100% Made & Designed in Italy

MULTIFUNCTION IIoT HMI

SENECA

www.seneca.it

A "SURPRISE" IN THE HMI

INTEGRATED SOLUTION

SURPRISE Smart Display is a latest generation 7" touch operator terminal with powerful 800 MHz ARM microprocessor, dual Fast Ethernet port, 802.11 b/g/n Wi-Fi module, interfaces and sniffer function for serial lines. It is a multi-purpose device with IIoT gateway, datalogger, Wi-Fi router, microcontroller with integrated I/O, remote assistance unit and remote control on LET'S platform.

HTTP POST

In IIoT, communication can also take place via http post protocol, where in the REST (REpresentational State Transfer) architecture the data are configured with the JSON (JavaScript Object Notation) format. Therefore http post can be used to send log samples and alarms (events), manage in advanced mode the datalogger and server settings (tags, updates, ftp configurations).

CLOUD SUPPORT

SSD can connect industrial machines and plants, and thousands of I/O in the field, to third party Cloud platforms through http/ Mqtt protocols. An alternative provided by SENECA is the CLOUD BOX server, an "on premise" solution, also available in Virtual Machine / VmWare version, where data is stored on a centralized database.

DUAL ETHERNET INTERFACE (LAN / WAN)

SSD can manage and separate different connections via 2 Ethernet ports (1 WAN and 1 LAN). This allows to coexist wired and wireless connections, in addition to resolve IP conflicts during the installation of new machines and plants. It is also facilitated access to devices via network segments blocks.

LOGICA IF-THEN-ELSE

SSD allows the implementation of logical rules affecting integrated or external I/O (acquired or written in shared memory). The control logics that can be set (e.g. continuous or event-driven writing, alarm sending, data processing, etc.) have a maximum number of 2,000 rules.

WI-FI

SSD is equipped with an 802.11 b/g/n 2.4 GHz Wi-Fi module with router or redundant network drive functionality. It is also selectable in Station mode (connected to an existing Wi-Fi access point) or Access Point mode (to which other devices can connect).

MQTT

SSD opens to the IoT world thanks to the support of the MQTT (Message Queue Telemetry Transport) protocol, ideal for realtime data transmission and M2M connections. The parameterization of the MQTT Client is done via Web Server. To enable secure connections (SSL/TLS) it is possible to use digital certificates.

OPC UA

OPC UA is a standard for cross communication based on the Client / Server principle via an independent platform. SSD operates as OPC UA Server and can be used in automation and data management applications with OPC UA clients from other manufacturers, in accordance with major security protocols such as SSL/TLS and X.509.

NAT 1:1 E STATIC ROUTER

The NAT 1:1 and Static Router features allow direct communication between the WAN and LAN automation network (which by default are independent and not communicating with each other). They also allow the deviation of the outgoing traffic from the SSD to a particular host or subnet.

ACCESSO REMOTO VPN

SSD è anche un Client della piattaforma di accesso remoto a macchine e impianti LET'S. Tramite il Server VPN BOX è possibile implementare connessioni Punto-Punto e On- Demand (P2P) verso il campo o creare reti virtuali, per connessioni «Always ON» di supervisione, gestione e monitoraggio di impianti remoti (Single LAN).

EASY INSTALLATION

SSD can be wall mounted using the external holes of the mounting accessory (supplied already assembled to the instrument) inside a masonry wall box according to size 503. Ease of installation in this mode allows easy wiring, coupling and Box-SSD side-by-side.

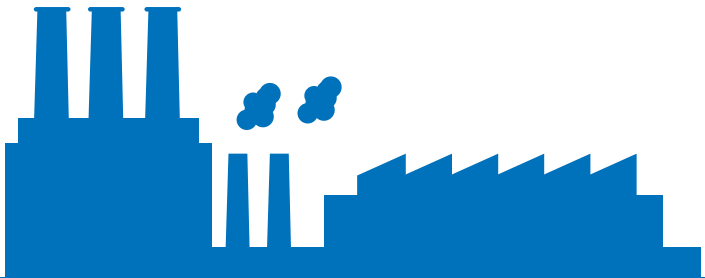
THE ALL-IN-ONE HMI SOLUTION WITHOUT PROGRAMMING FOR YOUR IIOT PROJECT

MQTT OPC UA http post

PLC | Factory Machine | Network equipments

BUILDING

MANUFACTURING



	Functions	Standard Version	Option -L (Logic)	Option -V (VPN)	Option -I (IoT)
1	Widget-based HMI 7" touchscreeb	X			
2	Remote Display	X			
3	Display On Display	X			
4	MoBUS Gateway (Serial / Ethernet, Shared memory, Transparent)	X			
5	IoT / Cloud Gateway (con supporto MQTT e http post)				X
6	Datalogger	X			
7	Alarm Unit	X			
8	LAN / WAN splitter	X			
9	Wi-Fi Router / Access Point	X			
10	Serial sniffer	X			
11	Microcontroller with built-in I/O		X		
12	Remote assistance / telecontrol VPN module			X	

7" TOUCHSCREEN

LET'S

Wi Fi

OPC UA

MQTT

OPENVPN

ModBUS Devices

SCADA / MES

HARDWARE
- Power supply 24Vac/dc
- Flash Memory 2 / 4 GB
- Nr.2 DI/DO
- IP64 degree of protection with membrane
- Operating temperature -20..+60°C

VISUALIZATION
- Display 7" TFT , 16M colours
- Capacitive multitouch
- 800x480 pixel resolution
- Standard widget display
- Display on Display
- Remote display

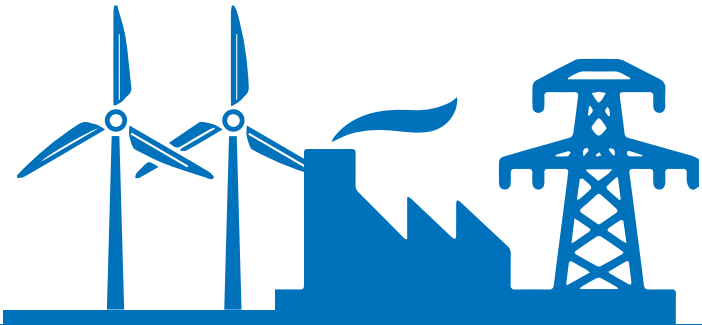
STANDARD COMMUNICATION
- Nr.2 Fast Ethernet ports
- Nr.2 serial ports
- Nr.2 USB ports
- ModBUS RTU
- ModBUS TCP-IP
- Max 32 TCP-IP clients, 2000 tags, 128 ModBUS slave nodes
- Max 244 slave nodes (128 on single serial without repeater)

