

SOKKIA

Series 030R

**Reflectorless Total Stations
with Integrated Data Collectors**



**Take the Lead with Superior EDM Performance
and Powerful SDR Software**

**30cm to 350m /
1ft. to 1,140ft.
Reflectorless Range**



Laser beam image is simulated.
Guide Light Unit is a factory option.



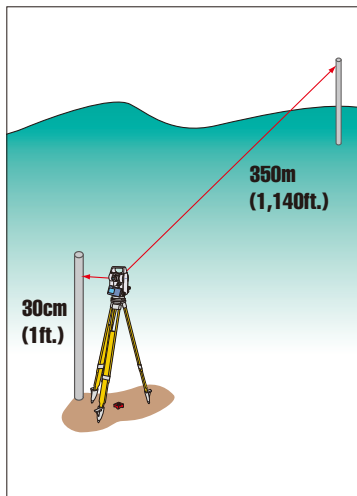
High-Precision Measure

Flexible, accurate measurements with RED-tech II EDM

Survey-grade accuracy from 30cm/1ft to 350m/1,140ft.*

RED-tech reflectorless EDMs are acclaimed for high-precision pinpoint accuracy and the flexibility to measure from distances as close as 30cm (1ft.).

*Class 3R laser models

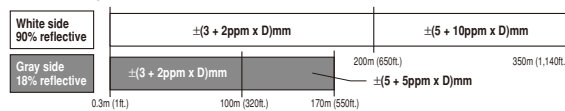


350m or 200m—choose the range you need

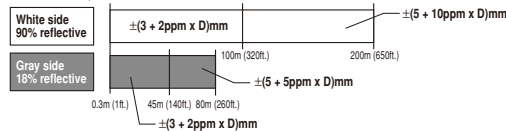
The Class 3R laser models provide reflectorless measurement up to 350m (1,140 ft.), while the Class 2 laser models cover a range up to 200m (650ft.). All models offer measurement from as close as 30cm (1ft.) for reflectorless measurement over a tremendous range of distances, while assuring survey-grade accuracy.

Reflectorless measurement range and accuracy with a Kodak Gray Card

SET1030R3 • SET2030R3 • SET3030R3 (standard models)
Class 3R laser products



SET1030R • SET2030R • SET3030R (factory options)
Class 2 laser products

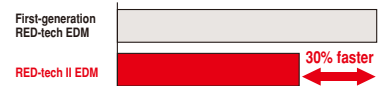


High-speed measurement now over 30% faster*

Measurement is fast at every 0.9 second and just 2.2 seconds for the initial measurement (in fine mode) for speed gains of over 30%.

* Compared with first-generation RED-tech EDM models.

Distance measurement speed



The proven technology behind the RED-tech II EDM

The RED-tech II EDM is a high-performance phase-comparison measuring system that set the standard for fast, flexible and stable distance measurement of a variety of objects under conditions difficult or impossible with other EDMs.

Phase-comparison measurement

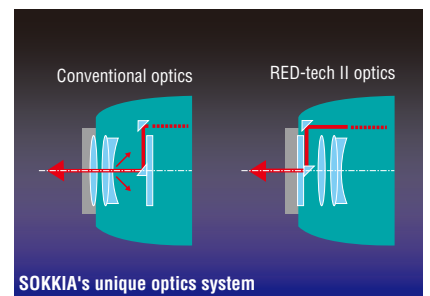
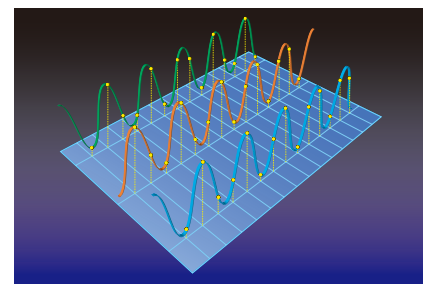
RED-tech II EDM uses phase comparison technology, which provides notable advantages in accuracy compared with EDMs using pulse measurement methods. Combined with SOKKIA's digital processing technology and unique optics, RED-tech II EDMs set the standard for highly accurate reflectorless measurement.

