EN

PR114

Programmable relay

User guide

PR114_2017.03_0242_EN
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CE

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Contents

1 Description

1.1 Function

Programmable relay PR114 is a logical module. Applications are created in Function Block Diagram with akYtec ALP programming software available to download from www.akytec.de. The relay has 12 inputs (8 digital / 4 universal) and 8 outputs (4 relay /4 optional). The universal inputs can be configured either as digital or analog (for detailed information see 1.3 ‘Ordering information’) and provides the following functions:

- connection of peripheral devices (sensors / actuators) with digital or analog inputs and outputs
- output control according to input status and logic of the saved program
- pulse-width modulation (PWM)
- input and output status indication
- fault status indication
- real-time clock (optional)

1.2 Modbus Networking

The relay can be connected to Modbus network via interface adapter PR-MI485, which can be ordered separately. Thus there will be the following additional functions available:

- Slave device in Modbus protocol structure
- support of Modbus-RTU and Modbus-ASCII protocols with automatic protocol identification
- For additional information with regard to other functions in Modbus network, see section 7.2

Programmable relay PR114 uses common standard RS485 for data exchange. The network consists of a Master device and can contain up to 32 Slave devices. Maximum length is 1,200 m. The number of Slave devices and network length can be increased using RS485 interface repeater.

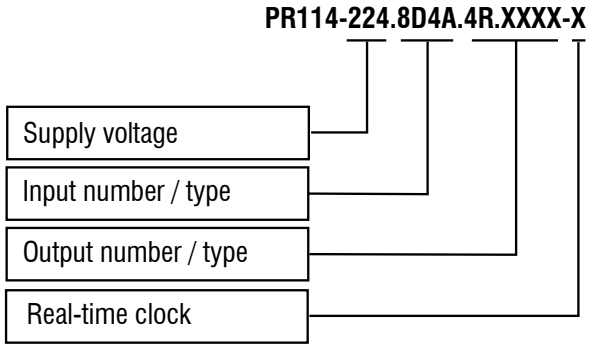
Devices are connected to a Network according to linear (bus) topology. It means that the line goes from the first device to the second one, from the second one to the third one, etc. Star connection and spur lines are not allowed.

Line reflections always occur at each of the 2 ends of the bus (the first and the last node). The higher the data transmission rate, the stronger they are. A terminating resistor is needed to minimize reflections. Line termination may be a 150 ohm value (0.5 W) resistor.

The relay can be used as a Slave device only. Master device can be PLC, computer with SCADA software or control panel.

1.3 Ordering information

Relay PR114 can be ordered in different variants depending on the required supply voltage, number and type of inputs and outputs:



Supply voltage

224 - 230 (90…264) V AC or 24 (20…375) V DC

Input number / type

8D4A - 8 digital inputs, 4 universal inputs

Output number / type

4RXXXX - 4 relay outputs, 4 optional outputs:

- R - relay output
- K - NPN transistor output *
- S - optical TRIAC *
- T - logic output DC *
- I - analog 4-20 mA *
- U - analog 0-10 V *

Real-time clock

RTC - real-time clock

**** Available on request***

Various types of outputs should be indicated in the order key only in the certain sequence: R -> K -> S -> T -> I -> U

Example:

PR114-224.8D4A.4RUUKK	incorrect
PR114-224.8D4A.4RKKUU	**correct**

The device with the correct ordering key shown in the example has the following features:

– 8 digital inputs 24V
– 4 universal inputs 0-10 V or 4-20 mA (see 6 ‘I/O configuration’)
– 4 relay outputs
– 2 NPN transistor outputs
– 2 analog outputs 0-10 V

1.4 Design

– Enclosure plastic, grey, for DIN-rail or wall mounting
– Terminal blocks 2 plug-in terminal blocks with 20 (40) screw terminals
– LED POWER power supply indicator
– LED COM flashes at data exchange over PROG port
– LED FAULT lit at fault (see table 5.1) or when transferring the applica-

tion to device

– 12 LEDs INPUTS lit at 24V at the digital input and when exceeding 15V at the analog input
– 8 LEDs OUTPUTS lit at a switched digital output and constantly at an analog output
– Port PROG (RJ12) to connect:
    - PR-KP20 programming adapter for connection to PC (see Fig. B.1)
    - PR-MI485 interface adapter for connection to Modbus network

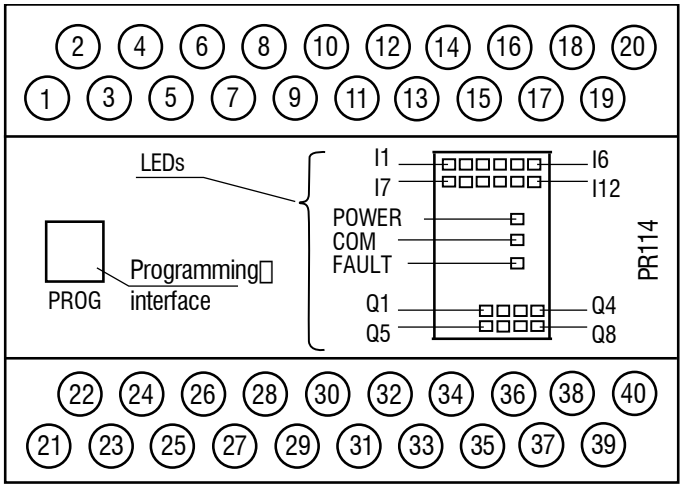


Fig. 1.1 Front view

The dimensional sketches are given in Appendix A.