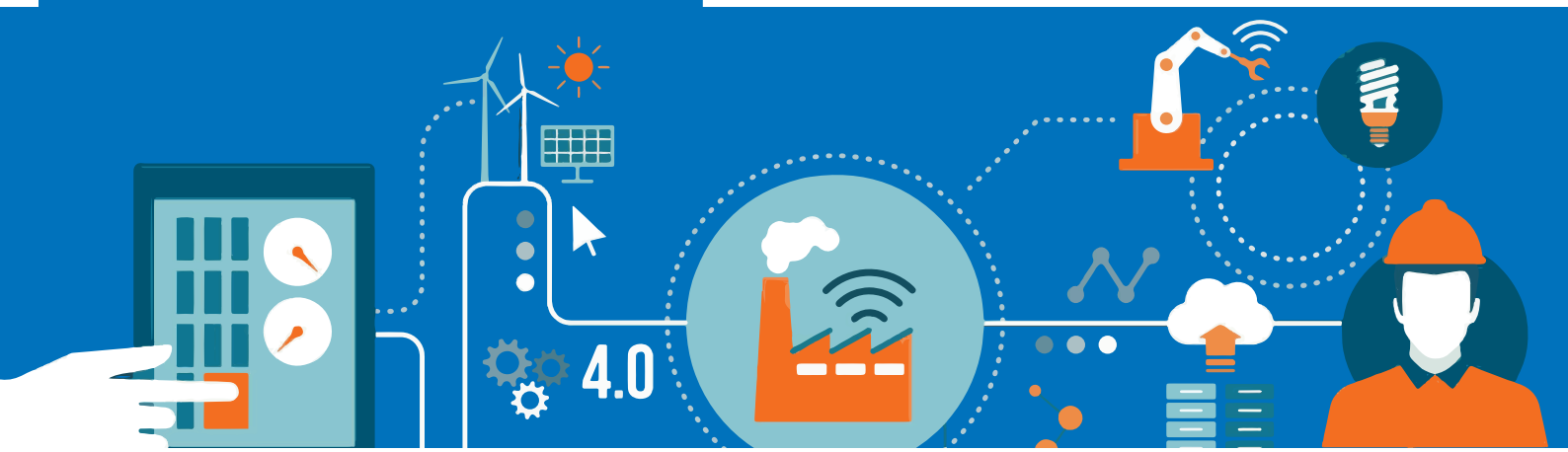
SETTING
- Built-in Web Server
- Widget library
- VPN management software
- Network management software (SDD, SESC)
- DIP switch factory reset
- Firmware update via web or usb pen (Fat32)

IIOT PROTOCOLS
- MQTT
- OPC UA
- http post, https
- Ftp / SFtp
- Cloud Support
- OpenVPN / SSL

CYBERSECURITY
- Data Encryption: Blowfish — Blowfish (128bit) in CBC mode
- Data Authentication: SHA1 — HMAC using Secure Hash Algorithm (160bit)
- Certification authority provided by VPN BOX
- Handshake Encryption: TLSv1/SSLv3 RSA- 2048 — 2048bit Ephemeral Diffie-Helman (DH)
- Service Channel: TLSv1/SSLv3 2048bit certificate

ENERGY





12 REASONS TO CHOOSE SURPRISE SMART DISPLAY

MULTIFUNCTION DEVICE

Surprise Smart Display is not only a touchscren HMI, but a multifunction device that integrates IIoT gateway, Wi-Fi router, remote assistance module, datalogger, microcontroller, serial sniffer and I/O.

A REAL IIOT DEVICE

The device can take advantage of the http post protocols and MQTT to connect to IoT / Cloud, as well as using OPC UA to read, write and export the tags of the variables of process towards SCADA, MES and software management.

IMMEDIATE USE

The preloaded software application enables the displaying parameters, sending commands, the configuration of the tags, the communication, of the individual video pages and alarm management. The project is configured directly on the device.

FLEXIBLE VISUALIZATION MODE

Surprise Smart Display has a display capacitive multitouch with 3 interface modes: widget-based, “Remote Display” interface and “Display on Display” for devices without monitor.

NO PROGRAMMING

No activity or competence of programming is necessary. It is in fact available a rich widget library of to create video pages, as well as the configurability of parameters remotely via Web Server.

WIRED / WIRELESS COMMUNICATION

communication operations flexible and command. The wireless use allows you to transmit data without long cables in the way.

SIMULTANEOUS CONNECTION WITH SEVERAL DEVICES

The device can operate as a Gateway from Modbus / Ethernet on multiple serial and in “shared memory” mode managing up to 32 Modbus TCP Client nodes simultaneously.

DATA ACQUISITION

SSD is a powerful data acquisition, visualization and export system thanks to its I/O and integrated datalogger. For each group of dataloggers 1,000 log files, 100,000 samples and 2,000 tags are managed.

POWER MONITORING

Thanks to the easy integration with the R203 network analyzer, SSD enables the analysis of all electrical parameters, displaying them with simplicity and speed in the intuitive icons and widgets based interface.

REMOTE MAINTENANCE

The device can create VPNs using as a server both Seneca VPN BOX and the OpenVPN standard and therefore allow the remote maintenance of machines and systems.

SUPERVISION AND REMOTE CONTROL

SSD also works as a monitoring, remote assistance and remote control unit on VPN infrastructure or local network allowing access to remote sites in total security.

UNIVERSAL APPLICATIONS

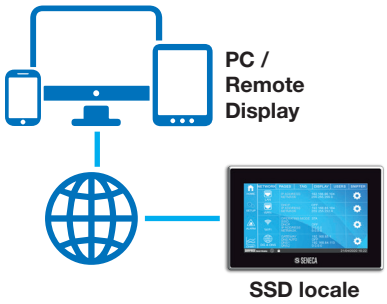
The main applications of the device include remote maintenance tasks, alarm management and data analysis, connection simultaneous with several devices, remote control, supervision of production activities and interconnected 4.0 solutions.

