all sites. Point to point mode makes it possible to define user groups and manage them. This VPN modality must be configured on "VPN Box".

There are two kinds of "Point-to-Point" VPN:

- routing Layer 3 VPN
- bridging Layer 2 VPN

In "Routing Layer 3 VPN", only IP (Layer 3) packets are transported over the VPN tunnel and a new virtual LAN is created with a network subnet which must be different from the LAN subnets of the server and clients.

Conversely, in "Bridging Layer 2 VPN", all Ethernet frames are transported over the VPN tunnel and the clients are inserted in the server LAN.

Each of the two kinds has benefits and drawbacks:

### Layer 2 benefits/drawbacks:

- can transport any network protocol
- broadcast traffic (e.g.: DHCP) is transported
- > causes much more traffic overhead on the VPN tunnel

### Layer 3 benefits/drawbacks:

- > can transport only IP traffic
- broadcast traffic (e.g.: DHCP) is not transported
- > lower traffic overhead, transports only traffic which is destined for the VPN clients

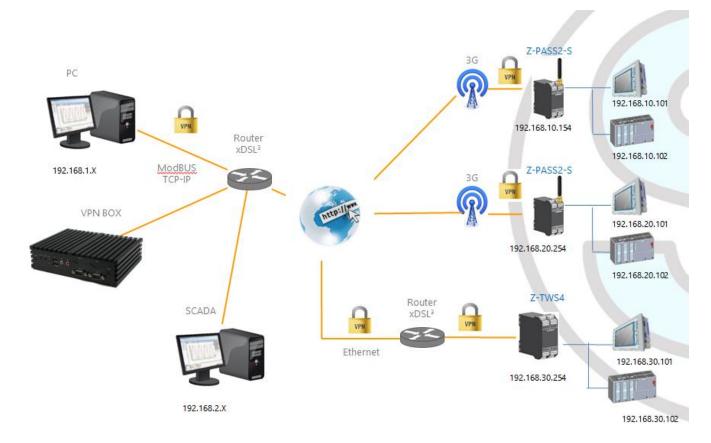
The "VPN Box" is supplied with two Windows applications:

- the "VPN Box Manager", which allows to configure the VPN<sup>4</sup> mode on the VPN Box and manage the devices<sup>5</sup>
- the "VPN Client Communicator", which lets the user connect the PC to the network (in the "Single LAN" case) or to a specific device (in the "Point-to-Point" case)

A detailed description of "VPN Box" can be found in the "VPN Box User Manual".

A detailed description of Z-TWS4/Z-PASS2-S/S6001-RTU VPN configuration parameters is given in 16.1.4 paragraph.

The following two sub-paragraphs give some more info about the two kinds of VPN.



# 10.1 "Single LAN" VPN

The above figure gives an example of a "Single LAN" VPN.

The client PC (with IP address 192.168.1.X) can connect, just as an example, to the first Z-PASS2-S by using its 192.168.10.154 IP address and to the PLC in the Z-PASS2-S LAN by using its local IP address 192.168.10.102.

Also, two devices which lie in two different LANs of the same VPN network (e.g.: 192.168.10.101 and 192.168.20.102) can connect to each other, again using their local IP addresses.

<sup>&</sup>lt;sup>4</sup> Only one of the two kinds of VPN can be configured on a given VPN Box.

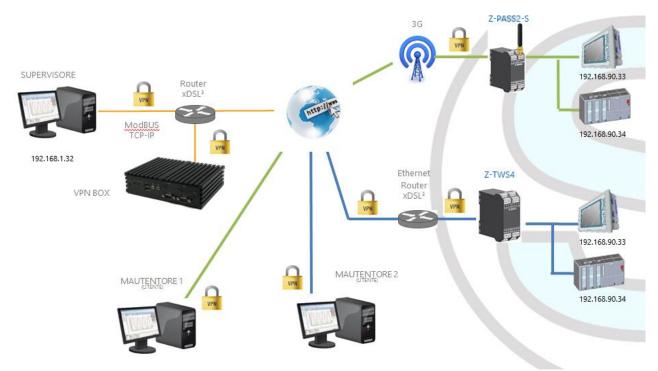
<sup>&</sup>lt;sup>5</sup> "VPN Box" functionality is available also on Seneca Z-PASS1 and Z-PASS2 products.

To let this scenario work correctly, an essential rule must always be followed: <u>the Device LANs and the PC</u> <u>LAN shall have different and not colliding subnets</u>; so, in the above figure, the following subnets allocation has been depicted:

PC LAN	192.168.1.0/24
SCADA LAN	192.168.2.0/24
Z-PASS2 LAN	192.168.10.0/24
Z-PASS2 LAN	192.168.20.0/24
Z-PASS1 LAN	192.168.30.0/24

The "VPN Box Manager" application guides you in the configuration task, checking that no subnet/IP address conflict is present in the network.

If subnet/conflicts cannot be avoided, using a "Single LAN" VPN is still possible if local IP addresses are not used; devices can be reached by means of their VPN IP addresses and machines beyond them can be reached by configuring some "port forwarding" rules on the Device Router (see 16.1.5 paragraph).



## 10.2 "Point-to-Point" VPN

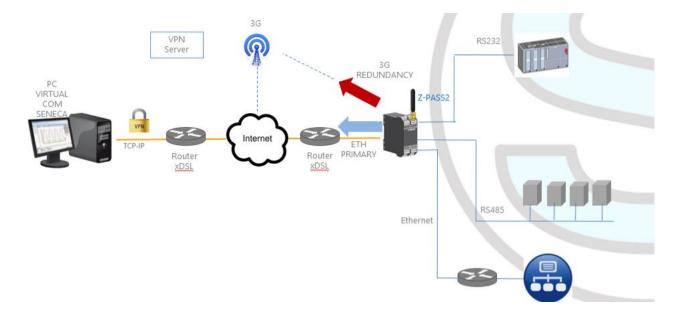
The above figure gives an example of a "Point-to-Point" VPN.

In this scenario a PC (acting as a VPN Client) can connect, on demand, to only one Device and its subnet, using local IP addresses. Since the client "sees" just one Z-TWS4/Z-PASS2-S/S6001-RTU (and attached devices) at time, the same subnet configuration can be assigned to different sites, without creating conflicts.

For this kind of VPN, the "VPN Box Manager" application lets define group of users that can connect only to assigned devices.

The "VPN Client Communicator" application retrieves the list of devices which are available for the logged user; then the user can select one device on the list and connect to it.

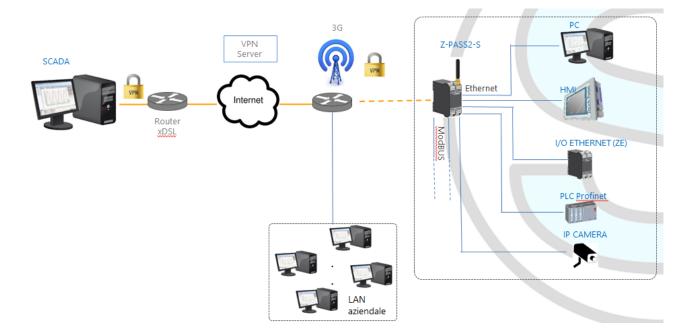
# **11 Network Redundancy**



"Network Redundancy" is a functionality than can be enabled on the Device when a 3G modem is available (true for Z-PASS2-S and S6001-RTU).

This functionality switches the network interface used to access the Internet from the Ethernet ("primary" interface) to the Mobile/3G ("secondary" interface), when Internet access through the primary interface becomes unavailable; when access through the primary interface become available again, the network interface is switched back to Ethernet.

The parameters provided to configure Network Redundancy are explained in paragraph 16.1.2 "Network and Services".



# **12 Router**

As already told before, "Router" functionality routes packets between the WAN (Mobile Network) interface and the LAN (Ethernet) interface and vice versa; so, this functionality especially makes sense when a 3G connection is active, which needs the availability of a 3G modem (true for Z-PASS2-S and S6001-RTU).

More specifically, an important feature of the Router is what is known as "IP forwarding"; this means that when the Device receives a packet not targeted for it, it does not discard the packet but forwards it to its actual destination; when a packet is routed from the LAN to the WAN, the Device also performs what is known as "IP masquerading", meaning that the original source IP address is replaced with the IP address of the WAN (Mobile Network) interface.

Another important feature is the availability of a DNS server/forwarder, which can resolve names either by itself or querying the external configured DNS server.

Also, a DHCP server is available which assigns IP addresses to clients connected on the Device LAN; here, you can configure the range of addresses used by the server and the lease time.

There is also the possibility to define up to five "Port Forwarding" rules or "Virtual Servers"; using these rules, you can, for example, redirect packets received on a TCP or UDP port to another Device port or to another machine, with a different IP address, on the same or another port.

As an alternative to using "Port Forwarding" rules, Router + VPN functionalities allow the use of local addresses, as shown in the previous chapter; in the router configuration, a flag is given to enable this feature.

A detailed description of the Router configuration can be found in paragraph 16.1.5.

# **13 Remote Connection Disable**

Z-PASS2-S-IO and Z-TWS4-IO products provide a dedicated digital input and a dedicated digital output to control and monitor remote connection to the device.

In details:

- when "Remote Connection Disable" digital input is set to HIGH state, remote connection to the device is disabled; conversely, when "Remote Connection Disable" digital input is set to LOW state, remote connection to the device is enabled; "Remote Connection Disable" digital input state is reported by the "RCD" LED;
- "Remote Connection Active" digital output is set to HIGH state when the device is remotely accessed (VPN connection is active); it is set to LOW state when VPN connection is not active.

Four levels of security can be configured to disable remote connection:

- Level 1 ("VPN Connection"): VPN connections are disabled in any VPN mode (VPN Box Point-to-Point, VPN Box Single LAN, OpenVPN), but VPN Box Service is still running, so the device can still be monitored on VPN Box Manager;
- Level 2 ("VPN Service"): VPN Box Service is disabled, but the device can still access the Internet and send/receive SMSs;
- Level 3 ("Internet Connection"): any Internet access is disabled, but the device can still send/receive SMSs;
- Level 4 ("SMS Service"): modem is off, so SMSs can't be sent/received.

See "Digital I/O Configuration" paragraph to learn how to set the desired security level.

# **14 Auto-APN**

The Auto-APN feature lets the Device establish mobile data connections without requiring the user to configure APN data<sup>6</sup> for the SIM in use.

This is accomplished by using the SIM IMSI and, possibly, some other data available on the SIM, to select the proper APN record in an internal DB<sup>7</sup>, containing APN records for all mobile operators in the world.

In some particular cases, however, when a "custom APN" shall be used, the Auto-APN feature can be disabled, setting the "APN Mode" parameter to "Manual", in the "Mobile Network" page (see paragraph 16.1.9).

# **15 Upgrading the firmware by USB pen**

The Device firmware can be upgraded by means of a USB pen; a pen drive formatted with FAT32 filesystem is needed.

<sup>&</sup>lt;sup>6</sup> APN data are: APN, Username, Password and Authentication Type.

<sup>&</sup>lt;sup>7</sup> This DB is updated to the one used in the last Android O.S. version.

The procedure is the following:

1) download the FW file from one of the following links:

http://www.seneca.it/products/z-tws4 http://www.seneca.it/products/z-pass2-s http://www.seneca.it/products/s6001-rtu

the downloaded file is a .zip file; extract the FW file from it; the FW file shall have a name like the following:

SW002940\_xxx.bin

- 2) copy the file into the root of the USB pen
- 3) switch off the Device
- 4) insert the USB pen into the USB#1 port
- 5) switch on the Device; the upgrade procedure will take some minutes to be completed; during this time, the Device MUST NOT be switched off; during the procedure, the Device will be rebooted several times; also, during the procedure, several LEDS will blink simultaneously<sup>8</sup>
- 6) the upgrade procedure is ended when only the LED "RUN" is blinking<sup>9</sup>
- 7) remove the USB pen

# **16 Web Configuration Pages**

NOTE: in this chapter, the web pages screen-shots are shown for only one of the products (Z-TWS4, Z-PASS2-S, Z-PASS2-S-R01, Z-PASS2-S-IO, S6001-RTU); the pages for the other products are identical, except for the product name shown in the top of the pages and for some details explained in the following paragraphs.

Furthermore, for S6001-RTU one more page ("I/O View") is available.

## **16.1** Administrator pages

The Device can be fully configured by means of a set of web configuration pages.

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

#### http://192.168.90.101:8080<sup>10</sup>

and, when asked, provide the following credentials (default values):

Username: admin Password: admin

<sup>&</sup>lt;sup>8</sup> This applies only to products with HW revisions IO and R01; in details: for IO HW revision, all LEDs will blink simultaneously, except for Power, LAN/WAN, COM and modem LEDs; for R01 HW revision, RUN, VPN and SERV LEDs will blink.

<sup>&</sup>lt;sup>9</sup> Also SERV and VPN LEDs might blink, depending on the Device configuration and status.

<sup>&</sup>lt;sup>10</sup> The default 80 HTTP port has been left available for customer pages.

You come to the "Main View" page, described in the following paragraph.

### 16.1.1 Main View

🗅 Z-PASS2-S	×	(!) Ciovanni	_			>
← → C 🛈 1	92.168.85.104:8080/index.php		Q	☆	J.	
SENECA"	Z-PASS2-S					
	Main View [user: admin] [logout]					
eneral Configuration						
ain View	Firmware Version: SW002940_332 [Modem: UC20GQBR03A14E1G]					
twork and Services	MAC Address: C8F9811B0000 [IMEI: 861075026600976] [IMSI: 222101600237890]					
al Time Clock Setup	Internet Access: Mobile					
N Configuration	Internet Access: Mobile					
outer Configuration	Energy Protocols: none					
ers Configuration	PLC Status: running (app: s203)					
V Upgrade						
onf. Management	Router: running					
obile Configuration						_
bile Network	NETWORK					
ONS Configuration	Ethernet Mode LAN/WAN					
gital I/O	DHCP on WAN OFF					
gital I/O Configuration	LAN IP Address 192.168.90.101					
agnostics	LAN Network Mask 255.255.255.0					
/ Versions	WAN IP Address 192.168.85.104					
ernet Interfaces	WAN Network Mask 255.252.0 Default Gateway 10.64.64.64					
dbus Modules	Default Gateway 10.04.04					
ta Logger (SD found)	DNS Server 83.224.65.143 83.224.65.134					
ga	IP Configuration from Discovery ON					
	WEB SERVER					
	Protocol HTTP/HTTPS					
	HTTP Conf Port 8080 HTTP User Port 80					
	HTTPS Port 443					
	FILE TRANSFER					
	Protocol FTP/SFTP					
	FTP Port 21					
	SFTP Port 22					
	PLC					
	Straton TCP Port 502					
	Straton Redundancy Enable OFF					
	Straton Redundancy IP Address 192.168.90.102					
	License Key 1122334455667788					
	NTP					
	Enable ON					
	Primary Server ntp1.inrim.it					
	Secondary Server ntp2.inrim.it					
	Time Zone Central Europe (CET/CEST)					
	VPN					
	Mode VPN Box					
	Enable OFF					
	Server 192.168.90.1					
	Password seneca					
	Tag Name zpase2e					
	MOBILE NETWORK					
	Enable ON					
	APN Mode Manual					
	APN m2mbis.vodafone.it					
	Authentication Type None					
	Username user					
	Pasaword pasa					
	PIN 8342					
	Ping Connection Testing IP Address www.google.com					
	NETWORK REDUNDANCY					
	Enable OFF					
	Ping Address 8 8 4 4					

In this page, main Device configuration parameters are shown, with their current values.

On the left side of the page, like in all the other pages, a menu is shown which lets you access all the configuration pages; the menu is divided in several sections:

- General Configuration
- Mobile Configuration (not available on Z-TWS4 and Z-TWS4-IO)
- Digital I/O (on Z-PASS2-S-IO, Z-TWS4-IO products)
- Diagnostics
- Data Logger

In S6001-RTU, a "S6001-RTU" section is also present.

On top of the page, like in all the other pages, the following information are shown:

- the page name
- the FW version, along with the modem FW revision, for Z-PASS2-S/S6001-RTU; for S6001-RTU, the FW version of the I/O board is also shown
- the MAC address; the modem IMEI, for Z-PASS2-S/S6001-RTU; the SIM IMSI, for Z-PASS2-S/S6001-RTU, when a SIM is present
- the network interface used for Internet Access (i.e.: "Ethernet" or "Mobile")
- which energy protocols are enabled (on a license base)
- the Soft PLC status (i.e.: "running" or "stopped"); if the PLC application execution is stopped or no application is loaded on the Device, the status "app not running" is also shown; if the PLC application is running, the name of the application is also shown
- the Router status (i.e.: "running" or "disabled")

The currently logged user (e.g.: "admin") and the "Logout" link are also present, near the page name.

In this page, the following buttons are available:

- "RESTART", to perform the Device reboot
- "FACTORY DEFAULT", to reset the Device to its factory state
- "CLEAN INTERNAL DATA LOGS", to delete internal data log files (this does not affect the data log files stored on the SD card, see paragraph 16.1.16)

Probably, the first parameters you need to change when setting up a new Device are those related to its network configuration.

You can accomplish this in the "Network and Services" page, described in the following paragraph.

## 16.1.2 Network and Services

The parameters shown in this page slightly change, depending on the HW version of the product (Z-TWS4/Z-PASS2-S or Z-PASS2-S-R01 or Z-TWS4-IO/Z-PASS2-S-IO) and, for new HW versions, on the selected "Ethernet Mode"; this is shown in the following figures.

🗋 Z-PASS2-S	×			(1) Ciovanni	_		×
← → C () 1	92.168.85.104:8080/setup.php				Q 🖞	<b>7</b>	:
SERVECA General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Router Configuration Users Configuration FW Upgrade	Z-PA882-8 Network and Services [user: admin] [logout Firmware Version: SW002940_331 [Modem: MAC Address: C8F9811B0000 [IMEI: 861075 Internet Access: Mobile Energy Protocols: none PLC Status: running (app: zpass2s_io) Router: disabled	UC20GQBR03A1	-				
Conf. Management	Rouler: disabled						_
Mobile Configuration		CURRENT	UPDATED				
Mobile Network Digital I/O	NETWORK						
Digital I/O Configuration	Ethernet Mode (*)	Switch	Switch V				
Diagnostics	DHCP		OFF V				
FW Versions		192.168.95.104	192.168.95.104				
Ethernet Interfaces	Network Mask	255.255.255.0	255.255.255.0				
Modbus Modules	IP Address 2 Enable	ON	ON V				
Data Logger (SD missing)	IP Address 2	192.168.85.104	192.168.85.104				
	Network Mask 2	255,255,252.0	255.255.252.0				
	Default Gateway		192.168.85.1				
	DNS Mode		Static V				
		192.168.84.113	192.168.84.113				
			ON V				
	IP Configuration from Discovery						
	WEB SERVER						
	Protocol (*)	нттр	HTTP V				
	HTTP Conf Port (*)	8080	8080				
	HTTP User Port (*)	8082	8082				
	HTTPS Port (*)	8043	8043				
	FILE TRANSFER						
		FTP/SFTP	FTP/SFTP V				
	FTP Port		21				
	SFTP Port		22				
			22				
	LOG FOLDER SHARING						
	Enable	ON	ON V				
	PLC						
	Straton TCP Port	502	502				
	Straton Redundancy Enable		OFF T				
	Straton Redundancy IP Address		192.168.90.102				
			1122334455667788				
	NETWORK REDUNDANCY						
	Enable		OFF V				
	Ping Address	8.8.4.4	8.8.4.4				
	WATCHDOG						
	Enable (*)	ON	ON V				
	Timeout (8)		60				
	DEBUG LOGS						
	Enable	ON	ON V				
	COM1						
	Mode	RS232	RS232 V				

The previous figure shows the "Network and Services" page for a Z-PASS2-S-IO, when the "Ethernet Mode" parameter is set to "Switch"; it also applies to a Z-TWS4-IO in "Switch" mode.

🗋 Z-PASS2-S	×			() Ciovanni	- 0	×
$\leftrightarrow$ $\Rightarrow$ C ()	192.168.85.104:8080/setup.php				९ 🛧 🗵	:
SENECA General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration	Z-PA882-8 Network and Services [user: admin] [logout Firmware Version: 8W002940_331 [Modem: MAC Address: C8F9811B0000 [IMEI: 861075 Internet Access: Mobile	UC20GQBR03A1	-			
Router Configuration Users Configuration FW Upgrade	Energy Protocols: none PLC Status: running (app: zpass2s_io) Router: disabled					
Conf. Management						
Mobile Configuration Mobile Network		CURRENT	UPDATED			
Digital I/O	NETWORK	r				
Digital I/O Configuration	Ethernet Mode (*)	LAN/WAN	LAN/WAN V			
Diagnostics	DHCP on WAN	OFF	OFF V			
FW Versions	LAN IP Address	192.168.95.104	192.168.95.104			
Ethernet Interfaces	LAN Network Mask	255.255.255.0	255.255.255.0			
Vodbus Modules Data Logger (SD missing)	WAN IP Address	192.168.85.104	192.168.85.104			
oura cogger (oo moonig)	WAN Network Mask	255.255.252.0	255.255.252.0			
	Default Gateway	192.168.85.1	192.168.85.1			
	- DNS Mode	Static	Static V			
	DNS Server	192.168.84.113	192.168.84.113			
	IP Configuration from Discovery	ON	ON V			
	WEB SERVER					
			HTTP V			
	Protocol (*)		HTTP V 8080			
	HTTP Conf Port (*)					
	HTTP User Port (*)		8082			
	HTTPS Port (*)	8043	8043			
	FILE TRANSFER					
	Protocol	FTP/SFTP	FTP/SFTP V			
	FTP Port	21	21			
	SFTP Port	22	22			
	LOG FOLDER SHARING					
	Enable		ON Y			
			UN V			
	PLC					
	Straton TCP Port		502			
	Straton Redundancy Enable	OFF	OFF V			
	Straton Redundancy IP Address	192.168.90.102	192.168.90.102			
	License Key	1122334455667788	1122334455667788			
	NETWORK REDUNDANCY	•				
	Enable	OFF	OFF V			
	Ping Address	8.8.4.4	8.8.4.4			
	WATCHDOG					
	Enable (*)		ON V			
	Timeout (8)	60	80			
	DEBUG LOGS					
	Enable	ON	ON V			
	COM1					
		RS232	RS232 V			
	NOTE: changing fields marked with * will cause a					
	system restart.					
			ADDLY			

The previous figure shows the "Network and Services" page for a Z-PASS2-S-IO, when the "Ethernet Mode" parameter is set to "LAN/WAN" it also applies to a Z-TWS4-IO in "LAN/WAN" mode.

☐ Z-PASS2-S	×			(!) Ciovanni	-		×
	2.168.85.106:8080/setup.php				Θ	☆ 🏸	:
	2.100.00.100.0000/setup.php				~	A 100	•
SENECA General Configuration Main View	Z-PASS2-S Network and Services [user: admin] [logout] Firmware Version: SW002940_331 [Modem: 1	231B02SIM6350I	E]				
Network and Services Real Time Clock Setup	MAC Address: C8FA81160002 [IMEI: 8622640	20406716]					
VPN Configuration	Internet Access: Ethernet						
Router Configuration	Energy Protocols: none						
Users Configuration	PLC Status: running (app: zpass2s_r01_8)						
FW Upgrade	Router: running						
Conf. Management Mobile Configuration							
Mobile Network		CURRENT	UPDATED				
Diagnostics	NETWORK						
FW Versions Ethernet Interfaces	Ethernet Mode (*)	Switch	Switch V				
Modbus Modules	DHCP		OFF V				
Data Logger (SD missing)		192.168.95.106	192.168.95.106				
	Network Mask		255.255.255.0				
	IP Address 2 Enable	192.168.85.106	ON T 192.168.85.106				- 11
	Network Mask 2		255.255.252.0				- 11
	Default Gateway		192.168.85.1				- 11
	Disadit Cateway DNS Mode		Static V				- 11
		192.168.84.113	192.168.84.113				
	IP Configuration from Discovery	ON	ON V				
	WEB SERVER						
	Protocol (*)	нттр	HTTP V				
	HTTP Conf Port (*)	8080	8080				
	HTTP User Port (*)	80	80				
	HTTPS Port (*)	443	443				
	FILE TRANSFER						
	Protocol	FTP/SFTP	FTP/SFTP V				
	FTP Port	21	21				
	SFTP Port	22	22				
	LOG FOLDER SHARING						
	Enable	ON	ON V				
	PLO	•					
	Straton TCP Port	502	502				
	Straton Redundancy Enable	OFF	OFF V				
	Straton Redundancy IP Address	192.168.90.102	192.168.90.102				
	License Key	1122334455667788	1122334455667788				
	NETWORK REDUNDANCY	•					
	Enable	OFF	OFF V				
	Ping Address	8.8.4.4	8.8.4.4				
	WATCHDOG						
	Enable (*)	ON	ON V				
	Timeout (8)	60	60				
	DEBUG LOGS						
	Enable	ON	ON V				
	NOTE: changing fields marked with * will cause a						*

The previous figure shows the "Network and Services" page for a Z-PASS2-S-R01, when the "Ethernet Mode" parameter is set to "Switch".

🗋 Z-PASS2-S	×			(!) Clovenni	_			×
$\leftrightarrow$ $\rightarrow$ C () 1	92.168.85.106:8080/setup.php				Q	$\overleftrightarrow$	J.	
SENECA General Configuration	Z-PASS2-S Network and Services [user: admin] [logout]							
lain View letwork and Services	Firmware Version: \$W002940_331 [Modem: 1		E]					
eal Time Clock Setup	MAC Address: C8FA81160002 [IMEI: 8622640	20406716]						
PN Configuration	Internet Access: Ethernet							
outer Configuration	Energy Protocols: none							
sers Configuration	PLC Status: running (app: zpass2s_r01_8)							
W Upgrade	Router: running							
Conf. Management	Houter. Fulling							
Iobile Configuration Iobile Network		CURRENT	UPDATED					
liagnostics	NETWORK							
W Versions	Ethernet Mode (*)		LAN/WAN V					
thernet Interfaces lodbus Modules	DHCP on WAN	OFF	OFF V					
ocbus Modules Data Logger (SD missing)	LAN IP Address	192.168.95.106	192.168.95.106					
	LAN Network Mask	255.255.255.0	255.255.255.0					
	WAN IP Address	192.168.85.106	192.168.85.106					
	WAN Network Mask	255.255.252.0	255.255.252.0					
	Default Gateway	192 168 85 1	192.168.85.1					
	DNS Mode		Static V					
		192.168.84.113	192.168.84.113					
	IP Configuration from Discovery		ON V					
	WEB SERVER		on -					
	Protocol (*)		HTTP V					
	HTTP Conf Port (*)		8080					
	HTTP User Port (*)	80	80					
	HTTPS Port (*)	443	443					
	FILE TRANSFER							
	Protocol	FTP/SFTP	FTP/SFTP V					
	FTP Port	21	21					
	SFTP Port	22	22					
	LOG FOLDER SHARING							
	Enable	ON	ON V					
	PLC							
	Straton TCP Port	502	502					
	Straton Redundancy Enable	OFF	OFF V					
	Straton Redundancy IP Address	192.168.90.102	192.168.90.102					
		1122334455667788	1122334455667788					
	NETWORK REDUNDANCY	0.55						
	Enable		OFF V					
	Ping Address	0.0.4.4	8.8.4.4					
	WATCHDOG							
	Enable (*)		ON V					
	Timeout (8)	60	60					
	DEBUG LOGS							
	Enable	ON	ON V					
	NOTE: changing fields marked with * will cause a system restart.							

The previous figure shows the "Network and Services" page for a Z-PASS2-S-R01, when the "Ethernet Mode" parameter is set to "LAN/WAN".

[] S6001-RTU	×			(!) Clovenni	_		×	
	2.168.85.106:8080/setup.php				Q	☆	<u>,</u>	
General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration	S6001-RTU Network and Services [user: admin] [logout] Firmware Version: SW002940_331 [I/O: SW00 MAC Address: C8F981000198 [IMEI: 8622640 Internet Access: Ethernet		231B02\$IM6360E]					•
Router Configuration Users Configuration FW Upgrade Conf. Management	Energy Protocols: none PLC Status: running (app: znet_s6001_2) Router: running							
Mobile Configuration Mobile Network		CURRENT	UPDATED					
S6001-RTU	NETWORK							
I/O View	DHCP		OFF T					
Diagnostics		192.168.85.106	192.168.85.106					
FW Versions								
Ethernet Interfaces	Network Mask IP Address 2 Enable		255.255.255.0					
Modbus Modules Data Logger (SD missing)			OFF ▼					
		192.168.100.101	192.168.100.101					
	Network Mask 2		255.255.255.0					
	Default Gateway		192.168.85.1					
	DNS Mode		Static V					
		192.168.84.113	192.168.84.113					
	IP Configuration from Discovery	ON	ON V					
	WEB SERVER							
	Protocol (*)	HTTP/HTTPS	HTTP/HTTPS ▼					
	HTTP Conf Port (*)	8080	8080					
	HTTP User Port (*)	80	80					
	HTTPS Port (*)	443	443					
	FILE TRANSFER							
	Protocol	FTP/SFTP	FTP/SFTP V					
	FTP Port		21					
	SFTP Port		22					
			22					
	LOG FOLDER SHARING							
	Enable	ON	ON V					
	PLC							
	Straton TCP Port	502	502					
	Straton Redundancy Enable	OFF	OFF V					
	Straton Redundancy IP Address	192.168.90.102	192.168.90.102					
	License Key	1122334455667788	1122334455667788					
	NETWORK REDUNDANCY							
	Enable		OFF T					
	Ping Address		8.8.4.4					
			0.0.7.7					
	WATCHDOG							
	Enable (*)		ON V					
	Timeout (s)	60	60					
	DEBUG LOGS							
	Enable	ON	ON V					
	NOTE: changing fields marked with * will cause a system restart.							Ŧ

The previous figure shows the "Network and Services" page for a S6001-RTU; it also applies to a Z-TWS4 and Z-PASS2-S (old version).