Digital signal processing

RED-tech II EDM simultaneously samples measuring signals in three different frequencies and calculates distances using advanced digital signal processing software. A calculation method best suited to the condition of the measuring signals is selected, and receiving signals are amplified to ensure a high level of reliability. Thanks to SOKKIA's advanced signal processing technology, RED-tech II EDMs provide a combination of superior accuracy, speed and efficiency.

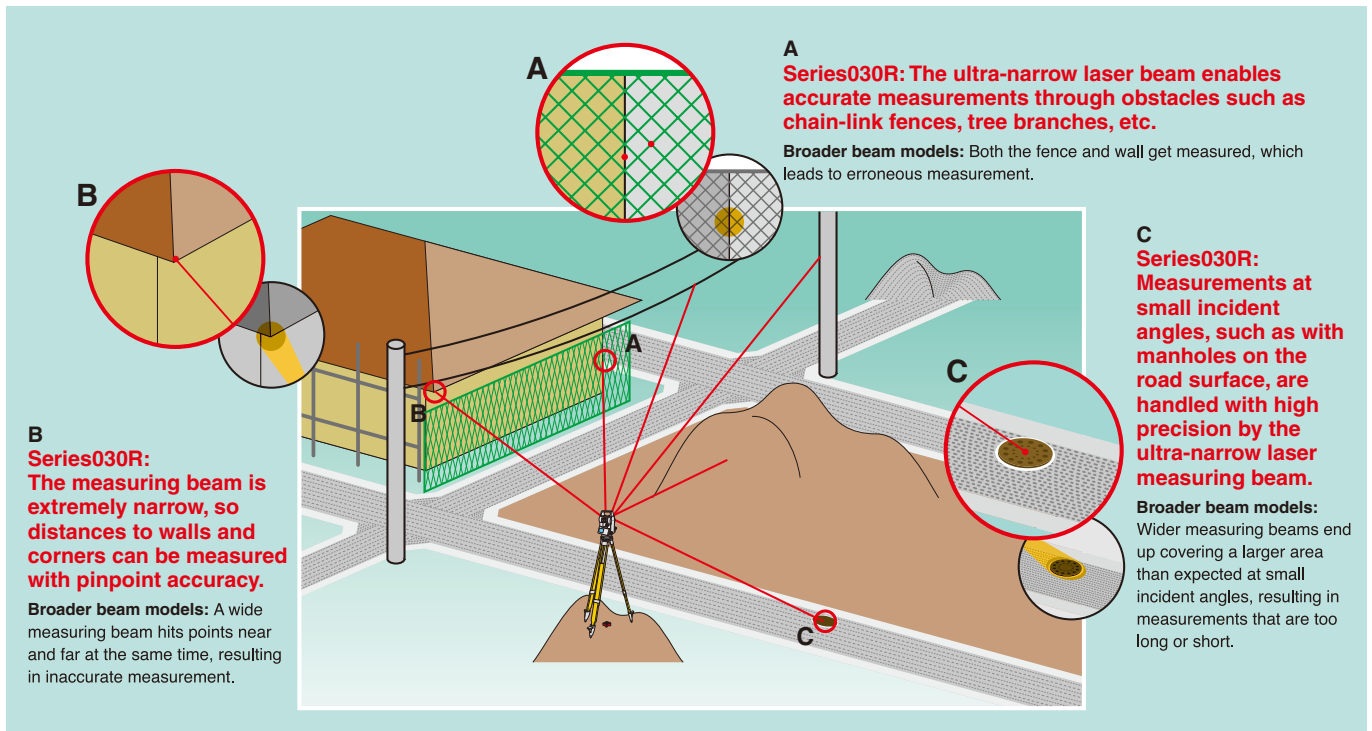
High-precision optics

SOKKIA has further refined its traditional optics system, which emits measuring light from the objective lens center and receives the returning light along its periphery. With enhanced optics that provide the ideal light path, RED-tech II EDM dramatically increases reliability by emitting the laser beam from in front of the objective lens to eliminate errors caused by internal reflection. Its highly tunable optical components ensure that only the necessary returning light is directed to the receiver for faster, more efficient measurement. What's more, the telescope provides an extremely bright and sharp view, and its compact size makes sighting easier than ever. The combination of one light source and one set of optics allows the RED-tech EDM to emit an ultra-narrow visible laser beam along the same axis as the telescope's sighting axis to enable accurate pointing using a distinct laser spot, pinpoint reflectorless measurement, as well as long-range distance measurement using prisms or reflective sheet targets.



ment using RED-tech Technology

■ Ultra-narrow visible laser for pinpoint accuracy



The Series030R employs an ultra small-diameter visible laser to obtain measurements with pinpoint accuracy. Fine objects, as well as the corners of walls and other structures, can be measured precisely. You can also make accurate measurements through obstacles such as chain-link fences and tree branches.



