

# Delta<sup>4</sup>

by ScandiDos

Delta4 Phantom+

## The fastest and most accurate 4D verification system



Pre-treatment

CONFIDENCE | SAFETY | ACCURACY | EFFICIENCY



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



# Delta<sup>4</sup>

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.



# Complete and independent treatment validation

**Delta4 Phantom+** provides fast and accurate dose and treatment delivery verification for your advanced treatment plans.

- Verifies IMRT, VMAT, Halcyon, SRS, SRBT, RadixAct and TomoTherapy treatment plans.
- Fulfills the requirements in TG-218
- One system for patient and machine QA

## ACCURATE PATIENT QA IN LESS TIME THAN EVER

**Delta4 Phantom+** system offers the most accurate and efficient verification of your IMRT, VMAT, Halcyon, SRS, SRBT, Radixact, and TomoTherapy treatment plans.

It is the **ONLY** system that measures the dose distribution in the isocentric region and not simply in one single flat or wrapped plane.

The patented geometric, dual orthogonal detector planes and the nature of the detectors make the Delta4 Phantom+ a unique quality assurance system.



# Real measurements in the isocentric target region

To keep up with increasing complexity, and ensure each patient is treated with confidence and accuracy, it's paramount that clinics perform a thorough verification of treatment plans. The wireless Delta4 Phantom+ provides fast and accurate dose and treatment delivery verification for your advanced treatment plans.

**Measure where it really matters.** The patented detector configuration with two orthogonal detector planes provides real measurements in the isocentric target region.

**Instant pass/fail analysis.** Since measurements are made in the target, the relevant dose is instantly available when the irradiation has been delivered. The delivered dose is instantly compared with the planned dose and analyzed against your pass/fail criteria.

**Independent Gantry angle verification.** An inclinometer gives you independent verification that the beams are delivered from the right angles.

**Machine QA.** In addition to patient QA the Delta4 Phantom+ can perform checks of the beam constancy and the MLC performance.



The Delta4 Phantom+ is a valuable tool for us at Herlev Hospital. We find great value in having an independent measurement of treatment plans. At Herlev Hospital we now have a complete range of Scandidos' Delta4 products covering TrueBeams, Halcyons and MRIdian.

Ulf Bjelkengren

Technical Manager, M.Sc., Medical Physics, Herlev and Gentofte Hospital

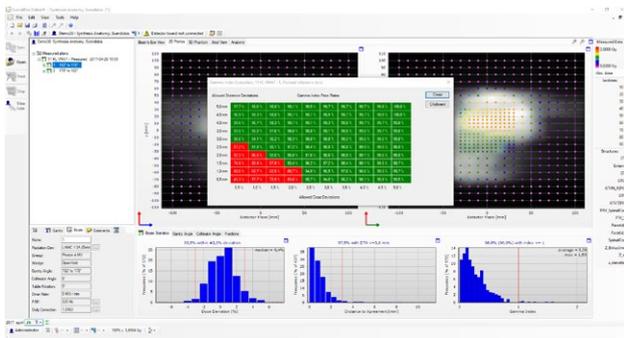
# Instant results and automatic analysis

## INTEGRATED IN THE WORKFLOW

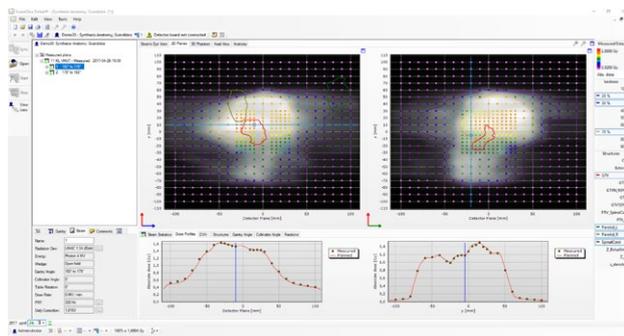
The Delta4 software is fully integrated in the clinical workflow. TPS plans are easily imported together with TPS dose and structures.

## INSTANT RESULTS

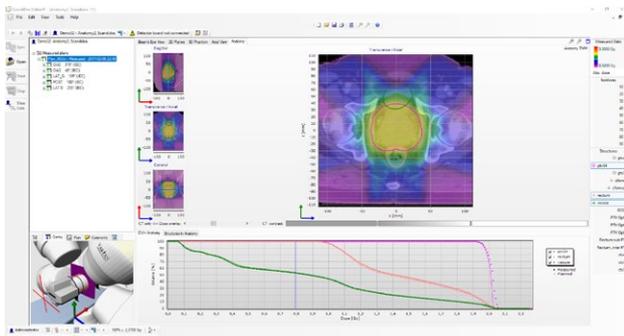
Your QA results, including dose deviation, distance to agreement (DTA) and gamma index, are instantly available without any further processing and QA reports are easily customized to your specific needs.



