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EQ Mod FAQ Finder / Listing

1. Should I make the mod to my mount and why?

I'm a new owner of an EQ6 (Orion Atlas) mount. It is mounted on a pier and holds my Apogee 4" and ED80 refractors. I am using a SBIG ST2000XCM camera for images and autoguiding. My laptop is running windows vista and I use CCDSoft 5 and TheSky 6 Pro to drive the mount through the hand controller.

I guess my question is should I make the mod to my mount and why? What does the modification do that I can't do? I would consider the adapter from Shoestring but I'm not sure of everything it will do. What am I not getting from the mount that I can get with the mod?

Thanks in advance for your help.

Rick

Hello Ricky,

Two reasons:

Accurate gotos/tracking and pinpoint guiding. Its the choice of algorithms that were used to implement these functions which made them possible.

The following are sample images captured using the mod:

<http://eq-mod.sourceforge.net/testimages>

Also because your setup is pier mounted, once we have the full n-star alignment capability, your alignment data can be saved/restored without the need to align on the next observation/imaging session. PEC also is in the works which will allow the user to "customize" the PEC curves for accurate tracking.

2. How do I Install It?

- a. "The user's manual would be written once the specs are finalized.

Currently the driver is evolving with a lot of new features."

- b. Download the latest ASCOM Drivers.

<http://ascom-standards.org>

"I have the ASCOM drivers on board and have downloaded EQMOD 1.07e, unzipped and clicked on register. Nothing showed up at first, but after unregistering and doing it a couple more times and clicking on EQMOD.exe (which told me it wasn't a standalone program), I finally have "EQMOD ASCOM scope driver" listed in PHD which starts up just fine."

- c. "It this all I have to do to give it a try? What's all that other stuff (and there is lots of it) in the unzipped ASCOM folder that I downloaded and do I need it?"

1. Only two files are needed for the actual execution;

eqmod.exe eqcontrl.dll

2. "As for the ASCOM files, the other program that you might need to use is POTH. Its an ASCOM hub that allows you to connect multiple ASCOM compatible programs such as PHD or CDC to the same eqmod driver. You can do this by executing POTH first then connect it to EQMOD. Then at PHD and CDC (or any ascom compliant planetarium application), choose POTH as the driver. Connect PHD first to POTH then your planetarium application to POTH also. POTH also has an ASCOM traffic logging facility. It will allow you to view all communications passed by PHD or CDC to EQMOD."

Hope this helps.

Mon

Hi Shevill,

Pulseguide commands are sent on the same EQDIR connection.
Typical data path for an autoguiding/goto setup would be;

Planetarium app --> ASCOM --> eqmod --> eqdir --> mount
+
Autoguiding app --> ASCOM --> eqmod ---> eqdir --> mount

In this case, both planetarium app and autoguiding application are connected to eqmod and can send simultaneous commands to the eqmod driver.

With the above setup, specific types of traffic are present in the ASCOM connection;

- ASCOM Mount Coordinate retrieval and display (planetarium)
- ASCOM GOTO/SYNC (planetarium)
- ASCOM Pulseguide autoguiding (autoguider app)

Another option would be to use an ASCOM HUB called POTH;

Planetarium --> ASCOM --> POTH --> ASCOM --> eqmod --> eqdir --> mount
+

Autoguiding --> ASCOM --> POTH --> ASCOM --> eqmod ---> eqdir --> mount

In this setup, POTH consolidates all ASCOM commands sent by the planetarium and Autoguiding application into one stream of commands and sent to the eqmod driver.

That advantages of POTH is that it allows you to log traffic and it doesn't shutdown the eqmod driver (as in the case of the first option) if in case one of the connected app goes down or attempts to reset the connection.

POTH can be found at the ASCOM installation directory or it can be executed from the windows start --> Programs -> ASCOM Platform --> POTH.

Hope this helps.
Mon

3. Register and Reregister did NOT work, What Next?

- a. "Kindly confirm if the path where the eqmod driver is installed also contains the other ascom driver such as the ones for meade, celestron, etc.

Also, one way to register the eqmod app is to double click on the eqmod.exe program itself at the ascom installation directory. A popup window will appear just ignore it and the program will exit. Once this is done, kindly check again on the ASCOM Telescope Chooser window if the EQMOD driver will appear in the telescope driver list."

- b. "When you register the eqmod driver, what it does basically is it copies both the eqmod.exe and eqcontrl.dll program to the ascom installation directories. Once it is registered, you can invoke it from the planetarium software's (Starry Night or Cartes du Ciel) telescope chooser."
- c. "We will come up with a more automated way of installing things to their proper location.

In the meantime, please edit these file (register.bat, reregister.bat, unregister.bat) accordingly based on the location of your installed windows."

1. NOTE!

"There are actually other issues on why all the ascom helper files are placed under "Common Files" instead of placing on its own standard directory. Anyway, the ASCOM developers are already taking steps to standardize this. Eqmod will then have to be adjusted based on their new standards."

regards,

Mon

4. Do I have to MODify my hand controller?

a. No.

Adapters for direct connection to the EQG / EQ6 / SYNTA / ATLAS / EQ5 mount without the hand controller are available from

Shoestring Astronomy (USA) or Pierro Astro (EU).

<http://www.store.shoestringastronomy.com> <http://www.pierro-astro.com>

"If you are planning to use Shoestring Astronomy's EQDIR, it already comes with a cable or you can buy the cable yourself. Depending on which side you will connect the EQDIR module. Assuming your PC has a DB9 serial port, you will need a DB9 serial cable. If you have a DB25 serial port, you will need a DB9 to DB25 serial cable."

5. I know I have to set the location in EQMOD and the Planetarium program.

What about GPS?

a. "For the GPS units;

Both of these GPS units will work. For these to be able to communicate properly with the test codes / eqmod driver, you need to activate NMEA protocol on each of them. Please refer to their respective user's manual.

You need to have at least two COM ports to be able to use the EQMOD driver side by side with the GPS unit. If you only have one COM port, one possible option is to use a USB to serial adapter on the GPS unit."

6. I have a good polar alignment, What's next?

- a. If you do NOT have a good Polar Alignment try...Polar Finderscope

<http://www.electra.psychol.ucl.ac.uk/jason/astro/>

- b. "Sequence should be;

1. Connect CDC to EQMOD
2. Click 1 Star on EQMOD setup (Alignement window will be displayed)
3. Initiate GOTO to alignment star using CDC (See *note below)
4. Accept button will activate at this point. Wait for the GOTO slew to complete, then center the star on the scope's FOV using the joystick, slewpad, or slew buttons.
5. Click Accept.

* Eqmod will intercept the GOTO command on the planetarium software while the alignment window is active in order to capture the alignment star coordinates

As for the joystick, click the "Joy" button on the eqmod window to activate the joystick scan routine. After this you may have to click any of the joystick buttons or move the stick to allow the driver to detect the presence of the joystick."

