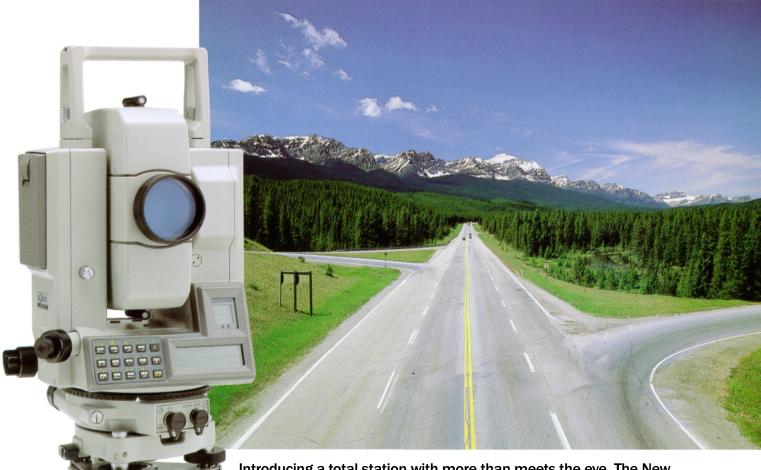


# SET2B SET3B SET4B

SERIES B TOTAL STATIONS
SET2BII • SET3BII • SET4BII
with BDC25 type battery



Introducing a total station with more than meets the eye. The New SERIES B Total Stations maintain the outstanding construction and operational simplicity characteristic of Sokkia surveying instruments, while incorporating major new features which add up to dramatically increased productivity. SERIES B now provides software for Offset and Resection measurements and boasts an internal memory for prestoring up to 100 sets of coordinate data for as long as a week. The powerful on-board battery now supports up to 2,600 measurements on a single charge, and the contrast of the LCD can be adjusted in six steps to clearly display readings under any lighting condition. The new SERIES B carries on the Sokkia tradition of providing the best combination of features at the best price to take on every surveying need. Simplicity outside, sophistication inside, quality throughout ...that's Sokkia.

# RELIABLE HARDWARE

From the detachable handle down to the detachable tribrach, the new SERIES B Total Station maintains the same ruggedness and dependability surveyors have come to expect from the SERIES B instruments along with some added extras.

# SET2B

Accuracy to 2" (0.6 mgon) and distance measurement up to 3,500 m (11,400 ft.) using 3 prisms.

## SET3B

Accuracy to 3" (1 mgon) and distance measurement up to 3,300 m (10,800 fit) using 3 prisms.

# SET4B

Accuracy to 5" (1.5 mgon) and distance measurement up to 2,100 m (6,900 ft.) using 3 prisms.

# 1 Telescope

Coaxial telescope (30x) and distance meter optics provide a single line of sight for optimum observation and measurement. EDM/ telescope module rotates completely for readings in both positions.

# 2 Optical plummet

Centering over the surveying point is made easy with the optical plummet (3x).

#### 3 Battery

Powerful yet portable, the two compact rechargeable batteries provided with the instrument each support up to 2,600 measurements in the field. An auto power off and remaining power indicator function let you know when it is time to pull the second battery out of your shirt pocket.



# 4 RS-232C

Connection with a personal computer or an SDR Electronic Field Book is facilitated by an RS-232C interface port, which is located in the base so that the instrument can be rotated without cable interference. The instrument also features an extensive two-way communication function for complete control over instrument operations, permitting the development of customized applications.





#### 5 Detachable Tribrach

The rugged detachable tribrach reduces set-up time during traverse work by enabling the SERIES B to be easily removed and mounted on another tripod.



# SET28

# 7 Angle measurement

Dual-axis compensator detects deviation of the standing axis from perpendicular in both sighting and trunnion directions and automatically corrects angle readings. The detected X and Y inclinations can be simultaneously displayed for extremely precise levelling without having to rotate the instrument. Precision engineered vertical and horizontal circles and axes provide exceptionally accurate angle readings.



**Dual axis compensator** 



**Vertical axis** 



**Horizontal circle** 





# 8 Smooth stable sighting

Both vertical and horizontal motion assemblies have coaxial fine motion knobs and wing clamps for optimum motion control. Horizontal and vertical fine motion screws feature two-speed adjustment for precise sighting (SET2B, 3B only). Slide cover on lower horizontal wing clamp prevents accidental movement of horizontal circle.

