# Leica TPS1200 Series High performance Total Station





- when it has to be **right** 

# 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 GPS.

### 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, GPS and RX1250.

#### Large graphic 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 GPS. Benefit from huge productivity of System 1200.



Combine TPS and GPS. 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.

Leica SmartStation	Leica GPS1200
<text></text>	Unites top GPS technolog with powerful data management. Perfect for all GPS applications.



#### Leica System 1200

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

These new high-tech TPS and GPS 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.

Leica TPS1200	Leica SmartPole	Leica SmartWorx	Leica Geo Office
Top performance, high accuracy total stations do everything you want and much more.	Save time with SmartPoles' setup On-the-fly and easily swap between GPS and TPS when needed.	SmartWorx TPS/GPS application software is both easy-to-use and extremely powerful.	Everything you need in a single package for TPS and GPS: import, visualization, conversions, quality control, processing, adjustment, reporting, export etc.
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# 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.

#### PinPoint – reflectorless EDM

Coaxial visible red laser with sensational range (up to 500m) and very small spot. Measures to building corners and inaccessible objects. Two range options: R100 and R300.

#### 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



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#### Bluetooth<sup>®</sup> Wireless-Technology integrated Wireless transfer of data

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.

#### 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 display

Large, bright display with perfect clarity and contrast. Excellent graphics and easy to read whether in fading light or bright sunshine.



**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. Select the ones that suit you best.

#### 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 GPS and TPS from one control unit.

#### Leica Geo Office

Software support package for TPS and GPS with tools and components for import, visualization, conversions, quality control, processing, adjustment, reporting, export etc.

Seamless dataflow



WORKING TOGETHER FUNCTION Integrated

### 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 GPS 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 selfexplanatory 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 GPS 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

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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

Export Data Fro	E Job CF Card (*)
Job Coord System	HC_120503 (*) <none></none>
Format File :	LISCAD. FET
File None	HC120503.txt
and the second se	1.0

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

System 1200 interfaces easily to third-party software packages.





#### Status icons

Indicate the current measurement and operation modes, recording and battery status, instrument settings etc.

#### Definable function keys

Allocate commands, functions, displays etc (whatever you like) to those keys for immediate access.

#### Configurable user menu

Set up your own user menu for the way you and your crews operate. Show what you need and hide the rest.

#### Quick settings key

For toggling PinPoint, ATR, LOCK, EDM tracking etc. ON or OFF. Quick changes save time.

### **QWERTY keyboard** The remote control unit has a standard QWERTY

has a standard QWERTY keyboard layout for fast, easy input of alphanumeric data and information.

#### Program menu

Direct access to all loaded application programs, such as Survey, Setup, Stakeout etc. and optional application programs.

#### Large graphic display

1/4 VGA high-resolution LCD, easy to read in any light. Display and keyboard light up for work in the dark.

#### Second keyboard/display

If required, TPS1200 can be fitted with a second keyboard and display for operating in face II.

#### **Touch screen**

The touch screen provides immediate access without using the keyboard. You can view data and information related to points and objects and call up all types of functions directly via the screen. Use the touch screen and/or the keyboard, whichever you prefer.

#### User definable displays

Name 1	Survy
Fixed Lines :	10
ist line	Point ID
Ind line	Reflector Height
Ird line :	Line Space Half
4th line :	Hz-Angle +
ith line :	V-Angle 1
ith line	Horiz Dist .

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

Oata: HC_120503	×
Points Lines Area	a Map
atrit	
1	08;18:29 -
100	08:47:42
1023	10:32:20
1024	10:32:23
1025	10:32:25
20341	10:32:32
20342	10:32:34 -
ACCOUNTS AND ADDRESS OF	0 a 0

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 GPS.



# Leica TPS1200 High-precision measurement technology **Time-saving measurement aids**

PinPoint -



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 an infrared 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 -2 mm + 2 ppm. Resolution is 0.1 mm.

- Fast, continuous, high-accuracy angle measurements
- Choice of accuracy from 1 to 5 seconds
- No initialization
- Twin-axis compensator EDM with standard,
- fast and tracking modes Long range, fast measurements
- and high accuracy Totally reliable

reflectorless EDM (RL)

Marks the point precisely Measures directly 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.

