

# USB-RLY16 - 8 relay outputs at 16A

## Technical Documentation



### Overview

The USB-RLY16 provides eight volt free contact relay outputs with a current rating of up to 16Amp each. The processor is powered and instructed from any standard USB bus and the relay power is obtained by the DC power input adaptor. The DC input jack is 2.1mm with positive core polarity, DC supplies are required to supply at least 500mA at 12vdc. The relays are SPCO (Single Pole Change Over) types. The normally open, normally closed and common pins are all available on the screw terminals.

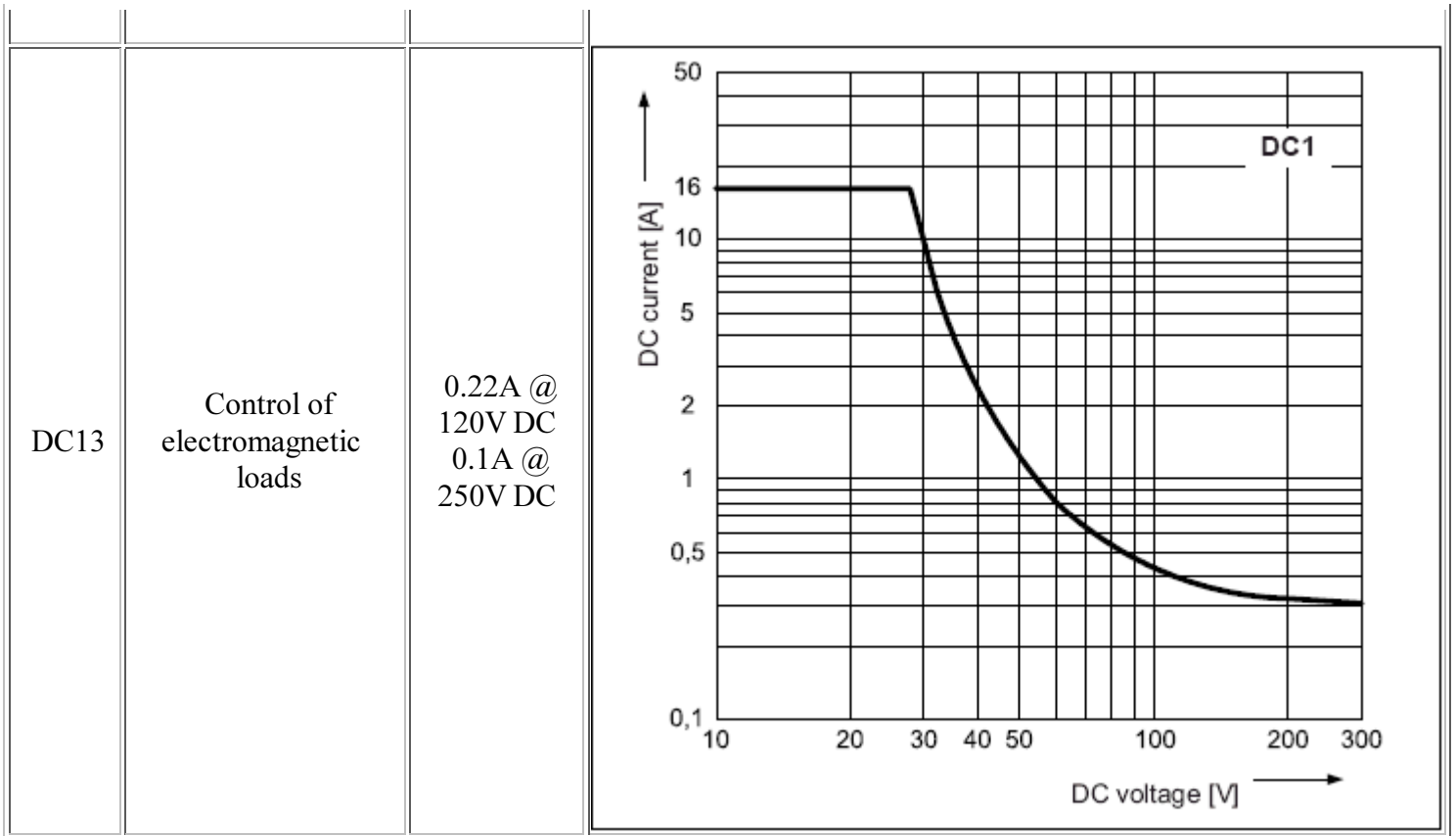
### LED indication

The USB-RLY16 provides a red LED mounted immediately next to each relay to indicate whether it is in a powered state (LED on), there is also two LED's which will flash with USB transactions to and from the module, green indicating