

SOKKIA

SDL30/SDL50

DIGITAL LEVELS

Save Time with Innovative, Industry-Leading Technologies

2.5-second High-speed Measurement, 20 lux Minimum Brightness, Inverted Staff Recognition, Wave-and-Read, and the Highest Accuracy in its Class

■ 2.5 seconds – High-speed Measurement

Aim, focus, and press a key. Height and distance are simultaneously measured in 2.5 seconds, 20 percent faster than ordinary digital levels.



■ Wave-and-Read Technology

The innovative "Wave-and-Read" technology provides an additional survey style option. The SDL30/50 tracks the RAB-Code staff wavel back and forth to read the correct height. The staff reading becomes the minimum when it is in vertical position. The SDL30/50 automatically detects the least value of staff readings.



■ Choice of Accuracy

SDL30: 0.4mm (New Super-Invar Staff) / 0.6mm (Invar) / 1.0mm (Fiberglass)
 SDL50: 0.6mm (New Super-Invar Staff) / 0.8mm (Invar) / 1.5mm (Fiberglass)
 Sokkia offers the top-of-the-line SDL1X model for higher accuracy of up to 0.2 mm.
 * 1km double-run leveling

■ Internal Memory

Up to 2,000 measurement data of elevation or height difference can be recorded in the internal memory. Auto mode records data as soon as the measurement is taken, while manual mode allows you to check the measurement results before recording. Stored data can be exported using the "Spectrum Link" software.

SDL30
0.6mm Accuracy
28x Telescope
X4



SDL30
0.4mm Accuracy
32x Telescope
X4

■ SDL30 / SDL50 Specifications

Model	SDL30	SDL50
Height accuracy	BIS30A staff (ISO 17122-2)*	BIS30A staff (ISO 17122-2)*
Visual	0.4mm (0.016in.)	0.6mm (0.024in.)
Electronic	0.6mm (0.024in.)	0.8mm (0.031in.)
BGS20/30 staffs	1.0mm (0.04in.)	1.5mm (0.06in.)
BGS staffs	1.0mm (0.04in.)	2.0mm (0.08in.)
Visual	1.0mm (0.04in.)	2.0mm (0.08in.)
Electronic	<±1.0mm (±0.4in.) [D=10m (D=32ft.)] <±0.1% x D [100-D=50m (328-D=164ft.)] <±0.2% x D [50-D=10m (164-D=328ft.)]	
Measuring range	1.6 to 100m (5.3 to 328ft.)	
Visual	from 1.5m (5.0ft.)	
Measuring mode	Single / Repeat / Average / Tracking / Wave-and-Read	
Display resolution	0.0001/0.001/0.01m (0.001/0.01/0.1ft.) / (8in.)	
Distance	0.01/0.1m (0.1/1ft., 1in.)	
Measuring time	Single/Repeat Average	<2.5s <2.5s x [number of measurements]
Tracking		
Minimum brightness condition	20 lux at the surface of staff (with natural light)	<15
Telescope	45mm (1.8in.)	36mm (1.4in.)
Magnification / Resolving power	32x / 3"	28x / 3.5"
Minimum focus / Field of view	1.5m (5ft.) / 1°20'	
Compensator	Type Pendulum compensator with magnetic damping system	
Working range		±15'
Sensitivity of circular level		10/2mm
Horizontal circle	Diameter: 103mm (4in.), Graduation: 1° (1pt)	
Display	Dot matrix LCD (128 x 32 dot) with illuminator	
Keyboard	8 keys (7 keys on front panel, 1 key on side panel)	
Data storage	2,000 points internal memory	
Interface	RS-232C, baud rate 1,200 to 38,400bps	
Onboard programs	Elevation / Height difference / Cut & Fill setting-out / Setting-out distance / Height measurement	
Water resistance	IPX4 (IEC60529:2001)	
Operating temperature	-20 to +50°C (-4 to 122°F)	
Size	W158 x D257 x H182mm (W6.2 x D10.1 x H7.2in.)	
Weight with battery	2.4kg (5.3 lb.)	
Standard battery	BDC468 (Rechargeable Li-Ion, 7.2V, 2.45Ah)	
Operating time	Approx. 16 hours at 25°C (77°F)	
* Standard deviation for 1km double-run leveling		

■ Standard Configuration

SDL30/SDL50 digital level, BDC468 battery, CDC68 charger, EDC113A/B/C power cable, tool kit, dust cover, cleaning cloth, operator's manual, carrying case

■ Optional Accessories

DE23 Diagonal eyepiece
 GS50L Circular level for staff

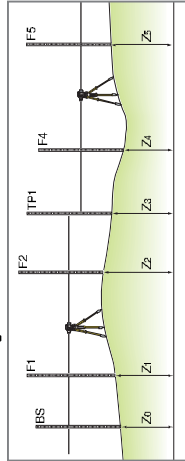
Material	Model	Length	Rear graduation	Sections	Weight
Fiberglass	BGS40	4m (13.2ft.)	Metric	3	2.4kg (5.3 lb.)
	BGS50	5m (16.4ft.)	Metric	4	3kg (6.6 lb.)
Aluminum	BGS50G3	5m (16.4ft.)	Feet/10m/100th	4	3kg (6.6 lb.)
	BASS5	5m (16.4ft.)	Metric	5	1.9kg (4.2 lb.)

