10MICRON MOUNTS

25 YEARS OF EXPERIENCE

OFFICIAL EU-DISTRIBUTOR

baader planetarium

www.10micron.eu



MADE IN ITALY

10MICRON
astro•technology
by COMEC-TECHNOLOGY











1. *Test Operation of AZ1000 HPS Silver – Solar Edition*

2. *Installation of GM3000 HPS in 3.5m Baader AllSky Dome*

3. *GM4000 HPS with multiple tescopes at Sharjah, UAE*

4. *GM3000 HPS for AG Orion in Hochtaunus, Germany*

5. *AZ2000 HPS in dual-use operation*

6. *AZ5000 DDS in Chile – operated with Webservatory® by sciencentric®*



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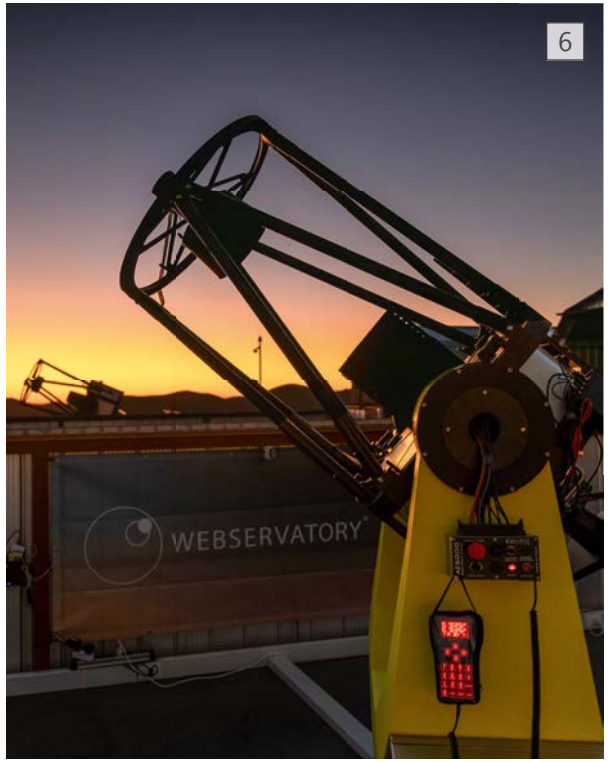
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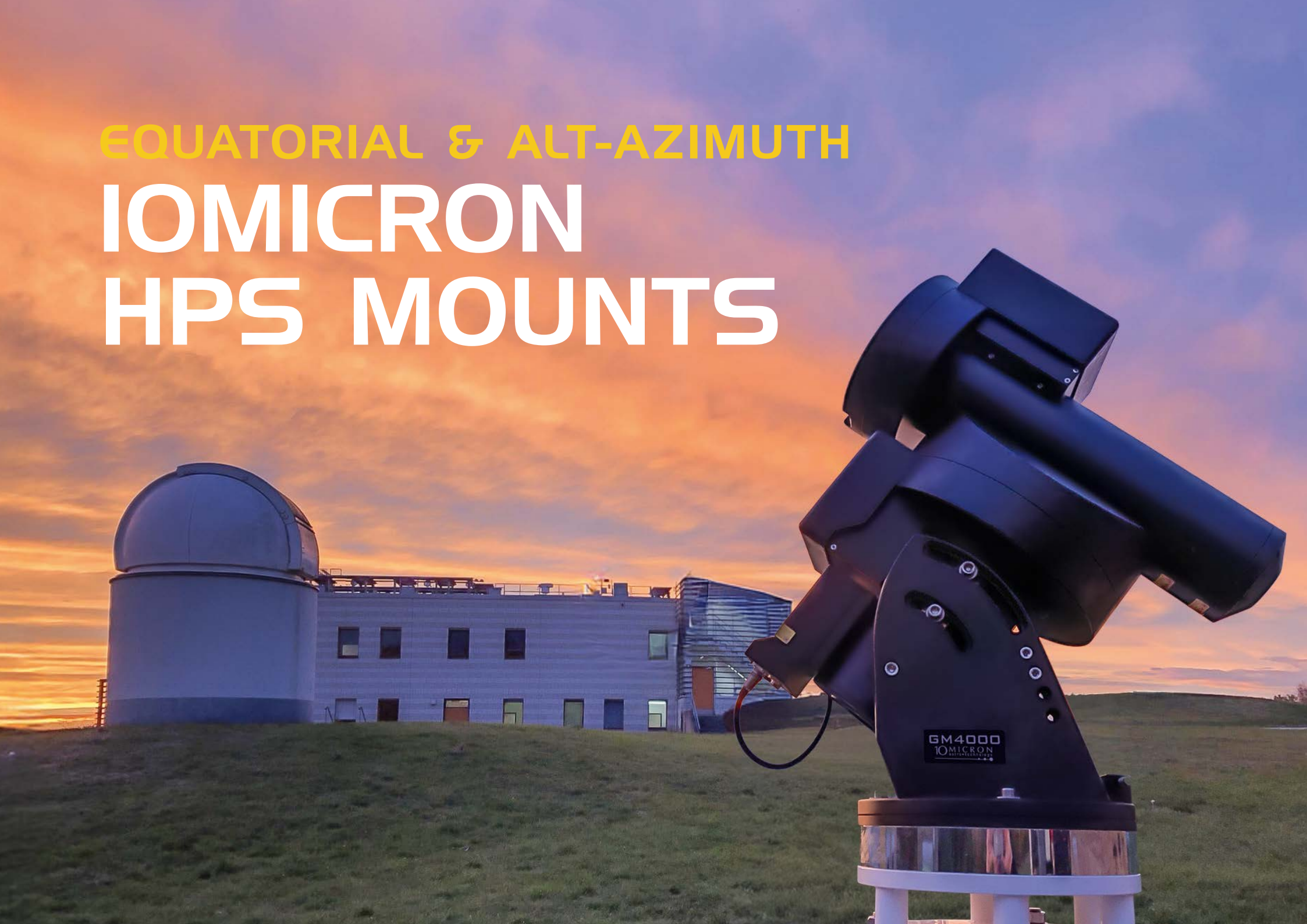
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EQUATORIAL & ALT-AZIMUTH

10MICRON HPS MOUNTS




CELESTRON
HPS
OMICRON
astro•technology

INTRODUCTION

THE IOMICRON HPS TECHNOLOGY

HPS stands for High Precision and Speed, representing the essence of 10Micron mounts. High precision, thanks to an innovative and exclusive absolute encoder paired with 10Micron manufacturing. High speed, thanks to high performance electronics and AC servo motors

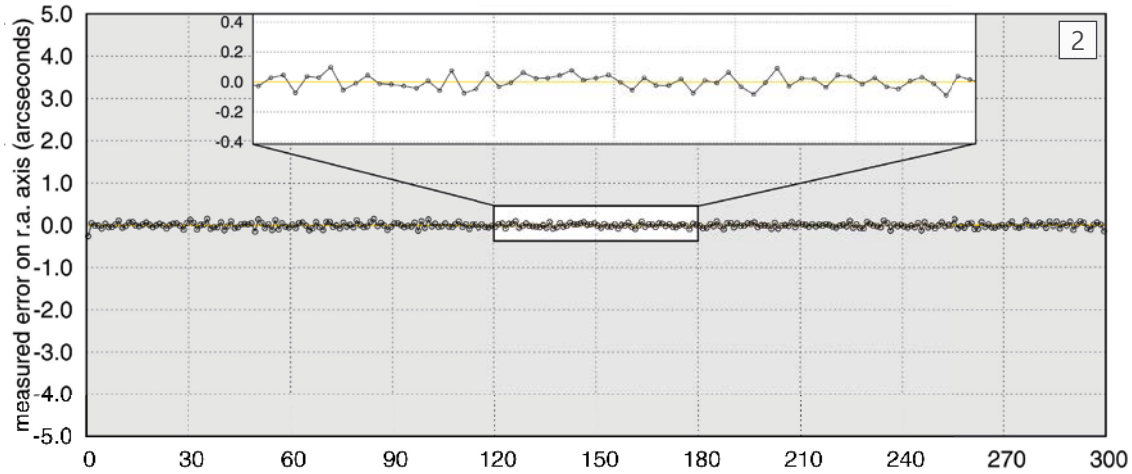
The HPS-series mounts are equipped with a pair of ultra-high resolution absolute encoders, directly mounted at the right ascension and declination axis.

This technology has already been used in professional observatories, where high costs and complexity is not an issue. Measuring the rotation angles of the axes directly allows to compensate for most of the mechanical errors, such as periodic errors and transmission backlash. However, this requires systems with very high resolution.

In the past few years this technology could also be found in amateur astronomers' instruments, often paired with the use of direct drive technology where motors are mounted directly on the mount's axes – without any mechanical reduction gear.

10Micron HPS mounts continue to feature the traditional worm to wormwheel drive solution, while pairing it with state of the art encoder technology. The encoders do their job with 1/10 arcsecond resolution. This enables HPS mounts to perform at the same level of precision as professional direct-drive mounts (without any mechanical drive) but without all the downsides of a mount only controlled by electronically manipulating magnetic fields.





1. *NGC 6960, GM2000 HPS II, CDK 14 • 43x480 sec • UNGUIDED • © Christoph Kaltseis*
2. *300 seconds unguided tracking with GM4000 HPS II, error curve measured by high resolution encoder*

IOMICRON FIRMWARE

UNGUIDED IMAGING

The described extremely high precision makes 10Micron mounts stand out and allows unguided imaging already on the first night!

Every 10Micron mount delivered by Baader Planetarium comes with a Quickstart Manual (along with the detailed ~80 page instruction manual), that explains you the first necessary steps to take your first guided or unguided image. If you follow the described proven and tested procedure you should be able to take

- images w/o autoguider (UNGUIDED) for several minutes of exposure, dependig on your equipment (stability, sampling etc): 10 minutes with 1000mm focal length are very usual*
- images with autoguider (GUIDED), with telescope setups not yet optimized for unguided imaging: longer exposures, also with long focal lenghts*

* This is an easy and fast method to take your first shoots on your first nights; once you will gain more experience with your mount you will soon be able to achieve much longer guided and unguided images.For example, some skilled customers regulary take **single UNGUIDED exposures of 50min**. with more than 2000mm focal lenght! GUIDED imaging is possible with virtually unlimited exposure time.



IOMICRON FIRMWARE

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, lunar and custom 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
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.

IOMICRON HPS MOUNTS

SPECS AND FEATURES

The object database contains many star catalogs and furthermore deep-sky objects up to 16th magnitude. Solar system objects can be tracked with non-sidereal speed. Orbital elements of comets, asteroids and artificial satellites can be loaded into the mount, so that these objects can be tracked directly using the keypad.

The usage of a model containing up to 100 stars makes the pointing accurate. Modeling allows correction of classical polar alignment and conic errors, and also of the most important flexure terms of the optical tube. This way it is possible to obtain pointing accuracies in the order of 15 arcseconds RMS. The same model can be used in order to obtain the maximum tracking accuracy, compensating also for the atmospheric refraction (depending on local atmospheric pressure and temperature).

A series of auxiliary functions provide automated align procedures for precisely aligning the mount to the celestial pole. You may save and recover the alignment data of different observing sessions. This function is very useful if you have many instruments in different setups, each one requiring different flexure corrections.

The resulting tracking accuracy makes autoguiding unnecessary for most projects. The absolute encoders on both axes allow to obtain a typical tracking error below 1 arcsecond. However it is still possible to autoguide using the ST4-compatible port or through the serial/Ethernet connection, with a guide rate configurable from 0.1x to 1x. The guide rate can be automatically corrected for the target declination, there is no need of recalibrating the autoguiding parameters when observing at different declination.

All HPS mounts can also be controlled with common software packages by connecting it to a PC with RS-232 serial port, Ethernet or WiFi, via the proprietary 10Micron ASCOM driver or conventional compatible command protocols. Furthermore, a dedicated software (included) can be used to create a „virtual keypad", replicating exactly the functions of the physical keypad. The RS-232 port also allows the direct control of Baader Domes without PC. Once configured with your instrument parameters, the firmware is able to make all the calculations required for positioning the dome slit in front of your optical tube for almost all instrument configurations

EQUATORIAL GM HPS MOUNTS

Applications:

- Astronomy
- Astrophotography
- For amateurs and science

Sizes:

- GM1000 - 4000

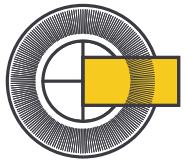
ALT-AZIMUTH AZ HPS MOUNTS

Applications:

- Astrophotography
- Dual-Telescope Usage
- Rec. for Public Observatories

Sizes:

- AZ1000 - 4000



ABSOLUTE ENCODERS

On-axis in RA & Dec, featuring more than 10 million increments (interpolated), fully encapsulated and calibrated.



