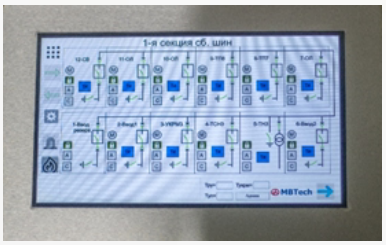
PLC MAKON: powerful and reliable solution

MAKON A200

MAKON for ATS in RMU



MAKON for monitoring&control

MAKON – one of the most powerful and productive controllers manufactured in the Russian Federation. Exclusive channel-distributed architecture of the board with a three-stage verification system ensures the reliability of the controller at the level of the world's leading manufacturers.

MAKON controllers use **MBTech 's patented technology** for working with digital signal processing modules.

To solve automation targets, the controller is equipped with Codesys v 3.5.

MAKON series controllers support **all the most common data transmission protocols** : Modbus TCP, IEC60870-5-101, IEC60870-5-101104, IEC 61850, MQTT .

In addition, three separate serial ports can be used to collect data from power meters using the DLMS (SPODES), Mercury and SET protocols, as well as to organize integration with other devices using the Modbus RTU.

Configuration and setup of supported data exchange protocols is carried out through a convenient and client oriented web application.

The controller is available in modular execution And Maybe contain V in his own composition various combinations of the following modules:

- main operation module;
- extension DIO module;
- extension RO module;
- U/I control module;
- display module;

A unique solution using a touchscreen LCD display module allows you to organize a local visualization, control and preventive diagnostics system at a significantly lower cost compared to a solution based on an HMI panel.

Additionally, MAKON series gives an opportunity to implement the system by connecting modules as remote input/output devices via the RS-485 interface.

MAKON controllers are suitable to solve the following tasks:

- organization of uninterruptible power supply and automatic switch to reserve power source at important facilities, such as data centers, critical infrastructure facilities;
- control, operation and monitoring in industrial sites and power substations ;
- systems using artificial intelligence, for example for preventive diagnostics of the object’s condition.

Main operation module MAKON-A200

A powerful and efficient processor with modern functional software and at the same time a reliable and simple design with rich peripherals make the MAKON controller a universal solution for most automation tasks where a high-quality technical solution is required.

The new A200 series controllers are equipped with all modern technologies for convenient setup and operation, which significantly reduces the costs of the corresponding types of work:

- Web server ;
- visualization, including trends, graphs, event log;
- remote access;
- remote update;
- different levels of access;

The reliable and noise-proof metal case distinguishes this line from its competitors with plastic and aluminum cases.

Parameter	Values (properties)
CPU	ARM Cortex-A55, 4 cores , 2 GHz , RAM 2 GB , ROM 16 GB
Programming and control environment	Codesys 3.5, TMIUS
Interfaces	Ethernet – 1 pc. RS485 – 4 pcs USB – 1 pc
Data transfer protocols	Modbus RTU/TCP, IEC-60870-5-101/104, IEC 61850 MMS/GOOSE, MQTT, SNMP, Mercury, SET, DLMS (SPODES)
Universal Digital Channels	12
Fast acting channels	1 input, 1 output
Universal analog channels (4-20mA, 0-10V)	1 input, 1 output
Control and display	2-position micro switch Data transfer indicators – 4 pcs. Programmable buttons – 2 pcs. Programmable indicators – 3 pcs.
Supply voltage	24V
Autonomous operation (with supercapacitor assembly)	3 min at room temperature
Operating temperature	From -20 to +50 °C
Overall dimensions (WxHxD)	58x137x129, mm
EMC Compliance	TR CU 020 and GOST 61000-6-5-2017

Display module M-X10

The color touch LCD module M-X10 with a wide viewing angle allows for the implementation of various visual images for local dispatching.

Extensive software capabilities for creating objects, trends, logs and access levels make the local automated workplace simple and convenient, which significantly increases the reliability of the system, since it allows the operator to quickly and correctly make the necessary decisions.

