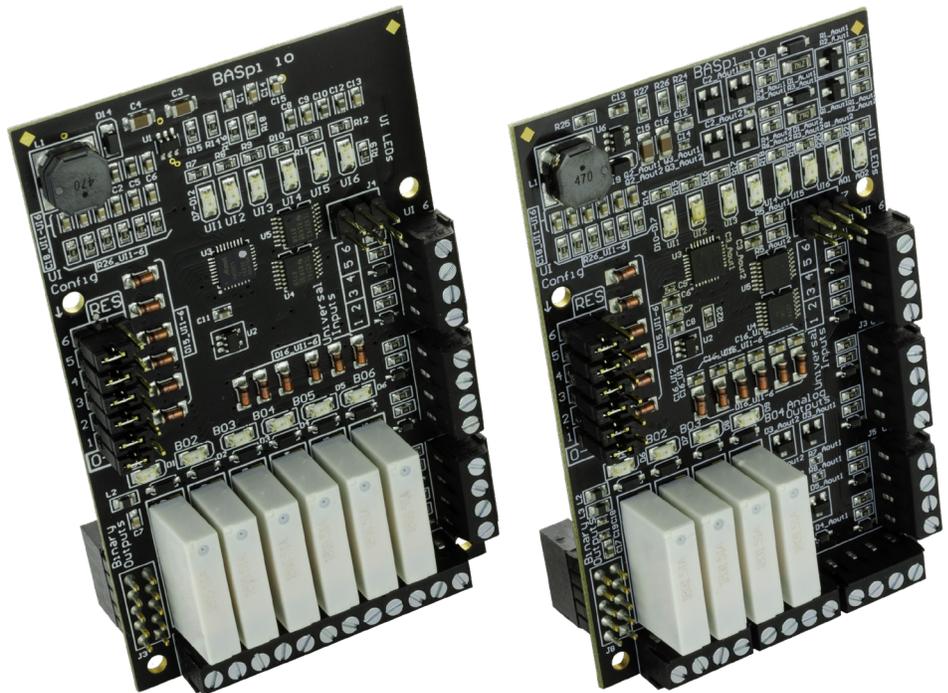




## BASpi I/O Software Installation Guide

Choosing the right download to get your BASpi working is easy!

The BASpi-IO board is required for the firmware to run on Raspberry Pi3 or 4. There are 2 software elements required to turn a Raspberry Pi and BASpi-IO board hardware into a fully working BASpi system – Raspbian with Desktop Operating System and the correct BASpi firmware files for the two BASpi-IO6U6R or BASpi-IO6U4R2A model options. Make sure you choose the correct firmware file for your BASpi IO board model..



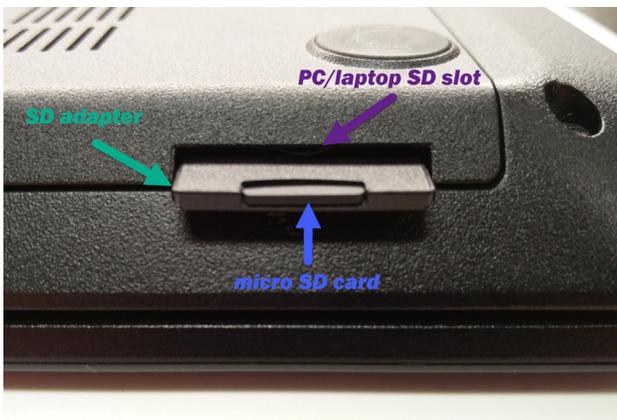
- A. If you have a blank micro SD card and want to get the entire system set up in one flash, use Method A – the pre-configured image. This method will flash both a clean installation of the latest Raspbian with Desktop Operating System and BASpi firmware files onto your micro SD card. After the image is burned, the micro SD card is mounted in the Pi, and the Raspberry Pi is powered on. The BASpi firmware will automatically start and the unit can be accessed using the default IP address and credentials outlined in the BASpi Installation Guide, Quick Start Guide and Data Sheet.
- B. If you already have Raspbian with Desktop Operating System installed on your Raspberry Pi and simply want to add the BASpi firmware files onto your system, use Method B – standalone

firmware files. Using this method, you will have to go through the steps of installing the BASpi firmware onto your Raspbian with Desktop OS. This method is useful if you already have a running Raspbian OS on your Pi and simply want to add the BASpi functionality without *losing other applications on your Raspberry Pi*.

