MOVIT SYSTEM G1

WIRELESS MOTION DEVICE SYSTEM

INTRODUCTION

The Movit System G1 incorporates multiple wireless motion devices (Movit G1) with the Dongle G1 station, dedicated software and a set of full body straps with quick coupling system.

The Movit System G1 is a highly accurate, completely wireless, small and lightweight 3D human motion tracker. It provides 3D orientation, acceleration, angular velocity, earth-magnetic field as well as static pressure.

The Movit transmission protocol ensures time-synchronization better than 16 µs between each Movit G1 on a wireless body area network.

PRODUCT OVERVIEW

Hardware
- Movit G1 inertial motion device
- Dongle G1 USB receiver
- Set of wearable supports
- Calibration base and supports
- Hub usb, Micro & AB usb cables

Software
- Motion Studio 3D
- Motion Analyzer 3D

Description

The Movit G1 is a small, highly accurate wireless inertial and magnetic sensing unit with pressure measuring capabilities.
The Movit G1 communicates with the PC using the unique MOVIT radio protocol developed by Captiks®.
The Movit protocol guarantees very accurate (< 16 µs difference) time synchronization between multiple Movit G1's.

The Dongle G1, usb wireless receiver, links up to 16 Movit G1's (standard configuration) to the PC (USB).

Specially designed body straps improve the efficiency of subject preparation, reducing the overall time needed for measurements.

FEATURES

Freedom of movement
- Completely wireless
- Portable case for easy transportation
- No occlusion or line-of-sight restrictions
- Use anywhere, under any lighting condition
- No lab or simulated environment required

Ease of use
- Fast coupling of Movit G1 into the wearable supports
- Intuitive software for real-time view, calibration, logging and export
- CSV (ASCII) export for easy import to many software applications
- Socket (UDP – ZeroMQ) communication facilitating real-time access to data

Accurate data
- Highly sensitive MEMS inertial sensors
- Dongle G1 wireless receiver ensures highly accurate time-synchronized data sampling (within <16 µs) in all connected Movit G1's
- Internal sampling at almost 200 Hz and internal pre-processing
- Internal fusion algorithms ensures highly accurate output
- Sensors securely fastened to straps to minimize skin motion artifact
- Movit G1 barometer makes it possible to calculate change in vertical height

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MOVIT G1 TECHNICAL SPECIFICATIONS

Orientation performance

Dynamic Range	All angles in 3D
Static Accuracy	< 1 deg
Dynamic Accuracy (Roll)	0.80 deg 1.15 RMS
Dynamic Accuracy (Pitch)	1.47 deg 1.70 RMS
Dynamic Accuracy (Yaw)	0.58 deg 0.85 RMS
Angular Resolution	0.0005 deg

Operating temperature range

Ambient	-10° C – 60° C
Specified Performance	0° C – 50° C

Description

Completely wireless inertial and magnetic motion devices
Wireless protocol based on IEEE 802.15.4 MAC
Use up to 16 Movit G1's in a configurable wireless-area network (standard configuration)
ISM 2.4 GHz radio frequency, worldwide license free use
Transmission range up to 30 m
Rechargeable maintenance-free lithium-ion battery
LED charging status

Charging time	less than 3 hours
Stand-by time	up to 2000 hours
Continuous use	up to 8 hours
Internal sample rate	200 Hz
Wireless update rates	
• 4 Movit G1	100 Hz
• 8 Movit G1	100 Hz
• 16 Movit G1	48 Hz

Physical Properties

Dimensions	48 mm x 39 mm x 18 mm
Weight	27 g (including battery)