There is an important difference between the parameter values shown in this page and those shown in the "Main View" page: the former are <u>configured</u> values, whereas the latter are <u>actual</u> values.

To better explain this difference, let's consider the case when the DHCP parameter is set to ON; in the "Network and Services" page, you may see the 192.168.90.101 default value for the "IP Address" parameter, whereas the "Main View" page shows the actual IP Address, assigned by the DHCP server.

In the following table, all configuration parameters available in the page are listed, with a short explanation and the parameter default value for each of them.

Field	Meaning	Default value
NETWORK/Ethernet Mode	This parameter determines if the two Ethernet ports work as two fully separated network interfaces ("LAN/WAN") or as the ports of an Ethernet switch ("Switch"); depending on the value of this parameter, some other network parameters are hidden/shown or renamed as described below. <u>This parameter is available only for</u> <u>Z-PASS2-S-R01, Z-PASS2-S-IO and</u> <u>Z-TWS4-IO products.</u> For all other products, only "Switch" mode is available, hence the parameter is not shown.	LAN/WAN
Ethernet Mode = "Switch"		
NETWORK/DHCP	Flag to enable/disable the DHCP functionality on the Ethernet interface.	OFF
NETWORK/IP Address	IP address of the Ethernet interface (disabled when "DHCP" is set to "ON")	192.168.90.101
NETWORK/Network Mask	Network mask of the Ethernet interface (disabled when "DHCP" is set to "ON")	255.255.255.0
NETWORK/IP Address 2 Enable	Flag to enable/disable the second IP address on the Ethernet interface. Note that the second IP address can be enabled also when the DHCP functionality is active.	OFF
NETWORK/IP Address 2	Second IP address of the Ethernet interface	192.168.100.101
NETWORK/Network Mask 2	Second network mask of the Ethernet interface	255.255.255.0
Ethernet Mode = "LAN/WAN"		
NETWORK/DHCP on WAN	Flag to enable/disable the DHCP	ON

	Construction of the Addate The second	[]
	functionality on the WAN Ethernet	
	interface	
NETWORK/LAN IP Address	IP address of the LAN Ethernet interface	192.168.90.101
NETWORK/LAN Network Mask	Network mask of the LAN Ethernet interface	255.255.255.0
NETWORK/WAN IP Address	IP address of the WAN Ethernet interface (disabled when "DHCP on	192.168.100.101
	WAN" is set to "ON")	
NETWORK/WAN Network Mask	Network mask of the WAN Ethernet interface (disabled when "DHCP on WAN" is set to "ON")	255.255.255.0
NETWORK/Default Gateway	Default Gateway IP address (disabled when DHCP functionality is enabled on any interface). When "Ethernet Mode" is set to "LAN/WAN", the Default Gateway shall be in the WAN subnet.	192.168.100.1 , for Z-TWS4-R0x and Z-PASS2-S-R0x (x=1,2) 192.168.90.1, for all other products
NETWORK/DNS Mode	Tells if the DNS Server shall be set statically (value: "Static") or dinamically assigned by the DHCP Server (value: "DHCP")	DHCP, for Z-TWS4-R0x and Z- PASS2-S-R0x (x=1,2) Static, for all other products
NETWORK/DNS Server	DNS server IP address (disabled when DHCP functionality is enabled on any interface and DNS Mode = DHCP)	192.168.100.1 , for Z-TWS4-R0x and Z-PASS2-S-R0x (x=1,2) 192.168.90.1, for all other products
NETWORK/IP Configuration from Discovery	Flag to enable/disable the possibility of changing some of the network configuration parameters by means of the SDD application (see chapter 6)	ON
WEB SERVER/Protocol	Protocol used to access the web pages: HTTP/HTTPS, HTTPS, HTTP	HTTP/HTTPS
WEB SERVER/HTTP Conf Port	TCP port to access the configuration pages, using HTTP protocol. Please note that <u>if this parameter is set to 80 (standard HTTP port), the web user site won't be available anymore.</u>	8080 Default URL for conf pages: <u>http://<ip_address>:8080</ip_address></u>
WEB SERVER/HTTP User Port	TCP port to access the user pages, using HTTP protocol.	80 Default URL for user pages: <u>http://<ip_address< u="">&gt;</ip_address<></u>

WEB SERVER/HTTPS Port	TCP port to access the configuration and user pages, using HTTPS protocol.	443 Default URL for conf pages: <u>https://<ip_address>/maintenance</ip_address></u> Default URL for user pages: <u>https://<ip_address></ip_address></u>
FILE TRANSFER/Protocol	Protocol used for File Transfer: FTP/SFTP, SFTP, FTP	FTP/SFTP
FTP Port	TCP Port for FTP protocol	21
SFTP Port	TCP Port for SFTP protocol	22
LOG FOLDER SHARING/Enable	Flag to enable/disable the sharing of the "/log" directory (by means of "Samba" service)	ON
PLC/Straton TCP Port	TCP port to connect to the Straton server	502
PLC/Straton Redundancy Enable	Flag to enable/disable the Straton Redundancy functionality	OFF
PLC/Straton Redundancy IP Address	IP address of the second Device used for Straton Redundancy	192.168.90.102
PLC/License Key	Key to enable/disable Energy Protocol functionalities in Straton (see paragraph 8.2)	1122334455667788 (dummy value) <sup>11</sup>
NETWORK REDUNDANCY/Enable	Flag to enable/disable the "Network Redundancy" functionality, that is using the Ethernet interface as the primary interface to access the Internet and the Mobile interface as the secondary interface, if the access through the primary interface becomes unavailable	OFF
NETWORK REDUNDANCY/Ping Address	IP Address used as ping destination to check if access to the Internet through the primary interface (Ethernet) is available. This address shall be different from the one set for "DNS Server" parameter, otherwise an error is shown.	8.8.4.4
WATCHDOG/Enable	Flag to enable/disable the watchdog functionality	ON
WATCHDOG/Timeout (s)	Watchdog timeout, in seconds;	60

<sup>&</sup>lt;sup>11</sup> The correct License Key string is provided by Seneca.

	when watchdog is enabled, if it's not refreshed for this amount of seconds, the system will be rebooted. Possible values are in the range [303600].	
DEBUG LOGS/Enable	Flag to enable/disable the debug logs	OFF
COM1/Mode	Operating mode of the COM1 serial port; possible values: RS485, RS232 <u>This parameter is available only for</u> <u>Z-TWS4-IO and Z-PASS2-S-IO</u> <u>products.</u>	RS485

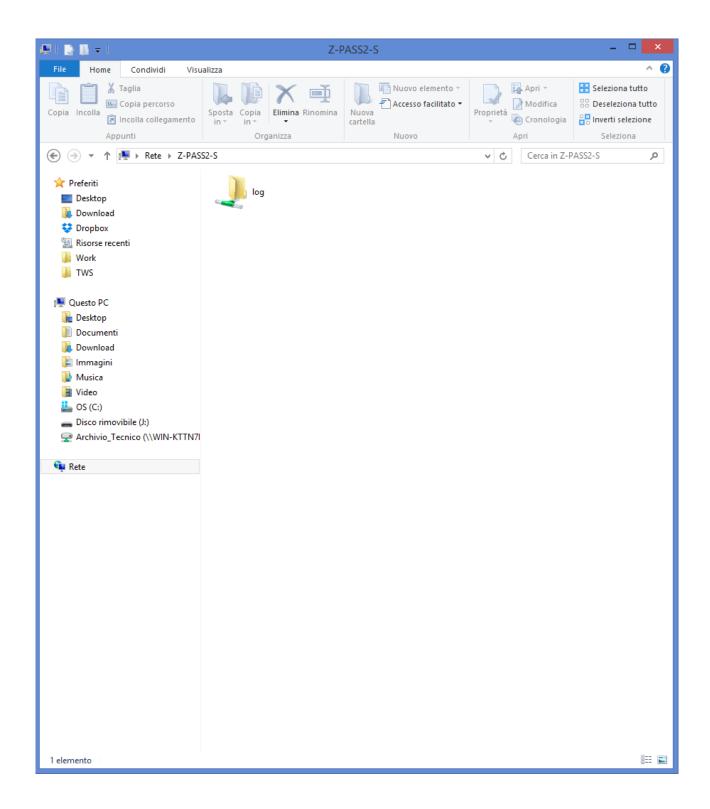
Some notes about the "DHCP" parameters:

- the "DHCP" parameter can be set to "ON" only if the "DHCP Server" parameter of the "Router Configuration" page is set to "OFF" (see paragraph 16.1.5);
- only the "DHCP on WAN" parameter can be set to "ON".

You can change any of the above parameters; to apply the changes, press the "APPLY" button; as warned by the note on the page, only for some parameters, the parameter change requires rebooting the Device; these parameters are:

- NETWORK/Ethernet Mode
- WEB SERVER/Port
- WATCHDOG/Enable, only when changing ON -> OFF
- DEBUG LOGS/Enable, only when changing ON -> OFF

If the "LOG FOLDER SHARING/Enable" parameter is ON, on a Windows PC, you can directly access the "/log" directory, as shown in the following pictures (the sharing name is equal to the product name, without '-' character, that is "ZPASS2S", "ZTWS4" or "S6001RTU"):



🖳 l 📮 🔢 🖛 l		log		- 🗆 🗙
File Home Condividi Visu	alizza			^ <b>(</b>
Copia Incolla Collegamento	Sposta Copia in * Copia	Nuova cartella	Proprietà • Cronologia	Seleziona tutto
Appunti	Organizza	Nuovo	Apri	Seleziona
( → ▼ ↑ ↓ Rete → Z-PAS	-		✓ Cerca in log	ק נ
🖌 🚖 Preferiti	Nome	Ultima modifica	Тіро	Dimensione
Desktop	📕 conf	26/10/2015 13.56	Cartella di file	
Download	disk	27/10/2015 09.22	Cartella di file	
Stopbox	📕 tmp	27/10/2015 07.40	Cartella di file	
🕮 Risorse recenti	🔄 .lmnt.log	27/10/2015 07.41	File LOG	5 KB
Work	.upgrade_firmware.log	27/10/2015 07.40	File LOG	2 KB
🐌 TWS	At_exec.log	27/10/2015 08.32	File LOG	115 KB
	at_exec.log.1	26/10/2015 17.12	File 1	293 KB
4 🕎 Questo PC	at_exec.log.2	26/10/2015 16.45	File 2	1.731 KB
🖻 ॊ Desktop	at_exec.log.3	26/10/2015 16.30	File 3	1.690 KB
> 📗 Documenti	at_exec.log.4	26/10/2015 16.15	File 4	1.511 KB
> 🕕 Download	at_exec.log.5	26/10/2015 16.00	File 5	1.689 KB
> 📄 Immagini	Cron.log	27/10/2015 09.48	File LOG	121 KB
🖻 🌗 Musica	fb_exec_handler.log	27/10/2015 09.21	File LOG	2 KB
🖻 📴 Video	fb_exec_handler.log.1	27/10/2015 08.44	File 1	316 KB
> 📥 OS (C:)	fb_exec_handler.log.2	26/10/2015 16.45	File 2	1.362 KB
🖻 👝 Disco rimovibile (J:)	fb_exec_handler.log.3	26/10/2015 16.30	File 3	1.158 KB
🛛 🖵 Archivio_Tecnico (\\WIN-KTTN7I	fb_exec_handler.log.4	26/10/2015 16.15	File 4	1.188 KB
	fb_exec_handler.log.5	26/10/2015 16.00	File 5	1.329 KB
🖻 🖣 Rete	🔠 mb_conf_handler.log	27/10/2015 09.21	File LOG	60 KB
	messages	27/10/2015 09.48	File	5 KB
	messages.0	27/10/2015 09.45	File 0	1.025 KB
	messages.1	26/10/2015 13.22	File 1	1.025 KB
	messages.2	26/10/2015 09.52	File 2	1.025 KB
	messages.3	26/10/2015 08.32	File 3	1.025 KB
	messages.4	23/10/2015 14.19	File 4	1.025 KB
	messages.5	22/10/2015 16.36	File 5	1.025 KB
	messages.6	21/10/2015 17.00	File 6	1.025 KB
	messages.7	20/10/2015 17.09	File 7	1.025 KB
	🖉 openvpn-status.log	27/10/2015 09.47	File LOG	1 KB
	🔼 t5energy.log	27/10/2015 09.47	File LOG	122 KB
	t5energy.log.1	26/10/2015 16.45	File 1	405 KB
	t5energy.log.2	26/10/2015 16.30	File 2	356 KB
	t5energy.log.3	26/10/2015 16.15	File 3	355 KB
	t5energy.log.4	26/10/2015 16.00	File 4	395 KB
	t5energy.log.5	26/10/2015 15.45	File 5	394 KB
35 elementi				III 🖿

Depending on the LAN configuration, a login may be needed to access the shared folder; if so, use the credentials shown in the following figure (username: "\guest", password: "" [empty]).

Sicurezza di Windows
Password di rete Immettere la password per la connessione a: ZTWS4
\guest         Password         Dominio:         Memorizza credenziali
Il sistema ha rilevato un possibile tentativo di compromissione della sicurezza. Accertarsi di poter contattare il server di autenticazione.
OK Annulla

### 16.1.3 Real Time Clock Setup

By clicking on the "Real Time Clock Setup" link, in the "General Configuration" menu, you come to the following page:

Z-PASS2-S	×		<b>(!)</b> (6	lovanni	_		×
← → C (i) 192.168.8	5.106:8080/rtc.php				Ð	☆ 🗵	:
SENECA General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Router Configuration Users Configuration FW Upgrade Conf. Management	Z-PASS2-S Real Time Clock Setup [user: admit Firmware Version: SW002940_331 MAC Address: C8FA81160002 [IME Internet Access: Ethernet Energy Protocols: none PLC Status: running (app: zpass2s Router: running	[Modem: 1231E El: 86226402040		E]			
Mobile Configuration		CURRENT		UPDAT	ED		
Mobile Network Diagnostics	NTP			OPDAT	20		
FW Versions	Enable	ON	ON 🔻				
Ethernet Interfaces	Primary Server	ntp1.inrim.it	ntp1.inrim.it				
Modbus Modules	Secondary Server		ntp2.inrim.it				
Data Logger (SD missing)	Time Zone	Central Europe	Central Eur			ST) ▼	
		RTC					
		YEAR 2017	,	2017			
		MONTH Octo	ber	Octob	er	W	
		DAY 05		05			
		HOUR 08		08			
		MINUTE 59		59			
		SECOND 05		05			
				S	ET C	LOCK	1
							-
(							

This page is made up of two sections: "NTP" and "RTC".

In the "NTP" section, you can change the parameters related to the Network Time Protocol and to the Time Zone, as listed in the following table:

Field	Meaning	Default value
NTP/Enable	Flag to enable/disable time	ON
	synchronization by means of NTP	
	protocol	
NTP/Primary Server	IP address or FQDN <sup>12</sup> of the Primary	ntp1.inrim.it
	NTP Server	
NTP/Secondary Server	IP address or FQDN of the Secondary	ntp2.inrim.it
	NTP Server	
NTP/Time Zone	Time Zone	Central Europe (CET/CEST)

When the "Time Zone" parameter is set to "Central Europe (CET/CEST)" value, the Device automatically enables (CEST) / disables (CET) the "Daylight Saving Time" setting.

A large number of Time Zones are available, as partially shown in the following figure:

<sup>&</sup>lt;sup>12</sup> FQDN: Fully Qualified Domain Name, e.g.: "pool.ntp.org".

MAC Address: C8FA81160002 [IMEI: 862264020406715]	🗋 Z-PASS2-S	×		(1) Ciovanni — 🗆
General Configuration General Configuration Real Time Clock Setup [Luser: admin] [logout] Firmware Version: SW002940_331 [Modem: 1231B02SIM5350E] MAC Address: C8FA81160002 [IMEI: 862264020406716] MAC Address: C8FA81160002 [IMEI: 862264020406716] Internet Access: Ethernet Energy Protocols: none PLC Status: running (app: zpass2s_r01_bis) Router: running Diagnostics W Versions Ethernet Interfaces Wodbus Modules Data Logger (8D missing) Real Time Zong Real Time	$\leftarrow \rightarrow \mathbf{C}$ (1) 192.168.85	5.106:8080/rtc.php		€ ☆ 🗵
Network and Services       MAC Address: C8FA81160002 [IMEI: 862264020406715]         Internet Access: Ethernet       Energy Protocols: none         PPL Configuration       PLC Status: running (app: zpass2s_r01_bis)         Router: running       PLC Status: running (app: zpass2s_r01_bis)         Router: running       CURRENT         UPDATED       Mobile Configuration         Abbie Network       NP         Secondary Server       ntp1.inrim.it         Internet Interfaces       Primary Server         Modules       Secondary Server         Data Logger (8D missing)       Time Zon         Central Europe (CET/CEST)       UTC-10:00 Huawai         UTC-09:00 Alaska       UTC-09:00 Alaska         UTC-07:00 Chinahua       UTC-07:00 Chinahua         UTC-07:00 Chinahua       UTC-05:00 Bogota         UTC-05:00 Haavaa       UTC-05:00 Haavaa         UTC-05:00 Rester Zone       UTC-05:00 Rester Zone         UTC-05:00 Rester Zone       UTC-05:00 Haavaa         UTC-05:00 Rester Zone       UTC-05:00 Rester Zone         UTC-05:00 Rester Zone       UTC-05:00 Rester Zone         UTC-04:00 Caitaba       UTC-04:00 Caitaba         UTC-04:00 Caitaba       UTC-04:00 Caitaba         UTC-04:00 Caitaba       UTC-04:00 Caitaba <tr< td=""><td>-</td><td>Real Time Clock Setup [user: admin</td><td></td><td>02SIM5350E1</td></tr<>	-	Real Time Clock Setup [user: admin		02SIM5350E1
VPN Configuration       Energy Protocols: none         PLC Status: running (app: zpass2s_r01_bis)         FW Upgrade         Conf. Management         Mobile Configuration         Wobile Network         Diagnostics         W Versions         Ethernet Interfaces         Wodous Modules         Data Logger (SD missing)         Secondary Server         Time Zone         Central Europe         UTC-10:00 Huawai         UTC-10:00 Huawai         UTC-00:00 Aleutian         UTC-00:00 Huawai         UTC-00:00 Aleutian	Network and Services Real Time Clock Setup	MAC Address: C8FA81160002 [IME		-
W Upgrade       Router: running         Mobile Configuration       Mobile Configuration         Mobile Configuration       Mobile Network         Diagnostics       NTP         W Versions       Enable         Stennet Interfaces       Modules         Modolus Modules       Secondary Server         Data Logger (SD missing)       Time Zone         Central Europe (CET/CEST)       UTC-10:00 Huawai         VECA       2017         ITIC - 09:30 Marquesas       UTC-09:00 Alaska         UTC-00:00 Alaska       UTC-07:00 Alaska         UTC-07:00 Anizona       UTC-06:00 Havaai         UTC-05:00 Bogota       UTC-05:00 Bogota         UTC-05:00 Bogota       UTC-05:00 Havaai         UTC-05:00 Havaai       UTC-05:00 Havaai         UTC-05:00 Bogota       UTC-05:00 Havaai         UTC-04:00 Asuncion       UTC-04:00 Asuncion         UTC-04:00 Caracas       UTC-04:00 Caracas         UTC-04:00 Caracas       UTC-04:00 Alantic Coast				
Mobile Configuration Aobile Network       CURRENT       UPDATED         Adobie Network       NTP       NTP         Diagnostics       NTP       N         W Versions       Enable       ON       ON         Ethernet Interfaces       Primary Server       ntp1.inrim.it       ntp1.inrim.it         Adobus Modules       Secondary Server       ntp2.inrim.it       ntp2.inrim.it         Data Logger (SD missing)       Secondary Server       ntp2.inrim.it       UTC-10:00 Huawai         Time Zone       Central Europe (CET/CEST)       UTC-10:00 Alaska       UTC-09:00 Alaska         UTC-09:00 Alaska       UTC-09:00 Alaska       UTC-09:00 Alaska       UTC-07:00 Arizona         UTC-05:00 Eastern Zone       UTC-05:00 Bogota       UTC-05:00 Bogota       UTC-05:00 Indiana         UTC-05:00 Indiana       UTC-05:00 Havana       UTC-05:00 Havana       UTC-04:00 Caracas         UTC-04:00 Cairacas       UTC-04:00 Cairacas       UTC-04:00 Cairacas       UTC-04:00 Cairacas	™ Upgrade		_r01_bis)	
W Versions Ethernet Interfaces Modbus Modules Data Logger (SD missing) Becondary Server Data Logger (SD missing) Becondary Server Time Zone Central Europe (CET/CEST) Time ZONE CON Huawai UTC-09:00 Alaska UTC-09:00 Alaska UTC-09:00 Alaska UTC-09:00 Alaska UTC-09:00 Central Zone UTC-06:00 Central Zone UTC-06:00 Eastern Zone UTC-05:00 Eastern Zone UTC-04:00 Caracas UTC-04:00 Caracas	Mobile Configuration		CURRENT	UPDATED
Ethernet Interfaces       Primary Server       ntp1.inrim.it       ntp1.inrim.it         Adobus Modules       Secondary Server       ntp1.inrim.it       ntp2.inrim.it         Data Logger (SD missing)       Time Zone       Central Europe (CET/CEST)       UTC-10:00 Huawai       Imp2.inrim.it         Image: Central Europe (CET/CEST)       UTC-10:00 Huawai       Imp2.inrim.it       Imp2.inrim.it         Image: Central Europe (CET/CEST)       UTC-10:00 Huawai       Imp2.inrim.it         Image: Central Europe (CET/CEST)       UTC-10:00 Huawai       Imp2.inrim.it         Image: Central Europe (CET/CEST)       UTC-00:00 Alaska       Imp2.inrim.it         Image: Central Europe (CET/CEST)       UTC-09:00 Alaska       Imp2.inrim.it         Image: Central Europe (CET/CEST)       UTC-09:00 Alaska       Imp2.inrim.it         Image: Central Europe (CET/CEST)       UTC-09:00 Alaska       Imp2.inrim.it         Image: Central Europe (CET/CEST)       Imp2.inrim.it       Imp2.inrim.it <t< td=""><td>0</td><td></td><td>ON</td><td>ON V</td></t<>	0		ON	ON V
Time Zone       Central Europe (CET/CEST)       UTC-10:00 Huawai         RTC       UTC-10:00 Huawai         UTC-10:00 Alausa       UTC-09:30 Marquesas         UTC-09:30 Marquesas       UTC-09:00 Alaska         UTC-09:00 Alaska       UTC-09:00 Alaska         UTC-07:00 Chihuahua       UTC-07:00 Arizona         UTC-06:00 Central Zone       UTC-06:00 Mexico City         UTC-05:00 Bogota       UTC-05:00 Bogota         UTC-05:00 Indiana       UTC-05:00 Havana         UTC-05:00 Havana       UTC-05:00 Havana         UTC-05:00 Bogota       UTC-05:00 Havana         UTC-05:00 Indiana       UTC-05:00 Havana         UTC-04:00 Cuiaba       UTC-04:00 Cuiaba         UTC-04:00 Cuiaba       UTC-04:00 Atlantic Coast				
RTCUTC-10:00 HuawaiVTC-10:00 AleutianUTC-09:30 MarquesasUTC-09:00 AlaskaUTC-09:00 AlaskaUTC-08:00 Pacific CoastUTC-07:00 ArizonaOctorUTC-07:00 ChihuahuaUTC-06:00 Central ZoneUTC-06:00 Mexico CityMINUTE55UTC-05:00 BogotaSECOND15UTC-05:00 IndianaUTC-04:00 AsuncionUTC-04:00 AsuncionUTC-04:00 CaracasUTC-04:00 CaracasUTC-04:00 La PazUTC-04:00 Atlantic Coast	)ata Logger (SD missing)		Central Europe	UTC-10:00 Huawai
			YEAR 2017 MONTH Octo DAY 05 HOUR 08 MINUTE 55	UTC-10:00 Huawai UTC-10:00 Aleutian UTC-09:30 Marquesas UTC-09:00 Alaska UTC-08:00 Pacific Coast UTC-07:00 Arizona UTC-07:00 Chihuahua UTC-06:00 Central Zone UTC-06:00 Mexico City UTC-05:00 Bogota UTC-05:00 Eastern Zone UTC-05:00 Indiana UTC-05:00 Havana UTC-05:00 Havana UTC-04:00 Asuncion UTC-04:00 Caracas UTC-04:00 Cuiaba UTC-04:00 La Paz UTC-04:00 Atlantic Coast

The "RTC" section of the page lets you manually change the Device date/time settings; since this makes sense only if NTP time synchronization is not enabled, when "NTP/Enable" parameter is "ON" the input fields and the "SET CLOCK" button are disabled and the parameters are only for viewing.

Instead, when "NTP/Enable" parameter is "OFF", the input fields in the "NTP" section are still enabled; this lets you change and save the parameter values, even if they are not actually used.

#### **16.1.4** VPN Configuration

By clicking on the "VPN Configuration" link, in the "General Configuration" menu, you come to the following page:

The page has a different layout depending on the value of the "VPN Mode" parameter, which can be "OpenVPN" or "VPN Box" (for an explanation of these values, see chapter 10).

### 16.1.4.1 **OpenVPN**

The page is made up of two sections: "VPN Files" and "VPN Configuration".

The "VPN Files" section lets you load the files needed to configure Open VPN and establish a secure VPN connection; these files are described in the following.

# 16.1.4.1.1 Configuration File

This file shall contain all the information needed to configure the Open VPN behaviour; the main configuration options are<sup>13</sup>:

• if the Device shall act as a client or a server (typically, it will be a client)

<sup>&</sup>lt;sup>13</sup> For more information about Open VPN configuration options, please refer to the OpenVPN web page ("openvpn.net").

- the transport protocol (UDP or TCP)
- the server IP address/host name and port
- the files needed to perform authentication procedures
- etc.

This file has the *.ovpn* extension (in Windows systems) or *.conf* extension (in Linux systems); regardless of the original name, it will be renamed as *ovpn.conf* on the Device.

This is the only mandatory file, that is if this file has not been loaded on the Device, VPN can't be enabled.

As reminded in the web page, in options requiring a file argument, only the file name shall be given, with <u>no path</u>, as in the following example:

ca ca.crt OK

ca /home/config/vpn/ca.crt KO!

Other two important rules that shall be followed are:

- the "dev" option shall be: "dev tun0" or "dev tap0"
- the "log" option shall be omitted (so that, logs are written to syslog)

An example of a client configuration file is given in paragraph 16.1.4.1.7.

### 16.1.4.1.2 CA certificate

This file shall contain the Certification Authority (CA) certificate and has the .crt extension.

It is needed when the configuration file contains the "ca" option.

### 16.1.4.1.3 Client certificate

This file shall contain the client certificate and has the .crt extension.

It is needed when the configuration file contains the "cert" option.

### 16.1.4.1.4 Client key

This file shall contain the client key and has the .key extension.

It is needed when the configuration file contains the *"key"* option.

#### 16.1.4.1.5 Additional file

This file can be of any type and may be needed for configuration options other than "ca", "cert" and "key".

More than one additional file can be loaded.

You can browse your PC to select the above files and send them to the Device by pressing the "UPLOAD" button.

Once the upload is done, a result page is shown like in the following figure.

