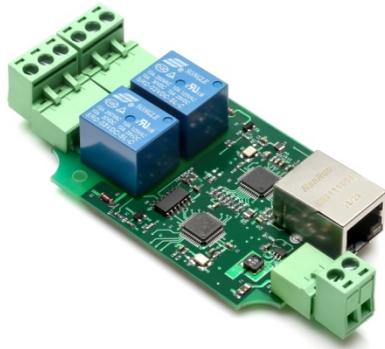


BrickElectric Ethernet Relay

BE-M104

Excellent network building block



Features

- **WEB control / Port Forwarding**
- **Software update via Internet**
- **5 - 24 VDC power supply**
- **EasyBus - simple solution**
- **Android App**
- **LAN mode**
- **DHCP - Plug and play**
- **Internet Control**
- **Password Protection**

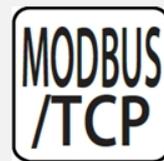
Introduction

BE-M104 is an Wide Supply Input, Ethernet Remote Relay Module, with 2 output channels, and provide with both enclosed and open type housing. Its Ethernet connector provides 10/100baseT interface.

It supports EasyBus-TCP, HTTP control and Internet control protocols, suitable for being used with servers, computers, mobiles, routers, etc., to provide remote control and monitor. You can also define the port number for HTTP by yourself, to realize Router Port Forwarding.

With DHCP functions, it doesn't need to make any settings anymore in field. So *just plug and play*, power it on and then enjoy your remote control.

BEM104 is a new generation product with more functions and higher stability. Control mode "toggle" and "automatic cycle operation" are provided additionally.



General

Power Consumption

3W max.

Operation Temperature

-30°C to +85°C

Module Size

75mmx50mmx20mm

Weight

-

Connection Diagram

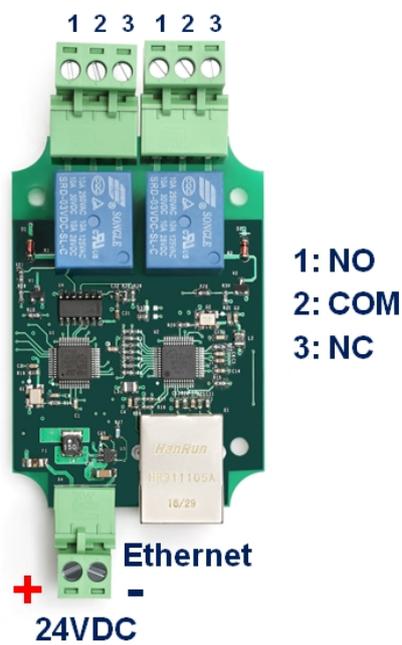


Fig. 1.1

Specifications

Electric Specifications

Parameters	Symbol	Values			Unit
		Min.	Typ.	Max.	
At T = 25°C, V _{supply} = 5V unless otherwise specified.					
Operating voltage	V _s	5	-	24	V
Output Relay Rating	-	250VAC/10A 125VAC/10A 24VDC/10A 12VDC/10A			-

Software Specifications

Default Settings

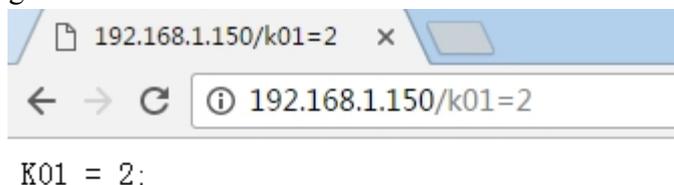
- **IP Setting:**
IP address: 192.168.1.105
Subnet Mask: 255.255.255.0
Gateway: 192.168.1.1
DHCP: disable
- **HTTP function**
State: Enable
Port: 80
- **Latest Firmware Version**
V3.0
You can download latest firmware for free.
- **Internet Control**
State: Enable
Platform with App : Android
/ iOS(in prepare) / Windows(in prepare)
Cross-Platform (Web Browser) in prepare

A Practical step-by-step operation guide for starters

This part is a step-by-step tutorial explaining how to start with BE-M104. We'll not discuss too much details here. The only idea here is to make it work by minimum steps. For more information, please refer to later chapters.

