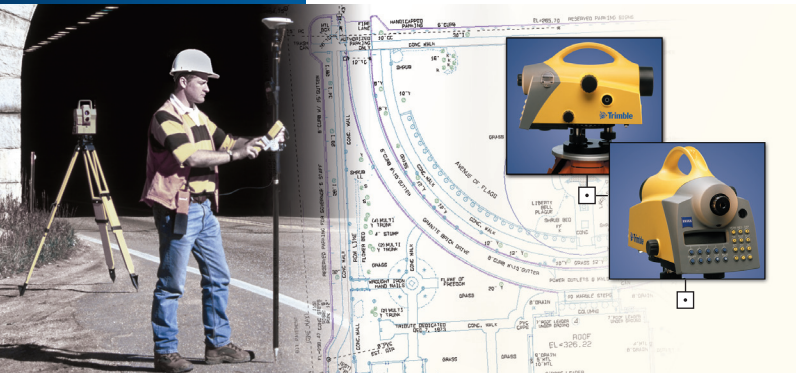


Trimble DiNi® 12, 12T, 22

Short Form User Guide



PN 571 703 081

Welcome to DiNi®

By purchasing a Digital Level from Trimble® you have opted for a leading-edge product in the field of surveying instruments.

We congratulate you on your choice and would like to thank you for the trust placed in our company.

These abridged instructions are intended to serve as start-up aid for you. Please find more detailed descriptions in the full Operating Instructions.

Good luck.

Safety Notes



- Do not point the telescope directly at the sun.
- Do not use the instrument and accessories in rooms with danger of explosion.
- Operate the instrument only in the compliance with the operating conditions specified.
- Protect operator and instrument sufficiently at the site of measurement (e.g. construction site, roads, etc.). Observe any relevant national regulations and the Road Traffic Act.
- Tread tripod legs firmly into the ground to prevent sinking in and falling over of the instrument by wind pressure.
- Mount the instrument to the tripod using the tripod screw immediately after you take the instrument from its case. Never leave the instrument placed loosely only on the tripod head. After loosening the tripod screw, immediately store the instrument in its case.
- Don't make any changes or repairs on the instrument and accessories. This must be done only by a service team or by authorised technical staff.



- When you work with staves in the vicinity of electric plants (e.g. electric railways, aerial lines, transmitting stations, etc.) your life is acutely endangered. This risk exists independent of the staff material (e.g. aluminium or wood). In such cases it is necessary to inform the competent and authorised safety authorities and observe their instructions.
- Don't use the instrument too long when it is raining. During breaks, cover the instrument with the protective hood. Wipe the instrument and case dry in the field and let it dry completely indoors, with the case open.
- In a thunderstorm, don't carry out surveying work to avoid being struck by a lightning.
- Remove the batteries in case of unloading or a longer time without using the instrument. Recharge the batteries with Single Battery Charger.
- Properly dispose of the batteries and equipment taking into account the applicable national regulations. Prevent improper use of the disposed instrument by proper disposal.



- Before every use of the instrument, verify that it is in perfect condition, particularly after longer transportation, fall or any other improper use. Systematic check measurements particularly before and after extensive surveying projects will help to avoid erroneous measurements.
- Do not operate the battery charger and PC Card reader in humid conditions (risk of electrical shock). Make sure the voltage setting is identical on the battery charger and voltage source. Do not use instruments while they are wet.
- The magnetic PC Card cover should always be in place to stop environment damage (water, dust).
- Do not use destroyed plugs and cables for accessories with the instrument.

Environmental information



NOTICE FOR TRIMBLE'S EUROPEAN UNION CUSTOMERS

Trimble is pleased to announce a new recycling program for our European Union customers. At Trimble, we recognize the importance of minimizing the environmental impacts of our products. We endeavor to meet your needs, not only when you purchase and use our products, but also when you are ready to dispose of them. That is why Trimble is actively pursuing, and will continue to pursue, the expanded use of environmentally friendly materials in all its products, and why we have established a convenient and environmentally friendly recycling program.

