Topcon GTS-M1

Robotic total station for machine control



Zero downtime, maximum productivity.
The GTS-M1 series total stations allow you to control your site and control your machine in challenging places. Super fast motors ensure fast tracking and reliable prism lock. Dual hot-swappable batteries mean that your tracking is never interrupted throughout the day.

- » Precise positioning with single-person operation
- » High-speed advanced Brushless Direct Current motors
- » Easy-to-use with Pocket3D software
- » Available in 1", 2" and 3" models
- » Three-year instrument and five-year motor warranty
- » Ultra-rugged IP65 dust and water resistance

Telescope

Length	142 mm
Aperture	EDM: 38 mm
Magnification	30x
Image	Erect
Resolving power	2.5"
Field of view	1°30'
Minimum focus	1.3 m (4.3 ft.)
Reticle illumination	5 brightness levels

Angle measurement

Horizontal and vertical circles type	Rotary absolute encoder
Detecting	2 sides
Angle Units	Degree/Gon/Mil (selectable)

Minimum display

GTS-M11 GTS-M12	0.5" (0.0001 gon/0.002 mil) 1" (0.0002 gon/0.005 mil) (selectable)
GTS-M13	1" (0.0002 gon/0.005 mil) 5" (0.0010 gon/0.0020 mil) (selectable)

Angle accuracy (ISO 17123-3 : 2001)

GTS-M11	1" (0.0003 gon/0.005 mil)
GTS-M12	2" (0.0006 gon/0.010 mil)
GTS-M13	3" (0.0010 gon/0.015 mil)
Collimation compensation	On/Off (selectable)
Measuring mode	Horizontal angle: Right/Left (selectable) Vertical angle: Zenith/Horizontal/ Horizontal ± 90° /% (selectable)

Tilt angle compensation

Type	Liquid 2-axis tilt sensor
Minimum display	1"
Range of compensation	± 6' (0.1111 gon)
Automatic compensator	On (V and H/V) / Off (selectable)
Tilt offset	Can be changed

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Distance measurement

Measuring method	Coaxial phase-contrast measuring system
Signal source	Red laser diode 685 nm Class 3R

(IEC60825-1 Ed. 3.0: 2014/FDA CDRH 21CFR Part1040.10 and 1040.11 (Complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice No.56, dated May 8, 2019.))

Measuring range

Prism-2 X 1 [2]	1.3 to 5,000 m (16,400 ft.)
360° Prism ATP1/ATP1S	1.3 to 1,000 m (3,280 ft.)
Prism-5	1.3 to 500 m (1,640 ft.)
Reflective sheet RS90N-K [3]	1.3 to 500 m (1,640 ft.)
Reflective sheet RS50N-K [3]	1.3 to 300 m (980 ft.)
Reflective sheet RS10N-K [3]	1.3 to 100 m (320 ft.)
Reflectorless (White) [2]	0.3 to 1,000 m (3,280 ft.)

(Using the following reflective prism/reflective sheet target during normal atmospheric conditions [1])

Minimum display

Fine/Rapid measurement	0.0001 m (0.001 ft./ 1/16 inch) or 0.001 m (0.005 ft./ 1/8 inch)
Tracking measurement	0.001 m (0.005 ft./ 1/8 inch) or 0.01 m (0.1 ft./ 1/2 inch)
Maximum slope distance display (Tracking)	Reflectorless: 600 m (1,960 ft.) Prism/reflective sheet: 1,280 m (4,190 ft.)
Maximum slope distance display (Except for tracking)	Reflectorless: 1,200 m (3,930 ft.) Prism/reflective sheet: 9,600 m (31,490 ft.)
Distance unit	m/ft./US ft./inch (selectable)

Distance accuracy (D: Measurement distance in mm)

Circular or 360° prism ATP1	Fine: 1 mm (0.003 ft.) + 2 ppm x D Rapid: 5 mm (0.016 ft.) + 2 ppm x D
Reflective sheet [3]	Fine: 2 mm (0.006 ft.) + 2 ppm x D Rapid: 5 mm (0.016 ft.) + 2 ppm x D
Reflectorless (White) [4]	Fine: 2 mm (0.006 ft.) + 2 ppm x D (0.3 to 200 m) 5 mm (0.016 ft.) + 10 ppm x D (200 to 350 m) 10 mm (0.032 ft.) + 10 ppm x D (350 to 1000 m) Rapid: 6 mm (0.020 ft.) + 2 ppm x D (0.3 to 200 m) 8 mm (0.026 ft.) + 10 ppm x D (200 to 350 m) 15 mm (0.049 ft.) + 10 ppm x D (350 to 1000 m)
Measurement mode	Fine measurement (single/ repeat/average) Rapid measurement (single/repeat) /Tracking (selectable)

