

Leica Nova TM60

Data sheet

Nova



Leica Geosystems' new monitoring solution comes with a strong promise: **real-time information and reports** you can always rely on, helping you make informed decisions in time and on time. Be it settling, flexing, shifting, sliding or any other change of state – you will have it **under control** 24 hours a day, seven days a week. The robust, precise and enduring TM60 comes with the world's longest **ATRplus range**, **half-second** automatic aiming accuracy, advanced **imaging** and the longest **continuous operation**. Combined with the **Leica GeoMoS monitoring solution**, you will be able to react to complex demands of any project – be it continuous or periodic. The decision is easy: maximum safety, minimum risk, half-second at a time.

LEICA NOVA TM60 MONITORING STATION: MONITOR IT.

- **Permanent monitoring (24/7):** remote operation, continuous monitoring, real-time measurement data, robust against various environmental conditions.
- **Campaign monitoring (periodical):** flexible instrument setup, automated measurements, Leica Captivate field software, dedicated monitoring app, connectivity to cloud services.
- **Buildings and structures:** monitoring of buildings, skyscrapers, industrial and sports facilities, offshore and underground structures.
- **Transportation infrastructure:** monitoring of tunnels, railway, bridges, roads & highways, airports, ports & canals.
- **Environmental monitoring:** monitoring of landslides, rock falls, subsidence.
- **Energy infrastructure:** monitoring of dams, oil & gas, nuclear facilities, pipelines power plants.
- **Mining:** monitoring of slope stability, high walls and quarries.

Leica Nova TM60 Monitoring Station

ANGLE MEASUREMENT

| | | |
|--------------------------------|-----------------------------------|-----------------------------------|
| Accuracy ¹ Hz and V | ■ Absolute, continuous, quadruple | 0.5" (0.15 mgon) or 1" (0.3 mgon) |
|--------------------------------|-----------------------------------|-----------------------------------|

DISTANCE MEASUREMENT

| | | |
|-----------------------------|--|---|
| Range ² | ■ Prism (GPR1, GPH1P) ³ ■ Non-Prism / Any surface ⁴ | 0.9 m to 3,500 m 0.9 m to >1,000 m |
| Accuracy / Measurement time | ■ Single (prism) ^{2,5} ■ Single (any surface) ^{2,4,5,6} | 0.6 mm + 1 ppm / typ. 2.4 s 2 mm + 2 ppm / typ. 2 s ⁹ |
| Laser dot size | At 50 m | 8 mm x 20 mm |
| Measurement technology | System analyser | Coaxial, visible red laser |

IMAGING⁷

| | | |
|-------------------------------|--|---|
| Overview and telescope camera | ■ Sensor ■ Field of view (overview / telescope) ■ Frame rate | 5 megapixel CMOS sensor 19.4° / 1.5° Up to 20 frames per second |
|-------------------------------|--|---|

MOTORISATION

| | | |
|---|--------------------------------------|--|
| Direct drives based on Piezo technology | Rotation speed / Time to change face | Maximum 200 gon (180°) per s / typically 2.9 s |
|---|--------------------------------------|--|

AUTOMATIC AIMING - LONG RANGE ATRplus

| | | |
|--|---|---|
| Target aiming range ² | ■ Circular prism (GPR1, GPH1P) ■ 360° prism (GRZ4, GRZ122) | ■ 3,000 m ■ 1,500 m |
| Accuracy ^{1,2} / Measurement time | ATRplus angle accuracy Hz, V | 0.5" (0.15 mgon) or 1" (0.3 mgon) / typically 3-4 s |

GENERAL

| | | |
|-----------------------------------|--|--|
| Operating System / Field Software | Windows EC7 / Leica Captivate with apps | |
| Processor | TI OMAP4430 1GHz Dual-core ARM® Cortex™- A9 MPCore™ | |
| Autofocus ⁸ telescope | Magnification / Focus Range | 30 x / 1.7m to infinity |
| Display and keyboard | 5" (inch), WVGA, colour, touch, Face 1 standard, Face 2 optional | 37 keys, illumination |
| Operation | 3x endless drives, 1x Servofocus drive, 2x Autofocus keys ⁸ , user-definable SmartKey | |
| Power management | Exchangeable Lithium-Ion battery with internal charging capability | Operating Time up to 9 h |
| Data storage | ■ Internal memory ■ Memory card | 2 GB SD card 1 GB or 8 GB |
| Interfaces | RS232, USB, Bluetooth®, WLAN | |
| Weight | Total station including battery | 7.2 kg |
| Environmental specifications | ■ Working temperature range ■ Dust & Water (IEC 60529) / Blowing rain ■ Humidity | -20°C to +50°C IP65 / MIL-STD-810G, Method 506.5-I 95%, non-condensing |