2 Specification

Table 2.1 General specifications

Power supply		230 (90…265) V AC; 50 / 60 (47...63) Hz or 24 (20…375) V DC
	Power consumption, max.	16 VA
	Galvanic isolation	1500 V
Integrated voltage source		24±3 V DC, 140 mA
Inputs	Digital	8
	Universal *	4
Outputs	Digital (relay)	4
	Optional	4
Programming	Software	akYtec ALP
	Interface	UART
	Connector	RJ12
	Functional blocks	450
	Retain variables	136 byte
	Flash memory	16384 byte
	SRAM memory	2560 byte
Connection to RS485 network		PR-MI485 Interface adapter
	Protocols	Modbus RTU/ASCII
Dimensions		96 x 110 x 73 mm
Weight		approx. 410 g
Material		plastic

* *Universal inputs I9…I12 can be configured whether as digital or as analog*

Table 2.2 Digital inputs I1…I8

Input signal	Switch contact, PNP with open collector
Input voltage	24 V
Input voltage, max.	30 V
Pulse voltage, max. (t_i=1 s)	50 V
Logical 1	15…30 V (2.0…4.0 mA)
Logical 0	-3…+5 V (0…0.1 mA)
Pulse length, min.	0.5 ms
Galvanic isolation	1500 V, in groups of 4 (1-4, 5-8)

Table 2.3 Universal inputs I9…I12

Input signal	analog 0-10 V, 4-20 mA (1) or digital
Input voltage (2)	-36…+36 V
Input resistance	67 ohm
Basic error	±0.5%
Temperature coefficient	≤ 25 ppm of measuring range /°C
Resolution	2.7 mV
Sampling time for 4 inputs	≤ 5 ms
Logical 1 (3)	0…10 V, adjustable
Logical 0 (3)	0…10 V, adjustable
Current at input voltage 15…30 V (digital modus)	1.0…2.7 mA
Galvanic isolation	none

(1) While connecting an input signal 4-20 mA the maximum load of 400 ohm should be taken into account. The greater the resistance, the higher is the measuring accuracy (see 5.3 'Universal inputs I9…I12').

(2) If the voltage at one input is below -0.5 V, the accuracy for all inputs cannot be guaranteed.

(3) Parameter can be set in akYtec ALP in 'Property Box' using the option 'Input mode' = 'digital'.

Table 2.4 Relay outputs Q1…Q4

Type		open contact
Contact capacity	AC	10 A, 250 V (resistive load)
	DC	5 A, 30 V
Minimum load current		10 mA (at 5 V DC)
Service life, mechanical		10,000,000 switching cycles
Service life, electrical		
	3 A, 125 V AC (resistive load)	200.000 switching cycles
	3 A, 250 V AC (resistive load)	100.000 switching cycles
	5 A, 30 V DC	100.000 switching cycles
	10 A, 250 V AC (resistive load)	25.000 switching cycles
Galvanic isolation		1500 V
Switching time		≤ 20 ms

Table 2.5 Optional outputs Q5…Q8

Ordering code	Output type	Loading capacity	Galvanic isolation
R	Relay	as Q1…Q4 (see Table 2.4)	yes
K *	NPN	400 mA, 60 V DC	yes
S *	Optical TRIAC	50 mA, 250 V AC	yes
T *	Logic output	25 mA, 4…6 V DC	no
I *	Analog 4-20 mA	12…30 V, max. 1 kohm	yes
U *	Analog 0-10 V	16…30 V, min. 2 kohm	yes

** Available on request*

Table 2.6 Real-time clock (optional)

Accuracy	±2 s/day (25°C)
Correction	-2.75…+5.5 min/month
Backup	min.110 hours at 25°C
Backup battery charging time	10 hours

2.1 Operating conditions

The following environment conditions must be met:

- clean, dry and controlled environment, low dust level
- closed non-hazardous areas, free of corrosive or flammable gases

Table 2.5

Condition	Permissible range
Ambient temperature	-20…+55 °C
Transportation and storage	-25…+55 °C
Relative humidity	up to 80% (at +25°C, non-condensing)
IP Code	IP20
Altitude	up to 2000 m above sea level

3 Safety

Explanation of the symbols and keywords used:

DANGER ***DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.***

WARNING ***WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.***

CAUTION ***CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.***

NOTICE ***NOTICE indicates a potentially harmful situation which, if not avoided, may result in damage of the product itself or of adjacent objects.***

3.1 Intended use

The device has been designed and built solely for the intended use described in this guide, and may only be used accordingly. The technical specifications contained in this guide must be observed.

The relay may be operated only in properly installed condition

Improper use

Any other use is considered improper. Especially to note:

- This device should not be used for medical devices which receive, control or otherwise affect human life or physical health.
- The device should not be used in an explosive environment.
- The device should not be used in an atmosphere with chemically active substance.

4 Montage

CAUTION

Improper installation
Improper installation can cause serious or minor injuries or device damage. Installation must be performed only by fully qualified personnel

- The programmable relay is intended to be mounted in a cabinet on DIN-rail or on the wall. For the dimension drawings see Appendix A.
- Install the relay in a cabinet with clean, dry and controlled environment.
- The relay is designed for natural convection cooling. It should be taken into account when choosing the installation site.

5 Wiring

⚠ DANGER

Dangerous voltage
Electric shock could kill or seriously injure.
All electrical connections must be performed by a fully qualified electrician.
Ensure that the mains voltage matches the voltage marked on the nameplate!
Ensure that the device is provided with its own power supply line and electric fuse!