# 9 Distance measurement

Precise distance measurement is accomplished through the built-in EDM which now supports both coarse and fine measurement to 1 mm (0.01 ft.). The modulated triple frequency infrared beam provides faster measurement. After the first measurement, fine measurement values are updated every 3.2 seconds and coarse measurement every 0.7 seconds. Tracking measurement is updated every 0.3 seconds.



# 6 Control panel

A complete user-friendly control panel, including keyboard and dual LCDs on each instrument face. LCD features six-step contrast adjustment and nonreflective glass. Simplified keyboard for easy operation.

# ERROR FREE MEASUREMENTS

A complete array of onboard software and automatic correction functions make SERIES B the ideal solution for your surveying needs.

# **Angle measurement**

# **Automatic circle indexing**

• Simply rotate the alidade to index the horizontal circle and fully transit the telescope module to index the vertical circle, and then implement desired measurement function.

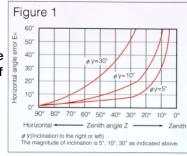
# **Measuring mode**

- **Horizontal:** Select Clockwise, Counterclockwise. Circle can be set to zero or required value by keyboard input.
- **Vertical:** Select Zenith angle, Vertical angle, or Height angle.
- Tilt: Tilt angle can be displayed to allow precise levelling of the instrument without rotation.

## Automatic correction

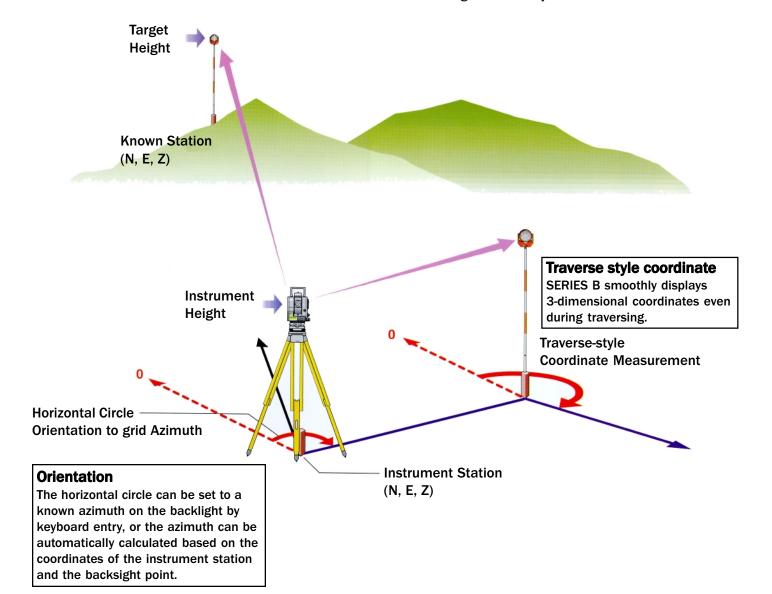
Dual-axis compensator:

 A dual-axis liquid
 compensator with a range of +3' detects deviation of the standing axis from perpendicular in both sighting and trunnion directions and automatically applies the



necessary correction to angle readings (Figure 1).

- Collimation: Onboard software automatically calculates and corrects collimation error between the reticle center and the line of sight.
- **O point error:** The zero point error in the vertical circle and the tilt sensor can be eliminated for angle measurement of the highest accuracy.



# **Distance measurement**

# **Measuring mode**

- Fine, coarse, tracking: Three modes of measurement to suit all your surveying needs.
- **Slope reduction:** Horizontal distance and height difference are automatically calculated based on measured slope distance.
- **3-D coordinates:** SERIES B quickly measures and displays the 3-dimensional coordinates (NEZ) of the target points in the field. Coordinates can be displayed to 10 digits (9,999,999.999 m or 9,999,999.99 ft.) in either NEZ or ENZ format.