Z-PASS2-S	× Giovann	mi _ 🗆	×
← → C ① 192.16	.85.103:8080/vpn_upload_files_cust.php	\$	] :
Seneral Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Router Configuration Users Configuration FW Upgrade Mobile Configuration Mobile Network Diagnostics Ethernet Interfaces Modbus Modules Data Logger (SD found) Logs	Z-PAS82-S VPN Configuration [user: admin] [logout] Firmware Version: SW002940_310 [Modem: 1231B02SIM5350E] MAC Address: C8FA81160002 Internet Access: Mobile Energy Protocols: none PLO Status: running (app not running) Router: disabled Upload: CLIENT1a.ovpn Size: 193 bytes Stored in: /home/config/vpn/ovpn.conf Upload: ca.ort Size: 1139 bytes Stored in: /home/config/vpn/ca.ort Upload: CLIENT1.ort Size: 3600 bytes Stored in: /home/config/vpn/CLIENT1.ort Upload: CLIENT1.key Size: 912 bytes Stored in: /home/config/vpn/CLIENT1.key		

You can check which VPN files are stored on the Device by clicking on the "SHOW VPN STATUS" button, as shown in the following figure (remember that the configuration file is renamed as "ovpn.conf"):

		(1) Giovanni	
Z-PASS2-S	×		
$\boldsymbol{\leftarrow} \rightarrow \mathbf{C}$ (i) 192	2.168.85.103:8080/vpn_files.php?showinfo=1		۹☆:
SENECA® General Configuration Main View Network and Services Real Time Clock Setup VPIN Configuration Router Configuration Users Configuration EW Upgrade Mobile Configuration Mobile Network	Z-PASS2-S VPN Configuration [user: admin] [logout] Firmware Version: SW002940_310 [Modem: 1231B02SIM5350E] MAC Address: C8FA81160002 Internet Access: Mobile Energy Protocols: none PLC Status: running (app not running) Router: disabled		
Diagnostics	CURRENT UPDATED		
Ethernet Interfaces Modbus Modules	VPN Mode OpenVPN OpenVPN		
Data Logger (SD found) Logs	VPN Files		
	Configuration File (.ovpn or .conf) NOTE 1: the file will be renamed as 'ovpn.conf NOTE 2: in options requiring a file ("ca", "cert", "key" etc.), only filename must be specified (without path) CA certificate (.ctt) Client certificate (.ctt) Client certificate (.ctt) Scegli file Nessun file selezionato (.ctt) Scegli file Nessun file selezionato (.ctt) Scegli file Nessun file selezionato (.ctt, Scegli file Nessun file selezionato (.ctt, Scegli file Nessun file selezionato VPN Configuration		
	Enable     OFF     OFF •       APPLY     HIDE VPN STATUS     Disconnected       IP Address     0.0.0       OpenVPN Status     Stopped       RX Packets / Bytes     0 / 0       TX Packets / Bytes     0 / 0       VPN Files (size in bytes)     0 / 0       NOTE: these files can be downloaded via FTP from '/home/config/vpn' directory, CLIENT1.crt (3600)     0       CLIENT1.key (912)     ca.crt (1139)       ovpn.conf (193)     REFRESH		

As reminded by the web page, the VPN files can be downloaded from the Device, if needed, via FTP/SFTP; they can be found in the */home/config/vpn* directory, as shown in the following figure.

OpenVPN_Client - user@192.168.85.	.117 - WinSCP									-		$\rightarrow$
ocale Seleziona File Comandi Sess	sione Opzioni Remo	oto Aiuto										
🐉 🎒 Coda 👻 拱 🚝 📚 Sincro	onizza 🗾 🧬 💽		Impostazioni trasferim	ento Prede	inito	- 🧬 -						
📮 user@192.168.85.117 📑 Nuova se	essione											
Desktop 🗾 🖻 🔽 🕴	🔶 - 🔶 - 🖹 🖻	a 🎧 🌮 😘				vpn 🔹 🚰 🖸	7 🔶 - 🔶 - 💼 🔁	🏫 🤔 🔝 Trova file	R.			
🖟 Upload 👻 📝 Modifica 👻 🚮	h 🕞 Proprietà 📑					Download 👻 📝 Modifica 👻	🗙 🚮 🕞 Proprietà 📑					
\Users\Spagiari\Desktop\OpenVPN_Cli						/home/config/vpn						
lome	Dimensi	Тіро	Modificato	Attr		Nome	Dimensi	Modificato	Diritti	Proprietario		
		Cartella superi	16/09/2016 15.56.06			t.,		20/09/2016 09.26.52	rwxr-xr-x	root		
a.crt	2 KB	Certificato di s	04/05/2015 09.30.28	а		a.crt	2 KB	20/09/2016 10.42.53	rw-rr	root		
CLIENT1.conf	1 KB	File CONF	06/09/2016 14.19.40	а		CLIENT1.crt	4 KB	20/09/2016 10.42.53	rw-rr	root		
CLIENT1.crt	4 KB	Certificato di s	04/05/2015 09.30.42	а		CLIENT1.key	1 KB	20/09/2016 10.42.53	rw	root		
CLIENT1.key	1 KB	File KEY	04/05/2015 09.30.40	а		vpn.conf	1 KB	20/09/2016 10.42.53	rw-rr	root		
CLIENT1a.conf	1 KB	File CONF	07/09/2016 08.26.05	а								
CLIENT1a.ovpn	1 KB	File OVPN	07/09/2016 08.26.05	а								
CLIENT2.crt	4 KB	Certificato di s	04/05/2015 09.30.44	а								
CLIENT2.key	1 KB	File KEY	04/05/2015 09.30.44	а								
CLIENT53.crt	4 KB	Certificato di s	04/05/2015 09.33.54	a								
CLIENT53.key	1 KB	File KEY	04/05/2015 09.33.52	a								
CLIENT54.ovpn	1 KB	File OVPN	06/05/2015 15.23.11	a								
						<						
3 di 15.504 B in 0 di 11						0 B di 5.844 B in 0 di 4						
									🔒 SF	тр-з 🗐	0.	.00.52

Is is possible to clear all the VPN files, by clicking on the "RESET" button; a pop-up will appear, requiring a confirmation:

	192.168.85.117:8080 dice:			×
¢	This will delete VPN files. Are you sure ?			
٤				
9		ОК	Annulla	
i,	,			

If VPN is enabled, the user is not allowed to delete VPN files, as warned by the following pop-up:

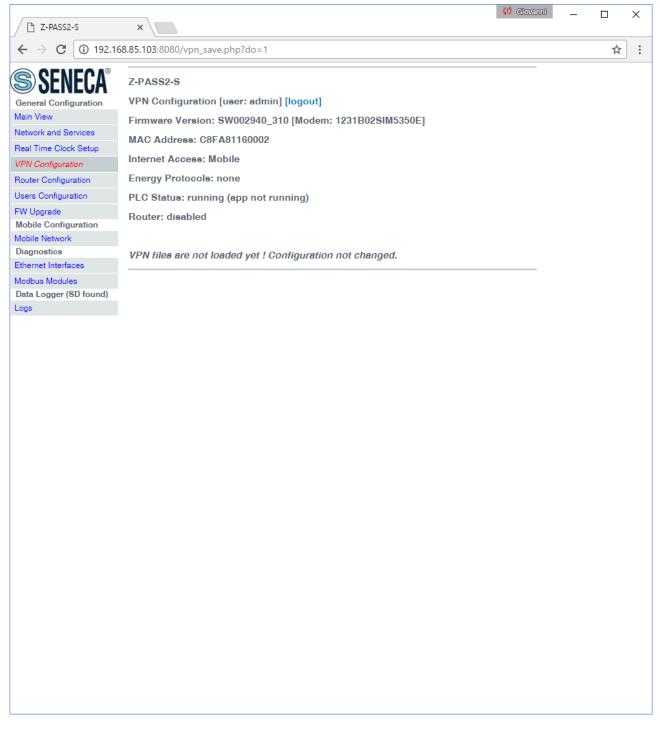
	192.168.85.117:8080 dice:	×	F
	VPN is enabled: files can't be deleted.		
e	ОК		
•		)	J

In the "VPN Configuration" section, there is only one parameter, as described in the following table:

Field	Meaning	Default value
VPN Configuration/Enable	Flag to enable/disable the VPN	OFF
	connectivity; when enabled, the	

Device will run the Open VPN		
process with the loaded		
configuration		

As already told above, if you try to enable the VPN connectivity, but no configuration file has been uploaded to the Device yet, an error is given as shown in the following figure:



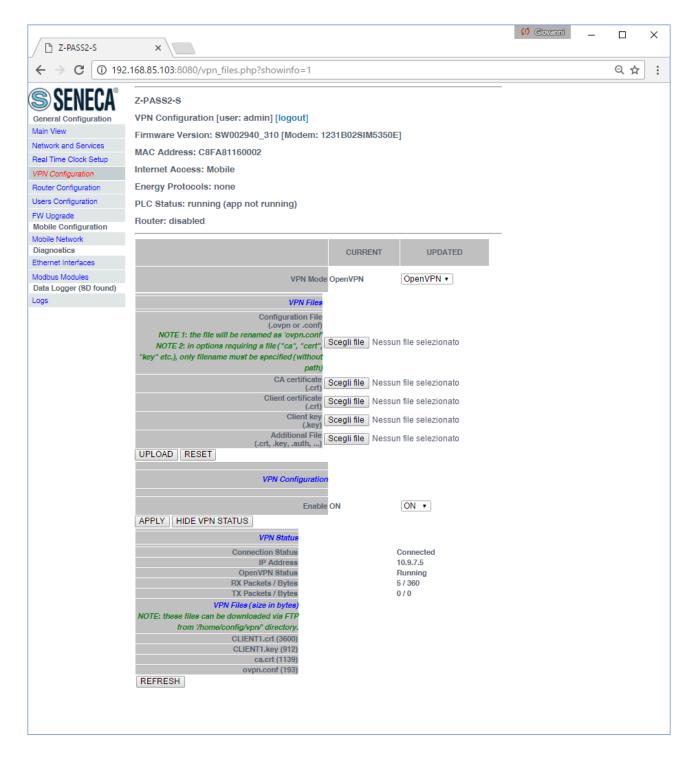
When you click on the "SHOW VPN STATUS" button, a third section appears, named "VPN Status", showing:

• the VPN "Connection Status" (i.e.: "Disconnected" or "Connected")

- the IP address assigned to the VPN interface when "Connected", the "dummy" IP address "0.0.0.0" when "Disconnected"
- the "OpenVPN Status" (i.e.: "Stopped" or "Running")
- the number of packets/bytes received from the VPN interface, when connected; "0/0" when disconnected
- the number of packets/bytes sent to the VPN interface, when connected; "0/0" when disconnected
- the VPN files stored on the Device (see above)

as shown in the following couple of figures:

		(!) Giovanni	– 🗆 X
🗋 Z-PASS2-S	×		
$\boldsymbol{\leftarrow}$ $\rightarrow$ $\mathbf{C}$ (i) 192	2.168.85.103:8080/vpn_files.php?showinfo=1		९ ☆ :
SENECA General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Router Configuration Users Configuration FW Upgrade Mobile Configuration	Z-PA\$\$2-\$ VPN Configuration [user: admin] [logout] Firmware Version: \$W002940_310 [Modem: 1231B02\$IM5350E] MAC Address: C8FA81160002 Internet Access: Mobile Energy Protocols: none PLC Status: running (app not running) Router: disabled		
Mobile Network Diagnostics Ethernet Interfaces	CURRENT UPDATED		
Modbus Modules Data Logger (SD found)	VPN Mode OpenVPN OpenVPN		
Logs	VPN Files		
	Configuration File (.ovpn or .conf) NOTE 1: the file will be renamed as 'ovpn.conf' NOTE 2: in options requiring a file ("ca", "cert", "key" etc.), only filename must be specified (without path) CA certificate (.crt) Client certificate (.crt) Client certificate (.crt) Client key (.key) Additional File (.crt, key, .auth,) VPLOAD RESET		
	Enable OFF OFF		
	APPLY HIDE VPN STATUS VPN Status Connection Status Disconnected IP Address 0.0.0.0 OpenVPN Status Stopped RX Packets / Bytes 0/0 TX Packets / Bytes 0/0 VPN Files (size in bytes) NOTE: these files can be downloaded via FTP from 'home/config/vpn' directory. no file REFRESH		



An important status information is given by the "OpenVPN Status" field; <u>if VPN is enabled ("ON")</u>, <u>but this</u> <u>status is "Stopped"</u>, <u>Open VPN process could not be correctly started</u>: <u>probably</u>, <u>the configuration file</u> <u>contains some errors or</u>, <u>maybe</u>, <u>some options not supported by the Device Open VPN implementation</u>.

You can refresh the VPN status, by clicking on the "REFRESH" button.

Finally, you can hide the "VPN Status" section, by clicking on the "HIDE VPN STATUS" button.

## 16.1.4.1.6 OpenVPN Server configuration file

This paragraph gives an example of OpenVPN server configuration; this is the server configuration typically used with Z-TWS4/Z-PASS2-S/S6001-RTU devices.

```
port 1194
proto udp
dev tun
ca ca.crt
cert server.crt
key server.key
dh dh1024.pem
server 10.9.7.0 255.255.255.0
ifconfig-pool-persist ipp.txt
client-config-dir ccd
client-to-client
keepalive 10 120
comp-lzo
persist-key
persist-tun
status openvpn-status.log
verb 3
```

### 16.1.4.1.7 OpenVPN Client configuration file

This paragraph gives an example of OpenVPN client configuration; this is the client configuration typically loaded on Z-TWS4/Z-PASS2-S/S6001-RTU devices.

```
client
dev tun
port 1194
proto udp
remote 2.192.5.105 1194
nobind
ca ca.crt
cert tws4.crt
key tws4.key
comp-lzo
persist-key
persist-tun
script-security 3 system
verb 3
```

16.1.4.1.8 LED signalling (Z-PASS2-S-R01/Z-PASS2-S-IO/Z-TWS4-IO)

In Z-PASS2-S-R01/Z-PASS2-S-IO/Z-TWS4-IO products, when VPN functionality is enabled in "OpenVPN" mode, the "SERV" and "VPN" LEDs give the following status information (see chapter 5):

LED	Status	Meaning
VPN Yellow	ON	VPN connection is working properly
	Blinking	VPN connection is not working properly

	OFF	VPN functionality is disabled
SERV Green	-	Not used

### 16.1.4.2 VPN Box

The page contains only ony section: "VPN Box", as shown in the following figure.

Th Z-PASS2-S	~			🥴 Ciovanti —		×
	×					
← → C ① 192.168	8.85.106:8080/vpn_files.php				☆ 🗵	:
<b>SENECA</b> ®	Z-PASS2-S					
General Configuration	VPN Configuration [user: admir	n] [logout]				
Main View	Firmware Version: SW002940_3	31 [Modem: 1	231B02SIM5350E	]		
Network and Services				-		
Real Time Clock Setup	-	IMEL: 00220402	20400713]			
VPN Configuration	Internet Access: Ethernet					
Router Configuration	Energy Protocols: none					
Users Configuration	PLC Status: running (app: zpas	s2s_r01_qua)				
FW Upgrade	Router: running					
Conf. Management						
Mobile Configuration Mobile Network			CURRENT	UPDATED		
Diagnostics						
FW Versions		VPN Mode	VPN Box	VPN Box 🔻		
Ethernet Interfaces						
Modbus Modules	VPN Box					
Data Logger (SD missing)	Enable	OFF	OFF <b>•</b>			
	Server	194.184.235.246	194.184.235.246	6		
	Password	seneca	seneca			
	Tag Name	7088828	zpass2s			
	APPLY SHOW VPN STATUS	Lpubblo	1940020			

The "VPN Box" section contains the following parameters:

Field	Meaning	Default value
VPN BOX/Enable	Flag to enable/disable the "VPN	OFF
	Box" functionality, that is the	
	procedure/protocol that lets the	

	Device setup the VPN, by interacting	
	with the "VPN Box" server (see "VPN	
	Box User Manual")	
VPN BOX/Server	IP address or FQDN of the "VPN Box"	192.168.90.1
	server	
VPN BOX/Password	Password to access the "VPN Box"	seneca
	server	
VPN BOX/Tag Name	Mnemonic name used to uniquely	zpass2s
	identify the Device; if the default	
	("zpass2s") value is left, the Device	
	will register as	
	"zpass2s_ <macaddress>" or</macaddress>	
	"ztws4_ <macaddress>" on the VPN</macaddress>	
	Вох	

When you click on the "SHOW VPN STATUS" button, a new section appears, named "VPN Status", showing:

- the VPN "Connection Status" (i.e.: "Disconnected" or "Connected")
- the IP address assigned to the VPN interface when "Connected", the "dummy" IP address "0.0.0.0" when "Disconnected"; this row is not shown for "Point-to-Point (L2)" VPN Box, since no IP address is assigned to the VPN interface
- the "OpenVPN Status" (i.e.: "Stopped" or "Running")
- the number of packets/bytes received by the VPN interface, when connected; "0/0" when disconnected
- the number of packets/bytes sent by the VPN interface, when connected; "0/0" when disconnected
- the "VPN Box Type", which can be "Point-to-Point", "Point-to-Point (L2)" or "Single LAN", if VPN Box is enabled
- the "VPN Box Status", if VPN Box is enabled
- the username of the connected user, if any

as shown in the following three figures:

SERVECAS       Z-PASS2-S         General Configuration       Kimware Version: SW002940_310 [Modem: 1231B02SIM5350E]         Main View       Firmware Version: SW002940_310 [Modem: 1231B02SIM5350E]         Network and Services       MAC Address: C9FA81160002         Real Time Clock Setup       Internet Access: Ethernet         VPN Configuration       Energy Protocols: none         Users Configuration       PLC Status: running (app not running)         Router: disabled       CURRENT         Mobile Network       Diagnostics         Ethernet Interfaces       VPN Mode         Mobile Subous       VPN Mode         Data Logger (SD found)       OFF         Logs       VPN Box         Enable       OFF •         Berver       192.168.90.1         192.168.90.1       192.168.90.1
General Configuration       VPN Configuration [user: admin] [logout]         Main View       Firmware Version: SW002940_310 [Modem: 1231B02SIM5350E]         Network and Services       MAC Address: C8FA81160002         Real Time Clock Setup       Internet Access: Ethernet         Fouter Configuration       Energy Protocols: none         Users Configuration       PLC Status: running (app not running)         FW Upgrade       Router: disabled         Mobile Configuration       CURRENT         Mobile Network       Diagnostics         Ethernet Interfaces       VPN Mode         Modules       VPN Mode         Data Logger (SD found)       Enable         Logs       VPN Box         VPN Box       Server         Password       seneca
APPLY       HIDE VPN STATUS         VPN Status       Disconnected         OpenVPN Status       0.0.0         OpenVPN Status       Stopped         RX Packets / Bytes       0 / 0         TX Packets / Bytes       0 / 0         REFRESH       V/0

2 -PASS2-5       ×         ←       •       <	Image: Construction       Image: Construction       Image: Construction         With Version Services       Read Time Clock Setup       VPA Services       VPA Configuration         With Version Services       Read Time Clock Setup       VPA Configuration       MAC Address: CBF A81160002         Version Configuration       Mac Address: CBF A81160002       Internet Access: Ethernet       Energy Protocols: none         PLG Status: running dap not running):       Router: configuration       Mode Internet       Internet Access: Ethernet         Mobile Network and Services       Router: running dap not running):       Router: running       Internet Access: Ethernet         Mobile Configuration       Noble Network and Services       Noble Network and Services       Internet Access: Ethernet         Mobile Network and Services       Router: running dap not running):       Router: running       Noble Network and Services         Mobile Network and Services       Internet Access: Ethernet       Internet Access: Ethernet       Internet Access: Ethernet         Services       VPN Box       VPN Box       VPN Box       Internet Access: Ethernet         Services       VPN Box       Internet Access: Ethernet       Internet Access: Ethernet       Internet Access: Ethernet         Services       VPN Box       Internet Access: Ethernet       Internet Access: Ethernet       Internet			(1) Giovanni	-		×
SERVECKAN         General Configuration         Main View         Main View         Network and Services         Real Time Clock Setup         VPN Configuration         Router Configuration         UPN Configuration         Base Configuration         Bouter Configuration         Busit Network and Services         Real Time Clock Setup         VPN Configuration         Bouter Configuration         Mobile Network         Diagnostics         Ethernet Interfaces         Module Configuration         Mobile Network         Data Logger (SD found)         Logs         VPN Box         VPN Box         VPN Box         Enable       ON         Not         Baseword       laboratorio         Tag Name       spass2sr01         Taga Name       spass2sr01         Taga Name       spass2sr01         Pass2sr01       spass2sr01         Tag Name       spass2sr01         Pass2sr01       spass2sr01         Pass2sr01       spass2sr01         Pass2sr01       spass2sr01         Passtator	SERVECKAN         General Configuration         Wain View         Real Time Clock Setup         VPN Configuration         Base Configuration         Base Configuration         Mobile Network and Base         Diagnostics         Ethemet Interfaces         Module Configuration         Module Scale         Module Configuration         Module Configuration         Module Configuration         Module Configuration         Module Configuration         Module Scale <t< th=""><th>🗋 Z-PASS2-S</th><th>×</th><th></th><th></th><th></th><th></th></t<>	🗋 Z-PASS2-S	×				
VPN Configuration VPN Configuration [user: admin] [logoul]   Native/kand Services Firmware Version: SW002940_310 [Modem: 1231B02SIM5350E]   Native/kand Services MAC Address: CBFA81180002   Real Time Clock Setup Internet Access: Ethernet   Realer Configuration Energy Protocols: none   Upgrade PLC Status: running (app not running)   Router: running Router: running   Wohble Network No   Origonatice VPN Box   Ethernet Interfaces VPN Box   Wohble Network VPN Box   Origonatice VPN Box   Upgrade VPN Box   Onder (S) found Internet Access: Ethernet   Logs VPN Box   VPN Box VPN Box   VPN Box VPN Box   VPN Box VPN Box   VPN Box VPN Box   Internet Access: Ethernet Internet Access: Ethernet   Router: running Router: running   Router: running VPN Box   VPN Box VPN Box   VPN Box VPN Box   Idoratorio Internet Access: Internet   Internet Access: Ethernet Internet Access: Internet   Router: running VPN Box   Idoratorio Internet Access: Internet   Idoratorio Internet Access: Internet   Internet Access: Internet Internet Access: Internet   Idoratorio Internet Access: Internet   Idoratorio Internet Access: Internet   Internet Access: Internet Internet Access: Inter	VPN Configuration VPN Configuration [user: admin] [logout]   Native/kand Services Firmware Version: SW002940_310 [Modem: 1231B02SIM5350E]   Native/kand Services MAC Address: C8FA81160002   Real Time Clock Setup Internet Access: Ethernet   Realer Configuration Energy Protocols: none   Users Configuration PLC Status: running (app not running)   Router: running Router: running   Wohble Network Router: running   Origonatice VPN Mode   Ethernet Interfaces VPN Mode   Wohble Network N   Origonatice VPN Mode   Ethernet Interfaces VPN Mode   Wohble Network N   Origonatice VPN Mode   Diagnostice VPN Mode   Data Logger (S0 found) VPN Box   Logs VPN Status   APPLY HIDE VPN STATUS   VPN Status Connected   Imp Address 10.9.0.1   OpenVPN Status Bunning   Imp Address 31.9.2.8.1K   VPN Box Type Pointclo-Point   VPN Box Type Pointclo-Point   VPN Box Type Pointclo-Point	← → C 🛈 192.1	58.85.103:8080/vpn_files.php?showinfo=1			☆	
Modules       VPN Mode       VPN Box       VPN Box         Data Logger (SD found)       VPN Box       VPN Box       Image: Status         Image: Status       Image: Status       Image: Status       Image: Status	Modules       VPN Mode       VPN Box       VPN Box         Data Logger (SD found)       VPN Box       VPN Box       Image: Status         Image: Status       Image: Status       Image: Status       Image: Status	Main View Network and Services Real Time Clock Setup /PN Configuration Router Configuration Jsers Configuration FW Upgrade Mobile Configuration Mobile Network Diagnostics	VPN Configuration [user: admin] [logout] Firmware Version: SW002940_310 [Modem: 1231B02SIM5350E] MAC Address: C8FA81160002 Internet Access: Ethernet Energy Protocols: none PLC Status: running (app not running) Router: running	ATED			
VPN Box         Enable       ON       ON         Enable       ON       ON         Server       194.184.235.246       194.184.235.246         Password       laboratorio       laboratorio         Tag Name       zpass2sr01       zpass2sr01         APPLY       HIDE VPN STATUS       Connected         IPAddress       10.9.0.1         OpenVPN Status       Running         QpenVPN Status       Status         IP Address       31 / 26.1K         VPN Box Type       Point-to-Point         VPN Box Status       OK (Configured)	VPN Box         Enable       ON       ON         Enable       ON       ON         Server       194.184.235.246       194.184.235.246         Password       laboratorio       laboratorio         Tag Name       zpass2sr01       zpass2sr01         APPLY       HIDE VPN STATUS       Connected         IP Address       10.9.0.1         OpenVPN Status       Running         RX Packets / Bytes       26 / 3.3K         TX Packets / Bytes       31 / 26.1K         VPN Box Type       Point-to-Point         VPN Box Status       OK (Configured)	Modbus Modules	VPN Mode VPN Box VPN Box	•			
Enable ON ON   Server 194.184.235.246   Password laboratorio   laboratorio laboratorio   Tag Name zpass2sr01   Zpass2sr01 zpass2sr01   APPLY HIDE VPN STATUS Connection Status Connected IP Address 10.9.0.1 OpenVPN Status RX Packets / Bytes 26 / 3.3K TX Packets / Bytes S1 / 26.1K VPN Box Type Point-to-Point VPN Box Status OK (Configured)	Enable ON ON   Server 194.184.235.246   Password laboratorio   laboratorio laboratorio   Tag Name zpass2sr01   Zpass2sr01 zpass2sr01   APPLY HIDE VPN STATUS Connection Status Connected IP Address 10.9.0.1 OpenVPN Status Running RX Packets / Bytes 26 / 3.3K TX Packets / Bytes 31 / 26.1K VPN Box Type Point-to-Point VPN Box Status OK (Configured)						
Server194.184.235.246PasswordlaboratorioIaboratoriolaboratorioTag Namezpass2sr01Zpass2sr01zpass2sr01APPLYHIDE VPN STATUSVPN StatusConnectedIP Address10.90.1OpenVPN StatusRunningRX Packets / Bytes26 / 3.3KTX Packets / Bytes31 / 26.1KVPN Box TypePoint-to-PointVPN Box StatusOK (Configured)	Server194.184.235.246PasswordlaboratorioIaboratoriolaboratorioTag Namezpass2sr01Zpass2sr01zpass2sr01APPLYHIDE VPN STATUSVPN StatusConnectedIP Address10.90.1OpenVPN StatusRunningRX Packets / Bytes26 / 3.3KTX Packets / Bytes31 / 26.1KVPN Box TypePoint-to-PointVPN Box StatusOK (Configured)	.ogs	VPN Box				
Password       laboratorio         Tag Name       zpass2sr01         Zpass2sr01       zpass2sr01         APPLY       HIDE VPN STATUS         VPN Status         Connection       Status         Connected       10.9.0.1         OpenVPN Status       Running         RX Packets / Bytes       26 / 3.3K         TX Packets / Bytes       31 / 26.1K         VPN Box Type       Point-to-Point         VPN Box Status       OK (Configured)	Password       laboratorio         Tag Name       zpass2sr01         Zpass2sr01       zpass2sr01         APPLY       HIDE VPN STATUS         VPN Status       Connected         IP Address       10.9.0.1         OpenVPN Status       Running         RX Packets / Bytes       26 / 3.3K         TX Packets / Bytes       31 / 26.1K         VPN Box Type       Point-to-Point         VPN Box Status       OK (Configured)		Enable ON V				
Tag Name zpass2sr01   APPLY HIDE VPN STATUS     VPN Status   Connection Status   Connected   IP Address   10.9.0.1   OpenVPN Status   Running   RX Packets / Bytes   26 / 3.3K   TX Packets / Bytes   31 / 26.1K   VPN Box Type   Point-to-Point   VPN Box Status   OK (Configured)	Tag Name       zpass2sr01         Zpass2sr01         Zpass2sr01         Zpass2sr01         VPN STATUS         Connection Status       Connected         OpenVPN Status       Running         OpenVPN Status       Running         TX Packets / Bytes       26 / 3.3K         VPN Box Type       Point-to-Point         VPN Box Status       OK (Configured)		Server 194.184.235.246 194.184.235.246				
VPN Status         VPN Status         Connection Status       Connected         IP Address       10.9.0.1         OpenVPN Status       Running         RX Packets / Bytes       26 / 3.3K         TX Packets / Bytes       31 / 26.1K         VPN Box Type       Point-to-Point         VPN Box Status       OK (Configured)	VPN Status         VPN Status         Connection Status       Connected         IP Address       10.9.0.1         OpenVPN Status       Running         RX Packets / Bytes       26 / 3.3K         TX Packets / Bytes       31 / 26.1K         VPN Box Type       Point-to-Point         VPN Box Status       OK (Configured)		Password laboratorio laboratorio				
VPN Status         Connection Status       Connected         IP Address       10.9.0.1         OpenVPN Status       Running         RX Packets / Bytes       26 / 3.3K         TX Packets / Bytes       31 / 26.1K         VPN Box Type       Point-to-Point         VPN Box Status       OK (Configured)	VPN Status         Connection Status       Connected         IP Address       10.9.0.1         OpenVPN Status       Running         RX Packets / Bytes       26 / 3.3K         TX Packets / Bytes       31 / 26.1K         VPN Box Type       Point-to-Point         VPN Box Status       OK (Configured)		· · ·				
IP Address     10.9.0.1       OpenVPN Status     Running       RX Packets / Bytes     26 / 3.3K       TX Packets / Bytes     31 / 26.1K       VPN Box Type     Point-to-Point       VPN Box Status     OK (Configured)	IP Address     10.9.0.1       OpenVPN Status     Running       RX Packets / Bytes     26 / 3.3K       TX Packets / Bytes     31 / 26.1K       VPN Box Type     Point-to-Point       VPN Box Status     OK (Configured)						
OpenVPN Status     Running       RX Packets / Bytes     26 / 3.3K       TX Packets / Bytes     31 / 26.1K       VPN Box Type     Point-to-Point       VPN Box Status     OK (Configured)	OpenVPN Status     Running       RX Packets / Bytes     26 / 3.3K       TX Packets / Bytes     31 / 26.1K       VPN Box Type     Point-to-Point       VPN Box Status     OK (Configured)		Connection Status Connected				
RX Packets / Bytes     26 / 3.3K       TX Packets / Bytes     31 / 26.1K       VPN Box Type     Point-to-Point       VPN Box Status     OK (Configured)	RX Packets / Bytes     26 / 3.3K       TX Packets / Bytes     31 / 26.1K       VPN Box Type     Point-to-Point       VPN Box Status     OK (Configured)						
TX Packets / Bytes     31 / 26.1K       VPN Box Type     Point-to-Point       VPN Box Status     OK (Configured)	TX Packets / Bytes     31 / 26.1K       VPN Box Type     Point-to-Point       VPN Box Status     OK (Configured)		OpenVPN Status Running				
VPN Box Type     Point-to-Point       VPN Box Status     OK (Configured)	VPN Box Type     Point-to-Point       VPN Box Status     OK (Configured)						
VPN Box Status OK (Configured)	VPN Box Status OK (Configured)						
				ed)			

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🗋 Z-PASS2-S	×	
$\epsilon \rightarrow c$ A Non side	curo bttps://192.168.85.104/maintenance/vpn_files	s.php?showinfo=1 ☆ 🗵 :
SERVECA® General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Router Configuration Users Configuration FW Upgrade Conf. Management Mobile Configuration	Z-PASS2-S VPN Configuration [user: admin] [logout] Firmware Version: SW002940_330 [Modem: Ud MAC Address: C8F9811B0000 [IMEI: 86107502 Internet Access: Mobile Energy Protocols: none PLC Status: running (app: ppp_blocks) Router: running	-
Mobile Network		CURRENT UPDATED
Digital I/O Digital I/O Configuration Diagnostics	VPN Mode	VPN Box VPN Box V
Ethernet Interfaces	VPN Box	
Modbus Modules	Enable ON	ON V
Data Logger (SD found) Logs	Server 194.184.235.246	194.184.235.246
	Password       seneca         Tag Name       zpass2s         APPLY       HIDE VPN STATUS         VPN Status       Connection Status         OpenVPN Status       RX Packets / Bytes         TX Packets / Bytes       TX Packets / Bytes         VPN Box Type       VPN Box Status         Connected User       REFRESH	seneca zpass2s Connected Running 349 / 73.8K 0 / 0 Point-to-Point (L2) OK (Configured) gspagiari

For an explanation of the differences between a "Single LAN" VPN and a "Point-to-Point" VPN, see chapter 10.

