



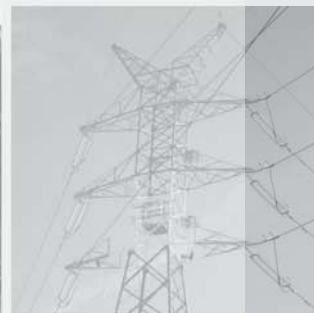
# products

## Systems

- SYNDIS the system for supervision, control and support
  - SCADA/NMS in transmission and distribution control-rooms
  - GIS, information system on geographic base
  - network calculation, work management and scheduled maintenance, customer inquiry and emergency report handling
- DMS/EMS modules for business and economics functions: customer outage information and analysis, operational planning, assets management, cost and investment planning, load forecasting
- Syndis-Energy for commercial functions and power economy: remote meter Reading, energy balance, electricity trading, optimum management of power resources, contract portfolio management, billing and invoicing
- SYNDIS SO-5 substation automation system
  - local HMI: bay control units management, measurements, indicating and alarms, automation and interlockings, local and remote communication, protection management, redundancy of communication network and devices
  - equipment integration
  - SMS messages
  - WWW server

## Devices

- Substation equipment
  - SO-50 dispatch terminal
  - SO-55 real time server
  - SO-51 communication control unit
  - SO-52v11 bay control unit
  - SO-5403 converter for electricity rates measurements
  - SO-5431 synchrocheck with phasing
  - SO-55 communication unit / data concentrator for protections
  - SO-55TS mimic board control unit
  - SO-56
  - SO-57
  - SO-58 controller for wireless measurements and controls
  - SO-52SC central indicating module
  - KMT / KMR radio / TV broadcast supervision and control devices
  - ARST-01 transformer station voltage regulator
- Recorders and analysers
  - SO-52R disturbance recorder
  - protocol analyzer with hardware interface PTR-xxx
  - AMS meter data concentrator for balance and account systems
  - ADAT phone call recording systems
- Additional equipment
  - telemechanika
  - transmission signal converters and separators
  - equipment for "intelligent buildings systems
  - multiplexers and transmission devices
  - data measurement, control and visualization units
  - signal strips, bus boards and safety circuits, power supply units





## SYNDIS system of supervision, control and support

SYNDIS is a state-of-the-art tool for building automation and control systems for electricity substations as well as for other technological and manufacturing processes. The SYNDIS-RV software, which is a part of SYNDIS, is a sophisticated graphics system to support wide range of SCADA applications. SYNDIS-RV is designed in distributed client-server architecture. It has a number of built-in mechanisms for data acquisition, graphical presentation on multi-screen displays and synoptic tables and ORACLE based backup system. SYNDIS-RV has got all the necessary graphic system features, e.g. dynamic object colouring, advanced filtering and adaptation tools to facilitate event logs and alert lists. SYNDIS can work with devices of various manufacturers, integrating all processed data into one standardized open protocol. This feature allows to build a flexible system which can be easily customized to work with other existing object solutions.



## SO-5xxx series of remote terminal units

SO-5xxx is a flexible modular system of controllers to be used in a wide range of automation, control and measurement applications. SO-5xxx provides the basis to build a virtual Remote Terminal Unit (RTU), to operate as part of a complex supervision and control system of power supply network or substations. Mikronika offers a wide range of RTUs with system features, number and type of inputs-/outputs individually tailored to particular applications. RTUs are based on a set of rack-mounted modules and embedded, stand-alone controllers. This hardware set of components consists of a processor, binary and analog input/output and serial transmission packages. All units are supplied with required communication interfaces. SO-5xxx system is highly recommended to work on substations and other location characterized by a high degree of electric and magnetic disturbances and rough environmental conditions.



## SO-55 protection devices communication unit

Protection Devices Communication Units manufactured by Mikronika work with Digital Protection Units installed in high, medium and low voltage power substations. They enable connecting this equipment with SCADA and EMS systems. Besides, they make it possible for a wide range of various devices to work and communicate with dispatch systems, national, regional and local, using different protocols. This Communication Unit supports almost all digital protection units available on the market, including ABB, AEG, Alstom, ITR, JM-Tronik, POLON, ZEG Tychy, SIEMENS, Schneider and using different transmission protocols, e.g. DNP 3.0, SPA, IEC-870, LON. Protection Devices Communication Unit can work with other IED station devices, such as voltage controllers, buffer power suppliers, security hubs and converters.



## Measuring converters

MIKRONIKA measuring converters are designed to carry out power parameter monitoring in power plant substations, heat-generating plants, Polish Power Grid Company (PSE) and other distribution companies. Measuring converters are capable of measuring all electric parameters of power supply network, this means currents, phase voltages, frequencies, line voltages, phase shift angles, active/-reactive energy and power, apparent energy, forward and reverse and peak power. Graphics- and character-based Tx series terminals are also available from Mikronika to facilitate user-friendly presentation of measurement results.

