Lisheen Mine Accelerates Survey Workflows Using GeoSLAM ZEB1 to Accurately Map Underground Mines

Accurately Mapping Underground Mines

Lisheen Mine, once the largest producer of zinc ore in Europe, has adopted GeoSLAM's game-changing survey solutions to fulfil its legal obligations for measuring and mapping more than 11 miles of underground mines located 200m below Ireland's green pastures. With a global shift towards electric power, the demand for zinc batteries is surging and meeting demand is made harder when traditional underground survey techniques are slow and the profiles measured are not always reliable.

"With the ZEB1 and ZebRA mount for remote control vehicles we are improving survey data quality while slashing survey times by a factor of 3x."

"With the ZEB1 – GeoSLAM's hand-held laser scanner, and ZebRA – an automation mount for remote control vehicles, we are improving survey data quality while slashing survey times by a factor of 3x." explained Harry Twomey, Chief Surveyor at Lisheen. *"With accelerated survey workflows ZEB1 is helping us to streamline our production process and get our zinc ore to market faster."*

Previously the Lisheen team used a Total Station to measure tunnel profiles by firing points at the roof, walls, and floor; a process that used to take approximately 45 minutes to measure and model a 15m length of tunnel.
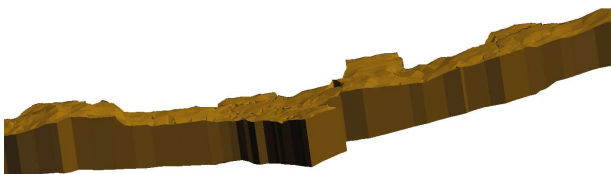
Section of tunnel measured with Total Station and Modelled using 3D Reshaper. Note the accurate roof surface and the approximate tunnel profile generated by reducing the number of measurement points used to create the walls.

Compare that piecemeal workflow with Lisheen's new GeoSLAM workflow and the results could barely be more different.

With ZEB1, a mine surveyor can accurately measure and model a complete cross section along the whole tunnel length in one third of the time it might take to approximately survey the same tunnel section using a Total Station.
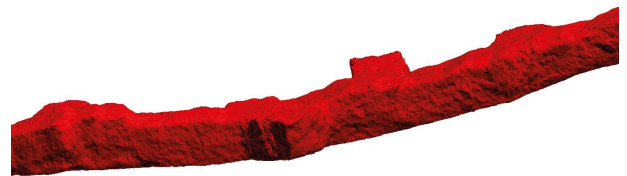
Identical section of tunnel measured this time with GeoSLAM ZEB1 and modelled again using 3D Reshaper. Note this time the improved accuracy for all tunnel surfaces including roof and walls leading to more accurate tunnel volume calculations.

This measurable time saving is a major factor in Lisheen's successful acceleration of survey workflows. Further, with increased accuracy along the whole tunnel length the team is also increasing the accuracy of volume calculations.

With a conventional survey workflow using the Total Station, the cross section of the tunnel can only be deemed 'accurate' along the roof and floor. Whereas the ZEB1-derived survey data is 'appropriately accurate' across all tunnel surfaces; improving survey insights and reducing the possibility of errors arising from inaccurate volume calculations.

GeoSLAM ZEB1 and 3DLM ZebRa Mount for remote activation

This is particularly important as the strategy for mining at Lisheen moved from drift and fill to long-hole open stoping where every second tunnel is ultimately backfilled with 'paste' (waste rock and low levels of cement) which is pumped in as slurry. Volumes of slurry need to be accurately calculated to reduce waste and improve safety standards.

Key facts

- Lisheen was Europe's largest zinc mine
- Includes 11 miles of underground tunnels
- Located 200m below Ireland's earth surface
- ZEB1 slashes survey times by factor of 3x
- Helps to get valuable zinc ore to market faster
- Reduces waste when calculating slurry volumes
- Increases safety of survey process underground

The value realised by the Lisheen Mine is clear and can be measured in terms of speed – with faster survey workflows; accuracy – through the generation of reliable volume calculations; and safety – by pumping in the correct levels of slurry paste during the backfill process. In addition, Lisheen has also been able to introduce safer survey workflows to reduce the risk of injury in the event of tunnel collapse.

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Using ZEB1 in combination with the 'ZebRA' mount the team is now able to measure and map extracted pillared areas which are ordinarily off-limits to human survey teams.

About ZEB1

The ZEB1 is the first truly mobile lightweight hand-held laser scanner which is suitable for use in a number of applications including: mining, forensics, architecture, forestry, stock piles and for rapid visualisation.

| ZEB1 Data Logger with Hand-Held Laser Scanner | "Survey in Motion" ZEB1 'Nodding' Laser Scanner | High-Quality Product Assembled in UK |

With ZEB1 in hand the user can simply walk through the target survey environment while rapidly recording more than 40,000 measurement points per second without the need for external positioning data such as GNSS. The ZEB1 works best in feature-rich environments while on the move, so there is typically no need for targets and absolutely no need for a tripod. Once the data has been collected, it can be uploaded to the GeoSLAM Cloud, where SLAM software transforms the survey measurements into a fully registered point cloud. Thereafter, the data can be downloaded (on a pay-as-you-go basis) for use inside all major CAD software. With this finance-friendly business model, the GeoSLAM solution eliminates the need for upfront software costs and annual maintenance charges.

About GeoSLAM

GeoSLAM develops game-changing survey solutions including ZEB1, for the measurement and mapping of multi-level three-dimensional environments. Backed by winners with a track record for innovation, GeoSLAM is a joint venture between CSIRO (Australia's national science agency and the inventor of WiFi) and 3D Laser Mapping (the UK's leading provider of LiDAR solutions to the mining industry and the inventor of 'Street Mapper' – the world's most accurate mobile laser mapping system).

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