HTTP Mode:

1. Connect BE-M104 with your routers or computer via a standard Ethernet cable. And then power it on with 5 - 24VDC power supply.(see **fig.1.1 at page 2**)
2. Open any Browser, for example Chrome is used here as demonstration. Please enter URL : `http://192.168.1.105/k01=2`. Relay channel 1 will be toggled, and also a message will be returned to your browser. Congratulations!



LAN Mode:

1. Connect BE-M104 with your routers or computer by Ethernet cable, and then power it on with 5 - 24VDC power supply.(see **fig.1.1 at page 2**)

2. Open any TCP test tool(if you don't have any, or you don't know what a TCP test tool is, you can use **TCP/IP Builder**, it is within our software package). Open it and see the following

Fig.1.2:

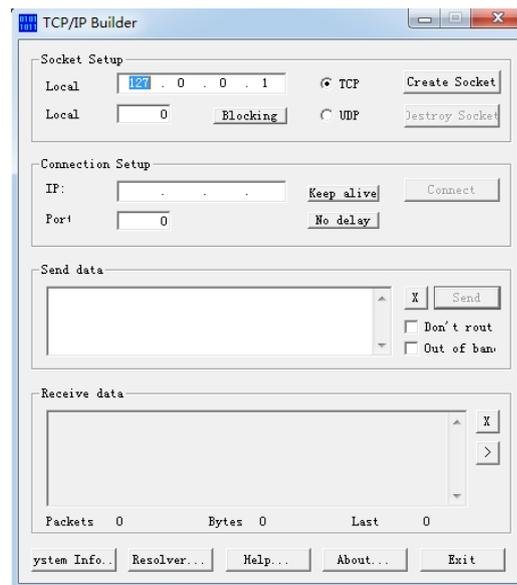


Fig.1.2

3. In "**Socket Setup**" group, at the first **Local** enter your PC's IP address, for example this demo PC is at 192.168.1.3, and then select **TCP**. At the second Local, leave the value 0 as default, and then click **Create Socket**. If you don't know your PC's IP address, please click on **System Info...** at bottom left, and you will get your PC IP address. Now we should see the following **Fig.1.3**(second **Local** will automatically change to a random value, it's OK):

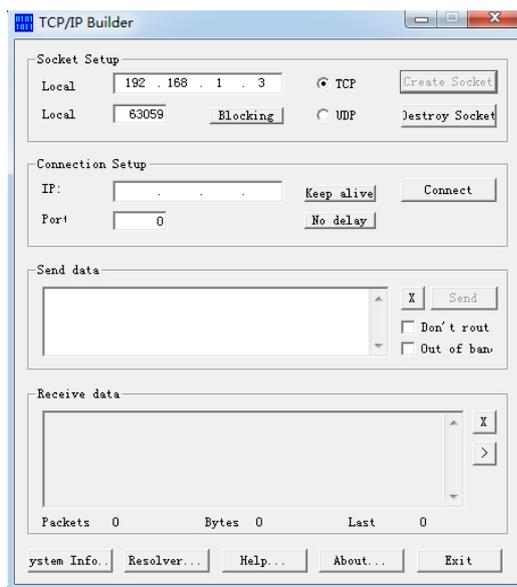


Fig.1.3

4. In "**Connection Setup**" group, at **IP** please enter the IP address of BE-M104, which by default is 192.168.1.105. At **Port** please input the port number of BE-M103, which by default is 5000. And then click on **Connect**. If everything goes right and the connection is successful, **Send** button will be enabled now. See **Fig.1.4**

