

StellariumScope User's Guide

Original Version 2007.12.10, Scott Pinkham – ByteArts.com

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Recommendation for Updating to New Versions of Stellarium

There are often problems created when moving to an update version simply because old settings are left behind. Please consider doing the following:

1. Use the option Delete INI files from the StellariumScope options menu.
2. Then start and stop Stellarium at least once so that it can create appropriate initialization files.
3. Then use the [Update Stellarium Configuration] button on the StellariumScope main window.

In extreme cases try:

1. Uninstalling the previous version of Stellarium
2. Remove the Stellarium folder from the user folder. It will be recreated the next time you start Stellarium.

On Windows 7 & 8, the folder could be found in

`%appdata%\Stellarium`

Note: The Application Data folder may be a hidden folder and you will need to adjust your folder options to display hidden folders.

For other operating systems, try using

Options | Display INI path & File Names

from within StellariumScope to locate the appropriate folder

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1. Overview

This program works in conjunction with the [Stellarium](#) planetarium software and the [ASCOM](#) telescope drivers to control a telescope that is connected to your Windows PC, allowing you easily pick an object and have the telescope move to point at that object. It can also be used to “synchronize” the telescope's position (RA/Dec) to a known object's position.

2. License

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3. Requirements

- Windows XP/Vista/7/8
- It has been reported to work on Windows 10 but the developer cannot confirm this.
- ASCOM telescope drivers and the required cable to connect your telescope to your PC. You can download the ASCOM package at www.ascom-standards.org. You can use the software without a telescope by choosing the “Telescope Simulator” driver.
- Stellarium software. You can download Stellarium from www.stellarium.org.

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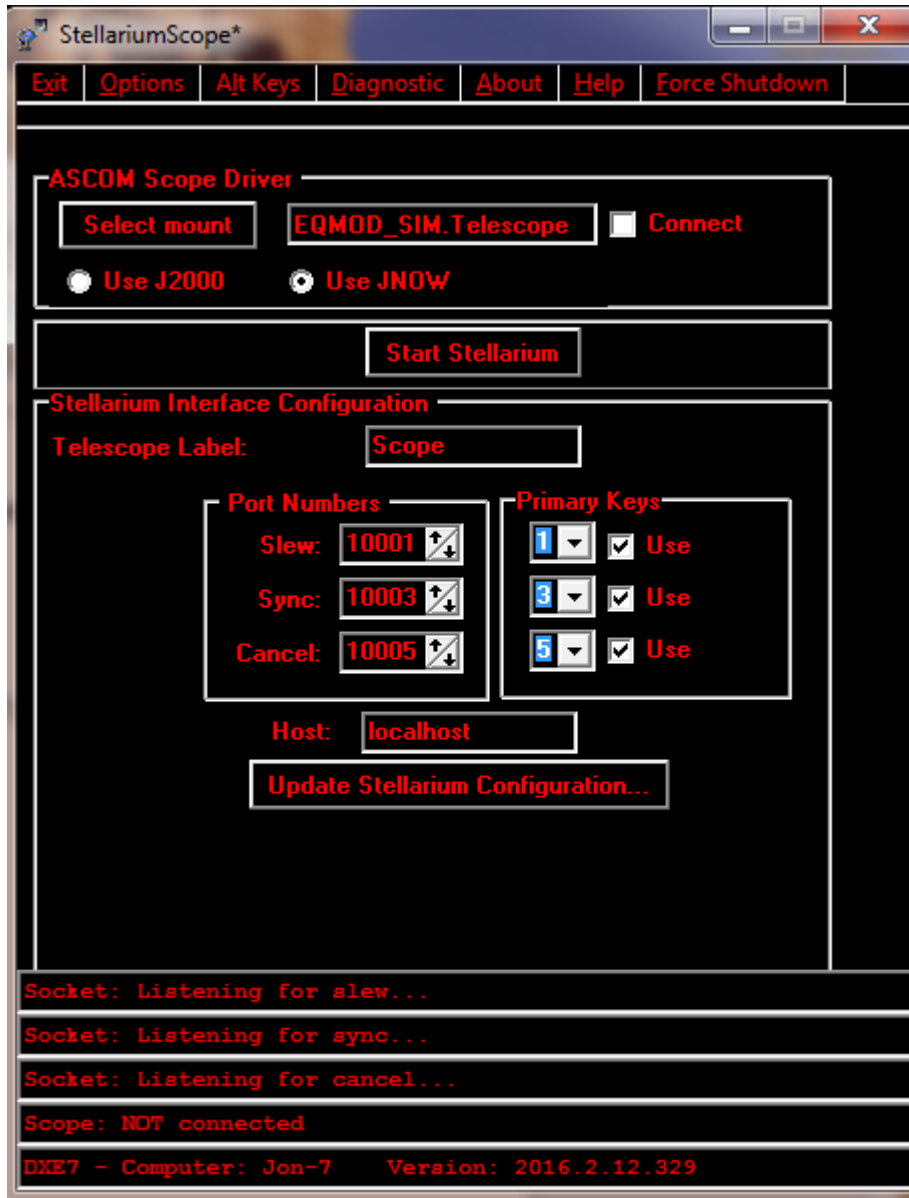
4. Installation