■ Laser-pointer function

The visible laser beam can be conveniently used as a laser pointer for interior leveling work, vertical alignment, setting out, and other tasks.

■ Long-distance measurement with reflectors

Measure up to 5,000m (16,400ft.)* with an accuracy of $\pm(2+2\text{ppm} \times D)\text{mm}$ using a single AP prism. Reflective sheet targets can be used to measure up to 500m (1,640ft.)** with $\pm(3+2\text{ppm} \times D)\text{mm}$ precision.

Choose from SOKKIA's wide selection of sheet targets to suit your needs. Rotating pin-pole targets, two-point target for measuring hidden points, and many other innovative reflective targets are available.

* In good weather conditions. ** When using RS90N-K.



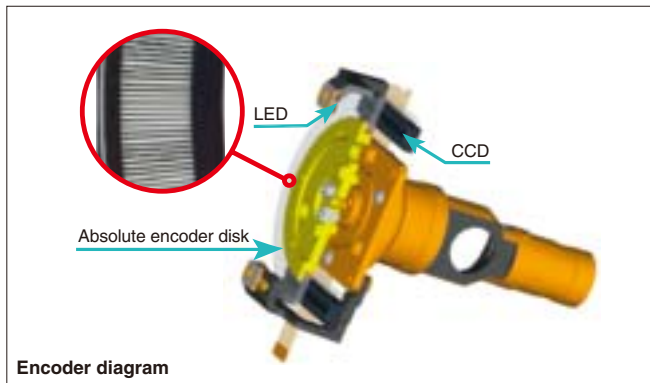
In reflective sheet and prism modes, maximum laser output is reduced to 0.22W, the equivalent of a Class 1 laser. The Series030R includes a telescope safety filter to protect your eye if you sight a prism or reflective sheet in reflectorless mode.





Enhanced Hardware Relia

■ SOKKIA's original absolute encoders



Series030R total stations are equipped with absolute encoders based on SOKKIA's digital level RAB (Random Bi-directional) Code technology which provide high stability and reliability. There is no need for zero indexing when starting a job meaning you can go from the moment you turn on the power. Work efficiency is further increased by immediate azimuth display.

■ Triple-axis compensation for high reliability

Vertical and horizontal angles are compensated for by a dual-axis compensator that detects the tilt of the total station in two directions. In addition, a collimation function corrects the deviation of the telescope's mechanical axis. Working together, these features offer maximum reliability with angle measurements.

■ Password function for security

The Series030R provides a password-protection function for security purposes. You can assign your own password to the instrument to prevent unauthorized use.

■ Large internal memory

The large internal memory can store approx. 8,800 data points in SDR33 format. Its multiple job file structure allows you to create an unlimited number of job files.

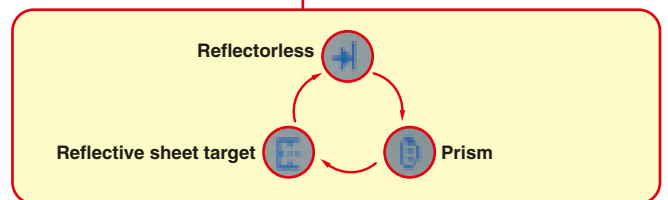
■ CompactFlash card drive



A card drive for commercially available CF memory cards (Type 1) is included as a standard feature. With this card drive, your memory capacity becomes virtually unlimited. Approx. 608,000 data points can be stored on an 64MB card. Cards up to 512MB are supported.

■ Check data and status at a glance

Each Series030R total station has a built-in control panel on both faces. These control panels have a clearly visible 8-line LCD screen that lets you quickly check EDM mode (reflectorless, prism, or reflective sheet target), laser beam mode, guide light function, and more.



