MAXBRIGHT® II BINOVIEWER



Manual

Thank you for your purchase of the Baader MaxBright® II Binoviewer! Properly used, this sophisticated optical accessory will provide you with a lifetime of amazing views. To ensure optimal performance, please read this instruction manual before using your binoviewer.



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Quickstart

The MaxBright II bino-viewer provides a multitude of adaptation options for various use cases, which we explain on the following pages. But in the most cases, one of the two following adaptations is the right choice.

With T-2 Coupling Nut



With T-2 Quick Changer/Micro Bayonet



These are the shortest possible adaptations to a lens telescope or a Schmidt-Cassegrain/Maksutov with (or even without!) using a glasspath corrector; for furter information see page 7. For an even shorter adaptation without a glasspath corrector see page 21.

A prism has got a shorter optical length than a mirror, and the T-2 star diagnal allow a direct adaptation to the binoviewer, without an eyepiece clamp or nose piece. You can read more about the different star diagonals on page 8.

A glass path corrector fulfils several purposes. On telescopes with an f/ratio of f/7 or faster, it is necessary to compensate for the colour aberrations that the prisms of the binoviewer would otherwise introduce. It also shortens the optical length so that you can reach focus at all on many telescopes, and ist prevents vignetting on fast telescopes, as the entrance aperture of the binoviewer has to be less close to the telescope lens and is therefore at a point where the beam of light beam is less wide. Further information can be found from page 22.

Furthermore, a glasspath corrector increases the focal length, so that you can use several magnifications with one pair of eyepieces and several glasspath correctors. To change the glasspath corrector more easily, you can use an optional T-2 quick changer. A matching T-2 dovetail (Zeiss Micro Bayonet) is included with the bino-viewer.

For a Newtonian telescope, you need the 2" glasspath corrector 1,7x for Newtons (coma correcting) *#2456300* or a telezentric system (page 6)

Configuration for Newtonians



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Baader MaxBright® II Binoviewer

– DEVELOPED ESPECIALLY FOR ASTRONOMY –

- Thanks to its large 27 mm prisms with 25.5 mm free aperture (on the telescope side even 26 mm), the MaxBright® II Binoviewer offers a significantly larger field of view than cheaper binoviewers. The free aperture is only slightly inferior to many more expensive bino-viewers like our Mark V Großfeld (Giant) binocular (with 30 mm prisms).
- Optical length with T-2-thread ca. 117 mm, can be shortened to 110 mm (page 19)
- Its features range from 7-layer multilayer anti-reflective coatings on all glass air surfaces through a high-performance beam splitter with dielectric splitter layer to self-centering ClickLock® quick clamps for both eyepieces, which have been specially redesigned for the MaxBright® II.
- Eyepiece clamps with diopter adjustment for both eyepieces allow perfect refocusing for each eye – this is essential for using any bino-viewer.
- Because of the 1:10 power gear ratio, a gentle, small rotation by 20° of the ClickLock® ring is enough to securely and reproducibly clamp every 1¼" eyepieces – or to release it later. Such a small rotation results in a lock which is at least as tight as a single clamping screw which is tightend with much more force.

We offer several Glasspath Correctors for our binoviewers, which are designed to correct spherical aberration. They are also designed to remove colour aberration which will occur because of the long light-path through the glass prisms in the binoviewer, if it is used with fast telescopes (with focal ratios between f/4 and f/7) because of the highly convergent light beams present in these instruments.

Also, as a Glasspath Corrector moves the focus away from a telescope – similar to a Barlow lens – you can use the binoviewer with almost any telescope. Only if you use "slow" telescopes like Schmidt-Cassegrains (SC), you do not need a glass- path compensator, because the lightbeams do not converge at such a wide angle. Nevertheless, they can still be used to achieve different magnifications. The sharpness will increase even when used with SC- and HD-telescopes.

These "colour-abberation correctors" are an important addition to the binoviewer. The peculiar housing of the three models with a clamping collar is designed to be inserted between T-2-screw-connections. This way, these lenses can be used with all telescopes, in different places of the light path, and you can achieve several distances for projection.

The MaxBright® II Binoviewer is made according to high quality standards. The optical polish of the prisms, all coatings and last, but not least, the optical adjustment and orthogonality of the 27 mm large prisms are so precise that the image doesn't deteriorate even at highest magnifications.

If you you want to experience the universe relaxed with both eyes open, then the MaxBright® II Binoviewer is the right choice for you!

Scope of Delivery and Accessories



1. MaxBright® II Binoviewer
2. Rotatable T-2 Coupling Nut with T-2 finetuning ring made of plastic (pre-mounted)
3. Zeiss microbayonet (dovetail ring)
4. Spanner tool to fix T-2 adapter or Zeiss-Microbayonet to the bino-viewer.
5. ABS hard-top case with compartment for a T-2 star diagonal and a nosepiece

Please note: This is only the scope of delivery of the MaxBright® II Binoviewer *#2456460*. The MaxBright® II is also available in different sets which include further accessories. These accessories (and more) are also described in this manual, but the sets are not further specified here. For more information, please visit:

www.baader-planetarium.com

Not included are Glasspath Correctors (which version you need depends on your telescope), eyepieces, star diagonal and T-2-adapter (these also depend on the kind of telescope which you want to use the binoviewer with).



The hard-top case of the MaxBright® II is prepared for further accessories like a T-2 star diagonal with an attached 2" nose-piece.

Optional Accessories

Glassspath Correctors (GPC)

A Baader Glasspath Corrector (GPC) fulfills two critical roles. Firstly, it corrects the glass path – that's the amount of glass through which light passes on its way through the prisms and which causes chromatic aberrations (colour errors) with fast telescopes. Secondly, the GPC magnifies the focal length and moves the focal point of the main telescope. You will find more information about choosing the right compensator in the addendum starting at page 20.

The GPCs with a Z in the part number are for use with the Zeiss microbayonet. They are inserted "upside down", directly into the binoviewer.