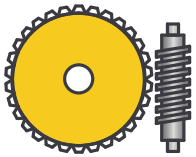
BUILT-IN INTELLIGENCE

Onboard industrial-grade Linux computer for standalone control, analysis of the absolute encoders and controlling motors – this mount „knows" that it is a mount.



AC SERVO MOTORS

High torque brushless servo motors, maintanence free, allowing a pointing speed of up to 20°/s (GM 2000).



WORM GEAR

High-precision traditional worm-wheel drives and clutches for the best reliability – made with B14 bronze.



CNC-MILLED

No casted parts, complete mechanical structure is CNC-milled, premium materials for high quality and durability.



REMOTE OPERATION

Fully remote controlled via your observatory PC through 10/100/1000 LAN or WiFi, ASCOM-compatible, mount PC also controls Baader Domes.

HIGHLIGHTS

IOMICRON GM/AZ HPS MOUNTS



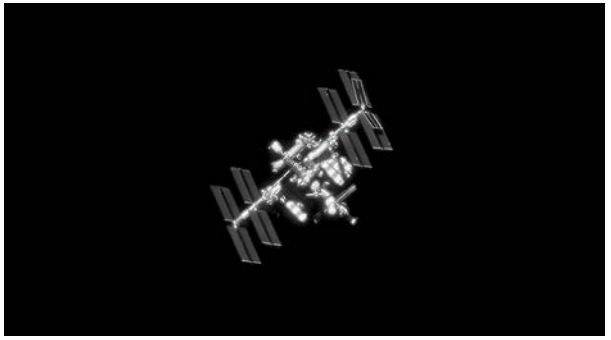
UNGUIDED TRACKING (UP TO 0.6" RMS)

Powerful firmware featuring advanced mount modeling, with several parameters computation and special functions: the only way for perfect unguided tracking during long exposures.



STAND-ALONE OPERATION

Control unit includes all necessary functions for field use – no PC required. Large, dimmable graphic display with up to five text lines / status icons, heated for low temp operation.



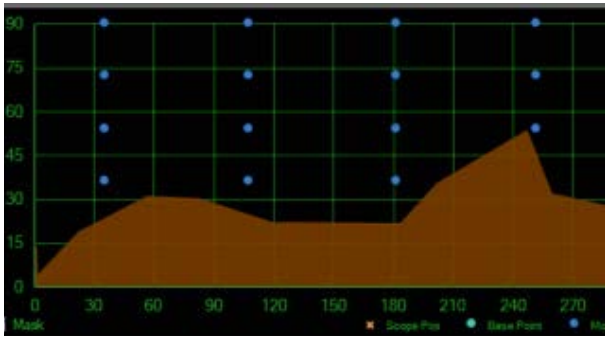
HIGH SPEED - SATELLITE SSA/SLR

Precise multistar pointing model, suitable e.g. for high precision spectroscopy, TLE manager for satellite tracking, orbital parameters management for ISS, minor planets and comets.



VERSATILE PLATFORM

They are a reliable basis for one or several telescopes and all astronomical purposes; but they can also track satellites, space debris and carry laser emitters and -receivers for communication, data transfer, and distance measurements.



PRECISE MULTISTAR POINTING MODEL

With third party software it is possible to automatically create sky models with plate solving technology with up to 100 data points. It's possible to store different models for different telescopes and switch between the models.



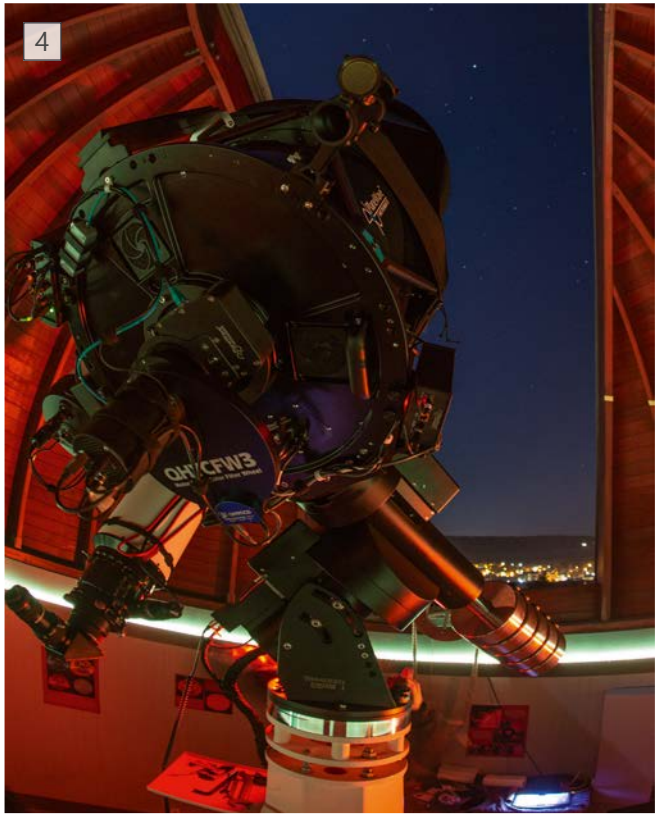
CONTROL BOX V3 - ADVANCED FEATURES

Featuring a powerful ARM mainboard, high-quality Binder connectors, optimized ports for LAN, autoguider & GPS, precise GPS with PPS signal, external WiFi option, improved 24 V power connector, and extended AUX interface.







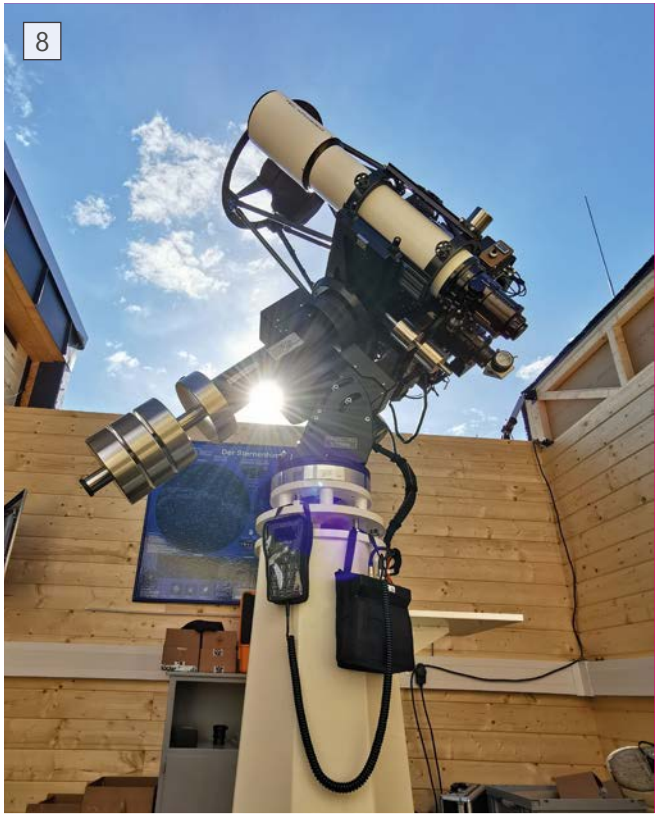




1. *GM 4000 HPS for the Open University, Tenerife*
2. *GM 3000 HPS at Private Observatory, Germany*
3. *GM 1000 HPS at Amateur Astronomer, Romania*
4. *GM 4000 HPS at Rodewisch Observatory, Germany*
5. *AZ 4000 HPS at experimenta Science Center, Germany*











6. *GM 3000 HPS for University of Kent, UK*

7. *GM 4000 HPS at Rodewisch Observatory, Germany*

8. *GM 3000 HPS at Staernwarte Gersbach, Germany*

9. *GM 4000 HPS at Kazan Federal University, Russia*

10. *GM 2000 HPS (older model) at Private Observatory, Germany*



GM 1000 – GM 4000

EQUATORIAL HPS MOUNTS

The classic astronomical mount offers a decisive advantage: By aligning the RA axis to the celestial pole, the earth's rotation is compensated with only one motor, a rotation of the field of view of eyepiece or camera is compensated. The object remains stably centered. For many decades, amateur astronomers have been working with this proven design, especially when it comes to photography with longer exposure times or observation with high magnifications.



GM4000 HPS in 4.5m Baader AllSky Dome for Open University, Tenerife





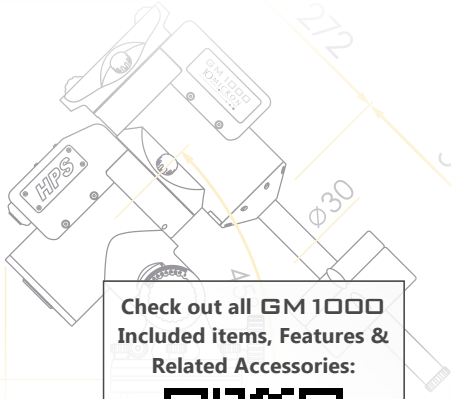




#1451002

GM1000 *HPS* EP

Loading Capacity	30 kg
Mount weight	19.5 kg (w/o accessories)
Working Temperature	-15°C to +35°C
GoTo Speed	adjustable from 2°/s to 15°/s
Power Parameters	~ 0,5 A guiding ~ 3 A max. speed ~ 4 A Peak



Check out all GM1000 Included items, Features & Related Accessories:

10micron.eu/gm1000

AMATEUR ASTRONOMER

The GM 1000 HPS is an excellent mount for astrophotography that is also perfectly suited for mobile use. The mechanics, stability and accuracy set new standards. (...) It makes Astrophotography a lot easier and ensures precise tracking.

Michael Deger



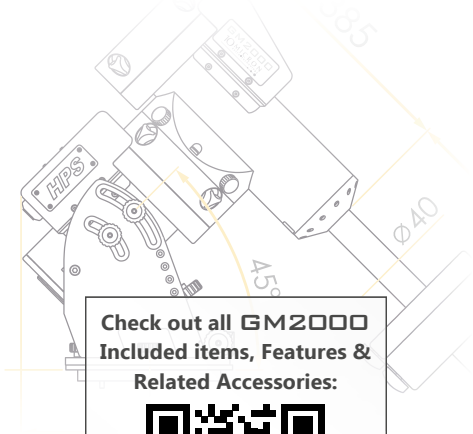




#1452030

GM2000 HPS II

Loading Capacity	50 kg
Mount weight	18.5 kg + 15 kg
Working Temperature	Standard: -15°C to +35°C COLD ❄: -30°C to +35°C
GoTo Speed	adjustable from 2°/s to 20°/s
Power Parameters	~ 0,7 A guiding ~ 3 A max. speed ~ 5 A Peak



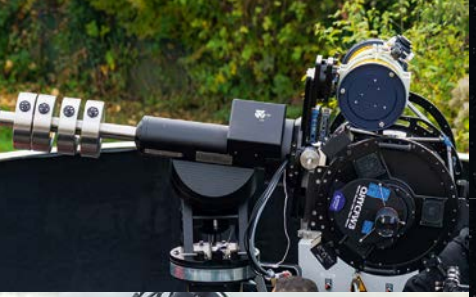
Check out all GM2000 Included items, Features & Related Accessories:

10micron.eu/gm2000

AMATEUR ASTRONOMER

The GM2000 HPS currently carries two telescopes. Due to the fixed setup of the mount I will now usually take my deep sky images unguided, which I have done occasionally so far. But now this will become the normal case and has proven itself very well.

Helmut Heinicke





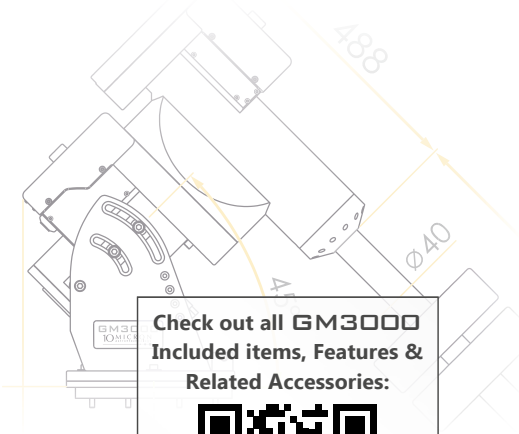




#1453000

GM3000 *HPS*

Loading Capacity	100 kg
Mount weight	65 kg (w/o accessories)
Working Temperature	Standard: -15°C to +35°C COLD ❄: -30°C to +35°C
GoTo Speed	adjustable from 2°/s to 12°/s
Power Parameters	~ 1 A guiding ~ 3 A max. speed ~ 5 A Peak



Check out all GM3000 Included items, Features & Related Accessories:

10micron.eu/gm3000

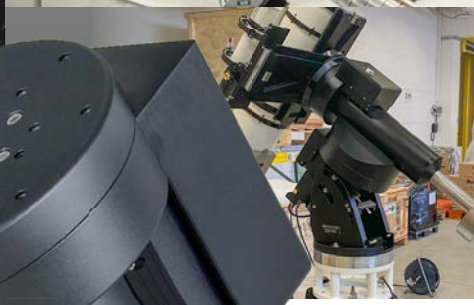
PRIVATE OBSERVATORY

My mount from 10Micron has been extremely successful in use. (...) Mechanically a gem: extremely fast, very quiet, very accurate and very stiff. This mount is a real "final solution". You can "forget" it, as it always works reliably.