As Trimble makes additional recycling facilities available for your use, we will post their locations and contact information to our Recycling Instructions web page.

For product recycling instructions and more information, please go to

<http://www.trimble.com/environmentT>

Recycling in Europe:

To recycle Trimble WEEE,

Call +31 497 53 2430, and ask for the "WEEE Associate" Or Mail a request for recycling instructions to:

Environmental information

Trimble Europe BV
c/o Menlo Worldwide Logistics
Meerheide 45
5521 DZ Eersel, NL

Contents

Introduction	3
Safety Notes	4
Environmental Information	7
Contents	9
Hardware overview	10
Software overview DiNi® 12,22	12
Software overview DiNi® 12T	13
Setting up and switching on	14
The control panel	15
Preparing for measurement	16
Projects and inputs	20
Line levelling	22
Line interruption	24
Line adjustment	26
Reference Heights in the Memory	28
Data Transfer	29
Data Memory PCMCIA Card	31
Adjustment	32
Accessories for DiNi®	35
Updates	36
Maintenance and Care	37

Hardware overview

Standard deviation as per DIN 18723	DiNi® 12	DiNi® 22	DiNi® 12T
Standard deviation on 1 km of double levelling			
Electronic measurement:			
- invar precision barcode staff	0.3 mm	0.7 mm	0.3 mm
- foldable bar code staff	1.0 mm	1.3 mm	1.0 mm
Visual measurement:			
- foldable staff, metric scale	1,5 mm	2.0 mm	1,5 mm

DiNi® 12

- Graduated circle, external
- Exchangeable PCMCIA Card

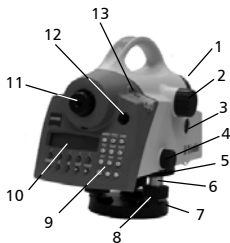
DiNi® 12 T

- Elektronik circle
- Exchangeable PCMCIA Card

DiNi® 22

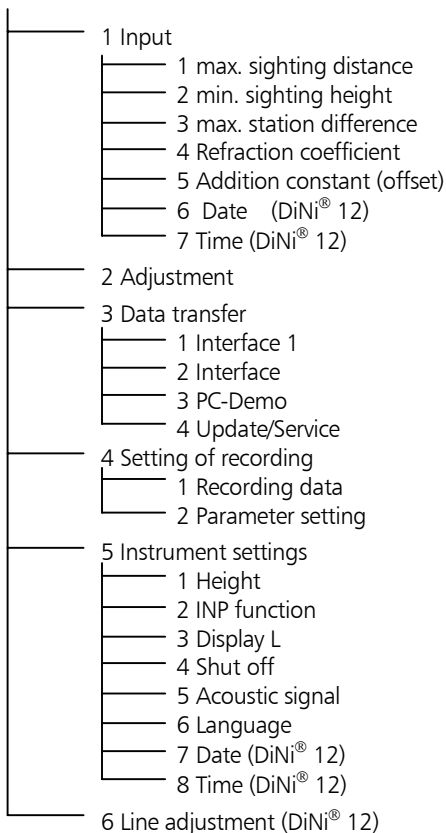
- Graduated circle, external
- Internal data memory