#2456300
1,7x GPC and coma corrector for Newtonians

Part Number	Factor	Focus gain
#2456314 / *#2456314Z*	1,25x	ca. 20 mm
#2456316 / *#2456316Z*	1,7x	ca. 35 mm
#2456317	2,6x	ca. 65 mm
#2456300	1,7x	ca. 80 mm – 2" Glasspath Corrector for Newton, to attach to the Zeiss microbayonet

GPCs to be inserted into star diagonals or MaxBright® II body



T-2 Glasspath Corrector
Factor 1,25
#2456314(Z)



T-2 Glasspath Corrector
Factor 1,7
#2456316(Z)



T-2 Glasspath Corrector
Factor 2,6
#2456317

Telecentric Systems

The achromatic Baader SunDancer II telecentric systems TZ-3S *#1363070* and TZ-4S *#1363080* with a magnification factor of three or four times can be used instead of a glasspath corrector, if you either qant high magnifications or can't reach the focus otherwise, e.g. when using a Newtonian. They ara attached directly to the T-2-thread of the bino-viewer.



SunDancer TZ-3S
#1363070

1¼" and 2" Nosepieces

A T-2 nosepiece in 1¼" (31,8mm, *#2458105*) or 2" (50,8 mm, *#2408150*) is used to connect the binoviewer either through the pre-installed T-2 coupling nut or the optional TQC quick changer with a focuser/eyepiece clamp. They can also be used to use a T-2 star diagonal at 1¼" or 2" focusers.



#2458105
1¼" nosepiece



#2408150
2" nosepiece

1¼" Star Diagonals

The optical length (that is, the necessary back-focus) must be added to the optical length of the binoviewer.

Part Number	Name	Optical Length
#2456100	T-2 Maxbright mirror diagonal dielectrical mirror made of Sitall glas ceramic	43 mm
#2456005	T-2 90° star diagonal (32 mm Baader Prism)	35 mm
#2456095	T-2 90° star diagonal (36 mm Zeiss Prism) wit BBHS® coating	38,5 mm
#2456130	T-2 / 90° Baader Astro-Amici-Prism with BBHS® coating, for upright images	48 mm
#2456103	Baader T-2 BBHS® star diagonal (mirror)	43 mm
#2458055	FlipMirror II star diagonal – to switch between straight-through and 90° light path	59 mm



Baader FlipMirror II
star diagonal
#2456100



T-2 / 90° star diagonal
with 32 mm Prism
#2456095



T-2 / 90° star diagonal
(Zeiss) Prism with BBHS® coating
#2456095

Shorter Optical Length with the T-2-System

Only with a T-2 prism diagonal you can achieve the shortest possible adaptation to lens telescopes ans Schmidt-Cassegrains. By using the T-2-threads, you do not need the long eyepiece clamps and nose pieces which cause problems on cheaper bino-viewers. This way, you can achieve focus with a less strong glasspath corrector, and on telescopes slower than f/7, you may even work without a glasspath corrector. This has got several advantages compared to using e.g. a 2" star diagonal, which you may already have, but which needs a longer back focus:

- A low-power glasspath corrector lets you use **lower magnifications**, which is perfect for observing large and dim Deep-Sky-objects. So, the bino-viewer is much more versatile and not restricted to bright objects at high magnifications like the members of our solar system
- The shorter overall length reduces or **avoids vignetting** through the eyepiece clamp or entrance opening of the binoculars even without a glass path corrector
- Telescopes with are focused by moving the main mirror (Schmidt-Cassegrains, Maksutovs) are operated **closer to their ideal focus position**

Only with a T-2 prism can you realize the shortest possible and tilt-free adaptation to a telescope!

2" Star Diagonals and Herschel Wedge

The optical length (necessary back-focus) of all components must be added to the optical length of the binoviewer. For a shorter connection, you can remove the 2" Clicklock® clamp of our star diagonals. Then you can attach the binoviewer directly to the housing with the 2"/T-2 adapter *#1508035* as shown in the image to the right.

The following table gives the optical length without the Clicklock®-clamp.



MaxBright II with 2" BBHS® star diagonal *#2456115*

Part Number	Name	Optical Length
#2956100	Baader 2" ClickLock® Mirror Diagonal	71,5 mm
#2456115	Baader 2" BBHS® Mirror Diagonal	71,5 mm
#2456117	Baader 2" BBHS® Prism Diagonal	59,5 mm
#2456120	Baader 2" Astro-Amici-Prism with BBHS® coating	85 mm
*#2456500**P*** / *#2456500**V***	2" Baader Safety Herschel Wedge (**P**hoto/**V**isual) for solar observation	66 mm

See page 16 for information about removing the 2" ClickLock® eyepiece clamp.



Baader 2" ClickLock® mirror diagonal with 2" ClickLock®-clamp *#2956100*



Baader 2" BBHS® mirror diagonal with 2" ClickLock®-clamp *#2456115*



Baader 2" BBHS® prism diagonal with 2" ClickLock®-clamp *#2456117*



Baader 2" Astro-Amici Prism with BBHS® coating *#2456120*



Safety Herschel Prism *#2956510P* / *#2956510V*

Configurations

There are many possible ways to adapt the Baader MaxBright® II Binoviewer to your telescope. To keep the required back-focus as short as possible, you can attach it directly to the T-2-threads of matching accessories. With the optional TQC Heavy Duty T-2 Quick Changer *#2456313A*, you can change the orientation easily. You can realise almost every combination with the Astro-T-2-System.

The most common combination is: 1¼" or 2" nose piece | prism diagonal *#2456005* (32 mm prism) or *#2456095* (36 mm BBHS prism) | glasspath corrector | bino viewer.

How to find the perfect Star Diagonal

When the binoviewer is used with refractors and Cassegrain telescopes, it is much more comfortable to use a diagonal between the telescope and the binoviewer. Unfortunately, many cheaper 1¼" star diagonals are not a good choice because they were only designed for an eyepiece which is fitted directly into the eyepiece holder. So close to the eyepiece, the optical quality of the star diagonal does not have to be very high. On the other hand, all of our star diagonals are of such a quality that they can be used up to 160 mm in front of the focal point. To achieve this, all optical surfaces have to be of a very good quality and very precisely polished.

