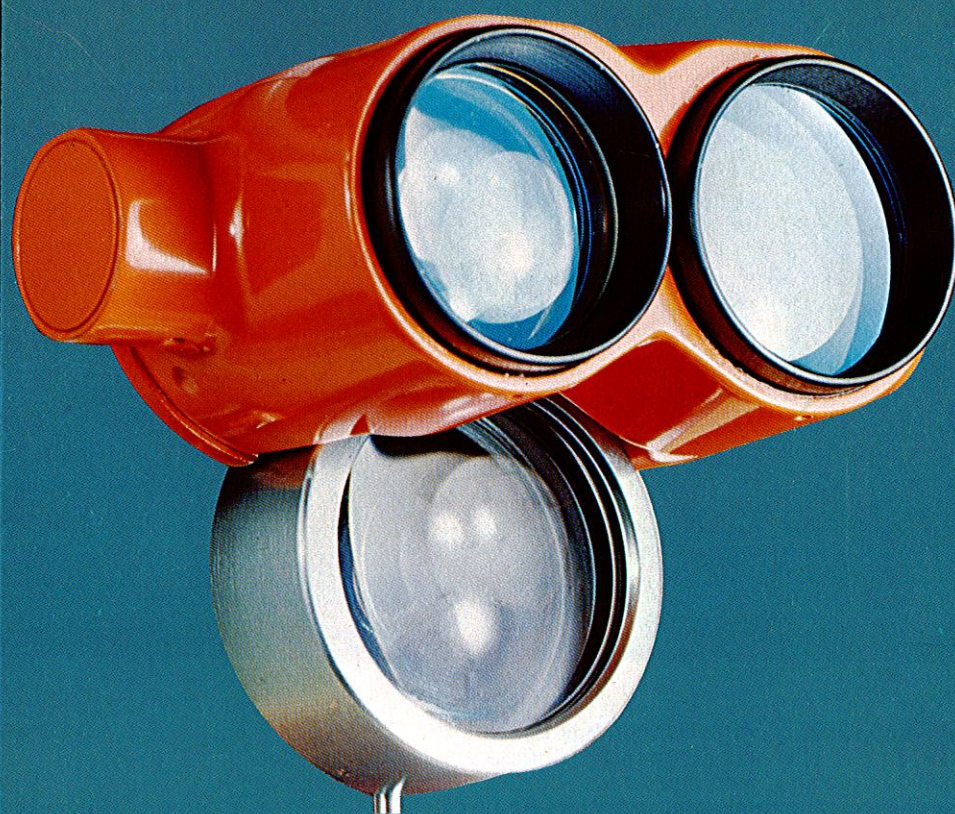
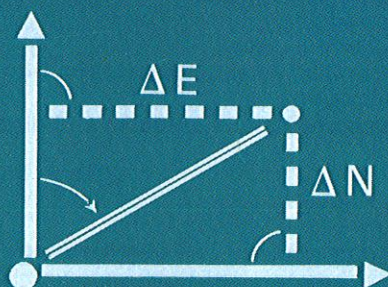
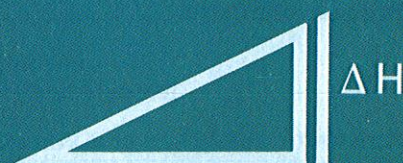
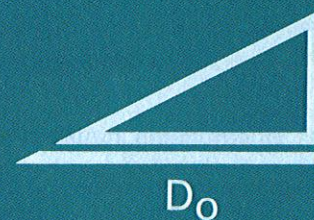


Reducing infra-red tachometer  
**WILD DISTOMAT D135**  
with 2000 m range



716.935





# WILD DISTO

## The reducing infra-red tacheometer



<b>Range</b>	1000 m (3300 ft) with 1 prism, 1600 m (1 mile) with 3 prisms, 2000 m (6600 ft) with 9 prisms, under average atmospheric conditions.
<b>Accuracy</b>	$\pm (5 \text{ mm} + 5 \text{ ppm})$ . Standard deviation $\sigma$ is indicated.
<b>Fully automatic measurement</b>	10-second measuring cycle at the touch of a switch. Signal balancing and calibration are completely automatic.
<b>Process computer</b>	Controls the measuring cycle. Applies corrections. Computes and displays: Horizontal distance, Difference in height, Coordinate differences.
<b>Any units</b>	Metres and feet. 360° and 400°.
<b>Theodolites</b>	Combines with Wild T1, T16 and T2 theodolites. Transits with the T1 and T16.
<b>Tracking</b>	Shortened measuring cycle repeats automatically for setting out.



