

C2A for Pulsar2 – how to control your telescope from C2A

C2a is a free and powerful planetarium program available from <http://www.astrosurf.com/c2a/english/> that offers native support for Pulsar2 without any additional driver.

Pulsar2 is a universal telescope driver electronics. <http://www.geminitlescope.com/gemini-german-fork-mounts-optics-goto-products/>

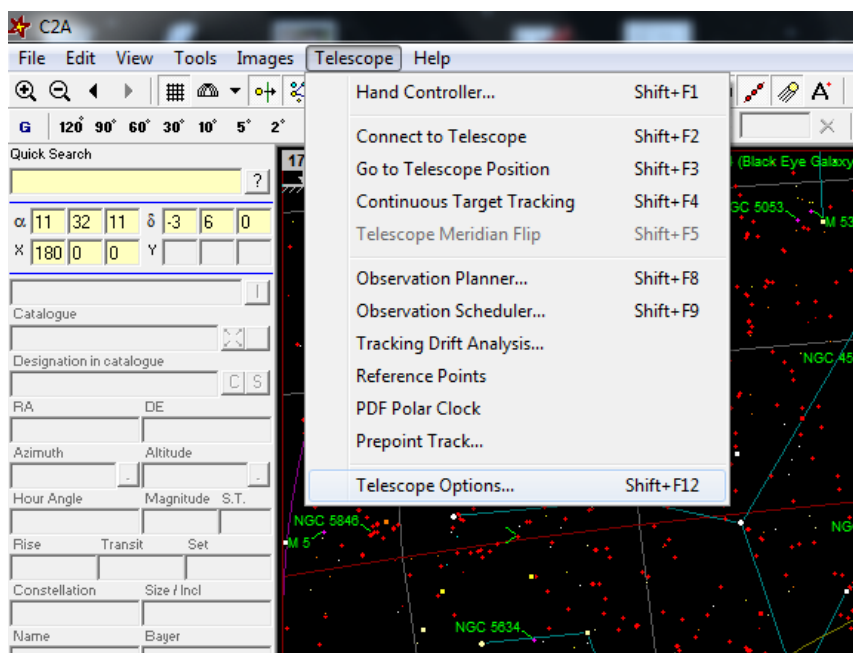
This manual describes the following :

- connecting Pulsar2 to the PC
- establishing a connection between C2A and Pulsar2
- the basic settings necessary for correct functioning
- the functions of the embedded virtual hand controller of C2A
- polar alignment with C2A

Use a type A-B USB cable to connect to the computer (For more options see the Pulsar2 manual). In Win8 and above Pulsar2 should be plug and play, under win7 needs a driver available from the Gemini downloads page. We recommend using Win7 on your dedicated astronomy PC to avoid digital signature problems.

Once the port has installed, C2A will automatically find Pulsar2.

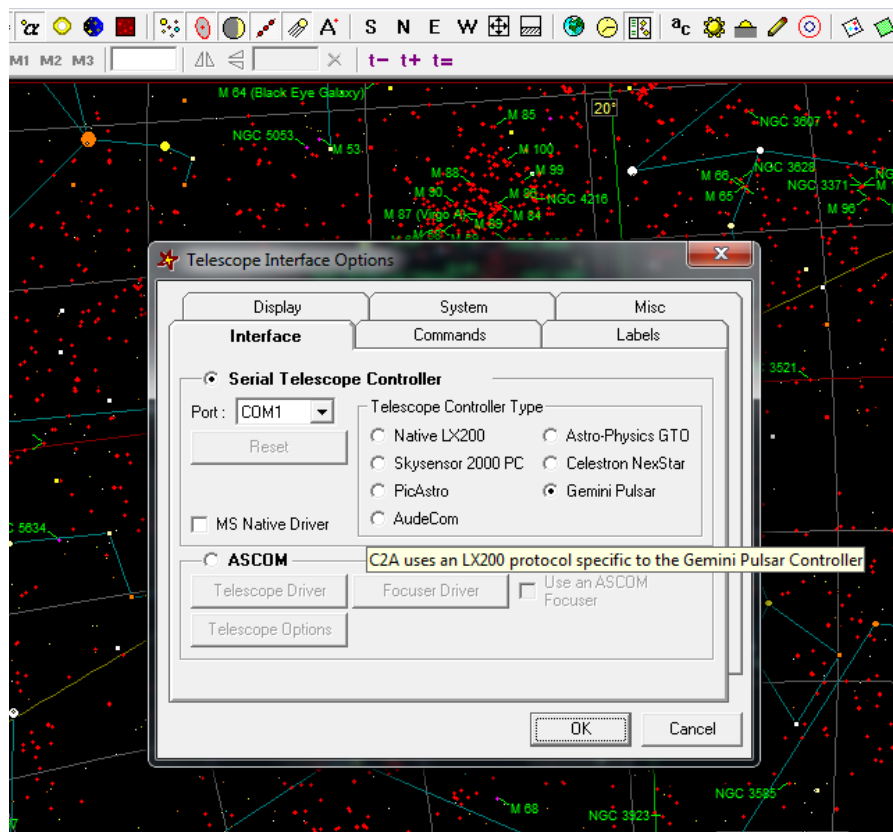
Install C2A if not installed yet.



