SOKKIA

Series30R

Reflectorless Total Stations

30cm to 350m / 1ft. to 1,140ft. Reflectorless Range*
Cutting-Edge Technologies Packed in a Compact Body

* Class 3R models

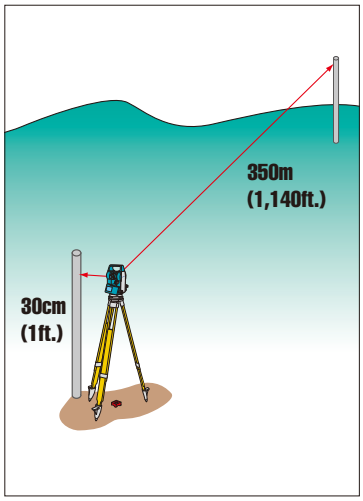
Laser beam image is simulated.

Innovative RED-tech EDM Makes Reflectorless Distance Measurement More Powerful Than Ever

EDM technology takes a big leap forward with state-of-the-art RED-tech II EDM

Pinpoint reflectorless measurement over an ultra-wide range

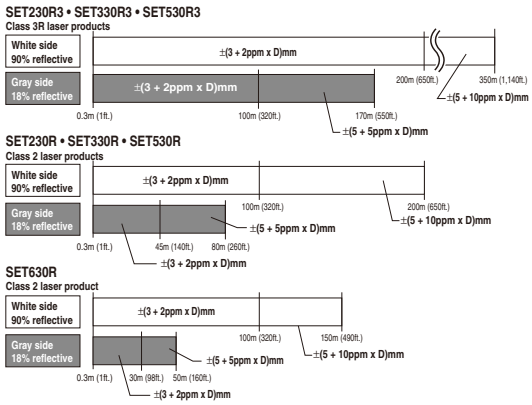
RED-tech II EDM retains the best of first-generation RED-tech EDM technology —including close-range reflectorless measurement from just 30cm (1ft.)—and takes it to a whole new level of performance.



● 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

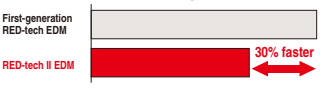


● High-speed measurement now over 30% faster*

Measurement is fast at every 0.9 second and just 1.7 seconds for the initial measurement (in fine mode) for speed gains of over 30%.

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

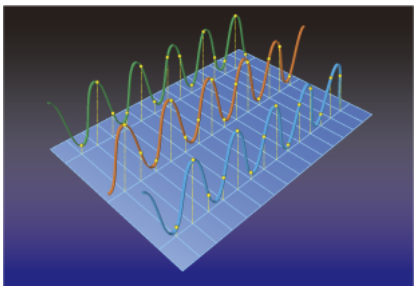
● Distance measurement speed



RED-tech II
REvolutionary Digital processing EDM technology

The proven technology behind RED-tech II EDM

RED-tech II EDM is a high-performance phase-comparison measuring system that delivers unprecedented distance measurement of a variety of objects under conditions difficult or impossible with other EDMs.



● Phase-comparison measurement

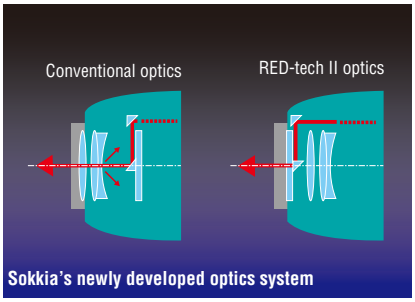
RED-tech II EDM uses phase comparison technology, which provides notable advantages in accuracy compared with EDMs using pulse measurement methods. Combined with Sokkia's leading edge digital signal processing technology and refined optics, superbly accurate reflectorless measurement is now a reality.

