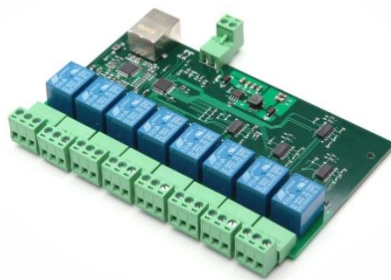# BrickElectric Ethernet Relay

BEM106

Excellent network building block

$C\epsilon$

Features

- **WEB control**
- **Modbus-TCP**
- **X-Connect**
- **Hardware Reset**
- **5 - 24 VDC power supply**
- **EasyBus - simple solution**
- **Android App**
- **LAN mode**
- **DHCP - Plug and play**
- **Internet Control**
- **Password Protection**

Introduction

BEM106 is an Wide Supply Input, Ethernet Remote Relay Module, with 8 output channels, and provide with both enclosed and open type housing. Its Ethernet connector provides 10/100baseT interface.

It supports EasyBus-TCP, HTTP control, Modbus-TCP 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.

BEM106 is a new generation product with more functions and higher stability. Control mode "toggle" and "automatic cycle operation" are provided additionally.

Table of Contents

1. Device Overview

1.1 General Ratings

Power Consumption	5W max.
Operation Temperature	-30℃ to +85℃
Module Size	150mmx80mmx20mm
Weight	-

1.2 Connection Diagram
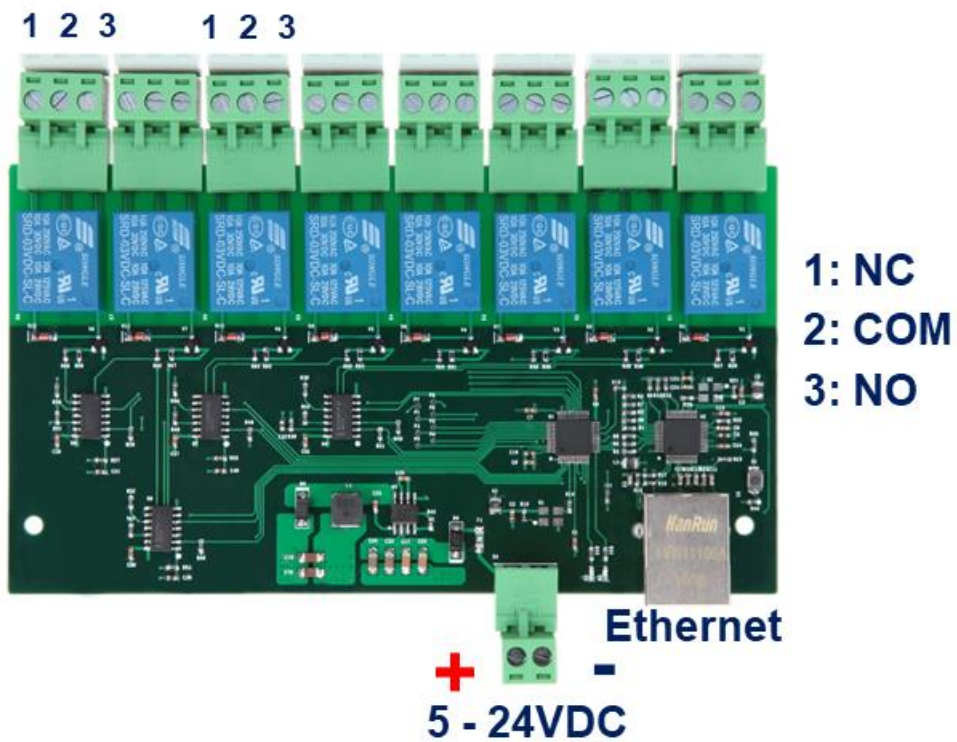
Fig. 1.1

2. Specifications

2.1 Recommended Operating Conditions

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

2.2 Default Software Settings

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**
  V106.0-00
  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

3. Easy Start

A Practical step-by-step operation guide for starters

This part is a step-by-step tutorial explaining how to start with BEM104. 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.

3.1 HTTP Mode

1. Connect BEM module 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 a message will be returned to your browser. Congratulations!
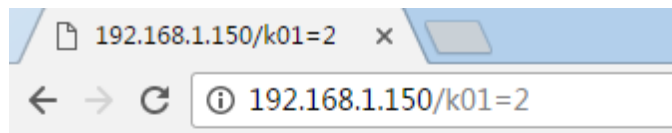

```
K01 = 2;
```

3.2 LAN Mode

1. Connect BEM module 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 **BE-Manager**, it is within our software package). Open it and see the following **Fig.1.2**:
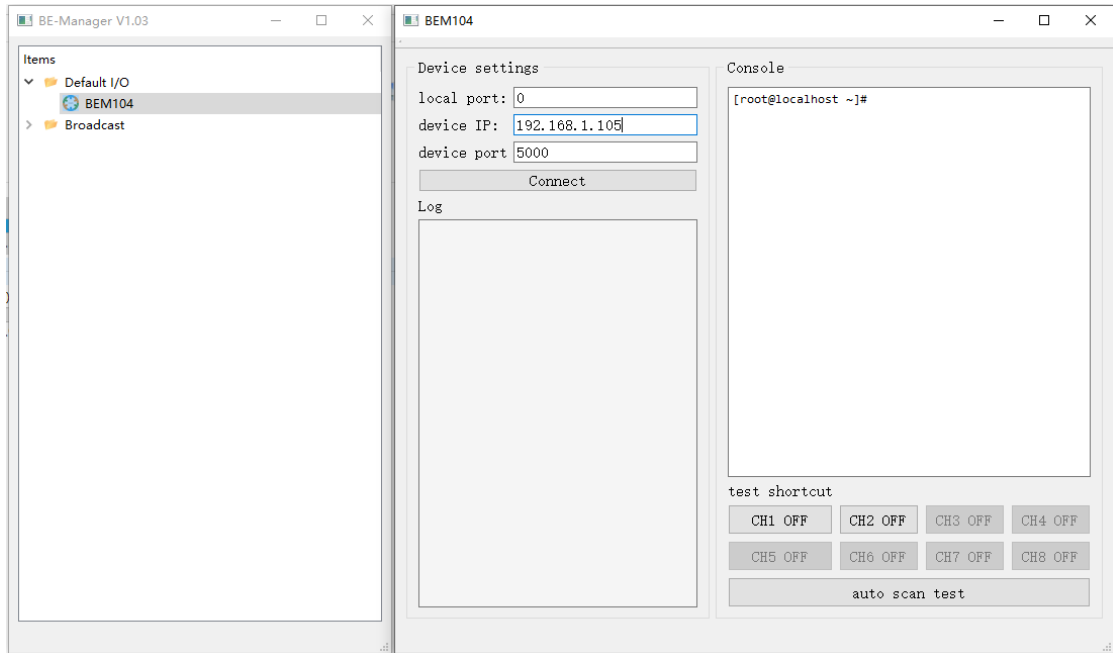
Fig.1.2

3. Click "*Connect*" button, and wait for module connected. Then, it is able control the relay module. Click "*CH1 OFF*" button, and the relay channel 1 will be switched on. See **Fig.1.3**
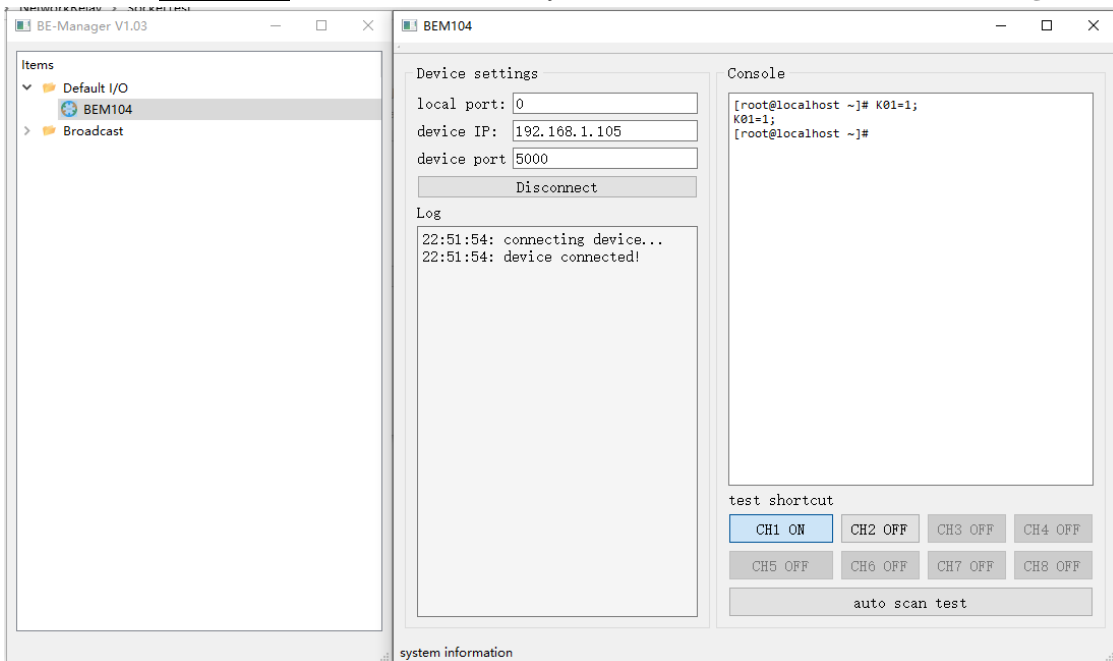
Fig.1.3

3.3 Internet Mode:

BEM series network controller module features an innovative Internet connectivity function: **Virtual LAN**.

