

SETX

SOKKIA CLASSIC



SOKKIA



A New Epic to a Legacy of Breakthrough Technology

Far from home, in the most demanding worksites, you need to rely on toughness and accuracy to pull you through. In the middle of the desert, deep in the heart of the jungle, or on a windswept mountain top, new discoveries are made and new trails are blazed. This is what surveying is all about.

Nobody knows this like SOKKIA, which is why we made the SOKKIA CLASSIC SET X total station, a rugged partner in a journey into undiscovered territory.



SET X

SET1X, SET2X, SET3X, SET5X



■ RED-tech EX — High-precision Reflectorless EDM

RED-tech EX EDM provides pinpoint accuracy using an ultra-narrow red laser beam. It performs fast and stable reflectorless measurements up to 500m (1,640ft.) from the industry's shortest 30cm (1ft.) distance. Advanced digital signal processing technology offers greater reliability even under harsh environmental conditions.

Using prisms, RED-tech EX measures up to 10,000m (32,800ft.), and with convenient reflective sheet targets up to 500m (1,640ft.).



Distance	2m (6.6ft.)	10m (33ft.)	40m (131ft.)	100m (328ft.)	300m (984ft.)	500m (1,640ft.)
Beam spot size (height x width)	5 x 7mm (0.2 x 0.28in.)	7 x 9mm (0.28 x 0.35in.)	14 x 14mm (0.55 x 0.55in.)	29 x 24mm (1.14 x 0.95in.)	76 x 56mm (2.99 x 2.2in.)	123 x 89mm (4.84 x 3.5in.)

Measuring beam spot size (Reflectorless mode)

■ Single Optimized Beam

RED-tech EX uses only one visible red laser beam for measuring and pointing, allowing you to visually confirm the exact measurement point.

■ Advanced Angle Measurement System



All models are equipped with market-proven absolute encoders. Advanced coding and digital processing technologies provide long-term reliability in any work-site conditions. The 1" and 2" high-precision models incorporate IACS (Independent Angle Calibration System) to further enhance measurement reliability.

■ IP65 Environmental Protection

SET X offers the highest in environmental protection for Windows CE total stations. SET X has an IP65 rating, meaning it is able to withstand the harshest conditions in the most demanding jobsites. SET X maintains its IP65 rating even with the external battery connected.



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.





User-friendly Design

■ Ergonomic Handle

SET X features a redesigned ergonomic handle and new attachment mechanism. The handle facilitates a tight grip for use in severe conditions. The handle can be easily and quickly removed for vertical and near vertical measurements and securely reattached in a flash.



■ Bluetooth® Wireless Communications

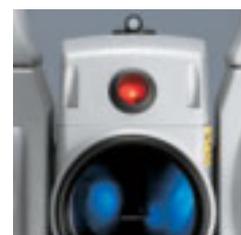
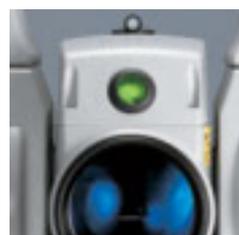


SET X features Class 1 *Bluetooth* wireless modem for license-free long range data communication of up to 200m (650ft.). Enjoy a wireless connection with your data collector or tablet PC for expanded data collection possibilities and seamless data handling.

Usage approval of *Bluetooth* wireless technology varies according to country. Please consult your local SOKKIA office or representative in advance.

■ Guide Light Unit

SET X comes standard with a guide light unit to assist in setting out measurements. The guide light unit consists of two different color LED's emitted from a single aperture. The lateral position of a prism can be easily determined at both long and short ranges. A special flashing pattern is also included to assist users with color weakness.