### Method A – pre-configured image

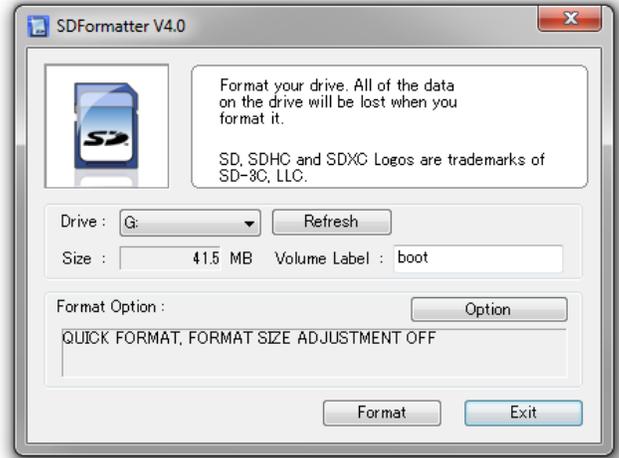
1. Download BASpi-X.X.X-Image.zip file from [www.baspi.io](http://www.baspi.io) or [www.ccontrols.com/diy/baspi.php](http://www.ccontrols.com/diy/baspi.php)
2. You will need an 8GB or larger micro SD card (we recommend pSLC micro SD cards for maximum system stability), a micro SD to USB adapter, or micro SD to SD adapter to insert into your PC.

- If the micro SD card is not brand new, has been previously used, or you are unsure of its formatting, please format it before proceeding to write the BASpi image. You can download *and install the free SDformatter tool from the SD Association web site: [www.sdcard.org/downloads/formatter\\_4/](http://www.sdcard.org/downloads/formatter_4/)*
- To format the card, use a micro SD to USB adapter or if your PC or laptop have an SD card slot, you could use a micro SD to SD card adapter. Insert it into your PC or laptop.



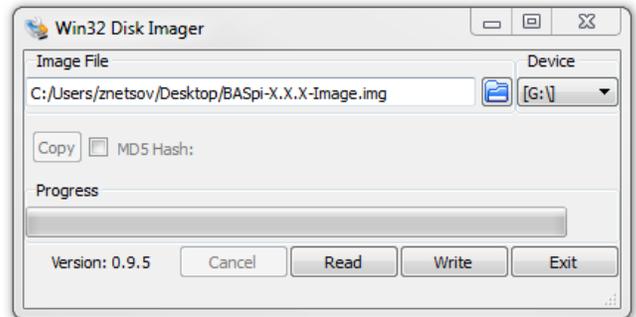
With the micro SD card in place carefully choose the Drive of the micro SD card (G: in example below) and click “Format”.

*NOTE: You must make sure you choose the correct drive letter for your micro SD card, because if you accidentally choose another drive, it will format it! Make sure you have the correct drive selected.*



- Once the micro SD card is formatted, unzip the *BASpi-X.X.X-Image.zip* anywhere on your computer.
- Next you will write the image onto the micro SD card. Use any tool for writing images to SD such as:

Etcher (<https://etcher.io>) or Win32DiskImager (<https://sourceforge.net/projects/win32diskimager/>).



- With the card inserted in your PC, point to the *BASpi-X.X.X-Image.img* file (blue folder icon in Win32DiskImager), choose the correct Drive (G: in the example) and flash it to the SD card by clicking “Write” button.

*NOTE: You must make sure you choose the correct drive letter for your micro SD card, because if you accidentally choose another drive, it will overwrite it! Make sure you have the correct drive selected.*

- When the image burn is done, power off your Raspberry Pi, insert the micro SD card in the micro SD card slot, and make sure the BASpi-IO board is mounted on GPIO 1-10.
- Power ON your Raspberry Pi. It will take 25 seconds to boot.
- BASpi web server will be accessible on its default IP address of 192.168.92.68 with subnet mask of 255.255.255.0 and login credentials of username: admin and password: admin over its Ethernet port. The web server is used to monitor and configure BASpi IO channels, virtual points, web components and system settings. This web server can be configured for use over Ethernet or Wi-Fi. BACnet /IP server and Sedona Virtual Machine can also be configured from BASpi web page for use over Ethernet or Wi-Fi adapters.
- Create a root level *ContemporaryControls* folder and change ownership:

```
> cd /  
> sudo mkdir /ContemporaryControls  
> sudo chown -R pi:pi /ContemporaryControls
```
- Download the “*BASpiFirmware-X.X.X.zip*” from [www.baspi.io](http://www.baspi.io). You could download it directly from your Raspberry Pi web browser and save it locally or use a PC and then copy it from a USB drive onto your Raspberry Pi.
- Power OFF your Raspberry Pi.
- Mount the BASpi-IO hat on GPIO pins 1-10 on your Raspberry Pi as shown in the images here.
- Power ON your Raspberry Pi

## Method B – standalone firmware files

If you already have Raspbian with Desktop on your Raspberry Pi and simply want to add BASpi IO board and firmware files to enhance your existing project, you can follow the instructions below. Some of these files may replace previous configuration.