Dr. Claus Possberg



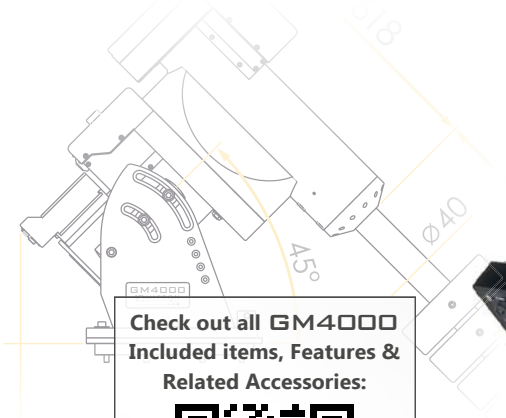




#1454010

GM4000 HPS II

Loading Capacity	150 kg
Mount weight	125 kg
Working Temperature	Standard: -15°C to +35°C COLD ❄: -30°C to +35°C
GoTo Speed	adjustable from 2°/s to 8°/s
Power Parameters	~ 1,5 A guiding ~ 5 A max. speed ~ 6 A Peak



Check out all GM4000 Included items, Features & Related Accessories:

10micron.eu/gm4000

HANS-HAFFNER OBSERVATORY

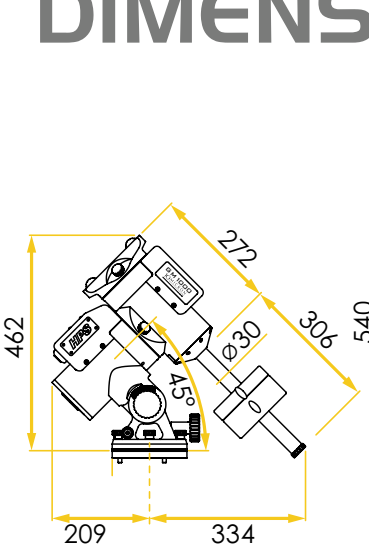
Already the first test images with the new mount showed the extraordinary high quality of the new system with additionally simplified handling. In addition to the high-precision tracking, the HPS II also impresses with its extremely accurate pointing.

Martin Feige

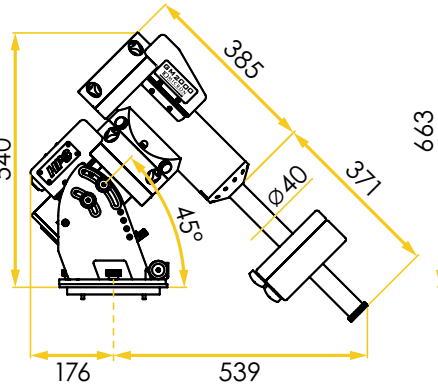
GM HPS MOUNT

DIMENSIONS

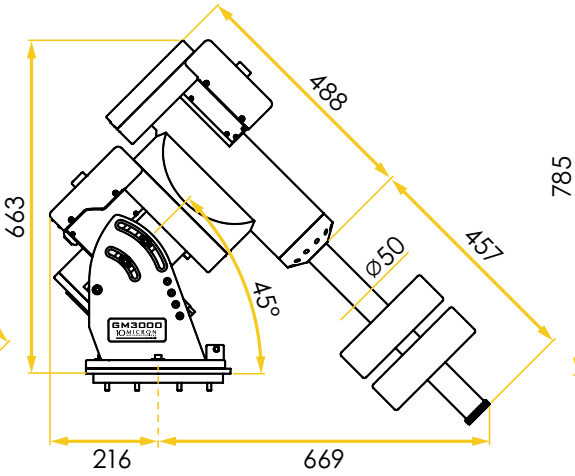
all given measurements in Millimeter (mm)



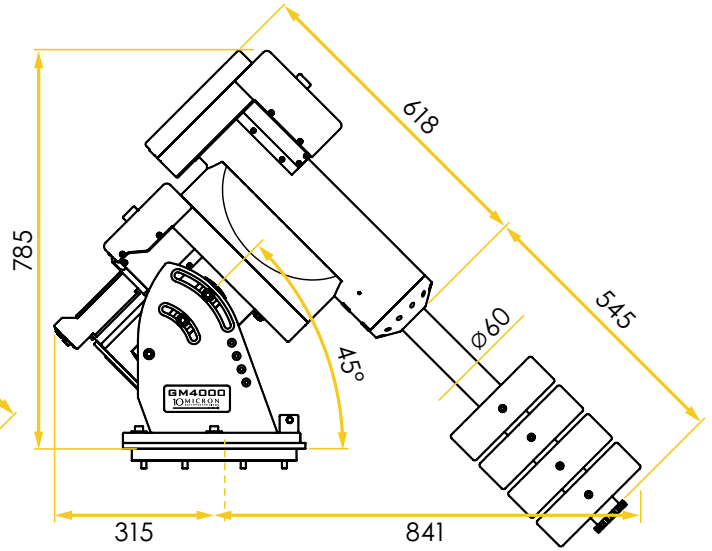
GM 1000



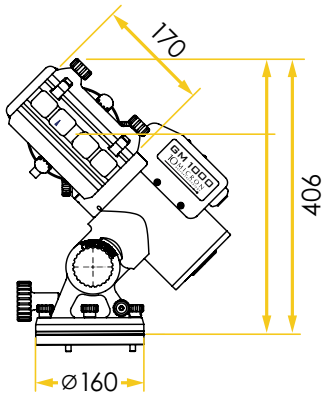
GM2000

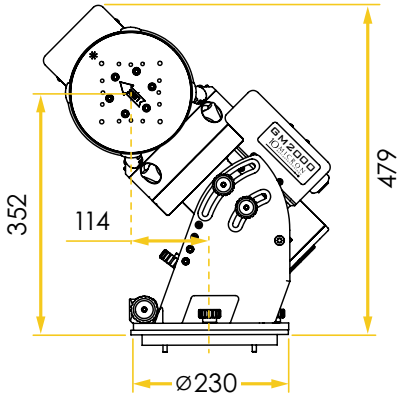


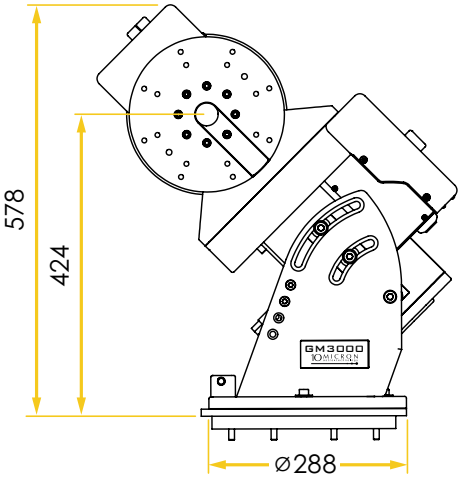
GM3000

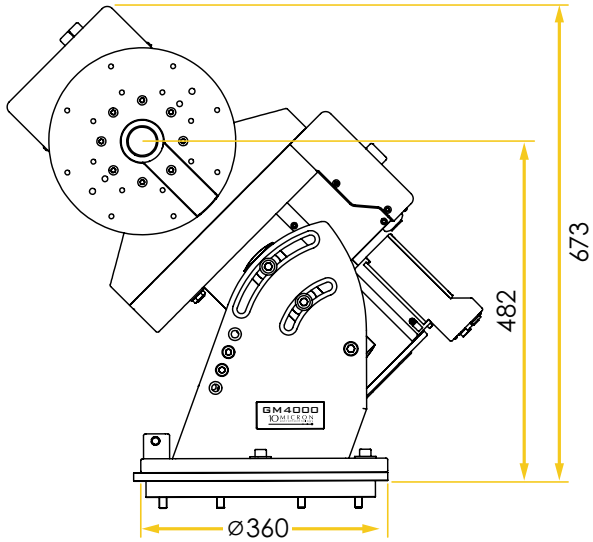


GM4000









GM HPS MOUNTS

TECHNICAL DATA



SPECIFICATIONS	GM1000 HPS EP	GM2000 HPS II	GM3000 HPS	GM4000 HPS II
Mount Type	German Equatorial Mount			
Weight (mount w/o acc.)	19,5 kg *(43 lbs)*	18,5 kg + 15 kg = 33,5 kg *(73 lbs)*	65 kg *(143 lbs)*	125 kg *(276 lbs)*
Instrument payload capacity	30 kg *(66 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	Reinforced Design: 32 mm (RA) /30 mm (DEC) 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 / Roller thrust bearings			
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
Transmission system	Backlash-free system with timing belt and automatic backlash recovery			
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
Working Temperature	-15°C to +35°C	Standard: -15°C to +35°C COLD ❄ Version available: -30°C to +35°C		
Pointing accuracy (typical)	<20" with internal 25-stars software mapping (max 100 stars). Modeling software available for automatic alignment, such as "Model Maker"			
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			
Safety Stop	+/– 30° past meridian in r.a. (software) +/– 45° past meridian in r.a. (mechanical)			

AZ 1000 – AZ 4000

ALT-AZIMUTH HPS MOUNTS

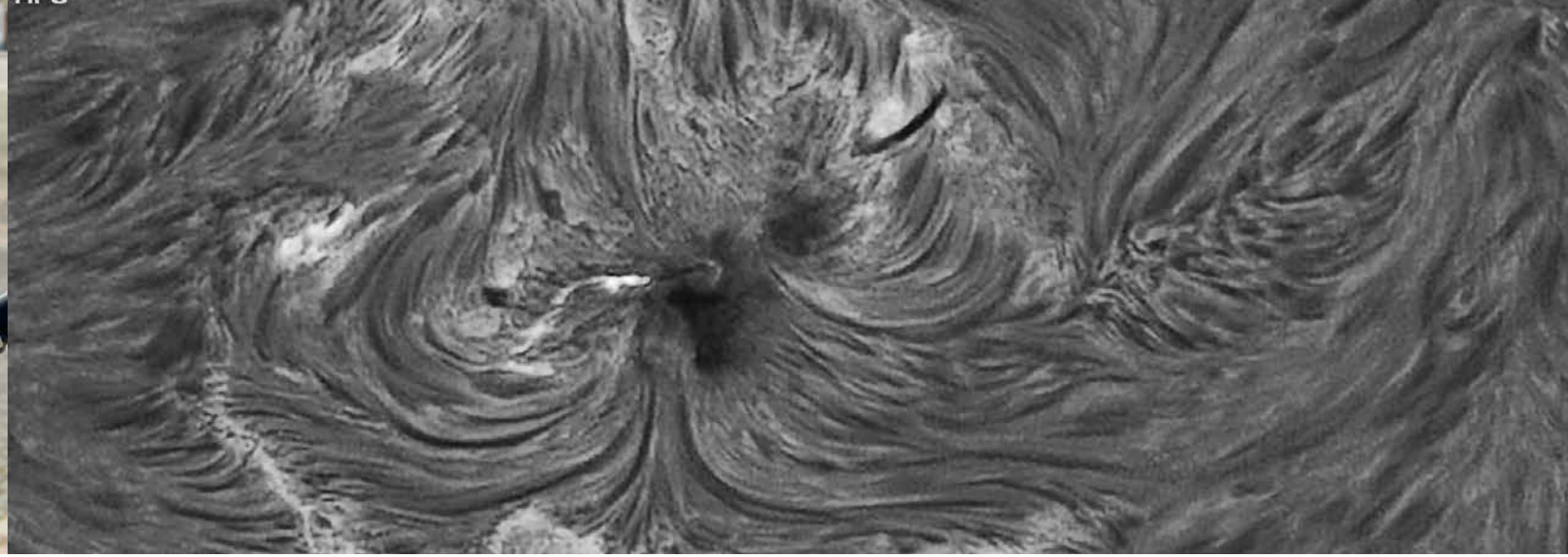
Their advantage lies in their compactness; larger telescopes can be accommodated in smaller domes. The complete payload can be used for instrument weight, no counterweight axis is needed in double configuration. ALT AZ mounts, however, have to track in three axes (ALT, AZ and derotator at camera/eyepiece) which is technically more demanding but no longer a problem due to modern computer technology. The AZ HPS mounts are often used by amateurs and public observatories for visual observation.



