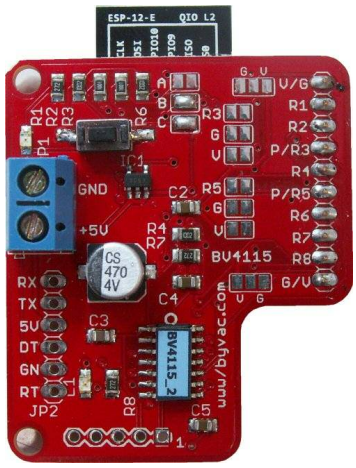
Wi-Fi Relay Controller BV4115_2



BV4115_2

WiFi Relay Controller

Product specification May 2016

Contents

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Rev	Change
August 2015	Preliminary
May 2016	Version 2, same hardware as 1 but new firmware.

1. Introduction

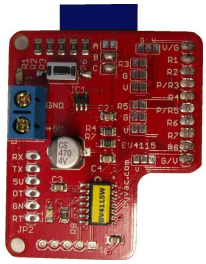
The BV4115 provides a WiFi interface to a standard relay board allowing on/off of individual relays and timed on and off.

It can be connected directly to most 2, 4 and 8 way relays using the on board solder jumpers.

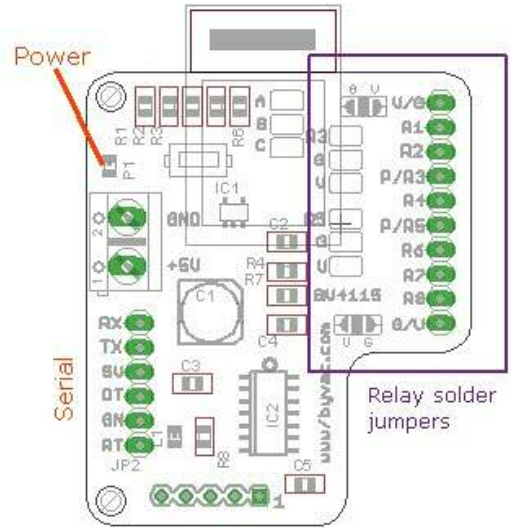
2. Features

- Wide voltage range 3.3V to 5.5V
- Up to 8 relays
- Timed on / off up to 48 days
- Addressable for security
- Use with high on or low on
- User configurable

3. Physical Description



BV4115_2



The interface has a 2.54mm spaced 2 rows by 5 pins. The serial interface is used for programming the WiFi module.

This will not normally be used by the user unless there is an update to the WiFi firmware.

Pin	Description
1	RX
2	TX
3	5V (up to 6V acceptable)
4	GT – reset, pulse low
5	GN Ground
6	RT(see wifi)

Serial WiFi Programming Connector

3.1. Power Supply

The device works on 3.3V but there is an on board 3.3V regulator and so it can operate from 3.3V or up to 6V.

The relays and serial interface are 3.3V logic. This will work for 5V logic systems and most Opto isolated relay boards.

5V relays should be used and they will be supplied directly from the 5V pin or the screw terminal.

4. Serial Interface

The serial interface is used to reprogram the WiFi module. This will not be used in most circumstances.

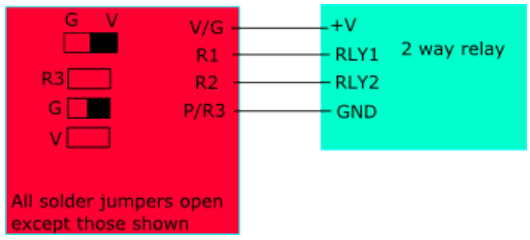
Instructions for re-programming are on the www.byvac.com website.

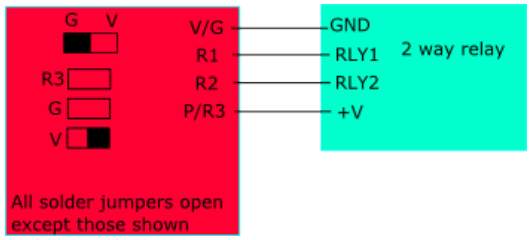
5. Relay Interface

There are various solder jumper options to cater for the many variations in relay board. This will allow in most cases a direct connection from this device to the relay board.