Instant display of dose deviation, distance to agreement, gamma pass rate, and plan pass/fail status



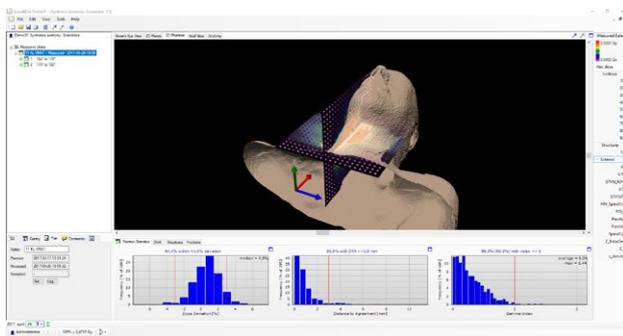
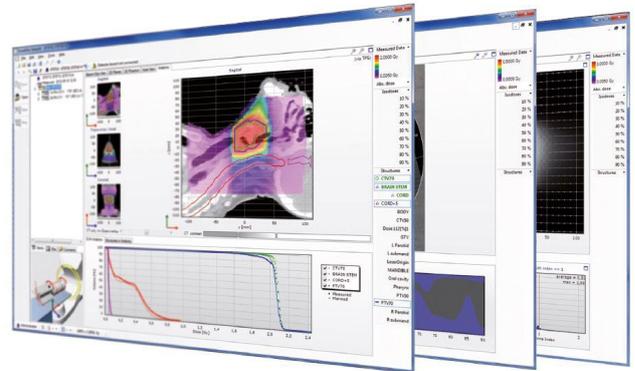
Wide range of analysis tools including profile display, isodoses, structure overlaying, continuous dose display, and dose-volume histograms.



Possibility to calculate continuous dose distributions within the patient.

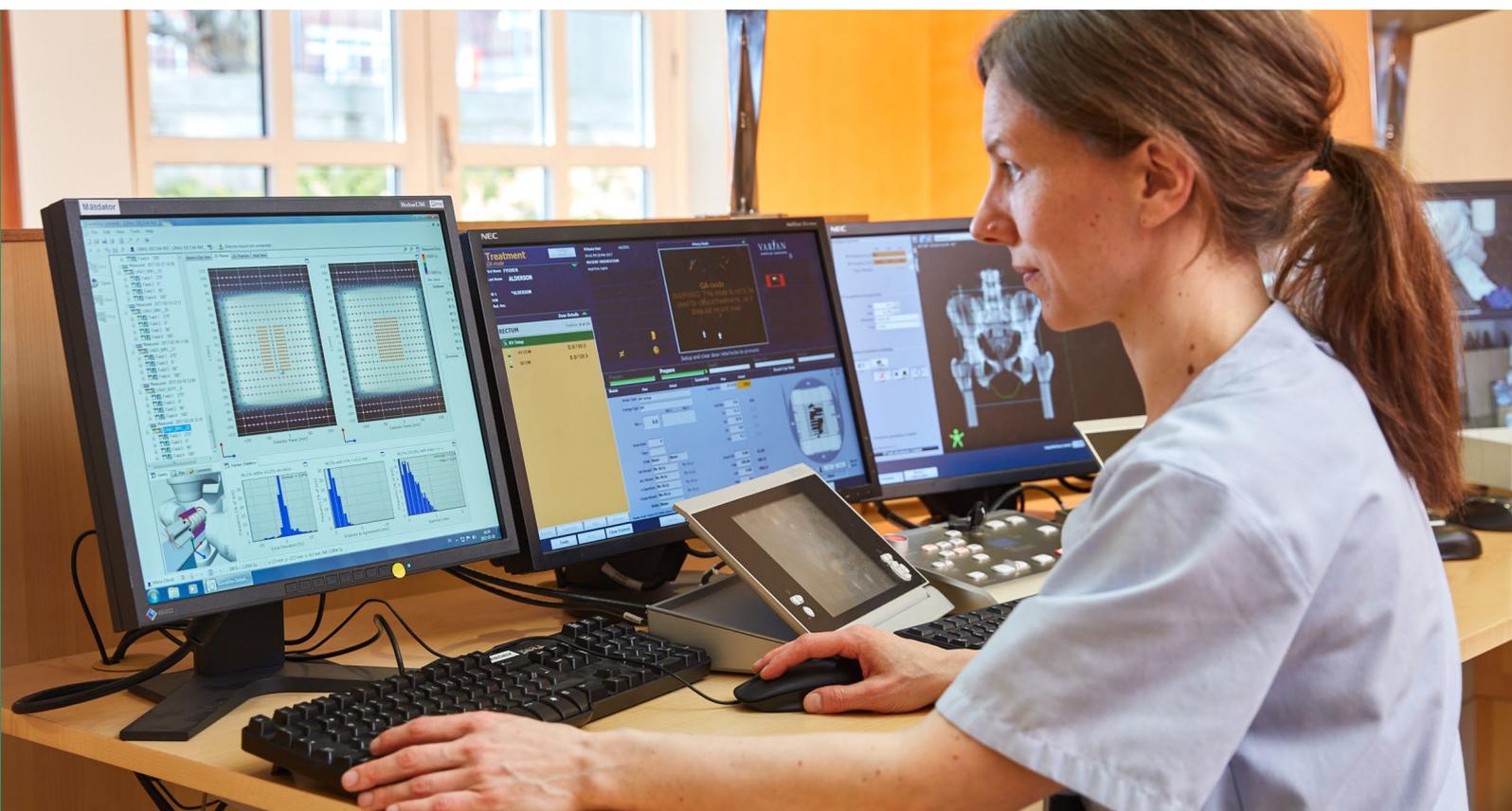
## INTUITIVE

The genuinely intuitive software flattens your learning curve. You can easily navigate between patients, measurements and analysis and all the information you need is just a click away. The QA analysis is performed automatically as soon as the dose has been delivered instantly indicating pass or fail.