When choosing a star diagonal, care must be taken to ensure the safety of the binoviewer and eyepieces. Many cheaper 1¼" diagonals are simply not up to the task of supporting a binoviewer setup, especially with two heavy widefield eyepieces. Plastic bodies, small locking screws and a generally lightweight construction are inadequate to safely hold heavy accessories like a binoviewer. Unfortunately it's quite common to hear about heavy and expensive eyepieces being dropped to the ground (and broken) because of the poor locking system on these budget diagonals.

This is compounded by the extra height (and increased leverage) imparted by placing the binoviewer on top of the diagonal's existing eyepiece clamp (which also consumes a large amount of precious back-focus). This is a large problem if you use 2" star diagonals. An eyepiece clamp can use approx. 60 mm of optical length. That is why the 2" Clicklock® of our BBHS and Clicklock® star diagonals can be removed, so that you can attach the binoviewer (or a camera body) directly onto the housing of the star diagonal. You need the optional adapter T-2/2" *#1508035* with an optical length of only 0.5 mm.

The perfect solution for this problem consists of using a Baader T-2 diagonal. Our T-2 diagonals are equipped with T-2 threads allowing the binoviewer to be mounted ***directly*** onto the diagonal body. The result is a very sturdy connection utilising the minimum amount of back-focus possible. These diagonals feature prisms or mirrors of the absolute best optical quality, incorporated into a solid one-piece precision machined metal body perfectly suited to hold the heaviest accessories.



The MaxBright® II can be attached directly to our 2" star diagonals with the 2"/T-2-adapter *#1508035* – as shown here with Baader Classic Orthos and the 2" BBHS® mirror diagonal *#2456115*

If your telescope is equipped with a 2" eyepiece clamp, you can use the binoviewer with an optional 2" nosepiece *# 2408150*. You can attach it either directly to the binoviewer with the TQC QuickChanger, or to an optional T-2 star diagonal.

How to find the perfect Glasspath Corrector

For telescopes with an f-ratio of about f/7 or faster, you need a Glasspath Corrector (GPC) to correct the colour aberrations introduced by the prisms at such fast telescopes. It also moves the focal point outwards, which is necessary to reach focus at all at some telescopes. Besides three GPCs especially for the astro T-2 system, there are also two special 2" GPCs, one for Newtonians and one for lens telescopes and Schmidt-Cassegrains. You can find more about choosing the best GPC in the addendum, starting at page 22.

How to find the perfect Eyepieces

The MaxBright® II Binoviewer features an optical window with a clear aperture of 26 mm, so you can use (almost) all standard 1¼" eyepieces.

The maximum outside body diameter of eyepieces that can be used with the binoviewer is about 58 mm. If the binoviewer is used with eyepiece having a larger diameter, for example the Pentax XW, you may have problems reaching the correct separation between the two eyepieces if the interpupillary distance between your eyes is less than 60 mm.



The Eudiascopic 35mm-eyepieces show a very large field of view, in spite of having only a 1¼" nosepiece.

For observing the planets with high resolution, we recommend our Classic Ortho or even Carl-Zeiss-Abbe eyepieces. For general observations, we recommend the Hyperion 68° and the Morpheus 76° wideangle eyepieces. These provide large eye relief and are very comfortable to use.



Two 36 mm Hyperion® Aspheric at the MaxBright® II Binoviewer

It is extremely important to choose pairs of identical eyepieces made by the same manufacturer in the same period of time. It is quite common to find significant differences (optically and mechanically) in eyepieces of the same brand and type built at different periods of time. If you do not use identical eyepieces, you may experience problems merging the two images, because the brain can't handle these different images.

Largest Field of View

Usually, eyepieces with a focal length of 32 mm provide the largest possible field of view; eyepieces with longer focal length can give you "only" a brighter image because of their lower magnification. The reason for this is that the nosepiece (with the field stop inside of it) physically limits

the part of the sky which you can see in it. That's why a 32 mm Plössl with about 50° apparent field of view usually shows already the largest true field of view. Nevertheless, we have two eyepieces which can show you even more. This is only possible because their field stop is not inside of the nose piece. These two eyepieces suitable for binoviewing are:

- Eudiascopic 35 mm eyepiece 1¼" *# 2404105* with 45,6° field of view (no longer in production). This is almost as large as the field of view of 32 mm 2" Erfle eyepieces.
- Hyperion® Aspheric 2" eyepiece 36 mm *# 2454636* – 50° field of view with the included 1¼" adapter.

Both eyepieces avoid the "tunnel view" which is typical for longer focal lengths, so that they combine lower magnifications and a convenient field of view.

Using Zoom-Eyepieces

Many economically priced zoom eyepieces only have a small field of view which decreases with higher magnifications. Furthermore, they have a low optical quality especially at higher magnifications.

In contrast to standard zoom-designs, our Hyperion® Universal Zoom Mark IV eyepieces are made so that they provide the best sharpness and the largest field of view at the highest magnification. Simple zoom-eyepieces are designed the other way round. That's why we recommend especially the Hyperion® Zoom eyepieces for use with a binoviewer. The precise click stops at 8/12/16/20/24 mm make it easy to set both eyepieces to the same magnifications.



MaxBright® II Bino-viewer with FlipMirror II Star Diagonal and two Hyperion® Universal Zoom Mark IV eyepieces on a Schmidt-Cassegrain.

Using rubber eyeshields

If your eyepieces are equipped with round rubber eyeshields (like e.g. our Hyperion or Morpheus eyepieces), leave them in an upright position, unless you are wearing glasses. If you need to wear glasses, fold the eyeshields down to see the complete field of view. If you are using eyepieces like the Baader Classic Orthos, it is best to use the eyeshields with the folding side wing.

Please note: If you are very short-sighted, you should wear the glasses for observations with the binoviewer – focusing will be easier then. This is also valid in the case of astigmatism, which is best corrected with glasses (or contact lenses) – you can't correct for astigmatismus only with the diopter adjustment.

Setting the Interpupillary Distance

Interpupillary distance (the separation between the centres of the eyes' pupils) varies from person to person. The binoviewer should be adjusted to match your interpupillary distance. Using both hands, hold the body of the binoviewer like a pair of binoculars. While viewing a distant object (daytime) or a bright star field, rotate the two halves of the binocular body about the central pivot until you see the field of view as a single sharp circle with both eyes.

