Paramount MKS 6000 Upgrade Kit
Supplemental Instructions

Revision 1.8
February 2024

Table of Contents

Introduction

The MKS 6000 upgrade kits contain the components necessary to upgrade your Paramount mount with the MKS 6000 telescope control system (TCS), including:

- MKS 6000 printed circuit board (PCB)
- Electronics Box to hold the MKS 6000 PCB
- Through-the-mount panel
- Instrument Panel PCB
- Instrument Panel housing
- Updated through-the-mount cables
- MKS 6000 power supply unit (required)

Minimum System Requirements

The MKS 6000 control system requires the following minimum hardware and software.

- **Paramount Requirements**: A Paramount MYT, MX, MX+, ME, or ME II model, or a gear-driven Paramount Taurus mount. See Table 1 below for details.
- **TheSky Professional Requirements**: TheSky Professional version 10.5.0 build 13655 or later.

Note that the Paramount MKS 6000 Upgrade Kit is *not* compatible with the Paramount GT-1100 or GT-1100 model mounts (shipped from 1996 to 2002).

MKS 6000 Upgrade Eligible Paramount Models

Table 1 lists the Paramount models that can be upgraded to the MKS 6000 telescope control system.

Paramount Model	Dates Manufactured	Mount Identifiers
Paramount MYT	November 2014 – April 2023	C0001 – C00531
Paramount MX	July 2011 – July 2014	A00001 – A00499
Paramount MX+	August 2014 – July 2023	A00500 – A01299
Paramount ME II (motor-based encoders)	March 2013 – August 2023	B00001 – B00599
Paramount ME II (on-axis absolute encoders) [3]	March 2013 – August 2023	B00001 – B00599
Paramount ME Classic	July 2001 – August 2012	N/A[1]
Paramount Taurus 400/500 Gear-Driven Models[3]	November 2019 – April 2023	T00001 – T00060
Paramount Taurus 400 (on-axis absolute encoders)[3]	November 2019 – April 2023	T00001 – T00060
Bisque TCS (with the MKS 3000, MKS 4000 or MKS 5000)[3]	July 2001 – April 2023	N/A[2]

[1] The original Paramount ME mount does not have a unique mount identifier; the mount's serial number was printed on the Paramount ME invoice from Software Bisque.

[2] The Bisque TCS product does not include a mount identifier or hardware serial number. See the Bisque TCS Identification document for details how to determine which MKS version your mount uses.

[3] MKS 6000 upgrade kits for these model mounts will be available in the first quarter of 2024.

TheSky Professional Edition Requirements

Controlling a Paramount with the MKS 6000 requires the latest release of TheSky Professional edition. Step-by-step MKS 6000 getting started instructions (including the latest digital release of this document) are available at https://www.bisque.com/6k-getting-started.

If your annual software subscription is expired, visit www.bisque.com, then click **Support**, **Renew Subscription** and follow the instructions on this page, or click: How Do I Renew TheSky's Software Subscription? for subscription renewal details.

MKS 6000 Upgrade Kit Hardware

Figure 1 shows the model-specific hardware components that are included with the MKS 6000 Upgrade Kit (the internal cables and other accessories are listed in the Packing List section on page 6).

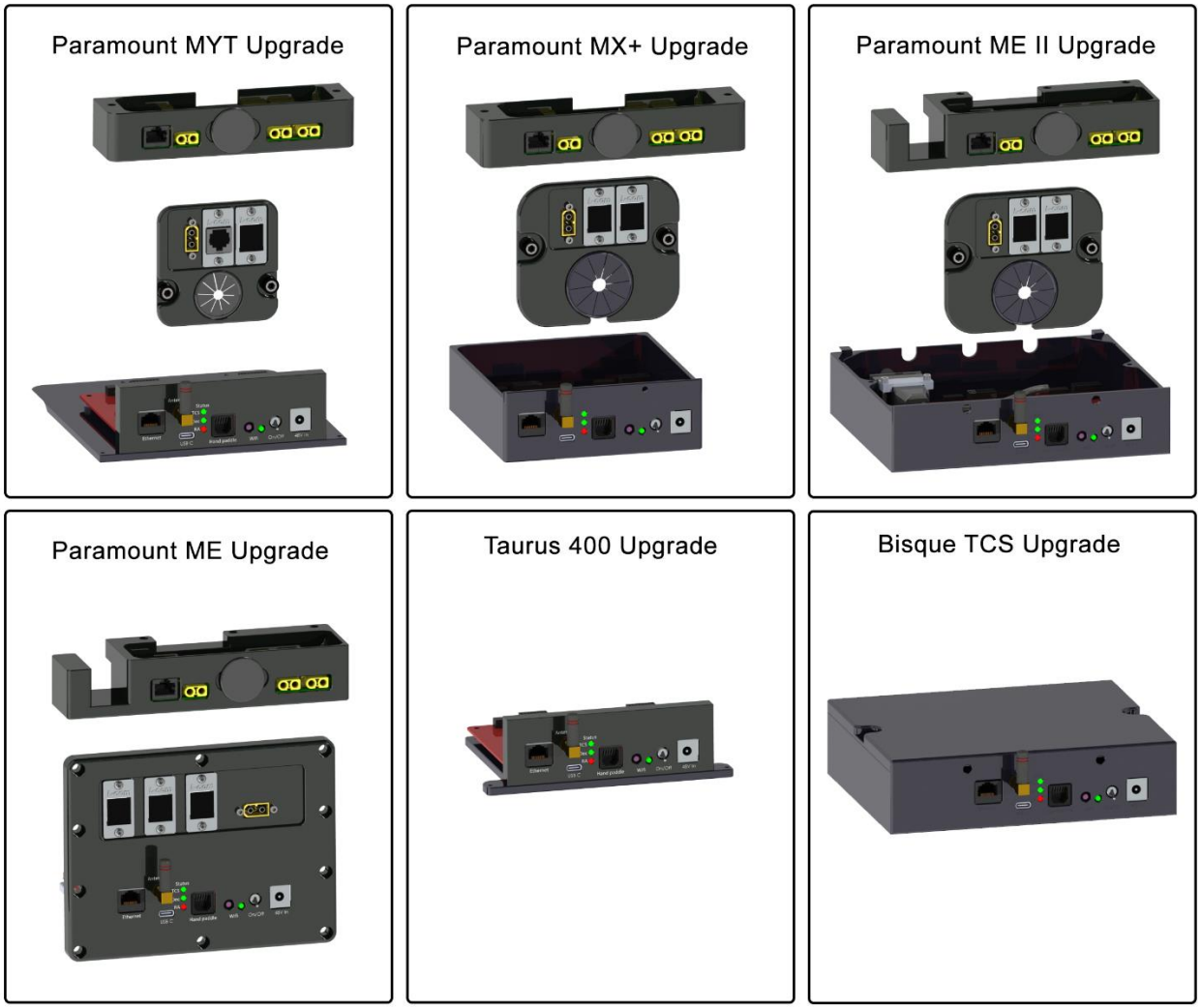


Figure 1: MKS 6000 upgrade kit hardware components.