VISUALIZATION MODE

Display standard widget based 7”

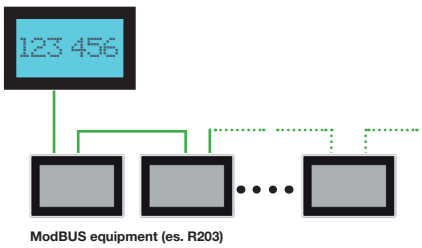
- HMI capacitive touchscreen, 800x480 dpi, multitouch recognition
- Setup menu (device configuration, LAN, WAN, WiFi, pages, widgets, display, tags, users, serial sniffer)
- Alarms menu (viualization, historical)
- Chart menu (real time or historical tag values - in fixed period)
- Page Widget (widget / tag association, page change, page type)

Remote Display



- All the operations managed on the local display can also be carried out remotely
- Connection from PC via LAN or web
- PC connection via web browser, port 80 (default) and SSD IP address
- Remote display that can be activated with any device and any operating system
- Download files from your PC

Display On Display



- Self-configuring backlit display for ModBUS device / Ethernet via special widget
- Screen digitisation for blind devices
- Management of up to 4 readings side by side per device or full screen
- Scroll screens
- Automatic network scanning
- Compatibility with daisy chain connection

BASIC CONFIGURATIONS (FROM DISPLAY)

SSD allows the creation of custom pages and the configuration of an automation project directly from touch panel with an extensive library of available widgets.

NETWORK
In this section you can configure the settings of the two Ethernet LAN and WAN ports and the Wi-Fi module. In the Wi-Fi section you can also select Wi-Fi Station or Access Point mode.

PAGES
On this screen you can add as many pages of widgets as you want, once set you can access the configuration of each page.

TAGS
In this section you can view the configured tags.

DISPLAY
In this section you can configure the brightness of the screen, language and screen refresh time.

USERS
In this section you can configure users who can access the display. You can avoid the need to enter a login to access the display (free access) or activate an administrator account and/or guest account.

SNIFFER
The serial sniffer function (in passive mode with read-only tag) allows to insert one or more Smart Displays in an existing system with Modbus RTU RS485 protocol.

ALARMS
This section shows the active alarms and alarm history. If the alarm requires manual confirmation, this can be done using the appropriate button.

CHARTS
In the Chart Real Time section you can display the tag values in real time (maximum 10 tags). In the Historical section, instead, you can load data in the desired range. You can also export the chart values you are displaying.

WIDGET
In the widgets section, interface elements will appear graphics associated with the configured tags. Among the available widgets: text, gauge, led, switch, real-time graph.

ADVANCED CONFIGURATIONS (FROM WEB SERVER)

For more advanced configuration and operation requirements, particularly in terms of connectivity and control logics, SSD offers a Web Server through which remote configurability is assured and complete with the device from a specific IP address (e.g. http://192.168.90.101:8080)

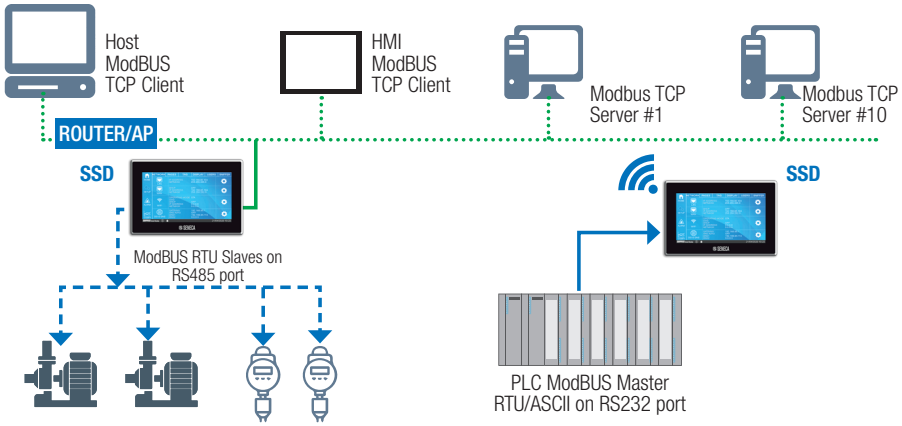
SSD CONFIGURATION		
	By SSD (on board)	By Web Server / PC
PAGES AND VARIABLES		
Pages	x	
Tags	x	x
Display	x	
User / Account	x	x
Alarms	x	x
Charts	x	
Widgets	x	
I/O / Tags / Registers	x	x
Device DB		x
COMMUNICATION		
Networksd and services	x	x
Communication and protocols		x
Sniffer	x	
Wi-Fi		x
Gateway		x
VPN		x
OPC UA		x
Router / NAT 1:1		x
UTILITIES AND CONTROLS		
Messaggs		x
RTC		x
Timer and Logic		x
Firmware		x
Licensing		x
VISUALIZATION MODE		
Standard Display	x	
Remote Display		x
Display On Display	x	

MAIN FUNCTIONS

1. MODBUS GATEWAY ETHERNET TO SERIAL
2. MODBUS GATEWAY “SHARED MEMORY
3. TRANSPARENT GATEWAY
4. IOT / CLOUD GATEWAY
5. DATALOGGER
6. REMOTE ALARM UNIT
7. WI-FI ROUTER
8. LAN / WAN SPLITTER
9. SERIAL SNIFFER
10. MICROCONTROLLER
11. VPN - REMOTE ASSISTANCE UNIT - POINT-TO-POINT
12. VPN - REMOTE CONTROL UNIT -SINGLE LAN

