For X-ray QA and Service

Piranha

Everything You'll Ask For

The Piranha with accessories makes the QA service easy and quick. Your investment is protected and the firmware is upgradeable, ensuring that you always have the latest features.

Innovative X-ray QA solutions ...of Course!

A Superior Tool in Sensitivity and Filtration

The Piranha has an extremely sensitive detector, capable of measuring on low-output mini C-arms and Mammography. The Auto-Compensation pioneered by RTI, available on all our existing multi-function meters, corrects for any added filtration. This ensures confidence in the accuracy and reproducibility of measurements without compromise.

A Pioneer at Measuring

Find your local distributor at www.rti.se

Innovative X-ray QA solutions ...of Course!

Piranha

Brilliant

Superior

Designed to Optimize

in One Shot

Since the Piranha is optimized, your required measurements will be minimized. Purchase the model that meets your exact application needs. Everything you need is included. Standard detectors are built-in. Communication is easy made via Bluetooth or USB. Just connect the Piranha to your laptop or iPAQ and you have a complete QA-Solution.

State of the Art

Latest Improvements

Together with numerous improvements to an already good concept, the Piranha of today will fulfill what the most demanding customers are asking for. Below are some of the latest extensions.

- Extreme Wireless performance. To ensure reliable wireless communication for all general use, the Piranha is equipped with Bluetooth range, up to 100 meter free in air.
- Full Net Book support. The Piranha comes with PC display software that works directly with modern Net Books. This offers an excellent user-friendly display for the Piranha.
- Measuring at low signal levels. The Piranha has always been known for being able to measure low signal levels. Further improvements recently introduced make the Piranha's performance unique, with greater pulse detection at low output, as well as improved kVp detection with pulsed radiation.
- New measuring parameters. mA/pulse and dose rate/pulse.

Designed to Optimize

Superiority Worth its Price

The Piranha with accessories makes the QA service quick and convenient. Your investment is protected and the firmware is upgradeable, ensuring that you always have the latest features.

Interactive Waveforms & Results

MPD Position Check

Piranha has a unique feature that makes it possible to check the position of the detector before a measurement is performed. When the Piranha is calibrated, a special filter (built into Piranha) is used to store a reference value with correctly irradiated detectors.

By using the "Position Check" function, you can verify that the detector area is fully irradiated by comparison against the reference value. Possible field inhomogenities are also neutralized. Note that this method is superior to other positioning methods utilized by other devices. When positioning the Piranha, the actual detectors that measure kVp is used to verify the position.

Assures Accurate Results

The Piranha assures accurate results in a simple, fast and smart way – on all radiographic systems you get in a single shot: kV, time, dose, dose rate, HVL, and total filtration. It measures on Cine and Dental, both Panoramic and Intra-Oral, as well as on traditional and slot scanning Mammography. With Pulsed Fluoroscopy you get pulse rate and dose/pulse.

By connecting the CT Dose Profiler the Piranha will also measure CTDI and give you CT dose profiles.

Interactive Display

Measurements with Piranha can be shown in either a PC running Ocean or a iPAQ running RTI QA Browser Software. Both measured values and waveforms instantly appear after each exposure. Up to eight measured values and three waveforms can be shown at the same time.

Setup is as simple as placing the Piranha under the x-ray beam, making an exposure, and seeing the results immediately. For the advanced user, there is an optional full database version of Ocean with extensive analysis capabilities available.

Position Check

Choose the One That Suits You

The Piranha models are divided into five main application groups. Choose one or a combination. Check with RTI to see which one suits your needs the best.

R&F/Mammo | R&F | Mammo | CT | Dental

These features are included/excluded depending on model:

Waveform | Dose and dose rate | External detector

Specifications Piranha's Internal Detector

Dose & Dose Rate specifications are with wide range option.

