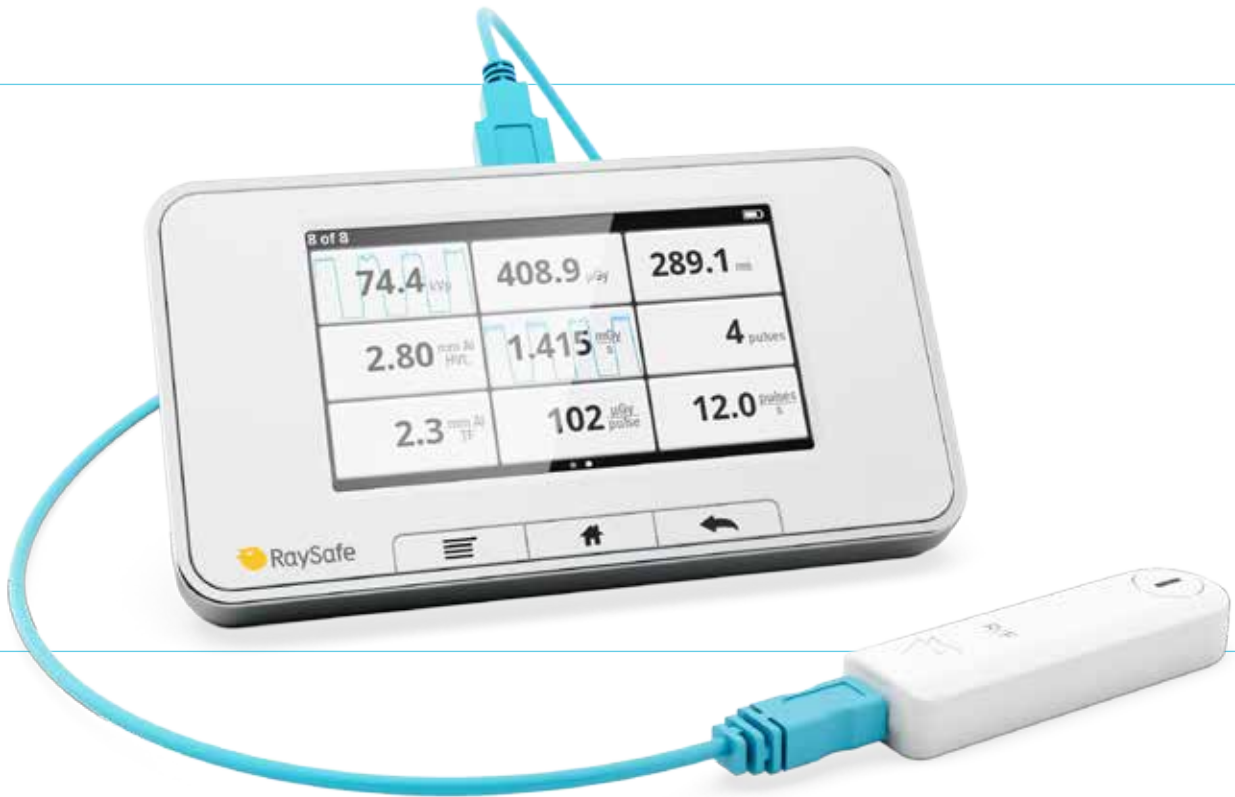


# RaySafe X2

Effortless measurements of X-ray





## At your fingertips

We've grown accustomed to intuitive interactions with our devices. After all, it's not the device that's most important, but what you can achieve with it that matters. Simplicity has always been a hallmark for Unfors RaySafe. But simplicity on the outside requires a lot of work on the inside. Our simplicity comes from a careful balance of advanced sensor technology paired with electronic wizardry and intelligent signal processing. The result – a device that provides accurate measurements with the ultimate in user friendliness. Right at your fingertips.

- Intuitive interface paired with first-class precision
- Full range measurements for R/F, MAM, CT, Survey, Light and mAs applications
- Effortless measurements of X-ray



## Less effort. More insight.

Life is busier. There are more demands on your time. So you need to remove the unnecessary steps in taking a measurement. Like positioning the sensor, choosing a setting, or interpreting the results. Fortunately, the X2 R/F sensor is orientation independent so the only thing you need to do is to place it in the X-ray beam and turn on the instrument. The rest is automatic – no menus, no selections.

## Full range measurements

Ease-of-use means you get everything you need in one exposure, with one sensor – automatically. The RaySafe X2 offers sensors for R/F, MAM, CT, Survey and even light applications. Choose the sensors you need and add the ones you will need at a later stage. The X2 sensors are made without the need to select ranges or special modes. Most sensors also measure waveforms that can be analyzed directly on the base unit.



#### WORKING WITH A PC

When working with the RaySafe X2 you may use the PC software as an extended display of the base unit or as a tool for further data analysis. The X2 View easily connects to Excel for reporting purposes.