● Digital signal processing

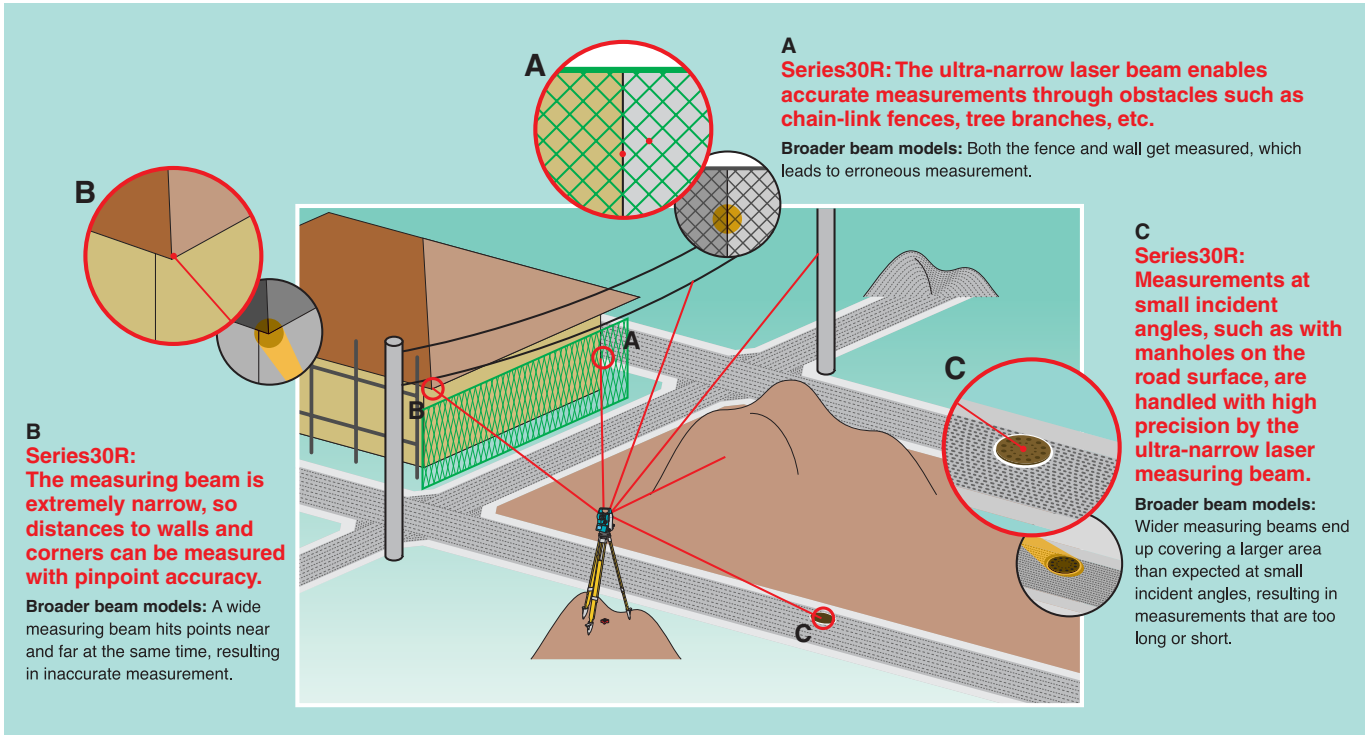
RED-tech II EDM simultaneously samples measuring signals in three different frequencies and calculates distances using advanced digital signal processing software. A calculation method best suited to the condition of the measuring signals is selected, and receiving signals are amplified to ensure a high level of reliability. Thanks to leading-edge signal processing techniques, RED-tech II EDM delivers superior accuracy and with greater speed and efficiency compared with conventional EDMs.

● 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. And 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 sight, and its compact size makes sighting easier than ever.
With its one light source, with its one optics system, RED-tech II EDM emits 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.



Ultra-narrow visible laser for pinpoint accuracy



A
Series30R: The ultra-narrow laser beam enables accurate measurements through obstacles such as chain-link fences, tree branches, etc.
Broader beam models: Both the fence and wall get measured, which leads to erroneous measurement.

B
Series30R:
The measuring beam is extremely narrow, so distances to walls and corners can be measured with pinpoint accuracy.
Broader beam models: A wide measuring beam hits points near and far at the same time, resulting in inaccurate measurement.

C
Series30R:
Measurements at small incident angles, such as with manholes on the road surface, are handled with high precision by the ultra-narrow laser measuring beam.
Broader beam models: Wider measuring beams end up covering a larger area than expected at small incident angles, resulting in measurements that are too long or short.

