



User Manual for Baader ClickLock Diagonal Mirror with 2"- and M68-Connection

Congratulations for purchasing a Baader 2" ClickLock Diagonal Mirror. It can deliver impressive images for many years and offers more connection possibilities than standard star diagonals. To make use of them, we recommend that you spend some minutes reading this manual.

ClickLock Mirrors – Overview

- Oversized 2" dielectric lamda / 10 mirror
- Scratch-resistant, hard-coated mirror surface for safe cleaning, scratch-resistant even in extreme conditions
- Mirror repels UV and IR radiation, provides high security at the solar observation in white light and with H-alpha solar filters
- Baader 2" ClickLock clamp for ultrafast clamping action
- Weight: 495 g



**2" nosepiece:
#2956100**



**M68 (Zeiss) thread:
#2956100Z**

2" Clicklock Diagonal Mirror #2956100

- Clear aperture with 2" nosepiece: 46,6 mm
- Removable 2" Safety Kerf nosepiece, both ends include M48 filter threads, featuring largest clear aperture for widefield application
- Mirror housing with S58 dovetail and on both sides M55- and 2" SC-threads
- Optical length: 112 mm

M68 Clicklock Diagonal Mirror #2956100Z

- Clear aperture of 51 mm – currently the largest aperture of all 2" star diagonals
- Instead of the 2" barrel of #2956100, it has an M68 thread, which makes it possible to mount the mirrors on our extensive range of M68-accessories with the largest possible diameter on many telescopes
- Mirror housing with M55-threads on both sides
- Optical length: 109 mm

Connection to the Telescope – 2" ClickLock Mirror



ClickLock mirror at a 2" focuser.

The 2" star diagonal #2956100 can simply be inserted into the 2" eyepiece holder of your telescope like any standard commercial star diagonal. The groove system of the Safety Kerfs offers good grip and protection against falling out, just like a traditional safety groove does. Furthermore, it also avoids that the diagonal may tilt if the clamping mechanism of the telescope is positioned in a bad place – if there is only a simple security groove, the telescope's clamping screws may miss the groove or sit on the edge.

Unscrewing the 2" socket will expose two more convenient connectivity options: a 2" SC thread for connection to Schmidt-Cassegrain telescopes and a S58 dovetail.

Direct connection to Schmidt-Cassegrain-threads

To save space, you can use the **SC-thread** to screw the star diagonal directly to a Schmidt-Cassegrain. With the optional NexStar Locking Ring 2" # 2458270 as counter nut, the diagonal can be locked in any position. This is very useful especially on azimuthally mounted telescopes: The mirror can remain firmly at the telescope and the telescope can swing through to the zenith.

To attach the mirror at a Schmidt-Cassegrain you usually have to remove the ClickLock eyepiece clamp, otherwise it may hit the focusing knob of the telescope. To do this, loosen the six small screws as described in the chapter about eyepiece connection. Now you can screw the housing onto the SC-thread, lock it in a comfortable position with the NexStar Locking Ring and attach the Clicklock again. If necessary, the star diagonal can also remain fixed at the telescope. This way, you can't lose it at public events or during transport.

Using the SC-thread, the star diagonal can also be used to save space



Use the NexStar Locking Ring #2458270 (right) for a low-profile attachment to the telescope (left). This way, even alt-az telescope reach the zenith.



The SC-thread can be used to attach the 2" star diagonal e.g. to H-alpha-filters by SolarSpectrum.

on focus-critical accessories like H-alpha-filters by SolarSpectrum. The eyepiece clamp, which is usually necessary to attach a star diagonal, can be omitted.

Direct connection to Baader Diamond SteelTrack focusers

You can use the S58-dovetail to attach the star diagonal directly at a Baader Diamond SteelTrack focuser. Simply replace the SteelTrack's standard clamp with the star diagonal, as shown in the images to the right. You can use the locking screws to fix the mirror in a convenient orientation to the focuser.

This way, you can enlarge the backfocus and easier reach focus with large accessories like bino-viewers. The Diamond Steeltrack focuser is rotatable, so you can still easily reach a comfortable position for the eyepiece.



The 2" ClickLock mirror can be attached directly at the end of a Baader Diamond SteelTrack focuser.