The mechanism has to "run in" over time. It is normal for it to be a little stiff at the beginning and become smoother over the years.

Adjusting Left-Right Focus (Diopter Compensation)

Many people require a different focus setting for their left and right eyes. That's why you set a different distance to the body of the binocular for each eyepiece. This diopter adjustment can be easily achieved. Adjust the focus of both eyepieces as follows:

1. Set the inner rings for the diopter compensation (marked with Up/Down) to somewhere in the middle. If you rotate them, you'll see how the upper end of the eyepiece clamp moves.
2. With the telescope aimed at an object, close the right eye and look into the left eyepiece. Using the telescope's focus mechanism, adjust until the image is sharp.
3. Close the left eye and with the right eye look into the right eyepiece. Rotate the right eyepiece holder until you see a sharp image. If you reach the limit of the focus travel, use the telescope's focus mechanism to adjust the image until it is sharp – then switch back to the left eye and rotate the left eyepiece holder for a sharp image.
4. Now you can look with both eyes into the eyepieces. You can now focus for different eyepieces or addition of other components to the optical path by using just the telescope's focus mechanism.

Please note: If the dioptric difference between your eyes is very large (more than 5 – 6 diopters), you may find that even with one eyepiece holder adjusted fully in and the other fully out, you cannot bring both to focus. If so, you may want to view while wear- ing your eyeglasses. Alternatively, you may unlock the eyepiece in the fully extended holder and lift it out a few millimeters to compensate for the strong difference between your eyes.



The lower ring collar is used for the diopter adjustment – compare the position of the eyepiece clamp on the left and on the right.

Connecting the MaxBright® II Binoviewer to a Telescope

There are many options to connect the binoviewer to your telescope. Depending on the back-focus and the optical design of your telescope, you can chose the option which best fits to your needs.

Assembly with T-2 Coupling Nut

With glasspath correctors 1,25x *#2456314,*
1,7x *#2456316* ***or 2,6x*** *#2456317*

When delivered, a T-2 counter nut is pre-mounted to the MaxBright® II Binoviewer. The pre-installed slotted fine-tuning ring provides the necessary hold, even on short T-2 threads.

Tip: By changing the Glasspath Corrector, you can achieve different magnifications with one pair of eyepieces.



MaxBright® II Bino with 1¼" star diagonal and 2" nosepiece

Option 1: Assembly with a T-2 Star Diagonal

Especially with a prism diagonal, this is the most common option, because a prism allows for a very short light path. By using the T-2-thread of our star diagonals, you can remove its eyepiece clamp and save several centimetres of back-focus. The lightpath of a prism is shorter than that of a mirror.

When using the T-2-thread, you simply screw one of the GPCs *#2456314, #2456316* or *#2456317* into the star diagonal (without the centering plastic ring which is included with the glasspath corrector). Our star diagonals provide a matching thread for this. You can find an overview of the different models and their optical lengths on page 5.

To use a T-2 star diagonal at a telescope without T-2-thread (but with a standard eyepiece clamp), you need in addition either the 1¼" nosepiece *#2458105* or the 2" nosepiece *#2408150*.

1. Remove the dust covers of your star diagonal.
2. Screw the glasspath corrector into the body of the star diagonal as shown in the picture to the right.
3. If necessary, attach a 1¼" nosepiece *#2458105* or a 2" nosepiece *#2408150* to the other side of the star diagonal.
4. Remove the dust caps from the binoviewer and attach the star diagonal to its T-2-thread. Turn the counter nut until both parts are connected securely. Untighten the counter nut slightly to change the orientation of the binoviewer, if necessary.



Inserting the glasspath correctors 1,25x, 1,7x and 2,6x into the Baader T-2 star diagonals.

Option 2: Assembly with a 1¼" (or 2") Nosepiece, without Star Diagonal

If your telescope has got enough back-focus or if you want to use it for straight-through-viewing, you can attach a 1¼" or 2" nosepiece directly to the bino-viewer.

1. Remove the dust cover from the binocular's T-thread

   2a. **1¼" Nosepiece:**
   Screw one of the Glasspath Correctors *#2456314*, *#2456316* or *#2456317* into the 1¼" nosepiece *#2458105.*

   2b. **2" Nosepiece**
   Put the black plastic ring which is included with the glasspath corrector over the thread of the GPC. Now place the GPC into the 2"-nosepiece *#2408150*.



The glasspath corrector is simply screwed into the 1,25" nosepiece.

3. Now use the T-2 counter nut of the binoviewer to fix the nose piece with the glasspath corrector to the binoviewer. Rotate the counter nut until the nosepiece holds tight.
4. Now put the binoviewer into the focuser of your telescope and secure it.
5. Remove the dust covers from the eyepiece clamps by opening the Click-Lock®-clamps. Simply rotate them to open the clamps. Please note: Both clamps work in opposite directions!
6. Insert two eyepieces with the same design and focal length into the binoviewer. Clamp them by turning the Clicklock® clamps.



This image shows how the glasspath corrector is inserted into the optional T-2/2"-adapter. The black plastic ring covers the thread of the GPC, so that it will be centered in the adapter.



Once the glasspath corrector is placed and centered in the 2"/T-2 nosepiece, you can screw it onto the T-2 counter nut of the binoviewer.

Please note:
The Zeiss glasspath correctors 1,25x *#2456314**Z*** and 1,7x *#2456316**Z*** can be reconfigured for use with the T-2-adaptation by turning the lenses upside-down.

Assembly with Zeiss Microbayonet

With glasspath correctors 1,25x *#2456314Z,* ***1,7x*** *#2456316Z* ***or 2,6x*** *#2456317*

For this, you need the optional TQC Heavy Duty T-2 Quick Changer *#2456313A.*

To use the included dovetail ring, you need to remove the inserted T-2 finetuning ring with the help of a sharp object. Then you can unscrew the T-2 counter nut. Use the included tool 4 for this. Set it into the two holes inside of the nut to unscrew the T-2-adapter from the MaxBright® II Binoviewer (as shown below). Then you can easily screw the dovetail ring onto the M34-thread of the binoviewer.