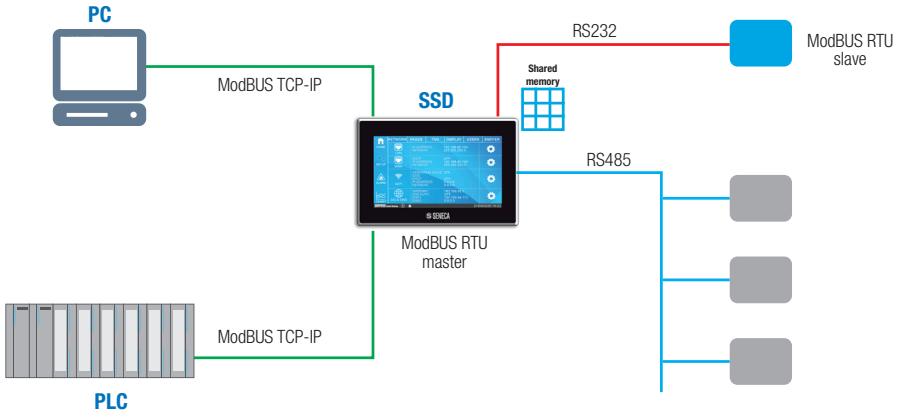
1 - MODBUS GATEWAY - ETHERNET TO SERIAL

- Gateway from Modbus Ethernet to Serial
- Modbus TCP requests converted to Modbus RTU and sent to the serial interface
- Modbus RTU replies received from the serial interface converted into Modbus TCP replies
- Modbus Ethernet ↔ Serial Gateway instances that can be activated for each serial port
- Ethernet Modbus Gateway Conversion ↔ Serial to multiple serials simultaneously
- Modbus Ethernet to Serial Gateway instances with support for up to 32 simultaneous TCP connections



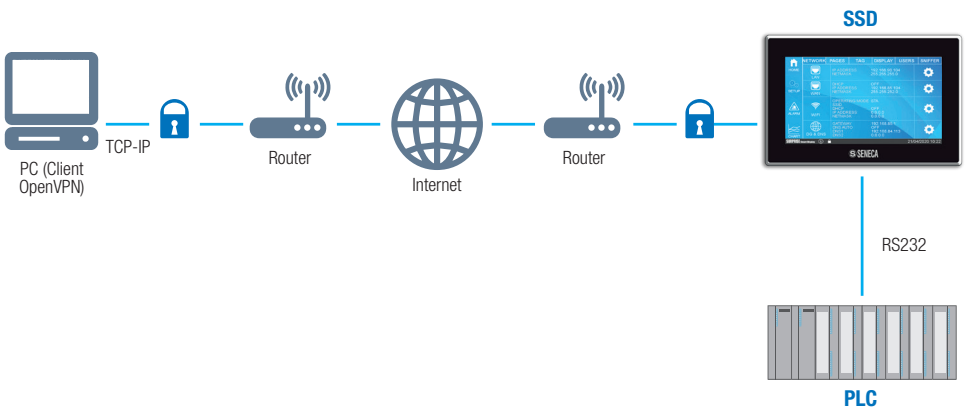
2 - MODBUS GATEWAY «SHARED MEMORY»

- Continuous data acquisition via Modbus TCP/Modbus RTU
- Data storage on shared memory
- Tags in read / write always available both Ethernet and Serial side
- Possibility to manage alarms, process data and command event or continuous writes

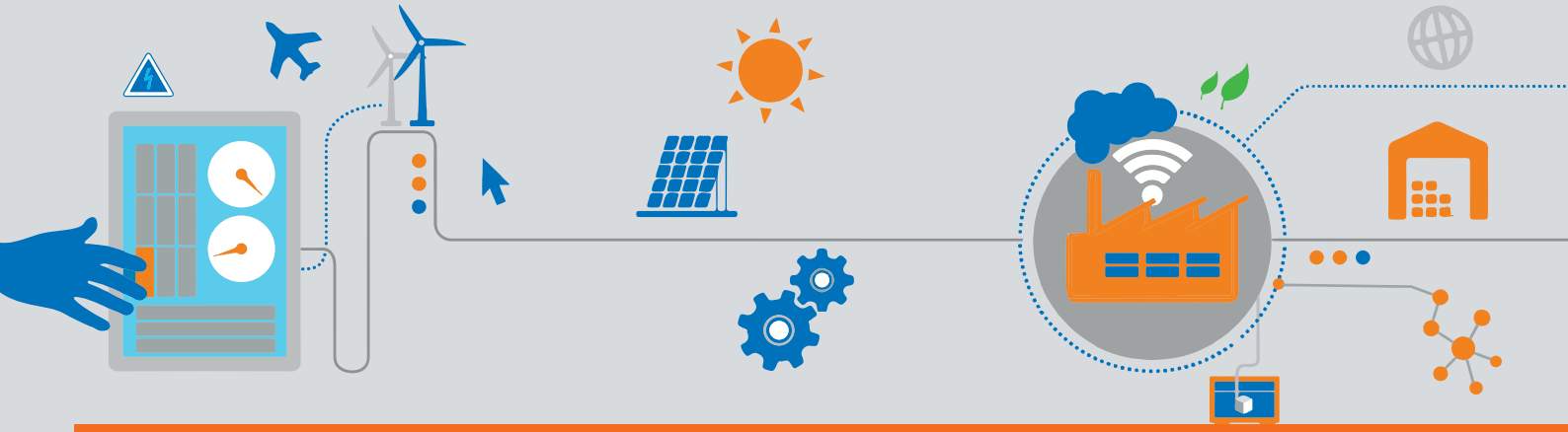


3 - TRANSPARENT GATEWAY / REMOTE COM PORT / TUNNELLING

- Integration with software application that supports serial communication only
- Extension of serial communication via LAN/VPN connection
- Transparent TCP connections to RS232/RS485 protocol
- P2P or PMP UDP / TCP tunnel: communication extension serial between 2 devices via LAN/WAN/VPN



