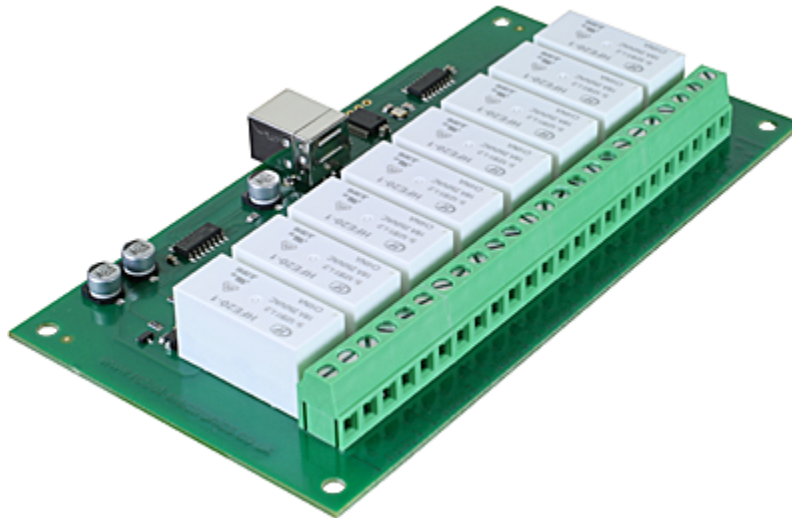


# USB-RLY16L - Low Power 8 channel relay outputs at 16A

## Technical Documentation



### Overview

A low power version of the USB-RLY16 module, the USB-RLY16L is powered solely from the USB bus and provides eight volt free contact relay outputs with a current rating of up to 16Amp each. The relays are SPCO (Single Pole Change Over) types and provide position 0, position 1 and common pins (latching relays and have no "normally open" or "normally closed" contacts) on the screw terminals labeled as 0, C and 1 accordingly. The relays will also retain their state in the absence of power.

### Operating Temperature

-40C to +70C

### LED indication

The USB-RLY16L provides a red LED mounted immediately next to each relay to indicate whether it is in a position 1 state (LED on) or position 0 state (LED off).

### Relay power rating

If the relay is used at a voltage or current exceeding this specification, the life of the contacts may be significantly shortened.

## CONTACT DATA

Contact arrangement	1A, 1B, 1C
Contact resistance	50mΩ (at 1A 24VDC)
Contact material	AgSnO <sub>2</sub> , W+AgSnO <sub>2</sub>
Contact rating	1A,1B: 16A 250VAC, 1 x 10 <sup>5</sup> OPS(Resistive) 20A 250VAC, 3 x 10 <sup>4</sup> OPS(Resistive) 1.5HP 240VAC(Motor) 8A 220VAC COSØ=0.4, 1x10 <sup>5</sup> OPS(Inductive) HFE20-1/X-1HXD: 3000W 220VAC, 1.5 x 10 <sup>4</sup> OPS (Incandescent & fluorescent lamp) 1C: 16A 250VAC, 5 x 10 <sup>4</sup> OPS
Max. switching voltage	277VAC
Max. switching current	16A
Max. switching power	5000VA
Mechanical endurance	3 x 10 <sup>6</sup> OPS
Electrical endurance	See "Contact rating"

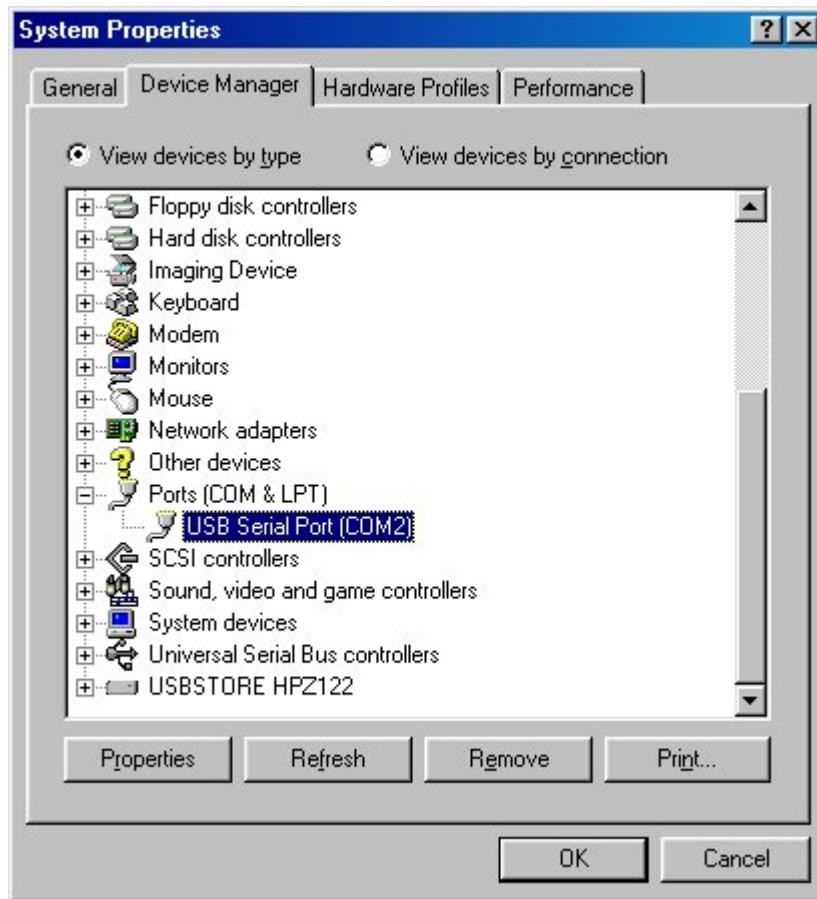
A full datasheet for the relays used on the USB-RLY16L is here: [HFE20 datasheet](#)

