A-TECH INSTRUMENTS LTD.

BIOMECHANICS

- EMG
- IMU
- FORCE PLATFORMS
- MOTION CAPTURE
- SIGNAL CONDITIONING
- DATA COLLECTION
- ANALYSIS
- REPORTING

LET US BUILD YOUR INTEGRATED BIOMECHANICS SOLUTIONS

416-754-7008 | SALES@A-TECH.CA |

AMTI
FORCE AND MOTION

FORCE SENSORS & INSTRUMENTED SYSTEMS

6-AXIS PLATFORMS

APPLICATIONS:

- Gait
- Rehab
- Balance
- Sports Performance

NEW OPTIMA HUMAN PERFORMANCE SYSTEM (HPS)

- Average COP accuracy, just a fraction of a millimeter (typically less than 0.2mm)
- Crosstalk values typically +/- 0.05% of applied load
- Measurement accuracy typically +/-0.1% of applied load
- Memory chip provides GEN 5 amplifier with calibration data

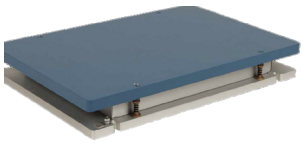
OPTIMA

The only force plate to conform to ASTM F3109-16

AMTI Optima-HPS and Optima-BMS series platforms are raising the bar for force platform performance. Our patented technology meets the new ASTM F3109-16 standard for accuracy across the entire platform's working surface and sets an unprecedented technological standard for gait and biomechanical force measurements systems.

OPTIMA-HPS

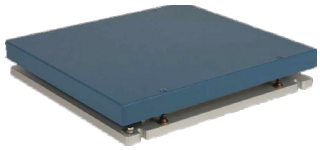
Human Performance System



The OPTIMA-HPS line undergoes the highest density calibration – this means the largest number of calibration locations and applied loads – resulting in the highest accuracy available.

OPTIMA-BMS

Bio-Measurement System



The OPTIMA-BMS line elevates our BP and OR6 plates by harnessing the OPTIMA technology while preserving the dimensions that meet your lab requirements.

OPTIMA AMPLIFIER

The OPT-SC signal conditioner combined with the OPTIMA series force plates provides industry leading performance, and innovative features in an easy-to-use and cost-effective package.

FEATURES

- Auto - Detect
- Multiple gains
- 1 kHz AAF Filter
- Independent Channel Adjust

A-TECH INSTRUMENTS LTD.
Measurement & Instrumentation For Biomechanics & Research

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ACCUGAIT

- Portable gait solution
- Pair with optional AccuGait Walkway

ACCUGAIT WALKWAY

- Walkway turns the force plate into a mobile gait lab
- Six-piece walkway with features that allow effortless set-up and take down

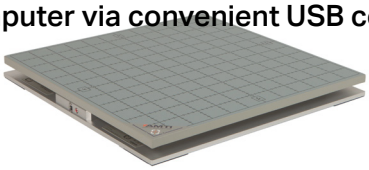
ACCUSWAY

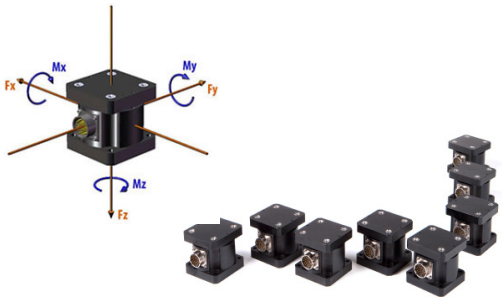
- Portable solution for balance

ACCUPOWER

- Solution for jumping and power analysis

Portable solutions designed to accurately measure ground reaction forces; interfacing directly with a computer via convenient USB connection





AMTI MULTI-AXIS LOAD CELLS

- 6 DOF measurement, measuring all forces and moments
- Minimal crosstalk between channels
- Wide range of sizes for a variety of applications
- Multiple Applications from walker sensors to handrail force measurement
- Utilizes the GEN 5 amplifier with built in calibration detection

FORCE PLATE STAIRWAY

- Isolates forces and moments generated during each of the four consecutive steps
- Information transferred to one of two force plates attached
- No two consecutive steps transfer to the same force plate
- Isolates the forces and moments generated during each step
- New or existing force plates can easily be made to accept a stairway

FORCE-SENSING TANDEM TREADMILL

- Tandem belt design eliminates data problems caused by "double support" during walking
- Two integral composite force plates included
- Speed: 0-20 kph, adjustable in .06 kph increments
- Reversible belt direction for uphill and downhill walk ing and running
- Analog and digital outputs from each force plate supplied by included GEN5 amplifiers Removable side and front handrails

