

## TECHNICAL DATA

### CPU Module

- CPU ARM MX7 2core 1GHz + Cortex M4 200MHz real-time co-processor
- RAM 1GB
- Flash memory 8GB
- Storage 8GB (integrated)
- Linux Embedded Yocto Project O.S.
- 2xGbE (2 RJ45 10/100/1000BASE-T or 1RJ45 10/100/1000BASE-T+1x1000FX SFP)
- 1xETH 10/100 for service/maintenance
- USB for external 4G/5G modem
- Wi-Fi 802.11 ac/a/b/g/n
- 1xRS-232
- 1xRS-485

### Power Supply Module

- Power supply voltage: 24Vdc-150Vdc
- Redundant (option)
- Equipped with microcontroller for self-diagnosis
- Max Power consumption: 20W
  - 800mA @ 24 Vdc
  - 400mA @ 48 Vdc
  - 180mA @ 110 Vdc

### Digital Input Module

- Input on main board: 16
- Input voltage/current:
  - 24 Vdc, 2 mA
  - 48 Vdc, 4 mA
  - 110 Vdc, 4 mA
- Scan accuracy: 1 ms

### Analog Input Module

- Input on main board: 4
- Input voltage/current:
  - -10/10V (and intermediate)
  - -20/20mA (and intermediate)
  - - 4-20mA
- Scan period & Accuracy: 20 ms, 0.2% full scale

### Digital Output Module

- Output on main board: 8
- Output Type: electromechanical relay
- Nominal current: up to 6A @ 250Vac

### AC Measurement Acquisition Module

- 3 analogue inputs in alternating current
- 3 analogue inputs in alternating voltage
- 1A / 5A inputs from CT
- 57.7V / 100V inputs from VT

### Analog Optoisolated Output Module

- Output on main board: 4
- 0.1% full scale accuracy

### PT100 Temperature Measurement Module

- 4 x IEC 60751 compliant inputs
- PT100 interface 2/4 wire

### GPS Module

- High precision coupling
- PPS output with max jitter 0.1ms
- Correction of time drift in case of signal loss
- Max drift in 24h without ref. temperature signal: <1ms

### LoRaWAN IoT Module

- 2xGbE (RJ45 10/100 / 1000BASE-T)
- 4x opto-isolated digital inputs 24/48 Vdc
- 868 MHz channeling (EU868)
- 8 simultaneous uplink channels
- 2x digital relay outputs with free contacts
- 2xSMA (wireless interface to the field nodes or for uplink)
- Management of class A, B and C LoRaWAN nodes as Gateway and functioning as a class C node
- Bluetooth 4.2 / BLE (optional)
- Wi-Fi 802.11 ac / a / b / g / n (optional)

### CYBER SECURITY

- Embedded FIPS 140-2 crypto chip
- Authentication and diagnostics: Radius, SNMPv3
- Access tracking: Security Log (syslog)
- Communication security: HTTPS, SSH, TLS
- Brute force attack protection, port filtering
- IEC62443 compliant
- IEC62351-3 / 5 compliant

### ENVIRONMENTAL

- Operating temperature: -25 ÷ +70°C (\*\*)
- Storage temperature: -40 ÷ +70°C
- Relative humidity: ≥ 93% a 40°C
- Insulation degree : IP 30

### COMMUNICATION

- Network type: IPv4

### Protocols

- Slave IEC 60870-5-101/104
- Server IEC 61850 + Goose Pub/Sub
- Client IEC 61850
- Master IEC 60870-5-101-104
- Master MODBUS (RTU / TCP)
- MQTT Pub/Sub

### DIMENSIONS

- Installation on DIN rail
- Dimensions (WxDxH): 35 x 162 x 145 mm
- Weight: <800 g

### TIME SYNCHRONIZATION

- Via NTP server
- Via IEC 60870-5-101/104 protocols
- IEC 1588 (PTPv2)
- RTC
- GPS (dedicated module)

(\*\*) extended range version



# STCE-SG

## Modular, Compact and Secure RTU Remote Control and IoT Gateway



**STCE-SG** is a modular RTU designed for DIN-rail mounting, which performs remote control, advanced event monitoring, local automation and data acquisition functions in secondary substations distributed automation scenarios, Smart Grids, Smart Cities, Smart Metering and as a concentrator of IoT sensors. Flexible and compatible with all major protocols, it is the ideal solution for any type of network, even complex one. **STCE-SG** is able to manage information to and from the plant in an integrated way with other station's devices and allows rapid, prompt and flexible communication with the network management centers. Suitable for the control of various types of networks, it is designed in particular with specific attention to security and robustness issues supporting its usage in HV/MV distribution substations. Advanced configuration and diagnostic tools allow simple, timely and effective maintenance interventions. **STCE-SG** is ready to be used as a protocol gateway also for IoT applications, and can be expanded with dedicated I/O modules. Within the LAN station, multiple **STCE-SG** can be connected to a local SCADA and one or more control centers by using standard protocols (IEC 61850, IEC 60870-5-101/104, Modbus in Master/Slave version). **STCE-SG** can be configured remotely and according to the latest security features (TLS, SSH) to comply with the data structures and protocols required by the IEC 62351 and IEC 62443 standards. **STCE-SG** allows the acquisition of IoT data from the plant, via cable or wireless, and the secure transmission of data to public/private cloud platforms.