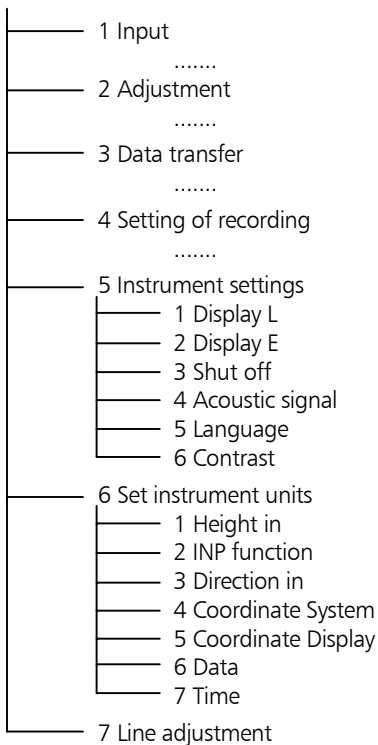
Hardware overview



- 1 Telescope objective with integrated sunshield
- 2 Telescope focusing control
- 3 Trigger key for measurement
- 4 Horizontal tangent screw (endless slow motion drive)
- 5 Graduated circle, external (DiNi® 12, 22)
- 6 PCMCIA Card plug-in module (DiNi® 12, 12 T)
- 7 Tribrach
- 8 Footscrews
- 9 Keyboard
- 10 Display
- 11 Eyepiece
- 12 Window for circular bubble
- 13 Cap, to be removed for adjustment of circular bubble
- 14 Battery compartment
- 15 15 Sight vane (notch and bead sights)
- 16 PCMCIA Card in the plug-in module (DiNi® 12, 12 T)



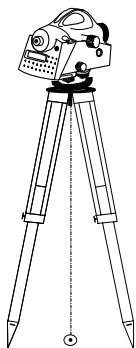




..... DiNi® 12 and 22

Setting up and switching on

Set-Up

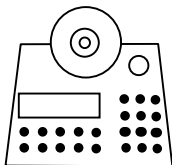
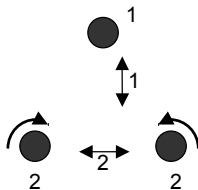
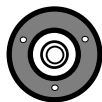


Set up the tripod securely

Remove instrument from container

Place instrument on tripod and screw down tightly (tripod retaining screw)

Move bubble into the centre of the circular level (tripod foot screws)



Switching on

● ON/OFF

Press button

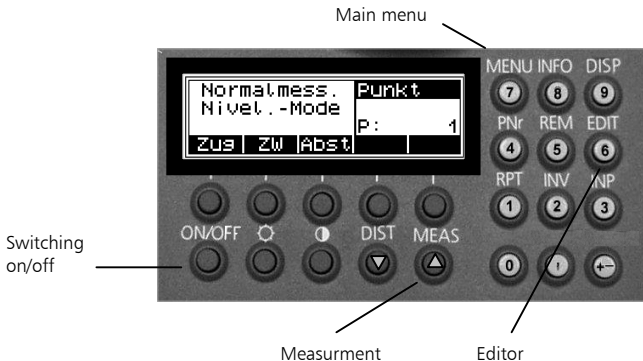
Requirements:

Battery charged

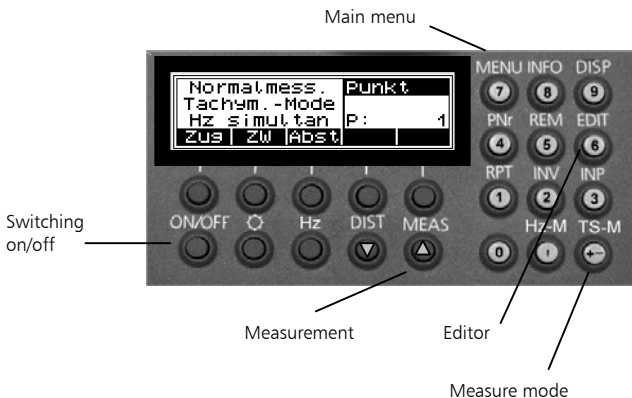
Memory Card inserted

The control panel

DiNi® 12 and DiNi® 22



DiNi® 12T



Normal rod measurement → MEAS	Point P: 2
Line IntM Sout	

Start Screen

Setting recording

- 7 MENU Call up Main Menu:

↑ 2 ADJUSTMENT
3 DATA TRANSFER
↓ 4 SET REC. PARAM.
ESC ↑ ↓ YES

Select from menus in this way

↑ ↓	Scroll through menu
Yes	Select marked entry
ESC	Return to previous menu
	or
MOD	Change entry
	or
└	Change softkeys

↑ ↓	4 SET REC. PARAM.
Yes	

Preparing for measurement

Normal rod measurement → MEAS	Point P: 2
Line IntM Sout	

The following settings are requirements for subsequent line adjustment!

