Topcon GT-1500/700

Robotic total station

Accurate, powerful, and versatile

Built for jobsite mobility, the flagship GT series robotic total station enables accurate and productive workflows for highly demanding survey and construction applications. Precisely lay out or survey more points in less time and improve quality and consistency. Easy-to-use digital processes with repeatably accurate results mean less rework and better quality control.

- » Precise positioning with single-person operation
- » High-speed advanced Brushless Direct Current motors
- » Easy-to-use with Topcon Field, Topcon Digital Layout or Pocket3D software
- » Available in GT-1500 and GT-700 models with multiple accuracy levels
- » 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

GT-1501/1502/702	0.5" (0.0001 gon/0.002 mil) 1" (0.0002 gon/0.005 mil) (selectable)
GT-1503/703/705	1" (0.0002 gon/0.005 mil) 5" (0.0010 gon/0.0020 mil) (selectable)

Angle accuracy (ISO 17123-3 : 2001)

GT-1501	1" (0.0003 gon/0.005 mil)
GT-1502/702	2" (0.0006 gon/0.010 mil)
GT-1503/703	3" (0.0010 gon/0.015 mil)
GT-705	5" (0.0015 gon/0.025 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' (0.0018 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 690 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]	GT-1500 series: 1.3 to 5,000 m (16,400 ft.) GT-700 series: 1.3 to 4,500 m (14,760 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]	GT-1500 series: 0.3 to 1,000 m (3,280 ft.) GT-700 series: 0.3 to 800 m (2,624 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: 768 m (2,510 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	GT-1500 series Fine: 1 mm (0.003 ft.) + 2 ppm x D Rapid: 5 mm (0.016 ft.) + 2 ppm x D GT-700 series Fine: 2 mm (0.006 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)	GT-1500: 200 degrees per second GT-700: 120 degrees per second
Max auto tracking speed	GT-1500: 20 degrees per second GT-700: 18 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	GT-1500: 1.3 to 1,000 m (3,280 ft.) GT-700: 1.3 to 800 m (2,624 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	1 GB
External memory	USB flash memory (up to 32 GB)
Visible angle	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 1.5
Range	600 m (while in communication with the RC-5A - no obstacles, few vehicles or sources of radio omissions/interference in the near vicinity of the instrument, no rain)
Authentication	Yes/No (selectable)

Wireless LAN

Communication distance	10 m
Access method	Infrastructure mode/ ad hoc mode
Frequency range	2,412 to 2,462 MHz (1 to 11 ch)
Transmission specification	IEEE802.11b/g/n

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Power supply

Power source	Rechargeable Li-ion battery BDC72
Working duration at 20°C	BDC72: approx. 4 hours
Fine single measurement = every 30 seconds after worked 180 degrees and locking on prism	
Battery state indicator	4 levels
Auto power-off	5 levels (5/10/15/30 min/Not set) (selectable)
External power source	6.7 to 12V

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

Windows Compact 7

Display

Color touchscreen 4.3 inch Transmissive TFT VWGA color LCD
Backlight LED 9 brightness levels
Touch panel resistance sensitive analog type

Sensitivity of levels

Circular level	10′/2 mm on tribrach 8′/2 mm on main unit (optional)
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	Standard models: -20 to 50°C (-4 to 122°F) (no condensation)
Storage temperature	-30 to 60°C (-22 to 140°F) (no condensation)
Dust/Water rating	IP65 (IEC 60529: 2001)
Instrument height	192 mm from tribrach mounting surface
Size with handle (w x d x h)	212 x 172 x 355 mm
Weight (with RC-handle/battery)	6.0 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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