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Award

Robotic Overground Harness System

UNIVERSITY OF ESSEX

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Notice identifier: 2025/S 000-039846
Procurement identifier (OCID): ocds-h6vhtk-055f1e (view related notices)
Published 15 July 2025, 10:42am

Scope

Reference

T1158

Description

ZeroG is a robotic overground harness system mounted to an overhead track which includes a small motor to propel the trolley and harness. The system provides zero drag for the patient/participant enabling realistic motion without added confounders. The harness system due to its unique fall arrest system (velocity or range of movement monitored at 1000Hz) allows a greater variety of movement tasks to be performed safely such as stair ascent/descent, sit to stands, complex terrain (i.e. obstacles) amongst others, meaning neuromechanical/motor control paradigms and theories can be tested beyond normal walking and running. During the performance of any task, ZeroG has the additional capacity to ensure consistent bodyweight support during dynamic movements - this is not available in most other harness systems. ZeroG's final and unique feature is its integrated perturbation system (TRiP), which generates specifically designed and controlled perturbations during movement or balance tasks. TRiP provides the opportunity for extensive investigation of the neuromechanical/motor control of movement and the recovery from system disturbance (e.g. via "preflexes"). This is a key integral function of

safe movement and understanding the fundamental underpinnings of motor control. Furthermore, understanding the deficits within this system are key for future novel movement health metric development, rehabilitation strategies, assistive devices and other clinically relevant interventions.

ZeroG is currently widely used as a rehabilitation tool in spinal injury (e.g. Queen Elizabeth University Hospital, Glasgow), other adult movement deficits (e.g. Adelante Rehabilitation Centre, Netherlands) and in children (e.g. Pulderbos Rehabilitation Centre, Belgium). At SRES, ZeroG would enable closer tie in with clinical applications by providing collaboration with the Health, Wellbeing and Care Hub (HWCH), and enabling rehabilitation opportunities for their patients. ZeroG would therefore enable SRES to expand our current research portfolio further into the clinical domains, but also provide a unique purpose for ZeroG to investigate the neuromechanical and motor control underpinnings of movement.

ZeroG will be focussed on novel research within both basic sciences (e.g. validating novel movement health metrics) and applied clinical domains (e.g. development of movement as an intervention for mental health; validation of falls devices for older adults). The integration of ZeroG into our state-of-the-art human biomechanics lab will provide a unique package of technology that enables innovative and world-leading research. More detailed specific activities and plans are outlined in section 4. Across these activities, the addition of ZeroG will lead to establishing the University of Essex as a centre of excellence in human neuromechanics and motor control, attracting further external funding and research students, enable further development of existing and new collaborations to develop basic sciences understanding into clinical applications, provide a unique rehabilitative modality for clinical populations, and combine state-of-the-art technologies in new research areas to expand our understanding of human neuromechanics and motor control.

Justification for sole source for the ZeroG Gait and Balance System of which Aretech, LLC is the sole manufacturer and Ectron Ltd is the sole distributor in the UK. Only one responsible source and no other supplies or services will satisfy agency requirements.

An awarded patent, a patent-pending software feature, and other proprietary features on the ZeroG Gait and Balance System prevents competition:

Contract 1

Supplier

- ECTRON LIMITED

Contract value

- £289,000 including VAT

Above the relevant threshold

Earliest date the contract will be signed

1 August 2025

Contract dates (estimated)

- 1 September 2025 to 31 January 2026
- 5 months

Main procurement category

Goods

Options

The right to additional purchases while the contract is valid.

Comprehensive Service Contract can be purchased and renewed after the installation for a maximum of four cycles (8 total years). Spare parts will be available for 10 years.

CPV classifications

- 33190000 - Miscellaneous medical devices and products
- 51410000 - Installation services of medical equipment

Contract locations

- UK - United Kingdom

Other information

Conflicts assessment prepared/revised

Yes

Procedure

Procedure type

Direct award

Direct award justification

- Single supplier - intellectual property or exclusive rights
- Single supplier - technical reasons

Justification for sole source for the ZeroG Gait and Balance System of which Aretech, LLC is the sole manufacturer and Ectron Ltd is the sole distributor in the UK. Only one responsible source and no other supplies or services will satisfy agency requirements.

The proposed procurement is for the purchase of a ZeroG Gait and Balance System. The ZeroG has patented and proprietary features that are not found in any other robotic body-weight support system. ZeroG is the only robotic body-weight support (BWS) system with proven performance that has been validated through peer-reviewed journals and includes three software modules that can train patients in fall prevention and balance training techniques.

An awarded patent, a patent-pending software feature, and other proprietary features on the ZeroG Gait and Balance System prevents competition:

- ZeroG uses a patented series elastic actuator, a key feature in achieving accurate body-weight support performance. ZeroG has been proven to have accurate trolley tracking and dynamic body-weight support in a peer-reviewed journal. Other robotic BWS systems do not have this patented feature.

- ZeroG includes TRiP (Training Responses in Postural Rehabilitation) which is patent pending. The TRiP module is used to apply well-controlled perturbations to the subject using the ZeroG robotic trolley. The strength and direction of the perturbation can be changed within the ZeroG software. It has been shown through numerous research studies that applying such perturbations helps subjects learn how to recover from a loss of balance during ambulation or stationary activities. Other robotic BWS systems do not have this feature.

- The ZeroG software includes integrated games with real-time biofeedback. Sensors on the ZeroG robotic trolley detect patient movements, both side to side and up and down, which are used to 'play' the game. These games with real-time biofeedback are used to learn interactive balance training techniques. Other robotic BWS systems do not have this feature.

- The ZeroG software includes interactive targets with real-time biofeedback, which are used for balance training using posterior, anterior, and lateral movements. Sensors on the ZeroG robotic trolley detect patient movements, both side to side and up and down, which are used to control a cursor on a real-time computer display. The goals is to move the cursor into the targets using specific body movements, the position of the targets being adjustable. Other robotic BWS systems do not have this feature.

- ZeroG uses Aretech harnesses which are exclusive to ZeroG. The Aretech harness includes rear-release buckles to prevent accidental patient release and interchangeable groin straps which is critical when heavy unloading of patients is required.

- ZeroG, including the remote control, have full medical electrical equipment safety certifications and Class A digital device compliance by an NRTL. Other robotic BWS devices do not have as many safety certifications.

Manufacturer/Contractor:

• Aretech, LLC (sole manufacturer)

Distributor in UK

• Ectron, Ltd (sole distributor)

Supplier

ECTRON LIMITED

- Companies House: 06139484
- Public Procurement Organisation Number: PNQY-6513-WVLD

Ectron Limited

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Region: UKK11 - Bristol, City of

Contract 1

Contracting authority

UNIVERSITY OF ESSEX

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Organisation type: Public authority - sub-central government