

GRAIL

Self Rehabilitation Technology

Origin: The Netherlands



GRAIL is a total package solution for gait analysis and gait training. GRAIL empowers user friendly assessments and exercises, in challenging conditions, to improve (pathological) gait patterns. Real-time feedback in GRAIL enable analysis and training during the same session.

Features

- Instrumented dual-belt treadmill
- Measuring 3D ground-reaction forces of the left and right leg independently
- Self-paced module
- Pitch and sway

Video, Motion Capture System And EMG

- Synchronized data streams
- Gait parameter calculations in real-time
- Spatio-temporal parameters, joint kinematics, joint kinetics, EMG
- Averages, standard deviations, variations over time

180° Projection And Surround Sound System

- Immersive VR with peripheral vision
- Interactive multi-sensory feedback for gait training

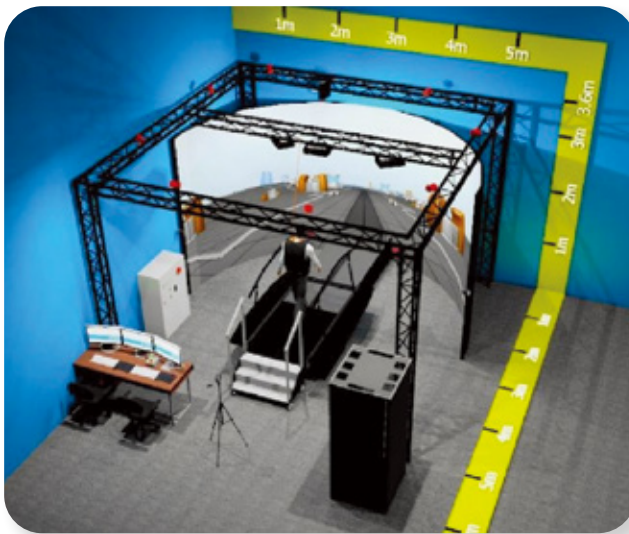
Software

Set of clinical applications for amongst others dynamic alignment of prostheses, left-right comparison, cueing, dynamic stability, gait adaptability, cognitive dualtasks, training of push-off/foot clearance. Musculo-skeletal Human Body Model with real-time visualization of muscle force.

Gait Offline Analysis Tool

- User friendly interface
- Synchronized data: videos (3x), 3D data, gait parameters
- Extensive interactive data analysis of multiple gait cycles
- Date reprocessing and export functionality
- Gait report generation





Dimensions

The recommended required room dimensions to facilitate the GRAIL system depends mainly on the chosen projection configuration:

GRAIL 180° Projection Screen With An Inner Diameter Of 5m:

- Floor Surface – Recommended : 6m x 7m
– Minimum : 5m x 6m
- Ceiling Height – Recommended : 3.6m
– Minimum : 3m (screen height will be reduced from 2.9m to 2.5m)

GRAIL 120° Projection Screen With An Inner Diameter Of 5m:

- Floor Surface – Recommended : 6m x 7m
– Minimum : 4.5m x 5.5m
- Ceiling Height – Recommended : 3.6m
– Minimum : 3m (screen height will be reduced from 2.9m to 2.5m)

GRAIL Flat 4m x 3m Projection Screen (Width X Height):

- Floor Surface – Recommended : 5m x 7m
– Minimum : 4m x 5.5m
- Ceiling Height – Recommended : 3.5m
– Minimum : 3m (screen height will be reduced from 2.9m to 2.5m)

Entrance Dimensions

85 x 200cm assuming the 230cm long crate can enter the room in a straight line.

Specifications

Motion Capture	Vicon Vero1.3	10x Vicon vero1.3 optical motion capture camera's
Projection 180 Degrees	Screen	Circular screen 5m diameter, 180°, 2.9m height
	Number Of Projectors	3
	Technology	Single chip professional grade DLP projector
Projection On Belt	Projection Surface	Width= 1m (same as belt), length=2.5m (on middle of belt up to screen)
	Projector	Ultra short-trow:1280x800
	Resolution	1280 x 800 (WXGA)
Power Supply	3-phase	

C-Mill

The Cutting-Edge Balance & Gait Treadmill

Origin: The Netherlands
Certificate: IEC 60601-1, CE

The C-Mill is unmatched in its functionalities and clinical opportunities. It can serve patients from early rehab, learning to stand, step and walk again, all the way to outbound patients who need to improve their overall walking performance and to reduce the risk of falling. The C-Mill is a treadmill for evaluation and training of impaired gait and balance using augmented and virtual reality. The C-Mill is available in three models, with different defaults and options.