7. Is Park / UnPark Necessary?

- a. "Yes park/unpark is very much necessary specially for fixed installations. The only issue right now is if we are to use the sync and align data to compute for 'Home' or "synced home" or just rely on whatever the stepper motor physical home position is. As mentioned, a "synced Home" may not be true always as we are constantly changing the delta sync values and to make it viable, we may need to inform the user to re-define the park position each time the sync values are changed. In the case of the stepper home position approach, the sync values are transparent to the stepper home location, and as a result. The park positions remain intact even if you chnage sync/align values. The drawback to this is that the home position would not always be the standard NCP/SCP location but some location equivalent to the position where the mount is at initial 'unparked' power up."

8. How do I start POTH?

- a. Poth can be executed at the ASCOM shortcut under the windows start button or at

C:\Program Files\Common Files\ASCOM\Telescope\Poth.exe

Execute POTH, click Setup, click choose scope then select the eqmod driver. Click "connect scope". At this point eqmod will start.

Then connect PHD and choose POTH. Then connect CDC to POTH.

Mon

9. I'm unsure about the "Synch" function in using EQMOD 1.07d and Starry Night Pro V4.05. Here is a list of my procedures:

1. Polar align the Atlas mount with the Polar scope.
2. Turn on mount power
3. Open Starry Night program
4. Click on the telescope tab in Starry Night
5. Click connect which opens the EQMOD ASCOM Driver software
6. A red EQMOD ASCOM crosshair appears in Starry Night over the NCP
7. Click on RESET ALIGNMENT Data and RESET SYNCH data in the driver software
8. Click on ONE STAR alignment button in the EQMOD software
9. Slew to the alignment star (say Mizar) by right clicking on it in Starry Night
10. The EQMOD ALIGNMENT TOOL pops up. I use it to center the alignment star in the center of the eyepiece FOV and hit ACCEPT.

The EQMOD ALIGNMENT TOOL disappears.

Now the mount tracks the alignment star with no trouble. I then do a GOTO slew to another star in Starry Night. It appears in the FOV of a wide angle eyepiece. I assume that I should now use the SLEW CONTROLS in the EQMOD software to center the star?

I also see that if I right click on the star in Starry Night, I can SYNCH with the star. What does this do? I assume it refines my alignment with respect to that star, possibly throwing my alignment off with the original alignment star? Is this correct?

I also see in the telescope tab of Starry Night that there is a SYNCH GAZE tab. What does this do?
Is it the same as the right click SYNCH function in Starry Night?

Answer...

Sync and Align work side-by-side. You can think of the Sync function as a fine-tuning alignment for the 1-star align. I have not tried experimenting with Starry Night's Sync Gaze tab.

I only use the Sync function of Starry Night and it works great.

Mon

10. A further follow-up...

For consistent results I do the following:

1. Put the scope in NCP home position (approximately... I'm doing this in the living room without a scope)
2. Start Starry Night
3. Turn on mount
4. Click the [Stop] button to stop tracking this load in the correct values for AltAz. If I don't do this the reported position of the scope is way off
5. Clear synch/align data
6. Select 1-star align
7. Slew to align star

This seems to work for me every time. The critical thing seems to be the clicking of the [Stop] button.

BTW I noticed when the scope is parked the values continue to change until the [Stop] button is clicked... then the Alt/Az values stop and point at the NCP

JonD

11. Is there a Simulator?

Is there any way to simulate the use of CDC and PHD through EQMOD ASCOM and POTH without being physically attached to the EQ mount?

I would like to become familiar with the way the software interacts with each other and the mount before I attach the mount. Without the mount attached the driver starts, but the software will not behave as though anything is happening, for instance in a slew or an alignment.

Hunter

Hello Hunter,

I have recompiled version 1.07e and made a simulator version of it.
You may download it at;

Files > EQASCOM > EQ_ASCOM_BETA_V107e_SIMULATOR.zip

EQMOD comes with a 'Developer's Simulator application that allows you to debug the modications even without a physical mount. You may use this to play around with the eqmod functions.

Enjoy!
Mon

If I "register" this version, will it overwrite and interfere with the 'real' EQMOD that I already have on my computer?
Is registering this version (just like the regular version) how I use it? If not, how?

Hunter

Use the reregister.bat of the simulator version.
It will overwrite the eqctrl.dll and exe file. If you need to re-install the non-sim version, just execute the reregister.bat bundled with thhe non-sim version.

Mon

Bottom line, I can't get CDC and the driver to communicate to try a mock alignment either with the sim driver or the real driver.

Hunter

Hello Hunter,

Please download 'mschrt20.ocx' from the net and copy this at the windows/system32 directory. This should fix the problem.

'mschrt20.ocx' is an ocx program that is used to display two pie charts on the simulator. The piecharts represent the ra / dec shaft position of an emulated mount.

Mon

12. Pulseguide start procedure Question

Mon:

This is what I have discovered, and seems to work.

1. open POTH (BUT, Do not connect to EQMOD)
 2. open PHD Guiding
 3. Connect to scope (POTH) using PHD Guiding. At this point, POTH Appears to connect to EQMOD Automatically and shows the scope as on line and tracking. And, PHD Guiding appears to also be connected. At least it shows "EQMOD ASCOM DRIVER" on the status screen of PHD Guiding. So I'm assuming PHD is properly connected for Pulseguiding. However, I will need nighttime skies to confirm all is OK.
- Is this the correct procedure for startup?? All I know for sure, is that it appears to be the only way, I can get pulseguiding to work for me.
- Paul

Ok. That is actually the first step. Then while PHD is connected to POTH, try also to connect CDC to POTH. Once ok, both PHD and CDC should be able to control the eqmod driver at the same time.

Mon

Just to confirm, Paul. I get exactly the same results using Mon's EQMOD ASCOM simulator program. If you just start PHD guiding with POTH listed as the driver, POTH starts and connects simultaneously. It seems that if you start POTH and connect to scope with POTH and THEN try to connect to POTH through PHD, it tries to start a second instance of POTH. I believe that may be the problem.

Starting CDC by itself and connecting to scope with POTH selected

does the same thing as starting PHD - POTH starts automatically.

If you start PHD first by doing it the way it works above (just starting the program without starting POTH first), then you can start CDC and hit "connect to scope" and it works no problem. HOWEVER, if you start CDC first and "connect to scope" and then try to start PHD by just starting the program as above, you get the error message and PHD will not connect.

Like This By Starting Order:

POTH Connect scope(OK)>CDC connect by POTH=OK

POTH Connect scope(OK)>PHD connect by POTH=NO

POTH Connect scope(OK)>CDC connect by POTH(OK)>PHD connect by POTH=NO

CDC Connect by POTH(OK)>PHD Connect by POTH=NO

PHD Connect by POTH(OK)>CDC connect by POTH=OK and
POTH driver panel is running and visible

SO if you are going to run both programs, the only viable combination is to start PHD by just starting the program with POTH listed as it's driver, and then starting CDC an just hitting "connect to scope" with POTH listed as it's driver in the preferences. DO NOT start POTH first before any programs.