¹ Standard deviation ISO 17123-3

² Overcast, no haze, visibility about 40 km, no heat shimmer

³ 0.9 m to 2,000 m for 360° prisms (GRZ4, GRZ122)

⁴ Object in shade, sky overcast, Kodak Gray Card (90% reflective)

⁵ Standard deviation ISO 17123-4

⁶ Distance > 500 m: Accuracy 4 mm + 2 ppm, Measurement Time typ. 6 s

⁷ Available on TM60 I models

⁸ Autofocus for TM60 I models, Servofocus only for TM60 models

⁹ Up to 50 m, max. measurement time 15 s for full range



Laser radiation, avoid direct eye exposure.
Class 3R laser product in accordance with IEC 60825-1:2014.

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Integrate with LOC8 - Lock & Locate

For more information visit: leica-geosystems.com/LOC8

Leica TS13

Data sheet



Sometimes you need your instrument to grow with your projects. The **Leica TS13** empowers you to start with two-person mode and upgrade the instrument gradually to a robotic total station. You decide when to upgrade it – you can choose a different **keyboard**, add **lock** to follow a moving target or include **robotic capabilities** with **SpeedSearch** and controller **connectivity** via a radio handle. The TS13 comes with **AutoHeight**, helping you to setup your instrument error-free.

LEICA TS13 TOTAL STATION: COLLECT IT.

- **Efficient data collection for mapping projects:** measurements, adjustments, and computations – all supported by powerful coding and linework routines.
- **Easy-to-use and data-centric field software:** efficient data collection, management, visualisation, import and export.
- **Upgradeable total station for measurement and layout tasks:** starting with two-person, scalable to one-person operation.
- **Accurate and effective stakeout and construction measurements:** automated routines for both two-person and one-person design data layout, as-built checks, and BIM tasks.

leica-geosystems.com



- when it has to be **right**

Leica
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Leica TS13 Total Station

Basic variant



ANGLE MEASUREMENT

| | | |
|--------------------------------|-------------------------------------|--|
| Accuracy ¹ Hz and V | ■ Absolute, continuous, diametrical | 1" (0.3 mgon), 2" (0.6 mgon), 3" (1 mgon), 5" (1.5 mgon) |
|--------------------------------|-------------------------------------|--|

DISTANCE MEASUREMENT

| | | |
|--------------------|--|---|
| Range ² | ■ Prism (GPR1, GPH1P) ³ ■ Non-Prism / Any surface ⁴ | 0.9 m to 3,500 m R500: 0.9 m to >500 m R1000: 0.9 m to >1,000 m |
|--------------------|--|---|

| | | |
|-----------------------------|--|---|
| Accuracy / Measurement time | ■ Single (prism) ^{2,5} ■ Single (prism fast) ^{2,5} ■ Single (any surface) ^{2,4,5,6} | 1 mm + 1.5 ppm / typically 2.4 s 2 mm + 1.5 ppm / typically 1.5 s ¹⁰ 2 mm + 2 ppm / typically 2 s ⁹ |
|-----------------------------|--|---|

| | | |
|----------------|--------|--------------|
| Laser dot size | At 50m | 8 mm x 20 mm |
|----------------|--------|--------------|

| | | |
|------------------------|-----------------|----------------------------|
| Measurement technology | System analyser | Coaxial, visible red laser |
|------------------------|-----------------|----------------------------|

AUTOMATIC AIMING - ATR

| | | |
|----------------------------------|---|----------------------|
| Target aiming range ² | ■ Circular prism (GPR1, GPH1P) ■ 360° prism (GRZ4, GRZ122) | ■ 1,000 m ■ 800 m |
|----------------------------------|---|----------------------|

| | | |
|--|--------------------------|--|
| Accuracy ^{1,2} / Measurement time | ATR angle accuracy Hz, V | 1" (0.3 mgon), 2" (0.6 mgon), 3" (1 mgon), 5" (1.5 mgon) / typically 3-4 s |
|--|--------------------------|--|

GUIDE LIGHT (EGL)

| | | |
|--------------------------|--|------------------------------------|
| Working range / Accuracy | | 5 - 150 m / typically 5 cm @ 100 m |
|--------------------------|--|------------------------------------|

