



MSG-6xx/7xx

GPRS/UMTS/LTE communication modules

MSG-6xx/7xx communication modules are specialized devices with additional interfaces able to convert protocols, designed for establishing connections with any devices in GPRS/UMTS/LTE networks.

MSG-6xx/7xx communication modules are advanced GPRS/UMTS/LTE communication devices which are able to function as modems, data concentrators and protocols converters simultaneously in appropriate applications in the power industry and other industry branches. The device may be applied in any SMART GRID networks for communication with devices which do not support GPRS/UMTS/LTE standards on their own.

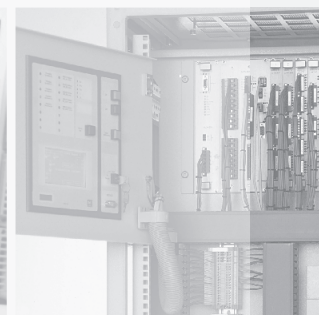
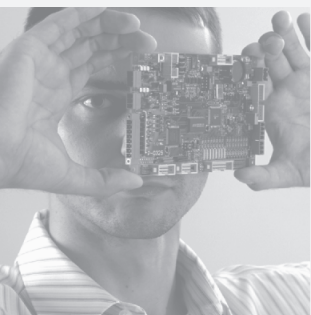
MSG-6xx/7xx modules successfully cooperate with digital protections, reclosers, controllers of biogas plants, wind and photovoltaic farms.

MSG-701-1 also supports measurement meters such as: electric energy, gas, water with the MBUS or RS-485 interface in any protocol DLMS/COSEM, MODBUS, IEC 60-870-5-101, EN 13757.

The devices perform advanced communication functions, such as parallel support of many transmission protocols in several communication channels with simultaneous protocol conversion.

Depending on the version, they are equipped with ETHERNET network connections, serial transmission channels and 1-Wire interfaces.

To ensure data privacy and protection, performed operation reliability and to protect against unauthorized operation and to prevent human errors, several „cyber security“ mechanisms have been implemented in modules to protect communication, remote and local access as well as sensitive information.



Features

Depending on the version, MSG-6xx/7xx devices are equipped with extended communication resources:

- Ethernet TP10/100 connections
- RS-232 channels or MBUS channel
- RS-485/RS-422 channels
- 1-Wire channel
- RS-232 channel for local diagnostic
- wifi service channel option
- wireless MBUS option (868 MHz)

Specific equipment is selected using product keys. MSG-6xx/7xx modules have a built-in modem with two SIM card slots what makes it possible to operate in networks of two different providers. The devices may communicate with a SCADA system using the built-in 2G/3G/4G modem, Ethernet network or RS-485/422 and RS-232 connections, supporting various communication protocols. For communication with SCADA systems the DNP3.0 or PN-EN 60870-5-104 protocols are usually applied, other protocols also possible. For measurements systems SFTP mechanism can be applied - e.g. csv/xml file exchanging. MSG-6xx/7xx can act as transparent gateway as well as data concentrator.

MSG-6xx/7xx modules are designed also for cooperation with the TETRA system. An external radio TETRA system terminal may be connected to the module using a serial connection. The module ensures simultaneous, parallel communication with a SCADA system in TETRA and GPRS/UMTS/LTE-APN connections.