General

Weight	Approx. 405 g
Size	133 x 75 x 26 mm^3
Power source	Rechargable batteries, external power supply
Battery life	Approx. 15 hours
Interface type	Built-in Bluetooth and USB
Display unit	PC or handheld iPAQ
Min. exp. time	0.1 ms

Rad/Flu/Dent/CT

Range	Inaccuracy
35 – 155 kVp (Rad/Flu)	±1.5 %
35 – 105 kVp (Dent)	±1.5 %
45 – 155 kVp (CT)	±1.5 %
0.1 ms – 2000 s	±1 % or ±0.5 ms
1 – 65535 pulses	±1 pulse
15 nGy – 1000 Gy	±5 %
2 µR – 100 kR	±5 %
15 nGy/s – 450 mGy/s	±5 % or ±7 nGy/s
1.7 µR/s – 50 R/s	±5 % or ±0.8 µR/s
0.1 mR/min – 3000 R/min	±5 % or ±0.05 mR/min
1.5 – 38 mm Al Total Filtr.	±10 % or ±0.3 mm
1.2 – 14 mm Al HVL	±10 % or ±0.2 mm

Mammography

Range	Inaccuracy
18 – 49 kVp (Mo/Mo)	±0.7 kV
0.1 ms – 2000 s	±1 % or ±0.5 ms
1 – 65535 pulses	±1 pulse
25 nGy – 1500 Gy	±5 %
3 µR – 150 kR	±5 %
25 nGy/s – 750 mGy/s	±5 % or ±0.04 µGy/s
30 µR/s – 86 R/s	±5 % or ±4 µR/s
1.8 mR/min – 5100 R/min	±5 % or ±0.3 mR/min
Included radiation qualities:	Mo/Mo, Mo/Rh, Mo/Al, Rh/Rh, W/Al, W/Rh, W/Ag

Waveform

Sampling rate	16–2000 samples/s
Recording time	1024 ms–524 s

Piranha Dose Probe

The Sensitive Field Expert

The Piranha Dose Probe is specially designed for very low dose rate measurements with image intensifiers. The detector is small to minimize interference with the X-ray system's automatic exposure control and to be able to fit into the table bucky. The Piranha Dose Probe is ideal for field service applications because of its rugged metal housing, preventing external damage to the detector. Since it is a solid state detector, no corrections for temperature or pressure are needed, and no bias voltage is required.

The Piranha Dose Probe characteristics also make it useful for other applications, such as scatter, leakage, and mammography. Thanks to the Piranha ADI system (automatic detector identification) the probe is automatically recognized by the Piranha when connected, which makes the service functionality safer, easier, and helps eliminate unnecessary user selections.

All information about the probe is stored in the memory inside the connector. The Piranha ADI system also gives full interchangeability of probes between different Piranha systems using the same type of probes.

Durable Sensitive

Fluoroscopy

Fast Response

The Piranha Dose Probe has a fast response which makes it ideal for pulsed fluroscopy. It can detect the individual pulses, determine pulse rate and show waveforms even at the highest pulse rates used on modern fluoroscopy systems. It can also be used for continuous and pulsed fluoroscopy. Ionization chambers respond much slower and find it difficult to resolve individual pulses like the Piranha Dose Probe.

Specifications Dose Probe

Type	R100B
Sensitivity	55 µC/Gy
Size	20 x 45 x 7.4 mm^3 0.79 x 1.8" x 0.29"
Weight	85 g (3 oz)
Active detector area	10 x 10 mm^2, 0.39" x 0.39"
Cable length	200 cm (6.6 ft)
Connector	Piranha type with automatic detector identification
Backscatter protected	Yes
Dose	0.1 nGy–1.5 kGy, 12 nR–170 kR
Dose rate:	1 nGy/s–76 mGy/s 0.4 mR/h–31 kR/h
Dose per pulse:	1 nGy/pulse–3000 Gy/pulse
Inaccuracy	±5 %

We are Committed to a Long Time Relationship

As an owner and user of any RTI product, you are guaranteed to always receive prompt and professional support if required. Our large distributor network provides the opportunity of support in your own language.

