SUBSTATION AUTOMATION

ACCORDING TO STANDARD IEC 61850

SELTA offers a new **integrated digital system** for the **automation of the HV and VHV power substations**, based on the most advanced technologies, able to manage and to carry out several functionalities: **control, automation, protection, monitoring and maintenance**.
All SELTA systems are natively compliant with the most widespread current regulations, in particular with the **IEC 61850**, **IEC 61131** and **IEC 60870** standards.

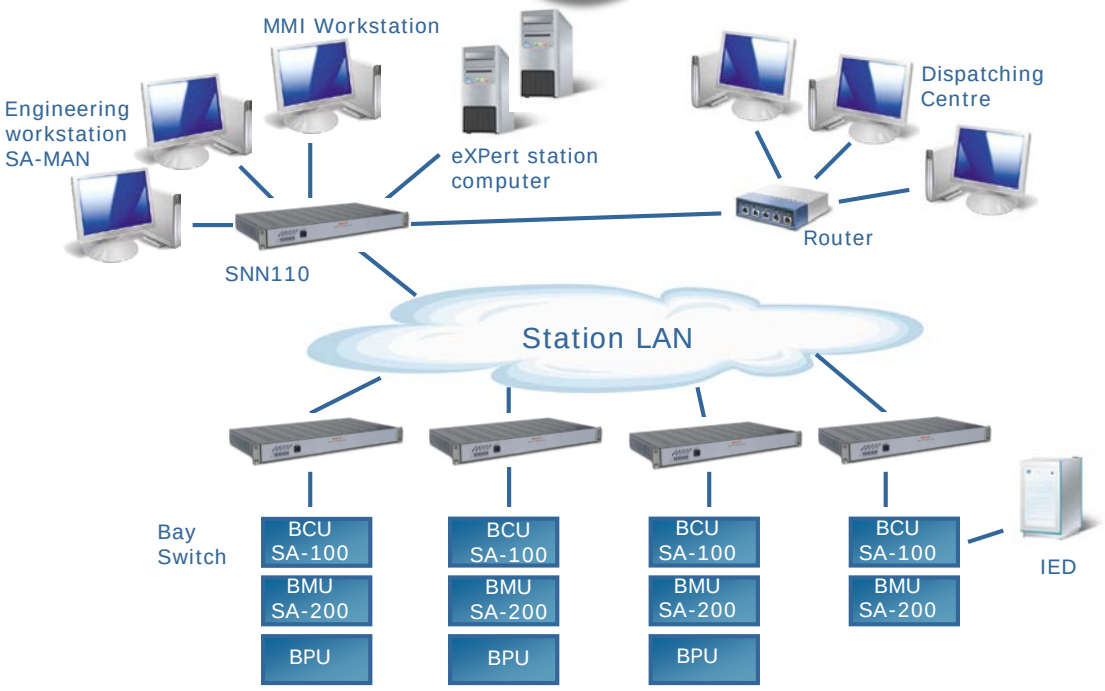
The SELTA solution includes electronic units -Bay Units- installed next to each power bay, which are specialized by function and interconnected through an optical LAN, controlled by a station computer. This is the ideal system for the Utilities managing HV and VHV power networks, that want to renew their substation control and automation systems, in order to maximize the efficiency and the quality of service.

Performances

- Integrated digital system for automation of HV and VHV power substation
- Functions of control, automation, protection, monitoring and maintenance
- Client/Server IEC 61850
- Support communication networks Optical fiber or copper with RSTP and PRP redundancy protocols

