

MULTIFUNCTION HMI GATEWAY PLC



SSD - SURPRISE SMART DISPLAY

The all-in-one solution for your IIoT project



SURPRISE Smart Display (SSD) is a state-of-the-art integrated system that combines gateway, IIoT router and 7" touch-screen HMI panel. Equipped with a powerful ARM microprocessor, high-brightness display with proximity sensor, dual Ethernet ports, Wi-Fi module, built-in I/O channels and two serial ports, SSD stands out for its versatility. The device offers advanced gateway, datalogger, alarm management, Wi-Fi router, VPN technology and remote service/telecontrol, as well as a convenient widget-based data visualization that requires no programming. It supports coexisting wired and wireless connections, provides simplified access via isolated network segments and is ideal for critical applications and secure data management.

VERSIONS

SSD-0-0-0-0

SSD-0-L-V-I

SSD-S-L-V-I

SSD-E-L-V-I

1



2



3



4



HMI GATEWAY MODBUS

HMI GATEWAY EDGE IIoT

HMI GATEWAY IIoT + PLC

HMI GATEWAY IIoT + PLC + Energy Protocols

Physical/virtual display	●	●	●	●
Modbus Gateway	●	●	●	●
Serial Device Server	●	●	●	●
Serial Sniffer	●	●	●	●
Wi-Fi Router	●	●	●	●
Nat 1.1 and Static Router	●	●	●	●
Datalogger	●	●	●	●
Energy Monitoring	●	●	●	●
IIoT Edge Gateway		●	●	●
Remote alarm unit		●	●	●
Remote Access VPN Module		●	●	●
Microcontroller (If-Then-Else Logic)		●	●	●
IEC 61131-3 Controller			●	●
Energy Controller				●

TRANSFORMATION

You can transform your gateway to Edge IIoT or Straton PLC. With upgrade activation, SSD gateway Modbus can become SSD gateway Edge IIoT, while the gateway versions can be transformed into PLC or Energy Controller with Straton activation.

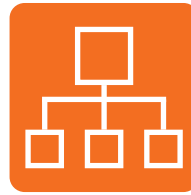
FUNCTIONS

ALL VERSIONS (1, 2, 3, 4)



PHYSICAL AND VIRTUAL HMI

Surprise Smart Display features a capacitive multitouch screen with three interface modes: widget-based, "Remote Display," and "Display on Display." It is ideal for devices without a monitor, ensuring flexibility in visualization and management in industrial environments.



MODBUS GATEWAY

In "ModBUS Gateway" mode, SSD manages communication between ModBUS RTU/ASCII and Ethernet, integrating serial devices into TCP/IP systems. It converts ModBUS RTU/ASCII messages to TCP and vice versa, ensuring interoperability in complex industrial environments.



SERIAL DEVICE SERVER

Serial Device Server feature enables SSD to connect serial devices (RS232/485) to TCP-IP networks, supporting Modbus RTU/TCP-IP. It provides remote communication, centralized management and interoperability in integrated industrial systems.



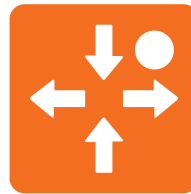
SERIAL SNIFFER

Serial sniffer function enables the insertion of one or more Smart Displays in systems with ModBUS RTU protocol, operating in passive mode with read-only tags, without altering the communications pre-existing in the system.



ROUTER Wi-Fi

SSD integrates a 802.11 b/g/n 2.4 GHz Wi-Fi module with redundant router or network mode. It can operate as a Station, connecting to an existing access point, or as an access point, allowing the connection of other devices, for maximum flexibility.



NAT 1:1 - STATIC ROUTER

You can turn your gateway into Edge IIoT or Straton PLC. By enabling upgrades, SSD gateway Modbus can become SSD gateway Edge IIoT, while gateway versions can be transformed into a PLC or Energy controller with Straton activation.