■ Easy target selection

Selecting a target is amazingly simple. During basic mode operation, you can switch between reflectorless, prism, and reflective sheet target modes with the push of a button, and the icon of the selected target is displayed on the LCD screen for easy confirmation.

■ Full alphanumeric keyboard with easy-to-use softkeys

Alphanumeric keys are laid out for the fastest possible operation. Entering job names, point numbers, point names, coordinate values, and processing surveying data can be done quickly and efficiently. Furthermore, four easy-to-use softkeys are included to simplify measurement.

■ Superior environmental protection

Featuring advanced protection against dust and water, the Series030R total stations are able to withstand harsh environmental conditions (IP64 compliant).

The International Electrotechnical Commission standard IEC 60529 describes a system for classifying degrees of protection provided by enclosures of electrical equipment. The IP Code consists of the letters IP and two numerals. Larger numbers represent greater levels of protection.

Protection against ingress of solid foreign objects
Highest level: 6
7 levels: 0 to 6.
X: unspecified.

IP 64

Protection against ingress of water
Highest level: 8
9 levels: 0 to 8.
X: unspecified.

ability and Increased Productivity



SF14 wireless keyboard



The SF14 wireless keyboard has a total of 37 keys (including alphanumeric keys, softkeys, and measurement controls), to enable quick and easy data entry of point names and coordinate values. Because all key operations can be performed with this wireless keyboard, you won't need to

touch the total station after it's been aimed at the target. Protection against dust and water is another advantage, as you can use the keyboard without worry in the rain or at a dusty construction site (IP44 compliant). The SF14 wireless keyboard can also be used with Series30R and Series10 total stations.

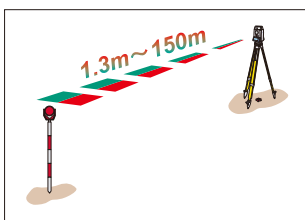
SF14 is an optional accessory.



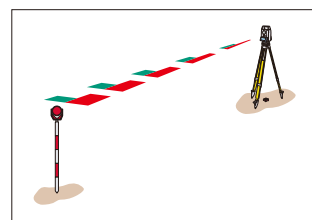
Guide Light Unit GDL2



The Guide Light Unit GDL2 boosts efficiency with setting-out jobs. Its guide light is composed of two lights of different colors that are emitted from one aperture. From the left side, you see only a green light; from the right, only a red light. And when you see green and red flashing back and forth simultaneously, that means you are on the telescope sighting direction. The GDL2 has a range of up to 150m (490ft.). A special flashing pattern is also included to assist users with color weakness.



The light may be used up to a range of 150m (490ft.).



A special flashing pattern is also included to assist users with color weakness.

Guide Light Unit GDL2	Green LED (524nm) and Red LED (630nm) (IEC Class 1 LED)
Visible range	1.3m to 150m (4.3ft. to 490ft.)
Visible width	Horizontal & vertical: more than $\pm 4^\circ$; approx. 7m at 100m (23ft. at 320ft.)
Center resolution	Within 4'; approx. 12cm at 100m (4.7in. at 320ft.)

The Guide Light Unit cannot be used simultaneously with the laser pointer function. The Guide Light Unit is a factory option.

FOF sensors

SOKKIA's original and extremely compact FOF (Fiber made of Optical Filter material) sensors are mounted on two sides of Series030R total stations for communication with the optional SF14 wireless keyboard. These sensors are extremely resistant to light interference, and have a wide signal reception range to allow comfortable use of the keyboard.



FOF sensor

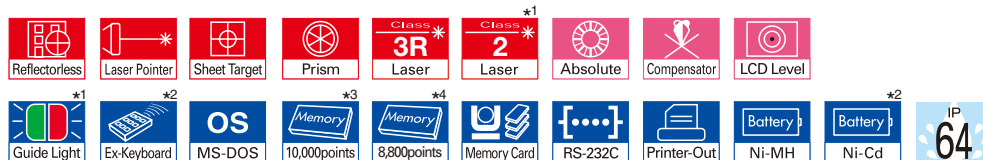
Two battery types: Ni-MH and Ni-Cd

The BDC35A Ni-MH battery* gives you 6 hours of continuous angle and distance measurement, and the CDC70 charger features a built-in refresh function to eliminate memory effect. The optional Ni-Cd battery (BDC40A) offers longer operation in low temperatures.