Packing List

Each kit includes components that are required to upgrade your model Paramount with the MKS 6000 TCS. The tables below show the packing list for each model mount.

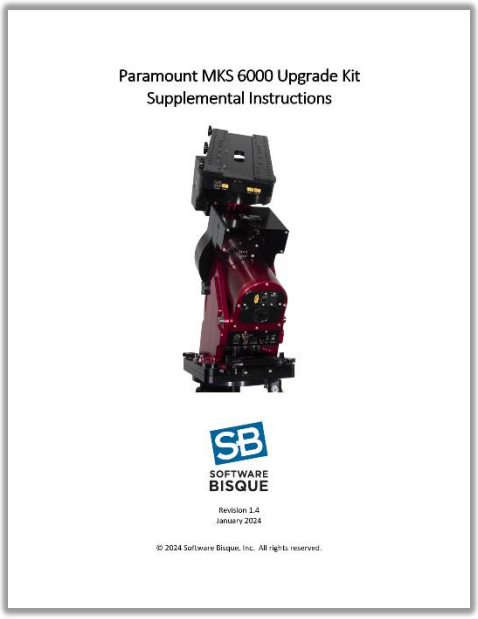
Upgrade Kit Packing List

Quantity	Photo	Description
1	 Figure 1: The Paramount MYT electronics housing.  Figure 2: The Paramount MX and MX+ electronics housing.  Figure 3: The Paramount ME II electronics housing.	The electronics housing holds the MKS 6000 printed circuit board (PCB). See “Electronics Box ” on page 11 for details about this component.

Quantity	Photo	Description
	 Figure 4: MKS 6000 PCB.	
1	 Figure 5: Paramount MYT and Paramount MX Instrument Panel.  Figure 6: Paramount ME II Instrument Panel.	
1	 Figure 7: Paramount MYT through the mount panel.	The Paramount MYT through the mount panel. See “Through-the-Mount Panel” on page 20 for details about this component.

Quantity	Photo	Description
1		15 in. (38 cm) hour angle motor cable.
1		28 in. (71 cm) declination motor cable.
1		36 in. (91 cm) CAT6E Ethernet cable.
1	 Figure 8: Paramount MYT through-the-mount panel with cable attached.	36 in. (91 cm) XT60 power cable attached to the through-the-mount panel.

Quantity	Photo	Description
	 Figure 9: Paramount MX and Paramount ME II through-the-mount panel.	
1		15 ft (4.6 m) USB-C cable.
1		USB-C Female to USB-A Male Adapter.
1		Wi-Fi Antenna.
1		MKS 6000 power supply unit. **Please read the "**Important MKS 6000 Power Jack Notes**" on page 18 about this new power supply unit.** Input: 100-240V ~ 1.5A at 50-60Hz Output: 48.0V ⎓ 1.88A, 90.2W

Quantity	Photo	Description
		The power out plug on the PSU is compatible with the MKS 6000 power in port. The MKS 5000 PSU used a completely different connector that is not compatible with the MKS 6000.
1		Power Cable for the Power Supply Unit (NEMA 5-15 male plug).
1		A printed copy of the Paramount MKS 6000 Upgrade Kit Supplemental Instructions (this document).

MKS 6000 TCS Components

The MKS 6000 upgrade kit's main components include the electronics box, instrument panel housing, the through-the-mount panel and an MKS 6000-compatible power supply unit.

Electronics Box

Figure 10 shows a Paramount MX Electronics Box with the harnesses attached to MKS 6000 PCB.

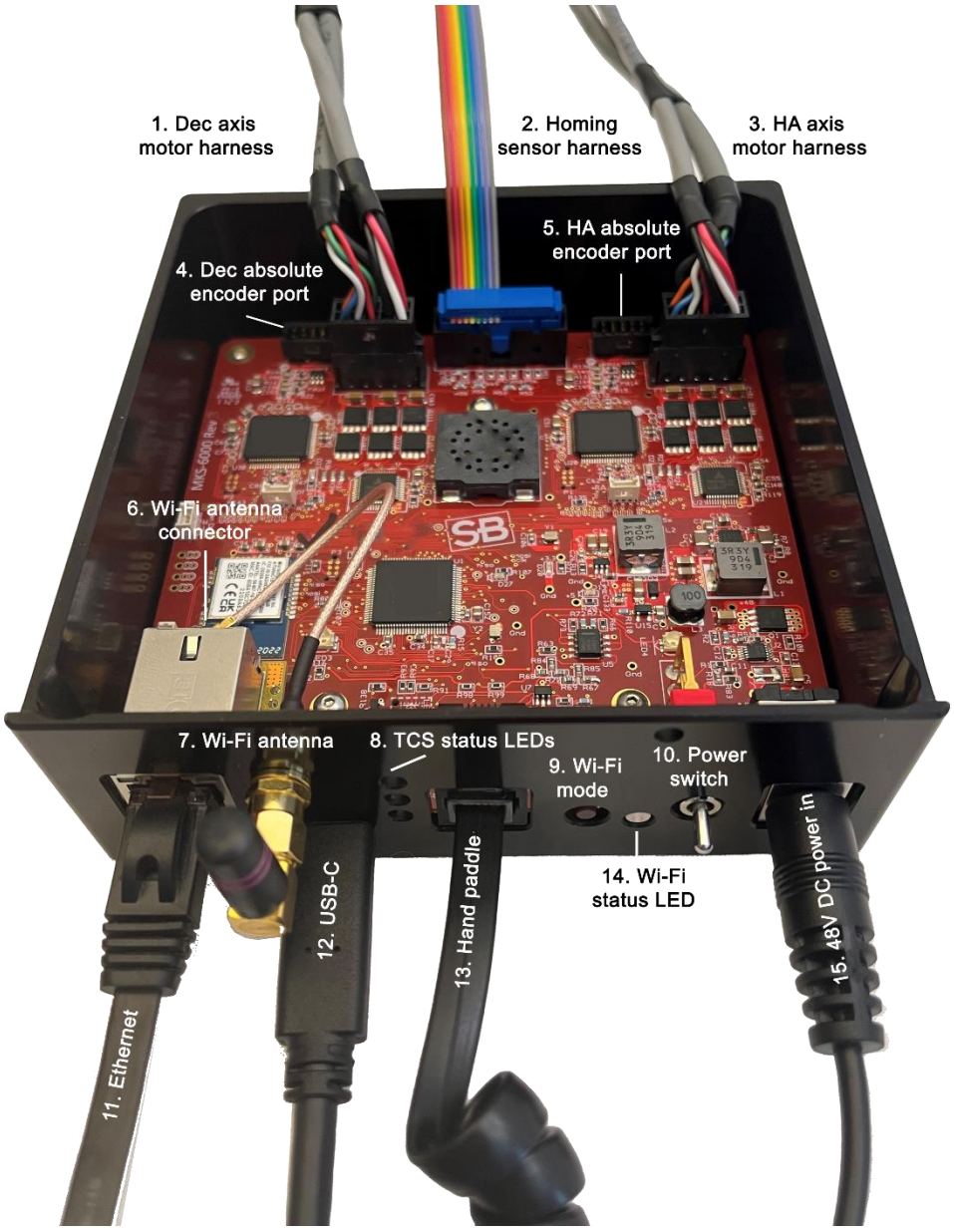
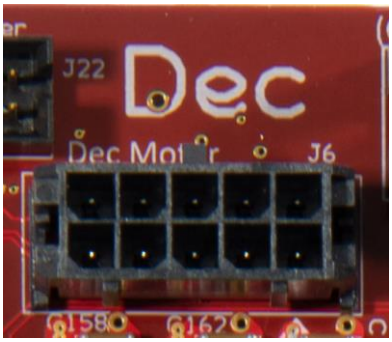
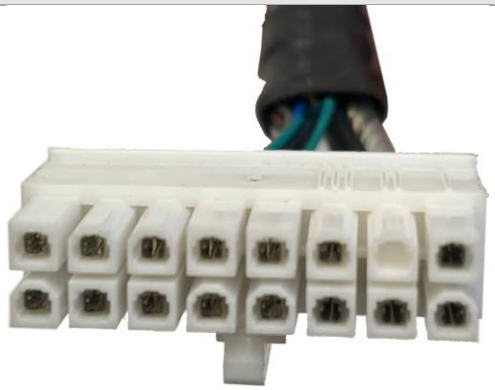
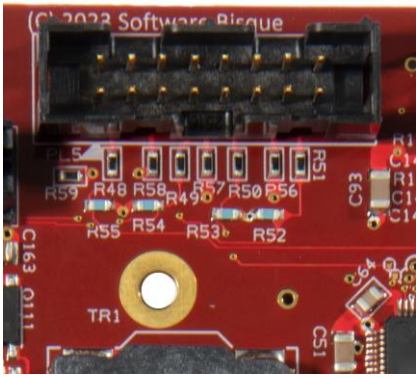


