

Controlling a Telescope Mount over WiFi

This guide describes how to connect a telescope mount to your computer over WiFi using ASCOM drivers which will allow you to control the telescope mount using standard ASCOM based astronomy software. Our test setup is based on a Celestron telescope GT Mount with NexStar+ hand control and the operating system is Windows 7 64-bit. The serial WiFi adapter we use is part number UCW232C.

This setup has been tested and confirmed working with the following software and mounts but will most likely work with all ASCOM based software; and since most mounts mainly works the same way we expect it will also work with most (possibly all) mount variations.

Tested and confirmed working software:

Cartes du Ciel
 Starry Night Orion Special Edition
 PHD2
 Meade Autostar Suite
 Stellarium (without ASCOM drivers)

Tested and confirmed working mounts:

Celestron CGE Mount
 Celestron GT Mount
 Celestron SLT Mount
 Meade LX200R Mount (using Meade interface cable)
 Meade LX75 (using Meade interface cable)

Tested and confirmed working controllers:

NexStar+ hand control
 Celestron StarSense Auto Telescope Alignment Accessory

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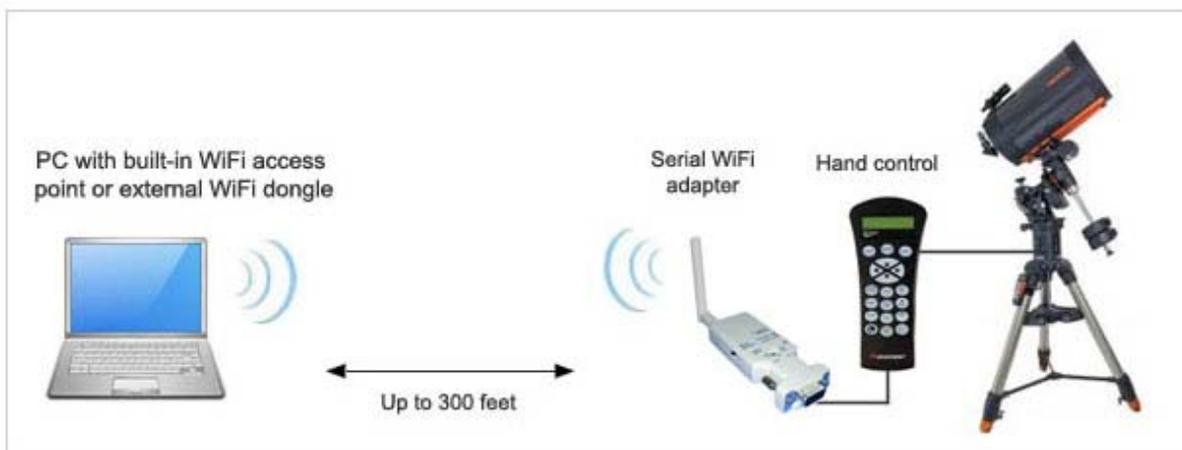
The Setup

By default the serial WiFi adapter has DHCP enabled so you can connect directly to the UCW232C using an Access Point with DHCP enabled.

If you want to connect the serial WiFi adapter using a wireless router connected to your PC, please jump to the section called: [How to connect using a wireless router.](#)

You can also connect by using a wired CAT5 cable with one of our serial to Ethernet converters, please contact us for details.

The setup using a PC with built-in WiFi is rather straightforward and looks like this:



The serial WiFi adapter is connected to the hand control via a RJ11 to DB9 female cable. The hand control is then connected to the telescope mount. You will need a male/male gender changer to connect the serial WiFi adapter to the DB9 end of the RJ11 to DB9 cable.

A look at the parts you need

Below is a list of parts we use for this setup; some are required, some are highly recommended and some are optional.



[Serial WiFi adapter](#)
[part UCW323C](#)

Available from
www.usconverters.com

or



[Rugged serial WiFi adapter with](#)
[part WF5000B](#)

If you need a stronger adapter
Available from
www.usconverters.com

Required



[RS232 / RJ11 Cable](#)
[part 93920](#)

Available from
www.celestron.com

This cable is used for connecting the serial WiFi adapter to the hand control.



This rechargeable lithium USB battery pack is optional but very useful if you have no other power source for the serial WiFi adapter.

Installing the drivers

Make sure you have the latest ASCOM drivers and Celestron drivers installed on your computer. As of this writing (June 2014) the latest drivers are:

ASCOM Platform 61SP1RC1, this is a Release Candidate currently available here:
<http://www.usconverters.com/downloads/ASCOMPlatform61SP1RC1.zip>

When this version of ASCOM is officially released it will be available here:
<http://ascom-standards.org/Downloads/Index.htm>

Notice: this setup will **NOT** work with any versions earlier than above version ASCOM Platform 61SP1