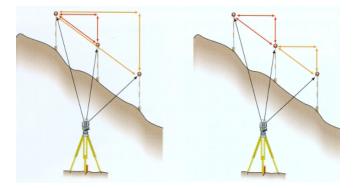
#### **Automatic correction**

- Atmospheric correction: Correction for temperature, pressure, and relative humidity conditions.
- Earth curvature and refraction correction: Automatically applied or ignored depending on instrument parameter setting.
- Prism constant: Adjustment within +99 to -99 in 1 mm steps to accommodate use of a variety of prism types.
- Beam intensity: Intensity of the EDM beam is automatically adjusted to ensure consistently accurate measurement.

# SPECIAL MEASUREMENTS

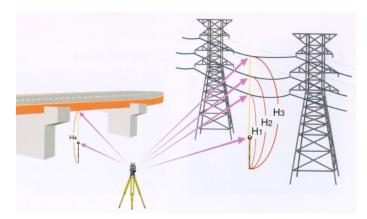
# Missing line

Measurement of horizontal, slope, and height distance between starting prism and a series of subsequently selected prisms from a single instrument station.



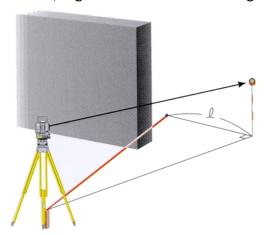
# **REM**

SERIES B can easily determine the height of a point where a prism cannot be directly placed by simply sighting a prism directly over or under the point and then sighting the point itself.



# Offset 1

Determine distance, angle, and coordinates of a point where a prism cannot be set by sighting a second prism (offset point) at a location the same distance away from the instrument station. Inputting the distance between the offset point and the target point facilitates calculation of the distance, angle and coordinates of the target point.



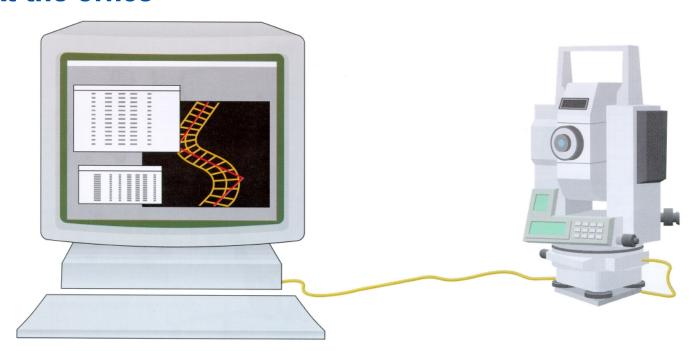
# Offset 2

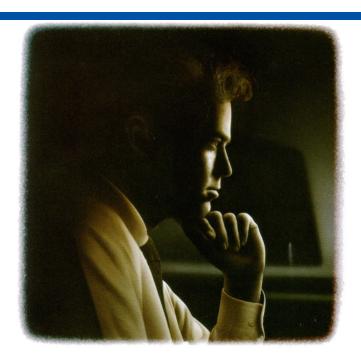
Distance, angle, and coordinates of the target point are calculated based on the angle measurement between the target point and the measured offset point.



# SURVEYING FOR ROAD CONSTRUCTION

# At the office





# **Designing**

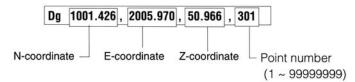
Designing road construction and ensuring accurate implementation has never been more efficient. Coordinate values determined by road designing software at the office can be directly input and

stored in the internal memory of the new SERIES B Total Station. Up to 100 sets of coordinate data can be prestored in the instrument at the office for accurate transfer of stakeout data for use in the field.

# Two options for inputting coordinates:

Predetermined coordinates can be entered by keyboard input or directly from a data storage source (e.g., personal computer) via the two-way communication function. More than 40 commands (in ASCII code) are available through the extensive two-way communication function, allowing a complete exchange of data between the instrument and an external device. The instrument can be operated by an external computer, including the selection and implementation of measurement modes and functions.