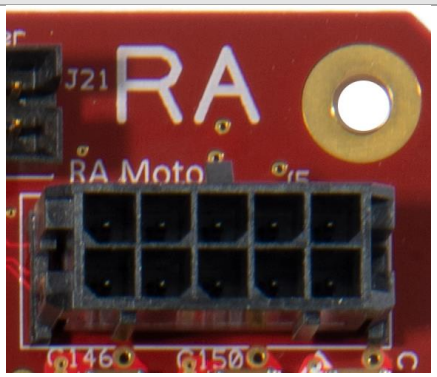
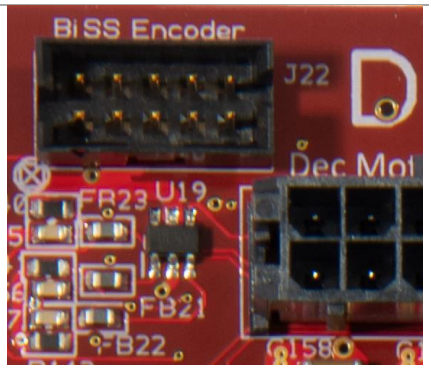
Figure 10: Electronics box with the MKS 6000 PCB cables and components.

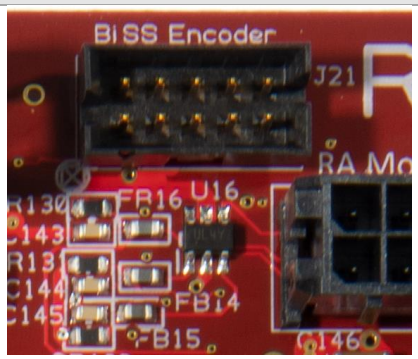
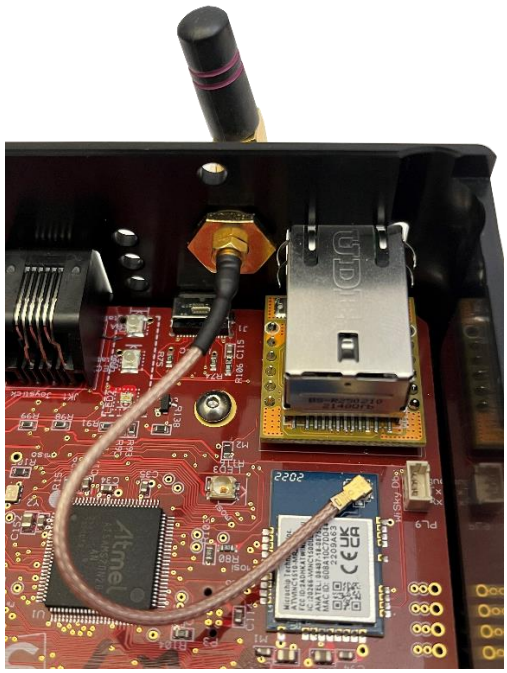
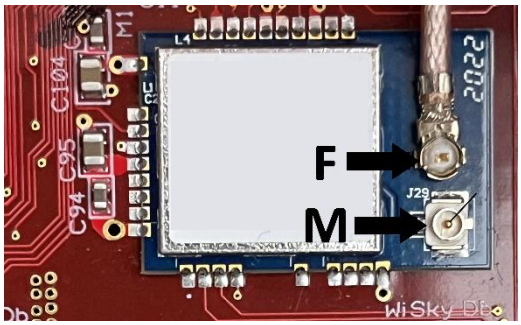
Table 1 lists each the numbered components, describes each cable, and how to plug each cable into the PCB.

Table 1: The Paramount Electronics Box Components

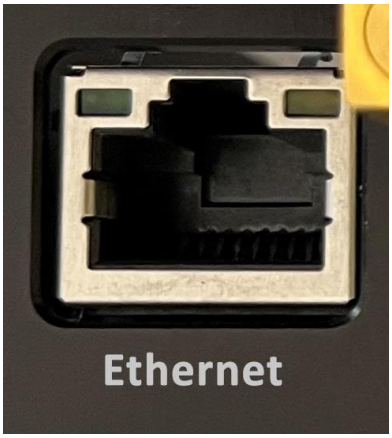
Number	Photos	Description
1	 Figure 11: The 10-pin dec motor extension cable connector plugs into the port labeled **Dec Motor**.  Figure 12: The 10-pin declination axis motor plug. The tab on the male connector is oriented toward the top of the female connector in this photo.  Figure 13: 16-pin female motor extension cable.	The 10-pin motor extension cable on the declination axis plugs into the MKS 6000 port labeled **Dec Motor** on the PCB (Figure 12). The 16-pin female connector (Figure 13) plugs into the declination axis motor harness (Figure 14).