DiNi® 12 and 22 only:

Yes	1	RECORDING OF DATA		
MOD	2	RECORD	PC Card	or iMEM
ESC	3	ROD READINGS	RMC	

Return

DiNi® 12T only:

Yes	1	RECORDING OF DATA		
MOD	2	RECORD	PC Card	
ESC				

Return

and

● +- TS-M Set Measure Mode

MOD	1	MODE	Level	
MOD	2	REG:- DATA	R,HD,Z	
ESC				

Return

Preparing for measurement

Normal rod measurement	Point
→ MEAS	P: 2
Line Int Sout	

Intermediate sight

Stake out

Without reference height

● MEAS

Initiate measurement – Repeatable as often as desired

Staff reading

Horizontal distance

		Point
R	1.08484	
HD	34.845	P: 2
Line Int Sout	Rpt	

With reference height

Intm

Start intermediate sight

Input benchmark height:

Inp benchmark height			
Z =	100.00000	m	
ESC	PRJ	?	o.k.

o.k.

Enter counter values in this way

0,1,...9

Use number keys

←

Correct input

o.k.

Confirm input

● MEAS

Measure backsight point

o.k.

Confirm measured value

Preparing for measurement

Height difference to the Backsight point

Z	99.86715	IntM
h	-0.13285	
HD	28.357	P: 2
ESC		Rpt

Height of the particular point

9 DISP

Browse values

A: Further measurements

B: Return

Stake out the height of a point

SOut

Start staking out

o.k.

Input benchmark height

MEAS

Carry out backsight measurement

o.k.

Confirm nominal value

Input nominal elevation

o.k.

Input nominal elev.			
Z =	100.10000	m	
ESC	PRJ	?	o.k.

MEAS

Initiate measurement

Actual height of point to be staked out

Visual rodreading

Nominal-
actual
deviation

Z	100.10989	SOut
dz	-0.00989	1.4388
HD	35.234	P: 1
ESC		o.k.

9 DISP

Browse values

o.k.

Repeat until dz is sufficiently small

A: Further nominal elevations

B: Return

Projects and inputs

Generating a new project (DiNi® 12 and 12T only)

● 6 EDIT

Call up edit mode

```
Project   noname.dat
last address  1070
free memory   89%
ESC Disp Del Inp PRJ
```

PRJ

Select project management

Yes

```
↑ 1 SELECT PROJECT
  2 NEW PROJECT
↓ 3 DATA FROM 0. PRJ.
ESC ↑ ↓ YES
```

Input name

```
Input projectname |rst
  muster.dat      |uvw
                  |xyz
ESC NUM          | ← | o.k.
```

Present character set

Switch to

o.k.

Project name

```
Project   muster.dat
last address  0
free memory 100%
ESC      Inp PRJ
```

ESC

Input alphanumeric characters in this way

abc , ABC	Switch to small, large, numeric
NUM	
<input type="radio"/> ↓ DIST.	Browse character set
<input type="radio"/> ↑ MEAS	Browse character set
0,1,....9	Number keys for characters
←	Correct input
o.k.	Confirm input

Line levelling

Normal rod measurement → MEAS	Point p: 2
Line Int Sout	

Start a new line

Line

new line

cont. line of Project	
continue line	
new line	
ESC	

Input line number

New line

o.k.

Input line number	
8	
ESC	ABC
←	o.k.

Select sequence of measur.

Procedure: B/F etc.

o.k.

Sequence of measur.	
BF	
BF..BF	
MOD	↑↓
	o.k.

Alternate: yes/no

Input benchmark height

o.k.

Inp benchmark height	
Z = 100.00000 m	
ESC	PRJ
?	o.k.

Input point number and point code

o.k.

Inp point number	
1	
ESC	ABC
←	o.k.

o.k.

Input point code	
AB	
.AB CDE FGH	
ESC	abc
←	o.k.