GENERAL

| | | |
|-----------|--|--|
| Processor | TI OMAP4430 1 GHz Dual-core ARM® Cortex™. A9 MPCore™ | |
|-----------|--|--|

| | | |
|---|---|------------------------------------|
| AutoHeight module for automatic instrument height measurement | ■ Distance accuracy ■ Distance range | 1.0 mm (1 Sigma) 0.7 m to 2.7 m |
|---|---|------------------------------------|

| | | |
|------------------|----------------------------------|--------------------------|
| Power management | Exchangeable Lithium-Ion battery | Operating time up to 8 h |
|------------------|----------------------------------|--------------------------|

| | | |
|----------------|---------------------------|-----------------------------|
| Field software | Leica Captivate with apps | Running on field controller |
|----------------|---------------------------|-----------------------------|

| | | |
|--------------|--|---------------------|
| Data storage | ■ Internal memory 2 GB ■ SD card 1 GB or 8 GB | On field controller |
|--------------|--|---------------------|

| | | |
|------------|------------------------------|--|
| Interfaces | RS232, USB, Bluetooth®, WLAN | |
|------------|------------------------------|--|

| | | |
|--------|---------------------------------|--------|
| Weight | Total station including battery | 5.0 kg |
|--------|---------------------------------|--------|

| | | |
|------------------------------|--|--|
| Environmental specifications | ■ Working temperature range ■ Dust / Water (IEC 60529) / Humidity | ■ -20°C to +50°C ■ IP55 / 95%, non-condensing |
|------------------------------|--|--|

Upgrades⁷



KEYBOARD DISPLAY UNIT (Optional)

| | | |
|-----------------------|-----------------------------|--|
| Keyboard with display | Face I and face II optional | 5" (inch), WVGA, colour, touch 25 keys, illumination |
|-----------------------|-----------------------------|--|

| | | |
|----------------|--------------------------------|----------------------------|
| Field software | Leica Captivate including apps | Running on TS13 instrument |
|----------------|--------------------------------|----------------------------|

| | | |
|--------------|--|--------------------|
| Data storage | Internal memory 2 GB SD card 1 GB or 8 GB | On TS13 instrument |
|--------------|--|--------------------|

| | | |
|--------|---------------------------------|--------|
| Weight | Total station including battery | 5.3 kg |
|--------|---------------------------------|--------|

TARGET LOCK (Optional)

| | | |
|-----------------------------------|---|--------------------|
| Target locking range ² | ■ Circular prism (GPR1, GPH1P) ■ 360° prism (GRZ4, GRZ122) | ■ 800 m ■ 600 m |
|-----------------------------------|---|--------------------|

ROBOTIC SURVEYING including PRISM FAST SEARCH (Optional)¹¹

| | | |
|---------------------------------|---------------------------|-----------------------|
| SpeedSearch range / Search time | 360° prism (GRZ4, GRZ122) | 300 m / Typically 7 s |
|---------------------------------|---------------------------|-----------------------|

| | | |
|---|---|------------------|
| Robotic range with long-range Bluetooth® ⁸ | To CS20 internal long-range Bluetooth® To CTR20 expansion pack | 500 m 1,000 m |
|---|---|------------------|

¹ Standard deviation ISO 17123-3

² Overcast, no haze, visibility about 40 km, no heat shimmer

³ 0.9 m to 2,000 m for 360° prisms (GRZ4, GRZ122)

⁴ Object in shade, sky overcast, Kodak Gray Card (90% reflective)

⁵ Standard deviation ISO 17123-4

⁶ Distance > 500 m: Accuracy 4 mm + 2 ppm, Measurement time typically 6 s

⁷ Initial or after sales, independent from each other

⁸ Under good radio conditions

⁹ Up to 50 m, max. measurement time 15 s for full range

¹⁰ Initial measurement time typically 2 s

¹¹ Available also without prism fast search



Laser radiation, avoid direct eye exposure.
Class 3R laser product in accordance with IEC 60825-1:2014.

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Integrate with LOC8 - Lock & Locate

For more information visit: leica-geosystems.com/LOC8

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- when it has to be **right**

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Leica Viva TS16

Data sheet



Engaging software

The Leica Viva TS16 total station comes with the revolutionary Captivate software, turning complex data into the most realistic and workable 3D models. With easy-to-use apps and familiar touch technology, all forms of measured and design data can be viewed in all dimensions. Leica Captivate spans industries and applications with little more than a simple swipe, regardless of whether you work with GNSS, total stations or both.



Infinitely bridging the field to the office

While Leica Captivate captures and models data in the field, Leica Infinity processes the information back in the office. A smooth data transfer ensures the project stays on track. Leica Captivate and Leica Infinity work in conjunction to join previous survey data and edit projects faster and more efficiently.