Number	Photos	Description
	 Figure 14: 16-pin male motor harness connector.	
2	 Figure 15: 16-pin homing sensor cable.  Figure 16: 16-pin homing sensor cable plug.	The homing sensor harness connects the HA and Dec homing sensors to the MKS 6000 home sensor port.

Number	Photos	Description
3	 Figure 17: The hour angle (HA) axis is labeled RA, for right ascension, on the MKS 6000 PCB.  Figure 18: The gray dot on the hour angle connector differentiates it from the dec motor extension cable connector.	The 10-pin hour angle motor extension cable connects the MKS 6000 to the hour angle motor.
4	 Figure 19: 10-pin Dec axis BiSS absolute encoder port.	The 10-pin male **Dec** axis absolute encoder cable is plugged into the 10-pin female plug labeled **BiSS Encoder** on the PCB.

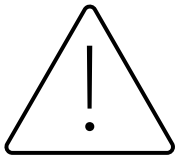
Number	Photos	Description
5	 Figure 20: HA on-axis encoder plug.	The 10-pin male hour angle axis absolute encoder cable is plugged into the 10-pin female plug labeled **BiSS Encoder** on the PCB.
6	 Figure 21: Wi-Fi antenna extension cable.  Figure 22: Close up of the Wi-Fi antenna extension cable's small coaxial connectors.	The external Wi-Fi antenna is connected to the Wi-Fi chipset using a short extension cable. In Figure 22, the coaxial female connector labeled **F** must be rotated 180 degrees and then plugged into the coaxial connector on the Wi-Fi module labeled **M**.

Number	Photos	Description
7		The right-angle Wi-Fi antenna screws into the Electronics Box faceplate.
8		The three Status LEDs provide visual feedback on the state of the TCS. LED normal operation: • TCS emits steady white • Dec LED emits steady red • RED LED emits steady red LED error condition: • TCS flashes white • Dec flashes red • HA flashes red
9 and 14		Press the circular **Wi-Fi Mode** button to toggle between five different Wi-Fi configuration modes. The color of the Wi-Fi status LED corresponds to the mode that was configured in TheSky Professional. See *TheSky Professional User Guide* for details about configuring MKS 6000 Wi-Fi and controlling the Paramount wirelessly.
10		The chrome-plated on/off switch controls power the TCS. Up is on, down is off.

Number	Photos	Description
11		The Ethernet port is used to control the TCS over a network using TCP/IP.
12		The USB-C port is used to communicate with the TCS using a serial command protocol.
13		Plug the RJ12 on the end of the hand controller's curly coil into the hand controller port.

Number	Photos	Description
14		The **Wi-Fi Mode** button and Wi-Fi status LED are described in number 9 above.
15		The 48V DC **Power In** jack. **Please read the "Important MKS 6000 Power Jack Notes" below about the new power supply unit included with the MKS 6000 Upgrade Kits.**

Important MKS 6000 Power Jack Notes



Do not use the MKS 5000 power supply for the MKS 6000!

Even though the MKS 5000 locking DC power plug appears to be similar to the MKS 6000 PSU power plug, the MKS 5000 should never be plugged into the MKS 6000 Power In port!

If plugged into the MKS 6000, the MKS 5000 PSU connector will have intermittent connection with the center pin and may damage the MKS 6000 electronics.

The MKS 6000 **Power In** DC jack is different from all earlier versions (MKS 3000-MKS 5000). While the power supply units for the MKS 6000 supply 48V DC, the new power supply units incorporate a different DC connector that is designed to properly mate with the MKS 6000 DC power jack. The new style connectors *do not use a locking collar*. They are designed grip firmly but allow pulling out if the cable inadvertently gets snagged and pulled.

Figure 23: The MKS 5000 PSU plug is ***not*** compatible with the MKS 6000.

Figure 24: MKS 6000-compatible power connector.

Instrument Panel

The Paramount Instrument Panel includes a pass-through Ethernet port, three XT60 power out ports and a cover for the through-the-mount cable access hole. Remove this cover when running custom cables through the mount.

Figure 25: The Paramount MX Instrument Panel components.

Through-the-Mount Panel

Figure 26: The through-the-mount panel components.

Table 2: Through-the-mount panel components.

Number	Description
1	When connected to an external DC power source, the male XT60 plug supplies power to the three female XT60 connectors on the Instrument Panel. The DC power supply's output connector must be equipped with a female XT60 connector. See "XT60 Connectors" on page 21 for more information. XT60 port specifications: • Rated for 30A, 500V (15,000 W maximum) • The internal cabling is 12 AWG. • The leads on the Instrument Panel are rated to carry 30A maximum.

Number	Description
2	This RJ-45 port accepts a CAT6 cable to provide pass-through Ethernet to the Instrument Panel's Ethernet port.
3	This is a customizable L-COM Keystone connector.
4	This access hole can be used to pass custom cables through the mount to the top of the declination axis.

XT60 Connectors

The Paramount power connectors and through the mount cabling are intended to be used with direct current (DC) power sources only.

Never attempt to power devices through the mount with an alternating current (AC) power source.

XT60 power connectors are commonly used for recharging batteries in e-bikes, RC cars and drones. They also excel at supplying power to astronomical equipment. Rated at 500V up to 30A (15KW maximum), they accept 12 AWG wires, and can provide sufficient power to all the direct-current astronomical devices on the telescope.

A variety of pre-made cables and cable adapters using these connectors are readily available and relatively inexpensive. The table below shows several pre-made cables that use XT60 connectors.

XT60 Cable Type	Example Photo
Input Power • XT60 Connecter Cable with DC 12V Battery Alligator Clips. • XT60 to O-Ring Terminal Cable,12AWG XT60 Male to O-Ring Connector Cable	
Power Cables • XT60 m/f to 2.1 mm m/f jack power adapter • XT60 m/f to 2.5 mm m/f jack power adapter • XT60 m/f to Anderson Powerpole™.	

XT60 Cable Type	Example Photo
Y-Splitters • M/F Y-splitters • M/F parallel adapters (bottom)	
Extension Cables • XT60 M/F to XT60 M/F cables	
Gender Changers and Extenders • M/F, F/F extenders	

The simple and robust XT60 connectors are exceptional for making custom DIY cables.

Jacketed XT60 Cables

The spacing between the Power Out 2 and Power Out 3 ports is based on the XT60 15.5 mm width specification. Third-party XT60 cables may have come with an extra jacket that makes the connector wider, about 19 mm total width. The extra width of the jacket prevents two of these cables from being plugged in to the Power Out 2 and Power Out 3 ports at the same time.

