# DOLPHIN

## Advanced Detector for 3D Patient QA

dolphin®

**CARE. CONTROL. CONFIDENCE.**

PROTECT +
ENHANCE +
SAVE LIVES

# Unique Design

## Unique multi-purpose Transmission Detector for Pre-Treatment Patient QA and Machine QA

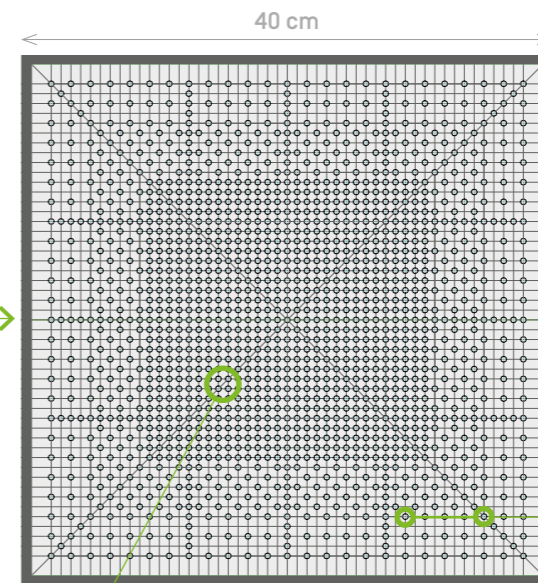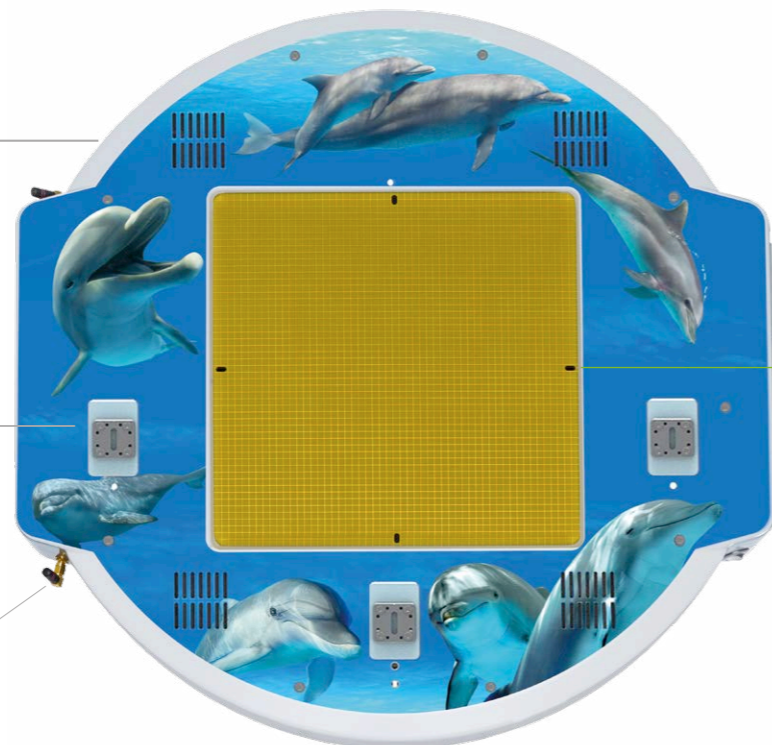**High-resolution, high-accuracy detector array**
- Detector is perpendicular to the beam
- No angular dependence

**Optimized for rotational treatments**
- Built-in gantry angle sensor
- Time resolved (4D) segment-by-segment response detection

**Cable-free design**
- Wireless data connection
- Battery-powered; seconds to change

40 cm

40 cm

Unique detector array design

**Unique multifunctional detector array design**
- Pre-treatment QA
- Machine and Morning QA
- Full 40 x 40 cm² treatment field size coverage

**High sensitive for Patient QA**
- 1513 ionization chambers, 5 mm spacing (central area)
- Fluence generated from the detector response
- High-resolution Monte Carlo modelling of the detector response

**Configured for Machine QA**
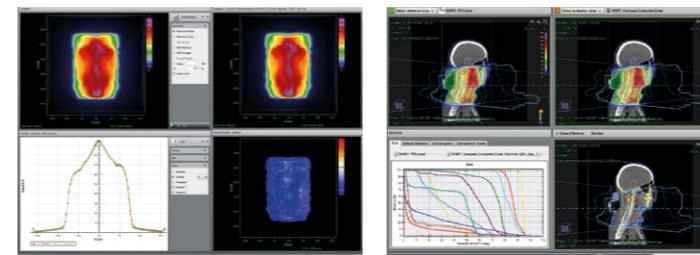- Use Dolphin measurements for machine QA with myQA Machines and myQA FastTrack