The Series30R 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

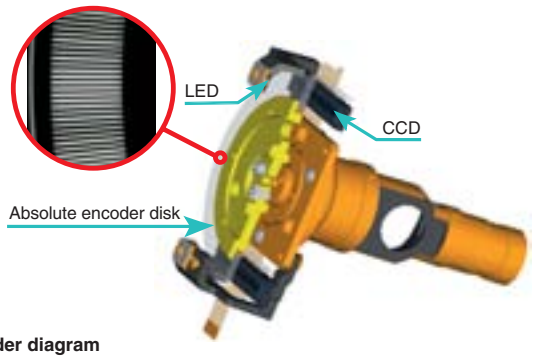
Measure long distances by directing the laser beam at a reflector. When using a single AP prism, you can measure as far as 5,000m (16,400ft.)* at once, with an accuracy of ±(2 + 2ppm x D)mm. In addition, reflective sheet targets may be used to get measurements of up to 500m (1,640ft.)** with ±(3 + 2ppm x D)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 except SET630R. ** When using RS90N-K.

In the reflective sheet or prism modes, maximum laser output is automatically reduced to 0.22mW. This is equivalent to the level of a Class 1 laser. The Series30R also includes a safety filter in the telescope, which protects your eye from the laser beam if you happen to sight a reflective prism or sheet target while in reflectorless mode.

A Durable Partner That Gives Heavy-Duty Support for Daily Surveying Needs

Sokkia's original absolute encoder

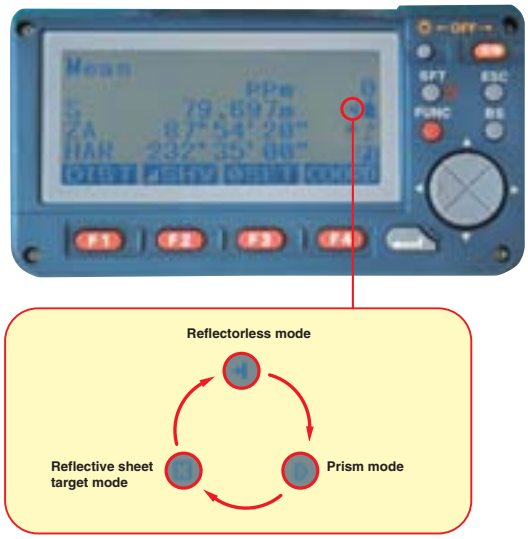


Encoder diagram

The Series30R models are equipped with Sokkia-developed absolute encoders. These encoders feature the RAB (RAndom Bi-directional) code technology first used in the SDL30 digital level, which provides high stability and reliability. You do not need to reset for 0 indexing at the start of a job, so surveying can begin from the moment you turn on the power. Work efficiency is also boosted by the immediate display of azimuth whenever you restart the total station.

Status check at a glance

The built-in control panel has an easy-to-view LCD screen with 192 x 80 pixel resolution. Key information, such as EDM mode (reflectorless, prism, or reflective sheet target) and laser beam status, can be checked at a glance.



Highest Level of Robustness

IP 66

The Series30R complies with IEC (International Electrotechnical Commission) environmental standard IP66 (IEC 60529). The first digit following IP indicates the level of protection against the ingress of solid foreign objects, of which 6 is the highest grade—dust-tight, meaning no dust can enter the unit. The second digit indicates the level of protection against the ingress of water. Grade 6 indicates protection against powerful water jets from any direction.

-30°C/-22°F

Working in extreme cold is not a problem, either. With the Low Temperature Models (factory option) of the SET530R3/530R, the operating temperature range of the Series30R is extended to -30°C (-22°F). These models feature newly enhanced mechanical structures as well as the latest LCD and lubricant developments to ensure the same ultra-smooth operation in extremely cold climates as under high temperatures. To ensure trouble-free, long-term operation even in the severe cold, a new external battery system has also been developed. The new external battery BDC57 utilizes a state-of-the-art battery cell that was first developed for use in hybrid motor cars, and new power cables EDC3A and EDC7A are as flexible in sub-zero conditions as at normal room temperature.

One-touch target selection

There are no complicated operations when it comes to selecting targets. The Series30R total stations let you switch between reflectorless, prism, and reflective sheet target just by pressing the SFT key in sequence. The selected target is displayed on the operation panel for easy confirmation.

