

Sometimes in our lives a setback in movement and mobility, due to disease, trauma, or aging, adversely affects our quality of life. To regain mobility, restore and improve human performance, Motekforce Link draws on 15 years of experience in rehabilitation technology and virtual reality.



Motekforce Link B.V.  
Keienbergweg 77  
1101 GE Amsterdam  
The Netherlands

[www.motekforcelink.com](http://www.motekforcelink.com)  
[info@motekforcelink.com](mailto:info@motekforcelink.com)

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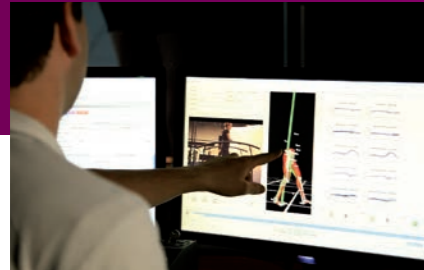
# M-Gait

Modular Gait Lab

# Modular System for Gait Research & Clinical Gait Analysis

Gait analysis on a treadmill is widely accepted as a substitute for traditional overground labs. The maturity of both hardware and software ensures accurate results, while the treadmill based set-up enables numerous other features that are impossible in a traditional overground lab.

With the modular M-Gait a 3D instrumented treadmill can be enhanced with for example pitch and/or sway, motion capture, Virtual Reality and Body Weight Support.



## M-Gait Standard Features

The M-Gait measures 3D ground reaction forces, center-of-pressure, and spatio-temporal parameters. D-Flow's built-in self-paced mode can make the treadmill adapt to the subject's own choice of walking speed.<sup>1</sup> Left and right belt speed can be controlled separately, allowing a split belt walking protocol and advanced gait research applications, mimicking tripping or slipping, provoked by sudden belt stops or belt speed increases.

The M-Gait is modular, enabling various system enhancements to improve the functionality of your set-up. Add, for example, fast treadmill pitch and sway, 3D motion capture and/or an interactive Virtual Reality. Both options for clinical use and research possibilities will be extended with each add-on.

## Run Dedicated Applications

Motekforce Link's M-Gait comprises a dual belt treadmill with fully separated 3D force measurement capabilities, controlled by the D-Flow basic software. Data synchronization and real-time processing allow users to develop and run dedicated applications.<sup>2</sup>

## High-end treadmill

The M-Gait has a very small (<8 mm) gap between the belts. A durable system keeps the belts in track at all times. The M-Gait does not require any modifications to the room; the frame can be bolted to the floor. The independent belts are driven by high-end servo motors, which provide high resolution and accuracy, real-time feedback and fast changes in the set points through a bus-system.

<sup>1</sup> Sloot, van der Krogt and Harlaar (2014) Self paced versus fixed speed treadmill walking. *Gait & posture* 39 (1), 478-484.

<sup>2</sup> Geijtenbeek et al. (2011). D-Flow Immersive virtual reality and real-time feedback for rehabilitation. *Proceedings of the 10th International Conference on Virtual Reality Continuum and Its Applications in Industry.*

## Real-time data

The system is controlled by the D-Flow basic software which synchronizes and processes data in real-time. All data streams are available for application development using the D-Flow application development interface. D-Flow is also used when integrating other hardware and to run custom research protocols.

## System Enhancements Improve Functionality

Various system enhancements are possible, which increase both the clinical and the research possibilities of your M-Gait. You can integrate 3D motion capture, fast pitch and/or sway of the treadmill, EMG, dynamic body weight support and/or an interactive Virtual Reality system. Use the musculoskeletal Human Body Model software for advanced real-time biomechanical analysis. Clinical applications for each add-on can be acquired from the Motekforce Link store.

*"Since I have a dual belt 3D instrumented treadmill we can measure hundreds of gait cycles, under various conditions, within a few minutes"*

PROF. DR. JAAP VAN DIEËN, VU UNIVERSITY  
FACULTY OF HUMAN MOVEMENT SCIENCES  
AMSTERDAM, THE NETHERLANDS

## Specifications

- Total system length x width: 2300x1200mm, width 1820mm with pitch/sway option.
- System height 300mm, 500mm with pitch/sway option.
- Walking surface: 2x500x1800mm.
- 2x permanent magnet full-servo belt motors of 4,5 kW.
- Speed accuracy <1%
- Speed: 0 – 5 m/s (18km/h), speed stepping of 0,01 m/s.
- Independent speed setting left/right.
- 6 load components available (Fz, Fx, Fy, Mx, My, Mz), available both analog and digital (USB).
- Max sensor loads: Fx,z: 5000N (horizontal), Fy: 10.000N (vertical).
- Centre of pressure (CoP) error <3mm.
- Crosstalk < 1%.
- Near zero drift.
- Power requirements: 3phase 400V, 30A.
- System weight: 500kg and 750 kg with pitch/sway.