### First Step - Install the Driver

The USB-RLY16L module uses the Microchip PIC18F14K50 to handle all the USB protocols. Before using the USB-RLY16L you will need to download the [Devantech inf files](#) and unzip them into a temporary folder. Connect the USB-RLY16L and windows will detect it and ask for the drivers. Point windows to the inf folder and it will install the driver. The USB-RLY16L will now appear as a com port.

### Which COM port?

After installing the drivers, and plugging in the USB-RLY16L module to a spare USB port, you will want to know which COM port it has been assigned to. This will vary from system to system depending on how many COM ports you currently have installed. To find out where it is, right click on your "My Computer" desktop icon and select the "Device Manager" tab. Now scroll down and open the "Ports (COM & LPT)" tab. You should see the USB serial port listed - COM2 in the example below. If you want to change the COM port number - just right click on it, select properties, select advanced and select the COM port number from the available list. The COM port may be left at the default baud rate etc, because they are not actually used - there is a direct USB connection into the processor.



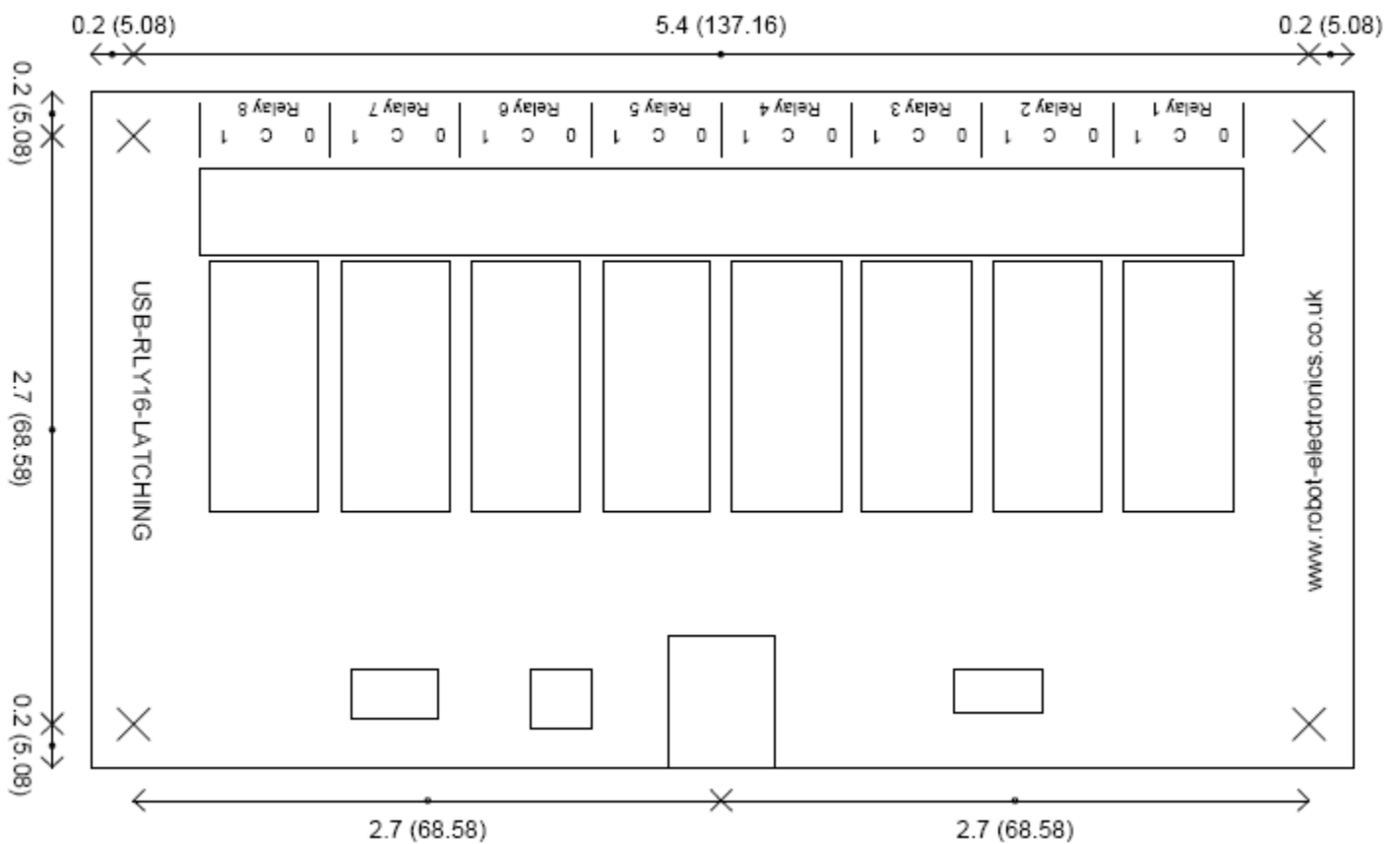
## Commands

The USB-RLY16L operates with an easy to use command set as described in the table below. Most commands are only a single byte and if applicable the USB-RLY16L will automatically send its response. The only exception to this being the "Set relay states" command which requires an additional desired states byte to be sent immediately after the command byte.