## MAIN INTEGRATED FUNCTIONALITIES

### RTU

- » acquisition of simple or multiple digital signals, analogue or digital measurements, pulses
- » commands and set-points
- » programming of filters, scale factors and threshold values
- » up to 6 control centers with IEC 60870-5-101 and 104 protocols
- » possibility to enable a IEC 61850 server
- » employment within dedicated, switched or IP networks
- » implementation of distributed architectures with station LAN
- » concentration of information coming from remote equipment or from local IEDs with standard protocols

### ADVANCED MONITORING

- events with 1 ms resolution
- storing and scheduled transmission of timed events
- time synchronization from the control center or via NTP server, GPS, IEEE 1588

### PLC AUTOMATION FUNCTIONS

The PLC software package allows to realize programmable automation sequences, without any additional hardware, guaranteeing:

- » complete integration with STCE-RTU peripheral units (SELTA Functional Blocks)
- » run-time direct interaction with run-time database
- » customization of the Functional Blocks
- » on-line check of automation state
- » internal simulator for automations check

### PLC LOCAL PROCESSING

- programming compliant with IEC 61131-3 standard
- interlocking functions
- processing and correlations among acquired data
- configuration of complex SW algorithms for the generation of local automations and commands sequences
- programming languages compliant with IEC 61131:
  - Ladder Diagram (LD), Functional Block Diagram (FBD)
  - Structured Text (ST), Instruction List (IL)

## FAST CONFIGURATION AND MAINTENANCE

All configuration and maintenance functions can be carried out by means of a computer, connected locally or from remote via IP network in secure mode. The device offers a WEB server function to access diagnostic information and events history through a simple web browser.

A dedicated webpage is also available to simulate the I/O without the need of external wired simulators.

### FLEXIBILITY OF THE PLANT ARCHITECTURE

**PROXY:** it concentrates the plant information, re-routing them in a transparent way in respect to procedures and exchanged application data, without modifying used protocol identifier

**MULTI-PROTOCOL RTU GATEWAY:** this function allows converting serial or not standard protocols to IP based protocols, having interoperability as a goal, especially in smart grids context

**IoT GATEWAY:** STCE-SG supports the acquisition of data from field IoT sensors connected via cable, wireless (Wi-Fi, Bluetooth) or LPWA networks (LoRaWAN) allowing the transmission of data to public or private cloud platforms using the MQTT protocol. STCE-SG, with the LoRaWAN networks module can be used to acquire and transmit data in wireless end-to-end mode, on public or private LoRa networks. The configuration of STCE-SG as a class C LoRaWAN node allows the creation of complex multi-layer wireless networks and enables new solutions for high-performance mixed wired and wireless architectures.

## CONFIGURATION AND DIAGNOSTIC

- complete functionality with a PC connected locally or remotely through IP network
- web server access to diagnostic data and stored files via secure protocols (SSL, HTTPS)
- syslog and network traffic recorder for data diagnostic

## INTEGRATED SECURITY

**STCE-SG** has been designed on a by-design security framework, based on the principles of the IEC-62443 standard and in line with the most recent international specifications (IEC-62351) in terms of communication security, such as secure remote access using certificates, user authentication and selective access to data based on roles, embedded data encryption, physical ports protection and filtering of protocols and communication ports. **STCE-SG** is available in the specific Cybersec version optimized for critical environments requiring additional security level (anti-tampering and resin coating readiness), in compliance with the CEI 0-16 all.O. The Cybersec version is ready for use as a Central Plant Controller.

## INDUSTRIAL IoT

**STCE-SG** can be used into IoT networks aimed at acquiring additional field data compared to those normally collected in RTU mode thanks to the availability of LoRaWAN, WiFi and Bluetooth wireless connections. The data coming from sensors or field nodes can be transmitted in a secure mode, wireless or via cable, to the SCADA on standard telecontrol protocols or, alternatively, in MQTT to native IoT applications. **STCE-SG** can separate the data acquired in RTU mode from that acquired in IoT mode, and provides the management of different communication channels both for data coming from the plant and for the communication to and from SCADA or cloud IoT platforms.