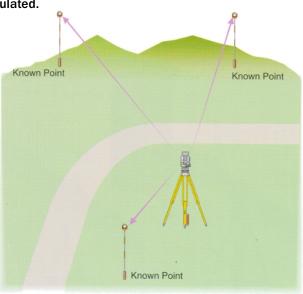
# **Command (Coordinate data input to memory)**



# In the field

# Resection

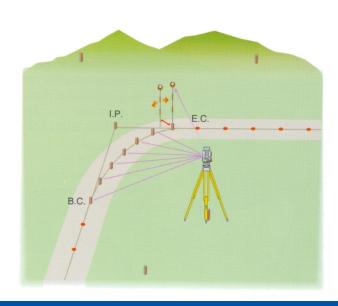
By observing from two to five known points, the new SERIES B can calculate instrument station coordinates based on either angle and distance (at least two known points) or angle alone (at least three known points). Set up the instrument to facilitate observation of the known points and recall the coordinate data for those points from the built-in memory. Sight the required minimum number of known points and the instrument coordinates will be automatically calculated.



# **Setting out**

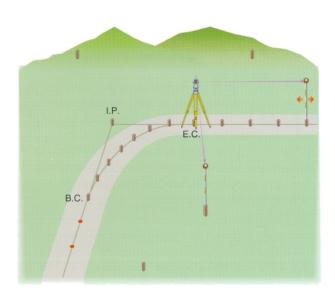
Once the instrument coordinates are known, set the horizontal circle reading to grid azimuth using a backlight point.

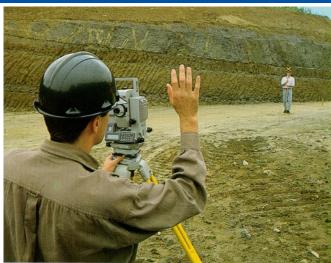
Next, recall the coordinates to be set out from the internal memory. SERIES B automatically calculates the setting-out azimuth and horizontal distance values from the instrument station point to the point to be set out.



# Move the instrument

When it is time to move the instrument to complete the task, relocate to an area from which a sufficient number of known stations can be sighted to determine the new instrument station coordinates. The new instrument station coordinates can also be determined by traverse-style coordinate measurement.

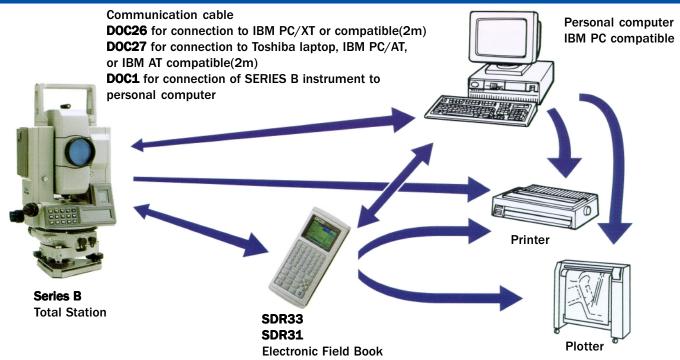






# **COMMUNICATIONS**

# **Diagram of communication system**



# **Electronic Field Book SDR33 • SDR31**



Two models—Standard and Expert—are available to fit the specific surveying task. The software functions of both models—supporting such specialized measurement tasks as Setting out, Resection, and Road cross-section—are readily implemented by separate alphanumeric keys and grouped cursor keys for faster inputting. The Expert model is specifically designed for road construction surveying. The Electronic Field Book units combine ergonomic considerations with resistance to weather and impact to provide an optimum integration of rugged durability with ease of use.

# **Software**



The Sokkia Comms Plus program is an easy-to-use, fast and effective software package that enables the direct exchange of data between an SDR33 Electronic Field Book and a personal computer (IBM PC compatible). Sokkia Comms Plus also features a user-friendly Windows™ style environment, optional mouse control, full file editing capability, and an on-board Help function to make working with the program easy and efficient.

