PRISM MANAGEMENT GUIDE

SOLOS

Automatic Lens Analyser

TOPCON Healthcare

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Prism notation

The SOLOS uses two formats to display prism values: Cartesian or Polar coordinates.

Cartesian coordinates, also known as rectangular coordinates, are specified by In (i), Out (o), Up (u), and Down (d) diopter values. The horizontal prism (HP) is represented by In and Out, while the vertical prism (VP) is represented by Up and Down.

Polar coordinates are specified by **P**rism power (in diopters) and a **B**ase direction (angle).

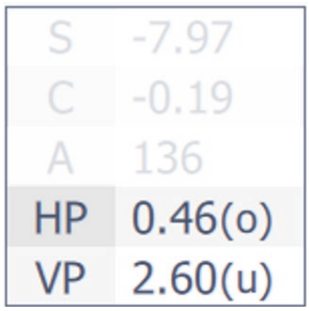


Fig 1a.
Example of prism notation using Cartesian coordinates.

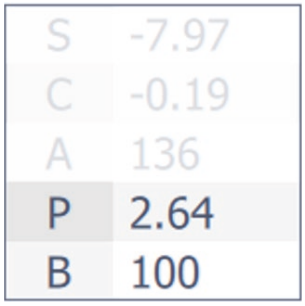


Fig 1b.
Example of prism notation using Polar coordinates.

In the SOLOS, the default prism notation can be set in the **Measurement** tab:

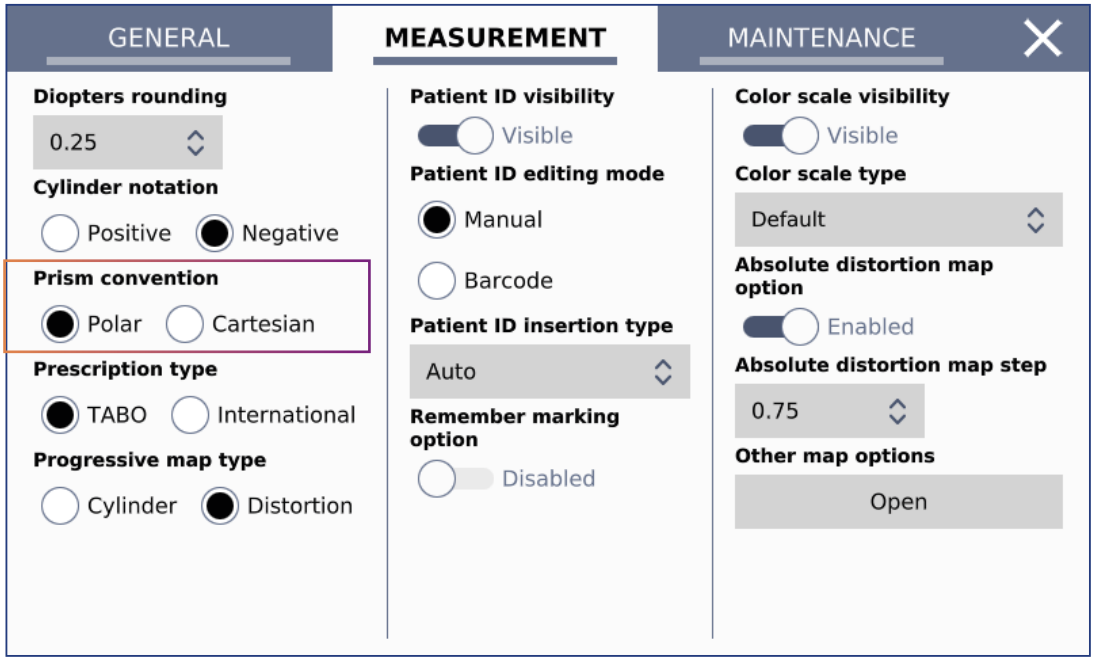


Fig 2. Prism convention under Measurement tab

For the Polar convention, the direction of the Base angle is determined by the selected Prescription type on the Measurement tab.

SOLOS can display axis findings using the International notation and the TABO notation. Before comparing SOLOS findings with lensometer data from other sources, please review the "prescription type" settings to ensure that the desired notation is selected, as this will determine the axis displayed by SOLOS – specifically for the axis of the left lens.

International notation

The axis value of the lens is measured from the Nasal to the Temporal position for each lens. Please refer to the illustration below for a visual representation.