# MAT<sup>®</sup> DI3S

solves your survey problems

**Control**

Horizontal and vertical control, precise traversing, triangulation, trilateration, trigonometrical heighting.

**Cadastral**

New layouts, subdivisions, boundary surveys, consolidation, amendments.

**Detail surveys**

Large scale detail and contour plans by high-speed tacheometry. Surveying utilities such as gas, water and sewage mains, electricity and telephone lines.

**Engineering and construction**

Profiles and cross sections for roads, railways, dams, watercourses, pipelines. Initial planning surveys and control for construction. Setting out at correct position and elevation.

**Tunnelling and mining**

Precise control, construction checks, setting out underground. Regular survey of open-cast workings to establish quantities cut.

**Deformation measurements**

Position and height checks on buildings, structures and land slip areas.

**Photo control**

Planimetric and height control for large scale mapping.

More than 7000 Distomats used throughout the world provide ample proof of the popularity of EDM instruments built by Wild and Sercel. Well engineered, meticulously tested, using the latest technology and the finest components, the DI3S continues the Distomat tradition of quality, reliability and accuracy.

The DI3S plus Wild theodolite is an electronic reduction tacheometer, a versatile piece of equipment for almost every type of survey work. The short measuring time and high degree of automation will be appreciated particularly when many points have to be measured in rapid succession.



# Your partner – the DISTOMAT® DI3S

## **Combines with Wild theodolites T1, T16 and T2**

Wild pioneered the concept of the infra-red distancer on a theodolite. And only a manufacturer of surveying instruments can integrate theodolites and EDM into a survey system.

The DI3S combines with either the T1, T16 or T2, as preferred. An adapter, screwed to the theodolite telescope, keeps the optical axis of the aiming head parallel to the telescope's line of sight. The counterweight ensures that the telescope/aiming head unit is in perfect balance so that strain within the theodolite can never occur. With the T1 and T16 the telescope transits with the aiming head in position.

Servos in the aiming head introduce filters for signal balancing at short distances and switch the beam from external measurement to internal calibration. The DI3S is fully automatic!

## **Emits a harmless infra-red beam**

Infra-red light radiated from a GaAs diode provides the carrier wave. It has important advantages: the diode has a long operational life; the range is the same by day and night; power consumption is low; being invisible, the beam does not disturb vehicle drivers and passers by; and as the light is harmless, no special safety measures are needed.

## **Covers from -65° to the zenith**

Apart from conventional survey work, the DI3S will measure shafts, provide control at all levels in mines and buildings, take the length of cable railways, measure towers and skyscrapers, etc.

## **Has enough battery capacity for a day's work**

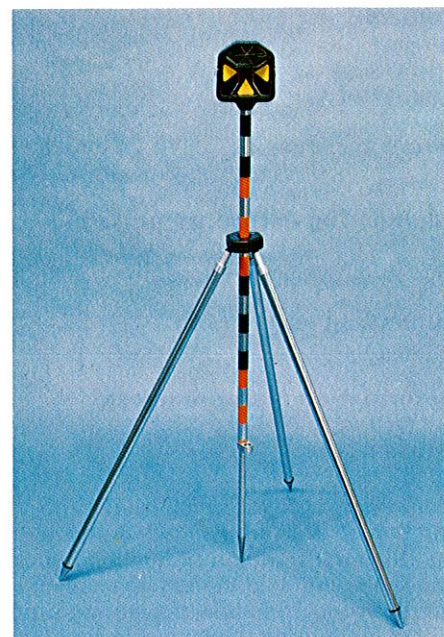
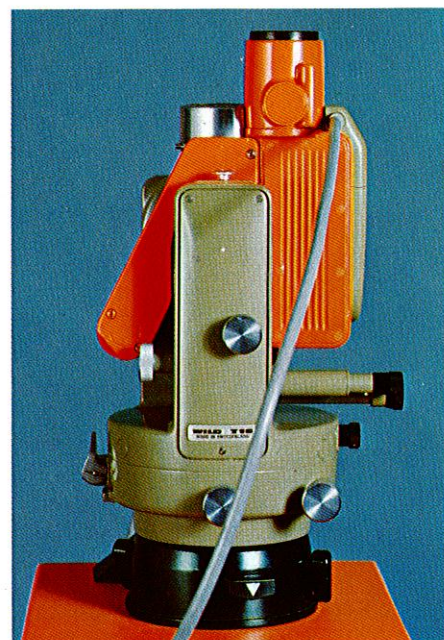
The DI3S runs off a 12 V NiCd battery hung on the tripod leg and connected by a thin cable. The small 1.8 Ah battery has a built-in charger, gives 120 measurements, and will be quite sufficient for many DI3S users. When many points have to be measured, the large 7 Ah battery for 500 measurements is recommended. In emergencies, the 4 m long extension cable connects the DI3S to a car battery.

