

Automatic Tailskin Clearance Measurement System SLuM Ultra

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 Ultra 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 Ultra evaluates automatically - based on ultrasound technology - 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 creating complex tunnel alignments.

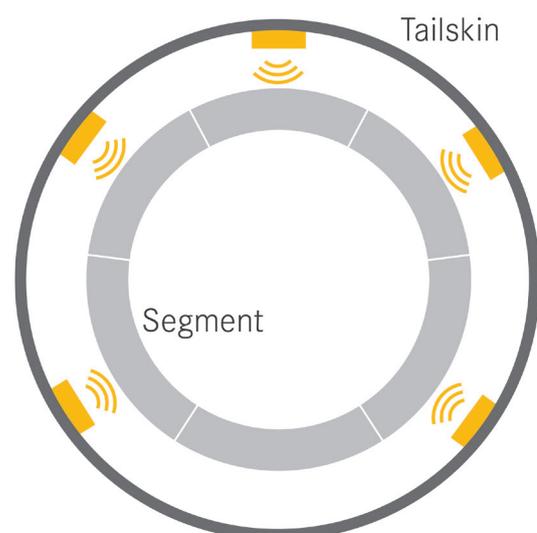
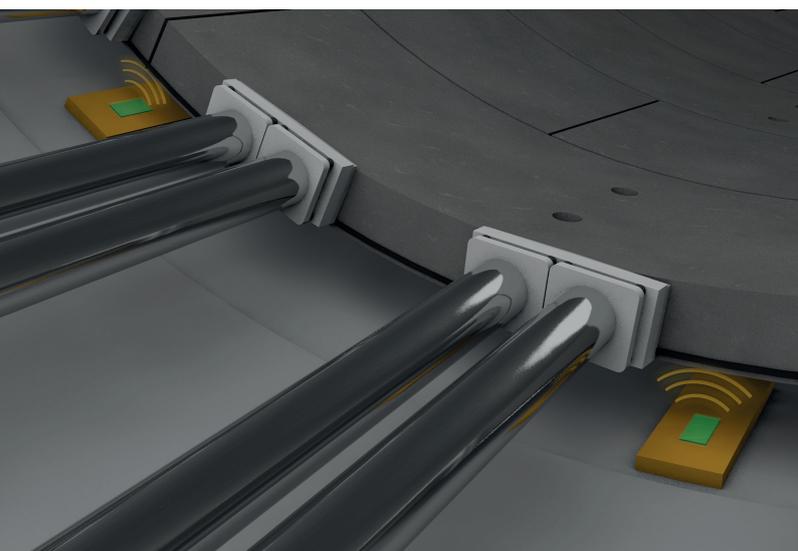
The system optimises the ring build process through interaction with the VMT Ring Sequencing software by taking into account the tunnel alignment, ring design, tailskin clearance, cylinder extensions as well as machine position and orientation. This avoids damage to the concrete segments and the shield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

SLuM Ultra 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

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



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

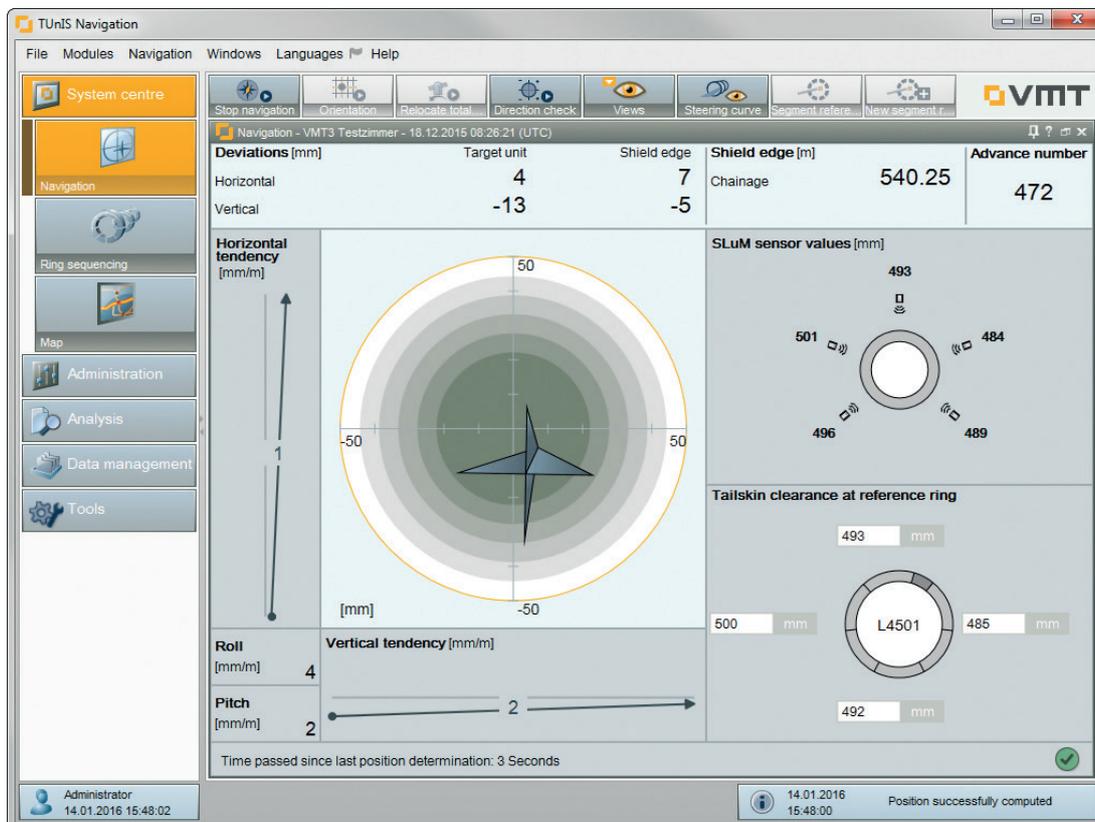
Technically, the system is based on mounting up to a maximum of eight high-precision sensors at significant tailskin positions that continuously measure the distance to the installed ring. Using these distance measurements, SLuM Ultra calculates the nominal point (top, bottom, left, right) to determine the ring eccentricity to the tailskin. TUNIS displays the ring position relative to the tailskin and the following ring sequence is evaluated. With VMT product SDS used at the same project, it is assured that availability of different ring types as well as their current order and delivery status are 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.



Features

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



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