



# SO-52v21-AUT

## control unit with fault signalization and sectionaliser functions

A multifunction and efficient solution for industry and energetics with modular structure and configu-rable software.

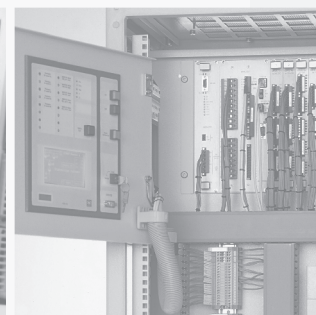
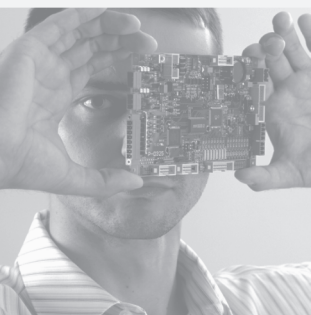
The SO-52v21-AUT controller is designed to support overhead and internal MV disconnectors by integrating functions of measurements, controls, telemetry, fault signaliser, sectionaliser and disturbance recorder.

**Signaliser function** - detection of interphase short-circuits and ground faults.

**Sectionaliser function** - detection of interphase short-circuits and ground faults with the option of opening a supervised disconnector by the controller in a selected non-voltage AR break.

The SO-52v21-AUT controller is manufactured in two hardware and functional versions:

- configuration with mAI-32-31 modules equipped with: 1 galvanically separated voltage input, 4 separated current inputs from current transducers; enables to perform by one controller up to three fault signalisers or sectionalisers and support a dozen or so MV connectors
- configuration with mAI-32-31 modules equipped with: 3 galvanically separated voltage inputs from reactance dividers, 4 galvanically separated current inputs from current transducers; enables to perform by one controller one fault signaliser or sectionaliser and support a dozen or so MV connectors



## Structure

The SO-52v21-AUT controller has a modular structure. Its modules are installed in a reinforced metal casing, resistant to harsh environmental conditions. The device may be installed in control cubicles, rack stands or on DIN rails.

Typical controllers communicating via a GPRS/UMTS-APN radio connection with the signaliser and sectionaliser functions are manufactured in two hardware and functional configurations:

- configuration 1 - the controller comprises:
  - central unit with a 3G modem: mCU-02-05
  - 24V DC power supply module: mPS-11-91
  - modules with 16 binary inputs and 6 binary outputs: mBM-48-21
  - analog input modules: mAI-32-31; the module is equipped with one galvanically separated voltage input 100V AC, 4 separated current inputs IAAC, LED signalization of IO> fault current flow and IO> ground current flow and 2 buttons TEST and KAS
- configuration 2 - the controller comprises:
  - central unit with a 3G modem and a full measurement device mCA-01-01; the module is equipped 3 galvanically separated voltage inputs from reactance dividers, 4 galvanically separated current inputs IAAC from current transducers, signalization of IO> fault current flow and IO> ground current flow and 2 buttons TEST and KAS
  - 24V DC power supply module: mPS-11-91
  - modules with 16 binary inputs and 6 binary outputs: mBM-48-21

## Telemetry and protection functions

The SO-52v21-AUT controller performs telemetry functions in the range of binary inputs reading, performing controls using relay outputs, measuring values of phase currents and voltages. States of all binary inputs and outputs and values of measurements are on-event or may be read cyclically by a supervising system. In the standard version the controller is equipped with 4 banks of settings, what facilitates operation significantly, especially when there is a need for changes in a power network configuration.

There are two buttons on the front panel of the SO-52v21-AUT controller:

- TEST - is used to run a test of signaliser operation correctness, with sending information to a supervising system simultaneously
- KAS. - is used to reset the fault signalization

The SO-52v21-AUT controller equipped with mAI-32-31 modules performs protection functions in the range of detecting interphase short-circuits and ground faults and measuring current and voltage presence in medium voltage lines. The device has also the sectionaliser function implemented. During short-circuits or ground faults the controller may open a supervised disconnecter in a selected non-voltage AR break.

The SO-52v21-AUT controller equipped with a mCA-01-01 module, apart the mentioned above functions of detecting short-circuits and ground faults and current measurements, realizes also measurements of phase voltages in medium voltage lines. Thanks to a full measurements system (3 voltage inputs from reactance dividers, 4 current inputs from current transducers) it may apply the following listed protection modules in order to detect short-circuits:



SHORT	NAME	SYMBOL
IINP	independent overcurrent protection module	I1>>
I2NP	independent overcurrent protection module	I2>>
I4NP	independent overcurrent protection module	I4>
I0NP	ground fault overcurrent protection module	I0>
PKIER	directional ground fault overcurrent protection module	I0K>
PNY	admittance ground fault protection module	Y0>
PNG	conductance ground fault protection module	G0>
PNB	susceptance ground fault protection module	B0>

## Event recorder

It is an event log available both from the pConfig configuration program and a dispatching system. It comprises all events connected with a supervised object. The time stamp of 1ms resolution enables to perform analyses of operations executed during normal exploitation, comprising on and off switches, changes of setting banks, changes of configuration, etc., and emergency situations as well.

## Disturbance recorder

The SO-52v21-AUT controller is equipped with a multi-channel disturbance recorder enabling to analyze emergency states and causes of their occurrence, in particular:

- analog values
- measured and calculated states of binary inputs and outputs
- controller internal states

## Communication with SCADA systems

The SO-52v21-AUT controller may communicate with a SCADA system using the built-in GPRS/UMTS-APN communication module, Ethernet network, RS-232 or RS-485 connections, supporting various communication protocols.

The following communication protocols are applied for communication with a SCADA system:

- DNP 3.0
- PN-EN 60870-5-101
- Iub PN-EN 60870-5-104

These protocols are supported in the range of realizing the command authentication according to the PN-EN 623514 standard.

The hardware configuration of the controller enables to apply in the future other radio connection systems, e.g. TETRA, CDMA2000, DMR and others. A change of the connection system requires only installing an additional communication module.

## Configuration and diagnostics

The remote and local configuration and diagnostics of the SO-52v21-AUT controller is performed using the dedicated pConfig program. Diagnostics of the device is available also via the WWW interface, SMS messages and telemetry protocols as well as the SNMP v3 protocol, which enables to connect the controller to a telecommunication network monitoring system.

The configuration and diagnostics is possible using the ETHERNET interface and through a GPRS/UMTS-APN network.



# Front panel of the mCA-01-01 module with its interfaces