Relatively speaking, it is very easy to visit/control a device or to communicate with a PC within your LAN, which means they are directly connected to your local network via one or several routers. In LAN it is very common to share a folder, create ERP service, use OA system or to visit/control some devices like BEM modules by their local IP address.

You can setup your own static IP address in LAN which is not limited by network service provider, and you can also trust the communication in LAN because without permission from firewall rules(or sometimes there is no Internet connection) there is no possibility to send information to devices within LAN unless you can directly access the router.

But LAN is also highly limited exactly by this feature, that means you have to connect everything by a physical Ethernet wire or wireless router. When the device is in a different building or even at a different city or country this is almost impossible to achieve. If this is the case, Internet is the only option left. But Internet also have its own weakness, like no static IP address (ISP have their own local networks and firewall, and mostly your device is not directly accessible by other device/PC), safety issues(well, we believe everyone agrees that there is no need to argue this point), server deployment and management.

Virtual LAN is created exactly to solve all these problems in Internet while keeping the advantages of LAN. Virtual LAN can be installed in PC and also is integrated in BEM series modules. With virtual LAN, you can add a virtual network adapter into your device/PC, and the device/PC will be connected to a virtual local network via this adapter.

For example, you have two PC and several BEM devices which is connected Internet at different locations, and they have dynamic local network IP address and thus can't visit each other. But with virtual LAN software activated, each PC and BEM devices will have a second IP address which is build upon their Internet connection and independent on their local IP, so you can directly visit each other once in this virtual LAN. PC A1 will have a virtual IP like 10.8.0.2, and PC A2 will have a virtual IP like 10.8.0.3. If you are PC A1, you can directly connected to PC A2 by visiting 10.8.0.3, no matter where you and PC A2 is connected as long as they both have Internet connection.

It is same way to use BEM devices with virtual LAN. No matter where they're installed, you can always connect to them use their virtual IP address as long as they have Internet connection. Only a simple click and you will have your own LAN in Internet.

Not only a simple connection can be established by virtual LAN, but also it can be used in all network applications, like share folder, file server, ERP system, OA system, web server and so on… It is easy to use and it is also safe because it is transmitting data in highly encrypted way.

1. Virtual LAN software product kit introduction and purchase page:
https://www.brickelectric.com/software-c-8/virtual-lan-service-099month-p-52.html

2. Download NetManager at:
https://www.brickelectric.com//downloads_and_updates.html

2. Open "***NetManager***" app for windows, register a new group and then you can add users or devices into group. Users are used for PC and devices are used for BEM modules.

3. You can manage users/devices with NetManager as you need. NetManager is only a user management software, it does not contain virtual LAN soft adapter.
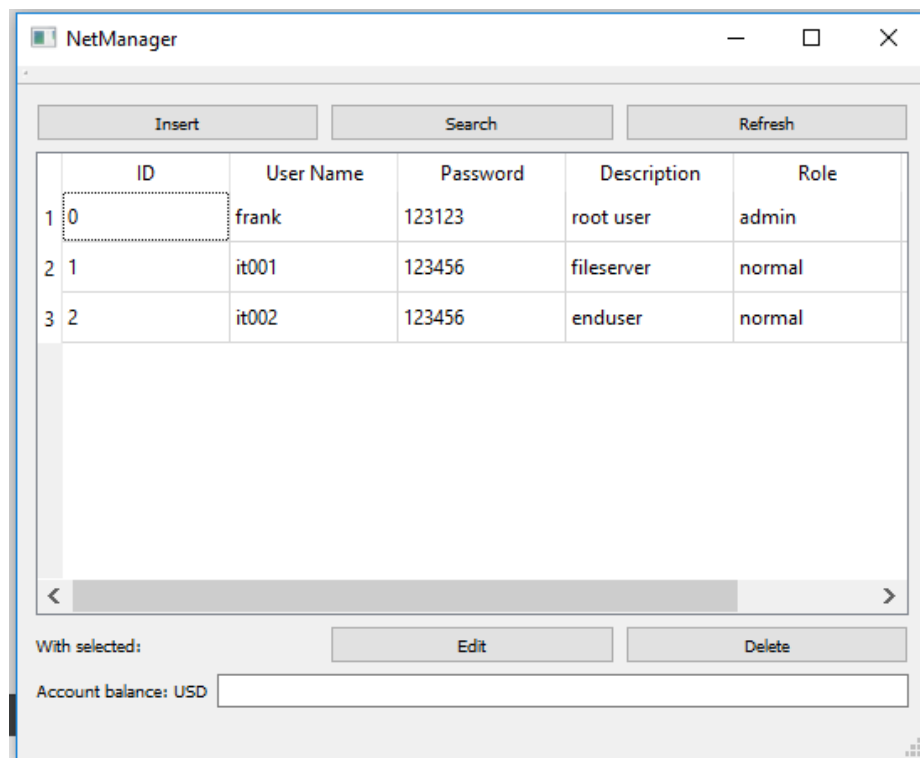
4. After you have created your own group and its users by NetManager, you can download virtual LAN soft adapter **NetScalable** at:
https://www.brickelectric.com//downloads_and_updates.html

5. Login into NetScalable and click button "Start VLAN", enjoy your virtual LAN connection.

www.BrickElectric.com
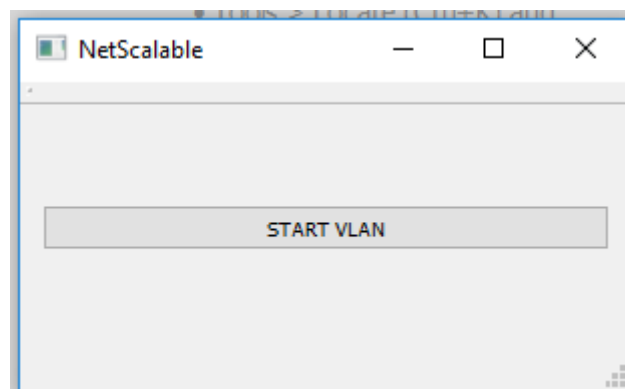
4. Functionality

4.1 Basic Network Communications

The main method of communication to BEM106 is a standard Ethernet communication. This communication protocol makes use of Network Sockets or HTTP protocol to create point to point tunnels that data can flow through bi-directionally. In this way, the computer that is controlling the relay can send commands and shortly thereafter receive the response through the same Socket/Web Page.

Communications

In most programming languages, all you need to do to open a socket is to import the appropriate plug-in, build the socket object, and connect the socket using the IP Address and Port Number of the target device.

MAC Address

You can find the MAC Address of the module at the simple starter manual delivered together with module package.

4.2 Save Parameters

After power cycle, BEM106 will lose its parameter modifications if you don't actively require it to save modified parameters into internal nonvolatile memory. For examples, IP Address, Gateway address and Net mask.

Assuming module current IP Address is 192.168.1.105 for all the following commands.

Save parameters

To save parameters:
Web access URL:
http://192.168.1.105/save=1
Socket command text:
save=1;

4.3 Reboot

Send the module a restart signal so it will restart itself. **Some parameters modifications are only effective after a reboot or power cycle.** Relay contact outputs are still in control during reboot process, under default setting, module will be keep the contact status unchanged during this reboot process. Parameters modifications will be lost if you don't save them before reboot or power cycle operation.

Assuming module current IP Address is 192.168.1.105 for all the following commands.

Reboot

To reboot device:
Web access URL:
http://192.168.1.105/reboot=1
Socket command text:
reboot=1;

4.3 DHCP Function

BEM106 supports both DHCP and static IP Addressing. For communication reliability, we recommend using a Static IP Address when you feel comfortable doing so. This will ensure that the device will always be where you expect it to be, when you try to connect to it.

DHCP stands for Dynamic Host Configuration Protocol and basically means that your router will assign the first available IP Address in the list of IP Addresses Range to your device. This technology makes network devices very easy to use, but it is not as reliable because in certain circumstances it will cause the IP Address it assigns to change. DHCP mode is recommended when you only use Internet control, or your local software is able to detect module IP changes.

Assuming module current IP Address is 192.168.1.105 for all the following commands.

Enable/Disable DHCP
Note: modification only effective after parameter saving and module reboot.
To Enable DHCP:
Web access URL:
http://192.168.1.105/dhcp=1
Socket command text:
dhcp=1;

To Disable DHCP:
Web access URL:
http://192.168.1.105/dhcp=0
Socket command text:
dhcp=0;

4.4 Static IP Address

This technology is the antithesis of DHCP in that it is manually set IP address and does not dynamically change without direct action. The disadvantage of this method is that, if done incorrectly, can make the module unreachable through any standard means. This usually happens when an IP Address is statically set to an IP Address outside of the range of the router, or another device on the network obtains this IP address via DHCP. If this happens, see the section of this guide titled "Reset Function". This method is the preferred and more reliable way to handle network IP Address allocation. For improved reliability, the IP Address assigned to this Module should be reserved on your router.