# **SPECIFICATIONS**

# SET2B, SET3B, and SET4B Specifications

			SET2B	SET3B	SET4B	
Telescope				and receiving optics integrated in the theo		
Length			177 mm (7 in)		170 mm (6 7 in)	
Objective aperture			Sighting: 45 mm (1.8 in), EDM: 50 mm (2	in)	45 mm (1.8 in)	
Magnification, Image			30x, Erect			
Resolving power			3"			
Field of view [at 1,000 r	m]		1°30'[26 m]			
Minimum focus  Peticle illumination			1.3 m (4.3 ft.)			
Reticle illumination Angle measurement			Built-in (Bright/Dim, selectable)	uning Both circles adont diametrical detection	on and are provided with absolute 0 index points	
Display resolution				g. 20th on 010 adupt didifferrical detection	and are provided with absolute of fluex politics	
Angle unit	H&V		360° sexagesimal, or 400 gon, selectable	•		
Accuracy (Standard dev	iation of mean of a measurement tak	ken in	position I and 11, according to DIN 18723)			
-	H&V		2" (0.6 mgon)	3" (1 mgon)	5"(1.5 mgon)	
Measuring time	H&V		Less than 0 5 seconds, continuous	(III		
Automatic dual-axis lev	el compensator		ON/OFF selectable, Type: Dual-axis liquid	tilt sensor. Range: ±3″(±55 mgon), of display resolution, Out-of -range warning	6 Massaga displayed	
Display mode	Н			or display resolution, out-or-range warning accumulation*, selectable; 0 set, Hold* ava		
Diopiny mone	V			rizontal 0), Height angle (Horizontal 0±), se		
Distance measurement	t		Electro-optical with modulated infrared lig			
Range(Slope distance)		A. Average conditions: slight haze, visibility about 20 km (12 miles), sunny periods, weak scintillation				
				t 40 km (25 miles), overcast, no scintillation		
with CP01 compact pris	sm	Α.	1.3m(4.3 ft.)~800m(2,600 ft.)	1.3m(4.3 ft.)~700m(2,300 ft.)	1.3m(4.3 ft.)~600m(1.900 ft.)	
with one AP01 prism		A.	1.3m(4.3ft.)~2,400m(7,800 ft.)	1.3m(4.3ft.)~2,200m(7,200 ft.)	1.3m(4.3ft.)~1,200m(3.900ft.)	
with three AP01 prisms	•	G. A.	1.3m(4.3 ft.)~2,700m(8,800 ft.) 1.3m(4.3 ft.)~3,100m(10,100 ft.)	1.3m(4.3 ft.)~2,500m(8,200 ft.) 1.3m(4.3 ft.)~2,900m(9,500 ft.)	1.3m(4.3 ft.)~1,500m(4,900 ft.) 1.3m(4.3 ft.)~1,700m(5,500 ft.)	
ar anocza oz prisitis	•	G.	1.3m(4.3 ft.)~3,500m(11,400 ft.)	1.3m(4.3 ft.)~2,900m(9,500 ft.)	1.3m(4.3 ft.)~2,100m(6,900 ft.)	
with nine AP01 prisms		Α.	1.3m(4.3 ft.)~3,700m(12,100 ft.)	1.3m(4.3 ft.)~3,500m(11,400 ft.)	1.3m(4.3 ft.)~2,200m(7,200 ft.)	
•		G.	1.3m(4.3 ft.)~4,200m(13,700 ft.)	1.3m(4.3 ft.)~4,000m(13,000 ft.)	1.3m(4.3 ft.)~2,800m(9,200 ft.)	
			Maximum range is achieved by using Sokkia CP01 Compact prism and AP prism system.			
Display resolution				(0.01 ft.) Tracking measurement: 0.01 m (	0.1 ft.)	
Distance unit	Financia		Meters or Feet, selectable by parameter s		1/F12VD\	
Accuracy	Fine measurement Coarse measurement		±(3+2ppmXD)mm ±(5+5ppmXD)mm	±(3+3ppmXD)mm (D=measuring distance in mm)	±(5+3ppmXD)mm	
Measuring time	Fine measurement		every 3.2 sec. (initial meas. 4.7 sec.)	(D-measuring distance in min)		
mousumg umo	Coarse measurement		every 0.7 sec. (initial meas. 1.7 sec.)			
	Tracking measurement		every 0.3 sec. (initial meas. 1.8 sec.)			
