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DorsaVi to Evaluate Reflex Platform for Next-Generation Robotics

Unlocking Ultra-Low Latency Robotic Reflexes with Next-Gen RRAM Technology

Key Highlights:

- DorsaVi initiates technical and commercial evaluation of RRAM-centric "reflex platform" for embedded, ultra-low latency robotic sensing and response.
- Sub-millisecond reflexes at microwatt power validated through RRAM integration, unlocking new performance thresholds for collaborative robots, wearables, and autonomous systems.
- Quantitative analysis underway to measure latency, endurance, and energy efficiency gains from distributed RRAM-based sensing, memory, and on-node compute.
- Enhanced safety, dexterity, and uptime expected from dramatic reductions in reflex latency critical for operation in dynamic, human-centric environments.
- Application focus includes soft grippers, AMRs, and exosuits, with evaluation results expected within four weeks.

Melbourne, Australia, 4 August 2025 – dorsaVi Limited (ASX: DVL), a global leader in FDA-cleared wearable sensor technology and human movement analysis, is pleased to announce an expansion of its RRAM evaluation program to include robotic reflex applications, building upon its recent success in biomedical sensor platforms[1]. The Company is exploring the integration of RRAM-based reflex platform as a core enabling technology to deliver sub-millisecond reaction times, local signal processing, and event-driven energy efficiency in next-generation robotics platforms.

This new initiative is a natural extension of the Company's validated results from biomedical testing, which confirmed exceptional speed, power, and endurance gains from embedding RRAM into its wearable sensor architecture.

[1] Refer to ASX announcement dated 22 July 2025

Why Robotics

Robotics is rapidly evolving from pre-programmed, fenced automation to real-time, contact-rich collaboration with humans, unstructured objects, and dynamic environments. In this new frontier, safety, dexterity, and uptime all depend on how quickly a robot can feel, decide, and react locally.

Emerging RRAM technologies offer a breakthrough solution allowing embedding sensing, memory, and compute into micron-scale nodes capable of delivering sub-millisecond reflexes at microwatt-level power. Following the successful RRAM integration in dorsaVi's biomedical sensors, we are now applying this architecture to evaluate and quantify the system-level value of RRAM-centric "reflex platform" for next-generation robotics.

The Reflex Gap in Today's Robots

Robotic reflex latency is compounded across multiple stages:

1. *Transducer physics*: The time it takes for a physical sensor (e.g., pressure, force, temperature) to convert a physical stimulus into an electrical signal.
2. *Sensor readout and bus transfer*: The delay in reading the signal from the sensor and transmitting it over data buses to the processing unit.
3. *Central processing*: The time taken by the processor (CPU/MCU) to analyse the sensor data and decide on an action.
4. *Network/fieldbus latency*: The communication delay between distributed components (sensors, controllers, actuators) across wired or wireless networks.
5. *Actuation delay*: The time it takes for the actuator (motor, gripper, etc.) to physically respond once the command is issued.

Even in systems running 500 Hz to 2 kHz motion loops, external contact detection is often gated by slower safety systems (light curtains, lidar, etc.) and distributed IO overhead, typically resulting in 10–80 ms reaction times.

Why Sub-1 ms Matters

- **Safety**: A robot moving at 1 m/s will travel 20 mm before reacting at 20 ms. At **0.5 ms**, it travels just **0.5 mm**, dramatically reducing injury and equipment damage.
- **Yield & Tool Life**: Fast tactile feedback prevents tool crashes, extends lifespan, and protects delicate assemblies.
- **Dexterity**: Reflex-level tactile servo (>1 kHz) enables slip control, force tuning, and texture-guided manipulation.
- **Power Budget**: Always-on centralized systems waste energy. Local, event-driven reflex platform remains idle in **nA–µA range**, yet **activates in microseconds**, ideal for mobile and wearable platforms.

