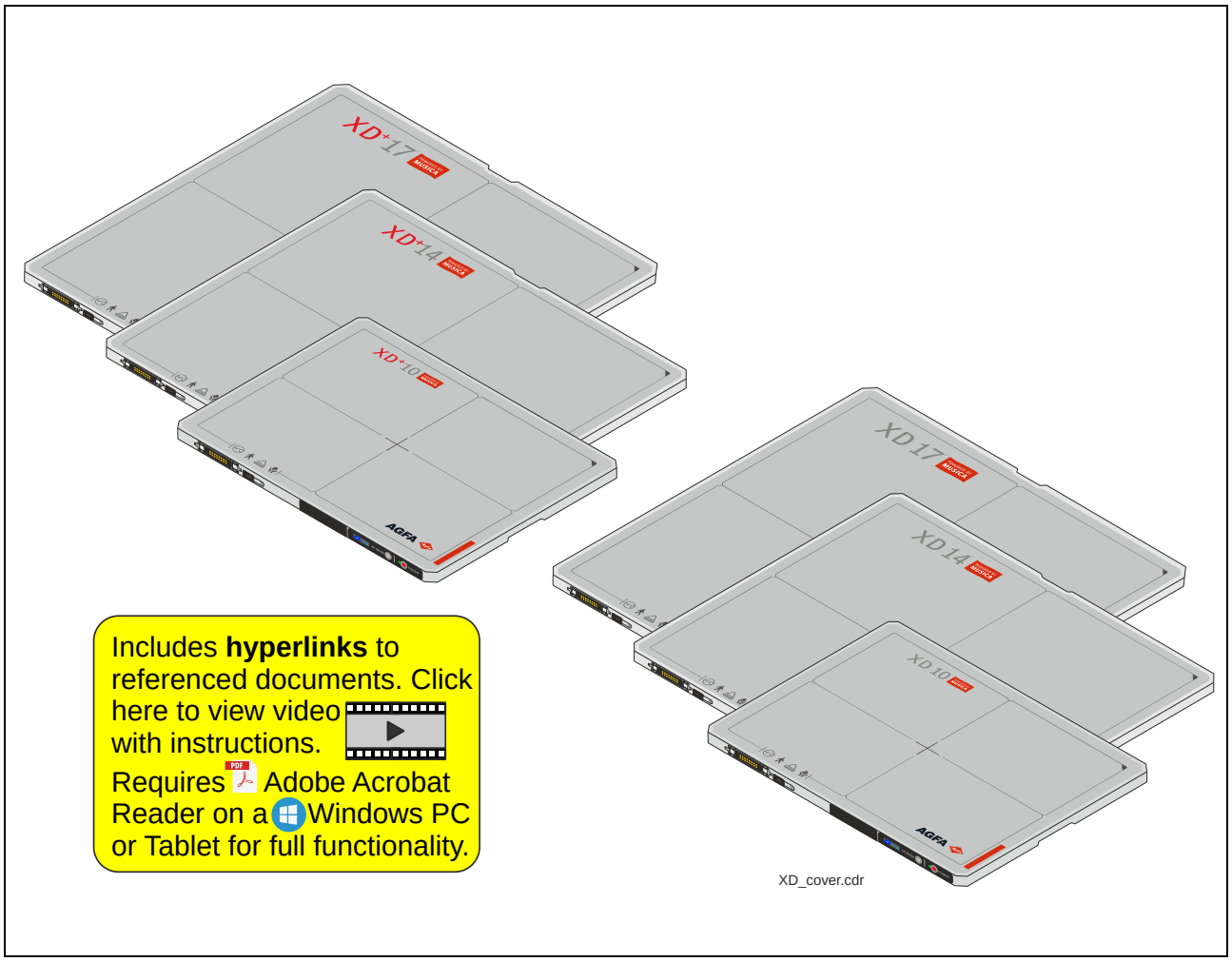
Document ID: 74858636

XD Detectors

XD 10, XD⁺10, XD 14, XD⁺14; XD 17, XD⁺17

Includes Excel document “XD Panel SNs where LDG Configurator needs to be run.xls“ in chapter 4.4.5.



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Vieworks Co., Ltd.

Published by

Agfa-Gevaert HealthCare GmbH
Tegernseer Landstraße 161
D - 81539 München
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WARNING:

Improper operation or service activities may cause damage or injuries.

(1) Read the *Generic Safety Directions* prior to attempting any operation, repair or maintenance task on the equipment.
Refer to Document ID 11849633 or offline replication.

(2) Strictly observe all safety directions within the *Generic Safety Direction* and on the product.

IMPORTANT:

The installation and service of the product(s) described herein is to be performed by qualified personnel who are employed by Agfa NV or one of its affiliates or who are otherwise authorized by Agfa NV or one of its affiliates to provide such services.

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0 About this manual

0.1 Purpose of this document

This document contains all information that service engineers need for installation as well as for corrective and preventive maintenance of the XD Detectors.

It does *not* contain:

- Specific service information for other target readers,
  for example Clinical Application Specialists or Service Managers
- Service Bulletins

0.2 Changes compared to previous revision

Changes in revision 4:

- Added in section 1.10, that software synchronisation between NX and Detector can be with or without Generator Sync Box, depending on the DR system.
- Added model files that were introduced with VDI 4.2 to the model file overview table on page 72.
- Added section 10.1.3, Software release VDI 4.2.
- Added possible warning message D201 during Detector calibration. Refer to section 4.8, Performing user training.
- Added that error ERR_05 also appears if only one battery is inserted instead of two. Refer to section 7.2.1, Error messages on the OLED display.
- Added section 8.5, Manual defect calibration.

Changes in revision 5:

- Corrected text in wiring diagrams in sections 13.2 and 13.3: Valory does not use Generator Sync Box anymore to perform software synchronization with Generator.

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0.3 Referenced documents

Document	Reference
Generic Safety Directions	Document ID 11849633 or offline replication.
DR wireless networking Service Manual	Document ID 58221971 or offline replication
DR Detector - basic configuration guide	Document ID 68310512 or offline replication
XRDI Service Manual	Document ID 72453884 or offline replication
NX Service Manual	Document ID 74737949 or offline replication
Video - mounting a network interface card	Document ID 76358952 or offline replication
Video - Operating the XD Detectors	Document ID 76425471 or offline replication
Video - Replacing the battery in a XD Detector	Document ID 76426744 or offline replication
XD 10 / XD⁺10 User Manual 0432	Refer to the Agfa MedImg Library
XD 14 / XD⁺14 User Manual 0430	Refer to the Agfa MedImg Library
XD 17 / XD⁺17 User Manual 0434	Refer to the Agfa MedImg Library
XD Detector as access point user manual 0335	Refer to the Agfa MedImg Library
DX-D DR Detector Calibration Key User Manual 0134	Refer to the Agfa MedImg Library
Service Quality Test Tool	Document ID 55022710
Anti-scatter grids for DR Systems 0037	Refer to the Agfa MedImg Library
System specific User Manual	Refer to the Agfa MedImg Library

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0.4 Explanation of notes

Safety-relevant notes

Icon	Signal word	Situation
	**CAUTION:**	Hazardous situation which, if not avoided, can lead to a minor injury to a user, engineer, patient or any other person.
	**WARNING:**	Hazardous situation which, if not avoided, can lead to a potential serious injury to a user, engineer, patient or any other person.
	**DANGER:**	Direct, immediate danger: If not avoided, it can lead to a serious injury to a user, engineer, patient or any other person
	-	Instruction to avoid damage to equipment and/or environmental pollution.
	-	Prohibition to avoid damage to equipment and/or environmental pollution.

Non-safety-relevant notes

Icon	Name	Type of information
	IMPORTANT:	Highlights very important actions which have to be carried out to prevent malfunction.
	NOTE:	• Indicates advice to facilitate the following step or action without having a direct influence on the step or action. • Highlights unusual points. • Indicates background information. • Can be used to explain or highlight displays of the graphical user interface.

0.5 Conventions

Style	Use case	Example
(1) Step 1 (2) Step 2	Step by step task description	(1) Connect the cables. (2) Mount the cover.
Bold	Menu topics, keyboard keys, device buttons, commands, and so on	Press **F9** or double-click the **Refresh** button.
Italic	Emphasizing a word or indicating references in continuous text.	Do *not* insert the USB flash drive yet. Refer to section 10, *Release information*.
`Courier bold`	System messages	When the **`success`** message appears, close the window.

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1 Product description

1.1 Intended use

The intended use statement is listed in the User Manuals of the XD Detectors.

1.2 Components of the product

The following components may be required to integrate the DR Detector into a DR system. The usage of the optional components is shown in some example hardware configurations in section 1.8.

Codes in brackets are the original Vieworks product codes.

For how to obtain the different components as sales items refer to the DR system specific sales information. The relevant parts are also available as spare parts. Refer to section 12.

#	Component / Purpose	Picture
1	**XD 10** (FXRD-2530VAW) Available as CSI wireless DR Detector. Captures X-ray images. Dimensions (H x W x D): 287 mm x 350 mm x 15 mm Weight: 1.95 kg Contains one battery pack	
2	**XD⁺10** (FXRD-2530VAW PLUS) Same like XD 10, with thicker CSI scintillator layer. Results in better image quality. Weight: 2.1 kg.	
3	**XD 14** (FXRD-3643VAW)* Available as CSI wireless DR Detector. Captures X-ray images. Dimensions (H x W x D): 384 mm x 460 mm x 15 mm Contains two battery packs Weight: 3.15 kg	

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#	Component / Purpose	Picture
4	**XD⁺14** (FXRD-3643VAW PLUS)* Same like XD 14, with thicker CSI scintillator layer. Results in better image quality. Weight: 3.3 kg	
5	**XD 17** (FXRD-4343VAW)* Available as CSI wireless DR Detector. Captures X-ray images. Named by Vieworks (manufacturer). Dimensions (H x W x D): 460 mm x 460 mm x 15 mm Contains two battery packs Weight: 3.65 kg	
6	**XD⁺17** (FXRD-4343VAW PLUS) Same like XD 17, with thicker CSI scintillator layer. Results in better image quality. Weight: 3.9 kg	
7	**Battery** (FXRB-04A)* Rechargeable battery Fixed mounted in the DR Detector. Can be removed or replaced by the customer in case of a defect (instructions in user manual). One battery in XD 10, XD⁺10. Two batteries in XD 14, XD⁺14, XD 17, XD⁺17 The same battery for all XD Detectors.	

#	Component / Purpose	Picture
8	**USB-C Charger** AC-DC adapter (DC 18V 5A max.) for fast charging of the DR Detector Part of each DR Detector delivery for orders from sales stock.	
9	**Battery Charger** (FXRC-04A) Charges two batteries. Can be used separately with external power supply (+ 24 DC – part of delivery) or in Detector cradle / with tether interface cable.	
10	**SCU Mini** (FXRS-04A) System Control Unit Mini For functions refer to section 1.2.2. Optional component	
11	**SCU Lite** (FXRP-02A) System Control Unit Lite For functions refer to section 1.2.2. Optional component	
12	**SCU** (FXRS-03A) System Control Unit For functions refer to section 1.2.2. This component is end of life, and therefore cannot be sold with a new system. It is possible however to connect the XD Detectors to an already existing System Control Unit (wireless and wired)	

#	Component / Purpose	Picture
13	**Tether interface cable (7 m)** Used for fixed cable connection, for image / data transfer and power supply. Connector works in both directions. Cable is specific for XD Detectors (cannot be used for DX-D 40/45/60). Optional component	
14	**DR Detector cradle** (FXRR-01A)* Allows simultaneous charging of two DR Detectors. Optional component	
15	**PCIe Intel Gigabit CT or Intel I210-T1 network adapter** Image interface for the DR Detector. Can be used for up to four DR detectors. Optional component	 
16	**DR Generator Sync Box** Interface between Generator and NX for exposure sync signals in some hardware configurations. For details refer to section 1.8. Optional component	
17	**D-Link network switch DGS-105** 5 port unmanaged switch Connects the different network devices. Optional component	

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#	Component / Purpose	Picture
18	**Access Point** Interface for wireless communication of one or more wireless detectors with the NX Workstation. For an overview of all available access points and their compatibility refer to the *DR wireless networking Service Manual*, Document ID 58221971 or offline replication. Optional component	 Example: Aruba AP-303

1.2.1 Detector bill of material

1 x Detector
1 x (XD 10, XD⁺10) or 2 x (XD 14, XD⁺14, XD 17, XD⁺17) Battery Pack
1 x USB-C type charger incl. power cable (EMEA / US)
1 x Vivix User Documentation CD
6 x Velcro Tape 25x50mm*
6 x Velcro Tape 25x100mm*
1 x Identification Labels
Purpose: Sticker to label Detector with name as configured on NX
1 x Agfa User Documentation CD
1 x Agfa CD leaflet
1 x Inspection Report (paper)

*NOTE:
The Velcro tapes can be sticked into the bucky to protect the Detector.
Instructions are included with the Detector delivery.
Check with the customer that the Velcro tape complies with the hospital's cleaning and disinfection regulations before applying the tape.

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1.2.2 Comparison of System Control Units “SCU”, “SCU Mini” and “SCU Lite”

This table shows a comparison of the three SCU types.

	SCU* 	SCU Mini 	SCU Lite 
Access point (up to 802.11n)	Yes	Yes	No
# connections for image transfer + power	2	1	1
Hardware sync**	Yes	Yes	No
Connections	Refer to Figure 1		

*SCU is not sold anymore. On existing installations the XD Detectors can be connected however.

**Hardware sync functionality (synchronize exposure with the Generator) is used for DX-D 40 / 45 / 60 only. Not used with XD Detectors

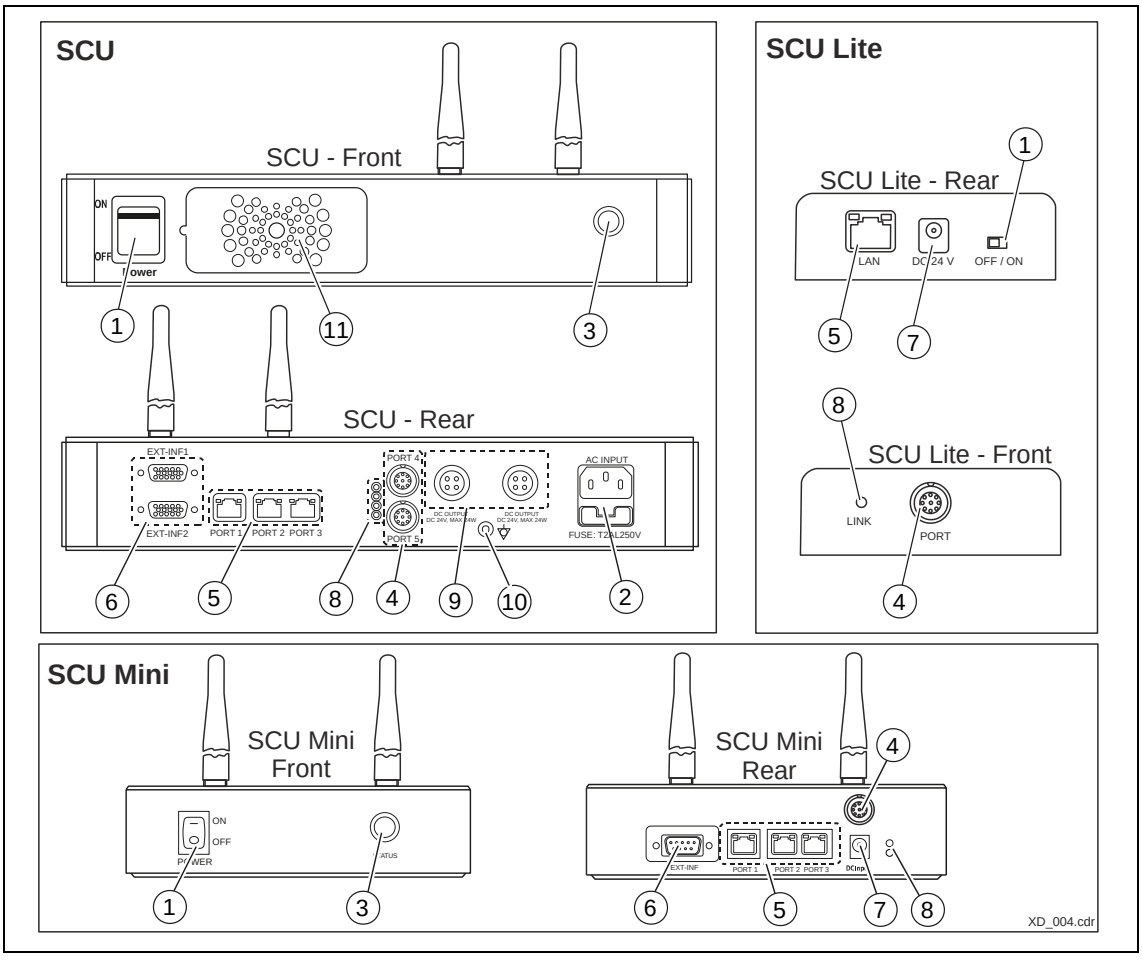


Figure 1: Controls and connections on the three SCU types

#	Function
1	Main switch
2	100 V to 240 V Power supply connection; Fuse T2AL250 V
3	Status LED: Blinking green = booting; Green = completed boot up; Blue = DR Detector connected and ready to communicate
4	PoE (Power over Ethernet) port for cabled connection to the DR Detector. SCU has two ports, SCU Mini and SCU Lite only one.
5	Network interface to NX. On SCU and SCU Mini only PORT 1 is used.
6	Interface for hardware sync with Generator. Not used on XD Detectors.
7	DC 24 V power supply input
8	PoE status: Green = 1 Gbps; Orange = 100 Mbps
9	DC output to DR Detector. Not used on XD Detectors.
10	Equipotential ground
11	Ventilation (blows out)

*Hardware sync functionality (synchronize exposure with the Generator) is used for DX-D 40 / 45 / 60 only. Not used with XD Detectors

In section 1.8 a few configuration examples are shown with SCU Mini and SCU Lite.

1.3 Technical Data

The technical data are listed in the following documents:

- XD 10 / XD⁺10 User Manual on the Agfa MedImg Library
- XD 14 / XD⁺14 User Manual on the Agfa MedImg Library
- XD 17 / XD⁺17 User Manual on the Agfa MedImg Library

An overview of the most important, service relevant parameters in comparison with other available DR Detectors is available in the DR Detector - basic configuration guide, Document ID 68310512 or offline replication

1.4 Connections and LEDs at the DR Detector

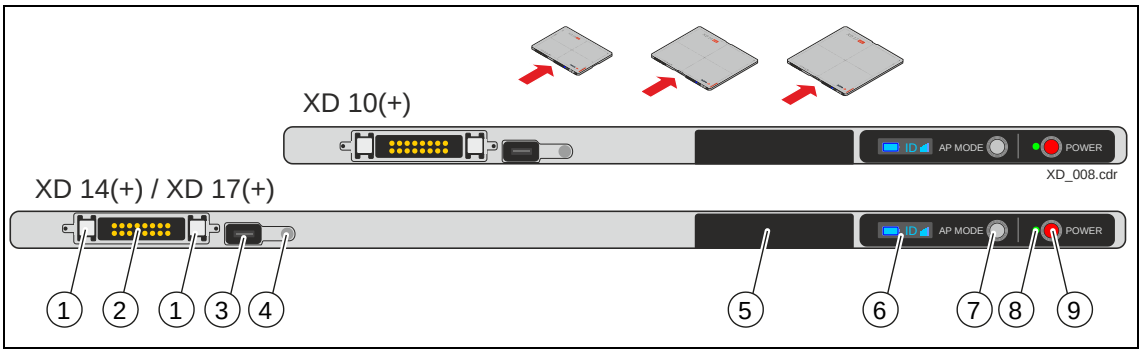


Figure 2

#	Function
1	Magnet for fixing the tether interface cable
2	Tether interface cable connector, for wired connection to SCU / SCU Mini / SCU Lite. Also connects to the charging connector inside the cradle.
3	USB-C Charger connector (AC-DC adapter - DC 18V 5A max.) for fast charging
4	Charge Status LED for the battery: • Discharged: LED is OFF • Charging: LED is in orange • Completed charging: LED is in green
5	Antenna for wireless communication. On the opposite side of the DR Detector two additional antennas are located.
6	OLED display (Organic Light Emitting Diodes) to display battery status, connection status (wired / wireless) and sleep mode status.
7	AP (access point) MODE button: Switches between AP mode and WiFi client mode (pressing 3 sec) or switches between APs (pressing for 3 sec.), depending on AP Button Type setup in Vivix.
8	Power Indicator LED: Displays system power and boot status: • Booting: LED blinks in green • Completed Booting: LED is in green • Detector out of order: LED is in orange
9	Power button. Allows power on/off and activates the OLED display

For more information refer to section 1.15, Operation basics.

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1.5 Type labels

The Detector type label is located on the rear of the DR Detector. Figure 3 shows an example.

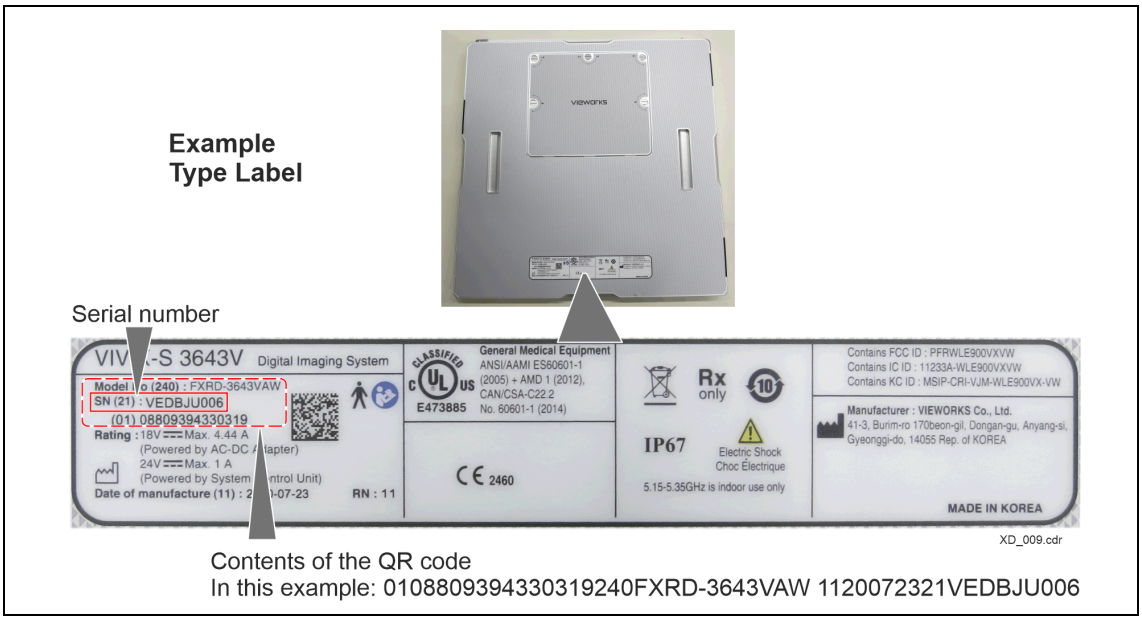


Figure 3

The following figures show the default type label for the different DR Detectors.

Type label of the XD 10

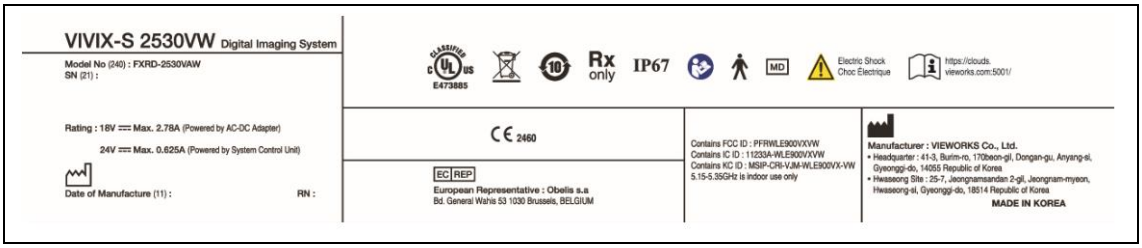


Figure 4

Type label of the XD⁺10

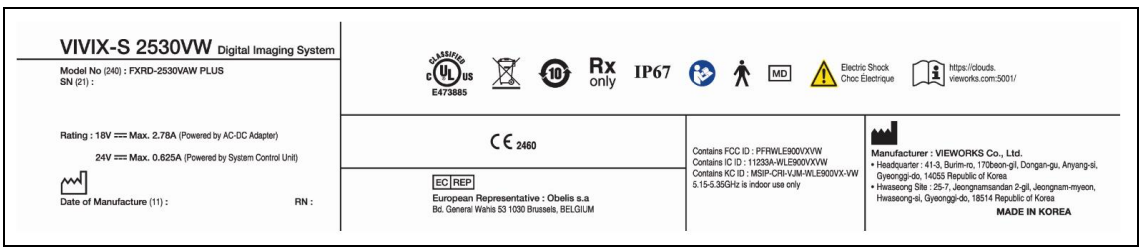


Figure 5

Type label of the XD 14

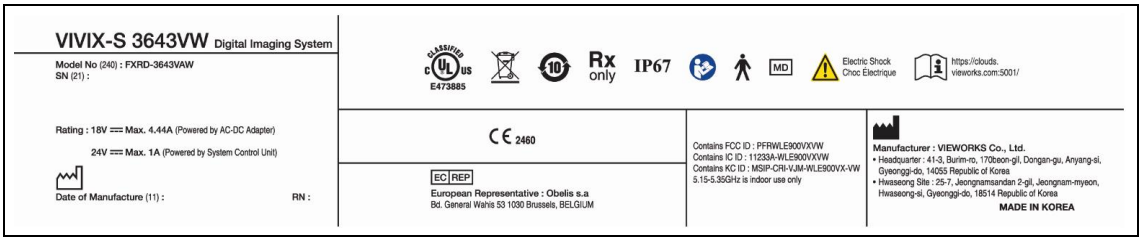


Figure 6

Type label of the XD⁺14

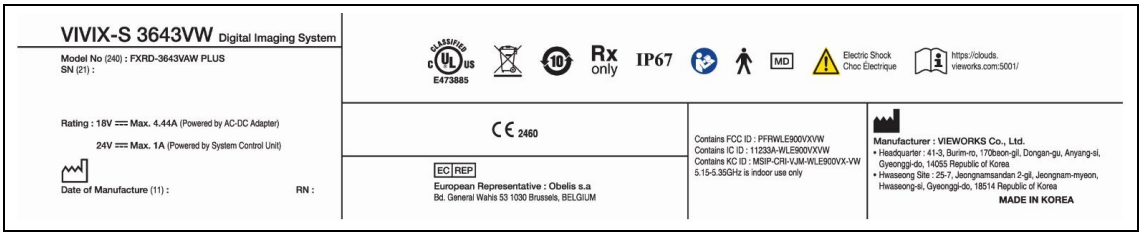


Figure 7

Type label of the XD 17

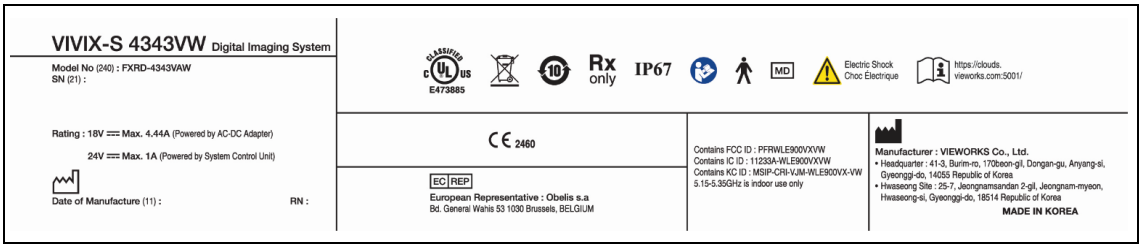


Figure 8

Type label of the XD⁺17

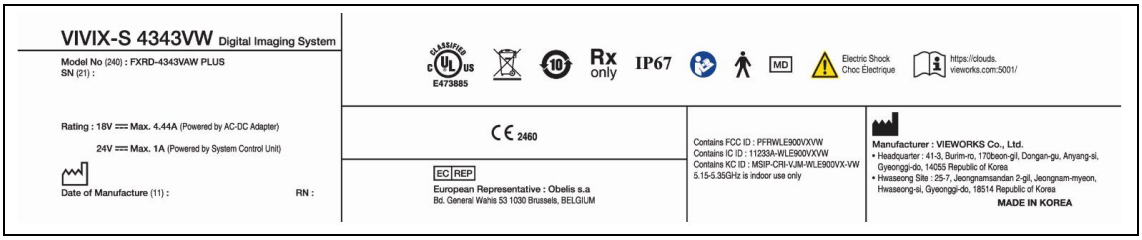


Figure 9

The following figures show the default type label for SCU, battery, battery charger and Detector cradle:

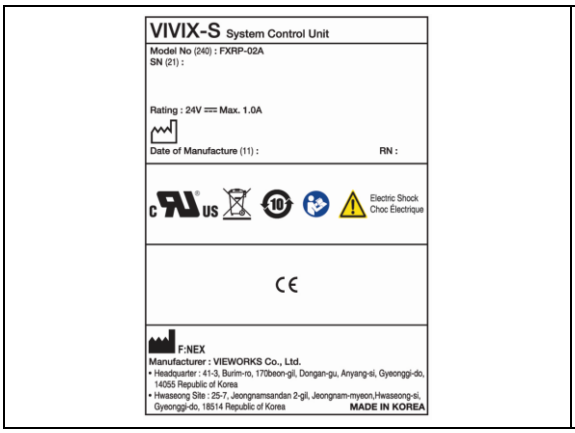


Figure 10: SCU Lite

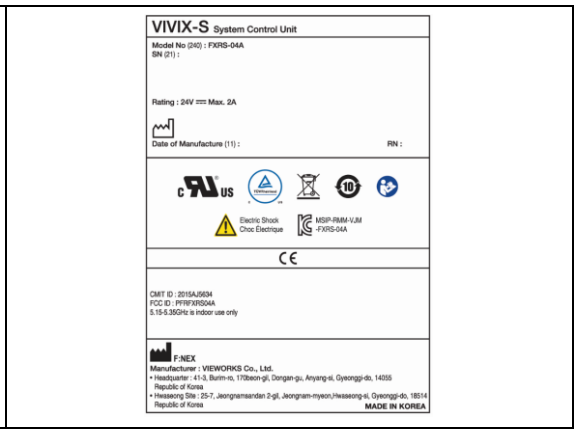


Figure 11: SCU Mini

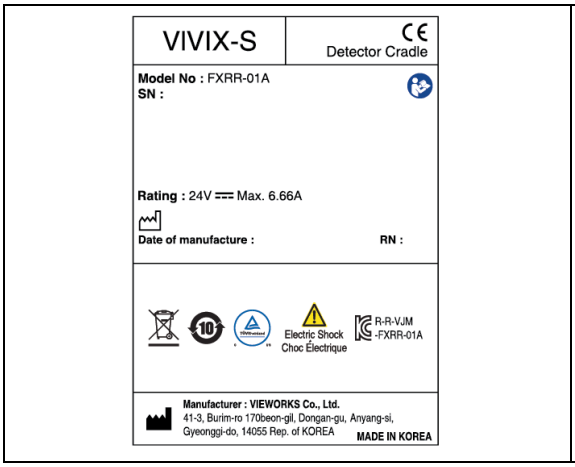


Figure 12: Detector cradle

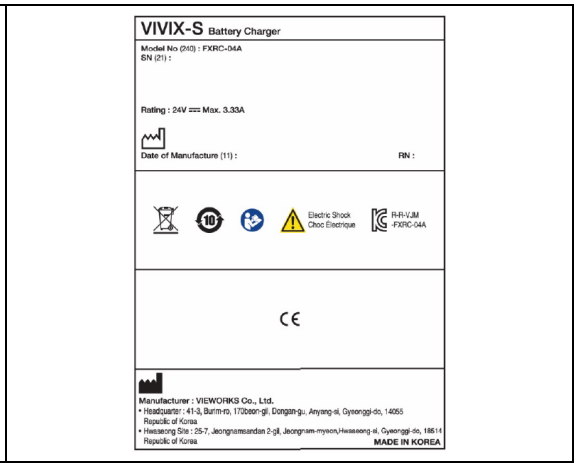


Figure 13: Battery charger

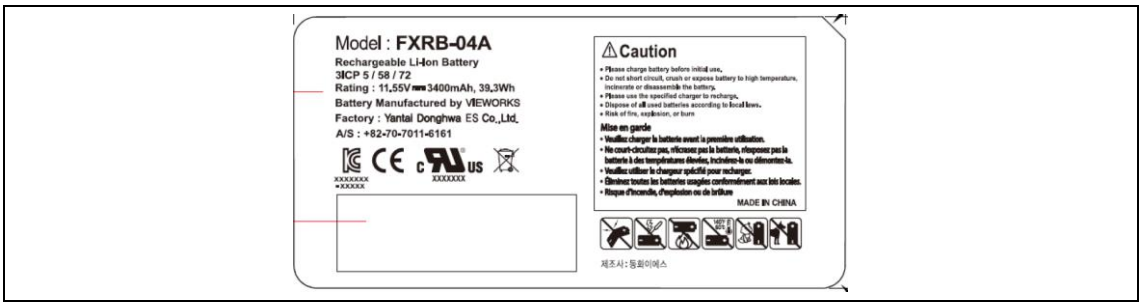


Figure 14: Battery

1.6 Software and hardware overview

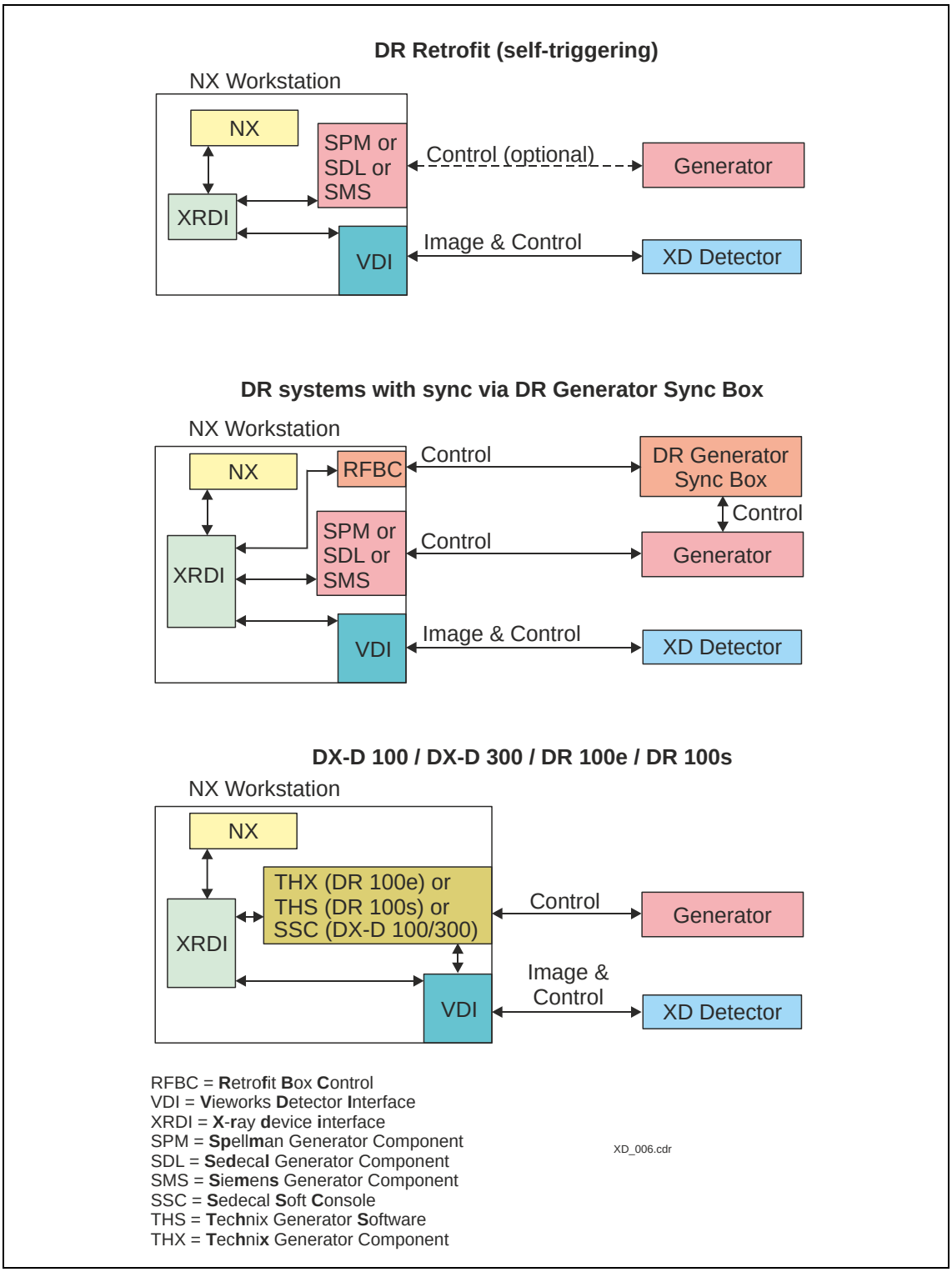


Figure 15

Software Components

Component	Comment
XRDI	X-ray device interface. Generic software component which interfaces between the NX application software and other, system specific software interfaces.
RFBC	Retrofit Box Control. Software interface for the control of the DR Generator Sync Box via Ethernet.
SPM	Spellman Generator Component. Software interface for the control of the Spellman Generator.
SDL	Sedecal Generator Component. Software interface for the control of the Sedecal Generator.
SMS	Siemens Generator Component. Software interface for the control of the Siemens Generator.
SSC	Sedecal Soft Console. Software interface for the control of the Soft console on NX (right part of the Graphical User Interface (GUI)) and for control of the Sedecal Generator.
THS	Technix Generator Software. Software interface for the control of the Technix (DR 100s) Generator.
THX	Technix Generator Component. Software interface for the control of the Technix (DR 100e) Generator.
VDI	Vieworks* Detector Interface. Software interface for image and control data of the XD Detectors. Minimum required: VDI 4.0. VDI 4.0 is release in combination with NX 22.00 SU1 / XRDI 22.

NOTE:
A more detailed overview of the software components on NX is available in the XRDI Service Manual, Document ID 72453884 or offline replication

1.7 Supported DR systems

When a Detector is released in a system, it is listed in the System Service Manual as a supported component.

1.8 Supported hardware configurations

The following table shows some examples of typical hardware configurations.
Others are also possible.
The combinations are shown in the referenced sub-sections.

PC type	Wifi module on PC	Detector wireless mode	Trigger mode	Reference
Desktop* or notebook	Access point**	WiFi client	AED	1.8.1
Desktop	Access point**	WiFi client	Software	1.8.2
Desktop	none	None – cabled	AED	1.8.3
Desktop	none	None – cabled	Software	1.8.4
Desktop	Access point**	1 x WiFi client + 1 x Cabled	AED	1.8.5
Desktop	Access point**	1 x WiFi client + 1 x Cabled	Software	1.8.6
Tablet or notebook	Internal	Access point	AED	1.8.7

* This setup also includes PCs integrated in a mobile DR system like DR 100s, DR 100e
** For supported access points refer to the compatibility matrix in the DR wireless networking Service Manual, Document ID 58221971 or offline replication

1.8.1 AED mode on a desktop PC with a wireless DR Detector

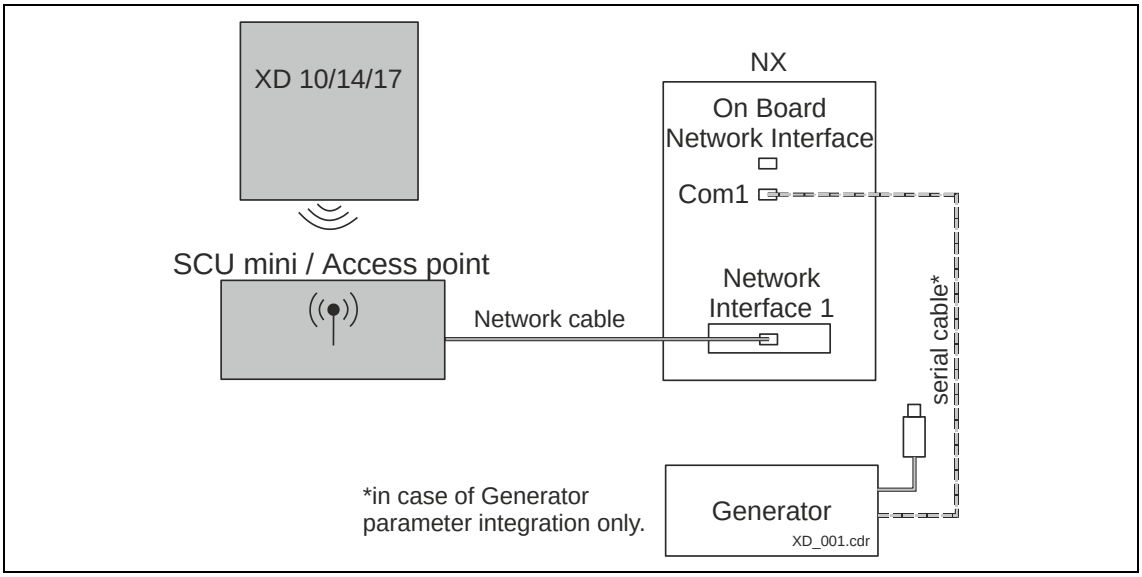


Figure 16

This is a typical retrofit configuration.
For a cost efficient solution, the SCU can be replaced by another access point.
Up to four wireless DR detectors can be connected.

This configuration is also used for mobile DR systems, like DR 100e or DR 100s.

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1.8.2 Software sync mode on a desktop PC with a wireless DR Detector (with / without GSB)

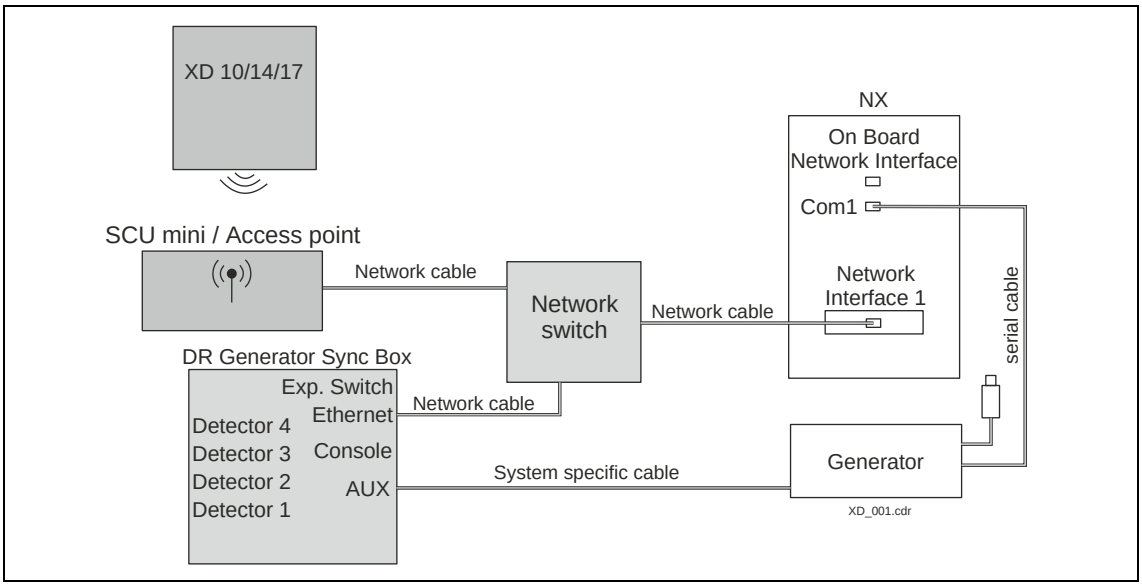


Figure 17: Software sync with GSB

This is a typical configuration with Generator integration in an Agfa DR system. For a cost efficient solution, the SCU can be replaced by another access point. Up to four wireless DR detectors can be connected.

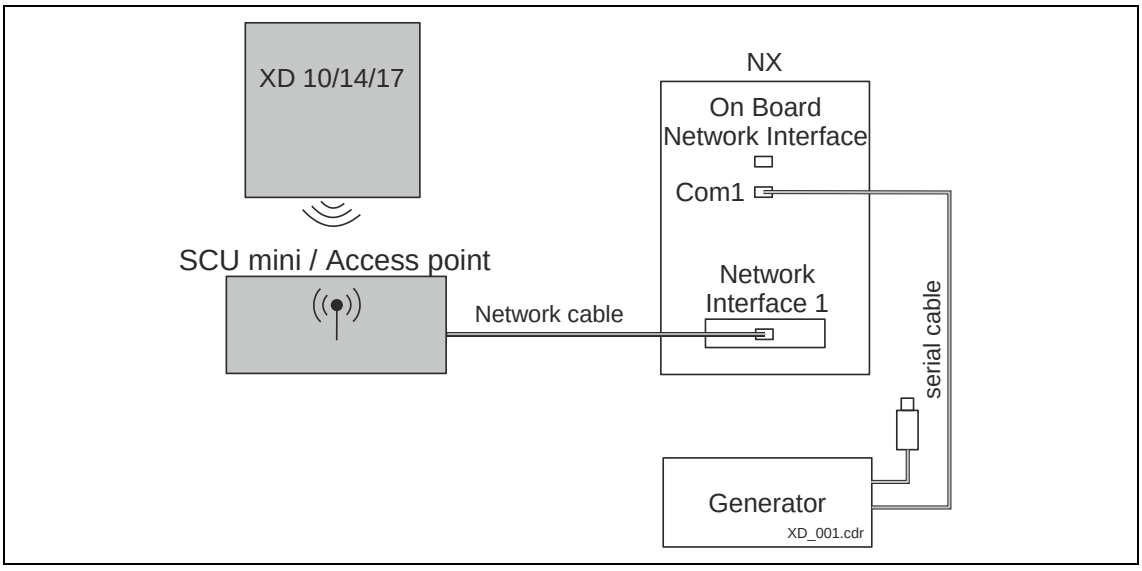


Figure 18: Software sync without GSB

For some DR systems (refer to section 1.10) the GSB is not used for software sync. Instead, an XRDI component on NX takes over the synchronization.

1.8.3 AED mode on a desktop PC with two fixed DR Detectors

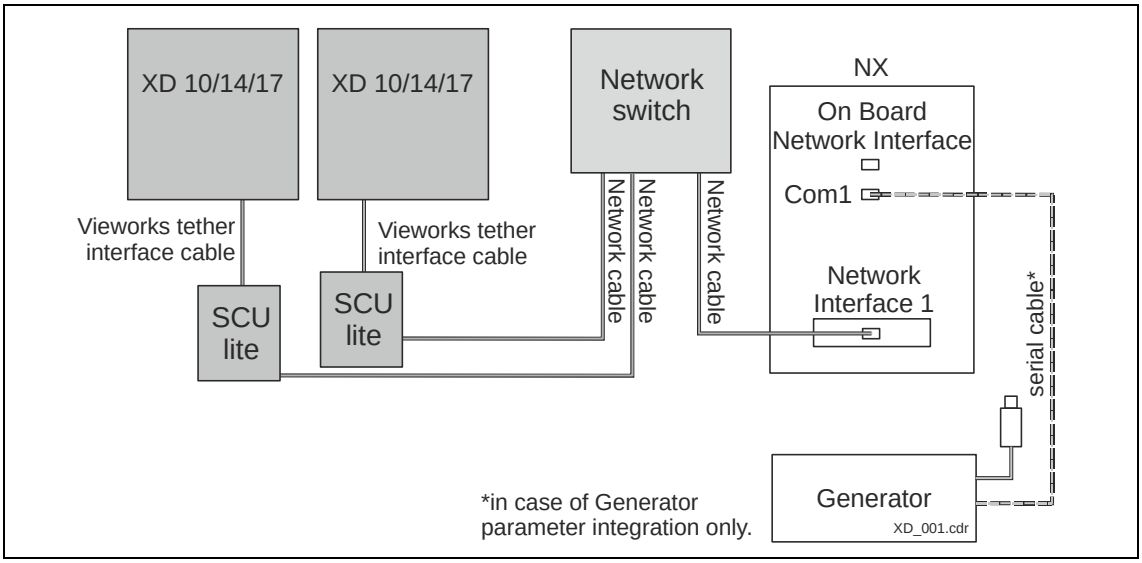


Figure 19

This is a typical retrofit configuration for fixed cable connection.
The SCU is mandatory, as it provides the interfaces towards the two DR Detectors.
For details to the fixed cable connection refer to section 1.9.

1.8.4 Software sync mode on a desktop PC with two fixed DR Detectors

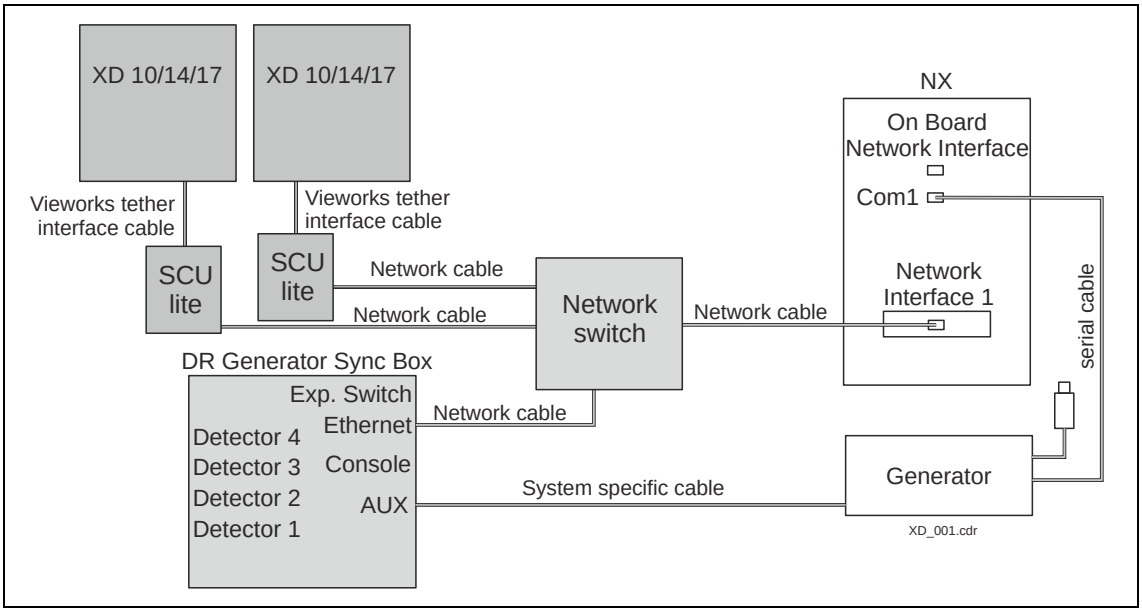


Figure 20

This is a typical configuration for fixed cable connection in an Agfa DR system.
For details to the fixed cable connection refer to section 1.9.

1.8.5 AED mode on a desktop PC with fixed and wireless DR Detectors

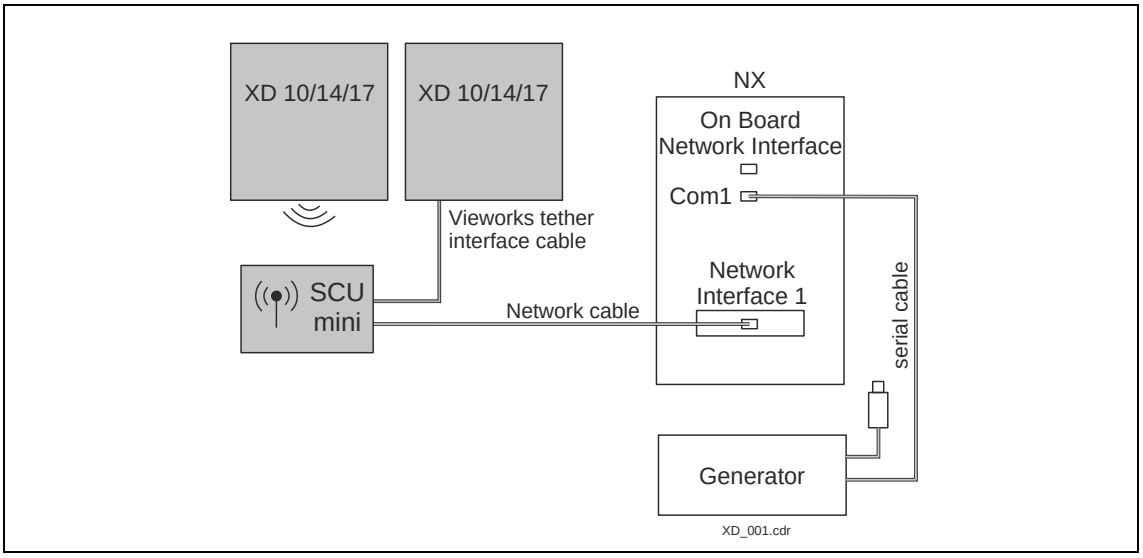


Figure 21

This is a typical configuration for combination of fixed cable connection and wireless DR Detector in a DR system without Generator integration (AED mode).

For details to the fixed cable connection refer to section 1.9.

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1.8.6 Software sync mode on a desktop PC with fixed and wireless DR Detectors

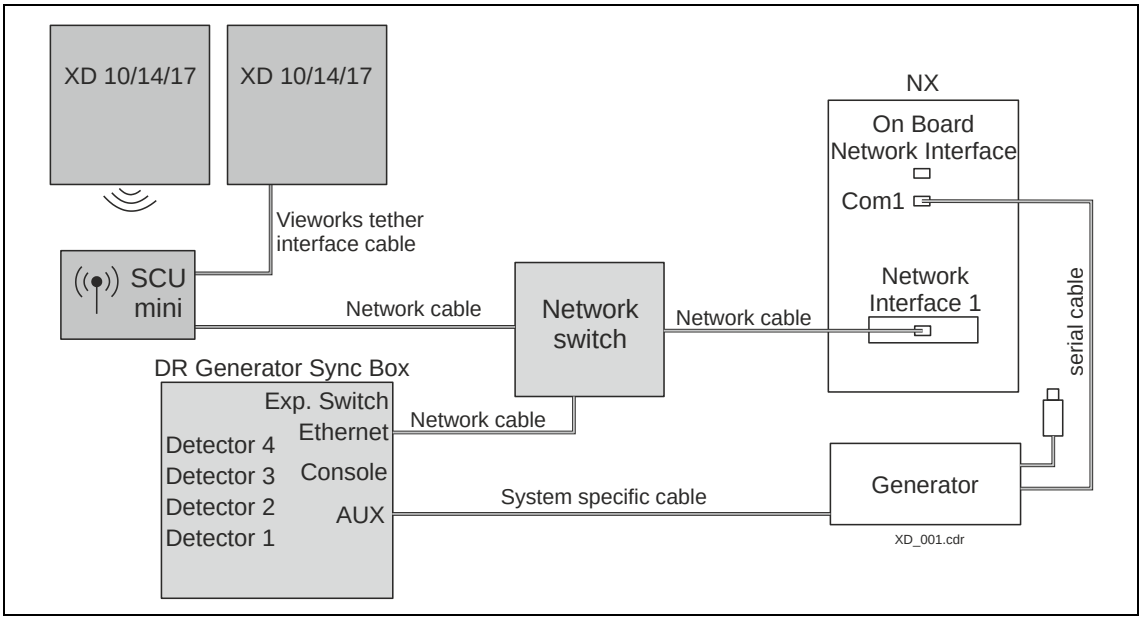


Figure 22

This is a typical configuration for combination of fixed cable connection and wireless DR Detector in a DR system with Generator integration (software sync).

For details to the fixed cable connection refer to section 1.9.

1.8.7 AED mode on a mobile PC with a wireless DR Detector

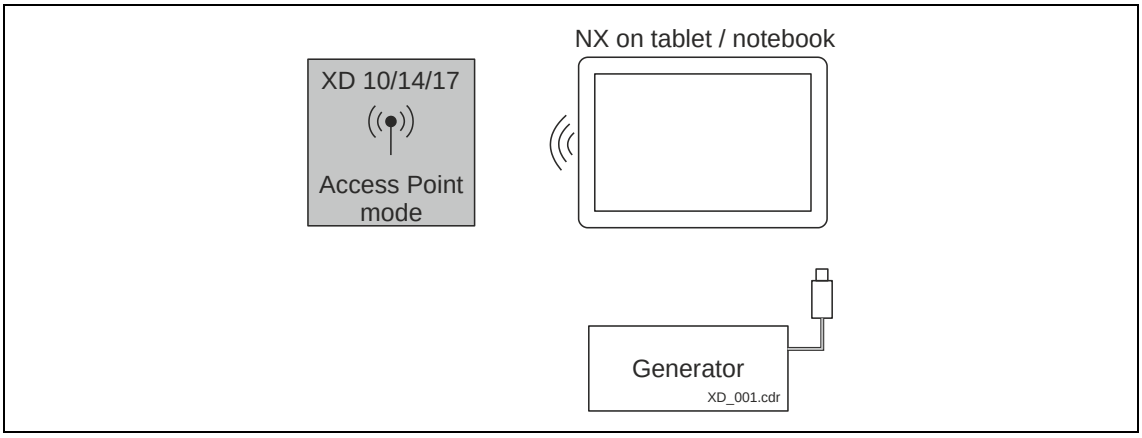


Figure 23

This is a typical configuration for an ultra mobile DR system, also known as DR mobile Retrofit.

The DR Detector works in access point mode.

The user must manually switch between DR Detector (image recording) and Hospital Wifi (RIS or archive connection).

It is possible to have several DR Detectors working in Access Point mode on one NX. The user has to switch between DR Detectors in the WiFi settings menu.

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1.9 Fixed cable connection

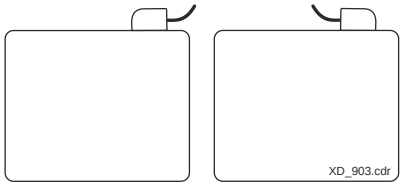
The Detector can be connected by a 7 m cable to the SCU, the SCU mini or SCU lite.

Advantage of the fixed cable connection:

- No wireless transmission problems
- No battery required: Not required to charge the battery
- If the Detector stays always in the same bucky: No drop down of the Detector during operation by the user

For fixed cable connection inside the Bucky there must be enough space for the connector.

The magnetic connector can be oriented left or right.



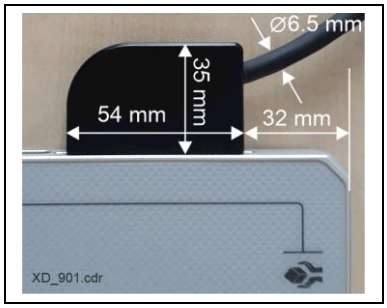


Figure 24

Example of bucky types, where the fixed cable connection cannot be used:

XD 14, XD+14; XD 17, XD+17 cannot be used in a DX-D 300, DX-D 400 and DX-D 600 Bucky.

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1.10 X-ray trigger modes: Software synchronization (ExposyncNetwork) or AED (Self)

The X-ray exposure and the Detector integration (= time where the Detector is active to capture images - refer to section 1.11) need to be synchronized. This ensures, that the Detector is active during exposure: It must be avoided:

- That the X-ray exposure is active while the Detector is not ready.
- That the Detector is active while there is no exposure.

In general the Detector can operate in two different X-ray trigger modes:

1. Software synchronization mode (ExposyncNetwork) – refer to section 1.10.1.
2. AED (Automatic Exposure Detection) or self-trigger mode – refer to section 1.10.2.

1.10.1 Software synchronization mode (ExposyncNetwork)

In software synchronization mode, the Generator and the Detector exchange sync signals to ensure sync between exposure and Detector integration. In this mode, the user can only expose, if a signal is sent from the Detector, that it is ready for exposure.

Software sync is used on all systems, where a cabled control communication with the Detector is possible. These are all systems, where Agfa sells the complete system, including the generator. For Retrofit systems, where Agfa only sells the NX and Detector, control communication is possible only, if the control communication with the Detector has been tested and released. Special cable kits are available per connection type. For details refer to the DX-D Retrofit Connectivity Document, Document ID 37654822 or offline replication. and the DX-D Retrofit connections document with ID 38077346 or offline replication.

Software synchronization can be with or without DR Generator Sync Box (GSB). Refer to the relevant DR system Service Manual, whether or not a GSB is required. With status 05-2022, the following DR systems do not require a GSB: DR 100e, DR 100s, DX-D 100, DX-D 300, Valory.

1.10.2 AED / self trigger mode

The self-triggering functionality, also called Automatic Exposure Detection (AED), means that the Detector captures and sends an image to the NX after detecting X-rays. The detector requires an exposure time of at least 3 ms to detect X-rays.