DATALOGGER

SSD offers acquisition, visualization and export data with built-in I/O and datalogger. It manages up to 1,000 log files, 100,000 samples and 2,000 tags, exportable in CSV format, which can be processed with Excel or PC software, for advanced analysis.



ENERGY MONITORING

SSD easily integrates with R203 power meter (max 40 units in daisy chain), enabling analysis of electrical parameters and their visualization via an intuitive icon and widget interface for quick and easy control.

IIOT, EDGE, PLC, ENERGY VERSIONS (2, 3, 4)



IIoT EDGE GATEWAY

The "L-V-I" versions of the device support http post, MQTT and OPC UA to connect to IoT/Cloud platforms, read, write and export process variables to SCADA, MES and management software, optimizing integration between automation and IT.



REMOTE ALARM UNIT

SSD operates as a multi-language remote alarm with notifications via email, Cloud, MQTT and customizable audio files (.wav). It plays back messages up to 5 times and allows confirmations via DTMF tones, ensuring timely interventions in case of anomalies.



VPN MODULE

SSD operates as a client of the "LET'S" remote platform. With the VPN BOX 2 Server, it supports Point-to-Point (P2P) or "Always ON" connections, enabling supervision, management and continuous monitoring of remote installations on a single virtual LAN.



IF-THEN-ELSE MICROCONTROLLER

SSD supports up to 2,000 logic rules on built-in or external I/O, handling writes, sending alarms and data processing. It integrates advanced scripts in Php or Python for custom logics, providing flexibility for complex algorithms.

PLC VERSIONS (3, 4)



IEC 61131-3 CONTROLLER

SSD softPLC version Straton IEC 61131-3 implements customized control logic. Adapted to different architectures, it meets the needs of complex systems, optimizing industrial processes and responding to specific hardware requirements.

ENERGY PLC VERSION (4)



IEC 60870 61850

ENERGY CONTROLLER

SSD in "Energy" version supports IEC 60870-101/104 and IEC 61850 for energy automation. It provides interoperability, remote control and smart grid management, adapting to complex scenarios with advanced control and scalable solutions.

SSD SURPRISE SMART DISPLAY

The all-in-one solution for your IIoT project



● COMMUNICATION

- 2 Fast Ethernet 10/100Tx ports (1 WAN, 1 LAN) to separate connections and manage IP conflicts
- 2 RS232/485 serial ports (switchable) and RS485
- 2 USB ports
- Wi-Fi 802.11 b/g/n support

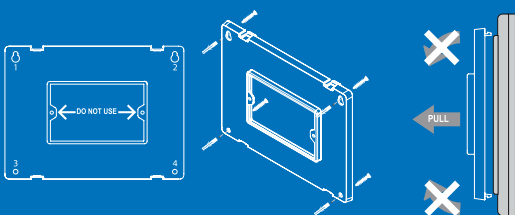
● PROTOCOLS

- Industrial protocols: ModBUS RTU / TCP/IP, S7 Client, M-BUS
- Network protocols: FTP/SFTP, SNMP v2, HTTP/HTTPS
- Security Protocols: SSL, OpenVPN
- IoT/Cloud Protocols: http(s) post, MQTT(s), OPC UA
- Energy protocols: IEC 61850, IEC 60870

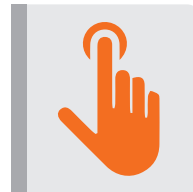
● I/O

- General Purpose Digital Channels can be used as: PNP inputs (ON >9V, OFF < 4V)
- Outputs with internal power supply (12V/50mA) or external (12-24V/100mA)

● EASY INSTALLATION PLATE 503



VISUALIZATION MODES



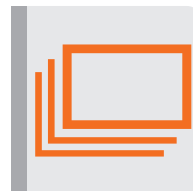
TOUCHSCREEN DISPLAY

Surprise Smart Display features a multitouch capacitive display 7" TFT display, scratchresistant glass, 16M colors, 800x480 pixel resolution, 350 cd/m2 brightness, 500:1 contrast SSD 3 viewing modes ensures up to 30,000 h operation (backlight level 5).