Figure 27: A wider jacketed XT60 connector.

If two jacketed connectors must be plugged in to Ports 2 and 3, plug a short female-to-female XT60 extender into one of the ports so that there is sufficient width for both jacketed cables to fit.

Figure 28: A female-to-female XT60 extender plugged into the Instrument Panel's Power Port 3.

L-com Keystone Panel Adaptors

The three L-com keystones on the front panel are designed to make through mount cabling easier to install, more accessible and simpler to connect and disconnect the through-the mount cables. The L-com webpage (http://www.l-com.com/adaptors) offers cables, connectors and adaptors that can be used to customize the mount for your astro-accessories.

Installing the MKS 6000 Upgrade

The *MKS 6000 Upgrade video* demonstrates how to remove the existing MKS control system electronics from your Paramount. Once the original telescope control system is removed, the MKS 6000, internal cabling and new Instrument Panel be installed.

The upgrade video covers the following topics:

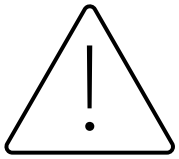
- Tools required for the upgrade
- Telescope and Counterweight Removal
- Electronics Box Removal
- Internal Cabling Installation
- Rear HA Panel Installation
- Instrument Panel and Versa-Plate Installation
- Hour Angle Worm Block Installation
- Declination Worm Block Installation
- Electronics Box Installation

The URL to view this video, go to https://www.bisque.com/6kvideo. Or scan the QR code below:

Figure 29: Scan the above code with your tablet or smart phone camera, then click on the link that appears to watch the MKS 6000 Upgrade video.

Once the upgrade installation is complete, the final step is to measure and save the motor index angles to the MKS 6000 as described below.

Connecting to TheSky Professional



Controlling a Paramount with the MKS 6000 requires the latest release of TheSky Professional edition. Step-by-step MKS 6000 getting started instructions (including the latest digital release of this document) are available here: https://www.bisque.com/6k-getting-started.

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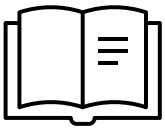
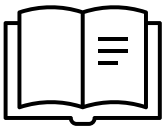


TheSky Professional User Guide

TheSky Professional User Guide can be downloaded as a PDF from the Software Bisque website.

To access this file, log in by clicking **My account**, **Log in,** and then enter https://www.bisque.com/thesky-ug in your browser.



Paramount User Guide

Use the camera on your tablet or smartphone to scan the code on the right and view the Paramount User Guide, or visit:

https://www.bisque.com/PS6UserGuide

to download the PDF to your laptop or desktop.

Scan to view the Paramount User Guide.

Using TheSky to operate a Paramount mount with the MKS 6000 is essentially identical to earlier control systems.

- Click **Telescope**, **Telescope Setup**, **Mount Setup** and choose the same model mount you always have (Paramount MYT, Paramount MX+, or Paramount ME II). *Do not choose one of the options for the Paramount Series 6 models*.
- When connecting to the Paramount with the MKS 6000 USB port, installation of a separate USB driver is *not* required (macOS, Windows and Linux).

Step 1: Power and Connect the Computer to the Paramount

1. Securely attach the mount to a permanent pier or tripod.
2. Plug the power supply unit's (PSU) power out connector into the Electronics Box port labeled **Power In**.
3. Plug the PSU into a suitable power source.
4. Plug the USB connector of the supplied USB cable into the Electronics Box port labeled ***USB***. See the Paramount User Guide for details on how to connect your mount to a computer using the Ethernet port or Wi-Fi.
5. Plug the other end of the supplied USB cable into a USB port on the computer.
6. Release the mechanical locking knobs, then flip the Paramount's **On/Off** switch to the on position (up).

The mount emits motor initialization beeps, and the three LEDs on the Electronics Box are illuminated.

The LEDs labeled *HA* (hour angle) and *Dec* (declination) should emit steady red light; the LED labeled *TCS* emits varying shades of purple to indicate the control system is operating nominally.

Step 2: Configure TheSky Professional to Control the Paramount

OS	Quick Start Configuration
	1. Make sure the Paramount is turned on so that the computer recognizes the Paramount USB port.[1,2] 2. From TheSky Professional, click **Telescope, Telescope Setup**. 3. On the **Imaging System Setup** window, highlight **Mount** in the **Imaging System** list. 4. Click **Mount Setup**, **Choose**, or double-click **Mount** in the **Imaging System** list. 5. On the **Mount Setup** window, expand **Software Bisque**, select your mount model, and click **OK**. 6. Click **Mount Setup, Settings**. 7. In the list of serial devices, select the port with the description **Software Bisque MKS 6000*.*** 8. Click the ***Connect*** command from the ***Telescope*** menu and then click the ***Close*** button on the ***Imaging System Setup*** window. The ***Telescope*** window's ***Status*** text shows the current state of the mount, which is *Not Homed*. On the **Telescope** window, click the **Tools**, **Find Home**. Once homed, the mount begins tracking at the sidereal rate, and can be slewed using the joystick on the hand paddle or with TheSky Pro.
	[1] By default, *Apple Silicon hardware* requires permission to connect to accessories. If you have a Mac that uses Apple Silicon hardware (M1, M2, or M3 processor), click **Settings**, **Privacy**, **Allow Accessories To Connect**, and set to **Always** to change this default behavior.

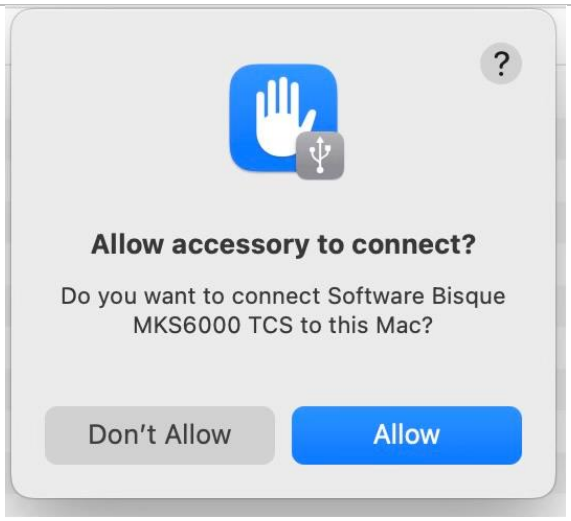


Figure 30: If prompted, click Allow to give Apple Silicon hardware permission to connect.

[2] macOS will not recognize the MKS 6000 USB device under the following conditions:

1. The MKS 6000 is powered on with one end of a USB-C cable plugged into the port on the Paramount Electronics Box port labeled **USB-C**.
2. *With the mount turned on*, plug the other end of the cable into a ***USB-C*** port on the computer.

To have the Mac computer recognized the MKS 6000 USB device:

1. Turn off the mount.
2. Plug the USB-C cable into the Mac.
3. Turn on the Paramount.

Or use a USB-C to USB-A adapter and plug the USB-A into an external hub that has a USB-A port (see Figure 32).

