



Tesmec launches a high precision 3D Digital Twin integrated system

Tesmec, leading group in the market for infrastructure technologies (overhead, underground and railways) for the transport of electricity, data and materials (oil and derivatives, gas and water), as well as surface mining and quarrying technologies, on the occasion of Bauma 2022 launches its brand new Mobile Mapping System (MMS), an integrated radar mapping system of the underground and high-precision digital 3D survey of the environment above.

The Mobile Mapping System is equipped with a detection system installed on the top and an Explorer 2.0 Georadar.

The survey system is designed to perform a georeferenced 3D reconstruction through the union of two types of data: the 3D point cloud obtained through the use of LIDAR technology; the 3D point cloud obtained through stereoscopy algorithms applied to the images acquired by high resolution matrix cameras.

The resulting point cloud with the image superimposed is then subjected to digital re-elaboration processing carried out by sophisticated artificial intelligence networks in order to get a georeferenced and accurate mapping.

The MMS detection system has an accuracy of about 2 cm and returns a cloud of points of the surrounding environment that can be consulted on the cloud platform, useful for proper planning of the construction site.

Explorer 2.0, è il modello Tesmec di georadar ad altissima precisione dotato di 32 antenne che scansionano il suolo fino a una profondità di 96 cm, e che è in grado di operare, trainato dal veicolo, ad una velocità massima di 17 km/h. L'output generato da Explorer 2.0, consiste nella mappatura delle infrastrutture interrate esistenti, utile per le attività di indagini preliminari allo scavo. L'uso del georadar permette infatti di accorciare/ridurre i tempi di esecuzione dei lavori, di garantire la sicurezza dei cantieri e di consentire una maggiore precisione nei lavori di scavo evitando le possibilità di danneggiamento delle utenze sotterranee esistenti.

Explorer 2.0 is the Tesmec very high precision georadar equipped with 32 antennas that scan the ground up to a depth of 96 cm, and which is able to operate, towed by the vehicle, at a maximum speed of 17 km / h. The output generated by Explorer 2.0 consists of the mapping of existing underground infrastructures, useful for preliminary excavation investigations. In fact, the use of the georadar allows to reduce the execution times of the works, to guarantee the safety of construction sites and to allow greater precision in excavation work, avoiding the possibility of damage to existing underground utilities.

The integration of the two surveys makes it possible to get a 3D digital mapping on a cloud platform, on which the As-Built map generated by "SmartTracker" Tesmec can be superimposed.

An integrated dashboard with a GIS engine is available through a web platform for displaying the information from the surveys and processing, which allows the georeferenced and simultaneous display of data. The specially configured interfaces allow navigation within different types of data, such as visible images and high-resolution videos, thermal images, laser point clouds and three-dimensional BIM models.



With the presentation to the market of this high-tech solution, Tesmec's participation in Bauma 2022 is confirmed under the banner of Digital Transformation. *"The Mobile Mapping System is a solution that can be combined with excavation technology and is complementary to it. The Digital Transformation has naturally pushed us towards the creation of a new portfolio of technologies and business models."* affirms Marco Quarta, New Technology Manager. *"This is a further step towards the supply of integrated solutions for the underground laying of high-tech cables. The product is part of the Group's growth strategy, under the banner of digitalization, sustainability and energy transition, with the aim to bring the advanced image processing and artificial intelligence skills acquired by the Group in different verticals to markets that are still unexplored."*

Tesmec Group

Tesmec Group is active in the design, production and marketing of systems and integrated solutions for the construction, maintenance and diagnostics of infrastructures (overhead, underground and railway networks) for the transport of energy, data and materials (oil and derivatives, gas and water), as well as technologies for quarries and surface mining. The Group operates in the following sectors: - **Energy**. Tesmec Group designs, manufactures and markets machines and integrated systems for the construction and maintenance of overhead and underground power lines, fibre optic networks (Stringing segment), as well as advanced equipment and systems for the automation, efficiency, management and monitoring of high, medium and low voltage electrical networks and substations (Energy Automation Segment); - **Trencher**. Tesmec Group carries out the design, production, sale and rental of trencher machines functional to four types of activities (excavation and mines, excavations for the installation of pipelines, for the construction of telecommunication and optical fibre infrastructures, excavations for the construction of underground power networks), as well as the provision of specialized excavation services. The trencher machines are rented by the Group both with the operator (hot rental or wet rental) and without the operator (cold rental or dry rental); - **Railway**. The Group designs, manufactures and markets machines and integrated systems for the installation and maintenance of the railway catenary, devices for the diagnostics of the railway catenary and track, as well as customized machines for special operations on the line.

Born in Italy in 1951 and led by the Chairman and CEO Ambrogio Caccia Dominioni, the Group counts on more than 900 employees and has its production sites in Grassobbio (Bergamo), Endine Gaiano (Bergamo), Sirone (Lecco), Monopoli (Bari) and Bitetto (Bari) in Italy, Alvarado (Texas) in the USA and Durtal in France. It relies on three research and development units in Fidenza (Parma), Padua and Patrica (Frosinone). Listed on the Milan Euronext STAR segment of the MTA Market of the Italian Stock Exchange, the Group boasts a global commercial presence through foreign subsidiaries and sales offices in the USA, in South Africa, West Africa, Australia, New Zealand, Russia, Qatar and China.

In its development strategy, the Group intends to consolidate its position as a solution provider in the three abovementioned business areas, by exploiting the trends of energy transition, digitalization, and sustainability.