STANDARD WIDGET DISPLAY

800x480 dpi capacitive touchscreen HMI with multitouch recognition. Intuitive menus for configuration (LAN, WAN, WiFi, widgets, display, tags, users), alarm management (display and history) and chart (real time or historical values). Customizable widget pages for tags and layout.



DISPLAY ON DISPLAY

Backlit self-configuring display for ModBUS/Ethernet device with dedicated widget. It supports digitization for blind devices, management of up to 4 side-by-side or full-screen readings, screen scroll, automatic network scanning, and daisy chain connection for maximum flexibility.



REMOTE DISPLAY

All operations on the local display can also be managed remotely via LAN or web. Access from browser (port 80, IP SSD) with any device and operating system. Remote display and file download directly from PC for easy and universal management.

CONFIGURATION



BASIC CONFIGURATION (from display)

SSD allows you to create custom pages and configure automation projects from touch panels, with widgets such as text, gauge and graphics. It supports LAN/WAN/WiFi, users, displays, alarms, and offers RS485 Modbus sniffers, exportable real-time/historical graphs, and flexible display access.



WEB SERVER CONFIGURATION

For more advanced configuration and operation needs, particularly in terms of connectivity and control logic, SSD offers a Web Server through which full remote configurability of the device is ensured from a specific IP address (e.g., <http://192.168.90.101:8080>).

SICUREZZA



ADVANCED SECURITY & VPN

SSD supports OpenVPN and SSL with X.509 certificates, AES-256bit-CBC encryption and SHA256 authentication. It includes a 4096-bit RSA MQTT key, TLSv1/SSLv3 RSA-048 handshake and 2048-bit Diffie-Hellman ephemeral, all user-configurable for maximum data security.



PENETRATION TEST

SSD has passed a rigorous independent penetration test based on the most widely used methodologies and standards in such as MITRE Common Weakness Enumeration, OWASP Web Security Testing Guide, The Open Source Security Testing Methodology Manual, Common Vulnerability Scoring System - CVSS v3.1, IEC62443-4-2.

IIoT TECHNOLOGIES



http post

In IIoT context, the HTTP POST protocol, based on REST architecture, uses data in JSON format to send logs, alarms, manage dataloggers and server configurations (tags, updates, FTP), enabling advanced and efficient communication between devices and systems.



OPC UA

OPC UA is a cross-platform standard based on the Client/Server model. SSD serves as the OPC UA Server, which can be integrated with third-party OPC UA clients for automation and data management, ensuring compliance with major security protocols such as SSL TLS and X.509 certificates.



CLOUD SUPPORT

SSD connects machines, plants and decentralized I/O to Cloud platforms via HTTP/MQTT. "Easy Cloud" technology ensures a bidirectional connection to major clouds, including Cumulocity, ADM 4.0 and Onsystem, through preconfigured templates based on MQTT.



OpenVPN

SSD supports OpenVPN software and technology used to create secure point-to-point encrypted tunnels. It allows hosts to authenticate with each other by means of shared private keys, digital certificates or user credentials/passwords.



MQTT

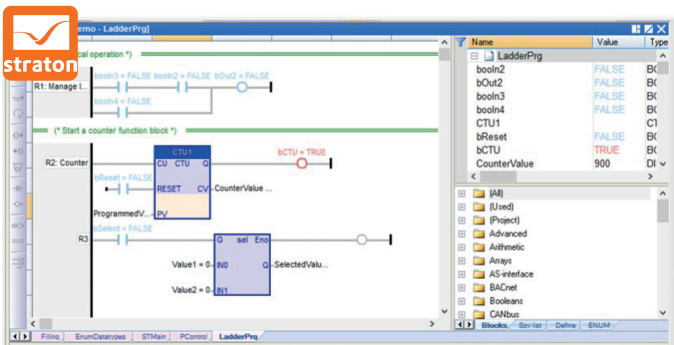
SSD embraces IoT with the MQTT protocol, ideal for real-time data transmissions and M2M connections. MQTT client configuration is done via Web Server. Digital certificates can be used for secure connections (SSL/TLS), ensuring reliability and protection.



