Serial Number	*Quality Check*
Date of Purchase	*Place of Purchase*

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USER'S GUIDE
MULTI-CHANNEL SWITCH
PMP-201/232
PMP-201/485

Usage

The multi-channel switch enables the user to connect many sensors to a single measurement instrument. The active channel can be chosen manually by the user (with the keyboard at the front panel) or automatically by the multi-channel switch (periodically), or remotely via serial interface RS-232/485.

There are LEDs in the front panel that indicate the active channel.

The multi-channel switch can be used for thermocouple sensors as well as for thermo-resistance sensors (RTDs) in two or three-wire connection.

Technical data

Number of channels	9
Paths per channel	3
Resistance of relay contact	< 100mΩ
Maximum switching voltage and current	30V, 100mA
Power supply	230 V AC +10% -15%, 50Hz,
Mounting window dimensions	92 x 43 mm
Dimensions	96 x 48 x 143 mm
Ambient temperature	0 ... 50 °C
Interface RS-232/485	2400 baud, 8 data bits, no parity check, one stop bit

Description

The multi-channel switch has a panel-mount housing. In the front facet there are 3 push-buttons ▲ ▼ ◀▶, 10 LEDs indicating the active channel, and 3 LEDs showing the operating mode (Fig. 1). The multi-channel switch operates in such a way, that one of the inputs **1**...**9** is connected to the output **OUT** (Fig. 2). The connection is made by one of triple relays P1...P9. The relays are controlled by a microprocessor. In the manual mode the multi-channel switch stores in its memory the actual channel so that powering off and on doesn't change the active channel.

Manual mode

The manual mode is the normal mode of the multi-channel switch. In order to enter the manual mode depress and hold the push-button ◀▶ until LEDs **A**, **T** and **M** go out. Then the user can choose the active channel using the push-buttons ▲ ▼. The user can choose any channel from 1 to *maximal channel number* (this parameter will be described below).

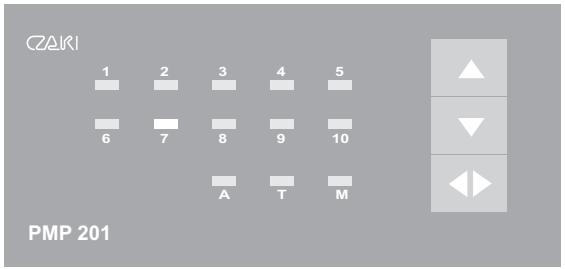

Fig.1 Front view.

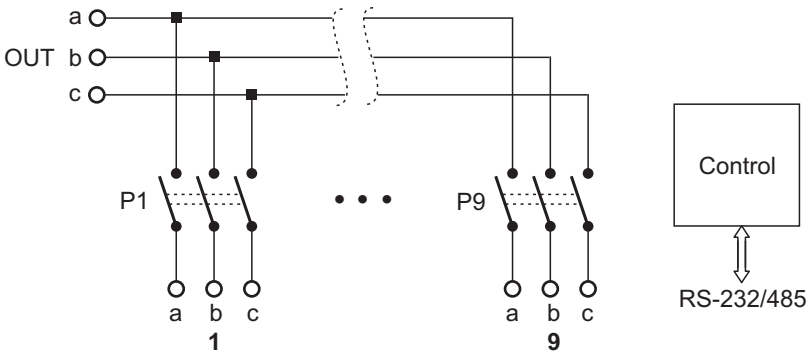

Fig. 2 Block diagram.

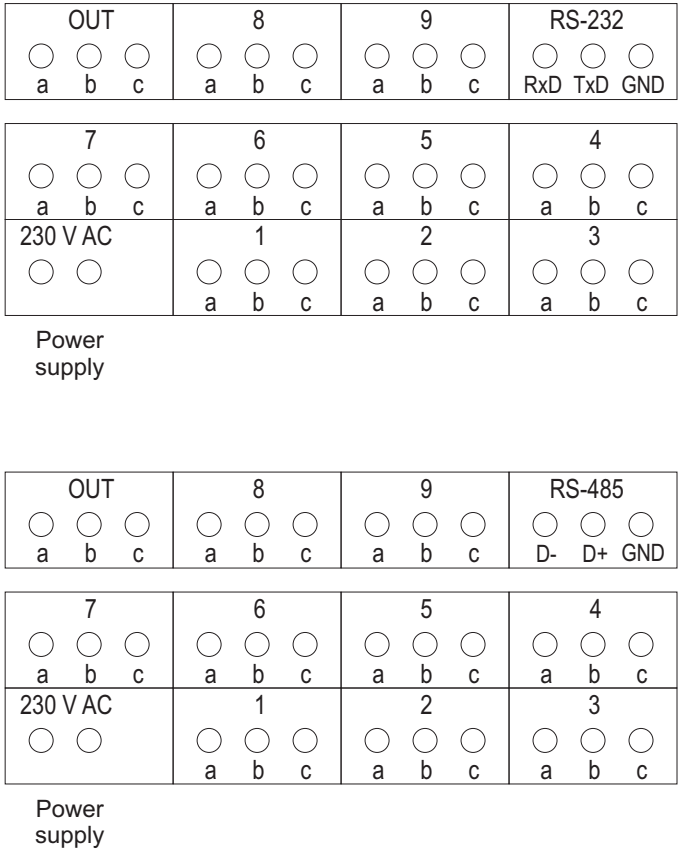

Fig. 4 Terminals of PMP-201/232 and PMP-201/485.