Main Features

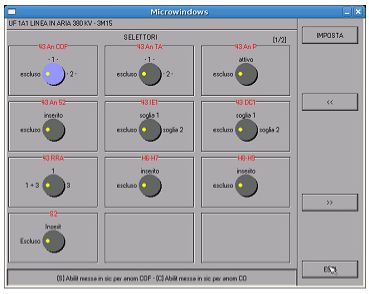
- Univocal and scalable architecture, easy to be extended, based on the concept of interoperability among the several control, monitoring and protection units
- The automation, both centralized and distributed on the several bays, is realized with software programs compliant with the IEC 61131 standard programming languages, instead of with the electromechanical relays
- Station LAN compliant with the 100Mbit/s Ethernet industrial standard and with a unique IEC 61850 standard protocol (client and server). It guarantees the interoperability among the different Bay Units and with the protection relay, allowing the evolution in different stages of the single equipment or the integration of equipments offered by different suppliers
- Integration in the protection system and IED equipment equipped with standard bus or with proprietary serial or parallel interfaces
- Synchronization of the entire system via GPS receiver, transmitted to bay units via an optical network, independent of Station LAN, based on IRIG-B protocol or NTP protocol
- Complete and easy plants configuration management through the Engineering workstation, interacting in complete safety with the automatic functions
- Simple integration of the station automation system into the hierarchically competent telecontrol network, with IEC 60870 standard protocols (101 client and 104 client/server) and with free access to all the information and functionalities necessary for the optimization of electric network operation and maintenance
- Standard setting of the engineering, of configuration, test and maintenance tools
- The system guarantees all functional performances, the respect of the environment conditions and very high quality standards.

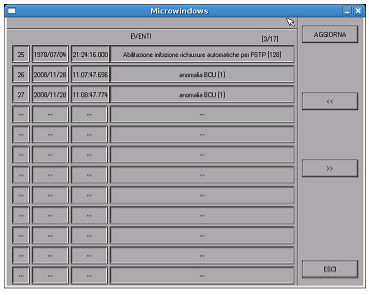


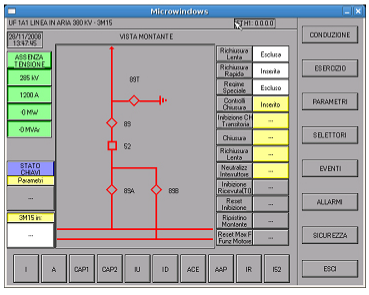
Bay Control Unit SA-100

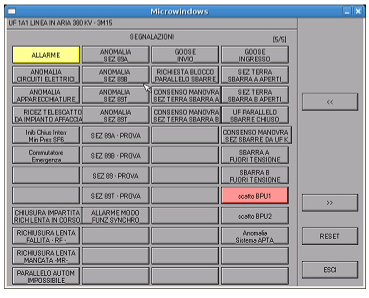
The BCU STCE/SA100 allows executing all the bay command and control functions, in particular:

- Interface with the field signals both directly through Input/Output cards and logically through the LAN
- Command and control of circuit breakers and disconnector switches, with direct connection without intermediate relays
- Interlocking logics among devices of the same bay and among devices of different bays
- Direct connection with the protections or realized through the LAN
- Automation functions, either Multi-bay or relevant to the local bay, carried out with IEC 61131-3 logics
- Digital Events Recording with 1 ms resolution and subsequent forwarding to the station computer for the out-of-line analysis
- Process measurements (voltage, current, active power, reactive power, frequency), through direct transducerless connection
- Syncrocheck function, also with asynchronous closings (networks with different frequencies)
- 10" colour display with graphic representation of the bay and of the position of all devices and with alarms list display. The display is complemented by a simple functional keyboard to allow the forwarding of the local commands
- Key selection of the command modes: local, remote, excluded, out of service.
- Interface via dedicated serial board with control, monitoring and protection device without protocols 61850, which allows the modernization of existing stations and the consequent integration of standard IEC61850 modules









Substation Control Unit SCU

The SCU is a system designed for the automation of small substations: it is a very compact and cheap solution, because it consists of a STCE/SA300 equipment with the same functions of BCU, connected to a panel PC that replaces the BCU display.

Bay Monitoring Unit SA200 (BMU)