That's how it works for me, anyway.

Hunter

I also discovered that POTH doesn't always close when you close PHD and CDC. It hangs around and isn't even visible unless you hit Ctrl-Alt-Del and see it in the applications list. I found this out when I shut down CDC and PHD and tried to restart things the right way (PHD then CDC) and immediately got an error message when trying to start PHD. I checked the applications list and there was POTH running. IT had stopped PHD from starting up.

It doesn't matter if you stop PHD or CDC first, it is a random event when POTH hangs around. So if you have trouble starting PHD on a second time, look for POTH still running in the background.

Another potential problem. Garrett says that using Starry Night, if you start PHD first, Starry Night sends nothing to the scope and the combo won't work. I assume that this is not using POTH to intervene between the two programs but by starting each program separately with EQMOD. How would it work with POTH? AND, how would PHD and CDC work when using each separately with EQMOD instead of POTH?

Hunter

13. How do I start up EQMOD and PHD and Starry Night Pro 5?

Step by step Startup Procedures for EQMOD, PHD and Starry Night Pro 5

1. Start Starry Night Pro (SNP)
2. Click the Telescope tab
3. Click [Connect]
 - a. The EQMOD interface will appear
4. Click [Stop] on Track Rate
5. Start PHD
6. Connect to Camera
7. Connect to Scope
8. EQMOD will start blinking
9. Return to EQMOD
10. Make sure scope is at home position, pointing approximately at Polaris
11. Click Setup
 - a. Click [Unpark]
 - b. Click [Reset Align Data]
 - c. Click [Reset sync data]
12. Click [One Star]
13. Switch to SNP
14. Select target for alignment
15. Slew to target
 - a. Right click on star and choose slew
 - b. Let the scope slew to the star
16. Switch back to EQMOD
17. Center the star in the finder using the [N] [S] [E] [W] buttons (or pad) on EQMOD
18. Click [Accept]

At this point, everything will be operational.

You can slew to your targets in SNP by selecting and choosing slew to...

You can center your object when you get there by using the [N] [S] [E] [W] buttons on EQMOD and then clicking sync in SNP.

GG

14. Why am I Having trouble Installing The Sky 6 and EQMOD?

EQMOD Installation Instructions by Gary Honis (eqmod msg # 1307)

Here I have documented my experience with installing EQMOD for use with TheSky6 planetarium software. The steps below were gathered from a collection of EQMOD Yahoo Group site messages posted here. It should be useful to someone wanting to know how to start with EQMOD. These steps can be followed even before you make any connections between the computer and EQ6/EQ-G Mount.

A. ASCOM INSTALLATION

Download latest ASCOM Platform at:

<http://ascom-standards.org/downloads.html#plat>

The file version at the time of my download was 4.1. It was a large file; about 14.5 MB.

Installation Steps:

1. Download "ascomXX.exe" (XX is version number such as 4.1) to temporary directory.
2. Exit all software and double click "ascomXX.exe" which is the setup program for ASCOM. There is no need to uninstall any existing version of ASCOM software.
3. The setup software may detect existing installed astronomy software and provide information during setup. For my installation, the setup software detected that I had "The Sky Astronomy Software" installed and I received the message "to allow The Sky to use ASCOM see the file: install.txt. The location of the file will be included in the file. Be sure to write down this location (path).
4. Upon completion of the ASCOM setup software a message will appear that the system will need to be restarted. Click OK to reboot computer.
5. After computer restarts, print any .txt files that the setup software announced in Step A-3 above. I opened "install.txt" for "The Sky" and it read as follows. My notes have been included in parenthesis:

<begin "install.txt">

TheSky ASCOM Plugin

=====

This plugin allows Software Bisque's TheSky to communicate with ASCOM-compliant telescopes via TheSky's "TeleAPI" feature.

Installation

(1) Rename the file

C:\Program Files\Common Files\System\TeleAPI.dll
to TeleAPI-Original.dll

(2) Copy the ASCOM TeleAPI.dll to

C:\Program Files\Common Files\System\TeleAPI.dll

(My note: The location of the ASCOM TeleAPI.dll to copy in Step (2) is C:\Program Files\Common Files\System\Telescope\Planetarium Plug-Ins\TheSky\TeleAPI.dll)

One-time Telescope Setup

(1) In TheSky, Telescope menu, select Setup...

(2) In the Control System box, select "Telescope API"

(3) Click Settings... to open the ASCOM Telescope Chooser and select the ASCOM compliant telescope you wish to use.

(My note: For the Atlas EQ-G mount operating with EQMOD, there will not be an " EQMOD ASCOM " Scope Driver in the ASCOM Telescope Chooser yet until EQMOD is installed. So click cancel for now. Close the "Telescope Setup" window in "The SKY", quit the "The Sky" software and skip the following Steps (4) and (5) for now.)

(4) Now click Properties... in the Chooser, which will display the settings window for the telescope type you just chose. Make adjustments as your telescope needs.

(5) Close all windows including the TheSky Telescope Setup window by clicking OK or Close. Do not click any Cancel buttons :-)

Operation

(My note: Skip the following Steps (1) and (2) for now)

(1) Make sure both your telescope and TheSky are set for the same geographic location and time.

(2) In TheSky, Telescope menu, select Link->Establish. You should see the cross-hairs indicating where the telescope is pointing.

<end "install.txt">

6. Follow the steps as detailed in the "install.txt" file(s) announced in Step A-3. See my notes for TheSky above.

B. EQMOD INSTALLATION

Download the latest version of EQMOD ASCOM ZIP file at:

<http://tech.groups.yahoo.com/group/EQMOD/files/EQASCOM/>

1. Download the latest ZIP file to a temporary directory and unzip all files.
2. Read the unzipped README.TXT file.
3. Double click the unzipped "register.bat" file. In the "C:\Windows\system32\cmd.exe" window, you will get the message: "press any key to continue". Press space bar to continue.

Step 3 should result in the "EQMOD ASCOM Scope Driver" appearing as a selection in your ASCOM enabled software, such as the planetarium software "TheSky". To check this in TheSky6 do the following:

1. Open TheSky6 planetarium software
2. From the menu select Telescope/Setup
3. For "Name" use down arrow to select "Telescope API"
4. Click on the "Settings" button.
5. Cursor through the selections, which are in alphabetical, order for "EQMOD ASCOM Scope Driver" and select it if it is there and skip to Step 7.

