Superior Range, Speed & Accuracy

EXPAND YOUR REACH WITH A 350m • 1,140ft. REFLECTORLESS RANGE
New advances with RED-tech EDM

Sokkia’s revolutionary digital signal processing technology, RED-tech, relies on a unique procedure for measurement beam analysis. Using an A/D converter, it simultaneously samples measuring signals in three different frequencies. Furthermore, RED-tech uses advanced software to calculate distances. As a result, RED-tech ensures that the calculation method most suited to the condition of the measuring beam is selected. It also is able to deliver greater accuracy, speed, and range.

And now, RED-tech has been further enhanced through the inclusion of improved optical and electronic components. Its new light emitting and receiving optics provide the ideal light path for capturing light with minimal loss. And its new highly tunable optical filter, which captures multiple samples of beams carrying the correct measurement information, gives you greater precision with difficult-to-measure objects. Thanks to these new components and its advanced technology, RED-tech EDM paves the way to unprecedented distance measurement possibilities.

Ultra-wide reflectorless measurement range

From extra-long distances to remarkably short ones, the Series130R offers accurate reflectorless measurement over a tremendous range of distances. The Series130R total stations feature an IEC/FDA Class 3R laser, and cover a range from 0.3m to 350m (1ft. to 1,140ft.). Models equipped with an IEC/FDA Class 2/II lasers are also available as a factory option. These have a reach of up to 150m (490ft.).

Distances based on use of the white side of a KODAK Gray Card.

Reflectorless measurement range and accuracy with a Kodak Gray Card

<table>
<thead>
<tr>
<th>Distance (m)</th>
<th>White side 90% reflective</th>
<th>Gray side 18% reflective</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3m (1ft.)</td>
<td>±(3 + 2ppm x D)mm</td>
<td>±(3 + 2mm x D)mm</td>
</tr>
<tr>
<td>100m (320ft.)</td>
<td>±(5 + 10ppm x D)mm</td>
<td>±(5 + 10mm x D)mm</td>
</tr>
<tr>
<td>200m (650ft.)</td>
<td>±(5 + 10ppm x D)mm</td>
<td>±(5 + 10mm x D)mm</td>
</tr>
<tr>
<td>350m (1,140ft.)</td>
<td>±(5 + 10ppm x D)mm</td>
<td>±(5 + 10mm x D)mm</td>
</tr>
</tbody>
</table>

Sokkia’s traditional optics

Sokkia’s traditional optics have never been more refined. Light is projected from the middle of an objective lens and received along its periphery. When combined with a narrow measuring beam, this design enables pinpoint measurement and is highly effective even with narrow objects. Furthermore, the new telescope provides an extremely bright and sharp sight.
Ultra-narrow visible laser for pinpoint accuracy

The Series130R 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 used as a convenient 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 (16,000ft.) 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 (1,600ft.) 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. ** 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 an IEC/FDA Class 1/1 laser. The Series130R 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.
Sokkia’s original absolute encoders

The Series130R total stations 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.

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 Series130R 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. 10,000 data points. Its multiple job file structure allows you to have 10 job files.

CompactFlash card unit (factory option)

A card drive for commercially available CF memory cards (Type I) can be added as an optional feature. With this card drive, your memory capacity becomes virtually unlimited. Approx. 72,000 data points can be stored on an 8MB card. Cards up to 128MB are supported.

Data and status checks at a glance

Each Series130R total station has a built-in control panel on both sides of its body. These control panels have a clearly visible 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. You can switch between reflectorless, prism, and reflective sheet target modes just by pressing the SFT key in sequence, and the icon of selected target is displayed on the LCD screen for easy confirmation.

Easy operation with alphanumeric keys, softkeys, and new direct keys

Alphanumeric keys (10 keys) are laid out for easy entry of point names, coordinate values, and other information. Softkey functions are freely assigned by users for their convenience. New direct keys allow on-the-fly access to "configuration", "electronic level" and "EDM returned signal check" screens.

Superior environmental protection

Featuring advanced protection against dust and water the Series130R total stations are able to withstand harsh environmental conditions (IP64 compliant).
Sokkia’s original and extremely compact FOF (Fiber made of Optical Filter material) sensors are mounted on two sides of Series130R 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 sensors

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 Series030R, Series30R, and Series10 total stations.