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NORAXON

PRESSURE TREADMILL AND WALKWAY SOLUTIONS

Gait, Plantar Pressure, and Balance Analysis

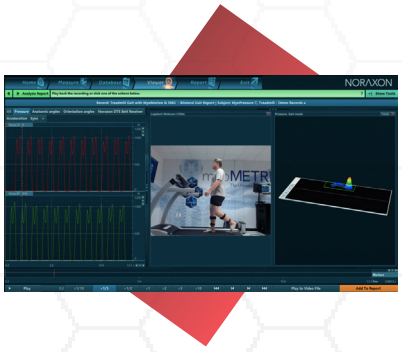
- Static and Dynamic Data Capture
- Automatic Calculation and Reporting on Plantar Pressure-Derived Metrics
- Spatio-Temporal Gait Parameters Force-time Visual Display
- Limb Comparisons

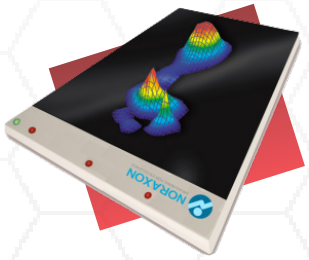
INSTRUMENTED TREADMILLS AND PLATFORMS

Designed with Pressure Distribution Measurement (PDM) technology and tested to withstand more than 10,000,000 steps, Noraxon's instrumented treadmills and pressure platforms ensure a robust, accurate and durable solution for pressure analysis.

Individually-calibrated capacitive sensors measure and deliver reliable data to efficiently conduct static and dynamic plantar pressure mapping.

The accompanying software module, myoPRESSURE™, streamlines the data capture and analysis process.





PRESSURE/FORCE

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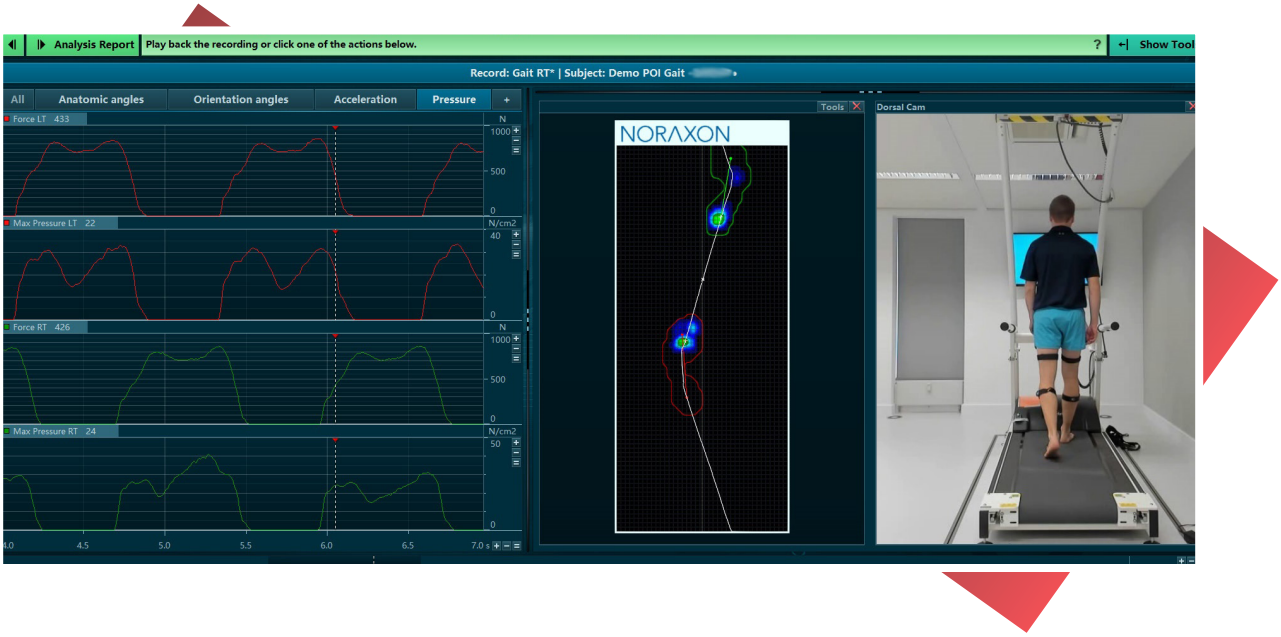
NORAXON



ENHANCE YOUR INSIGHT WITH DYNAMIC PRESSURE ANALYSIS

HARDWARE FEATURES

- Medical grade (model dependent)
- Synchronize to 3D kinematics, EMG and video
- Data can be collected on subjects wearing shoes, insoles, orthotics or barefoot

SOFTWARE FEATURES

- Real-time 3D pressure animation and CoP visualization
- Graphical display of vertical ground reaction forces and maximum pressure
- Automatic left-right step detection
- Object recognition & removal (canes, walkers, and other aids)
- Customizable reports
- Plantar pressure zone analysis