⚠ CAUTION

Switch on the power supply only after the wiring of the device has been completely performed.

- The terminal strips are shown in Fig. 5.1 and the terminal assignment is given in Table 5.1.
- Electrical connections for inputs and outputs are given in Fig. 5.2 – 5.14.
- Connect the supply voltage to the terminals PWR+ and PWR-.
- The maximum conductor cross-section for power supply is 1.5 mm².

► NOTICE

Signal cables should be routed separately or screened from the supply cables.

► NOTICE

Only shielded cable can be used for the signal lines.

- COM terminals must be connected to the negative pole of an external or integrated voltage source. A potential free contact or a sensor with an open PNP collector should connect the input with the positive pole of the voltage source.
- Digital inputs have 4-group galvanic isolation (1..4, 5..8). When connecting sensors, use only the common negative terminal of the same group.
- Connection to Modbus network should be carried out over PROG interface with PR-MI485 adapter (not included). For detailed information refer the adapter user guide.

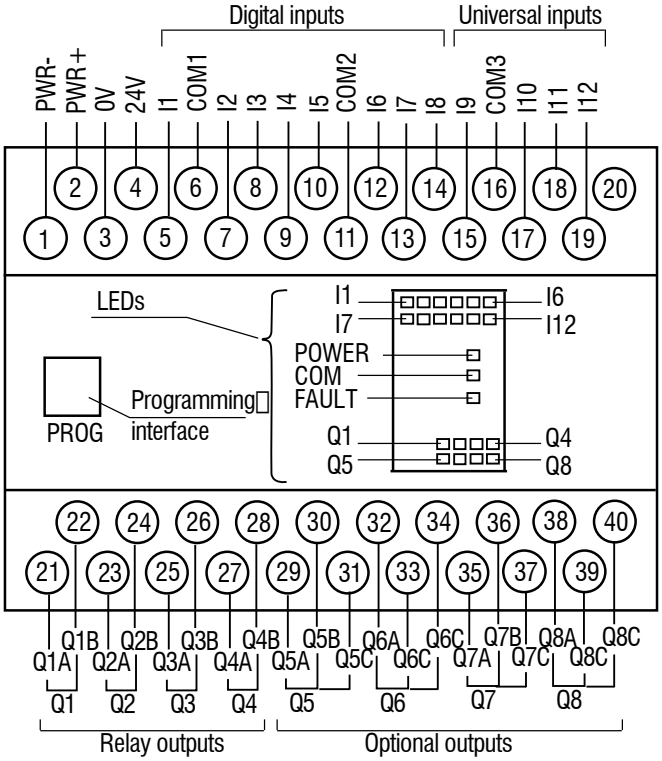


Fig. 5.1 Terminal blocks

Table 5.1 Terminal assignments

No.	Name	Function
1	PWR-	Power supply AC/DC
2	PWR+	Power supply AC/DC
3	0V	24 V DC Integrated voltage source
4	24 V	24 V DC Integrated voltage source
5	I1	Digital input I1
6	COM1	I1...I4 common negative pole
7	I2	Digital input I2
8	I3	Digital input I3
9	I4	Digital input I4
10	I5	Digital input I5
11	COM2	I5..I8 common negative pole
12	I6	Digital input I6
13	I7	Digital input I7
14	I8	Digital input I8
15	I9	Universal input I9
16	COM3	I9..I12 common negative pole
17	I10	Universal input I10
18	I11	Universal input I11
19	I12	Universal input I12
20	–	free
21	Q1A	Relay output Q1
22	Q1B	
23	Q2A	Relay output Q2
24	Q2B	
25	Q3A	Relay output Q3
26	Q3B	
27	Q4A	Relay output Q4
28	Q4B	
29	Q5A	Output Q5
30	Q5B	
31	Q5C	
32	Q6A	Output Q6
33	Q6B	
34	Q6C	
35	Q7A	Output Q7
36	Q7B	
37	Q7C	
38	Q8A	Output Q8
39	Q8B	
40	Q8C	

5.1 Programming interface

To program the relay, this has to be connected to the USB port of the PC over PR KP20 adapter (not included). The adapter has to be connected to the relay over PROG interface.

► **NOTICE** ***Switch the power supply on only when programming cable is connected.***

Using *akYtec ALP software* the user can transfer the device settings and the application to the relay. The required power supply for the adapter is provided over USB port from the PC.

Network parameters of interface:

Baud rate	9.6 kbit/s
Date bits	8
Parity	none
Stop bits	1

5.2 Digital inputs I1…I8

Use of the integrated voltage source is possible (terminals 24V / 0V).

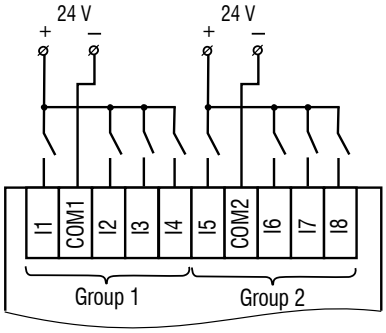


Fig. 5.2 Switch contact connection

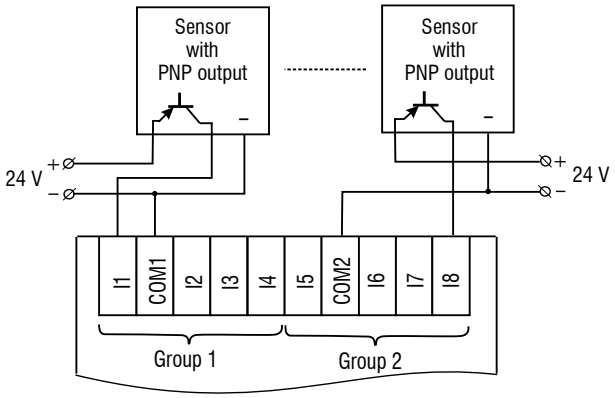


Fig. 5.3 Connection of 3-wire sensors with PNP transistor output

5.3 Universal inputs I9…I12

Use of internal auxiliary voltage source is possible (terminals 24V / 0V).