reception of data from the PC and yellow the transmission of data to the PC. Finally there is red power LED mounted near to the USB connector.

### Relay power rating

If the contact load voltage and current of the relay are in the region enclosed by the solid and dotted lines in the figure below, the relay can perform stable switching operation. If the relay is used at a voltage or current exceeding this region, the life of the contacts may be significantly shortened.

load type	Typical applications	Rating	Max DC load capacity
AC1	Non inductive or slightly inductive loads	16A @ 250V AC	
AC15	Control of electromagnetic load (>72VA)	3A @ 120V AC 1.5A @ 240V AC	
AC3	Control of motor	750W	
DC1	Non inductive or slightly inductive loads	16A @ 24V DC	



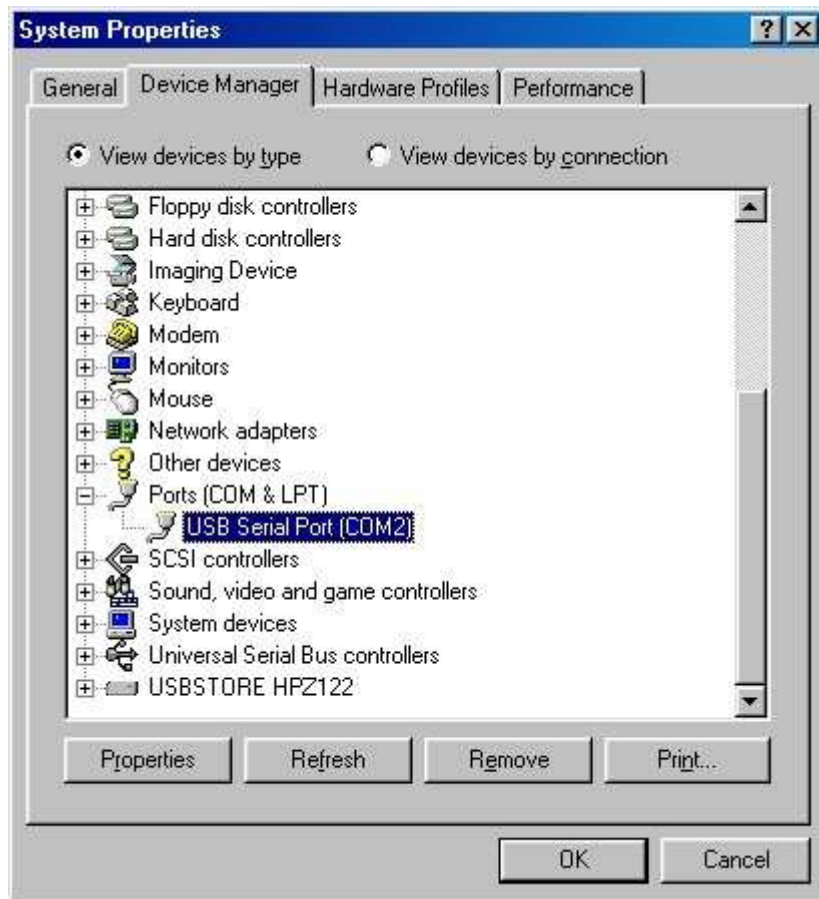
A full datasheet for the relays used on the RLY16 is here: [RM85 datasheet](#)