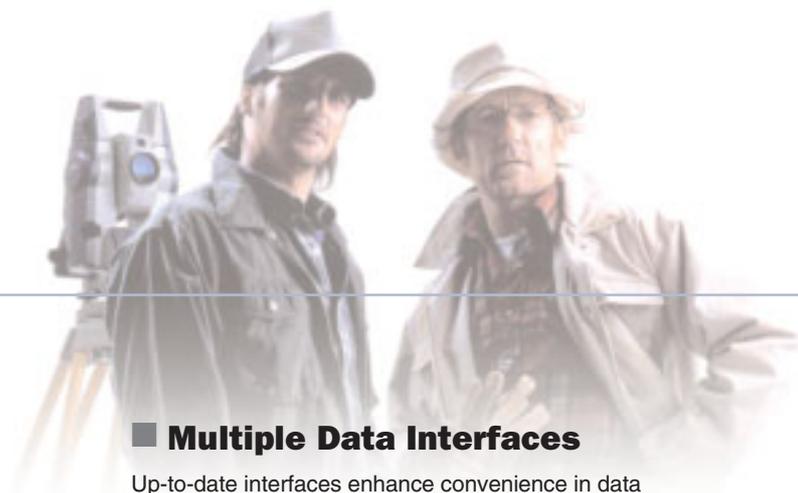


■ Color Display/Illuminated Keyboard

SET X has a color LCD touch screen display. The display has high angle visibility and subtle contrast for maximum visibility even in direct sunlight. The full alphanumeric keyboard has concave keys that can be easily pressed by hand or with the stylus and is illuminated to let you see what you are doing under any environmental condition.



An additional control panel on face 2 is available as a factory option.



■ Trigger Key

SET X features an ergonomically placed trigger key that greatly facilitates taking measurement while looking through the telescope and even while turning the fine motion screws. Measurement can be taken at any time with just the push of a button.



■ Rechargeable Li-ion Battery

SET X offers a flexible power system to support long hours in the field. SET X comes standard with 2 BDC58 rechargeable Li-ion batteries. Each standard accessory battery provides 14 hours of operational time for a total of 28 hours of battery life. The optionally available BDC61 external battery offers an astounding 38.5 hours of operation. The combination of the two provides enough power to work for a week without having to stop and recharge. SET X has no problem measuring long hours on remote jobsites.

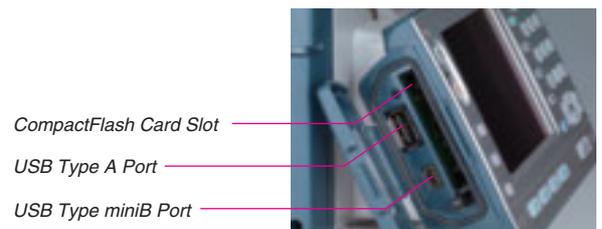


A BDC46B battery can also be used with the provided SB178 adapter.



■ Multiple Data Interfaces

Up-to-date interfaces enhance convenience in data storage and transmission.



CompactFlash Card Slot

CF cards (Type II, 3.3V, max. 4GB), SD cards (with CF adapter, max. 1GB) and CF type modems are supported.

USB Port

Up to 4GB USB flash memory (FAT32 format) is supported. A USB card reader can be used to further broaden media usability.

SFX

SFX technology enables data transfer via e-mail to and from anywhere in the world using an Internet-capable mobile phone or a CompactFlash modem.



Weatherproof Multi Port

Data transmission and external power connection are available in a single weatherproof port. The port boasts an environmental rating of IP65 with a cable connected.



Standard Accessories

BDC58 rechargeable Li-ion batteries (2 pcs.) ● CDC68 charger with EDC113A/113B/113C AC power cable ● SB178 battery adapter for BDC46B batteries ● Stylus (2 pcs.) ● CP9 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 ● Protective film (for LCD screen) and manual

Optional Accessories

For more information, please consult your local sales representative.

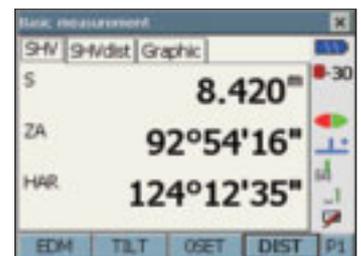
SDR Onboard Software adds a New Dimension

■ SDR Program

Built on knowledge from surveyors and previous generations of SDR electronic fieldbooks, the SET X SDR program is Windows CE-based data collection software that increases functionality by providing powerful surveying programs with an easy-to-follow workflow, customizable settings and a graphic interface. SDR program offers a full range of job file handling capacity, customizable feature code lists with point-sorting capabilities and the ability to export data with industry standard formats.

■ Status Bar

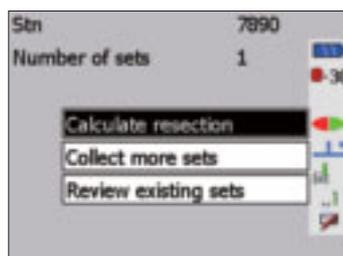
The status bar constantly displays the status of the instrument. Select and configure instrument settings at any time with just a touch of your finger or using the stylus. Battery life, target type, measurement mode and tilt are just a few of the many options that can be seen at a glance.



