Leica TPS1200+ Series
High performance
Total Station

- when it has to be right

Leica
Geosystems
Leica TPS1200+ Total Stations

Packed with exciting new features, built for speed, accuracy, ease-of-use and reliability. Leica TPS1200+ total stations carry out even the most complex tasks, better and more efficiently than ever before. And, best of all, they combine perfectly with GPS1200+.

Superb measurement technology
High accuracy angle measurements and precise long-range distance measurements backed by automatic fine pointing and fast, reliable reflector location. You work faster, more precisely and more relaxed.

Easy to operate
Intuitive interface, powerful data management, on-board routines and programs: all easy to use and identical for TPS, GNSS and RX1250.

Large graphic colour display
Easy viewing of entire surveyed area and immediate access to all measured data. You see exactly what you’ve done and what you’ve still to do.

Totally flexible
Configure and program TPS1200+ in the way you want, for your applications, for the way you work and for the data output you require.

A complete series
TPS1200+ total stations cover a range of models and options. Select the ones that suit you best.

Use TPS1200+ for everything
Use TPS1200+ total stations for surveying, engineering, stakeout, topo, monitoring etc. Combine them with GNSS. Benefit from huge productivity of System 1200.

Combine TPS and GNSS. Use them in the same way. Change easily from one to the other. Work faster, more accurately and more efficiently. Enjoy all the freedom, flexibility and power of System 1200.

TPS1200+ with integrated GNSS. All TPS1200+ can be upgraded to Smart Station.

Unites top GNSS technology with powerful data management. Perfect for all GNSS applications.
Leica System 1200

TPS and GNSS
Working together
For all applications
Today and in the future

Designed and built to the most stringent standards with the latest measurement technologies, Leica System 1200 instruments are extremely efficient and reliable, and stand up to the severest environments.

A new, highly intuitive user interface, a multitude of functions and features, powerful data management, and user-programming capabilities are common to both System 1200 TPS and GNSS instruments.

Operators can switch instantly between TPS and GNSS and use whichever is the most convenient and suitable; extra training is not required.

These new high-tech TPS and GNSS instruments with identical operation enable you to do every type of job, faster, more accurately and more efficiently than ever before.

And most important, you reduce your costs and increase your profits.

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Leica TPS1200+
Top performance, high accuracy total stations do everything you want and much more.

Leica SmartPole
Save time with SmartPoles’ setup On-the-fly and easily swap between GNSS and TPS when needed.

Leica SmartWorx
SmartWorx TPS/GNSS application software is both easy-to-use and extremely powerful.

Leica Geo Office
Everything you need in a single package for TPS and GNSS: import, visualization, conversions, quality control, processing, adjustment, reporting, export etc.
Leica TPS1200+
Exceptional performance and outstanding features

Fast, precise, long-range EDM
Coaxial, high-accuracy EDM with various measuring modes. 3 km range to a single prism.

RadioHandle
Transfers data instantly between TPS1200+ and remote control unit. Powered by TPS1200+ plug-in battery.

Plug-in Li-Ion battery
Small, light, high-capacity Lithium-Ion battery powers TPS1200+ for hours and hours.

Bluetooth® Wireless-Technology integrated
Wireless transfer of data to PDA’s and cell phones.

High-tech angle measurement
High-accuracy continuous angle-measuring system. Choice of accuracies from 1 to 5 seconds.

Endless drives
For fast, comfortable operation and precise pointing.

Well-designed keyboard
Clear, logical arrangement with alphanumeric, function and user-definable keys.

Touch screen
Gives instant access to all functions without using the keyboard.

Laser plummet
Centers TPS1200+ easily, quickly and exactly over a ground point.

PinPoint R1000
Best reflector-less electronic distance measurement technology in combination of range, accuracy, measurement time and laser spot size in the market. Measure more than 1000 m range with true PinPoint accuracy.
Guide Light (EGL)
Practical alignment aid for stakeout; helps rodman to line up reflector quickly and exactly.

Automatic Target Recognition (ATR):
Automatic fine pointing to prism. Speeds up measurements and improves productivity.

PowerSearch (PS)
Fast rotating laser fan finds reflector quickly and ATR fine points. Valuable aid for all types of work; perfect for remote control surveys.

High contrast graphic colour display
Best colour display in the market because of perfect clarity and contrast. Excellent graphics and easy to read whether in fading light or bright sunshine.

360° reflector
No orientation required; surveying and stakeout are easier and quicker.

Wide range of accessories
Can also be used for GPS1200+ and other Leica equipment.