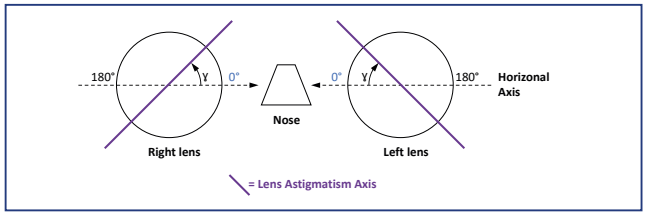


Fig 3a. International notation

TABO notation

In TABO notation, the axis value for the right lens is measured from the Nasal to the Temporal position, while for the left lens, it is measured from Temporal to Nasal position. Consult the accompanying illustration for a clearer understanding:

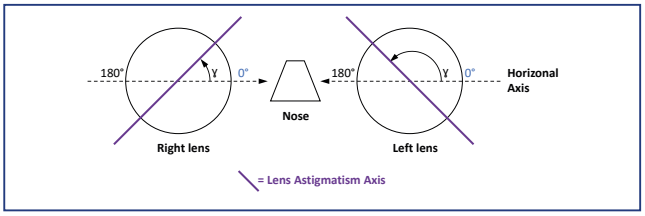


Fig 3b. TABO notation

As you can see, the axis of the right lens is the same, regardless of whether TABO or International notation is used. However, the axis value of the left lens will differ depending on the designated notation.

In particular, for the left lens values, the following rule holds: TABO axis = 180° – (International axis).

It should be noted that when measuring a single lens, it will always be assumed to be the right lens.

Induced prism

The SOLOS detects the optical centre of the lenses when measuring spectacles and displays the distance between these centres as the pupillary distance.

Fig 4. Example of measured distance between optical centres; 30.5 mm left and 30.5 mm right with a total of 61.0 mm

When a person is looking through these centres, there should be no prism effect. To measure the amount of horizontally induced prism at a location outside the optical centre, the pupillary distance can be adjusted on the SOLOS. Typically, the exact pupillary distance measurements for the patient are entered:

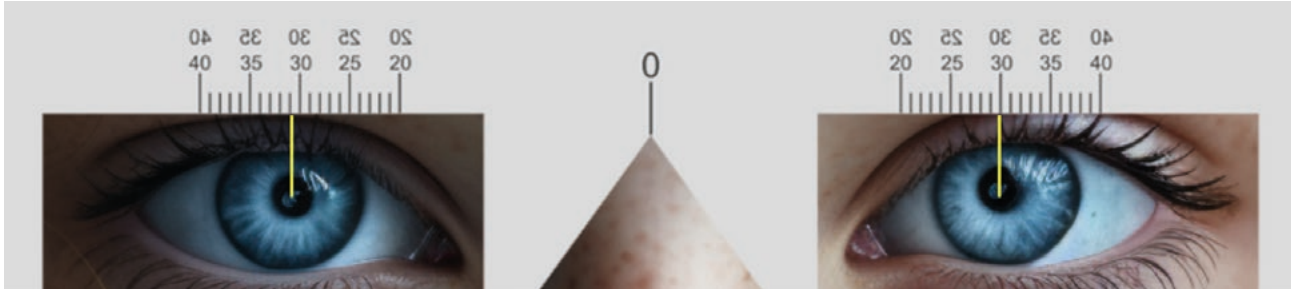
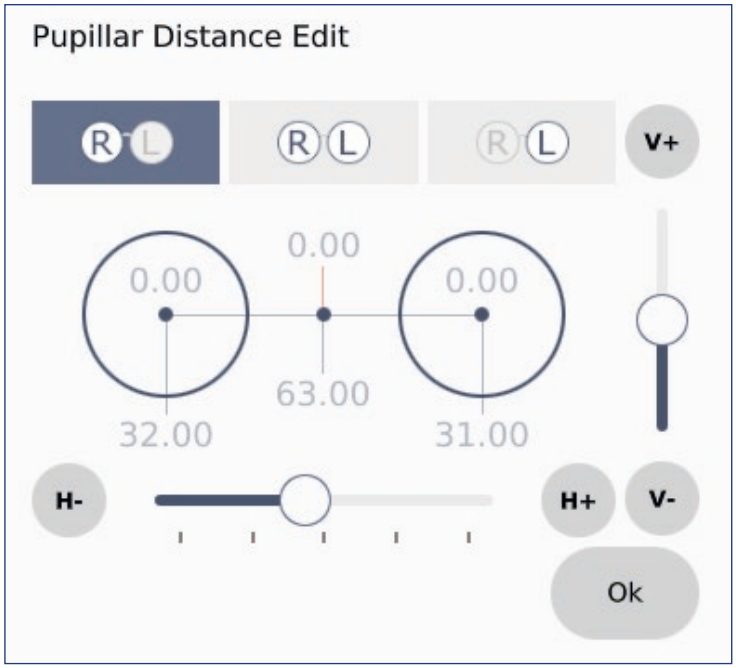


Fig 5. In this example the patient PD values are: 31 mm right and 30 mm left, for a total of 61.0 mm