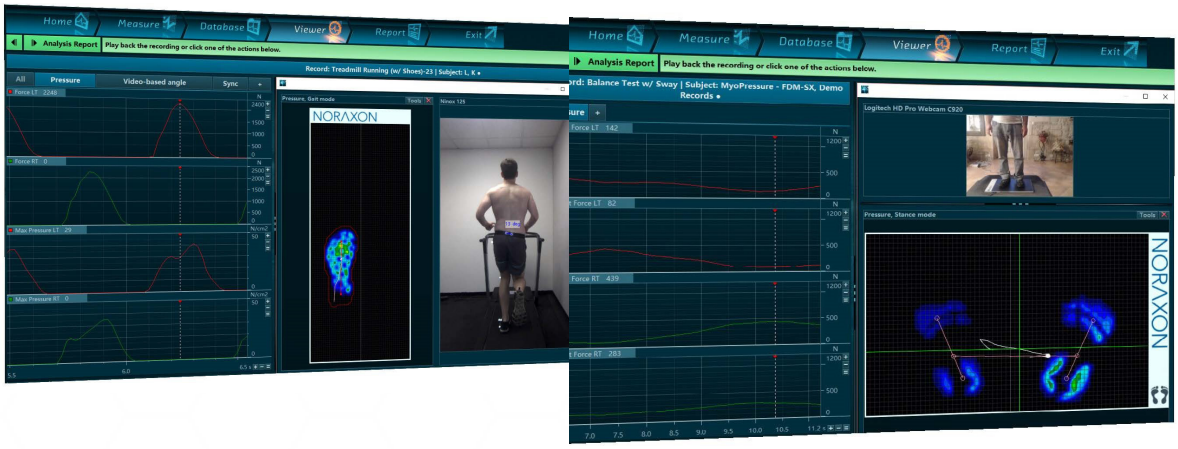
APPLICATIONS

- Gait analysis and education
- Running health and injury prevention
- Balance and sway assessments
- Dynamic load biofeedback

myo PRESSURE™

PRESSURE/FORCE

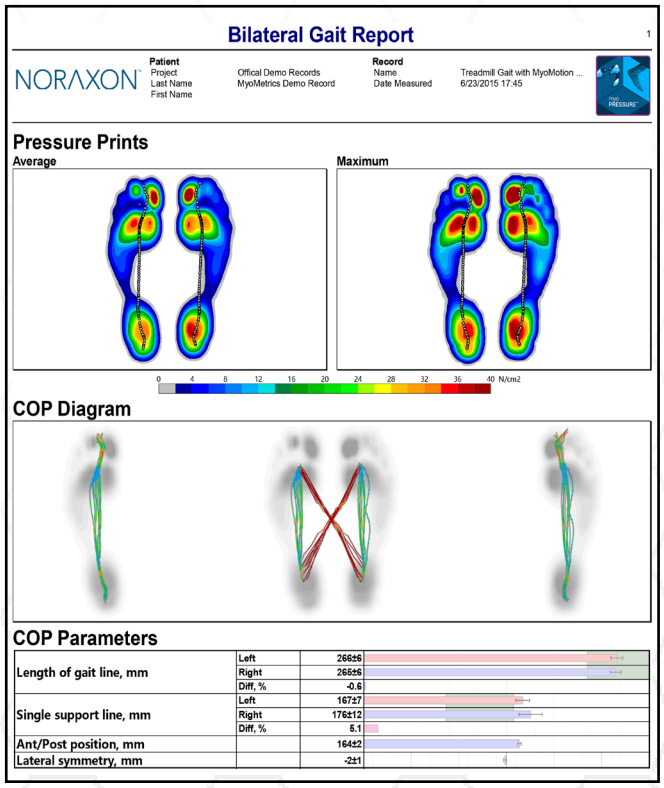
NORAXON



RUNNING ANALYSIS **BALANCE AND SWAY**

REPORT AND ANALYTICS

- Average and maximum pressure print
- COP gait line and butterfly diagram
- COP spatial and temporal variables
- Pressure zone segmentation
- Pressure zone separated force curves
- Peak force and duration statistics
- Average total force curve
- Gait normalized kinematics and muscle activation patterns