AZ2000 HPS for Rodewisch Observatory, Germany


AZ200D





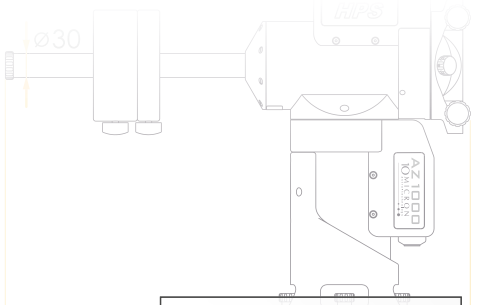


Counterweights not included

#1451902

AZ 1000 *HPS* EP

Loading Capacity	30 kg
Mount weight	19.5 kg (w/o accessories)
Working Temperature	-15°C to +35°C
GoTo Speed	adjustable from 2°/s to 15°/s
Power Parameters	~ 0,5 A guiding ~ 3 A max. speed ~ 4 A Peak



Check out all AZ1000 Included items, Features & Related Accessories:

10micron.eu/az1000

MIRATLAS, WORLDWIDE NETWORK

"We were looking for a reliable mount that could operate 24/7, always knowing were it stands whatever could happen: power loss, unexpected movement... And a mount easily controlled from a Linux machine. The AZ1000 makes it all, and even more!"

CTO of Miratlas

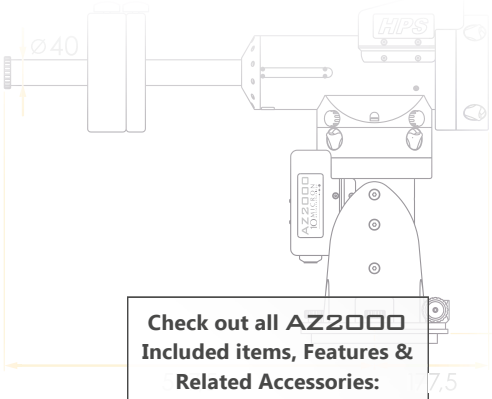




#1452901

AZ 2000 *HPS*

Loading Capacity	50 kg (+40 kg for optional dual-telescope configuration)
Mount weight	33 kg
Working Temperature	-30°C to +35°C COLD ❄ Capacity Built In
GoTo Speed	adjustable from 2°/s to 20°/s
Power Parameters	~ 0,7 A guiding ~ 3 A max. speed ~ 5 A Peak



Check out all AZ2000 Included items, Features & Related Accessories:

10micron.eu/az2000

RODEWISCH OBSERVATORY, GERMANY

On the one hand, the mount is very easy to use and, on the other hand, very precise. A real enrichment for our public observation evenings thanks to the dual option. The mount also delivers excellent results when tracking satellites live.

Olaf Graf



Counterweights not included







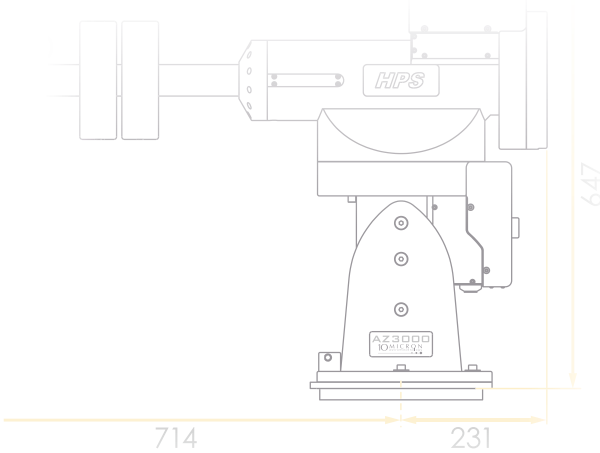
Counterweights not included

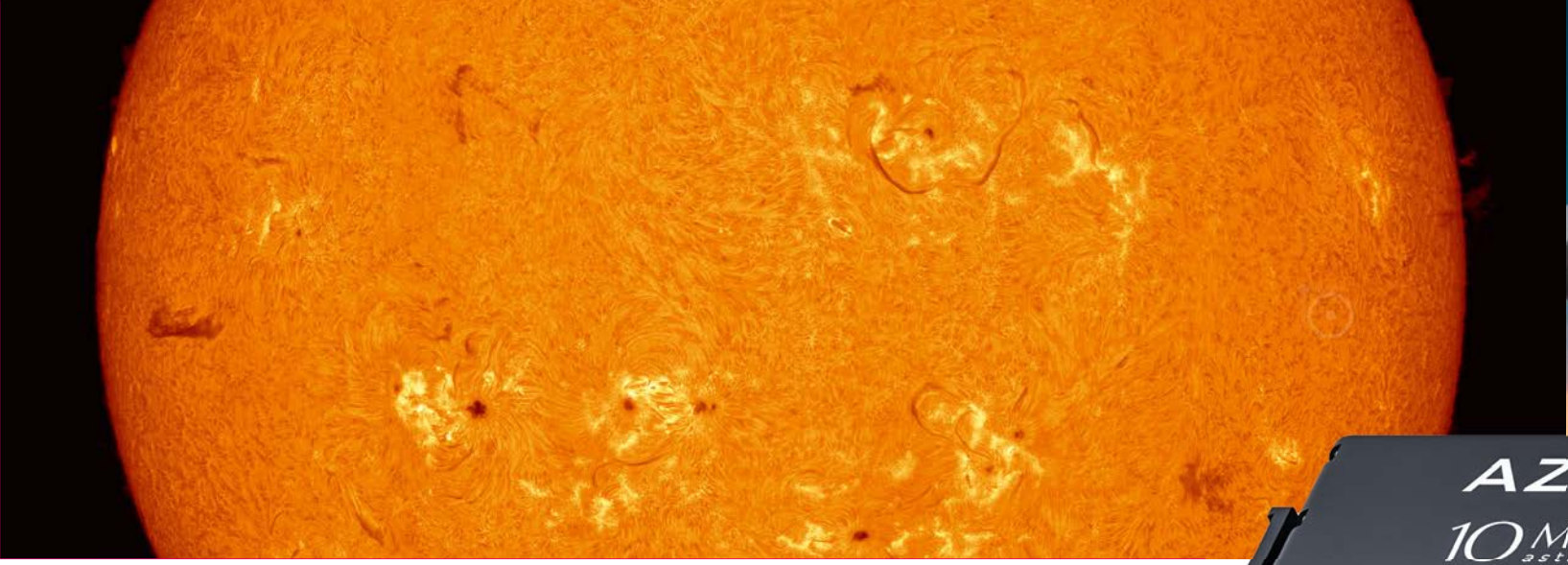
#1453900

AZ3000 *HPS*

Loading Capacity	100 kg (+65 kg for optional dual-telescope configuration)
Mount weight	65 kg (w/o accessories)
Working Temperature	-30°C to +35°C COLD ❄ Capacity Built In
GoTo Speed	adjustable from 2°/s to 12°/s
Power Parameters	~ 1 A guiding ~ 3 A max. speed ~ 5 A Peak

Check out all AZ3000 Included items, Features & Related Accessories:
10micron.eu/az3000





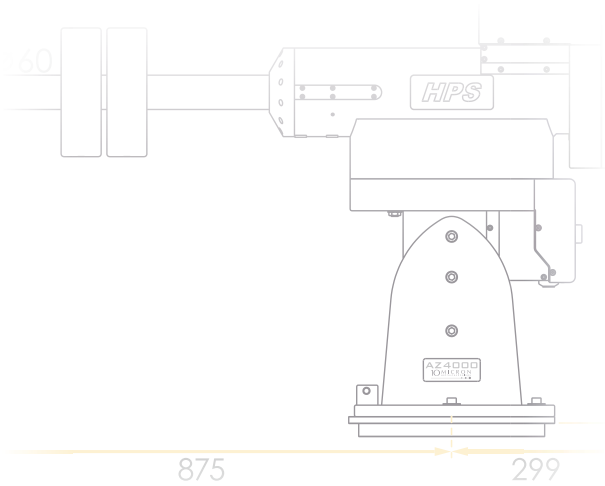


1454900

AZ4000 *HPS*

Loading Capacity	150 kg (+100 kg for optional dual-telescope configuration)
Mount weight	125 kg
Working Temperature	-30°C to +35°C COLD ❄ Capacity Built In
GoTo Speed	adjustable from 2°/s to 8°/s
Power Parameters	~ 1,5 A guiding ~ 5 A max. speed ~ 6 A Peak

Check out all AZ4000 Included items, Features & Related Accessories:
10micron.eu/az4000



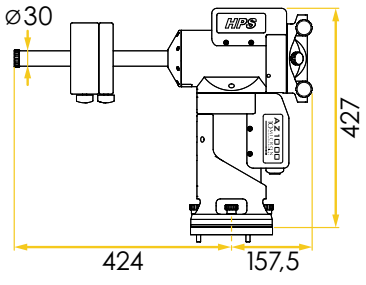


Optional: *DT-set for dual telescope configuration*

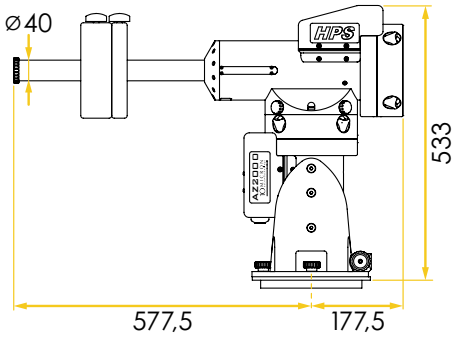
AZ HPS MOUNT

DIMENSIONS

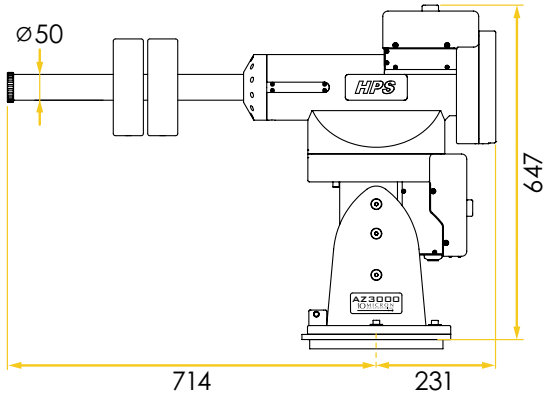
all given measurements in Millimeter (mm)



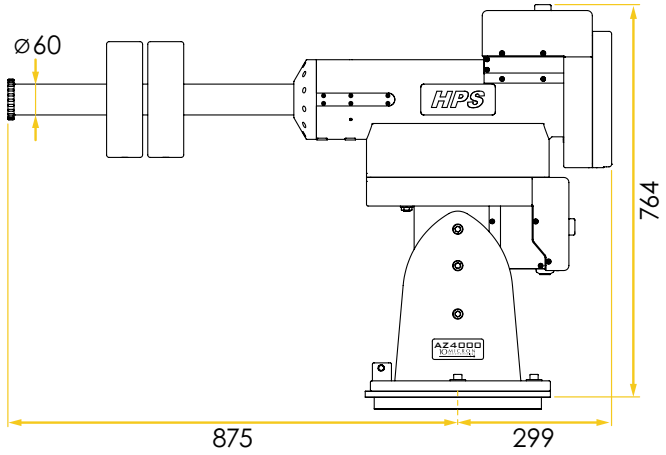
AZ1000



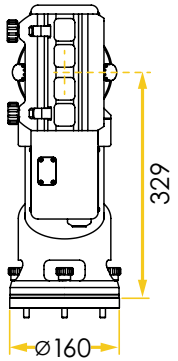
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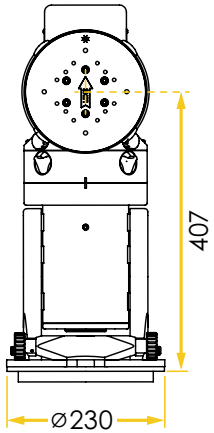