Line levelling

Z	100.00000	Back	1
		TP:	1
		P:	1
LEnd			

Measuring back and foresights

MEAS
backsight

Staff reading
backsight

Height of line of sight

Next sight

Zi	101.93820	Fore	1
Rb	1.93820	TP:	1
HD	25.750	Cp	1
LEnd	Int	M	SOut
			Rpt

DISP
Browse values

Backsight	1	Fore	1
Rb	1.93820	TP:	1
HD	25.750	Cp	1
LEnd	Int	M	SOut
			Rpt

Repeat

MEAS
Foresight

etc.

WdhI Repeat measurement

Ending line

LEnd

Yes

End of line end with closing benchmark ?			
NO			YES

Specify end of line as a benchmark height

Sh	-0.00220			
dz	0.00220			
Db	1667.65	Df	1616.36	
ESC				

Nominal-actual
deviation

Overall height
difference

Total
back/foresight
distances

Line interruption

Backsight 1	Fore 1
Rb 1.46756	TP: 1
HD 35.478	Cp 2
LEnd IntM SOut Rpt	

Intermediate sight

Stake out

Intermediate sight on the line

IntM Start intermediate sight

MEAS Initiate measurement

ESC Return

Staking out a height on the line

SOut Start staking out

o.k. Input nominal elevation

MEAS Initiate measurement

o.k. Confirm result

Continue with next height to be staked out

ESC Return

Continue with last line

Line

cont. line of Project
continue line
new line
ESC

Select option

Continue with line levelling

Backsight 1	Fore 1
Rb 1.46756	TP: 1
HD 35.478	Cp 2
LEnd IntM SOut Rpt	

Line interruption

Continuing with a line from another project

6 EDIT

```
Project   noname.dat
last address  1070
free memory   89%
ESC Disp Del Inp PRJ
```

Call up
project,
confirm
project

```
1 SELECT PROJECT
↓ 2 NEW PROJECT
3 DATA FROM 0. PRJ.
ESC ↑ ↓ YES
```

Cont. Line
of Project

```
cont. line of Project
continue line
new line
ESC
```

Search for start line

Select
Option

```
adr: 1
Start-Line BF
LNo : 7
ESC ↑ ↓ ?↓ o.k.
```

?PNo

?Cod

?Adr

?LNo

o.k.

Confirm end of line

```
adr: 78
End-Line
LNo : 7
ESC ↑ ↓ ?↓ o.k.
```

Continue
with line
levelling

```
Z 154.69162 Back 1
Tp: 2
CP 1
LEnd
```

Line adjustment

DiNi® 12 and 12T only

Line adjustments can only be performed if the levelling line has been completed and saved on the memory along with the intermediate heights.

In line levelling, a line is linked to points with known heights at the beginning and at the end so that the measured height difference can be compared with the nominal height difference.

The "line adjustment" program allows to spread the occurring difference over the individual staff stations proportionally to the sighting distances, obtaining adjusted heights as result.

7 MENU

Yes

```
↑ 5 SET INSTR. PARAM.
  Δ LINE ADJUSTMENT
↓ 1 INPUT
ESC | ↑ | ↓ | YES
```

Search for start of line

i.e.

?Znr

```
Search for
Start-Line
ESC | ?PNo | ?Cod | ?Adr | ?LNo
```

o.k.

```
Start-Line      adr:      1
LNo :           Δ      BF
ESC | ↑ | ↓ | ?
```

Line adjustment

End of line is automatically found

o.k.

End-Line					adr: 1027
LNo :					0
ESC	↑	↓	?	ok	

Yes

Line adjustment				
from adr. 1				
to adr. 1027				
NO				YES

Line check				
------------	--	--	--	--

Input
benchmark
heights

Inp benchmark height				
Z = 154.68900 m				
ESC	PRJ		?	o.k.

o.k.

Input point code				
.ab				
cde				
fgh				
ESC	NUM		←	o.k.

Mark changed
data

Start

Line adjustment				
-----------------	--	--	--	--

End line adjustment

ESC

Loop adjustment				
runs				
correct !				
ESC				

Reference Heights in the Memory

Besides entering of data it is possible to call up the stored data from the memory for line levelling and Staking out.

Call up the data in this way.

Select project

PRJ

Inp benchmark height			
Z =	154.68900		m
ESC	PRJ	?	o.k.

