

## How to change the prism constant in XPAD

**Notebook:** Xpad  
**Created:** 12/09/2019 16:47 **Updated:** 28/05/2020 17:05  
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**Tags:** Prism, Prism Constant, Prism Offset, Rothbucher, Xpad

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Version 2.00 DL 20200528 - Updated, screenshots added, different prisms added  
Version 1.00 PH 20190912 - Created

## Changing the Prism Constant in X-PAD

Important Background:  
Prism Constant = Prism Offset = Addition Constant

Why we have to deal with it:

The distance from the total station telescope to the prism is measured by the time that the laser beam takes to go from the telescope to the prism and back again. This is the 'time of flight'.

***Distance = Time of Flight x Speed of Light***

However, light is slowed down going through the glass in the prism, causing the distance to be measured as longer than it actually is. This is compensated through the use of the Prism Constant, and naturally it is -ve to reduce the measured distance to the actual distance. Some prisms manufacturers offset the back of the prism (which is the measured point) towards the instrument so that they have a 0.0 mm or any other desired prism constant.

There are generally two different approaches to prism constants depending on manufacturers.

- Absolute prism constants (used by majority of instrument manufacturers) – these are the fundamental constant of the prism irrespective of which instrument is being used
- Leica prism constant – these are the constant that applies when the prism is being used with a Hexagon's Geomax or Leica instrument

The reason Leica Prism Constants is different from absolute prism constant is because there is a pre-installed offset of 34.4mm in all Hexagon's instrument firmware/software.

These are formulas describing the differences in constants:

***Leica Prism Constant = Absolute Prism Constant + 34.4mm***

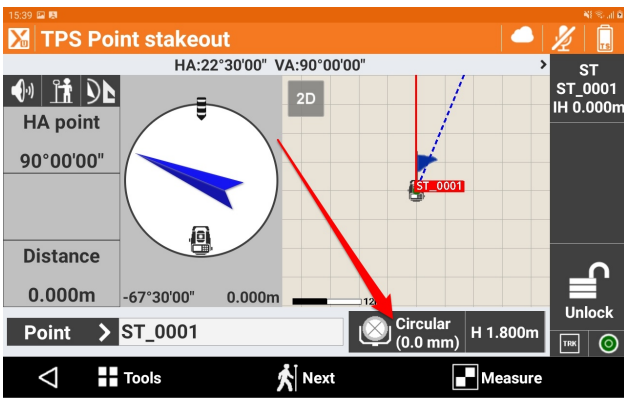
***Absolute Prism Constant = Leica Prism Constant – 34.4mm***

If a prism has a 0.0 prism constant you need to know whether it is Leica Prism Constant = 0.0 or Absolute Prism Constant = 0.0

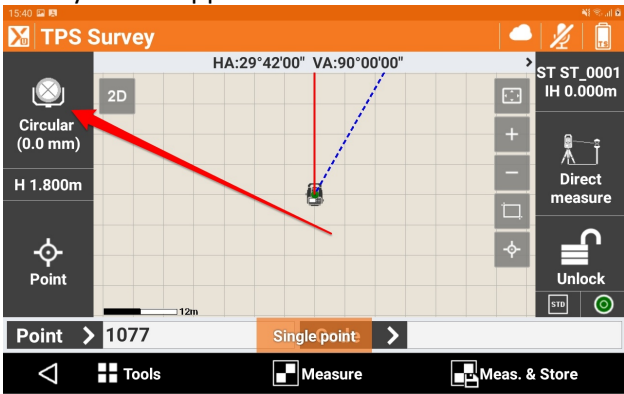
How to change the prism constant in X-PAD

You can reach the prism constant screen from any place where you see the prism icon:

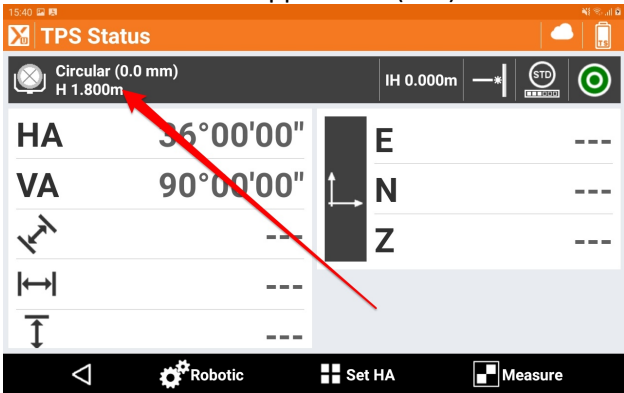
Setting Out application:



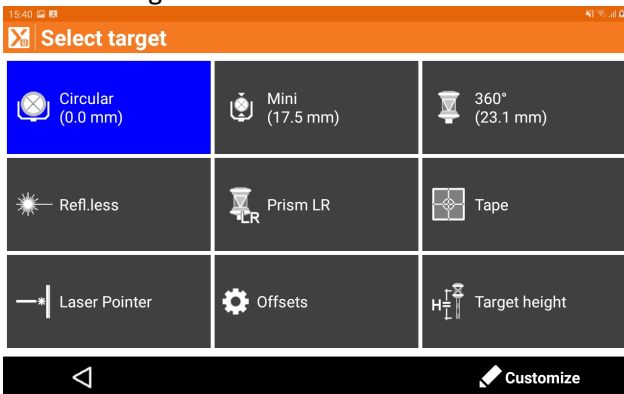
Survey Points Application:



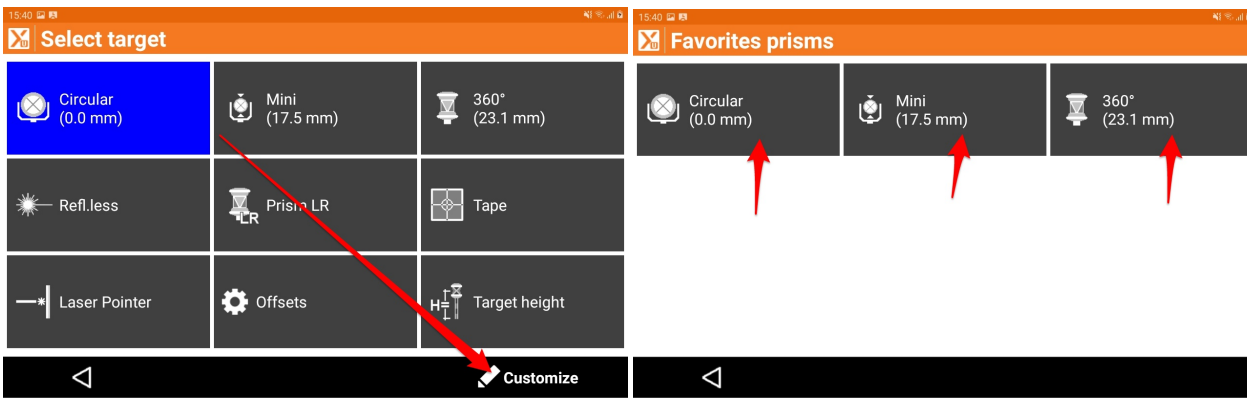
Basic Measurement Application (TPS):



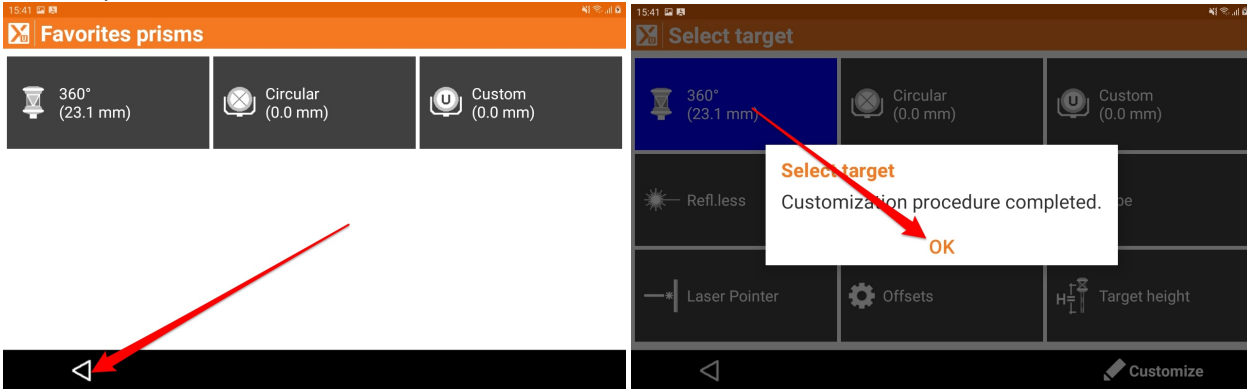
Prism Settings Screen:



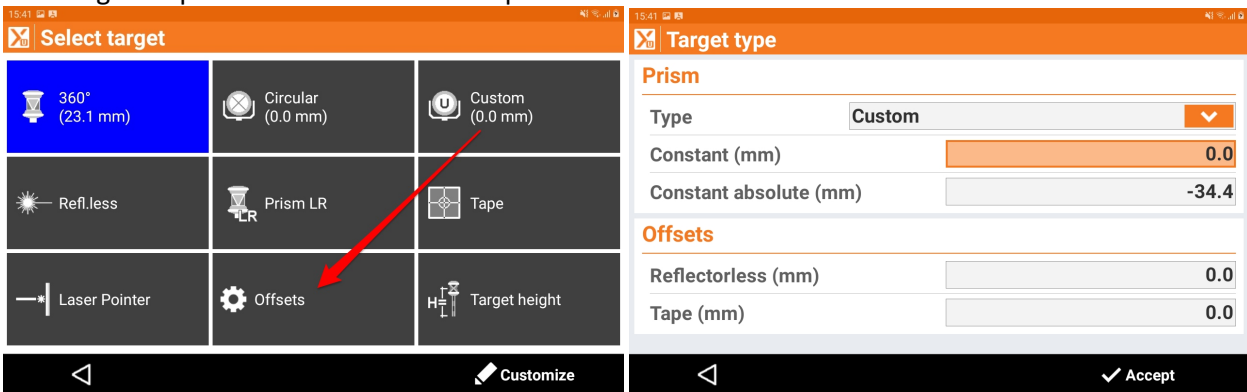
You can set up three most frequently used prism types in the top row (favourite prisms)



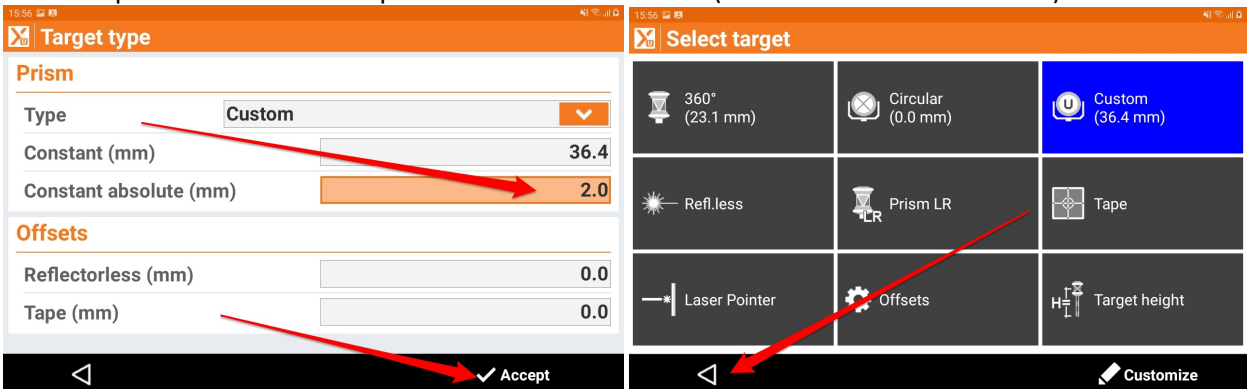
To change the prisms tap on the icons until you get the desired type. If the prism you want to set is not on the list use Custom prism

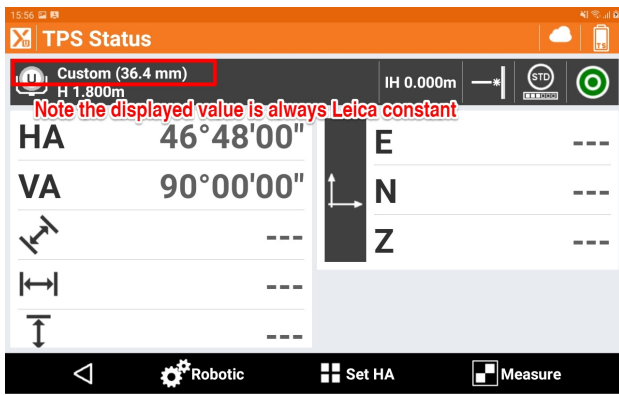


To change the prism constant for custom prism:



Input value in the constant you have from supplier. The other constant will be recalculated automatically. For example - Trimble 360 R10 prism with constant +2mm (this is an absolute constant)





#### Hints:

You can get into prism settings only if you are connected to total station. If the tablet is not connected to the total station, selecting TPS in the Main Menu gives you 'TPS not found'. You can fake a TS by adding a manual TS, and making it your current TS.

#### Most common custom prism settings:

Trimble 360 prism VX&S Series: absolute prism constant of +2mm

Leica 360 mini prism GRZ101: absolute prism constant of -4.4mm

Leica monitoring/control point prism GMP104: absolute prism constant of -25.5mm

Leica 360 setting out prism MPR122: absolute prism constant of -6.35mm

Rothbucher prism RSMP280/290: absolute prism constant of -10mm

Rothbucher prism RSMP380/390: absolute prism constant of -16.9mm

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