Optional for all TPS1200

- Two versions: standard range R100 (up to 200 m), superior range R300 (up to 500 m)
- Very small laser spot, marks the point exactly
- Standard measurement and tracking modes
- Accuracy 3 mm + 2 ppm
- Motorized TPS1200 with PinPoint - the perfect tool for scanning facades



Automatic Target

#### 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 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) Remote Control Unit (RX1250) SmartStation (ATX1230)



Finds reflector automatically

PowerSearch finds reflectors within seconds no matter where they are. With Power-Search 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. PowerSearch is particularly advantageous when operating with remote control.

- Optional for motorized TPS1200 equipped with ATR
- Activated at the touch of a key or automatically, if configured
- Finds standard prisms (no need for active target)
- Saves time, increases productivity
- Highly recommended for fast, efficient remote control

Operate at the reflector

With the RX1250 remote control unit you can control both the TPS1200 via RadioModem and Radio-Handle and the GPS Smart-Antenna 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 GPS 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 Radio-Handle and *Bluetooth®* Wireless Technology
- Perfect one-man survey system
- No need for cables
- Increases efficiency and productivity



### TPS & GPS perfectly combined

TPS1200 with GPS Smart-Antenna combined in one compact, easy-to-use instrument. No need for control points, traverses or resections. Set up Smart-Station and let RTK GPS 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 GPS and TPS. Once SmartStation is positioned, use the SmartAntenna on a pole with controller and sensor as an RTK rover.

- TPS and GPS 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

TOGETHER FUNCTION

LEICA SYSTEM 1200

WORKING

# Leica TPS1200 **Technical specifications** and system features



Models and options							
	тс	TCR	TCRM	TCA	ТСР	TCRA	TCRP
Angle measurement	•	•	•	•	•	•	•
Distance measurement (IR)	•	•	•	•	•	•	•
PinPoint reflectorless dist. measurem. (RL)		•	•			•	•
Motorized			•	•	•	•	•
Automatic Target Recognition (ATR)				•	•	•	•
PowerSearch (PS)					•		•
Guide Light (EGL)	o	o	0	•	•	•	•
Remote Control Unit / RadioHandle	o	0	o	o	0	0	0
GUS74 Laser Guide				o		0	
SmartStation (ATX1230)	o	o	0	0	0	0	0
	• = Sta	ndard	• = Optic	onal			

#### Angle measurement

		Туре 1201	Туре 1202	Туре 1203	Туре 1205
Accuracy	Hz, V	1'' (0.3 mgon)	2'' (0.6 mgon)	3′′ (1 mgon)	5′′ (1.5 mgon)
(standard deviation, ISO 17123-3)	Display resolution:	0.1" (0.1 mgon)	0.1" (0.1 mgon)	0.1" (0.1 mgon)	0.1'' (0.1 mgon)
Method	absolute, continuous, diametric	al			
Compensator	Working range:	4' (0.07 gon)	4' (0.07 gon)	4' (0.07 gon)	4' (0.07 gon)
	Setting accuracy:	0.5'' (0.2 mgon)	0.5'' (0.2 mgon)	1.0'' (0.3 mgon)	1.5'' (0.5 mgon)
	Method:	centralized dual a	kis compensator		

#### Distance measurement (IR)

Range	Round prism (GPR1):	3000 m	
(average atmospheric conditions)	360° reflector (GRZ4):	1500 m	
	Mini prism (GMP101):	1200 m	
	Reflective tape (60 mm x 60mm)	250 m	
	Shortest measurable distance:	1.5 m	
Accuracy / Measurement time	Standard mode:	2 mm + 2 ppm / typ. 1.5 s	
(standard deviation, ISO 17123-4)	Fast mode:	5 mm + 2 ppm / typ. 0.8 s	
	Tracking mode:	5 mm + 2 ppm / typ. < 0.15 s	
	Display resolution:	0.1 mm	
Method	Phase measurement (coaxial, invisible infrared laser)		

#### PinPoint R100/R300 reflectorless distance measurement (RL)

Rotating speed:

7	Range	PinPoint R100:	170 m / 100 m (Kodak Gray Card: 90 % reflective / 18 % reflective)
110	(average atmospheric conditions)	PinPoint R300:	500 m / 300 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	Reflectorless < 500 m:	3 mm + 2 ppm / typ. 3-6 s, max. 12 s
	(standard deviation, ISO 17123-4)	Reflectorless > 500 m:	5 mm + 2 ppm / typ. 3-6 s, max. 12 s
	(object in shade, sky overcast)	Long Range:	5 mm + 2 ppm / typ. 2.5 s, max. 12 s
	Laser dot size	At 20 m:	approx. 7 mm x 14 mm
		At 100 m:	approx. 12 mm x 40 mm
	Method	PinPoint R100:	Phase measurement (coaxial, visible red laser)
		PinPoint R300:	System analyzer (coaxial, visible red laser)