User-friendly keyboard and softkeys

The control panel also includes large, ergonomic buttons as well as four softkeys (F1-F4). Softkey functions are structured into 3 pages and 12 modes, and you are free to assign functions to any key you like. Productivity is enhanced through this balance of functionality and ease of use.

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 Series30R includes a password-protection function for security purposes. You can assign your own password to the instrument to prevent unauthorized use.

SF14 wireless keyboard

This 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. 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)

SF14 is an optional accessory for SET230R3/330R3/530R3 and SET230R/330R/530R

FOF sensors*

Sokkia's original and extremely compact FOF (Fiber made of Optical Filter material) sensors are mounted on two sides of the instrument for communication with the 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.

* Not included on SET630R

FOF sensor

Large internal memory

The Series30R can store approximately 10,000 data points, including known points and other information. To facilitate concurrent use at different work sites, data may be sorted into 10 different job files.

CompactFlash card unit

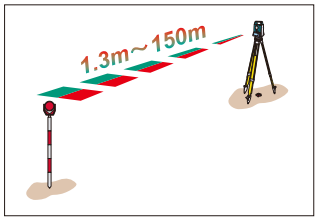
A card unit for commercially available CompactFlash memory cards can be added as a factory option. 576,000 points (114 files, each holding 4,000 points) can be stored with an 64MB memory card. Cards up to 512MB are supported.

The CompactFlash card unit is a factory option for SET230R3/330R3/530R3 and SET230R/330R/530R

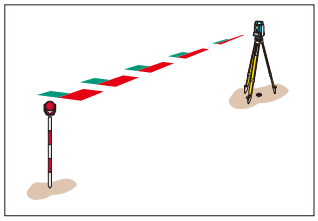
Guide Light Unit GDL1

The Guide Light Unit GDL1 boosts efficiency of setting-out measurements. Its guide light is composed of two lights of different colors that are emitted from one aperture. When you are on the left side, the green light is visible, and when you are on the right side, the red light can be seen. When green and red are flashing back and forth, you are on the telescope sighting direction.

The Guide Light Unit is a factory option.



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 GDL1	Green LED (524nm) and Red LED (630nm) (Class 1 LED)
Visible range	1.3m to 150m (4.3ft. to 490ft.)
Visible width	Horizontal & vertical: more than ±4'; 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.

Compact lithium-ion battery

Take 7 hours of continuous angle and distance measurements with the Series30R's rechargeable lithium-ion battery. Unlike Ni-Cd cells, the Series30R's battery can be fully recharged at any time, without diminishing its energy capacity. The BDC46A battery is commonly used for Sokkia's Series10 total stations, digital levels, and other equipment.

Reflectorless | Sheet Target | Prism | Laser Pointer | Class 3R Laser | Class 2 Laser

Absolute | Compensator | Repetition | % | LCD Level

*1 Guide Light | *2 Ex-Keyboard | RS-232C | Printer-Out | *3 Memory Card | Memory 10,000points | Battery Li-ion | IP 66 | *4 -30°C/-22°F

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 66

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

*1 Factory option for all models *2 Option for all models except SET630R *3 Factory option for all models except SET630R *4 Low Temperature Models only (factory option)

Packed with Versatile Functions for High Work Efficiency at Diverse Sites

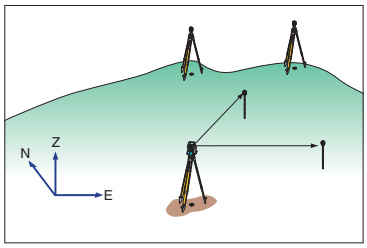
Missing Line Measurement (MLM)

At the touch of a key, the Series30R measures horizontal distance, slope distance, height difference and percentage of slope between two points.

Remote Elevation Measurement (REM)

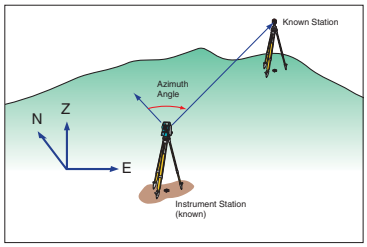
The Series30R easily determines the height of a point where distance cannot be measured directly. Sight a point either directly above or directly below the target point, and then sight the target point.