Command		Action
dec	hex	
90	5A	Get software version - returns 2 bytes, the first being the Module ID which is 15, followed by the software version
91	5B	Get relay states - sends a single byte back to the controller, bit high meaning the corresponding relay is in position 1
92	5C	Set relay states - the next single byte will set all relays states, All in position 1 = 255 (11111111) All in position 0 = 0
93	5D	Get DC input voltage - returns the supply voltage as byte, this is fixed at 50 meaning 5.0V DC
100	64	All relays to position 1
101	65	Relay 1 to position 1
102	66	Relay 2 to position 1
103	67	Relay 3 to position 1
104	68	Relay 4 to position 1
105	69	Relay 5 to position 1
106	6A	Relay 6 to position 1

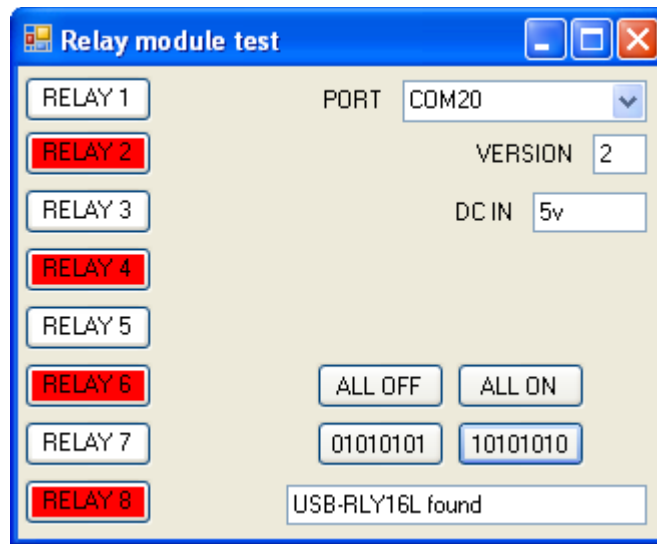
107	6B	Relay 7 to position 1
108	6C	Relay 8 to position 1
110	6E	All relays to position 0
111	6F	Relay 1 to position 0
112	70	Relay 2 to position 0
113	71	Relay 3 to position 0
114	72	Relay 4 to position 0
115	73	Relay 5 to position 0
116	74	Relay 6 to position 0
117	75	Relay 7 to position 0
118	76	Relay 8 to position 0

## Board dimensions



## Test program and example source code

To get the USB-RLY16L up and running in the minimum amount of time we have put together an example program to demonstrate the functionality of the module.



Visual studio express examples

Visual C# express

The test program is available as a visual c# express built exe file here [RelayModulesSetup.zip](#) or as visual c# express project here [RelayModulesSource.zip](#).