OS	Quick Start Configuration

Figure 31: USB cable with USB-C to USB-A adapter.

Another workaround is to use the MKS 6000 Ethernet port for mount to computer communication.

For instructions on how control the Paramount mount with TheSky, see “Controlling the Paramount with TheSky Professional Edition” in the Paramount User Guide.

Motor Index Angles

The Paramount’s hour angle and declination axis servomotors require a unique *motor index angle* that is required for motor initialization when the mount is turned on. These motor-specific motor index angles are normally measured and saved to the control system at the factory. For the MKS 6000, they must be measured and saved before the mount can operate normally.

Follow the steps below to measure and save the motor index angles to the MKS 6000.

Important: After installing the MKS 6000 upgrade and powering the mount on for the first time, the control system may emit successive beeps because the mount’s motor index angles have not yet been measured and saved to the MKS 6000 permanent memory.

The MKS 6000 uses a different convention for measuring motor index angles compared to earlier control systems. The measured motor index angle value for both the hour angle and declination axes will be approximately 200.

The MKS 6000 requires TheSky Professional version 10.5.0 build 13655 or later. If you have an active subscription, the latest release must be downloaded from www.bisque.com and installed. To do so, click ***My account, Log In*** to log in, then click ***My account, My Downloads.*** If your subscription has expired, you must renew it to access the latest release.

Measuring and Saving the Motor Index Angles

Use TheSky to measure and save the motor-specific motor index angles to the control system's permanent memory. This one-time initialization process is only required after installing a new control system, or after installing a replacement worm block assembly (with a new motor).

1. With the mount turned off, connect the supplied USB cable to the computer.
2. During the index angle measurement process, for a given axis, the MKS 6000 rotates the motor to find the motor index angle, and then reports the value. Note that the motors must be free to rotate, or the process will fail. Before proceeding, double-check the following:

    - Make sure to disengage the locking plungers in both axes on the Paramount MYT and Paramount MX mounts. For the Paramount ME II, be sure to remove the axis locking bolts so that both axes can rotate.
    - For the Paramount MYT, MX, MX+ and ME II mounts, the worm and gear must be disengaged by rotating the mechanical switch in both axes to the balance position.
    - For the Paramount ME and Paramount GT-1100S mounts, only, the motor drive belts must be removed before the motor index angles can be accurately measured.

3. Turn the mount on. The control system uses the factory default motor index angles to initialize the motors, and this may cause the motor initialization to fail. When motor initialization fails, the control system emits continuous audible beeps. Note that even if there are no audible beeps, you should still follow the steps below.
4. Launch TheSky Professional Edition.
5. Click **Telescope**, **Telescope Setup**. Under **Imaging System**, double-click **Mount** and select the name of your original model mount. For example, choose *Paramount ME II* for the *Paramount ME II* mount, not *Paramount ME* or *Paramount ME Series 6*. Click **OK** and **Close** the **Imaging System Setup** window.
6. Click **Telescope, Connect**. When prompted if you want to slew the mount to the home position, click **No** (see Figure 32).

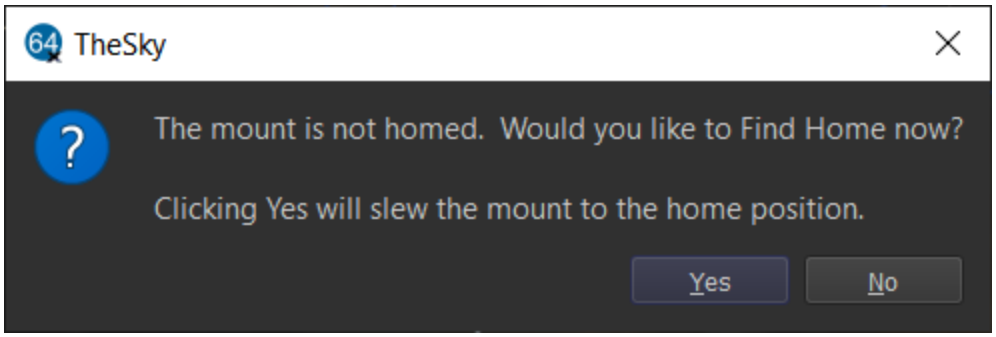


Figure 32: Slewing the mount to the home position is *not* required when measuring the motor index angles.

7. From the ***Telescope*** window, click ***Tools***, ***Bisque TCS***.
8. Click the ***Utilities*** tab and highlight the ***Set Motor Index Angles*** option on the left side of the window. The steps below are highlighted in Figure 34.
    a. Click the ***Reboot To Measure Motor Index Angles*** button and click ***Yes*** when prompted. Rebooting the MKS 6000 takes about 15 seconds or so.
    b. After double-checking that both axes are in the **Balance** position, click the ***Measure HA Index Angle*** button. When prompted, click **Yes** (Figure 35). The HA motor will rotate briefly as the motor index angle is measured, and a window showing the result is displayed.

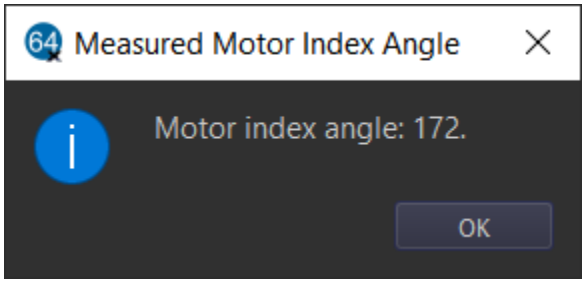


Figure 33: Enter the measured motor index angle into ***HA*** or ***Dec Index Angle*** text box.

    c. Enter this number into the ***HA Index Angle*** text box.
    d. Click the ***Measure Dec Index Angle*** button and wait for the result to be displayed.
    e. Enter this number into the ***Dec Index Angle*** text box.
    f. Click the ***Save to Bisque TCS*** button to permanently save these values to the control system.
9. Restart the mount or highlight the ***Reboot/Update Firmware*** option on the left side of the ***Utilities*** tab, then click the ***Reboot Normally*** button.

The motor index angles have now been permanently saved and the mount is ready for normal operation.