3-D Coordinate Measurement



The Series30R calculates 3-D coordinate values of measuring points and displays them either as N, E, Z or E, N, Z.

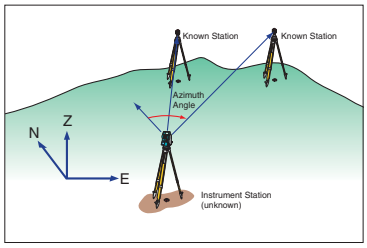
Automatic Azimuth Angle Setting



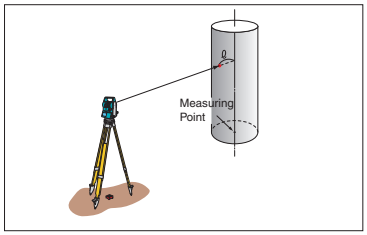
The Series30R can automatically set the horizontal angle to the azimuth of a back sight by using the coordinates of the instrument station and the back sight point.

Resection

The Series30R can determine the azimuth and coordinates of an unknown instrument station with 2 to 10 known points. When using two points, measure both angles and distances. When using three or more points, the distance is not required. Station elevation from known reference points (up to 10 points) can also be calculated and each deviation of multiple reference points is displayed. If a bad point is selected it can be recalculated, re-observed or replaced with a new point.



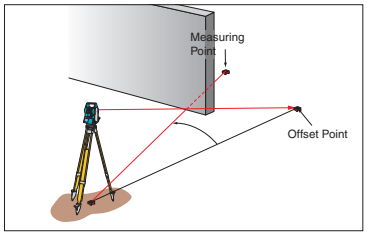
Offset/Distance



The Series30R calculates the angles and distance, or the coordinates of the measuring point by inputting the distance and direction between the measuring point and the offset point.

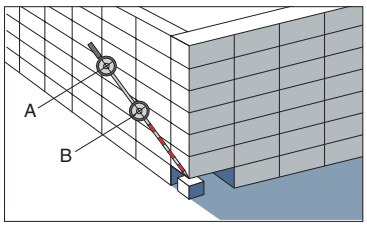
Offset/Angle

The Series30R automatically calculates the position of measuring points. First, measure a point on either side of the measuring point at the same distance from the Series30R instrument. Then sight the measuring point.



Two-Distance Offset

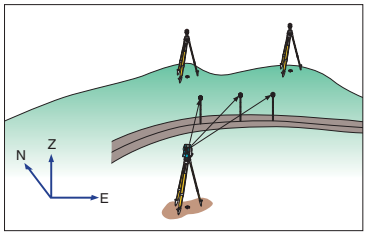
With the use of a 2RT500-K two-point target, the Series30R can measure hidden points easily and efficiently. Set the two-point target on the measuring point (the target does not have to be perpendicular), measure targets A and B, and input the length between target B and the measuring point. The Series30R calculates the position of the measuring point in angles and distance, or in coordinate values.



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.

Setting Out



The Series30R performs three-dimensional setting out with N, E and Z or E, N and Z coordinates. Directions and distances to the setting out position are indicated on the screen.

Set-out Line

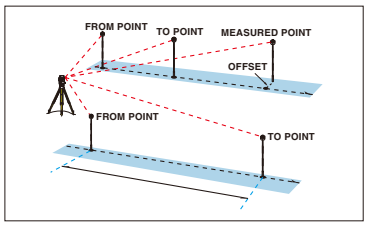
The Set-out line program is used for setting out and checking alignment of curb lines, construction boards and grades of pipes. A baseline or an offset from baseline can be defined.
When calculating the measuring point, it's possible to calculate and use the scaled down coefficient of the distance and surveyed value that was calculated using the known coordinate values of 2 points.

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.