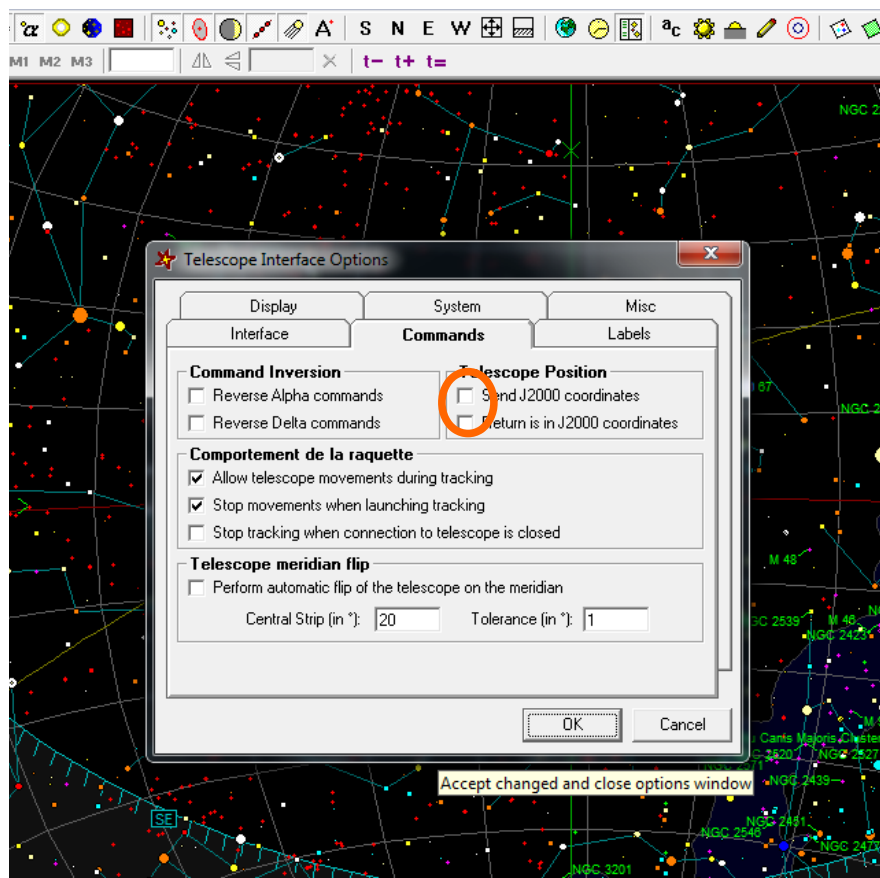
Open the **Telescope/Telescope Options** Menu as shown above.

Click on the **Interface** tab and set options as seen below

You do not have to set the port number for a USB connection. C2A will find the respective port automatically. (if it does not, reopen the Options menu to make C2A scan the ports)