The "VPN Box Status" string has the following format:

## Result (Status)

The following table gives a short explanation of the possible "Result" and "Status" strings:

Result	Status	Meaning
Error (Unexpected response)		A response code has been received that is not
		handled by the Device (it should never occur)
Error (No response from VPN		No response has been received from the VPN Box
Box)		(response timeout); this is normally due to
		connectivity problems
Error (Invalid response from		A response has been received whose content is
VPN Box)		not valid for the Device (it should never occur)
Error (Wrong password)		The password set on the Device is wrong
Error (License Limit Reached)		The maximum number of devices allowed by the
		license are already registered on VPN Box
Error (VPN Box not configured)		The VPN Box has not been configured yet
Error (Generic error)		A generic error has occurred on the VPN Box
ОК		The Device has just been registered on the VPN
		Вох
ОК	New	The Device is registered on the VPN Box, but it is
		not configured yet ("Single LAN" only)
ОК	Configuration updated	The Device configuration has just been updated
ОК	Configured	The Device is properly configured and available
		for VPN connection
ОК	Ban	The Device has been banned
ОК	Not found	The Device is unknown for the VPN Box; this
		happens when Device registration is deleted on
		the VPN Box
ОК	Unknown	The Device has an "unknown" status in the VPN
		Box (it should never occur)
ОК	Not bound	The "tunnel" between the Device and the VPN
		Box is not up; this may occur when the tunnel
		port is blocked ("not open") in the ADSL router
		on the VPN Box side ("Point-to-Point" only)
ОК	Unexpected status	A status code has been received that is not
		handled by the Device (it should never occur)

You can refresh the VPN status, by clicking on the "REFRESH" button.

Finally, you can hide the "VPN Status" section, by clicking on the "HIDE VPN STATUS" button.

# 16.1.4.2.1 LED signalling (Z-PASS2-S-R01/Z-PASS2-S-IO/Z-TWS4-IO)

In Z-PASS2-S-R01/Z-PASS2-S-IO/Z-TWS4-IO products, when VPN functionality is enabled in "VPN Box/Single LAN" mode, the "SERV" and "VPN" LEDs give the following status information (see chapter 5):

LED	Status	Meaning
VPN Yellow	ON	VPN connection is working properly

	Blinking	VPN connection is not working properly
	OFF	The Device has not been configured by the VPN Box yet or VPN Box functionality is disabled
SERV Green	ON	VPN Box "SERVICE" connection is working properly
	Blinking	VPN Box "SERVICE" connection is not working properly
	OFF	VPN Box functionality is disabled

Similarly, when VPN functionality is enabled in "VPN Box/Point-to-Point" mode, the "SERV" and "VPN" LEDs give the following status information (see chapter 5):

LED	Status	Meaning
VPN Yellow	ON	A VPN client is connected to the Device
	OFF	No VPN client is connected to the Device or VPN Box functionality is disabled
SERV Green	ON	VPN Box "SERVICE" connection is working properly
	Blinking	VPN Box "SERVICE" connection is not working properly
	OFF	VPN Box functionality is disabled

### 16.1.5 Router Configuration

By clicking on the "Router Configuration" link, in the "General Configuration" menu, you come to the following page:

🗋 Z-PASS2-S	×	(1) Ciovenni — 🗆 🗙
← → C ① 192	.168.85.104:8080/mobile_router.php	९☆ 🗵 :
SFNFC A°	Z-PASS2-S	
	Doutor Configuration (upor admin) (logout)	
General Configuration	Router Configuration [user: admin] [logout]	
Main View Network and Services	Firmware Version: SW002940_332 [Modem: UC20GQE	BR03A14E1G]
	MAC Address: C8F9811B0000 [IMEI: 86107502650097	5]
Real Time Clock Setup	Internet Access: Ethernet	
VPN Configuration		
Router Configuration	Energy Protocols: none	
Users Configuration	PLC Status: running (app: s203)	
FW Upgrade	Router: disabled	
Conf. Management		
Mobile Configuration	CURR	ENT UPDATED
Mobile Network	Router Enable OFF	OFF T
DDNS Configuration	DNS-DHCP	
Digital I/O Configuration		
Digital I/O Configuration Diagnostics	DNS Enable ON	ON V
FW Versions	DHCP Server Enable OFF	OFF V
Ethernet Interfaces	DHCP First Address 192.168.90.	.201 192.168.90.201
Modbus Modules	DHCP Last Address 192.168.90.	.210 192.168.90.210
Data Logger (SD found)	DHCP Lease Time (min) 15	15
Logs	Use Local Addresses through VPN	
	Enable OFF	OFF V
	Mobile Network Firewall	
	Enable ON	ON T
	Port Mapping / Virtual Server 1	
	Protocol TCP/UDP	TCP/UDP V
	External Port	
	Server IP Address	
	Internal Port	
	Port Mapping / Virtual Server 2	
	Protocol TCP/UDP	TCP/UDP V
	External Port	
	Server IP Address	
	Internal Port	
	Port Mapping / Virtual Server 3	
	Protocol TCP/UDP	TCP/UDP V
	External Port	
	Server IP Address	
	Internal Port	
	Port Mapping / Virtual Server 4	
	Protocol TCP/UDP	TCP/UDP V
	External Port	
	Server IP Address	
	Internal Port	
	Port Mapping / Virtual Server 5	

In this page, you can change the parameters related to the Router functionality.

First, you have a set of general parameters, as listed in the following table:

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Router Enable	Flag to enable/disable the Router	OFF
		011
	functionality	
DNS Enable	Flag to enable/disable the DNS	ON
	forwarding service	
DHCP Server Enable	Flag to enable/disable the DHCP	OFF
	service (DHCP server)	
	NOTE: this parameter can be set to	
	"ON" only if the "DHCP" parameter	
	of the "Network and Services" page	
	<u>is set to "OFF"</u> .	
DHCP First Address	These parameters define the range	192.168.90.201
DHCP Last Address	of IP addresses assigned by the	192.168.90.210
	DHCP server to requesting clients	
DHCP Lease Time (min)	Validity period for the IP address	15
	assignment, in minutes.	
	Possible values are in the range	
	[160].	

Then, you have the parameter shown in the following table.

Field	Meaning	Default value
Use Local Addresses Through VPN	Flag to enable/disable the access to	OFF
	the Device and other devices which	
	are in the Device LAN by using their	
	local (LAN) IP addresses	

Then, you have another important parameter, which is shown in the following table.

Field	Meaning	Default value
Mobile Network Firewall/Enable	Flag to enable/disable the "Mobile	ON
	Network Firewall", that is	
	disable/enable access to the Device	
	and other devices which are in the	
	Device LAN, by using the IP address	
	assigned to the Mobile Network (3G)	
	interface.	
	To open a port in the firewall, a	
	<u>"Port Mapping / Virtual Server" rule</u>	
	shall be defined.	

The above parameter shall be set to ON, to protect the Device against undesired (maybe malicious) accesses.

This is the only parameter in the "Router Configuration" page that is working also when the Router functionality is disabled (Router Enable = OFF).

It is important to note that, when the VPN is activated (see 16.1.4 paragraph), the parameter is automatically set to ON, as warned by the message shown in the following figure.



Finally, there are 5 sections which let you define up to 5 "Port Mapping" rules (also known as "Virtual Servers"); in each section, the available parameters are the following:

Field	Meaning	Default value
Protocol	This parameter defines the transport	TCP/UDP
	protocol (or kind of port) which is	

	affected by the rule: TCP, UDP or	
	both	
External Port	TCP or UDP port which a packet was	Empty
	originally sent to	
Server IP Address	IP address which the received packet	Empty
	is forwarded to	
Internal Port	TCP or UDP port which the received	Empty
	packet is forwarded to	

If Router is left disabled (Router Enabled = OFF), you can still change parameters; changes will be saved without actually applying them (except for the "Mobile Network Firewall" parameter, as told before); the following message will be given, after clicking the "APPLY" button:

If you try to enable the DHCP server functionality (DHCP Server Enable = ON), but the "DHCP First Address" and "DHCP Last Address" parameters define an address range that is not congruent with the Ethernet configuration (IP address and network mask), an error is given, as shown in the following figure:

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$\boldsymbol{\leftarrow}$ $\rightarrow$ $\mathbf{C}$ (i) 192.168	.85.104:8080/mobile_router_save.php?do=1	7	:
SESESSECS General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Users Configuration FW Upgrade Conf. Management Mobile Configuration Digital I/O Digital I/O Configuration Diagnostics FW Versions Ethernet Interfaces Modbus Modules Data Logger (SD missing)	Z-PASS2-S Router Configuration [user: admin] [logout] Firmware Version: SW002940_331 [Moden: UC20GQBR03A14E1G] MAC Address: C8F9811B0000 [IMEI: 861075026500975] [IMSI: 222101600237893] Internet Access: Mobile Energy Protocols: none PLC Status: running (app: zpass2s_io) Router: running Invalid DHCP parameters ! Configuration not changed.		

As already told before, the Router configuration page lets you define up to 5 "Port Forwarding" rules or "Virtual Servers".

An example is given in the following figure:

	168.85.104:8080/mobile_router.php		९ ☆ 🗵	:
			_	
S SENECA	Z-PASS2-S			- 1
General Configuration	Router Configuration [user: admin] [logout]			
Main View	Firmware Version: SW002940_332 [Modem: UC20GQBF	002414E101		
Network and Services		-		
Real Time Clock Setup	MAC Address: C8F9811B0000 [IMEI: 861075026500975]			
VPN Configuration	Internet Access: Ethernet			
Router Configuration	Energy Protocols: none			
Users Configuration	PLC Status: running (app: s203)			
FW Upgrade				
Conf. Management	Router: running			
Mobile Configuration	CURREN	NT UPDATED		
Mobile Network				
DDNS Configuration	Router Enable ON	ON V		
Digital I/O	DNS-DHCP			
Digital I/O Configuration	DNS Enable ON	ON 🔻		
Diagnostics	DHCP Server Enable OFF	OFF V		
FW Versions	DHCP First Address 192.168.90.20	192.168.90.201		
Ethernet Interfaces	DHCP Last Address 192.168.90.2	192.168.90.210		
Modbus Modules	DHCP Lease Time (min) 15	15		
Data Logger (SD found) Logs				
2090	Use Local Addresses through VPN			
	Enable OFF	OFF V		
	Mobile Network Firewall			
	Enable ON	ON V		
	Port Mapping / Virtual Server 1			
	Protocol TCP	TCP V		
	External Port 80	80		
	Server IP Address			
	Internal Port 8080	0000		
		8080		
	Port Mapping / Virtual Server 2			
	Protocol TCP/UDP	TCP/UDP V		
	External Port 502	502		
	Server IP Address 192.168.85.10	03 192.168.85.103		
	Internal Port 502	502		
	Port Mapping / Virtual Server 3			
	Protocol TCP/UDP	TCP/UDP V		
	External Port			
	Server IP Address			
	Internal Port			
	Port Mapping / Virtual Server 4			
	Protocol TCP/UDP	TCP/UDP V		
	External Port			
	Server IP Address			
	Internal Port			
	Alternal Port			

In this example, 2 rules have been set:

• the first rule tells the Device that any TCP packet received on the 80 (HTTP) port has to be forwarded to the 8080 port, leaving the original destination IP address unchanged; so, this rule lets

you access the Device configuration web site on the standard HTTP port; <u>however</u>, by doing this, <u>the access to the custom user's pages won't be possible anymore !</u>

• the second rule tells the Device that any TCP or UDP packet received on the 502 port (which is often used for Modbus TCP protocol) shall be forwarded to the 192.168.85.103 IP address (which corresponds to another device) on the same (502) destination port.

Another important aspect of "Port Mapping / Virtual Server" rules is that they let define <u>which ports are</u> <u>open in the "Mobile Network Firewall"</u>; for example, if you want to connect to the web configuration site and to the SSH console, through the public IP address assigned to the 3G interface, the 8080 and 22 TCP ports shall be open; this can be done as shown in the following figure.

Z-PASS2-S	×			(!) Ciovanni	_			×
← → C 🛈 192.	168.85.103:8080/mobile_router.php				Q	☆	J.	:
	Internet Access: Ethernet							
VPN Configuration								
Router Configuration	Energy Protocols: none							
Users Configuration	PLC Status: running (app not running)							
FW Upgrade	Router: running							
Conf. Management Mobile Configuration								-
Mobile Network		CURRENT	UPDATED					
DDNS Configuration	Router Enable	ON	ON V					
Digital I/O	DNS-DHCF	,						
Digital I/O Configuration	DNS Enable	ON	ON 🔻					
Diagnostics FW Versions	DHCP Server Enable	OFF	OFF V					
Ethernet Interfaces	DHCP First Address	192.168.90.201	192.168.90.201					
Modbus Modules	DHCP Last Address	192.168.90.210	192.168.90.210					
Data Logger (SD missing)	DHCP Lease Time (min)	15	15					
	Use Local Addresses through VPN	1						
	Enable	ON	ON 🔻					
	Mobile Network Firewal	1						
	Enable	ON	ON V					
	Port Mapping / Virtual Server 1							
	Protocol		TCP V					
	External Port		8080					
	Server IP Address							
	Internal Port		8080					
	Port Mapping / Virtual Server 2							
			TOD					
	Protocol		TCP V					
	External Port		22					
	Server IP Address							
	Internal Port	22	22					
	Port Mapping / Virtual Server 3							
	Protoco	TCP/UDP	TCP/UDP V					
	External Port	t						
	Server IP Address							
	Internal Port	t						
	Port Mapping / Virtual Server 4	4						
	Protoco	TCP/UDP	TCP/UDP V					
	External Port	t						
	Server IP Address							
	Internal Port	t						
	Port Mapping / Virtual Server &							
	Protoco	TCP/UDP	TCP/UDP V					
	External Port							
	Server IP Address							
	Internal Port							
			APPLY					+

# 16.1.6 Users Configuration

By clicking on the "Users Configuration" link, in the "General Configuration" menu, you come to the following page:

Th Z-PASS2-S	×		(1) Ciovanni —		]	×
← → C ① 192.168	3.85.106:8080/users.php			☆	J.	0 0 0
SENECA General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Router Configuration Users Configuration FW Upgrade Conf. Management	Z-PASS2-S Users Configuration [user: admin Firmware Version: SW002940_33 MAC Address: C8FA81160002 [IM Internet Access: Ethernet Energy Protocols: none PLC Status: running (app: zpass2 Router: running	1 [Modem: 123 IEI: 862264020				
Mobile Configuration		CURRENT	UPDATED			
Mobile Network Diagnostics FW Versions Ethernet Interfaces Modbus Modules Data Logger (SD missing)	WEB ADMINISTRATOR Username Password Username Password Username Username Password FTP USER Username	admin admin user user guest guest	admin admin user guest guest user			
	Password	123456	123456 APPLY			

In this page, you can change the "Web Administrator", "Web User", "Web Guest" and "FTP User" credentials, as explained in the following table:

Field	Meaning	Default value
WEB ADMINISTRATOR/Username	Username to access the web	admin
	configuration site (full access)	
WEB ADMINISTRATOR/Password	Password to access the web	admin
	configuration site (full access)	
WEB USER/Username	Username to access the web	user
	configuration site (limited access)	
	(see paragraph 16.2)	
WEB USER/Password	Password to access the web	user
	configuration site (limited access)	
	(see paragraph 16.2)	
WEB GUEST/Username	Username to access the web	guest
	configuration site, in "view-only	
	mode" (see paragraph 16.3)	
WEB GUEST/Password	Password to access the web	guest
	configuration site, in "view-only	
	mode" (see paragraph 16.3)	
FTP USER/Username	Username to access the Device	user
	FTP/SFTP site (see chapter 7)	
FTP USER/Password	Password to access the Device	123456
	FTP/SFTP site (see chapter 7)	

For all the fields in this page, the following characters are allowed:

a-zA-ZO-9- |!@\$%^&\*?+{}<>;,:.

each field can contain up to 100 characters.

The same rules apply to the other "Username" and "Password" fields of the web pages and to the "Tag Name" field of the "VPN Configuration" page.

Please note that, after changing the Web Administrator credentials, a new login will be required to access any page.

# 16.1.7 FW Upgrade

When clicking on the "FW Upgrade" link, in the "General Configuration" menu, the following pop-up is shown:

192.168.85.104:8080 dice:	×
Do you want to stop TWS services during upload ?	
(Once services are stopped, you can restart them by clicking on the 'RESTART TWS SERVICES' button.)	
OK Annulla	

If you click on the "OK" button, TWS Services (i.e. Soft-PLC) are stopped and you come to the "FW Upgrade" page, shown in the following figure.

	💭 🔲 🗆 🗸
Z-PASS2-S	×
$\boldsymbol{\leftarrow}$ $\rightarrow$ $\boldsymbol{C}$ (i) 192.16	8.85.104:8080/fw_files_bin.php?stop=1
SENECA®	Z-PASS2-S
General Configuration	FW Upgrade [user: admin] [logout]
Main View	Firmware Version: SW002940_331 [Modem: UC20GQBR03A14E1G]
Network and Services	
Real Time Clock Setup	MAC Address: C8F9811B0000 [IMEI: 861075026500975] [IMSI: 222101600237893]
VPN Configuration	Internet Access: Mobile
Router Configuration	Energy Protocols: none
Users Configuration	PLC Status: stopped
FW Upgrade	
Conf. Management	Router: running
Mobile Configuration	
Mobile Network	FW Upgrade
Digital I/O	
Digital I/O Configuration	FW file (SW002940_*.bin) Scegli file Nessun file selezionato
Diagnostics	UPLOAD RESTART TWS SERVICES
FW Versions	
Ethernet Interfaces	
Modbus Modules	
Data Logger (SD missing)	

Now, if you want to leave this page without performing the FW upgrade, the "RESTART TWS SERVICES" button lets you restart the TWS services which, otherwise, would remain in the "stopped" state.

Otherwise, if you click on the "Cancel" button of the pop-up, TWS Services are not stopped and you come to the same page where the "RESTART TWS SERVICES" button is disabled.

-	💭 Elovanni —			$\times$
🗋 Z-PASS2-S	×			
$\boldsymbol{\leftarrow}$ $\rightarrow$ $\boldsymbol{C}$ (i) 192.16	8.85.104:8080/fw_files_bin.php?stop=0	☆	J.	:
SENECA <sup>®</sup> General Configuration	Z-PASS2-S FW Upgrade [user: admin] [logout]			
Main View	Firmware Version: SW002940_331 [Modem: UC20GQBR03A14E1G]			
Network and Services	MAC Address: C8F9811B0000 [IMEI: 861075026500975] [IMSI: 222101600237893]			
Real Time Clock Setup				
VPN Configuration	Internet Access: Mobile			
Router Configuration	Energy Protocols: none			
Users Configuration	PLC Status: running (app: zpass2s_io)			
FW Upgrade	Router: running			
Conf. Management				
Mobile Configuration				
Mobile Network	FW Upgrade			
Digital I/O				
Digital I/O Configuration	FW file (SW002940_*.bin) Scegli file Nessun file selezionato			
Diagnostics	UPLOAD RESTART TWS SERVICES			
FW Versions	CLEAR HIS SERVICES			
Ethernet Interfaces				
Modbus Modules				
Data Logger (SD missing)				

So, it is up to the user to choose if Soft PLC shall be stopped or not, during FW Upload; on one side, stopping it is more safe and let the upload be completed in a shorter time; on the other side, there are situations in which PLC stop time shall be as short as possible.

Since an erroneous use of the FW Upgrade functionality might compromise the proper Device operation, use this page only to apply upgrades provided by Seneca, with the support of Seneca personnel.

This page lets you browse your PC to select the file containing the FW, which shall have a name of the following type:

*SW002940\_xxx.bin*<sup>14</sup>

If you select a file with a different name, an error will be shown at the end of the upload, as in the following figure.

<sup>&</sup>lt;sup>14</sup> The FW file can be downloaded from Seneca website (see chapter 15).

Z-PASS2-S     Z-PASS2	(*) Ciovanni —		×
		☆ 🔼	:
SENFC.A®	Z-PASS2-S	-	
	FW Upgrade [user: admin] [logout]		
General Configuration Main View			
Network and Services	Firmware Version: SW002940_331 [Modem: UC20GQBR03A14E1G]		
Real Time Clock Setup	MAC Address: C8F9811B0000 [IMEI: 861075026500975] [IMSI: 222101600237893]		
	Internet Access: Mobile		
VPN Configuration			
Router Configuration	Energy Protocols: none		
Users Configuration	PLC Status: stopped		
FW Upgrade	Router: running		
Conf. Management	-	_	
Mobile Configuration			
Mobile Network	Invalid file 'disk.tar.gz' !		
Digital I/O Digital I/O Configuration			
Digital I/O Configuration	A 'SW002940_*.bin' file is needed.		
FW Versions			
Ethernet Interfaces			
Modbus Modules			
Data Logger (SD missing)			

Once a file is selected, you can start the upload, by pressing the "UPLOAD" button.

	×	- 0	Х
← → C ① 192.168.85.104:8080/fw_files_bin.php ☆ 🗵	192.168.85.104:8080/fw_files_bin.php	☆ 🛛	:
<ul> <li></li></ul>	Xion       Z-PASS2-S         FW Upgrade [user: admin]]         Firmware Version: SW00294         MAC Address: C8F9811B00         Internet Access: Mobile         Energy Protocols: none         PLC Status: stopped         Router: running         Internet Access: Stopped         Router: running         Internet Access         Internet Access: Stopped         Router: running         Internet Access         Internet Access         Router: running         Internet Access         Internet Access         Router: running         Internet Access         Internet Access         Internet Access         Router: running         Internet Access         Router: running         Internet Access         Internet Access      <		

Once the upload is successfully completed, the following page is shown:

🗋 Z-PASS2-S	× Eleventi -		×
$\leftarrow$ $\rightarrow$ C (i) 192.16	3.85.104:8080/fw_upgrade_bin.php	☆ ≯	
SERVECA General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Router Configuration <i>FW Upgrade</i> Conf. Management Mobile Configuration Mobile Network Digital I/O Digital I/O Digital I/O Configuration Diagnostics FW Versions Ethernet Interfaces Modbus Modules Data Logger (SD missing)	Z-PASS2-S FW Upgrade [user: admin] [logout] Firmware Version: SW002940_331 [Modem: UC20GQBR03A14E1G] MAC Addrese: C8F9811B0000 [IMEI: 861075026500975] [IMSI: 222101600237893] Internet Access: Mobile Energy Protocols: none PLC Status: atopped Router: running File 'SW002940_331.bin' successfully uploaded ! Upgrade and Reboot Cancel and Reboot		

In this page, you can:

• press the "Upgrade and Reboot" button: this will start the upgrade procedure, which takes some minutes to be completed; during this time, the Device MUST NOT be switched off; during the

procedure, the Device will be rebooted several times; also, during the procedure, several LEDS will blink simultaneously<sup>15</sup>; the upgrade procedure is ended when only the LED "RUN" is blinking<sup>16</sup>;

Z-PASS2-S	(!) Ciovandi —		)	×
	8.85.104:8080/fw_upgrade_start.php?do=3	☆		:
SENECA <sup>®</sup>	Z-PASS2-S		 	
General Configuration	FW Upgrade [user: admin] [logout]			
Main View	Firmware Version: SW002940_331 [Modem: UC20GQBR03A14E1G]			
Network and Services				
Real Time Clock Setup	MAC Address: C8F9811B0000 [IMEI: 861075026500975] [IMSI: 222101600237893]			
VPN Configuration	Internet Access: Mobile			
Router Configuration	Energy Protocols: none			
Users Configuration	PLC Status: stopped			
FW Upgrade				
Conf. Management	Router: running			
Mobile Configuration				
Mobile Network	Upgrading firmware, this will take some time			
Digital I/O				
Digital I/O Configuration				
Diagnostics FW Versions				
Ethernet Interfaces				
Modbus Modules				
Data Logger (SD missing)				

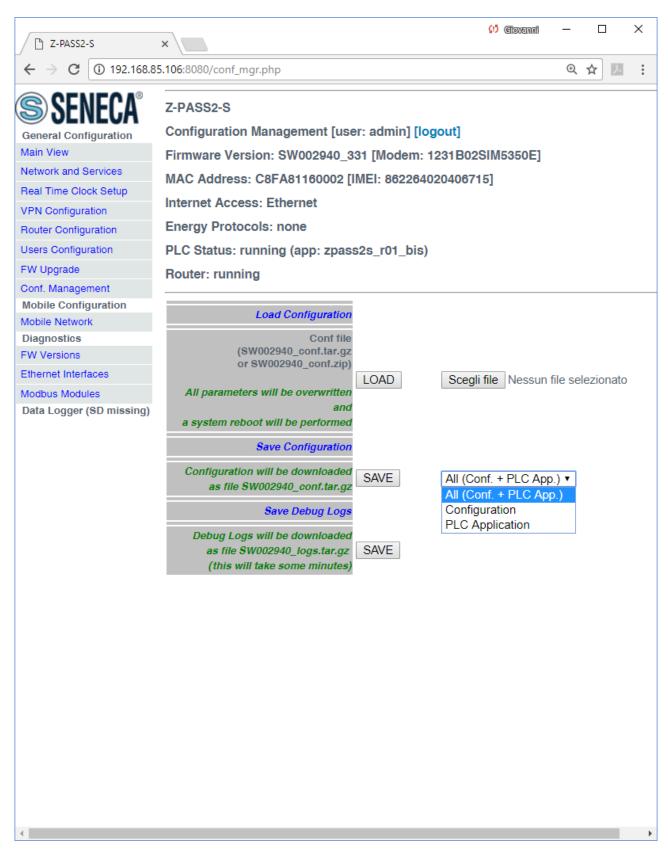
<sup>&</sup>lt;sup>15</sup> This applies only to products with HW revisions IO and R01; in details: for IO HW revision, all LEDs will blink simultaneously, except for Power, LAN/WAN, COM and modem LEDs; for R01 HW revision, RUN, VPN and SERV LEDs will blink. <sup>16</sup> Also SERV and VPN LEDs might blink, depending on the Device configuration and status.

• press the "Cancel and Reboot" button: this will delete the uploaded file on the Device and perform the reboot.