To work correctly in static IP address mode, you need to set correct IP address, gateway address and subnet mask. The following content describes how to modify each of them.

If module is currently in DHCP mode, to set a new static IP address you need to disable DHCP mode at first. After settings are done, please save parameters and reboot the device to make it effective.

Assuming module current IP Address is 192.168.1.105 for all the following commands.

Set static IP Address
Note: modification only effective after parameter saving and module reboot.
To set static IP Address to 192.168.1.100:
Web access URL:
http://192.168.1.105/ipaddr=192.168.1.100
Socket command text:
ipaddr=192.168.1.100;

Set static Gateway Address
Note: modification only effective after parameter saving and module reboot.
To set static Gateway Address to 192.168.2.1:
Web access URL:
http://192.168.1.105/gateway=192.168.2.1
Socket command text:
gateway=192.168.2.1;

Set static Net Mask
Note: modification only effective after parameter saving and module reboot.
To set static net mask to 255.255.0.0
Web access URL:
http://192.168.1.105/netmask=255.255.0.0
Socket command text:
netmask=255.255.0.0;

4.5 Relay outputs control

Eight basic different control modes are introduced into this Ethernet relay module to make more applications easier to work with. From the most basic simple contact switch operation to cycled operation with customized timing, you may use different commands to make your work easier.

In the following contents, assuming current IP Address is 192.168.1.105. If you need to switch different channels please replace "k0x" to the value you need. For example, if you want control ch2, you may replace "k01" with "k02".

Normal ON/OFF/TOGGLE

Normal on/off/toggle operation changes the relay output status immediately after receiving commands. No timing features included.

Switches

To **switch off** ch1 output:

Web access URL:

http://192.168.1.105/k01=0

Socket command text:

k01=0;
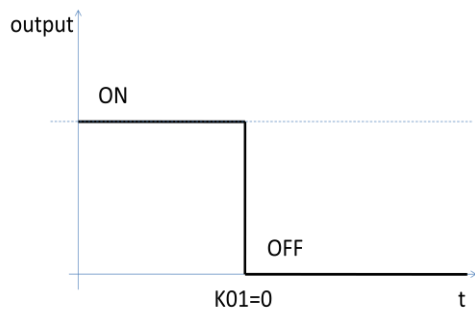
To **switch on** ch1 output:

Web access URL:

http://192.168.1.105/k01=1

Socket command text:

k01=1;
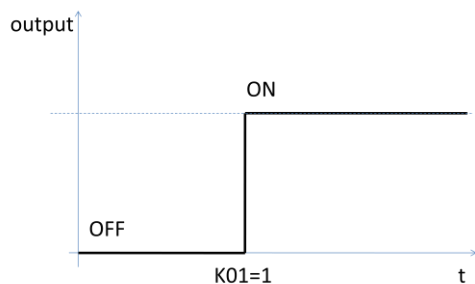
To **toggle** (opposite to previous status) ch1 output:

Web access URL:

http://192.168.1.105/k01=2

Socket command text:

k01=2;
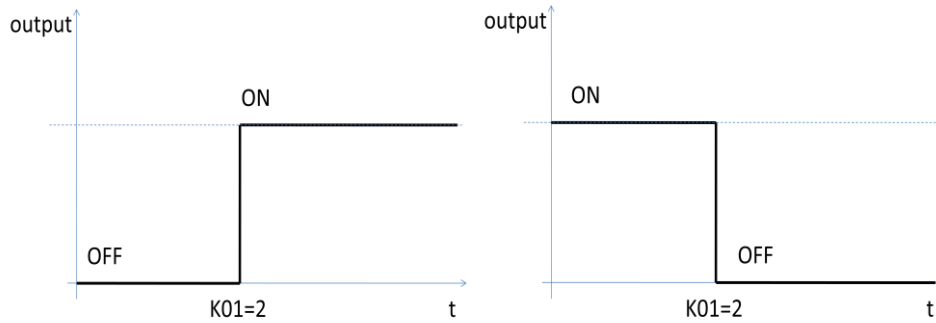
Timing Feature
NONE

Pulse ON/OFF/TOGGLE
Pulse on/off/toggle operation changes the relay output status immediately after receiving commands, and wait for a predefined time period, then automatically switches to opposite status.

Switches
To **pulse off** ch1 output, you can input by require web access:
Web access URL:
http://192.168.1.105/k01=3
Socket command text:
k01=3;
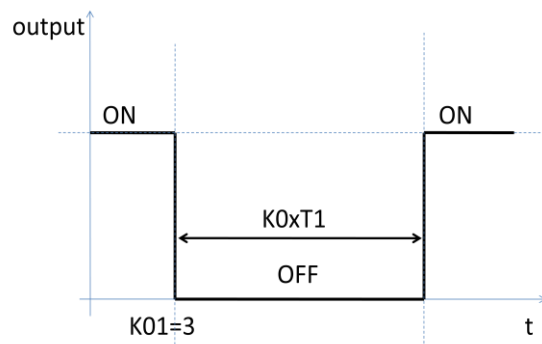
To **pulse on** ch1 output, you can input by require web access:
Web access URL:
http://192.168.1.105/k01=4
Socket command text:
k01=4;
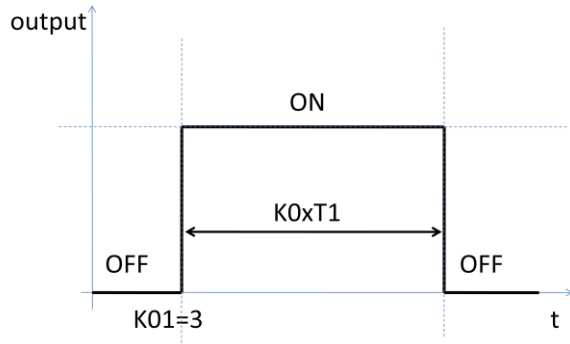
To **pulse toggle** (opposite to previous status) ch1 output:

Web access URL:

http://192.168.1.105/k01=5

Socket command text:

k01=5;
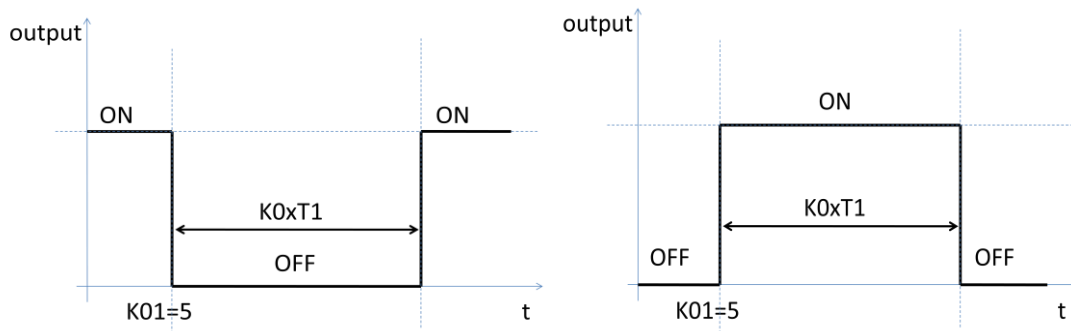
Timing Features

To set up customized timer for relay pulse outputs, timer T1 is used and need to be set. Each relay channel has an independent timer K0xT1, time period supports from 1ms to 4294967295 second. K0xT1 is needed to be set for time value, and K0xU1 is need to be set for timer value unit. Default value for K0xT1 is 1000, and default unit for K0xU1 is ms.

To set timer T1 value to 5000:

Web access URL:

http://192.168.1.105/setpara[65]=5000

Socket command text:

setpara[65]=5000;

To set timer T1 value unit to ms:

Web access URL:

http://192.168.1.105/ setpara[29]=0

Socket command text:

setpara[29]=0;

To set timer T1 value unit to second:

Web access URL:

http://192.168.1.105/ setpara[29]=1

Socket command text:
setpara[29]=1;

Cycle Switch Mode

Cycle switch mode changes the relay output status automatically on and off in customized time period. After receiving cycle commands, relay output will always cycle until you give it a new command.

Switches

To **pulse off** ch1 output, you can input by require web access:
Web access URL:
http://192.168.1.105/k01=6
Socket command text:
k01=6;
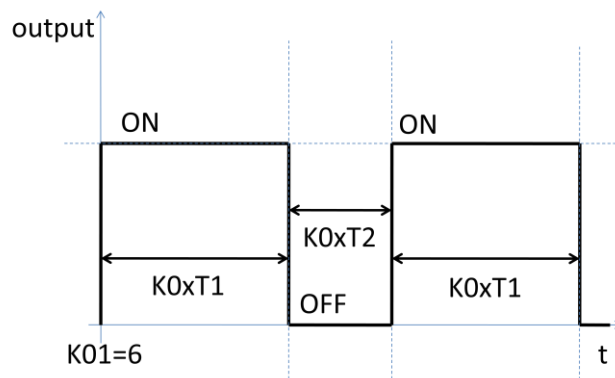
Timing Features

To set up customized timer for relay cycle outputs, timer T1 and T2 are used and need to be set. Each relay channel has two independent timers K0xT1 and K0xT2, time period supports from 1ms to 4294967295 second. K0xT1/K0xT2 is need to be set for time value, and K0xU1/K0xU2 is need to be set for timer value unit. Default value for K0xT1/K0xT2 is 1000, and default unit for K0xU1/K0xU2 is ms.