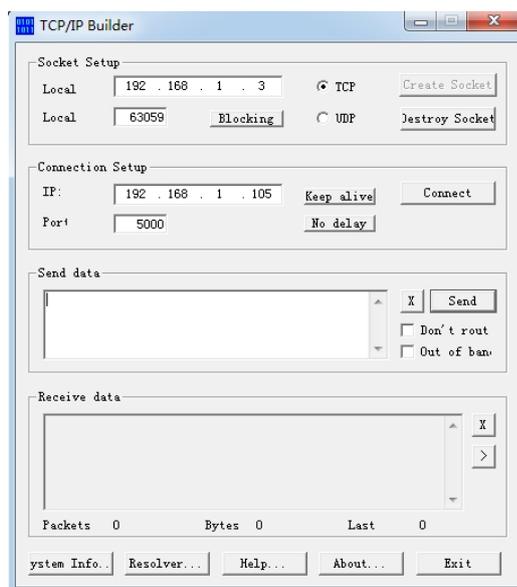


Fig.1.4

5. Now it is able control the relay module. To switch on relay channel 1, at **Send data** enter "K01 = 2;" and then click **Send**, you'll hear the relay toggled and also a feedback will show up at **Received data**: "K01 = 2;"; this means the relay module has received your message and executed it correctly. See **Fig.1.5**

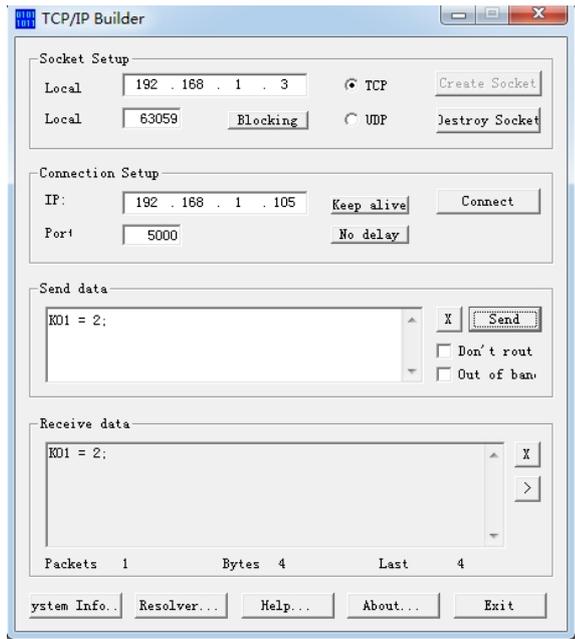
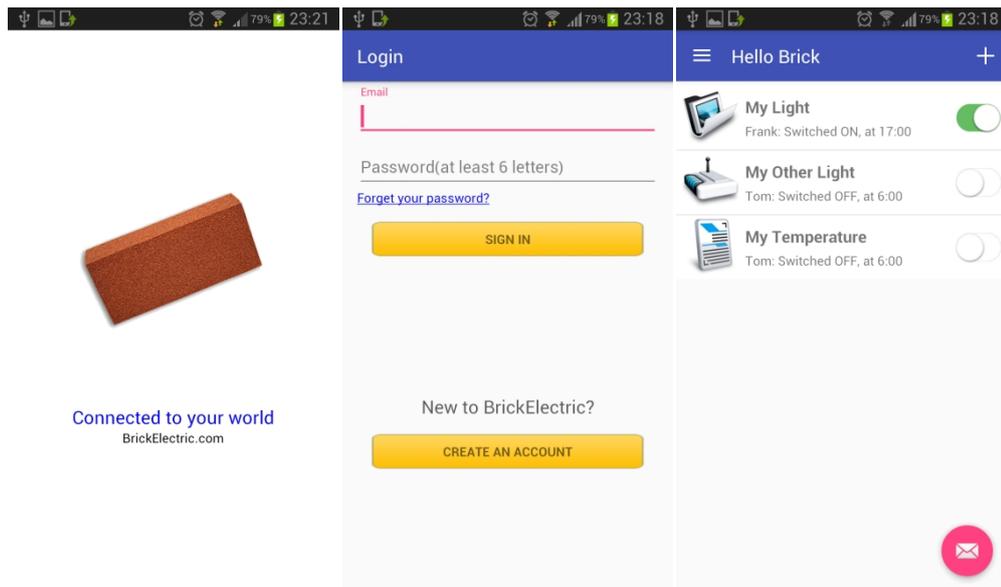