#### 16.1.8 Configuration Management

By clicking on the "Conf. Management" link, in the "General Configuration" menu, you come to the following page:



This page lets you save and load the whole Device configuration; this is very useful, for example, when you have to apply the same configuration to many devices.

The configuration archive file is named *SW002940\_conf.tar.gz*; its contents depend on the selected option, as shown in the following table:

Option	Files
All (Conf. + PLC App.)	- configuration parameters
	- OpenVPN configuration (if present)
	- PLC (Straton) application (if present)
	<ul> <li>web user pages (if present)</li> </ul>
Configuration	- configuration parameters
	- OpenVPN configuration (if present)
PLC Application	- PLC (Straton) application (if present)
	- web user pages (if present)

The configuration archive, once created and downloaded by means of the "SAVE" button can be uploaded to the same or another device, in two ways:

- by means of the "LOAD" button, in this page
- by means of a USB pen

The procedure to load the configuration into the Device by means of a USB pen is the following:

- copy the SW002940\_conf.tar.gz (or SW002940\_conf.zip, see below) file into the root folder of the USB pen;
- switch off the Device;
- insert the USB pen into the USB#1 port of the Device;
- switch on the Device; the procedure will take some minutes to be completed; during this time, the Device MUST NOT be switched off; during the procedure, the Device will be rebooted;
- after the reboot, wait until you see the "RUN" LED blinking;
- remove the USB pen;
- the configuration has been applied to the Device.

The only care <u>when you carry the configuration archive from a device to another one is that the two</u> <u>devices should be the same product model</u>; for example, it's not safe to load the configuration archive saved on a Z-PASS2-S-R01 into a Z-PASS2-S.

This page lets you load also the configuration archive created by Z-NET4 SW (see chapter 18) as a zip file (*SW002940\_conf.zip*).

Another useful feature available in this page is the one provided by the "Save Debug Logs / SAVE" button: when you click on it, a file named *SW002940\_logs.tar.gz* is downloaded, which contains the debug logs stored by the CPU during its operation.

	(1) (flovanit	– 🗆 X
Z-PASS2-S	×	
$\boldsymbol{\leftarrow}$ $\rightarrow$ $\mathbf{C}$ (i) 192.168	8.85.106:8080/conf_mgr.php	☆ ▶ :
Configuration Second Services Real Time Clock Setup VPN Configuration Router Configuration Users Configuration FW Upgrade Conf. Management Mobile Configuration Mobile Network Diagnostics FW Versions Ethernet Interfaces Modbus Modules Data Logger (SD missing)	335.10e3000/conf_mgr.php         Z-PASS2-S         Configuration Management [user: admin] [logout]         Firmware Version: SW002940_331 [Modem: 1231B02SiM5350E]         MAC Addrese: C8FA81160002 [IMEI: 862264020406715]         Internet Access: Ethernet         Energy Protocols: none         PLC Status: running (app: zpess2s_r01_8)         Router: running         Load Configuration (SW002940_conf.zip)         All parameters will be overwithen and a system reboot will be performed         Save Configuration Configuration will be downloaded as file SW002940_conf.ar.gz         Save Debug Logs W002940_conf.ar.gz         Save Debug Logs will be downloaded as file SW002940_logs.tar.gz (this will take some minutes)	
SW002940_logs.tar.c	Jz ^	Mostra tutto 🗙

Please note that, to get detailed debug logs, the "DEBUG LOGS / Enable" parameter, in "Network and Services" page, shall be set to ON.

### 16.1.8.1 Factory reset by USB pen

A USB pen can be used also to reset the Device to its factory state; the procedure is the following:

- create an empty file named SW002940\_reset\_cmd into the root of the USB pen;
- switch off the Device;
- insert the USB pen into the USB#1 port of the Device;
- switch on the Device; the procedure will take some minutes to be completed; during this time, the Device MUST NOT be switched off; during the procedure, the Device will be rebooted;
- after the reboot, wait until you see the "RUN" LED blinking;
- remove the USB pen;
- the factory reset has been performed.

### 16.1.9 Mobile Network

By clicking on the "Mobile Network" link, in the "Mobile Configuration" menu, you come to the following page:

□ Z-PASS2-S	×		🤃 Ciovanni	-		×
← → C U 192.160	8.85.104:8080/mobile_network.php			\$		:
S SENECA <sup>®</sup>	Z-PASS2-S					
General Configuration	Mobile Network [user: admin] [	logout]				
Main View	Firmware Version: SW002940_	332 [Modem: LIC	20G0BB03A14E1G1			
Network and Services		-	_			
Real Time Clock Setup	MAC Address: C8F9811B0000	[IMEI: 861073026	500975]			
VPN Configuration	Internet Access: Ethernet					
Router Configuration	Energy Protocols: none					
Users Configuration	PLC Status: running (app: s203	3)				
FW Upgrade	Router: running	- /				
Conf. Management	Router: running					
Mobile Configuration		CURRENT	UPDATED		1	
Mobile Network		o o militi	VI DATED			
DDNS Configuration	SIM					
Digital I/O	PIN (if required by SIM)	8342	8342			
Digital I/O Configuration						
Diagnostics FW Versions	Operator Selection					
Ethernet Interfaces	Mode	Automatic	Automatic •			
Modbus Modules	Operator	[22201] I TIM (UMTS)	Operator list not available <b>▼</b>			
Data Logger (SD found)	Data Connection					
Logs	Data Connection					
	Enable	OFF	OFF •			
	APN Mode	Automatic	Automatic <b>▼</b>			
	APN	ibox.tim.it	ibox.tim.it			
	Authentication Type	None	None <b>*</b>			
	Username	user	user			
	Password	pass	pass		1	
	Ping Connection Testing IP				_	
	Address (if empty, testing is disabled)	www.google.com	www.google.com			
	APPLY SHOW MOBILE STATU		ORLIST			
			ONCLOT			

The above figure shows the "Mobile Network" page for Z-PASS2-S-IO.

For Z-PASS2-S-R01, Z-PASS2-S and S6001-RTU, the "Operator Selection" section and the "GET OPERATOR LIST" button are not available, so the page is as shown in the following figure.

			(!) Clovenni -	- 🗆 ×	(
Z-PASS2-S	×				
← → C (i) 192.168	8.85.105:8080/mobile_network.php			☆ 🗵	:
<b>SENECA</b> °	Z-PASS2-S				
General Configuration	Mobile Network [user: admin] [	logout]			
Main View	Firmware Version: SW002940_	332 [Modem: 123	31B02SIM5350E1		
Network and Services		-	_		
Real Time Clock Setup	MAC Address: C8F981160017 [	IMEI: 862264020	382288]		
VPN Configuration	Internet Access: Ethernet				
Router Configuration	Energy Protocols: none				
Users Configuration	PLC Status: running (app: sms	blocks)			
FW Upgrade	Router: disabled				
Conf. Management	Router: disabled				
Mobile Configuration		CURRENT	UPDATED		
Mobile Network		CONNENT	OPDATED		
DDNS Configuration	SIM				
Diagnostics	PIN (if required by SIM)	1234	1234		
FW Versions	i in (in required by enity	1201	1204		
Ethernet Interfaces	Data Connection				
Modbus Modules	Enable	OFF	OFF •		
Data Logger (SD missing)	APN Mode	Automatic	Automatic <b>T</b>		
	APN	ibox.tim.it	ibox.tim.it		
	Authentication Type		None 🔻		
	Username		user		
	Password	0855	pass		
	Ping Connection Testing IP	paoo	pass		
	Address	www.google.com	www.google.com		
	(if empty, testing is disabled)				
	APPLY SHOW MOBILE STATU	5			
L					

In this page, you can change the parameters related to the Mobile Network, as listed in the following table:

Field	Meaning	Default value
SIM/PIN (if required by SIM)	PIN needed to unlock the SIM card,	1234
	if PIN locking functionality is enabled	

	on it <sup>17</sup>	
Operator Selection/Mode (only on Z-PASS2-S-IO)	<ul> <li>This parameter tells if the modem shall select the Mobile Network Operator:</li> <li>automatically (Mode=Automatic)</li> <li>as selected by the user (Mode=Manual)</li> <li>reverting to "automatic" mode, if "manual" selection fails (Mode = Manual/ Automatic)</li> </ul>	Automatic
Operator Selection/Operator (only on Z-PASS2-S-IO)	<ul> <li>This parameter contains the list of the Mobile Network Operators currently available, that is detected by the modem.</li> <li>The list items are strings with the following format: <ul> <li>the MCC+MNC<sup>18</sup> code in square brackets (e.g.: "[22201]")</li> <li>the string identifying the operator (e.g.: "I TIM")</li> <li>the access technology, that is "GSM" or "UMTS", in brackets</li> </ul> </li> <li>This list is initially empty: it shall be filled by clicking on the "GET OPERATOR LIST" button.</li> </ul>	"[22201] I TIM (UMTS)"
Data Connection/Enable	Flag to enable/disable the Mobile Network connectivity	OFF
Data Connection/APN Mode	This parameter tells if the APN and related parameters are automatically retrieved (based on SIM IMSI) (Mode=Automatic) or the values given in this page are used. When APN Mode = Automatic, APN, Authentication Type, Username and Password parameters are disabled.	Automatic
Data Connection/APN	Access Point Name, as given by the Mobile Network Operator	ibox.tim.it
Data Connection/Authentication Type	Type of authentication required; possible values are: "None", "CHAP/PAP", "CHAP only", "PAP only"	None
Data Connection/Username	Username needed for UMTS/GPRS connectivity, as given by the Mobile Network Operator; it may be empty, if "Authentication Type" parameter	user

<sup>&</sup>lt;sup>17</sup> Please note that the procedure to enable/disable the PIN locking functionality on the SIM is not performed by the Device. <sup>18</sup> MCC = Mobile Country Code, MNC = Mobile Network Code

	is "None"	
Data Connection/Password	Password needed for UMTS/GPRS	pass
	connectivity, as given by the Mobile	
	Network Operator; it may be empty,	
	if "Authentication Type" parameter	
	is "None"	
Data Connection/Ping Connection	FQDN or IP address used to	www.google.com
Testing IP Address (if empty, testing	periodically check, by means of	
is disabled)	"ping" packets, if the mobile	
	connection is actually working; if the	
	field is lefty empty, the check is not	
	performed.	
	It is important to note that the	
	FQDN or IP address specified must	
	be reachable from the Device mobile	
	network, otherwise the Device will	
	detect that the mobile connection is	
	not working and will drop it.	

In the "Mobile Network" page, when you click on the "SHOW MOBILE STATUS" button, a new section appears, named "Mobile Status", showing:

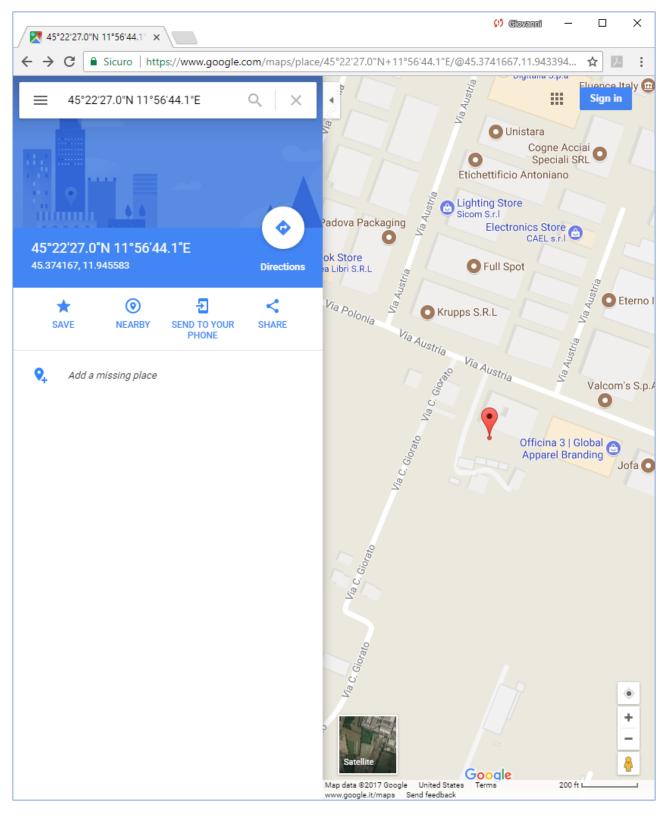
- the SIM/PIN Status; if an error in PIN setting has occurred or PUK/PUK2 setting is needed, this status is shown in red color
- the number of remaining attempts for PIN setting; when this value is less than 3 (shown in red color), it means that PIN setting has failed, that is the configured PIN value is wrong
- the radio "Signal Level", in the range [0..7]
- the selected operator (only for Z-PASS2-S-IO)
- the GSM "Registration Status"
- the Mobile Network "Connection Status" (i.e.: "Disconnected" or "Connected")
- the IP address assigned to the Mobile Network interface when connected, the "dummy" IP address "0.0.0.0" when disconnected
- the number of packets/bytes received from the Mobile Network interface, when connected; "0/0" when disconnected
- the number of packets/bytes sent to the Mobile Network interface, when connected; "0/0" when disconnected

as shown in the following couple of figures:

□ Z-PASS2-S	×	(!) Ciovanni	-		×
$\leftarrow \rightarrow \mathbf{C}$ (i) 192	.168.85.104:8080/mobile_network.php?showir	nfo=1	Q	☆ 🗡	:
Seneral Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Router Configuration Users Configuration FW Upgrade Conf. Management Mobile Configuration Mobile Network	Z-PASS2-S Mobile Network [user: admin] [logout] Firmware Version: SW002940_332 [Modem: MAC Address: C8F9811B0000 [IMEI: 861075 Internet Access: Ethernet Energy Protocols: none PLC Status: running (app: s203) Router: running CURRE	UC20GQBR03A14E1G] 5026500975] [IMSI: 222101600237890]		<b>A</b>	•
DDNS Configuration	SIM				
Digital I/O Digital I/O Configuration	PIN (if required by 8IM) 8342	8342			
Diagnostics	Operator Selection				
FW Versions	Mode Automatic	Automatic			
Ethernet Interfaces	Operator [22201] I TIM (UMTS)	Operator list not available 🔻			
Modbus Modules	Data Connection				
Data Logger (SD found) Logs	Enable OFF	OFF V			
Logs	APN Mode Automatic	Automatic 🔻			
	APN ibox.tim.it	ibox.tim.it			
	Authentication Type None	None 🔻			
	Username user	user			
	Password pass	pass			
	Ping Connection Testing IP Address (if empty, testing is disabled)	.com www.google.com			
	(in empty) receiving to discussed)	ATOR LIST			
	Mobile Status				
	SIM/PIN Status	PIN required			
	PIN Remaining Attempts Signal Level [07]	3			
	Selected Operator	"vodafone IT" (UMTS)			
	Registration Status	Registered (home network)			
	Connection Status IP Address	Disconnected 0.0.0.0			
	RX Packets / Bytes	0/0			
	TX Packets / Bytes GPS Location	0 / 0 45.37445,11.94516 [Map]			
	REFRESH	40.07440,11.04010 [Map]			

Z-PASS2-S	×		(!) Ciovanai	_		Х
← → C ① 192.	.168.85.104:8080/mobile_network.p	php?showinfo=1		Q	☆ 🏸	:
SERVECA General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Router Configuration Users Configuration FW Upgrade Conf. Management	Z-PASS2-S Mobile Network [user: admin] [lo Firmware Version: SW002940_33 MAC Address: C8F9811B0000 [IM Internet Access: Mobile Energy Protocols: none PLC Status: running (app: s203) Router: running	2 [Modem: UC20	-			
Mobile Configuration		CURRENT	UPDATED			
Mobile Network DDNS Configuration Digital I/O Digital I/O Configuration Diagnostics FW Versions	SIM PIN (if required by SIM) Operator Selection Mode	8342	8342			
Ethernet Interfaces	Operator	[22201] I TIM	Operator list not available V			
Modbus Modules	Data Connection	(UMTS)				
Data Logger (SD found) Logs	Enable		ON V			
		user pass	Automatic   ibox.tim.it  None  user  pass  www.google.com  LIST			
	Mobile 3 SIM/PIN 8 PIN Remaining Att Signal Level Selected Op Registration 8 Connection 9 IP Ad RX Packets / TX Packets / GPS Loc REFRESH	Status empts [07] erator Status Status dress Bytes Bytes	PIN required 3 6 "vodafone IT" (UMT8) Registered (home network) Connected 10.109.234.57 6 / 65 6 / 98 45.37433,11.94537 [Map]			

As shown in the above figures, only for Z-PASS2-S-IO, the last row of the "Mobile Status" gives the "GPS Location" as Latitude, Longitude values; clicking on the <u>Map</u> link, the Google Maps on the current position are shown.



If the GPS signal is not available, the "GPS Location" row contains the string "Not fixed" and the <u>Map</u> link is not shown.

The following figure shows the situation when an error in PIN setting has occurred, due to a wrong value of the PIN parameter.

Th Z-PASS2-S	×		(1) Elovand	-		>	×
	168.85.104:8080/mobile_network.p	hp?showinfo=1		Θ	☆	h.,	:
< 7 C 0 132.		mp:snowinio=1		~	<u>м</u>	22	:
SERVECA® General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Router Configuration Users Configuration FW Upgrade	Z-PASS2-S Mobile Network [user: admin] [lo Firmware Version: SW002940_33 MAC Address: C8F9811B0000 [IM Internet Access: Ethernet Energy Protocols: none PLC Status: running (app: s203) Router: running	2 [Modem: UC20	-				
Conf. Management Mobile Configuration							
Mobile Network		CURRENT	UPDATED				
DDNS Configuration	SIM						
Digital I/O	PIN (if required by SIM)	1234	1234				
Digital I/O Configuration	Operator Selection						
Diagnostics			Automatic				
FW Versions		Automatic [22201] I TIM	Automatic •				
Ethernet Interfaces	Operator	(UMTS)	Operator list not available V				
Modbus Modules Data Logger (SD found)	Data Connection						
Logs	Enable	OFF	OFF V				
	APN Mode	Automatic	Automatic 🔻				
	APN	ibox.tim.it	ibox.tim.it				
	Authentication Type	None	None v				
	Username	user	user				
	Password		pass				
	Ping Connection Testing IP Address	www.google.com	www.google.com				
	(if empty, testing is disabled) APPLY HIDE MOBILE STATUS	GET OPERATOR					
		GET OF ERATOR					
	Mobile						
	SIM/PIN		PIN error 2				
	Signal Leve		4				
	Selected Op	erator	No operator				
	Registration Connection		Searching for network Disconnected				
		Idress	0.0.0				
	RX Packets /		0/0				
	TX Packets / GPS Lo		0 / 0 Not fixed				
	REFRESH		HULINGU				

It should be noted that, when the PIN is set during procedures automatically performed by the Device firmware, if the number of remaining attempts is 1, no more attempt is done to avoid blocking the SIM.

You can refresh the Mobile Network status, by clicking on the "REFRESH" button.

You can hide the "Mobile Status" section, by clicking on the "HIDE MOBILE STATUS" button.

As already told above, the "GET OPERATOR LIST" button lets you retrieve the list of the operators currently available, that is detected by the modem (only on Z-PASS2-S-IO).

When you click on the button, the following page is shown.

Image: Construction       Image: Construction         Nain View       Z-PASS2-S         Main View       Second Seco
OLILIAN General ConfigurationMobile Network [user: admin] [logout]Main ViewFirmware Version: SW002940_332 [Modem: UC20GQBR03A14E1G] MAC Address: C8F9811B0000 [IMEI: 861075026500975] [IMSI: 222101600237890]Reat Time Clock SetupInternet Access: EthernetVPN ConfigurationEnergy Protocols: noneUsers ConfigurationPLC Status: running (app: s203)FW UpgradeRouter: runningConf. ManagementMobile NetworkMobile NetworkStart retrieving operator list, please waitDDNS Configuration(this will take some minutes)Digital I/ODigital I/O ConfigurationDiagnosticsFW VersionsEthernet InterfacesModulesModulesData Logger (SD found)

Tipically, it takes about 1 minute to get the list, so the page shows the number of seconds elapsed.

Z-PASS2-S	(!) (Etovanni —		]	×
	×			
$\leftrightarrow$ $\rightarrow$ $\times$ (i) 192.10	58.85.104:8080/mobile_network_scan.php	☆	J	:
SENECA <sup>®</sup>	Z-PASS2-S			
General Configuration	Mobile Network [user: admin] [logout]			
fain View	Firmware Version: SW002940_332 [Modem: UC20GQBR03A14E1G]			
letwork and Services	MAC Address: C8F9811B0000 [IMEI: 861075026500975] [IMSI: 222101600237890]			
leal Time Clock Setup				
PN Configuration	Internet Access: Ethernet			
outer Configuration	Energy Protocols: none			
sers Configuration	PLC Status: running (app: s203)			
W Upgrade	Router: running			
onf. Management	i odoli i dining			
Iobile Configuration				
lobile Network	Operator list retrieval in progress, please wait			
DNS Configuration	(15 seconds elapsed)			
igital I/O ligital I/O Configuration				
)iagnostics				
W Versions				
thernet Interfaces				
lodbus Modules				
ata Logger (SD found)				
.ogs				
attesa di risposta da 192.1	58.85.104			

When the procedure is completed, the following page is shown.

Z-PASS2-S	(!) Ciovanni —		×
	58.85.104:8080/mobile_network_scan.php	7	:
S SENECA <sup>®</sup>	Z-PASS2-S		•
General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration	Mobile Network [user: admin] [logout] Firmware Version: SW002940_332 [Modem: UC20GQBR03A14E1G] MAC Address: C8F9811B0000 [IMEI: 861075026500975] [IMSI: 222101600237890] Internet Access: Ethernet		
Router Configuration Users Configuration FW Upgrade Conf. Management Mobile Configuration	Energy Protocols: none PLC Status: running (app: s203) Router: running		
Mobile Configuration Mobile Network DDNS Configuration Digital I/O Digital I/O Configuration Diagnostics FW Versions	Operator list successfully retrieved !		
Ethernet Interfaces Modbus Modules Data Logger (SD found) Logs			

After some seconds, the page automatically evolves to the "Mobile Network" page, with the operator list filled, as shown in the following figure.

☐ Z-PASS2-S	×	😲 Ciovanni — 🗆 🗙
← → C () 192.16	8.85.104:8080/mobile_network.php	☆ 🗵 :
SERNECA General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Router Configuration Users Configuration FW Upgrade Conf. Management	Z-PASS2-S Mobile Network [user: admin] [logout] Firmware Version: SW002940_332 [Modem: MAC Address: C8F9811B0000 [IMEI: 861075 Internet Access: Ethernet Energy Protocols: none PLC Status: running (app: s203) Router: running	-
Mobile Configuration	CURRENT	UPDATED
Mobile Network DDNS Configuration Digital I/O Digital I/O Configuration Diagnostics FW Versions Ethernet Interfaces Modbus Modules Data Logger (SD found) Logs	SIMPIN (if required by SIM)1234Operator SelectionInternationModeAutomaticOperator[22201] I TIMOperator[22201] I TIMData Connection[22201] I TIMData ConnectionInternationEnableOFFAPN ModeAutomaticAPNibox.tim.itAuthentication TypeNoneUsernameuserPasswordpassPing Connection Testing IP Addresswww.google.cod(if empty, testing is disabled)GET OPERAPPLYSHOW MOBILE STATUSGET OPER	1234         Automatic         [2250] unknown (UMTS)         [2228] I WIND (GSM)         [2228] I WIND (GSM)         [22201] I TIM (UMTS)         [2210] vodafone IT (GSM)         [2210] vodafone IT (UMTS)         [210] vodafone IT (UMTS)         [210] vodafone IT (UMTS)         [210] vodafone IT (UMTS)         [210] vodafone IT (UMTS)

You can choose an operator from the list, to perform "Manual" or "Manual/Automatic" selection.

# 16.1.10 DDNS Configuration

By clicking on the "DDNS Configuration" link, in the "Mobile Configuration" menu, you come to the following page:

Z-PASS2-S	×		(!) Ciovanni — [		×
	8.85.104:8080/ddns_conf.php		\$	1	:
© CENEC A®	Z-PASS2-S				
SLINLUA		1.0			
General Configuration Main View	DDNS Configuration [user: admir				
Network and Services	Firmware Version: SW002940_33	2 [Modem: UC	20GQBR03A14E1G]		
Real Time Clock Setup	MAC Address: C8F9811B0000 [IN	IEI: 861075026	500975] [IMSI: 222101600237890]		
VPN Configuration	Internet Access: Ethernet				
	Energy Protocols: none				
Router Configuration					
Users Configuration	PLC Status: running (app: s203)				
FW Upgrade	Router: running				
Conf. Management Mobile Configuration					
Mobile Network		CURRENT	UPDATED		
DDNS Configuration	DDNS Configuration				
Digital I/O	Type	None	None <b>v</b>		
Digital I/O Configuration	Hostname				
Diagnostics					
FW Versions	Username				
Ethernet Interfaces	Password				
Modbus Modules Data Logger (SD found)	APPLY				
Logs					
	DDNS Update	Status			
		Status			
		Idress			
	11 700	uruaa	_		

Field	Meaning	Default value
Туре	Type of Dynamic DNS service;	None
	possible values are:	
	- None	
	- dyndns.it	
	- dyndns.org	
	- no-ip.com	
Hostname	The hostname provided with the service	empty
	subscription	
Username	The username provided with the service	empty
	subscription	
Password	The password provided with the service	empty
	subscription	

In this page, you can set the parameters related to the Dynamic DNS service, as listed in the following table:

The parameters shall be set according to the DDNS service subscription; an example is given in the following figure.

Z-PASS2-S	×	(15 Alexand — 🗆 🗙
$\boldsymbol{\leftarrow} \rightarrow \mathbf{C}$ (i) Non side	curo   192.168.85.104:8080/ddns_conf.php	☆ 区 :
SERVECA® General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Router Configuration Users Configuration FW Upgrade Conf. Management	Z-PASS2-S DDNS Configuration [user: admin] [logout] Firmware Version: SW002940_332 [Modem: UC MAC Address: C8F9811B0000 [IMEI: 861075026 Internet Access: Ethernet Energy Protocols: none PLC Status: running (app: s203) Router: running	-
Mobile Configuration Mobile Network DDNS Configuration Digital I/O Digital I/O Configuration Diagnostics FW Versions Ethernet Interfaces	CURRENTDDNS ConfigurationTypedyndns.itpasstest1.ns0.itgsp-senecaPasswordegdirba!	UPDATED dyndns.it zpasstest1.ns0.it gsp-seneca 123456
Modbus Modules Data Logger (SD found) Logs	APPLY DDNS Update Status Status IP Address	

When an IP address assigned to the Mobile Network Interface has been bound with the hostname, the "DDNS Update Status" section appears like in the following figure.

T Z-PASS2-S	×		(!) Ciovanni	- 0
$- \rightarrow \mathbf{C}$ (i) 192.16	8.85.104:8080/ddns_conf.php			☆ 🗵
eneral Configuration ain View etwork and Services eal Time Clock Setup PN Configuration outer Configuration	Z-PASS2-S DDNS Configuration [user: adm Firmware Version: SW002940_3 MAC Address: C8F9811B0000 [ Internet Access: Mobile Energy Protocols: none	32 [Modem: UC	_	0237890]
ers Configuration	PLC Status: running (app: s203	)		
V Upgrade onf. Management	Router: running	,		
obile Configuration		CURRENT	UPDATED	
DNS Configuration gital I/O gital I/O Configuration agnostics / Versions hernet Interfaces	Hostname Username	dyndns.it zpasstest1.ns0.it gsp-seneca	dyndns.it v zpasstest1.ns0.it gsp-seneca	
dbus Modules ta Logger (SD found) gs	Password	egdirba!	egdirba!	
	DDNS Update	Status Status ddress	good 2.45.73.76	

# 16.1.11 Digital I/O Configuration

By clicking on the "Digital I/O Configuration" link, in the "Digital I/O" menu, you come to the page described in the following sub-paragraphs<sup>19</sup>; the page differs between Z-TWS4-IO and Z-PASS2-S-IO:

16.1.11.1 Z-PASS2-S-IO

<sup>&</sup>lt;sup>19</sup> This page is available only for Z-TWS4-IO and Z-PASS2-S-IO products.

Z-PASS2-S	×				(1) Ciovanni	- □ >
← → C ③ 192.168	3.85.104:8080/digio	_conf.php				☆ 🎽
SERVECA General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Router Configuration	Internet Access Energy Protocol	n: SW00294 8F9811B00 Mobile s: none	10_332 [Mod 00 [IMEI: 86 <sup>-</sup>	em: UC20GQBR	03A14E1G] [IMSI: 2221016002	37890]
Users Configuration FW Upgrade	PLC Status: run		203)			
Conf. Management	Router: running					
Mobile Configuration Mobile Network				CURRENT	UPDATED	)
Mobile Network DDNS Configuration Digital I/O Digital I/O Configuration Diagnostics FW Versions Ethernet Interfaces Modbus Modules Data Logger (SD found) Logs	APPLY	( ( Input/( Input/(	Dutput 2 Mode Dutput 1 Mode Dutput 2 Mode <b>Security Level</b> ervice Disable	Remote connection disable Remote connection active General input General output General output VPN Connection	Remote connection Remote connection General input V General output V General output V VPN Connection	
			Digital I/O	Status		
	DI 1	DO 1	DI 2	DO 2	DIDO 1	DIDO 2
	LOW	LOW	LOW	LOW	LOW	LOW

In this page, you can configure the operating modes of the Digital I/Os and the security level applied by the "Remote Connection Disable" feature (see chapter 13).