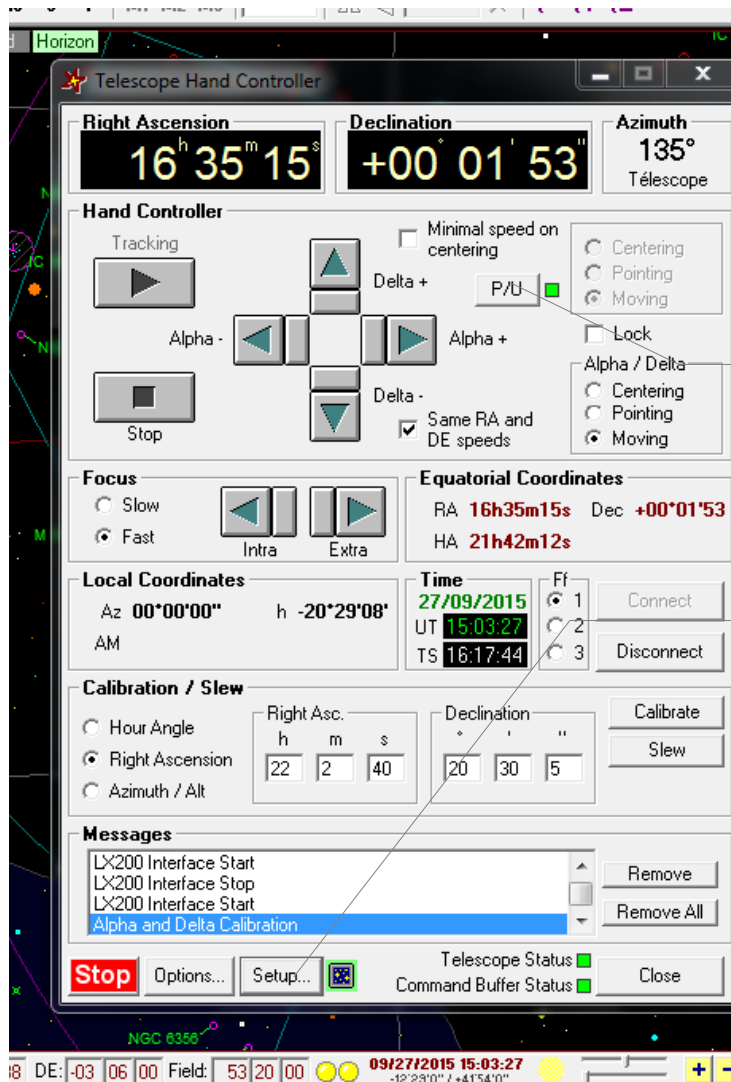


Next click the **Commands** tab and make sure to uncheck *SendJ2000* and *Return is in J2000*



Click [Telescope/Connect to Telescope](#) to establish the connection.

To check the connection, open the [Telescope/Hand Controller](#) menu and compare the Ra, Dec coordinates with those on the Pulsar2 hand controller. If they match you have a connection.



Click to Park or Unpark Pulsar2

Click to reach Pulsar2 settings



Click on these tabs to reach the various settings of the Pulsar2 menu

You can use C2A for a precise polar alignment, using the so called King method. You need to :

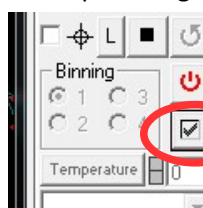
- have your mount roughly polar aligned
- have tracking enabled
- have free view of the pole (North or South)
- have a CCD camera driven by MaximDL, with a field of view of at least 10'x10' or larger
- know the pixel scale of your imaging setup (arcseconds/pixel) You can get this by plate solving an image in Maxim or calculate it if you know the pixel size of the CCD and the FL of the telescope. You can find a calculator on the internet.

Start MaximDL and connect to the CCD camera.

