The SO-57 bay control unit is integrated with an indication panel and a manipulator to perform control blocks. The SO-57 is designed for direct, centralized controlling any bays in substations of highest and middle voltages. The controller is equipped with a front elevation with an easily readable bay schema, elements indicating present bay status, manipulators setting the controller work mode with a mechanic or electronic key block, switch setting a bay work state, buttons for bi-hand controlling, auxiliary indicators and an LCD screen.

Directly plugged in signals informing about connectors states enables performing bay blocks directly in the controller. Communication with the device integrating the blocks function in a substation, i.e. SO-55 or other SO-57 devices enables performing interbay blocks. Execution elements of high power (300W DC) enable controlling the connection system without indirect relays.

The controller enables eliminating the traditional relay blocks and indications systems. The SO-57 is a ready-for-use device equipped with all elements necessary for local or remote manual controlling in normal, reserve and test mode. The controller is installed in control cubicles.

The specialized structure ensures required electromagnetic compatibility and resistance to environmental conditions. Controls may be performed in manual or remote mode through plugged in binary signals or data transmission. The number of operated connectors is up to 14, and number of bays integrated by blocks - up to 48.
Technical data

- **data transmission**
  - communication interface: RS-232, RS-485, fibre-optic cable, radio
  - cooperation with other devices: in star, track or mixed system
  - number of channels: 2 transmitting and 2 receiving
  - transmission protocol: SYNDIS, DNP3.0, VDEW-ZVEI, IEC 870-5-101, IEC 870-5-103
  - transmission: Full Duplex or Half Duplex
  - transmission speed: 50Bd up to 115kBd (defined for each channel separately)
  - options: transmission in two chosen standards simultaneously with defining the range of transmitted information and controls for each direction separately

- **time synchronization - time marker sources**
  - transmission channel synchronization - function implemented in the transmission protocol, supported connector with constant lag, transmission lapses not longer than 1 min., precision 10 ms
  - synchronization impulse - precision 1 ms

- **power supply**
  - voltage: 220 or 110V, AC/DC optionally 48 or 24V DC

- **mechanical realization**
  - structure of a 19" casing height: 6U, placed in a controller cubicle of the SO-51 type. Signal wires from modules are passed under the casings through soc. comb to the cubicle side, to signals terminal strips or to AN analog casings. In an AN analog casing there are transformers and separating measuring transformers

- **analog object signals connectors**
  - protection level: IP52
  - temperature range: version A: 0 ÷ 40°C; version B: -5 ÷ 55°C, version C: -25 ÷ 70°C
  - humidity: 30 ÷ 95% in 25 °C without condensation
  - atmospheric pressure: 800 ÷ 1200hPa
  - sinusoidal vibrations: amplitude 0.1mm in range up to 25Hz, acceleration 2.5m/s² in range 25 ÷ 80Hz
  - impacts/impulse wave: none
  - air ingredients: without corrosive vapours or gases in the standard version
  - operating conditions: in standard version the SYNDIS object controllers operate in the natural air circulation and do not require cooling the interior. For operating in surrounding temperature 40°C and above, in some devices there are fans installed inside. If a controller is to operate in the open area, it must be placed in a cubicle ensuring proper thermal isolation and appropriate protection level against dusts, water and dampness
Configuration of substation automation system with SO-57 controllers

Circuits of 220kV switchgear internal and auxiliary needs, 110kV switchgear secondary circuits and measurements circuits

Bay secondary circuits, indication from protections, counters

SP booth
L1 booth
Reserve
225kV 225kV 225kV

Teletechnical dedicated lines
Reserve
SCADA SYNDIS
DYSTER
protection department
KDM
Access
devices

GPS
Transducers
Protections

SO-52 SO-52
SO-55
SO-55

Attention: all connections between the devices of the SYNDIS system are fibre-optic.
SO-57 bay controller configuration for blocks