## **Measures 1000 m to a single prism**

For polar coordinate work, setting out, profiling, detail surveys etc., the single-prism reflector GDR31 is used on the plumbing pole. The pole can be hand-held or set in the tripod GST5. For control traversing and precise trig. heighting, the GDR31 reflector is forced-centred in a Wild tribrach or in the centring tripod GST70. 95% of all measurements are covered with the single-prism reflector.

## **And longer distances with more prisms**

The DI3S measures 1600 m – that's a mile – to the three-prism reflector GDR11, and 2000 m to nine prisms (GDR11 + GDR2 attachment). Ranges may vary according to atmospheric conditions.







Schaffhausen  
Flughafen +

Koblenz

Affoltern  
Wald-Spital

180 m



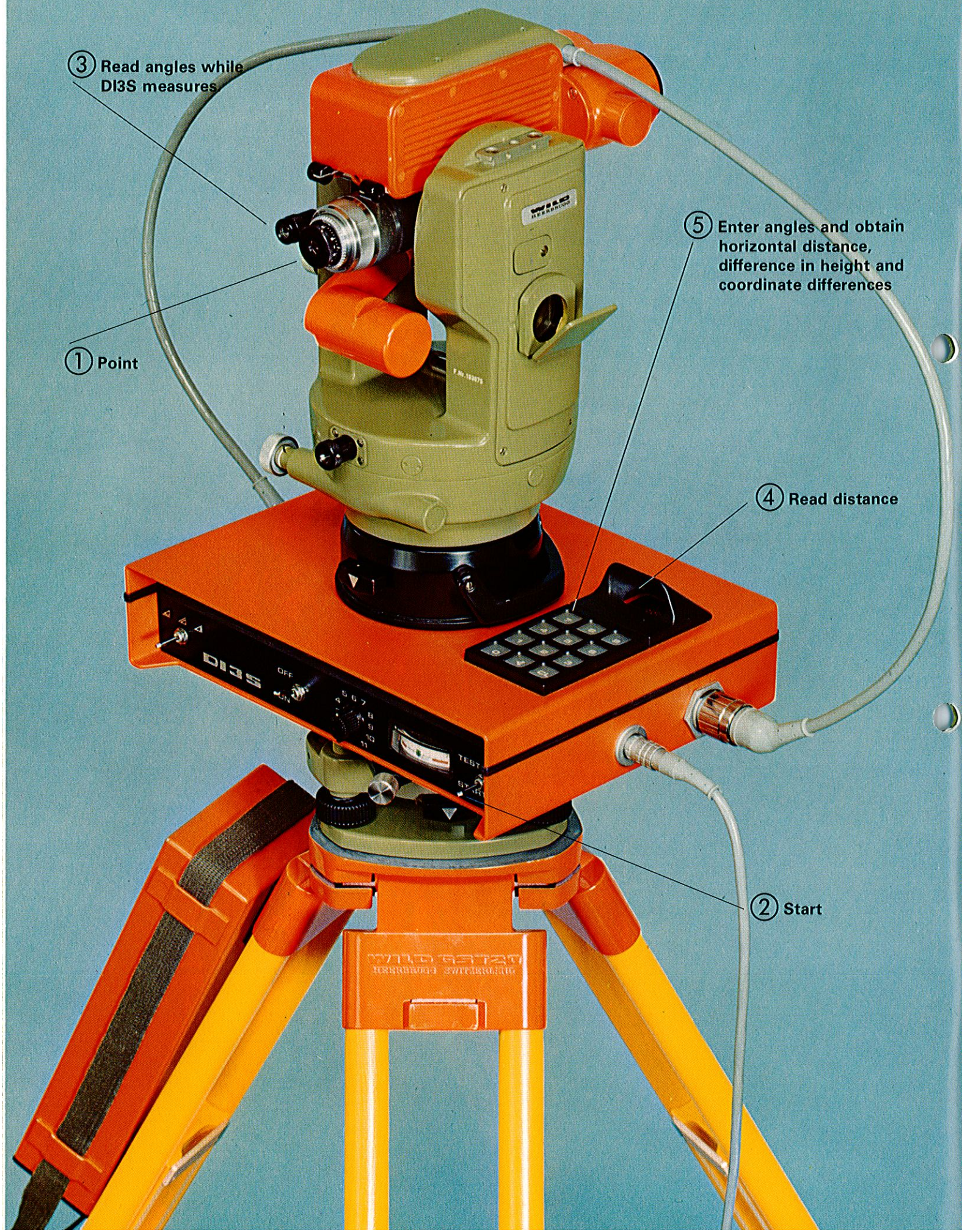
③ Read angles while  
DI3S measures

① Point

⑤ Enter angles and obtain  
horizontal distance,  
difference in height and  
coordinate differences

④ Read distance

② Start





# It's easy to measure with the DI3S

## Point once

for angles and distance

The GDR31 reflector is specially designed for the DI3S. As the target is the same distance below the prism as the telescope is under the aiming head, only a single optical pointing is needed for measuring angles and distance.

No signal balancing, no searching for maximum

## Press the start switch

and the DI3S measures

Servo-operated filters guarantee an optimum signal. The operator has only to press the start switch to trigger off the computer-controlled measuring cycle. During the 10 seconds from START to DISPLAY, the horizontal and vertical circles are read.

The automatic measurement runs as follows:

- Measurement of return signal and reduction if necessary by a filter.
- 100 fine measurements over the internal calibration path.
- 1000 fine measurements of the distance.
- 100 fine measurements over the internal calibration path.
- 500 coarse measurements of the distance.