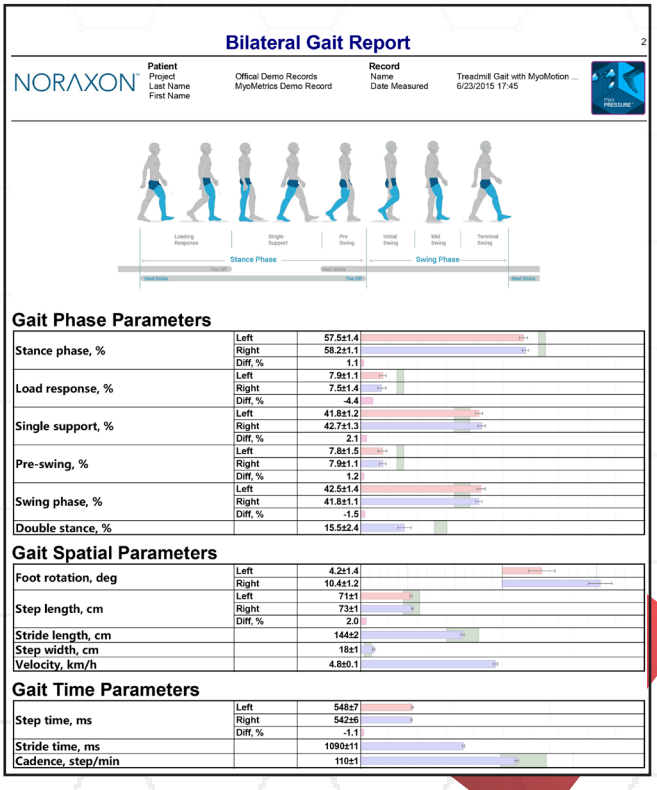
Bilateral Gait Report

Pressure Prints

COP Diagram

COP Parameters

Length of gait line, mm	Left	266±6
	Right	266±6
	Diff, %	-0.6
Single support line, mm	Left	167±7
	Right	176±12
	Diff, %	5.1
Ant/Post position, mm		164±2
Lateral symmetry, mm		-2±1



Bilateral Gait Report

Gait Phase Parameters

Stance phase, %	Left	57.5±1.4
	Right	58.2±1.1
	Diff, %	1.1
Load response, %	Left	7.9±1.1
	Right	7.5±1.4
	Diff, %	-4.4
Single support, %	Left	41.8±1.2
	Right	42.7±1.3
	Diff, %	2.1
Pre-swing, %	Left	7.8±1.5
	Right	7.9±1.1
	Diff, %	1.2
Swing phase, %	Left	42.5±1.4
	Right	41.8±1.1
	Diff, %	-1.5
Double stance, %		15.5±2.4

Gait Spatial Parameters

Foot rotation, deg	Left	4.2±1.4
	Right	10.4±1.2
Step length, cm	Left	71±1
	Right	73±1
	Diff, %	2.0
Stride length, cm		144±2
Step width, cm		18±1
Velocity, km/h		4.8±0.1

Gait Time Parameters

Step time, ms	Left	548±7
	Right	542±6
	Diff, %	-1.1
Stride time, ms		1090±11
Cadence, step/min		110±1

NORAXON

TREADMILLS

COMPARISON	PhysTread™ PT(medical option available)	KinTread™ Sport (medical option available)
Running Surface	150x50cm	170x65 cm
Size	L: 209 cm (6ft 10" ± 1/2"), W: 86 cm (2ft 9.9"± 1/2") H: 131 cm (4ft 3.6" ± 1/2")	L: 230 cm (7ft 6.6"), W: 105 cm (4ft 5.3") H: 145 cm (4ft 9.1")
Speed	0.1 - 18 km/h ((0.1 increments)	0.1 - 25 km/h (0.1 increments)
Elevation	0% - 20% incline	0% - 28% incline
Reverse	Optional	Optional
High Speed	Not Available	40 km/h
Sensor Area	102 x 50 cm ***	132x56 cm ***
# of Sensors	3,120 (6,720 optional)	4,576 (10,270 optional)
Sample Rate	120 Hz (240 Hz optional)	300 Hz
Measurement Range	1-120 N/cm2	1-120 N/cm2
Accuracy / Hysteresis	± 5% (FS) / <3% (FS)	± 5% (FS) / <3% (FS)
Synchronization	TTL 5V Sync Input	TTL 5V Sync Input
Power / Engine	220V / 3.0 HP	220V / 4.5 HP
Safety Arc	Optional	Optional
Manufacturer	HP-Cosmos	HP-Cosmos

*** Sensor area for 6,720 option changes to 102 x 47 cm

PLATFORMS & WALKWAYS

COMPARISON	Plate-SX (FDM-SX)	Plate-S (FDM-S)	Walkway 1.5 (FDM 1.5)*
Dimensions	55x40x2.1 cm	69x40x2.1 cm	158x60.5x2.1cm
Sensor Area	40x30 cm	54x33 cm	149x54.2cm
# of Sensors	1,920	2,560	11,264
Sample Rate	120 Hz	120 Hz, optional 240 Hz	100 Hz, optional 200 Hz/300Hz
Measurement Range	1-120 N/cm2	1-120 N/cm2	1-120 N/cm2
Accuracy / Hysteresis	± 5% (FS) / <3% (FS)	± 5% (FS) / <3% (FS)	± 5% (FS) / <3% (FS)
Synchronization	TTL 5V Sync Input	TTL 5V Sync Input	TTL 5V Sync Input
Power	Wall plug	Wall plug	Wall plug
Connection	USB	USB	USB

