10MICRON.COM

10 MICRON astro•technology by COMEC-TECHNOLOGY

10 MICRON HPS MOUNTS

TRUE PRECISION – FOR YOUR ASTRONOMICAL FUTURE

● UNGUIDED imaging – even in field use! ● Satellite tracking ● high-precision spectroscopy

GM 1000 HPS
25kg *(55 lbs)*
load capacity

GM 2000 HPS II
50kg *(110 lbs)*
load capacity

GM 3000 HPS
100kg *(220 lbs)*
load capacity

GM 4000 HPS II
150kg *(330 lbs)*
load capacity

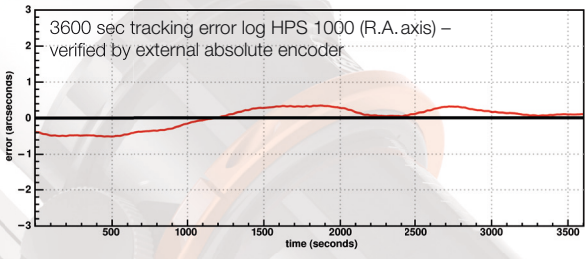
FEATURES

DRIVE MECHANICS

- Self-locking, high-precision worm-wheel-drives with classic friction clutches
- Internal wiring – no external mount cables
- High Torque AC Servo motors eliminate imbalance motor stall
- Proprietary motor-electronics for easy servicing

FIRMWARE

- Dual Tracking, automatic refraction (configurable) and flexures correction functions implemented – the only way for perfect unguided tracking during long exposures
- Intuitively operated V.2 software, proprietary motor control system with temperature compensated clock and integrated into an onboard Linux computer – intelligence **built-in**
- No external PC or laptop mandatory in the field – all functions in the onboard computer can be accessed via stand-alone hand control unit (HC)
- Precise multistar pointing models, entering satellite and comet trajectories, programming individual observing sessions and much more
- Well documented firmware and drivers, working autonomously w/o additional planetarium software, without need for external RS-232 converters / USB ports
- Excellent documentation in English and German
- Electronic balance - requiring one time balancing only
- Ultra stable pointing models for safe East/West load reversal – no change of pointing model necessary when changing accessories. Recordable models database for different telescope setups
- Precise polar alignment – software aided and accomplished within minutes
- Fully remote controlled via your observatory PC with 10/100/1000 LAN and WiFi option included – perfectly prepared for your future Internet observatory
- Manual, automatic (Clock Sync proprietary software) or GPS based time; leap seconds support for the different timescales of UT1 and UTC
- Remote diagnostics web assist option w. dedicated server



Professional graphic Keypad included:

- Stand alone control unit – no PC required – includes all necessary functions for field use
- Rugged keypad with metal housing and reliable professional micro switches
- Large graphic display with up to five text lines and status icons, heated for low temperature operation, dimmable display and keyboard with backlit keys

M-13 : © Markus Beer
GM 1000 HPS and TEC 140:
Canon 5D.Mark II, exposure
10x7min., 400 ISO.
UNGUIDED!

„Quality exists - when the price is long forgotten“ Sir Henry Royce - founder of RollsRoyce

DRIVE ELECTRONICS

- Absolute on-axis encoders in RA & Dec, featuring more than 10 million increments (interpolated), fully encapsulated and calibrated
- Up to 0.6" RMS tracking accuracy – for long duration unguided imaging
- Closed loop (encoder controlled) satellite tracking
- speed – up to 20°/s (GM 2000)
- Extremely low power consumption and miniature format (20 x 15 x 8cm) electronics
- After an observing session, the entire electronics box (motor electronics with Linux computer) and HC can be easily detached and protected from premature aging and moisture damage – Virtual Keypad on PC available for remote control
- Service friendly design – electronics box and HC can be easily exchanged for service, without returning the precisely adjusted HPS mount

10 MICRON astro•technology by COMEC-TECHNOLOGY

Authorized 10Micron Dealer:

Made in Italy

10 MICRON astro•technology

by COMEC-TECHNOLOGY

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SPECIFICATIONS	GM 1000 HPS	GM 2000 HPS II	GM 3000 HPS	GM 4000 HPS II
Mount Type	German Equatorial Mount			
Weight (mount w/o acc.)	~ 19.5 kg – *43 lbs*	~ 33 kg – *73 lbs*	~ 65 kg – *143 lbs*	~ 125 kg – *276 lbs*
Weight, Ultraportable version (mount)	----------	~ 18,5 kg – *40 lbs* + ~15 kg – *33 lbs* (without accessories)	----------	----------
Instrument payload capacity	25 kg – *55 lbs*	50 kg – *110 lbs*	100 kg – *220 lbs*	150 kg – *330 lbs*
Latitude range	0° – 82° (90° optional)	20° – 70°	20° – 70°	20° – 70°
Azimuth fine adjustment range	+/– 7.5°	+/– 10°	+/– 10°	+/– 10°
Counterweight shaft	30 mm diameter, stainless steel, weight 1.7 kg – *3.7 lbs*	40 mm diameter, stainless steel, weight 4 kg – *9 lbs*	50 mm diameter, stainless steel, weight 8 kg – *18 lbs*	60 mm diameter, stainless steel, weight 13 kg – *29 lbs*
Axes	30 mm diameter, alloy steel	50 mm diameter, alloy steel	**a.r.** 80mm / **dec.** 50mm diameter, alloy steel	**a.r.** 85mm / **dec.** 80mm diameter, alloy steel
Bearings	Pre-loaded tapered roller bearings	Pre-loaded tapered roller bearing	Pre-loaded tapered roller bearing	Pre-loaded tapered roller bearing
Worm wheels	250 teeth, 125 mm diameter, B14 bronze	215 teeth, 172 mm diameter, B14 bronze	**a.r.** 315 teeth, 244 mm diameter, B14 bronze **dec.** 250 teeth, 192 mm diameter, B14 bronze	**a.r.** 430 teeth, 330 mm diameter, B14 bronze **dec.** 315 teeth, 244 mm diameter, B14 bronze
Worms	20mm diameter, tempered alloy steel, grinded and lapped	24mm diameter, tempered alloy steel, grinded and lapped	32mm / 24mm diameter, tempered alloy steel, grinded and lapped	32mm diameter, tempered alloy steel, grinded and lapped
Motors	2 axes AC servo brushless			
Power supply	24 V DC			
Power consumption	~ 0,5 A while tracking ~ 3 A at maximum speed ~ 4 A peak	~ 0,7 A while tracking ~ 3 A at maximum speed ~ 5 A peak	~ 1 A while tracking ~ 3 A at maximum speed ~ 5 A peak	~ 1.5 A while tracking ~ 5 A at maximum speed ~ 6 A peak
Go-to speed	Adjustable from 2°/s to 15°/s	Adjustable from 2°/s to 20°/s	Adjustable from 2°/s to 12°/s	Adjustable from 2°/s to 8°/s

GENERAL SPECIFICATIONS

Transmission system	Backlash-free system with timing belt and automatic backlash recovery
Pointing accuracy	< 20" with internal 25-stars software mapping - max.100stars; possibility to use the Model Maker software for automated alignment operation.
Average tracking accuracy	~ 1" typical for 15 minutes ~ 0,6" RMS with internal 25-stars software mapping and compensation of system flexures and polar alignment errors
Security stop	+/– 30° past meridian in r.a. (software) +/– 45° past meridian in r.a. (mechanical)
Communication ports	RS–232 port; GPS port; autoguide ST-4 standard port; Ethernet 10/100/1000 port
Database	Stars: by Common Names, Bayer designation, Flamsteed designation, Bright Star Catalogue, SAO, HIP, HD, PPM, ADS, GCVS. Deep-sky: M, NGC, IC, PGC ,UGC limited up to mV = 16. Solar system: Sun, Moon, planets, asteroids, comets, artificial satellites. Equatorial and altazimuth coordinates. User defined objects. Quick slewing positions recalls for frequent focusing or useful operation.
Firmware features	User defined mount parking positions, 2stars and 3stars alignment function, up to 100 alignment stars for modeling, correction of polar alignment and orthogonality errors, estimate of average pointing error, storage of multiple pointing models, sidereal, solar and lunar tracking speed adjustable on both axes, declination-based autoguide speed correction, adjustable horizon height limit, pointing and tracking past meridian, assisted electronic balance adjustment, automatic (ClockSync proprietary software) manual or GPS time & site coordinates synchronization, leap seconds support and full accounting for the UT1-UTC timescale, configurable atmospheric refraction, direct Baader dome control via RS-232, network settings, comets and asteroids filter, multi-language interface. Remote Assist via Internet connection with dedicated server.
Keypad control	Rugged keypad with metal housing and reliable professional micro switches, Large graphic display – heated for operation under lowest temperatures, dimmable display and keyboard with back-lit keys, five information menu lines for coordinates, object information and symbols showing mount status and active external connections and accessories. All the functionality of the mount is available through the keypad without requiring an external PC
PC control	Remote control via RS-232, Ethernet, proprietary 10Micron ASCOM driver, LX200 compatible protocol, update of firmware and orbital elements of comets, asteroids and artificial satellites via RS-232 or Ethernet, PC virtual KeyPad control panel via RS-232 or Ethernet, Integrated Wi-Fi for connection with smartphones and tablets and any wireless network

We reserve the right for errors and manufacturers modification