## Intuitive interface and first-class precision

The RaySafe X2 sensors and electronics are specifically designed to minimize the need for user interaction. A groundbreaking concept in sensor design and circuitry provides unsurpassed accuracy, reproducibility and sensitivity. Intelligent algorithms clearly indicate when a parameter is outside its specified range.

Finally, a built-in, self-test system ensures your system is in complete working order. This provides added peace of mind and further assures accurate measurements the first time and every time.

# Finding your way

The RaySafe X2 touch screen interface allows the user to view data in a comprehensive yet flexible way. The home screen displays every available parameter from the attached sensor. To zoom in on any parameter, just tap it for a larger view. Use a quick swipe to display waveforms and pinch to zoom into details. Navigation is made simple by using common Menu, Home and Back keys.

All exposures are saved in the base unit. In each session, you can swipe to quickly go back to previous exposures for reference or comparisons. A full session of measurements can be uploaded to the X2 View software at a later stage for more manipulation.



**HOME SCREEN**  
Measurement of 1 – 12 parameters simultaneously with waveform overlay.



**SINGLE VIEW**  
Large view of selected parameter.



**WAVEFORM**  
Overview and simple analysis of kVp, dose rate or mA.



**ANALYZE MODE**  
Zoom-in on waveforms to determine, for example, peak dose rate of a pulse.



- No selections, no corrections
- Orientation independent
- Small footprint

## R/F sensor & mAs

The X2 R/F sensor, with its advanced stacked sensor technology, prevents the influences of heel effects on the measurements. And its small radiological footprint minimizes the influence on the automatic exposure control of the X-ray machine. Both make it easier to position the sensor and obtain the most accurate reading.

The X2 R/F sensor can be used on all R/F applications without the need to select ranges or modes. It is capable of measuring all radiological parameters such as dose, dose rate, kVp, HVL, total filtration, exposure time, pulses, pulse rate and dose/pulse – in one exposure. Waveforms of kV and dose rate can be analyzed directly on the base unit. The X2 R/F sensor can be used on radiographic and fluoroscopic machines as well as dental machines and measures kVp and HVL on CT machines.

The base unit has an optional built-in sensor for measurements of mA, mAs, exposure time, pulses, pulse rate and mA waveform. When using both the R/F and mA sensors the RaySafe X2 will display 12 parameters simultaneously including corresponding waveforms. Everything you need in one simple step.

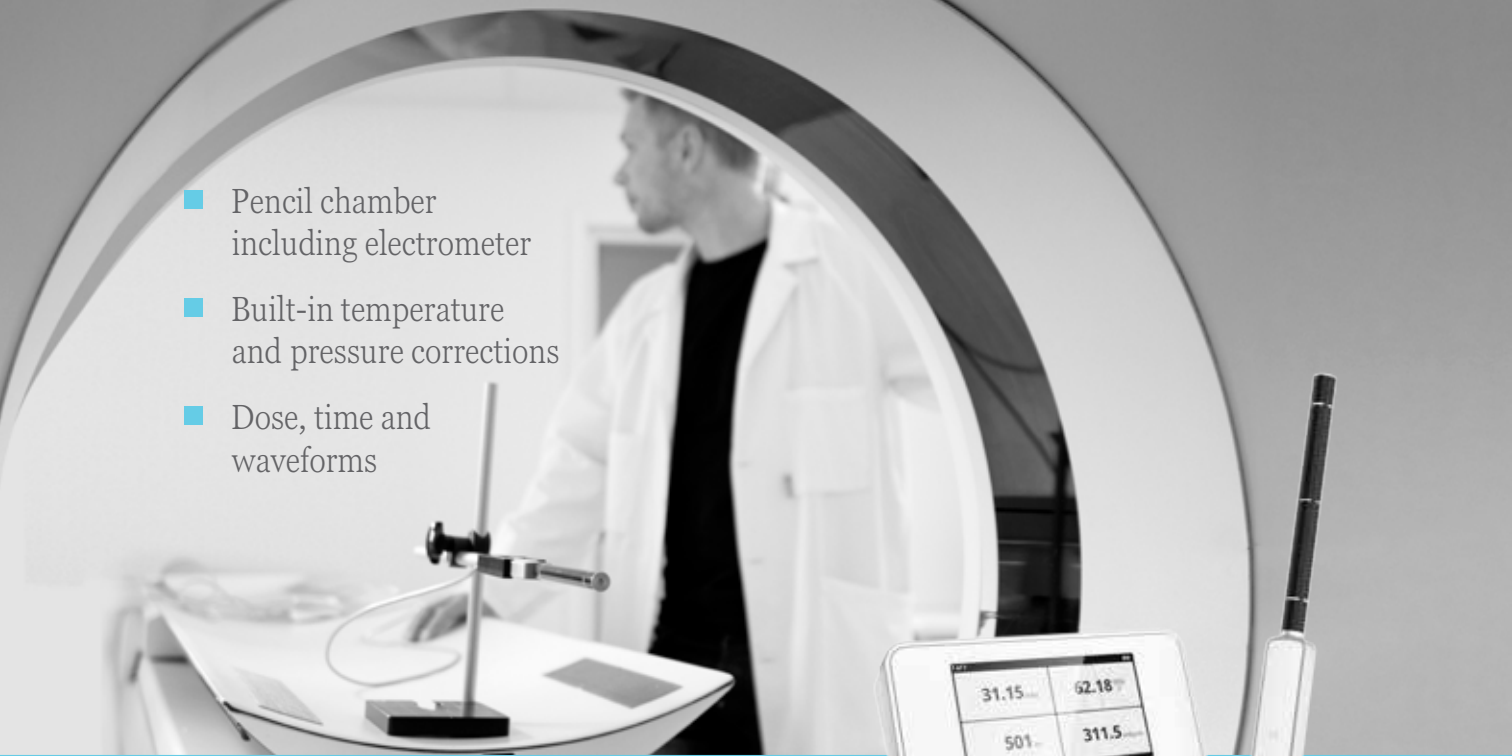
- Dose and HVL for all beam qualities – without selections
- Orientation independent
- Stacked sensor technology prevents the influence of heel effect



