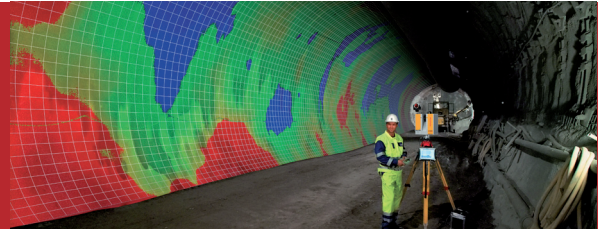


TMS Tunnelscan

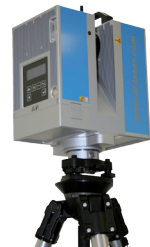
Scanner Options



TMS Tunnelscan is characterised by:

- Extensive over/under break data are available in the tunnel immediately after scanning
- Outstanding surveying performance, both during tunnel heading as well as in existing tunnels using APM™ (Amberg Positioning Method)
- Minimisation of down time during tunnel heading
- Exact setting out of under break areas enables a high level of accuracy for the various construction phases

Technical data, system suitability and typical system performance scanner options for TMS Tunnelscan



| | Amberg Profiler 5002/3 | FARO® Focus 3D | Leica HDS6200 | Z+F Imager 5006h |
|----------------------------------|---------------------------------|--------------------------|--------------------------|---------------------------------------|
| Type | 2D (5002) / 3D (5003) | 3D / 2D | 3D | 2D (PROFILER) / 3D (IMAGER) |
| Distance measurement type | Phase-shift | Phase-shift | Phase-shift | Phase-shift |
| Max. range | 79 m | 120 m / 20 m | 79 m | 79 m |
| Min. range | 1.0 m | 0.6 m | 1.0 m | 1.0 m |
| Data acquisition rate | 1'016'000 points/sec | 976'000 points/sec | 1'016'000 points/sec | 1'016'000 points/sec |
| Range noise at 10m / 10% | 1.2 mm rms | 1.2 mm rms | 1.2 mm rms | 1.2 mm rms |
| Range noise at 25m / 10% | 3.0 mm rms | 2.2 mm rms | 3.0 mm rms | 3.0 mm rms |
| Vertical field of view | 310° | 305° | 310° | 310° |
| Horizontal field of view | 360° | 360° | 360° | 360° |
| Max. vertical rotation frequency | 100 rps (5002) 50 rps (5003) | 97 rps | 50 rps | 50 rps (IMAGER) 100 rps (PROFILER) |
| Temperature range | -10°C - 45°C | 5°C - 40°C | -10°C - 45°C | -10°C - 45°C |
| Laser safety class | 3R (EN 60825-1) | 3R (EN 60825-1) | 3R (EN 60825-1) | 3R (EN 60825-1) |
| Dimensions | 286 mm x 190 mm x 412 mm | 240 mm x 200 mm x 100 mm | 294 mm x 199 mm x 360 mm | 286 mm x 190 mm x 372 mm |
| Weight | 14 kg | 5 kg | 14 kg | 14 kg |
| Power Supply | 2.5 h | 4.5 h | 2.5 h | 2.5 h |

TMS Tunnelscan

Complete tunnel information at a glance

Cost optimisation: Just-in-time over/under break measurement

- Precise and extensive results for reliable project accounting and exacting cost management
- Reduction of down time during tunnel heading using the APM™ method of positioning, which makes it possible to achieve higher tunnel advance performance
- Fast processing of scan data in the tunnel allows precise setting out of critical surfaces directly after the acquisition data

On the safe side: High quality in tunnelling

- Conservation of evidence regarding the existing state for project owners and subcontractors as well as optimisation of the over dimensions required
- Comprehensive real-time analysis reduces the need for installation of temporary safety measures to deal with instabilities in the tunnel
- Using the total station, direct setting out of critical underbreak areas and layers which are too thin

Meaningful & simple: Intuitive software leads through the process

- The highest degree of performance for one-person operation (200m/h) without impeding the tunnel advance work
- Using the measurement process optimised for tunnelling (APM™), no reference points in the scan area are required

All round flexibility: Independent of the hardware used

- TMS Tunnelscan supports the market leaders in laser scanner manufacturing: FARO, Zoller+Fröhlich and Leica Geosystems
- Surveying using the APM™ method can be done with any total station
- Scan data from various types of scanners can be used with PTS import feature to provide comprehensive office analysis

| | TMS Tunnelscan plus | TMS Tunnelscan light |
|---|------------------------|-------------------------|
| Profile extraction from georeferenced scan data | ✓ | ✓ |
| Comprehensive 2D profile analyses | ✓ | ✓ |
| Vertical and horizontal cuts calculation | ✓ | ✓ |
| Amberg Positioning Method (APM™) | ✓ | ✓ |
| Quick processing (e.g. 10 x 10 cm) in the tunnel | ✓ | ✗ |
| Undulation analysis (upgrade for undulation module) | ✓ | ✗ |
| Colourised area maps | ✓ | ✗ |
| Digitize critical area for stake out with total station | ✓ | ✗ |
| Detailed area/volume calculation (e.g. 1 x 1 cm) | ✓ | ✗ |

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