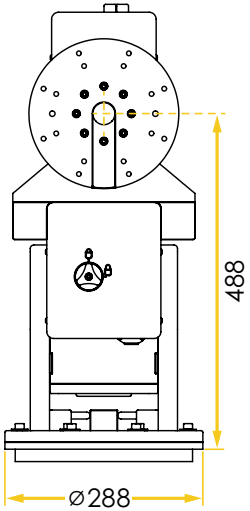
AZ3000

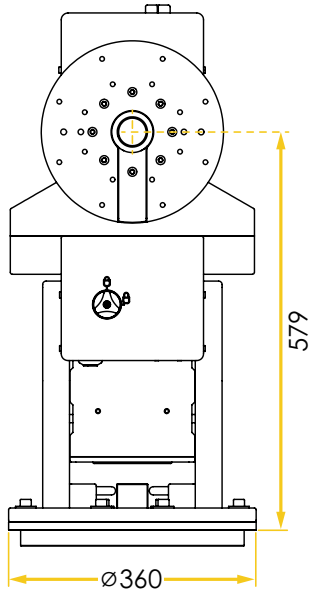


AZ4000









AZ HPS MOUNTS

TECHNICAL DATA



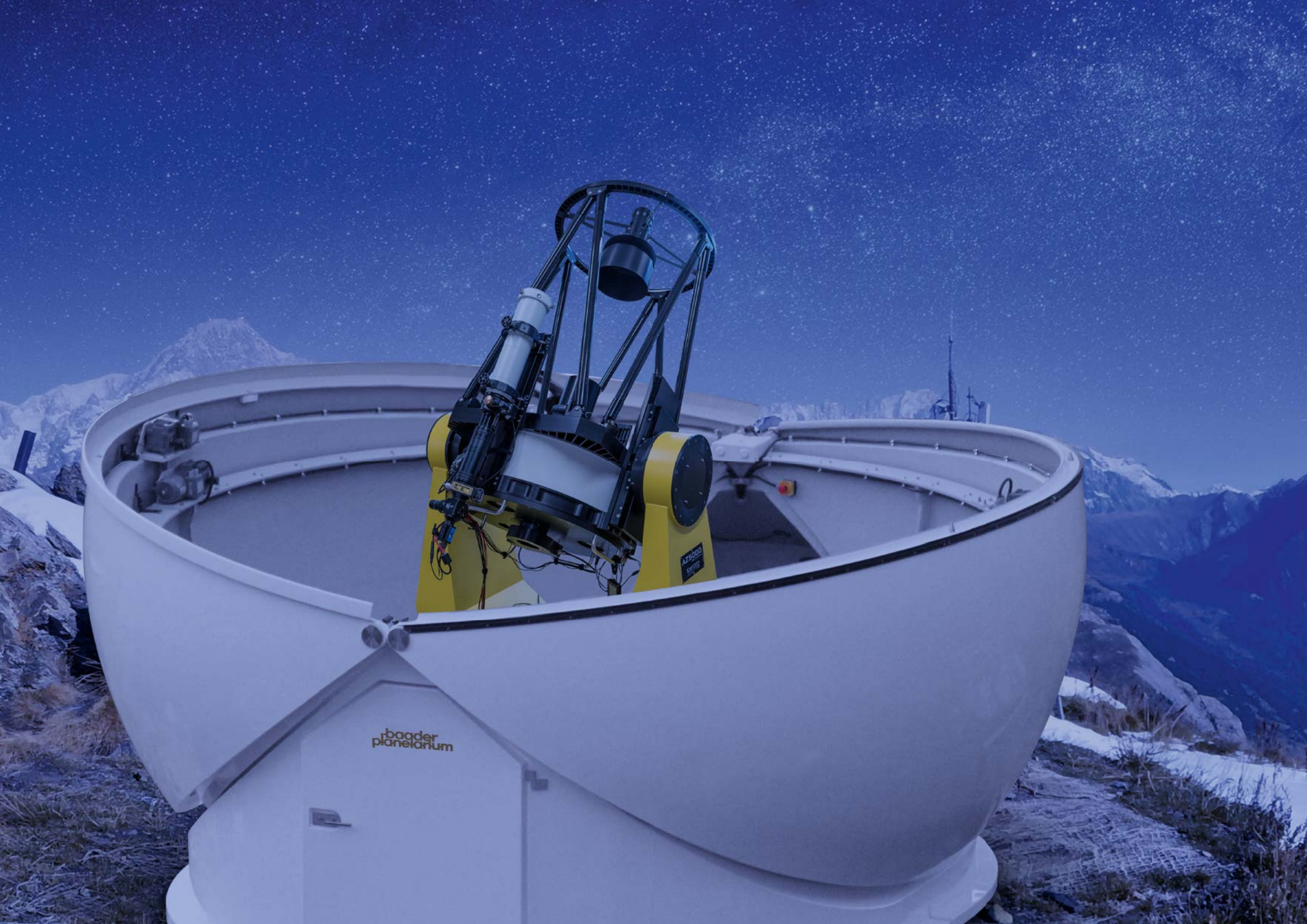






SPECIFICATIONS	AZ1000 HPS EP	AZ2000 HPS	AZ3000 HPS	AZ4000 HPS
Mount Type	Altazimuth German Mount			
Weight (mount w/o acc.)	19,5 kg *(43 lbs)*	33 kg *(73 lbs)*	65 kg *(143 lbs)*	125 kg *(276 lbs)*
Instrument payload capacity	30 kg *(66 lbs)*	50 kg *(110 lbs)* standard configuration 50 + 40 kg *(110 + 90 lbs)* for optional dual telescope configuration	100 kg *(220 lbs)* standard configuration 100 + 65 kg *(220 + 143 lbs)* for optional dual telescope configuration	150 kg *(330 lbs)* standard configuration 150 + 100 kg *(330 + 220 lbs)* for optional dual telescope configuration
Azimuth fine adjustment range	+/– 10° (for initial orientation)			
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	Reinforced: AZ 32 mm / ALT 30 mm diameter, alloy steel	50 mm diameter, alloy steel	AZ 80mm / ALT 50mm diameter, alloy steel	AZ 85mm / ALT 80mm diameter, alloy steel
Bearings	Pre-loaded tapered roller bearings / Roller thrust bearings			
Worm wheels	250 teeth, 125 mm diameter, B14 bronze	215 teeth, 172 mm diameter, B14 bronze	AZ 315 teeth, 244 mm diameter, B14 bronze ALT 250 teeth, 192 mm diameter, B14 bronze	AZ 430 teeth, 330 mm diameter, B14 bronze ALT 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
Transmission	Backlash-free system with timing belt and automatic backlash recovery – traditional worm gear mechanics			
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
Working Temperature	-15°C to +35°C	-30°C to +35°C | COLD ❄ Capacity Built In		
Pointing accuracy (typical)	<20" with internal 25-stars software mapping (max 100 stars). Modeling software available for automatic alignment, such as "Model Maker"			
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			
Safety Stop	**AZ**: +/- 150° (software) and +/- 155° (mechanical) | **ALT**: +/- 95° (software) and +/- 100° (mechanical)			


AZ 2500 – AZ 8000 DDS
DIRECT-DRIVE
DDS MOUNTS


baader
planetarium

INTRODUCTION

THE IOMICRON DDS TECHNOLOGY

DDS stands for Direct Drive System, representing the peak of cutting-edge engineering of 10Micron mounts. Designed for precision tracking in critical contexts, these mounts are the indispensable platform for professional research, telecommunication, high-end astronomy and the aerospace industry.

The implementation of Direct Drive System (DDS) technology in these mounts overcomes the constraints of traditional gear-based systems, eliminating mechanical limits and wear. At the heart of every mount, high-torque motors are integrated to ensure elevated performance. The origin of these motors, designed and produced in Italy, allows for meticulous control over the supply chain and provides consistent, reliable performance over time

The DDS series is equipped with high-resolution industrial absolute encoders, mounted directly on both axes, that constantly monitor and correct movement, providing unparalleled pointing and tracking accuracy.

Excellence is in every detail, starting from the large, highest-quality bearings that ensure stability, through to the rigid and compact forks, engineered to raise the system's natural frequencies and minimize operational vibrations. Regarding the control system, the integration of an industrial computer onboard with a Linux operating system guarantees full stand-alone management and robust Ethernet and Wi-Fi connectivity.

This uncompromising synergy between mechanics, electronics and software is the core of the 10Micron identity, ensuring efficiency and top-level performance essential for critical applications.



DDS Direct Drive System



1. *AZ5000 DDS at Planetarium Halle, Germany*

2. *AZ2500 DDS in Namibia for sciencentric® (Webservatory®)*

IOMICRON INTELLIGENCE

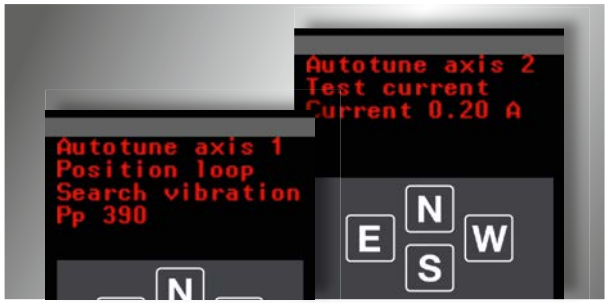
SYSTEM AUTONOMY & INTEGRATIONS

10Micron DDS mounts are not just precision mechanics but true integrated robotic systems. The advanced electronics, proprietary firmware, and new connectivity options guarantee maximum autonomy and perfect integration into remote and extreme environments.



ENCLOSED CONTROL BOX

The DDS control system is based on integrated, industrial-grade electronics. This configuration eliminates the need for an external PC, providing resilience and reliability in the field. The Enclosed Control Box, which manages the Direct Drive motors and the high-resolution absolute encoders, has been designed with specific attention to operational safety and continuity of service. Furthermore, in line with the 10Micron philosophy of long-term reliability, it has been engineered for quick and sustainable maintenance in case of urgency.



DDS AUTO-TUNING

To make sure that DDS mounts always operate at their maximum efficiency, an Auto-Tuning function (or dynamic calibration) has been developed, **directly integrated into the onboard computer**. Dynamic Auto-Tuning is vital for identifying the control parameters of the motors and eliminating any potential resonance or oscillation induced by the payload, ensuring that every installation can achieve stability and data quality.



ADVANCED INTEGRATIONS

Seamless integration and remote mount control are guaranteed through multiple communication standards. The advanced electronic architecture is ready for integration into proprietary automation systems, featuring support for robust protocols like CANopen, as well as access to control via ASCOM drivers. Additionally, to secure broader compatibility, the industrial standard RS232 protocol is also supported.



MODERN WEB INTERFACE

Access to mount control and configuration is possible through a new, professional WEB interface accessible from any browser. This allows operators in remote locations to manage or configure the mounts, consult manuals, and perform firmware updates simply and securely via Ethernet or Wi-Fi (LAN) connection. Furthermore, the download of satellite TLE or asteroid and comet databases is available, integrated into the proprietary interface.

IOMICRON DDS MOUNTS

SPECS AND FEATURES

The AZ DDS (Direct Drive System) mounts represent a modern standard of precision for 10Micron. This series is engineered for maximum integration and long-term performance, offering advanced solutions for demanding applications. Performance is driven by the ultra-low latency pointing system: reaching speeds up to 40°/second, it ensures immediate target acquisition while maintaining perfect final pointing and tracking precision.

The system's Proprietary Firmware is the central intelligence, delivering advanced control and maintaining uncompromising operational stability. Thanks to the sophisticated Internal Sky Model (Pointing Model), the 10Micron mounts achieve and maintain exceptional and distinctive unguided tracking. This model autonomously and precisely compensates for residual errors—including those induced by mechanics, atmosphere, and Earth's rotation—thereby eliminating the need for external guiding systems in most applications.

For advanced dynamic scenarios, such as Space Situational Awareness (SSA) and Free-Space Optical Communication (FSO), the mounts integrate satellite functionality, such as native support for Two Line Elements (TLE) orbital data, tracking satellites, asteroids, or comets; making them ready for the challenges of Research and New Space applications.

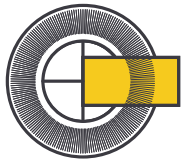
The mounts design is also optimized for maximum operational cleanliness. In both fork and "T" configurations, cabling is managed optimally within the mount itself. Additionally, each mount includes its dedicated Keypad, providing an intuitive and robust interface for easy field control, offering valuable support to the operator.

Finally, the full range of 10Micron accessories and adaptation flanges allow for the integration of any new or pre-existing optics or instrumentation to the mount. The company's technical expertise makes it well-equipped for the realization of complex installations and cluster setups as well, providing advanced solutions.

ALT-AZIMUTH AZ DDS MOUNTS

The AZ DDS series mounts are designed in an Alt-azimuth configuration, presenting two different form factors. The double fork gimbal configuration ensures maximum stability and quick positioning for professional applications.

Alternatively, the "T" gimbal configuration elevates the system's rigidity and compactness, allowing telescopes to be mounted on two opposite flanges. Furthermore, DDS models can be converted to Equatorial configuration (optional) using dedicated inclined bases (equatorial wedges). However, to maintain the simplicity of the Alt-Az setup, field rotation can be compensated via the direct control of integrated proprietary Focusers and Derotators (optional).