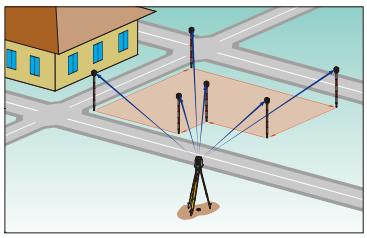
Point Projection

This program projects a point onto a line. It calculates the distance and offset of the point relative to the specified baseline, and it computes the coordinates of the intersection point, which can then be directly set out. Elevations are interpolated where possible.
When calculating the measuring point, it's possible to calculate and use the scaled down coefficient of the distance and surveyed value that was calculated using the known coordinate values of 2 points.



Set-out Line and Point Projection

Area Calculation



The Series30R can use measured points or stored data—up to 50 points in total—to calculate an area. Area calculations are made with 3D coordinates, so even sloped surfaces can be measured with ease and precision.

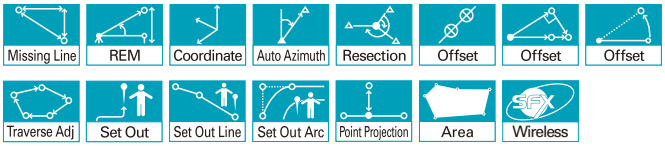
The ideal partner for data collectors

The Series30R's two-way communication capability brings out the full functionality of external data collectors. All operations, except for sighting, can be performed with a data collector.

Bluetooth®

The Series30R incorporates Bluetooth® wireless technology as a factory option to enable wireless communication with data collectors. Please consult your local Sokkia representative for option availability.

Bluetooth wireless technology is also available for the low temperature model of SET530R3



Standard accessories

BDC46A rechargeable battery: 2 pcs. (SET630R: 1 pc.) ● CDC68 quick charger with EDC113A/113B/113C power cable ● CP7 tubular compass ● Lens hood ● Lens cap ● Plumb bob ● Tool kit ● Wiping cloth ● Operator's manual ● Carrying case and shoulder strap

Optional accessories

SF14 wireless keyboard* ● GDL1 guide light unit (factory option) ● CF card unit* (factory option) ● BDC57 external Ni-MH battery (low-temperature compatible)*, EDC3A power cable for BDC57 (2m, low-temperature compatible)*, EDC7A power cable for BDC57 (0.5m, low-temperature compatible)*, CDC14 battery charger for BDC57* ● EDC2A AC power adapter (100 to 240V)* ● EDC14 external battery adapter*, EDC5 car battery cable for EDC14*, EDC4 car cigarette lighter cable for EDC14* ● OF3A solar filter ● DE25 diagonal eyepiece ● EL7 eyepiece (40x)* ● EL6 eyepiece for SET630R (30x) ● DOC46 printer cable ● DOC25 (25 pins, male), DOC26 (25 pins, female), DOC 27 (9 pins, female), DOC1 (w/o connector) interface cables ● LAP1 laser plummet ● ACE5 auto-collimation eyepiece ● 20"/2mm plate level for SET230R/230R3 (factory option) ● SC189 back pack

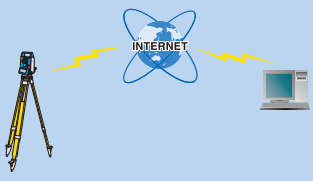
* Except SET630R

For more information, please consult your local sales representative.

Sokkia Field-info Xpress

Instantaneous data transfer between any worksite and your office.

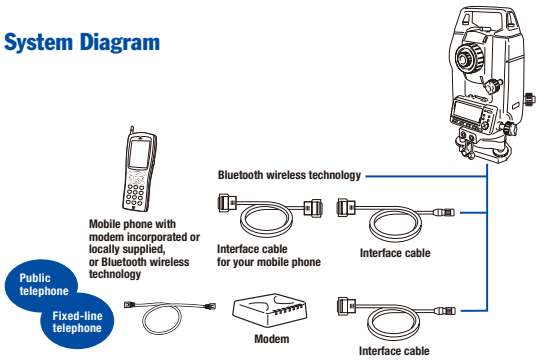
The Series30R can send surveyed data to a specified e-mail address or FTP server. It can also receive coordinate data for setting-out from your office computer or FTP server.



Just connect a mobile phone (and modem, if necessary) to the Series30R using the appropriate cables or ***Bluetooth*** wireless technology, establish an Internet connection, and select the job files. Multiple job files can be sent out simultaneously. Data should be in the SDR33 or SDR2x format. All SFX functions can be performed via the Series30R'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/or FTP server. Consult your local telecoms operator for proper equipment and connectivity requirements.