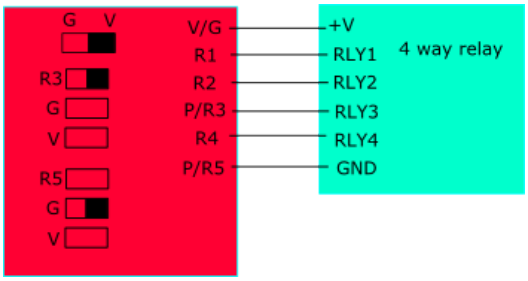
If this is not possible then wiring can be used.

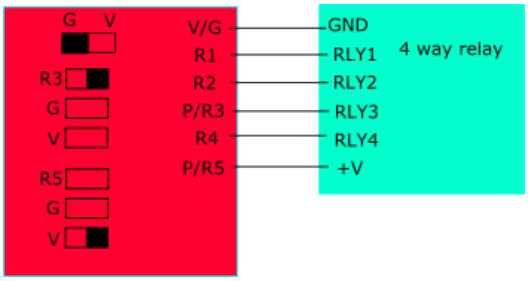
5.1. 2 Way Example



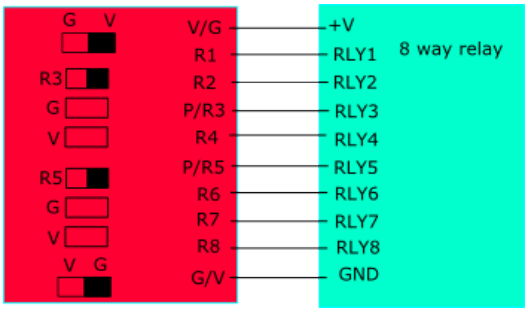


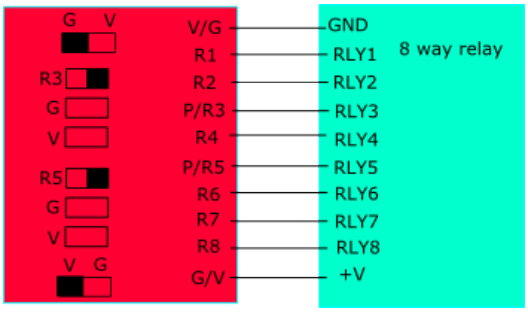
5.2. 4 Way Example





5.3. 8 Way Example





6. Operation

The operation is described in full on the www.byvac.com website and so is not repeated here.

7. Device Parameters

The EEPROM contains values that control the way the device behaves. All of the values can be changed by the user using the serial interface.

The EEPROM consists of 255 bytes and in general the first 16 bytes are used by the system

Adr	Default Value	Description
0	0	System Use
1	100	not used
2	1	Polarity
3	255	not used
4	65	ACK (A)
5	78	NACK (N)
6	10	End of Line (EOL1)
7	8	Baud rate Code
8	13	End Of Line (EOL)
9	1	Scale low byte
10	0	Scale high byte
14	106	not used
15	255	Security code

Table 1 System EEPROM use

7.1. Security Code

The security code is 'switched off' by default by having 0xff (255) at location 15. The code is activated by placing values between 33 and 126 (printable characters) in this location and adjoining locations terminated with 255.

** This is more easily done using the code command.

Example

192.168.11.30/device/fw (no security code)

EEPROM adr	Value
15	49 ('1')
16	50('2')
17	51('3')
18	52('4')
19	255 (terminator)

The controller will now only respond when the security code is in place, thus:

192.168.11.30/1234/device/fw

The code can be as short or as long as is required, up to the maximum number of bytes the EEPROM will hold (255-15).

7.2. Polarity

Some relay modules require a logic 1 to activate others require a logic 0. This is set to the active value of the relay. If set to 1 then the relay will be activated by a logic 1, if set to 0 then it will be activated by 0.

7.3. ACK character

By default this is A but can be changed using the EERPOM Write command. The effect will not be implemented until the device is reset.

7.4. NACK character

By default this is N but can be changed using the EERPOM Write command. The effect will not be implemented until the device is reset.

7.5. Baud Rate

The Baud rate has the following values:

0. no valid
1. Baud rate is fixed at 2400
2. Baud rate is fixed at 4800
3. Baud rate is fixed at 9600
4. Baud rate is fixed at 14400
5. Baud rate is fixed at 19200
6. Baud rate is fixed at 38400
7. Baud rate is fixed at 57600
8. Baud rate is fixed at 115200 (default*)

NOTE: Do not change this, it matches the WiFi interface.

