Remote Terminal Unit STCE-RTU

High security and performance unit

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REMOTE CONTROL

STCE-RTU equipment has been specifically designed to respond optimally to the needs and constraints of the electrical universe. Thanks to its characteristics of flexibility, modularity and ease of management, it is also easily used in the control of other types of geographically distributed plants such as gas pipelines, oil pipelines, water treatment and district heating plants.

STCE-RTU is flexible, modular, scalable and can be used in various plant applications which include concentrated, distributed or mixed architectures both in the electricity and gas networks.

Concentrated architecture: the signals coming from the system are wired and electrically connected to the I/O boards whose maximum number is equal to 49 units. Up to a maximum of 10,000 points can be managed and the processing capacities distributed over all the I/O units without performance degradation.

Distributed or mixed architecture: lower hierarchical RTUs and other devices such as protection relays and measuring instruments exchange data with the main apparatus using communication protocols (managed by the SC Plus unit).

A possible distributed architecture is the one in which the station LAN connects, through the optical fiber, various STCE-RTU devices of smaller dimensions, dedicated to single stalls or portions of the plant. The overall system provides all the available performances in terms of processing capacity, number of managed points, possible interactions between the different parts of the plant. An operator station for local control and one or more remote control centers can be connected to the station LAN, possibly using the STCE-RTU apparatus as a communication gateway.

TECHNICAL SPECIFICATIONS

CPU 4000

- Dual core ARM Cortex a7 32bit
- 2 serial ports RS232/RS485
- 1 Ethernet ports 10/100 BaseT RJ45 (service)
- 2 Ethernet ports 10/100 BaseT RJ45
- 2 Ethernet ports 10/100/1000 BaseT RJ45 / 1 port 100BaseFX SFP (alternative)
- storage: 8 GB integrated memory

I/O UNITS

64 digital inputs optoisolated:

- dual core ARM Cortex a7 32bit
- input voltages: 24 Vdc, 48 Vdc, 110 Vdc, 132 Vdc
- resolution 1 ms

64 digital outputs optoisolated::

- solid state relais
- max. output current 100 mA
- simultaneous closure of several output

32 analog inputs optoisolated (unipolar and bipolar):

- current input: ±20 mA and middle range, 4-20 mA
- voltage input: ±10 Vdc and middle range

8 analog outputs optoisolated:

- current output: ±20 mA and middle range, 4-20 mA
- voltage output: ±10 Vdc and middle range

2x32 relais command outputs:

- pulse commands (single and double)
- 1/N control
- max. switch voltage 130 Vdc

2x16 simultaneous and continuous command outputs:

- pulse commands (single e double)
- continuous commands (single)
- up/down setpoints
- simultaneous commands
- max. switch voltage 130 Vdc

32 digital inputs + 10 command outputs + 8 analog inputs:

- digital input voltage: 24 Vdc, 48 Vdc, 110 Vdc
- current input: ±20 mA and middle range, 4-20 mA
- voltage input: ±10 Vdc and middle range
- pulse commands (single and double)
- 1/N controll
- max. switch voltage 130 Vdc

COMMUNICATIONS UNITS

4 serial channel + 2 Ethernet interface (SC Plus unit):

- 4 serial ports RS232/RS485
- 1 Ethernet ports 10/100BaseT RJ45 (service)
- 2 Ethernet ports 10/100BaseT RJ 45 / 1 port 100BaseFX ST (alternative)

OPERATIONS RANGE

- Managed variables: max. 10.000
- communications buffer: max. 6.000 events/center
- events Log: max. 6.000 events
- security Log: max 1.000 events
- diagnostic Log: max. 200 events

COMMUNICATIONS PROTOCOL

Vs centers with the following Slave/Server communication protocols

- IEC 60870-5-101
- IEC 60870-5-104
- IEC 61850
- MQTT*

Vs IED, RTU, Master/Client protections plant devices

- IEC 60870-5-101
- IEC 60870-5-103
- IEC 60870-5-104
- IEC 61850
- MODBUS (IP and serial)
- MQTT*

Remote Terminal Unit

CYBER SECURITY
- Embedded security: updated SoM ARM and kernel Linux
- authentication and encryption: Radius, SNMPv3
- communications security: HTTPS, SSH, TLS
- access tracing: Security Log
- secure communications protocol: IEC 62351-3

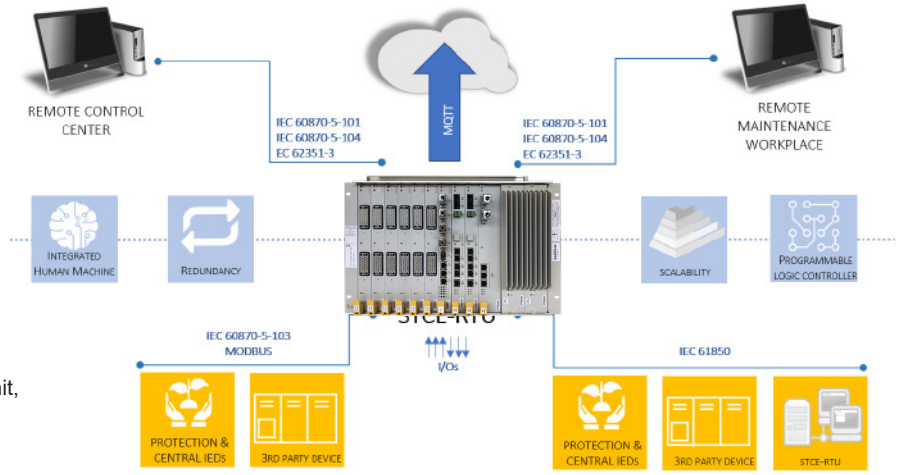
SYNCHRONISM
- From GPS connected to the service unit
- from NTP v4 server
- IEEE 1588 (PTPv2)
- RTC