SmartPole
SmartAntenna, 360° reflector and the RX1250 is the perfect setup to operate GNSS and TPS from one control unit.

Leica Geo Office
Software support package for TPS and GNSS with tools and components for import, visualization, conversions, quality control, processing, adjustment, reporting, export.

CompactFlash cards
High capacity, reliable data storage. Ideal for data transfer.

Internal memory
High capacity, reliable internal memory.

Various models and options
TPS1200+ total stations cover a range of standard and motorized models and various exciting options. Only pay for what you need!

Seamless dataflow

RX1250 Control Unit
Remote controls the TPS1200+ via radio modem and operates the SmartAntenna on the pole via Bluetooth® Wireless Technology or cable. Surveyor with reflector carries out the entire GNSS and TPS survey by himself.

Plug-in Li-Ion battery
Small, light Lithium-ion battery powers remote control unit and integrated radio.
Leica TPS1200+
Extremely powerful
Yet very easy to use

TPS1200+ is loaded with a multitude of features and functions to meet the many different needs of users all over the world, yet it is remarkably easy to use.

TPS1200+’s graphical operating concept is self-explanatory and guides you straight to what you need.

You can use the default settings or, if you prefer, you can set TPS1200+ to operate, display and output data in exactly the way you require.

When you use TPS1200+ you’ll find that everything is very easy to understand.

Even better, TPS1200+ and GPS1200+ are fully compatible with the same CompactFlash cards, data management, displays and keyboards.

Depending on the jobs you do, you can change easily from TPS to GNSS and continue working in exactly the same way.

Graphic view mode

Graphic views show your work. Zoom in for details and out for the entire survey. Use the touch screen or keyboard to access data related to points and objects.

With graphical views you can check quickly in the field for completeness and correctness.

Coding and plan of your work

Define points, lines and areas to build up a plan in the display as you survey. You see immediately what you’ve done. Attach the codes, attributes and information needed for input into your office or mapping software.

System 1200 has all types of tools and is incredibly versatile.

Data export in any format

Data can be exported directly from TPS1200+ or via Leica Geo Office in various standard formats or in your own user-defined formats for direct input into any type of processing, office, CAD or mapping software.

System 1200 interfaces easily to third-party software packages.
User definable displays
With TPS1200+ you can define different display masks so that the instrument shows exactly what you and your crews want to see when surveying in the field.
Set the displays according to the jobs you do and the information required.

TPS1200+ adapts perfectly to your needs.

Data management
The powerful database manages data, files, jobs, quality checks etc. You can view, edit, delete, and search with or without filters. Coordinates of points measured more than once are averaged provided that they lie within specified tolerances.

Surveying is much easier and more reliable with System 1200.

Application programs
TPS1200+ is supplied with many useful programs such as Survey, Setup, Stakeout, COGO etc.
Other programs such as RoadRunner, Reference line, Sets of Angles and DTM Stakeout are optional.
You can also write your own programs for special applications in Geo C++.

Most programs run on both TPS and GNSS.
Leica TPS1200+
High-precision measurement technology
Time-saving measurement aids

Angle and distance measurement (IR-Mode)

PinPoint – reflectorless EDM (RL-Mode)

Automatic Target Recognition (ATR/LOCK)

Highest accuracy
Longest range

TPS1200+’s precision angle-measurement system operates continuously providing instant horizontal and vertical circle readings that are automatically corrected for any “out of level” by a centrally located twin-axis compensator. The coaxial EDM uses a visible red laser, has various measuring modes, and measures to prisms and reflective tape. The range is excellent – 3 km to a single prism – and the accuracy superb – 1 mm + 1.5 ppm for all TPS1200+ models. Resolution is 0.1 mm.

Measure extreme ranges with highest accuracy

PinPoint is the ideal tool for measuring to wall corners, inaccessible objects, facades, rock faces, roofs and walls inside buildings, in fact to anything at which it is difficult to set up a reflector. PinPoint’s tightly bundled laser marks the point exactly with a small red dot. Measurements are taken instantly and directly (no complex routines measurement). And with PinPoint you can also take very long distance measurements to prisms.

Measure points quick and accurate

With ATR, you only need to point roughly and take a measurement; TPS1200+ then fine points to the center of the prism and measures, all fully automatically. In LOCK mode TPS1200+ remains locked onto the reflector and follows it as it moves. Measurements can be taken at any time. And, as software predicts reflector movements, TPS1200+ continues to track in spite of obstructions and short interruptions. If long interruptions should cause complete loss of lock, use PowerSearch.