Communication

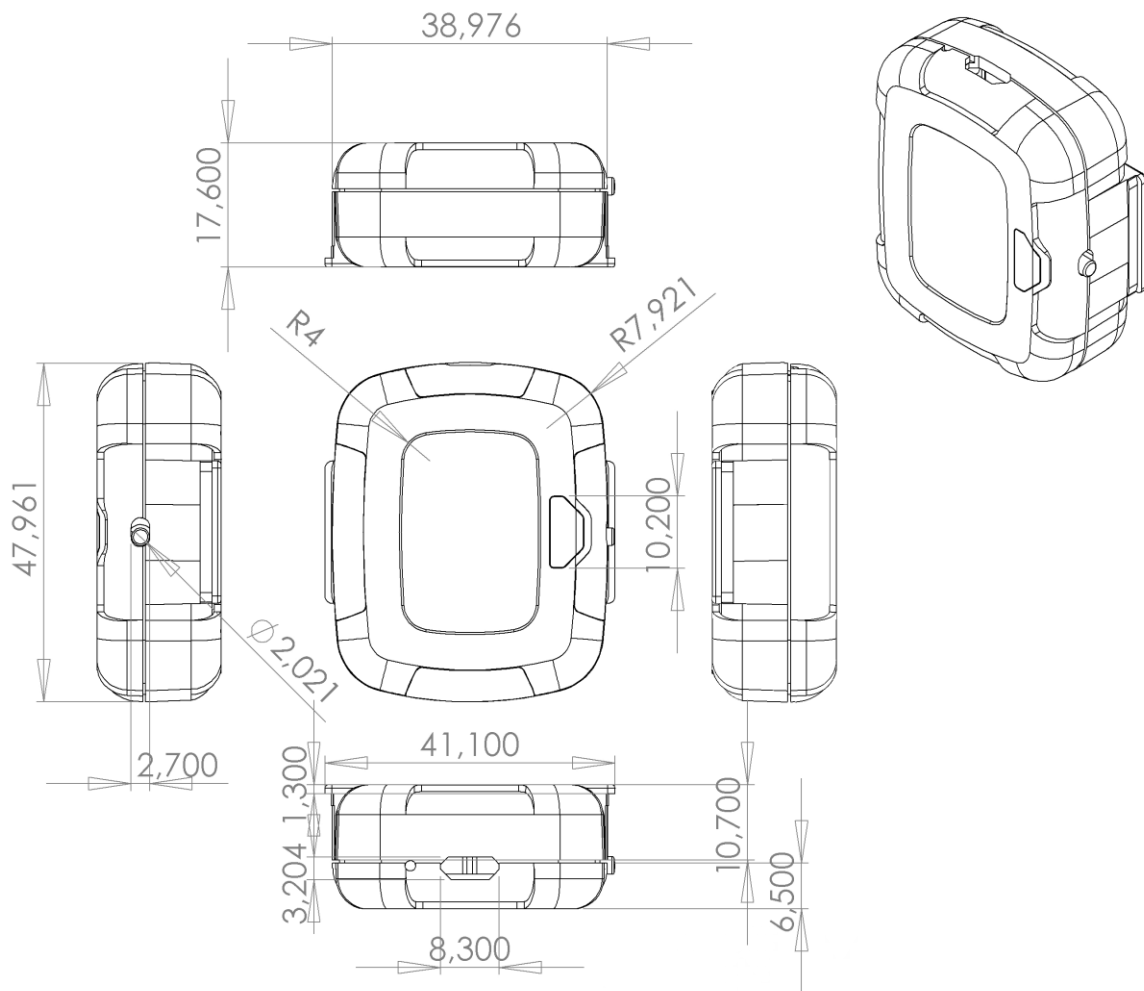|	
Wired Communication	USB
Wireless Communication	2.4 GHz – based on IEEE 802.15.4 MAC
RF Transceiver	Atmel AT86RF233
RF Frequency	2.405-2.48GHz
RF Channels	5Mhz separation 16ch
Output power	4 dBm max
Antenna gain	Average -3.6dBi; (Max gain: 0.9dBi)

SENSOR COMPONENT PERFORMANCE

	Gyroscope	Accelerometer	Compass	Barometer
	Angular Velocity	Acceleration	Magnetic Field	Pressure
Axes	3 axes	3 axes	3 axes	-
Full Scale Range	±2000 deg/s	±16g (156 m/s^2)	±4800 µT	300 – 1100 mBar
Resolution	16 bits	16 bits	14 bits	
Sensitivity	16.4 LSB/dps	2048 LSB/g	0.6 µT/LSB	-
Sample Rate	4 to 200 Hz	4 to 200 Hz	4 to 100 Hz	-

APPLICATIONS

- Biomechanics
- Research
- Rehabilitation
- Gait analysis
- Sports
- Ergonomics

The Dongle G1 wireless station can receive data from 16 Movit G1's (standard configuration) simultaneously.