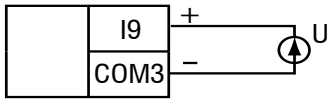


Fig. 5.4 Connection of sensor with 0-10 V output

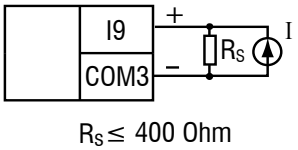


Fig. 5.5 Connection of sensor with 4-20 mA output

The permissible load resistance R_S for the 4…20mA input is 50...400 ohm. It is recommended to use the included resistor 180 ohm.

5.4 Relay outputs Q1…Q4

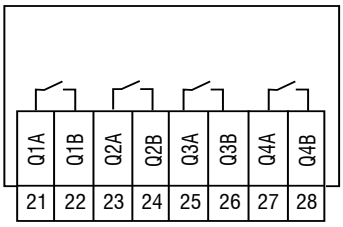


Fig. 5.6 Relay outputs

5.5 R type optional outputs Q5…Q8

The optional relay outputs of type R are equipped with changeover contact.

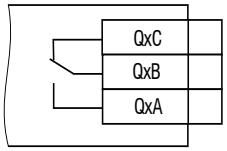


Fig. 5.7 Optional relay output (R)

5.6 K type optional outputs Q5…Q8

The NPN transistor outputs of K type are provided for control of low voltage relay up to 60 V / 400 mA.

► **NOTICE**

As a precaution against inadvertent current reversal on output, a parallel diode is usually included in the output circuit.

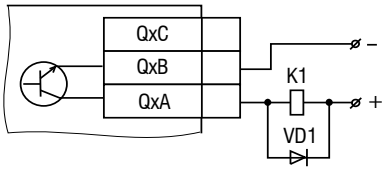


Fig. 5.8 NPN transistor output (K) wiring

5.7 S type optional outputs Q5…Q8

Optical TRIAC outputs are used for galvanically isolated connection of the power switching elements as power thyristors or TRIACs.
The resistor R1 (5…20 kohm) is used to limit the load current. To protect thyristors and TRIACs from overload a RC protect circuit should be connected in parallel to load: R2 (47…68 ohm) and C1 (0.1 x 630 V).

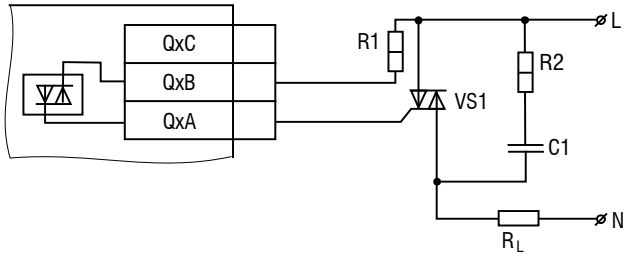


Fig. 5.9 Power TRIAC connection

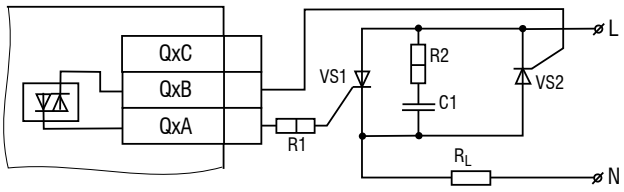


Fig. 5.10 Inverse-parallel connection of two thyristors

5.8 T type optional outputs Q5…Q8

The logic outputs of T type are provided to control solid state relay with rating voltage 4…6 VDC and current up to 25 mA.

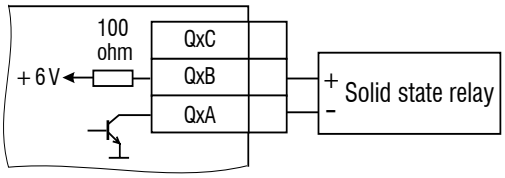


Fig. 5.11 Logic outputs (T) wiring

5.9 I type optional outputs Q5…Q8

An external power supply is required for analog output 4-20 mA.

► **NOTICE** ***If an external voltage source is used, the voltage must not exceed 30V.***

Furthermore, an external load resistor is required. The resistance value R_L depends on supply voltage and can be determined from the diagram (Fig. 5.13). If a measuring resistance R_M is used for current measurement and $R_M < R_L$, then an additional load resistance R_1 should be used for current limitation. Resistance R_1 can be determined as follows:

$$R_1 = R_L - R_M$$

Example 1

U = 12 V, $R_L = R_M$ = 100 ohm

Example 2

U = 24 V, R_L = 700 ohm, R_M = 100 ohm, R_1 = 600 ohm

The used resistance can differ from the designed value by ±10% maximum.

