

LEICA TPS1100 Professional Series

***Surveying
Experts***



***High-End Surveying
Precise, Fast and Intelligent***

Leica
Geosystems

TPS1100 Professional Series – More time for the essentials.



*Automated, practical programs are the main features of the
TPS1100 Professional Series. A suite of modern functions
will make your work more productive, more precise and
more flexible.*



Sophisticated functions for demanding users

The TPS1100 Professional Series was designed to provide practical solutions to make surveying processes simple, efficient and productive. The TPS1100 Professional Series includes a wide variety of practical, automated functions to achieve the highest degree of efficiency within the shortest period.

One of the many examples is the ATR, the Automatic Target Recognition. With ATR, the instrument fine to points targets by itself. Manual targeting is no longer required. Surveys are made faster and easier, leaving more time to carefully record all significant data.

Flexible in everyday applications

TPS1100 Professional Series high-end surveying instruments offer a high degree of flexibility. The easy-to-read, simple user interface and professional programming environment invite you to configure the instrument to meet your individual requirement and personal preferences. The modular system assures a large variety of available models and options to meet the varying demands and requirements.

Software for efficient data acquisition

Information technologies and surveying are growing closer together. This is evident in the range of software available for the TPS1100 Professional Series. The software programs are tailored to acquire and process data with the instrument and then to transfer the data from the instrument to a computer.

Leica's proven know-how

All the quality and performance that made the previous Leica total stations so successful are included in the new TPS1100 Professional Series. Plus the latest technological developments: light weight design, easy-to-use interface and the highest quality at an excellent price/performance ratio.



Why professionals choose TPS1100.

Integrated EDM means **quick and precise distance measurements**

High productivity with Automatic Target Recognition (ATR)

EGL guide light to help **stay on line**

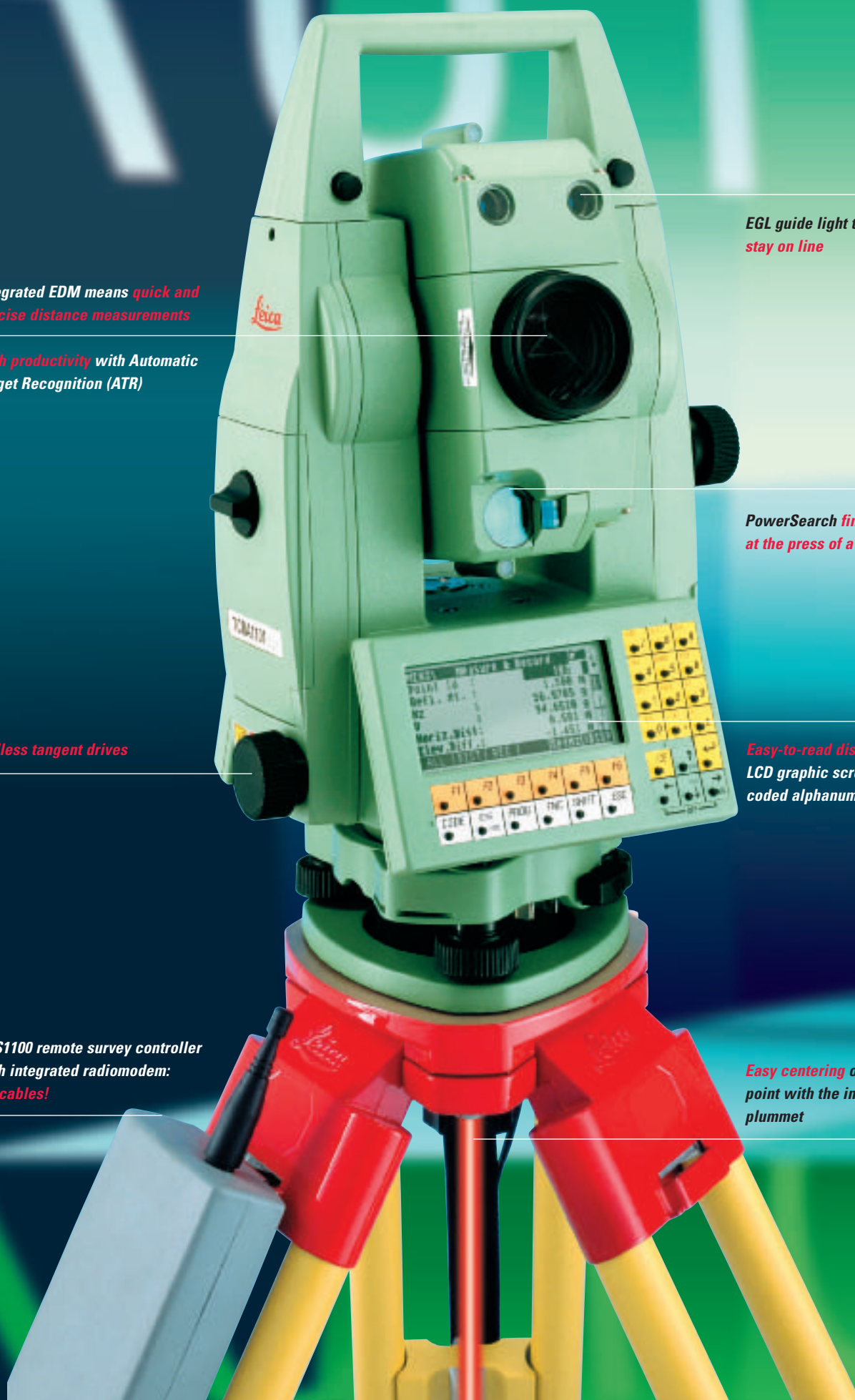
PowerSearch finds prisms **at the press of a button**