BASpi-X.X.X-firmware.zip

Some initial configuration to your Raspberry Pi is required. Log in as root user (superuser) and open a command line terminal.

- Enable serial interfacing options by typing:

```
> sudo raspi-config
```

Select “*Interfacing Options*” then select “*Serial*”. Choose “No” to having a login shell on the serial port. Choose “Yes” to enable the serial port hardware. Choose “*Finish*”.
- Connect to Internet and install the Python “netifaces” library as root by typing:

```
> sudo pip3 install netifaces
```
- Install the Raspbian required libraries as root.

```
> sudo apt install msmtpt ca-certificates -y
```
- Copy the “*BASpiFirmware-x.x.x.zip*” to */ContemporaryControls* and unzip it:

```
> cd /ContemporaryControls  
> sudo unzip BASpiFirmware-x.x.x.zip
```

You will now have a directory structure of */ContemporaryControls/BASpi/...*
- Make a copy of */etc/dhcpd.conf* it will be used when changing the wired IP configuration. This will provide a clean base file for IP address configuration:

```
> sudo cp /etc/dhcpd.conf /etc/dhcpd.conf.default
```
- Make a copy of */etc/wpa\_supplicant/wpa\_supplicant.conf* it will be used when changing the Wi-Fi IP configuration:

```
> sudo cp /etc/wpa_supplicant/wpa_supplicant.conf /etc/wpa_supplicant/wpa_supplicant.conf.default
```
- Time and date are managed by the application from the time web page. When the time zone or daylight savings settings are changed, the application compiles a new binary time zone file: */usr/share/zoneinfo/BAScontrol* Change */etc/localtime* to be a link to the file created by the application:

```
> sudo ln -sf /usr/share/zoneinfo/BAScontrol /etc/localtime
```

13. Go to /ContemporaryControls/BASpi and copy the startup script:

```
> sudo cp init.d.BASpi /etc/init.d/BASpi
```

14. NTP is managed by the application, so you must disable the Pi's NTP service:

```
> sudo systemctl disable systemd-timesyncd.service
```

15. Configure your Pi to automatically start the application:

```
> sudo update-rc.d BASpi defaults
```

NOTE: If you need to stop the application from starting automatically remove it by:

```
> sudo update-rc.d -f BASpi remove
```

NOTE: If you need to start or stop the application manually use:

```
> sudo /etc/init.d/BASpi start
```

---OR---

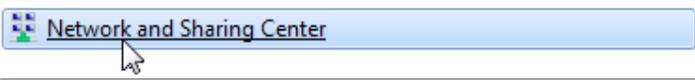
```
> sudo /etc/init.d/BASpi stop
```

## Getting Started - Setting the IP address of your PC

In order to connect to the BASpi at its default IP Ethernet address of 192.168.92.68 with subnet mask of 255.255.255.0 you must first temporarily configure your PC or laptop's Ethernet adapter to be in the same subnet as the BASpi.

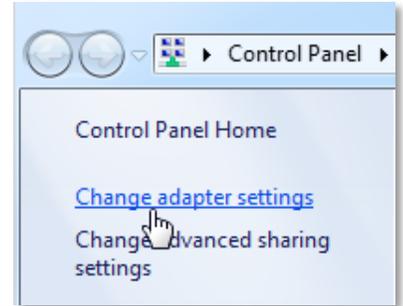
### To set your computer's IP static address in Windows 7 or Windows 8.x or Windows 10:

1. Type **network and sharing** into the search box in the Start Menu
2. Select **Network and Sharing Center** (which could also be found in Control Panel)