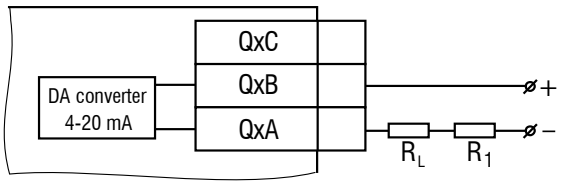


Fig. 5.12 4-20 mA analog output wiring

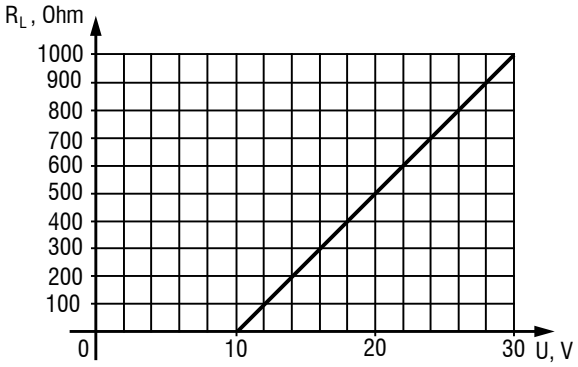


Fig. 5.13 Load resistance determination

5.10 Optional outputs Q5…Q8 of type U

Use of integrated voltage source is possible (terminals 24V / 0V).

► **NOTICE** ***If an external voltage source is used, the voltage must not exceed 30V.***

The load resistance R_L must be in the range of 2…10 kohm.

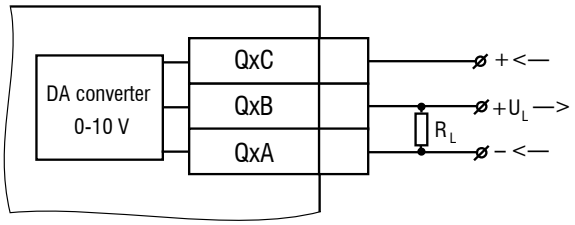


Fig. 5.14 0-10 V analog output wiring

6 I/O configuration

Universal inputs and optional outputs can be configured using *akYtec ALP* software.

6.1 Universal inputs I9…I12

Open the project for PR114 in *akYtec ALP*, select the universal input and set its properties in the ‘Property Box’.

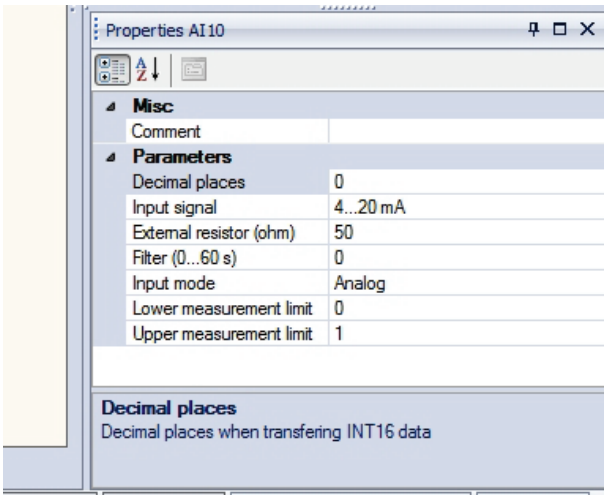


Fig. 6.1 Property Box, universal input

First the parameter ‘Input mode’ (Analog or Digital) has to be set.

6.1.1 Analog mode

– If ‘Input mode’ is set to ‘Analog’, the ‘Input signal’ has to be selected, 4-20 mA or 0-10 V.
– For input signal 4-20 mA an external resistance R_S is required (see 5.3). Its nominal value has to be entered in the Property box.
– The lower and upper measurement limits have to be set for scaling of measured value.
– The decimal point position (dP) has to be set to determine the accuracy, if the measured value is transmitted over Modbus as integer (see 7.2).

6.1.2 Digital mode

– If ‘Input mode’ is set to ‘Digital’, logical 0 and logical 1 have to be assigned with the voltage within the range of 0…10 V.

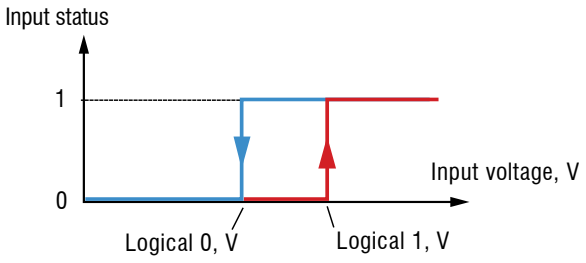


Fig. 6.2 Configuration of an input as ‘Digital’

6.1.3 Input filtering

Digital input filter is designed to steady the input reading. The input filter setting is a time constant expressed in milliseconds. The time constant can be set for each input within the range of 0…60 s. A value of '0' disables filtering.

The greater the time constant is, the higher the damping of interference signals and the slower reaction to process value changes are.

6.2 Optional outputs Q5…Q8

Analog (I, U) and digital (R, K, S, T) outputs can be ordered (see Table 2.5).
In order to obtain information about configuration of the device connected to PC (see Attachment B) select in *akYtec ALP* the menu item '*Device -> Device information…*'.
For output configuration open the project in *akYtec ALP*, mark an optional output of the device and set its properties in 'Property Box'.

