Quick Guide to connect the OnStep Controller to your PC (OnStep is not a product of GTD, it is an open source project)

The aim of this manual is to get you quickly to the point where you understand the different ways of accessing your OnStep (via Windows, Linux or Android)

Prerequisites (what you will need depends on your preferences)

The latest ASCOM or INDI platform installed on your PC/Laptop.

The latest OnStep Ascom or INDI driver installed (google search it). The Ascom driver is a local server allowing multi client access to the telescope.

A WiFi router

An Android device with the OnStep App installed (PlayStore)

A normal printer type AB, mini or micro USB2 cable, depending on the connector present on your OnStep controller.

There are 4 possible ways to access your OnStep.

1 USB Connection

The USB connection is used to create a COM port and access OnStep as an ASCOM device (telescope, focuser, weather station, etc...).

Check the data socket on your model of OnStep. It will be a type AB printer, a mini or a micro USB. Get the suitable cable from a vendor and plug it into the board, the other end to your PC/Laptop. Power your Onstep up.

Attention! You may encounter two basic problems with an USB cable. There are micro USB cables on the market suitable for recharging only (power only cable). These will not work naturally. Another problem may be the length of the cable. Some boards do not tollerate cables over 1m.

If your cable is OK, the PC/Laptop will have a new port. You can check it in Device Manager (you can access it by right clicking on Windows start menu...).
icon). If there is a warning by the port, you will need to find the USB driver of the chipset on the internet. You will need Administrator level access to do this.

When device manager reports the port as functioning correctly, you can start connecting to OnStep from your Astronomy apps. Below is an example with PhD2 guide.
Check if the parameters are correct. These can be uploaded from your Android device too. If the window remains blank, you do not have an USB connection and you must troubleshoot it. (cable, port number, usb driver)

### 2.1 WiFi connection – Access Point

The WIFI connections (Access Point and Station) can be used to access the ASCOM device(es) from a PC associated with OnStep, to manage settings/commands via the Webserver or the Android App.

This is the default mode of OnStep. It means that the WiFi module on the board is operating as your home wifi router where all your devices are connected for Internet access. Naturally, OnStep does not have internet access but it can be an access point for your Android and PC/Laptop so that you can reach the OnStep web server and other devices that are connected to this access point.

This mode is useful when you are in the field without internet and a wifi router. In this case you can have your Android device connected as a hand controller, your telescope based mini PC and your laptop. All will be connected to OnStep and can see each other via a remote desktop app. Remember to set the OnStep network to “connect automatically” on your telescope based mini PC. Naturally, your telescope based PC must have an integrated wifi module.

The Apps on the connected devices will reach OnStep via the wifi channel as in the illustration below.

![OnStep Telescope Setup](image)

To open the OnStep web server use the IP address 192.168.0.1. The other connected devices (the telescope based PC for example) will have an IP address assigned by the DHCP function of the OnStep wifi module and can be found by trial and error, starting from 192.168.0.2 or 0.100 and up.

### 2.2 Station mode

Station mode is useful in an observatory where you have a wifi router installed. All devices, including OnStep will be connected to your router as access point and you can reach them via the router. To set OnStep to Station mode, connect
your PC/Laptop to the OnStep network first and open the web server.
(type 192.168.0.1 in the address line as default address)

After clicking the WiFi tab, you will see something like this, depending on fw version.

It is recommended to **enable DHCP** in order to avoid IP address conflicts on your home network that may lead to unstable connection.

After having selected Station mode, click “Upload” and restart your OnStep, wait a few minutes and enter your WiFi router's user interface (see its manual if not sure how to do this). All routers have a menu that lists the connected clients. Here you can find the IP address of your OnStep and if it is not automatically recognized by the ascom dialog window, you can enter it, adding the :9999 socket at the end of the IP address.
3 Bluetooth mode

The BT mode can be used to access settings/commands from an Android device.

Some OnStep hardware versions have a BT module that is mainly used to connect to an Android device for access to the functions via the OnStep App available from Google PlayStore.

4 Ethernet adapter

Some OnStep hardware versions have an Ethernet adapter that allows your device to connect to your LAN with an Ethernet cable. The functionality is the same as the WiFi access point/station mode.

Scripting OnStep

It is possible to operate OnStep by scripts via some of the above connections. You can find information on scripting to Onstep here https://github.com/kbahey/onstep-python

For more detailed info have a look at the Wiki page of the OnStep. This is a good starting point:

https://onstep.groups.io/g/main/wiki/3863