



PHILIPS

Image guided therapy

DoseAware

Making the **invisible visible**

Philips DoseAware real-time
staff dose monitoring tools



Removing barriers to a healthy working environment

Whether you're part of a clinical team that works with X-ray during interventional procedures, a physicist that educates caregivers on the impacts of X-ray dose, or a lab manager with responsibility for protecting your people, you understand the risks of radiation exposure. Protective measures – such as using lead shields, wearing lead aprons and working in a dose-conscious manner – can help to control the potential risks. However, since it is not possible to see, feel or smell X-ray radiation, it can be difficult to assess whether care teams are adequately protected.

What if there was a way to gain prompt insights into how staff behavior can affect cumulative radiation exposure – allowing caregivers to take control and immediate action to protect their health and wellbeing?

Real-time insights into X-ray dose

Philips DoseAware – the latest update to our DoseAware family – addresses this issue with dose feedback tools for the interventional suite that make it easy for clinical staff to monitor and track their radiation exposure during their shift. The information that DoseAware provides during and after procedures is designed to increase radiation awareness for people who work in X-ray environments, and to promote healthy working practices.

DoseAware displays the invisible nature of radiation in real time, so that you and your staff can see it promptly, easily and simply – and rapidly understand the effect of behavior changes and work patterns. As a result, it stimulates radiation dose awareness, and promotes healthier work practices for team members.

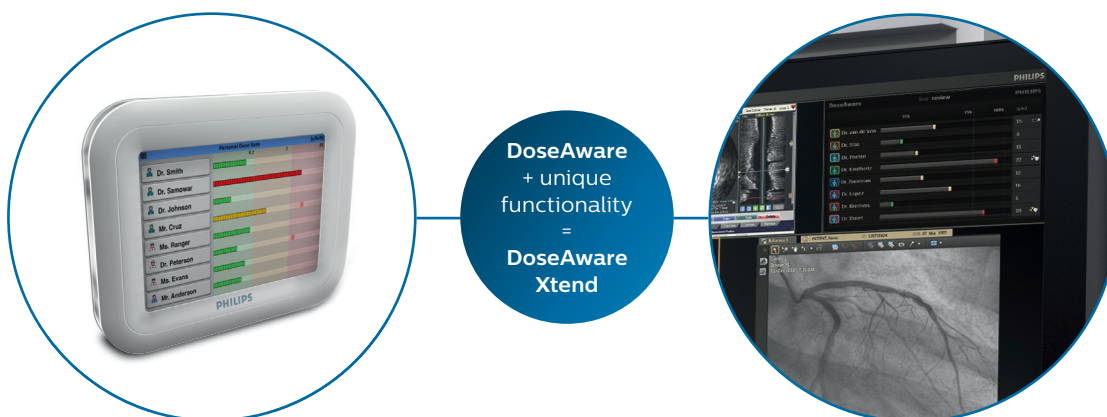
DoseAware Xtend – for detailed procedure-based feedback

Philips DoseAware Xtend is a dedicated solution for treatment rooms that builds on the capabilities of DoseAware and interfaces seamlessly with the Azurion X-ray system. Thanks to this seamless integration, DoseAware Xtend can provide live individual dose rates (Live screen) during procedures, and summarized procedure doses (Review screen).

During procedures, the DoseAware Xtend live screen provides extra information to guide staff behavior. This will automatically appear when the X-ray pedal is pressed. It also reminds staff to better protect themselves by providing a warning symbol when the lead protection screen is not being used properly.

Benefits at a glance

DoseAware and DoseAware Xtend



DoseAware capabilities:

- Visualize staff dose exposure in real time
- Aims to protect staff from potential harmful effects of radiation exposure
- Empower staff with data and insights that can influence their behaviors – with feedback compared among different users in the room
- Immediately see the effect of dose management techniques
- Demonstrate a commitment to quality and staff satisfaction
- Possibility to archive, report and analyze your radiation data at any time

DoseAware Xtend benefits:

- Display DoseAware Xtend data in real-time directly on FlexVision, for example
- Share information between Azurion and DoseAware Xtend, allowing for smarter read-out of data for each procedure
- Show a relative value as a performance indicator – with feedback compared to a reference dosimeter
- Receive advisory if a user is not using secondary lead protection
- Analyze data with ease, thanks to automatic email reporting for each dosimeter/lab

Instant information about X-ray dose levels

Currently, different kinds of dose measuring instruments are used to measure the amount of radiation exposure received by staff in the interventional room. A thermo-luminescent dosimeter (TLD¹) measures the cumulative amount of exposure received by an individual, usually over a one-to-three-month measuring period. Since this data is only processed after the measuring period, medical staff cannot use this information to correct their behavior in daily practice.