ROTATION

Max revolving speed (turning)	200 degrees per second
Max auto tracking speed	20 degrees per second

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Measuring time

Fine measurement	1.5 s + every 0.9 s
Rapid measurement	1.3 s + every 0.6 s
Tracking measurement	1.3 s + every 0.4 s
Temperature input range	- 35 to 60°C (in 0.1°C step)/ - 31 to 140°F (in 1°F step)
Pressure input range	500 to 1,400 hPa (in 0.1 hPa step), 375 to 1,050 mm Hg (in 0.1 mm Hg step), 14.8 to 41.3 inch Hg (in 0.01 inch Hg step)
ppm input range	-499 to 499 ppm (in 0.1 ppm step)
Prism constant correction	-99 to 99 mm (in 0.1 mm step) 0 mm fixed for reflectorless measurement
Earth curvature and refraction correction	No/Yes K=0.142 Yes K=0.20 (selectable)
Sea level correction	No/Yes (selectable)

*1: Slight haze, visibility about 20 km, sunny periods, weak scintillation.
*2: No haze, visibility about 40 km, overcast, no scintillation.
*3: Figures when the laser beam strikes within 30° of the reflective sheet target.
*4: Figures when using Kodak Gray Card White side (reflection factor 90%) and brightness level is less than 5,000 lx (a little cloudy). When performing reflectorless measurement, the possible measurement range and precision will change depending on the target reflection factor, weather conditions and location conditions.

UltraTrac™ tracking range

Prism-2	1.3 to 1,000 m (3,280 ft.)
360 degree prism (ATP1)	2 to 600 m (1,960 ft.)

AUTO POINTING accuracy

Standing still at 100 m or less	1.2 mm or better
Standing still greater then 100 m	0.3 mm (0.001 ft.) + 9 ppm x D

Guide light

Light source	LED (red 626 nm/green 524 nm)
Visible distance	1.3 to 150 m
Visible angle	Right and Left/Upward and Downward: ± 4° (7 m/100 m)
Resolving power at center area (width)	4' (about 0.12 m/100 m)
Brightness	3 levels (bright/normal/dim)

Memory and Data

Internal memory	16 GB
External memory	USB flash memory
Ports	Asynchronous serial RS232C compatible USB Revision 2.0 (FS) Host (Type A) Client (Type miniB)

LongLink™ Bluetooth® wireless technology

Transmission method	FHSS
Modulation	GFSK (Gaussian-filtered frequency shift keying)
Frequency band	2.402 to 2.480 GHz
Bluetooth® profile	SPP, GATT
Power class	Class 1
Range	600 m (while in communication with the RC-6 - no obstacles, few vehicles or sources of radio omissions/interference in the near vicinity of the instrument, no rain)
Authentication	Yes/No (selectable)

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Power supply

Power source	Rechargeable Li-ion battery BDC72
Working duration at 20°C	BDC72: approx. 8 hours
With 2 batteries - for auto-pointing / auto-tracking	
Battery state indicator	4 levels
Auto power-off	5 levels (5/10/15/30 min/Not set) (selectable)
External power source	12 to 16 V

Battery (BDC72)

Nominal voltage	7.2 V
Capacity	5,986 mAh
Dimensions (w x d x h)	40 x 70 x 40 mm
Weight	approx. 220 g
Charging time at 25°C	approx. 8 hours for two batteries using CDC77 charger

Charger (CDC77)

Voltage	AC100 to 240 V
Charging temperature range	0 to 40°C
Storage temperature range	-20 to 65°C
Size (w x d x h)	94 x 102 x 36 mm
Weight	about 250 g

Operating system

Linux

Display

Color touchscreen 5.0 inch Transmissive TFT VWGA color LCD
Backlight LED 9 brightness levels
Touch panel capacitive type

Sensitivity of levels

Circular level	10′/2 mm on tribrach
Electronic circular levels	Graphic display range: 6′ (inner circle) Digital display range: ± 6′ 30″

Optical plummet

Image	Erect
Magnification	3X
Minimum focus	0.5 m

Environmental

Operating temperature	-20 to 50°C (-4 to 122°F)
Storage temperature	-30 to 60°C (-22 to 140°F) (no condensation)
Dust/Water rating	IP65 (IEC 60529: 2001)
Instrument height	192.5 mm from tribrach mounting surface
Size with RC handle (w x d x h)	218 x 195 x 362 mm
Size with standard handle (w x d x h)	218 x 195 x 354 mm
Weight (with RC-handle/battery)	6.5 kg
Weight (with normal handle/battery)	5.9 kg

Certifications and Standards

USA FCC Class A
Europe R&TTE-Class1
Europe EMC-ClassB
Canada ICES -ClassA
Australia C-Tick N 13813
Europe WEEE Directive
Europe Battery Directive
California Proposition 65
California Perchlorate Material CR
TELEC

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