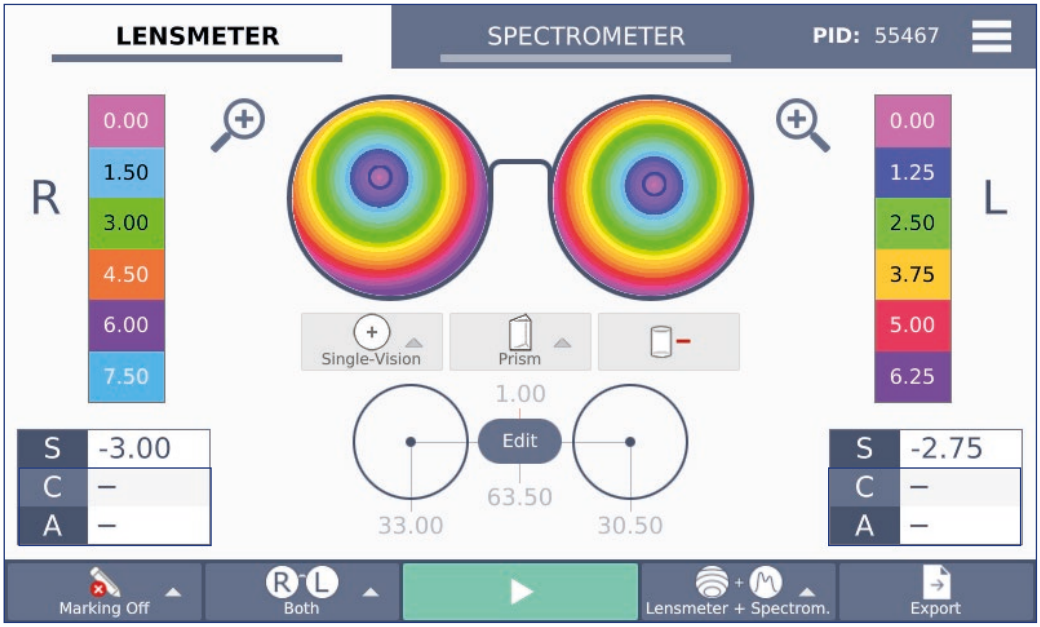
In the example on the left side, SOLOS measures the optical centres of the spectacles at a distance of 61 [mm]. Equally divided: 30.5 [mm] left and 30.5 [mm] right.

Let's say the patient's actual horizontal PD is 63.0 [mm] (31.0 [mm] left and 32.0 [mm] right. By pressing the Edit button, we can adjust the horizontal PD to match this actual PD value:

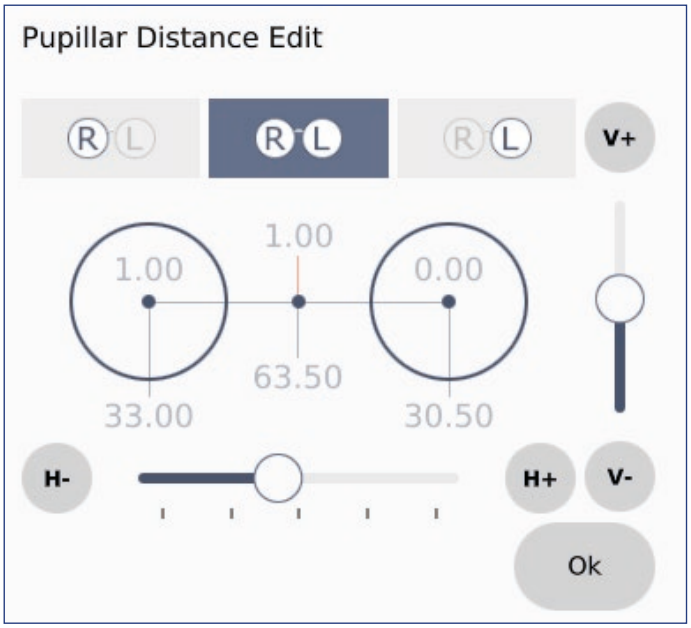


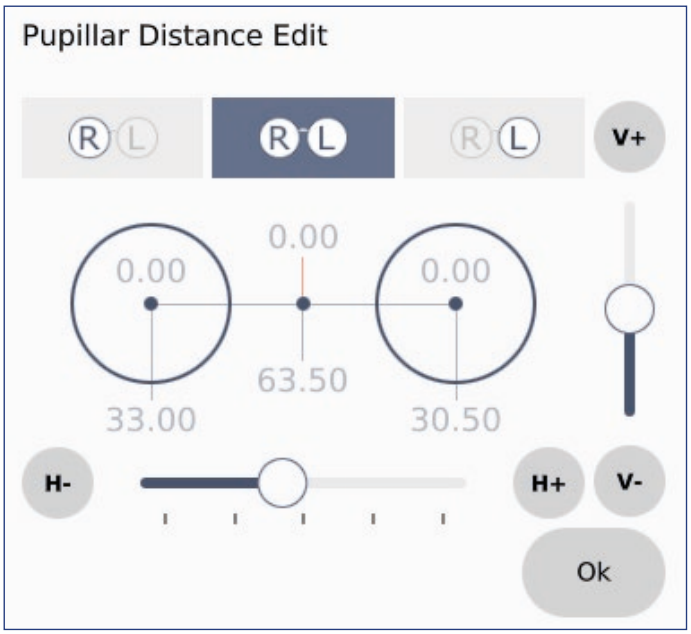
You can use the R, R+L or L icons to select the value you want to adjust. Make adjustments by using the slider or the H+/H- buttons next to the slider. Press the Ok button when ready.

