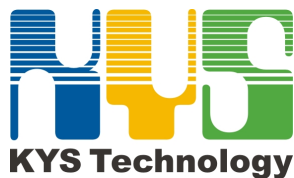


Research-Grade Motion Capture



The System of Choice For Research

OPTOTRAK
CERTUS™

 **3D**
Investigator

Northern Digital Inc. motion capture systems have earned the reputation as the gold standard for motion capture among research scientists. With unparalleled accuracy, speed and resolution, the Optotrak Certus and 3D Investigator Systems will help you achieve your research goals. Both systems easily integrate with other research devices, ensuring true-synchronous collection of data that meets all your needs. The Optotrak Certus and 3D Investigator's "active" technology means you will never have to waste time sorting data points. Furthermore, time consuming calibrations are not required. With a wide array of options, Northern Digital Inc. can meet the requirements of your most challenging research projects.

Let us help you choose the system that's right for you.



NO DATA SORTING

Research time should be used to perform research, not data sorting! Northern Digital Inc. motion capture systems will NEVER incorrectly identify or lose identity of markers. This means that time consuming and error prone manual data sorting is never required. As soon as you have collected data from your subject, you are ready to start analyzing.

RESEARCH-GRADE DATA

Northern Digital Inc. motion capture systems are often referred to as the "gold standard" among research scientists. Our products have earned this reputation due to the exceptional spatial and temporal accuracy the systems provide. You can be assured that the data you collect is accurate and objective.

NO REFLECTIONS

Northern Digital Inc. motion capture systems are not hampered by false signals created by reflections. Thus, there is no need for any special preparations to your lab.

Research-Grade Motion Capture



Applications

Posture and Balance
Hand and Foot Biomechanics
Infant Studies
Maxillofacial Research
Reaching and Grasping
Neuroscience
Gait Analysis
Spine Research
Sports Biomechanics
Occupational Biomechanics
Motor Control
Animal Biomechanics
Rehabilitation Biomechanics

TRUE REAL-TIME DATA

Northern Digital Inc. motion capture systems deliver true real-time data all the time. The exceptionally low latency of this data makes it ideal for virtual reality and other feedback applications.

INSTANT SET-UP

Northern Digital Inc. motion capture systems are factory calibrated using a proprietary manufacturing procedure exclusive to Northern Digital Inc. This means that you can collect data immediately after powering up your system. Even if you move your system, you can immediately begin operating it, without the need for a lengthy and complicated calibration procedure.

FREE CUSTOMER SUPPORT*

Northern Digital Inc. has earned a reputation for exceptional customer support.

Contact us via email, fax or phone. Our dedicated customer support team will quickly provide you with the information you need.

*Conditions apply.

Contact Northern Digital Inc. for details.

System Accessories

SYSTEM CONTROL UNIT

The System Control Unit allows for quick and easy input and output triggering, as well as synchronization of third party devices.



ANALOG AND DIGITAL INPUT



ODAU (Optotrak Data Acquisition Unit):

The ODAU is used for true synchronous capture of data from third party hardware devices such as: EMG systems, force plates, pressure transducers, and tension/compression machines. Features include:

- 16 synchronous analog channels, expandable to 64
- 8 synchronous digital channels
- automatic synchronization with third party devices
- scan frequencies of up to 100,000 Hz

STROBERS



MARKER STROBER:

Activates up to 24 markers per strober (512 markers maximum). Activation order may be configured within software. May be serially connected to additional strobers.



TOOL STROBER:

Accommodates up to 4 custom tools. "Plug and play" feature allows for automatic recognition of tools. Each tool can accommodate up to 20 markers, 3 switches and 4 visible LEDs.



3020 STROBER ADAPTER:

Allows compatibility of 3020 tools and accessories with current generation systems.

TOOLS AND MARKERS



4 MARKER RIGID BODY:

Provides 6 degrees of freedom (6DOF) tracking of body segments or objects. Pre-calibrated, with instant "plug and play" recognition.



4 MARKER DIGITIZING PROBE:

Provides a ability to digitize objects or create "virtual markers" on body segments or objects. Pre-calibrated, with instant "plug and play" recognition.



SMALL DIAMETER MARKERS:

7 mm diameter IRED markers with customizable cable lengths, and RJH connectors.



LARGE DIAMETER MARKERS:

11 mm diameter IRED markers with customizable cable lengths, and RJH connectors. Large diameter allows for secure adhesion to body segments or objects using self-adhesive pads.