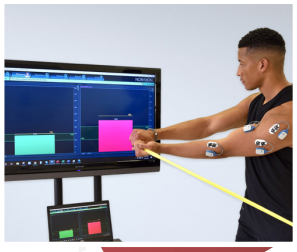
* Walkway 1.5 can be paired with a second Walkway 1.5 to acheive 3 meters in total length

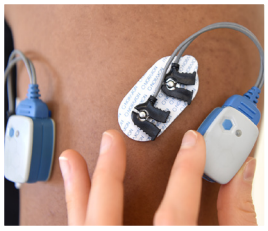
NORAXON

ULTIUM EMG

Wireless Surface EMG with Internal IMU and Biomechanical Sensors

- Versatile Options
- Up to 4000 Hz Sample Rate
- Complete Data Recovery with Lossless Technology
- Built-in Impedence Checker
- Lifetime Battery Replacement
- Digital Integration





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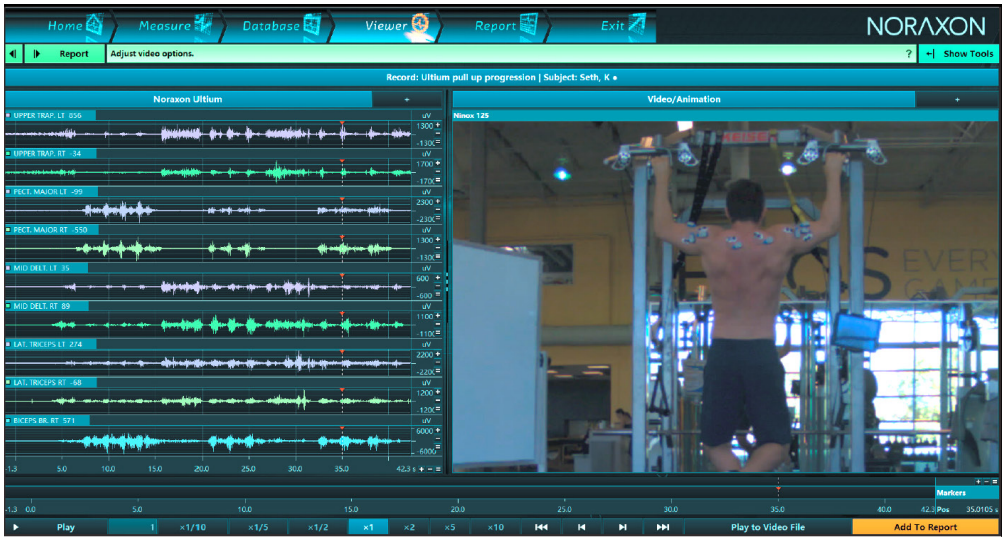
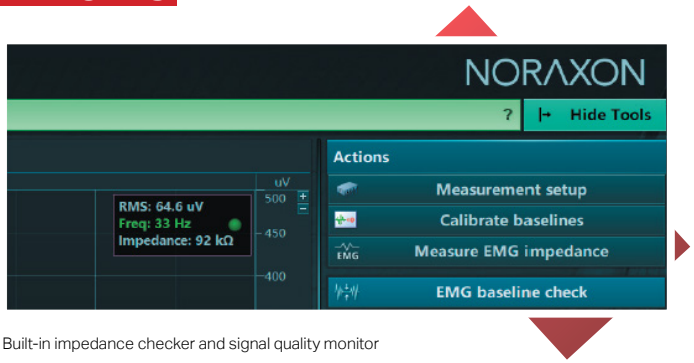
THE ULTIUM EMG SENSOR SYSTEM



HARDWARE FEATURES

- Up to 4,000 Hz EMG sampling rate
- 24-bit internal sampling resolution
- +/- 24,000 µV EMG input range
- Baseline noise <1 µV
- Shielded cables for minimal artifact
- Software controlled digital filtering
- Enhanced radio frequency communication
- Integrated IMU (16-bit resolution)
- Lossless technology with wireless or post-hoc data recovery
- Internal memory for up to 8 hours of data logging
- Up to 32 channels of analog output available
- Mobile device compatibility
- Sweat-resistant design

KEY FEATURES



Built-in impedance checker and signal quality monitor

VERSATILE SMARTLEADS

- Surface EMG
- Footswitch (FSR or insole)
- Fine-Wire EMG
- 2D Goniometer
- Analog Input Probe (3-channel)
- Flexiforce Local Pressure Sensor
- Physiomonitor (breath/heart rate)
- Accelerometer (all-in-one 24 g/100 g/400 g)
- Force Sensor (100 lbf or 500 lbf)