Dolphin real Linac output measurements used for 2D and/or 3D plan QA, **and** for pre-treatment



Check your dose output and profiles, beam uniformity, constancy, flatness, and more

## Dolphin accuracy and efficiency in numbers

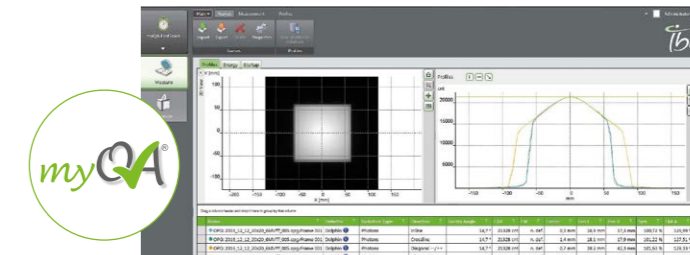| | |
|---|---|
| **1513** | ionization chambers in Dolphin detector |
| **40x40** cm² | full field size for QA of largest fields in one setup |
| **5** mm | detector resolution for high accuracy |
| **1** min | setup and readiness for QA measurements |

# Pre-Treatment QA

## Setup Efficiency

**Be ready to measure in 1 minute**

- Simply attach Dolphin to your gantry and operate wirelessly, no cables needed!
- Excellent setup positioning accuracy. Skip time-consuming setup and alignment of couch-based detector solutions
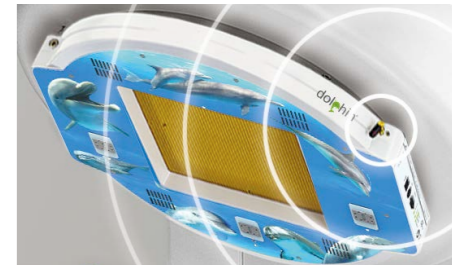
## Measurement Accuracy

**Designed to verify real dose in 3D**

- Highly accurate and proven ion chamber detector
- High error detection capability based on the real treatment delivery (vs. log file "calculation only" or EPID solutions[1])
- High-resolution full 40x40 cm$^2$ field size measurements

## Verification Power

**TPS-class error analysis**

- Comprehensive 3D measurement-based QA. Evaluate the plan in the Patient CT based on gamma and DVH metrics
- Possibility of independent TPS calculation with integrated Collapsed Cone algorithm
- Independent QA compared to Linac dependent log file solutions
- Save time by eliminating the need for hybrid plans
- Measurement of 6MV and 10MV photon beams, flattened and FFF.
- Monte-Carlo-based detector model with enhanced accuracy for high error detection sensitivity.
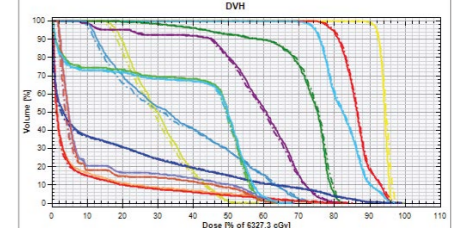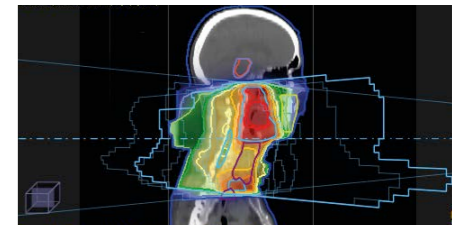
## Patient pre-treatment QA at the most advanced level

**QA efficiency, confidence, and safety before you treat your patients**

- Save time for your equipment setup, measurements, and verifications.
- Use Dolphin for pre-treatment QA and Machine QA

*In our institution we have clinically implemented Dolphin on our three Linacs. Prior to each patient treatment, an advanced measurement-based quality assurance is performed with Dolphin. This is our basis to achieve the highest QA standards and safe treatments for all our IMRT patients today and in the future.*

**Mathias Dierl**
Head of Medical Physics at the Klinikum Bayreuth, Germany

Watch Dolphin user M. Dierl

# Patient QA Workflow Simplicity

**dolphin®**

> ## Easy setup
> ## and QA measurements

> ## Automatic
> ## instant verification results

> ## Optional full 3D
> ## patient dose analysis with ꞶMPASS



The Physicist and Radiation Oncologists **evaluate** the case using IBA's comprehensive 3D / 4D verification software.

**DVH**

RTPS    Measured

4000    5000

Dose [cGy]

Evaluate!

