SCCS Monitoring Prism datasheet

Reflector (SAP#)	Figure	Leica prism constant	Centering accuracy	Range with standard ATR	Remarks
Leica L-Bar GMP104 (641762)		8.94mm	±2.0mm	2000m	A monitoring prism mounted in metal holder. Supplied with L-bar for fixed installations. The prism offset is dependent on the mounting position.
SCCS L-Bar (4501041)		8.94mm	±2.0mm	2000m	A monitoring prism mounted in metal holder. Supplied with L-bar for fixed installations. The prism offset is dependent on the mounting position.

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SCCS L Bar Prism - High Visibility (4501036)		8.94mm	±2.0mm	2000m	A monitoring prism mounted in metal holder. Supplied with L-bar for fixed installations. The prism offset is dependent on the mounting position.
SCCS mini L-Bar (4501038)		11.0mm	±2.0mm	180m	The mini 'L' Bar prism, invaluable where limited access is the overriding criteria. Overall depth of just 18mm.

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Ball prism Ø 30 mm (4501550)		23.1mm	±1mm to glass ±0.1mm to base	500m	material of the ball: galvanized steel. Ø steel ball: 30 mm shockproof and waterproof. Magnet base available with variety of Kg pull strengths.
GPR112 (4501071)		0.0mm	Dependant upon the mount point the prism is being used with.	2500m	Large diameter monitoring prism for long range measurements. For installation on M8 or 5/8” threaded bolts. Built in filter prevents condensation on the reflecting surface. Rain and snow cover available separately

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Leica Geosystems

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RSMP180 Grey (4501560) Red (4501561)		24.4mm	No centering point	400m	12.7mm mini prism mounted within a plastic housing. Prism can be turned in a radius of 180° making it possible to use the same survey point from different directions.
RSMP15 (6401410)		No axis of rotation, recommend setting constant as 0.0mm.	No centering point	185m	Suitable for short-range monitoring of difficult locations e.g. bridge, tunnel and rail construction. Works with all ATR instruments.
AT-05-MP-W		Multiple offset axis of rotation mean no standard constant can be determined, recommend setting constant as 0.0mm.	No centering point	150m	A dual axis roatational 25mm prism for ground monitoring tasks. Prism has a strong aluminium housing with snow and rain cover.

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Geosystems

Cats Eye Prism (4501222)		No pivot point for constant, recommend setting constant as 0.0mm.	No centering point	100m*	Specially designed for application on the ground. A 17mm diameter prism fixed within an aluminium housing with a vertical inclination of 20 degrees. Aluminium body 100 x 100 x 23mm.

* Prism is set at an angle, EDM reading quality dependant on anlge and distance from prism

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The below post is from the Leica GeoSystems webarchive.

Prism Basics:
How Reflex and Anti-Reflex Coatings Affect Prism Reflection surveying prisms

The degree of reflection of a surveying prism is defined as the ability of a material to reflect visible and infrared radiation. This capability depends on the material itself, as well as on the surface quality. To improve performance, reflex and anti-reflex coatings are often used. But what's the difference between the coating types, and how do they affect prism reflection?

Reflex Coating

High-quality prisms are coated with copper because its degree of reflection is higher than 75% and it can be encapsulated within black epoxy to keep it from corroding. This guarantees a longer lifecycle of the prism glass body itself.

Anti-Reflex Coating

When measuring distance, a large percentage of the signal is returned through the prism, but besides the desired reflection through the prism body, the emitted EDM signal will also be reflected (typically 4%) by the front surface.

Besides the desired reflection through the prism body, the emitted EDM signal will also be reflected by the front surface of a prism

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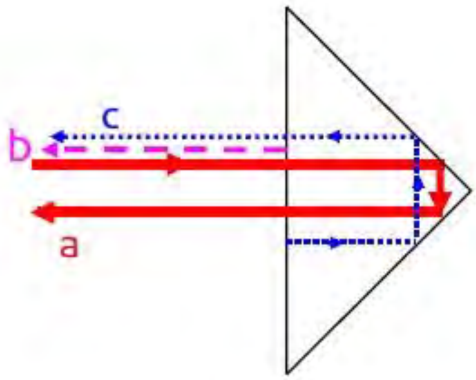

This part of the returned signal will disturb the desired signal because its travel time is shorter since it does not penetrate into the glass body of the prism.

In the above illustration, the signal reflected at the inner surface is in blue (about 4%), while the reflection caused at the front surface is shown in pink (less than 2%). The beam path of the expected incoming signal is in red and has the strongest intensity of about 70%.

This phenomenon can happen in close ranges assuming a very accurate alignment (the instrument's line of sight must perpendicularly intersect the prism's front surface). In this case, shorter distances are determined.