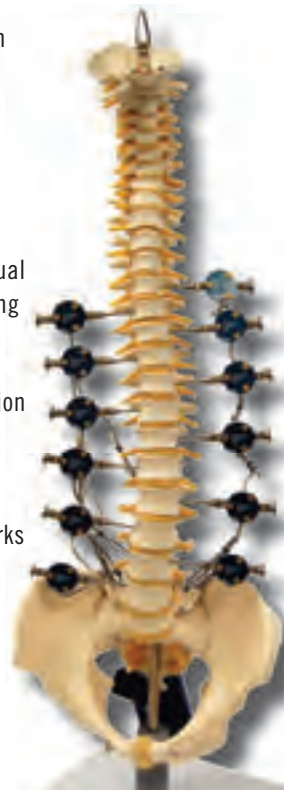
ORTHOPAEDIC RESEARCH PINS:

Created for fast and easy experiment set-up and instant marker detection, Orthopaedic Research Pins get you collecting data quickly and accurately.

- pre-characterized, instant 6DOF information using NDI First Principles
- sturdy and re-usable pins
- x-ray translucent aluminum

Orthopaedic Research Pins allow you to:

- measure translations and rotations of individual vertebral bodies during multidirectional loading
- quantify inter-segmental movement
- calculate angular and linear load-deformation response
- measure range of motion
- perform markerless tracking of boney landmarks
- rigidly affix an orthopaedic pin on each vertebral level
- digitize imaginary points for tracking



Wireless Accessories

OPTOTRAK SMART MARKER SYSTEM

- Allows for unencumbered subject mobility
- No wires between subject and system
- Minimal wires on subject - over 80% reduction over wired systems
- Tangle free
- Fast and easy set-up
- Compatible with Optotrak 3020, Optotrak Certus and 3D Investigator

Bringing you
Freedom
from wires



SMART MARKER:

Small diameter and light weight, Smart Markers are ideal for capturing human motion. Each marker is automatically and uniquely identified. No need to manually identify markers or sort data.



SMART MARKER HUB:

Unique to Northern Digital Inc., the Smart Marker Hub allows for maximum flexibility in marker set-up. Use a combination of Smart Markers and Smart Marker Hubs to quickly and repeatedly create any desired marker configuration. The Smart Marker System immediately determines the configuration, thus minimizing set-up time.



WIRELESS STROBER:

The Wireless Strober allows for maximum freedom of movement of the research subject. With no wires between the strober and the motion capture system, the subject can move freely. The Wireless Strober operates using a long-life battery that provides hours of run-time between charges. Use up to 50 markers per strober and up to 8 strobers per system.



SMART MARKER RIGID BODY:

For capturing 6 degrees of freedom (6DOF) of body segments. These lightweight devices can be quickly strapped onto the subject. They are pre-calibrated allowing for "plug and play" recognition.

MOUNTING OPTIONS

OPTIONAL TRIPOD STAND

- Adjustable footprint: 840 mm diameter to 1220 mm diameter
- Adjustable mounting height: 500 mm to 1600 mm
- Angular adjustment:
Vertical axis rotation 360°
Horizontal axis rotation +/- 10°



FIXED HEIGHT PEDESTAL STAND

Standard Base Stand with every Position Sensor

- Footprint: 770 mm diameter
Mounting height: 400 mm



OPTIONAL WALL BRACKET

Allows for mounting the Position Sensor on a vertical surface with two rotational axes of adjustment for orientation.



Software

Northern Digital Inc. provides software to collect, manage and display kinematic data in real-time or through post-hoc analysis. Software packages standard with each system include: NDI First Principles™ Real-Time Motion Capture Software, 6D Architect™ and DataView™. For even greater control and flexibility, the optional Visual 3D software and Optotrak Application Programmer's Interface (OAPI) are available.