The detector trigger mode is “self-trigger” in the NX configuration tool.

AED status in relation to NX status

The NX software can enable and disable AED mode of the Detector. This ensures, that no unwanted exposures are made, for example due to strong mechanical impact of the Detector or due to stray radiation from another modality, close to the Detector.

The following table shows the AED status in relation to the NX status, if the Detector is configured for trigger mode “self-trigger”:

#	NX Status	AED mode
1	NX startup: Connection to Detector is established	Disabled
2	No thumbnail for the Detector selected	Disabled
3	Thumbnail for the Detector selected	Enabled
4	After exposure	Disabled

AED mode restrictions

AED mode should only be configured, if no control communication with the Generator is possible.

Reason 1: A software controlled communication is more reliable.

Reason 2:The user can expose, even if the Detector is not ready, for example if the battery is empty.

AED sensor: Functional principle and location

The AED sensor is sensitive for X-rays and located between TFT panel and the electronics.

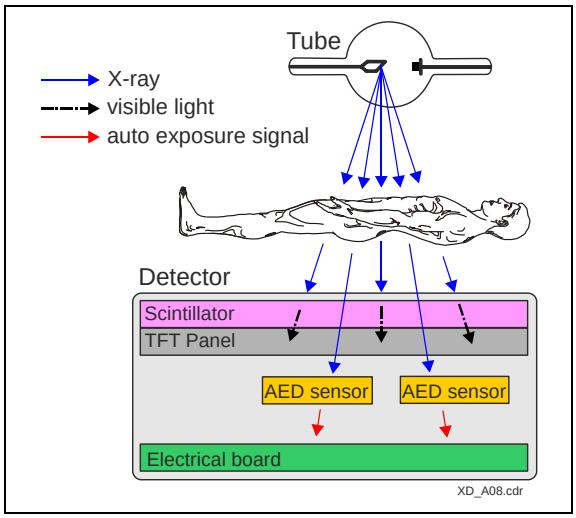


Figure 25

NOTE to Figure 25:

The scintillator is cesium iodide, which converts the X-rays into light.

The TFT (Thin-Film-Transistor) panel contains one photodiode per pixel which generates an electrical signal in proportion to the light produced by the scintillator layer.

Each Detector has two AED sensors. The location is indicated on the front panel by a cross +

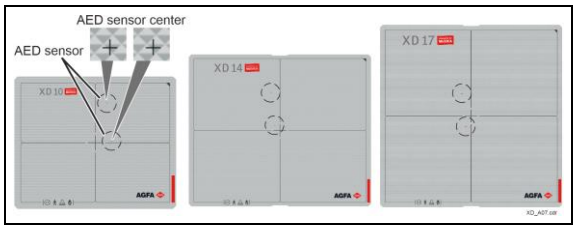


Figure 26

Collimation and AED sensor location

At least one AED sensor should be inside the collimated area, to ensure that the AED sensor triggers the exposure.

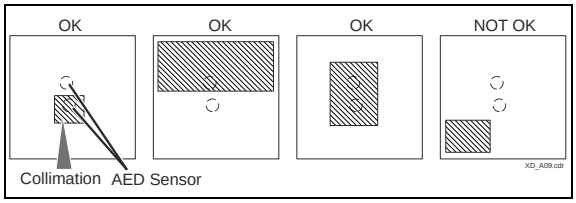


Figure 27

1.11 DR Detector integration time

The integration time is the length of time during which the detector is activated to capture images.

In general, two integration times are available: 1000 ms and 3000 ms.

The integration times are defined in the model file.

The model files are installed by the VDI software.

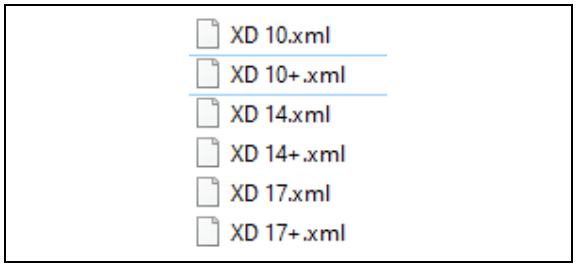


Figure 28: Detector model files

They need to be configured for each exposure (Parameter Modality settings > General Settings > max ms) in the NX Configuration Tool.

Rule of thumb: Use 1000 ms whenever possible. This improves image quality, compared to integrate for 3000 ms always. Use 3000 ms only if required, this means if an exposure time > 1000 ms is expected (examples: big patients).

NOTE:

The detector integration time is represented in the soft console by parameter “Detector ms” and in the exam tree by parameter “max ms”.

In the soft console, the user can switch between the two integration times (1000 ms / 3000 ms) before exposure. In the NX configuration tool only the default for a certain exposure is defined.

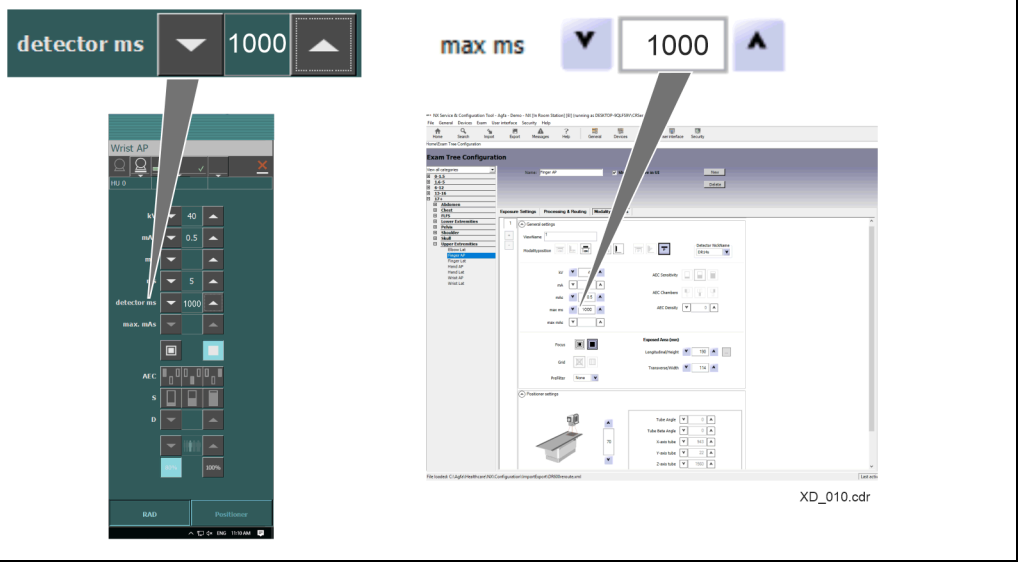


Figure 29

1.12 Wireless connection with NX: WiFi Client mode and Access Point mode

The XD Detector can operate in one of two Wifi modes:

- Detector is connected to an external Wifi access point (Wifi client mode)
- Detector is a Wifi access point and the NX PC is connected via Wifi to the Detector (Wifi Access Point mode)

WiFi Client Mode

By default, the Detector operates in WiFi client (station) mode.

In the user interface, when activating this mode via the AP button, this is named “Station mode” (abbreviated STA Mode)

STA Mode Start

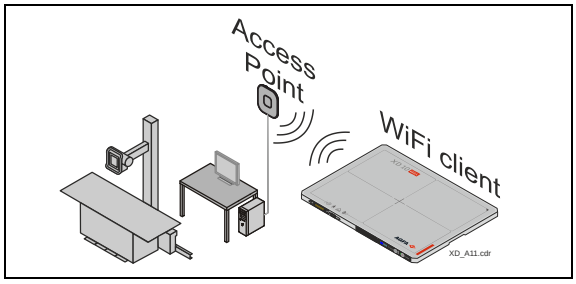


Figure 30

In the WiFi client mode, it is possible to define two or more presets with different access point configurations per X-ray room. The user brings the Detector in the room and presses the AP button on the Detector. The Detector scan for available access points and connects to the strongest it can find. For details refer to section 1.17.

Example:

- DX-D 100 wireless with preset name “Mobile System”. When connected, it shows “Mo” as selected preset.
- DR 400 in X-ray room 1 with preset with name “R1_DR400”. When connected, it shows “R1” as selected preset.

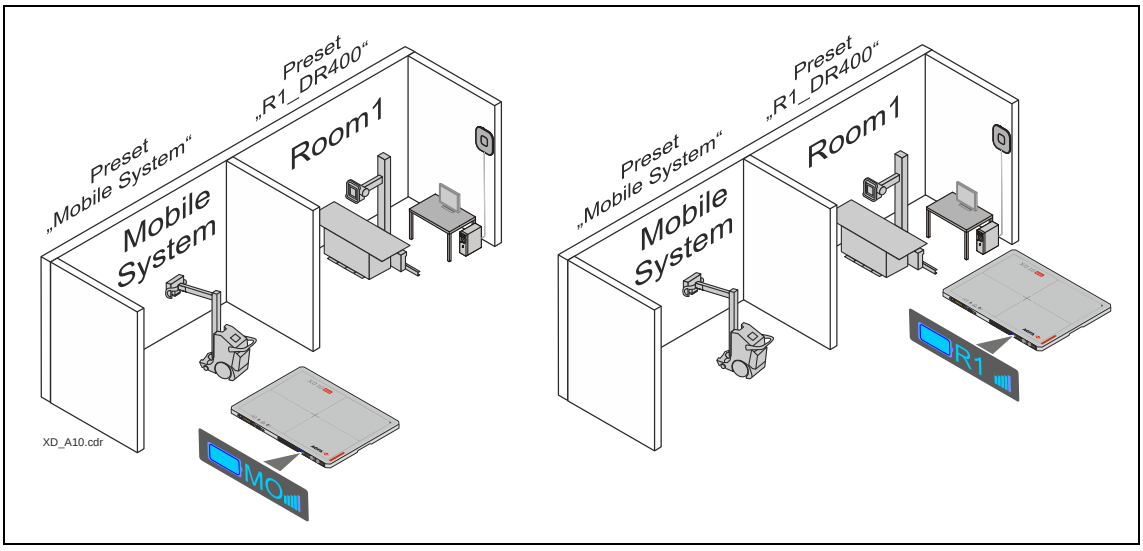


Figure 31

Access Point mode

For ultra mobile DR applications, where an access point connected to the tablet or notebook PC hinders mobility, the Detector is used in access point mode.

Connection to the Detector is established in the WiFi settings menu on Windows 10 of the NX tablet or notebook PC.

For initial setup, to be able to configure the Detector in the Vivix tool, the AP mode button needs to be pressed to activate the access point mode. Then it is possible to connect to the Detector via the WiFi settings menu (Default SSID: vivix_ap; default key: 1234567890).

Only one NX shall connect to the Detector in AP mode. Before another NX can connect to the Detector, it must be manually disconnected in the Windows 10 WiFi menu or the user needs to go out of WiFi range with the Tablet or Detector.

Technically it is possible that a Detector in access point mode is shared on two NX. As the workflow to change the connection of the Detector with NX 1 and NX 2 and all possible things that can go wrong* have not been tested, sharing an Detector in AP mode on two NX is not supported.

* One example what can go wrong: The Detector is connected to NX 1. As long as both are in WiFi range this is a safe connection, as the Detector does not allow NX 2 to be connected. If there is a short unwanted interrupt on the connection, for example briefly out of WiFi range, NX 2 can connect to the Detector, and prevents that NX 1 reconnects.

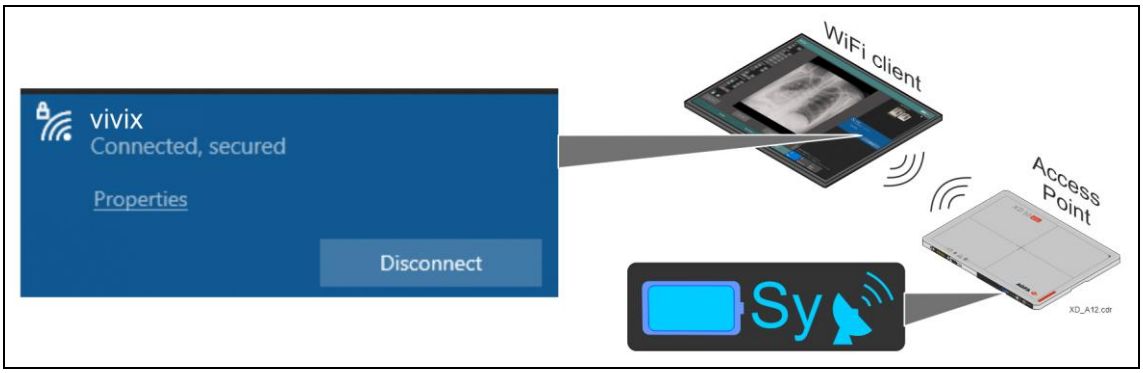


Figure 32

Settings which are important to enable AP mode:

- WiFi module IP address stays on default (obtain IP address automatically)
- “Connect automatically” in the WiFi settings menu must be disabled. Refer to section 2.1.
- Vivix tool, refer to section 4.4.3:
  - **AP Button Type** is set to **AP/Station**.
  - Access Point is set to Enable – ON
- If the NX shall also connect to the hospital WiFi: Adapt registry as described in section 4.9.2.

1.13 Supported and recommended IP addresses

This table lists the default network parameters for a Detector and SCU from stock or after factory reset. All factory default values are shown in section 8.3.

Component	IP Address	Subnet Mask	Gateway
Detector	169.254.1.10	255.255.0.0	169.254.2.100
SCU Box	169.254.2.100	255.255.0.0	169.254.2.100

The recommended IP address for the network interface card in NX is 169.254.0.50 with subnet mask 255.255.0.0.

In general, there is no restriction concerning IP address setup for Detector and SCU.

IMPORTANT:

It is recommended to use a dedicated network interface card (NIC) for XD detectors. Refer to rule # 4 in the DR Detector - basic configuration guide, Document ID 68310512 or offline replication

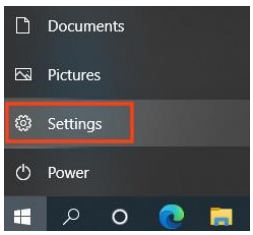
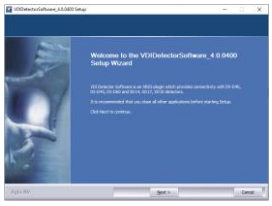
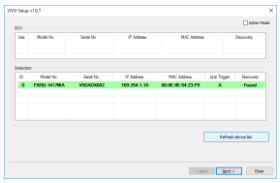
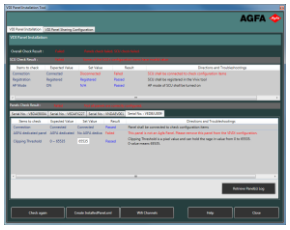
If the XD Detector is connected to a NIC for other system devices (for example a shared Detector or a DR Generator Sync Box), and out of any reason this NIC has more than one IP address assigned, then the XD Detector needs to have the lowest IP address. Otherwise network communication with the XD Detector will fail.

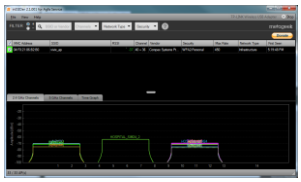
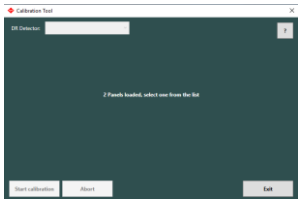
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1.14 Software Tools for installation and calibration

In the Quick Installation Guides in section 4.1.7, all required software tools for installation and calibration are shown.

The following table lists the functions of the tools:

Software Tool	Function
Windows settings 	• Configure network settings of the network interface card (NIC) for communication with the DR Detector. • Part of the operating system software (Windows 7 / Windows 10)
VDI Software 	• Contains drivers for communication of NX with DR Detector • Loads DR Detector model files with specific configuration settings • Installs VDI Panel installation tool, VIVIX Software and DR Detector Calibration Tool • Available on the AgfaBox for download
VIVIX software 	• Provided by Vieworks, to configure SCU (incl. SCU Mini / Lite) and DR Detector • Installed by the VDI software • The colors used to indicate the status have the following meaning: ○ Green background: Connected and selected detectors ○ White background, black texts: Connected but non-selected detectors ○ Gray background, gray texts: Device has been connected before, but is not connected at the moment
VDI Panel installation tool 	• Interface to enter Clipping Threshold per installed DR Detector • Allows creation of “InstalledPanel.xml”, which is used by the NX config tool for Detector configuration • Installed by the VDI software

Software Tool	Function
NX Config Tool 	• Contains all tools for NX configuration • Installed by NX
WiFi analyzer 	• App on the mobile phone (for example insider or Farproc WiFi Analyzer tool) • Can be started from VDI Panel Installation Tool (button “Wifi channels”), if a wireless XD Detector is installed on a notebook or tablet with internal WiFi module.
Calibration tool 	• Starts a wizard for DR Detector calibration • Installed by the XRDI software in combination with VDI software

1.15 Operation basics

This section describes the basics, the user needs to know for operation of the DR Detector:

The AP mode button can be configured in AP / Station mode or Preset Switching Mode. For an explanation see table below.

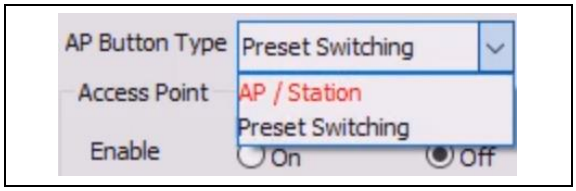


Figure 33

AP Button* Type Setting	Description
AP / Station	When pressing the “AP mode button” for 3 seconds, it changes from access point mode (AP) to WiFi client station mode (Station)
Preset Switching	When pressing the AP mode button for 3 seconds, it scans the neighboring APs and automatically changes to the one with the highest signal strength among the detected APs. For details refer to section 1.17.

* “AP mode button” is shown in Figure 2.

For details refer to the video “Operating the XD Detector”, Document ID 76425471 or offline replication

1.16 Auto power on/off

By default, **Power Control** is set to **by Detector**. In this case the Detector is powered-off either by an empty battery or by pressing the power on/off button for 3 seconds.

When changing **Power Control** to **by SCU**, the Detector automatically powers on/off if either the power cable from SCU lite or power cable from USB-C charger is connected / disconnected.

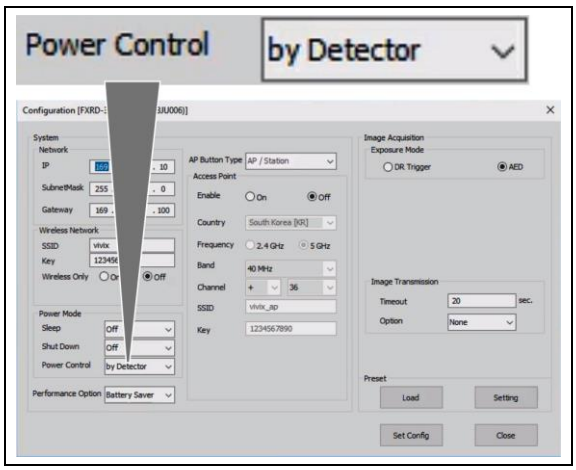


Figure 34

1.17 Detector sharing – switching between different modalities

Detector sharing means:
Using a DR Detector on two or more different systems, for example on DR Retrofit system in X-ray room 1 and DR Retrofit system in X-ray room 2.

IMPORTANT:
A Detector should not be shared if the Detector was calibrated with partial exposures on a vet system. See also section 5.1.

For Detector sharing, the AP button type is changed from default “AP switching” to “Preset Switching” in the Vivix tool. For the “Preset switching” mode, the Field Service Engineer configures a WiFi parameter preset (for example SSID and key per X-ray system. Refer to Figure 79). To switch between X-ray systems in different X-ray rooms, the user takes the Detector into the room of any X-ray system where the Detector is shared, and presses the AP button for 3 seconds. Then the Detector connects to the access point in this room.

Behaviour of the AP button in preset mode (”preset switching”):

Normally the Detector connects to the strongest Wifi out of its presets list. However, when it is already connected to one of them, then the Detector will ignore the connected-one and connect to another one from the list, even when weaker.

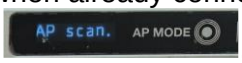
When no other is found, it remains connected with the current access point.

Side effect:

A user might thus disconnect a panel by pressing the button.

Conclusion:

The user has to check the display first and not start the scan when already connected.

Also the AP button should not be pressed during the AP scan 

. If the AP button is pressed for 3 seconds while **`AP scan`** … is displayed, the AP scan will not be performed again.

Preset Names

As there are only the first two characters of the preset name shown on the display, 

the service engineer has to give meaningful names to the presets, with focus on the first two characters.

Example: Detector is used on Agfa DX-D 300 and on a Philips Medio Retrofit System.
Use the following preset names:

System	Modality nickname used by users	Preset name	Name on OLED display*
Agfa DX-D 300	Agfa	AG_DXD300	AG
Philips Medio	Philips	PH_PhilipsMedio	PH

* OLED display shows the first two letters only.
Refer to video “Operating the XD Detector”, Document ID 76425471 or offline replication

1.18 Purpose of the System Control Unit and when it is needed

The SCUs provide the following main functions:

- SCU and SCI mini: Access point (up to 802.11n) and cabled power / image transfer
- SCU lite: Cabled power / image transfer

An SCU is mandatory in the following case:

- If WiFi is no option (cabled image transfer)

An SCU is recommended in the following case:

- If the Detector is used wireless and a simple installation “out of the box” is desired. When another access point is used, installation and configuration is more complex.

1.19 Offline image acquisition workflow

The XD Detectors in a DR Retrofit support the offline image acquisition workflow.
Short description:

1. Take the XD Detector outside the WiFi range.
2. Perform the exposures.
3. Return to WiFi range: The images appear as Recovery images on NX.
4. Assign the image to the correct patient and select the correct exposure type.

A detailed description of the offline image acquisition workflow is available in the XD Detector user manual.

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Restrictions:

- Maximum 200 images can be stored offline. If image #201 arrives, image #1 gets erased and so on.
- Detector must be configured for AED (automatic exposure detection) mode
- The exposure must be named “Offline Mode” (not case sensitive, “ofFLine mODe” works, too). This is a sign for NX to leave AED mode on, until another thumbnail is selected. If the offline image acquisition workflow is made with another exposure name (for example “Chest AP”), the AED is automatically stopped after the first image, if the Detector is still in reach. The user might not see this and creates all exposures while the Detector does not record any image.
- The exposure type for the 1st image that arrives on NX, after the Detector is in reach again, is defined by the “Offline Mode” thumbnail. The subsequent images appear as recovery images. The exposure type for these images is defined by the Recovery Procedure setup. Refer to Figure 74.
- NX must be configured to not automatically archive images when clicking “Close and Send All”: Reason: NX can only handle 18 (default) or 50 (with NX ICU CONFIGURATION license) open exams. When there are more than 18 or 50 images on the Detector, the user first has to click “Close and send all” after the first 18 or 50 images, to empty space in the input queue for the next recovery image. These images can be accessed later on from the “Closed Exams” worklist. If this special configuration is not made, images are sent to the archive without assignment of the correct patient and the correct exam type. The configuration is described in section 4.9.
- NX ≥ 23.00 is required for effective use of the offline image acquisition workflow. There the date/ time stamp of the recovery study is changed to the time when the image is recorded on the Detector. This facilitates assignment of the image to the patient. Refer to NOTE below.

NOTE:

The date / time stamp depends on the NX version:

NX version	Date time stamp
≤ NX 22.00 SU1	Time when the image arrives on NX
≥ NX 23.00	Time when the image is stored on Detector

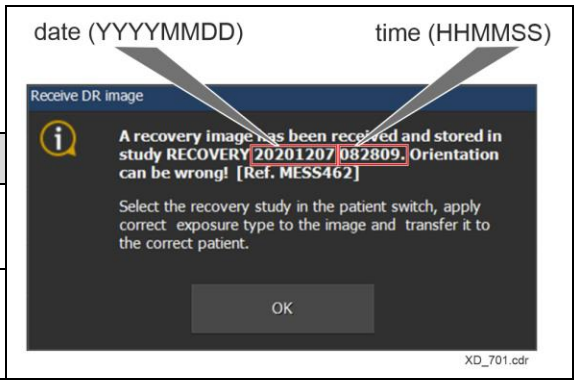


Figure 35

1.20 Comparison of DX-D 40/45/60 with XD 10/14/17

This table shows a comparison of the 1st version of the Vieworks Detectors, the DX-D 40/45/60 with the 2nd version, the XD Detectors. It lists the main parameters for operation and service. A more detailed comparison with all Detectors in the Agfa assortment is available in the “DR Detector - basic configuration guide”, Document ID 68310512 or offline replication

	DX-D 40/45	DX-D 60	XD Detectors
Communication	Ethernet / WiFi	Ethernet	Ethernet / WiFi
Power via cable	Tether cable*	Tether cable*	Tether cable* / USB
WiFi	802.11n	n.a.	802.11ac (better than 802.11n)
Linking for panel sharing	Via cable	n.a.	AP mode button
Auto Power on/off	No	Yes	Yes
Panel as AP mode	Yes	n.a.	Yes
Generator sync	HW, SW (VDI ≥ 4.0)	HW, SW (VDI ≥ 4.0)	SW
AED	Yes	Yes	Yes
Offline image acquisition workflow	Not supported	n.a.	Yes
GRF configuration****	Required	Required	Not required
Out of the Box installation***	With SCU: Yes	Yes	With SCU: Yes
Shock sensor **	Yes	Yes	Yes

* Three different cables. Interface towards SCU is identical. Interface towards Detector is different.

** Shock sensor not active if Detector is powered off.
Exception: DX-D 45 and DX-D 60 shock sensor is active also powered off, if battery is charged.

*** Out of the box installation means: After cabling and power on, Detector communicates with SCU.
Depending on the situation on site, there might still be configuration steps required.

**** GRF = Ghost removal function

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2 Safety directions

IMPORTANT:
For each service intervention follow the instructions in the *Generic Safety Directions*, Document ID 11849633 or offline replication.

The Generic Safety Directions document comprises the general safety-relevant information including relevant environmental and occupational safety instructions for the Service Engineer.

2.1 Safety notes for service activities

Sensitive device: Damage possible.
Observe the safety guidelines listed in the detector user manual.

The following safety note is applicable, if the Detector is used in Access Point mode. For details refer to section 1.12.

This safety note is also available for the user in the XD Detector as access point user manual 0335.

WARNING:

If the network connection is interrupted, the MUSICA Acquisition Workstation may reconnect to a different access point if the option “Connect automatically” in the Windows WiFi settings is enabled.

Do not enable the option “Connect automatically” when connecting to the hospital network or to a DR detector.

2.2 Labels

The meaning of the labels is listed in the following documents:

- XD 10 / XD⁺10 User Manual on the Agfa MedImg Library
- XD 14 / XD⁺14 User Manual on the Agfa MedImg Library
- XD 17 / XD⁺17 User Manual on the Agfa MedImg Library

An example of the type labels is shown in section 1.5.

3 Pre-Installation

A DR Detector cannot be used as a standalone device. It is always part of a DR system.

Pre-installation activities are therefore described in the corresponding system Service Manual.

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4 Installation and configuration

4.1 Installation overview

4.1.1 Required time for the installation



REQUIRED TIME:
Average required time: 1 to 2 hours

- 15 min. to 1 h Hardware installation
- 15 min. Software installation
- 15 min. Configuration
- 15 min. Installation verification

4.1.2 Required software

Minimum required software for XD Detectors:

- NX 23.00 SU1*
- VDI 4.0; strongly recommended: VDI 4.1 (or later version)
- VDI ≥ 4.0 requires Windows 7 HotFix 7.0.096 or later. No minimum HotFix version for Windows 10 required.

* NX 23.00 SU1 has an improved grid line suppression algorithm for the combination “XD Detector / 132 lpi anti-scatter grid”.

If an access point, other than the SCU Mini is used in the system:
The required software for access point setup is listed in the *DR wireless networking Service Manual*, Document ID 58221971 or offline replication.

4.1.3 Required hardware

The required hardware depends on the system order or the replacement scenario.
The complete set of required hardware is listed in section 1.2.
For order numbers and related bill of material refer to the corresponding system service information.

4.1.4 Restrictions

For restrictions when combining an XD Detector with other Detector types, refer to the DR Detector - basic configuration guide, Document ID 68310512 or offline replication. Especially observe rule #1. For restrictions in case of a fixed cable connection refer to section 1.9.

4.1.5 Required documents

Refer to the list of documents in section 0.3.

4.1.6 Installation steps overview

The installation steps depend on the use case. Refer to table below:

#	Use case	Typical DR system	Use case short name	Quick installation guide
1	Detector connects wireless to an SCU or SCU mini	Adding a XD Detector to a DR system with SCU, for example DR 400 or DX-D 100	Wireless / SCU mini	Figure 36
2	Detector connects wireless to an access point	Adding a XD Detector to a DR system with access point, for example DR 100e, DR 100s, DR 400	Wireless / Access Point	Figure 37
3	Detector is connected via cable to an SCU lite	DR Retrofit system with cabled Detector	Wired	Figure 38
4	Tablet or notebook connects to Detector in AP (Access Point) mode	Ultra mobile DR, also known as DR mobile Retrofit	DR mobile Retrofit	Figure 39

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	1 Wireless / SCU mini	2 Wireless / Access point	3 Wired	4 DR mobile Retrofit	Reference
Preparation					
Check delivery	✔	✔	✔	✔	4.2.1
Get familiar with Detector operation	✔	✔	✔	✔	4.2.2
Hardware and software installation					
Install network interface	✔	✔	✔	✘	4.3.1
Connect cables	✔	✔	✔	✘	4.3.2
Install network interface card driver	✔	✔	✔	✘	4.3.3
Install VDI software	✔	✔	✔	✔	4.3.4
Configuration					
Configure network interface	✔	✔	✔	✘	4.4.1
Establish connection PC - Detector	✔	✔	✔	✔	4.4.2
Configure Detector with Vivix tool	✔	✔	✔	✔	4.4.3
Configure SCU with Vivix tool	✔	✔	✔	✘	4.4.4
Configure Detector with VDI Panel Installation Tool	✔	✔	✔	✔	4.4.5
Configure Detector with NX Configuration Tool	✔	✔	✔	✔	4.4.6
Check WiFi connection	✔	✔	✘	✔	4.4.7
Setup of Detector on additional systems					
Configure detector sharing	✔	✔	✔	✔	4.5
Calibration					
Calibrate detector	✔	✔	✔	✔	4.6
Service Quality Test (SQT)					
Perform SQT	✔	✔	✔	✔	4.7
Customer Training					
Perform user training	✔	✔	✔	✔	4.8

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4.1.7 Quick installation guide

For a quick installation guide refer to the figures below.

