



Paramount Robotic German Equatorial Mount Specifications



MYT

\$6,000

Ideal for portable use
50 lb. (23 kg) instrument capacity
100 lb. (46 kg) instruments plus counterweights
34 lb. (15 kg) mount weight



MX+

\$9,000

Suitable for portable or permanent use
100 lb. (45 kg) instrument capacity
200 lb. (90 kg) instruments plus counterweights
50 lb. (23 kg) mount weight



ME II

\$15,000

Perfect for permanent observatories
240 lb. (109 kg) instrument capacity
480 lb. (218 kg) instruments plus counterweights
84 lb. (38 kg) mount weight

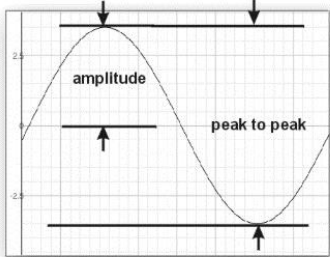
The legendary Paramount robotic German equatorial mount (GEM) is available in three models to suit your needs. The portable *Paramount MyT* carries 10-in. (0.25 m) class telescopes with today's "standard" digital imaging accessories (camera, autoguider, focuser, filter wheel, rotator, AO). The *Paramount MX+* supports 14-in. (0.35 m) telescopes with accessories. The *Paramount ME II* hefts up to 20-in (0.5 m) telescopes with accessories.

Critical Features and Performance Specifications

Category	Feature/Specification	Details
Control software	TheSky Professional Edition, Camera Add On, Dome Add On (Paramount ME II, only) and the TPoint Add On for Mac, Windows, Linux and Raspbian OS.	The Paramount includes the world's most advanced observatory control software, which means you'll enjoy the benefits of increased productivity and ease of use, right out of the box.
All-sky pointing accuracy	30 arcseconds or less	In theory, the Paramount can point your telescope under one arcsecond (the limit of the control system's encoders).



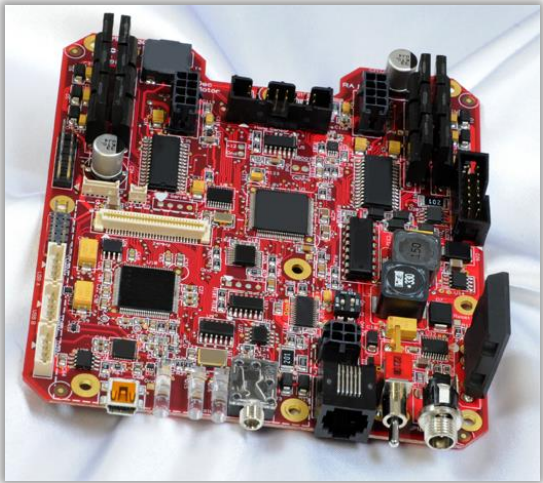
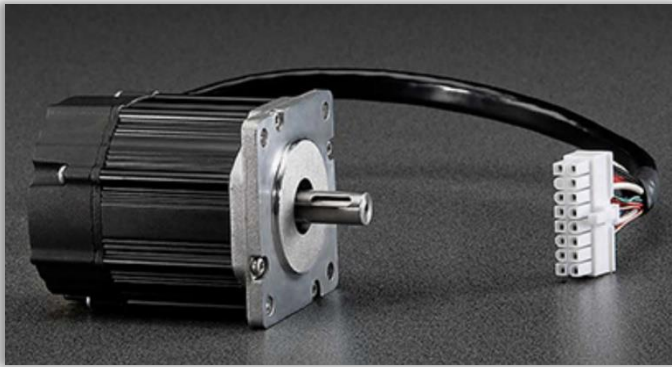
Category	Feature/Specification	Details
		<p>In <i>practice</i>, you should expect to achieve repeatable, quantifiable pointing accuracies at or below 30 arcseconds RMS by employing the TPoint Telescope Pointing Analysis software.</p> <p>The bottom line is that a Paramount with <i>TheSkyX Professional Edition</i>, the <i>TPoint Add On</i>, when used in conjunction with a well-mounted payload with a fixed mirror optical tube delivers exceptional pointing accuracy.</p>
Backlash	Negligible	The spring-loaded worm-to-gear interface results in extremely small backlash in both the right ascension and declination axis.
Nightly startup	Home and start imaging	When aligned with the celestial pole (a requirement for all GEMs), the Paramount can be restarted (powered off then on) with virtually identical pointing and tracking from session to session.
Tracking performance and periodic error	Seven arcseconds or less peak-to-peak periodic error before correction	<p>The <i>peak-to-peak periodic error</i> for the Paramount right ascension gear is seven (7) arcseconds or less, <i>before periodic error correction</i>.</p> <p>The typical periodic error <i>after</i> periodic error correction is applied is one (1) arcsecond peak-to-peak or less. This means the tracking errors that are the result of the worm rotating are generally less than the errors introduced by atmospheric turbulence (local seeing) and are typically negligible.</p> <p>Coupled TPoint's <i>tracking</i> correction technology, called ProTrack™, the Paramount can acquire pinpoint stars in relatively long, unguided photos, even at moderate focal lengths.</p> <p>The Paramount ME II offers optional on-axis, absolute encoders that virtually eliminate periodic error.</p>



