AMBERG TECHNOLOGIES

Amberg Navigator

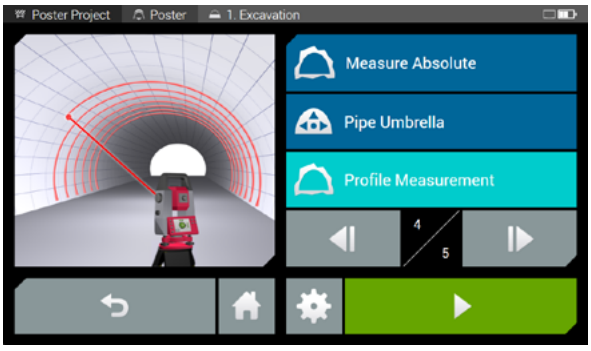
Datasheet

Amberg Navigator – Touch and build

Amberg Navigator consists of two components: the Amberg Tunnel software for defining the project in the office and the Amberg Navigator Tablet software for use in the tunnel.
You can put together the optimal Amberg Navigator Tablet software package by selecting the needed tasks from a broad range of available options.

Operative and economic benefits for the client

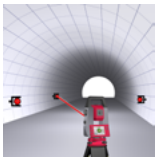
- Increased tunnelling performance through minimisation of idle time
- The system is quickly ready for use
- Licence fees only for the selected tasks
- Real-time scanning analysis and direct stake out of critical areas
- Cloud based platform for real time synchronisation of design and measurements data
- Directly use 3D point cloud results for effective stakeout of critical areas

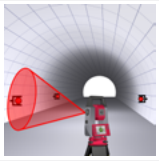


Optimise tunnel construction – reduce cost and time expenditures

T tunnel S shaft

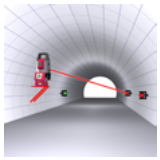
Positioning*

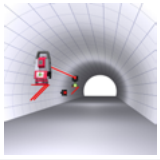
Tripod

- Manual positioning of the total station on a tripod
- No entry of point numbers is required
- Measurements with prisms or reflectorless measurements are supported (e.g. convergence points)

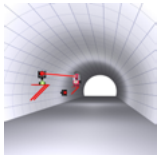
Tripod automatic

- Automatic positioning of the total station on a tripod
- Measurements with prisms (min. 3 control points visible)
- Measurements of check points and measurement in two faces

Temporary control points

- Setting of temporary control points can be done by the tunnelling crew
- Measurements with prisms or reflectorless measurements are supported
- Measurements of check points and measurement in two faces

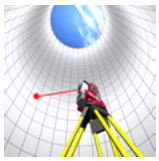
Console

- Manual positioning of the total station on a console
- Measurements with prisms or reflectorless measurements are supported
- Measurements of check points and measurement in two faces

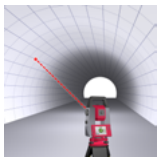
Move to new console

- Move the console with the heading status
- Checking of temporary check points to avoid positioning errors
- Max. check point deviations are freely definable

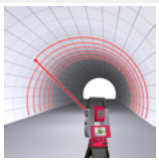
Last console

- Positioning on a previously measured console
- Total station is briefly removed from the console and then set up again, e.g. for blasting work

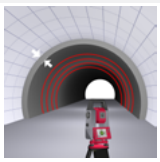
* All positioning methods are always included when purchasing a single task.

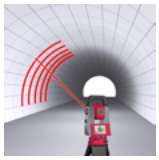
Profiling

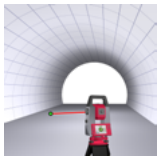
Single point

- Single-point measurement without continuous measurement
- Display of deviations from the theoretical profile

Point check

- Continuous measurement of single points (tracking)
- Display of deviations of all measured points from the theoretical profile
- Deviation display in interpolated sections

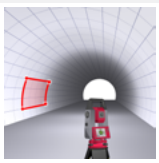
Profile measurement

- Automatic profile surveying at pre-defined stations
- Saving measurement values for analysis in Amberg Profile
- Free definition of point accuracy and of the number of iterations

Layer thickness profile

- Real-time evaluation of layer thickness data directly after measurements
- 2D profile visualisation of layer thickness data
- User-defined min and max thickness
- Requires Profile measurement task

Profile free

- Automatic profile surveying on free definable stations directly in the tunnel
- Free definition of profile start and end point
- Free definition of the distance interval on the profile

Measure absolute

- Measure points of interest reflectorlessly or with a prism (pole)
- Show absolute coordinates for position and orientation
- Points stored in CSV format for analyses

Scanning

Area scan

- Control of Leica MultiStation with a tablet
- Scanning of an area which is defined based on 4 points
- Define the scan resolution on the tunnel surface
- Stores data for analysiS

Blast round scan

- Control a laser scanner and total station or a Leica MS with one tablet
- Georeference scan data on site
- Scan processing and stake out of critical areas directly in the tunnel
- View deviation to design in real time for quality control

Line scan

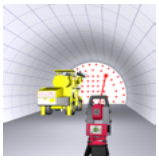
- Control a laser scanner and the total station with one tablet
- Task optimised for collecting several scans from one TPS Setup
- Georeference scan data directly

Layer thickness scan

- Compare georeferenced scans from one or more construction stages
- 3D layer thickness results directly after measurement in the tunnel
- View shotcrete thickness in real-time
- Requires Tunnelscan Plus module

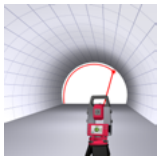
Navigation

Blast pattern



- Setting out of blast patterns at the tunnel face
- Show deviation from the target points
- View section definition of different blast patterns

Contour

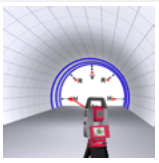


- Display of the excavation profile at the tunnel face
- Support of interpolated sections
- Definition of radial offsets