- 100 coarse measurements over the internal calibration path.
- Compilation of slope distance, multiplication by the scale factor, and conversion to feet if necessary.
- Display of slope distance.

Calibration before and after the fine measurement and the integration of 1000 phase measurements on the fine frequency are key factors for the high precision of the DI3S.

An automatic cut-out stops the measuring cycle if the return signal is too weak or if the beam is interrupted. Mistakes are impossible when measuring through traffic; the measurement stops the moment the beam is cut and continues as soon as the infra-red light is received again in the instrument. The beam can be broken any number of times and for any length of time without affecting the displayed result.



Control unit,  
the heart of the system

The electronics in the unit direct the measuring cycle and carry out the reductions.

An axis passes through the control unit. The bottom of the axis fits in any Wild tribrach or in the centring tripod GST70; the top takes a Wild theodolite. The hollow axis permits optical plumbing with the theodolite.

As the unit rotates with the theodolite, the controls and display always face the operator. And because the theodolite and control unit maintain the same relative position, the angle measuring accuracy is not impaired.

# The DI3S handles everything

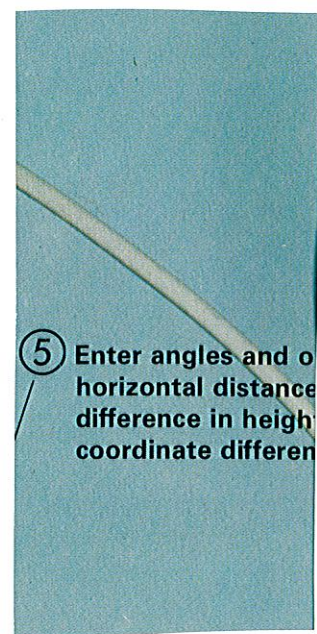
you select only

## the measuring units

A programme switch sets any combination of units: display in metres or feet, angle input in  $360^\circ$  or  $400^g$  according to the theodolite used.

## the scale factor

Depending on the setting of the SF switch, the measured slope distance is multiplied by a scale factor before being displayed. The atmospheric correction, sea level correction, and even the projection scale factor can all be applied automatically to the distance. Graphs for using the switch are provided.



