

TDB signs agreement with Multi Nano Sense Technologies for ₹37.51 crore RDI support to build indigenous multi-gas sensing platform

MEMS-based sensor and AFE SoC to advance from TRL-4 to TRL-9, strengthening India's capabilities in advanced sensors and semiconductor technologies

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From industrial safety and hydrogen infrastructure to energy systems and process monitoring, the ability to detect and accurately measure gases is becoming increasingly important across a wide range of emerging technologies. Giving a boost to indigenous capabilities in this domain, the Technology Development Board (TDB), Department of Science & Technology (DST), Government of India, has signed an agreement with M/s Multi Nano Sense Technologies Private Limited, Nagpur, Maharashtra for ₹37.51 crore financial support under the Research Development and Innovation (RDI) Fund. The project, with a total approved cost of ₹75.02 crore, focuses on the development of a Platform MEMS + AFE SoC Multi-Gas Sensor, with the objective of taking the technology from TRL-4 to TRL-9. The support will be provided through Optionally Convertible Debt (OCD).

Multi Nano Sense is developing an indigenous MEMS TCDIR gas sensor and CMOS AFE SoC platform aimed at enabling reliable and scalable multi-gas sensing in a compact form factor. The technology combines a MEMS-based sensing element with an application-specific front-end system-on-chip for signal acquisition and processing. The platform is designed for applications spanning leak detection, process control and health and safety monitoring, with potential use across industries including refineries, petrochemicals, power, PNG infrastructure, industrial safety, batteries and the hydrogen economy.

The proposed sensor platform is designed around a combination of high sensitivity, low power consumption, miniaturised and intelligent signal processing combination of MEMS Gas Sensor and a custom AFE SoC. The technology is intended to operate across a wide temperature range and in demanding industrial environments, while incorporating features such as auto-calibration, compensation for environmental parameters and software-based gas-library processing. With a targeted response time of less than 200 milliseconds, the platform is being developed for applications requiring rapid detection and monitoring. Its compact architecture, with a sensor package designed to be less than 25 mm × 25 mm × 15 mm, also opens possibilities for battery-operated and embedded applications.

The RDI-supported programme will enable Multi Nano Sense to undertake further development, integration, testing, validation and scale-up of the sensor and AFE SoC platform, with the ultimate objective of taking the technology to TRL-9. The project comes under the Deep Technology sector, with

Quantum Technology identified as the sub-sector. While the immediate application is advanced multi-gas sensing, the underlying platform brings together MEMS, semiconductor electronics and intelligent sensing, areas that are increasingly important for building indigenous technology capabilities.

Sh. Rajesh Kumar Pathak, Secretary, TDB, said, *“Sensors are the foundation of many modern technology systems, and indigenous capabilities in sensing and semiconductor technologies are important for both industrial competitiveness and strategic self-reliance. The RDI Fund enables us to support technologies that require sustained development before they can reach widespread commercial deployment. The agreement with Multi Nano Sense demonstrates how such support can help Indian deep-tech companies take advanced sensor technologies from development to scalable, market-ready solutions.”*

Representative of Multi Nano Sense Technologies Private Limited said, *“The RDI support from TDB will enable us to take our MEMS gas-sensing technology to the next stage of integration, validation and scale-up. Our objective is to develop a compact, low-power and scalable multi-gas sensing platform that can address demanding applications across industries. This support will be instrumental in advancing the technology towards TRL-9 and strengthening indigenous capabilities in MEMS and sensor electronics.”*



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