SF14 wireless keyboard (option)

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.

Guide Light Unit GDL2 (factory option)

The BDC35A Ni-MH battery* gives you 6.5 hours of continuous angle and distance measurement. The optional Ni-Cd battery (BDC40A) offers longer operation in low temperatures.

Two battery types: Ni-MH and Ni-Cd

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

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.
- **Missing Line Measurement (MLM)**
  At the touch of a key, the Series130R measures horizontal distance, slope distance, height difference and percentage of slope between two points.

- **Remote Elevation Measurement (REM)**
  The Series130R 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 Series130R 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 Series130R 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 Series130R 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 Series130R 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 Series130R automatically calculates the position of measuring points. First, measure a point on either side of the measuring point at the same distance from the Series130R instrument. Then sight the measuring point.

- **Two-Distance Offset**
  With the use of a 2RT500-K 2-point target, the Series130R 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 Series130R calculates the position of the measuring point in angles and distance, or in coordinate values.

- **Setting Out**
  The Series130R 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.

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.

Ideal partner for data collectors

The Series130R'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, so there is no need to touch the instrument itself.

Area Calculation

The Series130R can use measured points or stored data to calculate an area.

Standard accessories

- BDC35A rechargeable Ni-MH batteries (2 pcs.)
- CDC39/40/48 quick charger
- 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 (for Class 3R models only)

Optional accessories

- SF14 wireless keyboard
- Guide Light Unit GDL2 (factory option)
- SRRC3 CF card unit (factory option)
- CDC41 car cigar sockets charger
- BDC40A Ni-Cd battery
- BDC12 Ni-Cd large external battery
- EDC2A AC adaptor (100 to 240V)
- OF3A solar filter
- DE25 diagonal eyepiece
- DOC46 printer cable
- DOC25 (25 pins, male)
- DOC26 (25 pins, female)
- DOC27 (9 pins, female)
- DOC1 (w/o connector) interface cables
**Series 130R**

Reflectless Total Stations

**SPECIFICATIONS**

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**Model**

- **SET1130R**
- **SET2130R**
- **SET3130R**
- **SET4130R**

**Availability**

Standard models

**Laser class**

- E8T9A Class 3R Laser Product
- ECT9A Class 2 Laser Product

**Telescope**

- Fully traversing, coaxial sighting and distance measuring optics

**Angle measurement**

- Phosphorescent photoelectric encoder scanning. Both cycles adopt digital detection.

**Display resolutions (selectable)**

- 0.3 / 0.5 / 1.0 / 2.0 / 4.0 / 8.0 / 16.0 / 32.0 / 64.0 / 128.0 / 256.0 / 512.0 / 1024.0

**Accuracy**

- ±0.0001/0.0001, ±0.001/0.01, ±0.01/0.1, ±0.1/1.0 mm

**Measurement time**

- 0.5s or less, continuous

**Measurement mode**

- H: Stocking / Countertop, selectable, 0 set, Hold, Angle input, report; reproducible, available.

**Automatic dual-axis compensator**

- Automatic input for sensor, Working range: ± 1° (± 100"")

**Collimation compensation**

- 1°/0.1°, selectable

**Fine motion screws**

- Fire / Counter 2-speed motion

**Objective lens**

- Monocular laser phase comparison method with red laser diode, coaxial optics.

**Laser output**

- Reflectless mode: Class 3R equivalent (max. 5mW)
- Prism/mirror: Class 1 equivalent (max. 2.5mW)

**Unit**

- Meters / feet, selectable

**Measuring range (slope distance)**

- Reflectors: 1.3 to 4000m (13,120ft.), Under good conditions: 1.3 to 5000m (16,400ft.)
- (3 + 2ppm x D)mm

**With reflective sheet target**

- R300/2K: 1.3 to 500m (1640ft.), R200/3K: 1.3 to 300m (1000ft.), R100/7K: 1.3 to 100m (330ft.)

**With 1 AF prism**

- Under average conditions: 1.3 to 4000m (13,120ft.), Under good conditions: 1.3 to 5000m (16,400ft.)

**With 3 AF prisms**

- Under average conditions: 1.3 to 5000m (16,400ft.), Under good conditions: 6 to 9000m (19,600ft.)