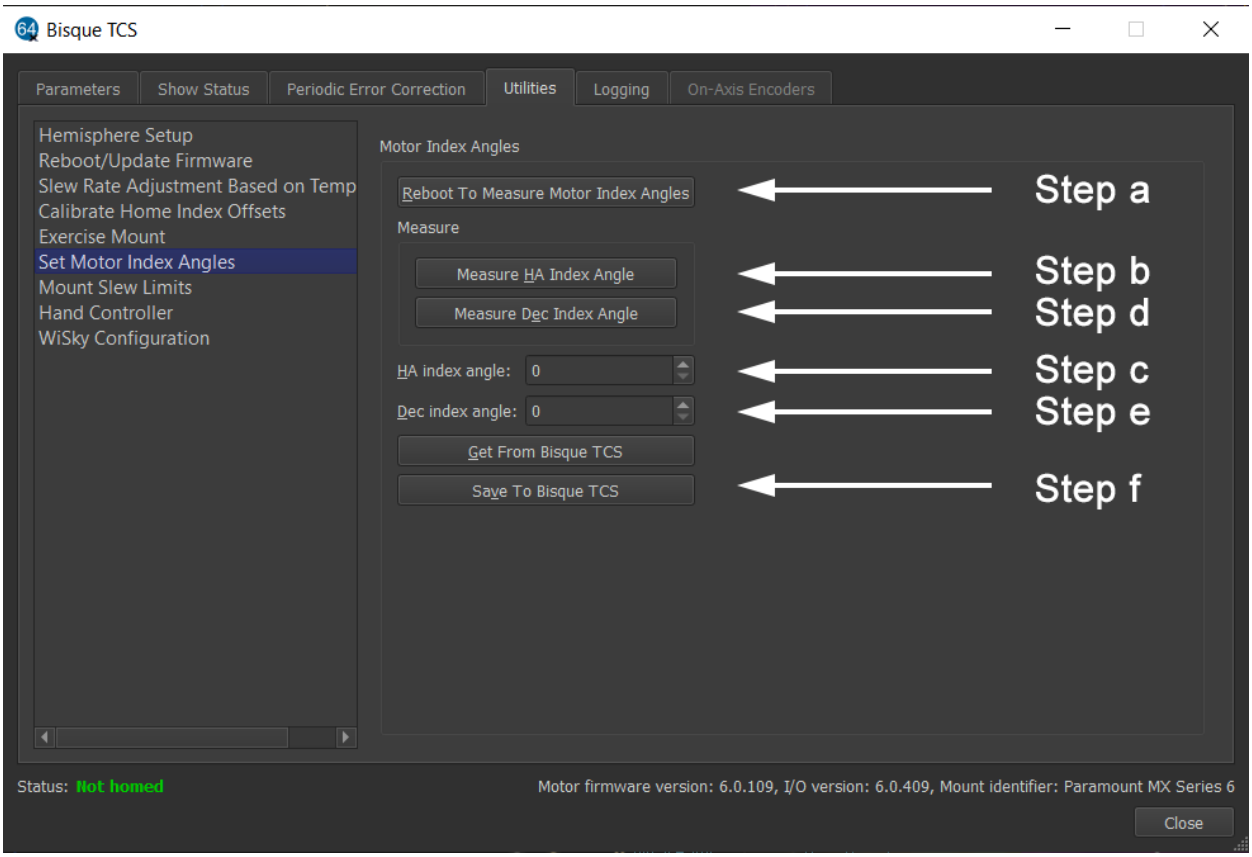


Figure 34: Follow Steps a-f to measure and save the motor index angles for both axes.

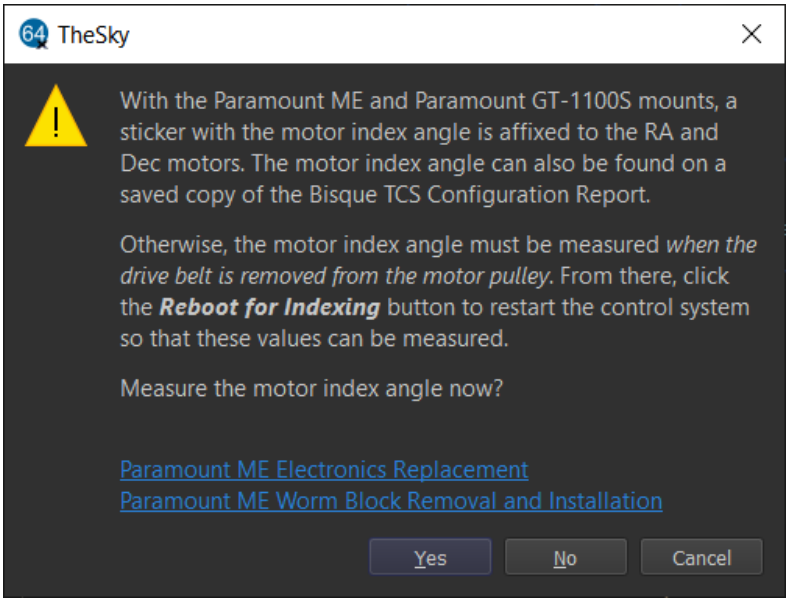
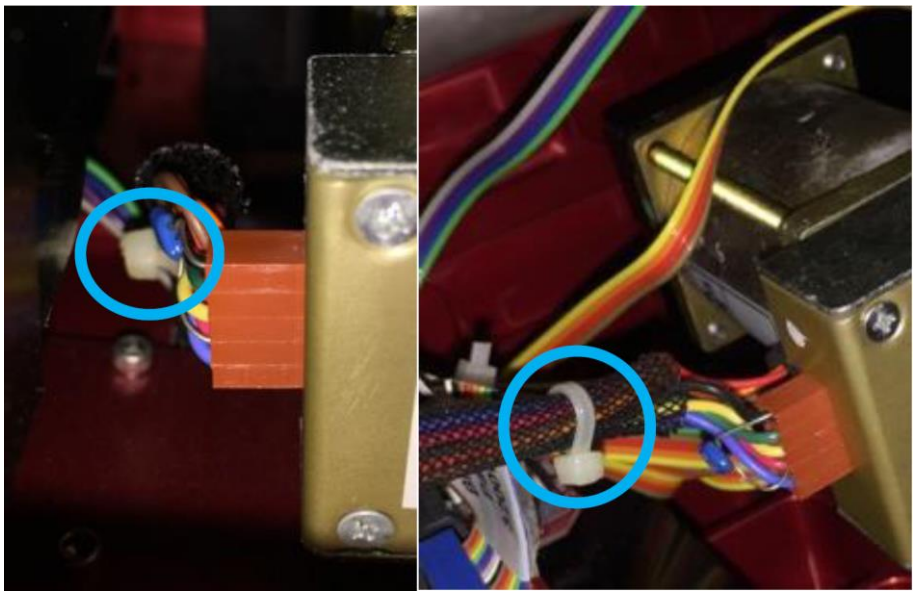


Figure 35: Prompt to measure the motor index angle.

MKS 6000 Troubleshooting

The table below describes some common issues that can occur when upgrading a Paramount with the MKS 6000.