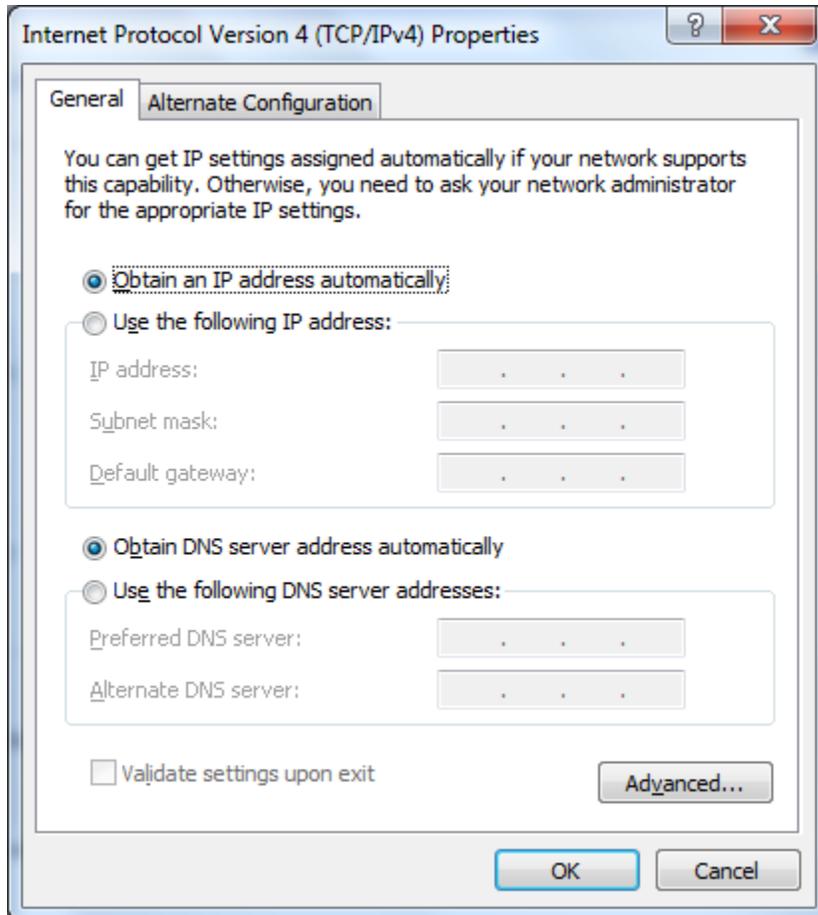
Celestron Unified (5.0.30):
<http://ascom-standards.org/Downloads/ScopeDrivers.htm>
Direct download link:
[http://download.ascom-standards.org/drivers/Celestron\(5.0.30\)Setup.exe](http://download.ascom-standards.org/drivers/Celestron(5.0.30)Setup.exe)

Connecting the adapter to WiFi

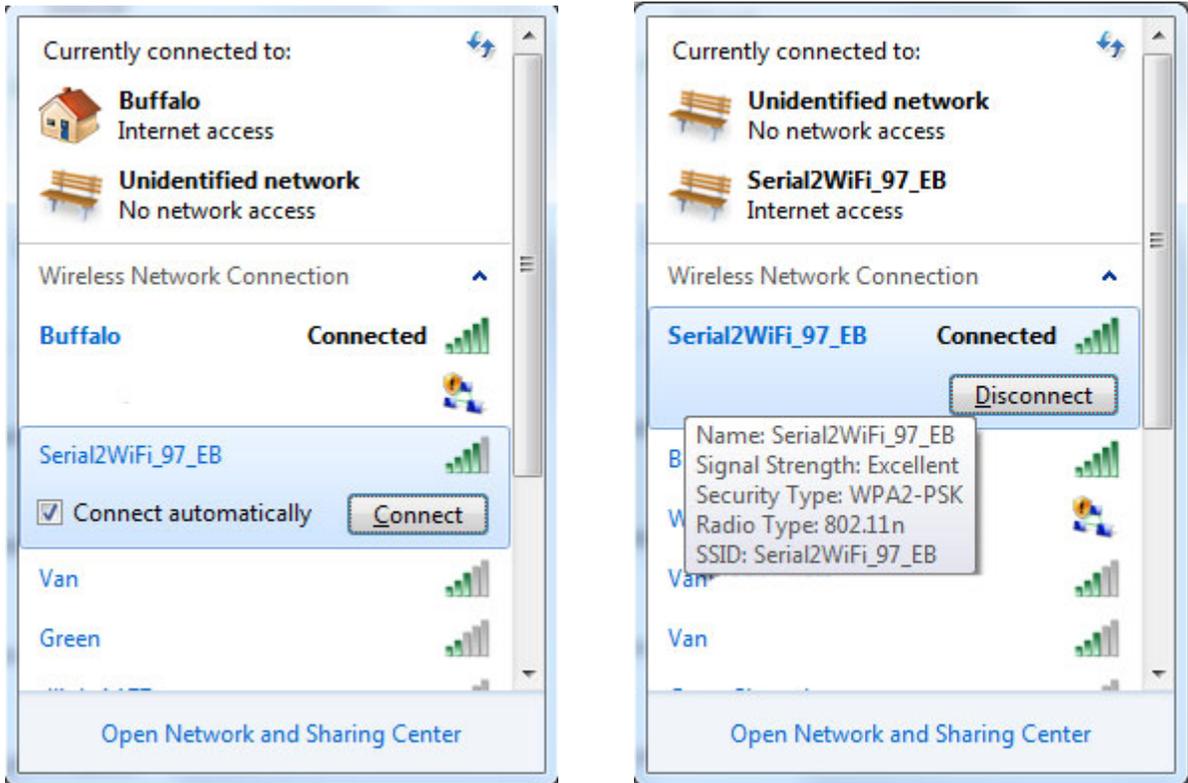
The UCW232C serial WiFi adapter is pre-configured for most astronomy software, so you will most likely not need to change any of the adapter's parameters.