Auto mode

In order to enter the auto mode hold down the push-button ◂▸ until LED **A** lights up. Then press the push-button ▲ to start cyclic switching the channels. Pressing the push-button ▼ stops the automatic switching the channels. To exit the auto mode press the push-button ◂▸ three times (then the LEDs **A**, **T** and **M** go out).

Programming switching time interval (concerns auto mode)

Depress and hold down the push-button ◂▸ until the LED **T** lights up. Then choose the required time interval per channel pressing the push-buttons ▲ ▼. One of the LEDs **1** ... **10** indicates the time interval accordingly to the following table:

LED label	1	2	3	4	5	6	7	8	9	10
Time interval [s]	1	3	5	10	20	30	40	50	60	90

To return to the normal mode of operation press the push-button ◂▸ twice (LEDs **A**, **T** and **M** go out).

Defining maximal channel number

Depress and hold down the push-button ◂▸ until the LED **M** lights up. Then choose the required maximal channel number using the push-buttons ▲ ▼. One of the LEDs **1** ... **9** shows the value of the parameter. To return to the normal mode of operation press the push-button ◂▸ (LEDs **A**, **T** and **M** go out).

Serial port communication

The multi-channel switch PMP-201/232 has a serial port RS232 and the switch PMP-201/485 has a serial port RS485. The serial port is used to connect the switch to a PC (or any terminal) in order to establish bi-directional transmission. The user can read or modify any parameter via the serial interface.

The RS485 serial interface allows to connect many switches PMP-201/485 to one line. In such a case every switch should have a unique address. Then the user can send an instruction to a selected switch (with a given address) or to all switches using the address 00 (broadcast address).

The switch responds to read instructions a well as write instructions. The formats of instructions and responses will be described below. If the instruction has improper format, the switch returns message “ERR”. The message is preceded by the address of the switch, and followed by CR-LF.

The serial interface of the multi-channel switch is configured as follows: speed 2400 baud, 8 data bits, no parity check and one stop bit. All data is transmitted in ASCII text format. The simplest way to remote control the switch is to use the terminal program (for instance *HyperTerminal* in *Windows* environment).

The following table shows all the remote instructions:

Mnemonic	Parameter	Range	Remarks
K or **k**	channel	00..09	00 - all channels disabled
T or **t**	switching time interval	01..10	
X or **x**	maximal channel number	01..09	
M or **m**	operating mode code	01..04	01 - manual 02 - auto 03 - time interval setting 04 - maximal channel number setting
D or **d**	address	01..99	00 - broadcast address
A or **a**	auto mode	00..01	00 - stop 01 - start
Z or **z**	keyboard lock	00..01	00 - unlocked 01 - locked

In the Figure 3 a detailed description of instructions and responses is presented.

Serial port connection

Connections between the switch PMP-201/232 and a PC should be following:

PMP-201/232 terminals	PC-side connector 9-pin D-Sub	PC-side connector 25-pin D-Sub
RxD	3	2
TxD	2	3
GND	5	7

Practical remarks on application

The multi-channel switch PMP-201 should be protected from quick changes in ambient temperature in order to achieve higher precision. It is recommended to allow plenty of room for free airflow on all sides of the equipment.

Protect the switch from vibration (due to shortage of lifetime).

When the parameter *maximal channels number* equals 1, it seems that the switch doesn't operate properly (no switching is possible).

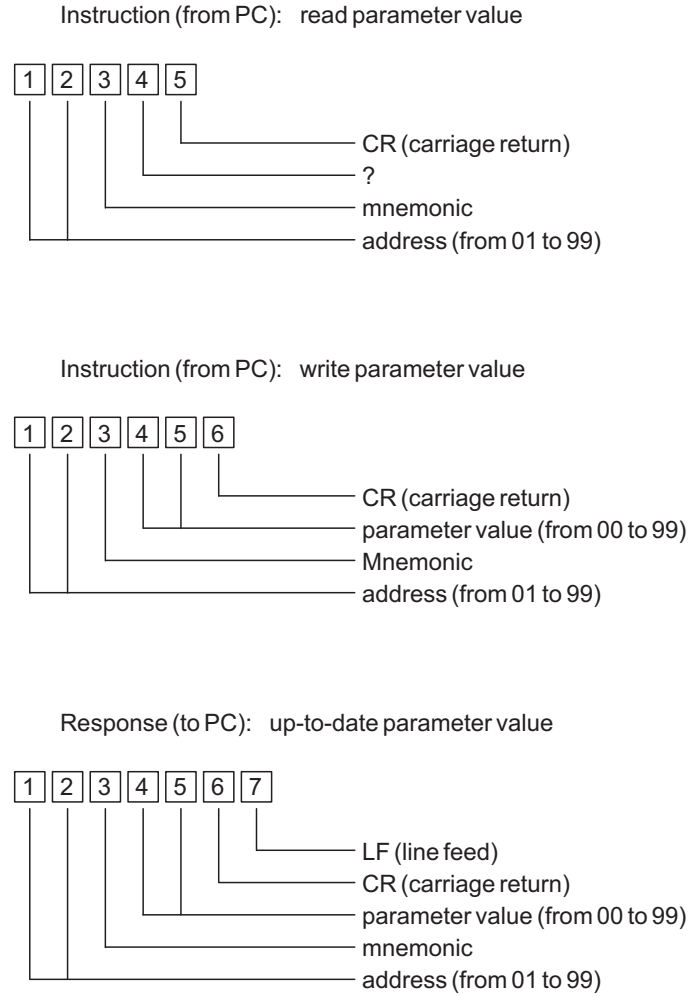

Fig. 3 Instructions format and response format.