Housing

The Housing enables the mounting of controller on top-hat DIN rail (35 mm). On the controller panel are a LCD Display 16x2, LED diodes which display the status of digital inputs (LED IN) and status of logic outputs (LED OUT) and a keyboard containing 6 keys.

Digital inputs

The controller contains 8 digital inputs with galvanic isolation. The inputs work in positive logic. The inputs are ground separate, which means they are in 2 groups of 4 inputs in each group. Each group has separate ground. The status of digital inputs is displayed on the panel by means of diodes.

Technical data:

Features	Value
Number of inputs	8
Nominal inputs voltage	24 VDC
Galvanic isolation	Yes
Logic	Positive
Input current	3 mA at 24 VDC

Analog inputs (voltage)

The controller contains 2 analog inputs for measurement of voltage 0..+10V (or 0..+5V). The signal range is switchable with jumper. Ground analog inputs (voltage) are connected to microcontroller ground.

Technical data:

Features	Value
Signal ranges	0..+10V (or 0..+5V)
Galvanic isolation	No
Resolution	10 Bit (0..1023)
Measuring principle	Successive approximation
Accuracy converting	2 ±LSB
Overvoltage protection	33 VDC

Analog inputs (temperature)

Temperature analog inputs enable the measurement of temperature by means of resistance thermometers PT100 (2-wire connection). The characteristic temperature curves are linearized independently in the controller. Ground of analog inputs (temperature) is common with ground of micro controller.

Technical data:

Features	Value
Range of temperature	-50..+160°C
Galvanic isolation	No
Resolution	10 Bit (0..1023)
Measuring principle	Successive approximation
Accuracy converting	2 ±LSB
Sensor type	PT100 (2-wire connection)
Linearization	Within controller (hardware)
Calibration	Separate for each channel (allows null balancing dependent on cable length)

Output relays

The controller contains 4 output relays with normally open contacts for alternating or direct current up to 2A, 250 VAC. Contacts of relays are not protected. The status of output relays is displayed on the panel by means of diodes LED OUT (No 1÷4).

Technical data:

Features	Value
Number of outputs	4, normally open contacts
Galvanic isolation	Yes
Type of relay	RM40, Relpol
Contact Protection	No

Output transistors

The controller contains 4 output transistors Output transistors have overvoltage, overload protection and galvanic isolation. The status of output transistors is displayed on the panel by means of diodes LED OUT (No 5÷8).

Technical data:

Features	Value
Number of outputs	4
Galvanic isolation	Yes
Polarity output	NPN
Current output	max. 0,5 A
Power supply	max. 24 VDC
Overvoltage protection	33 VDC
Overload protection	0,5 A; 60 VDC

Communication

The controller is equipped with port communication RS 232 and RS 485. Use jumpers to set interface.

Technical data:

Features	Value
RS 232	Line TxD and RxD
RS 485	Line A and B
Galvanic isolation	Yes
Baud rate	Max. 115.2 kbps

Analog outputs

The controller contains 2 outputs voltage 0..+10 V, drive by PWM of microcontroller.

Technical data:

Features	Value
Number of input channels	2
Signal ranges	0..+10 V
Resolution of input channel No 1 (PWM1)	8 Bit (0..255)
Resolution of input channel No 2 (PWM2)	16 Bit (0..65535)
Load impedance	$R \geq 10\ k\Omega$

Power supply

The Controller can be powered by alternating voltage (24 VAC), unregulated direct current (28..38 VDC) or direct voltage regulated (24 VDC).

Technical data:

Features	Value
Power supply AC	24 VAC
Power supply DC unregulated	28..38 VDC
Power supply DC regulated	24 VDC
Power consumption	0,2 A at 24 VDC

Programming

The central unit is microcontroller type RISC, ATmega 32, Atmel company.The program to the controller can be written in assembler (AVR STUDIO), C language (WINAVR) or BASIC language (BASCOM AVR). After compilation, the controller is programmed via ISP connection, which is compatible with ISP programmer units, for example STK200/300 (connection IDC 10).

The controller has been appointed in JTAG connection (also IDC 10 connection). By means adequate programmer (compatible with AVR JTAG ICE Atmel Company), JTAG interface of the controller cooperative with program AVR Studio and enables:

- debugging code program (On-Chip Debug) of the controller,
- control outputs and checking status inputs of the controller,
- memory and fuse control of processor programming.