**Display resolutions**

- Free mode: 0.0001/0.0001, 0.0001/0.001, 0.001/0.01, 0.01/0.1, 0.1/1.0, 1/10, 1/100, 1/1000, 1/10000

**Rapid single / Tracking**

- Rapid: single 0.005, 0.01, 0.05, 0.1, 0.5, 1.0, 5.0, 10.0, 100.0

**Measuring accuracy**

- O = Measuring distance, Unit: mm

- Reflectors: ±(1 + 2ppm x D)mm
- (Fine mode) ±(2 + 2ppm x D)mm

**With reflective sheet target**

- Reflectors: ±(2 + 2ppm x D)mm
- (Fine mode) ±(4 + 4ppm x D)mm

**With 1 AF prism**

- Reflectors: ±(2 + 2ppm x D)mm
- (Fine mode) ±(4 + 4ppm x D)mm

**With 3 AF prisms**

- Reflectors: ±(2 + 2ppm x D)mm
- (Fine mode) ±(4 + 4ppm x D)mm

**Measuring mode**

- Free: every 1.0s (use 2.0s), Single: every 2.0s

**Rapid single / Tracking**

- Rapid single 0.1s, Tracking: Every 0.3s or 1.6s

**Measuring accuracy (selectable)**

- Selectable, (average), Tracking, selectable

**Atmospheric correction / Prism constant correction**

- Temperature / Pressure / ppm input, available. / -99 to +99mm (1mm steps). 0 fixed in reflectorless mode.

**Position & earth-curvature correction**

- With reflective sheet target: 0.3 to 200m (1 to 650ft.), Over 200 to 350m (650 to 1140ft.)

**Measurement mode**

- Prism/Sheet mode: Class 1/I equivalent (max. 0.22mW)
- Reflectorless mode: Class 2/I equivalent (max. 0.39mW)

**Data storage and transfer**

- Approx. 10,000 points with max. 10 job files

**Memory card unit**

- SDSC card unit is available as a factory option.

**Scale factor setting**

- 0.3 to 3.0

**Interface**

- Asynchronous serial RS-232C compatible. Baud rate: 1200 to 38400bps

**Printer output**

- Centronics compatible (with optional DOC46 printer cable)

**Display**

- Alphanumeric/graphic dot matrix LCD, 160 x 80 dots, with backlight, with contrast adjustment, on both faces

**Keyboard**

- 4 softkeys, 3 direct keys, alphanumeric keys, total 31 keys on both faces

**Laser-pointer function**

- UK: 5.5x (9.2) / 10x (9.2) / 15x (9.2)

**Laser radiation indicator**

- Yes

**Special Light Unit (ULC)**

- Factory option

**Sensitivity of levels**

- Plate level: 20° / 3mm

**Circular / Graphic**

- Circular level: 10° / 2mm / Graphical LCD level: 3 / outer circle

**Optical plummet**

- Magnification: 3.5x

**Trichord**

- Durable

**Dust and water protection / Operating temperature**

- Conforms to IP64 (IEC 60529:1989) -20 to +50°C (-4 to +122°F)

**Tilt function**

- ±5° (max. tilt 5°)

**Power supply**

- 12V DC

**BOSSA detachable battery**

- Battery: 12V rechargeable battery, 3 BOSSA are included as standard accessories.

**Continuous use per battery**

- At 25°C (77°F): About 6 hours (about 4 hours) (single measurement every 10 seconds)

**Recharging time**

- 37 minutes per battery

**BOC12 external AC-DC battery (optional)**

- Continuous use at 25°C (77°F): about 25 hours (single measurement every 10 seconds), about 35 hours (single measurement)

**Automatic power cut-off**

- Auto-off time is selectable from 30, 15, 10, 5 minutes or none

**Resume function**

- Yes

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Set1130r - Set2130r - Set3130r - Set4130r - Set1130r - Set2130r - Set3130r - Set4130r

Set1130r: Standard models

E8T9A Class 3R Laser Product

Reflectless Total Stations

- Length: 171mm (6.7")
- Objective aperture: 45mm (1.8")
- Magnification: 30x, Resolving power: 2.5", Image: Erect, Field of view: 1°30' (26m/1000m)

- Maximum focus: 1.2m (48")
- Reflective glass: ± mark printed, Reflective Illumination: 5 brightness levels

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