Remove the T-2 finetuning ring with a sharp object

Remove the inner ring with the included tool

The M34-thread without the adapters

Screw the Zeiss-dovetail ring onto the M34-thread

Option 1: Assembly with a T-2 Star Diagonal

1. Remove the dust caps from the TQC Quickchanger.
3. a) GPC 1,25x and 1,7x:
   Screw the GPC into the chrome dovetail ring at the front end of the binoviewer (image below, to the right).
   b) GPC 2,6x:
   Screw the GPC into the T-2 star diagonal. (image below, to the left)
4. Screw the TQC Quickchanger onto the T-2 star diagonal (or onto the T-2 nose-piece, if you don't use a star diagonal.

2,6x GPC



The 2,6x glasspath corrector is inserted into the T-2 star diagonals as shown here.

1,25x + 1,7x GPC



The two 1,25x and 1,7x glasspath correctors are mounted into the dovetail at the binoviewer

5. Attach the TQC Quickchanger with star diagonal and T-2 nosepiece at the binoviewer.
6. Attach the binoviewer to your telescope and make sure that the connection is sturdy.
7. Remove the dust covers from the eyepiece clamps by opening the Click-Lock®-clamps. Simply rotate them to open the clamps. ***Please note:*** Both clamps work in ***opposite*** directions!
8. Insert two eyepieces with the same design and focal length into the binoviewer. Clamp them by turning the Clicklock® clamps.

Option 2: Assembly without Star Diagonal

You can connect the ring dovetail of binoviewer directly to a nosepiece, too, if you don't want to use a star diagonal. Because of the necessary quick-changer, the optical length increases a little bit. Nevertheless, this may be useful e.g. if you want to use the binoviewer with several telescopes.

The two glasspath correctors with factor 1,25x and 1,7x can be screwed into the ring dovetail, as described for option 1. Then, you can use the TQC quickchanger *#2456313A* to connect the binoviewer to every T-2-thread, either directly at the telescope or to a nosepiece.



The 2,6x glasspath corrector can be screwed into the 1,25" nosepiece.

The 2,6x glasspath corrector must be inserted into the 2" nosepiece *#2408150*. For this, you need the plastic spacer ring which is included with glasspath corrector (image below). Insert the GPC into the nosepiece and screw the TQC quickchanger onto the nosepiece. Now you can use the MaxBright II with every 2" focuser.



This image shows how to insert a 2,6x glasspath corrector into the optional T-2/2" adapter. The black spacer ring fits onto the thread of the glasspath corrector and centres it in the nosepiece.



Once the glasspath corrector is centered in the 2"/T-2 nosepiece, it can be screwed onto the quickchanger, which fits onto the ring dovetail of the binoviewer.

Please note:
The T-2 glasspath correctors 1,25x *#2456314* and 1,7x *#2456316* can be reconfigured for use with the Zeiss dovetail by turning the lenses upside-down.

Assembly with 2" Newtonian 1,7x Glasspath Corrector®

As described before, you need to replace the T-2 counter nut with the Zeiss microbayonet. The 1,7x glasspath corrector is then attached to the binoviewer instead of the TQC quickchanger. The TQC is not necessary for this setup.

The 2" Newtonian glasspath corrector *#2456300* provides you a focus gain of approx. 80 mm. It is the only chance for many Newtonian telescopes to reach focus without moving the main mirror.



2" 1,7x GPC *#2456300* at MaxBright® II Binoviewer

Assembly with SunDancer II Telecentric Systems

If no glasspath corrector is sufficient to provide enough back focus, or if you want to reach the desired high magnifications for observing the planets with eyepieces with long focal lengths, you can combine the bino-viewer also with the SunDancer 2 Telecentric Systems. The TZ-4S *#1363080* quadruples the focal length and illuminates eyepieces wwith field stop diameters up to 36 mm. Die TZ-3S *#1363070* triples the focal length and illuminates eyepieces with field stops of up to 27 mm.



MaxBright® II Bino with SunDancer TZ-3S *#1363070*

The big advantage of a telecentric system is that it gives you a beam of parallel light. This way you avoid the colour aberrations which the prisms of the bino-viewer would introduce at fast optics (faster than approximately f/7). In contrast to a barlow lens, the magnification factor does not depend on the distance to the eyepiece, so you alwayst get the desired magnification factor.



MaxBright® II Bino with SunDancer TZ-4S *#1363080*

Compared to an eyepiece without binoviewer, you only need about 5 mm of inward focus travel. So, you can reach focus on almost any telescope. The SunDancer II telecentrics can be connected to the bino-viewer either directly with the T-2-thread, or with a T-2 quick-changer.

Assembly with 2" Star Diagonals

With Glasspath Correctors 1,25x *#2456314 (Z),* ***1,7x*** *#2456316 (Z)* ***or 2,6x*** *#2456317*

You can achieve the shortest overall length with our T-2 prisms. A 2" star diagonal offers no advantages, but it usually needs a glasspath corrector with a higher power due to its greater optical length, so that you cannot use smaller magnifications.

In order to use an existing star diagonal, the 2" ClickLock® clamps e. g. of our 2" star diagonals can be removed. To do this, you must either loosen the small screws with an Allen key, as shown here for the ClickLock® star diagonal *#2956100* as an example, or unscrew the eyepiece clamp. A 2" SC thread then becomes accessible, into which the 2"/T-2 adapter *#1508035* is screwed. The glass path corrector is inserted into this ring, just like into the 1¼" receptacle. Then place the plastic centring ring over the thread of the glass path corrector. Now insert the glasspath corrector into the T-2/SC adapter. When you screw on the binoculars or the quick changer, it is fixed in position.



Remove 2" ClickLock® with an Allen wrench



2"/T-2-adapter *#1508035*



Mirror diagonal with revealed SC-thread



Mirror diagonal with threaded 2" / T-2-Adapter

Exception: The two glasspath correctors 1,25x *#2456314Z* and 1,7x *#2456316Z* for Zeiss micobayonet are mounted in the ring dovetail as described before.

