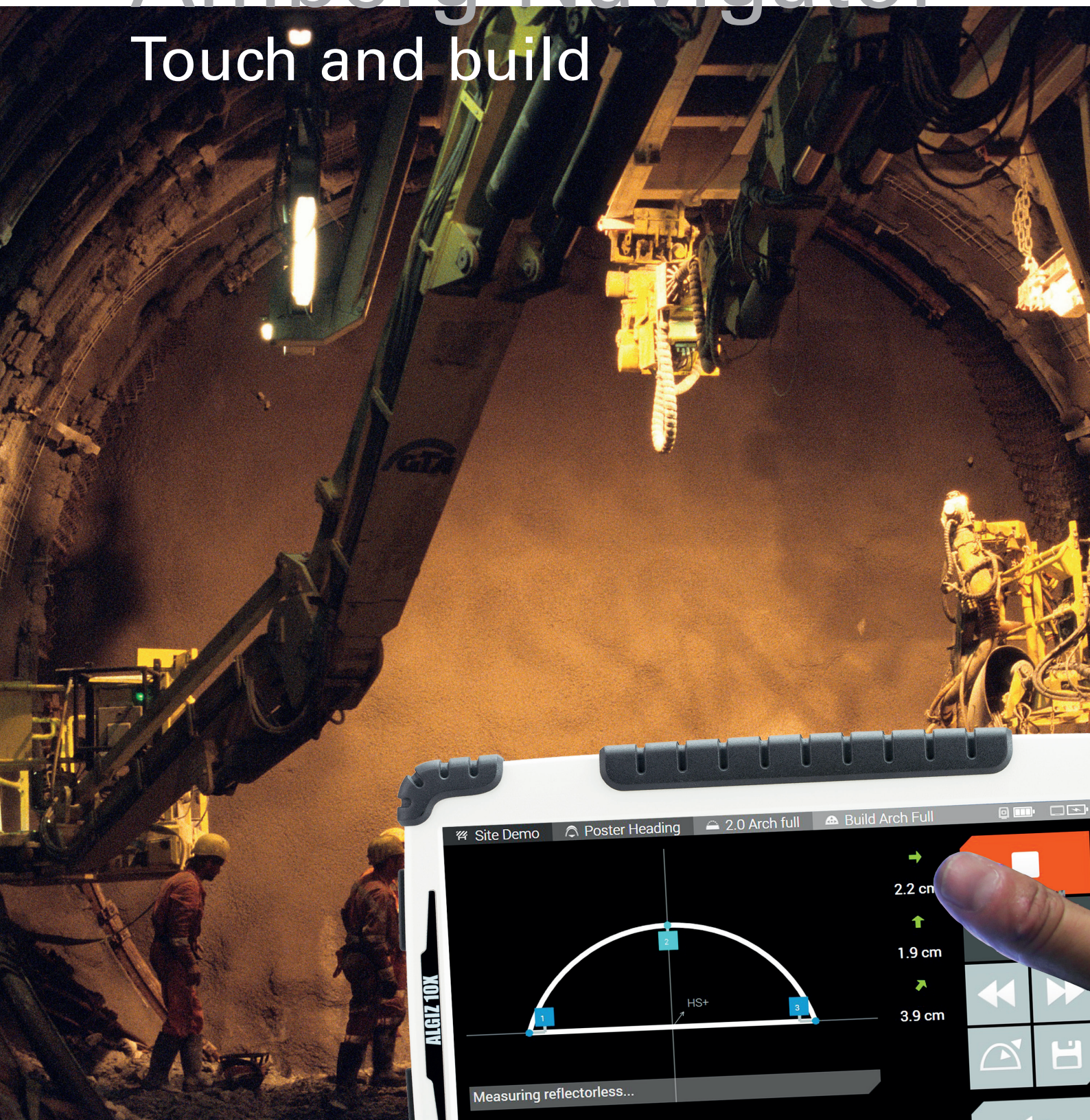


NEW TASKS

- Layer Thickness Scan
- Point Stake Out
- Measure Absolute

Amberg Navigator

Touch and build



Optimise tunnelling performance with Amberg Navigator



Increasingly complex project requirements and enormous investments contrast with a continuous rise in price and deadline pressures. Efficient, cost-effective surveying solutions are needed, without placing precision and safety at risk. Equipment needs to be tailored optimally to a specific project and be usable by the tunnel crew on site. With Amberg Navigator, you can choose which tasks you need for your heading guidance, excavation control and surveying of the inner lining.

Amberg Navigator – Touch and build

Tunnel heading guidance and control has never been as easy as with Amberg Navigator.

Amberg Navigator consists of the mobile Amberg Navigator tablet for the application in the tunnel and the Amberg Tunnel software for project definition in the office.

The tablet is operated by the tunnelling crew on site via the touchscreen. The measurement tasks arranged in the Amberg tablet software are based on project-specific applications, and provide fully automatic control of a total station, laser scanner, or Leica MultiStation, depending on the measurement task selected.