✓ Use and Benefits

- Functional walking with targeted treatment options
- Repeatable and variable training
- Motivating, engaging and fun for patient
- Training in a safe environment
- Assessment of patient's gait and gait adaptability
- Objective measurements and testing
- Monitor performance over time
- Clinical report options with or without video recordings
- No preparation time; session can start immediately after turning on the system



	C-MILL	C-MILL VR	C-MILL VR+
Treadmill Walking Surface	240 x 70 cm	300 x 70 cm	300 x 100 cm
Integrated 1D Force Plate	✓	✓	✓
Belt Projection	✓	✓	✓
Front Display	x	✓	✓
Body Weight Support	x	x	Optional
Video Camera	Optional	Optional	✓
Pitch	x	x	x
Research Suite	Optional	Optional	Optional

C-Mill

Train Foot Placement



- C-Mill applications
- Walking area 0.7 meter wide
- Self-supported safety frame
- Lower system height: allowing installations for ceilings 2.5m and higher
- Optional frontal and sagittal cameras
- Optional children handrails
- Optional research suite

C-Mill VR

Train Automated Movements & DualTasking

Features

- C-Mill applications
- VR suite
- Walking area 0.7 meter wide
- Self-supported safety frame
- Lower system height: allowing installations for ceilings 2.5m and higher
- Optional balance suite
- Optional frontal and sagittal cameras
- Optional children handrails
- Optional research suite



C-Mill VR+

Early To Late Rehabilitation With Balance & Body Weight Support



Features

- C-Mill applications
- VR suite
- Walking area 1 meter wide
- Self-supported safety frame or optional body weight support
- Frontal and sagittal cameras
- Adjustable handrails
- Optional balance suite
- Optional research suite

Optogait

Motion Analysis & Bio-Feedback

Origin: Italy
Certificate: IEC 60601-1



Single meter



2D system

Features

- Identify deficiencies, postural problems and asymmetries
- Provide report and video analysis to develop and apply therapeutic-rehabilitation applications
- Special tests and protocols, e.g. walking test, running test, jumping test, drift protocol, single legs 3 hops protocol, etc.
- Act as an audio and video biofeedback tools
- Act as virtual foot switches to support surface EMG
- Integration of external devices, e.g. heart rate monitor, inertial sensors

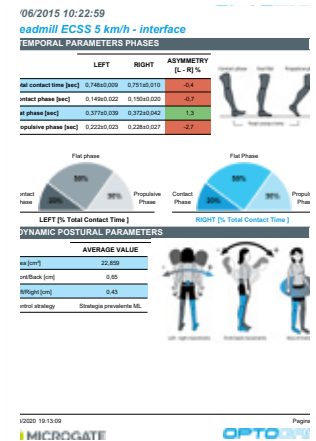
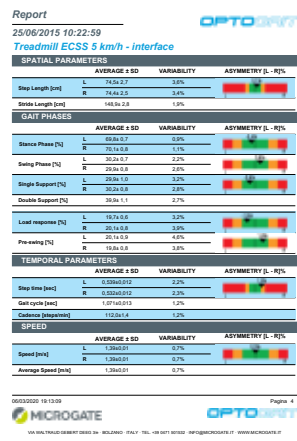
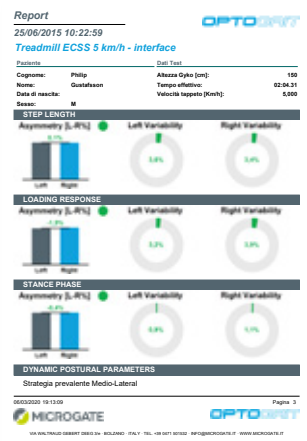


2D Gait Analysis Collects More Information

- Such as: step width, walking base, walking points, walking point gap
- It is also possible to analyze normal walking steps, steps with superposed feet, as well as walking steps with crutches

Report

- Specific report for gait or running tests, with average values, standard deviation and variability coefficient of all typical parameters or the leg and right leg
- Extended report contains all numerical and graphical data, stored step by step during the test



Data Table

Besides the below listed data, in each test average value, standard deviation, and variability coefficient are stated for each leg, where available. In this case, a difference between the two legs is shown in percentage.

	Gait/Run Test	Gait Test on Treadmill	Run Test on Treadmill	Jump Test	Tapping Test	Reaction Test
Stance Time	X	X				
Swing Time	X	X				
Step Time	X	X	X			
Gait Cycle	X	X				
Single Support	X	X				
Double Support	X	X	X			
Loading Response	X	X				
Pre-Swing	X	X				
Step Length	X	X	X			
Stride Length	X	X	X			
3 Foot Phases (Contact, Flat, Propulsive)	X	X	X			
Cadence/Rhythm/Pace	X	X	X	X	X	
Speed	X					
Acceleration	X					
Flight Time	X		X	X	X	X
Contact Time	X		X	X	X	
Height	X		X	X		X
Stride Angle	X		X			
Imbalance	X		X			
Specific Power				X		
Jumping Point				X		
Jumping Point Gap				X		
Used Area				X	X	
Cycle Time (Flight + Contact)					X	
Reaction Time						X

Q-Walk

Wearable Medical Device For Lower Limb

Origin: Italy
Certificate: CE



Features

- Q-Walk is a wearable medical device for gait and balance rehabilitation
- Q-Walk projects customizable visual light feedback
- Visual feedback is stabilised for correct gait tracking
- Integration with the platform and app allows the patient's treatment progress analysis through user-friendly graphics
- Q-Walk offers two projection modes: alternating feedback for classic gait training and fixed feedback for the other types of exercises

Q - Walk

- Light feedback
- Stabilisation
- Quick setting
- Customisation
- Adjustment
- Monitoring
- Engagement



QP-Rehab Platform

- Patient management
- Therapy plan creation
- Practice customization
- Video calling
- Monitoring

App

- Connection with Q-Walk
- Support and explanations
- Data collection
- Video calling
- Metronome
- Training session