INTUITIVE SOFTWARE

- Comprehensive signal processing tool box
- Customizable analysis reports
- Multi-device synchronization
- Multiple data export formats
- HTTP streaming functionality

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NORAXON

TECHNICAL DATA

POWER AND SYNCHRONIZATION

- Receiver: USB connection to PC
- TTL 2-5 V sync input
- Powered by USB

OUTPUT AND TRANSMISSION FREQUENCY
- up to 100 mW
- 30 m sensor transmission range
- 2402 - 2480 MHz
- 16-bit analog outputs with adjustable gain
- Fixed analog output delay: 300 ms

EMG SENSOR DATA ACQUISITION
- 24-bit ADC , dynamic resolution
  - 0.3 µV resolution for 0 to 5,000 µV
  - 1.1 µV resolution for 5,001 to 24,000 µV
- Selectable low-pass cutoff at 500/1000/1500 Hz
- Selectable high-pass cutoff at 5/10/20 Hz
- Selectable sample rate of 2000 or 4000 Hz

EMG PREAMPLIFIER

- No notch (50/60 Hz) filters
- Baseline noise: < 1 µV RMS
- CMRR < -100 dB
- Input impedance: > 1,000 MΩ
- Input range: ± 24 mV

IMU SPECIFICATIONS
- ± 16 g accelerometer
- ± 2000 degrees/second gyroscope
- ± 4800 µT magnetometer

DATA RECOVERY
- High-speed data transfer via docking station
- 2GB onboard memory, up to 8 hours

ULTIUM-EMG SENSOR DIMENSIONS
- Size: 37 x 24.5 x 16.5 mm (LxWxH)
- Weight: 14 grams

ULTIUM-EMG DOCKING STATION DIMENSIONS
- Size: 174 x 92 x 169 mm (LxWxH)
- Weight: 545 grams

ULTIUM RECEIVER DIMENSIONS
- Size: 261 x 36 x 29 mm (LxWxH)
- Weight: 185 grams

NORAXON

ULTIUM MOTION

PORTABLE 3D MOTION CAPTURE SYSTEM

State of the art sensor design

Advanced sensor fusion algorithms
Rotational velocities up to 7000 deg/s
Accelerations up to 200 g
400 Hz output rate
"Lossless" on-board data recovery
Universal Ultium receiver

Wireless IMU sensors allow for lab-quality 3D motion capture in natural environments

Ultium Motion delivers accurate & reliable kinematic data for all types of movement
-including high velocity and high impact conditions, while maintaining the advantages of the universal Ultium receiver and multi-device myoRESEARCH software platform.

TECHNICAL SPECIFICATIONS

Motion Sensor Weight:
Less than 0.67oz (19g)

Ultium Receiver:
Captures up to 16 channels
of Ultium EMG or Motion sensors

Ultium Charging Station:
Holds up to 9 Ultium EMG or Motion sensors

Measurement ranges:
- Acceleration: +/- 200 g
- Angular velocity: +/- 7,000 deg/s
- Magnetic field: +/- 16 Gauss

Static angular accuracy (RMS):
- 0.25 deg (pitch/roll)
- 1.25 deg (course)

Battery:
- Operational runtime: > 10 hours
- Recharge time: < 4 hours

Maximum measurement output:
- Ultium system sampling at 4,000 Hz
- Acceleration: 400 Hz
- Angular velocity: 400 Hz
- Magnetic Field: 100 Hz
- Quaternion: 100 Hz
- Orientation & joint angles: 400 Hz

Wireless transmission:
- Range: 40m (typical)
- Proprietary 2.4 GHz hopping protocol

NORAXON

NINOX CAMERA SYSTEMS

VERSATILE HIGH-PERFORMANCE, PLUG-AND-PLAY

The NiNOX camera provides crisp synchronized reference video. Its small size and aluminum housing make the camera highly portable and functional in many demanding environments. The NiNOX cameras stream real-time color video to the host computer through a USB3 connection.

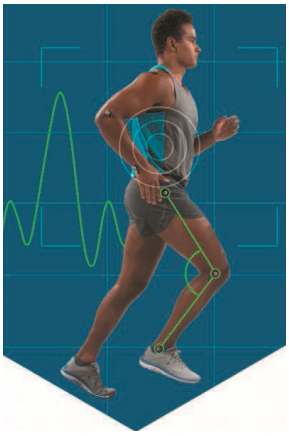
GENERAL

- Size: 1.15" x 0.8" x 4.42" [29.1 x 20.3 x 112.4 mm]
- Weight: 0.6 lb. [273 g]
- Housing materal: anodized aluminum
- Built In USB 3.1 & Sync Cables
- Standard Windows Camera Driver
- On-board MJPEG Compression
- Auto Focus & White Balance
- Constant Field of View
- Digital Zoom

NiNOX 120

FPS	Resolution
60	1920 X 1080 OR 1280 X 720
120	640 X 480

* Minimum computer technical specs required.