Tablet with easy-to-use user interface

One tablet for the guidance and control of an entire tunnel project.

Why use Amberg Navigator?

- Software packages for heading guidance, excavation control and surveying of the inner lining: a tool for several applications
- Illustrated, easy-to-understand workflows: the tunnelling crew can work independently
- Tunnel zone definition in 3D: simple, user-friendly definition of the entire construction project

Operative benefits for the client

- Productive and reliable heading control for the entire tunnel construction process
- Definition of different safety levels ensures reliable proceedings during setting-out work
- The system is quickly ready for use thanks to the easily-learned, intuitive user guidance

Economic benefits for the client

- Licence fees only for the selected tasks reduce investment costs
- Increased tunneling performance through minimisation of idle time
- Positioning of the total station on a tripod or console requires no previous surveying knowledge
- Turn scan data direct into results in the tunnel

Tunnel product portfolio

Amberg Navigator complements the Amberg Tunnel product portfolio ideally and trouble-free exchange of data with existing Amberg products is guaranteed.

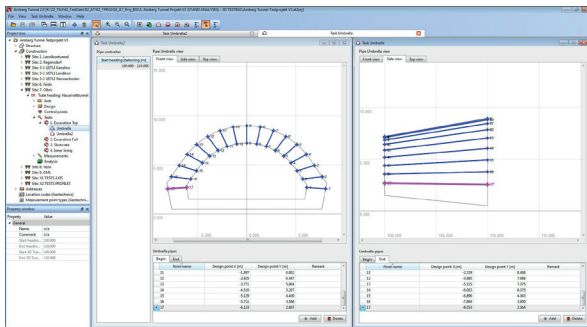
Amberg Tunnel software: Project definition

Input of the relevant project data

- Easy and fast definition of complex tunnel geometries with direct graphical feedback
- Flexible data transfer from Amberg TMS products and third-party suppliers
- Support of 3D calculation and 3D tunnelmeter for use in inclined and vertical shafts
- Comprehensive 3D analysis for independent axis-data verification

Definition of the tasks

- Selection of the desired tasks: Profile measurement, point check, rock bolt, pipe umbrella, blast round scan, etc.
- Comprehensive interval point generator for fast definition of complex setting-out geometries
- Flexible ASCII import of setting-out data for trouble-free data transfer



Definition of setting-out data in 3D

The project data and measurement tasks are transferred to the Amberg Tablet software via cloud sync or USB.

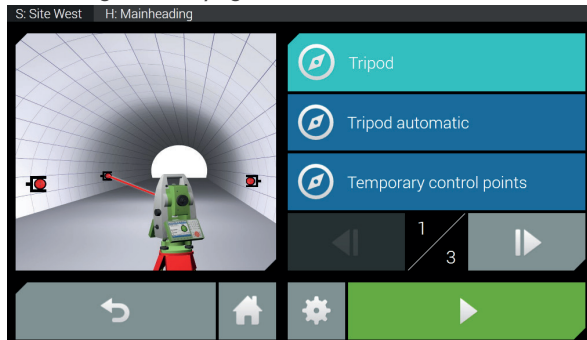
Amberg Tablet software: Project execution

A tablet with a modern, intuitive user interface

- Covers all aspects of a tunnel construction project and helps the operator to manage the data according to QM criterias
- Large graphics with little text so the tunnelling crew can work independently
- Settings such as language and units can be made for each user

Positioning has never been so easy

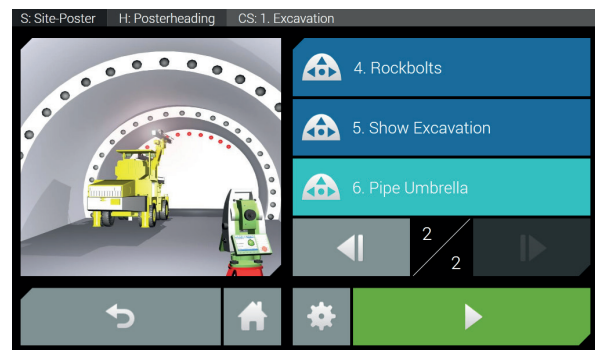
- Position the total station on a tripod or console
- An automatic feature enables positioning without previous knowledge of surveying



Selection of the positioning method

Task selection

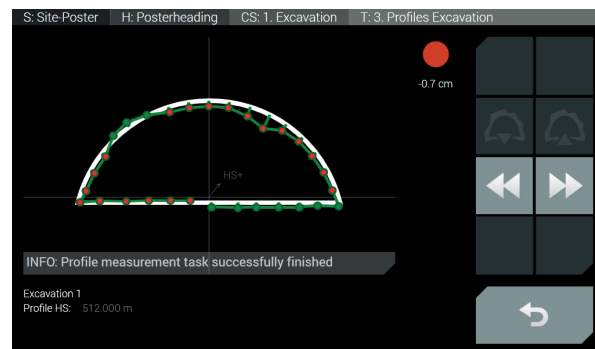
- Fast and reliable execution of difficult setting-out tasks
- High-level efficiency for frequently repeated tasks