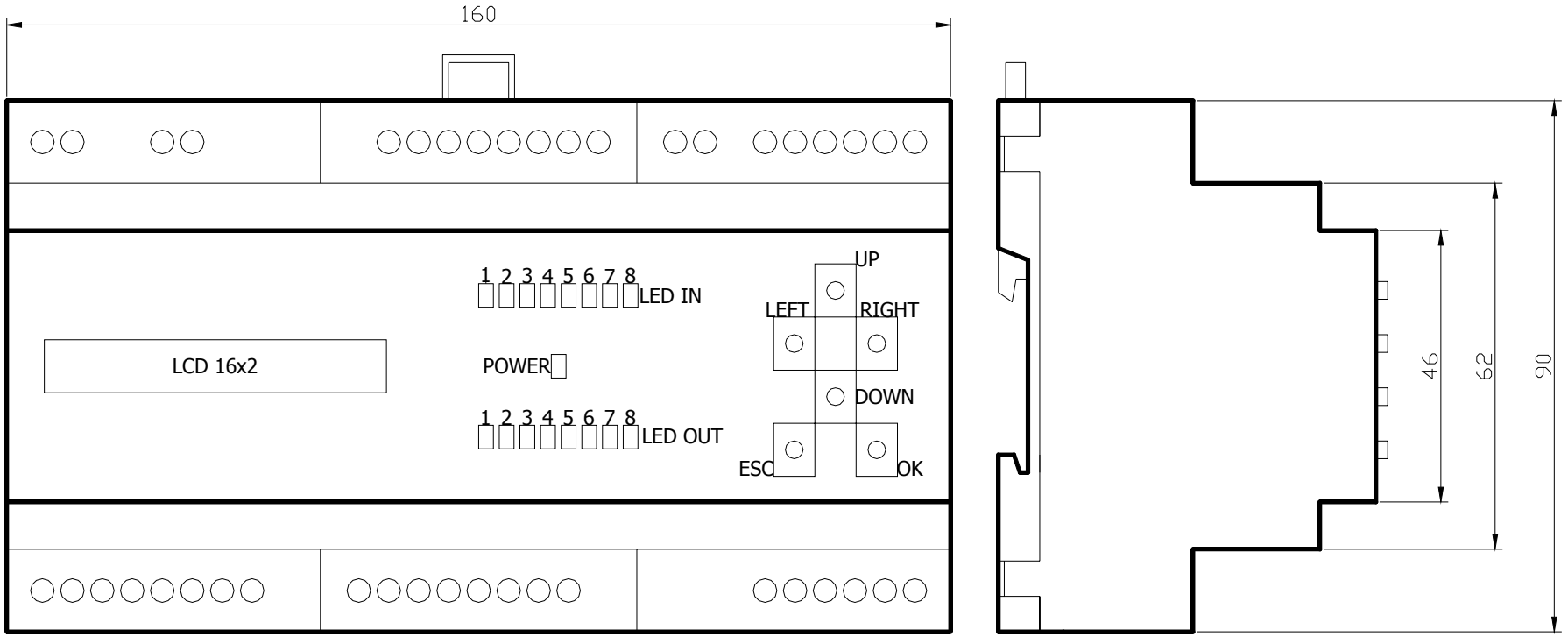

Fig. 1. Dimension SU 1.2.