To set timer T1 value to 5000:
Web access URL:
http://192.168.1.105/ setpara[65]=5000
Socket command text:
setpara[65]=5000;

To set timer T1 value unit to ms:
Web access URL:
http://192.168.1.105/ setpara[29]=0
Socket command text:
setpara[29]=0;

To set timer T1 value unit to second:

Web access URL:

http://192.168.1.105/ setpara[29]=1

Socket command text:

setpara[29]=1;

To set timer T2 value to 5000:

Web access URL:

http://192.168.1.105/ setpara[66]=5000

Socket command text:

setpara[66]=5000;

To set timer T2 value unit to ms:

Web access URL:

http://192.168.1.105/ setpara[30]=0

Socket command text:

setpara[30]=0;

To set timer T2 value unit to second:

Web access URL:

http://192.168.1.105/ setpara[30]=1

Socket command text:

setpara[30]=1;

Read Switch Mode

Read current relay output status for feedback control. Module will return the current status in web content or socket text, depending on how do you send the command.

To read relay ch1 current status:

Web access URL:

http://192.168.1.105/k01=7

Socket command text:

k01=7;

4.6 Password protection

Password protection function is used for protecting the device from un-authorized access. Once enabled, user can only send effective command when they're able to provide correct 6-bit length access password.

In the following contents, assuming current IP Address is 192.168.1.105. And device password is "123456", which is also the default password.

Enable/Disable Password Protection

To Enable password protection:

Web access URL:

http://192.168.1.105/pwenable=1

Socket command text:

pwenable =1;

To Disable password protection, you need also firstly input correct password:

Web access URL:

http://192.168.1.105/ pw=123456&pwenable=0

Socket command text:

pw=123456&pwenable=0;

Change Password

To change password to "abcdef", you need also firstly input previous correct password:

Web access URL:

http://192.168.1.105/ pw=123456&newpw=abcdef

Socket command text:

pw=123456&newpw=abcdef;

4.7 Http port setting

In default conditions, HTTP port is always 80 if you enter directly in web browser a URL without any additional parameters. But in some applications different port number is needed for port forwarding or any other reasons. For example, you can force your web browser to access http content at port 8080, to do so you need to enter http://url:8080.

This module is able to customize http access port to realize such functions. In the following contents, assuming current IP Address is 192.168.1.105.

Change Http Port

To change http port to 8080:

Web access URL:

http://192.168.1.105/ webport=8080

Socket command text:

webport=8080;

4.8 Hardware reset button

Hardware reset button is used for situations when you want to reset the device to factory settings. For example, if you set incorrect IP Address and the device is no longer detectable in your network. Two different level of reset are provided in this module. Level-1 only reset parameters, i.e. network settings, time settings and so on, while Level-2 will reset on-chip app, i.e. for firmware updating/reload.
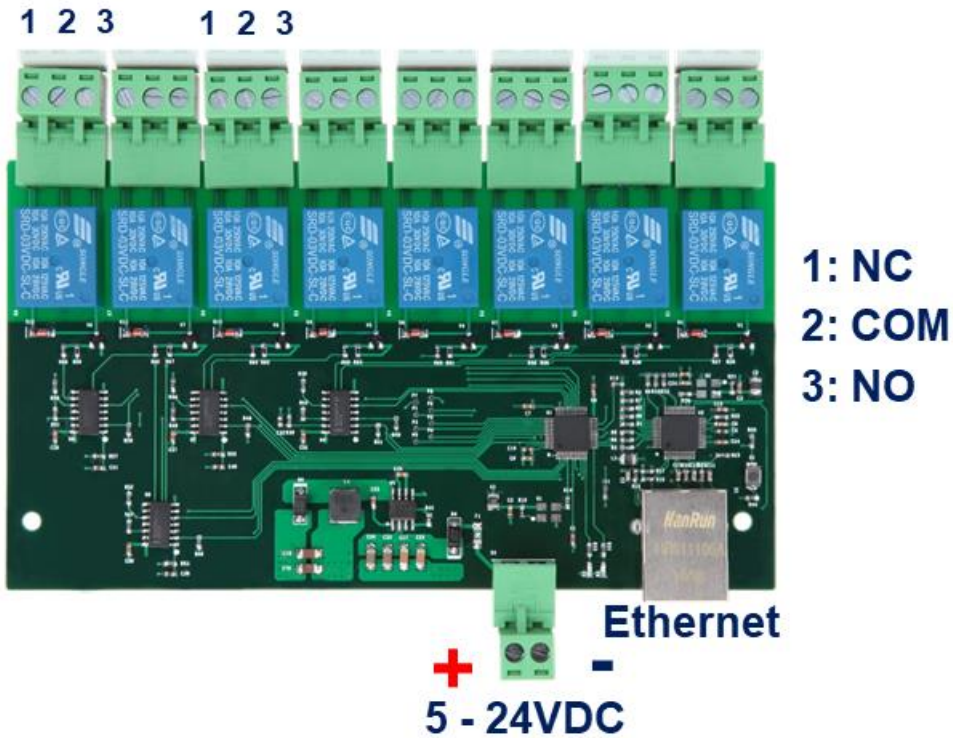
Hardware reset Level-1 (Parameter reset)

To reset parameters, press the hardware reset button in above pictures until green and red LEDs are both on, then release the button. Module will set all parameters to their default values.

Hardware reset Level-2 (Firmware update/reload)

To update firmware, press the hardware reset button in above pictures until green and red LEDs are both on, then continue to press the button for 10 seconds. Module will erase its firmware and try to download latest firmware from Internet. Please connect to internet when you do this operation.

4.9 Identification & customized information

When more than one modules are installed in the field, it is necessary to be able to read the identification information from module, for example serial number. Except for several pre-defined parameters in system, additionally a device name which can be set by user is supported.

Read serial number

You can read serial number by reading the sticker on the device, but you can also read device serial number by communication.

To read device serial number:

Web access URL:

http://192.168.1.105/ getpara[100]=1;

Socket command text:

getpara[100]=1;

Customized device name

In some applications, customer may want to set up their own name for better identification of the device. For this purpose, device name can be customized, with a maximum length of 15 letters.

To read device name:

Web access URL:

http://192.168.1.105/ getpara[97]=1;

Socket command text:

getpara[97]=1;

To change device name to "my_device":

Web access URL:

http://192.168.1.105/ setpara[97]=my_device

Socket command text:

setpara[97]=my_device;

Read device type

you can read device type by communication, for the purpose of better identification the device.

To read device type:

Web access URL:

http://192.168.1.105/ getpara[99]=1;

Socket command text:

getpara[99]=1;

Read device firmware version

you can read device firmware version by communication, for the purpose of better identification the device, or diagnosis.

To read device firmware version:

Web access URL:

http://192.168.1.105/ getpara[98]=1;

Socket command text:

getpara[98]=1;

4.10 *Easybus Server/Client Mode*

EasyBus supports both TCP Server and TCP Client mode, both mode has its application advantage. Additionally, one configurable communication watchdog can be setup to monitor the connection between Ethernet relay module and its server/client.

EasyBus Server Mode

By default, relay modules are setup in **EasyBus Server Mode**. Which means relay module listens to its port 5000(by default) and by actively connecting to module ip / port number you can create a TCP connection between your software and relay module. Unlike http interface, each module supports only one TCP channel at the same time. If

you want to connect to the module by another software, the previous TCP connection has to be disconnected at first. If you wish to connect multiple software to relay module at the same time, please reference to HTTP access mode, which allows multiple software connection at the same time.

To read relay module EasyBus mode:
Web access URL:
http://192.168.1.105/ getpara[132]=1;
Socket command text:
getpara[132]=1;
Tips:
Response 0 means: TCP Server Mode
Response 1 means: TCP Client Mode
Response 2 means: UDP mode

To set relay module to TCP Server Mode:
Web access URL:
http://192.168.1.105/ setpara[132]=0;
Socket command text:
setpara[132]=0;

EasyBus Server Local Port Number

This parameters setup the local listening port number at relay module. To read relay module EasyBus Server Local Port Number:
Web access URL:
http://192.168.1.105/ getpara[131]=1;
Socket command text:
getpara[131]=1;

To set relay module EasyBus Server Local Port Number, for example to 5000:
Web access URL:
http://192.168.1.105/ setpara[131]=5000;
Socket command text:
setpara[131]=5000;

EasyBus Client Mode

For applications, it is better to listen at the server and let the relay module be the TCP client and actively connecting to one server (for example, if DHCP mode is activated). Each relay module supports only one TCP connection to server, that means only one server can be connected in the same time.