* Standard equipment.

Optional accessories

SF14 wireless keyboard • Guide Light Unit GDL2 (factory option) • EDC115 car cigarette lighter cable for CDC70 • BDC40A Ni-Cd battery • BDC57 Ni-MH external battery • EDC3A power cable for BDC57 (2m), EDC7A power cable for BDC57 (0.5m), CDC14 battery charger for BDC57 • EDC2A AC adaptor (100 to 240V) • OF3A solar filter • DE25 diagonal eyepiece • EL7 40x eyepiece • DOC46 printer cable • DOC25 (25 pins, male), DOC26 (25 pins, female), DOC27 (9 pins, female), DOC1 (w/o connector) interface cables • ACE5 auto-collimation eyepiece • 20"/2mm plate level for SET2030R/2030R3 (factory option)



*1 Factory option *2 Option *3 With SDR2x format *4 With SDR33 format





Powerful SDR Software Wireless Long-Distance

■ Comprehensive Software Suite "Expert"

To maximize job efficiency in the field, the Series030R total stations come fully loaded with Expert, the comprehensive data collection software from SOKKIA. Expert provides an integrated solution to a wide variety of data collection and processing tasks.

SURV	COGO	ROAD
Topography	Set out cords	Select road
Traverse adjustment	Set out line	Set out road
Resection	Set out arc	Set out road surface
Set collection	Resection	Road topo
Set review	Inverse	Cross-section survey
Building face survey	Areas	Define road
Collimation	Intersections	Review road
Tilt offset	Point projection	Define template
Remote elevation	Taping from baseline	Review template
Keyboard input	Transformation	
	Keyboard input	

■ Enhanced productivity during reflectorless measurement

The full capability of Series030R's superior reflectorless measurement is realized when used in conjunction with the Expert software suite.

SURVEY (SURV)

The Survey program greatly simplifies topography, traverse surveying, building face surveying, and other applications.

■ Topography

The Series030R can average multiple observations for more accurate results. Tolerances are definable by the user. This program includes three types of convenient offset measurement functions: "two-distance offset," "single-distance offset," and "angle offset" for hidden points that cannot be observed directly.

■ Set Collection

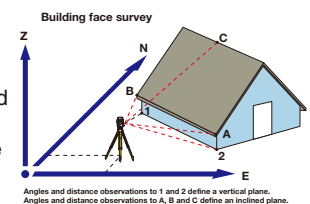
The Series030R averages observations collected on Face 1 and Face 2 of the instrument and also averages multiple sets of observations. The resulting observations can be used either for traverse calculations or resection calculations.

■ Traverse Adjustment

The Traverse Adjustment program allows you to specify a sequence of stations through which a traverse may be calculated and optionally adjusted. The observations do not have to be made in the same order as the traverse route.

■ Building Face Survey

The Building Face Survey program allows points on both vertical and non-vertical planes to be coordinated by angle-only-observations in order to pick up details of a building where the prism cannot be placed.

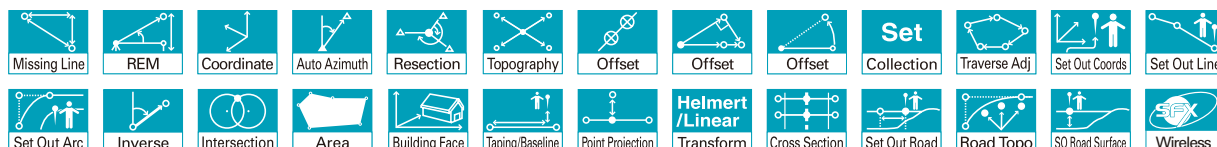
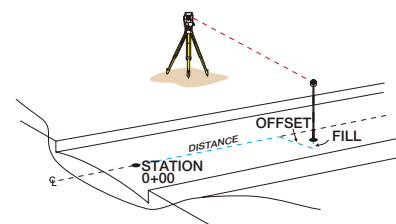


ROADING (ROAD)

The Roding program is one of the most comprehensive and powerful setting out solutions for road construction work. Horizontal alignment, vertical alignment, templates, side-slopes, road cross-sections, super-elevation, and widening can be defined as desired. Any point along the road can then be set out by specifying its station and offset.