10 Year Warranty – the Best in the Market

The RTI conditional warranty program for Barracuda and Piranha provides the option of a 10-year warranty.

At purchase, the basic warranty is prolonged to 24 months after delivery. By joining the RTI service/calibration program, you will have the opportunity to extend the warranty with two years at a time up to ten years. The recommended 24-month calibration interval together with the extended warranty program assures a low lifetime cost for you.

Simply do this:

1. Purchase the Piranha and get the first 24 months warranty period.
2. For an additional 20% of the calibration cost, you will have the opportunity to extend your Piranha warranty for two more years.
3. This option can be extended to a maximum of eight years, providing 10 years of factory warranty for your Piranha.

Quality-Assured Laboratories

RTI Electronics AB is accredited in compliance with ISO/IEC 17025:2005. This accreditation is a guarantee that our assignment is carried out impartially, fairly and based on internationally accepted standards.

The accredtiation provides third-party assurance that we have the quality management system to ensure all of our calibrations to be consistently of the highest quality.

A Small Piece of Revolution

CT Dose Profiler

Pat. pend.

No Limitations

The RTI CT Dose Profiler for Piranha has taken the CT quality assurance to the next level. Because of its revolutionary design, it has transformed the CTDI measurement from being inaccurate due to underestimation of the dose for wide beams to be more exact. It also has the ability to further analyze the result – all in one shot.

Using a standard 10 cm CT ionization chamber may result in inaccurate measurements due to underestimation of the dose. The CT Dose Profiler was developed to solve this problem. With its very thin detector chip the detector is completely irradiated when the table is moving and the CT beam scans over the probe. The dose is measured in every point of the X-ray beam and the total dose profile is acquired regardless of how wide the beam is and without the drawbacks of traditional CT ionization chambers. There is no limitation of the beam width.

With the CT Dose Profiler, the dose profile is seen in a matter of seconds. Therefore you can avoid more expensive methods that require both preparation before and read-out after each scan (like TLD and X-ray film). The CT Dose Profiler is also ideal for measuring point dose and dose rate in the CT beam. The CT Dose Profiler is based on solid state technology. It is robust and fits into existing standard phantoms used for CTDI measurements.

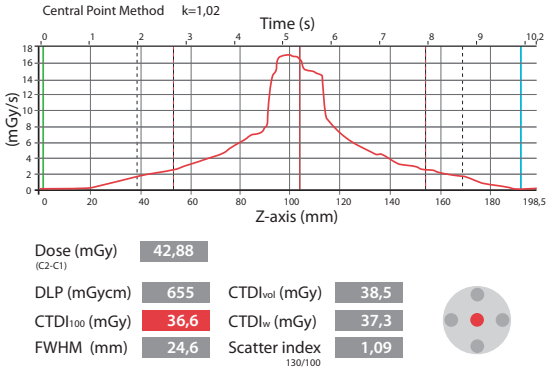
Methods and Exposure

The CT Dose Profiler is used together with the Piranha and a PC running the CT Dose Profile Analyzer Software. All settings for the meter and other pre-defined data are stored in templates. Once a template has been loaded, measurement, storage and analysis of data can be done quickly for different types of CT scanners. Measured data can be saved and be re-opened for later reviewing. Data can also be printed or exported to Microsoft Excel© for further analysis.

The dose is measured in every point of the X-ray beam and the total dose profile is acquired regardless of beam width. This makes it possible to measure without the drawbacks of traditional CT probes. After each scan (exposure), the data is presented instantly. The picture to the right shows a CTDI measured in a head Phantom for a nominal beam width of 20 millimeter and pitch 0.969. Only one exposure is needed to measure and calculate $CTDI_{100}$, $CTDI_{w}$, $CTDI_{vol}$, DLP, FWHM and Scatter index.

If you prefer, the software allows you to measure the $CTDI_{w}$ with the five exposures at different phantom positions.