An overview which describes use case and typical DR systems per quick installation guide is available in section 4.1.6.

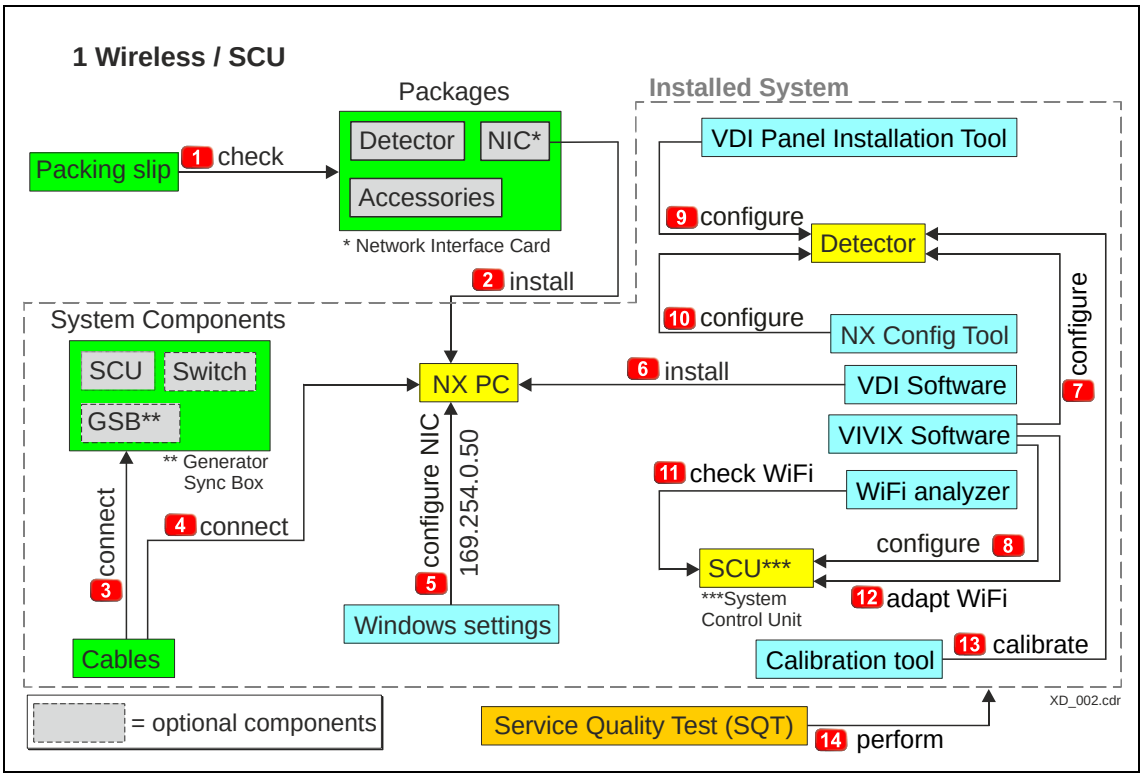


Figure 36

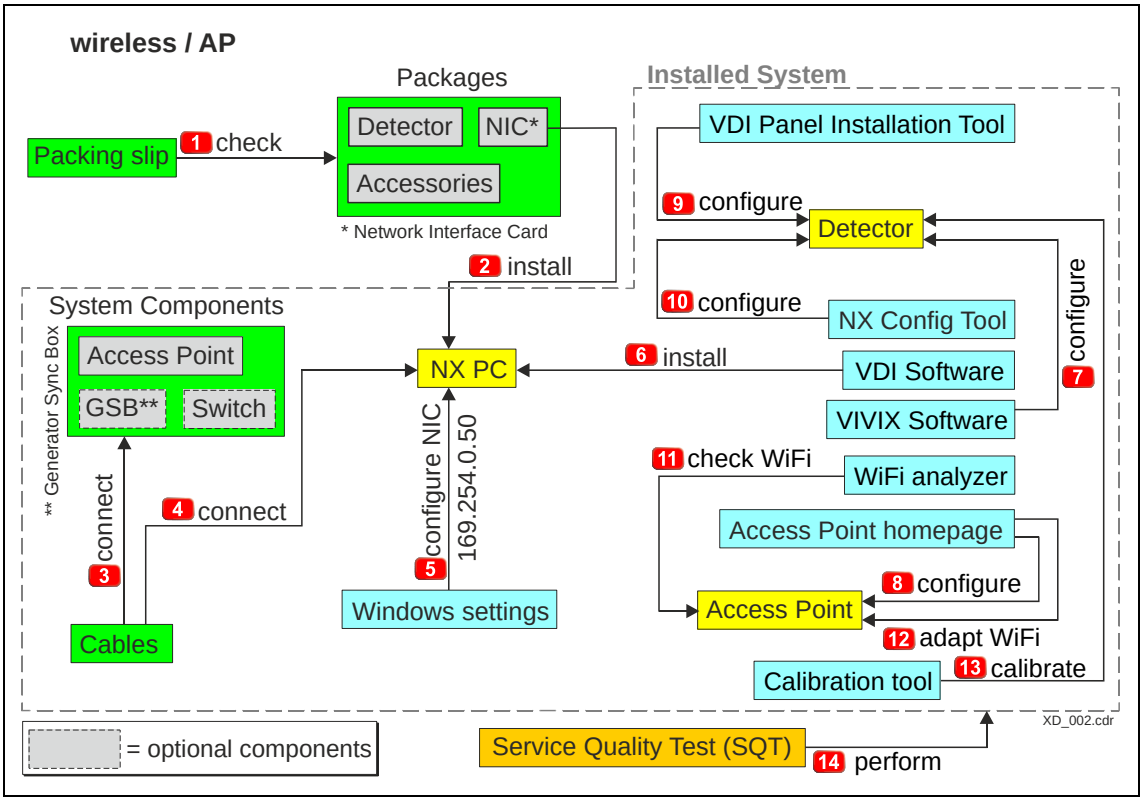

wireless / AP
Packages
Installed System
Packing slip
1 check
Detector
NIC*
Accessories
* Network Interface Card
2 install
VDI Panel Installation Tool
9 configure
Detector
10 configure
NX Config Tool
configure
7
System Components
Access Point
GSB**
Switch
** Generator Sync Box
NX PC
6 install
VDI Software
VIVIX Software
11 check WiFi
WiFi analyzer
Access Point homepage
8 configure
Access Point
12 adapt WiFi
13 calibrate
Calibration tool
connect
3
4 connect
configure NIC
169.254.0.50
5
Windows settings
Cables
XD_002.cdr
= optional components
Service Quality Test (SQT)
14 perform

Figure 37

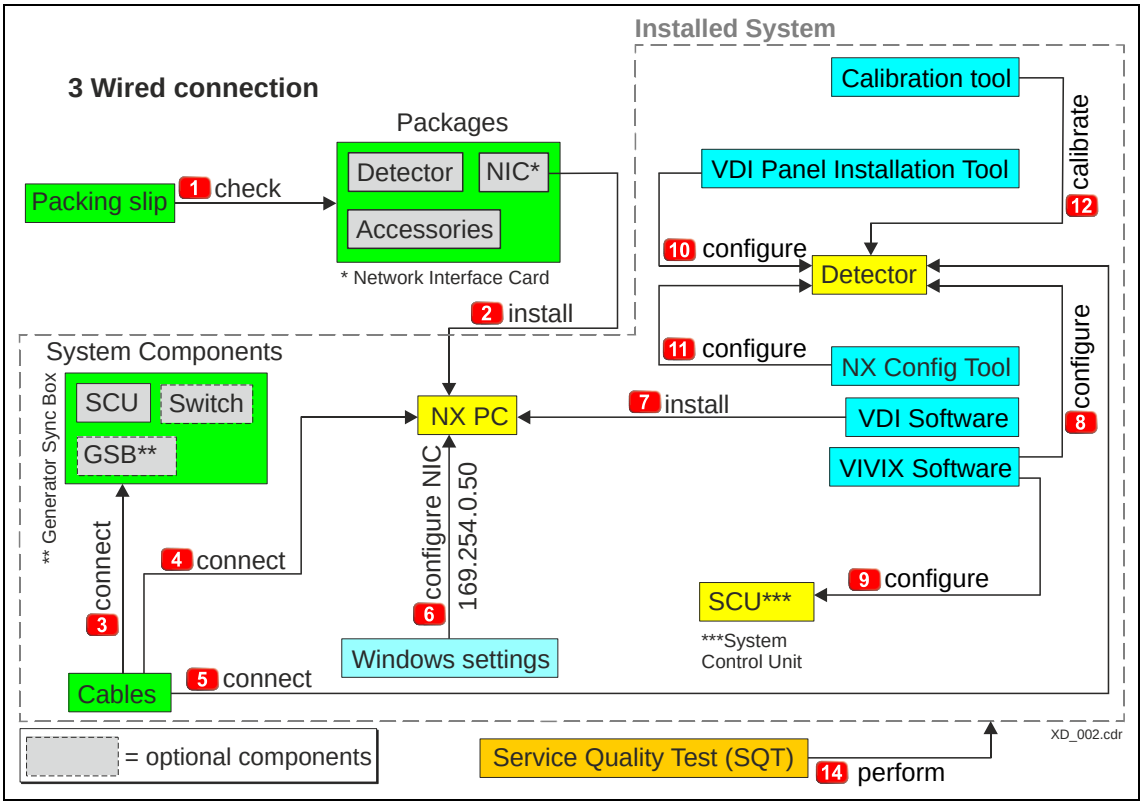


Figure 38

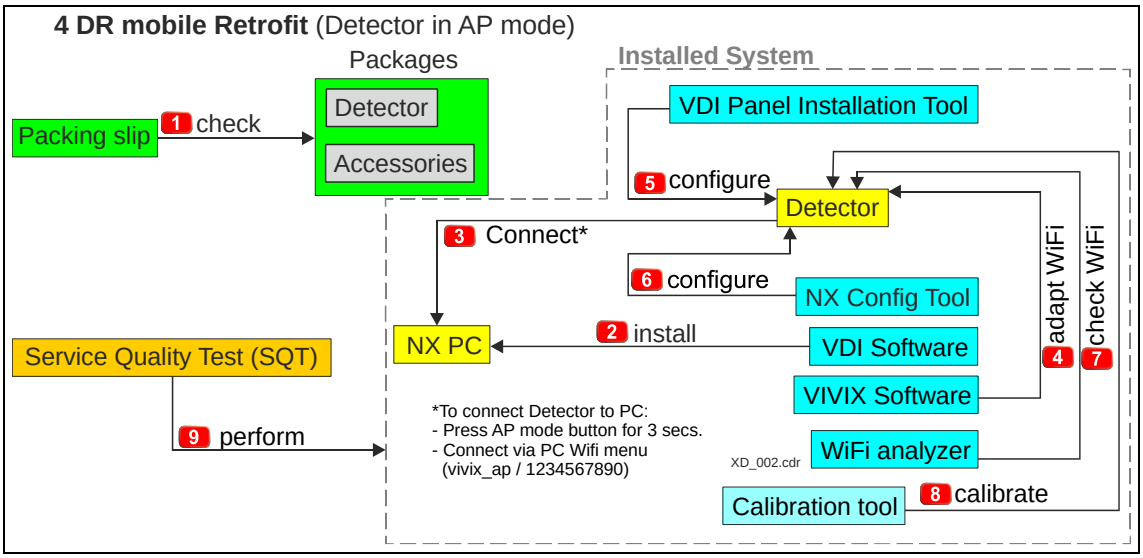


Figure 39

4.2 Preparation

4.2.1 Checking delivery

(1) Check shipment completeness by comparing it with the packing list.
(2) In case of missing parts, escalate to the next support level.
(3) Save a detector packaging to be prepared for a detector return.

4.2.2 Getting familiar with the operation of the Detector

(1) Use the following information to get familiar with the components and the operation of the Detector:
- Section 1.2, Components of the product
- Section 1.4, Connections and LEDs at the DR Detector
- Section 1.15, Operation basics
- Video “Operating the XD Detector”, Document ID 76425471 or offline replication

4.3 Hardware and software installation

4.3.1 Installing the network interface(s) in NX

Purpose

The network interface card (NIC) is the interface from Detector to NX. One network interface can be used for up to four XD detectors.

The NIC which is used for XD Detectors, can also be used for other Detectors. For details refer to rule #1 in the DR Detector - basic configuration guide, Document ID 68310512 or offline replication.

In mobile DR systems like DR 100e, DR 100s and DX-D 100, the NIC is already installed ex factory. For ultra mobile DR systems, also known as DR mobile Retrofit (tablet or notebook PC), this step is not applicable, because the internal WiFi module is used to connect to the XD Detector in AP mode.

(1) Stop NX and power off the PC.
(2) Disconnect the power cable.
(3) Use electrostatic discharge precautions, for example an antistatic wristband.
(4) Open the PC cover and mount the network interface card(s). For a PCIe Intel Gigabit CT Desktop adapter, use slots A, B or C. Do not use slot D. For details refer to video “Mounting a network interface card”, Document ID 76358952 or offline replication.
(5) Close the PC cover and connect the power cable.

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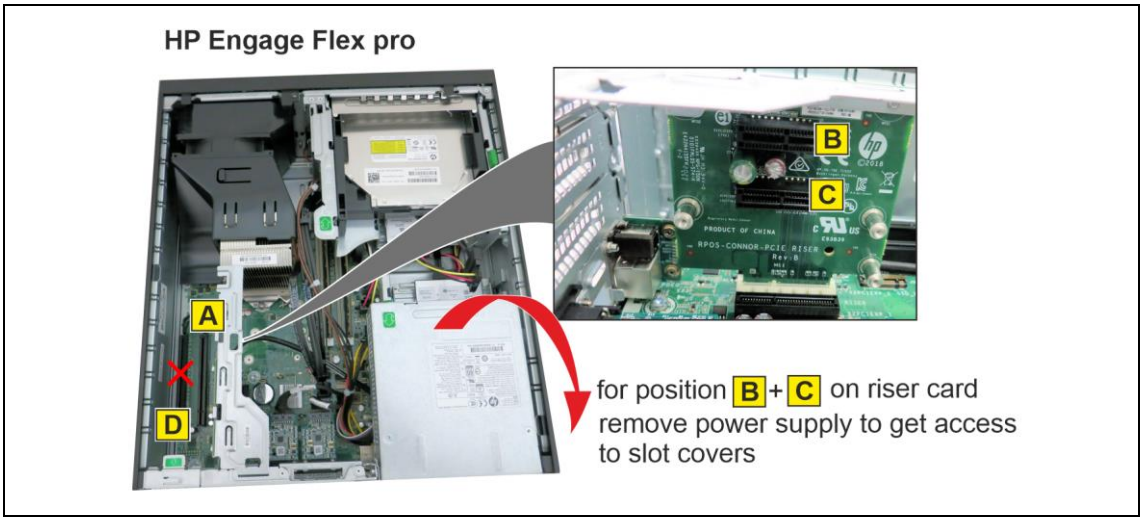


Figure 40

4.3.2 Connecting cables

(1) Connect cables depending on the system setup. Examples are shown in section 13.

4.3.3 Installing the network interface card driver

(1) Power on the MUSICA Acquisition Workstation.
The driver software for the new network interface card will be installed automatically.
In case the “Found new Hardware Wizard” appears, select **Install the software automatically**.

(2) Go to **Control Panel > Device Manager > Network Adapters**.

(3) Confirm that the installed network interface card is visible.

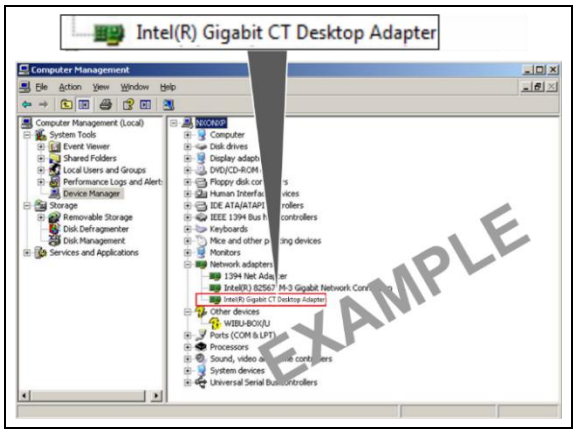


Figure 41

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4.3.4 Installing VDI software

Purpose The VDI Software enables communication between DR Detector and the XRDI (X-ray device interface) software of NX.

The VDI software (for example VDIDetectorSoftware_4.0.0900.exe) can be installed on NX in three ways:

1. Manual installation by executing the single installer file.
2. Semi-automatic installation using the Activation Utility Helper.
3. Automatic installation using the ELMS software collection tool.

All three ways of updating NX are described in the NX Service Manual section 11, Upgrade Installation.

Here described: A short version using the Activation Utility Helper.

(1) Copy the VDI installer to **C:\Agfa\Healthcare\NX\Installers\VDIDetectorSoftware** on NX.

(2) Load the new NX license file with the XD Detector license.

(3) If the NX is already configured, start the NX Configuration Tool and export the configuration.

(4) Select **MUSICA Acquisition Control Center > Service > Install Tools > Activation Utility Helper** and follow the further instructions.

(5) If the NX is already configured, start the NX Configuration Tool, import and activate the configuration.

4.4 Configuration

4.4.1 Configuring the network interface card (NIC)

Purpose The network interface card for communication with the access point or SCU needs a fixed IP address. This section describes the setup.

This step is not required for an ultra mobile DR system (also known as DR mobile Retrofit) where the Detector is used in AP mode.



IMPORTANT:

The IP addresses listed in this section and shown in the screenshots are based on the recommended and default system IP addresses. Refer to section 1.13. In case of other IP addresses observe IP addressing rules and the default IP addresses of the system components.

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(1) Enter **Network Connections** in the Windows search window and select **View Network connections**.

(2) On the NX disconnect all network cables except the cable to the newly installed NIC. This facilitates detecting the correct NIC.

(3) Double-click **Ethernet2** (can also be named for example Ethernet3).



Figure 42

(4) Click **Properties**.

(5) Select **Internet Protocol Version 4 (TCP/IPv4)**.

(6) Click **Properties**.

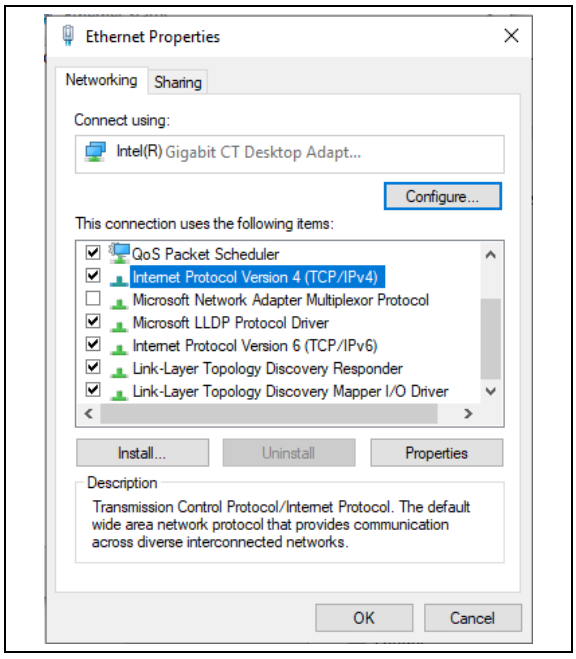


Figure 43

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(7) Enter IP address **169.254.0.50** / Subnet mask **255.255.0.0**.
(8) Click **OK**.
(9) Click **Close**.

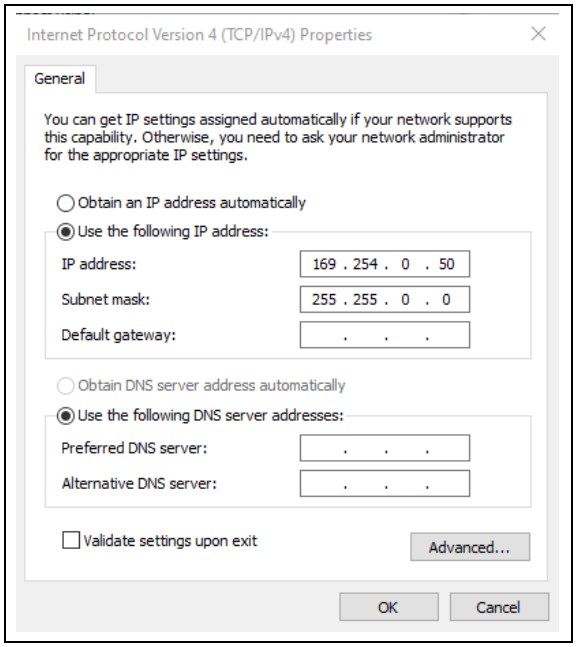


Figure 44

With the following steps the NIC performance is optimized for the use with the XD Detector. The following steps are based on the PCIe Intel Gigabit CT desktop adapter. Steps for the Intel I210-T1 network adapter are listed in the appendix, section 4.9.4.

(10) Clear all checkboxes except:
- ViVix Device Driver driver
- TCP/IPv4
- TCP/IPv6

(11) Click **Configure**.

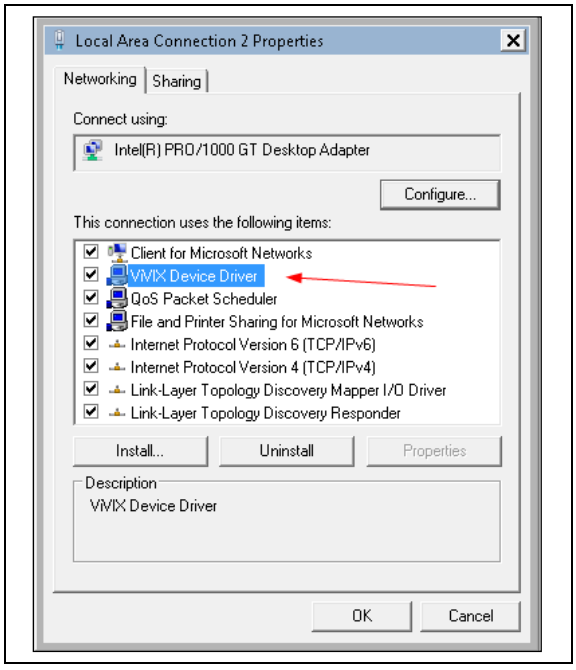


Figure 45

(12) Click the **Advanced** tab.

(13) Set **Jumbo Packet** to the maximum available value (here: 9014 Bytes).

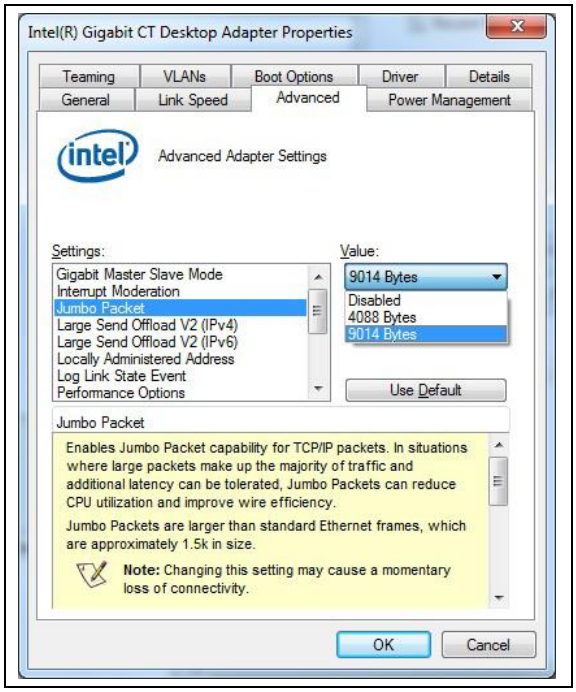


Figure 46

(14) Select **Performance Options** and click **Properties**.
Continue with step (19) if this Settings menu is not available.

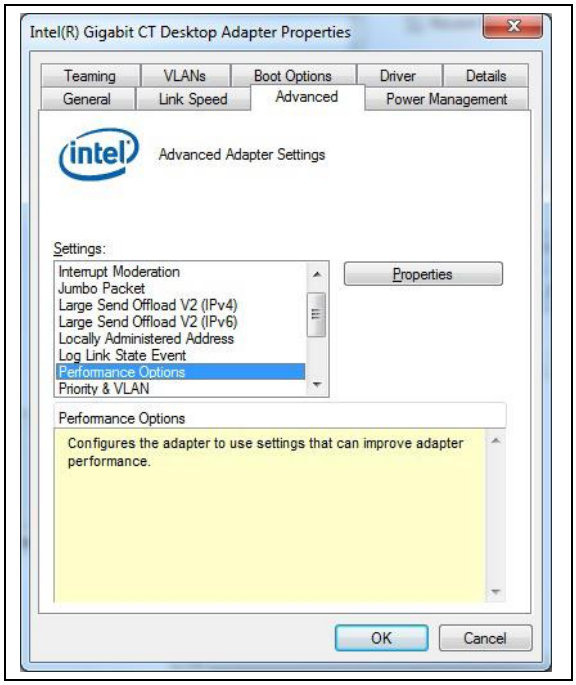


Figure 47

(15) Set **Flow Control** to **Rx & Tx Enabled**.

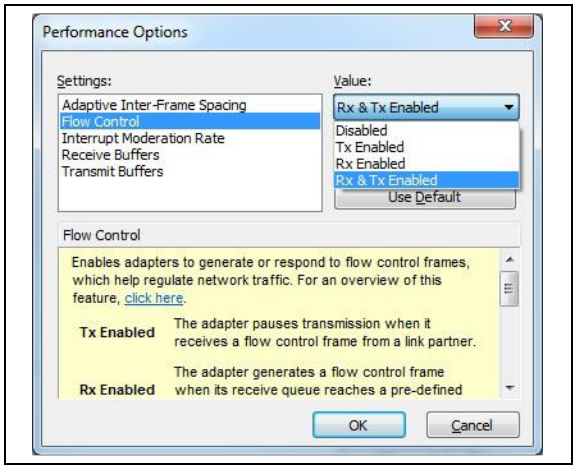


Figure 48

(16) Set **Interrupt Moderation Rate** to **Extreme**.

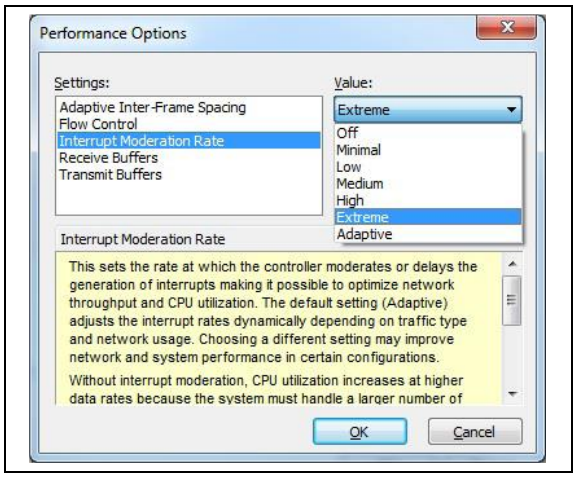


Figure 49

(17) Set **Receive Buffers t**o the maximum value (here: 2048).

(18) Click **OK**.

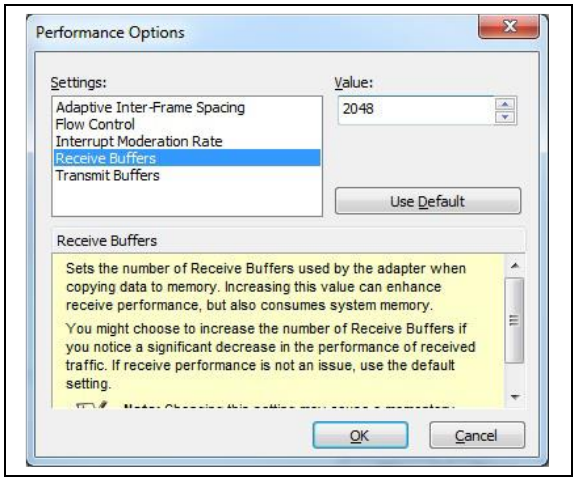


Figure 50

(19) In the Power Management Tab, clear the **Allow the computer to turn off this device to save power** checkbox.

(20) Click **OK**.

(21) Close all network configuration windows.

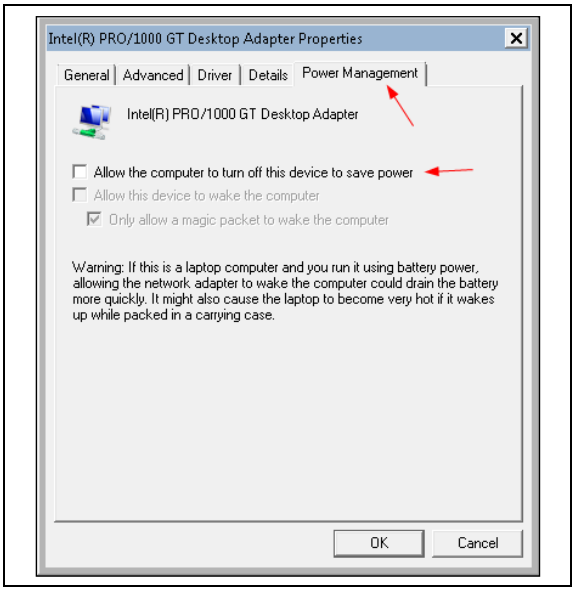


Figure 51

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4.4.2 Establishing the connection between PC and Detector

Purpose

With this step the connection between PC and Detector is established. This is a basic prerequisite to get access to the Detector for configuration.

Skip this step if the SCU* mini is used as access point. SCU mini and Detector connect to each other by the default settings.

NOTE:

* The large SCU is not sold with an XD Detector, but can be used from an already installed system. Setup of a XD Detector on SCU or SCU mini is identical. See also the comparison of SCU and SCU mini in section 1.2.2. Further in this document, only the SCU mini is mentioned and can be seen as a synonym for SCU and SCU mini.

Case 1: Connection between PC and Detector by an external access point, for example Aruba 303 (Detector used in WiFi mode).

(1) Configure the access point as described in the *DR wireless networking Service Manual*, Document ID 58221971 or offline replication.

The following initial SSID and PSK / passphrase have to be configured:

- SSID: **vivix**
- Passphrase: **1234567890**

Case 2: Detector used in access point mode in an ultra mobile DR system, also known as DR mobile Retrofit (Notebook or tablet PC used in WiFi mode).