To set relay module to TCP Client Mode:
Web access URL:
http://192.168.1.105/ setpara[132]=1;
Socket command text:

setpara[132]=1;

EasyBus Client Remote IP address

This parameter setup the remote server IP address for relay module to connect. To read relay module EasyBus Client Remote IP address:
Web access URL:

http://192.168.1.105/ getpara[117]=1& getpara[118]=1& getpara[119]=1& getpara[120]=1;
Socket command text:

getpara[117]=1; getpara[118]=1; getpara[119]=1; getpara[120]=1;

To set relay module EasyBus Client Remote IP address, for example to 192.168.1.100:
Web access URL:

http://192.168.1.105/
setpara[117]=192&setpara[118]=168&setpara[119]=1&setpara[120]=100;
Socket command text:

setpara[117]=192; setpara[118]=168; setpara[119]=1; setpara[120]=100;

EasyBus Client Remote Port Number

This parameter setup the remote server port number for relay module to connect. To read relay module EasyBus Client Remote Port Number:
Web access URL:
http://192.168.1.105/ getpara[130]=1;
Socket command text:
getpara[130]=1;

To set relay module EasyBus Client Remote Port Number, for example to 5000:
Web access URL:
http://192.168.1.105/ setpara[130]=5000;
Socket command text:
setpara[130]=5000;

EasyBus Client DNS Enable

For some applications, the remote server IP address is assigned by DHCP, so to get the actual address of server, DNS host name is used and in this case a properly setup DNS service must be provided to locate at the server. An enable bit is necessary to enable this DNS function, by default this function is disabled. To read relay module EasyBus Client DNS Enable:
Web access URL:
http://192.168.1.105/ getpara[129]=1;
Socket command text:
getpara[129]=1;

To set relay module EasyBus Client DNS Enable to be enabled:
Web access URL:

http://192.168.1.105/ setpara[129]=1;
Socket command text:
setpara[129]=1;

EasyBus Client Remote Host Name

For some applications, the remote server IP address is assigned by DHCP, so to get the actual address of server, DNS host name is used and in this case a properly setup DNS service must be provided to locate at the server. To read relay module EasyBus Client Remote Host Name:
Web access URL:
http://192.168.1.105/ getpara[128]=1;
Socket command text:
getpara[128]=1;

To set relay module EasyBus Client Remote Host Name, for example to BrickElectric.com:
Web access URL:
http://192.168.1.105/ setpara[128]=BrickElectric.com;
Socket command text:
setpara[128]=BrickElectric.com;

EasyBus Client Watchdog

In most of networks, router will kill a TCP connection if it is unused for some time period, an practical time will be 120 seconds. This behavior saves resource for the entire network but if you really want to keep a long connection between relay module and server, this behavior will create troubles. Another problem is when the connection is accidently broken, or the server is unreachable or rebooted at certain moment, the TCP connection will be lost. You can actively access http interface to reboot the relay module, so it will try to connect to server again, but you can also use the additional watchdog provided by relay module, so it will automatically reconnect to the server when no response is received after some time. The length of this waiting time is also configurable.

If this watchdog is enabled, it is important that your server continuously send message to the module, otherwise it will automatically disconnect and reconnect again.

To read relay module EasyBus Client Watchdog:
Web access URL:
http://192.168.1.105/ getpara[127]=1;
Socket command text:
getpara[127]=1;

To set relay module EasyBus Client Watchdog to enable:
Web access URL:
http://192.168.1.105/ setpara[127]=1;
Socket command text:
setpara[127]=1;

Tips:

The higher the value of this parameters, the longer the server un-response time will be allowed. In good network environment this is recommended so it will save the traffic in total. For example, setpara[127] = 2, or setpara[127] = 3, 4 … 9999.

5. Auto ping and reboot mode

Auto ping is an automatic system for rebooting IP equipment without human intervention. Auto ping works by running a pre-set commands sequence when a device becomes unresponsive to IP pings. You can input customized pre-set commands sequence to realize flexible action according to your requirement, like power cycling or specific timing functions.

BEM105 has a **2 independent auto ping channels watchdog** which can monitor 2 external servers/controllers on network at the same time. Auto ping monitor channels are completely independent from relay channels, you can map either one or both relay channel to each auto ping channel freely.

To use auto ping function, you need to follow these steps:
(1). Assign auto ping mode select, default is fixed IP mode.
(2). Configure Fixed IP or Domain Name, default is your gateway IP.
(3). Configure programmable reboot sequence, default is no action.
(4). Set time between pings, default is 5 seconds.
(5). Set max ping failures before reboot, default is 3 failures.
(6). Set delay time after reboot actions, default is 20 seconds.
(7). Start auto ping function, default is not start.

(1). Auto ping mode select
Two modes are available for auto ping function:
    1.Fixed IP Mode (mode 0).
    In Fixed IP Mode, you can set fixed IP address for auto ping.

    2.Name Server Mode (mode 1).
    In Name Server Mode, you can set a domain name for auto ping, and auto ping function will get actual IP address from your DNS server.

Change mode to Fixed IP Mode (mode 0) for auto ping:
Auto Ping Channel 1:
Web access URL:
http://192.168.1.105/setpara[149]=0
Socket command text:
setpara[149]=0;
Auto Ping Channel 2:
Web access URL:
http://192.168.1.105/setpara[150]=0
Socket command text:
setpara[150]=0;

Change mode to Name Server Mode (mode 1) for auto ping:
Auto Ping Channel 1:
Web access URL:
http://192.168.1.105/setpara[149]=1
Socket command text:
setpara[149]=1;
Auto Ping Channel 2:
Web access URL:
http://192.168.1.105/setpara[150]=1
Socket command text:
setpara[150]=1;

(2.a) Configure auto ping monitor target IP

If Fixed IP Mode is selected, auto ping target IP (external device's IP) address should be assigned manually before start auto ping.

Change monitor target IP address to 192.168.1.100.
Auto Ping Channel 1:
Web access URL:
Write:
http://192.168.1.105/setpara[101]=192&setpara[102]=168&setpara[103]=1&setpara[104]=100
Read:
http://192.168.1.105/getpara[101]=192&getpara[102]=168&getpara[103]=1&getpara[104]=100
Socket command text:
Write: setpara[101]=192;setpara[102]=168;setpara[103]=1;setpara[104]=100;
Read: getpara[101]=192;getpara[102]=168;getpara[103]=1;getpara[104]=100;
Auto Ping Channel 2:
Web access URL:
Write:
http://192.168.1.105/setpara[105]=192&setpara[106]=168&setpara[107]=1&setpara[108]=100
Read:
http://192.168.1.105/getpara[105]=192&getpara[106]=168&getpara[107]=1&getpara[108]=100
Socket command text:
Write: setpara[105]=192;setpara[106]=168;setpara[107]=1;setpara[108]=100;
Read: getpara[105]=192;getpara[106]=168;getpara[107]=1;getpara[108]=100;

(2.b) Configure auto ping monitor target domain name

If Name Server Mode is selected, auto ping monitor target IP will be assigned by your DNS server. The target domain name should be set manually before start auto ping.

Change domain name to "www.example.com"

Auto Ping Channel 1:

Web access URL:

Write: http://192.168.1.105/setpara[133]=www.example.com

Read: http://192.168.1.105/getpara[133]=any.input.here

Socket command text:

Write: setpara[133]= www.example.com;

Read: getpara[133]= any.input.here;

Auto Ping Channel 2:

Web access URL:

Write: http://192.168.1.105/setpara[134]=www.example.com

Read: http://192.168.1.105/getpara[134]=any.input.here

Socket command text:

Write: setpara[134]= www.example.com;

Read: getpara[134]= any.input.here;

(3) Configure auto ping programmable reboot sequence

In case of remote IP device becomes unresponsive, auto ping function will run a pre-set reboot sequence to make a customized reboot action according to your application.

For this function, the following commands are supported to generate a reboot sequence:

1. Programmable mark, for example:

  Start program input: program = 1;

  Stop program input: program = 0;

2. All switch relay output commands, for example:

  Switch on relay channel 1: k01 = 1;

  Switch off relay channel 1: k01 = 0;

  Toggle relay channel 2: k02 = 2;

  And so on...

3. Timing commands, waitms and wait, for example

  Wait 10 seconds: wait = 10;

  Wait 500 milliseconds: waitms = 500;

For example, in my application I need auto ping to power off the device, and then wait for 5 seconds, and then power it on again. I'm using k01 to supply power to my device, so my reboot sequence is: k01=0;wait=5;k01=1; and plus the programmable mark(if you don't insert programmable mark, your sequence will be running immediately rather than saving into preset program and wait to be triggered)

Auto Ping Channel 1:

Web access URL:

Write: http://192.168.1.105/program=1&k01=1&wait=5&k01=0&program=0

Read: http://192.168.1.105/getpara[141]=1

Socket command text:

Write: program=1;k01=1;wait=5;k01=0;program=0;

Read: getpara[141]=1;

Auto Ping Channel 2:

Web access URL:

Write: http://192.168.1.105/program=2&k01=1&wait=5&k01=0&program=0

Read: http://192.168.1.105/getpara[142]=1

Socket command text:

Write: program=2;k01=1;wait=5;k01=0;program=0;

Read: getpara[142]=1;

(4) Set time between pings

This is the time between each "ping" check of the IP address. Auto ping function waits this amount of time for a valid ICMP response and then send next ICMP message. Available options are from 1 millisecond to 65535 seconds. Normally 60 seconds should be useful for most applications.

To setup time you need to set 2 parameters, time unit and time.