## MAM sensor

The X2 MAM sensor possesses state-of-the-art precision in dose and HVL that enables the user to obtain important readings without any pre-knowledge of the mammography machine. Just connect the sensor and immediately measure without any selection of beam quality. If kVp readings are required, a Quick Setting menu with beam qualities is available, just one swipe away. Thanks to its Active Compensation technology the X2 MAM sensor is insensitive to variations in filter thicknesses and tube aging effects.

The X2 MAM sensor, with its unique stacked sensor technology, prevents the influences of heel effects on the measurements. What's more, it can be used on all mammographic applications including scanning tomosynthesis. The X2 MAM sensor is capable of measuring all radiological parameters such as dose, dose rate, kVp, HVL, exposure time, pulses, pulse rate and dose/pulse – in one exposure. For added ease of use, waveforms of kV and dose rate can be analyzed directly on the base unit.

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- Pencil chamber including electrometer
  - Built-in temperature and pressure corrections
  - Dose, time and waveforms



## CT sensor

Dose measurements used to calculate CTDI and other related quantities within Computed Tomography are becoming more common for both physicists and engineers. The X2 CT sensor is a very durable solution made for field use. It fits directly into a head and body phantom or can easily be positioned free-in-air in the gantry with the X2 Flexi stand. Since the sensor has a built-in bias supply and electrometer there is no need for the fragile and noisy analog cables traditionally associated with ion-chambers. There is also no need for manual temperature or pressure corrections because the CT sensor has built-in technology to manage both with complete precision.

A unique feature of the X2 CT sensor is the ability to measure exposure time and dose rate waveforms. These features come in handy when special attention is needed on the CT machine's output.



- Luminance and illuminance  
Class B sensor
- Durable housing
- Dual acquisition keys



## Light sensor

The RaySafe X2 brings a brand new design to our widely used RaySafe Xi light detector while maintaining the excellent photopic response our customers have come to appreciate. The X2 light sensor has an ergonomic design in durable aluminum, which allows for both manual measurements as well as easy mounting for automatic measurements. A small aperture angle ensures compliance with international regulations. For added ease-of-use, an acquisition key is available on both the sensor and in the base unit interface.

By turning the aperture wheel on the X2 light sensor it can be used for both luminance and illuminance measurements. There's even a third mode where the sensor automatically makes a zero adjust. This is recommended when performing very low luminance measurements.



- Lightweight with fast response time
- High precision in the X-ray range
- Dose, rate, mean energy and waveforms



## X2 Survey sensor

The versatile X2 Survey sensor is primarily used to perform leakage and scatter measurements in diagnostic X-ray applications. It is based on an energy compensated silicon diode array. Unlike a pressurized ion-chamber, a silicon based sensor can be shipped via air or ground without any special considerations or arrangements.

The intuitive user interface displays dose, dose rate, mean energy and time, as well as the dose rate waveform. To further simplify the operation, a real-time dose rate bar is visible in the display and a ticker provides the typical “survey” sound directly proportional to the dose rate. With its two different trigger modes, manual and automatic, the sensor is also an excellent tool for low dose rate measurements in the primary beam of the X-ray machine. A unique, and very usable feature is the ability to switch energy response between Air Kerma (Gy or R) and Ambient Dose Equivalent (Sv). It's like having several instruments in one! While the energy dependence for ambient dose is virtually flat in the X-ray range, the overall response for medical applications is state-of-the-art. This makes it a useful tool for many other applications.

Simply put, the X2 Survey sensor may be the easiest and fastest solution for precise survey measurements in the X-ray energy range.



Less effort. More insight.

Unfors RaySafe offers comprehensive solutions for the X-ray room to measure the performance of X-ray equipment and to monitor medical staff dose in real-time. RaySafe helps you avoid unnecessary radiation.

Unfors Instruments has changed its name to Unfors RaySafe  
[www.raysafe.com](http://www.raysafe.com)