■ Convenient Onboard Programs

The onboard measurement programs of SDL30/50 facilitate leveling and setting-out tasks. Programs include:

- Elevation
- Height Difference
- Cut and Fill Setting-out
- Setting-out in Distance

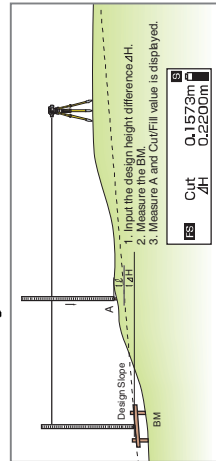
■ Elevation / Height Difference



The SDL30/50 calculates height difference between backsight (BS) and foresight (FS).

- Elevation of foresight can be calculated by inputting BS elevation.

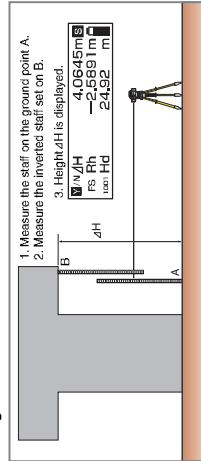
■ Cut and Fill Setting-out



Slope can be set using Cut and Fill Setting-out program.

- Leveling is possible by inputting the height difference zero (0).

■ Height Measurement



Two measurements provide the height of point B.

- Elevation can be calculated by inputting BS elevation.

■ RAB-Code Staff

Material	Model	Length	Linear expansion	Sections	Weight
New Super-Invar	BIS30A	3m (9.9ft.)	±0.1ppm/°C	1	5.5kg (12.2 lb.)
	BIS20	2m (6.6ft.)	1ppm/°C	1	4.3kg (9.5 lb.)
Invar	BIS30	3m (9.9ft.)	1ppm/°C	1	5.5kg (12.2 lb.)

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SOKKIA

SDL1X

DIGITAL LEVEL

0.2mm Standard Deviation for 1km Double-run Leveling

Ultimate Benchmark

The SDL1X is designed to achieve the highest precision and productivity in leveling and height measurement applications. From Intelligent Auto Focus to wireless operation, a number of innovative technologies are implemented for unmatched reliability while eliminating error factors during measurement. The SDL1X sets the ultimate benchmark for the precision digital levels.

Auto Focus

0.2mm Precision



■ Saving Measurement Time by up to 40%

- The combination of advanced "Auto Focus" and "View Finder" dramatically increases measurement speed.
- Measuring time – from sighting staff to completion of data storage – can be reduced by up to 40% compared to manual focus digital levels.

■ Seamless Switching Between Auto Focus and Manual

- No need to switch the focusing mode.
- Trigger key operation automatically starts Auto Focus.
- Manual focusing is possible at any time by rotating the focusing knob that supersedes the Auto Focus.

■ View Finder for Quick Sighting

- Innovative View Finder provides fast, easy and accurate sighting to the staff.
- In combination with Auto Focus, the SDL1X drastically reduces eye fatigue.

Eight innovative features never before available in the industry:*

1. 0.2mm precision (ISO17123-2)
2. Auto Focus for high-end digital level
3. View Finder for quick sighting
4. Remote Trigger for wireless operation
5. Dual-axis Tilt Sensor that ensures precision
6. SD card slot for data storage
7. 100m (320ft.) Bluetooth® wireless communication
8. BIS30A staff with ± 0.1 ppm/°C linear expansion coefficient

* As of June 1, 2009

When Precision Has Top Priority, and Measurement Speed Also Matters, SDL1X is the Ideal Digital Level that Fully Satisfies Both Demands



Intelligent Auto Focus

- The SDL1X automatically focuses exclusively on the RAB-Code staff.
- This technology completely eliminates false focusing on undesirable objects, enhancing measurement efficiency and reliability.
- Furthermore, Auto Focus eliminates the incomplete focusing that often causes inaccurate measurement with digital levels.

Remote Trigger

- The wireless Remote Trigger DLC1 prevents accidental jolts from touching the instrument.



DLC1

Dual-axis Tilt Sensor

- The liquid dual-axis tilt sensor alerts the users by LCD display and beeps when instrument tilt exceeds $\pm 8.5^\circ$, disabling measurement to avoid misreading.
- The LCD graphic circular level facilitates instrument setup.

Measurement and Recording Programs

- Onboard software supports height difference measurement and data recording in the following procedures:

BF, BFFB, BBFF, BFBF, aBF, aBFFB, aBFFB

(B: Backsight, F: Foresight, a: alternating)

- Measurement tolerance can be set in each route for on-site accuracy checks.

Up-to-date Data Memory and Interface

- 10,000-point internal memory.
- USB port and SD card slot for improved usability.

100m (320ft.) Bluetooth Wireless Modem (Optional)

- License-free Bluetooth technology enables wireless operation via various devices such as a data collector.