The DoseAware family addresses this issue with real-time dose feedback for the interventional suite that make it easy for staff to monitor and track their radiation exposure during their shift. The information that DoseAware provides during and after procedures is designed to increase radiation awareness for people who work in X-ray environments and to promote healthy working practices.

Personal Dose Meter (PDM)

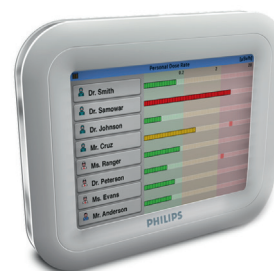
Worn by the staff, this smart badge measures scatter radiation and transmits this information to the Base Station (DoseAware) where it is displayed, or to the dosimetry hub (DoseAware Xtend).

The latest release of the PDM features several important enhancements. These include a replaceable battery, improved electromagnetic compatibility (EMC) immunity and measurement specifications, an automatic sleep mode, and a direct USB cable connection to the computer.



Base Station

DoseAware uses an LCD touchscreen to display real-time dose data for all PDMs within range. It includes drill-down screens for more information on a particular PDM. The Base Station stores PDM data as well. Multiple base stations can be network-linked to a computer running Dose management software. X-ray dose history information can be automatically retrieved from any Base Station or from any PDM via a connection cable, combined with Dose view software or Dose management software.

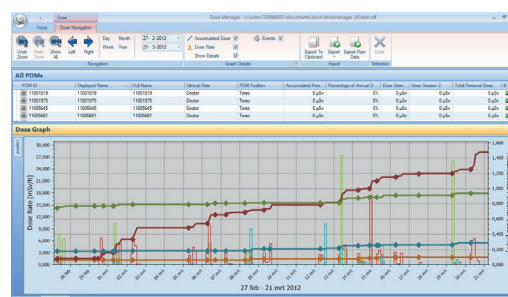


Dose view software

This PC software package is included with DoseAware and DoseAware Xtend. It connects to a PDM via a straightforward cable, and enables you to view data on a PC, change names assigned to PDMs, or reset PDMs.

Dose management software

Our optional Dose management software collects all data for reporting, exporting, and archiving. It can be connected to multiple Base Stations (DoseAware) and/or multiple dosimetry hubs (DoseAware Xtend) via the hospital network.



¹ The Personal Dose Meters (PDM) used by DoseAware and DoseAware Xtend do not replace the TLD as a legal dose meter.



DoseAware Xtend

for detailed procedure-based feedback

DoseAware Xtend makes real-time dose measurement even more precise and useful in a single display. It gives immediate feedback on scattered X-ray dose per procedure to help staff continually learn and improve their behavior. DoseAware Xtend also reminds staff to better protect themselves at certain moments during a procedure, and provides other useful information to help them easily identify trends in their exposure levels.

Dosimetry hub

An integral element of the DoseAware Xtend solution is the dosimetry hub, which is mounted on the ceiling inside the lab. It receives dosimetry information from all PDMs within range, using wireless radio communication networks. The Dosimetry hub enables connectivity with our DoseWise Portal² dose reporting tool, for all systems. It offers live view capabilities via monitors such as FlexVision, or your web browser. The Dosimetry hub is protected by advanced security features that include Https access, hospital certificate support, encrypted storage and extended audit trail logs – for greater peace of mind, and reliable, traceable data flows.

Live feedback to guide behavior

During procedures, the DoseAware Xtend live screen provides extra information to guide staff behavior. It shows the amount of real-time scattered X-ray dose per hour as a colored bar and the staff dose accumulated during the procedure in microsieverts (μSv). During a procedure, sterile sheets often hide lead shielding so staff may not realize it is not in place. When this occurs, an icon appears on the right of the live screen to remind staff to use the lead shielding or take other measures to manage X-ray exposure.

Procedural dose to gain insight into performance

After the procedure, the DoseAware Xtend review screen provides the cumulative amount of scattered X-ray dose received by each person for that procedure compared to the scatter dose in the room (reference dose). This helps staff better understand how their behavior during a specific procedure may have positively or negatively affected their X-ray exposure. For example, someone may have a green bar at one moment in the procedure and a red bar for the entire procedure.