Endless tangent drives

Easy-to-read display with large LCD graphic screen and color-coded alphanumeric keyboard

RCS1100 remote survey controller with integrated radiomodem:
No cables!

Easy centering over the ground point with the integrated laser plummet



Modular battery concept
economical camcorder batteries



Develop your own applications
with the GeoBasic programming
environment.

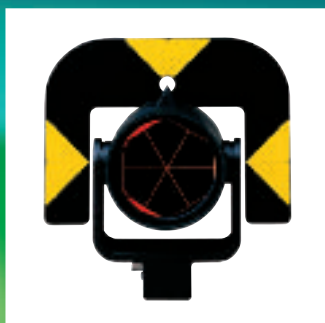


**Leica Survey Office, the user-
friendly program** enables you to
create code lists and coordinate
files, exchange data and install
software.

Record and store data with the
PCMCIA-memory card that can
also be used with Leica GPS and
DNA instruments.



**Optimal performance for every
application** with the extensive
range of accessories.

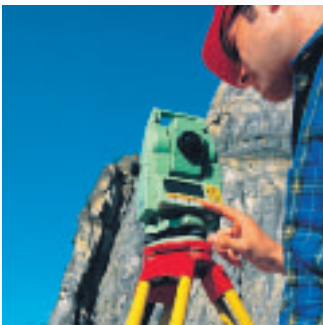


**Unique 360° reflector does
not have to be aligned with
the instrument reflectors.**

**The RCS1100 remote control
lets you operate from
the target point.**



Automatic Target Recognition (ATR) – measure without fine pointing and focusing



Have you thought about how much time you lose by manual pointing and focusing? ATR measures twice as many points with the same time as manual methods.

This is how it works:

After roughly pointing to the reflector and triggering a measurement, the instrument moves the telescope automatically to the center of the reflector and then makes the measurement.

Ideal for:

Stake out, topography, free stationing, traversing, sets of angles, and monitoring.

Efficient and relaxed

ATR attains a high degree of efficiency with the increase in measuring speed. Fine pointing and focusing is no longer required which makes for relaxed working procedures. ATR assures constant precision – under any condition and independent of the surveyor.

Automatic Target Tracking – measure with record setting speed

Mass point surveys are very time consuming if every point has to be targeted and recorded individually. ATR does all of that for you and records all measured data, point-by-point, just press the button.



This is how it works:

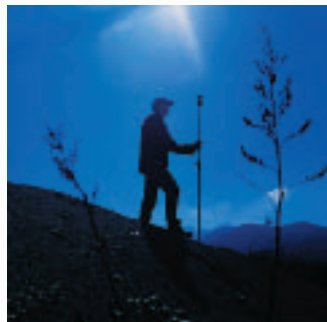
After the first targeting, the instrument tracks the reflector automatically – even if there are brief interruptions of the line-of-sight. Intelligent software routines assure reliable tracking – even under light reflected from third sources.

Ideal for:

Topographic surveys, stake-out, modeling digital landscapes or acquiring data for GIS systems.

Continuous and quick

With ATR, fine pointing is no longer required and even rough targeting is not needed. With the 360° reflector even aligning the reflector to the instrument is not required. By using distance tracking, measured values are recorded without interrupting target tracking – just press the button.



RCS1100 remote control – measure from the target point



How practical when you can measure from the target point! With RCS you can record information and perform surveying tasks on your own.

This is how it works:

In radio mode, the instrument transfers its data to the RCS1100 remote control, which has the identical keyboard and display as the instrument. In this way all instrument functions can be remotely controlled.

