



SOFTWARE BISQUE

Paramount GEM Robotic Mount System Specifications



\$7,295

Ideal for portable use

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



\$10,195

Designed for portable or permanent use

45 kg (100 lb.) instrument capacity
90 kg (200 lb.) instruments plus
counterweights
23 kg (50 lb.) mount weight







Starting at \$17,595

Perfect for permanent and remote use

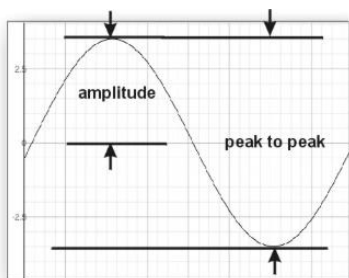
109 kg (240 lb.) instrument capacity
218 kg (480 lb.) instruments plus
counterweights
38 kg (84 lb.) mount weight

The legendary Paramount robotic German equatorial mount (GEM) is available in three models: the portable *Paramount MyT* carries up to 10-in. (0.25 m) telescopes and all your digital imaging accessories (including the camera, autoguider, focuser, filter wheel, rotator, AO); the *Paramount MX+* supports up to 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
Software control	The <i>Paramount Software Suite</i> includes the world's most powerful observatory control software, which means you will enjoy the benefits of increased productivity and ease of use, right out of the box.	The Paramount Software Suite includes TheSky Imaging edition, the Dome Add On (Paramount ME II, only), and the Multi-OS and Six License Add On. The suite is compatible with macOS, Linux (x86_64 and ARM32 and ARM64 architectures) and Windows.    

Category	Feature/Specification	Details
All-sky pointing accuracy	30 arcseconds or less	<p>In theory, the Paramount can point your telescope under one arcsecond (the limit of the control system's encoders).</p> <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 Paramount with <i>TheSkyX Professional Edition</i> and the world-renowned TPoint software, when used in conjunction with a well-mounted payload with a fixed mirror optical tube delivers unmatched telescope 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	Find 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 with TPoint's telescope <i>tracking improvement</i> technology, called <i>ProTrack™</i>, the Paramount can acquire pinpoint stars in relatively long, unguided photos, even at moderate focal lengths.</p> <p>The Paramount ME II with <i>optional</i> on-axis, absolute encoders have virtually zero periodic error and does not require periodic error calibration or correction.</p>

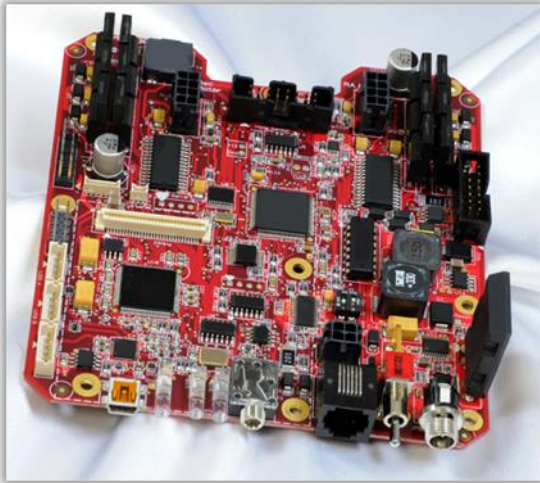


Graph showing amplitude vs. peak-to-peak periodic error.

Technical Specifications

Component	Specification	Details
Design	GEM	The German equatorial mount 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	Stainless steel	
Fasteners		Non-metal body components include the worm block adjustment access hole covers, the

Component	Specification	Details
Control system electronics	MKS 5000 dual-axis motion control system	<p>Delrin™ washers on the altitude axis retaining knobs and the hand paddle's joystick.</p> <p>Software Bisque's fourth-generation dual-axis motion control system features:</p> <ul style="list-style-type: none"> • USB 2.0 PC to mount interface for high-speed communication with TheSky Professional Edition. • 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 a 15-foot coiled cable. • Programmable periodic error correction with "seeing agnostic" periodic error curve fitting built into TheSkyX Professional Edition. • Autoguider port on the Instrument Panel accepts a phone line cord reverse 6P6C RJ12 plug autoguider cable (ST-4 compatible). • 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



Software Bisque's MKS 5000 dual-axis control system.