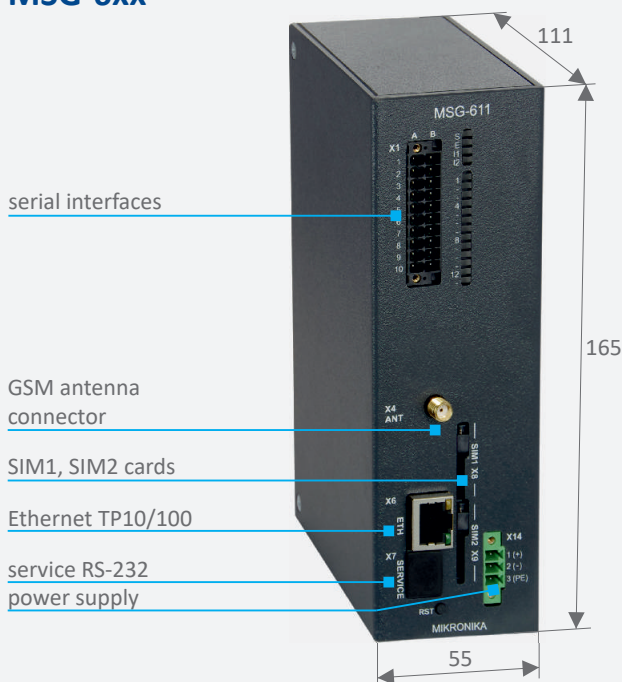
The integrated modem is used to establish connections in GSM/GPRS/EDGE/UMTS/HSPA+ networks and also LTE in 900/1800/1900/2100 MHz bands, class 10. Connection from wireless networks is realized in TCP/IP or UDP network protocols.

Structure

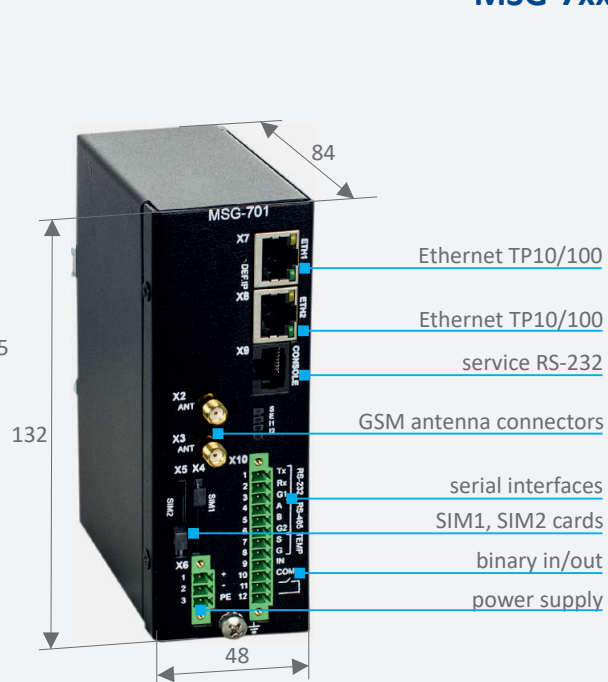
The module has a rugged casing, resistant to environmental conditions. Depending on the version, it may be made of metal covered by highly-resistant powder coating or coppered plastic. Module power supply is galvanically isolated from communication interfaces and logic systems. Multi-sided galvanic isolation ensures high reliability of operation, resistance to overvoltage-caused damage and transmission insensibility to interferences.

MSG-6xx/7xx are designed for installation on DIN 35 mm rails. Access to electronic components is possible in the service mode. All interfaces are available on the front. A view of modules with a description of interfaces and device dimensions are presented below.

MSG-6xx



MSG-7xx



Cooperation with communication devices

The modules enable simultaneous support for at least two any other communication modules. Optionally, it is possible to connect e.g. a PSTN modem or a specialized transmission converter. To MSG-6xx/7xx external interfaces any external modem may be also connected, supporting transmission in GSM/GPRS/UMTS or CMDA standard. It is also possible to connect a radio modem operating in dedicated standards, e.g. TETRA or DMR or a radio modem applying dedicated ranges or open frequencies.

„Cyber security” features

“Cyber security” solutions applied in MSG-6xx/7xx have been based on ENISE, NIST, BDEW and BlueCrypt recommendations. The implementation of security mechanisms is compliant with PN-EN 62351, IEEE P1686, PN-ISO/IEC 27001 standards and BDEW White Paper “Requirements for Secure Control and Telecommunication Systems”. They include:

- communication protection
- access control
- sensitive information protection
- user activity logging/monitoring

Specific functionalities are configured using the pConfig software (e.g. AES-128 encryption).