The RRAM Advantage in Robotics from Sensing to Reflex

- **RRAM-Fused Sensing Modalities Beyond Vision**

RRAM can be monolithically integrated with various transduction stacks (piezoelectric, capacitive, ionic, magnetic, thermal), enabling:

- In-sensor memory
- Adaptive gain
- Local event-based spiking

Recent advances have shown sub-50 µs response times in piezo-capacitive tactile sensors and thermal arrays. RRAM's compatibility with flexible, transparent substrates supports the development of skin-like sensor arrays for robotic limbs.

- **RRAM in Reflex Computing & Neuromorphic Processing**

RRAM crossbars natively support **analog matrix–vector multiplication (MVM)**, foundational to neural networks and signal transforms. In edge-scale robotics, this enables:

- Local AI/ML-based decision-making
- Neuromorphic reflex loops
- Reduced need for centralized compute

These capabilities provide an order-of-magnitude improvement in reflex performance and significant energy savings, especially in robots that require continuous touch, motion, or force adaptation.

How RRAM Transforms Key Robotic Subsystems

System Component	RRAM-Enabled Advantage
Tactile Sensing	Skin-level sensors with <50 µs latency for real-time feedback
Motion Control	Neuromorphic control loops reacting in microseconds
Power Systems	µW-level event-driven wakeups extend AMR and wearable robot lifetimes
Soft Grippers	Slip detection and force control at 1 kHz+ bandwidth
Prosthetics/Exosuits	Real-time EMG/ECG processing with on-node memory & logic

Gernot Abl, Chairman of dorsaVi, commented: "These results mark a pivotal moment in our roadmap. The integration of RRAM is no longer theoretical, it's delivering measurable, system-level gains that directly translate into smarter, faster, and more energy-efficient platforms. As we expand into advanced robotics and edge-AI applications, RRAM is emerging as a foundational

technology enabling real-time responsiveness and long-term reliability across a wide range of intelligent devices."

Next Steps: Toward Embedded Robotic Intelligence

Building on these results, dorsaVi will:

- Continue evaluating RRAM under robotic contact load and actuator feedback conditions
- Design embedded hardware demonstrators for edge-robotic use
- Explore commercial integration into adaptive prosthetics, soft robotics, and human-assistive machines
- Collaborate with academic and industrial experts in RRAM, AI, and neuromorphic design
- The company will release the results from this valuation in the next 4 weeks and will share the findings once available.

dorsaVi is actively reviewing neuromorphic and robotic technologies that align with its portfolio of nine newly licensed RRAM-related patents. The Company will continue to assess application opportunities for these technologies, particularly within the neuromorphic computing and robotics verticals, and will keep shareholders informed as progress is made.

This release has been authorised for lodgement by the Company's Board of Directors.

- ENDS -

For further information about dorsaVi, please contact:

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About dorsaVi

dorsaVi Ltd (ASX: DVL) is an ASX company focused on developing innovative motion analysis device technologies for use in clinical applications, elite sports, and occupational health and safety. dorsaVi believes its wearable sensor technology enables, for the first time, many aspects of detailed human movement and position to be accurately captured, quantified, and assessed outside a biomechanics lab, in both real-time and real situations for up to 24 hours. dorsaVi's focus is on two major markets:

- **Workplace:** dorsaVi enables employers to assess risk of injury for employees as well as test the effectiveness of proposed changes to OHS workplace design, equipment or methods based on objective evidence. dorsaVi works either directly with major corporations, or through an insurance company's customer base with the aim of reducing

workplace compensation and claims. dorsaVi has been used by major corporations including London Underground, Vinci Construction, Crown Resorts, Caterpillar (US), Boeing, Monash Health, Coles, Woolworths, Toll, Toyota, Orora, Mineral Resources and BHP Billiton.

- **Clinical:** dorsaVi is transforming the management of patients with its clinical solutions (ViMove+) which provide objective assessment, monitoring outside the clinic and immediate biofeedback. The clinical market is broken down into physical therapy (physiotherapists), hospital in the home and elite sports. Hospital in the home refers to the remote management of patients by clinicians outside of physical therapy (i.e. for orthopaedic conditions). Elite sports refer to the management and optimisation of athletes through objective evidence for decisions on return to play, measurement of biomechanics and immediate biofeedback to enable peak performance.

Further information is available at www.dorsaVi.com