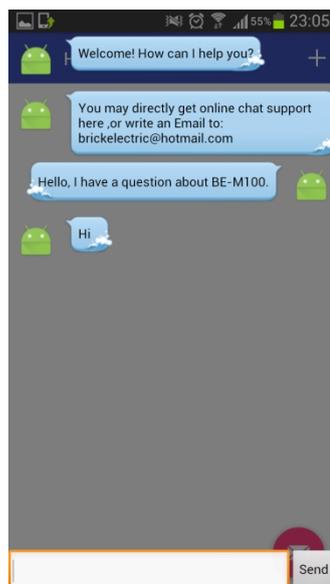
Fig.1.5

Internet Mode:

1. Connect BE-M104 with your routers or computer by Ethernet cable. And then power it on with 5-24VDC power supply.(see **fig.1.1 at page 2**)
2. Open "**Hello Brick**" app for android at any android phone, register a user and then have fun with Internet control. No other need at relay module is necessary.



3. If you need online help or need to contact us for customized functions, please click the bottom right red "online help button". One of our daily on duty R&D engineer will talk to you directly.



Easybus Specifications

EasyBus use more friendly language to control the relay module. With "easy to understand" grammar and similarity to OS command lines, it's extremely easy to work with it. Read the following materials and you will be ready to go with every details in 10 minutes.

Not like any other field bus, you don't need to be an expert of automation or learn programming to use it. This saves time for many people who wants to focus on more creative works, and they can start to create application with BE-M104 immediately, rather than spend lots of time on learning the old-fashioned and very detailed industry automation communication protocol before they can really start to do anything.

How to send a correct switch command?

Example - switch on relay channel 1:

K01 = 1;

Rules: To switch a relay, use the assignment: **element = expression;**

Explanation of switch elements:

In BEM104, elements(or variables) are basic control keywords(or so called "reserved variable name"), they're mapped internally to system functions. Assign an element with a value and then the system will recognize it and execute expected actions. The following table is the general description of all elements available:

Elements	Descriptions
K01	Relay Ch1.
K02	Relay Ch2
K01T1	Relay Ch1, time elements T1, range: 0 - 4294967295, default = 1000.
K01T2	Relay Ch1, time elements T2, range: 0 - 4294967295, default = 1000.
K02T1	Relay Ch2, time elements T1, range: 0 - 4294967295, default = 1000.
K02T2	Relay Ch2, time elements T2, range: 0 - 4294967295, default = 1000.
K01U1	Relay Ch1, T1 unit element, 0 = millisecond, 1 = second, default = 0 (millisecond)
K01U2	Relay Ch1, T2 unit element, 0 = millisecond, 1 = second, default = 0 (millisecond)
K02U1	Relay Ch2, T1 unit element, 0 = millisecond, 1 = second, default = 0 (millisecond)
K02U2	Relay Ch2, T1 unit element, 0 = millisecond, 1 = second, default = 0 (millisecond)
DHCP	dhcp function, 0 = dhcp disabled, 1 = dhcp enabled, default = 0(disabled)
SAVE	Save parameters, 1 = save parameters in flash.
REBOOT	Restart BEM104, 1 = restart
WEBPORT	Http port, you can change it to any number for port forward. default value: 80
PWENABLE	Password protection activate. 1 = enable, 0 = disable
PW	Password input, 6 bit length, default value = 123456. Example: pw = 123456
NEWPW	New password, 6 bit length. Example: newpw = abc123
IPADDR	IP address, this is the fixed IP of BE-M104 when dhcp function is disabled. default = 192.168.1.105
GATEWAY	Gateway, this is the fixed IP of your gateway when dhcp function is disabled. default = 192.168.1.1

NETMASK	Netmask, this is the netmask of BE-M104 when dhcp function is disabled. default = 255.255.255.0
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Explanation of switch modes expressions:

In BE-M104, each relay has 8 basic switch modes which are:

mode	Descriptions
0	mode 0, single off, to switch a relay off.
1	mode 1, single on, to switch a relay on.
2	mode 2, single toggle, the relay will go to opposite position to previous status.
3	mode 3, pulse on, switch on for a self defined time T1, then automatically switch off.
4	mode 4, pulse off, switch off for a self defined time T1, then automatically switch on.
5	mode 5, pulse toggle, toggle for a self defined time T1, then automatically toggle again.
6	mode 6, cycle mode, switch on for self defined time T1, and then automatically switch off for a self defined time T2, then switch on again in endless cycle.
7	mode 7, read current relay contact status.

Some examples:

To switch on relay channel 1 off:

K01 = 0;

To toggle relay channel 1:

K01 = 2;

To read relay channel 1 contact status:

K01 = 7;

Contact ON return : K01 = 1;

Contact OFF return : K01 = 0;

To set relay channel 1, T1 unit in second:

K01U1 = 1;

To set relay channel 1, T2 unit in millisecond:

K01U2 = 0;

To set relay channel 1, T1 period T = 5:

K01T1 = 5;

To set relay channel 1, T2 period T = 500:

K01T2 = 500;

To pulse on relay channel 1 for the pre-set time T1:

K01 = 3;

To cycle on and off relay channel 1 for the pre-set time T1 and T2:

K01 = 6;

To enable dhcp function:

DHCP = 6;

To save setting before reboot(if you want the modification to be still valid in next power on):

SAVE = 1;

To change webport to 12345:

WEBPORT = 1;

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To enable module password protection:

PWENABLE = 1;

To enable module password protection:

PWENABLE = 0;

Once password is enabled, each command line must contain a correct password input otherwise the command will be ignored. Default password will be 123456. Once the password is enabled, you need to input the correct password to disable it.

To input password:

PW = 123456;

This example is based on default password. After you have changed the system password, please input your own password here.

Example when password is activated, to input a valid command:

PW = 123456;K01 = 2;K02=2;

All the commands followed after password input will be valid. This only last until the end of this line. In every new input line a correct password is always needed.

To change input password:

NEWPW = abc123;

Once newpw is set, the system password will be changed. Attention, once you have activated password protection, you need to input correct password first and then you can set new password.

To change BEM104 IP address to 192.168.1.150:

IPADDR = 192.168.1.150;

HTTP Specifications

Http mode also use easy bus protocol, but use URL to control BEM104, and return message as html format. You can use any standard Browser to access BEM104, or you can use any programming language to realized http access, so that it is able customized your GUI or control logic.

The general elements and expression rules are the same with previous easybus description, so here only some examples of the URL command are listed for easy understanding. Examples below assuming default IP setting is used. If you changed IP settings please change the IP address in URL to the correct value.

To switch off relay channel 0:

URL: "**192.168.1.105/ K01=0**"

Return: "**K01 = 0;**"

To assign a new IP address, for example 192.168.1.100:

Send: "**192.168.1.105/ipaddr=192.168.1.100**"

Return: "**IPADDR=192.168.1.100;**"

To save the data you changed:

Send: "**192.168.1.105/save=1**"

Return: "**SAVE = 1;**"

To reboot the module:

Send: "**192.168.1.105/reboot**"

Return: "**REBOOT;**"

To enable dhcp functions:

Send: "**192.168.1.105/ dhcp=1**"

Return: "**DHCP = 1;**"

To modify HTTP port number for port forwarding:

Send: "**192.168.1.105/webport = 12345**" (replace 12345 with the port number you want)

Return: "**WEBPORT = 12345;**"

Notice: Once you changed the web port, please send your next command to the correct port number. For example when you changed it to 12345, you need the following address format:

Send: "**192.168.1.105:12345/k01=2**"

If you have any questions or any customized software/hardware requirement, please send an email to our mailbox: brickelectric@hotmail.com

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