

**SOKKIA**

# **SDL30**

**DIGITAL LEVEL**

0.6mm Standard Deviation for 1km Double-run Leveling



**POWER LEVEL**



The SDL30 digital level makes accurate distance measuring easy. Simply aim at the unique RAB-Code staff, adjust the focus and press a single button to accurately measure height and distance. The results are shown on the LCD display and recorded in the internal memory – making the SDL30 the ideal instrument for quick and easy leveling.

### Quick and Easy

This extremely simple and efficient digital level was designed primarily for height and distance measurement. Measurements are made within three seconds of pressing a single button and are immediately stored in the internal memory.



### Accurate

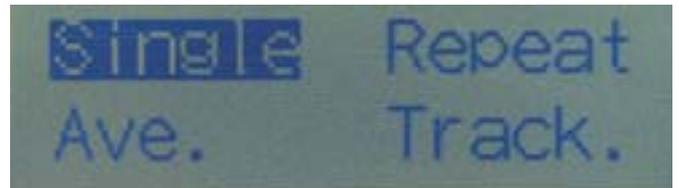
The SDL30 employs a CCD camera to read Sokkia's unique RAB-Code (RANdom Bi-directional Code) pattern that is immediately processed by an integrated processor. Even an inexperienced operator can make accurate measurements, and automatic operation eliminates conventional errors arising from misreading or variant results. Extensive field-testing has proven high accuracy with a standard deviation of only 0.6mm for 1km double-run leveling using invar staves, and 1mm using fiberglass staves. The SDL30 has a distance accuracy equivalent to  $\pm 1\text{cm}$  at 10m (0.4in. at 33ft.) and  $\pm 5\text{cm}$  at 50m (2in at 160ft.).



### Wide Range of Operability

The SDL30 can be used in a wide range of situations from low lighting to direct sunshine. Artificial lighting presents no problems allowing operation indoors or in tunnels. Measurements can even be performed in the dark using a small flashlight. The SDL30 is designed to provide consistent accuracy under different lighting conditions and harsh environments such as uneven lighting, heat shimmer and vibration.

### Four Measurement Modes



Four measurement modes are available: Single-Fine, Repeat-Fine, Average and Tracking.

### RAB-Code Staves are Ideal in the Field

Sokkia staves feature high accuracy along with lightweight portability and durable construction. Invar and fiberglass have been selected for their superior strength-to-weight ratio, unparalleled durability, and the latest in printing technology is employed to ensure accuracy. Sokkia's unique RAB-Code (RANdom Bi-directional Code) enhances measurement capabilities in a wide range of situations while assuring the highest accuracy of measurement. Staves can be held upside down to measure height from the ceiling and the SDL30 automatically identifies staff attitude and indicates the measurement accordingly. RAB-Code staves are available up to 5.0m (16.7ft.) facilitating operation with steep slopes.



The SDL30 Digital Level combines user-friendly convenience and performance in one compact body.



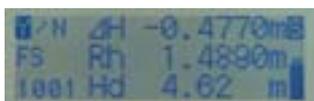
## Water and Shock Resistant Construction

The SDL30 conforms to IPX4 (IEC 60529) standards. The main unit is protected against splashes from all directions. Sudden showers are no longer a reason to panic. In addition, Sokkia's proven shock-resistant pendulum compensator with magnetic damping system ensures accuracy and dependability.

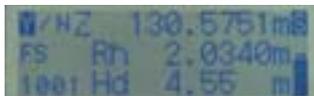
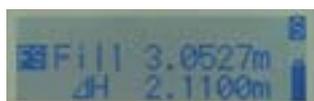
## The Digital Advantage

The SDL30 is equipped with a host of easy-to-use calculation functions. You can now leave your calculator in the office.

- Height difference: Calculate the difference between Backsight and Foresight. Calculate multiple Foresights in succession by fixing the Backsight point.
- Elevation: Input the Backsight elevation to calculate the Foresight height in elevation.
- Setting-out: Setting-out can be performed in three ways: height difference, elevation and horizontal distance.