New Super-Invar Staff for 0.2mm Precision

- The SDL1X achieves the highest in precision when combined with the New Super-Invar RAB-Code Staff BIS30A that boasts the industry's lowest linear expansion coefficient $\pm 0.1 \text{ ppm}/^\circ\text{C}$.
- Ideal for first-order leveling as well as sub-millimeter height and subsidence measurement applications.



BIS30A

RAB-Code Staff

Material	Model	Length	Linear expansion coefficient
New Super-Invar	BIS30A	3m (9.84 ft.)	$\pm 0.1 \text{ ppm}/^\circ\text{C}$
	BIS20	2m (6.56 ft.)	$1 \text{ ppm}/^\circ\text{C}$
Invar	BIS30	3m (9.84 ft.)	$1 \text{ ppm}/^\circ\text{C}$
	BGS40	4m (13.12 ft.)	Metric
Fiberglass	BGS50	5m (16.40 ft.)	Metric
	BGS50G3	5m (16.40 ft.)	feet / 10th / 100th

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Specifications

SDL1X Advanced		
Height accuracy (ISO 17123-2)*1	Electronic	0.2mm (0.008in.) ^{±2} with BIS30A staff 0.3mm (0.012in.) with BIS20/30 staffs 1.0mm (0.04in.) with BGS staffs
	Visual	1.0mm (0.04in.)
Distance accuracy (D: measuring distance)	Electronic	$< \pm 10 \text{ mm}$ ($< \pm 0.4 \text{ in.}$): up to 10m (33ft.) $< \pm 0.1\% \times D$: to 50m (to 164ft.) $< \pm 0.2\% \times D$: to 100m (to 328ft.)
	Visual	1.0mm (0.04in.)
C & R correction		$K=0.142 / 0.20$ / none, selectable
Measuring range	Electronic	1.6 to 100m (5.3 to 328ft.)
	Visual	from 1.5m (5.0ft.)
Measuring mode		Single / Repeat / Average / Rapid-repeat
Display resolution (selectable in all modes)	Height	0.00001 / 0.0001 / 0.001m (0.0001 / 0.001 / 0.01ft.)
	Distance	0.001 / 0.01 / 0.1m (0.01 / 0.1 / 1ft.)
Measuring time	Single/Repeat	$< 2.5 \text{ s}$
	Average	$< 2.5 \text{ s} \times [\text{number of measurements}]$
	Rapid-repeat	$< 1 \text{ s}$
Auto Focus	Method	Distance and Contrast measurement (Passive)
	Range	1.6 to 100m (5.3 to 328ft.)
	AF/MF modes	Automatic conversion
Telescope		Objective aperture: 45mm (1.8in.) Magnification: 32x, Resolving power: 3" Minimum focus: 1.5m (5ft.), Field of view: $1^\circ 20'$
View Finder		Magnification: 4.5x, Field of view: 3°
Compensator	Type	Pendulum compensator with magnetic damping system
	Working range	$\pm 12'$
	Setting accuracy	$\pm 0.3''$
Tilt warning	Sensor	Dual-axis liquid tilt sensor
	Functions	Graphic display, Beep tones, Disabling measurement at $\pm 8.5^\circ$ tilt (On/Off selectable)
Display		LCD graphic display with LED backlight
Keyboard		Alphanumeric, 27 keys with backlight
DLC1 remote trigger		Infrared, 3 keys (Trigger, ESC, Enter)
Data storage	Internal memory	10,000 points
	External memory	SD card (max.2GB), USB flash memory (max.4GB)
Interface	RS-232C	Baud rate 1,200 to 57,600bps
	USB	USB 1.1 Host Type A
Bluetooth wireless modem (optional)		Ver. 2.0, Class 1, Range: 100m (328ft.)
Sensitivity of levels	Circular level	8'/2mm
	LCD graphic level	$\pm 12'$ /inner circle, $\pm 24'$ /outer circle
Horizontal circle Graduation		1° (1gon) Estimation: 0.1° (0.1gon)
Dust and water protection		IP54 (IEC60529:2001)
Operating temperature		-20 to $+50^\circ\text{C}$ (-4 to 122°F)
Size		W226 x D260 x H200mm (W8.9 x D10.2 x H7.9in.)
Weight with battery		3.7kg (8.2 lb.)
Power supply	Input voltage	7.2V DC (nominal)
	Standard battery	BDC58 (Rechargeable Li-ion, 4.3Ah)
	Operating time (at 20°C (68°F))	Approx. 12 hours w/o Auto Focus Approx. 9 hours w/Auto Focus
Battery level display		4 levels and low level message
Auto power cut-off		30 minutes after operation / none, selectable

*1 Standard deviation for 1km double-run leveling.

*2 Conditions for the highest accuracy: Low level of atmospheric turbulence, stable ambient temperature, no direct sunlight on instrument and staff.

Standard Accessories

- BDC58 rechargeable battery ● CDC68 quick charger with EDC113A/113B/113C power cable ● DLC1 Remote Trigger ● Tool kit ● Operator's manual ● Carrying case

Optional Accessories

- DE28 diagonal eyepiece (32x) ● DE29 diagonal eyepiece (44x) ● DOC129 interface cable