Optional for all TPS1200+

Two versions: standard range R400 (more than 400 m), superior range R1000 (more than 1000 m)

Very small laser spot, marks the point exactly

Standard measurement and tracking modes

Accuracy 2 mm + 2 ppm

Motorized TPS1200+ with PinPoint – the perfect tool for scanning facades

Optional for motorized TPS1200+

Eliminates manual operation

Very fast measurements

Uniform high accuracy

Works with standard prisms (no need for active target)
Work easily, quickly and comfortably
Increase productivity and profits

**PowerSearch (PS)**
- Finds reflector automatically
- PowerSearch finds reflectors within seconds no matter where they are. With PowerSearch activated, TPS1200+ rotates and sends out a vertical laser fan. As soon as the fan strikes a prism TPS1200+ stops rotating, ATR takes over and fine points – all fully automatically.
- Use PowerSearch for the first ATR measurement or to find the reflector again if Automatic Target Tracking loses lock completely.
- Optional for motorized TPS1200+ equipped with ATR
- Activated at the touch of a key or automatically
- Finds standard prisms (no need for active target)
- Saves time, increases productivity
- Highly recommended for fast, efficient remote control

**Remote Control Unit (RX1250)**
- Operate at the reflector
- With the RX1250 remote control unit you can control both the TPS1200+ via RadioModem and RadioHandle and the GNSS SmartAntenna via Bluetooth® Wireless Technology or cable from the reflector pole. The control unit has the same display as the TPS1200+, a touch screen, optionally a colourscreen and a full alphanumeric QWERTY keyboard.
- Operation is exactly the same. You can trigger measurements, enter codes, use routines and programs, collect data from GNSS and TPS – whatever you like.
- Optional for all TPS1200+
- Extend setup to SmartPole
- Best with ATR, PowerSearch and 360° reflector
- Light, rugged, reliable
- Reliable wireless communication via RadioHandle and Bluetooth® Wireless Technology
- Perfect one-man survey system
- No need for cables
- Increases efficiency and productivity

**SmartStation (ATX1230+ GNSS)**
- TPS & GNSS perfectly combined
- TPS1200+ with ATX1230+ GNSS Smart-Antenna combined in one compact, easy-to-use instrument. No need for control points, traverses or resections. Set up SmartStation and let RTK GNSS determine the position within seconds to centimeter accuracy, then survey and stake out with TPS1200+. The total station controls all measurements, displays and data, for both GNSS and TPS. Once SmartStation is positioned, use the Smart-Antenna on a pole with controller and sensor as an RTK rover.
- TPS and GNSS combined into one instrument
- Fix the position with RTK then survey with TPS
- No need for control points, traverses or resections
- Increase productivity and profits
- All TPS1200+ can be upgraded to SmartStation
# Leica TPS1200+
## Technical specifications and system features

### Models and options

<table>
<thead>
<tr>
<th>Models and options</th>
<th>TC</th>
<th>TCR</th>
<th>TCRM</th>
<th>TCA</th>
<th>TCP</th>
<th>TCRA</th>
<th>TCRP</th>
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</thead>
<tbody>
<tr>
<td>Angle measurement</td>
<td>*</td>
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<tr>
<td>Distance measurement (IR-Mode)</td>
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<tr>
<td>PinPoint reflectorless dist. measurem. (RL-Mode)</td>
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<tr>
<td>Motorized</td>
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<tr>
<td>Automatic Target Recognition (ATR)</td>
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<tr>
<td>PowerSearch (PS)</td>
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<tr>
<td>Guide Light (EGL)</td>
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<tr>
<td>Remote Control Unit / RadioHandle</td>
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<tr>
<td>GUS74 Laser Guide</td>
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<td>*</td>
</tr>
<tr>
<td>SmartStation (ATX1230+ GNSS)</td>
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</tbody>
</table>