?

To search in memory using specified criteria

Search for:

Point number, point code or address

?PNr

?Code

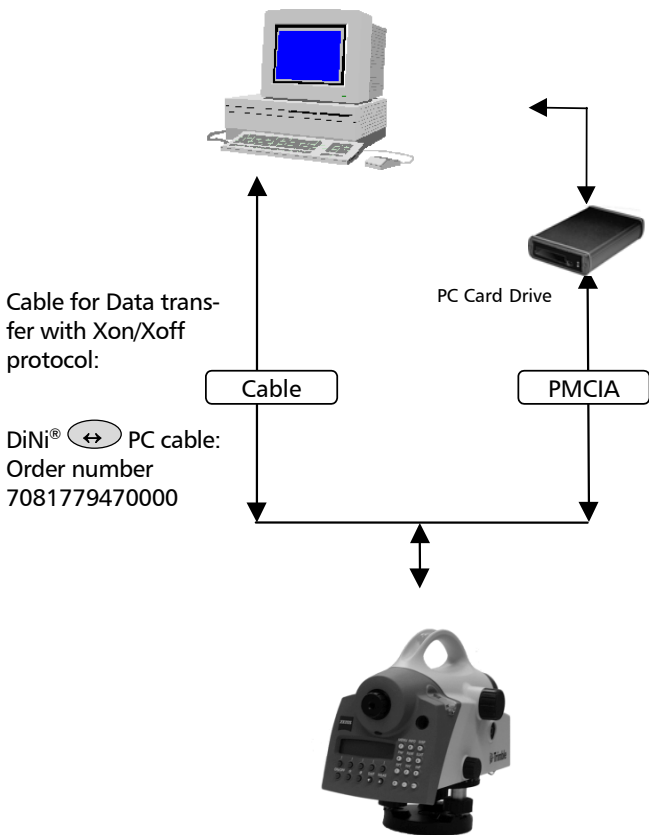
?Adr

Inp benchmark height			
Z =	0.00000		m
ESC	?PNr	?Cod	?Adr o.k.

o.k.

Confirm the height

Data Transfer



Data Transfer

Data transfer via cable

7 MENU

YES

```
↑ 2 ADJUSTMENT
  3 DATA TRANSFER
↓ 4 SET REC. PARAM.
ESC ↑ ↓ YES
```

Select interface

YES

```
↑ 4 UPDATE / SERVICE
  1 INTERFACE 1
↓ 2 INTERFACE 2
ESC ↑ ↓ YES
```

Select transfer direction

YES

```
  1 DiNi → PERIPHERY
↓ 2 PERIPHERY → DiNi
  3 SET PARAMETERS
ESC ↓ YES
```

Attention !

A requirement for transfer are identical parameters on the instrument and the peripheral device: format, protocol, baud rate, parity and stop bits.

i.e.

all

```
Selection of data
lines for transfer
to COMP1
ESC all ?
```

Start data transfer

YES

```
Transfer data lines
from adr. 1
to adr. 20
NO YES
```

Formatting a PC Card

With the DiNi[®] 12 and 12T it is possible to format a SRAM - PC Card.

7 MENU

YES

```
↑ 2 ADJUSTMENT
3 DATA TRANSFER
↓ 4 SET REC. PARAM.
ESC | ↑ | ↓ | YES
```

YES

```
↑ 3 PC-DEMO OFF
4 UPDATE / SERVICE
↓ 1 INTERFACE 1
ESC | ↑ | ↓ | YES
```

YES

```
1 FORMAT PC Card
↓ 2 UPDATE DiNi
ESC | | ↓ | YES
```

Attention !

Make sure to transfer the data stored in the PC Card to another storage medium beforehand, as all data in the memory is lost during formatting.

Adjustment

7 MENU

The instrument adjustment defines the necessary corrections and correction values for the line sight of DiNi[®], which are required to ensure optimum measuring accuracy.

YES



Before starting any adjustment, allow the instrument to adapt to the ambient temperature.