The optical centres are now adjusted to match the edited PD. You can see the blue circles on the map have moved slightly to the new positions. The prism values at these new reference points are now shown in the data table. Starting from SW V.1.2.2, it is also possible to edit the verical pupillary distance, specifying the position where the wearer is viewing through the lens in the vertical direction.

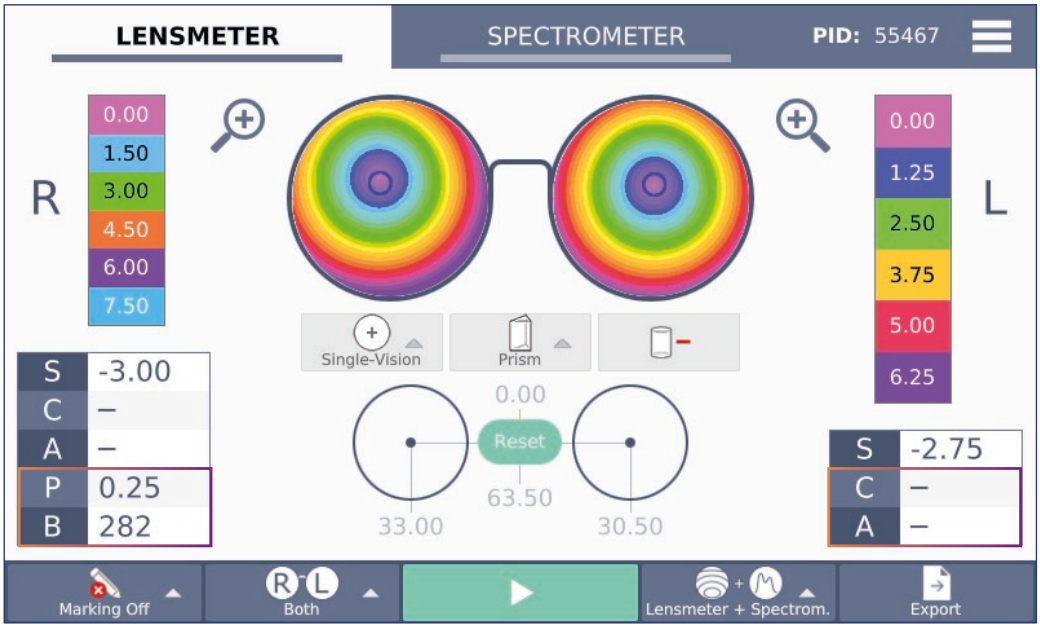


In the example above, SOLOS measures that the right optical center of the spectacles is 1.00 [mm] higher compared to the left optical center (while negative value means left optical center higher than right).
By pressing the Edit button, we can adjust the vertical PD to match them evenly.

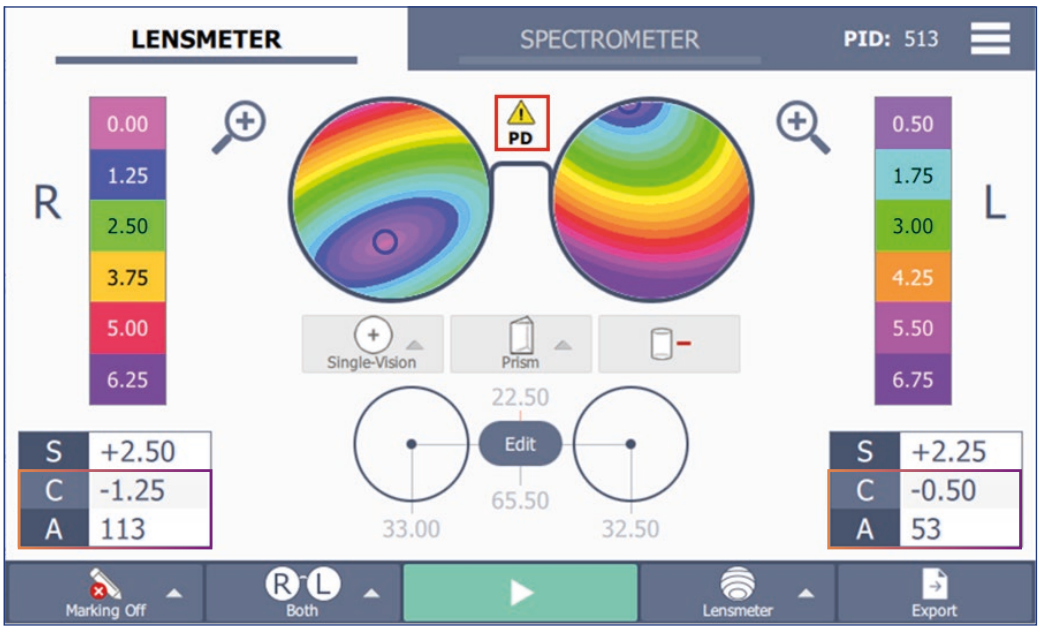




You can use R, R+L or L icons to select the value you want to adjust. Make adjustments by using the slider or the V+/V- buttons near the slider. Press the Ok button when ready.