6. If "EQMOD ASCOM Scope Driver" does not appear in the list (has happened for many) there are a few steps you can try to get it to appear as follows; check for its appearance in the list after each of these steps:

a. Double click the "reregister.bat" file in the directory of unzipped files from Step B-1 above.

b. Double click the "unregister.bat" file in the directory of unzipped files from Step B-1 above.

c. Double click the "register.bat" file in the directory of unzipped files from Step B-1 above.

d. Try different combinations of the previous steps A, B & C above

e. In Windows select START/All Programs/Accessories/Command Prompt

Type: cd \

At C:\ prompt type: cd Program Files

Type: Common Files

Type: ASCOM

Type: Telescope

Type: "eqmod.exe" /regserver

Close the command prompt window

f. Try different combinations of the previous steps A, B, C & E above.

It took me 22 tries using the above steps; Step E, which I tried, last worked for me. You may want to try it first. Please let the group know of your results.

7. Open TheSky6 planetarium software
From the menu select Telescope/Setup
For "Name" use down arrow to select "Telescope API"
Click on the "Settings" button.
Cursor through the selections which are in alphabetical order and select "EQMOD ASCOM Scope Driver".
Click the Properties button

If all is well, a window opens named: "EQMOD ASCOM Setup". Skip to Step C. EQMOD ASCOM SETUP.

If you get an error message: "failed to load driver: object required", this is a known problem of TheSky software (happened to many) but there is a fix for it as follows:

In windows select START/Run and type DCOMCNFG
Click + sign next to Component Services
Double click Component Services
Double click Computers
Double click My Computer
Double click DCOM Config, may get a message or messages if you want to record something....keep clicking no to bypass these messages.
Select "ASCOM Scope Driver Template" and right click
Select "Properties"
Change the Authentication Level from "Default" to "None", click Apply, Click OK
Close "Component Services" window.
Open TheSky6 planetarium software
From the menu select Telescope/Setup
For "Name" use down arrow to select "Telescope API"
Click on the "Settings" button.
Cursor through the selections which are in alphabetical order and select "EQMOD ASCOM Scope Driver".
Click the Properties button
If all is well, a window opens named: "EQMOD ASCOM Setup".

C. EQMOD ASCOM SETUP

For EQMOD Port Details, select Port Number, Baud Rate, Timeout and number of Retries.

For Site Information select same settings of Latitude, Longitude, Elevation and Hemisphere as those used in TheSky. Click OK.

D. EQMOD ASCOM DRIVER

In TheSky select Telescope/Link/Establish

The "EQMOD ASCOM DRIVER" window will open.
Click "Setup" button on bottom of window to expand window for all parameters.
<The End>
Gary Honis

15. Telescope API problem in TheSky 6?

I got it to work ok. I had some weird things going on. I will let you know what I saw/did so it can be passed on to anyone who has a similar issue.

As i noted in an earlier post Vista is a tricky one. It blocks files that are not resident in the windows system files. You need to locate the teleAPI.dll file, right click and select properties. At the bottom of the properties windows is a little note saying :This file came from another computer and has been blocked". Click the UNBLOCK button next to it to get it working.

The I started The Sky and opened the telescope setup window. I choose Telescope API and selected EQMOD Ascom and clicked properties. I got a window saying "failed to load driver: **object required**", I followed your advice and selected POTH, then selected EQMOD Ascom.

I then got a window saying "An action cannot be completed because a component (radec) is not responding. Choose "Switich To" to activate the component and correct the problem".

Under this were the buttons "Switch To", "Retry", and "Cancel" which was greyed out. I clicked "Switch To" and the EQMOD Ascom setup window.

I enter no information, just clicked "OK" to close the window, closed the other windows and closed TheSky. I then opened TheSky again and opened the telescope setup window. This time I choose Telescope API and EQMOD Ascom driver. Clicked properties and everything worked fine. Weird huh?

Ok, it all seems to be working ok now, Raining out so I can't connect to the mount and test anything yet but at least I know the drivers are working correctly.

Thanks for all your help. I'm sure I will have lots more questions.
I forgot to add I am running Ascom 4.1 and TheSky driver 4.1.3

Rick

16. Does EQMOD Execute a meridian flip?

This is a very interesting topic. Computation for Meridian flips is kinda tricky as you need to keep track of the final position of the scope right after a goto command. EQMOD does this by computing the final stepper encoder values before a goto command is executed. It then determines if a flip is required based on the computed position.

EQMOD does not perform a meridian flip on its own. The meridian flip (pier flip) is initiated only during an ASCOM GOTO command issued from the planetarium driver.

Mon

17. What is the best way to choose Alignment Stars?

With a planetarium application in place, you could visually determine which stars to choose from. Actually, any star would do as long as it is bright enough to locate and to center. Just choose the one you see which is bright and that is at least higher than 30 degrees from the horizon EQMOD currently cannot suggest which stars to choose from as it doesn't have a star database on its own. It has to depend on the database of the planetarium application.

The star alignment chooser that you see in the market simply determines which bright objects are present at a particular point in time and that are at least X degrees above horizon or visually present at a certain region in the sky. The same approach can be done manually by looking at the screen of your planetarium application and visually selecting which stars to slew from during the alignment process.

Mon

**18. Hi all, new to the group, and not very computer literate.
Is there a place to start out? Which programs need to be
downloaded and is there a place that explains their
operation, setup, things like that?**

Lawrie

Hi, Lawrie,

Glad to see you drop in.

There is a FAQ folder under the Files section. In there are a couple of helpful files, especially the EQMOD FAQ and EQMOD_Installation files.

The Installation file is directed toward using TheSky as a planetarium program, so you might have to be a little creative if you use some other code, but with ECU I didn't need to do anything special.

Just download the ASCOM driver package from

<http://ascom-standards.org/downloads.html#plat>,

and download any of the plugins included on the page that you think you might need for your situation. I didn't need anything else, but SNP and TheSky need plugins, for example.

Once you download and install the ASCOM package, you can enable the operation of the scope with your planetarium program through the HC, or without the HC. If all you were interested in was using the planetarium program through the HC, you would start up the planetarium program and use whatever setup instructions are applicable. For example, in ECU I would go to the Telescope pull down and select Setup ASCOM Telescope. From there, the ASCOM Telescope Chooser would come up; this same window will come up whatever your planetarium program is. EQMOD will not yet be listed; that will happen if you download and install the EQMOD driver set. If running through the HC, you'd choose either Celestron 5/8, 5i/8i, or one of the GPSs depending on the version of firmware in the HC.

But, if you want the EQMOD experience, you need to download the latest version from the EQASCOM folder in the Files section. I believe the latest is EQ_ASCOM_BETA_V107g.zip.

Follow the EQMOD installation steps in the Installation file above. I'll add a hint. After you've unzipped the V107g zip file into a directory, and double clicked on the register.bat file, it should be ready to select within the planetarium program. If not, the installation file gives a couple of hints. The one that forced things to work for me was to go to the folder C:\Program Files\Common Files\ASCOM\Telescope and double click on EQMOD.exe. It will tell you that it can only be executed within another program, but magic happens; it's now available.