Auto Ping Channel 1:

1. To set time unit to millisecond: setpara[45]=0;

2. To set time unit to second: setpara[45]=1;

3. To set time value to 60: setpara[81]=60;

I want to setup time between pings to 60 seconds, for example:

Web access URL:

Write: http://192.168.1.105/setpara[45]=1&setpara[81]=60

Read: http://192.168.1.105/getpara[45]=1&getpara[81]=1

Socket command text:

Write: setpara[45]=1;setpara[81]=60;

Read: getpara[45]=1;getpara[81]=1;

Auto Ping Channel 2:

1. To set time unit to millisecond: setpara[46]=0;

2. To set time unit to second: setpara[46]=1;

3. To set time value to 60: setpara[82]=60;

I want to setup time between pings to 60 seconds, for example:

Web access URL:

Write: http://192.168.1.105/setpara[46]=1&setpara[82]=60

Read: http://192.168.1.105/getpara[46]=1&getpara[82]=1

Socket command text:

Write: setpara[46]=1;setpara[82]=60;

Read: getpara[46]=1;getpara[82]=1;

(5) Ping failures before reboot

This function sets the number of failed communications attempts that must be sequentially detected before a system is rebooted. For example, when set to 5, the target system must fail to respond 5 times in a row before it is rebooted. Since occasional network overloads and missed packets can occur during normal network operation, a number between 5 and 10 pings is recommended.

To change to ping failures to 5, for example:

Auto Ping Channel 1:

Web access URL:

Write: http://192.168.1.105/setpara[157]=5

Read: http://192.168.1.105/getpara[157]=1

Socket command text:

Write: setpara[157]= 5;

Read: getpara[157]=1;

Auto Ping Channel 2:

Web access URL:

Write: http://192.168.1.105/setpara[158]=5

Read: http://192.168.1.105/getpara[158]=1

Socket command text:

Write: setpara[158]= 5;

Read: getpara[158]=1;

(6) Delay time after reboot

After auto ping detected an external controller unresponsive failure and running a reboot sequence, it is naturally necessary that the external controller need some time for reboot itself and finish some I/O commands. This time is decided by external controllers and could be longer than some minutes (for example if you have an server with operating system). To preventing auto ping reboot the controller again during this time, after reboot delay time can be set to wait for external controlling finish its start.

To setup time you need to set 2 parameters, time unit and time.

Auto Ping Channel 1:

1. To set time unit to millisecond: setpara[173]=0;

2. To set time unit to second: setpara[173]=1;

3. To set time value to 60: setpara[165]=60;

I want to setup after reboot delay time to 300 seconds, for example:

Web access URL:

Write: http://192.168.1.105/setpara[173]=1&setpara[165]=300

Read: http://192.168.1.105/getpara[173]=1&getpara[165]=1

Socket command text:

Write: setpara[173]=1;setpara[165]=60;

www.BrickElectric.com

Read: getpara[173]=1;getpara[165]=1;

Auto Ping Channel 2:

1. To set time unit to millisecond: setpara[174]=0;

2. To set time unit to second: setpara[174]=1;

3. To set time value to 60: setpara[166]=60;

I want to setup after reboot delay time to 300 seconds, for example:

Web access URL:

Write: http://192.168.1.105/setpara[174]=1&setpara[166]=300

Read: http://192.168.1.105/getpara[174]=1&getpara[166]=1

Socket command text:

Write: setpara[174]=1;setpara[166]=300;

Read: getpara[174]=1;getpara[166]=1;

(7) Start auto ping function

To start auto ping function, please make sure your every other setting is finished so it can work correctly. If you save settings after auto ping start, when power on the device, auto ping will automatically start again with the parameters of last time.

Auto Ping Channel 1:

To start auto ping:

Web access URL:

Write: http://192.168.1.105/setpara[181]=1

Socket command text:

Write: setpara[181]=1;

To stop auto ping:

Web access URL:

Write: http://192.168.1.105/setpara[181]=0

Socket command text:

Write: setpara[181]=0;

Auto Ping Channel 2:

To start auto ping:

Web access URL:

Write: http://192.168.1.105/setpara[182]=1

Socket command text:

Write: setpara[182]=1;

To stop auto ping:

Web access URL:

Write: http://192.168.1.105/setpara[182]=0

Socket command text:

Write: setpara[182]=0;

6. X-Connect

With X-Connect functionality, multiple BEM Series modules can be logically connected to each other without using a central controller (for example, a PC or a server). You can directly map any input channel of BEM Series I/O module to another output channel BEM Series I/O module.

For example, if you have one BEM108 which have 8 inputs and four BEM104 which each have 2 outputs and in total 8 outputs. In such a case you can map each input of BEM108 to the eight outputs of 4 BEM104 without central controller. Also, if you have 8 BEM107 which each have one input and in total 8 inputs, you can also map each of the input bit to one or more output modules. This mapping is totally free, you can map the same one input channel to 1 ~ 10 output channels at one output module or multiple output module.

When one input is mapped to one or more outputs, then if this input is triggered, all the outputs that it mapped will also be triggered immediately.

6.1 X-Connect Map Setting

Each BEM Series module can support at max 10 I/O mapping. Each I/O mapping is independent with each other. Each I/O mapping channel need to setup:
(1) Which input channel you want to map;
(2) Which module you want to map, that means IP address of the target module;
(3) Which output channel of target module you want to map;

For example, to setup BEM108 (IP: 192.168.1.105) input channel 1 to BEM104(IP: 192.168.1.106) output channel 1, all setting needed to be done at BEM108:
(1) Select input channel one in BEM108 by:
    Web access URL:
    http://192.168.1.105/ setpara[102]=1;
    Or Socket command text:
    setpara[102]=1;

(2) Select the module you want to map at 192.168.1.106 by:
    Web access URL:
    http://192.168.1.105/ setpara[133]=192;
    Or Socket command text:
    setpara[133]=192;

    Web access URL:
    http://192.168.1.105/ setpara[134]=168;
    Or Socket command text:
    setpara[134]=168;

Web access URL:

http://192.168.1.105/ setpara[135]=1;

Or Socket command text:

setpara[135]=1;

Web access URL:

http://192.168.1.105/ setpara[136]=106;

Or Socket command text:

setpara[136]=106;

(3) Select output channel one of target BEM104 by:

Web access URL:

http://192.168.1.105/ setpara[173]=1;

Or Socket command text:

setpara[173]=1;

6.2 X-Connect Map Parameter List

All eight X-Connect channels can be setup by the following parameter list:

Parameter Nr.	X-Connect Channel	Para Name	Description	Range
102	1	VWSL1	X-Connect CH1 input select	1 ~ 8
103	2	VWSL2	X-Connect CH2 input select	1 ~ 8
104	3	VWSL3	X-Connect CH3 input select	1 ~ 8
105	4	VWSL4	X-Connect CH4 input select	1 ~ 8
106	5	VWSL5	X-Connect CH5 input select	1 ~ 8
107	6	VWSL6	X-Connect CH6 input select	1 ~ 8
108	7	VWSL7	X-Connect CH7 input select	1 ~ 8
109	8	VWSL8	X-Connect CH8 input select	1 ~ 8
110	9	VWSL9	X-Connect CH9 input select	1 ~ 8
111	10	VWSL10	X-Connect CH10 input select	1 ~ 8
133	1	VWSIP11	X-Connect CH1 target IP 1	0 ~ 255
134	1	VWSIP12	X-Connect CH1 target IP 2	0 ~ 255
135	1	VWSIP13	X-Connect CH1 target IP 3	0 ~ 255
136	1	VWSIP14	X-Connect CH1 target IP 4	0 ~ 255
137	2	VWSIP21	X-Connect CH2 target IP 1	0 ~ 255
138	2	VWSIP22	X-Connect CH2 target IP 2	0 ~ 255
139	2	VWSIP23	X-Connect CH2 target IP 3	0 ~ 255
140	2	VWSIP24	X-Connect CH2 target IP 4	0 ~ 255
141	3	VWSIP31	X-Connect CH3 target IP 1	0 ~ 255
142	3	VWSIP32	X-Connect CH3 target IP 2	0 ~ 255
143	3	VWSIP33	X-Connect CH3 target IP 3	0 ~ 255