(1) Press the AP mode button for 3 seconds: The display shows the access point icon 

.

(2) On the notebook PC or Tablet connect to the Detector by clicking the WiFi icon in the taskbar. The default SSID used for access point mode is **vivix_ap**, the default key is **1234567890**. WiFi parameters: 5 Ghz band, channel 36, 40 MHz bandwidth.
Do *not* select **Connect automatically** in the Windows WiFi settings. See also safety note in section 2.1.

NOTE:

The IP address of the WiFi module on the tablet or notebook must stay on “obtain IP address automatically” (= default).

4.4.3 Configuring the Detector with the Vivix tool

Purpose This step configures the Detector.

(1) Stop NX.
(2) Power on the SCU mini (if available) and the Detector.
(3) Start the Vivix Tool: **MUSICA Acquisition Workstation Control Center > Service > VIVIX Tool**.

(4) Click **Refresh device list** if not all active devices (XD Detectors; SCU mini) are shown.
(5) Double-click each line to make the device active, indicated by a bright green background.
Refer to Troubleshooting section 7.2.4.2 in case of a strange behavior of the Vivix tool.
(6) Click **Next**.

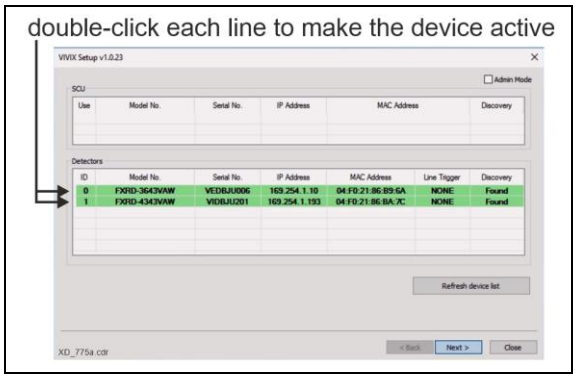


Figure 52

NOTE:

- Figure 52 shows a setup with two XD Detectors, without SCU mini.
- An “SCU mini” is shown in the SCU pane, an “SCU lite” is not shown.
- The **Model No**. corresponds to the Vieworks product codes. The corresponding Agfa product names are listed in section 1.2.
- Refer to page 39 for the meaning of the color codes of the Vivix Tool.

(7) Click **Configuration** on the Detector which shall be configured.

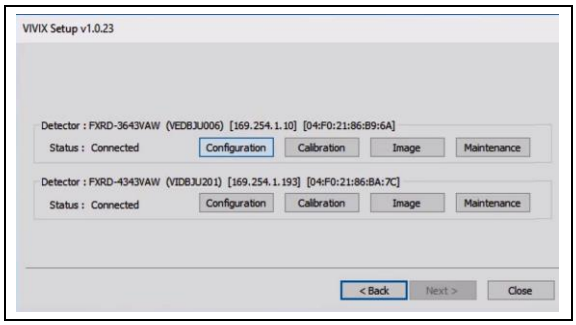


Figure 53

(8) Perform the settings as shown in the table below, depending on the use case.

(9) Click **Set Config**.

(10) Click **Close**.

(11) Repeat configuration for the 2nd Detector, if available.

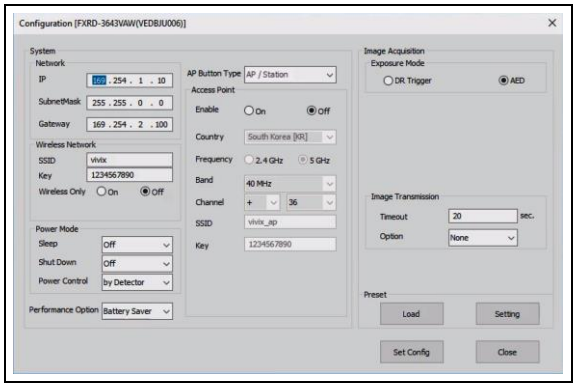


Figure 54

Settings different from factory defaults, depending on the desired configuration.
For factory defaults refer to parameters listed in section 8.3.

Use case (more than one possible)	Setting in Vivix Configuration
Detector is used in access point mode	In the **Access Point** pane set **Access Point** to **Enable – ON** (also performed by pressing the AP mode button for 3 seconds if “AP Button Type” is set to AP / Station). Adapt Frequency, Band and Channel to the recommendations in the *DR wireless networking Service Manual*, section 1, Document ID 58221971 or offline replication. If the PC also shall connect to the hospital WiFi, the registry needs to be adapted. Refer to instructions in section 4.9.2. See also section 1.12 which explains the access point mode.
Detector is used in WiFi client mode	Initially, no change required. Later on, before hand-over of the system to the customer, adapt SSID and key.
Detector is cabled and shall be automatically powered on / off by the SCU (mini or lite) or by the USB power connector.	In the **Power Mode** pane set **Power Control** to **by SCU**. For details refer to section 1.16.
A preview image shall be sent to NX. This way the user can see a low quality image in NX a few seconds before the actual image arrives.	In the Image Transmission pane change the **Option** dropdown from **None** to **Preview**.

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Use case (more than one possible)	Setting in Vivix Configuration
Detector in WiFi client mode is shared on other DR systems	Set **AP Button Type** to **Preset Switching**. In the **Preset** pane click **Setting** and configure the different WiFi network connections. Refer to instructions in section 4.9.3.

4.4.4 Configuring the SCU (mini) with the Vivix tool

Purpose This step optimizes WiFi connection between Detector and SCU (mini).
It is only required if a SCU or SCU mini is part of the system.

(1) Stop NX.
(2) Power on the SCU mini and the Detector.
(3) Start the Vivix Tool: **MUSICA Acquisition Workstation Control Center > Service > VIVIX Tool**.

(4) Click **Refresh device list** if not all active devices (XD Detectors; SCU mini) are shown.
(5) Double-click the line which shows the SCU parameters.
(6) Enable **Admin mode**.
(7) Click **Next**.
(8) Enter user name admin and password **1234**

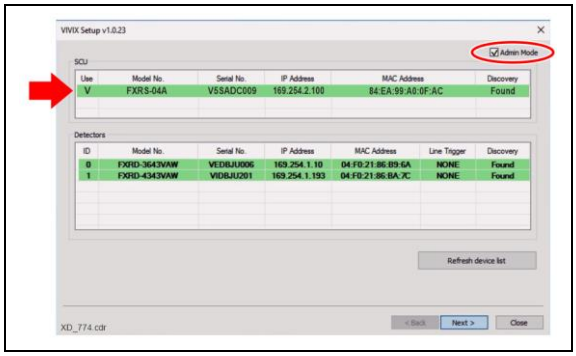


Figure 55

(9) Click **Configuration**.

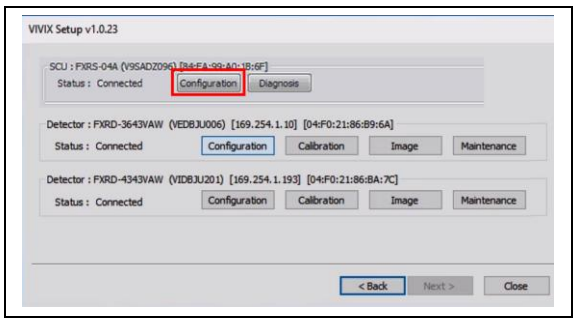


Figure 56

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(10) Use a Wifi scanner on the mobile phone to check a possible WiFi channel overlap.

(11) Adapt the **Country** parameter.
If the country is not listed, choose a country which meets the local requirements.

(12) Adapt **Frequency**, **Band** and **Channel** if required. For details refer to the *DR wireless networking Service Manual*, section 1, Document ID 58221971 or offline replication.

(13) Click **Set Config**.

(14) Click **Close**.

(15) Close the Vivix Tool.

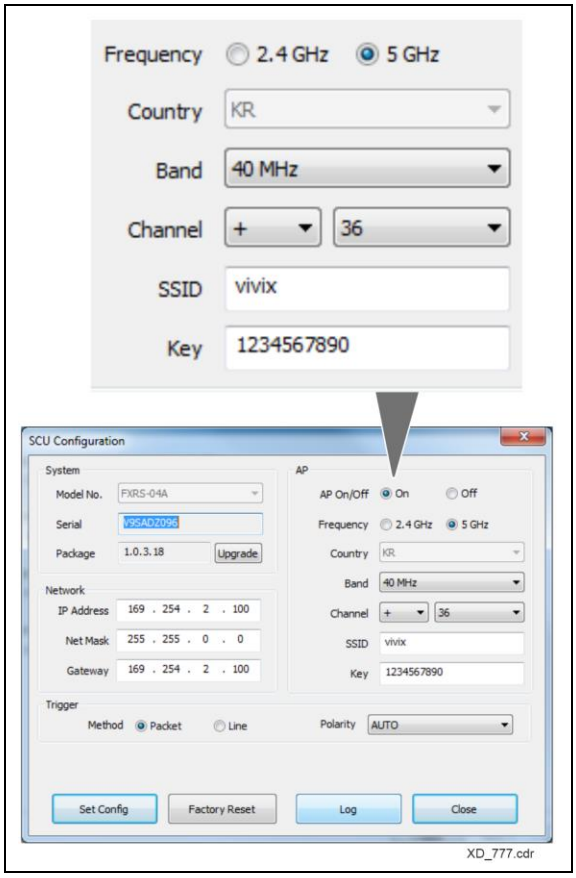


Figure 57

4.4.5 Configuring the Detector with the VDI Panel Installation Tool

Purpose The Vivix tool is provided by Vieworks for Detector configuration. The missing functions which are required to integrate the Detector into an Agfa system are provided by the VDI panel installation tool and NX Configuration Tool.

(1) Stop NX and close the Vivix tool (if not yet done).

(2) Power on the Detector.

(3) Start the VDI Detector Installation Tool: **MUSICA Acquisition Workstation Control Center > Service > VDI Panel Installation Tool**.

(4) In case of two or more Detectors: Ensure to select the correct Detector on tab (C).

(5) Check line (H) **Agfa dedicated panel**: It must show **This panel is an Agfa panel**. If the display shows, that this is not an Agfa Panel (Panel = DR Detector), click button **Check again**.

(6) For each Detector, fill-in Clipping Threshold (E) value **60000**.

(7) Click button (K) **Create InstalledPanel.xml**.

(8) If **`Firmware too old`** is displayed in line (I), perform a firmware update. Refer to instructions in section 11.2. Additional step for firmware update to V 1.0.6.0: If the Detector is listed in the attached Excel document, also run the LDG configurator. Refer to instructions in section 11.3.

(9) If the Detector is mounted in a Bucky for fixed Detectors, click checkbox (F) **Use as Fixed panel**.

(10) Write down Model file name in line (G) (available as of VDI 4.2 only). This is required later on when configuring the Detector on NX.

(11) For more information to the VDI Panel Installation Tool refer to table next page.

(12) Click **Close** (M).

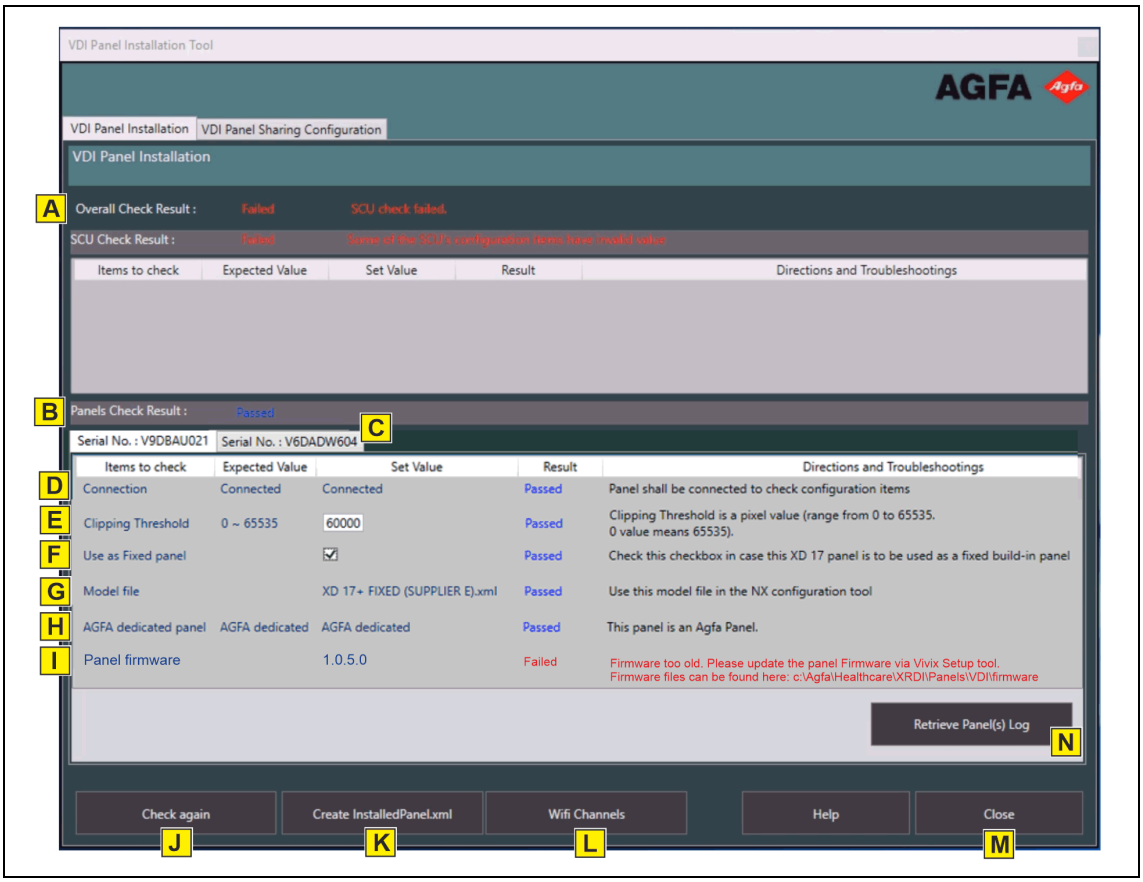


Figure 58

Description of VDI Panel Installation Tool parameters and displays:

Item	Name	Instruction / comment
A	Overall Check Result	Passed or Failed
B	Panel Check Result	Passed or Failed
C	Panel tab	This tab is used to switch between the installed panels.
D	Connection	Passed or Failed
E	Clipping Threshold	This parameter influences image quality and must be set to 60.000. See also NOTE below. This value is written to the NX when clicking button “Create InstalledPanel.xml”.
F	Use as Fixed panel	This parameter is used to determine the correct model file to be displayed in line (G) and to be used during Detector configuration on NX. Parameter is only displayed for XD 17 / XD⁺17.
G	Model file	Parameter available as of VDI 4.2 to indicate which model file shall be used for the NX Configuration (refer to section 4.4.6.2). Determined by evaluation of the parameters sent by the Detector.
H	Agfa dedicated panel	Passed or Failed: Checks whether this is a Detector which has been manufactured on Agfa’s specifications.
I	Panel firmware	Passed or failed: Compares installed Detector firmware version with available firmware included in the VDI software.
J	Button “Check again”	Re-initiates the tests performed when starting the VDI panel Installation Tool
K	Button “Create InstalledPanel.xml”	By pressing this button, file InstalledPanel.xml is created, which is required by the NX Configuration tool during panel configuration.
L	WiFi Channels	This button is available, when running the tool on a PC with a Wifi module (Notebook, tablet PC). Opens a window showing the 2.4 and 5 GHz Wifi spectrum in the neighborhood.
M	Close	Closes the tool.
N	Retrieve panel log	Manually retrieve panel and shock log files. For details refer to section 7.1.

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NOTE:
With VDI 4.1, the default clipping threshold value of 65.535 for XD Detectors is changed to 60.000.
When upgrading to VDI 4.1, the clipping threshold value for XD Detectors is re-set to 60.000, no matter what was configured before.
When changing the clipping threshold value (for example to 59.200) and re-installing VDI ≥ 4.1 the adjusted clipping threshold value (in the example 59.200) is preserved.

4.4.6 Configuring the Detector with the NX Configuration Tool

PURPOSE This section describes how to configure the Detector on NX.

4.4.6.1 Performing X-ray device configuration

Purpose The X-ray device configuration defines the way, the NX communicates with the modality, this means with the generator. Skip this step, if the X-Ray Device is already configured.

(1) Start the NX Configuration Tool.
(2) Go to: **Devices > X-Ray Device Configuration**
(3) Select: **New**.

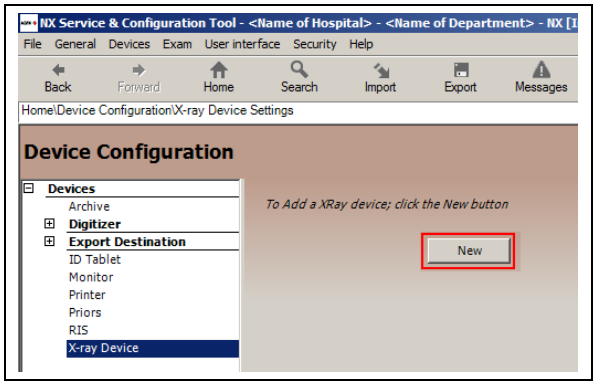


Figure 59

(4) Select: **Upload**

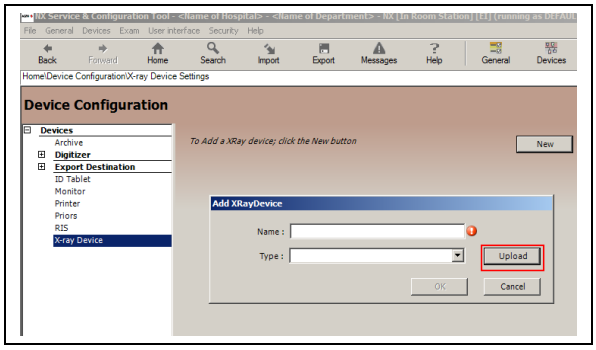


Figure 60

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(5) Open the required model file, depending on the system. Refer to table below.
(6) Click: **Open**
(7) Enter a name for the system (name not relevant for the function).
(8) Click: **OK**

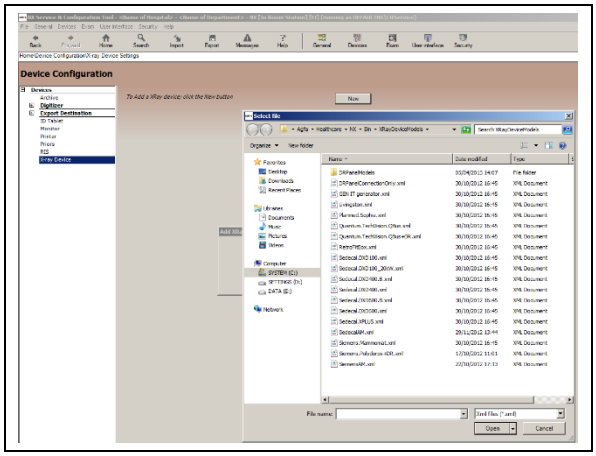


Figure 61

The following translation table for DR system model files is an excerpt from the XRDI Service Manual, Document ID 72453884 or offline replication:

DR system	X-Ray device model file to be selected
DR 100e Type 6012/003/004	Agfa.DR100e.xml
DR 100s Type 6013/100	Agfa.DR100s.xml
DR 400 Type 5520/100	Spellman.DR400.xml
DR 400 Type 5520/200	Agfa.DR400.xml
DR 600 Type 5530/100	Agfa.DR600.xml
DR 800 Type Type 6010/200	Agfa.DR800.xml
DX-D 100 system with a 20 kW generator	Sedecal.DXD100_20kW.xml
DX-D 100 system: All except 20 kW generator	Sedecal.DXD100.xml
DX-D 300 system	Sedecal.XPLUS.xml
DX-D 400, with or without Retrofit Box	SedecalAM.xml
DX-D 500 system	Siemens.Polydoros+DR.xml
DX-D 600 automatic system	Sedecal.DXD600.xml
DX-D 600 semi automatic system	Sedecal.DXD600.SemiAutomatic.xml
DX-D 600AM (analog manual)	SedecalAM.xml
Livingston Mammo generator (CR bridge)	Livingston.xml
Planmed Mammo generator	Planmed.Sophie.xml
Quantum solution CR and DR	Quantum.Techvisison.QBus+DR.xml

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DR system	X-Ray device model file to be selected
Quantum solution only CR	Quantum.Techvisison.QBus.xml
Retrofit system with Sedecal generator connection (XRDI connection)	SedecalAM.xml
Retrofit system with Siemens generator connection (XRDI connection)	SiemensAM.xml
Retrofit system without XRDI connection between NX and generator	DRPanelConnectionOnly.xml
Sedecal Retrofit	SedecalAM.xml
Siemens DXSi (XRDI 10)	GENIT generator.xml
Siemens DXSI Solution (from XRDI 15 and higher)	Siemens.DXSi.xml.xml
Spellman Retrofit	Spellman.Retrofit.xml
Siemens Mammo	Siemens.Mammomat.xml
Valory	Agfa.Valory1.xml

NOTE:
The following model files are for R&D purposes only:

- RetrofitBox.xml.
- AgfaPositionerController.DR400.xml
- AgfaPositionerController.DR600.xml.

4.4.6.2 Performing detector settings

(1) In the Detector Settings screen select: **Add**

(2) Select the detector model. Refer to table next page.

Note that as of VDI 4.2 the VDI Panel Installation Tool indicates which model file needs to be selected. Refer to section 4.4.5.

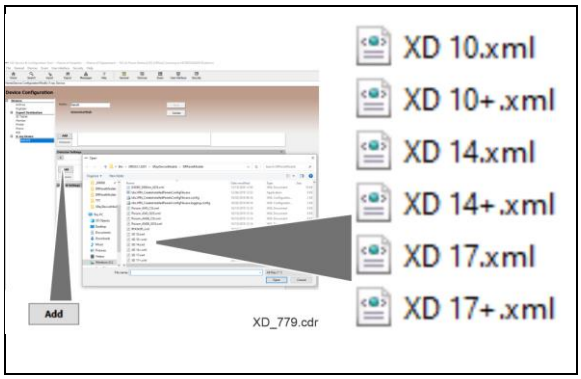


Figure 62

Model file name	Usage
XD Detectors	
XD 10.xml	XD 10; Third character of panel serial number = 'D'
XD 10+.xml	XD⁺10; Third character of panel serial number = 'D'
XD 14.xml	XD 14; Third character of panel serial number = 'D'
XD 14+.xml	XD⁺14; Third character of panel serial number = 'D'
XD 17.xml	XD 17; Third character of panel serial number = 'D'
XD 17+.xml	XD⁺17; Third character of panel serial number = 'D'
XD 17 FIXED.xml	XD 17 as fixed panel; Third character of panel serial number = 'D'
XD 17+ FIXED.xml	XD⁺17 as fixed panel; Third character of panel serial number = 'D'
XD Detectors with changed sensitivity. Refer to NOTE below.	
XD 10 (SUPPLIER A).xml	XD 10, supplier A; Third character of panel serial number = 'A'
XD 10+ (SUPPLIER A).xml	XD 10, supplier A; Third character of panel serial number = 'A'
XD 10+ (SUPPLIER E).xml	XD⁺10 - supplier E; Third character of panel serial number = 'E'
XD 14 (SUPPLIER A).xml	XD 14 - supplier A; Third character of panel serial number = 'A'
XD 14+ (SUPPLIER A).xml	XD 14 - supplier A; Third character of panel serial number = 'A'
XD 14+ (SUPPLIER E).xml	XD⁺14 - supplier E; Third character of panel serial number = 'E'
XD 17 (SUPPLIER A).xml	XD 17 - supplier A; Third character of panel serial number = 'A'
XD 17+ (SUPPLIER A).xml	XD 17 - supplier A; Third character of panel serial number = 'A'
XD 17+ (SUPPLIER E).xml	XD⁺17 - supplier E; Third character of panel serial number = 'E'
XD 17 FIXED (SUPPLIER A).xml	XD 17 as fixed panel; Third character of panel serial number = 'A'
XD 17+ FIXED (SUPPLIER A).xml	XD⁺17 as fixed panel; Third character of panel serial number = 'A'
XD 17+ FIXED (SUPPLIER E).xml	XD⁺17 as fixed panel; Third character of panel serial number = 'E'

NOTE:
The expression 'supplier' in the model file name refers to the supplier of the CSI layer. Depending on the supplier, different sensitivity settings are applied by the model file.
Black model files in the table above are new with VDI 4.1.
Blue model files in the table above are new with VDI 4.2.

(3) Select the Serial Number* from the drop down box.
(4) Enter a detector nickname.
(5) Label the Detector and Bucky with the detector nickname, to assist correct Detector identification.

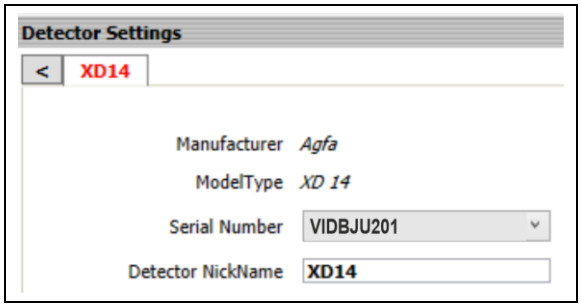


Figure 63

*Parameter read out from "InstalledPanel.xml" created with the VDI Panel Installation Tool.

IMPORTANT:

On a configuration with multiple DR detectors of the same type, it is required to apply labeling to the DR Detector containing a unique nickname for each DR Detector. The nicknames must be configured on the NX Workstation (refer to Figure 63). The DR Detector Switch in the NX GUI shows which DR Detector is active and shows its status, by means of the nickname of the DR Detector. An identical label is attached to the Bucky of the X-ray system to identify the dedicated workspace of each DR Detector.

NOTE:

When performing a **Test connection** right after configuration this usually fails. Waiting some seconds and repeating the test should result in a successful connection test.

(6) Adjust parameter **Trigger mode** to Self (AED) or Exposync Network. Refer to table next page.

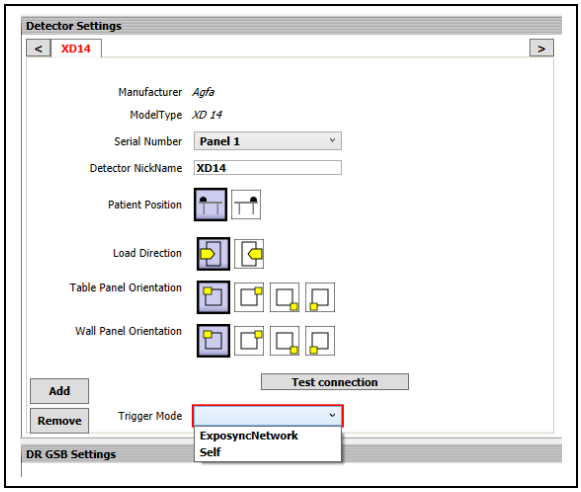


Figure 64

(7) Adjust DR GSB (Generator Sync Box) settings according the table below.
Two examples are shown in Figure 66 and Figure 67.

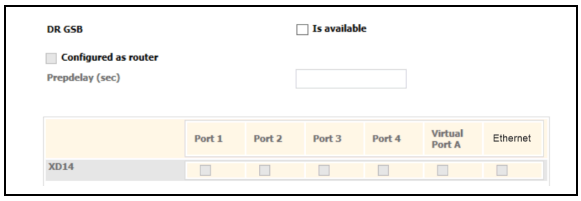


Figure 65

#	Case description	Typical DR system	Trigger Mode	DR GSB* "Is available"	DR GSB* Port
1	Detector does not synchronize with generator (AED) and no GSB* is used.	Ultra mobile DR, also known as DR mobile Retrofit (Tablet PC)	Self	Unchecked	n.a.
2	Detector does not synchronize with Generator (AED) and GSB* is used.	DR Retrofit without Generator integration	Self	Checked	Virtual Port A
3	DR Detector synchronizes with Generator via GSB*.	DR 400, DR 600, DR 800, DX-D 400, DX-D 500, DX-D 600, DR Retrofit with Generator integration, Valory with GSB	Exposync Network	Checked	Ethernet
4	DR Detector synchronizes via software component on NX, for example THS (for DR 100s).	DX-D 100, DR 100e, DR 100s, DX-D 300, Valory without GSB	Exposync Network	Unchecked	n.a.

* GSB = Generator Sync Box

NOTE:
For Retrofit Box parameters **Configured as router** and **Prepdelay** (if not configured as router) refer to the DR system specific Service Manual.

Example 1: Detector is used in AED mode and no Generator Sync Box available:

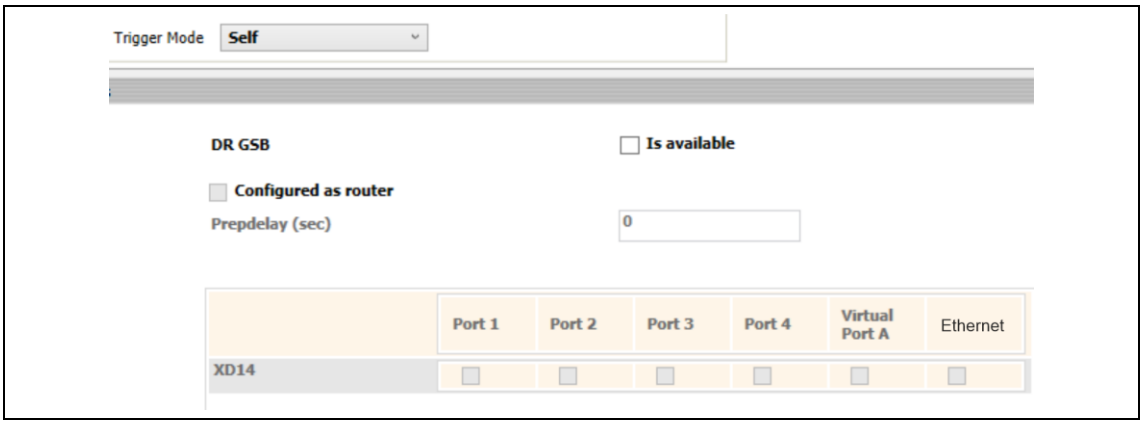


Figure 66

Example 2: Detector is used in software sync mode and Generator Sync Box available:

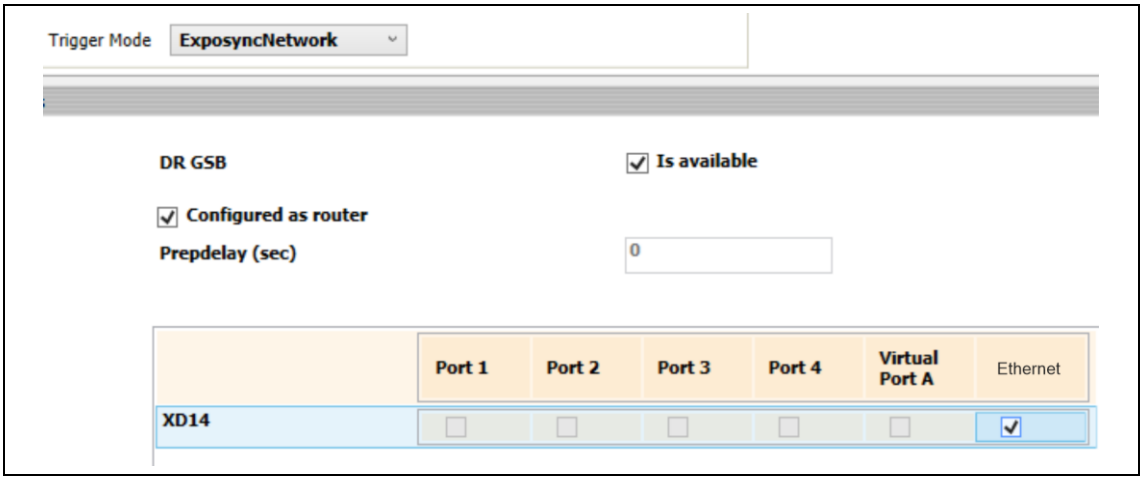


Figure 67

(8) Create or adapt exposures in the Exam tree for the newly configured detector.