• = Standard  
° = Optional

### Angle measurement

<table>
<thead>
<tr>
<th>Accuracy (std.dev., ISO 17123-3)</th>
<th>Hz, V</th>
<th>Type 1201+</th>
<th>Type 1202+</th>
<th>Type 1203+</th>
<th>Type 1205+</th>
</tr>
</thead>
<tbody>
<tr>
<td>1'' (0.3 mgon)</td>
<td>2'' (0.6 mgon)</td>
<td>3'' (1 mgon)</td>
<td>5'' (1.5 mgon)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display resolution:</td>
<td>0.1'' (0.1 mgon)</td>
<td>0.1'' (0.1 mgon)</td>
<td>0.1'' (0.1 mgon)</td>
<td>0.1'' (0.1 mgon)</td>
<td></td>
</tr>
<tr>
<td>Method</td>
<td>absolute, continuous, diametrical</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compensator</td>
<td>4' (0.07 gon)</td>
<td>4' (0.07 gon)</td>
<td>4' (0.07 gon)</td>
<td>4' (0.07 gon)</td>
<td></td>
</tr>
<tr>
<td>Setting accuracy:</td>
<td>0.5'' (0.2 mgon)</td>
<td>0.5'' (0.2 mgon)</td>
<td>1.0'' (0.3 mgon)</td>
<td>1.5'' (0.5 mgon)</td>
<td></td>
</tr>
<tr>
<td>Method</td>
<td>centralized dual axis compensator</td>
<td></td>
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</tr>
</tbody>
</table>

### Distance measurement (IR-Mode)

<table>
<thead>
<tr>
<th>Range (average atmospheric conditions)</th>
<th>Round prism (GPR1):</th>
<th>3000 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>360° reflector (GRZ4):</td>
<td>1500 m</td>
<td></td>
</tr>
<tr>
<td>Mini prism (GMP101):</td>
<td>1200 m</td>
<td></td>
</tr>
<tr>
<td>Reflective tape (60 mm x 60mm):</td>
<td>250 m</td>
<td></td>
</tr>
<tr>
<td>Shortest measurable distance:</td>
<td>1.5 m</td>
<td></td>
</tr>
<tr>
<td>Accuracy / Measurement time (standard deviation, ISO 17123-4)</td>
<td>Standard mode:</td>
<td>1 mm + 1.5 ppm / typ. 2.4 s</td>
</tr>
<tr>
<td>Fast mode:</td>
<td>3 mm + 1.5 ppm / typ. 0.8 s</td>
<td></td>
</tr>
<tr>
<td>Tracking mode:</td>
<td>3 mm + 1.5 ppm / typ. 0.15 s</td>
<td></td>
</tr>
<tr>
<td>Display resolution:</td>
<td>0.1 mm</td>
<td></td>
</tr>
<tr>
<td>Method</td>
<td>Special phase shift analyzer (coaxial, visible red laser)</td>
<td></td>
</tr>
</tbody>
</table>

### PinPoint R400/R1000 reflectorless distance measurement (RL-Mode)

| Range (average atmospheric conditions) | PinPoint R400: | 400 m / 200 m (Kodak Gray Card: 90% reflective / 18% reflective) |
| PinPoint R1000: | 1000 m / 500 m (Kodak Gray Card: 90% reflective / 18% reflective) |
| Shortest measurable distance: | 1.5 m |
| Long Range to round prism (GPR1): | 1000 m ~ 7500 m |
| Accuracy / Measurement time (standard deviation, ISO 17123-4) | Reflectorless ≤ 500 m: | 2 mm + 2 ppm / typ. 3 - 6 s, max. 12 s |
| Reflectorless > 500 m: | 4 mm + 2 ppm / typ. 3 - 6 s, max. 12 s |
| Long Range: | 5 mm + 2 ppm / typ. 2.5 s, max. 12 s |
| Laser dot size | At 30 m: | approx. 7 mm x 10 mm |
| At 50 m: | approx. 8 mm x 20 mm |
| Method | PinPoint R400 / R1000: | System analyzer (coaxial, visible red laser) |

### Motorized

| Maximum speed | Rotating speed: | 45° / s |
## Automatic Target Recognition (ATR)

<table>
<thead>
<tr>
<th><strong>Range ATR mode / LOCK mode</strong></th>
<th><strong>Accuracy / Measure time</strong></th>
<th><strong>Maximum speed (LOCK mode)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(average atmospheric conditions) Round prism (GPR1): 1000 m / 800 m</td>
<td>ATR angle accuracy Hz, V: 1° (0.3 mgon)</td>
<td>Tangential (standard mode): 5 m / s at 20 m, 25 m / s at 100 m</td>
</tr>
<tr>
<td>360° reflector (GRZ4, GRZ122): 600 m / 500 m</td>
<td>(std. dev. ISO 17123-3) Base positioning accuracy: ± 1 mm</td>
<td>Radial (tracking mode): 4 m / s</td>
</tr>
<tr>
<td>Mini prism (GMP101): 500 m / 400 m</td>
<td>Measure time for GPR1: 3 – 4 s</td>
<td></td>
</tr>
<tr>
<td>Reflective tape (60 mm x 60 mm): 55 m (175 ft)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shortest measurable distance: 1.5 m / 5 m</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PowerSearch (PS)