Rock bolt

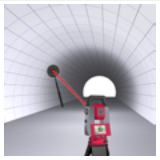
- Automatic setting out of radial rock bolt drilling points
- Display of the radial deviation
- Automatically saved set-out points in a log file for documentation purposes

Arch



- Automatic positioning of steel arches with predefined distance dimensions
- Stationing adaptation of the arch is possible in the tunnel
- With prisms or reflectorless

Tunnel disc



- Tracking a prism in the center of a tunnel disc and store distinct wall points
- Record efficiently wall points, e.g. of a steel arch

Tunnel saw

- Tracking a prism in the center of a tunnel saw
- Permanent transfer of radial deviation to the machine guidance system
- Optionally, define a search point

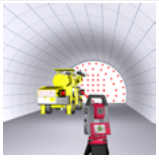
Dome faces

- Setting out of patterns at the tunnel face with different stationing offsets for each point
- Deviation from the target point
- To build curved tunnel face (SCL work)

Pipe umbrella

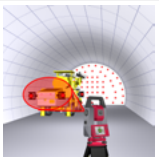
- Automatic and reflectorless setting out of drill position points on the tunnel face and orientation of the drilling rig with a prism
- Longitudinal slope and horizontal alignment of the pipe umbrella axis

Drill rig manual



- Measuring of drill rig prisms of any drill rig manufacturer
- Show absolute coordinates for the position and orientation of the drill rig

Drill rig automatic



- Automatic measuring of drill rig prisms
- Machine management with calibration values in Amberg Tunnel
- Show absolute coordinates for the position and orientation of the drill rig

Drill rig alignment laser

- Position of a drill rig by the alignment laser concept
- Transfer the laser line data to the drill rig by USB-stick or manually (e.g. Sandvik)

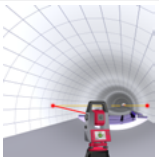
Bolting

- Automatic stake out of wall point (reflectorless) along the tunnel surface
- Saving set-out points in the log file
- Boom guidance (prism) to the design direction of drill hole

Formwork

- Automatic alignment of crown-arch and invert formwork
- Pilgrim step procedure is supported
- Setting out with reference to a block axis

Segment joints

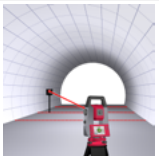


- Automatic setting out of joint points
- Measurement of segment joint points with a prism for quality assurance purposes

3D Geotechnical points

- Measures 3D points from Amberg Geotechnics module efficiently
- Stores measurements for a direct import to Amberg Geotechnics
- Stores measurements for adjustment of 3D coordinates in gsi16 format

Pole

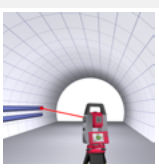


- Tracking a prism on a pole and store distinct floor points
- Record efficiently floor points over longer distances in a tube heading

Critical area

- Stake out critical area which was processed before in Amberg Tunnelscan
- Bring your point cloud back to the tunnel and stake out the points with a finger tip
- Choose between 2D map or 3D view

Infrastructure

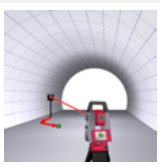


- Automatic stake out of wall point (reflectorless) along the tunnel surface
- Task points are searched along the bore hole axis
- Boom guidance (prism) to the design direction of the bore hole

Documentation

- Document with a single point measurement the current stage of the tunnel face
- Take an image from an area of interest
- The images will be stored under the construction stage in the photo folder

Point stake out



- Import absolute coordinate points from BIM models
- Stake out points refelector-less or with prism (pole) from a list
- Simple stake-out process for special shaft or tunnel elements

HARDWARE REQUIREMENTS

Amberg Navigator Tablet	
Operating system	Microsoft® Windows® 10/11 (64-bit)
RAM	4 GB or more. For scanning tasks 8 GB or more
Hard disk	30 GB or more. For scanning tasks, 100 GB or more (SSD)
Rugged feature spec	MIL-STD-810, IP65 recommended
CPU Type	Dual-core 1.80 GHz or better. For scanning tasks, Quad-core 2.80 GHz is recommended
Communications	Wi-Fi, Bluetooth®
Graphics	DirectX 11 compatibility with 512 MB or more memory. For scanning tasks, 4 GB or higher is recommended. Scanning tasks require OpenGL 4.2 or later.
Display	Touch display, 1280 x 1024 or higher with True color, screen size: 7" minimum
Expansion slot	USB 3.0 recommended

Requirements for Cloud Sync	
Synchronisation of profile measurement and design data	Download: 100 Mbit/s Upload: 100 Mbit/s
Synchronisation of scan measurement and design data	Download: 300 Mbit/s Upload: 300 Mbit/s

Laser scanners	
Leica	RTC360, BLK360, MS60
FARO	Focus

Total station	
Leica 1200 Series	TPS1200, TS30, TM30*
Leica Viva	TS15, TS16
Leica Nova	MS50, TS50, TM50*, MS60, TS60
License for Leica total station	GeoCom Robotics GeoCom Scanning**
Topcon	GT, NET, GTL series
Sokkia	iX, NET
License for Topcon & Sokkia	OAF license***
Trimble	S5, S6, S7, S8, S9

* Target lock and PowerSearch is not supported
** Required for Leica MultiStation Scanning task
*** Required for Topcon GT, GTL and Sokkia iX series

Amberg Technologies has been developing specialised system solutions for the infrastructure industry for more than 40 years. The unique combination of systems development experience and industry know-how results in measurement systems characterised by precision instruments, practical system design and powerful software. Last but not least, Amberg Technologies' products have gained the trust and recognition of tunnelling and railway industry experts thanks to a worldwide service and support network.

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