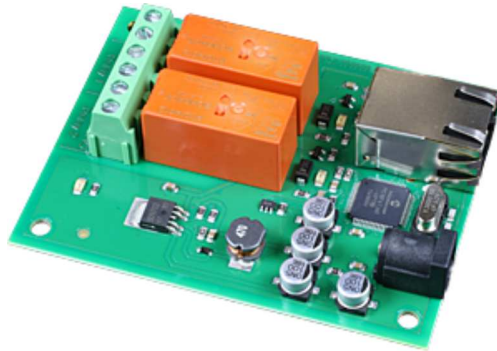# ETH-RLY02 - 2 relay outputs at 16A
Technical Documentation

Overview
The ETH-RLY02 provides two volt free contact relay outputs with a current rating of up to 16Amp each. The module is power from a 12vdc supply which can be regulated or unregulated. 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.
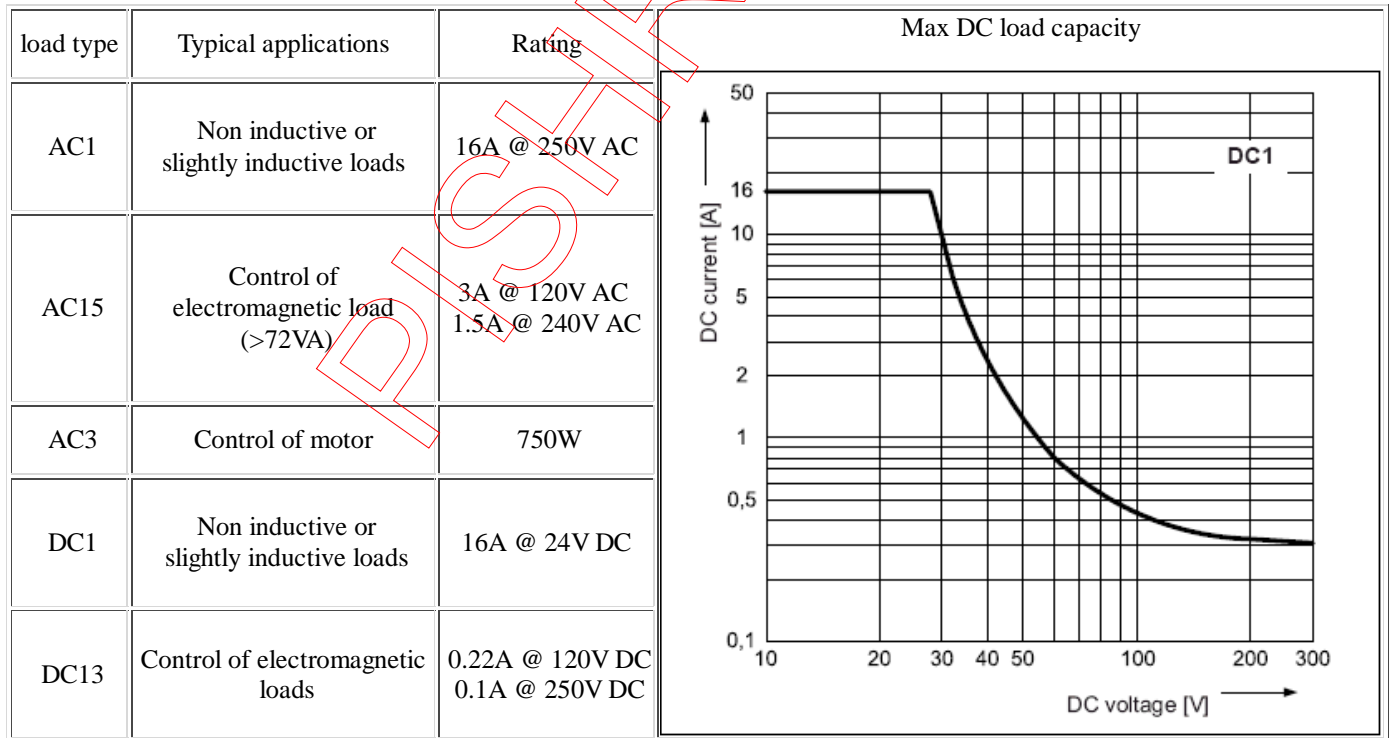
Operating Temperature
-40C to +70C

LED indication
The ETH-RLY02 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 mounted in the Ethernet connector which will flash with Ethernet traffic. Finally there is a red power LED alongside the screw terminals.