Connecting to the UCW232C over WiFi.

First you need to connect to the UCW232C over WiFi. The UCW232C has DHCP enabled by default so your wireless connection should be set to support this:



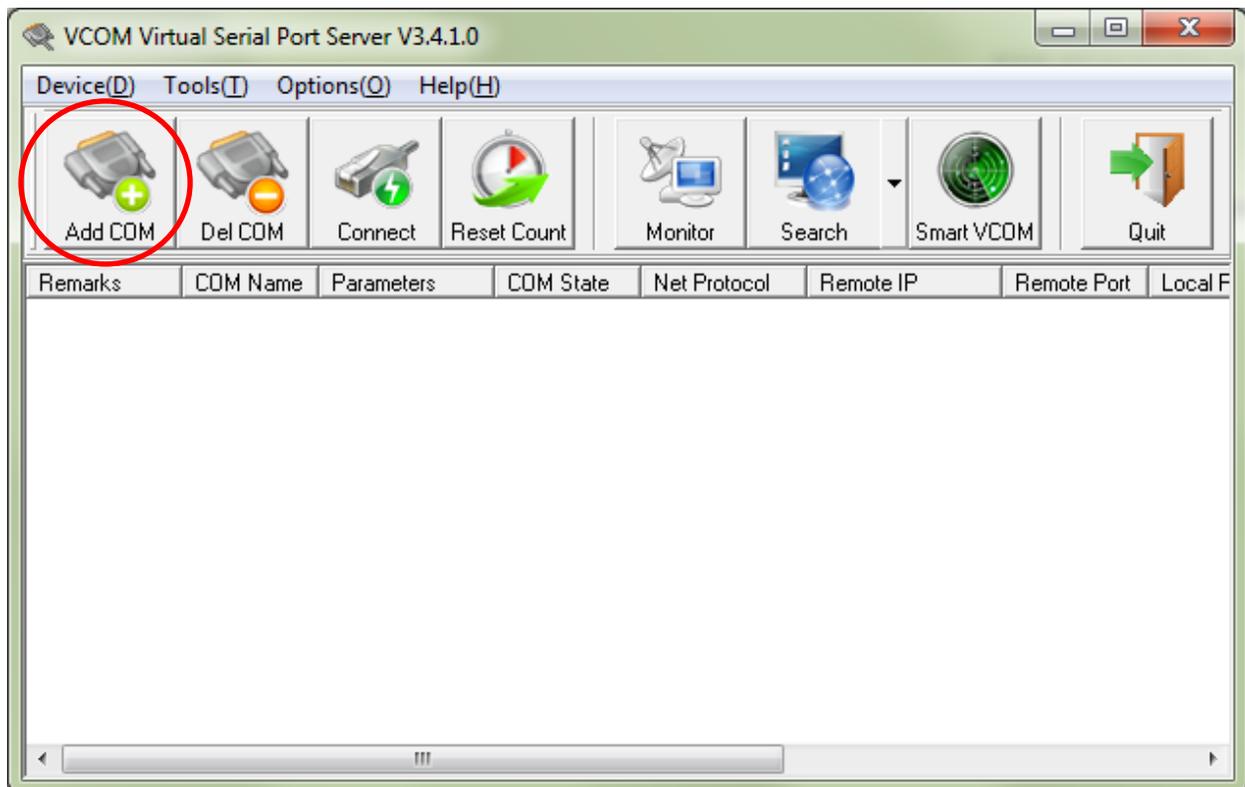
In this example we use Windows built-in wireless network manager to connect to the adapter:



Installing the software

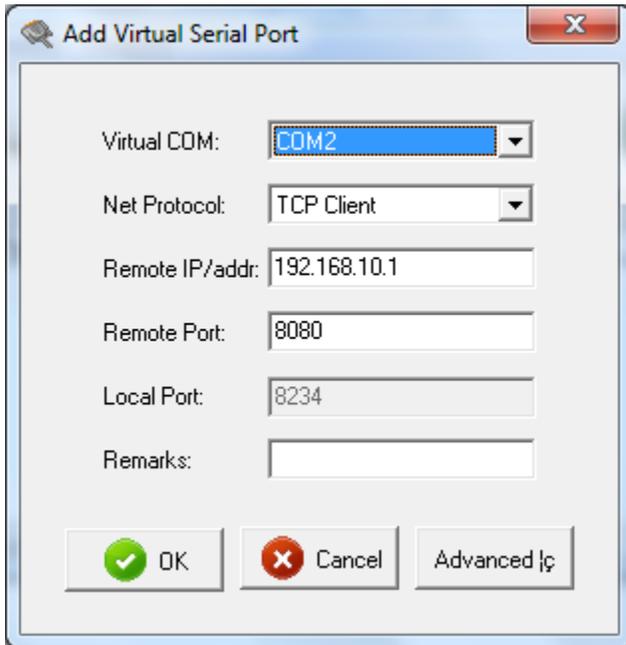
Now we need to create a virtual COM port in your computer so the software you are using (for example ASCOM and Cartes du Ciel) can connect to the serial WiFi adapter.