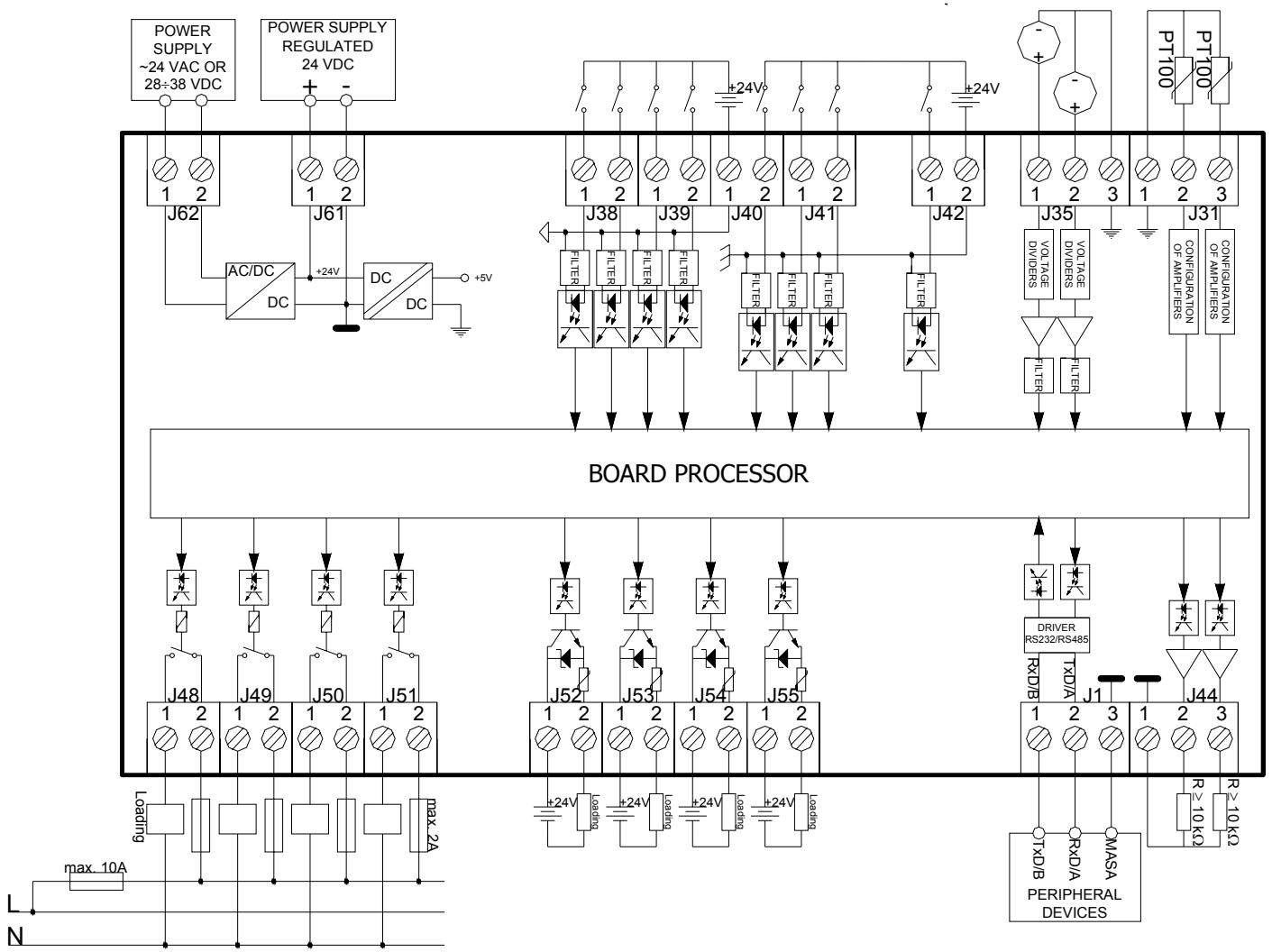

FIG. 2. Connection diagram SU 1.2.

Connectors

The controller has connections (screw terminal), which can fasten conductors of up to 1.5 mm^2.

No conn.	Connection description	Pin No	Pin description
J62	Power supply for controller, unregulated DC voltage or AC	1	24 VAC
		2	28..38 VDC
J61	Power supply for controller, regulated voltage +24 VDC	1	+24 VDC
		2	GROUND 24 VDC
J38	Digital input No 1 and No 2	1	Input No 1
		2	Input No 2
J39	Digital input No 3 and No 4	1	Input No 3
		2	Input No 4
J40	Common GROUND No 1 for digital inputs No 1,2,3 and 4	1	Ground No 1 DIG. INP.
	Digital input No 5	2	Input No 5
J41	Digital input No 6 and No 7	1	Input No 6
		2	Input No 7
J42	Digital input No 8	1	Input No 8
	Common GROUND No 2 for digital inputs No 5,6,7 and 8	2	Ground No 2 DIG. INP.
J35	Input analog (voltage), common ground	1	Channel No 1
		2	Channel No 2
		3	GROUND
J31	Input analog (temperature), common ground	1	GROUND
		2	Channel No 1
		3	Channel No 2
J48	Output logic No 1, relay contact without potential, normally open	1	Contact static
		2	Mobile contact
J49	Output logic No 2, relay contact without potential, normally open	1	Contact static
		2	Mobile contact
J50	Output logic No 3, relay contact without potential, normally open	1	Contact static
		2	Mobile contact
J51	Output logic No 4, relay contact without potential, normally open	1	Contact static
		2	Mobile contact
J52	Output logic No 5, transistor NPN	1	Supply of loading
		2	Output No 5
J53	Output logic No 6, transistor NPN	1	Supply of loading
		2	Output No 6
J54	Output logic No 7, transistor NPN	1	Supply of loading
		2	Output No 7
J55	Output logic No 8, transistor NPN	1	Supply of loading
		2	Output No 8
J1	Serial interface RS 232/RS 485	1	Line RxD/B
		2	Line TxD/A
		3	GROUNG 24 VDC
J44	Analog outputs, common ground	1	GROUND 24 VDC
		2	Channel No 1 (PWM 1)
		3	Channel No 2 (PWM 2)