<table>
<thead>
<tr>
<th><strong>Range</strong></th>
<th><strong>Accuracy</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(average atmospheric conditions) Round prism (GPR1): 300 m</td>
<td>Positioning accuracy: 5 cm at 100 m</td>
</tr>
<tr>
<td>360° reflector (GRZ4, GRZ122): 300 m (perfectly aligned to instrument)</td>
<td></td>
</tr>
<tr>
<td>Mini prism (GMP101): 100 m</td>
<td></td>
</tr>
<tr>
<td>Shortest distance: 5 m</td>
<td></td>
</tr>
</tbody>
</table>

### Guide Light (EGL)

<table>
<thead>
<tr>
<th><strong>Range</strong></th>
<th><strong>Accuracy</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(average atmospheric conditions) Working range: 5 m – 150 m</td>
<td></td>
</tr>
<tr>
<td>Positioning accuracy: 5 cm at 100 m</td>
<td></td>
</tr>
</tbody>
</table>

## General data

**Telescope**
- Magnification: 30 x
- Free objective aperture: 40 mm
- Field of view: 1°30' [1.66 gon] / 2.7 m at 100 m
- Focusing range: 1.7 m to infinity

**Keyboard and Display**
- Display: 1/4 VGA [320*240 pixels], graphic LCD, colour, illumination, touch screen
- Keyboard: 34 keys [12 function keys, 12 alphanumeric keys], illumination
- Angle display: 360° "", 360° decimal, 400 gon, 6400 mil, V°
- Distance display: meter, int. ft, int. ft/inch, US ft, US ft/inch
- Position: face I standard / face II optional

**Data storage**
- Internal memory: 256 MB (optional)
- Memory card: CompactFlash cards (256 MB)
- Number of data records: 1750 / MB

**Circular Level**
- Sensitivity: 6' / 2 mm

**Laser plummet**
- Centering accuracy: 1.5 mm at 1.5 m
- Laser dot diameter: 2.5 mm at 1.5 m

**Endless drives**
- Number of drives: 1 horizontal / 1 vertical

**Battery (GB221)**
- Type: Lithium-Ion
- Voltage: 7.4 V
- Capacity: 4.4 Ah
- Operating time: typ. 5 – 8 h

**Weights**
- Total station: 4.8 – 5.5 kg
- Battery (GB221): 0.2 kg
- Tribrach (GDF121): 0.8 kg

## Environmental specifications
- Working temperature range: –20°C to +50°C
- Storage temperature range: –40°C to +70°C
- Dust / water (IEC 60529): IP54
- Humidity: 95%, non-condensing

### Remote Control Unit (RX1250T/Tc)

**Communication**
- via integrated radio modem

**Control unit**
- Display: 1/4 VGA [320*240 pixels], graphic LCD, touch screen, illumination
- Keyboard: 62 keys [12 function keys, 40 alphanumeric keys], illumination
- Interface: RS232

**Battery (GB221)**
- Type: Lithium-Ion
- Voltage: 7.4 V
- Capacity: 2.2 Ah
- Operating time: RX1250T: typ. 9 h, RX1250Tc: typ. 8 h

**Weights**
- Control unit RX1250T/Tc: 0.8 kg
- Battery (GB221): 0.1 kg
- Reflector pole adapter: 0.25 kg

**Environmental specifications**
- Working temperature range: RX1250T –30°C to +65°C / RX1250Tc –30°C to +50°C
- Storage temperature range: –40°C to +80°C
- Protection against water, dust and sand (IEC 60529, MIL-STD-810F): IP67
- Waterproof to 1 m temporary submersion, dust tight
Whether you want to survey a parcel of land or a construction site, a facade or indoors to create as-built plans or carry out high-precision measurements of bridge and tunnel constructions – Leica Geosystems’ surveying instruments provide the right solution for all measuring tasks.

The System 1200 Series instruments as well as the software are designed to meet the daily challenges of modern surveying. They all have outstanding, easy to read and user-friendly interfaces. Their straightforward menu structures, their clearly outlined scope of functions and high technology perfectly mate GNSS and TPS applications in the field. Whether you use the advantages of both technologies combined or each separately – due to the exceptional flexibility of Leica Geosystems instruments, reliable and productive surveying is assured.

When it has to be right.