

Delta⁴

by ScandiDos

HexaMotion

Motion Synchronization QA for Synchrony[®]



Pre-treatment

CONFIDENCE | SAFETY | ACCURACY | EFFICIENCY



**We drive the
development
of solutions
for safer
radiation therapy**



Delta⁴

by ScandiDos

Reinforcing confidence in radiation therapy by making the process safe and efficient.

We are ScandiDos – an innovative forward-thinking company with groundbreaking software and hardware solutions for patient quality assurance in modern radiation therapy.

The Delta4 Family of products delivers a comprehensive QA solution, ensuring safe and accurate treatment. By using innovative solutions that further individualize radiation treatment, we make the process safe and efficient – while reinforcing confidence in radiotherapy clinics.

Empowering professionals with power and performance.

Our organization is a trusted authority when it comes to improving the daily workflow of medical physicists. We give them the tools and confidence they need to ensure clinic efficiency, accuracy, and patient safety.

The Delta4 brand guarantees efficient, accurate, and compelling QA products for medical physicists and physicians worldwide.



Your Ideal Solution for Motion Synchronization QA

HexaMotion is a motion platform that recreates the movement of a tumor in six dimensions* and independently simulates patient breathing motion. Together with Delta4 Phantom+, this solution helps you to:

- Validate the motion management technique for smooth and quick implementation.
- Obtain realistic pre-treatment verification of the dosimetric effects for Synchrony® treatments.

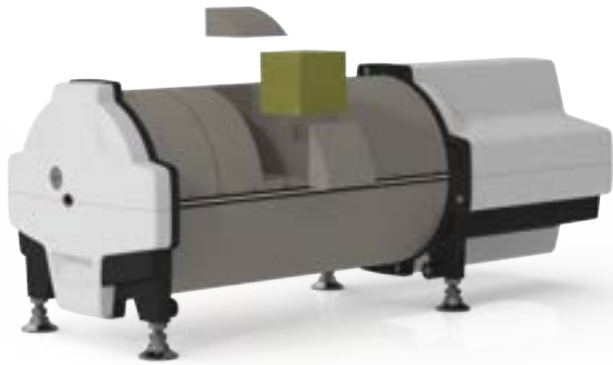
*Longitudinal, lateral, height, roll, tilt, and time.

COMPLETE AND INDEPENDENT TREATMENT VALIDATION

An easily identifiable target can be created for tumor tracking by placing a custom phantom-quarter in the QA system Delta4 Phantom+ to house the Accuray Ball Cube II. With the Independent Motion Platform (IMP) for HexaMotion, you can simulate the movement of a patient's chest or abdomen.

Together with the HexaMotion, this solution is ideal for end-to-end quality assurance of the Synchrony® real-time tracking and motion synchronization feature for moving targets.





Imaging and tracking solution for Synchrony®

The custom phantom-quarter of the Delta4 Phantom+ comes with three removable pieces that allow for an Accuray Ball Cube II to be inserted for imaging and tracking or, alternatively, kept as a solid PMMA phantom-quarter.

A special phantom-quarter for Delta4 Phantom+ is provided by ScandiDos. The Ball Cube II is supplied by Accuray.

THE FASTEST AND MOST ACCURATE 4D VERIFICATION SYSTEM DELTA4 PHANTOM+

The Delta4 Phantom+ is an innovative device that addresses volumetric delivery quality assurance for highly conformal treatments, such as those performed with TomoTherapy® and Radixact® Treatment Systems.

The response of the dual orthogonal detector planes and isotropic detector enhances the applicability of the Delta4 system for helical treatments.

The Delta4 Phantom+ is a unique volumetric dosimetry system. It is the only system that measures the dose distribution in the isocentric region, not just in one single flat or wrapped plane, providing you with superior results.