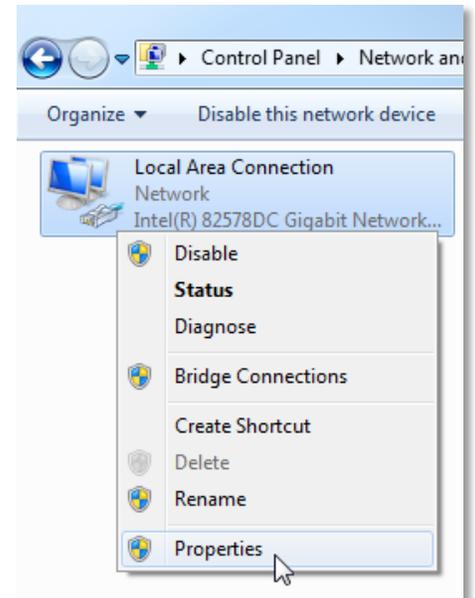


Network and Sharing Center

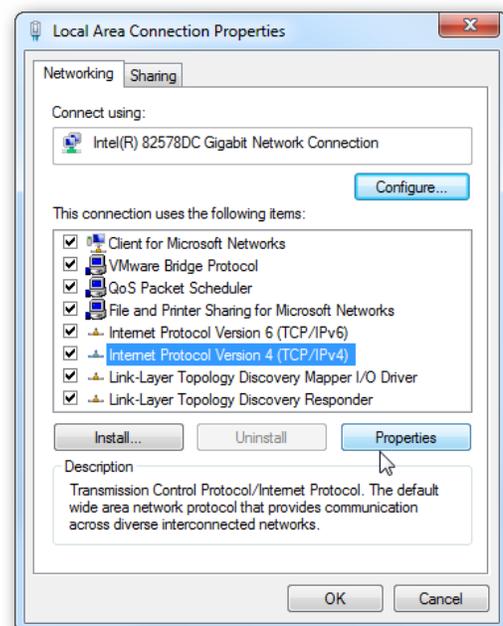
3. Click on **Change adapter settings**



4. Right-click on your network adapter and chose **Properties**



5. In the Local Area Connection Properties window highlight **Internet Protocol Version 4 (TCP/IPv4)** then click the **Properties** button.

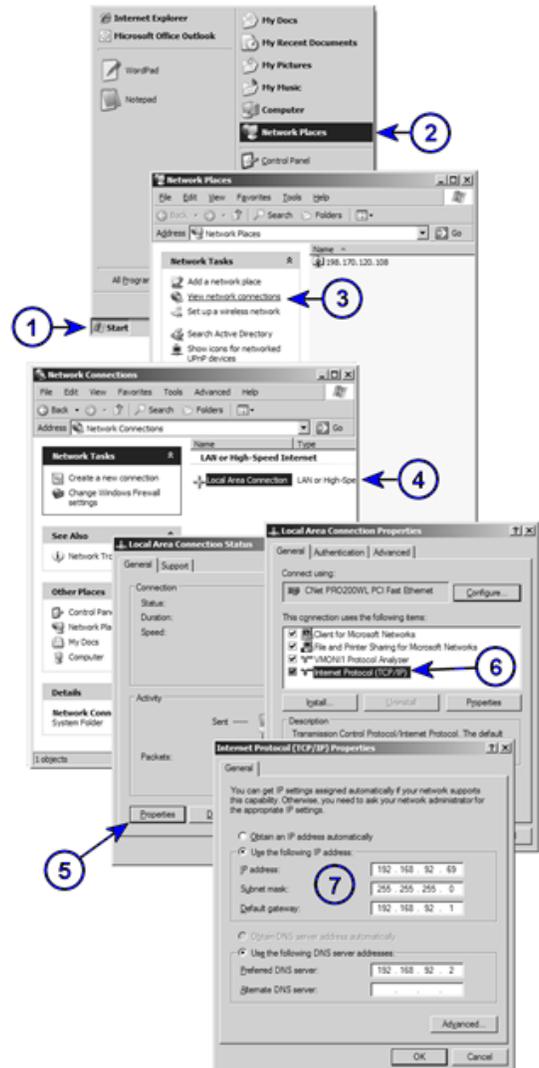


- Your computer was most likely set for DHCP (Obtain an IP address automatically) select the radio button **Use the following IP address** and enter in 192.168.92.69 (for example) in **IP address**.

Click on **Subnet mask** and 255.255.255.0 will be entered for you automatically. For **Default gateway** enter 192.168.92.1. Click **OK** and your network adapter IP address has been set.

## To set your computer's IP static address in Windows XP:

- Click **Start Menu**
- Select **Network Places**
- Click on **View network connections**
- Open **Local Area Connection**
- Choose **Properties**
- Double-click to open **Internet Protocol (TCP/IP)** settings
- Select **Use the following IP address**



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