

**COMMUNICATION SYSTEM, "RS" SIGNAL CONVERTER INTO "OPTO SIGNAL"
MODULAR CONSTRUCTION, GLASS OR PLASTIC OUTLETS
SERIES: "ZSK 100"**



DESCRIPTION

The ZSK100 system is intended for the communication connection of several peripheral devices within one object, that is, several nearby objects, via serial communication. The system is especially adapted to work in an electrically unfavorable environment, such as substations, where strong electromagnetic transients occur when power lines are switched on or off, which, in addition to classic RS232 communication, would lead to transmission errors, but also to device failures.

The basic transport medium for communication is an optical fiber (glass or plastic), and individual devices are connected to each other in a star configuration that ensures that the failure of an individual device does not lead to downtime in the rest of the network. The system can be configured for "master/slave" communication where, for example, the monitoring computer manages the overall communication, but also as a system in which each device can talk to each other (communication system LON, Echelon/ABB).

In addition to modules for optical communication, modules for RS232 or RS485/RS422 communication can also be included in the system. Thus, for example, by connecting two RS232 modules, galvanic isolation of RS232 communication can be achieved, and by connecting one RS232 and one RS485 module, protocol conversion with galvanic isolation can be achieved.

The ZK100 system is built modularly, and can be increased in steps of one or two communication channels, thus achieving the optimal system size. The device can be powered, depending on the built-in power supply module, from an alternating network 220V/110V, but also from direct current (24 V - 220 V). The modules are intended for mounting on a DIN rail.

TECHNICAL DESCRIPTION

1. Internal bus

The ZSK100 system is designed in a modular way, in order to achieve the size of the system suitable for the process being monitored or managed. The modules contain one to two communication channels, and they are connected to each other by an internal bus that enables the construction of the system in accordance with the desired configuration. With the appropriate

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settings on the communication modules, the internal bus can be configured for full duplex operation, for simultaneous data transfer in both directions, or for half-duplex operation, where transmission is only possible in one direction at a time, but information exchange is therefore enabled between any two communication channels.

The internal bus, in addition to the function of communication connection, also has the role of power distribution (5 volts) to all modules of the ZSK100 system.

1.1. Internal bus - full duplex

When the system is used for so-called "master/slave" communication, the communication modules must be configured for full duplex operation. A schematic representation of such a system is given in Figure 1. For this type of communication, one of the channels must be configured as "master" and it connects to a superior device, usually a computer that manages the communication (eg a remote control center). All other communication channels must be configured as "slaves" and they are connected to subordinate devices (eg protection relays in the substation). All messages received from the master device are forwarded to all slave devices, while messages from all slave devices are directed to the master. Since all slave devices transmit their information to the master device via the same bus, only one of them may be active at a time. The master device is responsible for synchronizing subordinate devices (eg with the "call/answer" system).

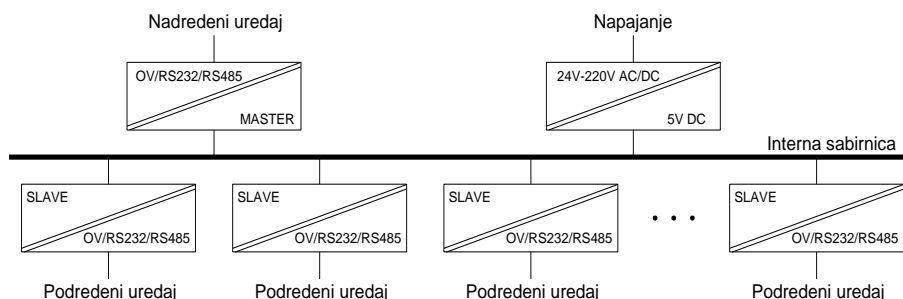


Figure 1 – Internal bus set up for full duplex operation

With this configuration of the system, a star structure of the communication network is built. Its advantage is that peripheral devices are completely separated from each other, so failure or disconnection of one or more of them does not cause interruptions in communication with other devices.

If individual parts of the network are physically dislocated (eg in objects far from each other), then it may be desirable to build a mixed, star-hierarchical, type of network. In this case, one ZSK100 system is installed at each remote location, which connects peripheral devices from that location in a star configuration. Individual parts are integrated into one whole by a hierarchical type of network. A schematic view of this network is shown in Figure 2.

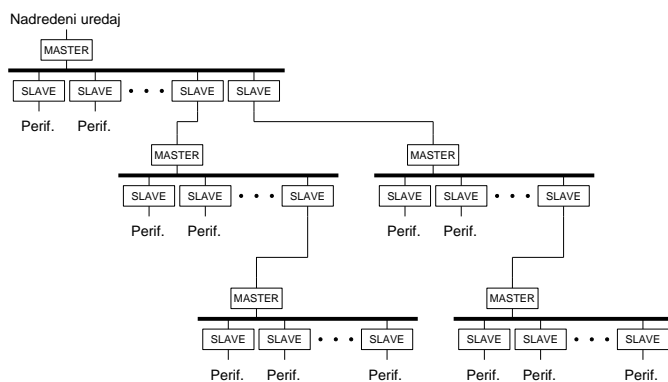


Figure 2 - Mixed, star-hierarchical type of communication network - full duplex

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1.2. Internal bus, full duplex

When the communication modules are set to use the internal bus in half-duplex mode, all communication between communication channels takes place through one pair of conductors, "two-wire". A schematic representation of such a system is given in Figure 4. When any of the peripheral devices sends a message, it is available to all other peripheral devices in the system, so "everyone to everyone" communication is possible. In order for this to be possible, the communication protocol must ensure such synchronization between peripheral devices that at one time only one of them is in the state of transmission. This can be achieved, for example, by collision detection, as is done by the LON protocol of the company Echelon/ABB. A star-hierarchical structure of the network, with the preserved possibility of "everyone to everyone" conversation, is possible and is shown in Figure