7.6. CR Character (EOL + EOL1)

By default this is 10 and 13 which is the standard ASCII CR, LF and the whole serial protocol relies on one of these being at the end of every command. It may be that this is unsuitable in some systems and so this can be changed.

NOTE: Do not change this, it matches the WiFi interface.

7.7. Scale

By default the timing value used by the device is milliseconds. This value can be scaled using a setting in the EEPROM.

The scale value is a 16 bit word, thus if it is set to 1000 then the timing value will be 1 second, if set to 60000 then the timing value will be 1 minute. As the maximum value a 16 bit word can hold is 65000 then the scale maximum is 65 seconds (approximately). So when a timer value of 65000 is given this is gives a delay of about 48 days.

The timings are approximate and will vary. If accurate timings are needed then tests should be carried out.

Some EEPROM values for various scales

Scale	(low)	(high)
10	10	0
100	100	0
1000	232	3
60000	96	234

The formula is: device the scale value by 256, that is the high byte, the remainder is the low byte.

Factory Reset

It is possible, by setting the EEPROM values to lock the device out. Fro example setting a security code and forgetting what it is.

As a fail safe the following procedure will reset the EEPROM value to a known state.

1) Turn off the device
2) Place a temporary shorting link on pads 3 an 4 of JP1. JP1 is the row of 5 holes at the bottom of the PCB next to C5. Pin 1 has the square pad.
3) Turn the device on fo at least 5 seconds
4) Turn the device off and remove the shorting link.

8. Commands

8.1. URL API

<table>
<tr><th>CMD</th><th>range</th><th>Description</th></tr>
<tr><td>help</td><td></td><td>Displays summary of commands</td></tr>
<tr><td>relay/name/action/time</td><td>name a to h
action 0 to 2
time 0 to 65350</td><td>Turns a relay on or off, gets timer value
Action has the following meaning:
0 Turn relay off
1 Turn relay on
2 Get timer value
Examples
relay/a/1/1000 (turn relay a on in 1 second time)
relay/b/0/0/ (turn relay b off immediately)
relay/c/2 (get the timer value of relay c)</td></tr>
<tr><td>relay/off</td><td></td><td>Turn off all relays
Turns off all relays with a single command</td></tr>
<tr><td>relay/status</td><td></td><td>Relay Status
This will return a byte representing the status of the relay port. Bit 1 is on and bit 0 is off:
<table><tr><td>Bit</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Rly</td><td>H</td><td>g</td><td>f</td><td>e</td><td>d</td><td>c</td><td>b</td><td>a</td></tr></table>
As an example if just relay b and d were on and the rest of the relays were off then the following byte would be returned:
00001010 which is 0xa or 10 in decimal.
The value is the status of the port that is driving the relays. This may not necessarily be the actual relay itself.</td></tr>
<tr><td>System</td><td></td><td></td></tr>
<tr><td>eeprom/w/address/value</td><td>address 0-255
value 0-255</td><td>Write to EEPROM
This will write a single byte to an EEPROM location
Example
eeprom/w/4/42 (change Ack to ‘*’)</td></tr>
<tr><td>eeprom/r/address/bytes</td><td>addtess 0-255
bytes 0-255</td><td>Read from EEPROM
Reads a singe or several EEPROM values from a given address.
Example
eeprom/r/15/5 (read 5 bytes from address 15)</td></tr>
<tr><td>device/id</td><td></td><td>Device ID
Returns the id of the device</td></tr>
<tr><td>device/reset</td><td></td><td>Reset</td></tr>
</table>

		Resets the device. This is a soft reset. A soft reset will normally be the same as a reset at start-up but this may not always be the case.
device/eereset		**EEPROM reset** Will reset the EEPROM back to the default values. See also Factory reset.
device/fw		**Version** Returns the firmware version .
code/<bytes>	<bytes> Printable characters	**Change Security Code** By default the security code is switched off. If this command is used then every command subsequent to using this command will require the code chosen. **Example** code/abcd After the above code has been entered every command will now require that prefix, e.g. abcd/device/fw The code can be any length but must consist of printable characters (ASCII 33 to 126) and must NOT contain spaces, which is in fact ASCII 32.
code/off		**Turn off security code** **Example** abcd/code/off This assumes that the code was set to abcd, obviously you need to know the existing security code to turn it off. eereset will also have the same effect.