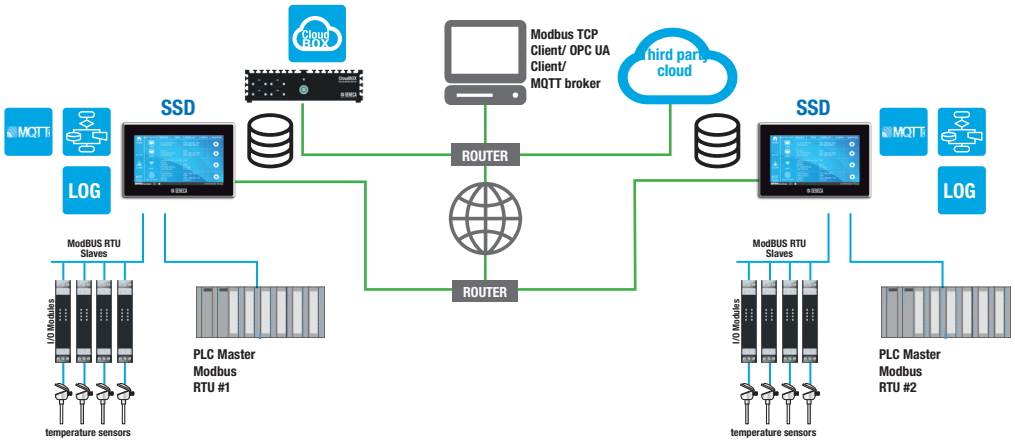
SSD SURPRISE SMART DISPLAY



MAIN FUNCTIONS

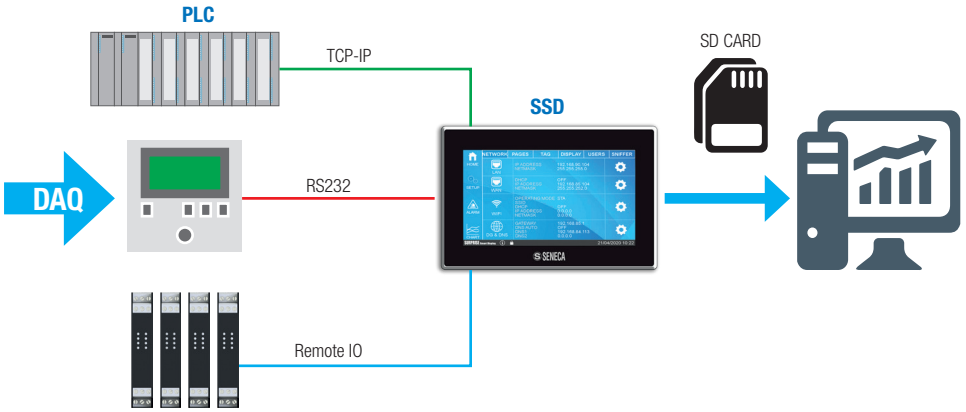
4 - IOT/ CLOUD GATEWAY

- Storage on SD and transmission via Ftp/Email/MQTT/HTTP of data and events associated with connected devices
- Compatibility with CLOUD BOX SENECA Cloud solution
- IoT on premixes, for data storage and web synoptic development
- Third party cloud compatibility
- Automation and data management applications with the OPC UA client of other producers
- Authentication of SSL/TLS security connections with certificates digital
- Standard, independent architecture platform and protocol



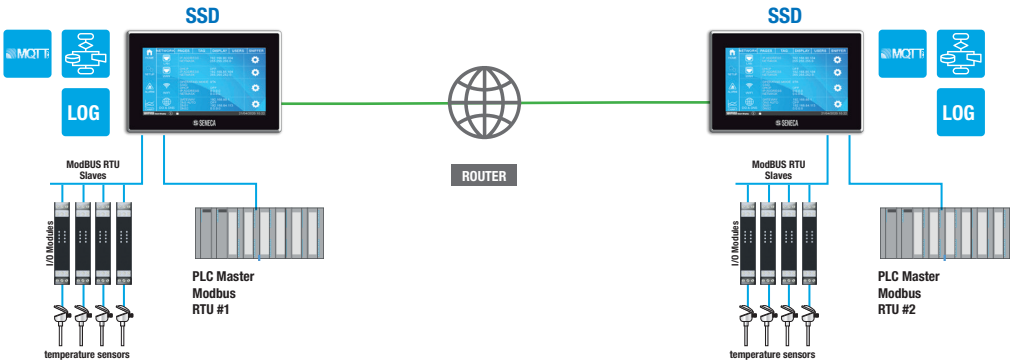
5 - DATALOGGER

- Multivariable real-time DAQ system with shared gateway mode memory
- Trend display
- Management of up to 1000 log files / 100,000 samples
- Tag values stored in log files
- Tag associated up to a maximum of 4 groups with different periods of sampling and transfer
- File transfer via key USB, FTP server, email, http post, MQTT
- “Rotate” of the log file (the oldet are overwritten by new)
- The standard “csv” log files processed by Excel™ or from PC software



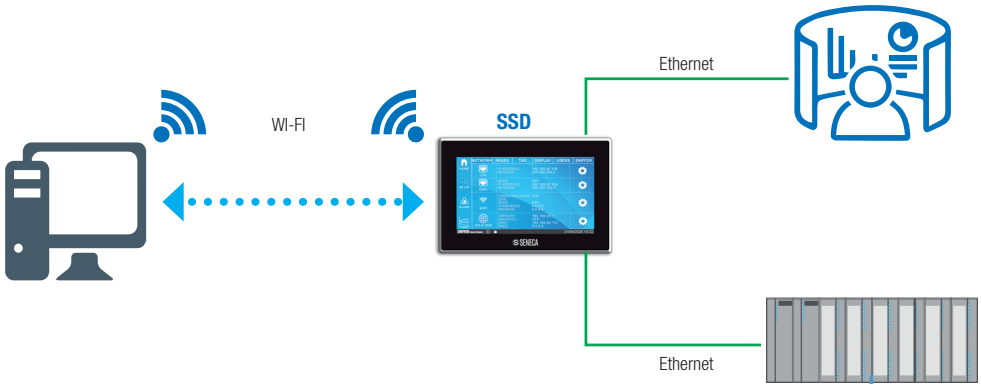
6 - REMOTE ALARM UNIT

- Remote alarm management
- Commands sent with Unicode multi-language support
- Direct user commands
- Activation of contacts in case of machine or system anomaly
- Alarm notifications via email, http post, Cloud BOX, MQTT
- Signals of exceeding thresholds or change of status