Simple In One Shot



Specifications CT Dose Profiler

Dose rate:	40 nGy/s–760 mGy/s, 0.26 mR/min–5200 R/min
Inaccuracy:	±5 % or ±10 nGy/s
Spatial resolution:	0.3 mm
Length:	155 + 45 mm (extension)
Diameter:	12.5 mm

X-ray Generator Current

The MAS-1 is an invasive probe that together with the Piranha provides you direct reading of mA and mAs as well as waveforms. The combination also allows you to simultaneously measure kV, dose, dose rate, and total filtration. When the MAS-1 is connected, the Piranha automatically identifies the probe and makes all necessary adjustments without any need for interaction from the user. The Probe can be used to measure tube current for all modalities including fluoroscopic and radiographic exposures.

Specifications MAS-1

Ranges:	0.001–9999 mAs, 0.1 mA–3000 mA
Inaccuracy:	±1 % or ± 0.01 mA

The MAS-2 is clamped easily on the high voltage cable. No connection inside the X-ray generator is required. Connected to the Piranha, the MAS-2 is ready for non-invasive measurements, reading mA, mAs, and capturing an mA waveform.

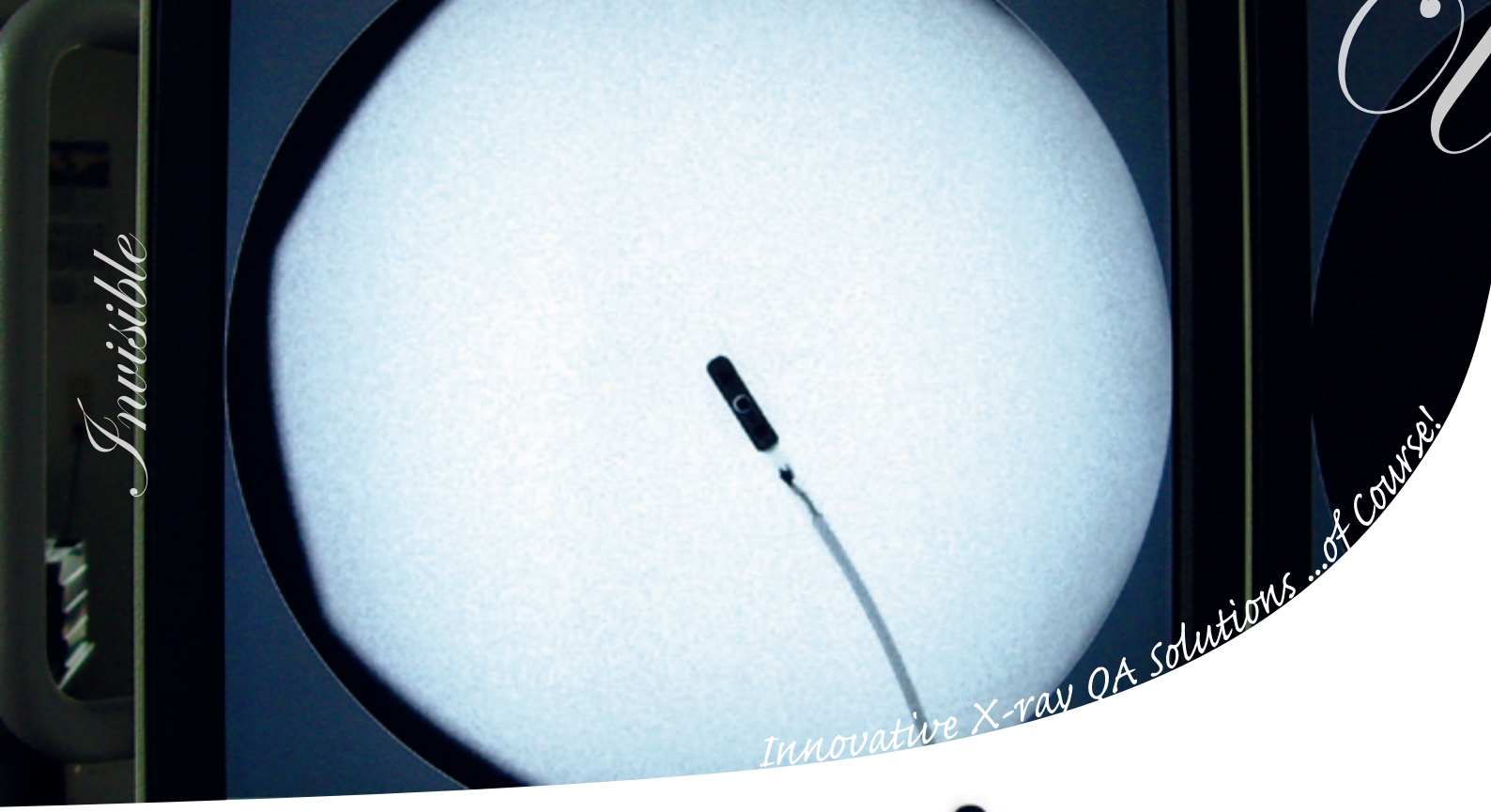
Specifications MAS-2

Ranges:	0.1 mAs–9999 mAs, 10 mA–4000 mA
Inaccuracy:	±5 % or ±2 mA

The MAS-3 system is the most sensitive, and can also measure low tube currents during fluoroscopy non-invasively. The probe is readied for measurements by threading the high voltage cable through the probe and connecting MAS-3 to the Piranha. Accurate reading can be done independent of position placement on the high voltage cable.

Specifications MAS-3

Ranges:	0.001–9999 mAs, 0.1 mA–2000 mA
Inaccuracy:	±1 % or ± 0.02 mA



T20

Almost Not There

The T20 (Translucent Detector) is a truly unique solution. T20 is a solid state detector dedicated for measurements on radiographic and fluoroscopic systems when it is crucial that the detector itself does not have any effect on the system output or disturbs the X-ray beam. It complements the Piranha Dose Probe, and together they can handle all applications related to installation, service, acceptance testing and QA/QC.