Before installing the StellariumScope software,

- install the ASCOM drivers for your telescope
- install Stellarium software.
- run Stellarium at least once so that it can create appropriate initialization files.
- download and install the StellariumScope package from www.welshdragoncomputing.ca under the menu item “StellariumScope”. An older version of StellariumScope that you might prefer is still available at ByteArts.com

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When you run StellariumScope you will see a window similar to the following:



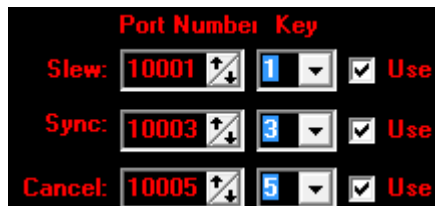
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5. Stellarium Configuration

By default, telescope control is not enabled in Stellarium, so you need to configure it and this accomplished automatically **from within StellariumScope**.

6. Stellarium Automatic Configuration (essential items)

The following information shows a number of settings with respect to Stellarium that can be made automatically. The settings with respect to the ports used for communication are essential (otherwise it won't work!).



Stellarium and StellariumScope communicate with each other using a TCP/IP connection called a "socket". While this type of connection is normally used by computers to communicate with each other across the Internet, it is also used by software programs on the same computer to "talk" to the each other (as in this case).

10001 & 10003 & 10005 are the default TCP/IP port numbers that are used for the connection to the Stellarium program. These can be changed if they conflict with other ports used on your computer.

The default keys used to control slew, sync and cancel are Ctrl-1, Ctrl-3 & Ctrl-5. You can use the drop down to select any keys from 1 through 9. The choice of these keys is limited by Stellarium. StellariumScope has no choice but to use this range of keys.

However, the current version of StellariumScope allows you use additional alternative keys for these (and other) functions. The alternative are sometimes easier to use since they may be a single rather than a control key and used with a second. Key.

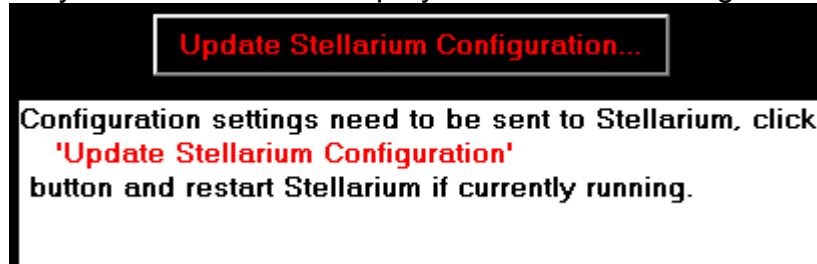
If you don't need a function to be activated (such as sync or cancel), simply uncheck the "Use" checkbox. In particular, EQMOD users with a gamepad should program a button on the gamepad for the synch process.

For any changes, remember to update the Stellarium configuration by using the **[Update Stellarium Configuration]** button. This is also necessary for the first setup to activate the connection between Stellarium and StellariumScope (see below).

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6. Stellarium Automatic Configuration (continued)

The very first time you use StellariumScope you will need to configure Stellarium.



- Simply click the **[Update Stellarium Configuration]** button to set the correct configuration for Stellarium to communicate with StellariumScope.
- You will be informed about the location of the *config.ini* file that is to be changed.
- Information will also be written to the file *telescopes.json*. This file is typically in a sub-folder of the above folder (*modules\TelescopeControl*)

Making any future changes to the port number, key number or enabling/disabling will also require an appropriate change to Stellarium (accomplished by using the **[Update Stellarium Configuration]** button).