*Brushless DC servo motors offer long life and reliable operation.
Photo © Teknic.*

Component	Specification	Details
		through software and does not have to be manually turned off, then on.
Motors	Brushless DC servo motors	<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 slew or track several foot-pounds out of balance. You'll spend less time fiddling with the telescope and more time acquiring data. • 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, even if the pole is not visible.</p>
Slew Limits	Configurable from TheSkyX Professional Edition	The mount's slewing and tracking limits are configurable and so that your equipment will not encounter the side of the pier. The motors are also current limited so that slews automatically stop, if this unexpected 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 with OTA rings or using the integrated 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.

Component	Specification	Details
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 unit, PC-to-mount USB cable, hand paddle, Paramount Software Suite, bubble level, hex wrench set, USB strain relief cable.
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 200+-page printed user guide is included and can also be downloadable in PDF format from bisque.com/downloads .

Physical Specifications

	MYT	MX+	ME II
Equipment Capacity GEMs require counterweights to balance the optical payload. <i>Additional counterweights may be required to balance heavier payloads.</i>	50 lb. (23 kg) total instrument capacity (not including counterweights). 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>	100 lb. (45 kg) total instrument capacity (not including counterweights). 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>	240 lb. (109 kg) total instrument capacity (not including counterweights). 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>
Mount Weight Includes the weight of the Versa-Plate mounting adaptor. These values <i>do not</i> include the weight of the removable counterweight shaft or the counterweights. Note that the Paramount body cannot be disassembled into smaller components.	34 lb. (15 kg)	50 lb. (23 kg)	84 lb. (38 kg)

Counterweights* Stainless-steel construction	One 20 lb. (9 kg) counterweight is included can balance about 25-30 lb. (11-15 kg) of instrumentation.	Two 20 lb. (9 kg) counterweights are included and can balance about 40-50 lb. (18-22 kg) of instrumentation.	Two 30 lb. (14 kg) counterweights are included and can balance about 60-70 lb. (27-32 kg) of instrumentation.
Counterweight Shaft Stainless-steel construction	The 13 in. (33 cm) x 1.5 in. (3.81 cm) counterweight shaft can carry up to four 9 kg (20 lb.) or five 4 kg (10 lb.) counterweights.	The 16 in. (41 cm) long x 1.5-in. counterweight shaft can carry up to six counterweights.	The 18.5 in. (47 cm) x 1.875 in. counterweight shaft 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

*Additional counterweights are required to balance heavier payloads.

**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 slew at the maximum slew speeds. When the payload is at or near the maximum capacity, or during cold temperature operation, the mount must be configured to run at a slower maximum slew speed and lower acceleration to prevent the motors from stalling.

Maximum slew rates up to 10 degrees per second can be achieved by the Paramount MYT and Paramount MX+ by purchasing the optional higher wattage power supply.

Optional Accessories

Wi-Fi Control

The WiSky Wi-Fi® control module allows the Paramount to be controlled wirelessly.

TheSky for iOS

Coupled with the WiSky module, control the Paramount from an iPhone or iPad. TheSky for iOS can be purchased from the Apple Store.

Counterweight shaft extension bar

Extends the length of the standard counterweight shaft to help balance heavier payloads.

Permanent piers

Piers are available in standard heights between 12 inches and 48 inches (30 cm to 122 cm). Custom-height piers can be manufactured upon request.

Power cable sets

Through the mount power cable sets are available for SBIG, Apogee, QSI, FLI, ZWO and other cameras. A generic cable set is available that can be customized for any power connector.

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 during portable use.

Pyramid Portable Pier

Lightweight, rapid-setup portable tripod for payloads up to 250 lb. (113 kg).

Paramount MYT Tripod

Lightweight, rapid setup portable tripod for total payloads up to 150 lb. (68 kg), includes a soft-sided 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).



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On-axis Absolute Encoders

Eliminates periodic error and the need for homing each session.

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The Pyramid Portable Pier **\$2,295-\$2,645**

(Paramount MX and Paramount ME II only)



48V DC EGO™ Battery to Paramount Power Adaptor **\$242**

(EGO™ battery sold separately)



Paramount MYT Tripod **\$1,783**



Helium™ Tripod **\$1,553**



TheSky Fusion **\$1,895**



WiSky Wi-Fi Control Module **\$397**



SOFTWARE BISQUE

Superior imaging solutions for discriminating astronomers.

© 2022 Software Bisque, Inc. ■ 862 Brickyard Circle ■ Golden, Colorado 80403-8058 ■ USA

Phone: +1.303.278.4478 ■ Fax: +1.303.278.0045

Website: bisque.com