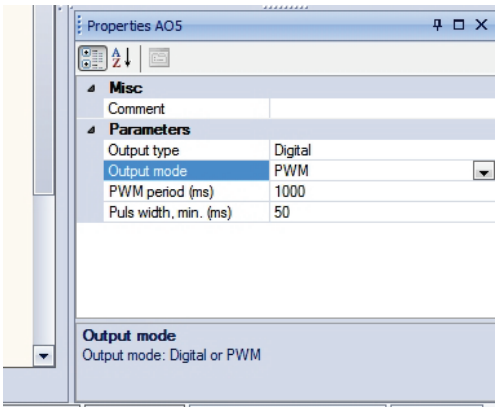


Fig. 6.3 Property Box, optional output

Output type 'Analog' don't require configuration.

Output type 'Digital' enables two modes: 'Digital' or 'Pulse-width modulation' (PWM). In PWM mode two parameters have to be set:

– PWM period (T), ms
– Minimal pulse duration (t_{min}), ms

The less the PWM period is, the faster the output response and more precise the control become. For outputs of K, S or T types the PWM period up to 1 s is possible. For output of R type longer period should be selected in order to avoid premature wear of relay contacts.

Pulses shorter than t_{min} will not be generated. It should be taken into account, that too short pulses can cause premature damage to relay contacts.

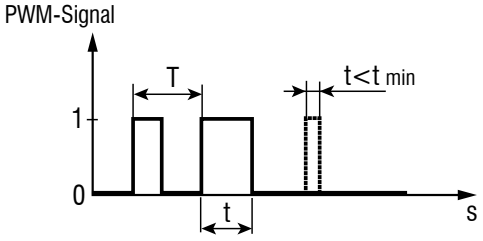


Fig. 6.4 Pulse-width modulation signal

Assign the variable of type REAL between 0 and 1 to the output in the ALP project, to control the digital output in PWM mode.

7 Operation

▶ NOTICE

Before starting
Before switching on, make sure that the device was stored at the specified ambient temperature (-20... +55 °C) for at least 30 minutes.

User application for the relay is created using programming software *akYtec ALP*. For detailed information about programming refer to menu 'Help' for *akYtec ALP*.

Once the program was transferred to the permanent memory of the relay, the relay restarts. On start up the relay runs a self-test. If unsuccessful, the relay will go to the fault state (see Table 7.1). Otherwise the user application runs.

Table 7.1 Error messages

LED 'FAULT'	Cause	Remedy
flashing	Firmware is damaged	Update the firmware or refer to akYtec service department
lit	User program is not correct	Repair the program with the *akYtec ALP* and repeat the upload

7.1 Modbus communication

Connection to the Modbus network is carried out over PROG interface with PR-MI485 adapter (not included). For communication with Master device, set network parameters of the relay. Necessary steps are described in online help for *akYtec ALP*.

The relay supports Modbus-RTU and Modbus-ASCII protocols with automatic protocol detection.

Functions as a Slave:

– read digital I/O status
– read analog I/O value
– read / write network variables
– read / write Real-Time Clock data

The following parameters are available for reading and writing:

Table 7.2 Modbus registers

Parameter	Data type	Address	Modbus functions
Inputs			
Input status I1…I8 (individual)	BOOL	0x1000 – 0x1008	0x01, 0x02
Input status I1…I8 (bitmask)	INT16	0x0100	0x03, 0x04
Measured value I9 analog	REAL32	0x0B00, 0x0B01	0x03, 0x04
Measured value I10 analog	REAL32	0x0B02, 0x0B03	0x03, 0x04
Measured value I11 analog	REAL32	0x0B04, 0x0B05	0x03, 0x04
Measured value I12 analog	REAL32	0x0B06, 0x0B07	0x03, 0x04
Measured value I9 analog (1)	INT16	0x0B80	0x03, 0x04
Measured value I10 analog (1)	INT16	0x0B81	0x03, 0x04
Measured value I11 analog (1)	INT16	0x0B82	0x03, 0x04
Measured value I12 analog (1)	INT16	0x0B83	0x03, 0x04
Decimal point (dp) I9 analog	INT16	0x0BC0	0x03, 0x04
Decimal point (dp) I10 analog	INT16	0x0BC1	0x03, 0x04
Decimal point (dp) I11 analog	INT16	0x0BC2	0x03, 0x04
Decimal point (dp) I12 analog	INT16	0x0BC3	0x03, 0x04