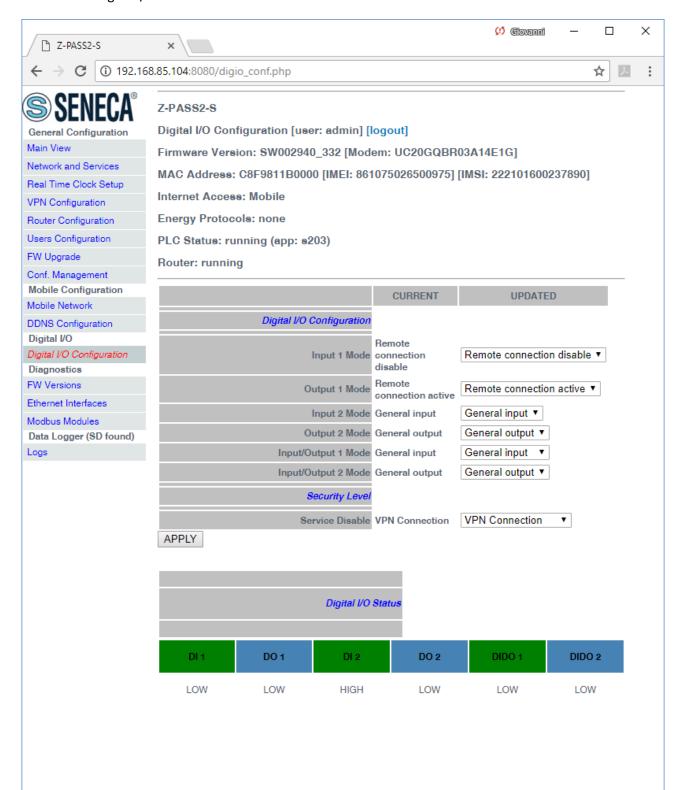
Field	Meaning			Default value	
Input 1 Mode	This	parameter	represents	the	Remote connection disable

	encycling mode of the Distal live	
	operating mode of the Digital Input	
	1 (DI 1).	
	Since this is the digital input used for	
	"Remote Connection Disable"	
	feature, its value ("Remote	
	connection disable") cannot be	
	changed.	
Output 1 Mode	This parameter represents the	Remote connection active
	operating mode of the Digital	
	Output 1 (DO 1).	
	Since this is the digital output used	
	to monitor remote connection, its	
	value ("Remote connection active")	
	cannot be changed.	
Input 2 Mode	This parameter represents the	General input
	operating mode of the Digital Input	
	2 (DI 2).	
	Possible modes are: "General input"	
	"Local alarm".	
Output 2 Mode	This parameter represents the	General output
	operating mode of the Digital	·
	Output 2 (DO 2).	
	Possible modes are: "General	
	output"   "Remote toggle" <sup>20</sup> .	
Input/Output 1 Mode	This parameter represents the	General input
	operating mode of the Digital	·
	Input/Output 1 (first configurable	
	digital I/O) (DIDO 1).	
	Possible modes are: "General input"	
	"General output".	
Input/Output 2 Mode	This parameter represents the	General output
	operating mode of the Digital	
	Input/Output 2 (second configurable	
	digital I/O) (DIDO 2).	
	Possible modes are: "General input"	
Service Disable	"General output". This parameter determines which access	VPN Connection
	services are disabled when "Remote	
	Connection Disable <sup>"</sup> digital input is	
	HIGH.	
	Possible values are: "VPN Connection"	
	"VPN Service"   "Internet Connection"	
	"SMS Service".	
	See chapter 13, for a detailed	
	See chapter 13, for a detailed	

<sup>&</sup>lt;sup>20</sup> "Remote toggle" function is still to be defined.

description of these values.

The "Digital I/O Status" section of the page gives the current status values ("LOW"/"HIGH") for each of the six available digital I/Os.



The status of the digital input configured as "Local Alarm" is reported in the "ALARM" column in the "Devices" tab of the "Seneca VPN Box Manager" and "Seneca VPN Client Communicator" applications.

, D	Utente Connesso SUPERVIS							SEN
	sitivo/ì, 2 nuovi, 0 in aggiomai		ame					🖏 Aggioma
_	TAG	MAC	IMEI	STATUS	ALARM	SIGNAL	UPTIME	
۲	zpass1_C8F981160066	C8:F9:81:16:00:66	MODEM NON INSTALLA	SERVICE OFF - VPN D	0	-	-	Reset
۲	ELTECO	C8:F9:81:1B:00:06	861075026509463	SERVICE OFF - VPN D	0	-	-	Reset
•	GREEN_METHANE2	C8:F9:81:02:01:D6	862264020120993	SERVICE ON - VPN U	P 🔴	6/7	Last 06/10/2017 11.43.5	Reset
۲	Demo	C8:F9:81:16:00:9E	862264020393319	SERVICE OFF - VPN D	0	-	-	Reset
•	zpass2s_C8F981160017	C8:F9:81:16:00:17	862264020382288	SERVICE OFF - VPN E	0	-	-	Reset
۲	ZEUS001	C8:F9:81:15:00:94	MODEM NON INSTALLA	SERVICE OFF - VPN D	0 •	-	-	Reset
۲	TOPCO	C8:F9:81:11:00:6D	862264020400825	SERVICE OFF - VPN D	0	-	-	Reset
		ltimo refresh 27/09/2017 14	4.17.08	- DI1			DIDO1 CONNECTION DISAE	🌣 Configura
Cor	nnessione Network 192.168	.96.0/255.255.255.0 (VPN	10.9.1.133)	ON DO	1 VPN STATUS	OFF	DIDO2 INPUT	
		331, hw Z-PASS1-R02, mod			NA			Elimina

# 16.1.11.2 Z-TWS4-IO

C Z-TWS4	x (!) Giova	aad —		]	$\times$
	8.85.103:8080/digio_conf.php		☆	X	:
SERVECA General Configuration Main View Network and Services Real Time Clock Setup VPN Configuration Router Configuration Users Configuration FW Upgrade Conf. Management	Z-TWS4 Digital I/O Configuration [user: admin] [logout] Firmware Version: SW002940_335 MAC Address: C8F9811B0001 Internet Access: Ethernet Energy Protocols: none PLC Status: running (app not running) Router: disabled				
Digital I/O Digital I/O Configuration	CURRENT UPDATED				
Dignostics FW Versions Ethernet Interfaces Modbus Modules Data Logger (SD missing)	Digital I/O Configuration       Remote connection active       Remote connection active         Output 1 Mode       General output       General output         Output 2 Mode       General output       General output         Input/Output 1 Mode       Remote connection disable       Remote connection disable         Input/Output 2 Mode       General output       General output         Security Level       General output       General output         Service Disable       VPN Connection       VPN Connection         APPLY       Digital I/O Status       Input/O status				
	DO 1 DO 2 DIDO 1 DIDO 2				
	LOW LOW LOW				

In this page, you can configure the operating modes of the Digital I/Os and the security level applied by the "Remote Connection Disable" feature (see chapter 13).

Field	Meaning	Default value
Output 1 Mode	This parameter represents the operating mode of the Digital Output 1 (DO 1).	Remote connection active

	Since this is the digital output used	
	to monitor remote connection, its	
	value ("Remote connection active")	
	cannot be changed.	
Output 2 Mode	This parameter represents the	General output
	operating mode of the Digital	
	Output 2 (DO 2).	
	Possible modes are: "General	
	output"   "Remote toggle" <sup>21</sup> .	
Input/Output 1 Mode	This parameter represents the	Remote connection disable
	operating mode of the Digital	
	Input/Output 1 (first configurable	
	digital I/O) (DIDO 1).	
	Since this is used as an input for	
	"Remote Connection Disable"	
	feature, its value ("Remote	
	connection disable") cannot be	
	changed.	
Input/Output 2 Mode	This parameter represents the	General output
	operating mode of the Digital	
	Input/Output 2 (second configurable	
	digital I/O) (DIDO 2).	
	Possible modes are: "General input"	
	"General output"   "Local alarm".	
Service Disable	This parameter determines which	VPN Connection
	access services are disabled when	
	"Remote Connection Disable" digital	
	input is HIGH.	
	Possible values are: "VPN	
	Connection"   "VPN Service"	
	"Internet Connection"   "SMS	
	Service".	
	See chapter 13, for a detailed	
	description of these values.	

The "Digital I/O Status" section of the page gives the current status values ("LOW"/"HIGH") for each of the four available digital I/Os.

# 16.1.12 I/O View (S6001-RTU)

In S6001-RTU CPU, one more page is available called "I/O View"; in this page, the current status of all the inputs/outputs is shown, along with some diagnostic information.

<sup>&</sup>lt;sup>21</sup> "Remote toggle" function is still to be defined.

🕒 \$6001-RTU	×	Giovanni		x
← → C 🗋 192	2.168.85.105:8080/io_view.php		Q 🖒	≡
-			Q $\sum_{i=1}^{i}$	
	DIAGNOSTICS Error Status 0			
	CRC Error Counter 0			

The following parameters are shown:

Field	Meaning	Values
DIGITAL INPUTS/Input 1Input 15	Status of Digital Input	LOW/HIGH
DIGITAL OUTPUTS/Output	Status of Digital Output (relay)	OPEN/CLOSED
1Output 8		
DIGITAL OUTPUTS/12 Volt Enable	Status of Digital Output enabling 12	LOW/HIGH
Output	Vdc voltage on screw terminals 37	
	and 38	
ANALOG INPUTS/Current 1	Value of analog current input (in uA)	020000

Current 4		
ANALOG OUTPUT/Current	Value of analog current output (in	020000
	uA)	
ANALOG OUTPUT/Voltage	Value of analog voltage output (in	010000
	mV)	
ELECTRODES/Level	Liquid level value	0,1,2
ELECTRODES/Sensitivity	Sensitivity value applied in liquid	0255
	level measurement (in $k\Omega$ )	
DIAGNOSTICS/Error Status	This parameter gives an information	0: no error
	about errors that might occur in the	Bit 9: flash memory error
	I/O board. The value is a bitmask, as	
	specified in the column "Values".	
DIAGNOSTICS/CRC Error Counter	This parameter counts the CRC	>= 0
	errors occurring in the	0 means "no CRC error"
	communication between the CPU	
	board and the I/O board; if the value	
	continuously increases, it means	
	that there is some HW problem	

If the Soft PLC application is not running, inputs/outputs values are not available, so the page appears like in the following figure:

← → C           192:168.85.105:8080/io.view.php
Control Configuration     I/O View       Hanvexi and Services     Firmware Version: SW002940_220 [Modem: 1231B02SIM5350E]       Hanvexi and Services     MAC Address: CBF981000198       Network and Services     Energy Protocols: none       PLC Status: stopped     PLC Status: stopped       Nobie Configuration     Nobie Configuration       Mobie Configuration     Internet Access: Ethemet       Nobie Configuration     Nobie Status: stopped       Nobie Configuration     Nobie Status: stopped       Nobie Configuration     Internet Access: Ethemet       Nobie Configuration     Internet Access: Ethemet       Nobie Status: stopped     Nobie Status: stopped       Status: disabled     Integrit simplifies       Nobie Configuration     Integrit simplifies       Nobie Status: disabled     Integrit simplifies

## 16.1.13 FW Versions

By clicking on the "FW Versions" link, in the "Diagnostics" menu, you come to the following page:

P₁ Z-PASS2-S	💭 Ciovanni — 🗆 🗙
	8.85.104:8080/fwver_full.php
<ul> <li>← → C ① 192.16</li> <li>♦ SENECA General Configuration</li> <li>Main View</li> <li>Network and Services</li> <li>Real Time Clock Setup</li> <li>VPN Configuration</li> <li>Router Configuration</li> <li>FW Upgrade</li> <li>Conf. Management</li> <li>Mobile Configuration</li> <li>Digital I/O</li> <li>Digital I/O</li> <li>Digital I/O Configuration</li> <li>Diagnostics</li> <li>FW Versions</li> <li>Ethernet Interfaces</li> <li>Modbus Modules</li> <li>Data Logger (SD found)</li> <li>Logs</li> </ul>	2.PASS2-8         FW Versions [user: admin] [logout]         Furmware Version: SW002940_332 [Modem: UC20GQBR03A14E1G]         MAC Address: C8F9811B0000 [IMEI: 861075026500975] [IMSI: 222101600237890]         Internet Access: Mobile         Energy Protocols: none         PLC Status: running (app: s203)         Router: running         Image: Protocols: none         PLC Status: running         Z-PASS2-8-10         FW Components Version         Linux Kerne         2.6.28 #137 PREEMPT Tue Jun 20         10:46:10 CEST 2017         Unitial RAM Disk         Default Disk File System         SW002940_332

In this page, the following information are shown:

- the product name along with its HW revision (in the above figure: "Z-PASS2-S-R01")
- the version strings of all the FW components, which are:
  - Linux Kernel (*kernel*)

- Initial RAM Disk (initrd)
- Root File System (rootfs)
- Default Disk File System (*diskdfl*)
- Disk File System (*disk*)

## 16.1.14 Ethernet Interfaces

By clicking on the "Ethernet Interfaces" link, in the "Diagnostics" menu, you come to the following page:

Z-PASS2-S	×		🤔 Giovanni	- 🗆 X
	8.85.103:8080/eth_stats.php			☆ :
				```
SENECA <sup>®</sup>	Z-PASS2-S			
General Configuration	Ethernet Status [user: admin] [logout]			
Main View	Firmware Version: SW002940_310 [Moden	n: 1231B02SIM5350E]		
Network and Services	MAC Address: C8FA81160002			
Real Time Clock Setup	Internet Access: Ethernet			
VPN Configuration				
Router Configuration	Energy Protocols: none			
Users Configuration	PLC Status: running (app not running)			
FW Upgrade	Router: running			
Mobile Configuration				
Mobile Network Diagnostics	LAN ETHERNET			
Ethernet Interfaces		Deve		
Modbus Modules	Link Status RX Packets / Bytes	Down 0 / 0		
Data Logger (SD found)	TX Packets / Bytes	0/0		
Logs				
	WAN ETHERNET			
	Link Status	Up		
	RX Packets / Bytes	11936 / 970.6K		
	TX Packets / Bytes	1533 / 492.0K		
	REFRESH			

The above figure applies to a Z-PASS2-S-R01/Z-PASS2-S-IO/Z-TWS4-IO CPU, when the "Ethernet Mode" is "LAN/WAN".

In this page, for each of the two available Ethernet interfaces (LAN and WAN), the following information is shown:

- the Ethernet link status (i.e. "Down" or "Up")
- the number of packets/bytes received from the Ethernet interface, when the link is up; "0/0" when the link is down
- the number of packets/bytes sent to the Ethernet interface, when the link is up; "0/0" when the link is down

For Z-TWS4, Z-PASS2-S, S6001-RTU and for Z-PASS2-S-R01/Z-PASS2-S-IO/Z-TWS4-IO when the "Ethernet Mode" is "Switch", the "Ethernet Interfaces" page is similar to the one shown in the following figure.

In this page, for the one available Ethernet interface, the following information is shown:

- the number of packets/bytes received from the Ethernet interface
- the number of packets/bytes sent to the Ethernet interface

You can refresh the Ethernet status, by clicking on the "REFRESH" button.

### 16.1.15 Modbus Modules

By clicking on the "Modbus Modules" link, in the "Diagnostics" menu, you come to a page similar to the one in the following figure:

← → C ① 192.1	68.85.103:8080	)/modules_statu	ıs_view.php			☆	
SENECA®	Z-PASS2-S	3					
General Configuration	Modules S	itatus View [us	er: admin] [logo	ut]			
Main View	Firmware	Version: SW00	2940_310 [Mode	m: 1231B02SIM5350E]			
Network and Services	MAC Addr	ess: C8FA811	60002	-			
Real Time Clock Setup			00002				
VPN Configuration	Internet A	ccess: Mobile					
Router Configuration	Energy Pre	otocola: none					
Users Configuration	PLC Statu	s: running					
FW Upgrade Mobile Configuration	Router: di	sabled					
Mobile Network Diagnostics							
Ethernet Interfaces	INDEX	ADDRESS	PORT	ТҮРЕ	STATUS		
Modbus Modules	1	2	COM2	Z-10-DOUT	OK		
Data Logger (SD found)	2	3	COM2 COM2	Z-4AI 1 Z-4AI 1	OK OK		
Logs	3	4 5	COM2 COM2	Z-4AL1 Z-DAQ-PID	OK		
	4	5	COM2	2-DAQ-11D	OK		

This page shows a table containing a row for each Modbus RTU Slave modules configured in the Z-NET4<sup>22</sup>/Straton project; each row contains the following information:

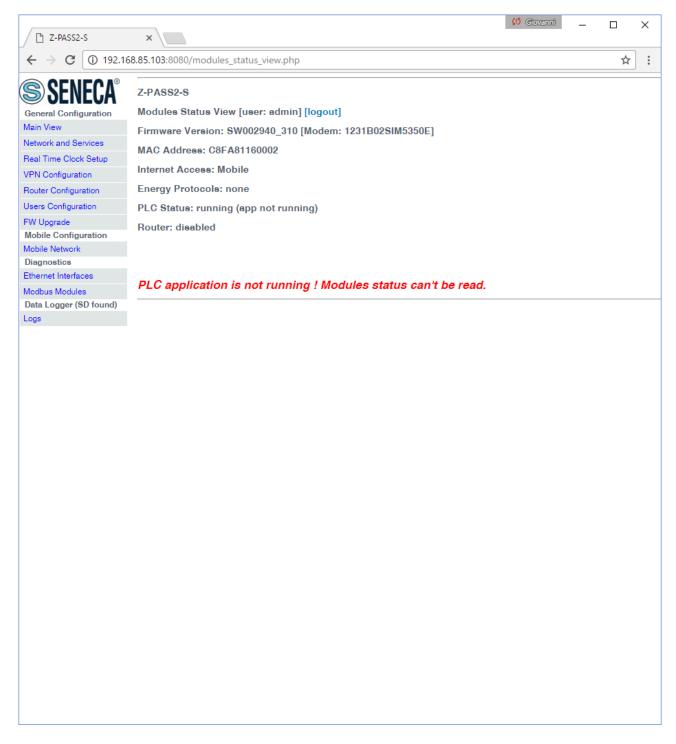
- a progressive index
- the Modbus Slave Address
- the name of the serial port (i.e. COM1/COM2/COM4) which the module is connected to
- the type of module
- the module status, which can be:
  - "OK", if the module is correctly responding to Modbus requests
  - $\circ$  "TIMEOUT", if the module is not responding to Modbus requests
  - "ERROR", if any other error occurs

The Modbus Modules page can't be shown in the following situations:

- if a Z-NET4 project is not loaded on the Device
- if TWS/PLC services are not running
- if a PLC application is not running, i.e. not present or stopped

As an example, for the third of the above cases, the following message is shown:

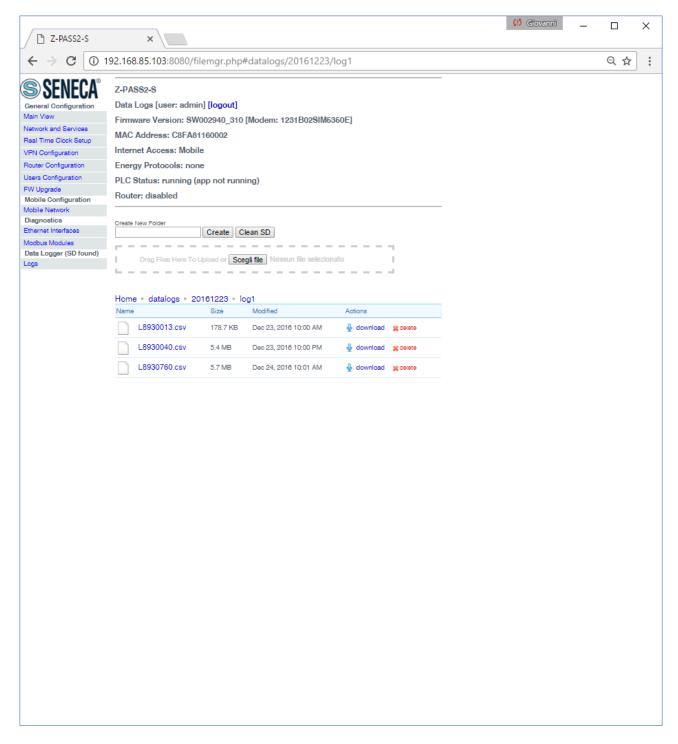
<sup>&</sup>lt;sup>22</sup> For information on Z-NET4 SW, please see chapter 18.



### 16.1.16 Data Logs

By clicking on the "Logs" link, in the "Data Logger" menu, you come to a page similar to those in the following figures:

Z-PASS2-S	× \					
← → C 🕕	192.168.85.103:8080	)/filemgi	.php#datalogs		ର ☆	
SFNFCA®	Z-PASS2-S					
General Configuration	Data Logs [user: ad	lmin] [log	outl			
Main View			0_310 [Modem: 1231B02SI	ICOCOE]		
Network and Services				NOSOULI		
Real Time Clock Setup	MAC Address: C8F		2			
VPN Configuration	Internet Access: Mo	obile				
Router Configuration	Energy Protocols:	none				
Users Configuration	PLC Status: runnin	g (app no	t running)			
FW Upgrade	Router: disabled					
Mobile Configuration Mobile Network						
Diagnostics	Create New Folder					
Ethernet Interfaces		Crea	te Clean SD			
Modbus Modules						
Data Logger (SD found) Logs	Drag Files Here	To Upload (	or Scegli file Nessun file sele:	zionato		
	1					
	Home ⊩ datalogs					
	Name	Size	Modified	Actions		
	20161223		Dec 23, 2016 10:00 AM	💥 delete		
	20161224		Dec 24, 2016 10:01 PM	💥 delete		
	20161225		Dec 25, 2016 10:01 PM	💥 delete		
	20161226		Dec 26, 2016 10:01 PM	💥 delete		
	20161227		Dec 27, 2016 10:02 PM	💥 delete		
	20161228		Dec 28, 2016 10:01 PM	💥 delete		
	20161229		Dec 29, 2016 10:01 PM	💥 delete		
	20161230		Dec 30, 2016 10:02 PM	💥 delete		
	20161231		Dec 31, 2016 10:01 PM	💥 delete		
	20170101		Jan 1, 2017 4:22 PM	💥 delete		
	20170102		Jan 2, 2017 10:01 PM	💥 delete		
	20170103		Jan 3, 2017 10:02 PM	💥 delete		
			Jan 4, 2017 10:02 PM	💥 delete		
	20170104					
	20170105		Jan 5, 2017 10:01 PM	🗶 delete		
	20170105		Jan 6, 2017 10:01 PM	St delete		
	20170105 20170106 20170107		Jan 6, 2017 10:01 PM Jan 7, 2017 10:01 PM	X delete X delete		
	20170105		Jan 6, 2017 10:01 PM	St delete		



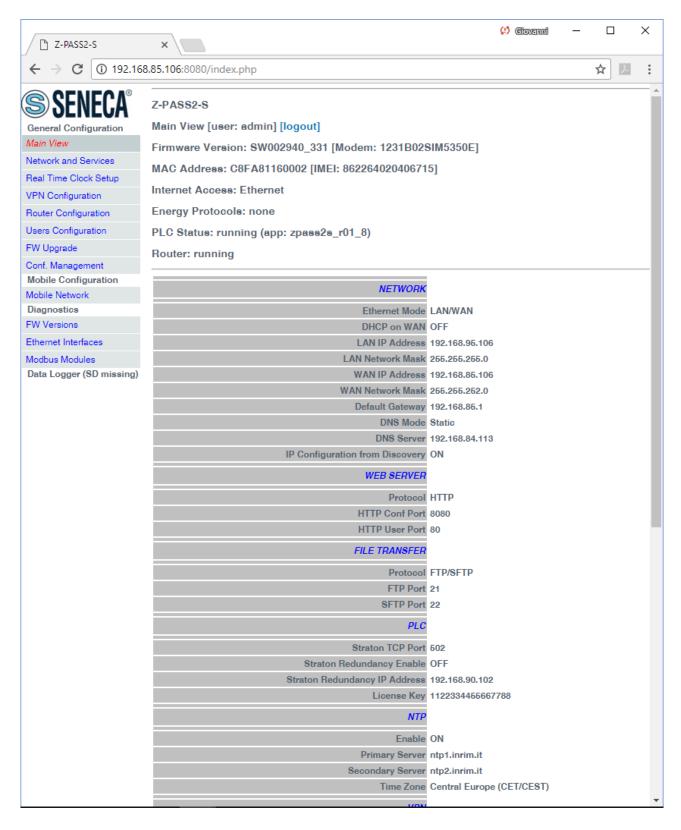
This page shows the contents of the SD card which, typically, is used to store "Data Logs" files; these files are created by the "Data Logger" functionality available in Z-NET4 "Telecontrol Functions" (see chapter 18).

The page lets you perform the following operations:

- browse the SD folder tree, clicking on the folder name links
- delete a folder, clicking on the "delete" link
- create a new folder, by means of the "Create New Folder" text-box and "Create" button; the new folder is created in the folder currently shown
- download a file, clicking on the filename link or on the "download" link
- delete a file, clicking on the "delete" link

- uploading a file, selecting it by means of the "Choose file" button or dragging it into the dashed area; the file is created in the folder currently shown
- clean the SD, by means of the "Clean SD" button; please note that this is done by formatting the SD, so all SD contents will be lost

If an SD card is not available on the Device, the "Logs" link is not shown, as in the following figure.



# 16.2 User pages

It is also possible to access the Device configuration site as a "non-administrator" user; this user is allowed to access only the "Main View" and "Network and Services" pages, viewing and setting only a limited number of configuration parameters; in S6001-RTU, the "I/O View" page is also available.

Also the "FW Versions", "Ethernet Interfaces" and "Modbus Modules" pages of the "Diagnostics" section are available for this kind of user; they will not be shown again here, as they are identical to those for administrator user.

To login as "non-administrator" user, connect the browser to the Device IP address on port 8080, e.g.:

# http://192.168.90.101:8080

and, when asked, provide the following credentials (default values):

Username: user Password: user

You come to the "Main View" page, described in the following paragraph.

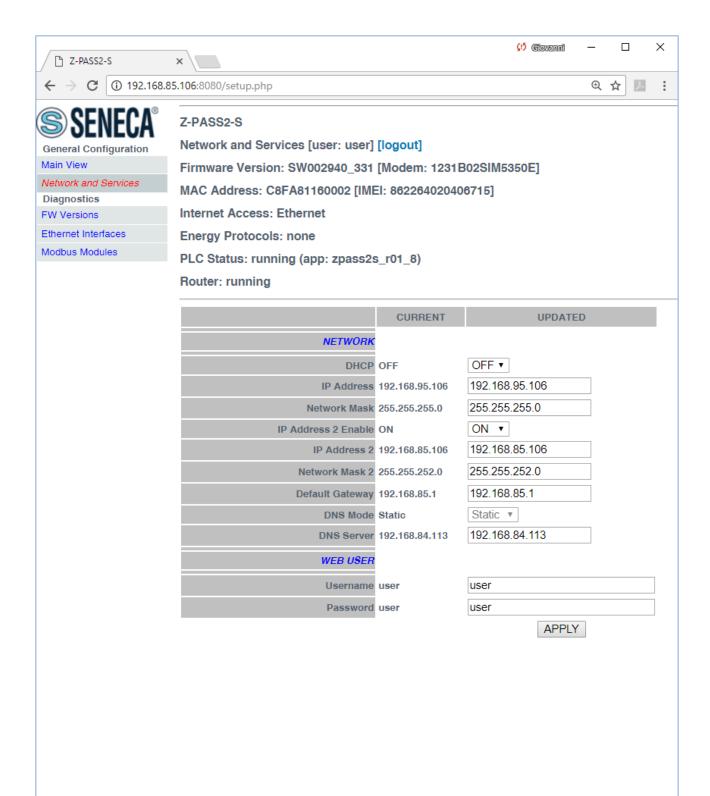
# 16.2.1 Main View

In this page, some Network parameters and the Web User credentials are shown, with their current values.