From this point, there are posts available and the FAQ pdf to guide the startup, alignment, GOTO, and Sync type operations. The FAQ pdf might make your eyes bleed with the talk about invoking POTH, but that's only necessary if you're doing pulseguiding or satellite tracking or other uses where ASCOM might get called more than once. If all you are doing is visual, and you've gotten the EQMOD to appear in your ASCOM telescope list in your planetarium program, you just need to worry about aligning. The FAQ, however, was written before the current 3-star alignment was implemented. To execute, you'll have to toggle between the planetarium program for the GOTO, then using EQMOD to center and align for each star.

Jim

19. What about Satellite Tracking with EQMOD?

Message # 1228

Hello,

I uploaded both the modified version of the EQMOD driver that allows custom rate tracking (Version 1.06) and the latest EQMODLX LX200-ASCOM connector.

Folder: EQ_Satellite

Filenames:

EQ_ASCOM_BETA_V106.zip

EQMODLX_BETA_V102.zip

You need to download both the EQMODLX and the V1.06 as V1.05i does not support custom rate tracking.

This version will allow you to implement custom rate tracking on both the RA and DEC motors.

Activation Sequence:

- 1) Execute Planetarium Software and Connect EQMOD
- 2) Execute EQMODLX and connect EQMOD, re activate Sidereal tracking
- 3) Execute the HWVSP Virtual Serial port emulator with the proper settings. Port 999, choose an unused COM port name, etc.
- 4) Execute the Satellite Tracker program and connect the emulated COM port (USE ONLY LX200GPS in POLAR MODE)
- 5) Load TLE file on Satellite Tracker Program
- 6) Select Satellite that is visible and above the horizon
- 7) Choose "Continuous" tracking
- 8) Click the Start Tracking button

(at this point EQMOD will execute an initial GOTO slew to the location of the satellite)

* If Slew is LONG, sometimes the satellite tracker will generate an error message indicating a slow slew rate. Just ignore the message and re-execute tracking by clicking on the Start Tracking button.

Once the scope is pointed directly at the satellite, Tracker will attempt to put the mount into custom tracking mode. You will hear both stepper motors (RA/DEC) rotating at a specified rate dictated by the Satellite Tracker (specified in degrees/second).

Important: You need to confirm the values of the RA/DEC coordinates displayed on the EQMOD driver to be almost equal to the RA/DEC coordinates of the Satellite as displayed on the Sat Track program.

The planetarium program will display realtime the location of where the scope is pointed.

* It is always possible that you may not be able to put the satellite on your scope's FOV due to the following reasons:

- OLD TLE Data, Invalid PC Date/Time
- LAT/LON Settings not properly set, best to use a GPS for this.
- Mount not synced to nearby stars (since we are not using any 2 star, or N-star alignment yet, it is very important that you implement a SYNC command on any of the stars along the satellite's path.

The Satellite tracker program has a feedback mechanism that regularly checks the EQMOD driver's RA/DEC values. If there is a discrepancy, it will attempt to correct it realtime by sending a series of rate change commands and LX200 Scope move commands.

Just one important Advise:

The Satellite Tracker puts your mount into a continuous tracking state, make sure you have all possible means to stop your mount from tracking in conditions wherein the Satellite tracker stalls.

As is, the satellite tracker program has a slew limit protection, it will automatically stop the mount from the custom tracking state once it detects the position of the scope near the horizon.

Do not attempt to disconnect the Satellite tracker program without clicking on the "Stop Tracking" button.

Mon

End of Message #1228

20. Satellite Tracking Frustration

Tonight I spent about three hours trying to get satellite tracking to work. It worked for me with V1.07d, but with 1.07g it's a total bust.

This time I did things right (I think!) many times. I started up the planetarium program, EQMODLX, executed Start on EQMODLX, started HW-Virtual Serial Port, enabled the comm port, everything peachy. Enabled telescope in the planetarium program, then proceeded to perform a 3-star alignment. When complete, started Satellite Tracker, chose Meade LX200 under Interface Protocol (later I would try the GPS options with no difference in performance).

When an appropriate satellite was available, I chose Start Tracking in Satellite Tracker. It started a slew to intercept the trajectory, but only for about a second. Then it crept along at an extremely slow rate toward the trajectory. It would eventually get to the trajectory way late, then try to slowly follow it, getting progressively farther behind. The window in EQMOD kept saying it was slewing to the right RA/DEC, but it never came close to the place it had to be. After a few minutes, the the HW-VSP application would spew buffer overruns, and stopping the process seemed impossible. The Stop button in EQMODLX and the stop sign in EQMOD did nothing. Even killing all of the windows wouldn't stop the steady slews! The only way to stop the mount motion was to re-establish EQMOD and use Park; the slow slews along the now many minutes stale trajectories would stop, and a high speed slew to near Park would occur. After a few tries, I just used Park to stop the tracking; that was the only way. If I didn't, then after some attempts to cancel all of a sudden the mount would go into a high speed slew to nowhere. Some of the consistent features were:

1. Very slow creeping toward the satellite trajectory, then a slow crawl along the trajectory with EQMOD constanly commanding slews to the right place, but only moving at a crawl.
2. Eventually, the HWVSP would stream buffer overruns, unless I hit Park when I saw the process was repeating.
3. Whatever alignment I did when starting up - 1-star, 3-star, any star, any three stars, and the GOTOs were bullet proof; nailed everything. Only satellite tracking seems garbled.
4. I tried Meade LX200, Meade LX200GPS, selecting/unselecting pulse guide options, just about every choice I could think of. High speed slews with the planetarium program were fine; it was only the satellite tracking that seemed to be inoperative.
5. One other odd thing. For some of the attempts, when starting from Park, then Unpark, then align, the first star (or one star if I chose that option), was way off; 20 degrees or more. Then, after the alignment (which worked great on GOTOs afterward), it lost it's mind on where to park. The DEC was appropriate, but the RA would be 90-180 degrees of rotation off. Then an unpark would give perfect GOTOs. And I made sure I always used the "Park To Home" button.

Very odd....

Jim

Re: Satellite Tracking Frustration

The only solution to this problem is to avoid using the generic LX200 protocol and configure the Satellite Tracker program to use Meade LX200GPS protocol (in Polar Mode) in connecting to EQMODLX. This was actually mentioned in the release message of EQMODLX (message #1228 , #4 of the activation sequence. We need to include this in the FAQ as well.

Setting the protocol to LX200GPS configures the Satellite tracker to send rate changes to EQMODLX every 1 second. This should normalize the message passing handling and eventually avoid those erratic slews and overrun errors.

Mon

Re: Satellite Tracking Frustration

Hi Jim,

Below is my reply on on your listed situations;

#1 - Please use only the Meade LX200GPS Polar mode on Satellite tracker and in EQMODLX as it cannot recognize the "end of slew" condition. Setup Details explained in message #1228. EQMODLX cannot process the old autostar "end-of-slew" status. Currently it uses the Meade200GPS method of indicating if the "end-of-slew" is active.