OK ✓ → Patient Treatment

---

- Fast detector setup in just 1 minute
- Simply attach Dolphin to your gantry without cables or calibrations
- Transmit your measured data wirelessly for efficient verification at your QA console

- Instant verification of Dolphin measurements vs. TPS plan and display of the result
- "**OK**" for a test that is successfully passed
- "**Evaluate**" for discrepancies exceeding your individual threshold
- In case further analysis is required, a full 3D measurement-based evaluation can be performed

- Proven DVH metrics and TPS evaluation tools support comprehensive evaluation and decision making
- Determine when re-planning is required, or when machine-specific tests are necessary
- Understand the clinical impact of the actual delivery in the patient anatomy

You Tube  Watch 1 min Dolphin setup video 👉

# Machine QA

dolphin®



myQA Cockpit gives you full overview of your machine QA status and trend analysis. The browser-based application ensures access anytime, anywhere!

## Machine QA efficiency

**Dosimetry tests with Dolphin Transmission Detector and myQA**

- Save time: Check your dosimetry constancy with the same Dolphin setup and in one session with your patient QA
- Easy comparison of test results and trend analysis
- myQA Machines connects Dolphin into your global QA platform

myQA®

## Unique detector layout

**Dolphin is designed also for Machine QA**

- Optimized detector layout for high-resolution profile measurements and diagonals
- Excellent stability, reproducibility (0.5%), and linearity (1.0%)
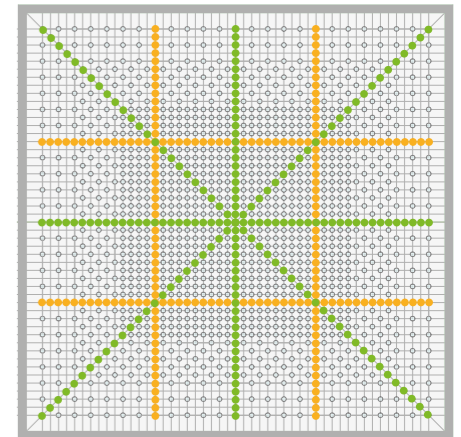
## Setup consistency and efficiency

**Overcome cumbersome table-based detector setup**

- Dolphin features excellent repositioning accuracy by simply attaching the detector to the gantry mount
- Ready to measure in 1 minute

Positioning variation    Dolphin setup consistency
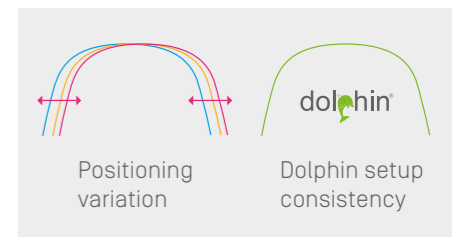
## myQA Machines

**For routine scheduled machine QA dosimetry tests**

- Verify your profile, output, and wedge constancy
- Check your machine behavior per gantry angle
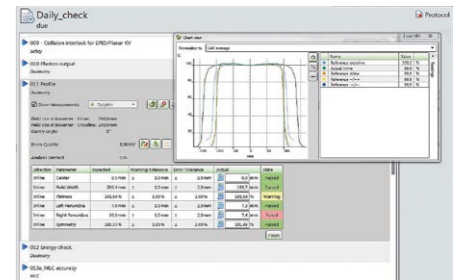
## myQA FastTrack

**For instant dosimetry measurements**

- For your measurements beyond scheduled routine machine QA workflow
- Display of results and real-time analysis e.g. for beam steering, start-up behavior, or profile comparison
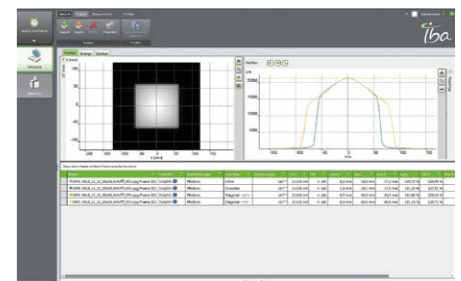
# DOLPHIN® & COMPASS
## FOCUS ON EVERY PATIENT

## DOLPHIN Key Benefits

**Ready to measure in 60 seconds**

Simply attach DOLPHIN to the gantry with one „click-in" at the same aligned and reproducible position with respect to the beam. Along with the cable-free design, this allows operation to start immediately.

**Full field measurement**

The DOLPHIN detector design enables measurements at all beam shapes and field sizes: entire large fields up to 40 × 40 cm² at isocenter plane as well as small fields at high precision. As opposed to other solutions, with DOLPHIN the actual patient plan can be measured, which helps prevent additional phantom plans or cumbersome combinations of multiple measurements.