Graph showing amplitude and peak to peak periodic error.

■ Technical Specifications ■

Component	Specification	Details
Design	GEM	The GEM is a highly stable and extremely flexible design used by amateur and professionals for astronomical imaging.
Composition		
Body and gears	6061 or 6063 aluminum	All mechanical components are manufactured and assembled in Golden, Colorado, USA.
Worm gear	Brass	
Counterweights and counterweight shafts Fasteners	Stainless steel	
Control system electronics	MKS 5000 dual-axis motion control system	Software Bisque's fourth-generation dual-axis motion control system features:

Component	Specification	Details
 <p data-bbox="147 829 553 852"><i>MKS 5000 dual-axis control system electronics.</i></p>		<ul style="list-style-type: none"> • USB 2.0 PC to mount interface for high-speed communication with TheSky. • LED and audible feedback for startup, homing, and error conditions. • Integrated internal wiring for all mount electronics. • Two port USB hub on the Instrument Panel (near your equipment). • Tracking and "in progress slews" are immediately stopped in the event the mount's payload encounters a fixed object, such as the side of the pier. • Power supply included; Paramount MX and Paramount MyT max power output: 80W, Input: 100-240VAC ~47-63 Hz 1.9A, output: +48V 1.66A max. Paramount ME II max power output: 221W Max, 4.6A, +48V, MEII/MX Input: 100-240VAC ~50/60HZ. • Field-upgradable firmware. • Hand controller features an integrated mini-joystick controller and configurable five position rate switch that allows single-handed mount control, an integrated bright red LED flashlight, a "hang anywhere" cable loop and 15-foot coiled hand paddle to mount cable. • Programmable periodic error correction with "seeing agnostic" periodic error curve fitting built into TheSkyX Professional Edition. • Built-in 'ST-4 standard' autoguider port on the Instrument Panel. • Temperature compensated internal oscillator with better than one part in 10 million precision to ensure accurate tracking rates over a wide temperature range. • Built-in temperature sensor that allows the slew rate to be automatically reduced when the temperature drops. • Soft "reboot" capability. This means that the control system can be restarted through software and does not have to be manually turned off, then on.
 <p data-bbox="196 1566 859 1589"><i>Brushless servo motors offer long life and reliable operation. Photo © Teknic.</i></p>	<p data-bbox="688 1665 980 1688">Brushless DC servo motors</p>	<ul style="list-style-type: none"> • All moving parts are on bearing surfaces and provide reliable operation that is suitable for all-night, every-clear-night use. • Fast slew speeds and consistent torque at all slew rates. Though good balance is always recommended, the Paramount can