4.4.6.3 Performing settings for the Offline Image Acquisition Workflow

(1) If the user intends to use the Detector for the Offline Image Acquisition Workflow, adapt the NX configuration as described in section 4.9.1.
The Offline Image Acquisition Workflow is described in section 1.19.

4.4.6.4 Activating the configuration

(1) In the NX Configuration Tool select: **File > Verify Configuration**
(2) Solve the errors and warnings, if any are displayed.
(3) Select: **File > Activate Configuration**
(4) Close the NX Configuration Tool.

4.4.7 Checking WiFi connection

(1) Stop NX.
(2) Start the Vivix Tool: **MUSICA Acquisition Workstation Control Center > Service > VIVIX Tool**.

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(3) Click **Refresh device list** if not all active devices (XD Detectors; SCU mini) are shown.

(4) Double-click each line to make the device active, indicated by a bright green background.

(5) Click **Next**.

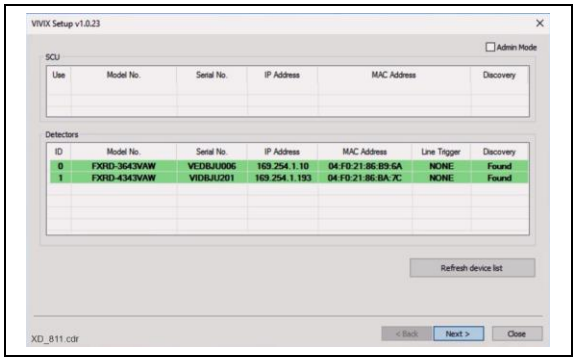


Figure 68

(6) Click **Maintenance** on one of the configured wireless Detectors.

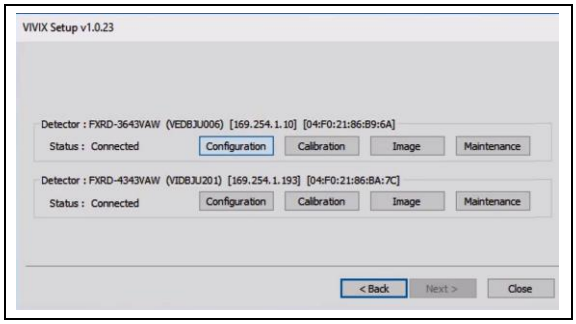


Figure 69

(7) Put the Detector on all locations where the Detector will be used (Bucky, on Table) and check parameter **Link Quality**. The value should be > 60 on all locations. Max value is 70.
In addition perform an **Image Transmission Time** test on all locations by clicking the **Download** button. Image transfer should be completed within maximum 6 seconds.

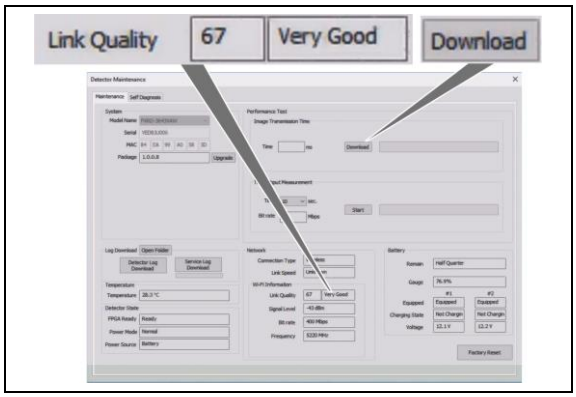


Figure 70

(8) If Link Quality is not optimal:

- Try a different location of the access point / SCU mini and / or
- Adapt Wifi parameters channel and bandwidth or
- Use another AP instead of a SCU: Aruba 303 supports WiFi standard 802.11ac, resulting in better WiFi performance

For details refer to the DR wireless networking Service Manual, section 1, Document ID 58221971 or offline replication

(9) Close the Detector Maintenance screen.

(10) Close the Vivix Tool.

4.5 Setup of the Detector on additional systems (Detector sharing)

(1) To setup the Detector on additional systems, refer to instructions in section 4.9.3.

4.6 Calibrating the Detector

(1) Calibrate the Detector. For instructions refer to section 5.

4.7 Performing the SQT

(1) Perform the Service Quality Test (SQT). Refer to section 6.

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4.8 Performing user training

The user training must contain at least the following functions:

1. **Functions independent of the configuration:**
   - Power on/off
   - Charging
   - OLED display
   - Battery replacement
   - Working with one battery only or without batteries in cabled setup. For details refer to section 7.2.1.2.

   For more information refer to the following videos:
   - Video - Operating the XD Detectors, Document ID 76425471 or offline replication
   - Video - Replacing the battery in a XD Detector, Document ID 76426744 or offline replication

2. **Functions in case of detector sharing (= XD Detector is also used on another modality)**
   - Changing between different modalities. Refer to the video “Operating the XD Detectors”, Document ID 76425471 or offline replication
   - Special behavior when pressing the AP mode button if optimal WiFi connection is already present. Refer to section 1.17.

3. **Functions in case of Detector access point mode configuration**
   - Connecting and disconnecting the Detector on NX. See also
     - Warning in section 2.1 and information in user manual *XD Detector as access point 0335*.
     - Section 1.12 which explains the AP mode.
     - Section 1.8.7 which explains usage of the Detector in AP mode in combination with a tablet PC.

4. **Functions in case the Detector is configured in AED mode**
   - Prerequisites for proper exposure in AED mode.
     For details refer to section 1.10.

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5. Functions in case of offline acquisition workflow

- Complete offline acquisition workflow if less than 18 (or 50*) images are acquired.
- Complete offline acquisition workflow if more than 18 (or 50*) images are acquired. In this case open recovery exams exceeding the maximum number of open exams have to be closed one by one to allow transferring a recovery image to a worklist entry.

* NX can only handle 18 (default) or 50 (with NX ICU CONFIGURATION license) open exams

For details refer to section 1.17 and to the XD Detector user manual.

6. Detector calibration

- Refer to the DX-D DR Detector Calibration Key User Manual 0134 (Agfa MedImg Library) to instruct the customer in Detector calibration. This must be performed each 6 months. A message on NX instructs the user to perform the calibration.
- Inform the customer, that in setup where the Detector is used without batteries (for example in a Bucky for a fixed DR Detector), the warning message D201 (no battery present) during Detector calibration does not indicate malfunction. The user can ignore this message and needs to click “Continue”.

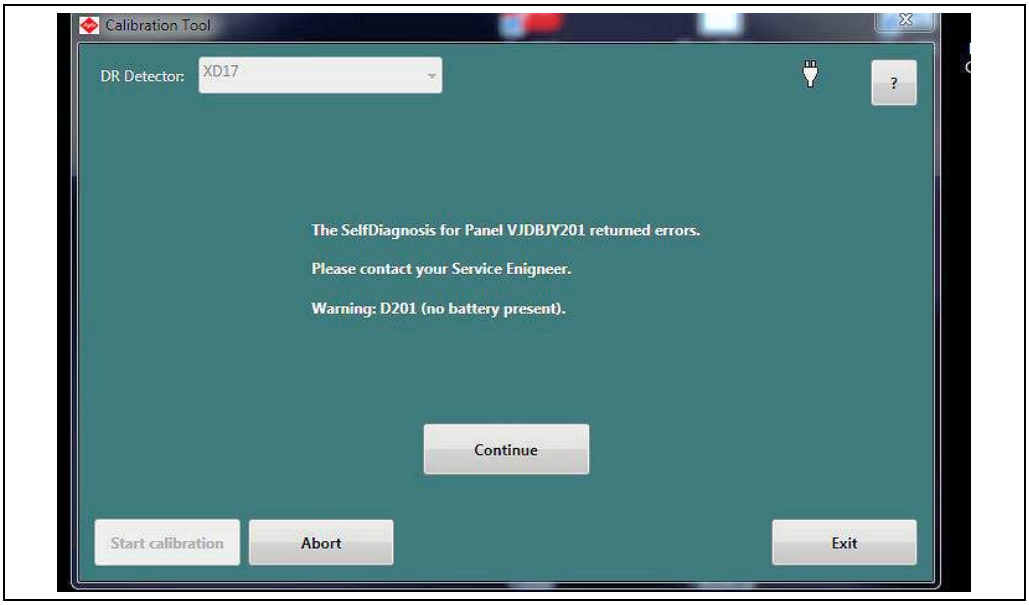


Figure 71

4.9 Appendix

This section contains seldom used installation steps.

4.9.1 Offline image acquisition workflow setup

This section shows the configuration settings in the NX Configuration tool. Background information for each step is available in section 1.19.

The following step is strongly recommended:

Although the XD Detectors can be operated with VDI 4.0 on NX 22.00 SU1 / XRDI 22, it is strongly recommended to use minimum NX 23.00 for the offline image acquisition workflow.

(1) If not yet done, upgrade the NX to ≥ NX 23.00.

The following steps are mandatory:

(2) Create one exposure named **Offline Mode**. This name is mandatory. It is not case sensitive.

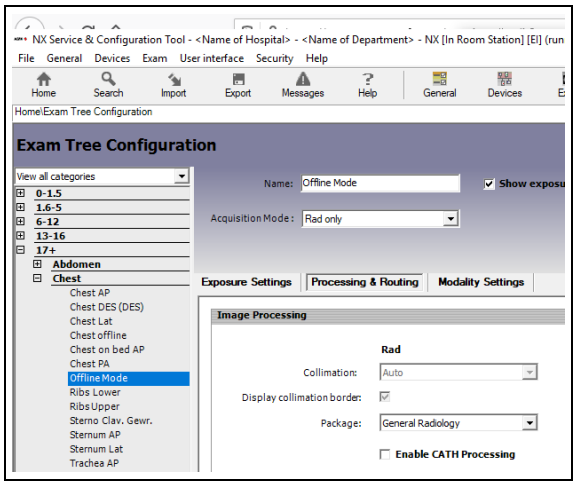


Figure 72

(3) Create one exposure for the DR Recovery Procedure. Name it for example **Recovery**. This name is *not* mandatory.

(4) Deselect the checkbox for **Show exposure in UI**.

(5) Deselect all checkboxes in the **Automation** pane.

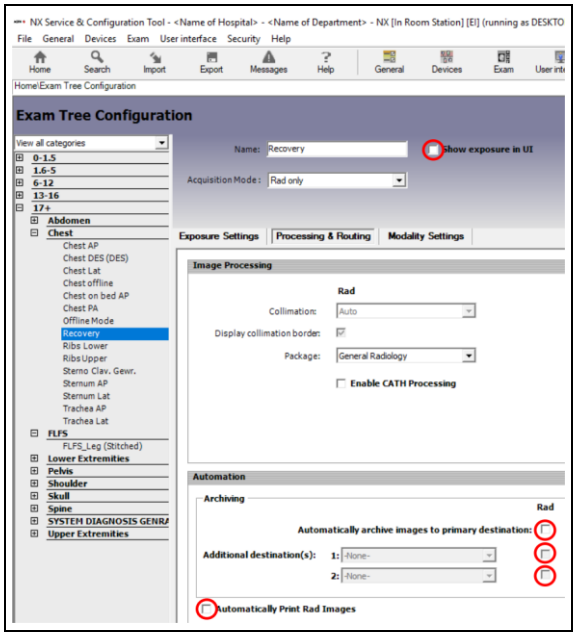


Figure 73

(6) In the **Device Configuration** click on **X-ray Device** and select the exposure, created in previous step, as **Exposure Type**.

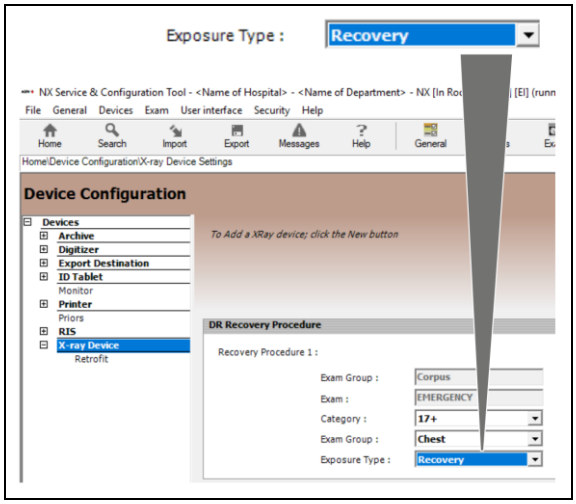


Figure 74

4.9.2 Adapting the registry to ensure IP address assignment

The following steps are required only, if the user switches manually between connection to the Detector, configured as an access point, and connection to the hospital Access Point.

This registry setting ensures that the PC always gets an IP address assigned after switching connection.

(1) Enter **regedit** in the search window of the PC.

(2) Hit **Enter**.

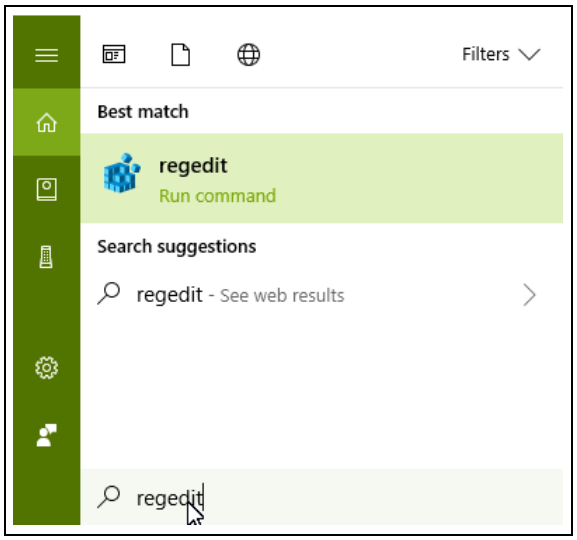


Figure 75

(3) Go to: **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\Tcpip\Parameters.**

(4) If parameter **DisableDHCPMediaSense** does not exist, right-click and select **New > DWORD (32 bit value)**

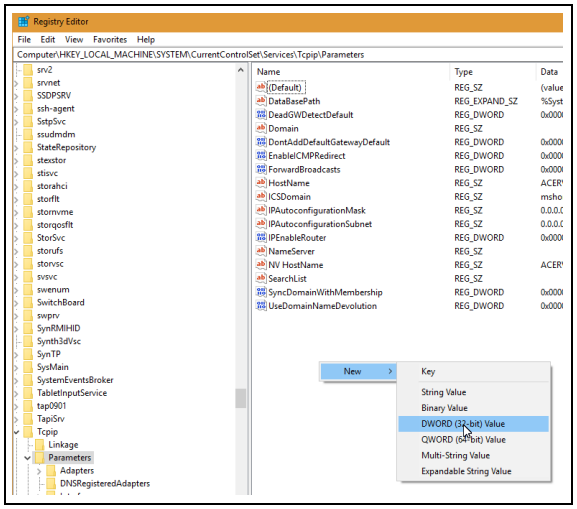


Figure 76

(5) Set DisableDHCPMediaSense value **0**.
(6) Click **OK**.

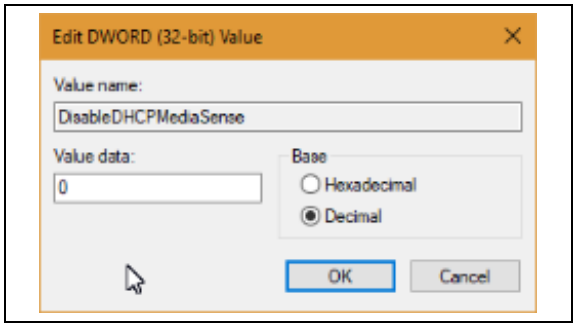


Figure 77

(7) Close the registry editor
(8) Reboot the PC.

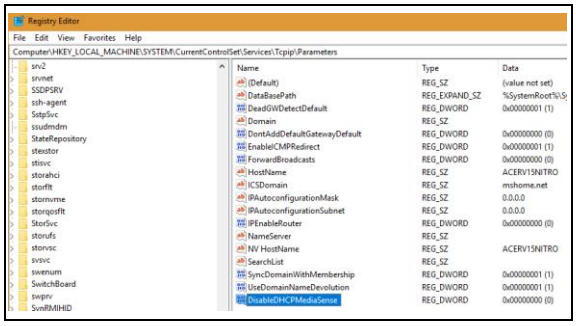


Figure 78

4.9.3 Detector setup in case of Detector sharing

Overview

In case of detector sharing, the sequence of steps is as follows:

Case 1: Detector is used in WiFi mode on one or more systems:

- Install Detector on the remote NX like described in this manual. Use IP address in the same subnet.
- Configure AP button type **Preset Switching.**
- Define presets. Refer to instructions next page.
- Perform Detector calibration on each system
- Perform SQT on each system

Case 2: Detector is used in WiFi client mode on the local system and Access Point mode on the remote system

- Configure AP button type **AP / Station**.
- Perform Detector calibration on each system
- Perform SQT on each system

Case 3: Detector is used in WiFi client mode on several systems and Access Point mode on another system:

- This configuration is not supported.

  Reason: Defining presets is not possible when the AP button is configured in AP / Station mode.

Case 4: Detector is used in access point mode on all systems:

- This configuration is not supported.

  Reason: This setup has not been tested. Only a clear 1:1 relationship “Detector in AP mode – NX” is supported.

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Preset configuration

(1) Start the Vivix tool: **MUSICA Acquisition Workstation Control Center > Service > VIVIX Tool**

(2) Go to **Configuration > Setting.**

(3) Enter a **Preset name** for the local system which is easy to recognize by the user. Refer to guidelines in section 1.17. Network settings are automatically filled in.

(4) Click **Add preset**.

(5) Enter a **Preset name** for the remote system.

(6) Enter **IP**, **NetMask** and **Gateway** of the Detector on the remote system.*

(7) Enter **SSID** and **key** of the remote system.

(8) Click **Add preset.**

* Detector must also be setup on the remote system like any other Detector.

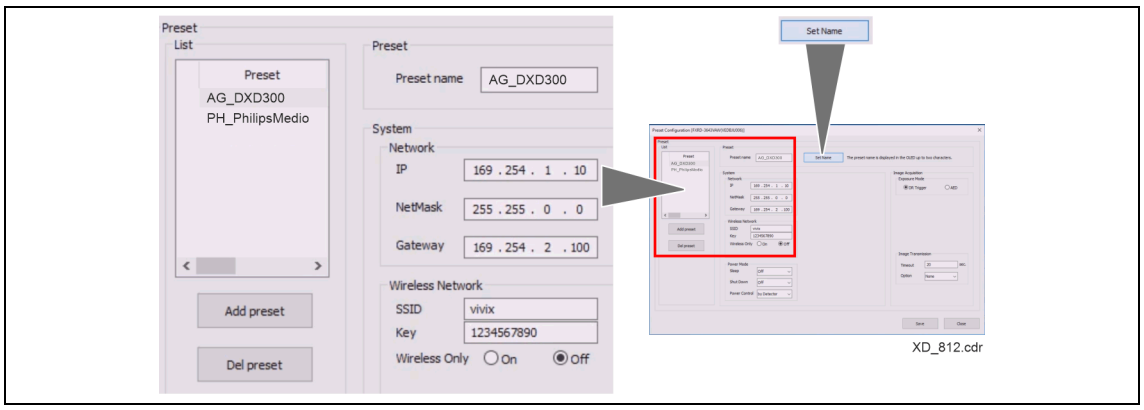


Figure 79

4.9.4 Optimizing the Intel I210-T1 network adapter performance

Section 4.3.1 lists the steps to optimize NIC performance for the PCIe Intel Gigabit CT desktop adapter.

This section describes the equivalent steps on the Intel I210-T1 network adapter.

(1) Clear all checkboxes except:
- VwFilter driver
- TCP/IPv4
- TCP/IPv6

(2) Click **Configure**.

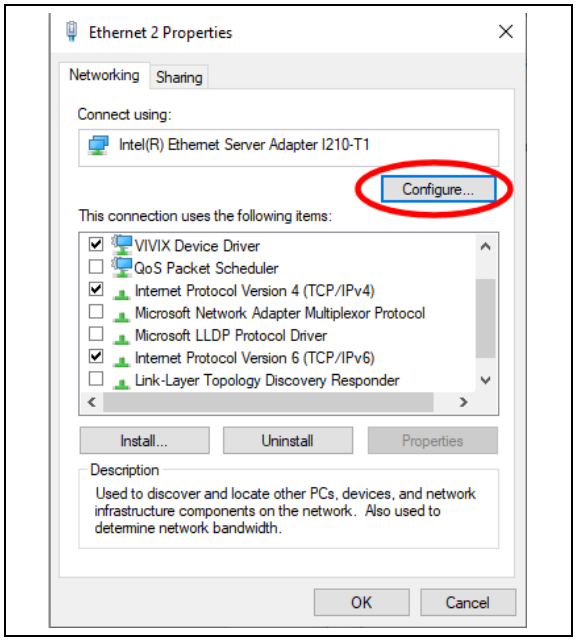


Figure 80

(3) Click the **Advanced** tab.

(4) Set **Jumbo Packet** to the maximum available value (here: 9014 Bytes).

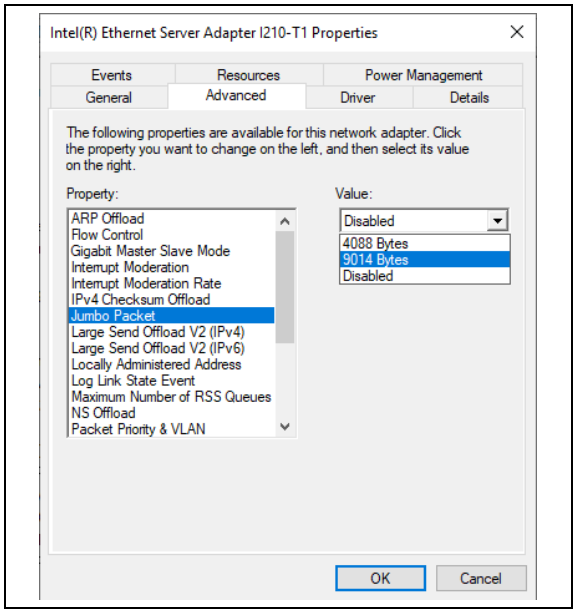


Figure 81

(5) Set **Flow Control** to **Rx & Tx Enabled**.

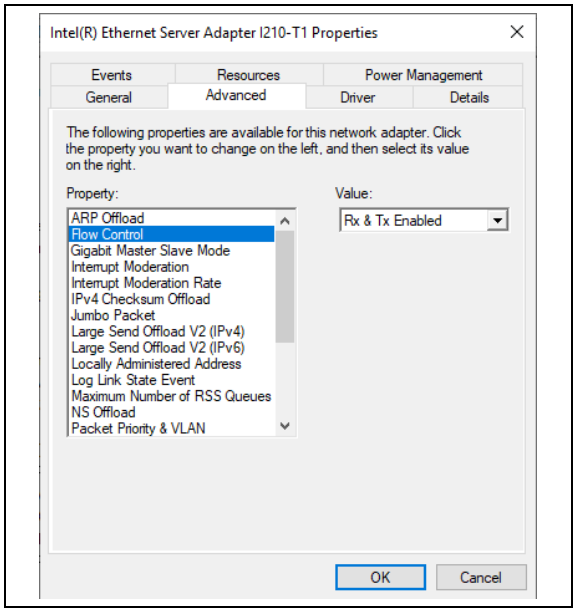


Figure 82

(6) Set **Interrupt Moderation Rate** to **Extreme**.

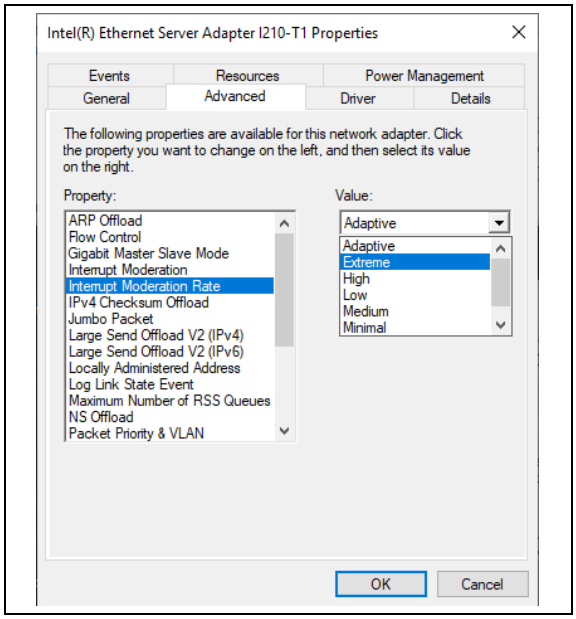


Figure 83

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(7) Set **Receive Buffers t**o the maximum value (here: 2048).

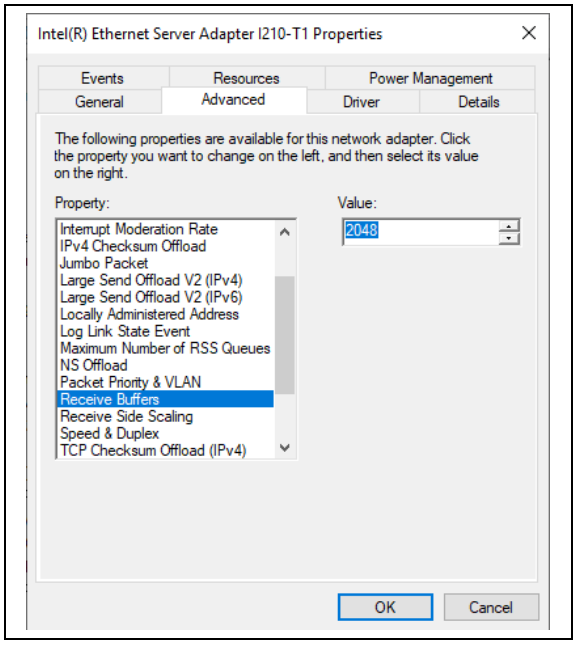


Figure 84

(8) In the Power Management Tab, clear the **Allow the computer to turn off this device to save power** checkbox.

(9) Click **OK**.

(10) Close all network configuration windows.

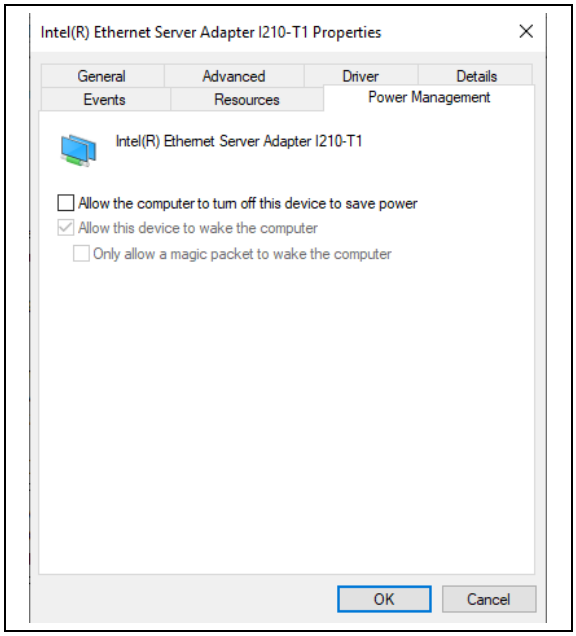


Figure 85

5 Calibration

5.1 Detector calibration

Purpose

- Determine the sensitivity for each pixel of the detector.
- Eliminate the effect of dead pixels.
- Eliminate inhomogeneity of the X-ray tube.
- Perform Detector self-diagnosis.

Use Case

Perform a detector calibration for each detector in the following cases:

- After installation
- After replacement of a Detector
- If performance is not acceptable
- In the time interval of 6 months the customer has to re-calibrate (triggered via user message at NX).
- In case the LDG Configurator has been used (refer to section 11.3).



REQUIRED TOOLS:

- 1.5 mm CU filter, spare part number CM+9515510152*

* The last digit in the spare part number indicates the spare part revision at release of this document. When ordering, the actual revision of the spare part is delivered.



REQUIRED TIME:

Approximately 30 minutes



NOTE:

- The uniformity check, which is performed by the Detector software during the calibration procedure, does not detect small objects (for example screws, washers). Image quality will be reduced, if small objects remain on the Detector during calibration.
- In case of a Vet system, the uniformity check allows a partial exposure: If the SID is not adjustable, the exposed area might be too small to cover the whole area. The calibration tool detects this and asks whether calibration shall be continued. In this case it is mandatory to put the Detector centered to the X-ray tube during Detector calibration. This is also valid later on for exposures on animals. See also section 1.17 regarding Detector sharing.
- Detector calibration needs to be performed on each system, where a Detector is shared.

(1) Follow instructions in the DR Detector Calibration Key User Manual.

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5.2 Acceleration sensor calibration

Purpose

- Calibrate the internal acceleration sensor

Use Case

Perform an acceleration sensor calibration if there is an evidence that SmartXR function “SmartAlign” (= panel orientation) shows wrong values.

REQUIRED TOOLS:

- A level table
- Spirit level

REQUIRED TIME:

Approximately 10 minutes

Calibration Workflow

Using the Vivix acceleration calibration sensor tool, the Detector is calibrated in six different positions. Refer to Figure 86.