## POWERFUL ANALYSIS

With unique 4D measurements you also have the data to analyze the delivered dose for fraction, beam arc or control point. The delivered 4D dose can also be analyzed in the patient anatomy. The Delta4DVH suite of software modules provides unique analysis tools to find the clinical significance of a deviation.



# Streamlined Workflow

**Fast set-up.** The phantom is easily transferred to the treatment couch with the Delta4 Trolley. You never have to lift the phantom! The Trolley also serves as a neat and compact roll-and-store platform for the phantom.

**Alignment** is easily done in seconds with clear markers on the phantom that allow you to accurately position the Delta4 Phantom+ in 6 dimensions.

**Instantly ready for measurement.** The Delta4 Phantom+ transfers data via Wi-Fi and it is battery powered. There are no cable connections. Just turn on the power and you are ready to measure.

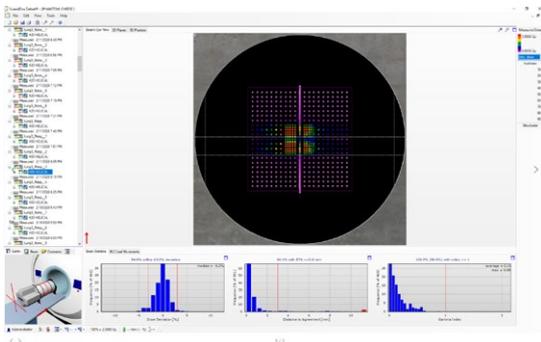


## Quick and easy setup

- Trolley eliminates all lifting
- Trolley available for all types of treatment tables
- Delivery verified with one measurement

## Easy levelling

- Levelling with 3 or 4 point adjustment



## Easy analysis and intuitive software

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

With an ambitious team of coworkers and strong relationships with the industry, ScandiDos continues to be the golden standard for patient QA.

## Quick facts about us:

- 1000+ systems installed
- Systems in 50+ countries
- 800+ customers

# Next generation technology that works for your benefit

## Unique detector configuration

- Isocentric measurements in two orthogonal detector planes
- Merge large fields up to 38 cm longitudinal
- Resolution 5 mm at isocenter, can be increased to 2.5 by merging



## Superior ScandiDos detector

- Long term stable, detectors, eliminates re-calibration of relative sensitivity
- Isotropic response
- FFF compatible

## Wireless

- Fastest set-up time
- Wireless communication (Wi-Fi)
- Battery operated

## Absolute measurement

- Quick and accurate absolute dose verification
- Ion chamber measurements can also be performed in the same phantom



As a Clinical Scientist, I value the straightforward, meaningful data that Delta4 provides. The new wireless functionality of the Delta4 Phantom+ makes it so quick and easy to use, it's even been described by one member of staff as 'an absolute dream'.

Karen Hawthorn. Clinical Scientist, Newcastle upon Thyne Hospitals NHS Foundation Trust

## WHY PERFORM PRE-TREATMENT PATIENT QA?

Modern radiation therapy uses complex plans with techniques such as IMRT, VMAT and Tomotherapy. A single plan can consist of more than a hundred control points and include MLC leaf movements, gantry and collimator angle rotations etc. in order to produce steep dose gradients within the patient.

To keep up with increasing complexity, a thorough verification of treatment plans is paramount for clinics to treat each patient with confidence and accuracy. For this purpose it is necessary to independently verify:

- The TPS dose.
- The transfer of data from TPS to the delivery system.
- The performance of the delivery system.
- The relationship of the delivered dose to the target and OAR's.



**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.



# Technical Specifications

## 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 cm<sup>2</sup> (when merging two consecutive measurements, otherwise 20 x 20 cm<sup>2</sup>)

### Distance between detectors

**Central area** (6 x 6cm<sup>2</sup>) 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 0.05mm<sup>3</sup>= 0,00004 cm<sup>3</sup>

**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

### Compatibility

**Modalities** Photon beams, with and without flattening filter

**Treatment plan import** Any treatment planning system that can export DICOM RT plan, RT Dose, and RT Structure





Being a solid-state array, the measured planer resolution is lower than that of film or EPID. Delta4 makes up for this in two ways; First, ray-scaling is used to calculate dose in 3D space at the same resolution as your calculated plan. Secondly, consecutive measurements with small shifts can be acquired and merged together to gain a measured resolution of 0.25 cm.

Michael Butkus, Chief Resident of Medical Physics, Yale University School of Medicine & Yale New Haven Hospital

# Innovative and Efficient QA [delta4family.com](http://delta4family.com)

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