

# TUnIS Navigation Gripper

TUnIS Navigation Gripper is a navigation system specially designed for Gripper TBMs. Based on a total station and a target unit, mounted inside the TBM shield, the navigation system determines the precise 3D TBM position. The system is equipped with additional sensors and software modules to comply with the tough conditions of hard rock tunnelling.

TUnIS Navigation Gripper determines and calculates all necessary data and information for navigating the TBM along the tunnel axis.

The system furthermore provides full documentation of the TBM drive in a database. This database is the basis for reports, exports (XLSX, CSV) or other analysis.

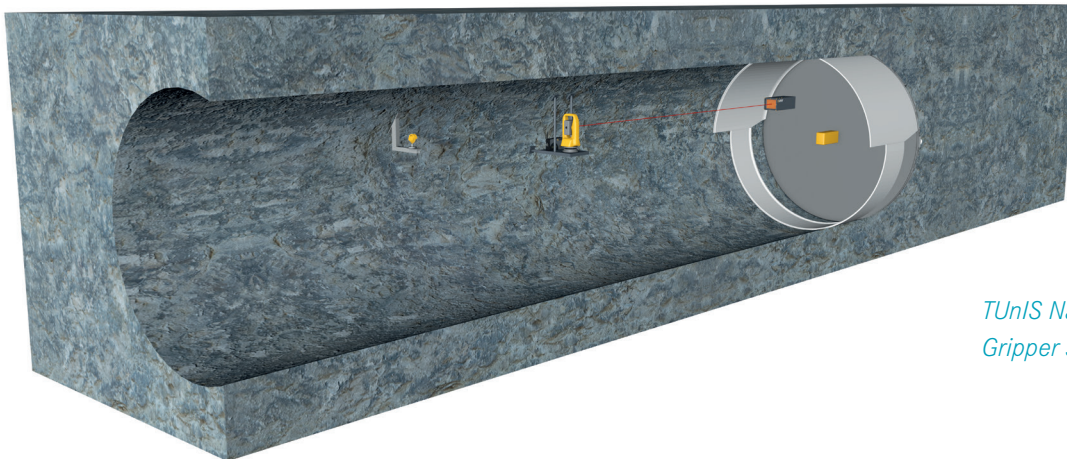
All hardware components are designed for the demanding use in a tunnel. A visible laser beam (Class 3R) between the total station and the target unit is used for calculation. The external 2-axis inclinometer is specially designed to comply with tough conditions of Gripper TBMs (vibrations in the shield during advance).

The high information content of the indicated data ensures an optimal control of the machine position, in order to keep an even advance with small deviations from the designed tunnel axis.



## Benefits

- ▣ The extension of the main system with the assistance system **TUnIS.track assistant** ensures continuous position determination and complete documentation – even during steering movements while tunnelling
- ▣ The TUnIS Navigation Gripper's angle of attack supports the TBM driver in aligning the machine: **steering movements are minimised** and the advance can be driven more precisely along the target route
- ▣ Thanks to the navigation equipment, which is designed to withstand strong vibrations, precise TBM position determination is ensured at all times and **driving off-track is avoided**
- ▣ In case of fall out of the laser target, the prism system can still be used to determine a continuous, precise TBM position. Due to this redundancy, **downtimes can be avoided**



*TUnIS Navigation  
Gripper schematic*

Thereby possibilities are given to visualise the progress of the project in relation to configurable views and to realise critical project situations graphically. Another mode of visualisation is the display as "Track Chart" which shows all calculated positions

of the Gripper shield. The visualisation can be used to analyse the machine's drift, which can be used to compensate the steering and in ring selection.

## TUnIS Navigation Gripper

The position and tendencies are continuously indicated to the shield driver. Thus control of vertical and horizontal curves is precise and simply to realise.

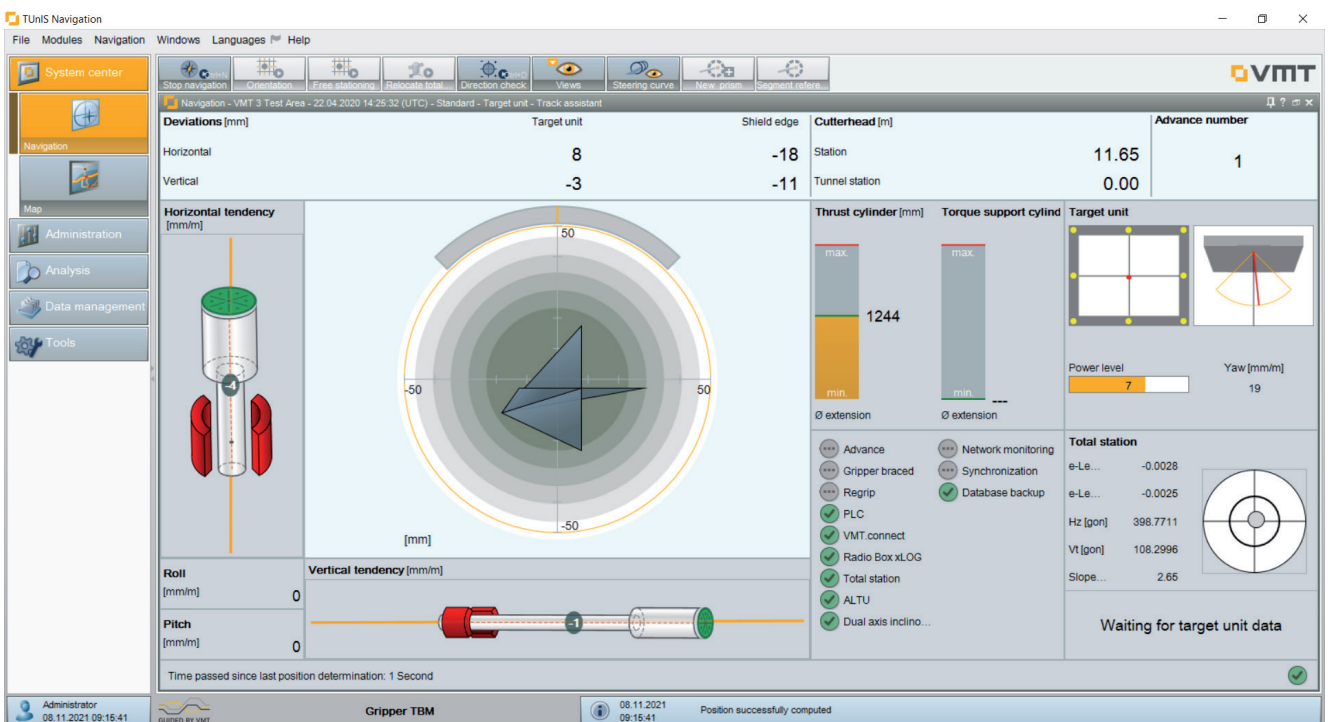


### Features

- ▣ Precise automatic calculation of TBM position
- ▣ Continuous and permanent visualisation of positions
- ▣ Redundant advancing system by navigating through thrust cylinders
- ▣ Software routine for relocating total station
- ▣ PLC connection for various types/producers

### Advice and competence from VMT

You won't be alone in the configuration and operation of TUnIS Navigation Gripper. We offer competent and continual support, with over 25 years' experience and more than 2,400 tunnelling projects successfully completed worldwide.



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