Automatic Tailskin Clearance Measurement System SLuM

The ring build is a decisive part of mechanised 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.

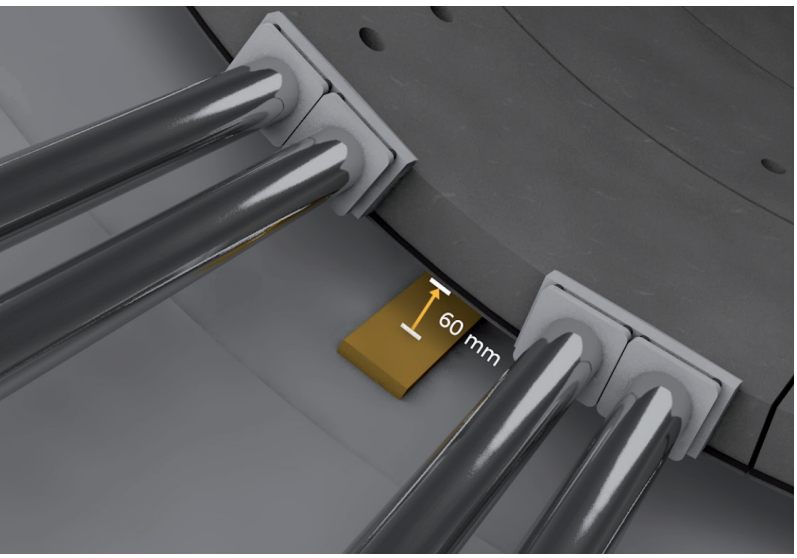
To determine the ideal ring position in the tailskin, SLuM automatically evaluates the available space in the tailskin and guarantees the centric positioning of each ring. This is even more important if conical rings are used, which are most suitable for the creation of complex tunnel alignments.

The system optimises the ring build process through interaction with the VMT Ring Sequencing software by taking into account the tunnel alignment, ring design, tailskin clearance and cylinder extensions, as well as 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.

Benefits

- The system determines the tailskin clearance with high accuracy by using 5 to 8 measurement points
- The fully automatic measurement of the tailskin clearance eliminates the risk of accidents during manual measurements
- Incorrect manual entries can be avoided, leaving more time for other tasks
- SLuM can be used as a stand-alone system, independent of VMT navigation systems
- To provide reliable measurement and precise results throughout the whole advance and independent from project conditions, SLuM is available in two technologies



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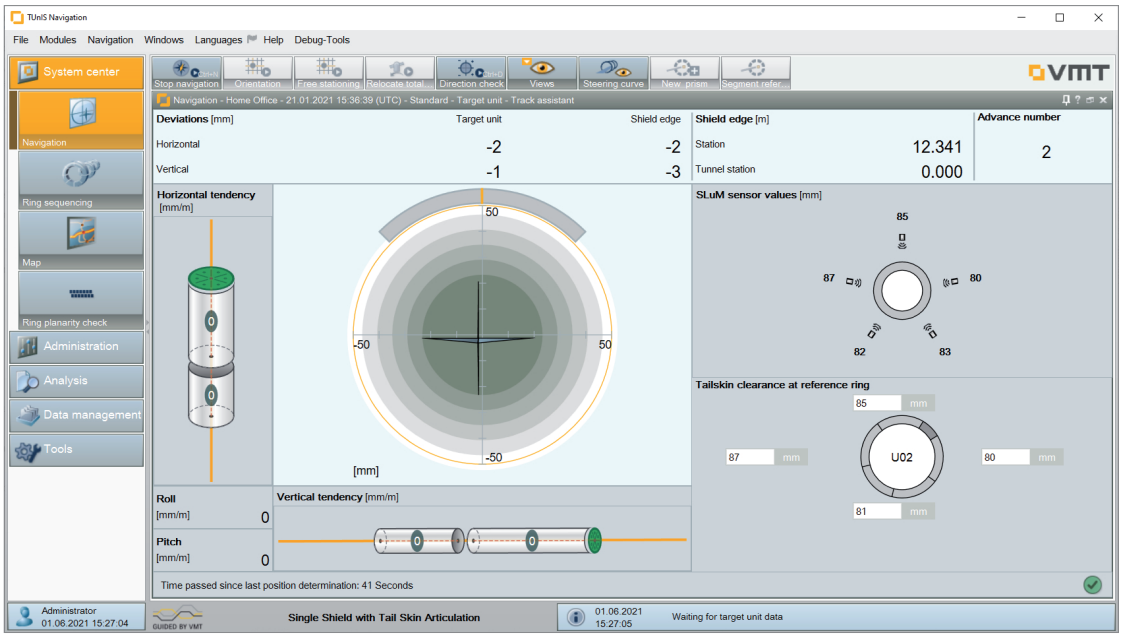
In combination with Segment Documentation System SDS, SLuM optimises the order of next required rings at the storage area by accelerating processes and reducing incorrect orders.

Technically, the system is based on mounting up five to eight high-precision sensors at significant tailskin positions that measure the distance to the installed ring. Using these distance measurements, SLuM calculates the nominal points (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. When used with VMT's product SDS on the same project, it is assured that availability of different ring types as well as their current order and delivery status can be viewed 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.

Features

- Fully automatic measurement and display of ring position within shield space
- Consideration of current process parameters such as ring design, cylinder extension and machine drive
- Improvement of data quality as manual measurement and manual data input are not required



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