Technical data

MSG-6xx/7xx modules meet requirements for class 2 device regarding security according to the PN-EN 60950 standard. It is possible to manufacture MSG-6xx/7xx in a version for on-table installation with additional handles and in a higher protection class. Such requirements should be consulted with the manufacturer.

| PARAMETER | RANGE |
|------------------------|--|
| casing | for installation on DIN35 or TS35 rail according to PN-EN 60715:2007 |
| moving parts | none |
| protection class | IP51 |
| weight | 530 g (MSG-601 and MSG-611), 600 g (MSG-701) |
| dimensions (W x H x D) | 55x165x111 (MSG-601 and MSG-611), 48x132x84 (MSG-701) |

Power supply

| PARAMETER | MSG-601 | MSG-611 | MSG-701 |
|--------------------------------|----------------|-----------|-----------|
| nominal supply voltage | 230/220V AC/DC | 12÷24V DC | 12÷24V DC |
| supply voltage range | 90÷280V AC/DC | 9÷36V DC | 12÷24V DC |
| maximal peak power consumption | 10W | 7W | 6W |
| average power consumption | 7W | 5W | 4W |

Communication

| PARAMETER | NETWORK TRANSMISSION | RADIO TRANSMISSION | SERIAL TRANSMISSION |
|-----------------|--|--|---|
| protocol | standard version PN-EN 60870-5-104 DNP 3.0 TCP/UDP MODBUS-TCP SFTP | standard version PN-EN 60870-5-104 DNP 3.0 TCP/UDP MODBUS-TCP SFTP | PN-EN 60870-5-101 PN-EN 60870-5-103 DNP3.0, MODBUS-RTU DMLS /COSEM MBUS (MSG-701-1) |
| physical aspect | ETHERNET TP10/100 channel | radio channels in GSM 2G/3G/4G network depending on device version | RS-232 or MBUS, RS-485/422, 1-WIRE depending on device version |
| connector type | RJ45 | SMA | 713-1430/107-000/ 713-1110/107-000, WAGO |

Environmental conditions

| PARAMETER | STANDARD AND CLASS | RANGE |
|--|--------------------------|---|
| operation temperature | PN-EN 60870-2-2 class C1 | from -25°C to 55°C from -25°C to 70°C *) |
| relative humidity | PN-EN 60870-2-2 class C1 | 5÷95% |
| atmospheric pressure | PN-EN 60870-2-2 class C1 | 86÷106kPa, 0÷2 000m |
| protection level, without additional protections | PN-EN 60529 | IP51 |

*) for „B” type construction

Isolation strength

| PARAMETER | STANDARD | RANGE |
|----------------------|-----------------|------------------|
| dielectric strength | PN-EN 60870-2-1 | 1kV/RMS for 1min |
| resistance to surges | PN-EN 60664-1 | 2kV |

Mechanical resistance

| PARAMETER | STANDARD AND RANGE | RANGE |
|---|------------------------|---------------------------------|
| transfers for sinusoidal vibrations | PN-EN 60255-21 class 1 | 0.035mm |
| accelerations for sinusoidal vibrations | | 0.5g ($g=9.81 \text{ m/s}^2$) |
| maximal acceleration in case of single surges | | 5g/11ms |

Configuration and diagnostics

Configuration and diagnostics of communication module may be performed using the pConfig configuration software. It is possible to preview module operation on-line on a WWW page and configure it in a limited range. Events connected with module operation, transmission state and diagnostic functions are stored in the device internal event log.

Selection key

MSG-xxx:

- 601** - device in a coppered plastic casing, power supply 230/220V AC/DC, 3G modem, 1x Ethernet TP 10/100, 2x RS-232, 2x RS-485 / 1x RS-422, 1-Wire
- 611** - device in a coppered plastic casing, power supply 12-24V DC, 3G modem, 1x Ethernet TP 10/100, 2x RS-232, 2x RS-485 / 1x RS-422, 1-Wire
- 701** - device in a metal casing, power supply 12-24V DC, 4G modem, 2 x Ethernet TP 10/100, 1x RS-232, 1x RS-485, 1-Wire, 1x binary input, 1x control output
- 701-1** - device in a metal casing, power supply 12-24V DC, 4G modem, 2 x Ethernet TP 10/100, 1x MBUS port, 1x RS-485, 1-Wire, 1x binary input, 1x control output