Install the USB-VCOM software by running the file called VCOM_V3.4.1 Setup.exe (this file is included and downloadable from our website). Alternatively you can use other virtual COM port software such as Fabulatech or PortShare. Run the program and you will get the following screen:

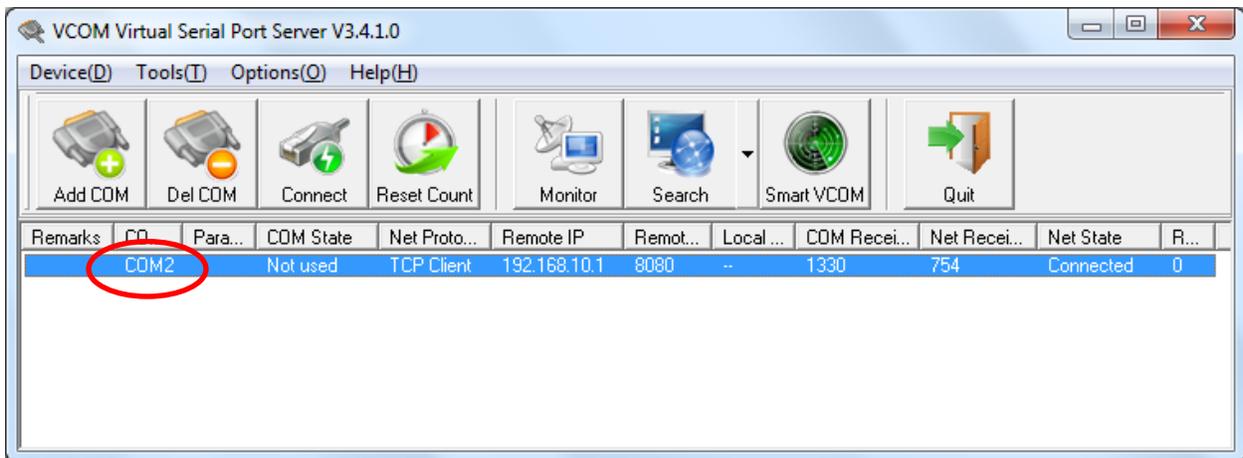


Click the Add COM port button.

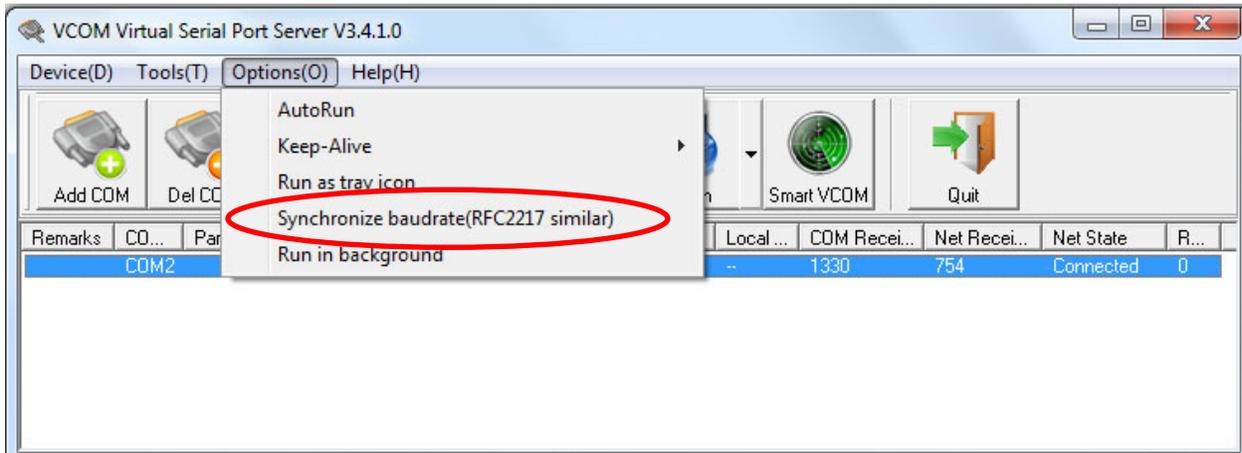
Select the COM port number you want to create, in this example we use COM 2. Also enter the serial WiFi adapter's IP address 192.168.10.1 and port number 8080, then click the OK button.



