

Specifications: Detailed Description of Components

DETECTOR - Imaging						
Receptor Type	Amorphous Silicon on glass - no tiling					
Conversion Screen	Attached Gd ₂ O ₂ S:Tb					
Pixel Size (µm)	139 x 139					
Resolution Limit (cyc/mm)	3.6					
Usable Pixel Area (cm)	35.4 x 42.5					
(inch)	14 x 16.7					
(pixels)	2544 x 3056					
MTF (%)	RQA-3 Beam			RQA-5 Beam		
0.056 cyc/mm, Typical	99			98		
0.5 cyc/mm, Typical	83			79		
1.0 cyc/mm, Typical	61			54		
1.5 cyc/mm, Typical	42			36		
2.0 cyc/mm, Typical	28			23		
2.5 cyc/mm, Typical	19			16		
3.0 cyc/mm, Typical	13			10		
3.5 cyc/mm, Typical	10			7		
DQE (%) (σ) ± 2 σ < 10 %	RQA-3 Beam			RQA-5 Beam		
IEC 62220-1-1, Edition 1.0, 2015	0.97 µGy	3.1 µGy	9.92 µGy	0.97 µGy	3.1 µGy	9.92 µGy
0.056 cyc/mm, Typical	35	38	37	34	35	35
0.5 cyc/mm, Typical	32	34	34	30	31	30
1.0 cyc/mm, Typical	27	30	30	25	25	25
1.5 cyc/mm, Typical	21	25	25	18	20	20
2.0 cyc/mm, Typical	14	19	20	13	15	15
2.5 cyc/mm, Typical	9	13	15	9	10	11
3.0 cyc/mm, Typical	5	8	10	5	7	7
3.5 cyc/mm, Typical	3	5	6	3	4	4
Energy Range (kVp)	40 – 150					
Scan Method	Progressive					
A/D Conversion (bits)	16					

Technical Specifications | CARESTREAM DRX Core 3543 Detector

Supported Data Interfaces	
Wireless	802.11 A -or- N -or- G
Tethered	10/100/1000 Ethernet

Environmental	
Shock	High Shock Tolerance
Temperature Range (°C)	Operating (+15 to +30) Ambient-Storage (-10 to +66) Shipping (-10 to +66)
Relative Humidity (%), Non-Condensing	Operating 10 – 86 Storage 10 – 86
Ingress Protection	IP44

Mechanical	
Size (cm)	35 x 43 Cassette (ISO 4090) 38.35 x 45.95 x 1.47 cm
Weight	3.36 kg (7.40 lb)
Housing Material	Aluminum
Sensor Protection Material	Carbon Fiber and Aluminum Plate
Load Limit	Applied to a single 4.0 cm (1.6 in.) point: 114 kg (250 lb) Distributed evenly over the detector area: 170 kg (375 lb)

Technical Specifications | CARESTREAM DRX Core 3543 Detector

DETECTOR BATTERY	
Technology	Lithium-polymer Technology "Smart" battery technology prevents overcharge
Size	21 x 15 x 0.67 cm
Weight	0.4 kg (12.4 oz)
Voltage / Energy	14.6 to 14.8 V (dc), 2.1 to 2.5 Ah capacity
Battery "Hot Swap" Capability	Yes
Charge Capability	340 maximum images per charge in "Direct Connect Mode" 14 days per charge in undisturbed "Sleep Mode"
Expected Life	500 charge / discharge cycles results in ~80 % full charge energy
Medical Safety	IEC 62133 —Safety requirements for secondary cells and batteries containing alkaline or other non-acid electrolytes
Electromagnetic Compatibility	IEC 60601-1-2 Ed. 2.1, —Medical Electrical Equipment Electromagnetic Compatibility Requirements and tests, including CISPR 11:1999 + A2:02 emissions Group 1, Class A)

Technical Specifications | CARESTREAM DRX Core 3543 Detector

WIRELESS SYSTEM	
Technical Specifications	
Network Protocol	TCP/IP, IPv4/IPv6
Network Type	Isolated Private Wireless LAN (WLAN) Enterprise Wireless
Wireless Protocol	802.11 A -or- N -or- G
Antenna	
Frequency Band	5 and 2.4 GHz
Available Channels (fixed at installation)	1, 5, 9, 13, 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 149, 153, 157, 161, 165
Maximum Power of Detector Radio	50 mW
Number of Antennas on Detector	2
IP Addressing	Static Private IP addresses for detectors and AP
Agency approvals	FCC Part 15
Typical Data Size	One 15 MB file per image
Dual Homed PC (two NIC cards)	Hospital network connection, Private network connection