MECHANICAL CHARACTERISTICS
Standard version (STCE-RTU)
- Base subframe and extension dimensions: 300 mm (H) x 280 mm (D) x 480 mm (W); standard fixing 19”
- base subframe capacity: 2 CPU, 2 power supply, 1 service unit, 7 I/O boards
- extension subframe capacity: 14 I/O boards
- max. n° extensions subframe: 3

Small version (STCE-RTU S19)
- Dimensions: 150 mm (H) x 280 mm (D) x 480 mm (W)
- capacity: 1 CPU, 1 power supply, 3 I/O boards

ENVIRONMENT CONDITIONS
- Operating temperature: -25°C ÷ +70°C
- storage temperature: -40 °C ÷ +70°C

STANDARD
- CE marking
- emissions: IEC 61000-6-4 industrial environments
- device, I/O circuits and power supply immunity: IEC 61000-6-2, IEC 61000-6-5
- isolation: IEC EN 60870-2.1 - class VW3



BENEFITS FOR CUSTOMER

MONITORING AND CONTROL
- Acquisition of simple or multiple digital signals, analog or digital measurements, pulses
- command and set-points
- filters, thresholds and scale factors programming
- concentration of information coming from local or remote devices
- time stamp assignment with 1 ms resolution
- execution of automation logics
- file transfer in the direction of control and monitoring
- opening towards IoT applications via MQTT Publisher/Subscriber protocol
- special applications for the management of the national electricity grid: dispatching orders (BDE Terna)
- special applications upon requests from TSOs and DSOs in Italy and abroad
- deployment of concentrated and distributed architectures with LAN station
- deployment in dedicated and switched packet networks
- power supply, CPU and communication cards redundancy to grant high reliability

COMMUNICATIONS
- Up to 7 control centers using the protocol
- TLS A standard IEC 62351-3
- 4 redundancy group for IEC 60870-5-104 protocol
- redundancy bonding
- role of concentrator in multiprotocol gateway mode

SECURITY
- HTTPS protocol with X509.3 standard based certificates management
- remote access management via Radius server (up to 2 server)
- device access based on SSH protocol authentication
- SNMP V.3 network protocol with USM authetication for diagnostic data access
- SysLog protocol for the remote control of all security information relating to the device
- security log for tracing access to the device and tracing events that may indicate an attempt to tamper with security
- Brute Force Attack functionality aimed at protecting the RTU from systematic attack
- NTPv4 authenticated synchronization protocol
- new HW

SECURE ACCESS + LDAP ACCESS
SSH access to the device in configuration or HTTPS consultation via web server is possible both locally and remotely in secure mode (login and password) according to profiles with different operating privileges: **viewer** (read-only access), **operator** (read/write access with full operations) and **administrator** (read/write access with full operations and users management).

CONFIGURATION SOFTWARE
A dedicated stand-alone application, compatible with Windows 10 operating system, allows the rapid and controlled configuration of communication parameters and plant interfaces thanks to intuitive menus and guided procedures, with runtime checks for errors and inconsistencies. I/O and communication units, when of the type, are interchangeable without the need for configuration, thus simplifying maintenance operations.

WEB SERVER
Through the web it is possible to access default data, field events log, diagnostic, security events and run-time display of I/O status and alarms with configurable display filters, mandatory tools for managing activations, maintenance and troubleshooting. Firmware download and upload, device configuration and automation available via web encrypted communication (anti-tampering), guarantee the secure remote upgrade of the device and the backup of all configurations for quick alignment in case of replacement of parts due to failures.

NET RECORDER
Native traffic logging function on CPU network ports (ports and filters configurable via web). Recordings are stored on 8 GB dedicated memory (up to 32 recordings of 32MB). Communication towards centers analysis tool increasingly indispensable in remote control systems whose complexity is increasing in terms of network architecture and telecommunication protocols.

LICENSES
The device manages the activation of software licenses allowing rapid capacity upgrades after purchase or activation in the plant, even remotely and autonomously.

LOCAL AUTOMATION
STCE-RTU integrates a real-time engine that executes automation sequences configured in compliance with the IEC 61131-3 standard using the programming languages: IL (Instruction List), LD (Ladder Diagram), FBD (Function Block Diagram), ST (Structured Text) and CFC (Continuous Function Chart). A software programming simulator allows the testing of implemented logics. STCE-RTU also allows online analysis of the automation operating status, manual shutdown and start of the automation (via software), automatic restart of the automation each time the device is switched on.

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DigitalPlatforms SpA BU Offices
BU DP Infrastructure - Selta: 29010 Cadeo (PC), Italy, Via Emilia 231 - ph. +39 0523.50161
BU DP Infrastructure - Selta: 64018 Tortoreto (TE), Italy, Via Nazionale km 404,500
DigitalPlatforms SpA registered office: 00155 Roma (RM), Italy, Via Andrea Noale 351
marketing@selta.com