ABSOLUTE ENCODERS

On-axis in RA & Dec, featuring more than 10 million increments (interpolated), fully encapsulated and calibrated.



BUILT-IN INTELLIGENCE

Onboard industrial-grade Linux computer for standalone control, analysis of the absolute encoders and controlling motors – this mount „knows" that it is a mount.



DIRECT DRIVE MOTORS

High-torque, High-Efficiency Made in Italy torque motors, optimized for astronomical applications and satellite tracking.



AUTO-TUNING

Integrated to optimize Direct Drive motor control parameters. This ensures stability and maximum data quality by eliminating induced resonance or oscillation.



CNC-MILLED

No casted parts, complete mechanical structure is CNC-milled, premium materials for high quality and durability.



REMOTE OPERATION

Fully remote controlled via your observatory PC through 10/100/1000 LAN or WiFi, ASCOM-compatible, mount PC also controls Baader Domes.

10MICRON DDS MOUNTS

EMPOWERING INNOVATION



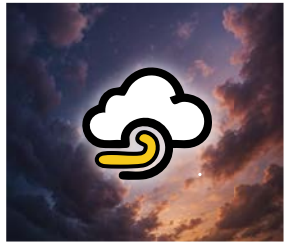
SSA & SST - SPACE AWARENESS

Space Situational Awareness and Surveillance (SSA & SST) requires tracking platforms equipped with unparalleled speed, accuracy and stability. The 10Micron DDS system guarantees precise and dynamic movements for tracking fast-moving objects and long-term stability crucial, for example, for the cataloguing of space debris.



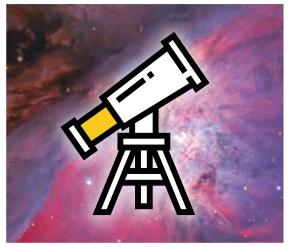
FSO & LASERCOM - FREE SPACE OPTICAL

Free Space Optical communications (FSO) and Lasercom links, the avant-garde of telecommunications, demand precise pointing accuracy and trajectory maintenance. DDS technology features a zero-hysteresis drive system, swift slew response and ultra-high encoder resolution, making it the definitive platform for stabilizing and pointing laser beams.



ATMOSPHERIC SCIENCES

Applications in Atmospheric Sciences require high operational versatility. DDS mounts allow for rapid positioning without compromising precision. This response capability is essential for transient atmospheric phenomena or for operating in environments with dynamic variations, ensuring precise and timely measurement data.



ASTRONOMICAL RESEARCH

Professional astronomical research depends on critical factors, such as a total absence of induced vibrations and accurate tracking. The DDS system allows for near-zero tracking error even with long exposures. The long-term reliability and structural robustness of the mounts ensure that the high quality of the collected data remains constant over time.

10MICRON astro•technology

by COMEC-TECHNOLOGY

25+ YEARS OF EXPERIENCE
Over a Quarter Century of Reliable Solutions

RELIABLE & ROBUST
Mission-Critical Reliability & Robustness

GLOBAL INSTALLMENT
Proven Global Deployment & Installations

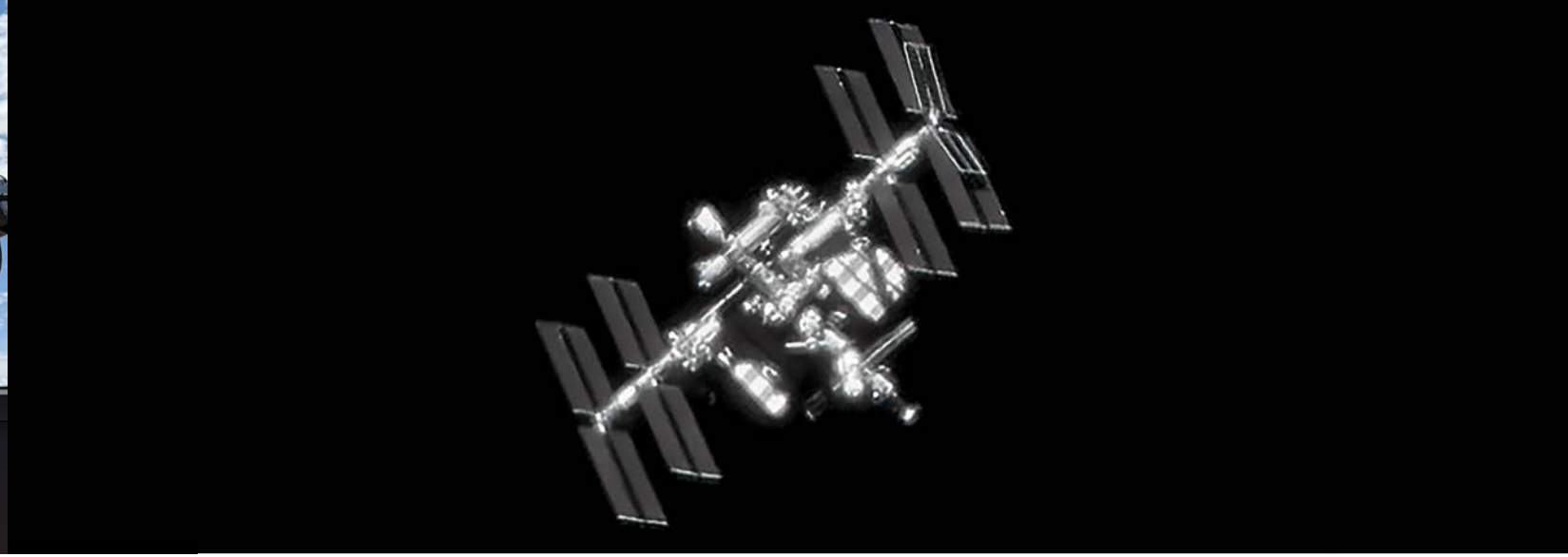
EXTREME CONDITIONS
Constant performance in most environments



EMERGING APPLICATIONS

The 10Micron Direct Drive technology also extends beyond established frontiers, offering the adaptability and versatility necessary to drive innovation and accommodate new applications in both space and terrestrial sectors.





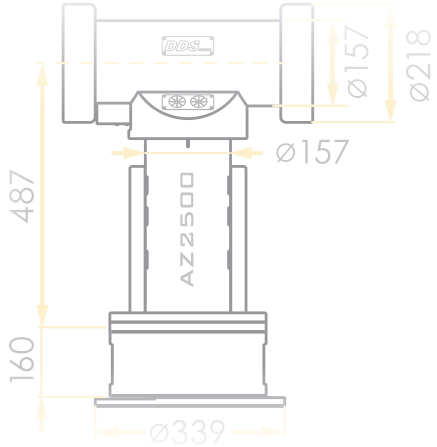


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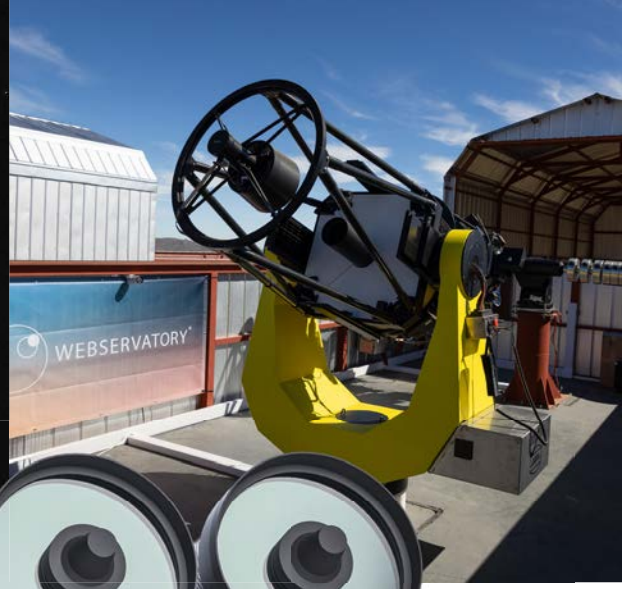
AZ2500 DDS

Loading Capacity	75 Kg + 75 Kg (dual config.) 75 kg (single config. optional)
Mount weight	85 kg
Working Temperature	Standard: -25°C to +35°C POLAR ❄🌡: -40°C to +35°C
GoTo Speed	up to 40°/s
Power Parameters	48V DC | ~ 10 A peak

Check out all AZ2500 Included items, Features & Related Accessories:
10micron.eu/az2500



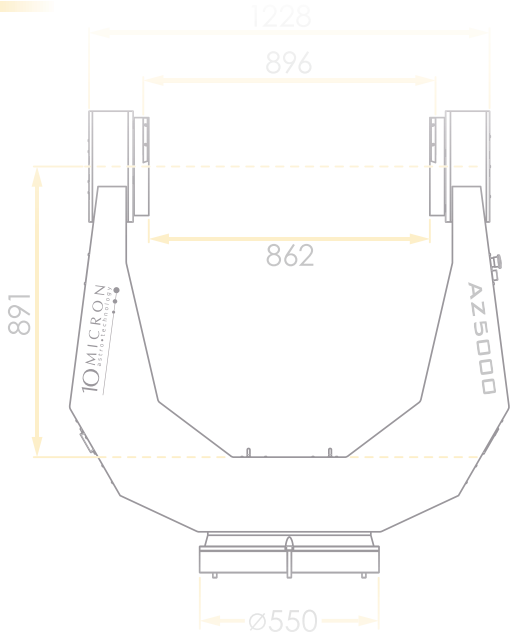




#1456500

AZ5000 DDS

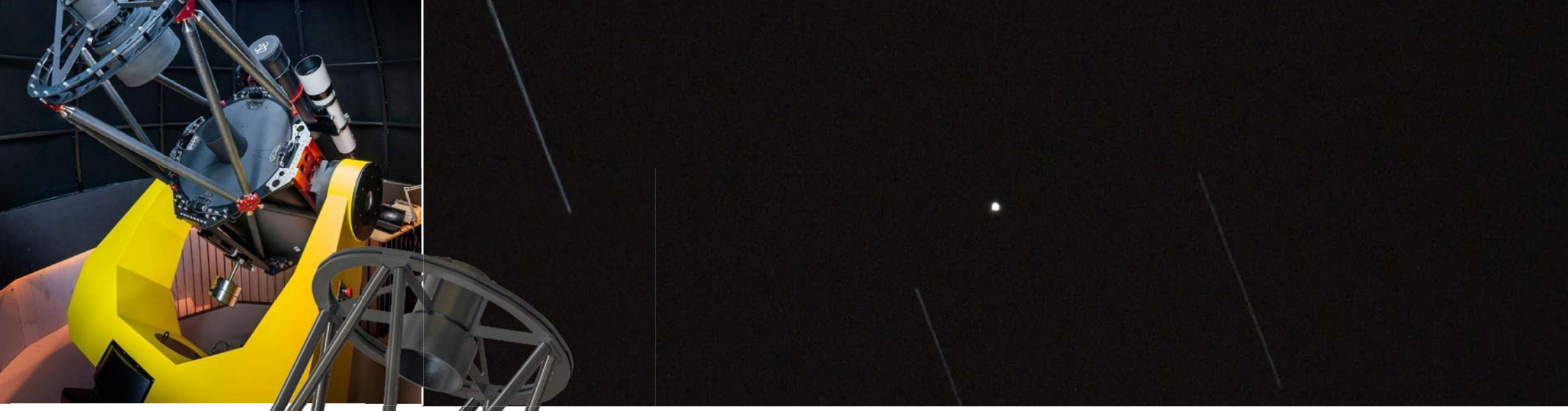
Loading Capacity	up to 250 kg, 650 mm (26") diameter
Mount weight	330 kg
Working Temperature	Standard: -25°C to +35°C POLAR ❄🌡: -40°C to +35°C
GoTo Speed	up to 40°/s
Power Parameters	48V DC | ~ 10 A peak



Check out all AZ5000 Included items, Features & Related Accessories:
10micron.eu/az5000