T20 is developed mainly for measurements of the patient entrance dose (skin dose) and maximum dose rate in the radiographic and fluoroscopic field. Previously, if it was not possible to lock or switch off the automatic exposure function of the X-ray system, the probe had to be placed outside the active area to avoid affecting the feedback of the system. T20 can be placed anywhere in the X-ray field.

T20 has a built-in correction filter which allows the detector to self-compensate for different beam energies. Therefore it has a flat energy response in the radiographic range with no need for correction factors. It fulfills the IEC 61674 for dose detectors regarding energy independency, measuring range and angular dependency for RQR, 50 – 150 kV.

Solid State

The Invisibility

Invisibility

How can a solid state detector made of dense material be invisible to the X-ray system? Although the detector part itself is impenetrable, it has been made very small and hence it is possible to avoid detection of the X-ray system. The detector is separated from the cable attachment by a carbon fiber rod. The rod's extension is sufficiently long for measurements on a digital detector/image intensifier as large as 45x45 cm^2.

To stabilize the positioning and ensuring that the detector surface lies flat against the incident beam, small "wings" of carbon fiber have been added to the small detector. It is designed to not affect the automatic exposure control at all.

Specifications T20

Type	T20B
Sensitivity	8 µC/Gy
Active detector area	21 mm^2
Energy Dependence	Less than 2 % RQR 50–150 kV
Connector	Piranha type with automatic detector identification
Cable length	200 cm
Size of detector house	25 x 5 square millimeter
Length	318 mm (rod & detector)
Backscatter protected	Yes
Dose	0.7 nGy–10 kGy, 80 nR–11 MR
Dose rate	27 nGy/s–500 mGy/s 10.8 mR/h–205.2 kR/h
Dose per pulse	7 nGy/pulse–20 kGy/pulse
Inaccuracy	±5 %

Complement Your Needs

The Light Probe is designed to comply with the needs for QA in modern X-ray departments. With a monitor and a lux adapter, the Light Probe measures the ambient light in the room, brightness on monitors and film viewing boxes.