Series30R REFLECTORLESS TOTAL STATIONS

SET230R3 · SET330R3 · SET530R3 · SET230R · SET330R · SET530R · SET630R

SPECIFICATIONS

Model	SET230R3	SET330R3	SET530R3	SET230R	SET330R	SET530R	SET630R
Laser class*1	Class 3R Laser Product			Class 2 Laser Product			
Telescope	Fully transiting, coaxial sighting and distance measuring optics						
Magnification / Resolving power	30x / 2.5"						26x / 3.5"
Others	Length: 171mm (6.7in.), Objective aperture: 45mm (1.8in.) (EDM 48mm (1.9in.)), Image: Erect, Field of view: 1°30' (26m/1,000m), Minimum focus: 1.3m (4.3ft.), Reticle illumination: 5 brightness levels						
Angle measurement	Photoelectrical absolute encoder scanning, both circles adopt diametrical detection						
Unit / Display resolutions	Degree / Gon / Mil, selectable / 1" / 5", 0.2 / 1mgon, 0.005 / 0.02mil, selectable						
Accuracy (ISO17123-3:2001)	2" / 0.6mg / 0.01mil	3" / 1mg / 0.015mil	5" / 1.5mg / 0.025mil	2" / 0.6mg / 0.01mil	3" / 1mg / 0.015mil	5" / 1.5mg / 0.025mil	6" / 1.9mg / 0.03mil
Measuring time	0.5s or less, continuous						
Measurement mode	H: Clockwise / Counterclockwise, selectable; 0 set, Hold, Angle input, Repetition, available V: Zenith 0 / Horizontal 0 / Horizontal 0± / Slope in %, selectable						
Automatic dual-axis compensator	Dual-axis liquid tilt sensor, Working range: ±3' (±55mg)						
Collimation compensation	Yes / No, selectable						
Fine motion screws	2-speed motion	1-speed motion		2-speed motion	1-speed motion		
Distance measurement	Modulated laser, phase comparison method with red laser diode, coaxial optics						
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 / Display resolutions	meters / feet / feet-inches, selectable / Fine, Rapid single: 0.001m / 0.01ft. / 1/8in. Tracking: 0.01m / 0.1ft. / 1/2in.						
Measuring range (slope distance) — Reflectorless*2 (with Kodak Gray Card)	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)			0.3 to 150m (490ft.) (white side, 90% reflective)
With reflective sheet target*3/*8	RS90N-K: 1.3 to 500m (1,640ft.), RS50N-K: 1.3 to 300m (980ft.), RS10N-K: 1.3 to 100m (320ft.)						
With mini prisms	CP01: 1.3 to 800m (2,620ft.), OR1PA: 1.3 to 500m (1,640ft.)						
With 1 AP prism A*4	1.3 to 4,000m (13,120ft.)						1.3 to 3,000m (9,840ft.)
With 1 AP prism G*5	1.3 to 5,000m (16,400ft.)						1.3 to 4,000m (13,120ft.)
With 3 AP prisms A*4	to 5,000m (16,400ft.)						to 4,000m (13,120ft.)
With 3 AP prisms G*5	to 6,000m (19,680ft.)						to 5,000m (16,400ft.)
Accuracy (D=measuring distance, unit: mm) — Reflectorless*2/*6 (Fine mode)	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 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.): ±(3 + 2ppm x D)mm Over 100 to 150m (over 320 to 490ft.): ±(5 + 10ppm x D)mm
Reflectorless*2/*6 (Rapid single mode)	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.): ±(6 + 2ppm x D)mm Over 100 to 200m (over 320 to 650ft.): ±(8 + 10ppm x D)mm			0.3 to 100m (1 to 320ft.): ±(6 + 2ppm x D)mm Over 100 to 150m (over 320 to 490ft.): ±(8 + 10ppm x D)mm
With reflective sheet target	Fine: ±(3 + 2ppm x D)mm, Rapid single: ±(6 + 2ppm x D)mm						
With AP prism	Fine: ±(2 + 2ppm x D)mm, Rapid single: ±(5 + 2ppm x D)mm						
Measuring time — Fine mode / Rapid single / Tracking	Fine repeat: Every 0.9s (initial 1.7s) / Rapid single: 1.4s / Tracking: Every 0.3s (initial 1.4s)						
Measuring mode	Fine (single / repeat / average), Rapid (single), Tracking						
Atmospheric correction / Prism constant correction	Temperature / Pressure / ppm input, available / -99 to +99mm (1mm steps), 0 fixed in reflectorless mode						