Parameter	Data type	Address	Modbus functions
Inputs			
Input status I9 digital	BOOL	0xB800	0x01, 0x02
Input status I10 digital	BOOL	0xB810	0x01, 0x02
Input status I11 digital	BOOL	0xB820	0x01, 0x02
Input status I12 digital	BOOL	0xB830	0x01, 0x02
Network inputs (individual)	BOOL	0x2000 – 0x21FF	0x01, 0x02, 0x05, 0x0F
Network inputs (Bitmask)	Int16	0x0200 – 0x021F	0x03, 0x04, 0x06, 0x10
Outputs			
Output status Q1…Q4 (individual)	BOOL	0x0000 – 0x0003	0x01, 0x02
Output status Q1…Q4 (Bitmask)	INT16	0x0000	0x03, 0x04
Controlled value Q5 analog (0…1)	REAL32	0x0A00, 0x0A01	0x03, 0x04
Controlled value Q6 analog (0…1)	REAL32	0x0A02, 0x0A03	0x03, 0x04
Controlled value Q7 analog (0…1)	REAL32	0x0A04, 0x0A05	0x03, 0x04
Controlled value Q8 analog (0…1)	REAL32	0x0A06, 0x0A07	0x03, 0x04
Controlled value Q5 analog (0…10000) *	INT16	0x0A80	0x03, 0x04
Controlled value Q6 analog (0…10000) *	INT16	0x0A81	0x03, 0x04
Controlled value Q7 analog (0…10000) *	INT16	0x0A82	0x03, 0x04
Controlled value Q8 analog (0…10000) *	INT16	0x0A83	0x03, 0x04
Output status Q5 digital	BOOL	0xA800	0x01, 0x02
Output status Q6 digital	BOOL	0xA810	0x01, 0x02
Output status Q7 digital	BOOL	0xA820	0x01, 0x02
Output status Q8 digital	BOOL	0xA830	0x01, 0x02
Network outputs (individual)	BOOL	0x3000 – 0x31FF	0x01, 0x02
Network outputs (Bitmask)	INT16	0x0300 – 0x031F	0x03, 0x04
Real-time clock			
Seconds	INT16	0x0400	0x03, 0x04, 0x06, 0x10
Minutes	INT16	0x0401	0x03, 0x04, 0x06, 0x10
Hours	INT16	0x0402	0x03, 0x04, 0x06, 0x10
Day	INT16	0x0403	0x03, 0x04, 0x06, 0x10
Month	INT16	0x0404	0x03, 0x04, 0x06, 0x10
Year	INT16	0x0405	0x03, 0x04, 0x06, 0x10
Weekday	INT16	0x0406	0x03, 0x04
Week of month	INT16	0x0407	0x03, 0x04
Calendar week	INT16	0x0408	0x03, 0x04

** To calculate the INT16 value, the value of type REAL32 is multiplied by 10^{dp}, where 'dp' is a decimal point position and is set as configuration parameter (see 6.1.1). For outputs dp = 4 is fixed.*

Example 1: Readout of status for digital input I4
There are two possibilities:

a. Use function 0x01 (0x02) with address 0x1003.
b. Use function 0x03 (0x04) with address 0x0100 to read out bit mask of inputs and outputs and evaluate the third bit.

Example 2: Readout of status for analog input A19
There are two possibilities:

a. Use the read function 0x03 (0x04) with initial address 0x0B00 and two registers length (0x0B00, 0x0B01) to get the measured value as REAL32.
b. - Use the read function 0x03 (0x04) with initial address 0x0B80 and one register length to get the measured value as INT16.
   - Use the same function with address 0x0BC0 to get the decimal point position 'dp' as INT16
   - Divide the INT16 measured value by 10^{dp}.

The register order and the byte order can be changed in *akYtec ALP* in menu item '*Device-> Device Configuration…-> Interfaces'*, when transmitting REAL32 value. The setting applies for all variables of this data type.

The decimal point position can be set for each analog input I8…I12 individually (see 6.1.1).

Network inputs and outputs are special types of variables. They can be used in the program to process different values. For example, time parameter of timers or counters can be changed or counter status can be read out.

Variables transmitting values from the Master to the relay should be specified as network inputs.

Variables used to read out the data from the relay should be specified as network outputs.

For further details about using of network variables see online help for *akYtec ALP*.

8 Firmware update

To update the relay firmware the following is required:

- PC with Windows XP/Vista/7 operating system
- Interface adapter PR-KP20
- Programming software akYtec ALP

Update procedure:

- Connect the relay to the PC according to Fig. B.1
- Switch on the device
- Select menu item ‘Device->Firmware update…’ in akYtec ALP
- Follow instructions on the screen.

9 Maintenance

The maintenance includes:

- cleaning of the housing and terminal blocks from dust, dirt and debris
- checking the fastening of the device
- checking the wiring (connecting leads, fastenings, mechanical damage)

The device should be cleaned with a damp cloth only. No abrasives or solvent-containing cleaners may be used. The safety information in section 3 must be observed when carrying out maintenance.

10 Transportation and storage

Pack the device in such a way as to protect it reliably against impact for storage and transportation. The original packaging provides optimum protection.

If the device is not taken immediately after delivery into operation, it must be carefully stored at a protected location. The device should not be stored in an atmosphere with chemically active substances.

Permitted storage temperature: -25...+55 °C

► **NOTICE**

Transport damage, completeness
The device may have been damaged during transportation.
Check the device for transport damage and completeness!
Report the transport damage immediately to the shipper and akYtec GmbH!