■ BASIC

In Basic mode, SET X has the functionality to take basic measurements.

- Coordinate Measurement
- Remote Elevation Measurement
- Surface Area Calculation
- Setting Out
- Missing Line Measurement
- Offset Measurement
- Resection

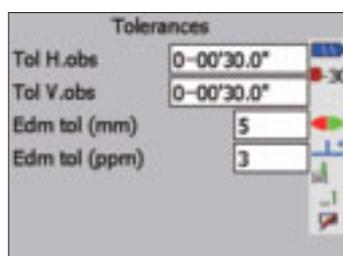


Resection

Resection uses least squares adjustment techniques to determine the coordinates of an unknown instrument point.

■ FUNC

The Functions menu option is used to set up and start a survey job and controls SDR program settings.



Tolerances

Specify the required tolerances. SET X checks observations for consistency and notifies you of measurements that exceed the set tolerances.

on to Traditional Wisdom



■ SURV

The Survey menu provides the programs frequently used in the field for data collection.

- Topography
- Traverse Adjustment
- Resection
- Set Collection
- Set Review
- Building Face Survey
- Collimation
- Remote Elevation
- Keyboard Input

Traverse Adjustment

Traverse adjustment allows you to specify a sequence of stations through which a traverse can be calculated and adjusted. Observations do not need to be in order of the traverse route.

Traverse precision	
Δ Ang	0-00'01.0"
Δ Dist	0.120
Precision	825059
Δ North	0.100
Δ East	0.020
Δ Elev	0.000

Adjust Store Option

■ COGO

COGO performs coordinate geometry calculations and setting out field work, dramatically increasing productivity for construction and civil engineering applications.

- Set Out Coords
- Set Out Line
- Set Out Arc
- Resection
- Inverse
- Areas
- Intersections
- Point Projection
- Taping from Baseline
- Transformation
- Keyboard Input

Set Out Arc

Set Out Arc provides an arc calculator to define curves from almost any combination of parameters. Points along the arc can be coordinated and directly set out.

Define arc	
Direction	Left
From	1000
To pt	1001
Center	1002
Radius	13.074
Angle	44°58'17"

■ ROAD

Roading is a comprehensive solution that provides powerful programs for road construction.

- Select Road
- Set Out Road
- Set Out Road Surface
- Road Topo
- Cross-Section Survey
- Define Road
- Review Road
- Define Template
- Review Template

Road Topo

Perform a topographical survey relative to a defined road.