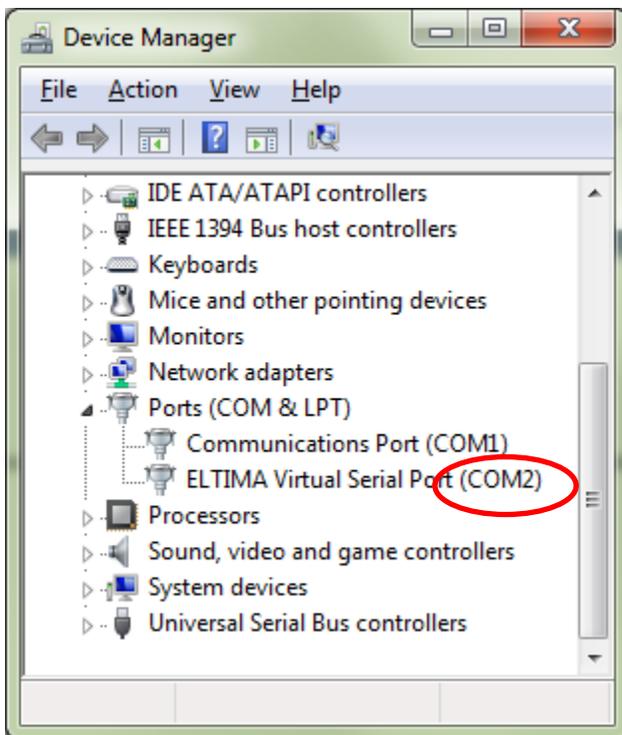
You should now be able to see the created COM port:



We recommend disabling “Synchronize baudrate (RFC2217 similar)” in the Options menu:



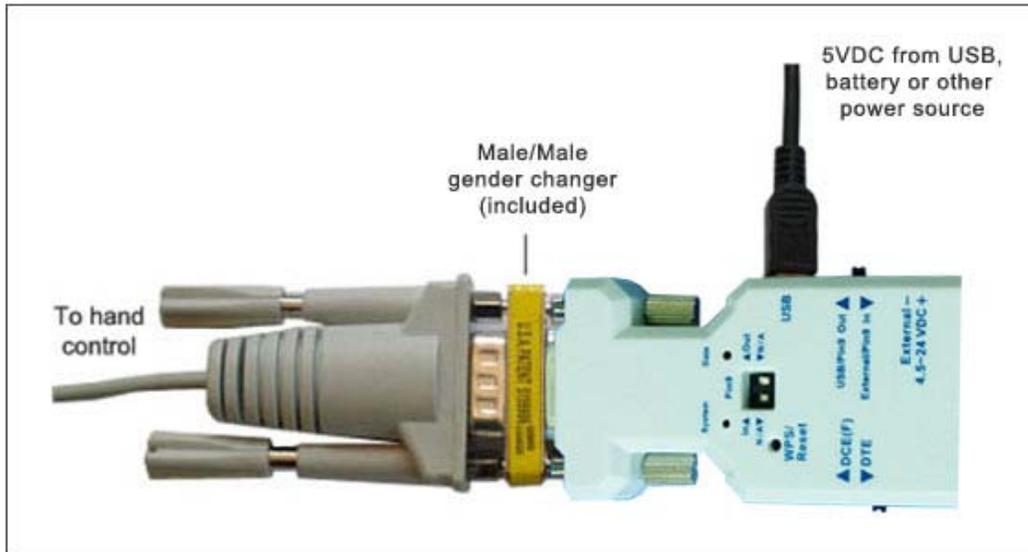
To make sure the COM port is created successfully you should also check if it has been created in Windows Device Manager:



Connecting the serial WiFi adapter to the hand controller

You are now ready to connect your computer to the hand control via the serial WiFi adapter.

First connect the serial WiFi adapter to the hand control using the RS232 / RJ11 cable and the male/male gender changer. Below is an illustration of the connections from the hand control cable to the serial WiFi adapter. **NOTICE: The DCE/DTE switch on the side of the adapter must now be in position DTE.**



Align your telescope using the hand control or other means.

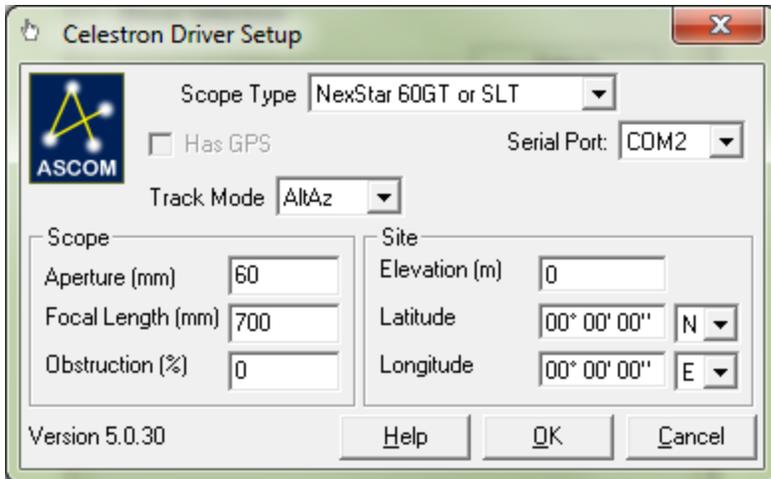
Start Cartes du Ciel. In the menu line click 'Telescope' -> 'Telescope Settings' and select 'ASCOM'.

Click 'Telescope' again and then click 'Control Panel'. Click 'Select' in the ASCOM telescope interface window and then select 'Celestron Scope Driver' from the dropdown menu.