Height difference measurement



Elevation measurement



Reticle cross-hair adjustment



Setting-out measurement

## Data Storage and Transfer

An internal memory stores up to 2000 data points in a maximum of 20 job files. Point numbers can be defined and data attributes can be selected and checked during operation or after completion either automatically or using the instrument keys. The SDL Tool software utility allows easy data export from the SDL30 to a PC in CSV format. In addition, internal memory makes it possible to set up double-run leveling.



## Advanced Power System

The SDL30 is powered by one BDC46A Lithium-ion battery. It provides a continuous supply of power for over 8.5 hours and is fully compatible with Series10 and Series30R total stations. The battery is fully recharged in less than two hours meaning you can maximize your time in the field.



# SDL30 Applications

## Measuring Elevation

The Elevation Measurement function automatically calculates the elevation of ground points. Enter the Backsight (BS) elevation and start measuring. The SDL30 also records the elevation of each Turning Point (TP) allowing the instrument to be repositioned to continue measurement.

3. After measuring Turning Point, select "Yes". The SDL30 stores TP1 elevation Z3.

4. Move the instrument and observe the TP1 as BS.

1. Input BS elevation Z0 and measure.

2. Foresight elevations Z1, Z2, Z3 are calculated.

5. Foresight elevations Z4, Z5, Z6 are calculated.

<input checked="" type="checkbox"/> Z	Input Elev.	<input checked="" type="checkbox"/> S
BS	Z 0041.7210m	

<input checked="" type="checkbox"/> Y/N	Z	41.9352m	<input checked="" type="checkbox"/> S
FS	Rh	1.7420m	<input checked="" type="checkbox"/> m
1001	Hd	35.09	<input checked="" type="checkbox"/> m

## Measuring Height Differences

The Height Difference function automatically calculates the height difference between Foresight (FS) and Backsight (BS) points. Measurements are performed in 0.1 or 1mm / 0.001 or 0.01ft.

1. Measure the reference point BM.

2. The SDL30 measures the height difference  $\Delta H$  and distance D2 simultaneously.

<input checked="" type="checkbox"/> Y/N	$\Delta H$	0.4316m	<input checked="" type="checkbox"/> S
FS	Rh	2.1016m	<input checked="" type="checkbox"/> m
1001	Hd	24.08	<input checked="" type="checkbox"/> m

<input checked="" type="checkbox"/> Y/N	BS Rh	2.5332m	<input checked="" type="checkbox"/> S
1000	Hd	45.17	<input checked="" type="checkbox"/> m

## Measuring Height Difference with Multiple Instrument Positions

Enter "0" for the BS elevation using the Elevation Measurement function to measure the height difference between BS and FS. The SDL30 can be repositioned, enhancing operability for wide area surveys or in the case of obstacles.

3. Select "Yes" and elevation Z1 is stored in memory.

4. Move the instrument and observe point A as BS.

1. Input BS elevation "0".

2. Height difference Z1 is calculated.

5. Height difference Z2 is calculated.

<input checked="" type="checkbox"/> Y/N	BS Rh	3.0210m	<input checked="" type="checkbox"/> S
1001	Hd	20.46	<input checked="" type="checkbox"/> m

<input checked="" type="checkbox"/> Z	Input Elev.	<input checked="" type="checkbox"/> S
BS	Z 0000.0000m	

<input checked="" type="checkbox"/> Y/N	Z	0.5210m	<input checked="" type="checkbox"/> S
FS	Rh	0.3170m	<input checked="" type="checkbox"/> m
1001	Hd	15.94	<input checked="" type="checkbox"/> m

<input checked="" type="checkbox"/> Y/N	Z	0.2570m	<input checked="" type="checkbox"/> S
FS	Rh	3.2850m	<input checked="" type="checkbox"/> m
1002	Hd	21.71	<input checked="" type="checkbox"/> m

## Leveling

The Setting Out Height Difference function makes ground leveling a snap. The SDL30 indicates the cut or fill value for each point.