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#### Automatic Target Recognition (ATR)

Range ATR mode / LOCK mode	Round prism (GPR1):	1000 m / 800 m
(average atmospheric conditions)	360° reflector (GRZ4, GRZ122):	600 m / 500 m
	Mini prism (GMP101):	500 m / 400 m
	Reflective tape (60 mm x 60 mm):	55 m (175 ft)
	Shortest measurable distance:	1.5 m / 5 m
Accuracy / Measurement time	Positioning accuracy:	< 2 mm
	Measurement time:	3 - 4 s
Maximum speed (LOCK mode)	Tangential (standard mode):	5 m / s at 20 m, 25 m / s at 100 m
	Radial (tracking mode):	4 m / s
Method	Digital image processing (laser beam)	

#### PowerSearch (PS)

Round prism (GPR1):	200 m
360° reflector (GRZ4, GRZ122):	200 m (perfectly aligned to instrument)
Mini prism (GMP101):	100 m
Shortest distance:	5 m
Typical search time:	< 10s
Rotating speed:	45° / s
Digital signal processing (rotating laser fan)	
	Round prism (GPR1): 360° reflector (GRZ4, GRZ122): Mini prism (GMP101): Shortest distance: Typical search time: Rotating speed: Digital signal processing (rotating laser fan)

### Guide Light (EGL)

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ange			
(average atmospheric conditions)	Working range:	5 m – 150 m	
Accuracy	Positioning accuracy:	5 cm at 100 m	

#### General data

Telescope		Laser plummet	
Magnification:	30 x	Centering accuracy:	1.5 mm at 1.5 m
Free objective aperture:	40 mm	Laser dot diameter:	2.5 mm at 1.5 m
Field of view:	1°30' (1.66 gon) / 2.7 m at 100 m	Endless drives	
Focusing range:	1.7 m to infinity	Number of drives:	1 horizontal / 1 vertical
Keyboard and Display		Battery (GEB221)	
Display:	1/4 VGA (320*240 pixels), graphic LCD, illumination,	Туре:	Lithium-Ion
	touch screen (optional)	Voltage:	7.4 V
Keyboard:	34 keys (12 function keys, 12 alphanumeric keys), illumination	Capacity:	3.8 Ah
Angle display:	360° ' '', 360° decimal, 400 gon, 6400 mil, V%	Operating time:	typ. 6 – 8 h
Distance display:	meter, int. ft, int. ft/inch, US ft, US ft/inch	Weights	
Position:	face I standard / face II optional	Total station:	4.8 – 5.5 kg
Data storage		Battery (GEB221):	0.2 kg
Internal memory:	32 MB (optional)	Tribrach (GDF121):	0.8 kg
Memory card: CompactFlash cards (32 MB and 256 MB)		Environmental specification	IS
Number of data records:	1750 / MB	Working temperature range:	-20° C to +50° C
Interfaces:	RS232, Bluetooth <sup>®</sup> Wireless-Technology (optional)	Storage temperature range:	-40° C to +70° C
Circular Level		Dust / water (IEC 60529):	IP54
Sensitivity:	6' / 2 mm	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 (GEB211)	Туре:	Lithium-Ion
	Voltage:	7.4V
	Capacity:	1.9 Ah
	Operating time:	RX1250T: typ. 9 h, RX1250Tc: typ. 8 h
Neights	Control unit RX1250T/Tc:	0.8 kg
	Battery (GEB211):	0.1 kg
	Reflector pole adapter:	0.25 kg
nvironmental specifications	Working temperature range:	RX1250T -30°C to +65°C / RX1250Tc -30°C to +50°C
	Storage temperature range:	-40° C to +80° C
	Dust / water (IEC 60529):	IP67
	Waterproof (MIL-STD-810F):	temporary submersion to 1 m

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 GPS 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.

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Total Quality Management our commitment to total customer satisfaction

Ask your local Leica Geosystems dealer for more information about our TQM program.



Laser plummet: Laser class 2 in accordance with IEC 60825-1 resp. EN 60825-1

Distance meter (IR). ATR and PowerSearch: Laser class 1 in accordance with IEC 60825-1 resp. EN 60825-1

Guide light (EGL): LED class 1 in accordance with IEC 60825-1 resp. EN 60825-1

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Leica SmartPole Leica Product brochure



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Leica GRX1200 Product brochure





- when it has to be **right** 