■ Set Out Road Surface

The Set Out Road Surface program allows setting out of the cut or fill at any point on a road surface. Simply take a reading, and the cut/fill value is displayed. The design elevation can then be set if required.



for Complex Field Operations, Plus Data Transmission

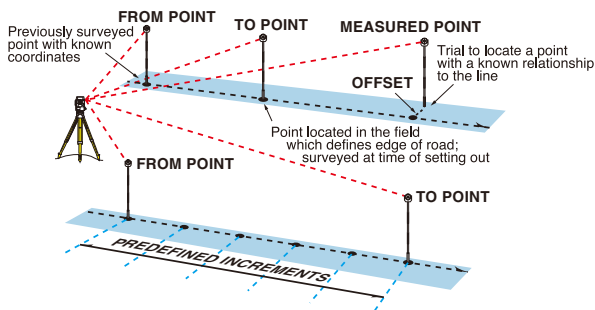


COGO

The Series030R offers a comprehensive suite of functions designed to carry out data collection, field calculations, and various setting-out tasks for civil engineering and construction. These streamlined functions dramatically increase productivity.

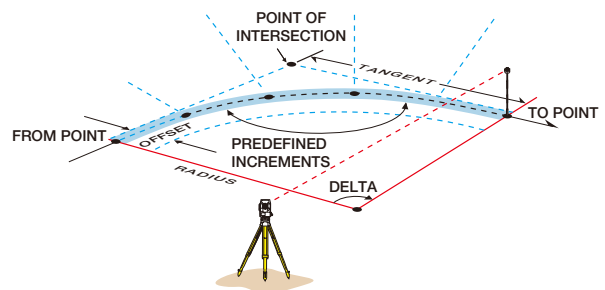
■ Set Out Line

The Set Out Line program is used for setting out and checking alignment of curb lines, construction boards, and grades of pipes. A baseline or an offset from baseline can be defined.



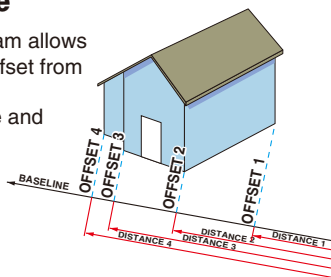
■ Set Out Arc

The Set Out Arc program provides a generalized arc calculator to allow the definition of curves from almost any combination of parameters. Points along the arc can be coordinated and directly set out.



■ Taping from Baseline

The Taping from Baseline program allows you to set out by distance and offset from the baseline or to collect the topographical details by distance and offset.



■ Transformations

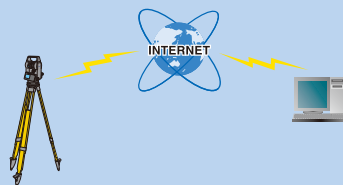
The Series030R transforms the job coordinates to a different coordinate system. Helmert transformations and linear transformations are available.



Sokkia Field-info Xpress

Instantaneous data transfer between any worksite and your office.

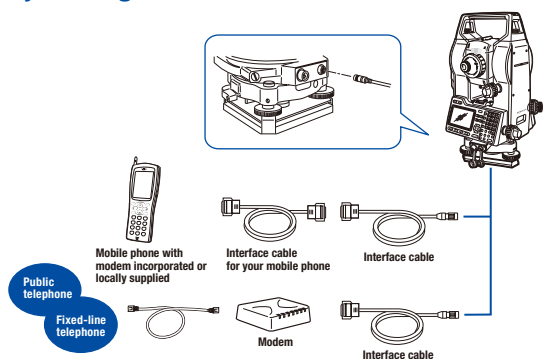
The Series030R can send surveyed data to a specified e-mail address or FTP server. It can also receive coordinate data for setting-out from your office computer or FTP server.



Just connect a mobile phone (and modem, if necessary) to the Series030R using the appropriate cables, establish an Internet connection, and select the job files. Multiple job files can be sent out simultaneously. All SFX functions can be performed via the Series030R's operation panel.

Password protection is available to prevent unauthorized use.

System Diagram



SFX requires connectivity using a mobile phone with a service provider capable of e-mail data transfer to an external source, as well as an active e-mail account and FTP server. Consult your local telecoms operator for proper equipment and/or connectivity requirements.