Smart reporting supports continuous improvement

To make it easy for staff to track weekly or monthly X-ray dose exposure, DoseAware Xtend automatically sends a dose report via email. It provides an overview of the cumulative X-ray scatter dose. Since this information is presented by procedure, it can help users identify micro and macro trends in radiation exposure, by type of procedure, time of day, room, etc.

² DoseWise Portal and DoseAware (Xtend) are not available in all markets. Please consult with your local Philips representative for more information.



Discover the power of DoseAware in the interventional suite

“Capturing staff doses from the Philips DoseAware dosimeters has greatly enhanced awareness of radiation issues within our interventional cardiology service. The dosimeters have allowed immediate feedback on critical staff doses at a time of reduced eye dose limits, and this feature has been especially useful for our cardiology trainees. DoseAware has been integral to our efforts to improve our radiation safety culture within the cardiac cath lab.”

Andy Rogers, a Lead Interventional Medical Physics Expert from Nottingham, United Kingdom, underlines the importance of DoseAware to his overall dose management program

The flexibility of DoseAware

DoseAware is a flexible solution that can be deployed in any room that uses radiation, e.g. the interventional lab or hybrid OR, for real-time feedback on scattered X-ray exposure. The PDM measures the X-ray dose received and is wirelessly connected to the Base Station, which can be mounted alongside an exam room monitor. The Base Station shows the amount of scattered X-ray dose received by each PDM as colored bars (green, yellow, or red). Recognizing the yellow or red status allows the staff member to consider taking immediate action to manage their X-ray exposure.

Part of DoseWise

DoseAware is part of our DoseWise solutions, which aim to protect patients and clinical staff in X-ray environments. Personal Dose Meters (PDMs) are designed to complement TLDs by giving detailed real-time information to staff about exposure levels, so they can change their behaviors if needed.

DoseWise is our long-standing commitment and philosophy to effectively manage X-ray dose. It comprises a set of techniques, programs and practices that focus on providing excellent image quality, while protecting patients and clinical staff in X-ray environments. DoseWise is applied at every level of new product design and development and helps us continually move forward in dose management.

Empowering staff and delivering value

Together, we can make the difference by making it easy for people who work in X-ray environments to monitor and track their own X-ray exposure throughout the day. Informed by the real-time feedback from the DoseAware family, healthcare professionals are empowered to take steps to better manage their own exposure levels. This can make a true difference to the health of medical professionals who work in the interventional environment.

DoseAware

Specifications overview

Personal Dose Meter

Weight	34 g (1.2 oz)
Operational unit	HP (10)
X-ray dose range	1 – 10 Sv
X-ray dose resolution	1 µSv
X-ray dose uncertainty	5% or 1 µSv
X-ray dose rate range and linearity	10% or 10 µSv/h (40 µSv/h – 150 mSv/h) 20% (150 mSv/h – 300 mSv/h) 40% (300 mSv/h – 500 mSv/h)
Energy dependency rays	< 25% within N40 – N150
Average battery life	At least 2 years based on daily use

Dosimetry hub (to be mounted on ceiling)

Dimensions	18.5 × 13.5 × 3.5 cm (w × h × d) / 5.3 × 7.3 × 1.4 inch
Weight	170 grams (6 ounces)
Display	via FlexVision (Pro) or dedicated monitor (handled via the NVA)
Resolution	640 × 480 pixels (handled via the NVA)
Storage	The capacity of the dosimetry hub depends on the number of PDMs that have been online and the number of dose rate samples, for example: 290 hours of dose exposure for 50 PDMs.
Communication	Wireless radio communication with PDMs (868.3, 918.3 MHz)
Ethernet	10/100 Mb/s port for the Dose management software and connection to X-ray system.

DoseAware Base Station

Dimensions	30 × 25 × 6 cm (w × h × d) / 11.8 × 9.8 × 2.4 inch
Weight	1.45 kilograms (51.15 ounces)
Display	10.4 inch touch screen
Resolution	640 × 480 pixels
Storage	The capacity depends on the number of PDMs that have been online and the number of dose rate samples, for example: 290 hours of dose exposure for 50 PDMs.
Communication	Wireless radio communication with PDMs (868.3, 918.3, 927.9 MHz)
Ethernet	10/100 Mb/s port for the Dose management software connection

Dose view software and Dose management software PC Requirements

Operating system	Windows XP, Windows 7, Windows 8.1 or Windows 10
PC requirements	• Net 3.5 (internet connection is required for installing on Windows 8 or 10 if you do not have .NET 3.5) • At least one USB port available • At least 2 GB RAM • At least 1 GB free disk space • Recommended screen resolution at least 1024 × 768