144	3	VWSIP34	X-Connect CH3 target IP 4	0 ~ 255
145	4	VWSIP41	X-Connect CH4 target IP 1	0 ~ 255
146	4	VWSIP42	X-Connect CH4 target IP 2	0 ~ 255
147	4	VWSIP43	X-Connect CH4 target IP 3	0 ~ 255
148	4	VWSIP44	X-Connect CH4 target IP 4	0 ~ 255
149	5	VWSIP51	X-Connect CH5 target IP 1	0 ~ 255
150	5	VWSIP52	X-Connect CH5 target IP 2	0 ~ 255
151	5	VWSIP53	X-Connect CH5 target IP 3	0 ~ 255
152	5	VWSIP54	X-Connect CH5 target IP 4	0 ~ 255
153	6	VWSIP61	X-Connect CH6 target IP 1	0 ~ 255
154	6	VWSIP62	X-Connect CH6 target IP 2	0 ~ 255
155	6	VWSIP63	X-Connect CH6 target IP 3	0 ~ 255
156	6	VWSIP64	X-Connect CH6 target IP 4	0 ~ 255
157	7	VWSIP71	X-Connect CH7 target IP 1	0 ~ 255
158	7	VWSIP72	X-Connect CH7 target IP 2	0 ~ 255
159	7	VWSIP73	X-Connect CH7 target IP 3	0 ~ 255
160	7	VWSIP74	X-Connect CH7 target IP 4	0 ~ 255
161	8	VWSIP81	X-Connect CH8 target IP 1	0 ~ 255
162	8	VWSIP82	X-Connect CH8 target IP 2	0 ~ 255
163	8	VWSIP83	X-Connect CH8 target IP 3	0 ~ 255
164	8	VWSIP84	X-Connect CH8 target IP 4	0 ~ 255
165	9	VWSIP91	X-Connect CH9 target IP 1	0 ~ 255
166	9	VWSIP92	X-Connect CH9 target IP 2	0 ~ 255
167	9	VWSIP93	X-Connect CH9 target IP 3	0 ~ 255
168	9	VWSIP94	X-Connect CH9 target IP 4	0 ~ 255
169	10	VWSIP101	X-Connect CH10 target IP 1	0 ~ 255
170	10	VWSIP102	X-Connect CH10 target IP 2	0 ~ 255
171	10	VWSIP103	X-Connect CH10 target IP 3	0 ~ 255
172	10	VWSIP104	X-Connect CH10 target IP 4	0 ~ 255
173	1	VWSR1	X-Connect CH1 output select	1 ~ 8
174	2	VWSR2	X-Connect CH2 output select	1 ~ 8
175	3	VWSR3	X-Connect CH3 output select	1 ~ 8
176	4	VWSR4	X-Connect CH4 output select	1 ~ 8
177	5	VWSR5	X-Connect CH5 output select	1 ~ 8
178	6	VWSR6	X-Connect CH6 output select	1 ~ 8
179	7	VWSR7	X-Connect CH7 output select	1 ~ 8
180	8	VWSR8	X-Connect CH8 output select	1 ~ 8
181	9	VWSR9	X-Connect CH9 output select	1 ~ 8
182	10	VWSR10	X-Connect CH10 output select	1 ~ 8

7. Modbus-TCP

Modbus-TCP is supported by relay module. Standard Modbus-TCP is implemented at port number 502. The Modbus-TCP address table is as following:

Address	Ch	Function Code	Description	Access
00000	1	05	Relay 1 output control	Write/Read
00001	2	05	Relay 2 output control	Write/Read
00002	3	05	Relay 3 output control	Write/Read
00003	4	05	Relay 4 output control	Write/Read
00004	5	05	Relay 5 output control	Write/Read
00005	6	05	Relay 6 output control	Write/Read
00006	7	05	Relay 7 output control	Write/Read
00007	8	05	Relay 8 output control	Write/Read

To look into Modbus-TCP frame structure or create your own Modbus-TCP program, here are the detailed message frame for each command:

To switch on relay channel 1 output
Ethernet frame: 0x05 0x00 0x00 0xFF 0x00

To switch off relay channel 1 output
Ethernet frame: 0x05 0x00 0x00 0x00 0x00

To switch on relay channel 2 output
Ethernet frame: 0x05 0x00 0x01 0xFF 0x00

To switch off relay channel 2 output
Ethernet frame: 0x05 0x00 0x01 0x00 0x00

To switch on relay channel 3 output
Ethernet frame: 0x05 0x00 0x02 0xFF 0x00

To switch off relay channel 3 output
Ethernet frame: 0x05 0x00 0x02 0x00 0x00

To switch on relay channel 4 output
Ethernet frame: 0x05 0x00 0x03 0xFF 0x00

To switch off relay channel 4 output
Ethernet frame: 0x05 0x00 0x03 0x00 0x00

To switch on relay channel 5 output
Ethernet frame: 0x05 0x00 0x04 0xFF 0x00

To switch off relay channel 5 output

Ethernet frame: 0x05 0x00 0x04 0x00 0x00

To switch on relay channel 6 output

Ethernet frame: 0x05 0x00 0x05 0xFF 0x00

To switch off relay channel 6 output

Ethernet frame: 0x05 0x00 0x05 0x00 0x00

To switch on relay channel 7 output

Ethernet frame: 0x05 0x00 0x06 0xFF 0x00

To switch off relay channel 7 output

Ethernet frame: 0x05 0x00 0x06 0x00 0x00

To switch on relay channel 8 output

Ethernet frame: 0x05 0x00 0x07 0xFF 0x00

To switch off relay channel 8 output

Ethernet frame: 0x05 0x00 0x07 0x00 0x00

8. Fast Program Reference

8.1 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 detail 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 BEM106 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;
Example – set parameter 65, to value 1000:
setpara[65] = 1000;
Example – read parameter 65 (value will be returned in module reply):
getpara[65] = 1;

Parameter list

In BEM105, there are many parameters for controlling the behavior of module. The following table is the general description of all parameters available and their functionality:

No.	Name	Functionality
000	-	Reserved parameter default value: - range: -
001	-	Reserved parameter default value: - range: -
002	GW1	module gate way address 1 default value: 192 range: 0 – 255
003	GW2	module gate way address 2 default value: 168 range: 0 – 255
004	GW3	module gate way address 3 default value: 1 range: 0 – 255

005	GW4	module gate way address 4
		default value: 1
		range: 0 – 255
006	SN1	module subnet mask 1
		default value: 255
		range: 0 – 255
007	SN2	module subnet mask 2
		default value: 255
		range: 0 – 255
008	SN3	module subnet mask 3
		default value: 255
		range: 0 – 255
009	SN4	module subnet mask 3
		default value: 0
		range: 0 – 255
010	SIP1	module IP address 1
		default value: 192
		range: 0 – 255
011	SIP2	module IP address 2
		default value: 168
		range: 0 – 255
012	SIP3	module IP address 3
		default value: 1
		range: 0 – 255
013	SIP4	module IP address 4
		default value: 105
		range: 0 – 255
014	-	Reserved parameter
		default value: -
		range: -
015	-	Reserved parameter
		default value: -
		range: -
016	-	Reserved parameter
		default value: -
		range: -
017	Reboot	reboot module, 0 = none reboot, 1 = reboot start
		default value: 0
		range: 0 – 1
018	DHCP	DHCP functionality, 0 = static IP mode, 1 = DHCP mode
		default value: 0
		range: 0 – 1
019	PWEN	Password enable, 0 = password disable, 1 = password disable
		default value: 0

		range: 0 – 1
020	WEBPORT	http port default value:80 range: 0 – 65535
021	-	Reserved parameter default value: - range: -
022	-	Reserved parameter default value: - range: -
023	-	Reserved parameter default value: - range: -
024	-	Reserved parameter default value: - range: -
025	-	Reserved parameter default value: - range: -
026	-	Reserved parameter default value: - range: -
027	-	Reserved parameter default value: - range: -
028	-	Reserved parameter default value: - range: -
029	K1U1	Relay K1 timer T1 unit selector, 0 = ms, 1 = second default value: 0 range: 0 – 1
030	K1U2	Relay K1 timer T2 unit selector, 0 = ms, 1 = second default value: 0 range: 0 – 1
031	K2U1	Relay K2 timer T1 unit selector, 0 = ms, 1 = second default value: 0 range: 0 – 1
032	K2U2	Relay K2 timer T2 unit selector, 0 = ms, 1 = second default value: 0 range: 0 – 1
033	K3U1	Relay K3 timer T1 unit selector, 0 = ms, 1 = second default value: 0 range: 0 – 1
034	K3U2	Relay K3 timer T2 unit selector, 0 = ms, 1 = second

		default value: 0
		range: 0 – 1
035	K4U2	Relay K4 timer T1 unit selector, 0 = ms, 1 = second
		default value: 0
		range: 0 – 1
036	K4U2	Relay K4 timer T2 unit selector, 0 = ms, 1 = second
		default value: 0
		range: 0 – 1
037	K5U1	Relay K5 timer T1 unit selector, 0 = ms, 1 = second
		default value: 0
		range: 0 – 1
038	K5U2	Relay K5 timer T2 unit selector, 0 = ms, 1 = second
		default value: 0
		range: 0 – 1
039	K6U1	Relay K6 timer T1 unit selector, 0 = ms, 1 = second
		default value: 0
		range: 0 – 1
040	K6U2	Relay K6 timer T2 unit selector, 0 = ms, 1 = second
		default value: 0
		range: 0 – 1
041	K7U1	Relay K7 timer T1 unit selector, 0 = ms, 1 = second
		default value: 0
		range: 0 – 1
042	K7U2	Relay K7 timer T2 unit selector, 0 = ms, 1 = second
		default value: 0
		range: 0 – 1
043	K8U1	Relay K8 timer T1 unit selector, 0 = ms, 1 = second
		default value: 0
		range: 0 – 1
044	K8U2	Relay K8 timer T2 unit selector, 0 = ms, 1 = second
		default value: 0
		range: 0 – 1
045	-	Reserved parameter
		default value: -
		range: -
046	-	Reserved parameter
		default value: -
		range: -
047	-	Reserved parameter
		default value: -
		range: -
048	-	Reserved parameter
		default value: -
		range: -