The 2" ClickLock®-clamps of our 2" star diagonals and the Herschel Wedge (see below) can be removed. For this, you need to remove the small screws, as shown here for the BBHS® mirror diagonal *#2456115*, or in the case of the Herschel, you need to unscrew the clamp. Then you can access a female 2"-SC-thread, into which you can screw the 2"-SC/T-2-adapter *#1508035*. The glasspath corrector is inserted into the 2"-SC/T-2-adapter.

Now you can attach the MaxBright® II either directly to the prism with the T-2 counter nut, or you attach the optional TQC quickchanger *#2456313A* to the housing, to use the Zeiss microbayonet.



Star Diagonal with T-2 adapter and glasspath corrector



Star diagonal with optional T-2 quick-changer



Binocular with T-2 quickchanger at the 2"-Clicklock® mirror diagonal

Further Adaptations

Solar Observations with the Baader Safety Herschel Prism

Binoviewing is especially impressive when you look at the sun – you'll see it in 3D, like a ball floating in space. Delicate surface details will be much more obvious compared to monocular viewing. The MaxBright® II Binoviewer is uniquely suited to provide outstanding views with the 2" Baader Herschel Solar Prism, an optical accessory designed for refractor telescopes to permit safe, high-resolution observation and imaging of the solar photosphere. For the shortest possible connection, you can use the Astro T-2 system to attach the bino-viewer directly to the Herschel wedge.

CAUTION: Before you start exploring the Sun it is very important to be informed about all the possible risks of solar observation. Please take a careful look at the manuals of all the equipment and filters before pointing your telescope at the Sun.

Adapting the MaxBright® II to the Cool Ceramic Safety Herschel Prism

To use the MaxBright® II with our Safety Herschel Prisma Mark II *#2956510P/V*, you need to replace the ClickLock® eyepiece clamp by opening the six Allen screws with a Diamond Steeltrack® S58/T-2 adapter *#2957202* (image to the left). If necessary, add a T-2 extension tube 7.5 mm *#1508155* to the S58/T-2-adapter (see below).



The Clicklock® of the Cool Ceramic Herschel Prism Mark II can be replaced with the S58/T-2-adapter *#2957202*.

When using the ***MaxBright II with T-2-thread***, the glasspath corrector (1.25x: *#2456314*, 1.7x: *#2456316*, 2.6x: *#2456317*) is placed inside of the 7.5 mm extension and centered with the black plastic ring included with the glasspath corrector. Then mount the bino-viewer with the T-2 coupling nut onto the extension tube, rotate it into a convenient position and tighten the coupling nut.

The adaptation of the ***MaxBright II with a T-2 quick coupler*** depends on the glasspath corrector which is used. The ***glasspath corrector 2.6x*** is placed into the 7.5 mm extension *#1508155* as described above. Then screw the T-2 quick changer onto the extension ring and insert the bino-viewer with the dovetail ring. The glasspath corrector is held in place by the dovetail ring of the bino-viewer.

The ***glasspath correctors 1.25x (# 2456314Z) and 1,7x (#2456316Z)*** are screwed into the dovetail ring of the bino-viewer, without the böack centering ring. The 7.5 mm extension ring *#1508155* is not necessary, the T-2 quick changer is screwed directly onto the T-2-adapter *#2957202*. You can find further information in the manual of your Herschel prism.



The glasspath correctors for bino-viewers with T-2-thread and the 2,glasspath corrector are placed into the 7.5 mm T-2 extension *#1508155*. The bino-viewer can be attached directly to the T-2-thread, or via a T-2 quick changer.

Adapting the MaxBright® II to Herschel-Prisms with SC-Thread

For a direct adaptation of the bino-viewer to older Baader Herschel prisms with SC-thread (#*2956500P/V* oder #*2456200*), you need the adapter #*1508035*, which converts the female SC-thread of the Herschel prism into a male T-2-thread. This female 2" thread is under the 2" eyepiece clamp, which can be unscrewed.

To use the glasspath correctors 1,25x (#*2456314*), 1,7x (#*2456316*) and 2,6x (#*2456317*), you also need the 7.5 mm T-2 extension tube #*1508155*. It is not necessary if you use the T-2 quick changer in combination with the glasspath correctors 1.25x (#*2456314Z*) and 1.7x (#*2456316Z*). The bino-viewer can then be attached to the Herschel prism as described above.



At a Herschel prism with SC-thread, remove the Clicklock eyepiece clamp and the SC conversion ring and replace it with the SC/T-2-adapter #*1508035*.



MaxBright bino-viewer with SunDancer Telecentric System at a Herschel prism with 2" eyepiece clamp.

Adapting the MaxBright® II to Herschel-Prisms without adapter threads

If you want to use the bino-viewer on a prism where the eyepiece clamp can't be removed, you can try to install the 2.6x glasspath corrector #*2456317* inside of a T-2-nosepiece as described on page 6. If you can't reach focus with it, you need to use a telecentric system as described on page 7.

You can use a telecentric system also with our 2" Herschel prisms.

Assembly with the Universal Alan Gee II Telecompressor for Schmidt-Cassegrains

For Schmidt-Cassegrains, the Universal Alan Gee II (UAG II) Telecompressor #*2454405* offers an interesting opportunity to almost double the field of view. It changes the focal ratio of a typical Schmidt-Cassegrain from f/10 to f/5.9.

It can be attached directly onto the T-2-thread of the binoviewer. To attach the UAG II onto the star diagonal, the included 7.5mm T-2 extension ring #*1508153* is required.

Alternatively to the included 7,5mm extension, you can use the T-2 Quick-Changer System (TQC/TCR) #*2456322*.

The T-2 star diagonal can then either be attached to the SC-thread of the telescope with the help of the BTA-adapter #*2408160*, or you can use a 2"/T-2 nosepiece #*2408150* if the telescope is equipped with a 2" ClickLock® eyepiece clamp (#*2956220* for C8 and C925; #*2956233* for C11 and C14). The simple clamping screw of the standard 1,25" visual back is not strong enough to keep the heavy combination of binoviewer, eye-pieces and star diagonal securely in place.



The Universal Alan Gee II ❶ is connected with the help of the included 7,5mm extension ring ❷ onto the T-2 star diagonal ❸. The star diagonal is attached to the telescope either through the BTA-adapter for Schmidt-Cassegrains #*2408160* ❹ or a 2"/T-2 nose piece #*2408150* ❺.