Different Methods with identical result

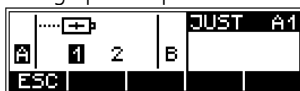
	Situation
Förstner	<p style="text-align: center;">A 1 2 B</p> <p style="text-align: center;"> 1/3 1/3 1/3 </p>
Nähbauer	<p style="text-align: center;">1 A B 2</p> <p style="text-align: center;"> 1/3 1/3 1/3 </p>
Kukkamäki	<p style="text-align: center;">2 A 1 B</p> <p style="text-align: center;"> app. 20m app. 20m </p>

Adjustment

After the selection of the adjustment method, you can change the settings of earth curvature and refraction. This is not possible at another point of the DiNi® menu system. Changes of earth curvature and refraction settings become effective only if you adjust the system afterwards. The line of sight will then be corrected accordingly.

with graphic help

● MEAS



.....

Result



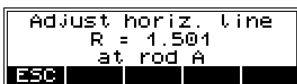
o.k.

If the new line of sight correction is adopted, the program requests the checking of the reticule alignment (for visual reading).

screw below the eyepiece - 1



1



Adjustment

Adjustment of circular bubble

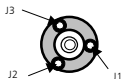


Check the function of circular bubble:
By turning the instrument 180° round the vertical axis the circular bubble has to remain within the circle.



Adjustment of circular bubble:
Remove the screw (2) of the protection cap with the adjusting tool and detach the protection-cap.

Turn the instrument 180° .



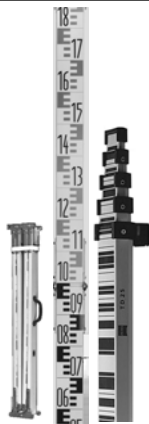
Eliminate half the residual deviation of the circular bubble by means of the tribrach screw and half by adjusting the circular bubble (J1..3).

Repeat this procedure and check the residual deviation.



Fix the protection cap again. Make sure that the rubber joint is placed in the groove.

Accessories for DiNi®



Foldable staff made of wood

length: 3 m or 4 m

Telescopic staff made of aluminium

length: 4 m or 5 m

Special parts and invar tape

made of aluminium, invar and foil

length: 30 cm, 50 cm and 1 m



Invar staff

- small and wide base
- length: 1 m, 2 m and 3 m
- Transport case
- Telescopic support

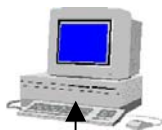
Battery pack and charger



Memory Card and data transmission cable



Updates



DiNi[®] PC
Cable:

Order-
number
708177-
9470.000



Software updates are offered by the manufacturer on Internet sites with reservation as to extensions of the functional range. Surf to our Web sites. The dealer will be pleased to communicate the Internet site names, when required.

The updates offered contain the following functions:

- Update of the instrument computer
- Update of the interface computer (DiNi[®] 12 and DiNi[®] 12 T only)
- Loading of an additional language (four languages can be loaded)

The files loaded from the Internet sites have to be unpacked and copied on a floppy disk.

For the update processes , the operating system DOS has to be used in any case.

Additionally to the files required for the update process, the update instructions have to be loaded from the Internet in any case and have to be observed strictly. No liability will be assumed for claims resulting from the non-compliance with the specification.

In these instructions, all steps are described in detail. They may contain and explain commands that differ from the description given here.

Instructions for Maintenance and Care

Allow sufficient time for the instrument to adjust to the ambient temperature.

Use a soft cloth to remove dirt and dust from the instrument.

When working in wet weather or rain, cover the instrument during longer breaks with the protective hood.

Clean the optics with special care using a clean and soft cloth, cotton wool or a soft brush, do not use any liquid except pure alcohol.

Do not touch the optical surface with the fingers.

For transportation over long distances, the instrument should be stored in its case.

When working in wet weather, wipe the instrument and case dry in the field and let it dry completely indoors, with the case open.

Let wet instruments and accessories dry before packing them up.

After a long storage, check the adjustment of the instrument prior to use.

Observe the boundary values for the temperature of storing, especially in the summer (interior of the vehicle).





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