To avoid this phenomenon, a special layer of anti-reflex coating can be added to the front surface of the prism glass.

Not all prisms have this anti-reflex coating. If your prism does not have this coating – or if the coating is adjusted to the wrong wavelength – distance measurement errors of up to 3 mm can occur.

If you need help choosing the right prism or determining whether your prism is contributing to measurement errors, please contact us. Our knowledgeable experts will be glad to assist you.

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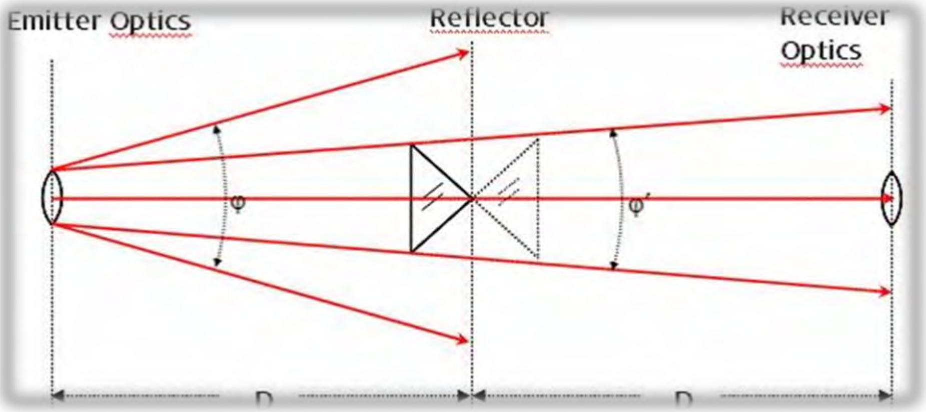
Prism Basics:

How Prism Glass Affects Signal Accuracy surveying prism

The grinding of a prism glass plays a major role when reflecting signals. The more accurately the glass is ground (corner angles and surfaces), the more accurate and intense the signal. How can you tell whether your prism meets the basic standard?

The deviation between incoming and outgoing beams has a critical influence on the measurement range. The returning signal goes along a deviant angle. The figure below shows the deviation of the reflected signal after leaving the prism towards the instrument.

The distance measurement is based on the detection of the phase difference (or time of flight) between incoming and outgoing signals.



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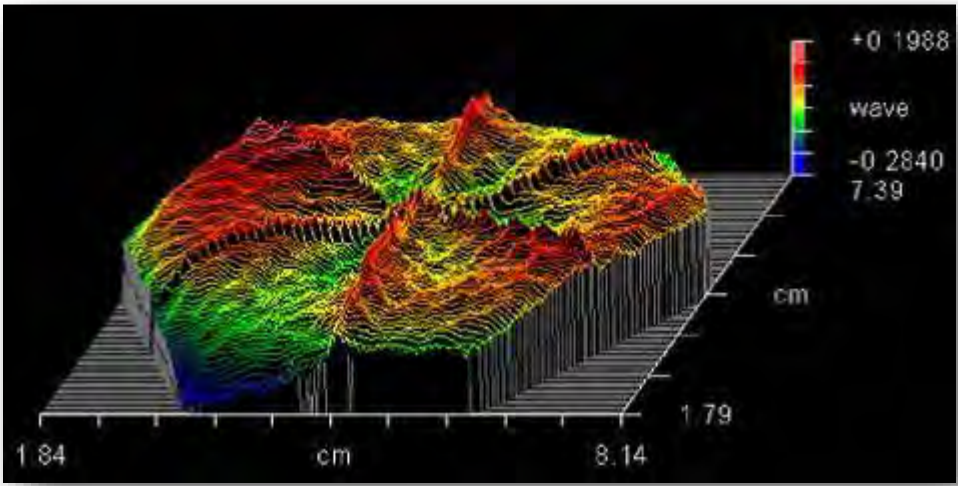
Typically, surveying prisms have a beam deviation of a few arc seconds. Prisms from major manufacturers like Leica Geosystems, Chicago Steel Tape (CST), and SECO have been checked after assembly to see whether the beam deviation falls below the threshold of one arc second and are certified.



The above example shows a test measurement of the beam deviation for a round prism taken with an interferometer. Interferometer measurements determine phase in homogeneity, how well polished a particular prism is.

In this example, the star-shaped pattern represents a slightly higher deviation than average caused by the prism's edges. The round prism tested above has a maximum deviation of 0.8 arc seconds. This means that in every sixth of the prism's glass body, the direction of the incoming beam differs less than 0.8 arc seconds compared to the outgoing beam.

If the glass edges are excluded, then the average values are far below one arc second.

Most prisms today are standardized, so there is not a big separation of quality between brands. If you have any questions about your prism performance or need help selecting a prism, please contact us.

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