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	
DC13	Control of electromagnetic loads	0.22A @ 120V DC 0.1A @ 250V DC	

A full datasheet for the relays used on the ETH-RLY02 is here: RM85 datasheet

First Test
Having plugged in your 12vdc power supply and Ethernet connection, start up your web browser and type **http://ethrly02** into the address bar, please note this only works in windows. You will be prompted for a password as shown below:

You should now see the following web page:

This web page will allow you to switch the relays on and off by clicking the relay buttons (the red/gray circles). It also contains a link to this technical documentation page.

TCP/IP Commands
The ETH-RLY02 can also be controlled using a simple command set sent over TCP/IP on port 17494 (0x4456). This is the default port, it can be changed in the configuration settings.
Most commands are only a single byte and if applicable the ETH-RLY02 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 a single byte, the software version number
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 (11111111) 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
110	6E	All relays off
111	6F	Turn relay 1 off

112	70	Turn relay 2 off
119	77	Get MAC Address. Returns the unique 6 byte MAC address of the module.

IP addresses & DHCP Servers

The easiest way to use the ETH-RLY02 is to connect it to a network with a DHCP server. In this case the ETH-RLY02 will have its IP address assigned automatically by the DHCP server. This is the recommended way to use the ETH-RLY02.

If there is no DHCP server on the network, then a fixed IP address of 192.168.0.200 is used. To control the ETH-RLY02 using this fixed IP address your computer MUST be on the same subnet. Set your computers IP address to 192.168.0.1 (we will never supply a module with that address). Set the default gateway and DNS server to the same IP address. The subnet mask should be set to 255.255.0.0.
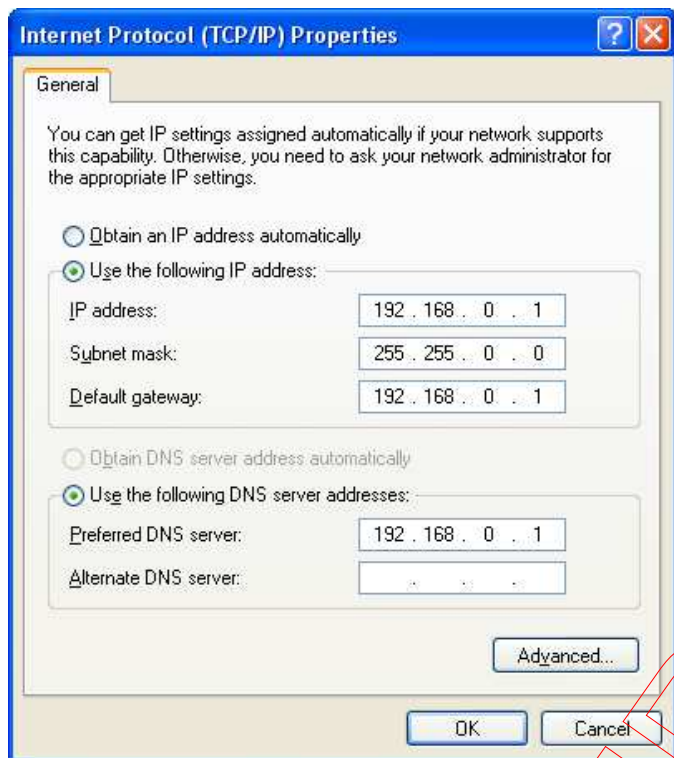
This image is for a PC running Windows XP.
To get to the TCP/IP properties screen, go to:
Control Panel->Network Connections->Local Area Connection->Properties.
Select Internet Protocol (TCP/IP) from the scroll box and click Properties.

That gets you to the dialog box shown left.

Configuration

Now it's possible to configure the ETH-RLY02 IP address and subnet mask together with the ability to set a password for entry to control screens. All settings are saved to memory so be careful to remember the username and password! Default password settings are shown in the picture below.


Board Configuration

This section allows the configuration of the board's network settings.