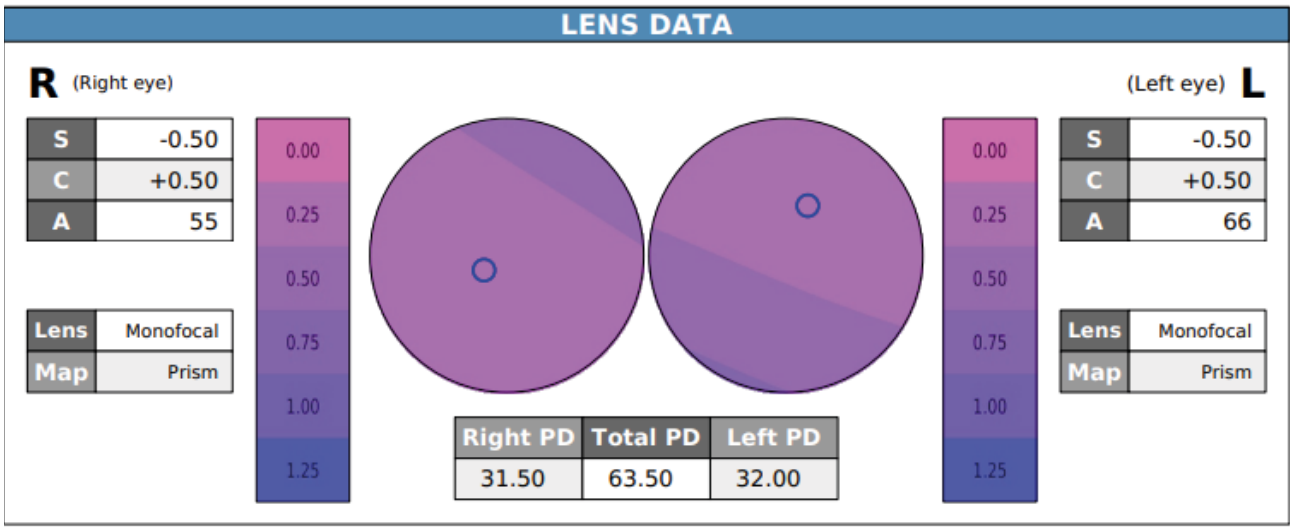


The optical centres are now adjusted to match the edited PD. You can see the blue circle on the map have moved slightly down to the new position. The automated measured values of the vertical prism by decentration are now shown in the data table.



However, during the measurement of a spectacle frame, if SOLOS identifies a substantial vertical or horizontal displacement between the positioning of the optical centres (i.e. left and right pupil distances), it will alert the user to this inconsistency with the following warning symbol ⚠. The example above demonstrates the existence of vertically displaced optical centres and strongly suggests the presence of vertical prism.

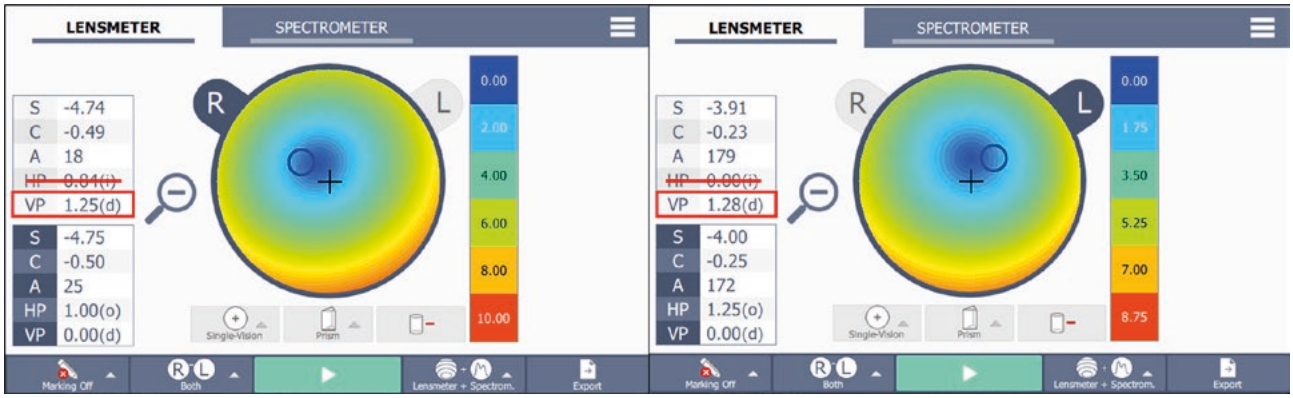
Under specific conditions, when analyzing a lens with a low cylinder value and plano resultant power in one meridian, the SOLOS may indicate a misalignment of optical centres, suggesting the presence of vertical prism where none exists. An example of this case is displayed below. Please note: this phenomenon can also be observed with a conventional lensometer (focimeter).