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7. Automatic Setting of Other Optional Stellarium Settings

There are several other optional Stellarium settings that can be configured. You can make all or some of the following changes but you must click the

[Update Stellarium Configuration]

button and restart Stellarium (if it's running) after you have changed the options.

Once your telescope is properly connected, Stellarium will display its position. You can choose the label that is displayed.

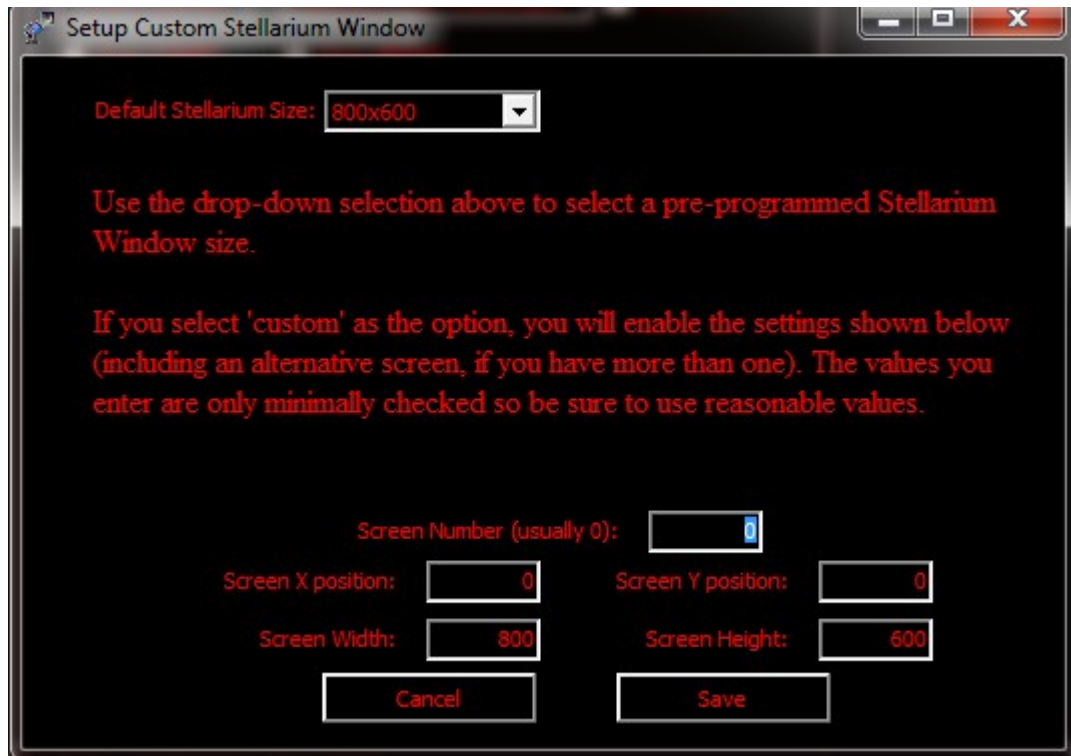
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Stellarium Window Size

The Stellarium window appears in several different formats. The default mode fills the screen without any borders or top title bar. However, you can select a reduced size in a traditional window format by selecting:

Options | Setup Stellarium Custom Window

In addition, you can specify the location (including a 2nd monitor screen if you have one).



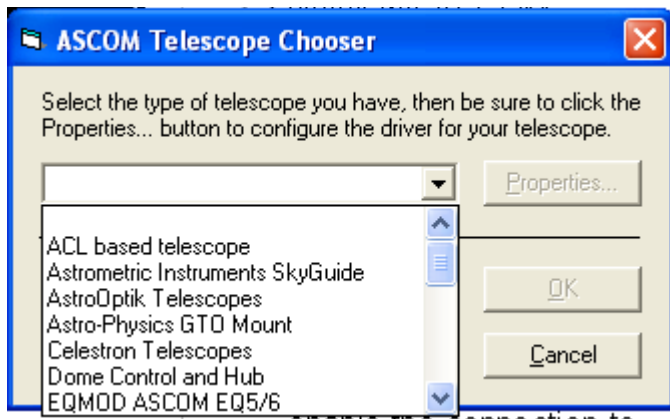
Important:

For any of the above settings to be applied you must

- a) ***click the [Update Stellarium Configuration] button***
- b) ***restart Stellarium if currently running.***