Problem Description	Solution
1. I need my mount's motor index angles. Where can I find them?	For the MKS 6000, you must measure then save the motor index angles to the control system's permanent memory. See "Measuring and Saving the Motor Index Angles" on page 29 for details.
2. After powering the mount, the MKS 6000 beeps continuously.	The motor index angles that are stored in the MKS 6000 are incorrect for one or both of the servo motors, so the motors cannot be properly initialized. 6000 control system. **Paramount ME Classic Mounts Only** Check to make sure there are no cable ties (usually white or black) around the DC servomotor cables. If there are, carefully remove them without cutting any of the motor wires (Figure 36). As the motors cable on all Paramount ME mounts that used the MKS 3000 control system were tied together in this manner, these steps are especially important when upgrading to the MKS 6000.  Figure 36: Remove these motor cable ties to eliminate communication interference between the two Paramount ME motors. This issue is *not* present on any other Paramount model.

3. After issuing the ***Find Home*** command, the telescope status text shows *Not Homed* or homing the mount by double-tapping the button on the joystick fails.	**Solution 1: Calibrate the MKS 6000 Joystick Port** 1. Connect to the mount. 2. Choose the ***Bisque TCS*** command from the ***Tools*** pop-up menu on the ***Telescope*** window. 3. Highlight ***Hand Controller*** in the list on the left side of the ***Utilities*** tab on the ***Bisque TCS*** window. 4. Click the ***Calibrate Joystick*** button. 5. ***Important!*** Choose the ***Save All Parameters*** to the ***Mount*** command from the ***Commands*** pop-up menu on the ***Parameters*** tab of the ***Bisque TCS*** window. **Explanation**: The MKS 6000 control system has an internal sensor that detects input from the joystick on the hand paddle. Joystick calibration ***should be*** performed at the factory, and normally need not be calibrated again. However, if the joystick sensor was not calibrated at the factory, issuing the ***Find Home*** command may fail unexpectedly and the telescope status text on the ***Telescope*** window will show *Not Homed*. Note that the hand paddle *does not* need to be plugged in to the Electronics Box for successful joystick calibration. **Solution 2: Ensure both ends of the homing sensor cable are plugged in.** One end of the homing sensor cable plugs into the MKS 6000 PCB (Figure 34), and this cable splits into to two separate cables for right ascension and declination homing sensor. See the Paramount GEM Homing Sensor Cable Troubleshooting and Installation Use document (log in required) for reference on where to locate these sensors: http://tinyurl.com/3nnknenh Double-check that all three ends of the homing sensor cable are in place and that there is no grease in between either of the posts that separate the optical sensors.
5. After installing the MKS 6000, stars are always trailed in right ascension as if the wrong sidereal tracking rate is being used.	If your mount is exhibiting this behavior, the first step is to connect to the mount and verify that the **Mount Identifier** is correct for your model mount. 1. Click **Telescope**, ***Connect***. 2. On the ***Telescope*** window, click **Tools**, ***Bisque TCS***. 3. Verify the **Mount Identifier** in the lower right of the Bisque TCS window (Figure 37) matches your model mount.

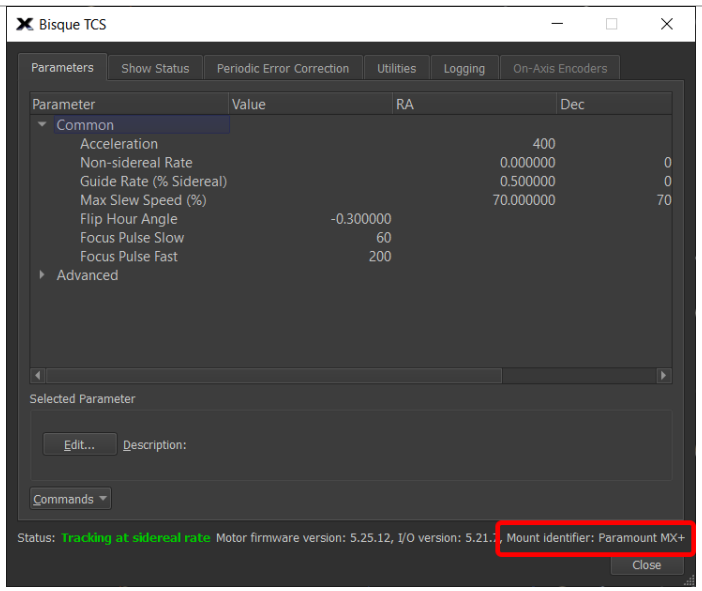


Figure 37: Location of the Mount Identifier on bottom right of the Bisque TCS window.

Restoring the Paramount to Default Settings

If not, configure the MKS 6000 for your mount, as described below:

After installing the latest version of TheSky:

1. Launch TheSkyX Pro.
2. Click **Telescope**, **Connect**.
3. On the **Telescope** window, click **Tools**, **Bisque TCS**.
4. On the **Parameters** tab, click **Commands**, **Restore Defaults**.
5. **CRITICAL**: When prompted, **be sure to choose the correct model of your mount** (Figure 38).
6. **CRITICAL**: Click **Commands**, **Save All Parameters To Mount** to permanently save these settings to the MKS 6000.
7. On the **Telescope** window click **Shut Down**, turn off the mount, reconnect, and verify that the **Bisque TCS** window shows correct **Mount Identifier**.

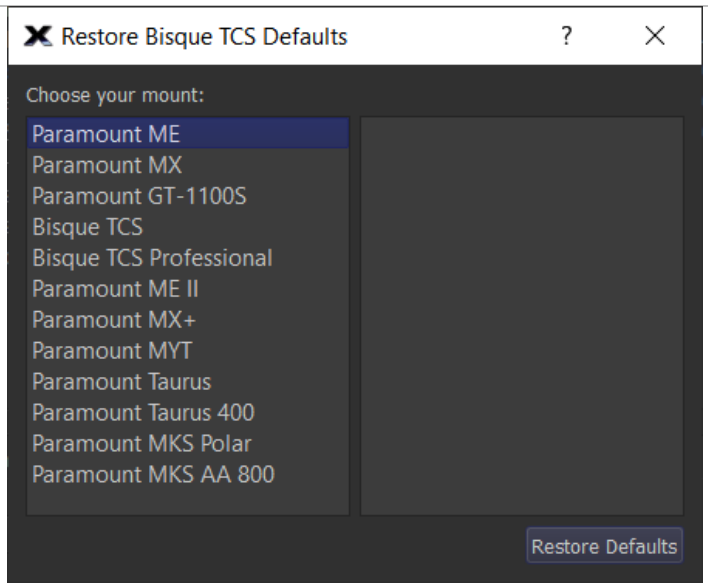


Figure 38: Choosing your Paramount model.

The Paramount will now track at the sidereal rate.

Appendix A: Revision History

The table below describes the changes in each revision of this document.

Revision Number	Changes
1.5	Paramount Model 6 Series draft release.
1.6	Initial public release.
1.7	Updated MKS 6000 LED status documentation
1.8	Correct number of pins on motor extension cable.