The table for the calibration must be level, however for calibration steps 3 to 6 it is not mandatory, that the Detector is placed 90° towards the table.

For Steps 3 to 6, use for example the DR Detector cradle to put the Detector in a stable position.

Check that the table, where the calibration is performed, is level, using a sprit level or similar.

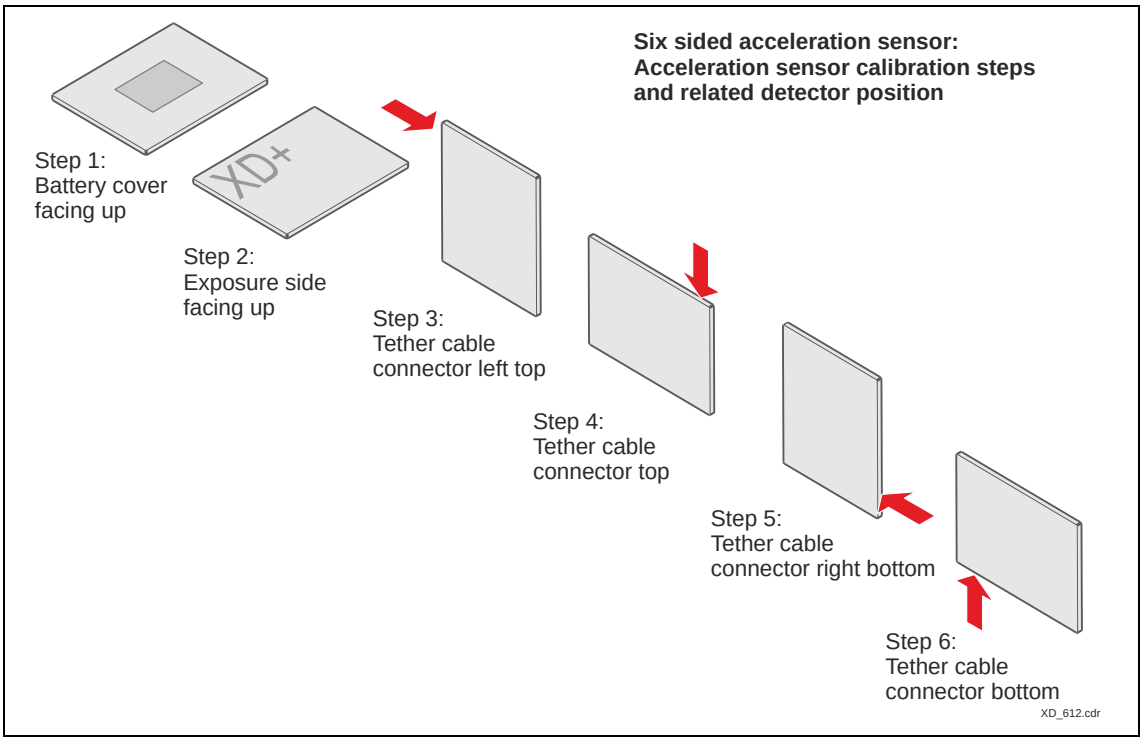


Figure 86

Proceeding to calibrate the acceleration sensor:

(1) Stop NX.

(2) Power on the SCU / Access Point (if available) and the Detector.

(3) Start the Vivix Tool: **MUSICA Acquisition Workstation Control Center > Service > VIVIX Tool**.

(4) Click **Refresh device list** if not all active devices (XD Detectors; SCU mini) are shown.

(5) Double-click the line which shows the Detector parameters.

(6) Enable **Admin mode**.

(7) Click **Next**.

(8) Enter user name admin and password **1234**

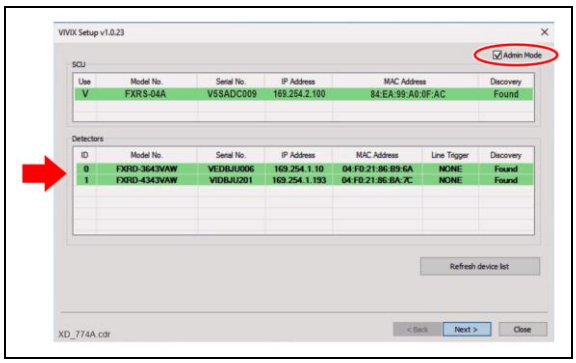


Figure 87

(9) Click **Calibration** on the Detector which shall be calibrated.

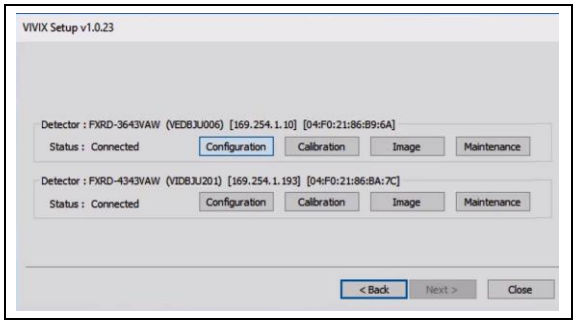


Figure 88

(10) Click **Acceleration Sensor.**

(11) Click **OK.**

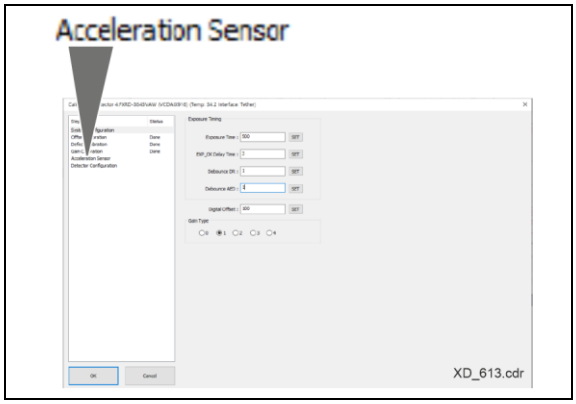


Figure 89

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(12) Put the Detector on the table with battery cover facing up.
(13) Click **step1**.
(14) Click **Calibration Start** and wait until the progress bar is completely green.
(15) In case of a 6-sided calibration sensor: Repeat for the other positions as shown in Figure 86.

For a description of the user interface refer to table next page.

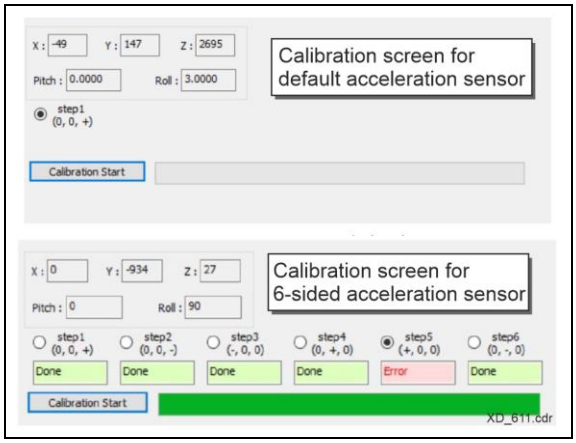


Figure 90

Description of the user interface

Item	Description
X, Y, Z	Displays the read values of acceleration sensor for every 2 seconds. The value of 0,0, 1000 is gained when the battery cover of the Detector is facing up. After calibration, the vector values of x, y, and z range from 900 and 1100.
Pitch, Roll	Gets rotation information of the Detector by calculating the value of x, y, and z. The unit is degree.
Step 1 to 6	Displays the steps of acceleration calibration. Click the Calibration button after placing the detector to the appointed direction on a flat table. You can place the detector referring the displayed coordinates on the button. The (0, 0, +) indicates that work should be performed under the condition that coordinate of x, y, and z is 0, 0, 900~1100 when the detector is placed on a flat table.
Result of the calibration	If the model has the six-sided calibration feature, a results window for each step displays. If you re-calibrate Step 1, the upper steps are all initialized, and Not Calibration is shown. If calibration is done in the correct direction for each step, Done is displayed.If calibration is done in the wrong direction, Error is displayed. For the model with six-sided calibration, the sensor values of x, y, and z cannot be guaranteed if calibration is not properly executed.
Calibration Start button	Starts the acceleration sensor calibration for the currently chosen step.
Progress bar	Marks the calibration progress in acceleration sensor.

6 Service Quality Test

Perform the Service Quality Test (SQT) as a last step before hand-over of the new or updated system to the customer.

The SQT is available on the Agfa Medimg Library with Document ID 55022710.

SQT instructions are available as online help and are separately available with Document ID 54513844 or offline replication

7 Troubleshooting

NOTE:
For the general escalation procedure refer to the following document: The Field Service ABCs, Document ID 25722561or offline replication.

For the DR Detector repair procedure refer to chapter 8.

7.1 Log files for error identification

The table below gives an overview of the available log files.

Log file	Location	Part of NX snapshot
Detector log files	They are stored on detector but will be stored on NX during complete shutdown of the NX (detector powered on). They also can be downloaded manually via **VDI Installation Tool > Retrieve Panel(s) Log** They are stored on NX in the **C:\Agfa\Healthcare\Log\IDIS\XML\ViVIX\Panel\<detector serial number>** directory.	Yes
Shock log files *	They need to be downloaded manually via **VDI Installation Tool > Retrieve Panel(s) Log** They are stored on NX in the **C:\Agfa\Healthcare\Log\IDIS\XML\ViVIX\Panel\<detector serial number>** directory.	No* * Shock log files, which are part of the detector log files, are **not** part of an NX snapshot.
VDI log files	They are stored on NX in **C:\Agfa\Healthcare\Log\IDIS\XML** directory.	Yes
VIVIX SDK log files	They are stored on NX in **C:\Agfa\Healthcare\Log\IDIS\XML\ViVIX** directory.	Yes
Detector service log files	As from VDI 3.3: They need to be created manually via **VIVIX Tool > next > Maintenance > Service Log Download**.	No
VIVIX Setup log files	They are stored on NX in **C:\Agfa\Healthcare\XRDI\Panels\VDI\ChameleonSetup\Log** directory.	No
SCU log files	They need to be created manually via **VIVIX tool > Configuration (of SCU) > Log** They are stored on NX in **C:\Agfa\Healthcare\XRDI\Panels\VDI\ChameleonSetup\Log\SCU\<SCU serial number>** directory.	No

IMPORTANT:
To collect the required log files in case of errors:
Follow the instructions in the detector repair form, which is part of the DR Detectors - Repair Process, Document ID 56762931.

7.2 Symptoms and their solutions

7.2.1 Error messages on the OLED display

7.2.1.1 ERR_01 or ERR_02 or ERR_03 or ERR_04

Symptom ERR_01 or ERR_02 or ERR_03 or ERR_04 is displayed on the OLED display. The same symptom after restart of the Detector.

Cause Internal electronics failure

Solution Replace Detector. Follow the Detector repair process as listed in section 8.4.

7.2.1.2 ERR_05

Symptom ERR_05 is displayed on the OLED display. The same symptom after restart of the Detector.

Cause Battery pack failure or insufficient battery pack or battery removed in a cabled setup or only one battery is inserted.

Solution When working in a cabled setup without battery or with one battery only (instead of two): No action required. ERR_05 display is normal. In all other cases: Replace battery pack.

7.2.2 Image quality issues

7.2.2.1 Banding or uneven densities on the image on SQT test 5.3

Symptom SQT (Service Quality Test) 5.3, Clipping level DR Detector, fails: Banding or uneven densities on the image.

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Cause Detector is saturated. This symptom is called "clipping effect", because density differences above a certain threshold are not visible anymore

Solution
(1) Stop NX and start the Vivix tool.
(2) Lower the clipping threshold value from 60.000 (default) in steps of 800, until image is optimal.

7.2.2.2 White pixels or lines in the image

Symptom Defective pixels or lines in the image, showing up as white pixels or white lines.

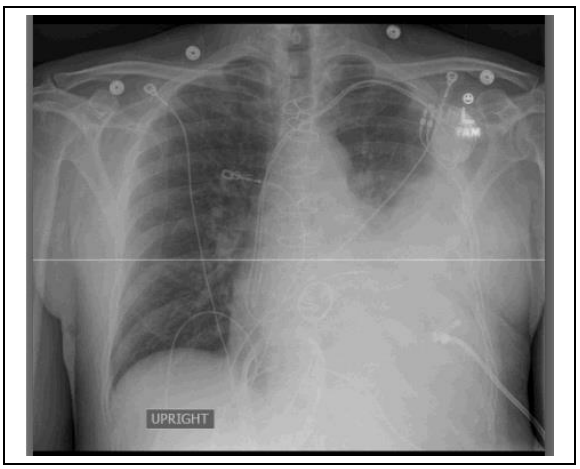


Figure 91

Cause Defective pixels or lines.

Solution Perform a Detector calibration. If this does not eliminate the white pixels or lines, perform a manual* defect calibration. For instructions refer to section 8.5.

* This calibration is named “manual defect calibration”, because during Detector calibration an automatic defect calibration is performed.

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7.2.3 Detector calibration issues

7.2.3.1 Uniformity check fails

Symptom Uniformity check fails during Detector calibration.

Cause
1. Wrong collimation: Detector is not completely exposed.
2. Object between X-ray tube and Detector.
3. Factory gain calibration performed with different detector orientation
4. Software issue in VDI 4.0: Border where uniformity check is done not optimal.

Solution
1. Check that Detector is completely exposed during Detector calibration.
2. Check for objects between X-ray tube and Detector
3. Rotate Detector by 90°
4. Update to VDI > VDI 4.0.

7.2.4 Detector configuration issues

7.2.4.1 X-ray generator configuration error (MESS372, xMESS55) after VDI upgrade

Symptom A model file related error is displayed in the NX Configuration Tool (…**`please upgrade models`** …) and on NX (**`xMESS55`** or **`MESS372`**) after software update.

Cause Model file for the Detector has been updated with VDI update.

Solution
(1) Start the NX configuration tool.
(2) Select **Load active configuration**.
(3) Select **File > Save as…**, define a file name and save the configuration.
(4) Select **File > Load from File** to re-load the same configuration again.
(5) Activate the configuration.

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7.2.4.2 Strange behavior of the Vivix tool

Symptom

Strange behavior of the Vivix tool, for example the Detector is not visible in selection screen but in configuration screen (see Figure 92) or the XD Detector cannot be selected in the Vivix Tool (see Figure 93).

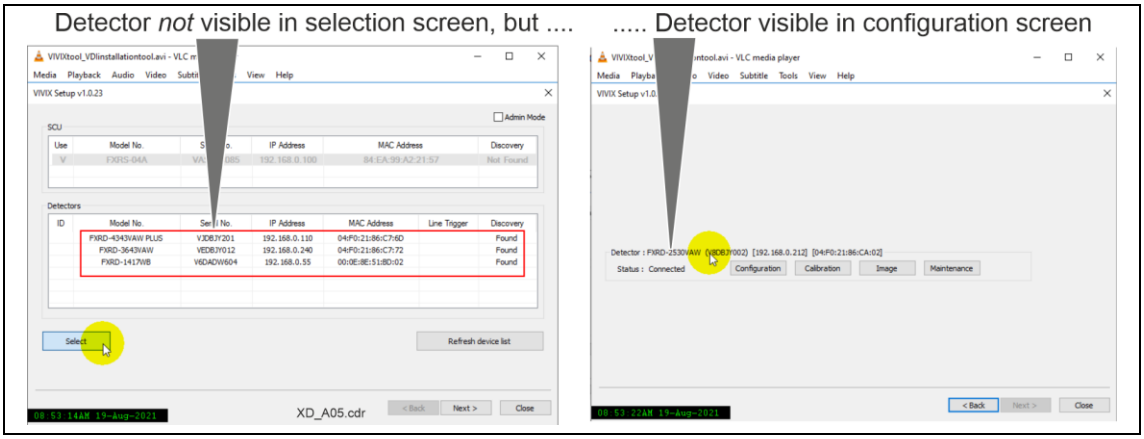


Figure 92

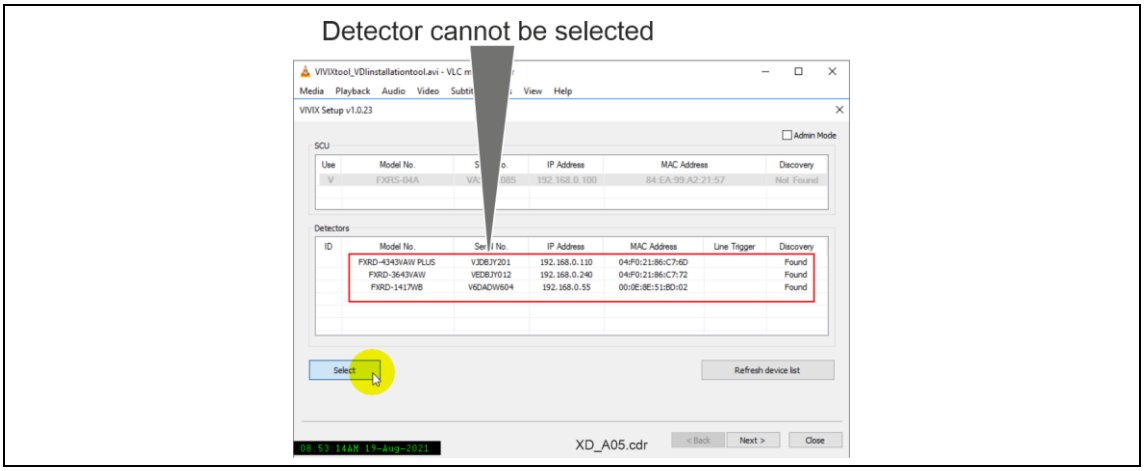


Figure 93

Cause

Software issue in Vivix Setup.

Solution

Delete file **C:\ProgramData\Vieworks\configuration.xml** and repeat the detector setup in the Vivix tool.

7.2.4.3 Vivix tool does not start on Windows 7 PC

Symptom

After installation of VDI 4.0 or later, the Vivix tool does not start: A system error is shown, indicating a missing GCBase_MD_VC141_V3_2.dll.

The symptom was only experienced on old Windows 7 hardware, for example HP Probook 650 G2.

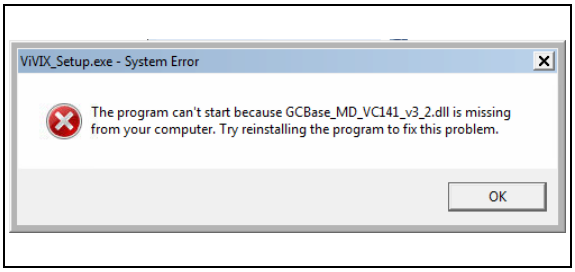


Figure 94

Cause

Software issue during VDI software upgrade to VDI 4.0 or later.

Solution

Upgrade to VDI 4.1. There the issue is solved in most cases.

For cases, where after upgrade to 4.1 the Vivix tool does not start, proceed as follows:

(1) Uninstall VDI 4.1 (from Control Panel > Programs and Features).

(2) Uninstall the VwFilterDriver (from Control Panel > Programs and Features).

(3) Reboot the PC.

(4) Re-install VDI 4.1.

7.2.4.4 NX Configuration tool does not show Detector Serial Number

Symptom

During Detector configuration on NX, the Serial Number is not shown.

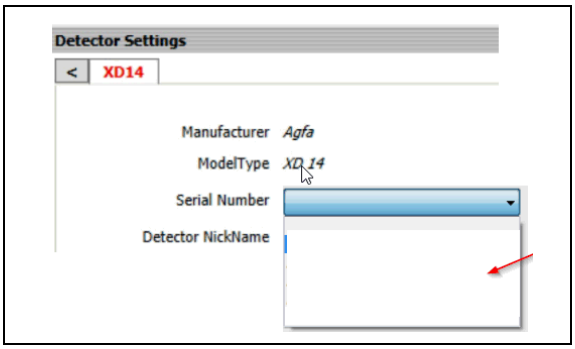


Figure 95

Cause

Wrong Detector model file selected: The NX configuration tool makes a plausibility check. If this fails, the Detector cannot be added.

Solution

Select the correct Detector model file. Refer to table on page 72.

7.2.5 Wireless connection issues

7.2.5.1 Detector does not connect to NX

Symptom Detector does not connect to the NX.

Cause
1. Wrong wireless settings
2. Wrong network settings on network interface card (NIC)
3. Additional software tool besides NX is running, blocking communication with NX
4. In case Detector is used in AP mode: Another NX is already connected to the Detector.
5. Already 5 Detectors are connected.

Solution
1. Check wireless settings in Vivix tool and on AP (SSID, key)
2. Check network settings on network interface card (NIC) and in Vivix tool. If more than one IP address is configured on the NIC, the IP address for the XD Detector must be the lowest one.
3. Stop additional tools, like Vivix setup, VDI Panel Installation Tool, Detector Calibration Tool.
4. In case Detector is used in AP mode: Disconnect the currently connected Detector in the tablet PC WiFi menu or put it out of range.
5. In the Vivix tool it is not possible to add more than 5 Detectors.

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8 Repair

8.1 Wireless initialization

Purpose With these instructions the Detector wireless settings are reset to factory defaults. This does *not* erase already defined presets for using the Detector on another NX (Detector sharing).

(1) Power on the Detector and wait until it completely booted up.
(2) Press the **Power button** and the **AP mode** button for 3 seconds.
The green LED starts flickering and the Detector reboots automatically.

Now the Detector is set to wireless initialization values as listed in section 8.3.

8.2 Resetting the Detector to factory defaults

Purpose With these instructions the Detector is reset to factory defaults. This also erases already defined presets for using the Detector on another NX (Detector sharing).
Note that this step can only be performed on a Detector which is connected to a PC (in WiFi mode or access point mode or cabled). If this is not possible, reset the wireless parameters first (described in section 8.1), connect to the Detector, and then perform the steps described in this section.

(1) Stop NX.
(2) Power on the Detector.
(3) Start the Vivix Tool: **MUSICA Acquisition Workstation Control Center > Service > VIVIX Tool**.

(4) Click **Refresh device list** if the required Detector is not shown.
(5) Double-click on the line which displays the required Detector.
(6) Click **Next**.

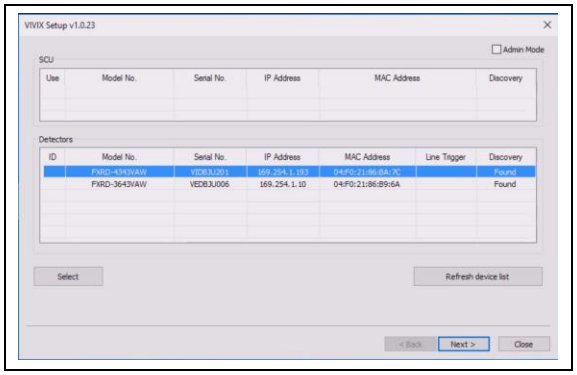


Figure 96

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(7) Click **Maintenance** on the Detector which shall be reset to factory defaults.

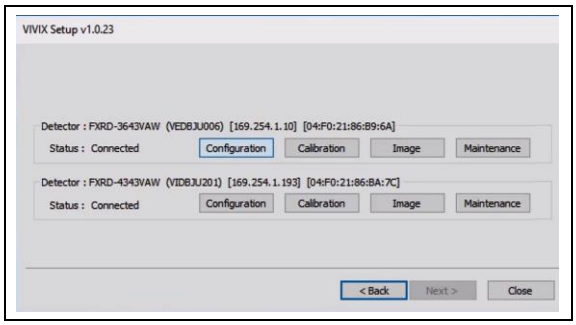


Figure 97

(8) Click **Factory Reset**.

(9) The display shows **Factory reset is in progress** and the Detector reboots automatically.

Wait until the automatic Detector reboot is finished: The OLED display shows initially **`Start …,`** followed by the following display a few seconds later:



Now the Detector is set to factory default values as listed in section 8.3.

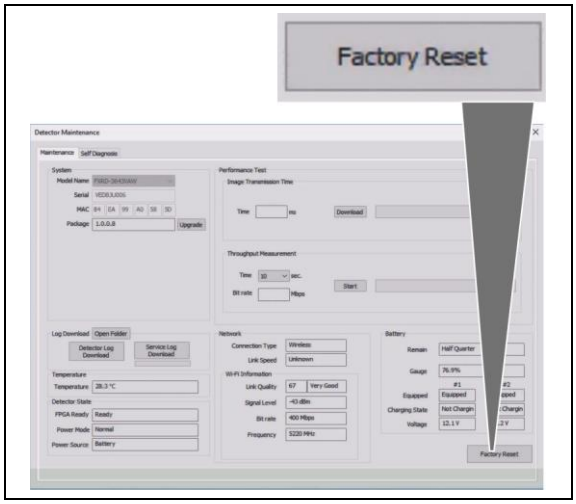


Figure 98

8.3 Factory default values

This table lists default values of a new detector from stock. It also shows, which parameters are reset by function **Factory Reset** (refer to section 8.2) and **wireless initialization** (refer to section 8.1).

Pane	Parameter	Default Value	Factory Reset	Wireless initialization
Network	IP Address	169.254.1.10	✔	✔
	Subnet Mask	255.255.0.0	✔	✔
	Gateway	169.254.2.100	✔	✔
Wireless Network	SSID	vivix	✔	✔
	Key	1234567890	✔	✔
	AP Button	AP switching	✔	✔
	Wireless Only	OFF	✔	✔
Power Mode	Sleep	OFF	✔	✘
	Shut down	OFF	✔	✘
	Power Control	By Detector	✔	✘
AP	Enable	OFF	✔	✔
	Frequency	5 GHz	✔	✔
	Country	KR	✔	✔
	Band	40 MHz	✔	✔
	Channel	+36	✔	✔
	SSID	vivix_ap	✔	✔
	Key	1234567890	✔	✔
Image Acquisition	Exposure Mode	AED	✔	✘
Auto Offset Refresh Setting	Use offset refresh	Uncheck	✔	✘
	Time Interval	30 Min	✔	✘
	Temperature Interval	3°C	✔	✘
	Number of shot	5	✔	✘
Image Transmission	Timeout	20 sec	✔	✘
	Option	None	✔	✘

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8.4 Detector Repair Process

In case of a detector problem, which cannot be solved by the FSE on site, it is mandatory to follow a dedicated DR detector repair process.

This ensures an effective detector repair.

Refer to the DR Detectors - Repair Process, Document ID 56762931.

8.5 Manual defect calibration

PURPOSE Manual defect calibration is only required, if the DR Detector Calibration procedure (Refer to section 5.1) is not able to eliminate defective (dead) pixels or defective lines.

Refer to Troubleshooting section 7.2.2.2, White pixels or lines in the image.

There are always a few defective pixels among the up to 9.3 million pixels (XD 17). They are determined in production, and stored on the Detector in a “defect map”.

The relationship between the defect map and this process is as follows:

- The original defect map is created by Vieworks production and copied to the panel.
- Detector calibration updates the defect map as new defects are found.
- If Detector calibration is not able to remove defects, a manual defect map can be created (this procedure). The manual defect map is created in two steps:
  - Step 1: Correction by the Auto Defect Finder
  - Step 2: If step 1 does not eliminate all defective pixels or lines, perform a manual defect correction
- If this manually created defect map is saved, it is effective immediately. No power off/on and no detector calibration required to make it effective.
- The panel is defining appropriate gray levels for the manually defined dead pixels / dead lines by interpolation. Defining dead pixels / lines which are actually OK will affect the quality of the diagnostic image and is not allowed.



REQUIRED TIME:
Approximately 1 h



TOOLS:
Cu filter (for Collimator)

Instructions

Identifying the defective pixels and / or lines in a flatfield image

(1) Start the NX Configuration Tool.

(2) Import the System Diagnosis exam tree.

(3) Activate the configuration.

(4) Create a flat field image (for example “Flat Field 400”) with the following exposure parameters:
- CU filter inserted
- SID 150 cm
- 75 kV, 12 mAs

(5) Using Window / Level, identify the defective pixels and / or lines.

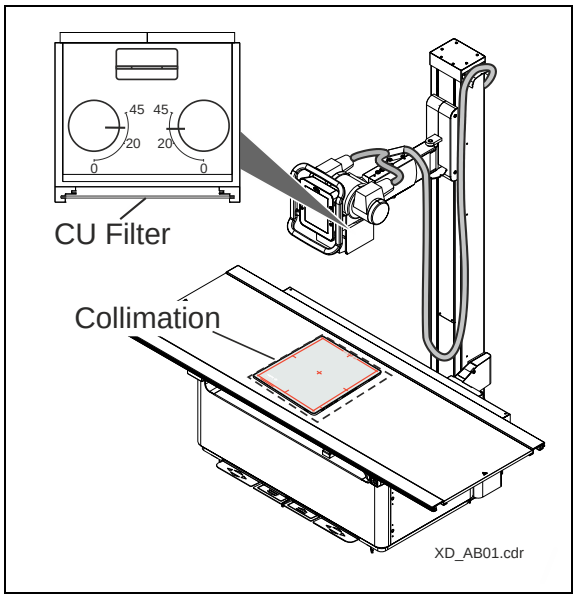


Figure 99

Creating two raw images in the Vivix tool for the defect map

(6) Stop NX.

(7) Open the Vivix tool. Make sure the Detector is connected.

(8) In **VIVIX Setup** select the correct detector and click **Configuration**.

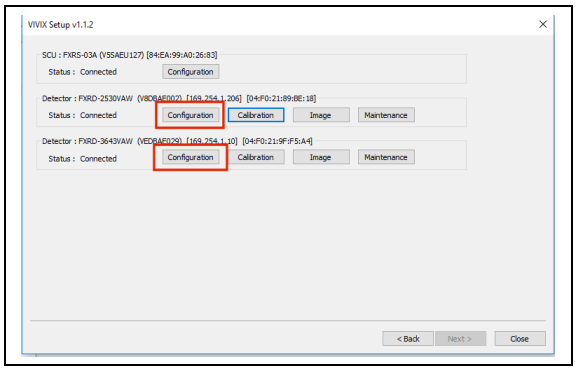


Figure 100

(9) Set the Exposure Mode to **AED**.

(10) Click **Set Config**.

(11) Click **Close**.

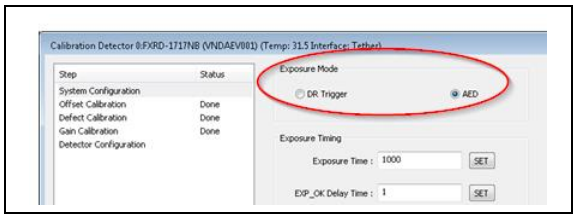


Figure 101

(12) Click **Image**.