NDI FIRST PRINCIPLES REAL-TIME MOTION CAPTURE SOFTWARE

- True real-time data streaming
- Intuitive and easy to use
- Flexible software package allows user to collect raw data and analyze from NDI First Principles
- Allows for basic data analysis
- Frame-by-frame synchronized video integration
- Collect 3D/6DOF motion capture data
- Integrated digitization feature
- Collect and synchronize analog/digital signals from third party hardware devices
- Easily integrate force platforms, EMG systems, eye trackers, tension/compression machines and other third party devices



NDI 6D ARCHITECT

- Enables user to develop “rigid bodies” for determining 6DOF data of body segments and objects
- Enables user to build and qualify digitizing probes (for designating imaginary markers and for general digitizing)

NDI DATAVIEW

Graphical and text view of:

- marker data
- rigid body data
- analog/digital data captured from third party peripheral devices



OPTOTRAK APPLICATION PROGRAMMER'S INTERFACE (OAPI)

The OAPI allows integration of the Optotrak Certus and 3D Investigator Systems into custom applications. OAPI sample programs, which include sample code using C programming language, assists in development of custom software applications.

REAL-TIME INTEGRATION

The Northern Digital Inc. Optotrak Certus and 3D Investigator allow for seamless real-time integration with the following 3rd party hardware/software products. Optional accessories may be required for some integrations.

- Visual 3D by C-Motion
- Vizard by WorldViz
- Motion Builder by Autodesk
- Caren platform products by Motec
- Easy import into MatLab and many other research software/hardware products, including
 - Eye trackers
 - Forceplates
 - EMG Systems



Using Visual 3D by C-Motion with Smart Markers

System Comparison

OPTOTRAK[®]
certus[™]

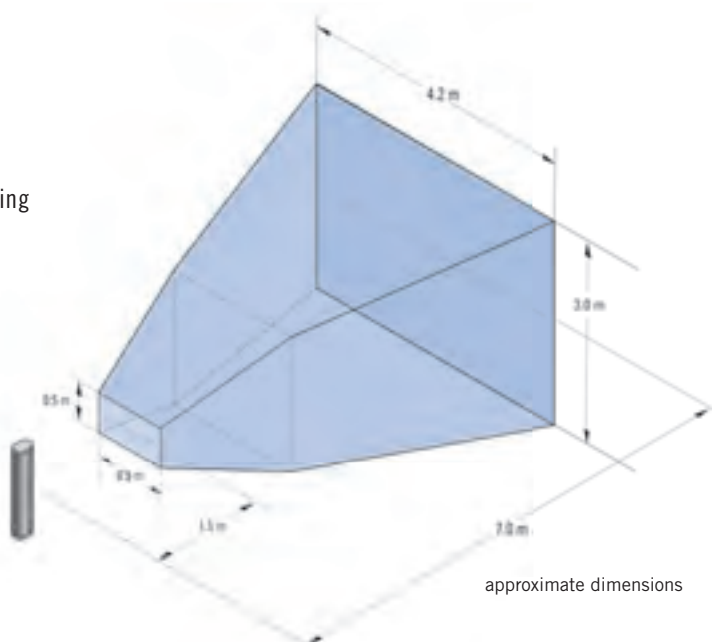
 **3D**
Investigator



Position Sensor Dimensions	1126 mm x 200 mm x 161 mm	1126 mm x 200 mm x 161 mm
Position Sensor Weight	18 kg	18 kg
Marker Frequency	4600 Hz	4600 Hz
Maximum Frame Rate	4600(n+1.3)	4600(n+1.3)
Accuracy	0.1 mm	0.4 mm
Resolution	0.01 mm	0.01 mm
Phone Support	Included, no charge	Included, no charge
Software Upgrades	Currently unlimited (online)	6 months
Warranty	1 Year	1 Year
Maximum number of markers	512	150
Markers included with system	30	30
Strobers included with system	2	2
Real-time data streaming to 3rd party software	included	optional
Integrated Video Plug-in	included	optional
Communication Protocol	Ethernet, USB	Ethernet, USB
Cross Platform Capability	Communicates with Optotrak 3020 and Optotrak Certus products	Communicates with all 3D Investigator products

MEASUREMENT VOLUME

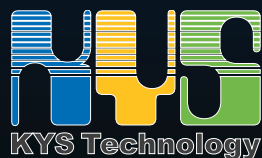
Northern Digital Inc. motion capture systems are factory calibrated, optimizing accuracy in the volume illustrated. Combine up to eight Position Sensors to create a much larger volume or unique volume.



approximate dimensions



For almost 30 years, Northern Digital Inc. (NDI) has been providing researchers with the tools they need for research-grade motion capture. Today the company is a world leader in advanced 3D measurement technology. With over 15,000 installations in more than 30 countries, our success has been built on the ability to understand your application.



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