Instead of classic HMI solution, data processing occurs on the controller itself, and the panel serves only for the human-machine interface. This solution is more cost-effective, due to the provision of two conditions at once: a reduction in the cost of the equipment itself and a reduction in the cost of setup due to the lack of need to program the panel itself (the entire program is implemented in the main module of the controller).

The metal housing and front protection rating of IP 54 are suitable for difficult operating conditions.

Parameter	Values (properties)
Display type	LCD
Diagonal size	10.1 inches
Permission	1024x600 pixels
Viewing angle	170°
Type matrix	IPS
Sensor type	capacitive
Number of touches	10
Installation dimensions (WxHxD)	258x168x67 (mm)
Supply voltage	220V AC or 24V DC
Interfaces	Ethernet – 1 pc.
Housing material	metal
Degree of protection	IP54, IP21

The panel is also available in a stainless steel housing.
A 15-inch panel is under development.

MBTech

Digital signals extension module M-DIO32

M-DIO 32 is digital signal module with the largest number of universal inputs and outputs in Russia in a vertically positioned housing allows for easy and elegant implementation of rich data collection and transmission schemes. Additional convenience of installation is achieved by using plug-in mating terminal connectors.

The module is universal and can be used both as part of the MAKON system (connection via bus) and as an independent remote input/output device, since it supports data transmission via Modbus-RTU through RS-485 port.

All channels are universal, so this module allows you to optimize warehouse stocks and spare parts, as well as avoid unforeseen situations during installation and commissioning at remote sites.

Parameter	Values (properties)
Universal Discrete Channels	32
Discrete Channel Type	Dry contact
Supply voltage	24V
Operating temperature	From -20 to +50 °C
Interfaces	RS485 – 1 pc
Data transfer protocols	Modbus RTU
Overall dimensions (WxHxD)	58x137x129 (mm)
Housing material	metal
Degree of protection	IP21

MBTech

Relay Output Module M-RO12

The output signal module with 10A (~220V) power relays allows switching not only control circuits, but also power equipment, such as motor operation drives, tripping coils, compressor equipment or electric motors.

Due to the lack of need for intermediate relays, the standard module for the MAKON series allows for significant space savings and a reduction in the number of wires, which simplifies installation, increases reliability and reduces the cost and production time of cabinets.

Just like the digital signal module, the M-RO 12 relay module can be used separately for remote control of power equipment via Modbus-RTU through RS-485 port

Parameter	Values (properties)
Number of outputs	12
Output type	relay
Rated current of the relay	10A
Rated voltage of the relay	220V AC
Mechanical switching resource	10 million operations
Electrical switching resource	0.5 million transactions
Supply voltage	24V
Operating temperature	From -20 to +50 °C
Interfaces	RS485 – 1 pc
Data transfer protocols	Modbus RTU
Overall dimensions (WxHxD)	58x137x129 (mm)
Housing material	metal
Degree of protection	IP21

MBTech

Network Parameter (U/I) Control Module M-KC3

The M-KC3 network control module is available in several modifications depending on the parameters that need to be controlled. The device is specially designed taking into account the requirements for reliability and efficiency of operation in substations of power grid and industrial companies.

A distinctive feature is the ability to analyze voltage circuits directly from a capacitive or resistive divider in high-voltage switchgears 6-35 kV or from a voltage presence indicator.

The M-KC3 module provides control for all main electrical parameters of the power grid: from the effective values of currents and voltages to power (P, Q, S), frequency and cos-φ.

The M-KC3 module, like other MAKON modules, can be used as a separate device for remote monitoring of an object with data transmission via Modbus-RTU.

Parameter	Values (properties)
Number of current control channels	3 (0)
Number of voltage control channels	3
Voltage channel connection type	RJ45/ screw terminal
Measured parameters	1. Phase current (RMS) 2. Phase voltage (RMS) 3. Active, Reactive, Phase apparent power 4. Network frequency 5. Power factor
Supply voltage	24V
Operating temperature	From -20 to +50 °C
Interfaces	RS485 – 1 pc
Data transfer protocols	Modbus RTU
Overall dimensions (WxHxD)	58x137x129 (mm)
Housing material	metal
Degree of protection	IP21

*- dimensions and other characteristics of the product may change without notice. Check the current information on the date of order.