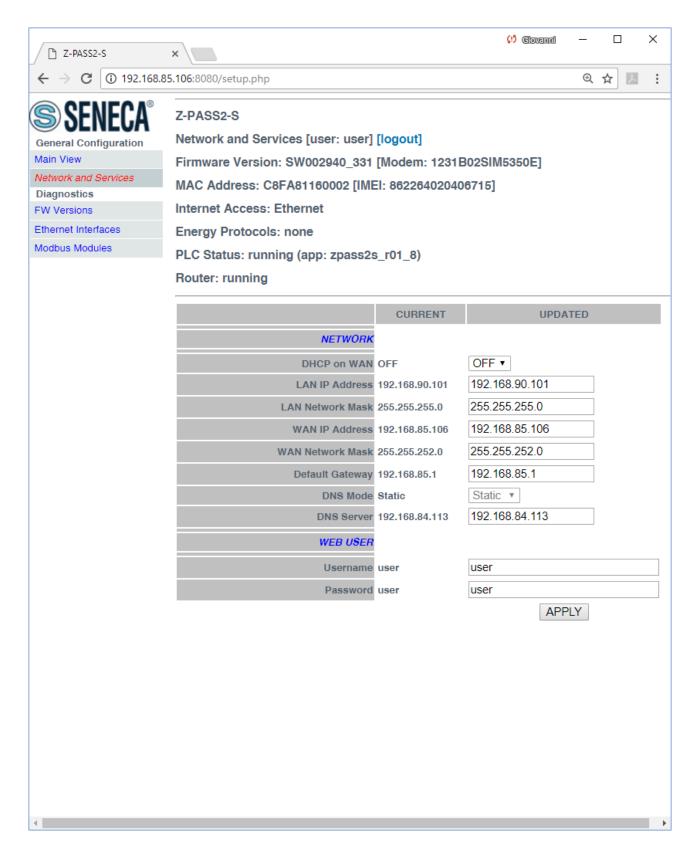
To change the parameter values, you have to go to the "Network and Services" page, described in the following paragraph.

# 16.2.2 Network and Services

The parameters shown in this page slightly change, depending on the HW version of the product (Z-TWS4/Z-PASS2-S or Z-PASS2-S-R01/Z-PASS2-S-IO/Z-TWS4-IO) and, for new HW versions, on the selected "Ethernet Mode"; this is shown in the following figures.



The previous figure shows the "Network and Services" page for a Z-PASS2-S-R01/Z-PASS2-S-IO/Z-TWS4-IO, when the "Ethernet Mode" parameter is set to "Switch"; it also applies to a Z-TWS4 and Z-PASS2-S (old versions) and to a S6001-RTU.



The previous figure shows the "Network and Services" page for a Z-PASS2-S-R01/Z-PASS2-S-IO/Z-TWS4-IO, when the "Ethernet Mode" parameter is set to "LAN/WAN".

There is an important difference between the parameter values shown in this page and those shown in the "Main View" page: the former are <u>configured</u> values, whereas the latter are <u>actual</u> values.

To better explain this difference, let's consider the case when the DHCP parameter is set to ON; in the "Network and Services" page, you may see the 192.168.90.101 default value for the "IP Address" parameter, whereas the "Main View" page shows the actual IP Address, assigned by the DHCP server.

In the following table, all configuration parameters available in this page are listed, with a short explanation and the parameter default value for each of them.

Note that "Ethernet Mode" parameter is not shown in user pages.

Field	Meaning	Default value
Ethernet Mode = "Switch"		
NETWORK/DHCP	Flag to enable/disable the DHCP	OFF
	functionality on the Ethernet	
	interface.	
NETWORK/IP Address	IP address of the Ethernet	192.168.90.101
	interface (disabled when "DHCP"	
	is set to "ON")	
NETWORK/Network Mask	Network mask of the Ethernet	255.255.255.0
	interface (disabled when "DHCP"	
	is set to "ON")	
NETWORK/IP Address 2 Enable	Flag to enable/disable the second	OFF
	IP address on the Ethernet	
	interface.	
	Note that the second IP address	
	can be enabled also when the	
	DHCP functionality is active.	
NETWORK/IP Address 2	Second IP address of the Ethernet	192.168.100.101
	interface	
NETWORK/Network Mask 2	Second network mask of the	255.255.255.0
	Ethernet interface	
Ethernet Mode = "LAN/WAN"		
NETWORK/DHCP on WAN	Flag to enable/disable the DHCP	ON
	functionality on the WAN	
	Ethernet interface	
NETWORK/LAN IP Address	IP address of the LAN Ethernet	192.168.90.101
	interface	
NETWORK/LAN Network Mask	Network mask of the LAN	255.255.255.0
	Ethernet interface	
NETWORK/WAN IP Address	IP address of the WAN Ethernet	192.168.100.101

Г		
	interface (disabled when "DHCP	
	on WAN" is set to "ON")	
NETWORK/WAN Network Mask	Network mask of the WAN	255.255.255.0
	Ethernet interface (disabled when	
	"DHCP on WAN" is set to "ON")	
NETWORK/Default Gateway	Default Gateway IP address	192.168.100.1 , for Z-TWS4-
	(disabled when DHCP	R0x and Z-PASS2-S-R0x
	functionality is enabled on any	(x=1,2)
	interface).	192.168.90.1, for all other
	When "Ethernet Mode" is set to	products
	"LAN/WAN", the Default Gateway	
	shall be in the WAN subnet.	
NETWORK/DNS Mode	Tells if the DNS Server shall be set	DHCP, for Z-TWS4-R0x and
	statically (value: "Static") or	Z-PASS2-S-R0x (x=1,2)
	dinamically assigned by the DHCP	Static, for all other products
	Server (value: "DHCP")	
NETWORK/DNS Server	DNS server IP address (disabled	192.168.100.1 , for Z-TWS4-
	when DHCP functionality is	R0x and Z-PASS2-S-R0x
	enabled on any interface and DNS	(x=1,2)
	Mode = DHCP)	192.168.90.1, for all other
		products
WEB USER/Username	Username to access the web	User
	configuration site (limited access)	
WEB USER/Password	Password to access the web	user
	configuration site (limited access)	

Some notes about the "DHCP" parameters:

- the "DHCP" parameter can be set to "ON" only if the "DHCP Server" parameter of the "Router Configuration" page is set to "OFF";
- only the "DHCP on WAN" parameter can be set to "ON".

You can change any of the above parameters; to apply the changes, press the "APPLY" button.

Please note that, after changing the Web User credentials, a new login will be required to access any page.

# 16.2.3 I/O View (S6001-RTU)

This page is identical to that shown for "administrator user" (see 16.1.10).

🗅 \$6001-RTU	×	Giovanni	- □ ×
← → C' 🗋 19	92.168.85.105:8080/io_view.php		೩ ಭ ≡
General Configuration Main View Network and Services S6001-RTU I/O View	S6001-RTU I/O View Firmware Version: SW002940_220 [Modem: 1231B02SIM5350E] MAC Address: C8F98100019B Internet Access: Ethernet Energy Protocols: none PLC Status: running Router: disabled		
	DIGITAL INPUTS Input 1 LOW Input 2 LOW Input 3 LOW Input 4 LOW Input 5 LOW Input 6 LOW Input 6 LOW Input 7 LOW Input 8 LOW Input 9 LOW Inp		

# 16.3 Guest pages

It is also possible to access the Device configuration site as a "guest" user; this user is allowed to access all the pages except for "FW Upgrade", "Configuration Management"" and "Data Logs" pages, viewing all configuration parameters and status information, without changing any parameter; so, in all the pages, the "APPLY" buttons (and any other button used to perform changes) are disabled.

To login as "guest" user, connect the browser to the Device IP address on port 8080, e.g.:

http://192.168.90.101:8080

and, when asked, provide the following credentials (default values):

Username: guest Password: guest

You come to the "Main View" page, shown in the following figure.

🗋 Z-PASS2-S	×	(!) Ciovand	— C	
← → C 🛈	192.168.85.104:8080/index.php		Q 🕶 🕁	۶.
obile Network	Kouter: running			
DNS Configuration				
gital I/O	NETWORK			
gital I/O Configuration	Ethernet Mode LAN/WAN			
agnostics	DHCP on WAN OFF			
/ Versions	LAN IP Address 192.168.90.101			
ernet Interfaces	LAN IF Address 192, 108, 90, 101			
	WAN IP Address 192.168.85.104			
dbus Modules	WAN Network Mask 255.255.252.0			
	Default Gateway 10.64.64.64			
	DNS Mode Static			
	DNS Node State DNS Server 83.224.65.143 83.224.65.134			
	IP Configuration from Discovery ON			
	WEB SERVER			
	Protocol HTTP/HTTPS			
	HTTP Conf Port 8080			
	HTTP User Port 80			
	HTTPS Port 443			
	FILE TRANSFER			
	Protocol FTP/SFTP			
	FTP Port 21			
	SFTP Port 22			
	PLC			
	<i>FL0</i>			
	Straton TCP Port 502			
	Straton Redundancy Enable OFF			
	Straton Redundancy IP Address 192.168.90.102			
	License Key 1122334455667788			
	NTP			
	Enable ON			
	Primary Server ntp1.inrim.it			
	Secondary Server ntp2.inrim.it			
	Time Zone Central Europe (CET/CEST)			
	VPN			
	Mode VPN Box			
	Enable OFF			
	Server 192.168.90.1			
	Password seneca			
	Tag Name zpass2s			
	MOBILE NETWORK			
	Enable ON			
	APN Mode Manual			
	APN m2mbis.vodafone.it			
	Authentication Type None			
	Username user			
	Password pass			
	PIN 8342			
	Ping Connection Testing IP Address www.google.com			
	NETWORK REDUNDANCY			
	Enable OFF			
	Ping Address 8.8.4.4			
	WATCHDOG			
	Enable ON			
	Timeout (a) 60			
	DEBUG LOGS			
	Enable ON			
	COM1			
	Mode RS485			
	FACTORY DEFAULT RESTART			
	CLEAN INTERNAL DATA LOGS			

Note that, as told above, the "FACTORY DEFAULT", "RESTART" and "CLEAN INTERNAL DATA LOGS" buttons are disabled.

Another example of a page accessed by the "guest" user is given in the following figure.

					😲 Giovanni	– 🗆 X
🗋 Z-PASS2-S	×					
$\boldsymbol{\leftarrow}$ $\rightarrow$ $\mathbf{C}$ (i) 192.16	8.85.103:8080/mobile_network.php?	showinfo=1				☆ :
	Z-PASS2-S Mobile Network [user: guest] [logout]					
Main View				5051		
Network and Services	Firmware Version: SW002940_3	sto [wodem: 123	STB0251MD3	SOUEJ		
Real Time Clock Setup	MAC Address: C8FA81160002					
VPN Configuration	Internet Access: Mobile					
Router Configuration	Energy Protocols: none					
Users Configuration	PLC Status: running (app not ru	unning)				
Mobile Configuration	Router: disabled	37				
Mobile Network						
Diagnostics Ethernet Interfaces		CURRENT		UPDATED		
Modbus Modules	Modem Available	Yes	Yes ▼			
	Mobile Configuration					
	Enable	ON	ON 🔻			
		ibox.tim.it	ibox.tim.it			
	Authentication Type		None	•		
	Username		user			
	Password					
	Password PIN (if required by SIM)		pass 1234			
		1234	1234			
	Ping Connection Testing IP Address www.google.com (if empty, testing is disabled)					
	APPLY HIDE MOBILE STATUS					
	Mobil	e Status				
	Signal Lev			4	_	
	Registration Status				(home network)	
	Connection	n Status Address		Connected 2.192.0.221		
	RX Packets			3389 / 264.4	к	
	TX Packets			2947 / 212.7		
	REFRESH					

In the "Mobile Network" page, the "APPLY" button is disabled, whereas the "SHOW MOBILE STATUS"/"HIDE MOBILE STATUS" and "REFRESH" buttons are enabled, letting the "guest" user to view the Mobile Status.

# **17 Seneca StratON Library**

To let the users exploit Z-TWS4/Z-PASS2-S/S6001-RTU features in their IEC 61131-3 programs, Seneca has developed a set of "Function Blocks" and Functions, supplied with the Seneca library for StratON.

In this chapter, all the FBs and functions available on Z-TWS4/Z-PASS2-S/S6001-RTU are listed, providing a description of input/output parameters and some notes for each of them.

# **17.1 Function Blocks**

# 17.1.1 General FB behavior

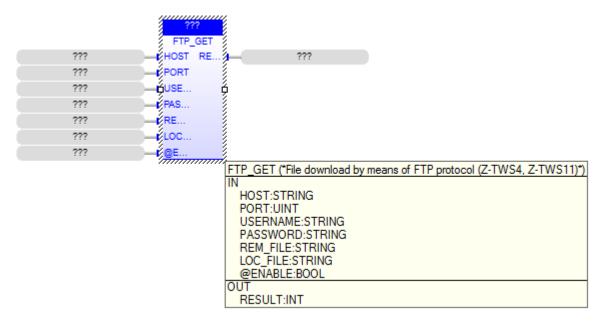
The description given in this paragraph apply to all the FBs available on Z-TWS4/Z-PASS2-S/S6001-RTU, except for the LINUX\_SHELL FB, which has a particular behavior (see related paragraph).

All the FBs require more than one PLC cycle to be completed (Asynchronous Function Block); so, the application shall run them for a number of cycles until it detects that the FB execution has ended.

Every FB has an "ENABLE" parameter, which is an input/output parameter: to let the FB actually run, the application shall put ENABLE=TRUE (input), not changing the parameter value during the FB execution; when the execution is completed, the FB code itself will put ENABLE=FALSE (output); when the FB is called with ENABLE=FALSE, it does nothing and returns the *NOT\_DONE* (-2) result value.

All the FBs return the *FAILED* (-1) result value to signal that the FB execution has failed, for a generic reason; some FBs provide further failure result values, in particular the *TIMEOUT* (2) result value.

All the FBs return the *RUNNING* (0) result value to tell the application that the FB processing is still running and the *DONE* (1) result value when the FB processing has successfully ended.



# 17.1.2 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.

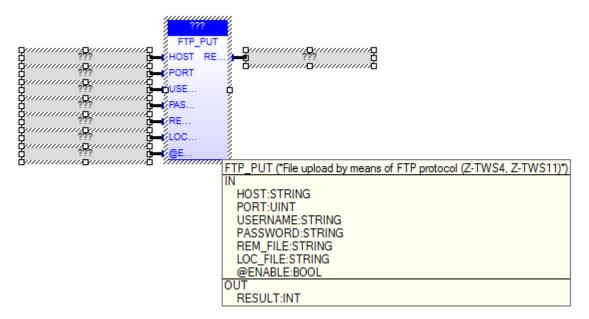
The FB has the following input parameters: - HOST : IP address or host name of the FTP server - PORT : TCP port for the FTP protocol (normally: 21) - USERNAME : username for authentication

```
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

The FB has the following output parameter:

RESULT : -2, when called with ENABLE=FALSE
-1, in case of any failure
0, if the process is still running
1, if the process has successfully finished.
```

#### 17.1.3 FTP\_PUT



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

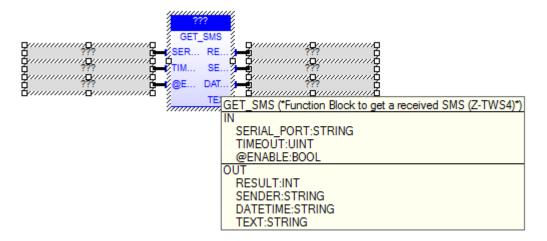
When first called, the FB runs a process which starts performing the upload; on subsequent calls, it only checks if the process has finished its job.

```
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
The FB has the following output parameter:
- RESULT : -2, when called with ENABLE=FALSE
           -1, in case of any failure
            0, if the process is still running
            1, if the process has successfully finished.
```

### 17.1.4 GET\_ALARMS

```
st_GET_AL.
                          GET_ALARMS
                          STA...
                              RE.
               222
   222
               ???
                           SEP... FIR.
   ???
               ???
                           AX... LAS.
   ???
               ???
                           ۹L...
                              RE.
   222
               ???
                                 GET_ALARMS (*Retrieve alarms with the specified status from the DB.*)
                                 IN
                                  STATUS:USINT
                                  SEP_CHAR:USINT
                                  MAX_REC:UDINT
                                  FILENAME:STRING
                                  @ENABLE:BOOL
                                 00
                                  RESULT:INT
                                  FIRST_ID:UDINT
LAST_ID:UDINT
                                  REC_NUM:UDINT
This FB retrieves all alarm records with the specified status from the DB;
the records are written as lines into the specified file.
INPUTS:
- STATUS : this parameter is handled as a "negative bitmask", meaning that this
FB will provide alarm records such that:
  (alarms.stat & STATUS) = 0, where:
  alarms.stat: DB field
  STATUS: this parameter
- SEP CHAR : the field separator to be used in the file lines; possible values:
" "|","|";"
- MAX REC : the maximum number of records (lines) to be retrieved
- FILENAME : the file name, with absolute path
- @ENABLE: TRUE -> FB is executed
            FALSE -> FB is skipped
            the parameter is set to FALSE by the FB at the end of execution
OUTPUTS:
- RESULT: the FB result; possible values are:
   0: FB still running
   1: FB successfully executed
  -1: FB execution failed
  -2: FB execution timeout
- FIRST ID : the id of the first record retrieved; this value shall be passed as
an argument to the SET ALARMS STAT FB
- LAST ID : the id of the last record retrieved; this value shall be passed as
an argument to the SET ALARMS_STAT FB
- REC NUM : the number of records retrieved
```

### 17.1.5 GET\_SMS



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

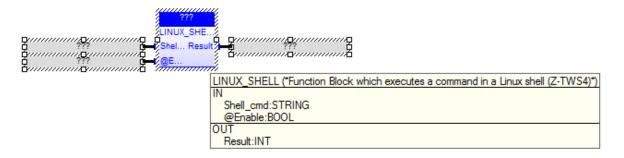
When first called, the FB runs a process which starts getting the SMS; on subsequent calls, it only checks if the process has finished its job.

The FB has the following input parameters:

<ul> <li>SERIAL PORT : this parameter is not used (it is still present only for compatibility reasons); it can be set to '' (empty string)</li> <li>TIMEOUT : timeout, in seconds</li> <li>@ENABLE : TRUE -&gt; FB is executed FALSE -&gt; FB is skipped</li> </ul>
The FB has the following output parameters:
<pre>- RESULT : -2, when called with ENABLE=FALSE -1, in case of any failure 0, if the process is still running 1, if the process has successfully finished and an SMS has been</pre>
found
2, if timeout has expired
3, if the process has successfully finished but no SMS has been
<pre>found     4, if PPP is active, on Z-MINIRTU     5, if MODEM_RESET FB is running - SENDER : SMS sender (only if RESULT=1)</pre>
- 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, on Z-MINIRTU.

17.1.6 LINUX\_SHELL



Seneca FB for access to the Linux Shell. Max 255 command line characters. For access to the output use "> output.txt"

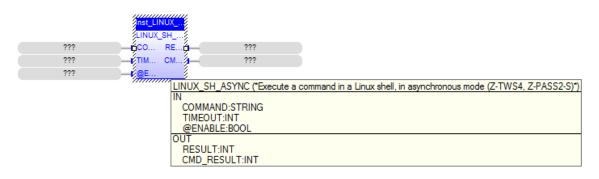
Shell\_cmd : string command @Enable : if true execute the shell command Result : the return value of the "system" C function

Usage Example:

"ls > output1.txt"

create the directory list into output1.txt

#### 17.1.7 LINUX\_SH\_ASYNC



The LINUX\_SH\_ASYNC FB executes a command in a Linux shell, in asynchronous mode.

When first called, the FB runs a Linux shell process which starts performing the command; on subsequent calls, it only checks if the process has finished the command execution.

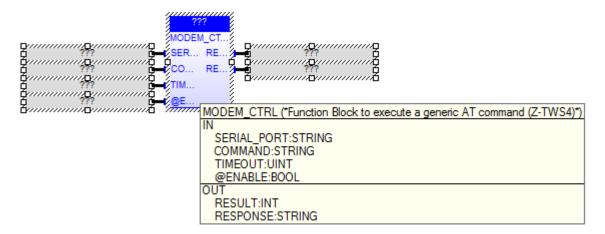
The FB has the following input parameters: - COMMAND : the command to be executed

- TIMEOUT : timeout, in seconds
- @ENABLE : TRUE -> FB is executed FALSE -> FB is skipped

The FB has the following output parameters:

RESULT : -2, when called with ENABLE=FALSE
-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
CMD RESULT: command exit code

#### 17.1.8 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 : this parameter is not used (it is still present only for
compatibility reasons); it can be set to '' (empty string)
- COMMAND
           : AT command to be executed
- TIMEOUT
             : timeout, in seconds
- @ENABLE
              : TRUE -> FB is executed
               FALSE -> FB is skipped
The FB has the following output parameters:
           : -2, when called with ENABLE=FALSE
- 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
              4, if PPP is active, on Z-MINIRTU
              5, if MODEM RESET FB is running
- 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, on Z-MINIRTU.

This FB cannot be used (i.e.: it won't work) in the following situations:

- if modem is set to send numeric result codes (see "ATV" command)

- for commands using a prompt (e.g.: "AT+CMGS" command)

- for call-handling commands (e.g.: "ATD", "ATA", "ATH").

#### 17.1.9 MODEM\_ONOFF

	Inst_MODEM MODEM_0
??? -	ON RE ???
???	— <b>1</b> @E
	MODEM_ONOFF ("Power on/off the Modem (Z-TWS4, Z-PASS2-S, Z-MINIRTU)") IN ON_OFF:BOOL @ENABLE:BOOL OUT RESULT:INT

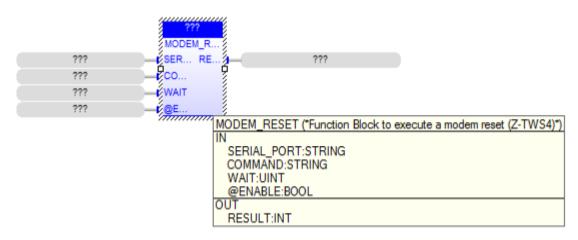
This FB permits to control the power ON/OFF digital input of the MODEM.

The params are :

ON\_OFF : if True power-up the modem @ENABLE : if True the FB is executed

RESULT : -2 FB executed with @ENABLE set to False -1 Error 0 operation not completed +1 OK +2 modem is already ON/OFF

#### 17.1.10 MODEM\_RESET



The MODEM\_RESET FB sends an AT reset command to the GSM modem and waits for a specified time.

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	: this parameter is not used (it is still present only for
compatibility	reasons); it can be set to '' (empty string)
- COMMAND	: reset AT command to be sent;
- WAIT	if left empty, the "AT+CFUN=1,1" command will be sent
- WAII	: wait duration, in seconds, after sending the command; valid values are: [30300]
- @ENABLE	: TRUE -> FB is executed FALSE -> FB is skipped
- RESULT : -2,	e following output parameter: when called with ENABLE=FALSE in case of any failure
0,	if the process is still running

1, if the process has successfully finished

2, if timeout has expired (timeout = WAIT + 5 seconds)

- 4, if PPP is active, on Z-MINIRTU
- 5, if MODEM RESET FB is already running

Please note that the MODEM\_RESET FB can't be successfully executed while the PPP connection is active, on Z-MINIRTU. Also note that, when MODEM\_RESET FB is running, all other "modem related" FBs (PPP\_CONNECT, SEND\_SMS, GET\_SMS, MODEM\_CTRL and MODEM\_RESET itself) are rejected.

#### P CONN. RE. 111110 LO. SER. GP... RE. USE. AC. PPP\_CONNECT (\*PPP connection setup/release (Z-TWS4)\*) ¢тім., $\cdots \square$ IN €/@E... CONNECT:BOOL SERIAL\_PORT:STRING GPRS\_APN:STRING USERNAME:STRING PASSWORD:STRING TIMEOUT:UINT @ENABLE:BOOL OUT RESULT:INT LOCAL\_IP:STRING REMOTE\_IP:STRING

#### *17.1.11 PPP\_CONNECT*

The PPP\_CONNECT FB performs PPP connection setup or release, by means of a GPRS/UMTS 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.

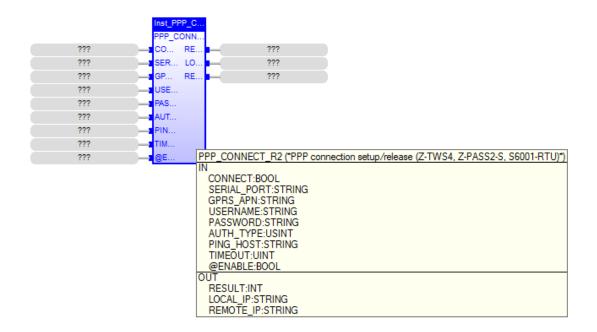
The FB has the following input parameters:

- CONNECT	: TRUE -> connection setup FALSE -> connection release
compatibility	<pre>: this parameter is not used (it is still present only for reasons); it can be set to '' (empty string) : GPRS Access Point Name (as given by the mobile operator);</pre>
is activated	if this parameter is left empty, "Automatic APN" functionality
- USERNAME	: username required for authentication (it can be empty, if authentication is not required); not used with "Automatic APN" functionality
- PASSWORD	: password required for authentication (it can be empty, if authentication is not required)
	not used with "Automatic APN" functionality
- TIMEOUT	: timeout, in seconds
- @ENABLE	: TRUE -> FB is executed FALSE -> FB is skipped

When CONNECT=FALSE, GPRS APN, USERNAME and PASSWORD parameters can be empty.

The FB has the following output parameters: - RESULT : -2, when called with ENABLE=FALSE -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 5, if MODEM\_RESET FB is running - LOCAL\_IP : IP address assigned to the PPP network interface (only if RESULT=1, when CONNECT=TRUE) - REMOTE\_IP : IP address of the remote host (set as default gateway) (only if RESULT=1, when CONNECT=TRUE)

*17.1.12 PPP\_CONNECT\_R2* 



The PPP CONNECT R2 FB performs PPP connection setup or release, by means of a GPRS/UMTS 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 : this parameter is not used (it is still present only for compatibility reasons); it can be set to '' (empty string) - GPRS APN : GPRS Access Point Name (as given by the mobile network operator); if this parameter is left empty, "Automatic APN" functionality is activated - USERNAME : username required for authentication (it can be empty, if authentication is not required); not used with "Automatic APN" functionality - PASSWORD : password required for authentication (it can be empty, if authentication is not required); not used with "Automatic APN" functionality - AUTH TYPE : authentication type: 0 : None 1 : CHAP/PAP 2 : CHAP only 3 : PAP only not used with "Automatic APN" functionality - PING HOST : IP address or Host Name used to check that PPP connectivity is available, running ping test; if this parameter is left empty, ping test is not performed - TIMEOUT : timeout, in seconds - @ENABLE : TRUE -> FB is executed FALSE -> FB is skipped

When CONNECT=FALSE, GPRS\_APN, USERNAME, PASSWORD and PING\_HOST parameters can be empty.

#### *17.1.13 PPP\_STATUS*

nst_PPP_ST. PPPP_STATU:	
??? <u>SER RE.</u>	
	PPP_STATUS (*PPP connection status (Z-TWS4, Z-PASS2-S, Z-MINIRTU)*)
	IN
	SERIAL_PORT:STRING
	OUT
	RESULT:INT

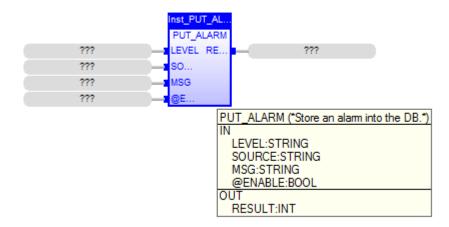
The PPP STATUS FB returns PPP connection status.

The FB has the following input parameters: - SERIAL\_PORT : this parameter is not used (it is still present only for compatibility reasons); it can be set to '' (empty string)

The FB has the following output parameters:

- RESULT : 0, PPP DISCONNECTED
  - 1, PPP CONNECTED
  - 2, PPP CONNECTING
  - 3, PPP DISCONNECTING

#### *17.1.14 PUT\_ALARM*



This FB stores an alarm record into the DB; the "index" and "timestamp" fields are set by the FB; the "status" field is set to 0 by the FB. The FB is also responsible for keeping the DB size (number of records) under a specified limit (e.g.: 1000). INPUTS:

```
- LEVEL: a string representing the alarm/event level (e.g.: "INFO") (max_len=10);
```

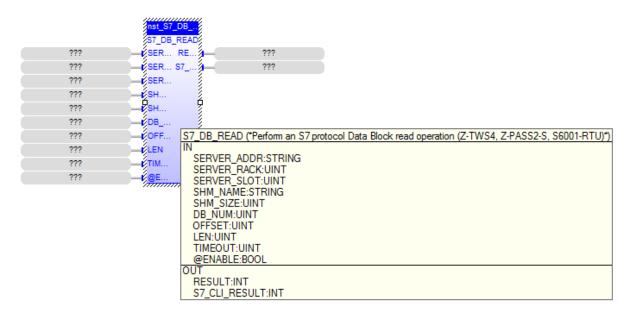
```
possible values are defined by the application
```

SOURCE: a string representing the alarm/event source (e.g.: "GRP1") (max\_len=10); possible values are defined by the application
MSG: the text message of the alarm (max\_len=255)
@ENABLE: TRUE -> FB is executed FALSE -> FB is skipped the parameter is set to FALSE by the FB at the end of execution

#### OUTPUTS:

- RESULT: the FB result; possible values are:
  - 0: FB still running
  - 1: FB successfully executed
  - -1: FB execution failed
  - -2: FB execution timeout

#### 17.1.15 S7\_DB\_READ



This FB performs an S7 protocol Data Block read operation. It connects to the specified S7 server IP address, rack and slot, performs the operation and then disconnects. The data read are written to the Straton shared-memory specified in the SHM\_NAME parameter.