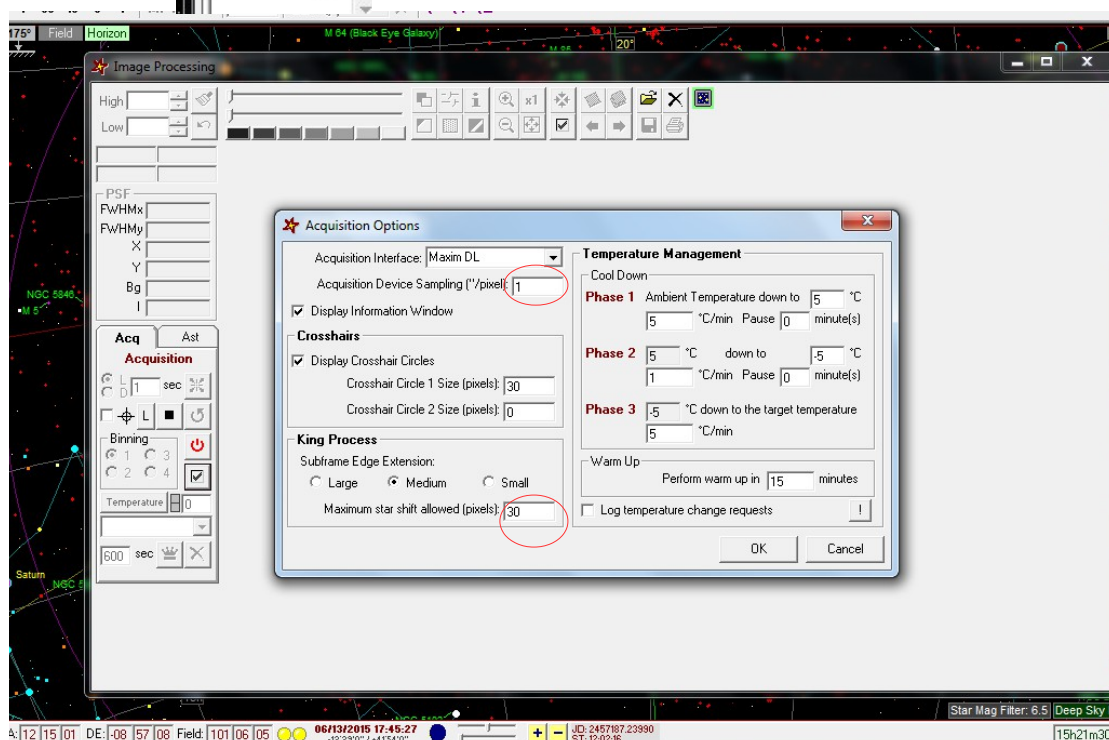
Connect the telescope to C2A and point at a star about 1 degree from the pole. The precision increases as you point closer to the pole. It is not necessary to know the exact position where the telescope is pointing.

Hit F11 in C2A to access the polar alignment menu.

Click the check mark



to bring up the settings dialogue box



And enter your pixel scale (red ellipse) and 30 as star shift limit.

Set the exposure time and the delay between exposures (60-600 sec, start with a smaller value).

Click the Crown to start the process. A dialog window will pop up and give instructions.

What are you doing actually?

Frame a star near the pole and take a short exposure.

C2A will ask you to draw a rectangle around the star.

After a delay of a few minutes (set by the user) the exposure will be repeated. You will draw a rectangle around the new position of the SAME star.

C2A will calculate the polar error from the star drift and place a blue circle on the image and start a continuous image acquisition. You will have to move the mount elevation and azimuth screws until the star is in the circle.

Hint: move the adjustment screws a fraction of a turn only, until you are not sure about the correct direction in which you have to move. Otherwise you will lose the star from the field or confuse it with other stars in the field.

Possible errors.

A saturated star fouls C2A centroid calculation. Reduce exposure time and check the saturation in MaximDL beforehand.

The drift during the delay is larger than the pre-set limit. Increase the limit or decrease the delay between exposures.

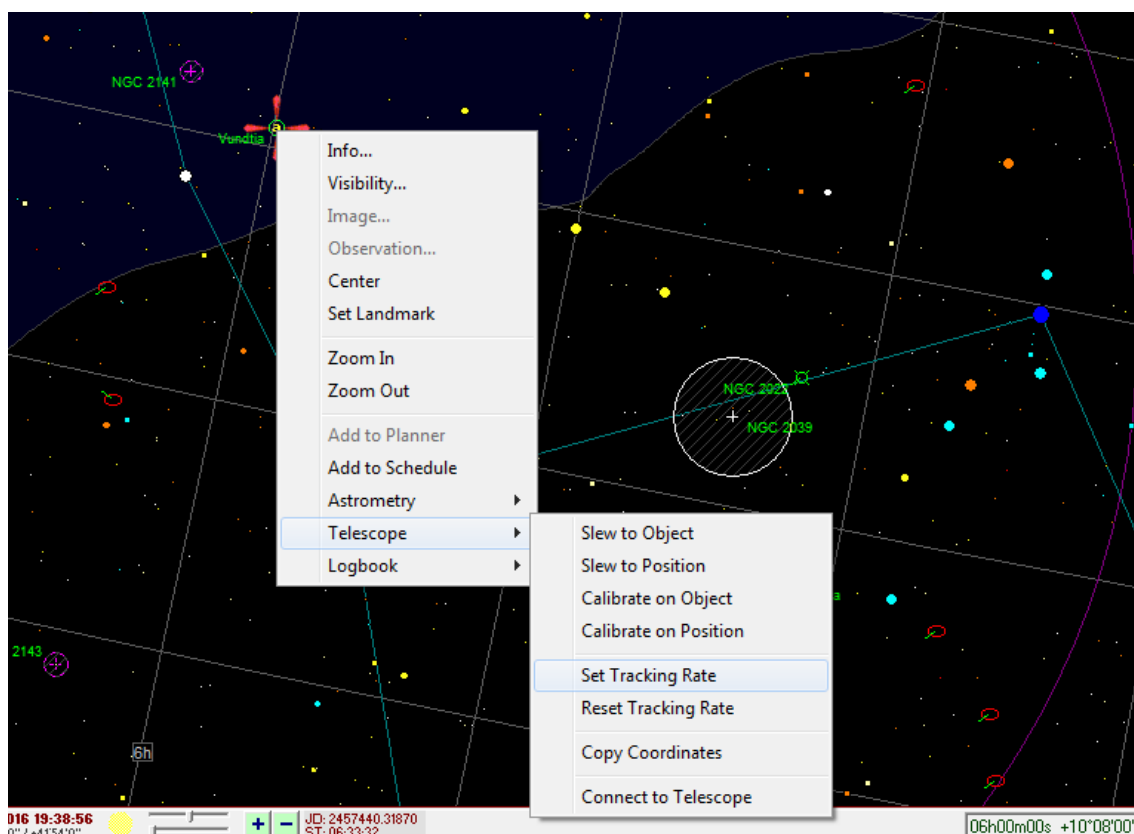
The polar error is large and the target circle is outside the CCD field. The circle will be placed at the edge and you have to iterate until it is inside the field.

