Glossary Of Terms

Often, the meaning of many terms used for describing properties of Binoviewers are not properly understood. Please consult this Glossary and email us using "Contact" on this website to have us add terms that are not present in this section.

Back Focus: This refers to the position of the image plane in relation to the exit aperture of the telescope. In other words, any telescope objective creates a converging cone of light that terminates in an image plane. The total distance beyond the exit hole of the telescope where this focused image plane occurs is described as "amount of back focus". Usually expressed in millimeters, it is important because many accessories such as cameras and binoviewers have quite a bit more light path to transverse than eyepieces. In order to allow them to focus, there needs to be a lot of back focus. The more back focus that is present, the more the accessory can be moved inside of that point where the image plane occurs which allows the accessory to become focused. Most telescopes are configured to allow only eyepieces to reach focus such as Newtonians. Refractors typically allow eyepieces placed in star diagonals and cameras placed directly into the Refractor focuser tube to reach focus. Binoviewers will not reach focus with most Refractors and star diagonals unless the tube assembly has been specially shortened for this purpose. Some refractors may manage to allow a binoviewer to reach focus without the use of a star diagonal but this is not very practical for night use due to very awkward observing positions when viewing higher than about 45 degrees. Remember that a 2" star diagonal consumes 100mm of back focus. Typically, 85mm of back focus will suffice to allow a camera to reach focus. Binoviewers have a light path ranging from 100mm to more than 130mm. This is why the Denkmeier OCS™ needs to be employed. The OCS functions as a relay, moving the image plane through the extra binoviewer light path while maintaining a reasonably low magnification. Without our Power x Switch Star Diagonals™ which integrate our OCS or our other OCS systems, the amount of back focus would need to exceed at least 100mm (2" star diagonal) + 114.5mm (Denk Binoviewer) + some additional back focus to accommodate the eyepieces for the binoviewer to reach focus in a Refractor. Only SCTs typically can allow binoviewers to focus. They often have an amount of back focus in excess of 350mm. Our Star*Sweeper innovation exploited this fact so that focal reduction with a binoviewer could occur. We now incorporate the Star*Sweeper into all Power x Switch Systems intended for SCTs.

Binoviewer: Also called Bino Viewer, Binocular Viewer, Bino, et al. Basically, this device allows a single light cone formed by a telescope to be split into two cones that can then be focused by two eyepieces so that the observer may incorporate the use of both eyes to view the original image plane.

Fully Multi-Coated: Abbreviated as FMC, this refers to the presence of a multi-layered anti-reflective coating on the air-to glass surface of every optical element in the binoviewer or OCS optical element or eyepieces. The multi-layered coatings used by Denkmeier Optical are extremely efficient in reducing reflectivity, hence increasing contrast. The typical reflectivity on a Denkmeier air-to glass optical surface that is FMC is 0.15% or better. It should be noted that when an optic consists of a cemented doublet, the internal cemented surfaces where the two single elements fuse are not coated. This is because the refractive index of the cement matches that of the glass. Reflectivity on such a surface is negligible because there is no internal air-to-glass surface.

IPD: Interpupillary Distance refers to the measured distance between the center of the eye's pupils. The typical adult male probably has an average IPD of 65mm. Of course, some are narrower and some are wider. All Denkmeier Binoviewers accommodate a minimum of 48mm to a maximum of 75mm though we can make provisions to increase this maximum IPD (we have had to do this only once in three years). To measure your IPD, use a transparent metric ruler. Stand in front of a mirror and hold the ruler up to your eyes so that the ruler is parallel with the floor. While closing the right eye, allow a mm line to divide the left pupil and make a note of the reading (ex: 5mm) of that gradient line. Hold the ruler very still and open the right eye and note what the line dissecting your right pupil reads (ex: 70mm). Subtract the lower number from the higher number and this will give you your IPD. In the example, 65mm is the IPD.

OCS: This is our trademark for our Patent Pending Optical Corrector Systems. These systems relay the image plane produced by a telescope through the extra light path of a Denk Binoviewer. Various instant magnifications can be obtained because our OCS has evolved into a Power x Switch system (see "Power x Switch).

Power x Switch: The "x" is silent. "Power Switch™" was an existing trademark and Denkmeier Optical, Inc. respects the laws and rules of business delineated by the United States Patent and Trademark Office (USPTO). The Power x Switch is our Patent Pending relay system that allows an image plane produced by a telescope to be relayed through the additional light path of a Denk Binoviewer at varying magnifications. These magnifications are capable of being called upon instantly while using one pair of eyepieces. The Power x Switches are threaded onto the Denk Binoviewer and are available with the Standard Binoviewer as a single arm Power x Switch or on the Denk II as a dual arm Power x Switch. Since the single arm Power x Switch has two possible settings ("IN" and "OUT"), it allows two instant magnifications. The Denk II Power x Switch has two Power x Switch arms which allow three magnifications (Logo-Side Arm "IN", Non-Logo-Side Arm "IN", or both arms "OUT"). The Power x Switch arms are manually operated.

#R2: #R2 is our Power x Switch Star Diagonal designed for Refractors. It has two 2" format Power x Switches and allows 6 binoviewer magnifications and 7 single magnifications when used with a single eyepiece.

#S1: #S1 is our Power x Switch Star diagonal designed for SCTs and single eyepiece use. #S1 allows focal reduction, normal and 2X Multiplication instantly by moving the Power x Switch arms in and out of the light path. Reduction and Multiplication may be increased by using eyepiece extension tubes. Binoviewers will not focus when the Reduction mode is used.

#S2: #S2 is our Power x Switch Star Diagonal designed for Binoviewers when used in an SCT. Focal reduction, normal and multiplication factors are all possible when using a Denk Binoviewer and many other brands of binoviewers. The factors may be increased by withdrawing the binoviewer from the star diagonal though focus will not be possible in reduction mode if the binoviewers is moved too far out of the diagonal. Single eyepieces may also be used in all magnification modes though the eyepieces need to be withdrawn from the eyepiece holder if the factors of #S1 are to be achieved when using #S2. For those not planning on using a binoviewer, #S1 is recommended for single eyepiece use.

SCD Holders: "Self-Centering-Diopter Holders". Denkmeier Optical's innovative eyepiece holders that allow individual Diopter focusing adjustments while maintaining the self-centering system which produces a merged image. The eyepieces can be focused individually by rotating a helical fine focuser that has been built into each SCD Holder. This allows a very fine focus to be achieved in each eye after the telescope focuser has been adjusted (see "Self-Centering").

Self-Centering: This refers to the method by which the eyepiece is retained within the binoviewer eyepiece holder. Because a small allowance for room between the internal holder diameter and the eyepiece barrel external diameter must be made so that eyepieces can be slid down into the holder, an eyepiece could be micro-tilted unless the fit happened to be perfect. 1.25" eyepiece barrels can vary by more than 11/1000ths of an inch in diameter, even among the same brands and focal lengths. If set-screws are used to hold eyepieces in place after insertion, micro-tilts may occur. This is not important when using a single eyepiece but such tilting can cause an unmerged image when combining two eyepieces two such images to form a single "merged" image in a binoviewer. This is because merging asymmetrical binoviewer eyepiece fields into a single image will cause eyestrain at best, and make merging impossible at worst. All of our holders incorporate a self-centering design. The collapsing internal ring applies pressure from 360 degrees so that when the eyepieces are retained, they are said to be "Self-Centered". In actuality, the eyepieces are not "self-centered", but centered by the properly designed and accurately machined eyepiece holders of the Denkmeier Binoviewer.