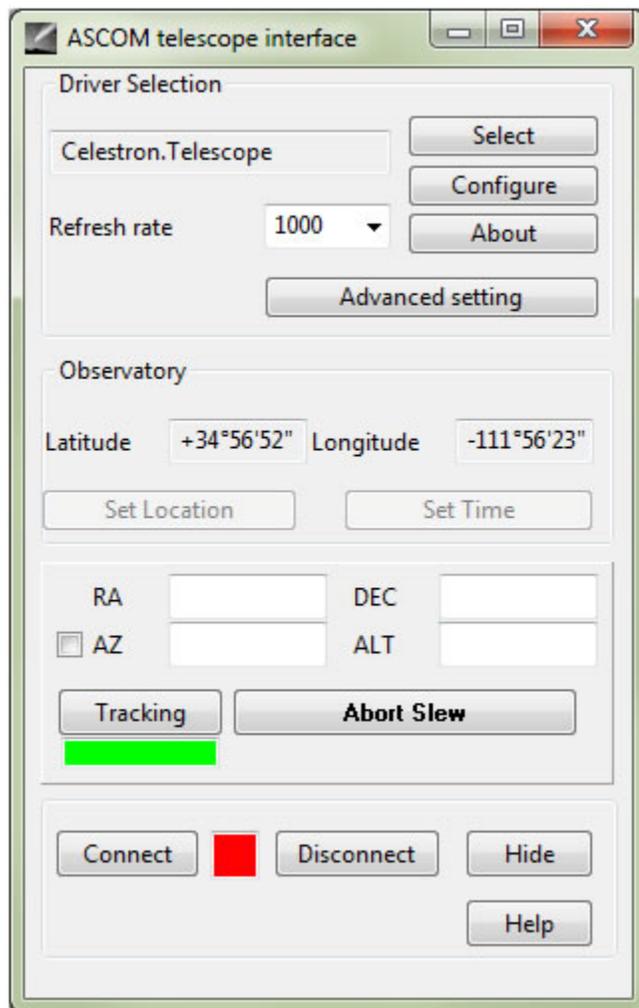


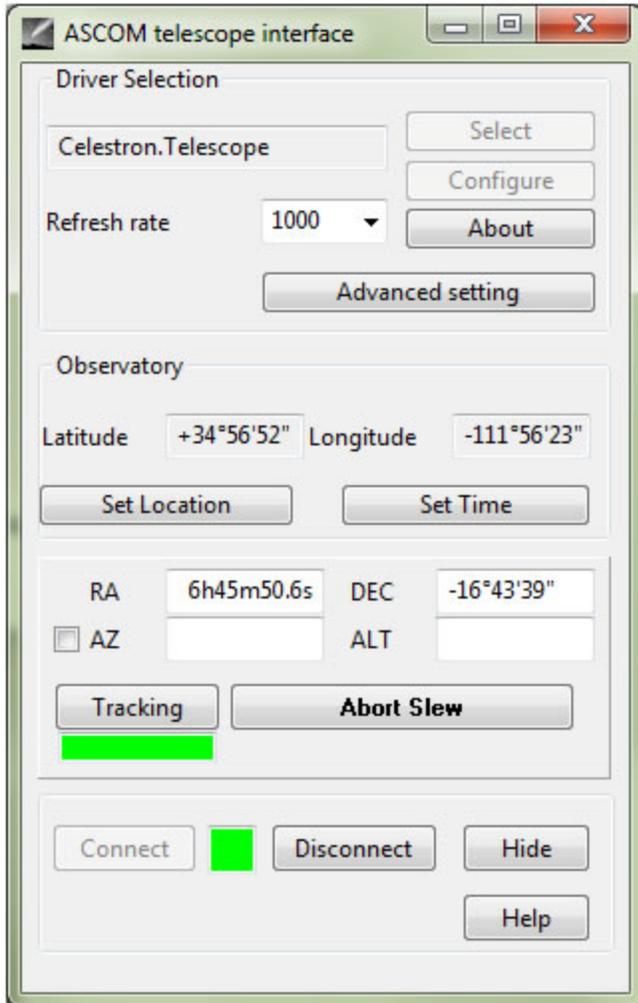
Click the 'Properties' button and set the serial port number to the number created by the virtual COM port software; in this example COM 2.

Select the Scope type and click 'OK'. Also click 'OK' in the ASCOM Telescope Chooser window.



Now click 'Connect' in the control panel window:





You can now control the telescope mount by clicking on a star in Cartes du Ciel and click the 'Slew' button.