To determine the magnitude of vertical prism by decentration when a misalignment of optical centres is noted in this case, it is necessary to manually set a new reference point for SOLOS to measure the prism at that specific point in each lens. Follow these steps:

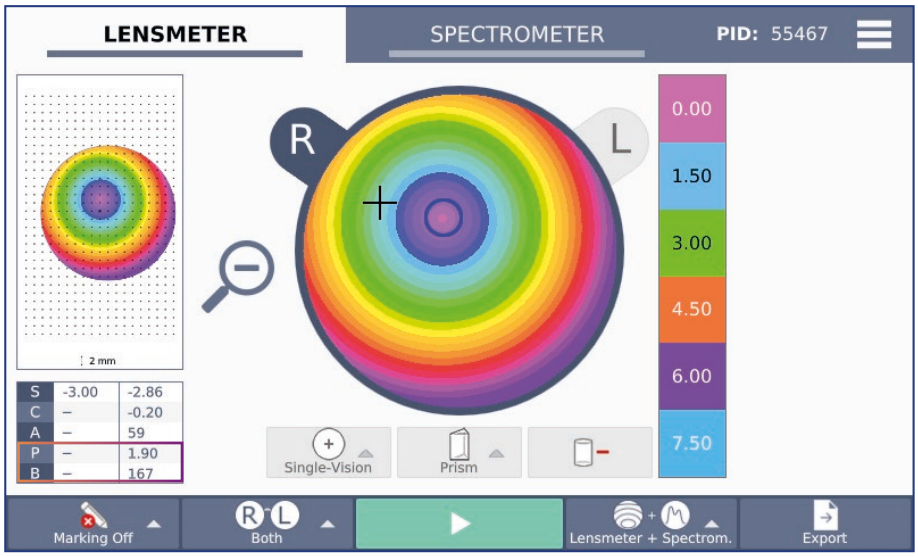
- Select the magnification button.
- Place the + crosshair approximately in the centre of the measurement area on the right ("R") lens. SOLOS will provide the amount of prism measured at the specified point.
- Toggle to the left ("L") lens while keeping the + crosshair in the same position to obtain the prism measurement at the same point for the left lens. You can then calculate the net/total prismatic effect by considering the amount measured in each lens.

Please note: This is an approximation since the true vertical pupillary distance may not exactly match the chosen reference point. This method assumes the patient is looking directly through the centre of the lens in the vertical direction.



Prism power at any point on the map

The SOLOS lens map can be zoomed in using the magnifying glass icon. By clicking on any point on the map, the optical properties at that specific location can be viewed. The selected location is marked by a black cross, and the prism values at that point are also displayed.

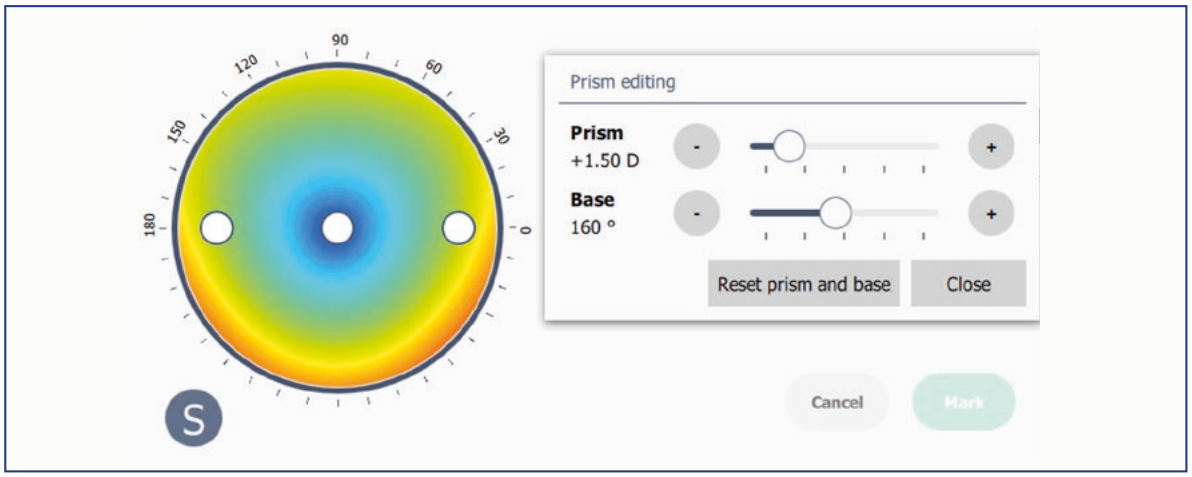


Prism editing during marking

There are two situations during which prism data is entered during marking. Both cases are described below:

1. Prism editing during marking of a single lens

When measuring a single, uncut lens, a prism offset can be applied during the marking process (this is the only way to add prism displacement to a single lens). This shifts the marking to the point where the specified prism is located, resulting in the lens being cut and framed with the optical centre shifted away from the patient's pupil centre. Instead, the line of sight point that provides the desired amount of prism is centred in front of the pupil centre.



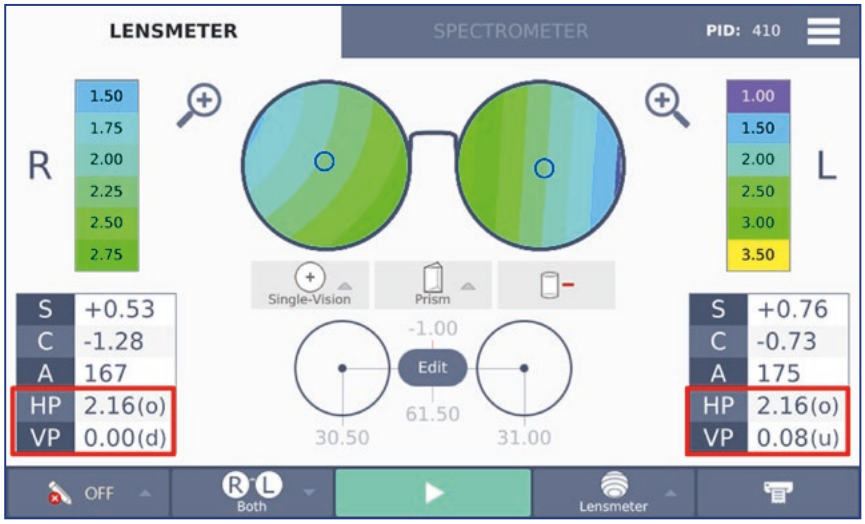
Prism editing during marking is **always** defined using Polar coordinates (Prism and Base). After marking, the far blue circle on the map is shifted to the new position and the prism displacement is shown in the lens data table.

2. Prism editing during marking of framed spectacle lenses

When applying a marking to framed lenses, known prism data can also be entered. This is used to verify that the line of sight points align correctly with the patient's pupil centres when wearing the spectacles. Editing the prism data in this instance resembles the procedure outlined in the preceding paragraph.

Measuring a lens with prism in the optics

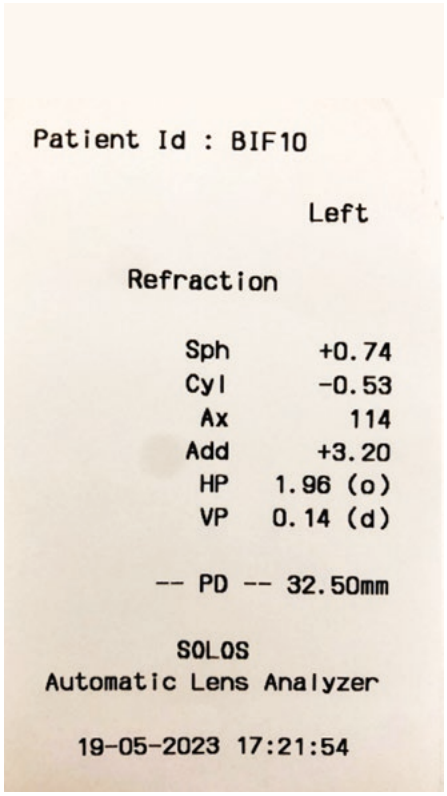
If SOLOS is unable to locate an optical axis while measuring a lens with refractive power, it will assume that the lens has some prism ground into the optics. The calculated prism displacement, which is the average across the lens, is divided into HP (horizontal prism) and VP (vertical prism). The prism value will be displayed on the screen, specifically in the red boxes shown in the image below. The blue circle(s) on the maps indicate where the virtual optical centre would be if the calculated amount of prism were removed, corresponding to the wearer's pupillary distance. It is important to note that the blue circles on the map do not represent the actual optical centre of the lenses in this particular case.