CERTIFIED DEVICE

A "Certified Cumulocity Device" is a device compatible with the Cumulocity IoT platform, certified for smooth integration. It provides connectivity, interoperability and security, facilitating remote monitoring and management of industrial assets, sensors and machines.

PLC



The Straton PLC built into the SSD supports IEC 61131-3 and includes an IDE for Windows with advanced tools. It handles protocols such as Modbus, MQTT and OPC-UA. It offers libraries to simplify PLC development. Real Time reduces jitter. Seneca Straton package installs IDE and libraries.rie

OPERATING MODES

SSD supports 3 operating modes: "None" (PLC inactive, gateway multifunction), "Legacy" (PLC backward compatible with ZNET-4 and earlier firmware) and "Shared" (advanced PLC with gateway functions). Upgrade to "Shared" requires Straton licenses or only activation via web server.

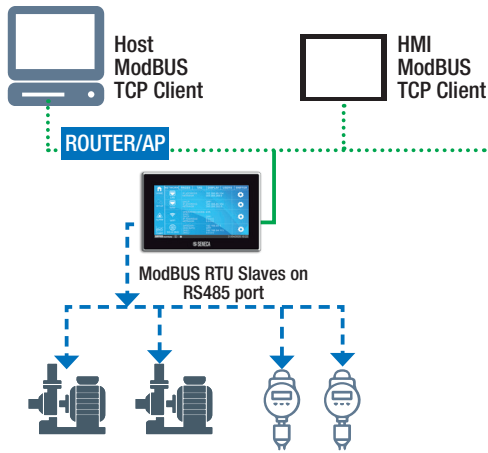
ENERGY PROTOCOLS

In SSD device, in addition to the Straton PLC, it is possible to activate protocols for energy management: IEC61850 (Server/Client) and IEC60870-5 (101 Master/Slave, 104 Server/Client). IEC61850 is for electrical substation automation, IEC60870-5 for remote control over TCP/IP (104) or serial (101.).

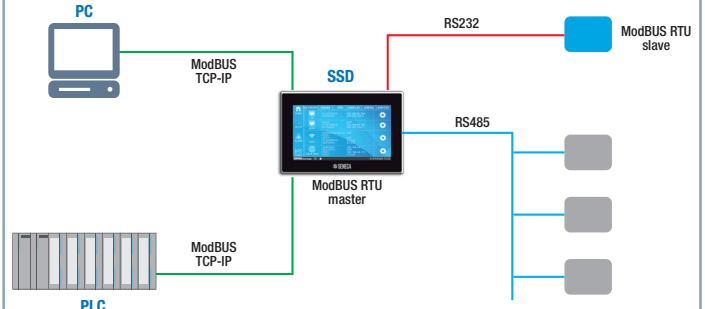
The all-in-one solution for your IIoT project