Connection to the Telescope – M68 ClickLock Mirror

The M68 version of the mirror offers the largest possible entry aperture of all 2" star diagonals currently available on the market, but it lacks the connections for 2" focusers and S58 dovetail rings. Instead, it has a male M68 thread on the telescope side.



The M68 ("Zeiss") thread is the common solution when heavy equipment needs to be held securely in place.

Adaptation with M68 quick changer

It is widely used on large telescopes. For example, heavy-duty accessories can be installed torsion-free using screwed connections such as the M68 telecompendium (#2459258). The large and massive M68 quick change clamp consisting of S68 / M68 Zeiss change ring (#2458185) and M68 / S68 Zeiss changer (#2458180) provides a much better grip than smaller 2" or T-2 quick changers, yet you can use it to mount the mirror quickly and in the correct position on all appropriate telescopes.

Please Note: The Baader M55 / M68 (Zeiss) Adapter for 2" CL Mirror #2956110 can be used to convert the 2" Click Lock Mirror #256100 to the Zeiss system with a male M68-thread. This adapter is already included in the M68 mirror. To remove the black threaded ring from the case and expose the M55 thread, you need the adjustable pin type face wrench \varnothing 2mm #2450062.

On the other hand, the M68 mirror can not be rebuilt to 2", as the necessary adapter is not available separately.

In addition, you can use the adapter #2458234 to equip both star diagonals with a male M68-thread on the eyepiece side, e.g. to attach the M68 quick changer system.



Adaptation of the M68 star diagonal. Top left: The exposed M68 thread. Top right: With M68 / S68 Zeiss exchange ring. Bottom left: Additionally with S68 / M68 Zeiss changer. Bottom right: Mounted on the telescope. With the adapter #2458234, a quick changer can also be attached at the eyepiece-side.

Attaching Filters – only 2" ClickLock Mirror #2966100

There are two options to attach 2" filters in front of the 2" star diagonal #2956100. The nosepiece has got an M48 filter thread as usual. In addition, it has got another M48 filter thread on the other side to permanently mount a 2" filter close to the mirror's housing – either as dust protection or to keep a deep sky or light pollution filter in the light path.

Please note that the farther away from the focal point a filter is mounted, the higher are the demands on its optical quality. Only filters with a high-quality, plane-parallel surface do not harm the image, even if they are mounted in front of a star diagonal (or a bino-viewer).

This is not possible with the M68 zenith mirror because the 2" filters would obstruct the aperture.



The ClickLock Eyepiece Clamp

The Baader ClickLock is a precisely fitting, very massive eyepiece clamp without clamping screws (!). Inserted eyepieces, CCD cameras and similar accessories are securely held in place, locked against rotation and won't be scratched in any way! With a small turn of 20°, each eyepiece is firmly clamped. You will never have to handle small locking screws again – instead, just rotate the top of the eyepiece clamp for a few degrees, and the eyepiece will be firmly fixed. This is also no problem with gloves on!

Our various ClickLock clamps are made of seven precision-machined components which provide a highly effective retention mechanism that securely holds any 1¼" or 2" eyepiece. The clamp is very expensive to assemble, the price therefore initially may



appear high for "nothing more than" a clamping device. But if you think about the comfort, precision and stability, it's well worth the money.

You do not have to tighten the ClickLock clamps with brutal force, because the mechanical principle comes from professional mechanical engineering. This is how the tool holder in modern CNC milling centers works. Clever use of leverage multiplies the torque. The inserted object is held on three sides similar to a quick-action chuck and can therefore no longer carry out any tilting movements.

Optionally: 1,25" reducer

The Clicklock Mirror is delivered without a 1/4" reducer, as these adapters are often already present – or, depending on your other accessories, not needed. If you need an adapter, we recommend the ClickLock Reducer 2" to 1/4" (T-2 component #15b), #2956214. In addition to the 1/4" Clicklock with brass clamping ring, it offers a T-2 and a 2" filter thread and has an optical length of only 9.5 mm.



Detailed information about the 2" ClickLock system

We have tested the effectivity and stability of the ClickLock mechanism for many years with the 1/4" ClickLock clamp. The 2" ClickLock system is designed to be much more mechanically solid.