Motors

Component	Specification	Details
		<p>slew or track several foot-pounds out of balance. You'll spend less time fiddling with the telescope and more time acquiring data.</p> <ul style="list-style-type: none"> • FEA designed with sintered Neodymium-Iron-Boron permanent magnet (no plastic) for optimal performance. • Optimized thermal design meets continuous high torque demands. • Smooth rotation and quiet operation.
Polar alignment	Calibrated Vernier-scales in altitude and azimuth	<p>Both the altitude and azimuth polar alignment adjustments are designed to allow precise changes to the mount's polar axis without significant "cross axis motion" when the mount's base is close to level.</p> <p>TPoint modeling software, included, can be used to quantify the mount's polar alignment error and the built-in <i>Accurate Polar Alignment</i> feature simplifies this normally complicated procedure.</p>
Slew Limits	Configurable from TheSkyX Professional Edition	The mounts slewing and tracking limits are configurable and so that your equipment will not encounter the side of the pier. (And current limited slews automatically stop the motors, even if this unfortunate event should ever occur.)
OTA mounting	Versa-Plate Mounting Plate	The Versa-Plate allows most any optical tube assembly to be attached to the Paramount, and includes a built-in Losmandy™ D dovetail.
External ports	Located on the Instrument Panel mounted to the Versa-Plate (near telescope)	The Instrument Panel offers a two port USB hub, +12V, +5V, 2.1 mm power plug ports, a guider port, focuser port, and custom through the mount powering system that can power cameras, filter wheels, guiders or other devices.
Work area illumination	Hand paddle and control system LEDs	A built-in red LED on the hand paddle doubles as a flashlight that can be helpful during nightly setup tasks. Integrated "landing lights" beneath the mount's polar axis can be turned on to illuminate your work area.
Accessories included		Counterweights, counterweight shaft, Versa-Plate, 48V DC power supply, PC-to-mount USB cable, hand paddle, TheSkyX Pro and Add Ons for Mac and Windows, bubble level, hex wrench set.

Component	Specification	Details
Through the mount cabling	All the control system cabling is routed internally.	Built-in cable conduits allow additional custom cables to be routed through the mount.
Documentation	Paramount User Guide	A 190-page printed user guide is included, and can also be downloadable in PDF format from www.bisque.com/downloads .

Physical Specifications

	MYT	MX+	ME II
<p>Equipment Capacity GEMs require counterweights to balance the optical payload.</p> <p><i>Additional counterweights may be required to balance heavier payloads.</i></p>	<p>50 lb. (23 kg) total instrument capacity (not including counterweights).</p> <p>The <i>total</i> Paramount MYT carrying capacity is 100 lb. (46 kg) including instruments and payload. <i>Additional counterweights may be required to balance heavier payloads.</i></p>	<p>100 lb. (45 kg) total instrument capacity (not including counterweights).</p> <p>The <i>total</i> Paramount MX+ carrying capacity is 200 lb. (90 kg) including instruments and payload. <i>Additional counterweights may be required to balance heavier payloads.</i></p>	<p>240 lb. (109 kg) total instrument capacity (not including counterweights).</p> <p>The <i>total</i> Paramount ME II carrying capacity is 480 lb. (218 kg) including instruments and payload. <i>Additional counterweights may be required to balance heavier payloads.</i></p>
<p>Mount Weight Includes the weight of the Versa-Plate mounting adaptor.</p> <p>These values <i>do not</i> include the weight of the removable counterweight shaft or the counterweights.</p> <p>Note that the Paramount body cannot be disassembled into smaller components.</p>	34 lb. (15 kg)	50 lb. (23 kg)	84 lb. (38 kg)
<p>Counterweights Stainless-steel construction</p>	<p>One 20 lb. (9 kg) is included can balance about 25-30 lb. (11-15 kg) of payload.</p> <p><i>Additional counterweights are required to balance heavier payloads.</i></p>	<p>Two 20 lb. (9 kg) are included and can balance about 40-50 lb. (18-22 kg) of payload.</p> <p><i>Additional counterweights are required to balance heavier payloads.</i></p>	<p>Two 30 lb. (14 kg) are included and can balance about 60-70 lb. (27-32 kg) of payload.</p> <p><i>Additional counterweights are required to balance heavier payloads.</i></p>
<p>Counterweight Shaft Stainless-steel construction</p>	13 in. (33 cm) x 1.5 in. (3.81 cm) stainless-steel counterweight shaft. Thread-compatible with the	The 16 in. (41 cm) long x 1.5-in. stainless-steel counterweight shaft, also	The 18.5 in. (47 cm) x 1.875 in. stainless-steel counterweight shaft, also included, can carry up to six counterweights.