Modulation frequencies			3 frequencies			
Unambiguous measurir			9,999.999m (32,808.33 ft.)			
Atmospheric	Input range			and applied by keying in temperature (°C	· ·	
correction	PPM range		-499 to +499 ppm (1 ppm steps)	e range of -30°C to +60°C and 500 mb to	1,400 mb	
Prism constant correction	<del>-</del>		-99 to +99 mm (1 mm steps)			
Refraction & Earth-curvature correction		` .,	eric refraction constant "K" is selectable ei	ther 0.142 or 0.20 when		
			the correction is applied			
Audio target acquisition	1		ON/OFF selectable			
General						
Display unit			Four alphanumeric (dot matrix) LCDs with	built-in illumination ain display (16 characters x 3 lines) on eac	h face	
				9,999.999m to 9,999,999.999m (-9,999,		
			,	nd measuring mode) is always shown on e		
Keyboard			15 latex keys on each face, control all fun		· · · · · · · · · · · · · · · · · · ·	
			Range of value to be entered: -9,999,999.	999m to 9,999,999.999m (-9,999,999.99	ft. to 9,999,999.99 ft.)	
			Range of point to be entered: 1 to 999999			
				ered for each code: available characters a	re 0 to 9, A to Z,	
			([space]), (. [period), (-[hyphen]), (& [ampe	ersandj)		
Sensitivity of levels	Plate level		Note: up to 20 characters long 20"/2mm	30"/2mm		
	Circular level		10'/2 mm (in tribrach)	, <del></del>		
Optical plummet			In alidade, Image: Erect, Magnification: 3x	, Minimum focus: 0.1m (0.33 ft.)		
Standing axis			Double			
Self-diagnostic function	1		Messages/codes displayed			
Battery check display	·		Codes/message displayed	table		
Automatic power cut-of Data storage	Onboard		30 minutes after operation, ON/OFF select 100 coordinate data can be stored in an in			
Data Storage	External		Connect an external device (e.g., SDR Elec			
Interface			Asynchronous serial, RS-232C compatible			
			Checksum: Yes/No, Parity: No/Even, selection			
Operating temperature			-20°Cto+50°C(-4°Fto+122°F)			
Tilting / Trunnion axis he			236 mm (9.3 in) from tribrach bottom, 19		W460 v D470 v H274 foods have the H2000	
Size with handle and BDC25			W168 x D177 x H371 [w/o handle, H: 330	=	W168 x D170 x H371 [w/o handle, H:330]mm	
Weight with handle and	IBDC25		(W6.6 x D7.0 x H14.6 [w/o handle, H: 13.0 7.4 kg (16.3 lbs); BDC25 battery: 235g (8.0 kg)		(W6.6 x D6.7 x H14.6 [w/o handle, H: 13.0] in) 7.3 kg (16.1 lbs)	
Operating voltage	. 25020		6V DC	0 02), Hallaid. 2005 (1 02),	1.0 ng (10.1 ib3)	
Power supplies						
BDC25 Rechargeable b			Ni-Cd, 2 supplied			
Continuous use at 25°	C(77°F)			mode: about 2,500 to 2,600 measuremer		
Charging time	a shanwa shi a ha O a a			ours with optional CDC11 series charger, 8	30 min. with optional CDC29 charger	
BDC12 Large external r			Ni-Cd, plugs into base by EDC3 cable, opti		onts (Coarso and single mass)	
Continuous use at 25° Charging time	O(II F)		15 hours with optional CDC14 series char	node: about 12,500 to 13,000 measurem	ents (Coarse and Siligle Meas.)	
Specifications not liste	an undar enacific instruments are id	antic	at to those appearing to the left		*Available only with version A type instrument	