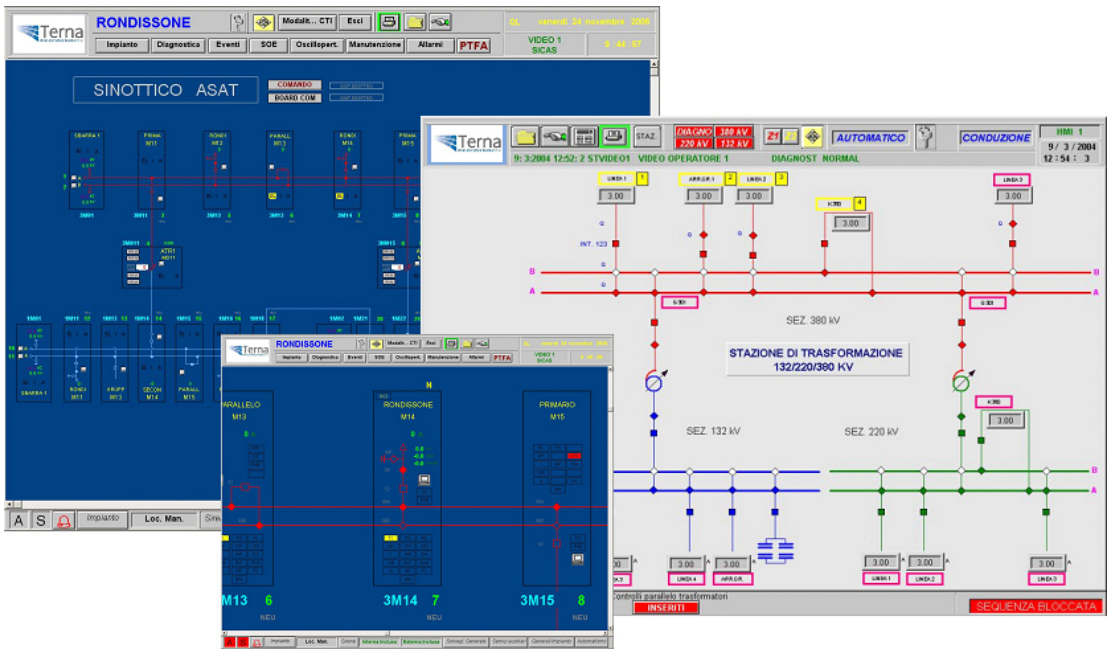
The BMU STCE/SA200 allows the monitoring functions of the electric system, of the operating parameters and of the components diagnostic. It carries out several functions:

- Interface with the field signals both directly through Input/Output cards, and logically through the LAN
- Perturbations recording (DFR) with memorization of the COMTRADE files and automatic forwarding to the Station Computer
- Monitoring of the HV electromechanical devices (circuit breakers, transformers, etc.) with direct transducerless connection
- Recording of the digital events with 1 ms resolution and subsequent forwarding to the station computer for the outline analysis.

All monitoring functions carried out by the BMU SA200 can be integrated into the BCU SA100.

EXPERT Station Computer

The Station Computer is the collector of all the information acquired by the bay units and it contains the complete Station database.
The SC provides with all the necessary functionalities for the supervision, for the management, for the automation and for the local or remote station maintenance.
It is composed by a server, that can be redounded in order to guarantee the service continuity, and by a number of workstations suitable to the operational needs.
The main functions can be subdivided into:
SCADA functions, dedicated to the building of the plants updated data base, through the continuous connection with all the Bay Units linked within the Station LAN
HMI/Web Server functions, allowing the display of the whole substation layout (with detailed zoom on every single bay), with the representation of status of the devices, the organs, the alarms, the measures, the monitoring functions etc.
All the video pages are shown on the MMI or are published into the WEB;
Station Automation functions, which can be configured according to the IEC61131-3 standards, in order to integrate the automation functions carried out by the BCU autonomously;
Gateway function, referred to the interfacing with the remote management or maintenance centres or with possible local RTU in accordance with the IEC 60870-5-101 and 104 protocols
Historical Data management, for the storage and the subsequent extraction of the information collected by the plant. In particular it is possible to manage chronological recording of the electric network perturbations, for further out-of-line analyses.



SNN 110

The aim of the network node SNN 110, designed for HV stations, is to realize a ring level 2 network architecture, in order to ensure the required application redundancy.
The unit, equipped with a redundable DC/DC converter with input voltage of 110 Vdc, is provided with an IRIG-B synchronization splitter on RJ45 port (up to 3 output) and on optical port (up to 4 outputs).
The device, now synchronized via NTP protocol (standard IEC 61850), is ready, regarding the hardware, to implement the new synchronism standard via IEEE 1588 protocol (Transparent Clock mode), in order to have only one optical communication infrastructure for data and time.
The IEC 61850-3 certification completes the set of features specific for the SAS version of the product.

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