049	-	Reserved parameter
		default value: -
		range: -
050	-	Reserved parameter
		default value: -
		range: -
051	-	Reserved parameter
		default value: -
		range: -
052	-	Reserved parameter
		default value: -
		range: -
053	-	Reserved parameter
		default value: -
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054	-	Reserved parameter
		default value: -
		range: -
055	-	Reserved parameter
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056	-	Reserved parameter
		default value: -
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057	-	Reserved parameter
		default value: -
		range: -
058	-	Reserved parameter
		default value: -
		range: -
059	-	Reserved parameter
		default value: -
		range: -
060	-	Reserved parameter
		default value: -
		range: -
061	-	Reserved parameter
		default value: -
		range: -
062	-	Reserved parameter
		default value: -
		range: -
063	-	Reserved parameter
		default value: -

		range: -
064	-	Reserved parameter default value: - range: -
065	K1T1	Relay K1 timer T1 value default value: 1000 range: 0 - 65535
066	K1T2	Relay K1 timer T2 value default value: 1000 range: 0 - 65535
067	K2T1	Relay K2 timer T1 value default value: 1000 range: 0 - 65535
068	K2T2	Relay K2 timer T2 value default value: 1000 range: 0 - 65535
069	K3T1	Relay K3 timer T1 value default value: 1000 range: 0 - 65535
070	K3T2	Relay K3 timer T2 value default value: 1000 range: 0 - 65535
071	K4T1	Relay K4 timer T1 value default value: 1000 range: 0 - 65535
072	K4T2	Relay K4 timer T2 value default value: 1000 range: 0 - 65535
073	K5T1	Relay K5 timer T1 value default value: 1000 range: 0 - 65535
074	K5T2	Relay K5 timer T2 value default value: 1000 range: 0 - 65535
075	K6T1	Relay K6 timer T1 value default value: 1000 range: 0 - 65535
076	K6T2	Relay K6 timer T2 value default value: 1000 range: 0 - 65535
077	K7T1	Relay K7 timer T1 value default value: 1000 range: 0 - 65535
078	K7T2	Relay K7 timer T2 value

		default value: 1000
		range: 0 - 65535
079	K8T1	Relay K8 timer T1 value
		default value: 1000
		range: 0 - 65535
080	K8T2	Relay K8 timer T2 value
		default value: 1000
		range: 0 - 65535
081	-	Reserved parameter
		default value: -
		range: -
082	-	Reserved parameter
		default value: -
		range: -
083	-	Reserved parameter
		default value: -
		range: -
084	-	Reserved parameter
		default value: -
		range: -
085	-	Reserved parameter
		default value: -
		range: -
086	-	Reserved parameter
		default value: -
		range: -
087	-	Reserved parameter
		default value: -
		range: -
088	-	Reserved parameter
		default value: -
		range: -
089	-	Reserved parameter
		default value: -
		range: -
090	-	Reserved parameter
		default value: -
		range: -
091	-	Reserved parameter
		default value: -
		range: -
092	-	Reserved parameter
		default value: -
		range: -

093	-	Reserved parameter default value: - range: -
094	-	Reserved parameter default value: - range: -
095	WANEN	Internet function enable, 0 = disable, 1 = enable default value: 1 range:0 – 1
096	-	Reserved parameter default value: - range: -
097	NAME	Device name, max 18 characters default value: BEM105 range: -
098	FMVER	Device firmware version default value: - range: -
099	DEVTYP	Device model type default value: 105 range: -
100	DEVSN	Device serial number default value: - range: -
101	PIP1-1	Ping monitor 1 IP address 1 default value: 192 range: 0 – 255
102	PIP1-2	Ping monitor 1 IP address 2 default value: 168 range: 0 – 255
103	PIP1-3	Ping monitor 1 IP address 3 default value: 1 range: 0 – 255
104	PIP1-4	Ping monitor 1 IP address 4 default value: 1 range: 0 – 255
105	PIP2-1	Ping monitor 2 IP address 1 default value: 192 range: 0 – 255
106	PIP2-2	Ping monitor 2 IP address 2 default value: 168 range: 0 – 255
107	PIP2-3	Ping monitor 2 IP address 3 default value: 1

		range: 0 – 255
108	PIP2-4	Ping monitor 2 IP address 4 default value: 1 range: 0 – 255
109	-	Reserved parameter default value: - range: -
110	-	Reserved parameter default value: - range: -
111	-	Reserved parameter default value: - range: -
112	-	Reserved parameter default value: - range: -
113	-	Reserved parameter default value: - range: -
114	-	Reserved parameter default value: - range: -
116	-	Reserved parameter default value: - range: -
117	-	Reserved parameter default value: - range: -
118	-	Reserved parameter default value: - range: -
119	-	Reserved parameter default value: - range: -
120	-	Reserved parameter default value: - range: -
121	-	Reserved parameter default value: - range: -
122	-	Reserved parameter default value: - range: -
123	-	Reserved parameter

		default value: -
		range: -
124	-	Reserved parameter
		default value: -
		range: -
125	-	Reserved parameter
		default value: -
		range: -
126	-	Reserved parameter
		default value: -
		range: -
127	-	Reserved parameter
		default value: -
		range: -
128	-	Reserved parameter
		default value: -
		range: -
129	-	Reserved parameter
		default value: -
		range: -
130	-	Reserved parameter
		default value: -
		range: -
131	-	Reserved parameter
		default value: -
		range: -
132	-	Reserved parameter
		default value: -
		range: -
133	PNAME1	Ping monitor 1 domain name, max 55 characters
		default value: www.example1.com
		range: -
134	PNAME2	Ping monitor 2 domain name, max 55 characters
		default value: www.example2.com
		range: -
135	-	Reserved parameter
		default value: -
		range: -
136	-	Reserved parameter
		default value: -
		range: -
137	-	Reserved parameter
		default value: -
		range: -

138	-	Reserved parameter
		default value: -
		range: -
139	-	Reserved parameter
		default value: -
		range: -
140	-	Reserved parameter
		default value: -
		range: -
141	PCODE1	Ping monitor 1 reboot program code, max 55 characters
		default value: K01=1;WAIT=5;K01=0;
		range: -
142	PCODE2	Ping monitor 2 reboot program code, max 55 characters
		default value: K02=1;WAIT=5;K02=0;
		range: -
143	-	Reserved parameter
		default value: -
		range: -
144	-	Reserved parameter
		default value: -
		range: -
145	-	Reserved parameter
		default value: -
		range: -
146	-	Reserved parameter
		default value: -
		range: -
147	-	Reserved parameter
		default value: -
		range: -
148	-	Reserved parameter
		default value: -
		range: -
149	PSEL1	Ping monitor 1 mode selector, 0 = fixed IP mode, 1 = DNS mode
		default value: 0
		range: 0 – 1
150	PSEL2	Ping monitor 2 mode selector, 0 = fixed IP mode, 1 = DNS mode
		default value: 0
		range: 0 – 1
151	-	Reserved parameter
		default value: -
		range: -
152	-	Reserved parameter
		default value: -

		range: -
153	-	Reserved parameter default value: - range: -
154	-	Reserved parameter default value: - range: -
155	-	Reserved parameter default value: - range: -
156	-	Reserved parameter default value: - range: -
157	PFTRY1	Ping monitor 1 max allowed no response failure times before reboot default value: 3 range: 0 – 65535
158	PFTRY2	Ping monitor 2 max allowed no response failure times before reboot default value: 3 range: 0 – 65535
159	-	Reserved parameter default value: - range: -
160	-	Reserved parameter default value: - range: -
161	-	Reserved parameter default value: - range: -
162	-	Reserved parameter default value: - range: -
163	-	Reserved parameter default value: - range: -
164	-	Reserved parameter default value: - range: -
165	PDT1	Ping monitor 1 delay timer after reboot default value: 1000 range: 0 – 65536
166	PDT2	Ping monitor 2 delay timer after reboot default value: 1000 range: 0 – 65536
167	-	Reserved parameter

		default value: -
		range: -
168	-	Reserved parameter
		default value: -
		range: -
169	-	Reserved parameter
		default value: -
		range: -
170	-	Reserved parameter
		default value: -
		range: -
171	-	Reserved parameter
		default value: -
		range: -
172	-	Reserved parameter
		default value: -
		range: -
173	PDU1	Ping monitor 1 delay timer unit selector after reboot, 0 = ms, 1 = second
		default value: 0
		range: 0 – 1
174	PDU2	Ping monitor 2 delay timer unit selector after reboot, 0 = ms, 1 = second
		default value: 0
		range: 0 – 1
175	-	Reserved parameter
		default value: -
		range: -
176	-	Reserved parameter
		default value: -
		range: -
177	-	Reserved parameter
		default value: -
		range: -
178	-	Reserved parameter
		default value: -
		range: -
179	-	Reserved parameter
		default value: -
		range: -
180	-	Reserved parameter
		default value: -
		range: -
181	PCTRL1	Ping monitor 1 control word, 0 = stop, 1 = start
		default value: 0
		range: 0 – 1

182	PCTRL2	Ping monitor 2 control word, 0 = stop, 1 = start default value: 0 range: 0 – 1
183	-	Reserved parameter default value: - range: -
184	-	Reserved parameter default value: - range: -
185	-	Reserved parameter default value: - range: -
186	-	Reserved parameter default value: - range: -
187	-	Reserved parameter default value: - range: -
188	-	Reserved parameter default value: - range: -

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