ACC»

Customer care is only a click away

Through Active Customer Care (ACC), a global network of experienced professionals is only a click away to expertly guide you through any problem. Eliminate delays with superior technical service, finish jobs faster with excellent consultancy support, and avoid costly site revisits with online service to send and receive data directly from the field. Control your costs with a tailored Customer Care Package, giving you peace of mind you're covered anywhere, anytime.

Leica Viva TS16 Total Station

ANGULAR MEASUREMENT

| | | |
|--------------------------------|-----------------------------------|--|
| Accuracy ¹ Hz and V | Absolute, continuous, diametrical | 1" (0.3 mgon), 2" (0.6 mgon), 3" (1 mgon), 5" (1.5 mgon) |
|--------------------------------|-----------------------------------|--|

DISTANCE MEASUREMENT

| | | |
|-----------------------------|--|---|
| Range ² | Prism (GPR1, GPH1P) ³ Non-Prism / Any surface ⁴ | 1.5m to 3500m R500: 1.5m to >500m, R1000: 1.5m to >1000m |
| Accuracy / Measurement time | Single (prism) ^{2,5} Single (any surface) ^{2,4,5,6} | 1mm + 1.5ppm / typically 2.4s 2mm + 2ppm / typically 3s |
| Laser dot size | At 50m | 8mm x 20mm |
| Measurement technology | System analyser | Coaxial, visible red laser |

IMAGING

| | | |
|-----------------|---------------------------------------|--|
| Overview camera | Sensor Field of view Frame rate | 5 megapixel CMOS sensor 19.4° Up to 20 frames per second |
|-----------------|---------------------------------------|--|

AUTOMATIC AIMING - ATRplus

| | | |
|--|---|---|
| Target aiming range ² / Target locking range ² | Circular prism (GPR1, GPH1P) 360° prism (GRZ4, GRZ122) | 1500m / 1000m 1000m / 1000m |
| Accuracy ^{1,2} / Measurement time | ATRplus angle accuracy Hz, V | 1" (0.3 mgon), 2" (0.6 mgon), 3" (1 mgon), 5" (1.5 mgon) / typically 3-4s |

POWERSEARCH

| | | |
|---------------------|---------------------------|---------------------|
| Range / Search time | 360° prism (GRZ4, GRZ122) | 300m / typically 5s |
|---------------------|---------------------------|---------------------|

GUIDE LIGHT (EGL)

| | | |
|--------------------------|-------------------------------|--|
| Working range / Accuracy | 5-150m / typically 5cm @ 100m | |
|--------------------------|-------------------------------|--|

GENERAL

| | | |
|------------------------------|---|--|
| Field software | Leica Captivate with apps | |
| Display and keyboard | 5" (inch), WGA, colour, touch, face I standard / face II optional | 37 keys, illumination |
| Processor | Ti OMAP4430 1GHz Dual-core ARM® Cortex™ A9 MPCore™ | Operating system - Windows EC7 |
| Power management | Exchangeable Lithium-Ion battery | Operating time 5-8 h |
| Data storage | Internal memory Memory card | 2 GB SD card 1 GB or 8 GB |
| Interfaces | RS232, USB, Bluetooth®, WLAN | |
| Weight | Total station including battery | 5.3 - 6kg |
| Environmental specifications | Working temperature range Dust / Water (IEC 60529) / Humidity | -20°C to +50°C IP55 / 95%, non-condensing |

| LEICA VIVA | TS16 M | TS16 A | TS16 P | TS16 I |
|-------------------------------------|--------|--------|--------|--------|
| Angular measurement | ✓ | ✓ | ✓ | ✓ |
| Distance measurement to prism | ✓ | ✓ | ✓ | ✓ |
| Distance measurement to any surface | ✓ | ✓ | ✓ | ✓ |
| Automatic target aiming - ATRplus | ✗ | ✓ | ✓ | ✓ |
| PowerSearch (PS) | ✗ | ✗ | ✓ | ✓ |
| Overview camera | ✗ | ✗ | ✗ | ✓ |
| Guide Light (EGL) | ✓ | ✓ | ✓ | ✓ |

✓ = Standard ✗ = Not available

¹ Standard Deviation ISO 17123-3

² Overcast, no haze, visibility about 40 km, no heat shimmer

³ 1.5m to 2000m for 360° prisms (GRZ4, GRZ122)

⁴ Object in shade, sky overcast, Kodak Gray Card (90% reflective)

⁵ Standard deviation ISO 17123-4

⁶ Distance > 500m: Accuracy 4mm + 2ppm, Measurement time typically 6s

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