Series 030R Reflectorless Total Stations with Integrated Data Collectors

SET1030R3 · SET2030R3 · SET3030R3 · SET1030R · SET2030R · SET3030R

SPECIFICATIONS

Model	SET1030R3	SET2030R3	SET3030R3	SET1030R	SET2030R	SET3030R
Availability	Standard models			Factory options		
Laser class*1	Class 3R Laser Product			Class 2 Laser Product		
Telescope	Fully transiting, coaxial sighting and distance measuring optics					
	Length: 171mm (6.7in.), Objective aperture: 45mm (1.8in.) (EDM 48mm (1.9in.)), Magnification: 30x, Resolving power: 2.5', Image: Erect, Field of view: 1°30' (26m/1,000m), Minimum focus: 1.3m (4.3ft.), Reticle glass: ∞ mark printed, Reticle illumination: 5 brightness levels					
Angle measurement	Absolute encoder scanning. Both circles adopt diametrical detection.					
Unit	Degree / Gon / Mil, selectable					
Display resolutions (selectable)	0.5° / 1', 0.1 / 0.2mg, 0.002 / 0.005mil		1° / 5', 0.2 / 1mg, 0.005 / 0.02mil	0.5° / 1', 0.1 / 0.2mg, 0.002 / 0.005mil		1° / 5', 0.2 / 1mg, 0.005 / 0.02mil
Accuracy (ISO 17123-3:2001)	1° / 0.3mg / 0.005mil	2° / 0.6mg / 0.01mil	3° / 1mg / 0.015mil	1° / 0.3mg / 0.005mil	2° / 0.6mg / 0.01mil	3° / 1mg / 0.015mil
Measuring time	0.5s or less, continuous					
Measurement mode	H: Clockwise / Counterclockwise, selectable. 0 set, Angle input, available. V: Zenith 0 / Horizontal 0, selectable					
Automatic dual-axis compensator	Dual-axis liquid tilt sensor, Working range: ± 3' (± 55mg)					
Collimation compensation	Yes / No, selectable					
Fine motion screws	Fine / Coarse 2-speed motion					
Distance measurement	Modulated laser, phase comparison method with red laser diode.					
Laser output	Reflectorless mode: Class 3R (max. 5mW) Prism/Sheet mode: Class 1 equivalent (max. 0.22mW)			Reflectorless mode: Class 2 (max. 0.99mW) Prism/Sheet mode: Class 1 equivalent (max. 0.22mW)		
Unit	Meters / feet / US feet, selectable					
Measuring range (slope distance)	Reflectorless*2 (using Kodak Gray Card) With reflective sheet target*7 With mini prisms With 1 AP prism With 3 AP prisms			0.3 to 350m (1 to 1,140ft.) (White side, 90% reflective) 0.3 to 170m (1 to 550ft.) (Gray side, 18% reflective) 0.3 to 200m (1 to 650ft.) (White side, 90% reflective) 0.3 to 80m (1 to 260ft.) (Gray side, 18% reflective)		
Display resolutions	Fine mode Rapid single / Tracking		0.001 / 0.001m (0.001 / 0.01ft.) 0.001m (0.01ft.)	0.0001 / 0.001m (0.001 / 0.01ft.) 0.001m (0.01ft.)		0.001m (0.01ft.)
Accuracy (D-measuring distance, unit:mm)	Reflectorless*2*3 (Fine mode) Reflectorless*2*3 (Rapid single mode) With reflective sheet target With prism		0.3 to 200m (1 to 650ft.): ± (3 + 2ppm x D)mm Over 200 to 350m (over 650 to 1,140ft.): ± (5 + 10ppm x D)mm 0.3 to 200m (1 to 650ft.): ± (6 + 2ppm x D)mm Over 200 to 350m (over 650 to 1,140ft.): ± (8 + 10ppm x D)mm		0.3 to 100m (1 to 320ft.): ± (3 + 2ppm x D)mm Over 100 to 200m (over 320 to 650ft.): ± (5 + 10ppm x D)mm 0.3 to 100m (1 to 320ft.): ± (6 + 2ppm x D)mm Over 100 to 200m (over 320 to 650ft.): ± (8 + 10ppm x D)mm	
Measuring time	Fine mode Rapid single / Tracking		Fine: ± (3 + 2ppm x D)mm, Rapid single: ± (6 + 2ppm x D)mm Fine: ± (2 + 2ppm x D)mm, Rapid single: ± (5 + 2ppm x D)mm Repeat: Every 0.9s (initial 2.2s), Single: 2.2s		Rapid single: 2.0s / Tracking: Every 0.3s (initial 2.0s)	
Measuring mode	Fine (single / repeat), Rapid (single), Tracking					
Atmospheric correction / Prism constant correction	Temperature, Pressure, Humidity, ppm input available / -99 to +99mm (1mm steps). 0 fixed in reflectorless mode.					