Ideal for:

One-man operation, topographic mass-point surveys with coding and stakeout.

Quick and efficient one-man operation

The RCS1100 lets you work from the target point. Everything you do at the instrument can also be done from the target point. Intelligent search functions such as defining a work area, controls by joystick or compass, predicting the 3D path of the reflector accelerate working from the reflector.

REMOTE CONTROL



PowerSearch finds prisms – just press the button



Find prisms with just a press on the button and save valuable time. Never before have you been ready to measure this quickly.



This is how it works:

In PowerSearch mode, the instrument rotates around its standing axis and sends out a vertical laser signal swath. As soon as it finds a prism, the instrument stops rotating and automatically targets the prism.

Ideal for:

Topographic mass-point surveys in difficult areas. Robotic surveys with the RCS1100 remote control, machine guidance.

Immediately ready to measure

PowerSearch finds your prism quickly. Just press the button and you are ready to measure even after tracking was interrupted. Continue to use the accessories you already have – no special prisms are required. In one-man operation, PowerSearch saves time and effort.

Reflectorless distance measurement – measure directly to the target

It's often very difficult to precisely measure an inaccessible target. With reflectorless distance measurements, you can quickly measure to the target – with just a press on the button and without any complicated measuring programs.



This is how it works:

Using the phase measuring method, the instrument sends out a concentrated, visible laser that clearly marks the target and determines the distance with a high degree of accuracy.

Ideal for:

Measuring inaccessible objects, house corners, facades and interiors. With motorized drive, surfaces can be scanned or profiles can be measured.

Reflectorless and precise

Reflectorless distance measurement lets you measure over obstacles in your daily work. Just measure directly to the object and achieve reliable and accurate results.

***Distance meter (IR), ATR and
PowerSearch:***

Laser class 1 acc.

IEC 60825-1 resp. EN 60825-1

Laser class I acc.

FDA 21CFR Ch. I §1040

EGL:

LED class 1 acc.

IEC 60625-1 resp. EN 60825-1.

***Distance meter (RL, standard
range) and laser plummet:***

Laser class 2 acc.

IEC 60825-1 resp. EN 60825-1

Laser class II acc.

FDA 21CFR Ch. I §1040



***Distance meter
(RL, extended range):***

Laser class 3R acc.

IEC 60825-1 resp. EN 60825-1

Laser class IIIa acc.

FDA 21CFR Ch. I §1040



TPS1100 software package – higher performance and productivity with the appropriate software

Standard

- *Free stationing*
- *Orientation / Height transfer*
- *Resection*
- *Stake out*
- *Tie distance*
- *Remote height*

TPS Advanced

- *Reference line*
- *COGO*
- *Sets of Angles*
- *Area*
- *Traverse*
- *Local resection*

TPS Expert

- *Reference Line*
- *COGO*
- *Sets of Angles*
- *Area*
- *Traverse*
- *Local resection*
- *AutoRecord*
- *Hidden Point*
- *Reference plane*
- *Face Scan*
- *DTM stake out*

Auxiliary programs

- *Road Plus*
- *Monitoring*



***Total Quality Management
is our commitment to total
customer satisfaction***

For more information about
our TQM program, ask
your local Leica Geosystems
agent.

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TPS1100 Professional Series – Technical data

Define your requirements

Overview of the models and options

| | TC | TCR | TCRM ⁺ | TCA ⁺ | TCRA ⁺ | TCRA ⁺ Power Search |
|---|----|-----|-------------------|------------------|-------------------|-----------------------------------|
| Angle measurement | • | • | • | • | • | • |
| Distance measurement (IR) | • | • | • | • | • | • |
| Reflectorless and Long Range distance measurement (RL) ~ | | • | • | ~ | • | • |
| Motorized | | | • | • | • | • |
| Automatic Target Recognition (ATR) | | | ~ | • | • | • |
| PowerSearch (PS) | | | | ~ | ~ | • |
| Electronic Guide Light (EGL) | ○ | ○ | ○ | • | • | • |
| Remote Control RCS1100 | ○ | ○ | ○ | ○ | ○ | ○ |
| • Standard ○ Optional ~ Retrofit possible – Option: standard range + plus | | | | | | |

Angle measurement

| | Type 1101 | Type 1102 | Type 1103 | Type 1105 |
|----------------------|---------------------------------|---------------|---------------|---------------|
| Accuracy | | | | |
| Hz, V (ISO 17123-3): | 1.5" (0.5 mgon) | 2" (0.6 mgon) | 3" (1 mgon) | 5" (1.5 mgon) |
| Display resolution: | 1" (0.1 mgon) | 1" (0.1 mgon) | 1" (0.5 mgon) | 1" (0.5 mgon) |
| Method | absolute, continuous, diametric | | | |