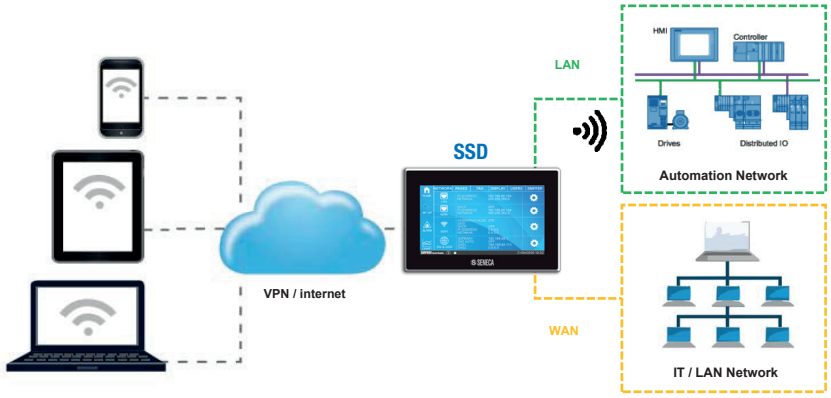
7- ROUTER WI-FI

- LAN (Ethernet) / WAN (Mobile Network) / WIFI packet routing or via mobile connection.
- Re-route actual destination packet (IP forwarding)
- Replacing source IP address with WAN IP address (IP masquerading)
- DNS Server/Forwarder availability with or without external DNS
- DHCP Server availability for IP assignment over LAN or via Wi-Fi in Access Point mode
- Definition of “Port Forwarding” or “Virtual Servers” rules
- Router + VPN functionality for using local addresses



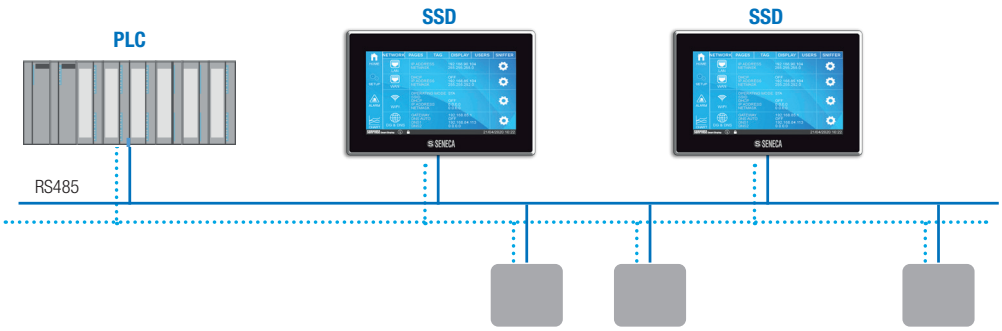
8 - LAN /WAN SPLITTER

- Isolation of the Corporate Network (WAN) from the Industrial Network (LAN)
- Possibility of configuring the 2 Ethernet ports independently (electrically separated network cards)
- Support for static and autodetection addresses (DHCP client)
- During the Point-to-Point remote connection only the Industrial Network (LAN) can be accessed.
- SDD (software that detects Seneca devices connected to the PC) works on WAN port

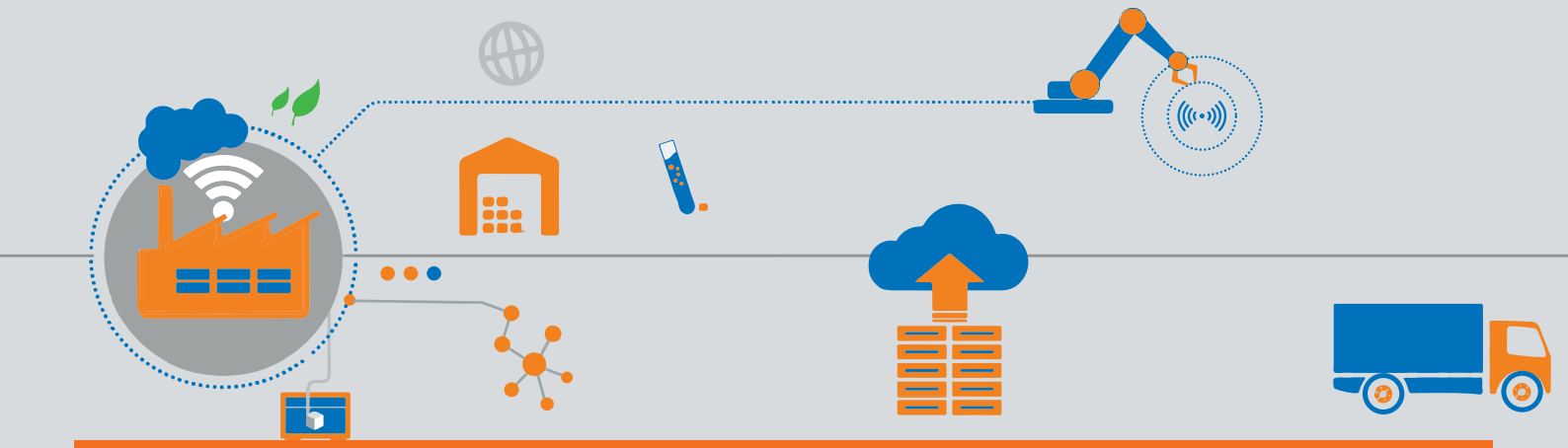


9 - SERIAL SNIFFER

- Network serial traffic analysis
- Variable display of Modbus RTU protocol in passive mode
- Inserting one or more SSDs into an existing system with Modbus RTU / RS485 communication
- Reception of serial packets transmitted between master and slaves, packages associated with tags that will then be enhanced.
- Once you’ve identified the registers that the devices are exchanging, you need to associate the tag name and type of data content