# **ACCESSORIES**

# SET2B, SET3B, and SET4B Total Stations Standard equipment:

Main unit with WA-type tribrach, two BDC25 Rechargeable batteries, EDC19 Battery charging adapter, CDC27 or CDC31 Quick charger, CP7 Tubular compass, Sunshade, Lens cap, Plumb bob, Vinyl cover, Tool kit, Operator's manual, Two-way communication manual, Field guide and Carrying case.

A complete range of components, including reflecting prisms, traversing equipment, tripods, optional power supplies, and electronic Field books, is available to suit any application or field condition. These systems are compatible with other Sokkia instruments. For more detailed information, please ask your distributor for individual product brochures or for our complete general catalogue.

A complete range of components and accessories:



APS11 P APS12+PFW1B(Tripod) APS12 Single tilting prism complete with coaxial target APS11 Single tilting prism complete with sighting pole APS33 Triple stationary prism complete with coaxial target **APS31** Triple stationary prism complete with sighting pole APS34 Triple tilting prism complete with coaxial target **APS32** Triple tilting prism complete with sighting pole

APS11P Range pole prism complete (single, tilting) APS12P Range pole prism complete (single, double yoke tilting)

**CPS11P** Compact prism complete (single, tilting)



Soft case **SC67** Soft case can hold APS12 or APS 11 sets.





Hardwood telescopic tripod. head screw: 5/8 in. dia. PFG3 Hardwood/fiberglass telescopic aluminum frame, weathertripod, head screw: 5/8 in. dia.

**Backpack** 



**SC84** Designed for both comfort and rugged performance, the SC84 features an proof hyperon exterior, and polyethylene foam padding to protect the instrument.

#### **Tribrach**



**APS91** Nine prism complete

WOA Detachable tribrach fitted with optical plummet.

#### Diagonal eyepiece



Diagonal evepiece allows sighting at steep angles up to zenith.

# **Objective solar filters**

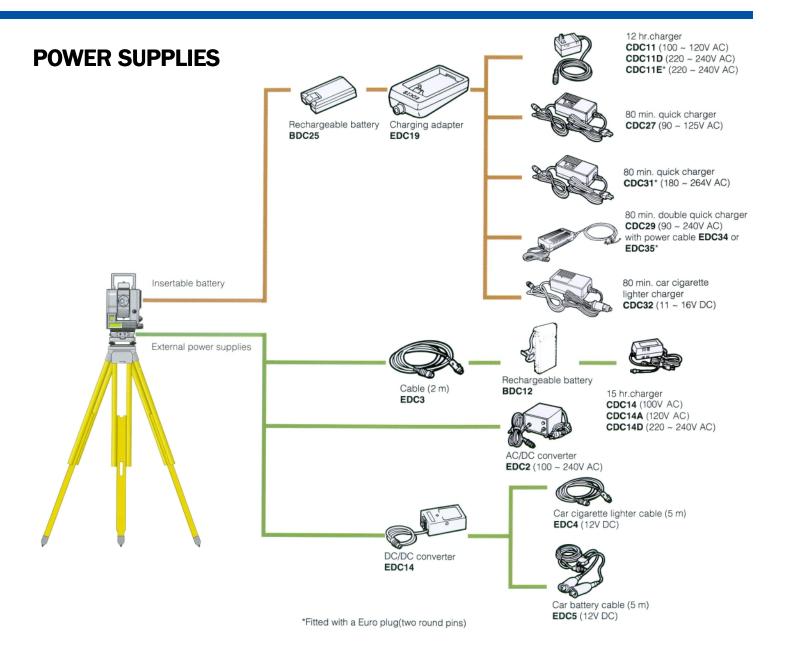


OF2A • OF1A Objective solar filters, flip-type, for solar observations.

#### **Objective solar filters**



OF2 • OF1 Objective solar filters for solar observations.





CDC32



**BDC12** 



**CDC29** 



EDC2



EDC14+EDC5

## **Introducing Sokkia**

SOKKIA CO., LTD, is the world's leading manufacturer and supplier of surveying instruments, including Total Stations and theodolites, levels, electronic field books, and surveying software. Sokkia's innovative products and manufacturing processes benefit from a strong commitment to research and development. The focus of our efforts is to incorporate advanced technologies which boost productivity and ensure dependable performance under the most severe field conditions. Innovative designs and careful attention to detail from a user's perspective have been the hallmarks of Sokkia instruments for over 70 years. Furthermore, every Sokkia instrument is subject to strict quality control measures involving rigorous inspection at each stage of production. After final assembly, the instruments are subjected to a further battery of tests including simulation of extreme weather conditions. We feel, however, that Sokkia's most important component is its team of skilled professionals who support Sokkia products around the world to ensure that users gain the full benefits of the finest surveying equipment and systems available. Under the company slogan "Our best for the world," our network of offices in North America, Europe, Oceania, and Asia provides marketing and customer support around the world. We are proud to continue our leadership in the field of precision measurement with the development of our own global position system (GPS).

# **SOKKIA CO.,LTD.**

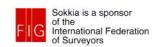
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