

MONITOR Process

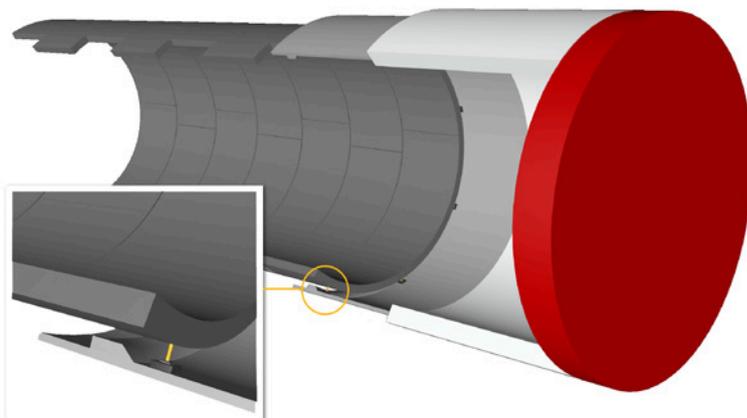
The ring build is a decisive part of mechanized tunnelling with segmental lining. To determine the optimal installation of the ring it is necessary to observe the current position and orientation of the TBM, plus the position of the last built ring. SLuM enhances the ring build process by measuring the ring position relative to tailskin axis with millimetre-accuracy.

Automatic Tailskin Clearance Measurement System SLuM

Regarding the demand of ideal ring position within the tunnel, SLuM supports centric ring build by automatically evaluating the room available in the shield space. This is even more important if conical rings are used, which are most suitable for creating complex tunnel alignments.

The system optimizes the ring build process by interacting with the VMT Ring Sequencing software by taking into account the tunnel alignment, ring design, tailskin clearance, cylinder extensions and machine position and orientation. This avoids damage to the concrete segments and the shield itself.

SLuM is a fully automated system which enables faster evaluation of measured values and more efficient tunnel construction. It also improves data quality, reduces faulty values and contributes to site safety as manual measurement and manual data input are not required.



Schematic SLuM

Automatic Tailskin Clearance Measurement System SLuM

In combination with Segment Documentation System SDS, SLuM optimizes the order of next required rings at the storage area by accelerating processes and reducing wrong orders.

Advantages

- Meets demands for high accuracy during ring build
- Completely automatic system process after installation prevents faulty manual inputs as well as peoples accidents
- Real-time measurement enables fast calculations and processes during ring build and thereby saves time and money

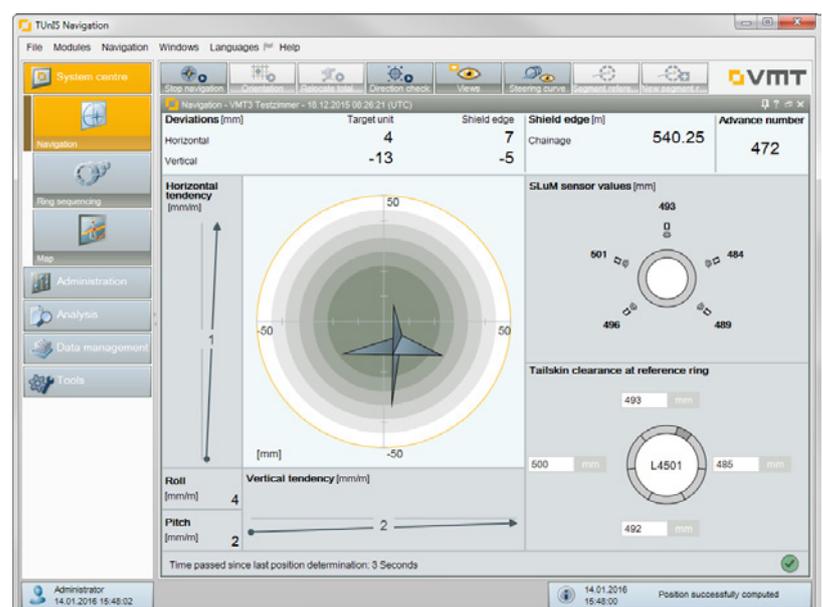
Features

- Automatic measurement and display of ring position within shield space
- Optimization of ring build process with segment order at segment storage when combining with other VMT products
- Consideration of current process parameters as ring design, cylinder extension and machine drive

Combinable Systems

- Navigation Systems in Large Diameter Tunnelling
- Ring Build Sequencing
- TBM Process Data Management
- Quality assurance and logistics during segmental lining

Technically, the system is based on mounting up to a maximum of eight high-precision sensors at significant tailskin positions that continuously measure the distance to the installed ring. Using these distance measurements, SLuM calculates the nominal point (top, bottom, left, right) to determine the ring eccentricity to the tailskin. TUNIS displays the ring position relative to the tailskin and the following ring sequence is evaluated. If VMT product SDS is used at the same project, it's secured that availability of different ring types and their current order and delivery status is displayed at any time. Measured values are automatically transferred to the TUNIS software in real time. Capture of sensor output is guaranteed by the possibility of adding measured values manually to TUNIS in case of sensor failure.



Screen Display SluM