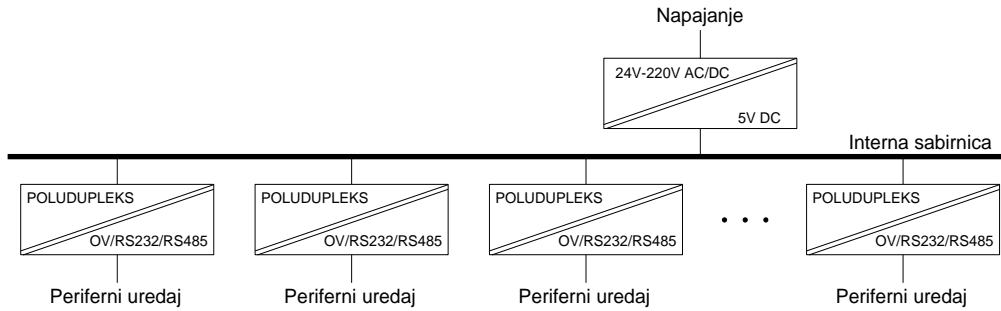


Figure 4 – Internal bus set up for half-duplex operation

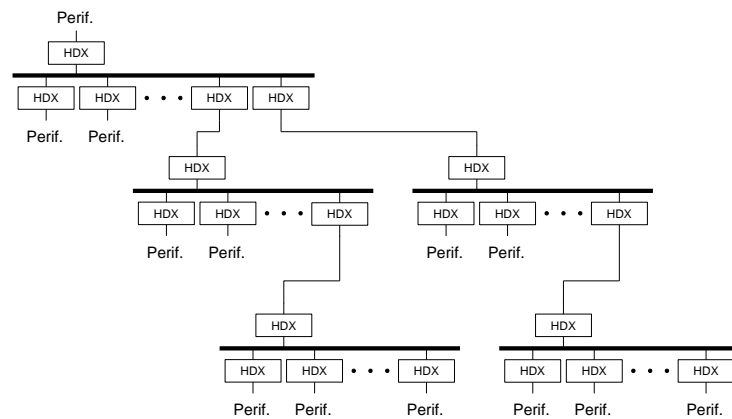
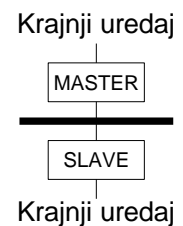


Figure 5 – Mixed, star-hierarchical type of communication network – half-duplex

1.3. Communication modules

The ZSK100 system includes a wide range of communication modules. Since it is a system intended for operation in an electrically unfavorable environment, modules for communication via optical fiber (OV) are most often used. There are versions with one or two communication channels per module. Multimode glass fiber or plastic fiber can be used as a transport medium, and modules are produced with different types of connection connectors. For the needs of protocol conversion, i.e. galvanic separation, there are also communication modules for RS232 and RS485 standard.



1.4. Power supply

The modules of the ZSK100 system are powered by an internal bus, with a voltage of 5 volts. When dimensioning the system, it is necessary to take care that the total consumption of communication modules does not exceed the nominal power of the sources used. If necessary, it is possible to install more than one source in the system

By choosing the appropriate module, the ZSK100 system can be powered from an alternating or direct voltage source in the range of 48 to 220 volts. The ability to be powered by direct current is especially important for applications in substations, where for the sake of safety or autonomy in the event of an alternating voltage failure, most devices are powered by batteries.

Up to 15 two-channel output modules can be connected to one power supply module_ZSK101 type modules are intended to supply communication modules with the appropriate voltage via the internal bus. They also contain one RS232 communication channel, which can be included in the system as a "master" for full duplex operation if necessary.

Technical data of the power supply module

Source

Input voltage: 150 V, DC to 380 V, DC for type ZSK 101 H

40 V, DC to 150 V, DC for type ZSK 101 L

Output voltage: 5 V, DC – 2 A

Isolation input - output: 2.5 kV, 50 Hz, 2 min

RS 232 channel

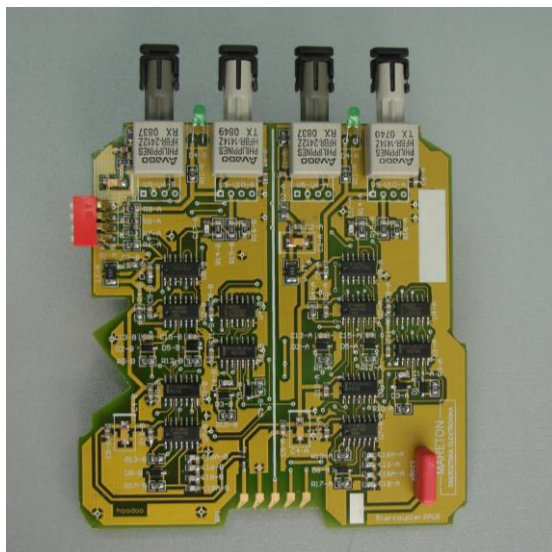
Transmission speed: 115,200 kbps

Operation module: full duplex

1.5. Tipovi modula

ZSK 101 L – Power supply + RS, Llow vottage 40 – 150 VDC
ZSK 101 H – Power supply + RS, high voltage 150 – 380 V,DC
ZSK 102-2S – communication, two channels, glass
ZSK 102-1S - communication, one channel, glass
ZSK 102-2M
ZSK 102-2-P – communication, two channels, plastic
ZSK 103
ZSK 102-DS - double bond

ZSK 102-2-P



Power supplies + RS input