APPLICATION DIAGRAMS APPLICATION DIAGRAMS

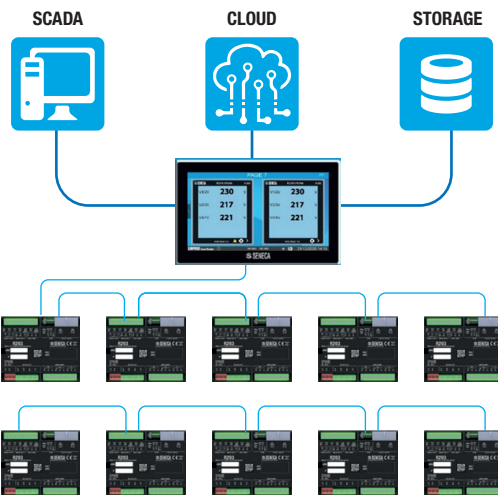
ETHERNET / SERIAL GATEWAY



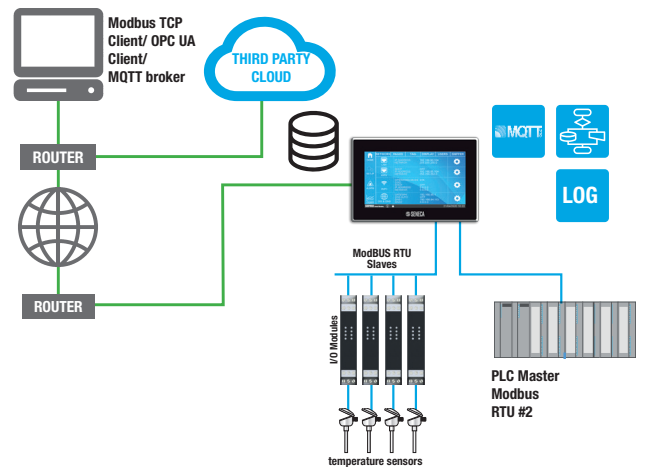
SHARED MEMORY GATEWAY



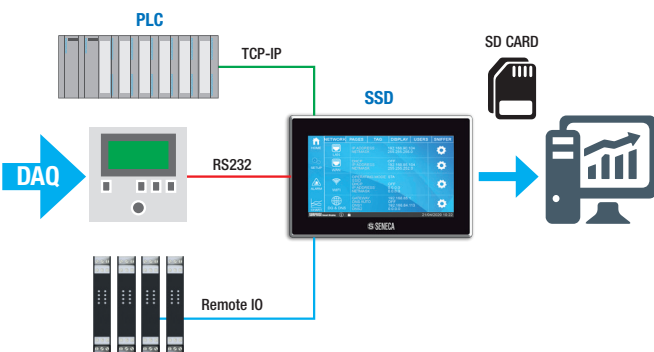
ENERGY MONITORING



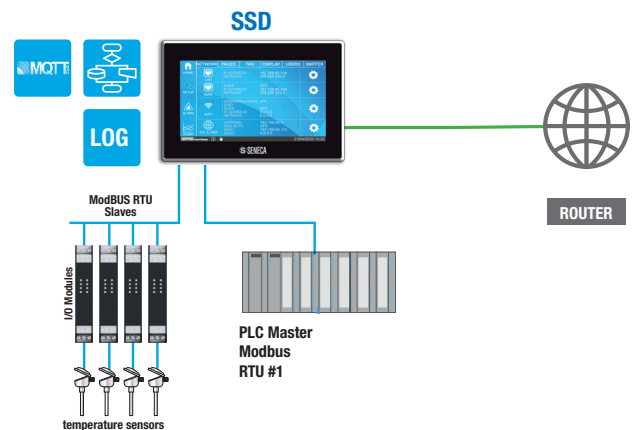
IIoT / CLOUD GATEWAY



DATA LOGGER



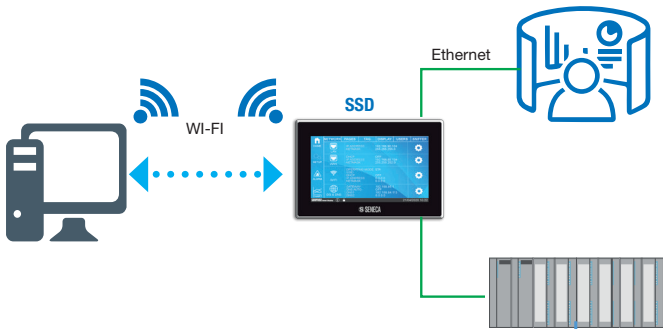
REMOTE ALARM



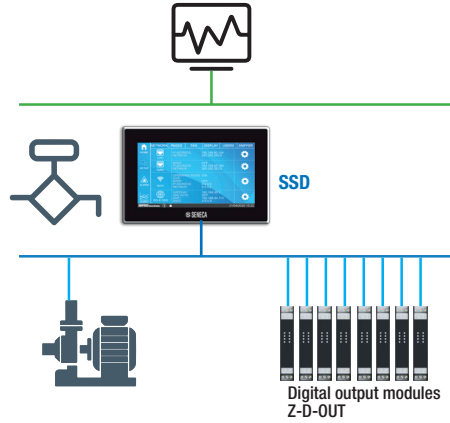


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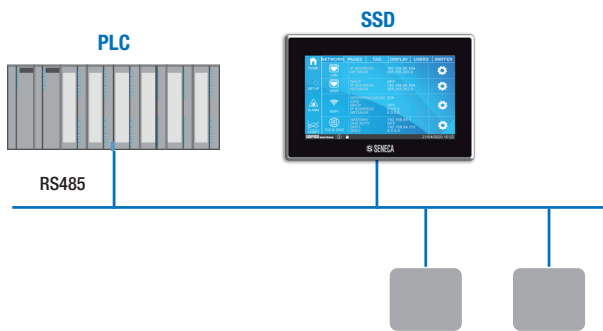
WI-FI ROUTER