Data from multiple Movit G1's is time-synchronized within 16 µs.

Operating temperature range

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Ambient	-10° C – 60° C
Specified Performance	0° C – 50° C
Specifications for non-condensing environment	
Avoid wet and humid conditions	

Power supply

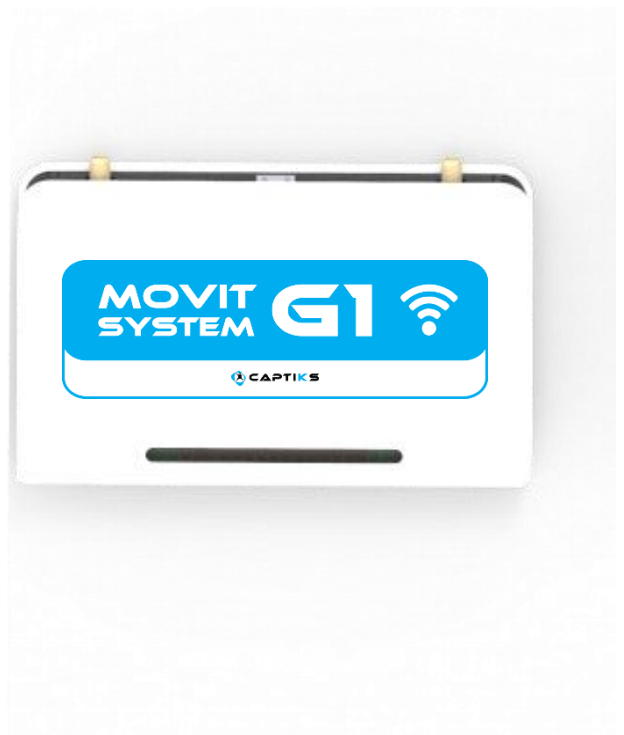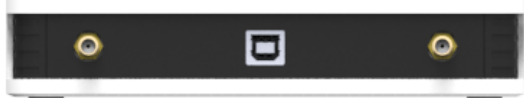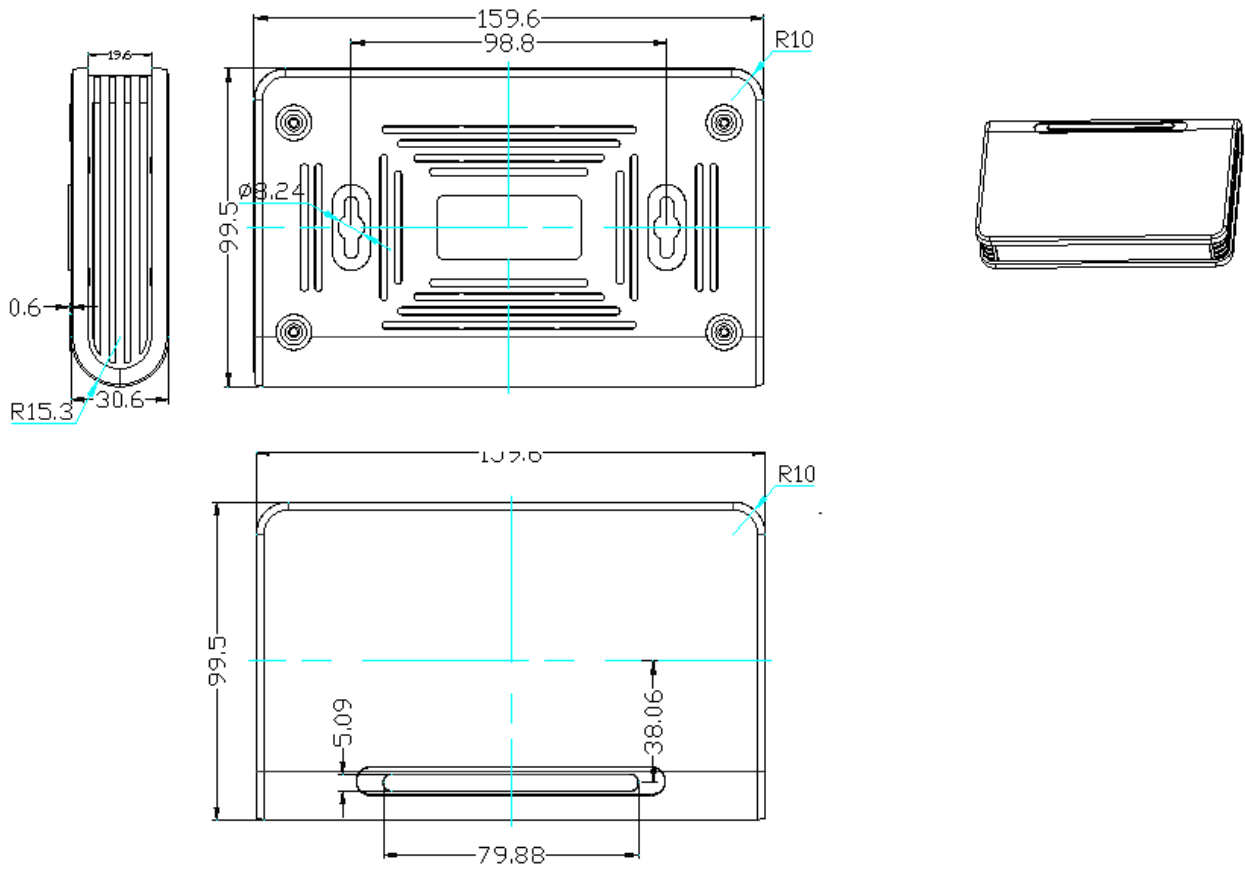|	
USB	5 V