POWERFUL MYOVIDEO™

The accompanying software analysis module, myoVIDEO™ streamlines the entire video data capture and analysis process. Software features include:

- 2D video analysis toolset
- Slow motion playback
- Automatic marker-tracking
- Integration into customizable reports

NiNOX 300c - includes the choice of 1 lens

FPS	Resolution	
30	1920 x 1080	
60	1280 x 1080	
125	960 x 720	
250	640 x 480	
300	480 x 340	
Lens Options	**Field of View**	
SIZES	**30 FPS**	**300 FPS**
3.5 mm	76	21
4.5 mm	68	17
6 mm	50	13
12 mm	27	7

MOTION ANALYSIS

OPTICAL 3D MOTION CAPTURE

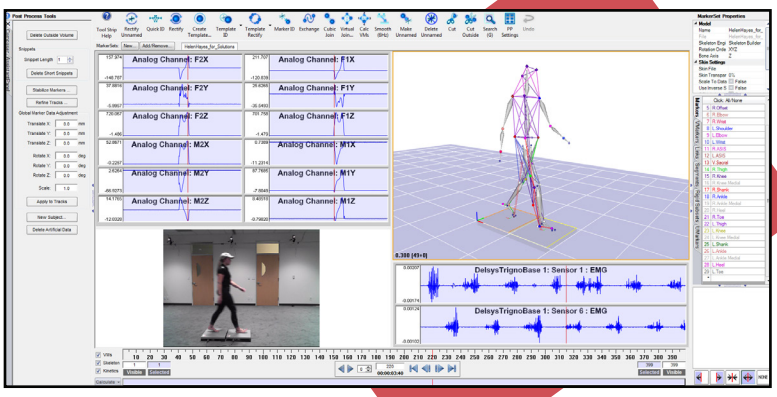
Motion Analysis Motion Capture Cameras

INDUSTRY EXCLUSIVE FEATURES:

- Operates with passive, retro-reflective markers, without wires or lighting on the subject
- Uses Cat5e from camera to hub, hub is connected to computer via a single Cat5e
- "Refine " function for improving camera calibration dynamically, in real-time
- All levels of cameras are compatible with each other
- Robust marker tracking, greatly reducing post processing and relabeling time

MOTION ANALYSIS KESTREL SERIES CAMERAS

- Small format solution with frame rate and resolution options for any need
- Resolution ranging from 0.3 to 4.2 megapixels and 810 to 200 frames per second at full resolution with windowing capabilty to accomadate higher frame rates
- Assures reliable and accurate data for motion capture technicians
- No degradation of the signal over distance, less noise, and no re-sampling of data
- Signal processing embedded in the camera
- FPGA is software and firmware upgradeable through the Cortex software

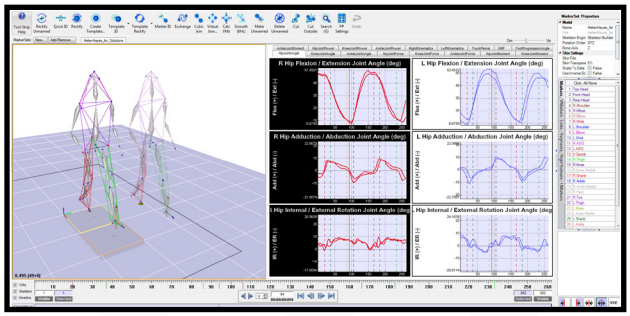


CORTEX SOFTWARE

- Software captures complex motion with extreme accuracy
- Real-time capabilities allow users to view capture results at the same instant as subject performing a specifi c task
- Ability to collect, edit, post process ,and report data in a completely integrated software
- Identifying, tracking, and calculating skelton data
- Ability to seamlessly integrate and synchronize EMG and force plate data, digitally or through analog acquisition device
- View and compare results or multiple captures at once through additional capture loader

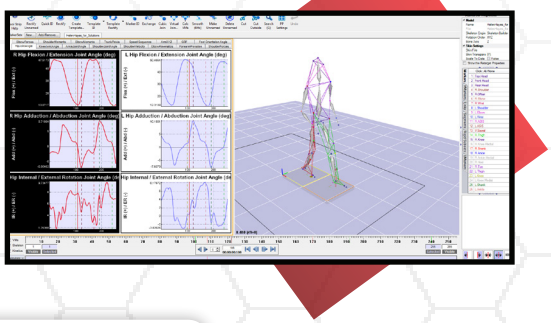
SKELETON BUILDER

- Software tool allowing user to construct a skeleton to measure kinematics
- A ppropriate for identifying rigid external props like crutches, walkers, sport implements and other objects
- Calculations are performed in real-time and are available to be used in Cortex to instantly give feedback to the operator or subject
- 3D graphical interface and display to show segmental positions and orientations plus graphical gizmo to rotate the segment