Security	
WPA2-PSK AES	Factory-loaded and user-loaded keys
SSID	Broadcast
Private Patient Identification Data	No patient ID data exchanged with detector
Username and Password	Non-default username and password

CARESTREAM DRX Core Detectors Statements Related to Systems Integration

CARESTREAM DRX Core Detector Safety

The CARESTREAM DRX Core Detector has been approved to IEC 60601-1 by TUV Rheinland and has a cTUVus and CE safety certification as a Medical Electrical Equipment device.

Recycling

- The CARESTREAM DRX Core Detector should be returned to Carestream Health at the end of life. The components will be recycled appropriately.
- The Lithium-polymer battery is WEEE compliant (as shown by Wheelie Dustbin logo) and should be recycled at local recycling stations. Carestream Health pays taxes in the EU Battery Directive countries to cover the recycling costs.

Line Noise Correction

The Image Correction Preference is used for the following purposes:

- **Normal** – reduces correlated line noise due to readout ICs. This is a very subtle correction, limited to near zero signal levels.
- **Enhanced** – reduces correlated line noise due to external EMI sources, such as motor drives and power supplies. This level should only be used if there is detectable line noise in the images.

Grids

- **Moving Grids** – Moving grids should not exhibit grid aliasing. If the exposure time is very short, the grid may alias with any digital detector. This is normally not a problem, since grids are used on large body parts, which generally require exposure times longer than 20 ms.
- **Low Resolution Stationary Grids, 30-50 Lines/cm (76-127 Lines/inch)** – Carestream Image Processing software will automatically remove the visible lines from the full-resolution image.
- **High Resolution Stationary Grids, > 75 Lines/cm (>191 Lines/inch)** – Grid resolutions of 75 Lines/cm or greater will not be visible on CARESTREAM DRX Core Detector images.
- **Med Resolution Stationary Grids, 50-75 Lines/cm (127-191 Lines/inch)** – Stationary grids in this range may cause aliasing, and are therefore not recommended. Medium resolution *moving* grids should not exhibit aliasing.

Technical Specifications | CARESTREAM DRX Core 3543 Detector

Durability

The CARESTREAM DRX Core Detector has been designed to be a robust device and function properly in normal handling. The instrument may be damaged if it receives a strong jolt from a drop or strike. The warranty does not cover damage as a result of accident or abuse, including broken detector glass and other obvious damage. A drop rider can be purchased to protect the investment. The detector has been equipped with internal accelerometers that will register when the detector has incurred a significant shock. The drop height that results in a registered event depends on the orientation of the detector during the drop, and the stiffness of the surface it strikes.

Detector Life

- The detector system is specified to last 10 years under normal use of 56,000 images per year. That is ~560K images. This statement relates to the life of the physical aspects of the product, including hardware, normal physical handling and image acquisition.
- No preventive maintenance required on the system.

Detector Quality Assurance

The detector must undergo gain calibration on an annual basis. A 360-day reminder is built into the software.

Express Calibration restores Gain Calibration and Defect Calibration and does a defect quality check. *Full Calibration* is same as *Express Calibration* and adds quality checks for Signal Uniformity, Noise Uniformity, and Dark Noise.

Permanent pixel defects are identified in the factory based on outlier performance in dark noise, X-ray uniformity response, and time lag response. Additional pixel defects are identified during Express Calibration and Full Calibration.

Quality Limits - No 4 x 4 defect clusters; Signal uniformity = 2 %; Noise Uniformity = 40 % (lowest exposure), 31 % (1/3 gain calibration exposure), 28 % (gain calibration exposure), 28 % (2 times gain calibration exposure); Two Image Dark Noise = 9.2 ADC.

Wireless FAQs

What impact will the CARESTREAM DRX-1 Access Point have on the Hospital/Clinic WLAN?

The CARESTREAM DRX-1 Access Point will have the channel fixed and the transmit power reduced to the minimum level needed for reliable operation of the detector moving around the room in which the AP is installed. Because of the intermittent bursts of data lasting only a few seconds, and the low transmission power, the impact of the DRX-1 WLAN on the Hospital mobile devices is minimized.

What is the range of the wireless communication?

The wireless communication should have plenty of range for any single room installation. The connection range is typically more than 30 m, depending on the obstructions between the access point and the detector.