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8. Scope Driver Setup



- Connect the telescope to the computer and power on the telescope
- run StellariumScope
- select the ASCOM telescope driver by clicking on the [Select Mount] button in the ASCOM Scope Driver box. The ASCOM Telescope Chooser dialog box will then be displayed allowing you to select and configure the interface with the telescope. Once you have selected your mount, you may need to use the [Properties] button to configure the control port, data settings etc.
- Check the “Connect” box to enable the connection to the telescope.
- Click on J2000 or JNOW as appropriate. You can change back and forth at any time although you will have to update the Stellarium configuration if you change the setting

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9. Starting Stellarium

[Start Stellarium] button or you can start Stellarium from any of the associated Windows icons. *Please note that if you have a folder window open with the name 'Stellarium' there may be issues with conflicting names.*



You can also choose to have StellariumScope automatically run the Stellarium program whenever you run StellariumScope:

Options|Auto Start Stellarium

10. StellariumScope Main Menu



The main menu is essentially self-explanatory.

1. Many of the options are explained below
2. Alt Keys allows certain keys to be used along with the existing control keys. Selecting keys other than Ctrl or Alt key combinations allows “one finger” control.
3. the diagnostic menu item checks the configuration of Stellarium against the StellariumScope settings
4. About menu item provides some basic information about the current StellariumScope version
5. the Help menu item displays this PDF
6. The [Force Shutdown] menu item is an emergency close-down of StellariumScope. It should be used with extreme caution as it does no cleanup of the computer environment and may leave your mount slewing or tracking in an unpredictable way.

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11. Other StellariumScope Options



You can change the frequency at which StellariumScope queries the telescope position by selecting “Set Poll Rate” from the Options menu and entering in the polling interval in seconds. Keep in mind that if the poll interval is too fast then telescope may not be able to respond in time and/or may return spurious values. If the interval is too slow, then the telescope position displayed in Stellarium will update slowly.

You can also choose to change the Stellarium start up command line from the Options menu. This would be useful for cases where you have more than one version of Stellarium installed. Perhaps you have installed Stellarium 0.13.x in (say) folder Stellarium2 and you want StellariumScope to start version 0.13.x even though version 0.11.x is installed in folder Stellarium.

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You can display the path and file name that StellariumScope has calculated in order to find folders used for configuration. There are so many varieties of installation, StellariumScope may not figure out the correct location. Looking at this value will help you diagnose issues of configuration.

The “Delete INI files” options is of particular interest when you have configuration issues. By starting fresh most issues are usually solved. After you delete the files, you have to run Stellarium at least once (and then close it down). You will then need to use the StellariumScope **[Update Stellarium Configuration]** button.

You may wish to hide the update message that appears below the **[Update Stellarium Configuration]** button. This would possibly be the case if you have manually setup Stellarium but StellariumScope doesn't know this and reports the need to perform an update. As well, you would probably want to to disable the “Disable Initial Diagnostics”.

The remaining settings are purely optional and can help with automation of of the various windows as well as custom colours.

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12. Controlling the Telescope

Once the software has been configured, you are ready to control your telescope using Stellarium! Just follow these steps:

1. Power on the telescope and connect it to the computer.
2. Start the StellariumScope program and click on the "Connect" box to enable telescope control. Check the status bar at the bottom of the window and make sure it says "Scope: Connected".
3. Run Stellarium (if it's not already running). Check the status bar at the bottom of the StellariumScope window and make sure it says "Connected" for Slew (and probably), Synch & Cancel
4. Click on an object in Stellarium, then press **<Ctrl+1>** (the control key and the 1 key together). *Note: This is the default key for slew... use the key that you have defined.* The scope will slew to the object. You can cancel the slew by pressing **<Ctrl+5>** (if the feature is enabled). Again, use the key that you have defined.
5. You may then need to adjust the scopes pointing. Use the appropriate controls on the mount and then synchronize the mount to the current object by clicking **<Ctrl+3>** (the control key and the 3 key together). The telescope is not actually moved, but the RA and Dec coordinates of the scope are set to match the object.

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13. Using Two Computers

There are at least 2 methods that work so that you can have a computer (your 'observatory' computer) connected to the mount and a second remote (your 'house' computer) as your master control computer.

Method One:

This method uses VNC control software installed on both computers so that your 'master' computer can control every action of your 'observatory' computer. Effectively, you will be sitting in front of the 'observatory' computer while working with your 'house' computer.

The appropriate software is available as a free application. One such version is available at: <http://www.uvnc.com/>

Using uVNC the following are some guideline steps for installation:

The computer to be controlled ('observatory') is considered to be a server and the control ('house') computer is considered a viewer.