2. Measure the reference point BM.

3. Measure the point A and the SDL30 indicates "Fill" value.

1. Input height difference "0".

<input checked="" type="checkbox"/> FS	Fill	0.0497m	<input checked="" type="checkbox"/> S
	$\Delta H$	0.0000m	<input checked="" type="checkbox"/> m

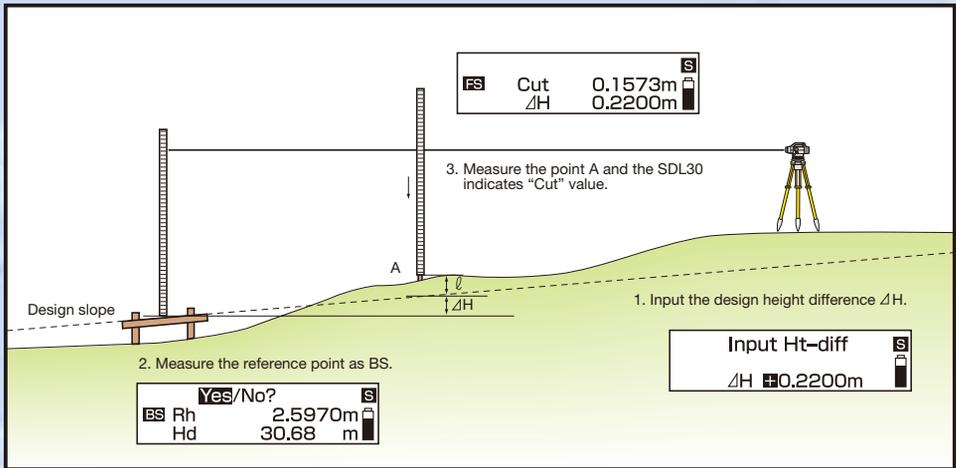
<input checked="" type="checkbox"/> BS	Yes/No?	<input checked="" type="checkbox"/> S	
	Rh	0.5970m	<input checked="" type="checkbox"/> m
	Hd	30.68	<input checked="" type="checkbox"/> m

<input checked="" type="checkbox"/> Input	Ht-diff	<input checked="" type="checkbox"/> S
	$\Delta H$ 0.0000m	

# SDL30 Applications

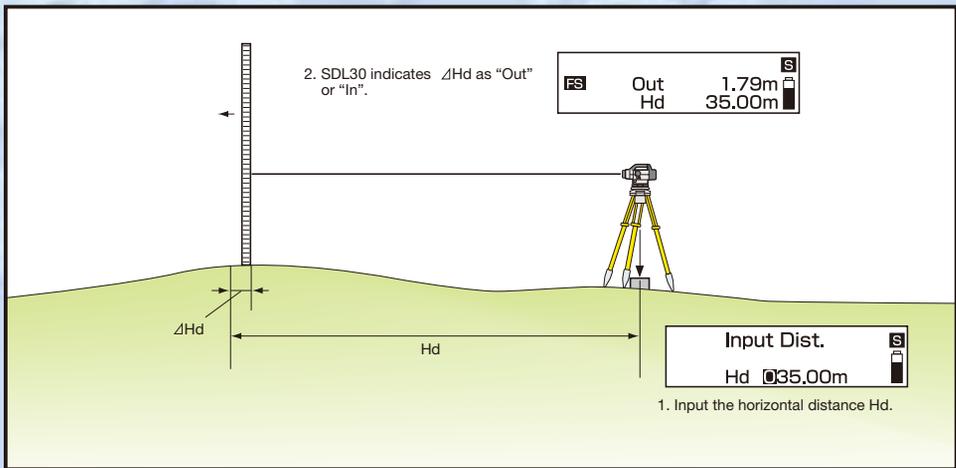
## Slope Setting

Set slopes with the utmost of ease using "Setting Out Height Difference". The SDL30 automatically calculates the cut or fill values from the reference point. Measurements are performed in 0.1 or 1mm / 0.001 or 0.01ft.