Refraction & earth-curvature correction	Yes (K=0.14 / 0.20) / No, selectable					
Scale factor setting / Sea level correction	0.5 to 2.0 / Yes / No					
OS, data storage and transfer						
Operating system	MS-DOS compatible (DR-DOS)					
Data storage	Internal memory Memory card drive		Approx. 10,000 points with SDR2x format, approx. 8,800 points with SDR33 format. Equipped as standard for Compact Flash card Type 1 (max. 512MB)			
Interface	Asynchronous serial RS232-C compatible, Baud rate: 1,200 to 38,400bps					
SFX wireless data transfer	Provided					
Printer output	Centronics compatible (with optional DOC46 printer cable)					
General						
Display / Keyboard	Alphanumeric/graphic dot matrix LCD, 20 characters x 8 lines, with backlight, on both faces / Full alphanumeric, 43 keys, on both faces					
SF14 wireless keyboard	Optional					
Laser-pointer function	ON (auto off in 5 minutes) / OFF, selectable. (does not work simultaneously with the Guide Light)					
Laser radiation indicator	Yes					None
Guide Light Unit GDL2	Factory option					
Sensitivity of levels	Plate level Circular / Graphic		20° / 2mm 30° / 2mm*6		20° / 2mm	30° / 2mm*6 30° / 2mm
Optical plummet	Magnification		5.5x 3x		5.5x	3x
Tribrach	Detachable					
Dust and water protection / Operating temperature	Conforms to IP64 (IEC 60529) / -20 to +50°C (-4 to +122°F)					
Instrument height / Size with handle and battery	236mm (9.3in.) from tribrach bottom / W 186 x D 171 x H 345 mm (W 7.3 x D 6.7 x H 13.6 in.)					
Weight with handle and battery	Approx. 5.9kg (12.9lb.)					
Power supply	6V DC					
BDC35A detachable battery	Ni-MH rechargeable battery, 2 BDC35A are included as standard accessories.					
	Continuous use per battery at 25°C (77°F)		About 6 hours (single measurement every 30 seconds) About 8 hours (angle measurement only)			
	Recharging time		About 120 minutes per battery			
BDC57 external Ni-MH battery (optional)	Continuous use at 25°C (77°F)			About 24.5 hours (single measurement every 30 seconds)		About 25.0 hours (single measurement every 30 seconds)
				About 27.5 hours (angle measurement only)		About 28.5 hours (angle measurement only)
Automatic power cut-off / Resume function	Auto-off time is selectable from 1 to 99 minutes. / Yes					

*1 IEC 60825-1 Amd.2: 2001 / FDA CDRH 21 CFR Part 1040.10 and 1040.11 (Complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice No.50, dated July 26, 2001.)

*2 Reflectorless range/accuracy may vary according to measuring objects, observation situations and environmental conditions. *3 With Kodak Gray Card White Side (90% reflective)

*4 Average conditions: Slight haze, visibility about 20km (12 miles), sunny periods, weak scintillation. *5 Good conditions: No haze, visibility about 40km (25 miles), overcast, no scintillation. *6 20° / 2mm plate level is available as a factory option.

*7 When the beam's angle of incidence is within ±30° up and down / right and left in relation to the surface of the target.



Standard accessories

BDC35A rechargeable Ni-MH batteries (2 pcs.) • CDC70 charger and EDC114 with EDC113A/113B/113C power cable • CP7 tubular compass • Lens hood • Lens cap • Plumb bob • Tool kit • Wiping cloth • Vinyl cover • Operator's manual • Carrying case • Shoulder strap • Laser caution sign board (for Class3R models only)



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