Shortest possible Adaptation *without* Glasspath Corrector

In combination with telescopes with long focal lengths (f/10 or slower), it may be interesting to screw the binoviewer directly onto the star diagonal. This gives you a very short (and theft-proof) adaptation, which is ideal for public observatories. In addition, you can screw a T-2 star diagonal directly onto our Baader Diamond SteelTrack focusers with the optional T-2-adapter #*2957202* – very compact, and protected from "accidental removal". To do so, you have to remove the T-2 counter nut or the Zeiss microbayonet.

The shortest possible adaptation can be achieved with the prism diagonal #*2456005* (T-2 90°, with 32 mm Baader prism).

You also need the T-2 Locking Ring #*2458271* and the Slip Ring #*2458272*. Screw the Locking Ring onto the male thread of the T-2-prism and put the Slip Ring between binoviewer and locking ring. The raised surface of the slip ring should face towards the binoviewer and the flat one towards the star diagonal. Now screw the binoviewer onto the prism and fix it in the desired position with the locking ring. The slip ring lets you still set the interpupillar distance.



If the handle of the locking ring ends up in an uncomfortable position, you can change its position. It is only screwed into the ring, you can put it into any of the three threaded holes which are all around the locking ring, each 120° apart.



Addendum

Addendum 1: The right Glasspath Corrector

Back-Focus

Sometimes referred to as “in-focus” or “in-travel”, back-focus is an important factor to consider when choosing a binoviewer or any other long accessory (cameras, Herschel Wedge, etc). Back-focus is simply the distance from a telescope's focal point to the surface of its fully retracted focuser. Any accessory inserted into the focuser consumes some of this back-focus – star diagonals, eyepiece adapters, reducers, cameras, eyepieces, etc. In order to reach focus, the focal plane of an eyepiece or camera must be positioned at the telescope's focus.

To aid in determining the total path length when using various components, our listing of Baader Astro T-2 System™ includes the optical path length for each product. If the stack-up of parts is longer than the telescope's back-focus, it will not be possible to reach focus.

Unfortunately, there is no consistency in the telescope industry for the amount of back-focus a telescope provides. *Very few manufacturers provide the back-focus specifications for their scopes. Thus, the best way to determine your telescope's back-focus is to measure it yourself.* To reduce the possibility of errors, it is best to measure the back-focus using all adapters or star diagonals that will be present when using the binoviewer.

Newtonians typically have the least amount of back-focus; in order to extend the focal point well past the focuser surface, a larger secondary mirror would be required, or at least moving the primary mirror up the tube – which of course creates its own issues, too. This increases the central obstruction resulting in a loss of contrast and increased cost. For this reason, we offer a large 2" 1,7x Glasspath Corrector that is designed specifically for Newtonians. This compensator also corrects the off-axis coma that affects fast Newtonians and reduces the required back-focus to 31 mm!

Most Schmidt-Cassegrain and Maksutov telescopes provide large amounts of back-focus due to their movable primary mirror. It may be possible to use a binoviewer without a compensator, though our 1,25x Glasspath Corrector is recommended for its colour correction and to keep the focal length of the telescope closer to its optimal design.

Refractors vary considerably in the amount of back-focus they provide, sometimes even within the same model line. Even if a refractor will come to focus without a compensator, it is again recommended that at least the 1,25x Glasspath Corrector should be used for colour correction or to allow the use of longer focal length eyepieces while still providing higher magnifications.

How to measure the back-focus of my telescope?

The best method for finding out the back-focus of your telescope is: Do a measurement! Don't forget to attach all the adapters you will need for the binoviewer before measuring the back-focus.

The easiest way to measure back focus is to point your scope at the Moon (with all accessories, but without an eyepiece) and project its image onto a white card. The focuser should be fully retracted. Hold the card behind the empty focuser or above

the star diagonal and find the position where the image of the Moon comes to sharp focus. This position is your telescope's focal plane. Measure the distance from the card to the end of the focuser or the top of the star diagonal. This is the amount of available back-focus for additional accessories – for example, a binoviewer plus eyepieces. Armed with this information, refer to the first row of the table below. First, subtract the recommended 5-10 mm from your back-focus value to allow for differences in eyepiece design and vision. Then, find the first column with a value less then your adjusted back-focus. The heading of this column indicates the appropriate Glasspath Corrector.

Item Nr.	Configuration with various Baader Glasspath Correctors	No GPC	T-2 1,25x GPC	T-2 1,7x GPC	T-2 2,6x GPC	2" 1,7x Newton GPC	2" 1,8x RT/SC GPC
	Straight-through (only with nosepiece)	110	92	77	44	31	n/a
#2456005	T-2 Prism Diagonal 32 mm	148	131	116	83	n/a	n/a
#2456095	T-2 Deluxe Zeiss Prism Diagonal	151	134	119	86	n/a	n/a
#2456103	T-2 BBHS® Mirror Diagonal	153	136	121	88	n/a	n/a
#2456130	T-2 Deluxe Amici-Prism, 90° (for upright images)	158	141	126	93	n/a	n/a
#2456100	T-2 / 90° Maxbright Mirror Diagonal	153	135	120	87	n/a	31
#2956510P #2956510P	Herschel Prism Mark II with 2" ClickLock eyepiece clamp	238	220	203	162	n/a	
#2956510P #2956510P	Herschel Prism Mark II with 7,5mm T-2 extension tube *#1508155*	216	193	176	140	n/a	

Table 1: Combinations of Glasspath Correctors (GPC) and the MaxBright® II Binoviewer. Required back-focus in mm. n/a = not applicable
Please note: The lengths are approximate values; allow for some variation e.g. for diopter adjustment.

Some telescopes don't have enough back-focus for any of our glasspath correctors – then your only option is using one of our telecentric systems with 3x or 4x magnification (see page 6). Try to avoid 2" star diagonals, because they have a long optical length which requires a longer GPC and results in a higher minimum magnification. You can achieve lower magnifications (and thus a larger field of view) by using our very compact star diagonals which were designed especially with binoviewing in mind.