Telescopes not included





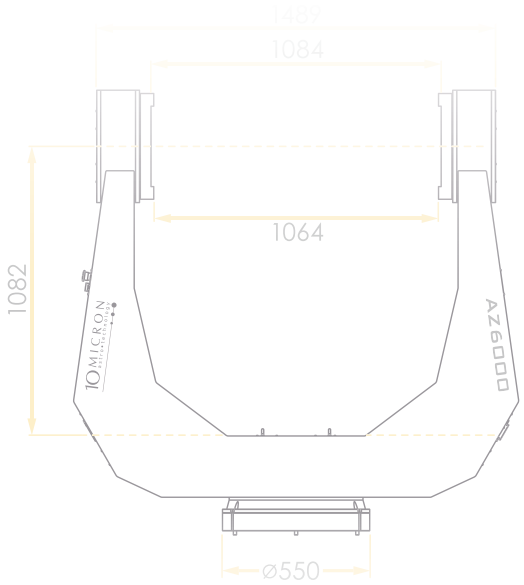
Telescope not included

#1456600

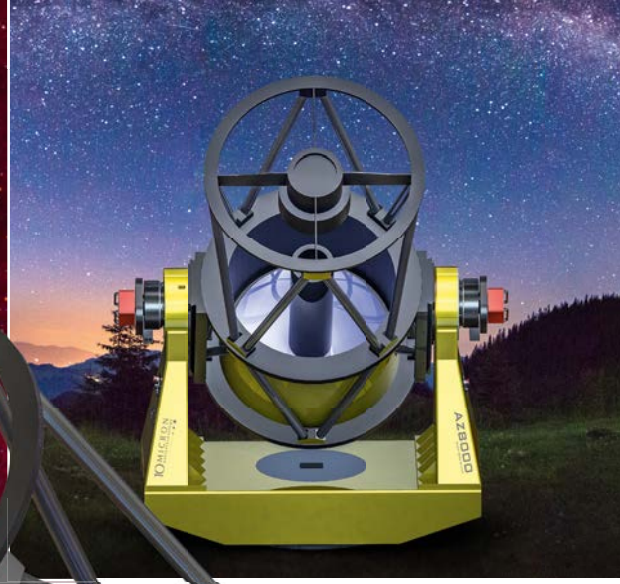
AZ6000 DDS

Loading Capacity	up to 300 kg, 800 mm (31") diameter
Mount weight	400 kg
Working Temperature	Standard: -25°C to +35°C POLAR : -40°C to +35°C
GoTo Speed	up to 40°/s
Power Parameters	48V DC | ~ 10 A peak

Check out all AZ6000 Included items, Features & Related Accessories:
10micron.eu/az6000



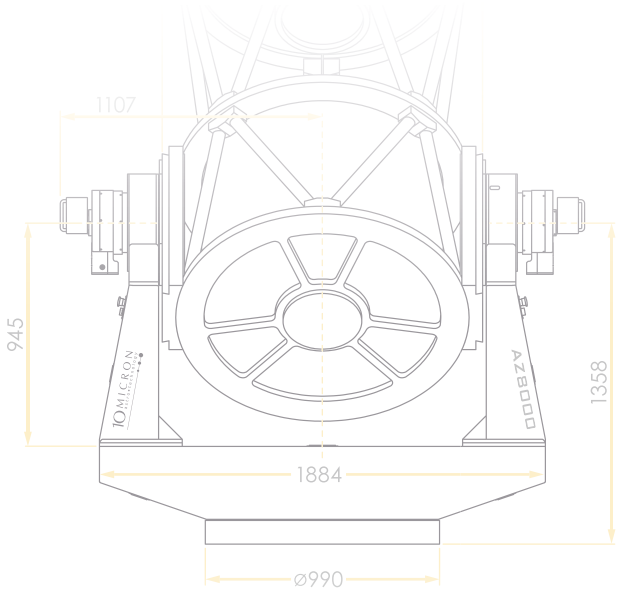




#1456800

AZ8000 DDS

Loading Capacity	up to700 kg, 1000 mm (40") diameter
Mount weight	950 kg
Working Temperature	Standard: -25°C to +35°C POLAR ❄🌡: -40°C to +35°C
GoTo Speed	up to 30°/s
Power Parameters	48V DC | ~ 20 A peak





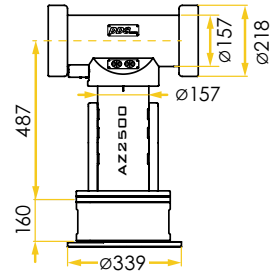
Telescope not included

Check out all AZ8000 Included items, Features & Related Accessories:
10micron.eu/az8000

AZ DDS MOUNTS

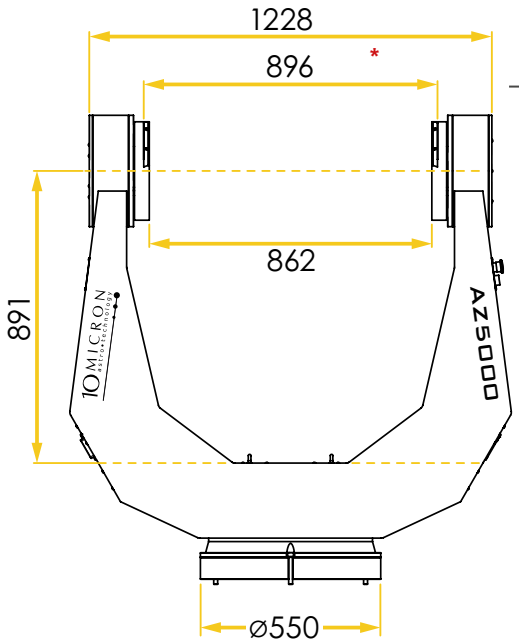
DIMENSIONS

all given measurements in Millimeter (mm)

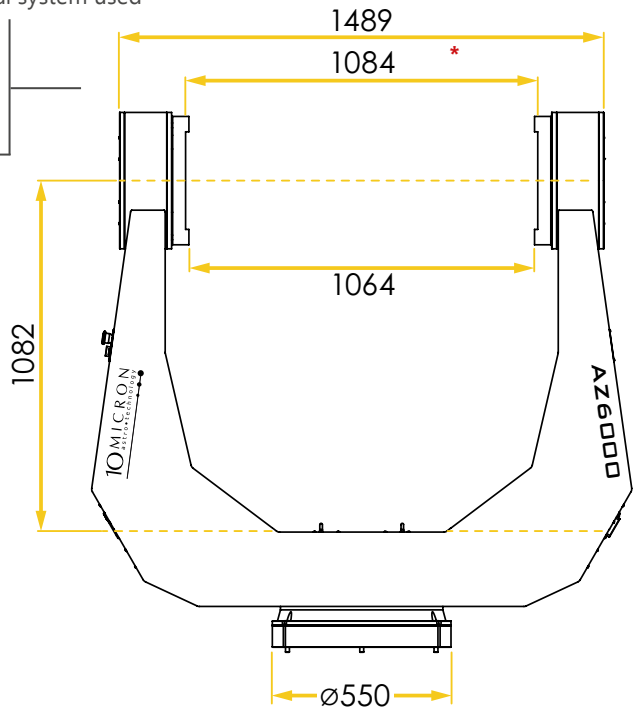


AZ 2500 DDS

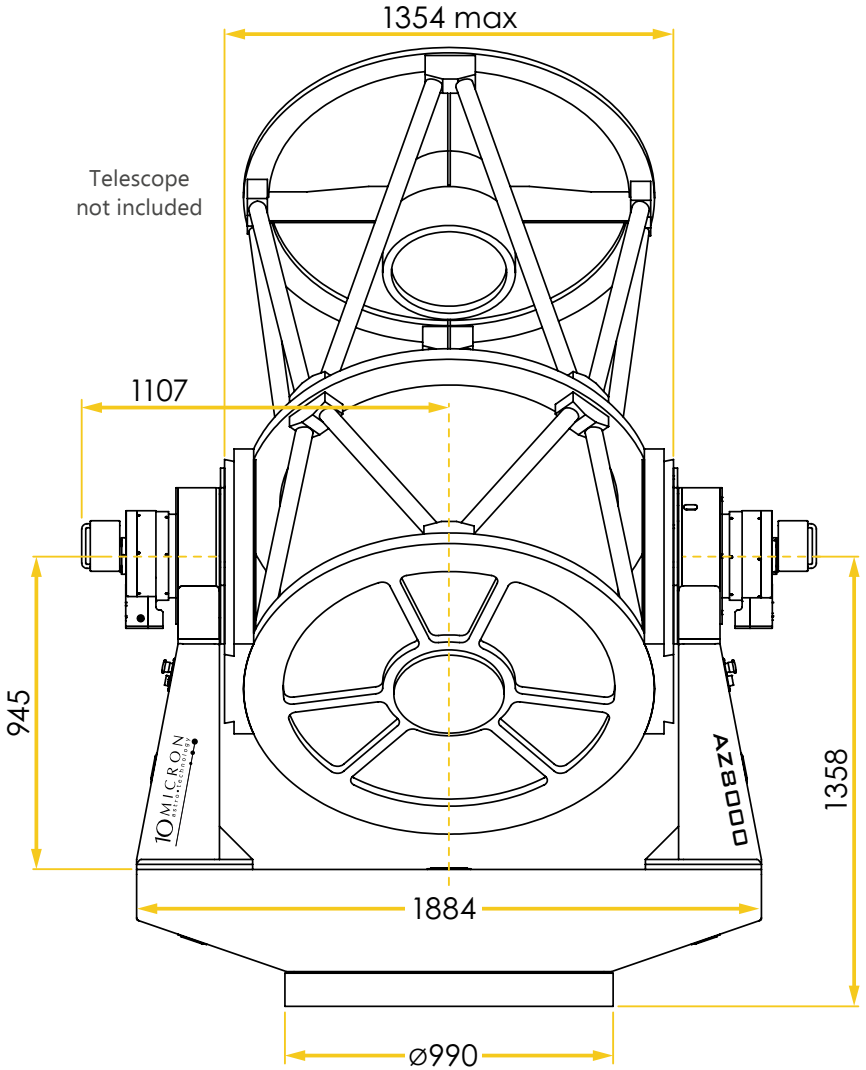
* to be defined according to the optical system used



AZ 5000 DDS



AZ 6000 DDS



AZ 8000 DDS

AZ DDS MOUNTS

TECHNICAL DATA









SPECIFICATIONS	AZ 2500 DDS	AZ 5000 DDS	AZ 6000 DDS	AZ 8000 DDS
Mount Type	Alt-azimuth (Equatorial optional)	Alt-azimuth fork mount (Equatorial optional)		Alt-azimuth fork mount
Transmission system	Direct-Drive System with on-axis high resolution absolute encoders			
Weight (mount w/o acc.)	85 kg *(187 lbs)*	330 kg *(728 lbs)*	400 kg *(882 lbs)*	950 kg *(2094 lbs)*
Instrument payload capacity	75 Kg + 75 Kg (dual telescope configuration)	up to 250 kg, 650 mm (26") dia-meter	up to 300 kg, 800 mm (31") dia-meter	up to700 kg, 1000 mm (40") dia-meter
Axes bearing	Premium quality large diameter, high precision bearings			
Motors	Professional grade direct drive motors; no worm gears or transmission systems, zero backlash			
Encoders	High Resolution absolute encoders, industrial grade			
Power supply	48 V DC			
Power consumption	10 A peak	10 A peak	10 A peak	20 A peak
Go-to speed	40 °/s	40 °/s	40 °/s	30 °/s
Pointing accuracy	<10" RMS with internal 25 stars software mapping, max 100 stars. Automatic modeling software available			
Average tracking accuracy	1" typical for 15 minutes / 0.6" RMS with internal 25-stars model (real sky observation)			
Nasmyth holes diameters	----------	1 standard on the motor side – 100mm diameter	2 standard on both sides – 110mm diameter	2 standard on both sides – 160mm diameter
Nasmyth focus payload capacity	----------	30 kg	35 kg	50 kg
Safety features	Mechanical stops in both axis, Anti-wrap logic Unbalance protection system	Mechanical stops in both axis, Anti-wrap logic, On board and remotable Emergency stop button with safety relay, Aural warning system, Unbalance protection system		
Security stops	AZ +/- 235 and Alt: -100° .. +100°	Mechanical Off-Travel stops at AZ +/- 300° (~2 turns) and Alt: 100° (-5° / +95°)		
Security brakes	Electromechanical brake & stops for unbalance safety in altitude			
Working Temperature	Standard: -25°C to +35°C POLAR Version available: -40°C to +35°C			
Dimensions (mount with fork)	460 x 288 x 669 mm	1350 x 550 x 1350 mm	1660 x 550 x 1520 mm	1900 x 1000 x 1500 mm
Focuser/DeRotator dedicated (optional)	10Micron specific, software integrated control, internal temperature probe:			
	GO-0 0 (de-rotator only) and GO-1 by 10Micron. 12.5kg (0) / 25kg (1) payload capacity			**GO-1 and GO-2 by 10Micron.** 25 kg (1) / 50 kg (2) payload capacity


BAADER PLANETARIUM
YOUR RELIABLE
PARTNER


baader
planetarium

FROM ONE SOURCE

TURN-KEY OBSERVATORY SOLUTIONS

With 60+ years of experience, Baader Planetarium provides turn-key observatory solutions that include services from conceptualization up to installation and training. Depending on your application and mission parameters, we can also guide you through the process, including selection of the optimal equipment and software that is controlled by our Observatory Management System (OMS).