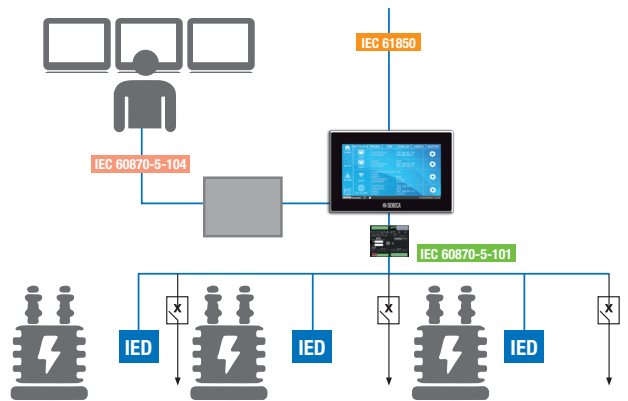
MICRO CONTROLLER



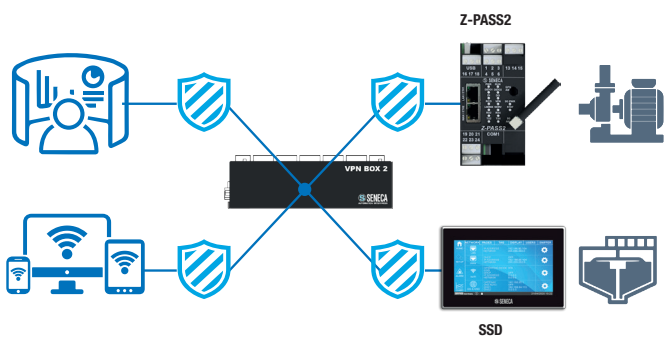
SERIAL SNIFFER



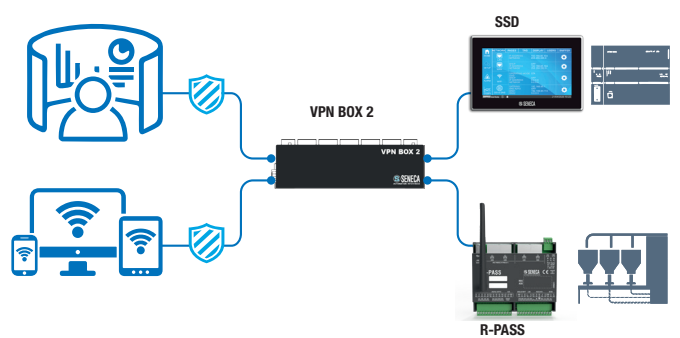
IEC 60870 / 61850 CONTROLLER







TELECONTROL - SINGLE LAN



REMOTE ASSISTANCE - POINT-TO-POINT



TECHNICAL DATA

	SSD-0-0-0-0	SSD-0-L-V-I	SSD-S-L-V-I	SSD-E-L-V-I
				
	HMI multifunzione, Gateway	HMI multifunzione / IIoT Gateway	HMI multifunzione / IIoT Gateway / Controllore IEC 61131-3	HMI multifunzione / IIoT Gateway / Controllore IEC 61131-3 con protocolli IEC 61850/IEC 60870
HMI / DISPLAY				
Screen	7" TFT LCD backlit, scratch-resistant glass, touchreen			
Resolution	800 x 480 pixels			
Format	16/9			
Colors	16 million			
Display Modes	Standard widget-based display - Remote display (on PC and devices with any O.S.) - Display on Display (R203 Series display emulation)			
Alarm Management (Real Time, Historical)	Yes			
Total number of tags	Max 2,000			
Graph management (Real Time, Historical, Histogram)	Yes			
Synoptics	Max 20			
Widgets	Max 400 (up to No.40 R203 in daisy chain)			
GENERAL DATA				
Power supply	24 Vdc/ac +/- 10%			
Power consumption	AC: Max. 16 VA, 10 W; DC: Max. 9W			
Led status indicators	Ethernet links and traffic			
Protection degree	IP64 (on front with membrane)			
Processor	ARM 800 MHz			
Flash Memory (data)	>=4 GB			
RAM	512 MB			
DI/DO configurable	No.2 digital channels (PNP inputs with internal power supply)			
Operating Temperature	-20 °C..+70 °C			
Dimensions (LxHxP)	192 x 127x 32 mm			
Panel cutout dimensions (LxH)	157x102 mm			
Weight	420 g approx.			
Case	ABS , color black			
Installation	Panel mount or via mounting brackets or wall mount (503 flush-mount boxes)			
Approvals	CE, UKCA			