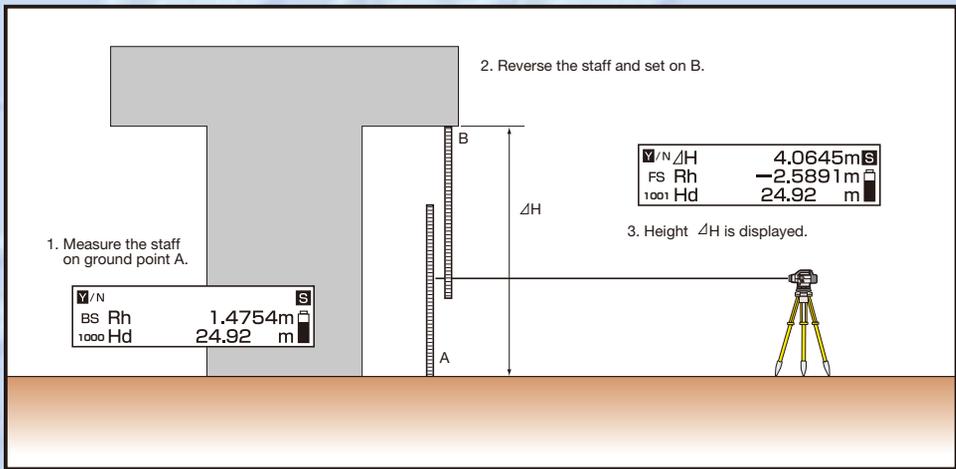
## Setting Out with Horizontal Distance

Find the ground point at a specified distance by entering the horizontal distance from the instrument center. This is useful for determining instrument position between two staves or locating a staff at a specific point while setting out.



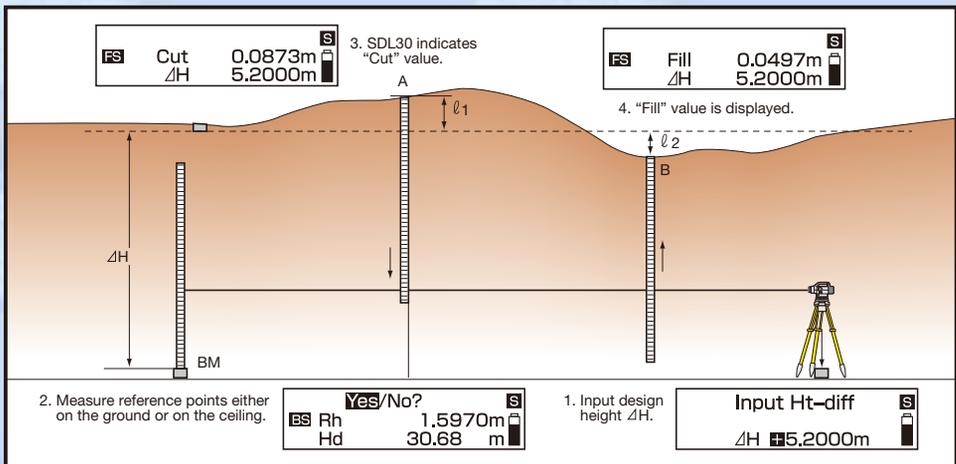
## Height Measurement

Determine the heights of ceilings, trees, bridges, road signs and other items with ease using the Height Difference Measurement Function. Measure the staff on the ground directly beneath the measuring point, then flip the staff upside down and set it on the measuring point. The SDL30 automatically identifies the staff attitude and calculates the height.



## Ceiling Leveling

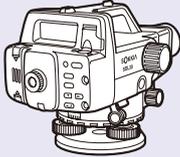
Level ceilings by positioning inverted staves and using the Setting Out Height Difference function. Reference points can be located either on the ground or on the ceiling. A detachable circular level can also be attached to an inverted rod.



◀ For demonstration purpose, the RAB-code appearing here may be used with the SDL30 for actual measurement.