#### INPUTS:

- SERVER ADDR: the S7 server IP address
- SERVER RACK: the S7 server rack number
- SERVER SLOT: the S7 server slot number
- SHM NAME: name of the Straton shared-memory which the data are written to
- SHM SIZE: size of the Straton shared-memory which the data are written to
- DB NUM: the number of the Data Block to be read
- OFFSET: start offset for the read operation in the Data Block
- LEN: number of bytes to be read
- TIMEOUT: timeout for the FB execution, in seconds

- @ENABLE: TRUE -> FB is executed
FALSE -> FB is skipped
the parameter is set to FALSE by the FB at the end of execution
OUTPUTS:

RESULT: the FB result; possible values are:
0: FB still running
1: FB successfully executed
-1: FB execution failed
-2: FB execution timeout

S7\_CLI\_RESULT: the S7 Client result; possible values are:

0: no failure
-1: invalid arguments failure
-2: initialization failure (e.g.: error opening the shared-memory)
-3: connection failure
-4: read operation failure

#### *17.1.16 S7\_DB\_WRITE*

1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1           1         1		Inst S7 DB2
???         SER RE         ???           ???         SER ST         ???           ???         SER         ???           ???         SH         P           ???         ESR         ST_DB_WRITE ("Perform an S7 protocol Data Block write operation (Z-TWS4, Z-PASS2-S, S6001-RT           IN         SERVER_ADDR:STRING         SERVER_SLOT.UINT           SERVER_SLOT.UINT         SERVER_SULT.UINT           DB_NUM:UINT         OFFSET:UINT           DB_NUM:UINT         OFFSET:UINT           @ENABLE:BOOL         OUT           RESULT:INT         RESULT.INT		
???         SER \$7         ???           ???         SER         ???           ???         SH            ???         PSH            ????         PSH            ???         PSH <td>???</td> <td><u> </u></td>	???	<u> </u>
???       SER         ???       SH         ???       COFF         ???       ELEN         SERVER_RACK.UINT         SERVER_RACK.UINT         SERVER_SLOT:UINT         SHM_NAME:STRING         SHM_SIZE:UINT         DB_NUM:UINT         OFFSET:UINT         LEN:UINT         TIMEOUT:UINT         @ENABLE:BOOL         OUT         RESULT:INT	777	
???       SH         ???       DB         ???       COFF         ???       ELEN         SERVER_ADDR:STRING         SERVER_RACK:UINT         SERVER_SLOT:UINT         SHM_SIZE:UINT         DB_NUM:UINT         OFFSET:UINT         LEN:UINT         TIMEOUT:UINT         @ENABLE:BOOL         OUT         RESULT:INT	777	
???       S7_DB_WRITE ("Perform an S7 protocol Data Block write operation (Z-TWS4, Z-PASS2-S, S6001-RT         IN       SERVER_ADDR:STRING         SERVER_RACK:UINT       SERVER_SLOT:UINT         SHM_NAME:STRING       SHM_SIZE:UINT         DB_NUM:UINT       OFFST:UINT         DFN:UINT       OFFST:UINT         DB_NUM:UINT       OFFST:UINT         UINT       UINT         OFFST:UINT       TIMEOUT:UINT         RESULT:INT       RESULT:INT	777	SH.
???       S7_DB_WRITE ("Perform an S7 protocol Data Block write operation (Z-TWS4, Z-PASS2-S, S6001-RT         IN       SERVER_ADDR:STRING         SERVER_RACK:UINT       SERVER_SLOT:UINT         SHM_NAME:STRING       SHM_SIZE:UINT         DB_NUM:UINT       OFFST:UINT         DFN:UINT       OFFST:UINT         DB_NUM:UINT       OFFST:UINT         UINT       UINT         OFFST:UINT       TIMEOUT:UINT         RESULT:INT       RESULT:INT		P <sub>SH</sub> 9
???       S7_DB_WRITE ("Perform an S7 protocol Data Block write operation (Z-TWS4, Z-PASS2-S, S6001-RT         IN       SERVER_ADDR:STRING         SERVER_RACK:UINT       SERVER_SLOT:UINT         SHM_NAME:STRING       SHM_SIZE:UINT         DB_NUM:UINT       OFFST:UINT         DFN:UINT       OFFST:UINT         DB_NUM:UINT       OFFST:UINT         UINT       UINT         OFFST:UINT       TIMEOUT:UINT         RESULT:INT       RESULT:INT		
???       S7_DB_WRITE ("Perform an S7 protocol Data Block write operation (Z-TWS4, Z-PASS2-S, S6001-RT         IN       SERVER_ADDR:STRING         SERVER_RACK:UINT       SERVER_SLOT:UINT         SHM_NAME:STRING       SHM_SIZE:UINT         DB_NUM:UINT       OFFST:UINT         DFNUM:UINT       OFFST:UINT         DB_NUM:UINT       OFFST:UINT         UINT       UINT         OFFST:UINT       TIMEOUT:UINT         RESULT:INT       RESULT:INT		OFF
???       S7_DB_WRITE ("Perform an S7 protocol Data Block write operation (Z-TWS4, Z-PASS2-S, S6001-RT         IN       SERVER_ADDR:STRING         SERVER_RACK:UINT       SERVER_SLOT:UINT         SHM_NAME:STRING       SHM_SIZE:UINT         DB_NUM:UINT       OFFST:UINT         OFFST:UINT       TIMEOUT:UINT         OFFST:UINT       TIMEOUT:UINT         OFFST:UINT       TIMEOUT:UINT         RESULT:INT       RESULT:INT		LEN
???       ST_DB_WRITE ("Perform an S7 protocol Data Block write operation (Z-TWS4, Z-PASS2-S, S6001-RT         IN       SERVER_ADDR:STRING         SERVER_RACK-UINT       SERVER_SLOT:UINT         SHM_NAME:STRING       SHM_SIZE:UINT         DB_NUM:UINT       OFFSET:UINT         LEN:UINT       TIMEOUT:UINT         @ENABLE:BOOL       OUT         RESULT:INT       RESULT:INT	222	- FTIM.
IN SERVER_ADDR:STRING SERVER_SLOT:UINT SHM_NAME:STRING SHM_SIZE:UINT DB_NUM:UINT OFFSET:UINT LEN:UINT TIMEOUT:UINT @ENABLE:BOOL OUT RESULT:INT	222	
SERVER_SLOT:UINT SHM_NAME:STRING SHM_SIZE:UINT DB_NUM:UINT OFFSET:UINT LEN:UINT TIMEOUT:UINT @ENABLE:BOOL OUT RESULT:INT		IN SERVER_ADDR:STRING
DB_NUM:UINT OFFSET:UINT LEN:UINT TIMEOUT:UINT @ENABLE:BOOL OUT RESULT:INT		SERVER_SLOT:UINT SHM_NAME:STRING
OFFSET:UINT LEN:UINT TIMEOUT:UINT @ENABLE:BOOL OUT RESULT:INT		
LEN:UINT TIMEOUT:UINT @ENABLE:BOOL OUT RESULT:INT		
TIMEOUT:UINT @ENABLE:BOOL OUT RESULT:INT		
OUT RESULT:INT		TIMEOUT:UINT
RESULT:INT		

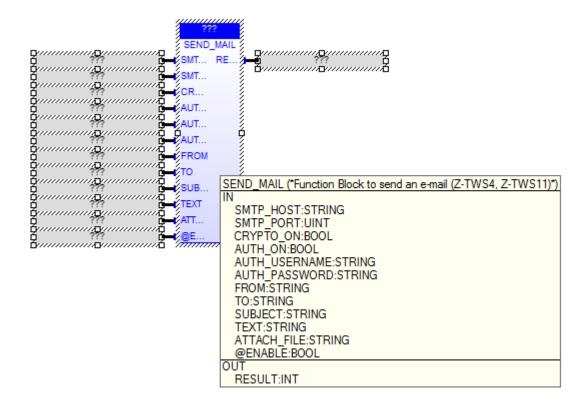
This FB performs an S7 protocol Data Block write operation. It connects to the specified S7 server IP address, rack and slot, performs the operation and then disconnects. The data to be written are read from the Straton shared-memory specified in the SHM\_NAME parameter.

INPUTS:

- SERVER ADDR: the S7 server IP address
- SERVER RACK: the S7 server rack number
- SERVER SLOT: the S7 server slot number
- SHM NAME: name of the Straton shared-memory which the data are read from
- SHM SIZE: size of the Straton shared-memory which the data are read from
- DB NUM: the number of the Data Block to be written
- OFFSET: start offset for the write operation in the Data Block
- LEN: number of bytes to be written
- TIMEOUT: timeout for the FB execution, in seconds
- @ENABLE: TRUE -> FB is executed

```
FALSE -> FB is skipped
the parameter is set to FALSE by the FB at the end of execution
OUTPUTS:
- RESULT: the FB result; possible values are:
    0: FB still running
    1: FB successfully executed
    -1: FB execution failed
    -2: FB execution timeout
- S7_CLI_RESULT: the S7 Client result; possible values are:
    0: no failure
    -1: invalid arguments failure
    -2: initialization failure (e.g.: error opening the shared-memory)
    -3: connection failure
    -4: write operation failure
```

#### 17.1.17 SEND\_MAIL

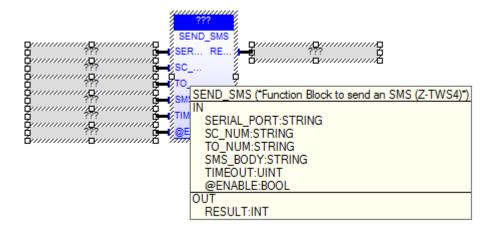


The SEND\_MAIL FB sends an e-mail, by means of the SMTP/SMTPS protocol. When first called, the FB runs a process which starts sending the e-mail; on subsequent calls, it only checks if the process has finished its job. The FB has the following input parameters: - SMTP\_HOST : IP address or host name of the SMTP/SMTPS server - SMTP\_PORT : TCP port for the SMTP/SMTPS protocol (normally: 25, for SMTP; 465, for SMTPS) - CRYPTO\_ON : if cryptography (SSL) shall be used (FALSE -> SMTP, TRUE -> SMTPS) (CRYPTO\_ON=TRUE is available only for Z-TWS4/Z-PASS2-S) - 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
                 more than one recipient can be specified, using the ','
character as separator
- SUBJECT
               : e-mail subject
- TEXT
                : e-mail text
                : name of the file (with path) to be attached to the e-mail (it
- ATTACH FILE
can be empty)
- @ENABLE
                : TRUE -> FB is executed
                  FALSE -> FB is skipped
The FB has the following output parameter:
- RESULT : -2, when called with ENABLE=FALSE
           -1, in case of any failure
            0, if the process is still running
            1, if the process has successfully finished.
```

#### 17.1.18 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 : this parameter is not used (it is still present only for
compatibility reasons); it can be set to '' (empty string)
- 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/SIM)
- 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 : -2, when called with ENABLE=FALSE
-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

4, if PPP is active, on Z-MINIRTU
5, if MODEM RESET FB is running

Please note that the SEND SMS FB can't be successfully executed while the PPP connection is active, on  $\overline{\rm Z}\mbox{-MINIRTU}.$ 

#### 17.1.19 SERVICE\_CTRL

	Inst_SERVI SERVICE	
???	SER RE	
???	SER ER	
???	TIM	
???	@E	
		SERVICE_CTRL (*FB to enable/disable remote connection services (Z-TWS4, Z-PASS2-S, S6001-RTU)*) IN SERVICE_ENABLE:BOOL SERVICE_LEVEL:INT TIMEOUT:UINT @ENABLE:BOOL OUT RESULT:INT ERROR:INT

The SERVICE\_CTRL FB enables or disables connection services, based on the required service level.

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

The FB has the following input parameters:

```
- SERVICE ENABLE : TRUE -> enable connection services
                  FALSE -> disable connection services
- SERVICE LEVEL : this parameter defines the "Security Level", that is it tells
which connection services shall be enabled/disabled;
possible values are:
 0: None
 1: VPN Connection
 2: VPN Service
 3: Internet Connection
 4: SMS Service
-1: the value of the "Security Level / Service Disable" configuration parameter
will be used
- TIMEOUT : timeout, in seconds
- @ENABLE : TRUE -> FB is executed
            FALSE -> FB is skipped
The FB has the following output parameters:
- RESULT : -2, when called with ENABLE=FALSE
           -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
- ERROR : this parameter is meaningful only when RESULT=-1; in all other cases,
it is set to 0;
possible values are:
1: the FB has been called with SERVICE LEVEL=0
2: the procedure to enable/disable the connection services is already running
3: the CPU configuration procedure is running -> FB execution has been aborted
```

4: connection services are disabled since Remote Connection Disable (RCD) digital input is HIGH -> FB execution has been aborted

### 17.1.20 SET\_ALARMS\_STAT

	nst_SET_AL
???	STA RE
???	FIR
???	
???	
	SET_ALARMS_STAT (*Set the status of the specified alams in the DB.*) IN STATUS:USINT FIRST_ID:UDINT LAST_ID:UDINT @ENABLE:BOOL OUT RESULT:INT

This FB sets the value of the "status" field for the alarm records specified by the passed arguments.

```
INPUTS:
- STATUS : this parameter is handled as a bitmask, meaning that the status of
the relevant alarm records will be set as:
 alarms.stat = (alarms.stat | STATUS), where:
 alarms.stat: DB field
 STATUS: this parameter
- FIRST ID : the id of the first record retrieved by the GET ALARMS FB
- LAST ID : the id of the last record retrieved by the GET ALARMS FB
- @ENABLE: TRUE -> FB is executed
          FALSE -> FB is skipped
          the parameter is set to FALSE by the FB at the end of execution
OUTPUTS:
- RESULT: the FB result; possible values are:
  0: FB still running
  1: FB successfully executed
  -1: FB execution failed
```

```
-2: FB execution timeout
```

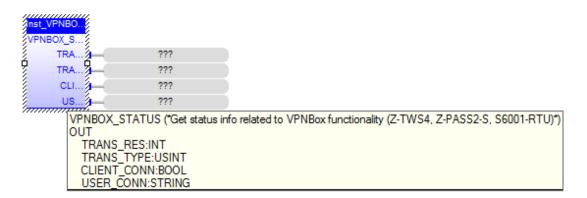
#### *17.1.21 TIME\_SYNC*

OTIME_SYNC	
	TIME_SYNC ("Time synchronization by means of NTP protocol (Z-TWS4, Z-TWS11)")
	IN
	@ENABLE:BOOL
	OUT
	RESULT:INT

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 The FB has the following output parameter: - RESULT : -2, when called with ENABLE=FALSE -1, in case of any failure 0, if the process is still running 1, if the process has successfully finished.

### 17.1.22 VPNBOX\_STATUS



This FB provides information about the VPN Box functionality.

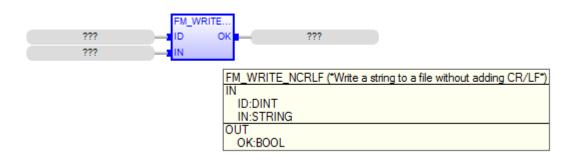
INPUTS: none

OUTPUTS: - TRANS\_RES : the result of the last VPN Box transaction performed by the CPU;

possible values: -2: No response from VPN Box -1: Invalid response from VPN Box 0: OK 3: Wrong password 7: License limit reached 201: Generic error 202: VPN Box not configured 1000: No transaction has been performed (e.g.: VPN Box functionality is disabled) other: Unexpected response - TRANS TYPE : the type of the last VPN Box transaction performed by the CPU; possible values: 0: None (no transaction performed) 1: Register 2: Poll - CLIENT CONN : flag telling if a VPN Client is connected (meaningful only for "Point-to-Point" VPN Box) 0: no VPN client is connected 1: a VPN client is connected - USER CONN : if a VPN Client is connected, this parameter provides the authenticated username; otherwise, it is an empty string ('') (meaningful only for "Point-to-Point" VPN Box)

# **17.2 Functions**

### 17.2.1 FM\_WRITE\_NCRLF



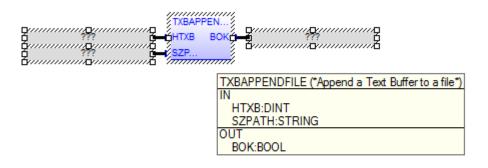
Same behaviour as FM\_WRITE but without inserting final CR-LF  $\,$ 

Input parameters:
- ID: id of the file (already open)
IV

- IN: string to write into the file

Output parameters:
- OK: boolean result value: (TRUE:success, FALSE:failure)

# **17.2.2 TXBAPPENDFILE**

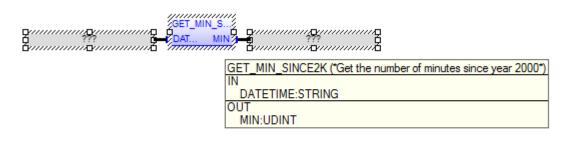


Append a Text Buffer to a file (without reloading the file).

Input parameters
- HTXB: Text Buffer handle
- SZPATH: file absolute path

Output parameters
- BOK: boolean result value: (TRUE:success, FALSE:failure)

#### 17.2.3 GET\_MIN\_SINCE2K



This function returns the current number of minutes since January 1, 2000 0:00:00, if DATETIME is empty or DATETIME is not a valid date/time; otherwise, it returns the number of minutes since January 1, 2000 0:00:00, corresponding to DATETIME. DATETIME shall have the following format: "dd/mt/yyyy hh:mm:ss"

#### **17.2.4 WDOG\_KEEP\_ALIVE**

WDOG\_KE... RE... ??? WDOG\_KEEP\_ALIVE ("Function to refresh the HW Watchdog (Z-TWS4, Z-PASS2-S, S6001-RTU)") OUT RESULT:INT

This function restarts the HW Watchdog timer.

NOTICE: once enabled, the HW Watchdog cannot be disabled; the WDOG\_KEEP\_ALIVE function shall be called to restart the timer; if timeout elapses, an HW reboot is triggered.

To let this function actually work, the "WATCHDOG/Enable" parameter in the CPU configuration shall be set to "OFF"; otherwise, the function will return the -2 value (see below).

INPUTS: none

OUTPUTS:

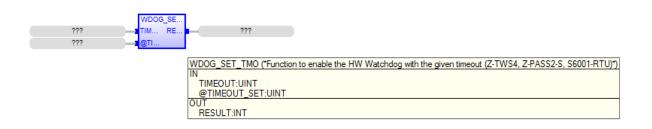
- RESULT: the function result; possible values are:

0: OK

-1: watchdog setting failed (WDOG\_SET\_TMO function has not been called or failed)

-2: watchdog controlled by system ("WATCHDOG/Enable" parameter set to "ON") -3: watchdog keep-alive failed

#### **17.2.5 WDOG\_SET\_TMO**



This function enables the HW Watchdog.

NOTICE: once enabled, the HW Watchdog cannot be disabled; the WDOG\_KEEP\_ALIVE function shall be called to restart the timer; if timeout elapses, an HW reboot is triggered.

The function can be called many times; if the timeout value is the same already set, it will do nothing; otherwise, the new timeout value will be set.

To let this function actually work, the "WATCHDOG/Enable" parameter in the CPU configuration shall be set to "OFF"; otherwise, the function will return the -2 value (see below).

INPUTS:

TIMEOUT: Watchdog timeout, in seconds; possibile values: [30..3600]; if an out-of-range value is given, the default value 60 will be set
@TIMEOUT\_SET: at the end of the execution, this parameter will contain the timeout value actually set (in seconds)

OUTPUTS:

RESULT: the function result; possible values are:
0: OK
-1: watchdog setting failed
-2: watchdog controlled by system ("WATCHDOG/Enable" parameter set to "ON")

# **18 Z-NET4**

When using Z-TWS4/Z-PASS2-S/S6001-RTU with Modbus RTU I/O Modules, a very useful and powerful tool is provided by the Z-NET4 program suite, running on Windows PCs.

Among other things, these programs let you:

- automatically discover the I/O modules available on the bus;
- configure the CPU (Z-TWS4/Z-PASS2-S/S6001-RTU) and the I/O modules;
- automatically create a StratON project containing the I/O variables, with the Modbus tasks needed to acquire/control them; for S6001-RTU, variables corresponding to the CPU I/Os are also inserted into the project
- automatically generate code for the StratON project, performing "Remote Control Functions", such as:
  - Data Logging
  - Command and Status SMS
  - Alarm generation
- easily create custom web pages, with graphic widgets, and upload them to the CPU (these pages can be accessed on the standard HTTP [80] TCP port).

The Z-NET4 SW is available at the following link:

http://www.seneca.it/products/z-net4

Please contact Seneca to get more information about the Z-NET4 suite.

# **19 Access to Straton variables**

The aim of this chapter is to explain how an application (typically, web-based) can access the variables of the Straton Soft-PLC running on Z-TWS4/Z-PASS2-S/S6001-RTU.

Currently, there are two ways to access Straton variables:

- direct access to Straton shared-memory
- access by means of CGI

The main differences between the two methods is that the first requires developing a C program, running on the Device, typically invoked by the *lighttpd* web server, while the second does not require any changes in the Device FW, provided that the currently supported CGIs are used.

# **19.1 Shared Memory**

Straton Workbench lets you define a shared-memory area and tell which PLC variables shall be put in it.

Image: Second constraints     I	5	STRATON - test_zp	ass2s_retain		- 🗆 🗙
Workspace     Ditwork     If #2       Image: Complex state of the	File Edit View Insert Project Tools Wind	low Help			
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Image: Splatup       Image		2NE1_SHM [4096]			main (*main program*)
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For each variable in the shared-memory, the Workbench lets you define the following properties:

- Symbol: the name of a Straton variable defined elsewhere (Global Variables, Retain Variables etc.)
- *Offset*: the offset in the shared-memory
- *Size*: the variable size, in bytes
- Format: the kind of variable, i.e. "signed integer"
- *Mode*: if the variable is an *Input*, an *Output* or an *In/Out* (from the Straton point of view)

	Variable	×
Identification Symbol: Offset:	VarINT	OK Cancel
Format in sha Format: Select a pr	signed integer v Size: 2 edefined data type v	
Output	de rom shared memory to STRATON) (from STRATON to shared memory) Bidirectional)	

The list of variables in the shared-memory, along with their properties, can be saved to / loaded from a *csv* file; the format of this file is as in the following example:

```
"NAME";"OFFSET";"SIZE";"FORMAT";"MODE";"ERROR_REPORT"
"VarINT";"0";"2";"0";"2";"CPU_ErrorReport_dummy"
"VarUINT";"2";"2";"1";"2";"CPU_ErrorReport_dummy"
"VarDINT";"4";"4";"0";"2";"CPU_ErrorReport_dummy"
"VarUDINT";"8";"4";"1";"2";"CPU_ErrorReport_dummy"
```

# 19.2 C program example

In this paragraph, an example is given of a simple C program which can be used to access a shared-memory.

The program arguments lets you specify:

- the shared-memory name
- the shared-memory size
- the offset, used to tell the program from which address in the shared-memory it shall start printing byte values

```
int main(int argc, char* argv[])
{
    long shmid;
    char *pMap;
    sem_t *sem;
    int i, iCpt ;
    for (i=1; i<argc; i++)
    {
        if (strcmp (argv[i], "?") == 0 || strcmp (argv[i], "/?") == 0)
        {
            printf ("Syntax: shmtest [options]\n");
            printf ("Options:\n");
            printf (" /name= Named memory\n");
            printf (" /size= Memory size\n");
        }
    }
}
</pre>
```

```
printf (" /offset=
                                Memory offset\n");
        return 0;
    }
    if (strncmp (argv[i], "/name=", 6) == 0)
    {
        strcpy (szName, (argv[i] + 6)) ;
    }
    else if (strncmp (argv[i], "/size=", 6) == 0)
    {
        wSize = atoi (argv[i] + 6);
    }
    else if (strncmp (argv[i], "/offset=", 8) == 0)
    {
        wOffset = atoi (argv[i] + 8);
    }
}
shmid = shm_open(szName, O_RDWR, S_IRWXO|S_IRWXG|S_IRWXU) ;
if (shmid < OL)
{
   printf("Error shm open : <%s>\n", szName) ;
   return 0;
}
ftruncate(shmid, wSize) ;
pMap = mmap(NULL, wSize, PROT READ | PROT WRITE, MAP SHARED, shmid, 0);
if (pMap == MAP FAILED)
{
   printf("Error mmap : <%s> size <%d>\n", szName, wSize) ;
   return 0;
}
sem = sem open(szName, O RDWR, S IRUSR | S IWUSR, 0);
if (sem == SEM FAILED)
{
   printf("Error sem_open : <%s>\n", szName) ;
   return 0;
}
init_keyboard() ;
iCpt = 0;
while(_ShouldTerminate()==0)
{
    sem wait(sem) ;
    printf("Iteration %d\n", iCpt++) ;
   for (i=0+wOffset ; i<wSize ; i++)</pre>
     printf ("%02X ", (unsigned char)pMap[i]);
     if ((i+1)%16 == 0)
       printf("\n") ;
    }
    sem_post(sem);
   usleep(100*1000) ;
   system("clear") ;
}
close_keyboard() ;
munmap(pMap, wSize);
sem close(sem);
close (shmid) ;
return 0;
```

}

Note that the above code will print shared-memory byte values, without any knowledge of the variables properties.

Indeed, it is important to understand that <u>the shared-memory contains only the variables values</u>; the variables properties shall be retrieved, for example, by loading them from the *csv* file, shown above.

Below, some lines of code are given providing some definitions useful for variables properties handling.

```
#define VAR NAME MAX LEN 50
#define VAR MAX NUM 100
typedef enum
{
    VAR FORMAT INT,
   VAR FORMAT UINT,
   VAR_FORMAT_FLOAT,
   VAR_FORMAT_STRING,
   VAR FORMAT NUM
} VAR FORMAT T;
const char *var_format_str[] =
{
    "integer",
    "unsigned integer",
    "float",
    "string"
};
typedef enum
{
    VAR MODE_IN,
    VAR MODE OUT,
    VAR MODE INOUT,
    VAR MODE NUM
} VAR MODE T;
const char *var_mode_str[] =
{
    "input",
    "output",
    "input/output"
};
typedef struct VarDescrS
{
    char name[VAR NAME MAX LEN+1];
    unsigned int offset;
   unsigned int size;
   VAR FORMAT T format;
   VAR MODE T mode;
} VarDescrT;
static VarDescrT *vars[VAR MAX NUM];
```

# 19.3 CGI

Another way to gain access to the Straton variables is by means of CGIs.

The variables that can be read/written by means of CGIs are those which are placed in the Straton sharedmemory. In the Device FW, a daemon is running which:

- parses the CGI requests
- reads/writes the requested variables from/to the shared-memory
- gives back the values/results in the CGI responses

Two CGIs are defined, one to read and one to write variables, as described in the following.

Both CGIs shall be inserted into HTTP POST requests.

It is important to note that, as far as the variables properties are concerned, normally the application sending the CGIs doesn't need to know the offset, size and format of a variable, while it needs to know the variables names and, possibly, the variables modes, to tell which variables can be read/written and which can only be read.

# 19.3.1 CGI "readVariable"

To read one variable:

```
request:
goform/readVariable?nVars=1&var1=<var name1>
response:
#<var name1>
                                <var code1> <var add info1>
<var value1>
Example:
request:
goform/readVariable?nVars=1&var1=M1 Output 1
response (successful case):
# M1 Output 1
                               0
1
response (failure case):
# M1 Output 1
                               5 Operation timeout
```

The CGI can be extended to read N variables (N>1), for example to read 2 variables:

goform/readVariable?nVars=2&var1=<var name1>&var2=<var name2>

The response contains N sections with the format described above.

### 19.3.2 CGI "writeVariable"

To write one variable:

Example:

request goform/writeVariable?nVars=1&var1=M1\_Output\_1&value1=1 response (successful case): # M1\_Output\_1 0 response (failure case): # M1\_Output\_1 5 Operation timeout

The CGI can be extended to write N variables (N>1), for example to write 2 variables:

```
goform/writeVariable?nVars=2&var1=<var_name1>&var2=<var_name2>&value1=<va
r_value1>&value2=<var_value2>
```

The response contains N sections with the format described above.

# **20 Glossary**

<u>Router</u>: a networking device that forwards data packets between computer networks, e.g. between a LAN and a WAN (the Internet).

<u>Switch</u>: a networking device that connects devices together on a computer network, by using a form of packet switching to forward data to the destination device.

<u>VPN</u>: a Virtual Private Network extends a private network across a public network, such as the Internet. It enables a device to send and receive data across the public network as if it were directly connected to the private network. A VPN is created by establishing a virtual point-to-point connection through the use of tunnelling protocols, with traffic encryption.

<u>Tunnel</u>: an IP tunnel is an Internet Protocol (IP) network communications channel between two networks. It is used to transport another network protocol by encapsulation of its packets.