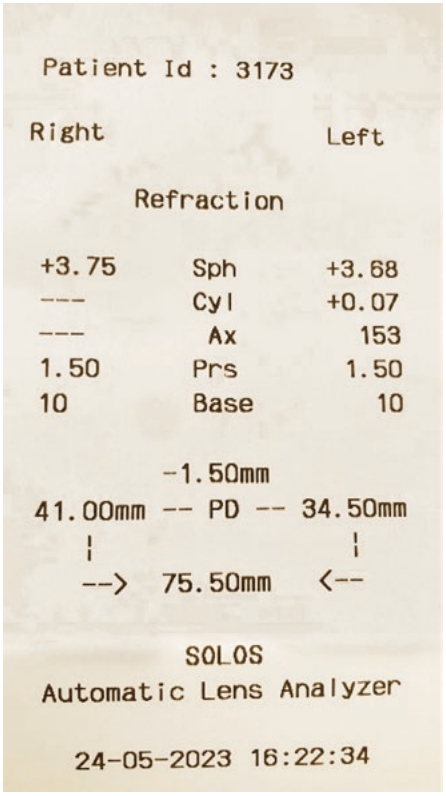
Note:
For progressive lenses, the ground-in prism data will not be displayed as SOLOS is not able to detect the prism reference point on such lenses. This functionality is limited to single vision and bi-focal lenses.

Prism data on the printout and reports

If prism is detected in the optics or induced due to editing the PD (pupillary distance), the prism data will be displayed in the data table on the SOLOS display. Additionally, it will be included in the printout and the PDF report(s) for comprehensive documentation. Prism data will also be included in the printout when prisms are edited during marking.



Here is an example of a printout showcasing the measurement of the left lens with prisms added



Another example of a printout including prism data

Eye health education begins here: learning.topcon.com

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TOPCON HEALTHCARE SOLUTIONS EMEA OY
Saaristonkatu 9, 90100 Oulu, FINLAND
Phone: +358-20-734-8190
E-mail: thsemea.sales@topcon.com
www.topconhealthcare.eu

TOPCON EUROPE MEDICAL B.V.
Essebaan 69, 2908 LJ Capelle a/d IJssel
THE NETHERLANDS
Phone: +31 -(0)10-4585077
Fax: +31 -(0)10-4585045
E-mail: medical@topcon.com
www.topconhealthcare.eu

TOPCON DANMARK
Praestemarksvej 25, 4000 Roskilde
DANMARK
Phone: +45-46-327500
Fax: +45-46-327555
E-mail: info.todk@topcon.com
www.topconhealthcare.eu/dk_DK

TOPCON SCANDINAVIA
Neongatan 2, P.O.Box 25, 43151 Mölndal
SWEDEN
Phone: +46-(0)31-7109200
Fax: +46-(0)31-7109249
E-mail: info.hcs.se@topcon.com
www.topconhealthcare.eu/sv_SE

TOPCON ESPAÑA
Oficina Principal en España
Frederic Mompou, 4,
08960 Sant Just Desvern, Barcelona, SPAIN
Phone: +34-93-4734057
Fax: +34-93-4733932
E-mail: medica@topcon.com
www.topconhealthcare.eu/es_ES

TOPCON ITALY
Viale dell'Industria 60,
20037 Paderno Dugnano, (MI) ITALY
Phone: +39-02-9186671
Fax: +39-02-91081091
E-mail: info_tit@topcon.com
www.topconhealthcare.eu/it_IT

TOPCON FRANCE MEDICAL
1 rue des Vergers, Parc Swen,
Bâtiment 2, 69760 Limonest, FRANCE
Phone: +33-(0)4-37 58 19 40
Fax: +33-(0)4-72 23 86 60
E-mail: topconfrance@topcon.com
www.topconhealthcare.eu/fr_FR

TOPCON DEUTSCHLAND MEDICAL
Hanns-Martin-Schleyer-Straße 41,
D-47877 Willich, GERMANY
Phone: (+49)2154-885-0
Fax: (+49)2154-885-177
E-mail: info@topcon-medical.de
www.topconhealthcare.eu/de_DE

TOPCON POLSKA SP. Z. O. O.
ul. Warszawska 23, 42-470 Siewierz
POLAND
Phone: +48-(0)32-670-50-45
Fax: +48-(0)32-671-34-05
E-mail: info.tpl@topcon.com
www.topconhealthcare.eu/pl_PL

TOPCON GREAT BRITAIN MEDICAL
Topcon House, Kennet Side, Bone Lane,
Newbury, Berkshire RG14 5PX
UNITED KINGDOM
Phone: +44-(0)1635-551120
Fax: +44-(0)1635-551170
E-mail: medical.tgbm@topcon.com
www.topconhealthcare.eu/en_UK

TOPCON IRELAND MEDICAL
Unit 292, Block G, Blanchardstown,
Corporate Park 2 Ballycoolin
Dublin 15, D15 DX58, IRELAND
Phone: +353-12233280
E-mail: medical.ie@topcon.com
www.topconhealthcare.eu/en_IE

VISIA IMAGING S.R.L.
Via Martiri della Libertà 95/e, 52027 San Giovanni Valdarno (AR), ITALY

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