1. download appropriate versions of uVNC (32 bit vs 64 bit). Note: you may have a mix of 32 bit and 64 bit computers... not a problem... just install the correct version of uVNC on each computer.
2. On 'observatory' computer, set up a fixed IP address.
3. On 'observatory' computer, install the appropriate version of uVNC (32 bit vs 64 bit).
 - o select just the server (no viewer etc)
 - o register as a service
 - o create desktop icons
4. the uVNC service will be installed and started automatically
5. You must set a password before you will be able to connect remotely.
 - o in lower right tray, right click the VNC icon
 - o click Admin Properties in the popup menu
 - o under authentication enter a VNC password of your choice.
 - o clear the View-Only password
 - o click OK
6. On the control ('house') computer install the appropriate version of uVNC (32 bit vs 64 bit).
 - o select just the viewer (no server etc)
 - o create desktop icons
 - o start UltraVNC viewer (not UltraVNC Launcher)
 - o enter IP address of the server (controlled) computer
 - o enter the password
 - o you're connected.

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Method Two:

This method uses just StellariumScope. This means that the 'house' computer will control the mount but will not have any access to other controls on the 'observatory' computer.

As long as Stellarium knows the IP address of the computer where StellariumScope is located and you have allowed traffic through any firewalls, it works quite well.

Let's assume you have a 'house' computer and an 'observatory' computer'

1. Install StellariumScope on both computers
2. The 'observatory' computer will have StellariumScope, ASCOM and connection to your mount.
3. Set the IP address of the 'observatory' computer to a fixed value such as 192.168.1.200. (the actual value will depend upon your local network settings).
4. Configure StellariumScope with the same options on both computers
5. Use StellariumScope on the 'house' computer to modify the "Host" entry from 'localhost' to the IP address of the 'observatory' computer not the IP address of the 'house' computer. Not: the Host setting on the 'observatory' computer is ignored so just leave it as 'localhost'.
6. Use the [Update Stellarium Configuration] button on the 'house' computer to setup Stellarium.
7. Close down StellariumScope on the 'house' computer. It's only needed for the initial setup of Stellarium. You not need to use it again unless you need to change some settings in Stellarium.
8. Start up Stellarium on the 'house' computer.
9. Start up StellariumScope on the 'observatory' computer.
10. Connect the mount to StellariumScope. You should see the connections reported in the lower messages on StellariumScope.

Here are some reasons that Stellarium will not communicate with StellariumScope when 2 computers are involved.

1. The StellariumScope/telescope driver computer has been rebooted with a new/different IP address.
2. The control keys defined for StellariumScope do not match the control keys defined for Stellarium.
3. The ports defined for StellariumScope do not match the ports defined for Stellarium.

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14. Problems

Most difficulties typically relate to the configuration of Stellarium not matching the StellariumScope setup. If you have difficulties making Stellarium control your telescope you should:

1. confirm the settings you have selected for StellariumScope. The critical ones are the ports you have selected for control and the ASCOM scope driver.
2. Then click the **[Update Stellarium Configuration]** button.
3. Then restart Stellarium.

These steps make sure that Stellarium and StellariumScope agree on their communications protocols.

For hard to solve cases try:

1. delete the INI file using the menu option in “Options” or
2. delete the config.ini file in the Stellarium folder stored in the user's folder (not the Programs folder). Use:
Options | Display INI path & File Names
from within StellariumScope to find the folder.
3. Run and stop Stellarium at least once. The *config.ini* file will be recreated with default values.
4. Start StellariumScope and set options
5. Use the [Update Stellarium Configuration] button
6. Start Stellarium.

NOTE ABOUT FIREWALLS: If you have a firewall enabled, then you could possibly see a warning when you run StellariumScope – in this case, you should “unblock” StellariumScope in your firewall software, otherwise it will not be able to communicate with Stellarium. StellariumScope does not send any information over the Internet. In most cases the firewall will not be an issue and no settings will have to be changed.

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15. Uninstalling StellariumScope

To uninstall StellariumScope use the Windows “Add or Remove Programs” option. You may also have to manually remove the following folder:

C:\Program Files\ByteArts\StellariumScope

You may also have a left-over file called StellariumScope.ini in the Stellarium configuration folder.

If you continue to use Stellarium without StellariumScope, you will have to manually remove the 'telescopes' using the Stellarium configuration option.