The complete instructions to use the king method are here:

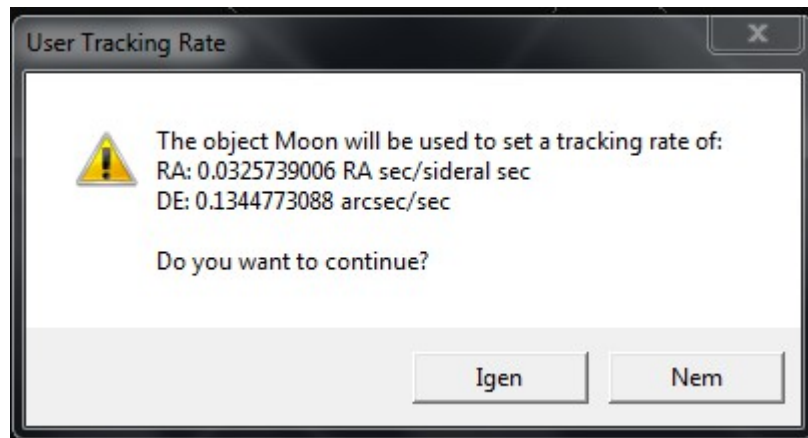
http://www.astrosurf.com/c2a/english/support/help/Html/Acquisition_d_images_et_methode_de_King.htm

How to track Solar System bodies with C2A

To use the command, select a Solar System object, (planet, Sun, Moon, asteroid, comet) in the map (asteroids and comets can be displayed through the Asteroid & Comet tool) with the mouse right-button, as shown below.



Select the sub-menu "Telescope" in the contextual menu then click the command "Set Tracking rate".

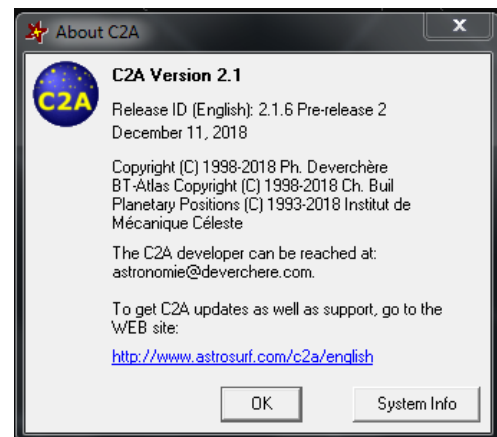


A message that summarizes the calculated RA and Dec tracking rates will be displayed, if you click yes, the Pulsar2 controller will be updated. You finally get a message to confirm the command was successful.(not present under ascom) If you want to reset the Tracking Rate to zero, you can use the command "Reset Tracking Rate" on whatever object in the map or use the Set Tracking Rate on a star.

This feature is available also if you connect to C2A via the ascom driver (preferably via the Generic HUB, otherwise the Pulsar2 will be available to one program at a time only.).

You will need the latest Pulsar2 ascom driver (ver 2018r1) and ascom platform 6.4

You need C2A version 2.1.6 or higher.



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