Refraction & earth-curvature correction	YES (K=0.142 / 0.20) / NO, selectable						
Scale factor setting / Sea level correction	0.5 to 2.0 / Yes / No						
Data storage and transfer							
Data storage — Internal memory	Approx. 10,000 points						
CF memory card unit	Factory option, the 64MB CF card stores approx. 576,000-point data						n/a
Interface	Asynchronous serial RS-232C compatible, Baud rate 1,200 to 38,400bps / *Bluetooth* wireless communication is available as a factory option						
SFX wireless data transfer	Provided						
Printer output	Centronics compatible (with optional DOC46 printer cable)						
General							
Display / Keyboard	Alphanumeric/graphic dot matrix LCD, 192 x 80 dots, with backlight, with contrast adjustment / 4 soft keys and 11 keys						
Control panel location	On both faces						On one face
Wireless keyboard SF14	Optional						n/a
Laser-pointer function	ON (auto off in 5 minutes) / OFF, selectable (Does not work simultaneously with the Guide Light)						
Guide light GDL1	Factory option						
Sensitivity of levels — Plate level	30" / 2mm*7	30" / 2mm		30" / 2mm*7	30" / 2mm		40" / 2mm
Circular / Graphic	Circular level: 10' / 2mm / Graphic LCD level: 3' / outer circle						
Optical plummet / Tribrach	Image: Erect, Magnification: 3x, Minimum focus: 0.3m (0.98ft.) / Detachable						
Dust and water protection / Operating temperature	Conforms to IP66 (IEC 60529) / -20 to +50°C (-4 to +122°F)(-30 to +50°C (-22 to +122°F) with Low Temperature Models of SET530R3/530R)						
Instrument height / Size with handle and battery	236mm (9.3in.) from tribrach bottom / W 165 x D 171 x H 341 mm (W 6.5 x D 6.7 x H 13.5 in.)						
Weight with handle and battery	Approx. 5.4kg (12 lb.)						Approx. 5.3kg (11.6 lb.)
Power supply	7.2V DC						
BDC46A detachable Li-Ion rechargeable battery	2 BDC46A are included						1 BDC46A is included
Continuous use per battery at 25°C (77°F)	Approx. 7 hours (800 points) for single measurement every 30s, Approx. 8.5 hours for angle measurement only						
Recharging time at 25°C (77°F)	Within 2 hours with CDC68 standard quick charger						
BDC57 external Ni-MH battery (optional)							
Continuous use at 25°C (77°F)	Approx. 26 hours for single measurement every 30s Approx. 34.5 hours for angle measurement only			Approx. 27 hours for single measurement every 30s Approx. 36 hours for angle measurement only			n/a
Continuous use at -30°C (-22°F)	With Low Temperature Model of SET530R3: Approx. 22 hours for single measurement every 30s, Approx. 29 hours for angle measurement only With Low Temperature Model of SET530R: Approx. 22.5 hours for single measurement every 30s, Approx. 30 hours for angle measurement only						
Automatic power cut-off / Resume function	Auto-off time is selectable from 30, 15, 10, 5 minutes or none / On / Off selectable (backed up for approx. 1 week)						

*1 IEC 60825-1Amd.2: 2001 / FDA CDRH 21 CFR Part1040.10 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 At temperatures -30 to -20°C (-22 to -4°F) using the Low Temperature Models: 1.3 to 300m (980ft.) with RS90N-K, 1.3 to 180m (590ft.) with RS50N-K, 1.3 to 60m (190ft.) with RS10N-K.
*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 With Kodak Gray Card White Side (90% reflective).
*7 20" / 2mm plate level is available as a factory option for SET230R3 and SET230R. *8 When the beam's angle of incidence is within ±30° up and down / right and left in relation to the surface of the target.

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