

# Specifications

# SX12 Scanning Total Station



## Survey Performance

### Angle Measurement

Sensor type	Absolute encoder with diametrical reading
Angle measurement accuracy [1]	1" (0.3 mgon)
Angle display (least count)	0.1" (0.01 mgon)

### Automatic Level Compensator

Type	Centered dual-axis
Accuracy	0.5" (0.15 mgon)
Range	±5.4' (±100mgon)
Electronic 2-axis level, with a resolution of	0.3" (0.1 mgon)
Circular level in tribrach	8' / 2mm

### Distance Measurement

Accuracy	
Prism mode, standard [2]	1mm +1.5ppm
Prism mode, tracking [2,3]	2mm +1.5ppm
DR mode, standard [2]	2mm +1.5ppm
Measuring time	
Prism mode, standard	1.6s
DR mode, standard	1.2s
Range	
Prism mode, 1 prism [4]	1m - 5,500m
DR mode, Kodak white card	1m - 800m
DR mode, Kodak grey card	1m - 450m
Autolock and Robotic Range	
Autolock range - traverse 50mm [5]	1m - 800m
Autolock range - 360 prism	1m - 300m [6] / 700m [7]
Angle accuracy [1]	1"

## Scanning Performance

### General Scanning Specifications

Scanning principle	Band scanning using rotating prism in telescope
Measurement rate	26.6kKz
Point spacing	6.25mm, 12.5mm, 25mm, or 50mm @ 50m
Field-of-view	360° x 300°
Coarse scan; full dome with density of 1 mrad, 50mm spacing @ 50m	Scan time: 12 minutes
Standard scan; area scan (90°x45°) with density of 0.5mrad, 25mm spacing @ 50m	Scan time: 6 minutes

### Range Measurement

Range principle	Ultra-high speed time-of-flight powered by Trimble Lightning Technology
Range	
Kodak white card	0.9m - 600m

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Kodak grey card	0.9m - 350m
Range noise	
@ 50m on 18-90% reflectivity	1.5mm
@ 120m on 18-90% reflectivity	1.5mm
@ 200m on 18-90% reflectivity	1.5mm
@ 300m on 18-90% reflectivity	2.5mm
Scanning accuracy	
Scanning angular accuracy	5" (1.5 mgon)
3D position accuracy @ 100m [7]	2.5mm

## EDM Specifications

Light source	Pulsed laser 1550 nm; Laser class 1M
Beam divergence DR mode	0.2 mrad
Laser spot size @ 100m (FWHM)	14nm
Atmospheric correction	Available through field and office software

## Laser Pointer

Color	Green, 520 nm
Eye safety	Laser class 1
Focusing	Automatic, Manual
Operating modes	Low-light, Standard, Extended Range Flashing
Laser pointer spot size (Full Width Half Maximum)	
1.3 - 50m	3mm ± 1mm
100m	6mm ± 1mm
150m	9mm ± 1mm

## Imaging Performance

Imaging principle	3 calibrated cameras in telescope powered by Trimble VISION technology
Cameras total field of view	360° x 300°
Live view frame rate (depending on connection)	Up to 15 fps
File size of one total panorama with overview camera	15 MB - 35 MB
Panorama measurement time and resolution	
Overview panorama; Full dome (360° x 300°) with 10% overlap	2.5 mins, 40 images, 15mm @ 50m per pixel
Primary panorama; Area capture (90° x 45°) with 10% overlap	2.5 mins, 48 images, 3.5mm @ 50m per pixel

## Cameras Specifications

### General Camera Specifications

Resolution of each camera chip	8.1 MP (3296x2472 pix)
File format of images	.jpeg
Field of view, max	57.5° (horizontal) x 43.0° (vertical)

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Field of view, min	0.51° (horizontal) x 0.38° (vertical)
Total zoom (no interpolation)	107x
35mm equivalent focal length	36-3850 mm
Exposure modes	Auto, spot exposure
Manual exposure brightness	±5 steps
White balance modes	Auto, daylight, incandescent, overcast
Temperature compensated optics	Yes
Calibrated cameras	Yes
<b>Overview Camera</b>	
Position	Parallel to measurement axis
One pixel corresponds to	15mm @ 50m
<b>Primary Camera</b>	
Position	Parallel to measurement axis
One pixel corresponds to	3.5mm @ 50m
<b>Telescope Camera</b>	
Position	Coaxial
Focusing	Automatic, manual
Focusing distance	1.7m to infinity
One pixel corresponds to	0.69mm @ 50m
Pointing precision (std dev 1 sigma)	1" (HA: 1.5 cc, VA: 2.7 cc)
<b>Plummet Camera</b>	
Usable range	1.0 - 2.5m
Resolution on ground - one pixel corresponds to	0.2mm @ 1.55m instrument height
Accuracy	0.5mm @ 1.55m instrument height

## General Specifications

Communications	WiFi, 2.4Ghz Spread Spectrum, cabled (USB 2.0)
IP-Rating	IP55
Operating temperature range	-20 °C to +50 °C (-4 °F to +122 °F)
Security	Dual layer password protection

## System Specifications

### Servo System

MagDrive servo technology	Integrated servo/angle sensor electromagnetic direct drive
Clamps and slow motions	Servo-driven

### Centering

Centering system	Trimble 3-pin
Plummets	Built -in video plummet
	Split optics tribrach with optical plummet

### Power Supply

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Internal battery	Rechargeable Li-ion battery 11.1V, 6.5 Ah
Operating time [8]	
One internal battery	Up to 2.25 hours
Three batteries in multi-battery adapter and one internal	Up to 7 hours

## Weight and Dimensions

Instrument	7.5 kg (16.5 lbs)
Tribrach	0.7 kg (1.5 lbs)
Internal battery	0.35 kg (0.77 lbs)
Trunnion axis height	196mm
Front lens aperture	56mm

- 1- Standard deviation according to ISO17123-3
- 2- Standard deviation according to ISO17123-4
- 3- Single measurement, target static
- 4- Standard clear conditions (No haze, overcast or moderate sunlight with very light heat shimmer, visibility about 10km)
- 5- Under perfect conditions (Overcast, visibility about 10km, no heat shimmer)
- 6- Normal conditions (Moderate sunlight, visibility about 10km, some heat shimmer)
- 7- Standard deviation of fitted position of a sphere target
- 8- The capacity in -20°C is 75% of the capacity at +20°C

Specifications subject to change without notice.

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