Road	
Cd	Road
Pt	1015
Sta.ing	0+000.144
Offset	-0.144
N	0.204
E	0.000
EI	-0.109

Model		SET1X	SET2X	SET3X	SET5X
Telescope		Fully transiting, coaxial sighting and distance measuring optics Length: 173mm (6.8in.), 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", 0.0001 / 0.0002gon, 0.002 / 0.005mil			
Accuracy (ISO 17123-3:2001)		1" / 0.3mg / 0.005mil		2" / 0.6mg / 0.01mil	
IACS (Independent Angle Calibration System)		Provided		n/a	
Measurement mode		H: Clockwise / Counterclockwise, selectable. V: Zenith 0 / Horizontal 0 / Horizontal 0±90° / Slope in %, selectable			
Automatic dual-axis compensator		Dual-axis liquid tilt sensor, Working range: ±4' (±74 mg)			
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)			
Unit		Meters / feet / US feet, selectable			
Measuring range (slope distance)		Reflectorless*1 (using Kodak Gray Card) 0.3 to 500m (1 to 1,640ft.) (White side, 90% reflective) 0.3 to 250m (1 to 820ft.) (Gray side, 18% reflective) With reflective sheet target*2 RS90N-K: 1.3 to 500m (4.3 to 1,640ft.) With mini prisms Under average conditions*3: w/ CP01: 1.3 to 2,500m (4.3 to 8,200ft.), w/OR1PA: 1.3 to 500m (4.3 to 1,640ft.) With 1 AP prism Under average conditions*3: 1.3 to 5,000m (4.3 to 16,400ft.), Under good conditions*4: 1.3 to 6,000m (4.3 to 19,680ft.) With 3 AP prisms Under average conditions*3: to 8,000m (to 26,240ft.), Under good conditions*4: to 10,000m (to 32,800ft.)			
Display resolutions		Fine mode 0.0001 / 0.001m (0.001 / 0.01ft.)		0.001m (0.01ft.)	
Accuracy (ISO 17123-4:2001) (D-measuring distance, unit:mm)		Reflectorless*1 (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 Over 350 to 500m (over 1,140 to 1,640ft.): (10 + 10ppm x D)mm		Reflectorless*1 (Rapid 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 Over 350 to 500m (over 1,140 to 1,640ft.): (15 + 10ppm x D)mm	
		With reflective sheet target*2 Fine: (3+2ppm x D)mm, Rapid: (6+2ppm x D)mm			
		With prism Fine mode (2+2ppm x D)mm			
		With CPS12 precision prism system (1.5+2ppm x D)mm		n/a	
		With prism Rapid mode (5+2ppm x D)mm			
Measuring time		Fine mode / Rapid / Tracking 0.9s (initial 1.5s) / 0.6s (initial 1.3s) / 0.4s (initial 1.3s)			
Measuring mode		Fine (single, repeat, average), Rapid (single, repeat), 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			
OS, data storage and transfer					
Operating system / Application		Microsoft Windows CE / SDR Data Collection Software			
Data storage		Internal memory 64MB (More than 1MB available for data) Memory card drive Support up to 4GB CF Type II (3.3V only), SD card (max. 1GB) with CF type adapter, USB flash memory up to 4GB (FAT32 format)			
Interface		Asynchronous serial RS232C compatible, Baud rate 1,200 to 38,400bps USB1.1 Type A and Type miniB			
Bluetooth wireless modem*5		Class 1, Ver.2.0 + EDR. Operating range: up to 200m (650ft.)			
SFX data transfer		Provided			
General					
Display		3.5in. Transreflective TFT QVGA color LCD on single face (Face 1) with backlight (Bright / Dim selectable), 324x240 dots (active area: 72.5mm x 49.5mm), touch screen, 2nd control panel on Face 2 is a factory option.			
Keyboard		Alphanumeric, 32 keys with backlight			
Laser-pointer function		ON / Auto Off in 1/5/10/30 minutes / OFF, selectable. (does not work simultaneously with the Guide Light)			
Guide Light		Two color LEDs, single aperture, Class 1 LED product. Operating range: 1.3 to 150m (4.3 to 490ft.)			
Sensitivity of levels		Plate level 20" / 2mm		30" / 2mm	
		Circular / Graphic Circular level: 10" / 2mm / Graphic LCD level: ±4.5' (±81mgon, ±1.35mil) / outer circle			
Optical plummet		Magnification 5.5x		3x	
Tribrach		Detachable			
Dust and water protection / Operating temperature		IP65 (IEC 60529:2001) / -20 to +50°C (-4 to +122°F)			
Instrument height / Size with handle and battery		236mm (9.3in.) from tribrach bottom / W 201 x D 202 x H 375 mm (W 8.0 x D 8.0 x H 14.8in.)			
Weight with handle and battery		Approx. 6.9kg (15.2lb.), With optional F2 control panel: approx. 7.1kg (15.7lb.)			
Power supply		7.2 to 12V DC			
Battery		BDC58 (standard) Li-ion rechargeable battery (4.3Ah, 2pcs. included standard) BDC46B (optional) Li-ion rechargeable battery (2.45Ah) (Use with the SB178 adapter included as a standard accessory) External batteries (optional) Ni-MH rechargeable battery, BDC60 (6.5Ah), BDC61 (13Ah)			
Operating time at 20°C (68°F) (single measurement every 30 seconds)		BDC58 Approx. 14 hours BDC46B Approx. 6.5 hours External batteries (optional) BDC60: approx. 19 hours, BDC61: approx. 38.5 hours.			
Automatic power cut-off		5/10/15/30 minutes after operation / Off, selectable			

Laser Class 3R conforms to: IEC 60825-1 Amd.2: 2001 / FDA CDRH 21 CFR Part 1040.10 and 1040.11

*1 With Kodak Gray Card white side (90% reflective). Reflectorless range/accuracy may vary according to measuring objects, observation situations and environmental conditions.

*2 When the beam's incidence angle is within 30° in relation to the reflective sheet target.

*3 Average conditions: Slight haze, visibility about 20km (12 miles), sunny periods, weak scintillation.

*4 Good conditions: No haze, visibility about 40km (25 miles), overcast, no scintillation.

*5 Usage approval of Bluetooth wireless technology varies according to country. Please consult your local SOKKIA office or representative in advance.

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