#2 - This is a condition (buffer overrun) where the PC cannot cope with the processing requirements of the driver. What is the current specs of your PC ? V107g is currently processing a 4x4 matrix for coordinate transformation every 200 milliseconds. This matrix was introduced on the 3star alignment processing. It is transforming coordinates as it reads the motor position values. It may be processing the matrix more than the messages coming from eqmodlx can handle. Could you test V107g on one star (indoor test) and see if the overrun still exists ?

#3 - Once the Satellite tracker is active, EQMODLX and EQMOD becomes the slave of the satellite tracker. Even if you push the STOP button on EQMODLX or in EQMOD, tracking will temporarily stop however the Satellite tracker program is continuously sending LX200 Nudge commands to EQMOD/EQMODLX every 1 second each specifying a new rate on every second during an active satellite track. At this point, EQMODLX will process the LX200 command and re-enable EQMOD to implement the new track rate. The only way to stop the system is to click on the "STOP Tracking" button on the satellite tracker. This command will then be cascaded to EQMODLX then down to EQMOD. In event that the Satellite tracker crashes, you can stop tracking via EQMODLX or EQMOD.

#4 - Settings should be LX200GPS polar mode

#5 - The initial goto on prior to an alignment even coming from a park condition would always be off as there is no alignment data in place. We can only achieve a good goto after an unpark once we are able to save the 3star alignment data. Park from a 3-star alignment would not be valid on the next session.

Hope this helps.

Mon

Re: [EQMOD] Re: Satellite Tracking Frustration - solution

Thanks Again, Mon!

Recall I once said that I'm the person chosen to test code at work because I WILL do it wrong!

I knew that about LX200GPS/Polar - in fact, when I went to start up, it was grayed out because I was running Satellite Tracker into a log file. So of course I reenabled the wrong choice.

I did try to change to the right option during the events, but the buffer overruns swamped the whole system and I didn't restart cold with the right configuration.

#1 - My Bad.

#2 - The last three tries were with 1-star alignments; no change in behavior. Computer is a 5 month old HP with 1GB ram, 1.9 GHz, 60 GB harddrive, 833MHz front side bus. Still, it isn't idiot proof 'cause we idiots are so clever.

#3 - STOP Tracking did NOT work, ever. Once the choke situation started, Satellite Tracker was out of the process, or had a mind of its own. Even killing it didn't stop the march of tiny steps across the sky. Even killing ST, HWVSP, and EQMODLX wouldn't stop the monster. Only selecting Park To Home in EQMOD overrode the previous situation.

#4 - Yep; Again, My Bad.

#5 - The reason for noting that, when doing the slews from Park through the alignment stars there seems to be a huge pointing offset that needs to be adjusted out in the alignment, is that with the Hand Controller, if the polar alignment and Park positions are good to start, then the slews to the alignment stars put the stars near the center of the Telrad. Funny, though, that while slews to the alignment stars are within the center circle on the Telrad with the HC, and 15 degrees or more off with EQMOD, once the alignment is complete then EQMOD GOTOs are near perfect (don't need to go away from 275X eyepiece), I sometimes need to jump to 50X with the HC to finish centering after GOTO with the HC.

EQMOD is so doggone GOOD!

Thanks Again!

Jim

. Satellite Tracking

- * Satellite Tracking F/W Lag processor removed
- * Mount versions higher than v101 should be able to track properly
- * Removed that nasty bug of not properly setting the speed on higher rates (need to stop mount first prior to configuring mount to move at hi-speed mode: a motor controller requirement)

- * Implemented a speed reversal function that allows the mount motors to move backwards if in case slewing goes much faster than what satellite coordinate is being reflected. Motors will de-accelerate and will stop first prior to a movement reversal function

2. Custom Tracking rate function now enabled on the EQMOD window

3. Implementation of the RightAscensionRate/DeclinationRate Property calls in ASCOM (For Bruno). It now follows the ASCOM specs.

4. Nudge buttons/Joystick fully functional even during custom tracking or Satellite Tracking

- * However if you do a nudge, Satellite Tracker will still attempt to normalize the position of the scope to the original position.

5. Applied a value limit on the SYNC data (to avoid invalid slews caused by cross-meridian syncing)

Some reminders:

1. For Satellite Tracking, make sure MEADELX200 GPS Polar mode is selected

- * FloodBug is still present if using the old LX200 protocol (as reported by Jim). Fix has to be done on the Sat Track prog.

2. It would be best if you connect both the Planetarium application and EQMODLX to eqmod first prior to a 1-star/3-star alignment.

3. Stop/Abort function is only available on the Satellite Tracker program during Satellite Tracking mode

- * You need to shutdown the tracker program for the Stop/Abort buttons to work on EQMOD. Stop/Abort actually works in EQMOD however, the Satellite tracker always attempt to restart tracking even if you do the abort function on EQMOD.

regards,
Mon

21. Is There Slew Limiting to Prevent a Collision with the Mounting Pier or Tripod?

Releasing version 1.07h with RA Limit function.

Files > EQASCOM > EQ_ASCOM_BETA_V107h.zip

Added two buttons that will allow you to define the RA shaft limit on both sides of the Pier.

Just manually slew/position your mount on each side to a point before telescope_tube-tripod contact and click on the "Set Shaft Limit.." button. You have to do this on the other side of the pier as well and click the same button. EQMOD will automatically detect the encoder position on each side.

Any GOTO or tracking past this point will automatically stop the mount.

Manual slews made from the nudge buttons/joystick will be ignored by this function.

A value of "0" on the stepper position (set by the reset button) will disable this function.

The slew limit Values are saved and automatically restored during a PARK/UNPARK function.

This function is enabled by default and assumes a limit with the RA shaft parallel to the ground.

If the eqmod driver is restarted without parking the mount, it will assume the default RA limit values.

Just click on the reset button to disable the RA limiter.

Chuck, please include this in the FAQ as well.

Other pending items to follow...

Mon

DEC limit usually is not required as it is dependent on the position of the RA shaft which is the part where the tail end of the scope could hit the tripod. Users should position DEC first with the tailend of the tube pointed down and the RA shaft adjusted to a point with enough space allowance between the tube and tripod leg. DEC should 'freely' move even at this position.

Mon

Guys, By the way, the limiter is enabled by default. However this will only work if the counterweights are pointed down when mount is set on a HOME position state. If the eqmod driver is activated on an "unparked mount" and the mount is NOT in a home position state, eqmod will still assume that the counterweights are pointing down (even physically it is not) and could position the limiter point somewhere beyond the tripod leg breach point.

Mon

22. A Word about Pulsguiding...

Let me just share some of the secrets on the pulseguide method in eqmod.