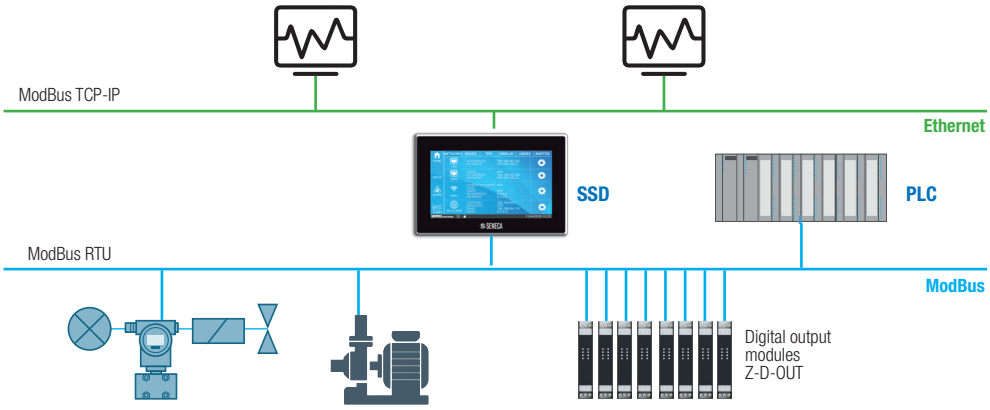
SSD SURPRISE SMART DISPLAY



MAIN FUNCTIONS

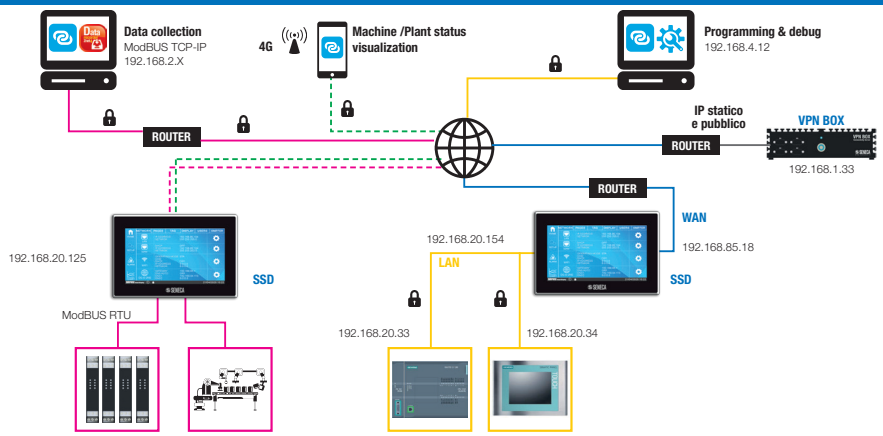
10 - MICROCONTROLLER

- If Then Else" logic integrated in the web server
- Configuration up to a maximum of 2000 logical rules
- Integrated or external I/O management
- Mathematical functions, start/ stop and combinations of logical conditions based on alarm states
- Event, trigger and timing management
- Execution of up to 3 actions within the same rule



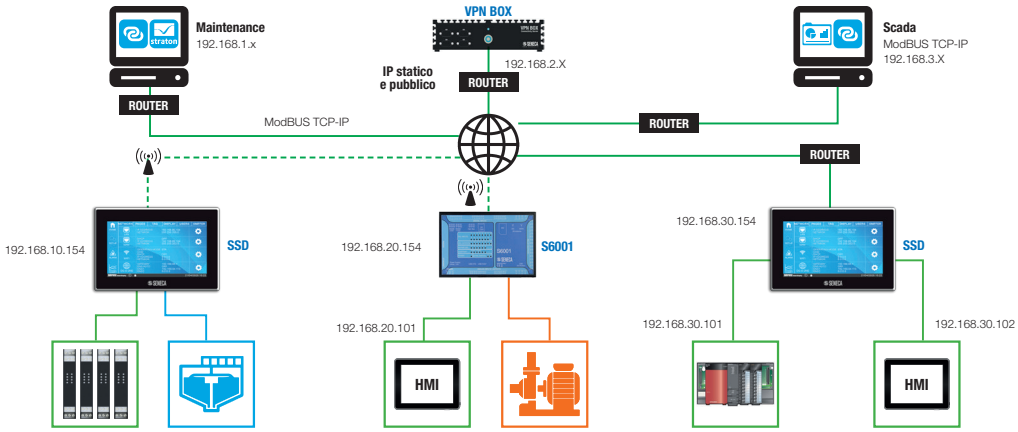
11 - VPN REMOTE ASSISTANCE UNIT / POINT-TO-POINT

- Point-to-point connection between a PC and a device or machine in the field
- On-demand connections for maintenance, start-up, remote control of machines
- Multi-user management
- Access to the remote subnet via local addresses
- Reduction of logistics and maintenance costs
- Convenience and speed of intervention



12 - VPN REMOTE CONTROLO UNIT / POINT-TO-POINT

- VPN connection between systems with different subnets (Single LAN)
- Always-on connections for supervision and data exchange
- Installations always visible to all users of the VPN network
- Access to the remote subnet via local addresses
- Real-time alarm on Scada
- Remote and simultaneous monitoring on different systems

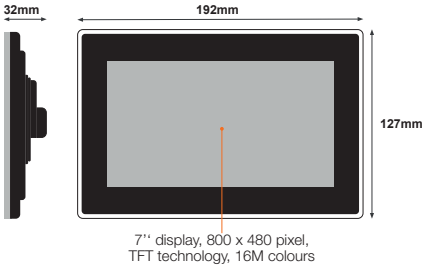


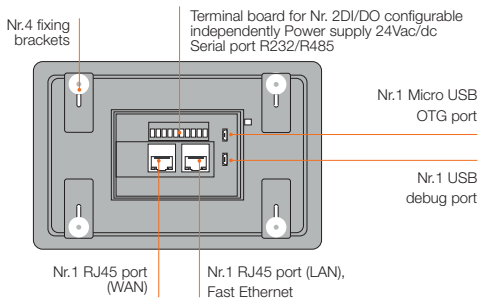
HMI 7” TOUSCHSCREEN WITH GATEWAY FUNCTIONS, DATA LOGGER, REMOTE ASSISTANCE AND BUILT-IN I/O