The Piranha Light Probe has the same spectral response as the human eye and complies with the CIE curve. This makes it reliable for all different types of measurements, independent of the light source.

Specifications Light Probe

Monitor, viewing box		
	Ranges:	0.03–72000 cd/m2
	Inaccuracy:	±5 % or ±6 mcd/m2
Ambient light		
	Ranges:	0.01–24000 lx
	Inaccuracy:	±5 % or ±0.2 mlx

Piranha Panoramic Holder is ideal for measurement on panoramic (OPG) systems. The small detector area and the Piranha position check, a feature that makes it possible to verify the detector position, ensure more accurate and more reproducible results. The holder provides for easy and precise fixation of the Piranha onto the panoramic system for accurate and complete measurements.

A Dose Probe Holder gives you a useful extra hand and makes the positioning of the detectors very easy, reproducible, and accurate. The holders comes in different models and lenghts.

Aluminum Filter. Different pieces of aluminum for measuring half value layers for Rad and Mammo.

Ocean

Get Work Flow

Get going – without any obstacles. By using Ocean, you can plan the measurements at your desk in advance, create checklists, add information as a pop-up window for a certain exposure, and include instructions to simplify the work for you and your co-workers.

Waveforms can be studied immediately and setup is as simple as placing the Piranha under the X-ray beam, making an exposure, and seeing the results instantaneously. The data can automatically be transferred into your customized Ocean database or into your current Excel® worksheets.

Ocean will handle the communication with your Piranha. It gives you access to the full power of the instruments in a very intuitive way.

A Safe Traveler

Light-weight, Hardwearing or Standard

Sometimes an innovative solution is as simple as getting from point A to point B safely without damaging expensive test tools. Three different choices of Piranha carrying cases provide the RTI Piranha user with convenient and practical solutions. Either way, your investment is safe and ready for use the next time you walk into an X-ray room.

Piranha Premium ALU Case

Piranha Premium Outdoor Case

Piranha Hard Case

Pianha Premium ALU Case: Made of light-weight aluminum, the Piranha Premium Case is attractive and just “the right size” to provide a space for the Piranha and all its accessories included in the popular Piranha Premium Kits. The new Piranha Premium ALU Case gives the Piranha user the perfect solution for transporting and storing the RTI X-ray QA test tools. RTI thought, imagination and foresight are evident in this solution. Open the two latches, and lift up the lid. You will notice the sturdy foam in the top of the case and in its sides. This helps keep each Piranha accessory secure in its own “cubby hole” until you need it. Pull up the top tray, and you have additional accessories, power supplies and extra storage area on the bottom level.

Piranha Premium Outdoor Case: If a tough, dent-resistant, transport option is preferable, the new Piranha Premium Outdoor Case may be right for you. Made with a rugged, high impact polypropylene exterior, this case is waterproof and can take a licking. Inside, it has many of the same design features as the Piranha Premium ALU Case. The Piranha and any desired accessories are stored in two convenient and compact layers.

Piranha Hard Case: Don't own a Piranha Premium kit? Then we have a standard Piranha Hard Case to offer. This is a slim, standard case for your Piranha with some accessories. Or simply choose one of the affordable Piranha Premium transport cases to carry your Piranha and the accessories you may some day add to your QA kit.

Scandinavian Quality

RTI Electronics was founded in 1981 when several curious and enterprising students met at Chalmers University of Technology in Gothenburg, Sweden. They saw their vision grow into the beginning of RTI products – today world leading in X-ray QA and Service instrumentation.

There are many reasons why RTI Electronics has become a market leader. Besides fulfilling the highest user demands, products from RTI Electronics are known for cutting edge innovation. Other reasons include our engagement, our expertise accumulated over more than a quarter of a century, and our commitment to doing it right.

We are convinced that You will be satisfied with Your choice of product, and we would like to continue to grow – together with You.

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