COMMUNICATION				
Ethernet Ports	Nr.2 Fast Ethernet 10/100Tx ports on rear RJ45			
Serial ports	Nr.1 RS232 / 485 serial port switchable max 115kbps			
USB ports	USB ports / Nr.1 USB serial port for debugging software			
WiFi	Wi-Fi 802.11 b/g/n, banda 2.4 ÷ 2,4835 GHz			
Nr. Max Client TCP-IP (Server Mode)	50			
Nr. Max TCP-IP Server (Client Mode)	25			
Max Tags	2000			
Nr. Max Modbus RTU/ASCII SERIAL Nodes	128			
Security	Penetration test, certificati x.509			
Basic Protocols (ModBUS RTU / TCP-IP, FTP/SFTP Server, SSL)	Yes			
Advanced Protocols (OpenVPN, HTTP/HTTPS Server, http(s) post, MQTT(s), OPC UA Client/Server)	-			
Industrial protocols (SNMP v2, S7 Client, M-BUS)	-			
Energy protocols (IEC 61850, IEC 60870)	-			
OPERATION MODES				
Physical/virtual display	Yes			
Modbus Gateway	From ModBus TCP-IP to Modbus RTU (Slave)			
Serial Device Server	Yes			
Serial Sniffer	Yes			
Wi-Fi Router	Yes			
Nat 1.1 and Static Router	Yes			
Data Logger	Yes			
IIoT Edge Gateway	-			
Remote alarm unit	-			
Remote Access VPN Module	-			
Microcontroller (If-Then-Else Logic)	-			
IEC 61131-3 Controller	-			
Energy Controller (IEC 61131-3+IEC 61850/60870)	-			
Yes; Straton IDE; cycle time >=1ms; prog. languages. ST, LD, FBD, IL SFC; function blocks Modem management, VPN, FTP, EMAIL, MeterBUS, S7 Client, watchdog, Linux shell				
ADVANCED SETTINGS & FEATURES				
Web server	Yes, status information, setup, alarms, charts, widgets			
VPN client software	VPN Client Communicator			
Firmware upgrade	From web page or USB flash drive			
Advanced Diagnostics	Yes			
PLC modes "None," "Legacy," "Shared"	Yes			
Sending voice alarms	-			
Script execution for complex algorithms	-			
Third-Party Cloud Support (EASY CLOUD)	.			