TECHNICAL DATA

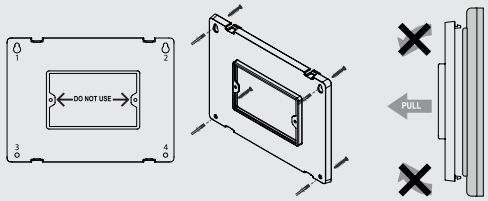
HMI DATA	
Screen	7" TFT LCD TFT backlit, scratch-proof glass
Resolution	800 x 480 pixel
Format	16/9
Brightness	350 cd/m2
Colours	16 M
Touchscreen	Capacitive
Duration	30,000 h (backlighting level 5)
Viewing angles	70° / 50° / 70° / 70° (Top, Bottom, Left, Rigth)
Display Functionality	Display standard widget-based Remote display (on PC and device with any O.S.) Dis+B27+B15
GENERAL DATA	
Power supply	24 Vdc/ac +/- 10%
Power consumption	AC: Max. 16 VA, 10 W; DC: Max. 9W
Status indicators	Ethernet links and traffic
Connections	Nr.1 removable clamp 3,5 mm pitch 10 ways
Degree of protection	IP64 (front with gasket)
Operating temperature	-20 °C..+60 °C
Dimension (lxhxp)	192 x 127 x 32 mm
Panel drilling dimensions (lxh)	157x102 mm
Weight	Approx 420 g
Case	ABS, black color
Mounting	By fixing brackets or wall support
COMMUNICATION	
Ethernet ports	Nr.2 Fast Ethernet 10/100Tx ports on rear RJ45
Serial ports	Nr.1 serial port RS232 / 485 switchable max 115k Nr.1 RS485 port, baud rate max 115kbps
USB ports	Nr.1 USB OTG port Nr.1 serial USB port for debugging software
Wi-Fi module	Wi-Fi 802.11 b/g/n, 2.4 ÷ 2.4835 GHz band
Protocols	ModBUS TCP server, ModBUS RTU master / Slave, FTP/SFTP Server, HTTP/HTTPS Server, OpenVPN, SSL, MQTT, OPC UA, http post
Operating modes	ModBUS Gateway (Ethernet - Seriale, shared memory, transparent gateway, serial tunnelling), IoT/Cloud-based gateway, datalogger, alarm unit, serial sniffer, Wi-Fi router, network redundancy unit, VPN remote assistance / telecontrol unit, microcontroller, LAN/WAN splitter
I/O	
Configurable DI/DO	Nr.2 digital channels (PNP inputs with internal power supply)
PROCESSING & MEMORY	
Processor	ARM 800 MHz
Flash Memory (data)	1 GB
RAM	512 MB
Scheda Micro SD	No
SECURITY	
Data Encryption	Blowfish — Blowfish (128bit) in CBC mode
Data Authentication	SHA1 — HMAC using Secure Hash Algorithm (160bit)
Handshake Encryption	TLSv1/SSLv3 RSA-2048 — 2048bit Ephemeral Diffie-Helman (DH)
Service Channel	TLSv1/SSLv3 2048bit certificate
Web Server Authentication	Yes
Security protocols	OpenVPN, SSL
SETTING & SOFTWARE	
DIP switch	Factory reset
Web server	Yes, status information, setup, alarms, chart, widget
VPN management software	VPN BOX Manager, OpenVPN, VPN Client Communicator
SDD (Seneca Discovery Device)	Yes
SESC (Seneca Ethernet to Serial Connection)	Yes
Firmware update	From website or USB stick (FAT32)
STANDARD	
Approvals	CE
Norms	EN 300328, EN 301489-17, EN 301489-1, EN 60368-1, EN 62311

LAYOUT AND DIMENSION





WALL MOUNTING WITH IN-WALL BOXES 503



ORDER CODES

Code	Description
MULTIFUNCTION HMI	
SSD-0-0-0-0	Advanced touchscreen HMI with integrated I/O
SSD-0-L-0-0	Advanced touchscreen HMI with integrated logic and I/O
SSD-0-0-V-0	Advanced touchscreen HMI with integrated VPN and I/O
SSD-0-0-0-I	Advanced touchscreen HMI with integrated IIoT and I/O
SSD-0-L-V-0	Advanced touchscreen HMI with integrated logic, VPN and I/O
SSD-0-L-0-I	Advanced touchscreen HMI with integrated IIoT, logic and I/O
SSD-0-0-V-I	Advanced touchscreen HMI with integrated IIoT, VPN and I/O
SSD-0-L-V-I	Advanced touchscreen HMI with integrated IIoT, logic, VPN and I/O
UPGRADE	
SSD-UPG-L	SSD - Upgrade "logic" functions
SSD-UPG-V	SSD - Upgrade "VPN" functions
SSD-UPG-I	SSD - Upgrade "IIoT/MQTT/Cloud" functions
SSD-UPG-L-V	SSD - Upgrade "logic" and "VPN" functions
SSD-UPG-L-I	SSD - Upgrade "logic" and "IIoT/MQTT/Cloud" functions
SSD-UPG-V-I	SSD - Upgrade functions "VPN" and "IIoT/MQTT/Cloud".
SSD-UPG-L-V-I	SSD - Upgrade functions "logic, "VPN" and "IIoT/MQTT/Cloud
SERVER VPN	
VPN BOX	Codes and features available at https://bit.ly/3IPFQXX
IOT/CLOUD SOLUTIONS	
CLOUD BOX	Codes and features available at https://bit.ly/33VsRh6
SOFTWARE TOOLS	
SDD	SENECA Discovery Device, IP scanner
SESC	SENECA Ethernet to Serial Connection
ACCESSORIES	
CE-RJ45-RJ45-R	Straight Ethernet cable (RJ45 / RJ45)
CU-A-MICRO-OTG	Micro USB OTG - USB Type A female adapter cable
MSD	Micro SD memory card con adattatore

CONTACTS AND INFORMATION

Addresses

Address of Registered Office and Operating Headquarters:
Via Austria 26 - 35127 Padova (I)
Tel. +39 049 8705 359 (408)
Fax +39 049 8706287

Web

Website: www.seneca.it
Documentation: www.seneca.it/cataloghi-flyers/
Support: www.seneca.it/supporto-e-assistenza/
E-commerce: www.seneca.it/vetrina/

E-mail

General information: info@seneca.it
Sales office: commerciale@seneca.it
Quality Assurance: qualita@seneca.it
Product technical support: supporto@seneca.it
Supporto tecnico prodotti: supporto@seneca.it

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