11 Scope of delivery

–	Programmable relay PR114	1
–	User guide	1
–	Resistor 180 ohm	4

Appendix A Dimensions

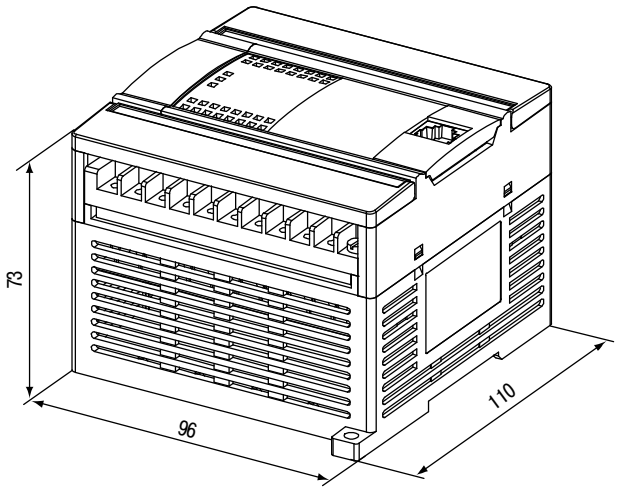


Fig. A.1 External dimensions

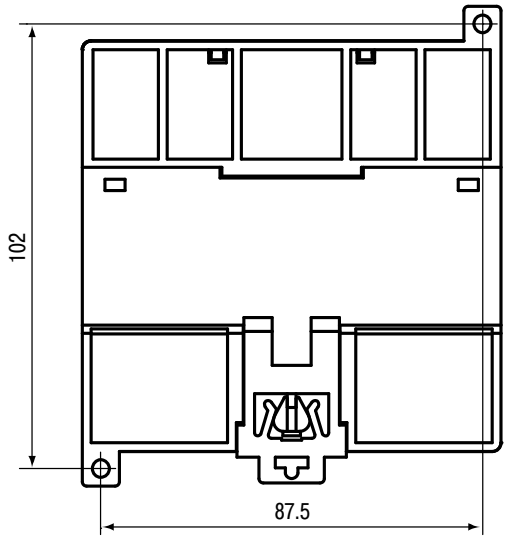


Fig. A.2 Wall mounting dimensions

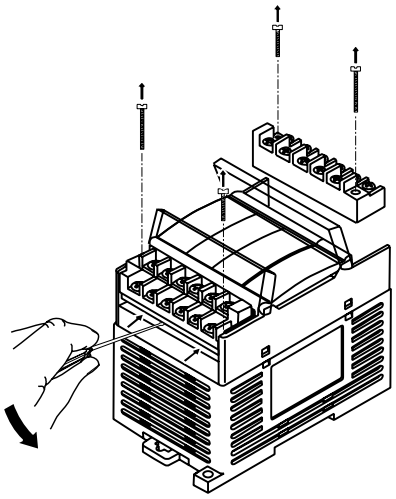


Fig. A.3 Replacement of terminal blocks

Appendix B Connection to PC

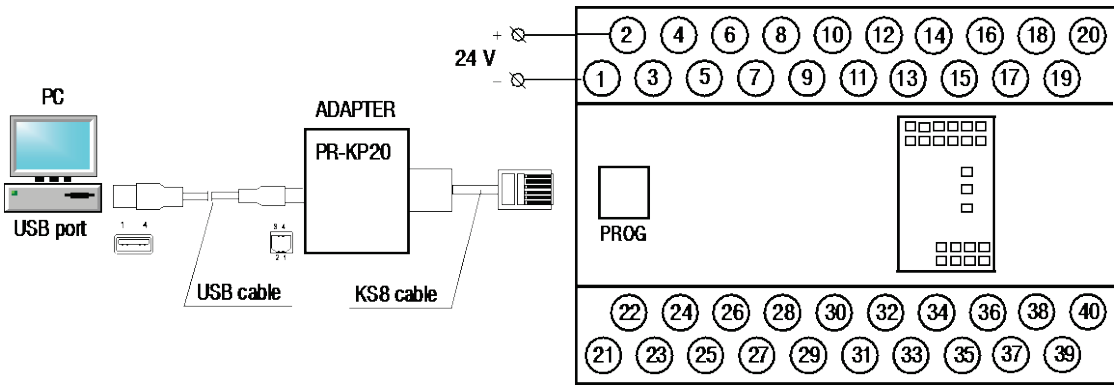


Fig. B.1 Connection to PC

Appendix C Input circuit diagrams

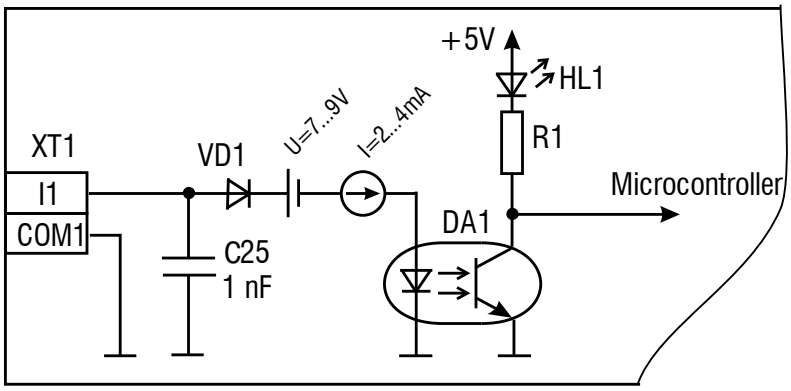


Fig. C.1 Digital input circuit diagram

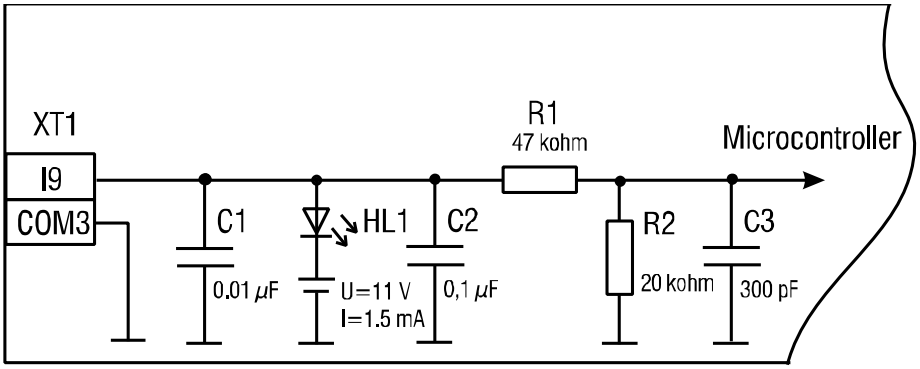


Fig. C.2 Analog input circuit diagram