CAUTION: Incorrect settings may cause the board to lose network connectivity.

MAC Address	00:04:A3:48:C1:A8
Host Name	ETHRLY02
Username:	admin
Password:	password
Port	17494
☑ Enable DHCP	
IP Address	192.168.0.49
Subnet Mask	255.255.255.0

Save Config

Test program and example source code

To get the ETH-RLY02 up and running in the minimum amount of time we have put together an example program to demonstrate the functionality of the module. We provide the full source code for this program. You may examine this code to see how it works or use it as a starting point for your own application.
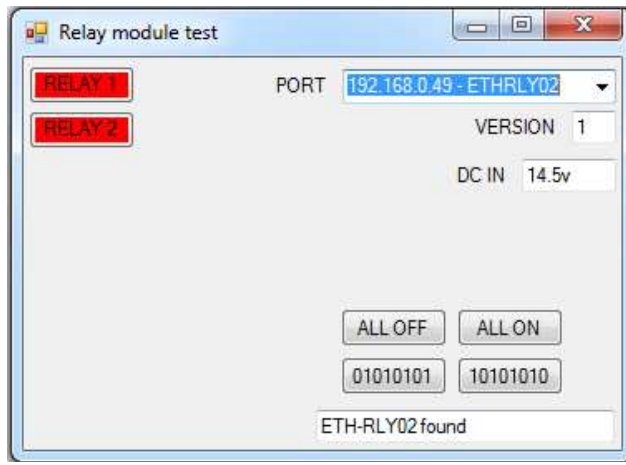
Visual studio express C# examples
The test program is available as Visual C# express ready built installation files here, or as Visual C# express project with source files here.
Visual studio express is provided free from Microsoft: http://www.microsoft.com/exPress/download/

Access from the Internet
The ETH-RLY02 can be controlled over the internet almost as easily as on your local network. Your network will most likely be connected to the internet with a broadband router. This will provide NAT (Network Address Translation) and Firewall services. To access the ETH-RLY02 from the internet you will need to open up port 17494 (0x4456) to allow incoming TCP connections. Be careful not to open up any other ports. There are a wide variety of routers and we cannot give details for all of them. If in doubt ask you system administrator for assistance. The following shows how to open up a port on a Netgear DG834 router.

 After logging on to your routers setup page, the first thing to do is create a new service. Click on the "Services" menu then "Add Custom Service". Enter a name for the service, select TCP and enter the ETH-RLY02's port address for both the start and finish ports. Click "Apply".


Now go to the "Firewall Rules" menu and click "Add" in the Inbound services section. Select the ETH-RLY02 service and ALLOW always. The "Send to LAN Server" IP address is the ETH-RLY02's IP address, 192.168.0.15 in the example above but check what it is on your network. Click "Apply" and that's it. The ETH-RLY02 is now accessible over the internet. Before you close the routers setup pages, go to the "Router Status" menu and make a note of its ADSL port IP address. This is the routers internet facing IP address.
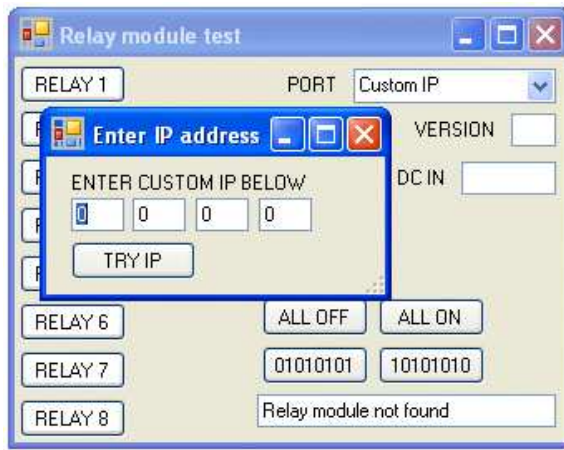
To test this you will need a computer that has its own internet connection and is NOT connected to the same network as the ETH-RLY02. Download and run the test program above and select Custom IP. In the pop-up box enter your routers internet facing IP address. Click on "Try IP" and it will connect you to the ETH-RLY02 just as if it were on your own network.

We also have a free Android App available to remotely control your relays.

Board dimensions