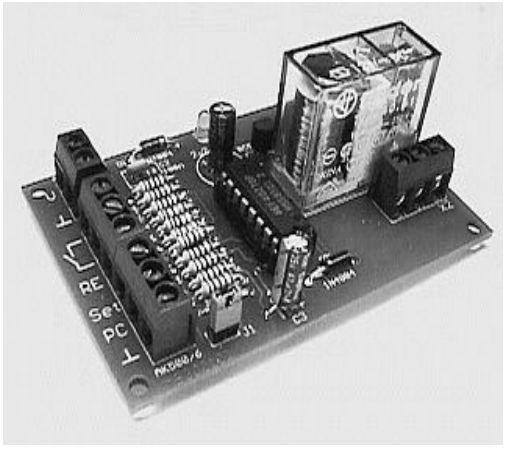
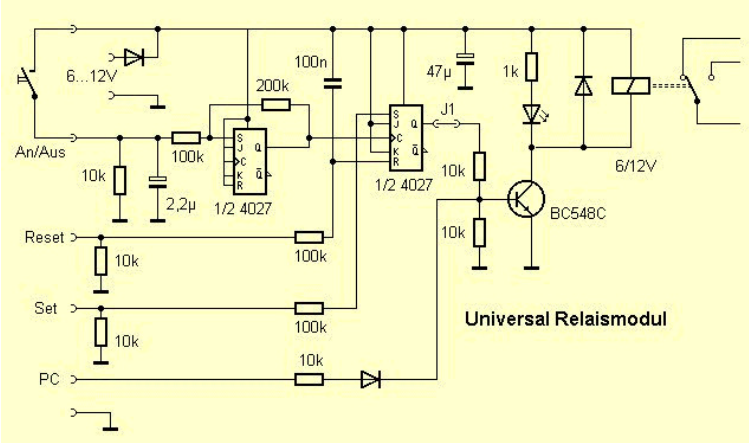
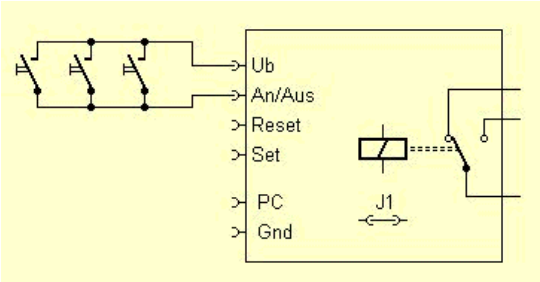
UniREL – A Universal Relay-Board





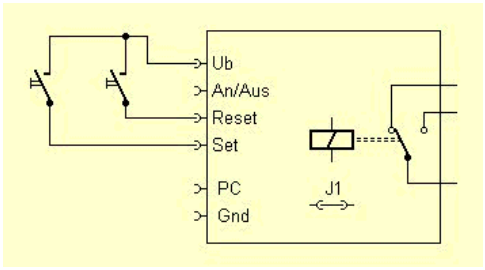
Usable as Latching- („Toggle“), Set/Reset- or computer-controlled relay and many more.
For 12V- or 6V-relays with 2x changeover-contacts (DPDT)

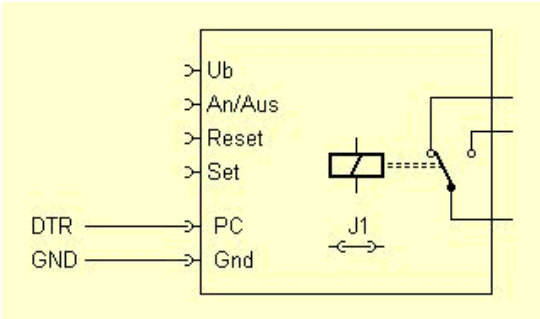
The relay-board is suited for many different applications. Here we will first explain the basic circuit for the most important uses.



One or more pushbuttons in parallel are needed to use the relay-board as latching- or toggle-relay.
After power-on the internal reset-circuit sets the flipflop to OFF-state. After that every action on a pushbutton toggles between ON and OFF-state (=latching function).
You could place the pushbuttons e.g. on a long floor. At every place you have a pushbutton you can switch the lights ON and OFF

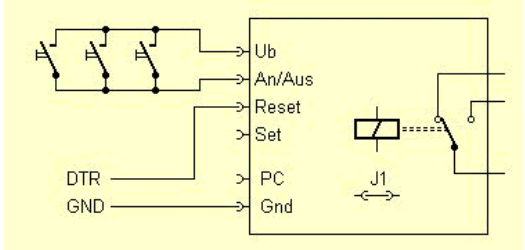
In addition (or as an alternative) you can connect pushbuttons for setting directly the ON- or OFF-state like it´s utilized at motor-switches.
E.g. a green pushbutton switches the motor on and a red one off.
Instead of pushbuttons you can control the circuit directly at the SET- and RESET-inputs with a PC over the serial interface (e.g. the DTR-line) or with a PC-interface like our SIOSLAB-USB-Interface.
You just need two interface-lines in this example.