## the measuring mode

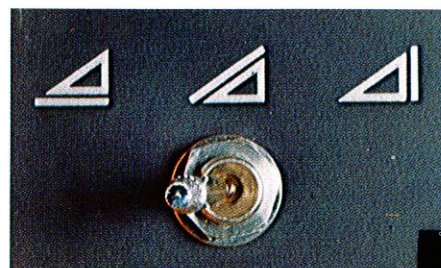
10-second automatic measurement with  $\pm (5 \text{ mm} + 5 \text{ ppm})$  accuracy, or tracking.

A touch of a key switches the DI3S to tracking mode for rapid measurements when setting out on land and water. The slope distance is displayed every 2 seconds for 1 second duration. As the shortened measuring cycle has fine and coarse measurements and calibration, errors cannot occur if the reflector moves out of and back into the beam. The measuring accuracy in tracking mode is about 2 to 3 cm.

## the display

Slope distance, horizontal distance, difference in height, and coordinate differences, according to the position of the selector switch.

And with the start switch held down, the standard deviation  $\sigma$ , which can be expected from the following distance measurement, is indicated on the galvanometer.



# The DI3S computes for you

Just enter the vertical angle and obtain horizontal distance and difference in height.

Then tap in the horizontal angle for coordinate differences,  $\Delta N$  and  $\Delta E$ .

Don't be encumbered with a hand-held calculator!