Users of Newtonian telescope may get the most out of the typical short back-focus by chosing either the 2,6x glasspath corrector or, if a 2"-focusser is available, by using the even shorter 2" GPC for Newtonians. You may also try to move the main mirror closer to the focuser by about 15 mm, so that they may use the next-smaller GPC.

Choosing a Glasspath Corrector

The Baader Glasspath Corrector fulfills two critical roles. First, it corrects the chromatic aberration (colour error) caused by the long light-path through the binoviewer glass prisms. Second, the corrector magnifies and extends the focal point of the main telescope.

The focal extending aspect is vital to using a binocular viewer with most telescopes. Due to the basic design of all binocular viewers, light must travel an additional 110mm or more before reaching the focal plane of the eyepieces. Many telescopes, especially

Newtonian reflectors, do not have sufficient back-focus (in other words, not enough focuser in-travel) to achieve focus with such an optically long accessory. By using a Glasspath Corrector, the focal point of the telescope can be extended sufficiently to accommodate the length of the binoviewer.

It also compensates the colour aberrations which would otherwise occur beause of the huge amounts of glass inside of the binoviewer. A GPC is more than a simple Barlow element! The optical design is from Carl Zeiss and Astro Physics – we have tested many lens systems from other sources which only extend the focal point, but which do not remove the colour aberrations.

Another benefit of the GPC is to provide additional magnification ahead of the binoviewer. For high magnifications (for example, planetary observation), it is preferable to magnify the image before the binoviewer, rather than to use shorter focal length eyepieces. By magnifying prior to the binoviewer, the effects of any optical tolerances and misalignments in the centering of the eyepieces are reduced. Additionally, longer focal length eyepieces tend to have longer eye relief and are more comfortable to use. In general, for binoviewing use we recommend eyepieces with focal lengths of 5 mm or longer. It is also less expensive to purchase an additional corrector to provide additional magnifications rather than to purchase additional pairs of eyepieces.

We recommend first choosing the lowest-power corrector that will allow your scope to reach focus. This will permit the widest possible field of view. In addition, one or more higher powered compensators can be added to give a greater range of magnifications.

For selecting the matching Glasspath Correctors, you need to measure the back-focus of your telescope first, as described in the previous chapter. Table 1 on the previous page then tells you, which compensators will work.

Please Note: The distances in the table are approximate and are measured from the front mounting flange of the binocular viewer or nosepiece to the top surface of the eyepiece holders. Many eyepieces have their focal points located ahead of or behind their shoulder. The effects of an eyepiece's focal point location are not taken into consideration here and thus the distance required to reach focus will usually vary from these values. Additionally, those who are near or far-sighted will also find that more or less back-focus is needed. *For these reasons, we recommend at least 5 – 10 mm additional back-focus.*

Let's look at an example. The Takahashi Sky90 SV Teleskop is found to have 160mm of back-focus as measured from the rear surface of its stock 2" eyepiece clamp to its focal point. Referring to Table 1, this scope can reach focus without a Glasspath Corrector, even when using the Baader Deluxe Amici erecting prism. Anyway, we would recommend either the 1,7x or 2,6x corrector. This would provide the ability to use the binoviewer with no compensator for low-power wide field viewing or with the higher powered corrector for optimum image quality at higher magnification for planetary observations. Otherwise, the colour abberation would harm the image quality at high magnifications. Only for wide-field observations e.g. of the Milky Way at low power, you can work without the Glasspath Corrector.

Addendum 2: Servicing and Maintenance

Your Baader binoviewer does *not* require any special or periodic maintenance. If the binoviewer should need servicing please return it to the shop where you purchased it, directly to Baader Planetarium or to a facility recommended by the authorised distributor of Baader products in your country.



Baader Optical Wonder is perfect for cleaning optical surfaces. It causes no scratches and cleans without leaving residues.
#2905000

Please do not attempt to open the binoviewer. Doing so will void the warranty. The optical collimation (alignment) of the internal prisms is the most important technical aspect of a binocular viewer. Baader Planetarium has gone to great lengths to produce the most accurately collimated binoviewer possible. If your binoviewer has been accidentally dropped or otherwise physically damaged, it is possible for it to loose its optical alignment and require servicing to restore the collimation of its prisms.



Baader Optical Wonder Cleaning Fluid is the perfect cleaning fluid for sensitive optical surfaces. It removes dirt, fat and finger prints from modern, multi-coated lenses without leaving stains or residues.
Item-Nr.: *#2905007*

If moisture should form inside of the binoviewer, never try to remove it manually! Store the binoviewer in a warm and dry place without dust caps. Wait until it is completely dry before storing it in the box.

Generally the glass surfaces of your binoviewer will not require anything more than a burst of clean air from a blower bulb in order to remove dust. Avoid touching the optical window lens or the prisms inside the eyepiece holders with your fingers. Should you touch them, it is advisable to clean them promptly, since the natural grease of fingerprints contain weak acids which can corrode the optical coatings of the lens/prisms. Before cleaning fingerprints or other dirt spots, first remove dust with a soft brush and a burst of clean air. To achieve the best results, we suggest you use a few drops of Baader Optical Wonder Fluid on a Baader Optical Wonder Cloth. This combination does not scratch or damage optics and won't leave a halo, film, chemical residue or tissue fibres. Additionally, unlike many cheaper microfibre cloths, Optical Wonder Cloth is antistatic, inhibiting the attraction of dust onto freshly cleaned optical surfaces.

Never spray the cleaning fluid directly onto the glass surfaces! The fluid might soak into the housing and distribute dirt in such a way that the binoviewer becomes useless. Always apply the fluid only to the cloth and never to the lenses!

IMPORTANT WARNING!

Do NOT try to disassemble the binoviewer and do NOT try to clean it inside!



Baader Optical Wonder Cleaning Fluid and Micro Fibre Cloath are also available as set.
Item-Nr.: *#2905009*

Problems, Maintenance and Warranty

If you should happen to notice problems or defects inside your binoviewer, NEVER try to open it yourself and do not request service from personnel not authorised by Baader Planetarium. Doing so will void the warranty. If you have any problems or questions about the use of the binoviewer or its optional accessories, please contact Baader Planetarium or your local distributor.

www.baader-planetarium.com

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