One: The pulseguide command applied on RA and on DEC are treated independently. This means you can issue back-to-back pulseguide commands on both RA and DEC simultaneously allowing PHD to apply the correction on both axis at the same time. Other ASCOM drivers apply the correction one at a time and locks the entire driver during the entire duration of the correction (duration sleep)

Later versions of PHD/MaximDL/K3CCD heavily rely on the "IsPulsguiding" ASCOM property call which allows them to implement "properly timed" corrections on EQMOD on both RA and DEC axis at the same time. A combination of the "IsPulsguiding" status support on the autoguider app and EQMOD's 'non-blocking' calls is what makes pulsguiding a very precise autoguiding processing (on the subpixel level) option for guided imaging.

Two: Guiderates on RA and DEC can be independently adjusted from 0.1x to 0.9x of the sidereal rate at 0.1 increment. It allows you to better fine tune the setup.

Of course, precision would still depend on how the pulseguide rates, autoguider app settings, polar alignment, etc. are configured on your setup and they always differ each time you move your mount from one location to another.

Mon

**23. I have the Atlas EQ-G and the EQDIR adapter with PHD and EQMOD.
A little setup help, if you will?**

I am guiding with a C8 reduced with .63 reducer and using a DSI pro.
(Later will tackle imaging with the C8 at fl 1000mm.)

I set the latitude and longitude settings, etc.

PHD settings (ver. 1.5 RC1):

RA Aggr - 95
RA Hyster - 15
Dec mode - auto
Dec algorithm - low pass
Calib step - 700
Min Motion - .25 pixels
Search region - 20 pixels
Time lapse (ms) - 0

EQMOD settings:

RA rate - 0.5
Dec rate - 0.5

Reply:

Based on your message, I think the setup and preparation is ok. At some point you might need to reduce the pulseguide settings (depending on your polar alignment) 0.1 to 0.3 on DEC and values between 0.3 to 0.5 on RA.

PHD Calibration steps should be between 500 to 700ms. These values are based on the optimum settings most users have posted here.

You also need a planetarium program such as CDC/Starry night/etc to be able to fully utilize the GOTO/SYNC functions. Connect PHD first then the planetarium application. Another program that you might need to use is POTH. Its an ASCOM hub that allows you to connect multiple ASCOM compatible programs such as PHD or CDC to the same eqmod driver.

You can do this by executing POTH first then connect it to EQMOD. Then at PHD and CDC (or any ascom compliant planetarium application), choose POTH as the driver. Connect PHD first to POTH then your planetarium application to POTH also. POTH also has an ASCOM traffic logging facility. It will allow you to view all communications passed by PHD or CDC to EQMOD.

Hope this helps.
Mon

24. Is it necessary to ACCURATELY align the scope at DEC 0° and counterweights pointing EXACTLY the ground ?

If we voluntarily offset the scope 10° of this position, then align on 3 stars, what will be the influence on pointing results? What will be the scope position when we click "PARK to Home position"?
Thanks for any precision about this! :-)

Paul,

Aligning should work regardless of the home position. It's just that the initial slew to the alignment target will be off depending on the accuracy of the home position. 1 Star alignment -is- affected by polar alignment. 3 Star should work fine even if polar alignment is less than optimal. We currently don't do dual axis tracking though so while the goto-slew will be accurate the object will drift out of view if polar alignment is not accurately done.

Please report back if you experience otherwise.

Sander

Reply:

To accurately set your mount to the H0me position, you need two cylinder glass tube bubble levelers such as the one pictured here;

http://www.govart.com/images/hwr_trackbubbleLG.jpg

One is mounted on the counterweight shaft and the other one on the dovetail or on your telescope tube.

Position the counterweight shaft horizontally and level it using the bubble level on the counterweight shaft. Set the RA setting circle to read 6 hours. Lock the RA setting circle.

While the counterweight shaft is in the horizontal position, level the DEC side (dovetail and scope) horizontally using the bubble leveler on the dovetail (or on the telescope). Move your DEC setting circle to read as the exact degrees as indicated on your mount's altitude indicator (your site's altitude). Choose the DEC degree setting such when you move the scope to 0 Degrees DEC circle (cw shaft still in horizontal position), end of tube should move up), Lock the DEC setting circle.

Setting mount to the RA Home Position:

Simply move the RA shaft until it points to 0 Hours. (counterweights should now be pointing down).

Setting the mount to the DEC Home Position:

Simply move the DEC shaft until the DEC setting circle reads 0 degrees. Scope should be pointing at NCP/SCP at this point.

Hope this helps.

Mon

25. Is There Numeric Keypad and Joystick Support in EQMOD

EQMOD has added support for:

1. Slewing Functions via numeric keypad (USB Keypad, or Keyboard Keypad). The keypad functions is only attached to the 'SLEW PAD' window. Just select the slewpad window and all keypress commands will be recognized. (Once Sander releases the nstar alignment, keypress functions will be added on the main window as well).

You can now also slew 'diagonally' using the keypad:

Button 7: Slew North West
Button 8: Slew North
Button 9: Slew North East
Button 4: Slew West
Button 6: Slew West
Button 1: Slew SouthWest
Button 2: Slew South
Button 3: Slew SoutEast

Left Arrow : Slew West
Right Arrow : Slew East
Up Arrow: Slew North
Down Arrow: Slew South

Button 5: EMERGENCY STOP/Disable Tracking

Button 0: Activate Sidreal Tracking

* Keypad Slewrates is based on the SLEW PAD Rate slider buttons

2) Joytick Control Functions

At the Main driver window, click on the "Joy" button found beside the slew buttons, eqmod driver will start polling for joystick events. It will display a "Joystick Not Found" error at the message center window if the driver is not able to find an instance of a joystick installation.

The EQMOD driver will recognize slew commands from the following joystick components:

- Primary Analog Joystick Control

* Secondary Joystick is currently reserved for FOCUS control

- Joystick 4-Direction Buttons
- GamePAD Directional Pads
- GamePAD Analog Joystick

* Diagonal Slews (dual axis slews) are also supported

* For gamepad controllers, you may need to click on the 'mode' button for the selection of commands to be generated by the controller.

Emergency stop can be done by pressing the Joystick paddle down (joystick switch button). This is also made available by pressing down any of the analog sticks on the gamepad.

Sidereal Tracking is activated by the "Start Button"

L1-L2, R1-R2 buttons in front of the GamePad controls Rate adjustments.

I have tested this using a generic joystick and a wireless gamepad controller. Wireless control really looks cool

* You may need to click some of the buttons on the wireless controller in order to initialize the communication

* The stability of this function depends on how your joystick sends out the control events data. Perform some slew tests first near the scope (and check for runaway slews) before controlling your mount remotely.

Mon

26. EQMOD takes approx 8-11 seconds to respond to any commands.

I have loaded up all the eqdir software and registered it, I am using SNP6. All looks ok, but it takes approx 8-11 seconds to respond to any commands.

For example if I press a slew button to slew say N it takes several seconds for the N button to be highlighted and several seconds for the mount to move.