Communication

Wired Communication	USB
Wireless Communication	2.4 GHz – based on IEEE 802.15.4 MAC
RF Transceiver	Atmel AT86RF233
RF Frequency	2.405-2.48GHz
RF Channels	5Mhz separation 16ch
Output power	4 dBm max
Antenna gain	Average -3.6dBi; (Max gain: 0.9dBi)

Physical Properties

Dimensions	100 mm x 160 mm x 33 mm
Weight	400g
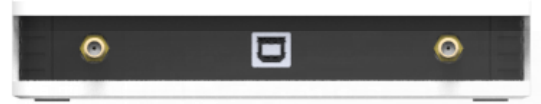
SOFTWARE SPECIFICATIONS

Motion Studio 3D Software

For ease of use, data can be collected in the software.

This software allows configuration of the Movit G1's, real-time view of 3D orientation and sensor data, recording of data streamed from the Movit G1's through the Dongle G1 and export to CSV (ASCII) files for further analysis.

Software provides a real-time socket communication (UDP – ZeroMQ) also.

- Intuitive user interface
- Drag & Drop configuration
- Battery level indicator
- Wireless channels indicator
- Wireless synchronization button
- Configure wireless network settings and update rates
- Real-time graphical data visualization and export of:
- 3D angular velocity (deg/s)
- 3D acceleration (m/s^2)
- 3D earth magnetic field (a.u.)
- Pressure (Bar)
- 3D orientations (Quaternions)
- Export orientation as Quaternions
- Export BVH file animation
- Export Video file synced with data
- Record and save data with ease
- Export data as ASCII text (CSV) for further processing

Captiks Motion Studio 3D is Windows 7, Windows 8, Windows 10 compatible.

Motion Analyzer Software

Captiks Motion Analyzer is a software package able to reload data recorded with Motion Studio Software and edit session. With Motion Analyzer 3D you can edit recorded session, sync data, select sub-sessions, extract areas of interest.