Distance measurement (IR)

| | |
|--|--|
| Range (average atmospheric conditions) | |
| Round prism (GPR1): | 3000m / 9,800 ft |
| 360° reflector (GRZ4): | 1500m / 4,900 ft |
| Mini prism: | 1200m / 3,900 ft |
| Reflective tape (60 mm x 60 mm): | 250 m / 820 ft |
| Shortest measurable distance: | 0.2 m to round prism (GPR1) / 1.5 m to a 360° reflector |
| Accuracy (ISO 17123-4) / Measuring time | |
| Standard mode: | 2 mm + 2 ppm / 1.0 sec |
| Fast mode: | 5 mm + 2 ppm / 0.5 sec |
| Tracking mode: | 5 mm + 2 ppm / 0.3 sec |
| Fast mode tracking: | 10 mm + 2 ppm / < 0.15 sec |
| Display resolution: | 1 mm |
| Method | Principle of phase measurement (coaxial, invisible infrared laser) |

Reflectorless and Long Range distance measurement (RL)

| | |
|--|---|
| Range (average atmospheric conditions) | |
| Reflectorless (extended range): | 170 m / 550 ft (Kodak Gray Card, white side) |
| Reflectorless (standard range): | 80 m / 260 ft (Kodak Gray Card, white side) |
| Shortest measurable distance: | 1.5 m |
| Long Range on to round prism (GPR1): | 1000 m – 5000 m |
| Accuracy (ISO 17123-4) / Measuring Time | |
| Reflectorless (standard mode): | 3 mm + 2 ppm / typ. 3–6 sec, max. 12 sec |
| Reflectorless (tracking mode): | 10 mm + 2 ppm / typ. 3–6 sec, max. 12 sec |
| Laser dot size: | 5 mm + 2 ppm / typ. 2.5 sec, max. 8 sec |
| Laser dot size | |
| At 50 m: | approx. 10 mm x 20 mm |
| At 100 m: | approx. 15 mm x 30 mm |
| At 200 m: | approx. 30 mm x 60 mm |
| Method | Principle of phase measurement (coaxial, visible red laser) |

Motorized (M)

| | |
|----------------------|-----------------------------|
| Maximum speed | |
| Rotating speed: | 50 gon / sec (45 deg / sec) |

Automatic Target Recognition (ATR)

| | |
|--|--|
| Range ATR mode / LOCK mode (average atmospheric conditions) | |
| Round prism (GPR1): | 1000 m / 800 m (3300 ft / 2600 ft) |
| 360° reflector (GRZ4): | 600 m / 500 m (1900 ft / 1600 ft) |
| Mini prism: | 500 m / 400 m (1600 ft / 1300 ft) |
| Reflective tape (60 mm x 60 mm): | 65 m / -- (200 ft / --) |
| Shortest measurable distance: | 1.5 m to 360° reflector (GRZ4) |
| Accuracy / Measuring Time | |
| Distances < 300 m: | 3 mm / 3 sec |
| Distances > 300 m: | 1.5", 2", 3", 5" (equivalent type) / 3–4 sec |
| Maximum speed (LOCK mode) | |
| Tangential (standard mode): | 25 m / sec at 100 m |
| Tangential (tracking mode): | 18 m / sec at 100 m |
| Radial (tracking mode): | 4 m / sec |
| Method | Digital image processing (laser beam) |



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PowerSearch (PS)

| | |
|---|---|
| Range (average atmospheric conditions) | |
| Round prism (GPR1): | 200 m / 650 ft |
| 360° reflector (GRZ4): | 200 m / 650 ft (optimal when aligned with the instrument) |
| Mini prism: | 100 m / 330 ft |
| Shortest measurable distance: | 5 m / 15 ft |
| Search Time | |
| Typical time to find prism: | < 10 sec |
| Maximum speed | |
| Rotating speed: | 50 gon / sec (45 deg / sec) |
| Method | |
| Digital signal processing (laser swath) | |

Electronic Guide Light (EGL)

| | |
|--|------------------------------|
| Range (average atmospheric condition) | |
| Work range: | 5 m – 150 m / 15 ft – 500 ft |
| Accuracy | |
| Positioning accuracy: | 5 cm to 100 m |