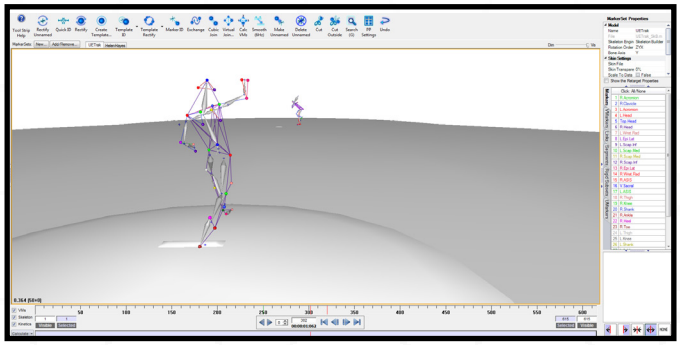
KINEMATICS AND KINETIC FEATURES

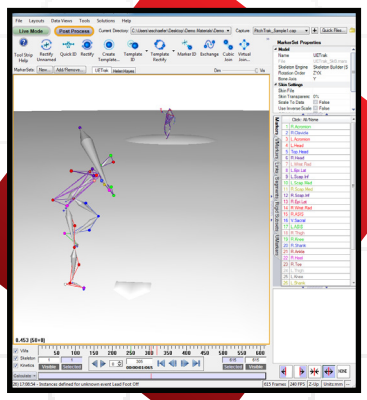
- Mass Model Editor for entering parameters to the model
- Kinetics and Kinemtaics output to ASCII file
- Linear and rotational velocities and accelera-tions for each segment
- Center of mass of the whole body model and segments
- Overall moment of inertia for the current pose
- Customizable layouts for displaying kinetic and kinematic measurements graphically in real-time



3D MOTION CAPTURE

- Cameras have the capability of being used indoors and outdoors providing the user with a flexible system that can be used for various applications
- Cameras have the ability to adjust zoom, aperture, and focus allowing for greater flexibility of camera positioning
- A ble to optimize different set-ups while retaining optimal camera field of view
- Ground reaction forces, joint force vectors, and joint moments can be displayed in real-time
- Models can be built for any user-defined marker set





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ACCUPOWER SOLUTIONS

ACCUPOWER 4.0 SOFTWARE

Makes performance assessment and baseline monitoring simple and easy.

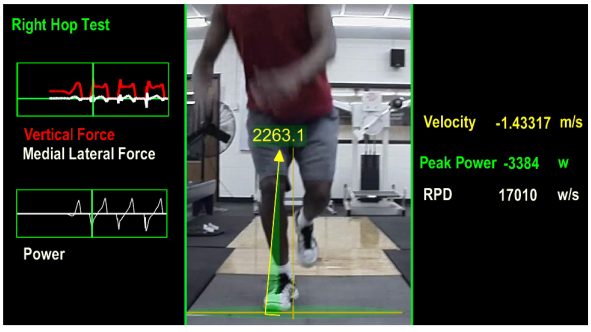
- Software packaged with AMTI AccuPower Force Plate System
- Compatible with all AMTI Single and Dual Force Plate Configurations
- Flexible design allows user to customize tests and analysis for many applications
- Integrated Video and Custom Report features provide Professors with innovative and effective teaching resources

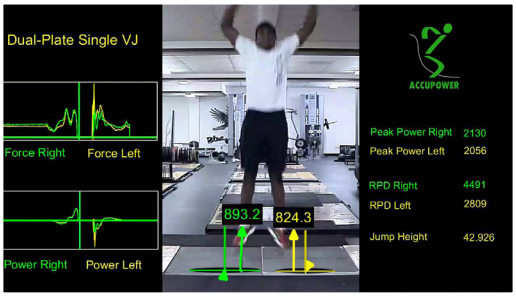
COMPLETE ARRAY OF TESTS

- Jumps, Landings, Gait, Isometrics, and Strength Training
- Very useful for Sport Biomechanics,Clinical, Educational, and Research applications

A STREAMLINED PROCESS FOR DELIVERING

- Expanded test menu allows users to create their own tests and customize analyses.
- Proprietary method for determining start of the movement for any jump or landing cycle. (ICC scores > 0.92)
- User-selectable statistics allow within and between subject comparisons in real-time
- Customizable reports and data export functions generate meaningful results in seconds.
- LIVE display of Real-Time Force and 3D Force Vector Overlay. Up to 5 high speed HD cameras (120-200 fps)
- Key Events in the Movement Cycle are Indexed, allowing for instantaneous review in Playback Mode.
- Customizable Video Overlay and Video Export functions allow videos to be easily shared





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