Selection of the task

Surveying and setting out

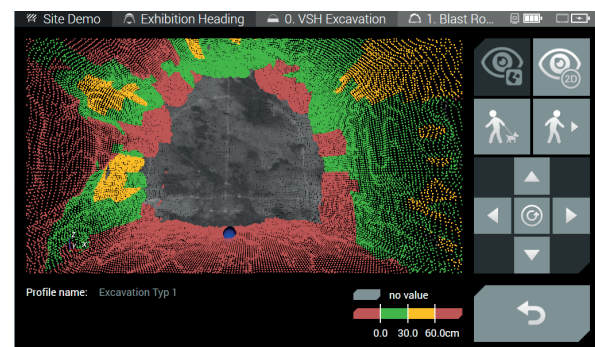
- To provide a better overview, only the information relevant for the respective task is displayed
- Free definition of warning and error levels for colour visualisation enables faster interpretation of the results



Example of a surveying screen: Task "Profile measurement"

Scanning and setting out

- Georeference the point cloud directly in the tunnel
- Point cloud processing directly on the tablet, allowing for the stake out of critical areas



Turn scan data into results on site

Analysis and evaluation

- In the interest of evidence preservation, all relevant information, such as setting-out data and positioning information, is saved in a log file
- To enable a detailed analysis of the profile surveying values in Amberg Profile, the measured values are managed in a separate database
- Comprehensive scan data processing in Amberg Tunnelscan

Tunnel construction – Touch and build

- Every task can be called up by the tunnelling crew at the tap of a finger
- No previous surveying knowledge is required for heading guidance and excavation control in the tunnel
- Task-based licensing model
- Unique, intuitive handling concept: After a brief introduction time, the tunnelling crew will be able to operate the system independently, quickly and reliably
- Control a laser scanner and total station with one tablet
- Turn scan data into results direct in the tunnel

“The use of Amberg Tunnel makes it possible for personnel from other sectors to carry out simple, routine surveying tasks reliably, efficiently and independently. This means that on both ends, unnecessary waiting times can be avoided because the measurements required can be integrated directly in the work procedures.”

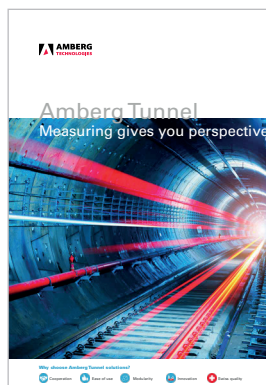
Jürgen Wilhelm, Surveyor Engineer

Solbakk tunnel project in Norway, Marti IAV Solbakk DA



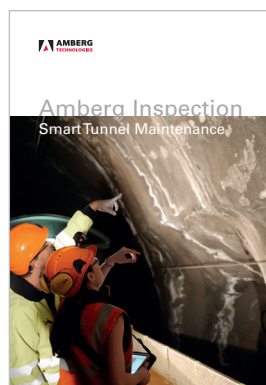
Amberg Navigator: Control and verify an entire tunnel project with a single tablet

Amberg Tunnel Solutions



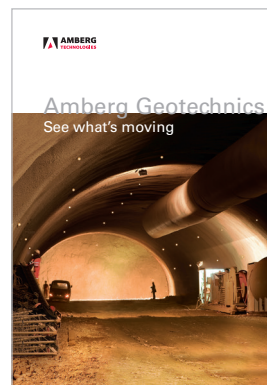
Amberg Tunnel

- One software package for heading guidance, excavation control and surveying of the inner lining for the entire tunnel construction process as well as maintenance
- Illustrated, intuitive and easy-to-understand workflows
- Measurements can be made by the tunnelling crew, enabling them to work independently



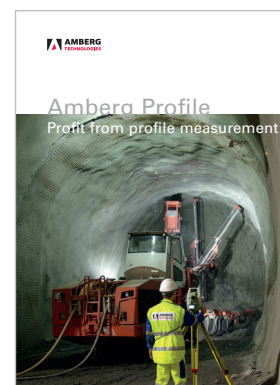
Amberg Inspection

- Open interface for any kind of background images (e.g. from laser scanner, inspection train, unmanned carrier, ...)
- Pre-defined feature catalogue definition covering specific needs for a more systematic and efficient inspection work
- Using artificial intelligence for a semi-automatic inspection process which will increase the productivity by 60%



Amberg Geotechnics

- Comprehensive software solution for observation of deformations
- Clear and relevant geotechnical analyses
- Import of surveying data independent of manufacturer
- Recognise risks and hazard potentials quickly, clearly and comprehensively



Amberg Profile

- The software package is tailored to your needs in terms of profile analysis
- Quick results for surveying and tasks which are repeated daily
- Full 3D calculations for complex projects
- Flexible report generation for project-specific requirements

Amberg Technologies has developed specialised system solutions for the infrastructure industry for more than 35 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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