	Paramount Counterweight Extension Bar.	included, can carry up to six counterweights.	
Equatorial wedge range for polar axis elevation adjustment	0° to 64°	10° to 65° An optional polar wedge is available for latitudes outside this range.	14° to 62° An optional polar wedge is available for latitudes outside this range.
Tracking past meridian	Two (2) hours	Two (2) hours	Three (3) hours
Gears	Research-grade 6.5 in. (16.5 cm) 320 tooth brass right ascension gears.	Research-grade 7.5 in. (19 cm) 375 tooth brass right ascension <i>and</i> declination gears.	Research-grade 11.4 in. (29 cm) 320 tooth brass right ascension gears. 9.5 in. (24 cm) declination gears.
Bearings	4.3 in. (11 cm) contact ball bearings in both right ascension and declination.	6 in. (15 cm) contact ball bearings in both right ascension and declination axis.	8 in. (20 cm) 48-point contact ball bearings in both right ascension and declination axes.
Maximum Slew Rates*	5.4 degrees per second in RA and Dec	5.4 degrees per second in RA and Dec	4 degrees per second in RA and Dec




*Maximum Slew Rates Disclaimer

The factory default of 80% maximum slew rate works well with most payloads over a wide range of temperatures. Paramount mounts can slew at the *maximum slew rate* with a balanced payload that is approximately 50% or less of the total rated capacity, when the spring plunger pressure adjusted to factory standards and at moderate ambient temperatures.

As the mass of the payload increases, and/or the ambient temperature decreases, the mount may not be able to maintain maximum slew speeds. When near or above the stated capacity of the mount, or during cold temperature operation, slower maximum slew speeds and lower accelerations are required.

Slew rates up to 10 degrees for the Paramount MYT and Paramount MX+ can be achieved by purchasing an optional higher wattage power supply.

Optional Accessories

			
Wi-Fi Control The <i>WiSky</i> Wi-Fi® control module allows the Paramount to be controlled wirelessly.	✓	✓	✓
TheSky for iOS Coupled with the <i>WiSky</i> module, control the Paramount from an iPhone or iPad.	✓	✓	✓
Counterweight shaft extension bar Extends the length of the standard counterweight shaft to help balance heavier payloads.	✓	✓	✓

Polar alignment scope Use an optical polar alignment scope for polar alignment.	-	✓	✓
Permanent piers Pier heights available from 24 inches to 60 inches (61 cm to 152 cm).	✓	✓	✓
Power cable sets Through the mount power cable sets are available for SBIG, Apogee, QSI, FLI and other cameras.	✓	✓	✓
Pier adaptor plate An adaptor plate that attaches the Paramount base to the top of most any existing permanent pier or tripod.	✓	✓	✓
48V DC EGO™ battery to Paramount power adaptor Power the Paramount mount using an EGO battery.	✓	✓	✓
Pyramid Portable Pier Lightweight, rapid setup portable tripod for total payloads up to 300 lb. (136 kg).	-	✓	✓
Paramount MYT Tripod Lightweight, rapid setup portable tripod for total payloads up to 150 lb. (68 kg), includes carrying case.	✓	-	-
Paramount MYT Tripod Extension (10 inches)	✓	-	-
Polar wedge Allows the elevation of the Paramount's polar axis to reach low and high latitudes.	-	✓	✓
Large Dovetail Plate Enables the Paramount ME II's Versa-Plate to accept optical tube assemblies that use the PlaneWave Instrument dovetails (including PlaneWave Instruments and Officina Stellare telescopes).	-	-	✓
Absolute On-axis Encoders Improves overall pointing accuracy, eliminates need for homing, and eliminates periodic error.	-	-	✓



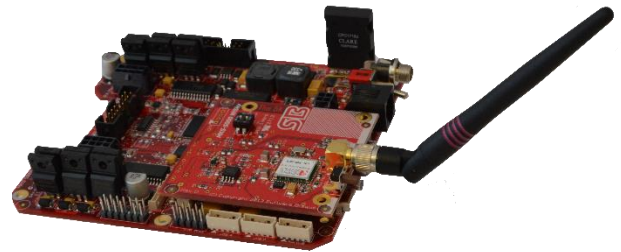
The Pyramid Portable Pier (Paramount MX and Paramount ME II only) **\$2000**



48V DC EGO™ battery to Paramount Power Adaptor (EGO™ battery sold separately) **\$99**



Paramount MyT Tripod **\$1350**



WiSky Wireless Control Module **\$225**



Made in the USA



THE ROBOTIC TELESCOPE MOUNT ENGINEERED TO GO WHERE YOU GO.

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