Remote Control RCS1100

| | | |
|----------------------------|---|-------------------------------------|
| Method | | Datalink via integrated radio modem |
| Control unit | | |
| Display: | 8 lines with 32 characters 256*64 pixels, graphic LCD | |
| Keyboard: | 30 keys (6 function keys, 12 alphanumeric keys) | |
| Interface: | RS232 | |
| Battery | | |
| Type: | Nickel Metal Hydride (NiMH) | |
| Voltage: | 6 V | |
| Capacity (GEB111): | 1.8 Ah | |
| Weight | | |
| RCS1100: | 0.77 kg / 1.7 lb | |
| Battery (GEB111): | 0.2 kg / 0.45 lb | |
| Reflector pole adapter: | 0.18 kg / 0.4 lb | |
| Working environment | | |
| Working temperature range: | –20°C to +50°C / –4°F to +122°F | |
| Storage temperature range: | –40°C to +70°C / –40°F to +158°F | |
| Dust/water (IEC 60529): | IP54 | |
| Humidity: | max. 95% non-condensing | |

General data TPS1100

| | | | | | |
|--------------------------------------|---|------------------|------------------|------------------|------------------|
| Compensator | | Type 1101 | Type 1102 | Type 1103 | Type 1105 |
| Setting range: | 4' (0.07 gon) | | | | |
| Setting accuracy: | 0.5'' (0.2 mgon) | | | | |
| Method: | centralized dual axis compensator | | | | |
| Level | | Type 1101 | Type 1102 | Type 1103 | Type 1105 |
| Sensitivity of circular level: | 6' / 2 mm | | | | |
| Display resolution electronic level: | 1'' (0.1 mgon) | | | | |
| Telescope | | | | | |
| Magnification: | 30x | | | | |
| Free aperture of objective: | 40 mm | | | | |
| Field of view: | 1°30' (1.66 gon) / 2.7 m at 100 m | | | | |
| Focussing: | 1.7 m to infinite | | | | |
| Control unit | | | | | |
| Display: | 8 lines with 32 characters 256*64 pixels, graphic LCD | | | | |
| Keyboard: | 30 keys (6 function keys, 12 alphanumeric keys) | | | | |
| Angle display: | 360''°, 360° (decimal), 400 gon, 6400 mil, V% | | | | |
| Distance display: | Meter, Int. Ft, Int. Ft/Inch, US Ft, US Ft/Inch | | | | |
| Number of Displays: | 1 / 2 (optional) | | | | |
| Data storage | | | | | |
| Memory card: | PCMCIA ATA Flash (16 MB) / PCMCIA SRAM (512 KB, 2 MB) | | | | |
| Number of data files: | 18000 / 2 MB | | | | |
| Interface: | RS232 | | | | |
| Laser plummet | | | | | |
| Accuracy: | Deviation from the plumb line 1.5 mm (2 sigma) at 1.5 m | | | | |
| Point diameter: | 2.5 mm at 1.5 m | | | | |
| Endless drive | | | | | |
| Number of drives Hz / V: | 1 / 1 | | | | |
| Steps: | infinite | | | | |
| Battery | | | | | |
| Type: | Nickel Metal Hydride (NiMH) | | | | |
| Voltage: | 6 V | | | | |
| Capacity (GEB121): | 3.6 Ah | | | | |
| Number of measurements: | 400 – 600 | | | | |
| Weight | | | | | |
| Instrument: | 4.7 – 4.9 kg (10.4 – 10.8 lbs) | | | | |
| Battery (GEB121): | 0.4 kg (0.8 lbs) | | | | |
| Tribach (GDF121): | 0.8 kg (1.7 lbs) | | | | |
| Working environment | | | | | |
| Working temperature range: | –20°C to +50°C / –4°F to +122°F | | | | |
| Storage temperature range: | –40°C to +70°C / –40°F to +158°F | | | | |
| Dust/water (IEC 60529): | IP54 | | | | |
| Humidity: | max. 95% non-condensing | | | | |



Distance meter (IR), ATR and PowerSearch:
Laser class 1 acc.
IEC 60825-1 resp. EN 60825-1
Laser class I acc.
FDA 21CFR Ch. I §1040

Distance meter (RL, standard range) and laser plummet:
Laser class 2 acc.
IEC 60825-1 resp. EN 60825-1
Laser class II acc.
FDA 21CFR Ch. I §1040

CAUTION
LASER RADIATION – DO NOT STARE INTO BEAM
620-690nm/0.95mW max.
CLASS II LASER PRODUCT

Distance meter (RL, extended range):
Laser class 3R acc.
IEC 60825-1 resp. EN 60825-1
Laser class IIIa acc.
FDA 21CFR Ch. I §1040

DANGER
LASER RADIATION – AVOID DIRECT EYE EXPOSURE
620-690nm/4.75mW max.
CLASS IIIa LASER PRODUCT

EGL:
LED class 1 acc.
IEC 60625-1 resp. EN 60825-1

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