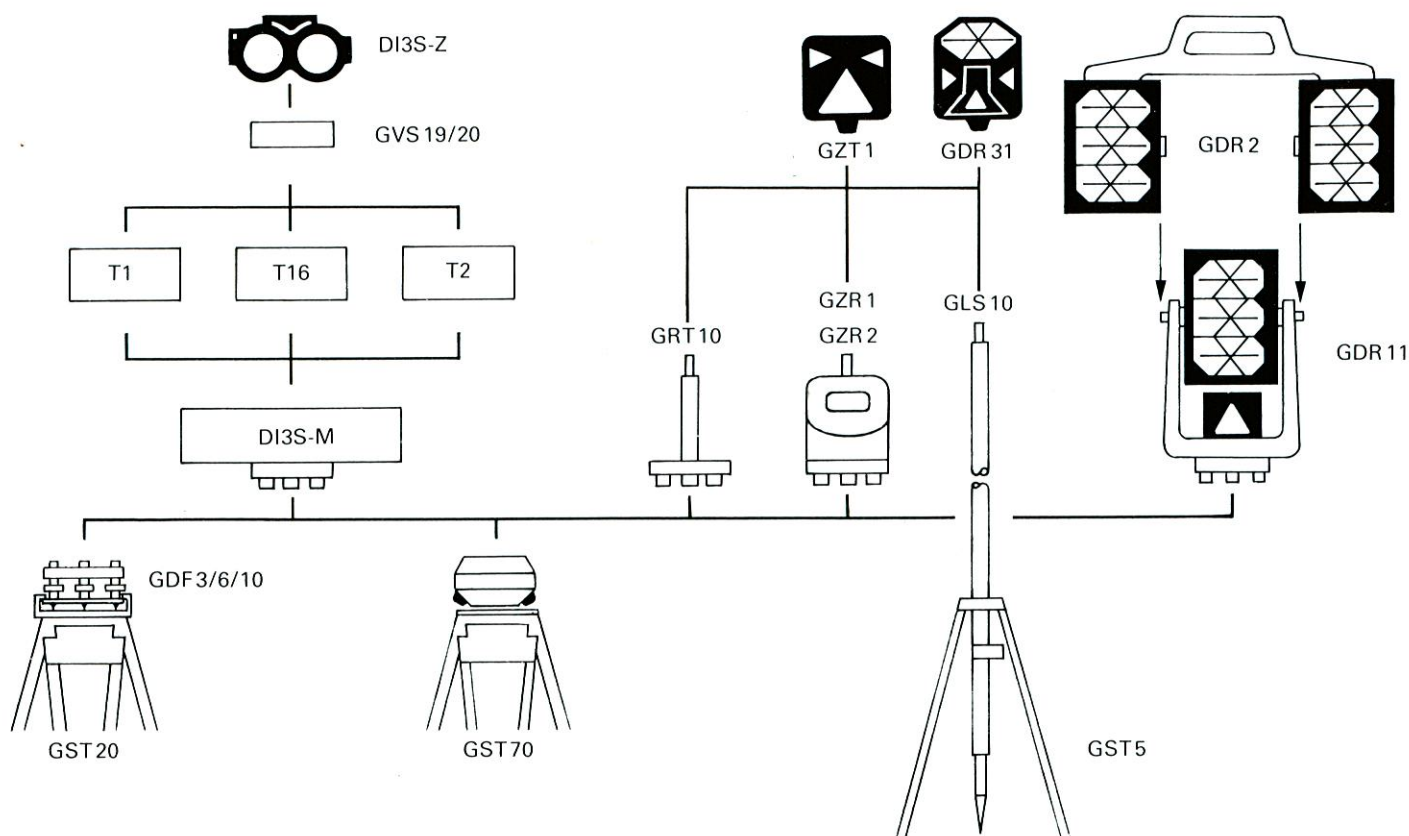


# Technical Data

Standard deviation	$\pm (5 \text{ mm} + 5 \cdot 10^{-6} \cdot D)$
Distance measurement	in metres or feet, switchable
Time from start to display	10–12 seconds
Display (LED)	digital, six-figure, to mm or 0.01 ft.
Slope distance unambiguous up to	999.999 m or 6561.67 ft (= $2000 \text{ m} \times 3.280835$ )
Reduction for horizontal distance, difference in height, difference in coordinates	for distances up to 999.999 m or 6561.67 ft
Angle input for reduction	six-figure (degrees, mins., tens of secs.), switchable for 360° or 400°
Range under average atmospheric conditions	
To single-prism reflector GDR31	about 1000 m (3300 ft)
To three-prism reflector GDR11	about 1600 m (1 mile)
To nine-prism reflector GDR11 plus GDR2	about 2000 m (6600 ft)
Measuring scale factor, variable by Scale change per switch step	11-step switch 3 mm/100 m, 0.03 ft/1000 ft, i.e. $D \times 3 \times 10^{-5}$
Calculation time for reduction	0 to 4 seconds
Free objective aperture of emitting and receiving objectives	35 mm
Focal length	38 mm
Emitting diode	GaAs luminescent diode
Receiving diode	Avalanche photodiode
Beam width at half power	4' (12 cm at 100 m, 1.2 ft at 1000 ft)
Carrier wave length	0.885 $\mu\text{m}$ infra-red
Measuring scale frequencies	
Fine measurement	7.4927 MHz
Coarse measurement	74.927 kHz
Emitted power	about 0.02 mW
Power consumption	
After switching ON and while measuring	about 17 W
When calculating and displaying	about 5 W
Small battery with built-in charger	
Small battery, NiCd	12 V/1.8 Ah (10 $\times$ 1.2 V gas-tight cells)
Mains/line supply for charger	115 or 220 VAC, 50–60 Hz
Time for charging flat battery	about 14 hours
Number of measurements at 20°C (68° F) with fully-charged battery	about 120
Large battery, NiCd, rechargeable	12 V/7 Ah (10 $\times$ 1.2 V, gas-tight cells)
Number of measurements at 20°C (68° F) with fully-charged battery	about 500
Charging Unit GKL 11 for 7 Ah NiCd battery	
Mains/line input voltage	115 V/220 V $\pm$ 20%, 50/60 Hz
Power consumption	about 25 VA
Charging current	0.7 A $\pm$ 10%
Charging time for flat battery	about 14 hours
Charging temperature for battery	$\pm$ 10°C to + 30°C ( $\pm$ 50°F to + 86°F)
Temperature range for DI3S operation	–25°C to +50°C (–13°F to +122°F)
Dimensions (length $\times$ breadth $\times$ height)	
Aiming head (without counterweight)	19 $\times$ 11 $\times$ 7 cm (0.62 $\times$ 0.36 $\times$ 0.23 ft)
Control unit (without axis)	20 $\times$ 28 $\times$ 7 cm (0.66 $\times$ 0.92 $\times$ 0.23 ft)
Container (2 containers)	37 $\times$ 29 $\times$ 26 cm (1.21 $\times$ 0.95 $\times$ 0.85 ft)
Small battery	22 $\times$ 14 $\times$ 4.5 cm (0.72 $\times$ 0.46 $\times$ 0.15 ft)
Large battery	29 $\times$ 10 $\times$ 6 cm (0.95 $\times$ 0.33 $\times$ 0.20 ft)
Tilting range with aiming head on telescope	–65° to zenith (–70° to zenith)
Control unit axis dish above tribrach dish	125 mm (0.41 ft)