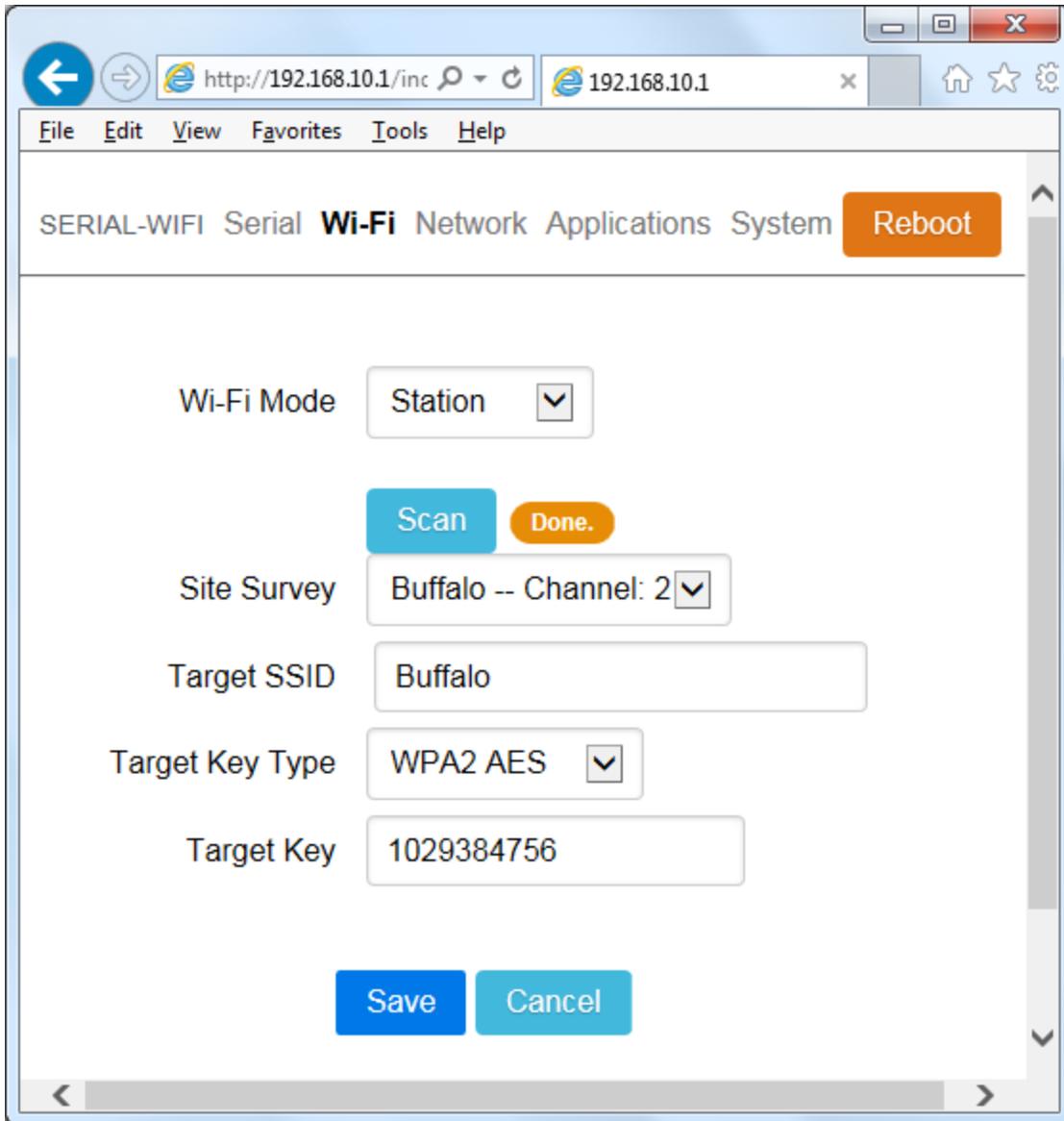
How to connect using a wireless router

The setup using a PC connected to a wireless router looks like this:

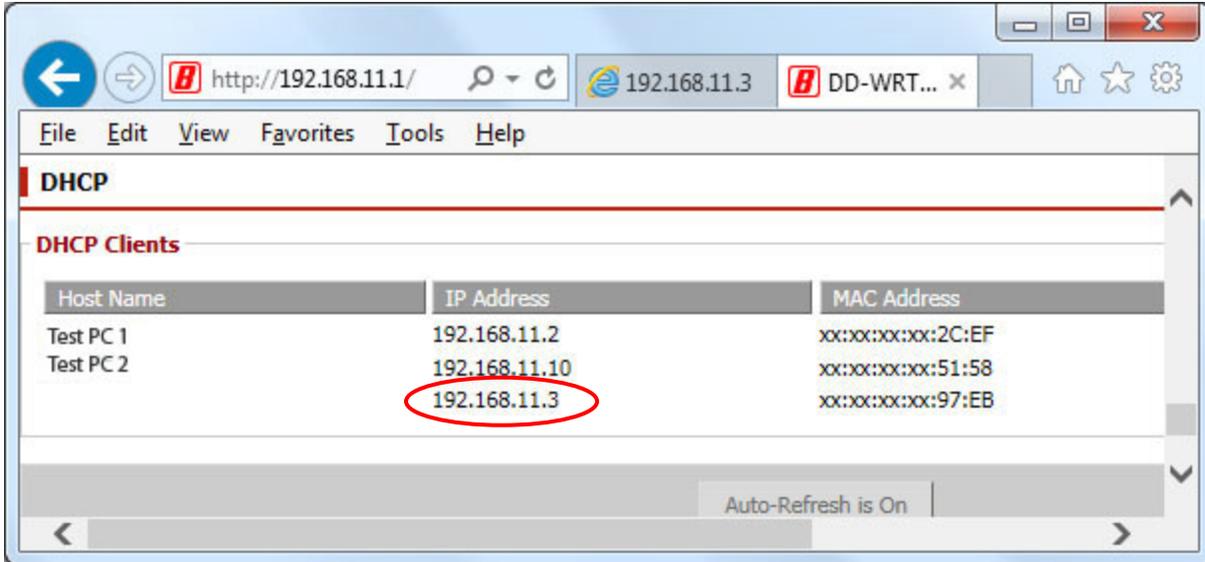


Before you can use your wireless router to communicate with the serial WiFi adapter you first need to configure the adapter as an infrastructure device, also called Station Mode. Please follow the instructions below.