- Even a 20° turn with light pressure of the rotary lever is enough to hold all 2" accessories absolutely securely and firmly.
- Ratchet function – indicates the position of the clamp acoustically and haptically. So you can know if the clamp is open or closed in the dark and without looking.
- Massive tension ring – keeps even the most expensive accessories absolutely safe, without causing scratches and bruises



- The position of the rotary lever is adjustable either by six camera slotted screws or by six Allen screws with a hexagonal wrench (depending on the model)
- The heaviest tested load to date is a complete C14 with an SCL-clamp and a 2" Click Lock star diagonal with a Scopos 30mm extreme eyepiece (pictured left). The C14 has been lifted on the eyepiece. We emphasize that this test setup is not recommended for imitation.
- ClickLock eyepiece clamps are also available separately and can be retrofitted to many focusers.

Connecting Eyepieces

Shown at the 2" ClickLock Star Diagonal

With the ClickLock eyepiece clamp, all 2" eyepieces can be used as usual. The optical length of the star diagonal in its standard configuration is 112 mm – in the graph below, this corresponds to the distance from A to C.



2" ClickLock star diagonal with 2" eyepiece. The required backfocus is 112 mm.

You can also remove the ClickLock for particularly focus-critical applications or to securely attach accessories to the star diagonal by using one of the threads. To do this, you need to loosen the six M2.5 screws at the side of the ClickLock to expose the S58 dovetail and the SC female thread.

This SC female thread now offers you several options.



The required backfocus can be reduced from 112 mm with the ClickLock (A-C) to approximately 71,5 mm without the ClickLock (A-B).

You can use the optional 2" / T-2 adapter #1508035 to provide the star diagonal with a short, male T-2 thread, so you can use a binoviewer (depending on the existing back focus) without using a T-2 zenith mirror or the need to rely on a glass path corrector (which would increase the magnification).

In addition, you can screw the Hyperion Mark IV Universal Zoom Eyepiece directly onto the mirror housing to gain 47mm back focus. For this you need the 2" inverter ring #1508020. The Mark IV Zoom eyepiece can be screwed directly onto this ring.



2" / T-2-adapter #1508035 (#27)

To save space, the Mark V Großfeld (Giant) binoviewer can be attached with the 2" / T-2-adapter #1508035 (#27) securely to the star diagonal.



The Hyperion Mark IV Universal Zoom-eyepiece can be screwed onto the star diagonal with the help of a 2" inverter ring.

Overview of recommended accessories

Clicklock-Reducer 2" to 1¼" – (T-2 part #15b) #2956214

- 2" to 1¼" reducer with compression ring made of hardened bronze. Inserted height only 9.5mm
- M48 thread for 2-inch filters, T-2 (M42x0,75) inner photo-thread for most T-2 threaded accessories,



NexStar Locking Ring – #2458270

- Gain 20% field of view by space-efficient connection of 2" accessories to Schmidt-Cassegrains. Works as counter nut.
- Attach 2" accessories to the larger NexStar telescopes – screw the star diagonal directly onto the telescope.

S68 / M68 Zeiss Steel Change Ring (#2458185) and M68 / S68 Zeiss Changer (#2458180)

Quick-release system to easily attach and orient the M68 star diagonal to telescopes with M68-threads.



2"/T-2 Adaptor #1508035

Adapter with short-build design to attach T-2-accessories to the star diagonal – e.g. for binoviewers or cameras.

Optical length only 0.5 mm.

2" Inverter Ring #1508020

Provides a male 2" (SC) thread, just like on the Schmidt-Cassegrain telescopes. Can be used to mount heavy accessories without tilting, or to permanently mount compatible eyepieces thief-proof.



M55/M68 (Zeiss) adapter #2956110 (telescope-side) and #2458234 (eyepiece-side)



#2956110

Refits our 2" star diagonals with a female (#2458234) or male (#2956110) M68-thread, e.g. to attach the M68/S68 Zeiss quick-changer.

#2458234 can also be used to provide an M68-thread on the eyepiece-side of the M68-mirror,



#2458234

too. We recommend the the adjustable pin type face wrench \varnothing 2mm #2450062 for installation of these adapters.

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