# The DI3S system for maximum use of equipment and full interchangeability



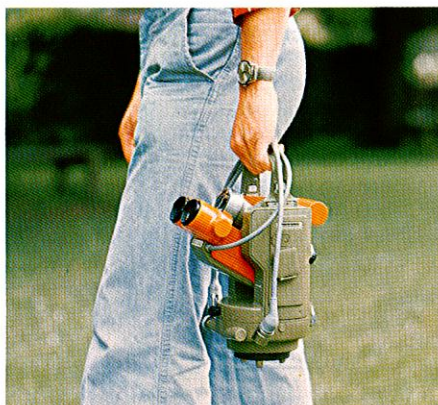
## Easy to transport

For short distances the carrying handle is used.

For hilly and difficult country there's a carrying frame.

And for shipping by road, rail, sea or air, the standard packing is employed.

The use of the Wild forced-centring system, as well as the small size and light weight of the equipment, allows the instrument to be packed easily and quickly for transport and changing stations.





# Equipment

Stock No.		kg	lb
304072	DI3S Equipment for T1/T16 comprising		
368865	DI3S aiming head and control unit	1.2	2.6
	in container	4.3	9.5
	Accessories: 10 spare fuses, 1 hexagonal key, 1 plastic cover	6.0	13.2
365181	1 Counterweight GGD4	0.9	2.0
300990	1 Small battery, 12 V/1.8 Ah, with built-in charger. Supply for charger 110/220 VAC, 50-60 Hz	2.3	5.1
349642	1 Battery cable, battery to control unit, 2 m long, grey		
349644	1 Cable for 12 V car battery, 4 m long, grey		
304073	DI3S Equipment for T1/T16, as 304072, but with large battery 12 V/7 Ah 349641 (instead of small battery 300990)		
304074	DI3S Equipment for T2 (from No. 185853), as 304072, but with counterweight GGD5 365136 (instead of GGD4 365181)		
304075	DI3S Equipment for T2 (from No. 185853), as 304072, but with counterweight GGD5 365136 (instead of 365181) and with large battery 12 V/7 Ah 349641 (instead of 300990)		
304076	DI3S Equipment for T1A (up to No. 187352), T16 (up to No. 183742), T2 (up to No. 184042), as 304072, but with counterweight GGD6 376580 (instead of 365181)		
304077	DI3S Equipment for T1A (up to No. 187352), T16 (up to No. 183742), T2 (up to No. 184042), as 304072, but with counterweight GGD6 376580 (instead of 365181) and with large battery 12 V/7 Ah 349641 (instead of 300990)		

## Theodolite for DI3S (according to choice)

	Wild T1 Micrometer Theodolite, with adapter GVS20 and focussing sleeve extension already fitted,	5.8	12.8
	in container	2.8	6.2
374903	T1, 400 <sup>g</sup> , with tribrach GDF10		
380881	T1, 400 <sup>g</sup> , without tribrach, for centring tripod GST70		
374902	T1, 360 <sup>g</sup> , with tribrach GDF10		
380880	T1, 360 <sup>g</sup> , without tribrach, for centring tripod GST70		
	Wild T16 Scale Reading Theodolite, with adapter GVS20 and focussing sleeve extension already fitted,	5.3	11.7
	in container	2.8	6.2
373728	T16, 400 <sup>g</sup> , with tribrach GDF10		
380883	T16, 400 <sup>g</sup> , without tribrach, for centring tripod GST70		
373729	T16, 360 <sup>g</sup> , with tribrach GDF10		
380882	T16, 360 <sup>g</sup> , without tribrach, for centring tripod GST70		
	Wild T2 Universal Theodolite, with adapter GVS19 already fitted,	6.0	13.2
	in container	2.2	4.8
366695	T2, 400 <sup>g</sup> , with tribrach GDF6		
380885	T2, 400 <sup>g</sup> , without tribrach, for centring tripod GST70		
366694	T2, 360 <sup>g</sup> , with tribrach GDF6		
380884	T2, 360 <sup>g</sup> , without tribrach, for centring tripod GST70		

**Adapter for DI3S** to be mounted on customer's theodolite. (Note: DI3S adapters = DI3 adapters. Therefore DI3S fits on theodolite with corresponding DI3 adapter.)