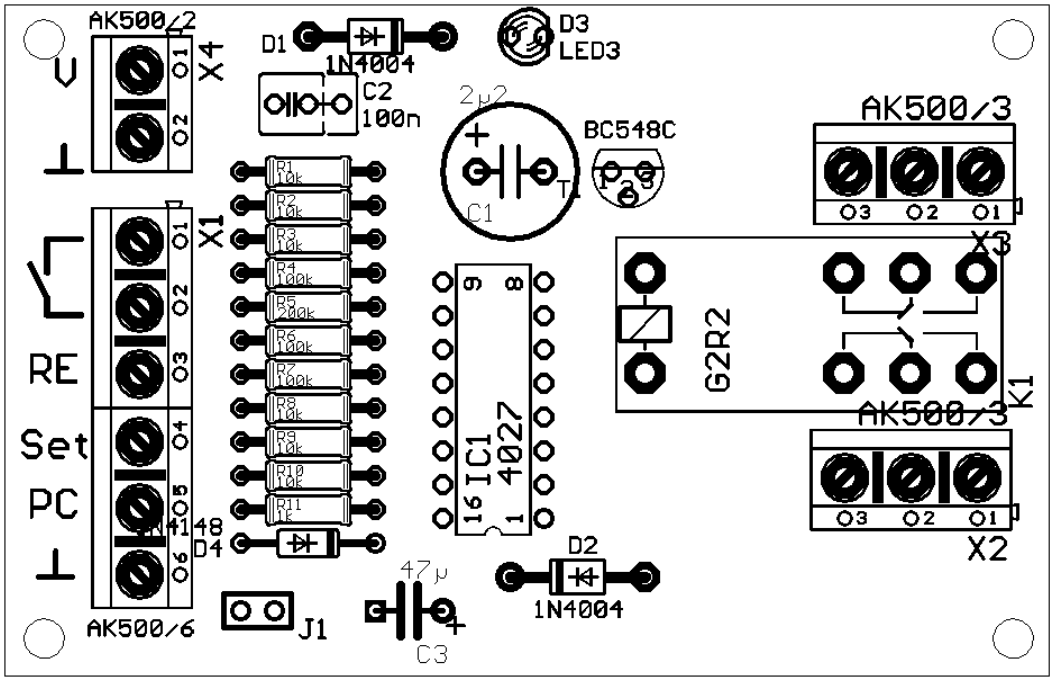




For direct PC-control or for control from other hardware you can use the „PC“-Input. A DC-voltage of +5V or more switches the relay to ON-state. A pull-down resistor at the base of T1 keeps the relay in the OFF-state when no DC-voltage is present.
Jumper J1 kann remain closed, to enable the parallel operation by means of the pushbuttons (aka the other inputs SET/RESET/Toggle).
That way a progammed motor-control over the „PC“-Input kann get an additional emergency-OFF switch or pushbutton at the RESET-input .
When jumper J1 is removed, the parallel control over the SET/RESET and latching-inputs is disabled.
If you <u>only</u> use the PC-input, the CMOS 4027 and the peripheral components can be left unpopulated on the PCB.

With a mixed use of pushbutton- and PC-controlled inputs you can exploit the priority of the SET ür RESET-inputs. With the pushbuttons you can switch ON and OFF, but the „PC“-input can at any force a load to be swiched off over the RESET-input.
As long as the RESET-input remains logic high, neither the toggle-/latching-input nor the „PC“-input can switch the load on.





Parts list:

1	MB300102	PCB	
1	CD4027	CMOS dual JK-master/slave flipflop	IC1
1	BC548C	NPN transistor	T1
2	1N4004	Diode	D1, D2
1	1N4148	Diode	D4
1	LED3	LED, 3 mm, green	D3
1	2,2µF	Polarized cap 25V RM5	C1
1	100nF	Capacitor RM 2,5/5	C2
1	47µF	Polarized cap 25V RM5	C3
1	1kΩ	Resistor	R11
6	10kΩ	Resistors	
3	100kΩ	Resistors	R4, R6, R7
1	200kΩ	Resistors	R5
1	AK500/6	Terminal PTR500 6-pole	X1
2	AK500/3	Terminal PTR500 3-pole	X2, X3
1	AK500/2	Terminal PTR500 2-pole X4	
1	G2R2	RELAY 12V, 2xchangeover-contacts (alternatively: 6V)	K1
1	JUMPER	JUMPER or wire-bridge	J1

Other material (not supplied with the UNIREL):

1	pushbuttons	
1	ICF16	IC-socket 16 pins
1	case	
1	NT	power-adapter 12V

*** Warning:**

An important note about electrical safety: Though the circuit, the component-selection and the PCB were designed to comply with safety-regulations concerning direct mains operation, the open PCB without a proper enclosure and wiring cannot have a CE-/VDE-/GS-/UL- or any other approval the way we supply it. We advice you to use the UNIREL only with safe voltages up to 48V.
Using it with mains-connetected loads is only recommended when the wiring, isolation and encasing is done by approved electricians or other qualified personell.

Technical details in our online-shop shop.kainkalabs.com (english/german) or www.ak-modul-bus.de
Tutorial and explanation of the circuit-diagram at our YouTube channel „kainkalabs“
Questions and suggestions at our forum forum.kainkalabs.com (english/german)

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