### First Step - Get The Drivers

The USB-RLY16 module uses the [FTDI FT232R USB chip](#) to handle all the USB protocols. The documentation provided by FTDI is very complete, and is not duplicated here. Before using the USB-RLY16, you will need to install FTDI's Virtual COM Port ( VCP ) Drivers. These drivers appear to the system as an extra Com Port ( in addition to any existing hardware Com Ports ). Application software accesses the USB device in the same way as it would access a standard Windows Com Port using the Windows VCOMM API calls or by using a Com Port Library. Drivers are available for Windows, Apple, Linux and Open BSD systems directly from the [FTDI website](#). You should get and install the drivers now, before you connect the USB-RLY16 to your computer. The Drivers page is [here](#).

### Which COM port?

After installing the drivers, and plugging in the USB-RLY16 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 should be set up for 19200 baud, 8 data bits, no parity and two stop bits.



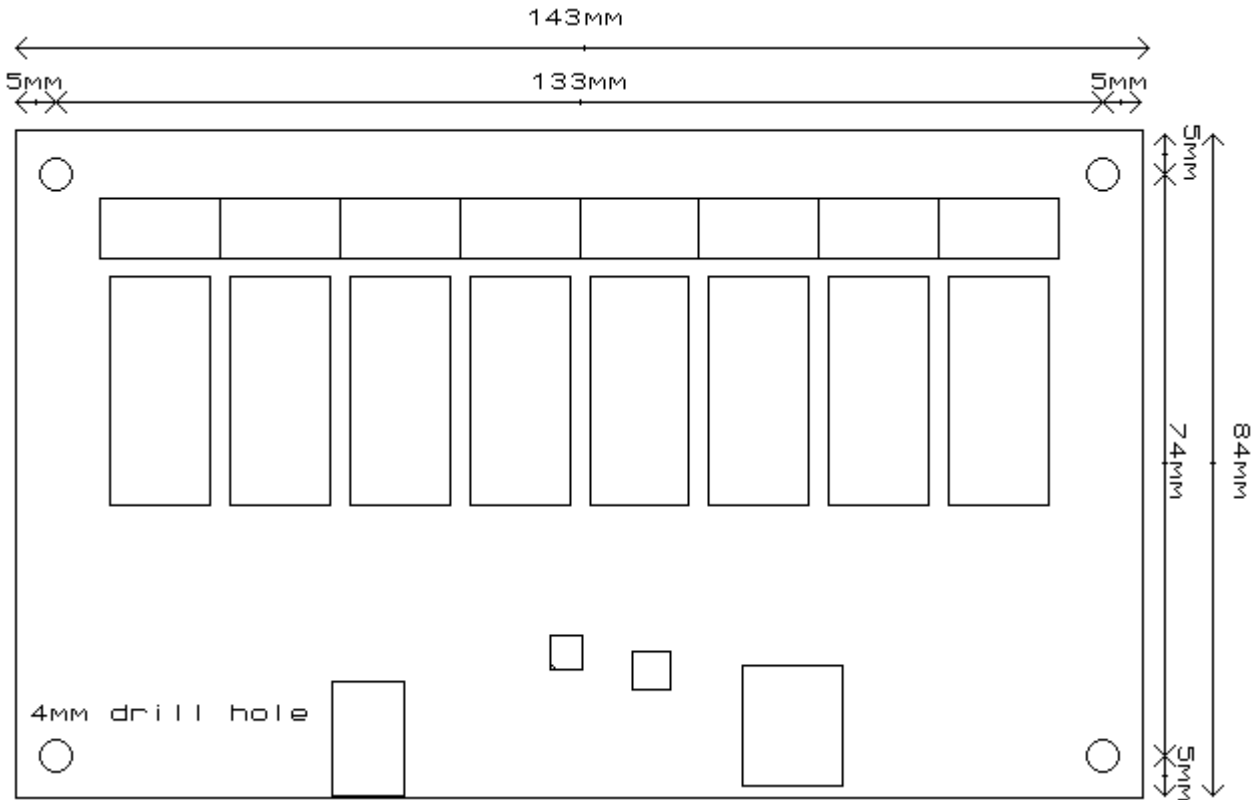
### Commands

The USB-RLY16 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-RLY16 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 9, 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 powered