368847	Adapter GVS20 for T1 (from No. 187353) and T16 (from No. 184543), with focussing sleeve extension		
346530	Adapter GVS19 for T2 (from No. 185853)		
353166	Adapter GVS17 for former T1A (up to No. 187352) and former T16 (up to No. 183742)		
353167	Adapter GVS18 for former T2 (up to No. 184042)		

Stock No.		kg	lb
	<b>Reflectors</b>		
353162	Single-prism reflector GDR31, with target, tiltable	1.5	3.3
353163	Soft-bag container for 1 GDR31 or		
365361	Hard plastic container for 2 GDR31, 2 reflector carriers (GRT10 or GZR1 or GZR2), and 2 tribrachs	3.5	7.7
	For GDR31 according to choice:		
325719	Plumbing pole GLS10, cm graduation	0.7	1.5
358897	Plumbing pole GLS10-2, 0.05 ft graduation	0.7	1.5
325722	Reflector carrier GRT10, with centring flange (without tribrach)	0.3	0.7
	Note: The single-prism reflector GDR31 also fits on target carrier GZR1 (360530) for T1/T16 target equipment, and on target carrier GZR2 (360532) for T2 target equipment		
258980	Three-prism reflector GDR11, tiltable, in container (without tribrach)	2.9	6.4
266856	Six-prism attachment GDR2, fits on GDR11, in container	0.9	2.0
		4.6	10.1
		1.1	2.4

## Tibrachs for reflector-carrier and three-prism reflector GDR11

305065	Tibrach GDF10, without optical plummet (T1/T16 tibrach)	0.8	1.8
296643	Tibrach GDF6, with optical plummet (T2 tibrach)	0.8	1.8
183550	Tibrach GDF3, without optical plummet (takes all Wild equipment, T1/T16, T1A, former T16, T2)	0.7	1.5

Note: The DI3S control unit does not fit in the tibrach GDF1 of the former T1A and former T16. Therefore, when using these theodolites with the DI3S, an extra tibrach - GDF10 or GDF6 or GDF3 - must be ordered.

Note: When using the centring tripod GST70, a tibrach is not required.

Note: If a T2, and/or traverse equipment, is equipped with the GDF2 tibrach (i.e. old-style T2 tibrach with detachable base plate) we recommend converting the GDF2 to GDF6 (i.e. fitting a stronger spring plate and non-detachable base plate).

296695	Conversion kit, for converting GDF2 to GDF6		
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## Tripods and Centring Rods

296632	Tripod GST20, with telescopic legs	6.5	14.3
373726	Centring rod for T1/T16, cm graduation	0.7	1.5
373727	0.05 ft graduation	0.7	1.5
212956	Centring rod for T2, cm graduation	0.7	1.5
212957	0.05 ft graduation	0.7	1.5
	Centring tripod GST70, telescopic legs, rod with cm-graduation only: -		
373725	GST70 for T1/T16	7.9	17.4
356117	GST70 for T2	7.9	17.4
316170	Tripod GST20-2, extra-long, 2.5 m, telescopic legs	8.8	19.4
	Centring rod, extra-long, 2.5 m, for use with GST20-2, cm-graduation only:		
373731	Centring rod extra-long for T1/T16, cm-graduation	1.0	2.2
266862	Centring rod extra-long for T2, cm-graduation	1.0	2.2
353196	Tripod GST5, for plumbing pole GLS10	2.0	4.4

## Other Accessories

181990	Charging Unit GKL 11 (115/220 VAC, 50/60 Hz, mains and charging cables attached)		
349641	Large battery 12 V/7 Ah, rechargeable (spare)	3.0	6.6
300990	Small battery, 12 V/1.8 Ah, with built-in charger. Supply for charger 110/220 VAC, 50-60 Hz (spare)		
377776	Back-pack carrying frame for DI3S	4.3	9.5
315010	Shoulder carrying strap, for tripods GST20 and GST70		
373136	Case for 2 plumbing poles GLS10		
325721	Extension GZW10, 1 m length, for plumbing pole GLS10		

Modifications resulting from technical developments may be made in the interest of our customers. Illustrations and specifications are not binding therefore and are subject to change without notice.