## Radio-based telemechanics

Radio-based telemechanics is designed to perform wireless control functions of the equipment installed in power supply networks when it is required due to technical or economic conditions. The use of radio transmission enables MIKRONIKA to build wide, wireless networks providing measurement functions and control support. Manufactured devices make it possible to create many different network structures, connected directly with the master station or with local retransmission (wire or wireless). Controllers can work with short current flow indicators to provide automatic short circuit detection system. Communication can be based on the DIGICOM 7 net trunking system, open channel radio communication (433MHz or 868MHz) or a GSM/GPRS mobile network.



## SYNDIS-ENERGIA power balance system

SYNDIS-ENERGY is used for analysis of production, consumption, forecasting and power media exchange accounting. System takes advantage of all new technologies in range of measurement and communication, e.g. Internet and Intranet. SYNDIS-ENERGY is recommended to work in industrial plants, energy distribution companies, power plants, heating facilities, water supply plants and others, dealing with media energy management. SYNDIS-ENERGIA operates with media market software (WIRE), SCADA systems and financial software.



## AMS-xxx power consumption recorders

AMS Power Recording Unit is designed to collect real-time data essential for efficient supervision of power and electric energy management processes. AMS records data even from 128 Pulse outputs from electricity meters, gas meters, hot water meters and other measuring devices. An AMS recorder with digital input module can read and gather all the data directly from energy meters equipped with a data transmission interface. AMS can perform all the required signalling and control features, e.g. the order overdrafts of energy and demand power or control of compensating capacitor batteries. Total of pulses from each line can be retransmitted constantly or at regular intervals (e.g. ONLINE every minute retransmission to RTU telemechanics units or Electrical Balance Software). AMS recorders are equipped with up to 6 data retransmission channels to allow simultaneous, remote communication with recorder over wired connection, modem and/or computer network.

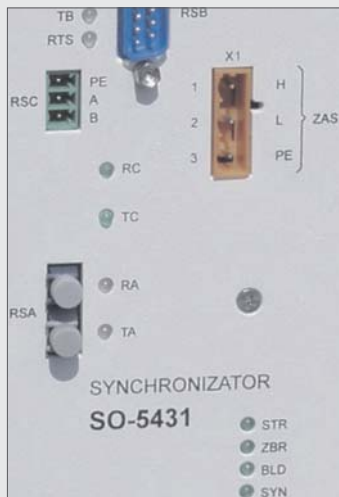


## Electronic energy meter

MARK-V electricity meters are a group of four quadrant 0.2 class digital meters designed for use in systems where high precision is required. The meters are additionally equipped with measurement and recording options to measure energy quality parameters, including sag, swells, harmonic, outages. MARK-V advanced metering features are especially useful in power distribution companies and metering systems to collect and process data for the power market. This type of meters are designed for use in measurement systems as operated by power plants, heat-generating plants and many several other types of facilities where large amounts of energy are consumed.







## Synchrocheck modules

Synchrocheck modules are designed to supervise and control processes whenever two power lines or power areas need to be connected. The parameters that are under supervision include:

- U1 and U2 voltage values in both lines
- voltage difference between the lines
- voltage phase difference
- frequency difference

After having analysed the above parameters, the Synchrocheck module sends the ready to connect signal. Depending on the status of individual lines, three different types of connection are then performed, i.e. non-voltage, line connection in the shared energy system and connection of separately powered areas.



## Signal converters, separators and multiplexers

Mikronika offers a wide range of devices for digital data transfer over wire and fiber interfaces. The range comprises signal converters and isolators in various hardware configurations, such as Ethernet 10/100TP/FO, current loops combined with one another or with fiber optic. Fiber devices include: multiplexers, starcouplers and intelligent transmission multiplexers MKT and STC series. Our fiber optic based transmission devices allow proper connection of several types of measurement, control and telecommunications controllers. They can operate in single-mode, multi-mode, plastic and glass fiber standards.



## ADAT-xxx call monitoring & recording system

Call Monitoring & Recording System is an advanced system that makes it possible to replace conventional multi-channel tape recorder with computer based technology. ADAT-xxx can handle large amounts of data that need to be recorded and stored as backup. Thanks to browsing tools, all recorded data can be accessed from the computer network or from the Internet. ADAT-xxx allows to connect and record calls transmitted over such devices as analog and ISDN phones, radio communication systems, microphones and many others. Recording is performed using direct phone-analog connection or using the 2B + D or E1 digital standards.



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