- Intuitive user interface
- Re-open data recorded
- Edit data recorded
- Load raw data
- Load animation data
- Load video recorded with Motion Studio
- Load external video
- Synchronize all video, data, animation tracks
- Export data
- Save projects

Captiks Motion Analyzer 3D is Windows 7, Windows 8, Windows 10 compatible.
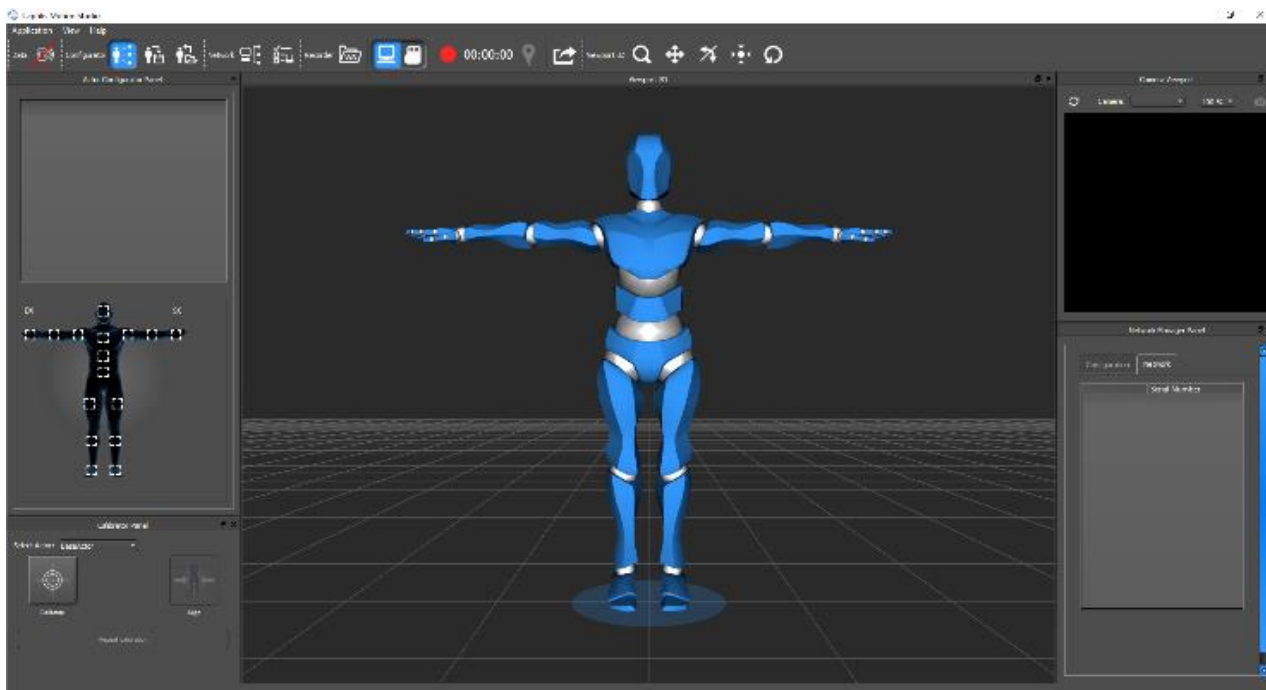
STRAPS SPECIFICATIONS

Full-body straps

- Fast and easy coupling system to securely insert Movit G1 into body straps
- Strong elasticated straps, fastened using Velcro
- Dryflex biocompatible material
- More sizes to fit each body part

PACKAGING

Packaging

Entire system conveniently packed and shipped in a compact carrying case:

- Strong and durable
- Suitable as hand-luggage
- Shipping weight ~4 Kg

REQUIREMENTS

Recommended Computer System

Operating system	Windows 7/8/10
Processor	Quad core or higher (2.0 GHz or faster)
RAM	8 GB
Hard Disk space	200 MB
USB Ports	1 USB port per Dongle G1
Graphic card	Hardware acceleration for DirectX 9 / OpenGL with 1 GB or more of dedicated memory

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