SPECIFICATIONS



- **Turn-key observatories** utilizing Classic Slit or AllSky domes that range from 2.1 - 8.5m
- **Various electronic equipment configurations**, that allow you to setup a classic observatory or one with remote access that can be fully autonomous
- **Tailored to your requirements,** suitable for amateur astronomers as well as for schools, universities, research institutes and commercial customers.

> *The whole is greater than the sum of its parts*
>
> Aristotle

INDIVIDUALLY TAILORED TO YOU

We would be pleased if you contact us regarding your observatory project at **www.baader-planetarium.com/dome-requests**

YOUR RELIABLE PARTNER

BAADER PLANETARIUM

Baader Planetarium has been the official 10Micron distributor for Europe since 2004. We provide the tools to teach and enable people to explore the universe we live in.

OUR VALUE PROPOSITION

- We offer the most **reliable Domes** in the market which survive the harshest environmental conditions.
- We provide **Turn-Key Observatory Solutions** by integrating observatory equipment to function as a system utilizing in-house developed and customized products and software.
- Customers can rely on fast shipment of requested **Astronomical Consumer Products** along with support.

HISTORY

Our company started in 1966 with the first product being the Baader Planetarium which also became our name. Since then, we continued to expand by offering domes that would protect telescopes for astronomers in different environments around the world. We also realized the need of further educating and providing the right equipment for our customers needs, hence, we developed a variety of accessories to adapt all the components required to install complete observatories.

The observatory domes we produce and the high end telescopes and mounts from the brands we sell are also in demand from the space industry. We combine these devices to fully integrated turn-key ground stations for satellite tracking, lasercommunication and space debris tracking and install them everywhere in the world.






>600
OBSERVATORIES

60+
YEARS EXPERIENCE

3.560m
TALLEST MOUNTAIN

300 km/h
HIGHEST WIND LOAD

-86°
COLDEST TEMPERATURE

DISCOVER

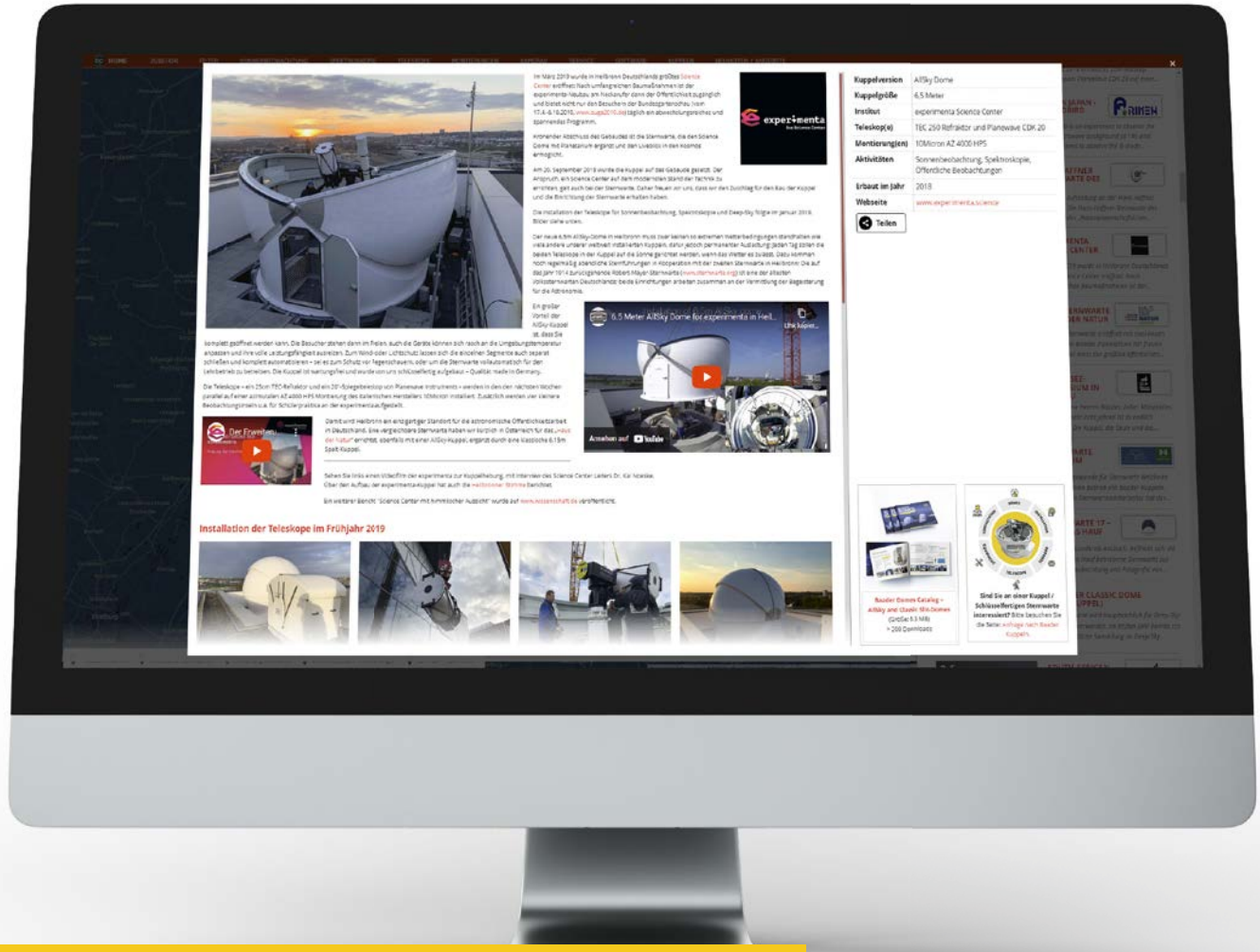
BAADER OBSERVATORIES

WE WOULD LIKE TO SEE YOU BE ADDED TO OUR WORLD-WIDE OBSERVATORIES.

Please let us know how we can help you within your desired application by contacting us at:

kontakt@baader-planetarium.de

+49 (0)8145 / 8089-0



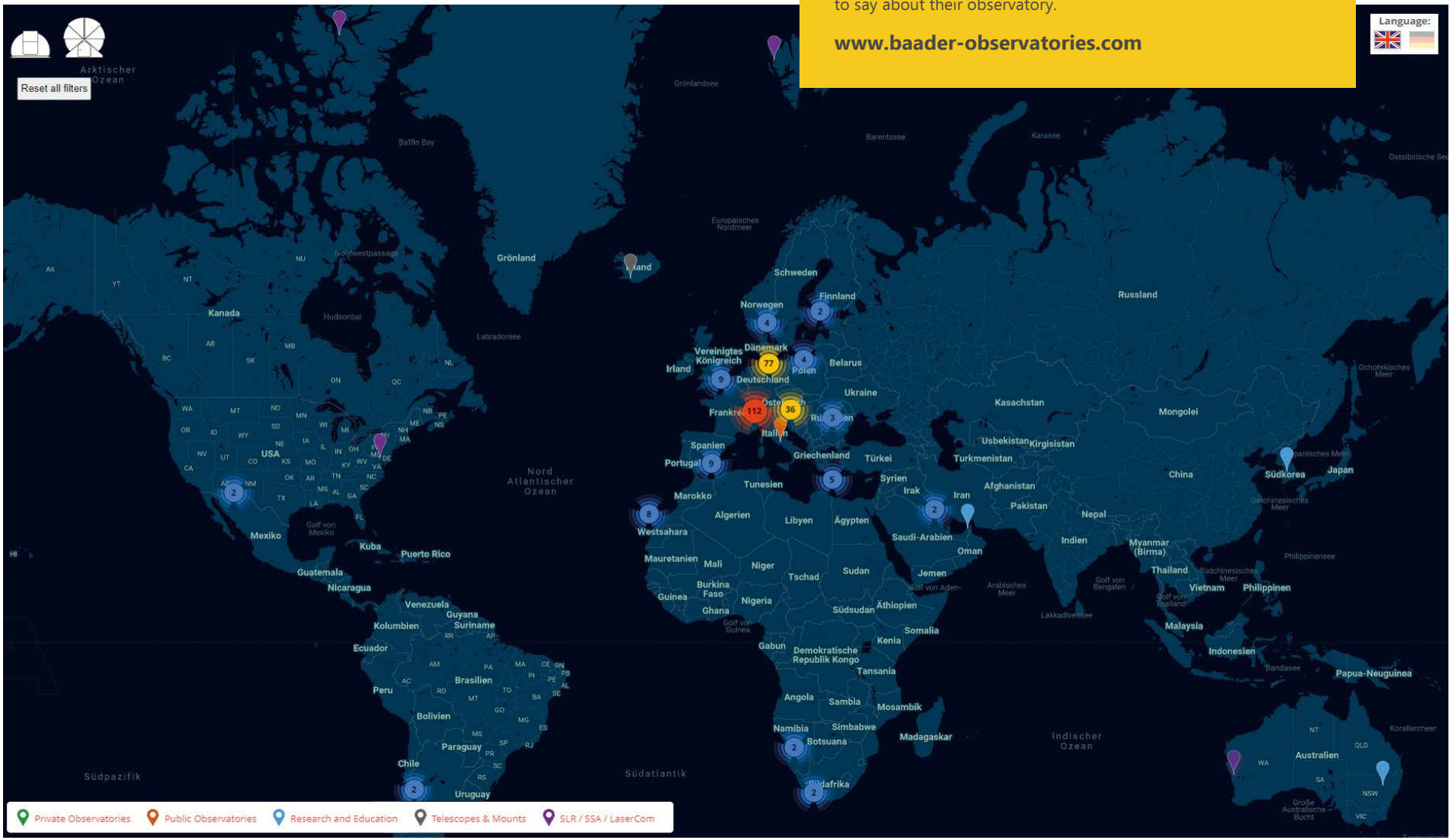
www.baader-planetarium.com/dome-requests

BAADER OBSERVATORIES

AROUND THE WORLD

On our observatory world map you can see all the installations we are allowed to present with a multitude of pictures and information. Discover what the owners of our domes (even after decades) have to say about their observatory.

www.baader-observatories.com



REFERENCES

SLR / SSA / LASERCOM































NASA | ESA – European Space Agency | Airbus Defence and Space | DLR – German Aerospace Center | cailabs – Innovative Solutions for Optical Communication | MPE – Max Planck Institute for Extraterrestrial Physics | RIKEN Center for Advanced Photonics (RAP) | DIGOS – Laser Ranging for Satellites | Bundeswehr – German Armed Forces | arianespace – Launch Services for Satellites | GFZ – Helmholtz Centre Potsdam | KIT-Campus Alpine: Atmospheric Environmental Research | BKG – Federal Agency for Cartography and Geodesy | SSC – Swedish Space Corporation | NLS – Finnish Geospatial Research Institute FGI

SCIENCE & RESEARCH




























The Open University | DWD – German Weather Service | AWI – Alfred Wegener Institute | MPA – Max Planck Institute for Astronomy | MPP – Max Planck Institute for Physics | MPI – Max Planck Institute for Informatics | ZEISS | AIP – Leibniz Institute for Astrophysics Potsdam | FORTH – Foundation for Research and Technology Hellas | ESO – European Southern Observatory | Sharjah Center for Astronomy and Space Sciences | KIS – Kiepenheuer Institute for Solar Physics | Solaris – Nicolaus Copernicus Astronomical Center | Institute for Astrophysics Göttingen | MeteoSwiss – Federal Office of Meteorology and Climatology

EDUCATION









































Universität Bern | LMU – Ludwig-Maximilians- Universität München | University of Kent | EGN – Einstein Gymnasium Neuenhagen | IAC – Instituto Astrofisica Canarias | Eberhard Karls Universität Tübingen | Arnoldischule Gotha – Staatliches Gymnasium | Kepler Gymnasium | vhsrt – Volkshochschule Reutlingen | Universität Hamburg | phaenovum – Staernwarte Gersbach | JSG – Rheinische Friedrich Wilhelms Universität Bonn | Leonardo DaVinci Campus | Universitat de Barcelona | LGL – Lessing Gymnasium Lampertheim | Gymnasium Penzberg | Kopernikusschule Freigericht | SGM – Staffelsee Gymnasium Murnau | Gymnasium Balingen | Hamar Cathedral School

PUBLIC





















experimenta – Das Science Center | Haus der Natur – VEGA Sternwarte | ATHOS – Centro Astronomico Isla de la Palma Canarias | Sternwarte Welzheim | Sternwarte Zollern-Alb | Sternwarte Lübeck | Volkssternwarte München | SWRT – Sternwarte und Planetarium Reutlingen | TLS – Thüringer Landessternwarte | Sternwarte Drebach

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