92	5C	Set relay states - the next single byte will set all relays states, All on = 255 (1111111) All off = 0
93	5D	Get DC input voltage - returns relay supply voltage as byte, 125 being 12.5V DC
100	64	All relays on
101	65	Turn relay 1 on
102	66	Turn relay 2 on
103	67	Turn relay 3 on
104	68	Turn relay 4 on
105	69	Turn relay 5 on
106	6A	Turn relay 6 on
107	6B	Turn relay 7 on
108	6C	Turn relay 8 on
110	6E	All relays off

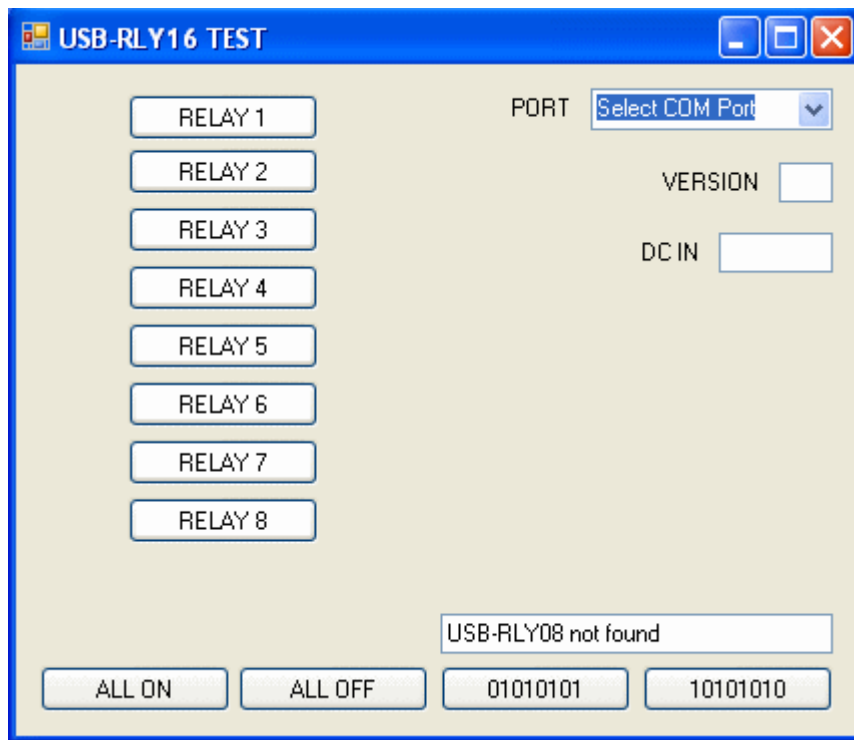
111	6F	Turn relay 1 off
112	70	Turn relay 2 off
113	71	Turn relay 3 off
114	72	Turn relay 4 off
115	73	Turn relay 5 off
116	74	Turn relay 6 off
117	75	Turn relay 7 off
118	76	Turn relay 8 off

### Board dimensions



### Test program and example source code

To get the USB-RLY16 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 [USB RLY16 TEST](#) or as visual c# express project here [USB-RLY16 TEST.zip](#).

Visual basic express

The test program is available as a visual basic express built exe file here [USB RLY16VB](#) or as visual basic express project here [USB-RLY16VB.zip](#).

Visual studio express is provided free from Microsoft here: <http://www.microsoft.com/exPress/download/>