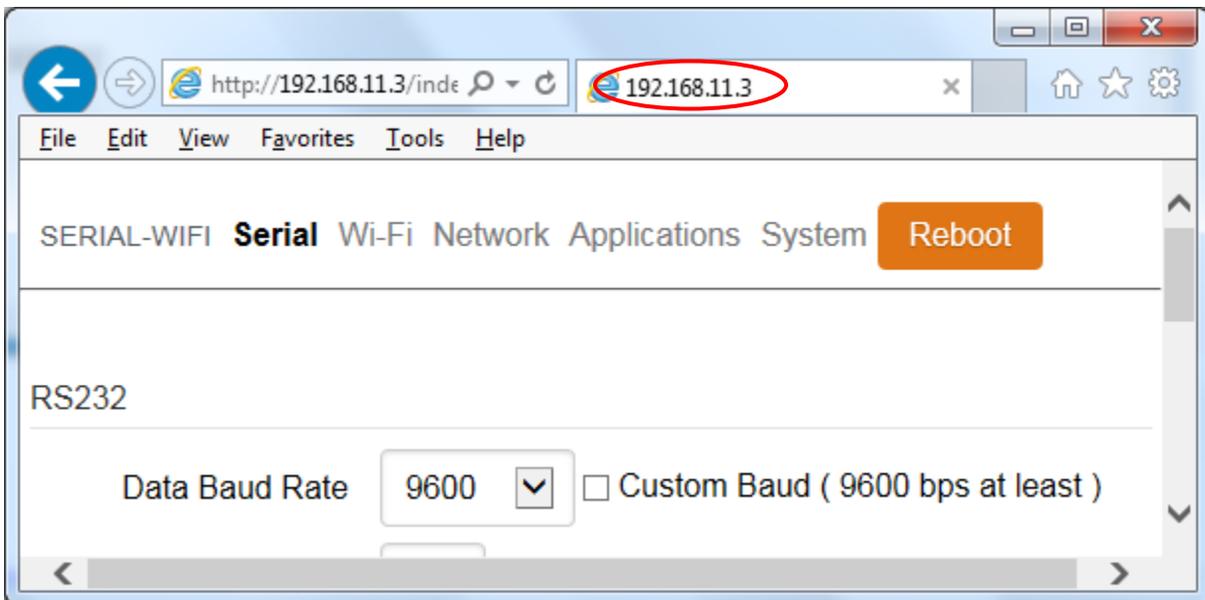
Reset the adapter to make sure it has all default settings. Login to the adapter via an access point. Once you have logged in, go to the “Wi-Fi” menu and change the WiFi Mode to “Station”. Then click the “Scan” button to scan for a wireless router. Select the wireless router once the adapter finds it and then select the security protocol and enter the password. Click “Save” and “Reboot” and then power cycle the adapter.



After the adapter restarts from the power cycle the wireless router will assign an IP address to the adapter. You now need to find out which IP address has been assigned to the adapter. The easiest way is to login to your wireless router's status page to see which IP address has been assigned:



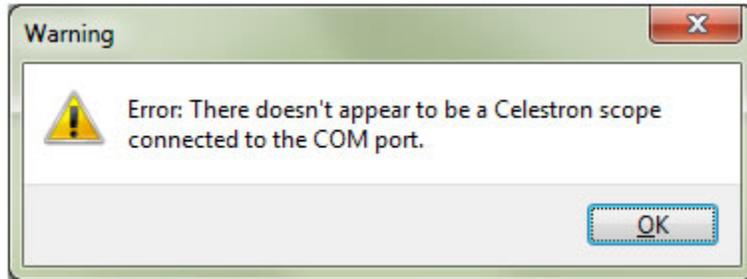
Since our wireless router in this case has an IP address in the 192.168.11.xx range the IP address assigned to the adapter is 192.168.11.3. We can now login to the UCW232C:



If logging into your wireless router is not an option then you can use an IP Scanner to find the UCW232C. We recommend "Advanced IP Scanner" <http://www.advanced-ip-scanner.com/> which is free and easy to use.

Known Issues

If you are getting this error when you try to connect:



then there might be several causes and solutions:

You have either connected the serial adapter incorrectly or the baud rate was not properly set or the virtual COM port has not been successfully created.

For the two first reasons you will need to recheck your setup and confirm that the serial WiFi adapter's baud rate actually is 9600.

If the serial virtual COM port for some reason has not successfully been created a computer restart can help. Check the COM port number after restart. If this does not help, try and delete the virtual COM port and recreate it using the USB-VCOM software.