EFFICIENT AND EASY TO USE

- Uniquely measures in and around isocenter with high resolution
- Instant results
- Simple and quick to set up for measurements
- Completely wireless



We chose to work with ScandiDos for our internal testing of the Synchrony® feature for the Radixact® System because they have a robust solution for comprehensive quality assurance of moving targets. We have found the Delta4 Phantom+ and the HexaMotion to be convenient, accurate, and easy to use.

Dylan Casey, PhD
Director of Medical Physics & Systems Analysis at Accuray Incorporated

Validation Includes Respiratory Motion

Validation of Synchrony® real-time motion tracking and correction Our solution validates the correlation model between respiration, as detected by LED markers on the patient's chest, and the actual position of the tumor from kV images.

Phase shift simulates the actual patient situation The task of the Independent Motion Platform (IMP) for HexaMotion is to mimic the breathing of the patient independent of the motion of the phantom/tumor. The sensors that are placed on the patient during treatment are placed on the IMP during pre-treatment verification.

The HexaMotion software allows you to run the HexaMotion movement and the extra stage movement with a phase shift in order to properly simulate the actual patient situation. As a result, you are able to fully validate the Synchrony® treatment.

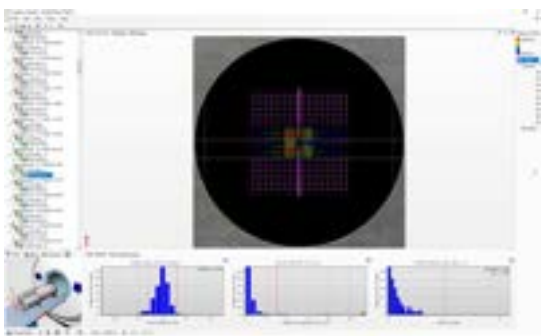


Streamlined Workflow



Quick and easy setup

- Trolley eliminates all lifting
- System slides from trolley to treatment table
- Remote-controlled alignment of the system
- Delivery verified with one measurement



Easy analysis and intuitive software

- Fully automated
- Instant results in one place
- Powerful analytic tools
- Clear and modifiable reporting

Technical Specifications

HEXAMOTION

Positioning accuracy	Better than 0.5 mm
Movement range	X: +/- 40 mm, Y: +/- 40 mm, Z: +/- 40 mm Roll: +/- 10o @ origin, Tilt: +3o/-6o @ origin
Total weight	17 kg

Trolley provides easy and ergonomical handling of the system eliminating heavy lifts



INDEPENDENT MOTION PLATFORM

Positioning accuracy	Better than 0.5 mm
Movement range	Z: +/- 40 mm, vertical movement only
Total weight	3 kg



DELTA4 PHANTOM+

Cylinder Phantom

Material PMMA

Diameter 22 cm

Length 40 cm **Total Length** 71 cm **Total Weight** 27 kg

Ion chamber insert in cylinder Inserts for common cylindrical ion chambers available

Detectors

Type p-Si

Total number 1069

Layout Distributed on coronal and sagittal plane

Max field size 20 x 38 cm² (when merging two consecutive measurements, otherwise 20 x 20 cm²)

Distance between detectors

Central area (6 x 6cm²) 5 mm (or 2.5 mm in longitudinal direction with merging of two consecutive measurements)**Outer area** 10 mm

Size (radial x axial) 1 x 0.05mm³= 0,00004 cm³

Detector stability (6MV beam) Better than 0.1% per kGy, typically 0.04%/kGy

Wireless Communication

Wireless data communication protocol Wi-Fi 802.11n

Battery operation capacity >4 hours Rechargeable Li-ion battery – power supply for charging included

Accuracy Compatibility

Fully compatible with TomoTherapy® and Radixact® solutions





The HexaMotion platform allowed for accurate phantom positioning and motion for a wide range of simple and realistic patient motions. The Delta4 Phantom+ was found to be very reliable, easy to setup and allowed for easy analysis of dose delivery accuracy. The combination of the two allowed for validation of the Radixact Synchrony®.

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Innovative and Efficient QA delta4family.com

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