All in all it can take 8-10 seconds for the mount to move after I release the slew button. When I release the button sometimes the mount stops quickly other times it runs on for 5 seconds or more.

I am using a 1.7Ghz laptop, 512M Ram Windows XP Home, eqdir version .05g, USB to serial convertor through shoestring eqdir adapter. Starry night Pro 6 (SNP5 gave the same results).

Is this delay response normal, or what haven't I done correctly.

Hi Warren,

You are actually the third person who encountered this problem and this was traced to the USB to Serial converter you are currently using. Either its a Targus based or a Belkin based USB serial converter which uses a U232/MCT based chip. Users encountered the same problem using these brands of USB to Serial converters. May we know the exact brand you are using? If this is the case, one recommendation is to replace this with a different one.

Please refer to the Database section of the EQMOD yahoo groups under USB2Serial for the tested USB2Serial devices.

Mon

Warren,

OKay so you don't have to go out and buy a new unit, **you can do this...**

With the mount connected via the EQ Direct method

(I think this is what you are using). Load up SNP6 or other planetarium and turn on the mount via it's on/off switch. Load up hyperterminal and create a new connection via the com port the USB/serial adapter is connected to (Com1 or Com2 usually) After this has been done set the communications to do 9600/8/N/1/none you can do this by going into File/Properties and then select the comport via "connect using".

You can then configure the port Baud rates etc....

(this is done under the connect to tab)

Okay, with me so far? Next click on "Settings" tab. Go down to emulation and select TTY. After this hit the Ascii setup button and select "Echo typed characters locally" Okay your all done now..... Hit OK.

You should be back in the main window. Now with the mount turned ON. Type in the command : **j1** and press Enter. You should get a return code something like #000080 or similar. This is the mount telling you "okay let go do some dancing with the stars" Now close the terminal window, you can disconnect if you like.

Now under SNP6 or other planetarium, connect to the mount via the Ascom driver EQMOD and it should come up with the screen and numbers quite quickly. And away you go.....

You will have to reinitialize the USB/Serial adapter by the above method every time you shut the mount down or disconnect the USB drivers.

Its easier if you save the Hyperterminal connection under a name like EQmod or something and have the shortcut to the file on the desktop, so all you need to do is double click on the icon and it will automatically load up your settings, so all you have to do is type in :**j1** and close it down. I wish there was an easier way or if it could be written into the code some how, but for the time being this is the way to do it.

Andrew Wall..

South Australia

Astroman02 : Skype

Hi Mon,

I found a USB convertor that works very well.
It is a Keyspan Model number USA-19HS.

This fixed my problems of long delays when you activate a slew ect.
The EQDIR program now looks very impressive.

Regards

Warren

SEE DATABASE in EQMOD GROUP

27. Here is the initial version of the N-Star for the eqmod driver.

FILES > EQASCOM > EQ_ASCOM_BETA_V108.zip

This overrides the prior V107k release now with multiple alignment star functionality. There are two ways to add an alignment star;

One is via the Align Window. Simply Click the N-Star button on the eqmod window. The align window will pop up. Initiate the goto and star centering on the planetarium program and click accept. The driver automatically goes into three star mode at the 3rd accept. Succeeding gotos/centering will just populate the 'in-memory' alignment star database. Clicking on the "END" button will activate the rest of the alignment stars and will be included in the transformation process.

The second option is via SYNC command of the planetarium program. Tick on the "Append as N-Star" beside the 'reset sync' button. Once enabled, all succeeding sync commands will be automatically appended on the eqmod driver as alignment stars. Simply initiate the GOTO on the planetarium program, center the star, then activate SYNC. The driver goes into 3-star alignment mode on the 3rd SYNC, that is if you are starting from 0 alignment stars.

Theoretically the driver can handle up to 1000 alignment stars :-)

I would suggest that you distribute your alignment stars on both side of the meridian. Avoid syncing or aligning stars at the meridian itself as the driver will block such operation.

Option to save the alignment data to follow...

Other added functions:

"Sync Mode" Check box:

This option if enabled will turn off all affine/taki/polar coordinate transformation routines. The alignment stars will be treated as multiple "localized" SYNC stars. The number beside the Sync Mode Check box shows which alignment star is currently being used as a localized sync data.

Debug: "AFFINE_TAKI+POLAR" Check Box:
(temporary function)

This is enabled by default. The eqmod driver will process all the alignment stars data using AFFINE+TAKI+POLAR coordinate transformation (tests on my side actually shows better accuracy and less prone to centering errors).

If this option is disabled, eqmod driver will use the old Affine/Taki implementation.

This checkbox is valid only on the 3-star/N-star functions.

Please check on your side and kindly report which option (affine taki only or affine + Taki + Polar) you think is accurate and less forgiving on centering errors.

You can also test the "Sync Mode" (X-Y Delta) method.

Let us know the results of the tests.

regards,

Mon

28. What is "N" Star Alignment?

The latest eqmod driver now supports the 3-star and N-Star Alignment algorithm. (See release details below);

3Star and N-Star basically is a mount stepper coordinate to Sky coordinate affine/taki matrix transformation process. The driver internally plots the sky using a minimum of three alignment star (anchor stars) as reference points. You increase the pointing accuracy by simply adding more anchor stars on different parts of the sky. This will automatically compensate any mount alignment errors (polar, cone, etc) and yield to accurate pointing.

http://eq-mod.sourceforge.net/eqmod_3star.html

3Star and N-Star Analogy:

Think of the coordinate space of the mount+eqmod as a rubber sheet with the star database marked on its surface. You place the rubber sheet on top of a star map (your sky) and align the stars on the sheet with the ones on the map. You then lock the sheet with push pins on top of the map. The push pins are now your "anchor points" or "alignment stars" in the real world. To align the markings on the rubber sheet with respect to the catalog points on the map means stretching/ rotating/ scaling specific areas of the sheet and locking them to the star map using the anchor stars (push pins).

The affine/taki matrix coordinate transformation routine is actually the one implementing the "stretching/rotating/scaling" functions and it needs at least three stars as anchor points to define the process.

The eqmod driver on the other hand dynamically selects 3 anchor points or alignment stars from the list of anchor point stars (N-star) to apply in the coordinate transformation during a goto process;

<http://eq-mod.sourceforge.net/testimages/G7.gif>

Accuracy is best within the bounds of the 3 anchor points and degrades dramatically (due the centering errors) as it goes outside the three points. However, if the stars are centered dead-on, even the gotos outside the area of the three anchor points should be accurate. N-star basically solves the 3point bound limitation by simply adding more 3-point bounded areas across the sky.

To answer the original question, simply use stars on the area where you most likely to do your gotos. Imagine one big triangle formed by the 3 stars, gotos are mostly accurate within the triangle area.

Hope this helps

Mon

[I Hope this outline of FAQ helps]

Chuck Singbiel