**3D dose analysis in the patient's CT**

The actual measured dose delivery is reconstructed to the patient's anatomy by the COMPASS software, providing a 3D analysis of the actual dose impact. The TPS-class dose engine embedded in COMPASS enables a truly independent second calculation and comparison wth the TPS plan data.
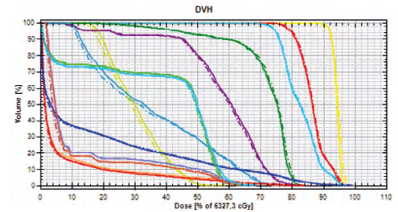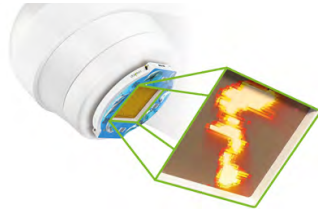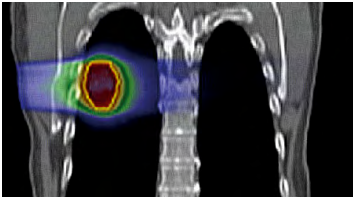


## The perfect package:
## Dolphin detector plus sophisticated TPS-class verification software

### COMPASS

**CALCULATION BASED TPS CHECK &
DOLPHIN MEASUREMENT BASED DELIVERY CHECK**

- Instant automatic check of the measured data with result of „pass" or „evaluate"
- Fast 3D Dose reconstruction on the actual patient CT
- TPS-class collapsed-cone algorithm
- Dose difference calculation with proven TPS tools like DVH, 3D Gamma and dose difference maps
- Automatic measurement mode with beam trigger

**Verification power**

Understand the source of deviations and the clinical impact of the actual delivery.

### DOLPHIN

**TRANSMISSION DETECTOR FOR PRE-TREATMENT QA, AND MACHINE QA**

- Precise ionization chamber technology, 1513 chambers, fast sampling time
- Measurement at photon beam energies of 6MV and 10MV, flattend or FFF
- Embedded sensor for physical gantry angle measurement, resolution +/-1°
- Cable-free design, battery powered, secure WiFi

**Configured for Machine QA**

The DOLPHIN's sensor layout is also optimized for dosimetry constancy checks (Machine QA), to be used in conjunction with myQA Machines and myQA FastTrack.

iba

## DOSIMETRY

## DOLPHIN SPECIFICATIONS

| | |
|---|---|
| **Outer dimensions** | 600 mm (Ø) x 57 mm (h) |
| **Weight incl. battery** | 12 kg / 26.45 lbs (ca) |
| **Detector field size** | 40 x 40 cm²; Full treatment fields supported (Detector size of 24.3 x 24.3 cm²) |
| **Detector resolution** | 5 mm high-resolution in the inner 15 x 15 cm² detector area (center-to-center distance). Chamber board layout with central detector and dedicated patterns to support future machine QA (diagonals, MLC check layout). |
| **Ionization chamber specs** | 1513 air-vented plain parallel ionization chambers of 3.2 mm (Ø) x 2.0 mm (h); Chamber volume 0.016 cm³ |
| **Max. dose rate** | Collection efficiency (pulsed beam at 360Hz PRF): >98% at 2.8 mGy / pulse (corres. to 2400 MU / min with 10MF FFF) |
| **Sampling time** | 20 ms sampling time; Parallel readout of 1513 Ionization Chambers |
| **Nominal sensitivity** | 1.8 nC/Gy (measured in transmission in central detector area with 1 Gy at isocenter at 5 cm depth with a 10 x 10 cm² field and 6 MV photons) |
| **Angle sensor resolution** | +/- 1 ° |
| **Mechanical connection** | Linac head accessory mounts supported including accessory mounted coding. Double locking mechanism for maximum security |
| **Data connection** | WiFi access to 802.11 g/b; Ethernet option for test purposes |
| **Battery life (max)** | 2 x 5 h for battery-powered function supporting a full treatment day; LED charge indicator included |
| **Software** | The Dolphin software workflow is optimized for automatic pre-treatment plan verification. Comprehensive 3D/4D verification is supported with advanced TPS-class software for dose analysis in patient anatomy including comparative DVH. Connect Dolphin optionally to myQA Machines for your routine scheduled dosimetry tests or to myQA FastTrack for unscheduled instant dosimetry measurements. |

## CONTACT US

**IBA DOSIMETRY GMBH**
Bahnhofstr. 5
90592 Schwarzenbruck, Germany

Europe, Middle East, Africa, Latin America | ☎ +49-9128-6070
USA, Canada | ☎ +1-901-386-2242
Asia Pacific | ☎ +86-10-8080-9288

Fax: +49 9128 607 10
E-mail: dosimetry-info@iba-group.com

## FOLLOW US

YouTube | youtube.com/user/ibadosimetry
LinkedIn | Linkedin.com/showcase/10585244/
Twitter | twitter.com/ibadosimetry

PROTECT +
ENHANCE +
SAVE LIVES