SDL30 Specifications		
HEIGHT ACCURACY	Electronic measurement	0.6mm (0.03in.) (With Invar RAB-Code Staves)
Standard deviation for 1km double-run leveling	Visual measurement	1.0mm (0.04in.) (With Fiberglass RAB-Code Staves)
DISTANCE ACCURACY	Electronic measurement	Up to 10m (33ft.): Within ±10mm (±0.4in.)
Standard deviation	(Invar and Fiberglass RAB-Code staves)	10 to 50m (33 to 160ft.): ±0.1% x D Over 50m (160ft.): ±0.2% x D (D=measuring distance, unit: m)
Measuring mode		Single/Repeat/Average/Tracking (selectable)
Measuring range	Electronic measurement (Invar and Fiberglass RAB-Code staves)	1.6 to 100m (5.3 to 328ft.)
Minimum display	Height	Single, Repeat or Average mode: 0.0001m / 0.001m, 0.001ft. / 0.01ft. or 1/8in. Tracking mode: 1mm, 0.01ft. or 1/8in.
	Distance	Single, Repeat or Average mode: 0.01m (0.1ft. or 1in.) Tracking mode: 0.1m, 1ft.
Measuring time		Single, Repeat or Average mode: Less than 3s Tracking mode: Less than 1s
Telescope	Magnification	32x
	Image	Erect
	Objective aperture	45mm
	Field of view	1°20' (2.3m at 100m)
	Resolving power	3"
	Minimum focus	1.5m (5.0ft.)
Compensator	Stadia	Multiplication constant: 100, Additive constant: 0
	Type	Pendulum compensator with magnetic damping system
Data storage (Internal memory)	Working range	More than ±15'
	Capacity	2000 points (64KB)
	Job control	Up to 20 jobs (job name definable)
	Point number	Auto Incremental / Definable
	Attribute	Selectable
	Interface port	RS-232C compatible
	Baud rate	38400 / 19200 / 9600 / 4800 / 2400 / 1200 bps
Data output format	CSV / SDR2x (selectable)	
Sensitivity of circular level		10'/2mm
Horizontal circle		Graduation 1° (1gon) / Estimation 0.1° (0.1gon)
Display		Graphic LCD, 128 x 32 dot matrix with display illumination
Water resistance		Complies with IPX4 (IEC60529)
Operating temperature		-20°C to 50°C (-4°F to 122°F)
Power supply	Battery BDC46A	Rechargeable Lithium-ion, 7.2V
	Working duration at 25°C (77°F)	More than 8.5 hours
	Charging time at 25°C (77°F)	Less than 2 hours with CDC68 quick charger
Size		W158 x D257 x H182mm (W6.2 x D10.1 x H7.2in.)
Weight with battery		2.4kg (5.3lb)

**POWER SUPPLY**





BDC46A (Li-ion)  
Rechargeable battery

CDC68  
2hr. quick charger  
(110V to 240V ±10%)  
charges 2 batteries  
successively.

### SDR Series Data Collectors

Measurement data can be logged in Sokkia's SDR series data collectors which have a complete library of surveying programs that can be used with Sokkia total stations and GPS receivers.

### Invar RAB-Code Staves

RAB-Code on one side  
BIS20: 1.9305m (6.333ft.), 1 section, 4.3kg (9.5lb.)  
BIS30: 2.9725m (9.725ft.), 1 section, 5.5kg (12.2lb.)

### Fiberglass RAB-Code Staves

Front: RAB-Code, Reverse: graduated  
BGS40: 4.0m (13.3ft.), 3 sections, 2.4kg (5.3lb.)  
BGS50: 5.0m (16.7ft.), 4 sections, 3.0kg (6.6lb.)  
BGS50G3: 5.0m (16.7ft.), 4 sections, 3.0kg (6.6lb.), feet / 10th / 100th

### Aluminum RAB-Code Reflective Staff

Front: RAB-Code, Reverse: graduated on reflective surface  
BRS55: 5.0m (16.7ft.), 5 sections, 1.95kg (4.3lb.)

### Aluminum RAB-Code Staff

Front: RAB-Code, Reverse: graduated  
BAS55: 5.0m (16.7ft.), 5 sections, 1.9kg (4.3lb.)

### Optional Accessories

DE23: Diagonal Eyepiece  
GS60L: Circular Level for staff

### Standard Configuration

SDL30 comes with an internal BDC46A battery, CDC68 charger, EDC113A/B/C power cable, dust cover, tool kit, operator's manual and a carrying case.

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