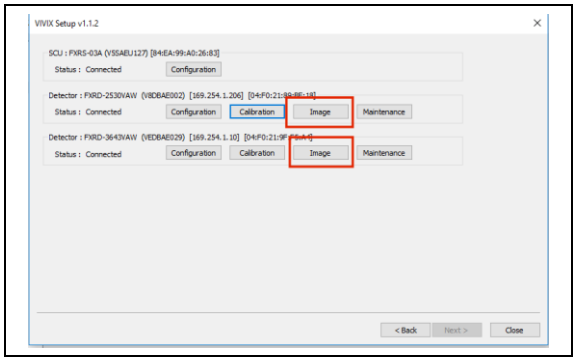


Figure 102

(13) Wait until the status window (A) shows **Ready**.

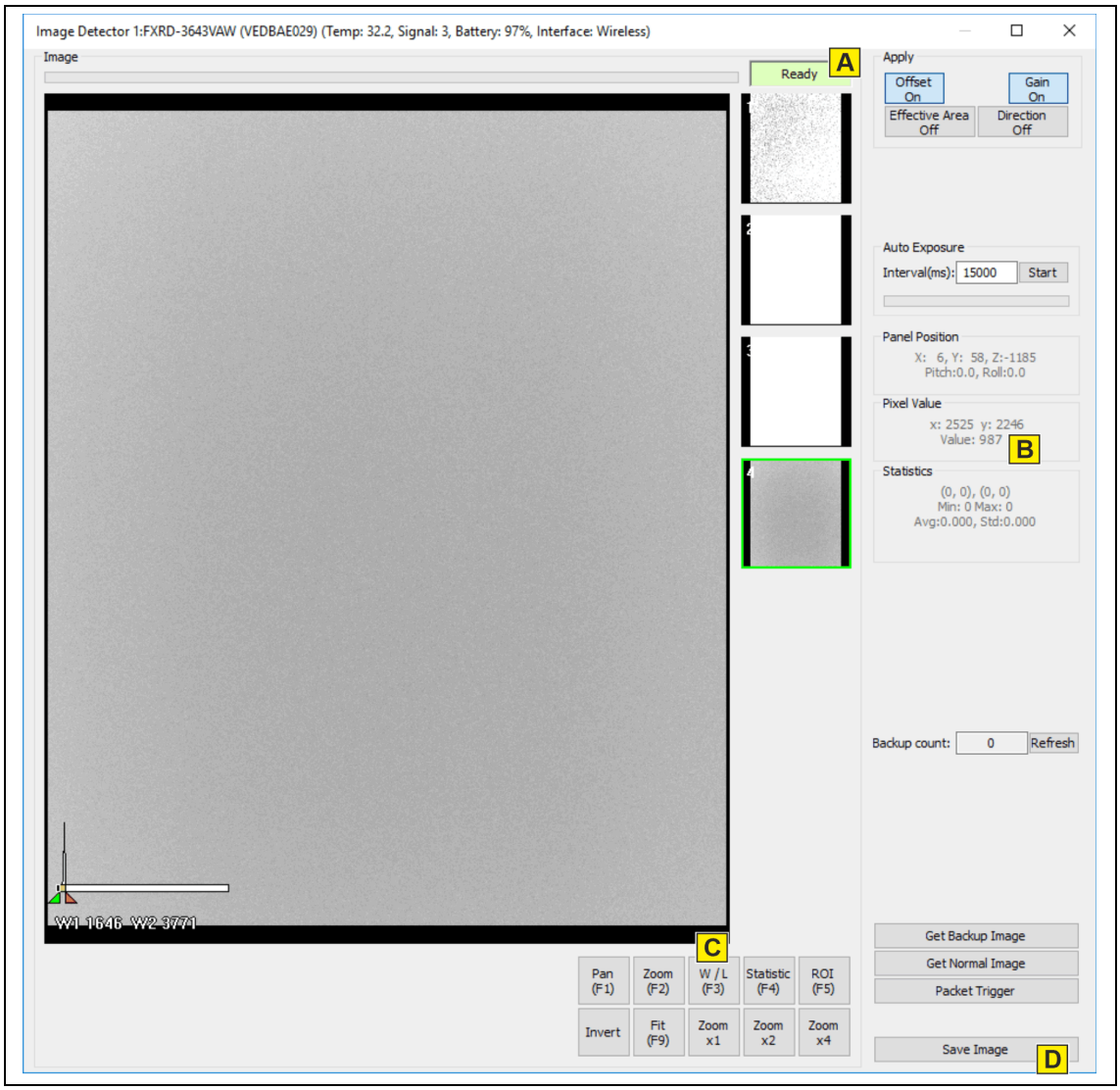


Figure 103

(14) Create a flat field image on the modality with the following exposure parameters:

- CU filter inserted
- SID 150 cm
- 75 kV, 12 mAs

Note, that during exposure the status will briefly change to **`Not Ready`** and back to **`Ready`**.

(15) When the image arrived, check the pixel value (B) (refer to Figure 103): It should be in the range of 900 to 1100.

(16) Repeat the flatfield exposure with different exposure parameters if required, until the desired pixel value is reached.

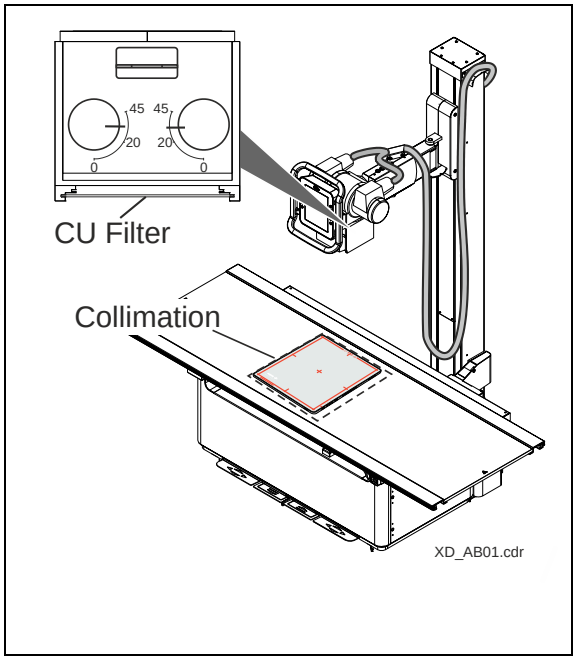


Figure 104

(17) Click the Window/Level Button (C), place the cursor in the image and adjust Window / Level this way, that a homogeneous gray image is visible.

(18) Click **Save Image** (D) to save the image for example as **image1.raw** on the D: drive of NX, for example in directory D:\PixelMap.

(19) Make a second exposure with slightly different exposure parameters, for example 80 kV, 15 mAs.

(20) Click the Window/Level Button (C), place the cursor in the image and adjust Window / Level this way, that a homogeneous gray image is visible.

(21) Click **Save Image** (D) to save the image for example as **image2.raw**
Result: Two raw images are available, which will be used in the next step to create the updated defect map.

(22) Close the window by clicking **x** in the upper right corner.

Creating the pixel map – auto correction

(23) Go to **Calibration** and select **Defect Calibration**.

(24) Click the **Manual Defect Correction** button.

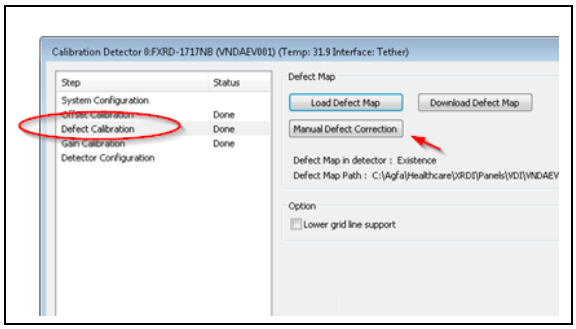


Figure 105

(25) Select the raw image saved previously (image1.raw).

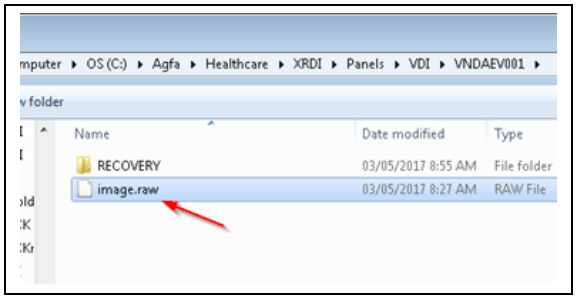


Figure 106

(26) Click **Show** and **Apply**.
(27) Click **Auto Defect Finder**.

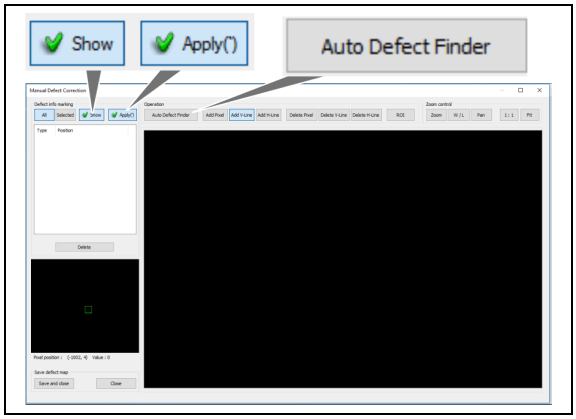


Figure 107

(28) In the **Pixel List** screen set **Threshold** to **15%** and **Offset** to **100**.
(29) Click **Search**.

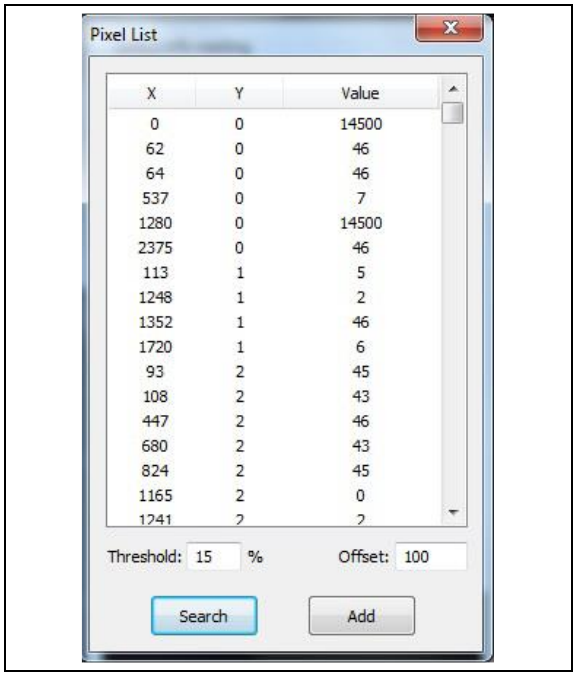


Figure 108

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(30) Use the CTRL or SHIFT key to select the defective pixels to be added to the Defect Map.

(31) Click **Add**.

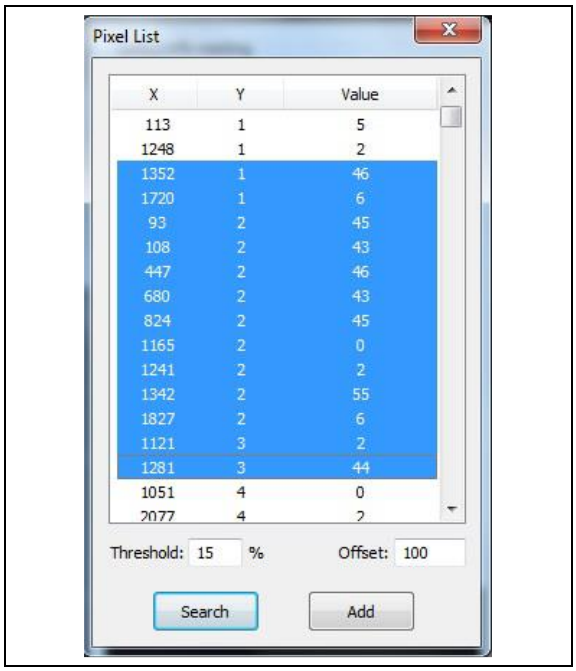


Figure 109

(32) Check whether the selected defect pixels are added to the pixel list on the left.

(33) Click **Save and close**.

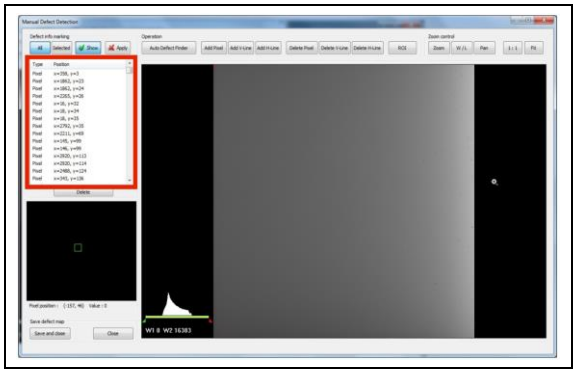


Figure 110

(34) Repeat the Auto Defect Finder a 2nd time, using the other flatfield (image2.raw), starting with step (23). This improves the defect pixel detection.

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Checking image quality

(35) Close the Vivix tool.

(36) Restart NX.

(37) Create a flat field image (for example “Flat Field 400”) with the following exposure parameters:

- CU filter inserted
- SID 150 cm
- 75 kV, 12 mAs

(38) Using Window / Level, try to identify the defective pixels and / or lines.

(39) If the defective pixels have disappeared, the procedure is finished. If defective pixels are still present, continue with “**Creating the manual defect map”** (omit the following two steps).

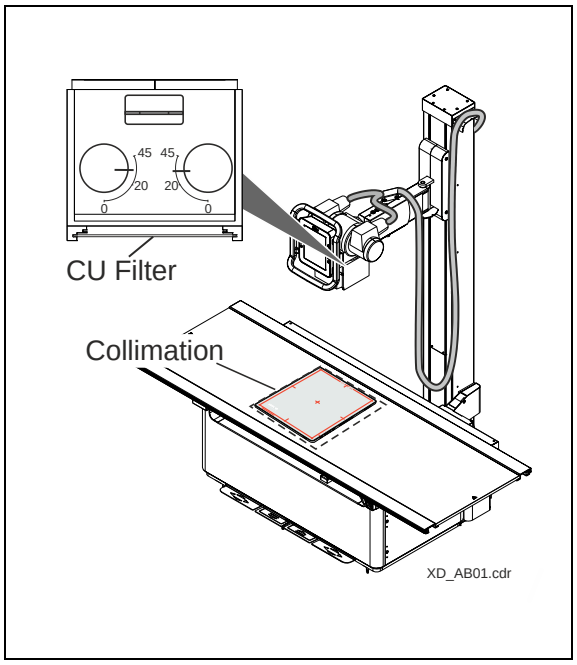


Figure 111

(40) Set the exposure mode back to **DR Trigger** when done.
Do this even for self-trigger configurations, as the VDI software enables AED when needed during startup of NX.

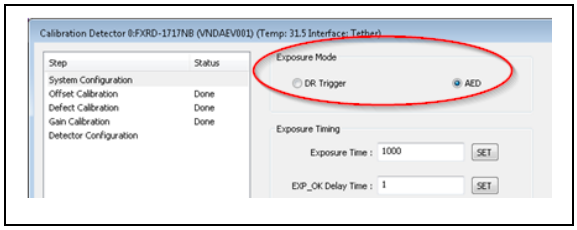


Figure 112

(41) Remove or hide the System Diagnosis exam tree.

Creating the manual defect map

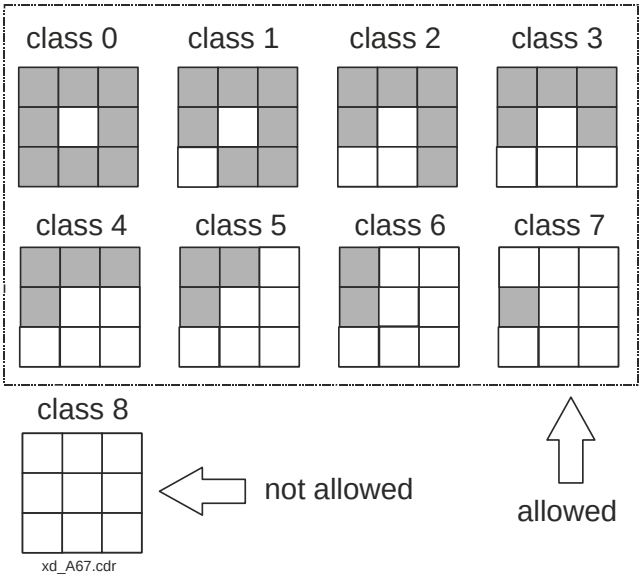
Sometimes the Auto Defect Finder does not detect all defective pixels or lines. By adding pixels or lines manually to the defect map, the remaining pixels or lines are removed.

Only defective pixels or lines must be added to the manually created defect map. If also good pixels or lines are added to the defect map, this reduces image quality unnecessarily.

There are some limitations what can be mapped manually, even if there is no software limitation for manual defect mapping. Note that the total number of allowed pixel defects depend on the detector, refer to the table below.

In case more pixels are corrected than specified in the table below, this can lead to masked clinical information and is therefore not allowed.

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Item	Allowed defects
Cluster / pixel	Class 0 to 7 can be corrected by defect calibration. If a class 8 (= 3x3 pixels) or higher cluster defect is present, the Detector needs to be replaced as described in section 8.4. 
Total number of pixel defects XD 14, XD⁺14, XD 17, XD⁺17	Maximum 40.000 pixels
Total number of pixel defects XD 10, XD⁺10	Maximum 30.000 pixels
Number of line defects	Maximum 10 lines
Number of normal lines between two bad lines	Minimum 3 lines

(42) Go to **Calibration** and select **Defect Calibration**.

(43) Click the **Manual Defect Correction** button.

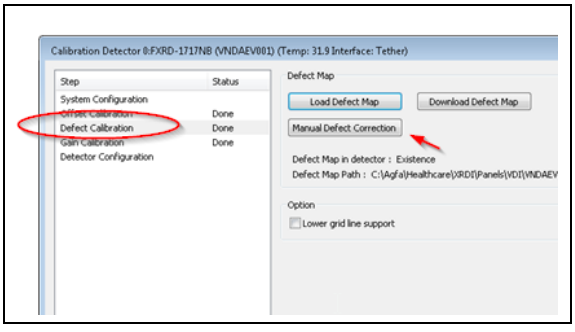


Figure 113

(44) Select one of the two raw images saved previously (image1.raw or image2.raw).

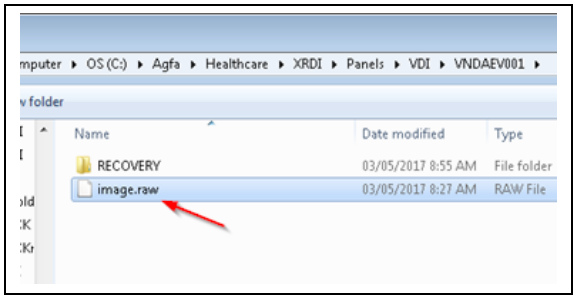


Figure 114

(45) Click **Show** and **Apply**.

(46) If required use the **W / L**, **Zoom** and **Pan** buttons to make the defect pixels and / or lines better visible.

(47) Click **Add Pixel** or **Add V-Line** or **Add H-Line**.
V-Line = vertical line
H-Line = horizontal line

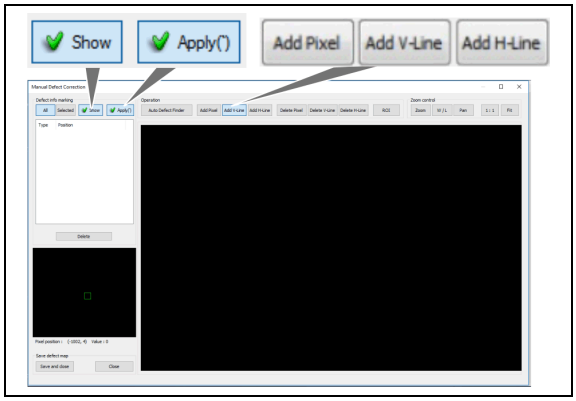


Figure 115

(48) When finished with adding pixels or lines, click Save and close.

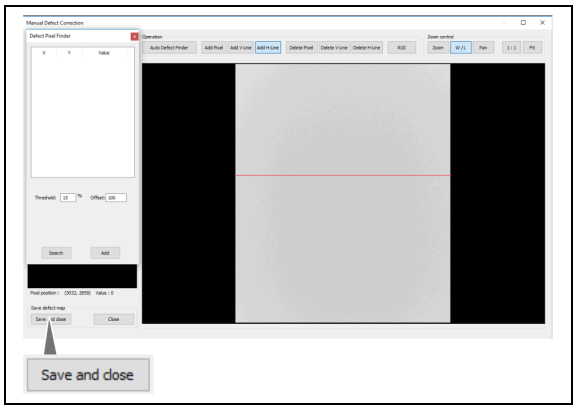


Figure 116: Example: Horizontal line

Checking image quality

(49) Close the Vivix tool.

(50) Restart NX.

(51) Create a flat field image (for example “Flat Field 400”) with the following exposure parameters:

- CU filter inserted
- SID 150 cm
- 75 kV, 12 mAs

(52) Using Window / Level, try to identify the defective pixels and / or lines.

(53) If the defect pixels have disappeared, the procedure is finished. If there are still defect pixels, repeat the process to create a manual defect map.

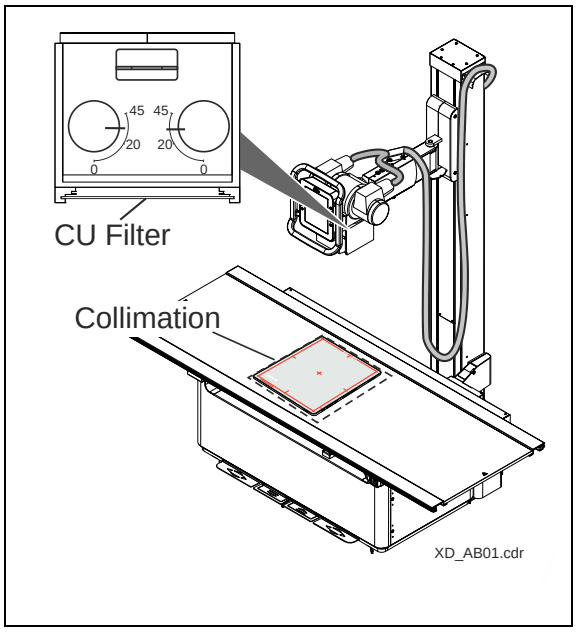


Figure 117

(54) Set the exposure mode back to **DR Trigger** when done.
Do this even for self-trigger configurations, as the VDI software enables AED when needed during startup of NX.

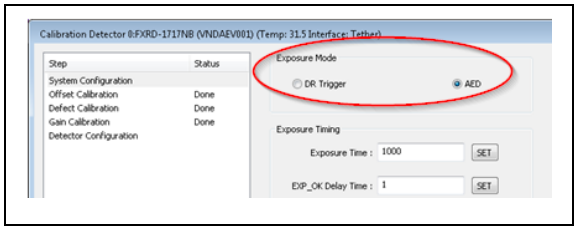


Figure 118

(55) Remove or hide the System Diagnosis exam tree.

8.5.1 Frequently asked Questions about manual defect calibration for XD Detectors

Question **Where is the defect map located and when is it updated?**

Answer For the XD Detectors, the defect map resides in the panel and gets updated with every new Detector calibration.

Question **Are there different defect maps for different X-ray modalities, if the Detector is shared on two or more NX?**

Answer No, there is only one defect map.

Question **Are there any use cases, where the FSE needs to upload or download the defect map manually?**

Answer No, when working on the defect map by performing a manual defect calibration, the defect map is uploaded automatically by saving it.

Question **If the FSE wants to start from a clean defect map, how can this be done?**

Answer In the manual defect correction Window, delete all defects and save.

Question **If the FSE can only perform a partial Detector calibration, because the required SID cannot be reached, not all defect pixels will be updated. Can the panel be used in other rooms in this case?**

Answer Detector calibration as well as possibly required manual defect calibration should be performed on an X-ray modality which allows to expose the complete Detector. Then it can be used on all X-ray modalities.

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9 Maintenance

Preventive maintenance is defined on DR system level. Consult the respective DR system Service Manual for the preventive maintenance schedule and tasks.

Consult the XD Detector user manual for preventive maintenance to be performed by the user.

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10 Release information

10.1 VDI Detector software

10.1.1 Software release VDI 4.0

Release Date	May 2021
Availability	Agfa MedImg Library (References to Agfabox)
Prerequisites	Refer to simplified ELMS DR sub product Interoperability Matrix, Document ID 35878296 or offline replication.
New Features	Initial version
Reference	See system specific Service Bulletin on the Agfa MedImg Library.

10.1.2 Software release VDI 4.1

Release Date	April 2022
Availability	Agfa MedImg Library (References to Agfabox)
Prerequisites	Refer to simplified ELMS DR sub product Interoperability Matrix, Document ID 35878296 or offline replication.
New Features	Solves several software issues Includes new Detector model files and new firmware file VIVIX_S_VW_PKG_V1.0.6.0.vhdr
Reference	See system specific Service Bulletin on the Agfa MedImg Library.

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10.1.3 Software release VDI 4.2

Release Date	June 2022
Availability	Agfa MedImg Library (References to Agfabox)
Prerequisites	Refer to simplified ELMS DR sub product Interoperability Matrix, Document ID 35878296 or offline replication.
New Features	• New XD⁺ Detector model files to support CSI layer supplier “A” • Preview on wired XD Detector • XD Detector as “fixed panel” in the Bucky
Reference	See system specific Service Bulletin on the Agfa MedImg Library.

11 Upgrade procedure

11.1 Updates / upgrades to a higher VDI version

(1) This step is only required, if the NX is installed on a Windows 7 PC.
Before software update to VDI 4.1, check whether also an Innolux (IRI component for DR 10e/14e/17e) or Varian (VRN component for DX-D 10 / DX- D 20 / DX-D Fixed) Detector is installed.

- In case of Innolux Detector, the Windows 7 PC must be exchanged by a Windows 10 PC before VDI 4.1 update. For Windows 7 to Windows 10 PC replacement refer to NX SB with Document ID 68621246.
- In case of a Varian Detector, the VRN version must be minimum VRN 8.0.

NOTE:
For more information on this incompatibility, refer to the “DR Detector - basic configuration guide”, Document ID 68310512.

(2) Perform a VDI software update as described in the *NX Service Manual*, Document ID 74737949, section *11*.

11.2 Detector firmware upgrade

PURPOSE Perform a firmware update of the Detector, usually initiated by a Service Bulletin.

The VDI Detector software checks whether a compatible firmware is installed on the Detector. If not, a corresponding message is displayed. Refer to Figure 119.

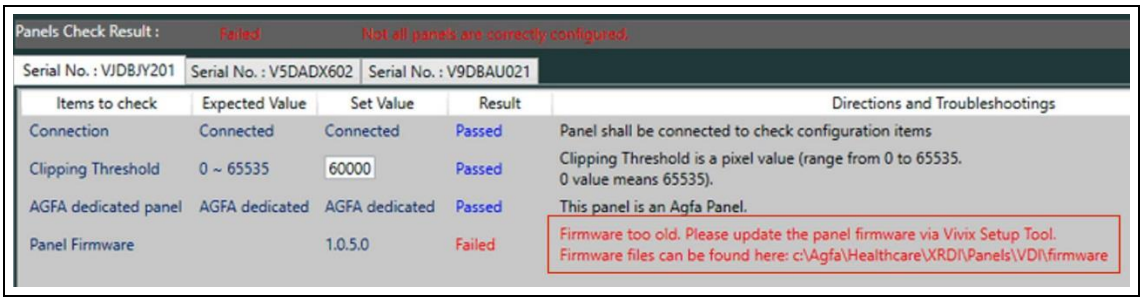


Figure 119: VDI Panel Installation Tool

REQUIRED TIME:
15 minutes (FW update, verification)

(1) Stop NX.

(2) Power on the SCU mini (if available) and the Detector.

(3) Start the Vivix Tool: **MUSICA Acquisition Workstation Control Center > Service > VIVIX Tool**.

(4) Click **Refresh device list** if not all active devices (XD Detectors; SCU mini) are shown.

(5) Double-click each line to make the device active, indicated by a bright green background.
Refer to Troubleshooting section 7.2.4.2 in case of a strange behavior of the Vivix tool.

(6) Click **Next**.

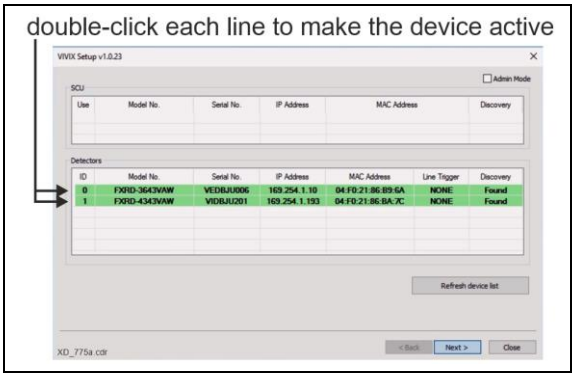


Figure 120

NOTE:

- Figure 121 shows a setup with two XD Detectors, without SCU mini.
- An “SCU mini” is shown in the SCU pane, an “SCU lite” is not shown.
- The **Model No**. corresponds to the Vieworks product codes. The corresponding Agfa product names are listed in section 1.2.
- Refer to page 39 for the meaning of the color codes of the Vivix Tool.

(7) Click **Maintenance** on the Detector which shall be upgraded.

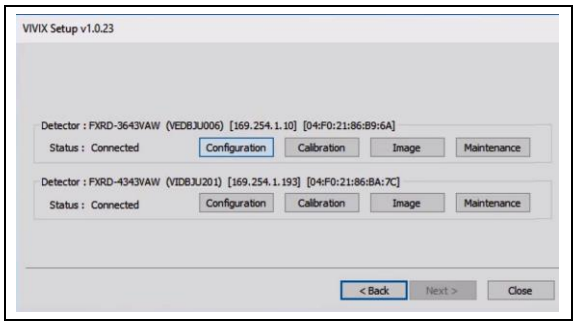


Figure 121

(8) Check battery status. Do not perform firmware update with low battery.

(9) Check Wi-Fi information: Link Quality should be “Very good”. Bring Detector closer to the access point if required.

(10) Click **Upgrade**.

(11) Browse to directory **C:\Agfa\HealthCare\XRDI\Panels\VDI\firmware*** and select file **VIVIX_S_VW_PKG_VX.X.X.X.vhdr**

***** or the directory where you have copied the firmware file, if it has been published separately on the Library.

(12) Click **Open**.

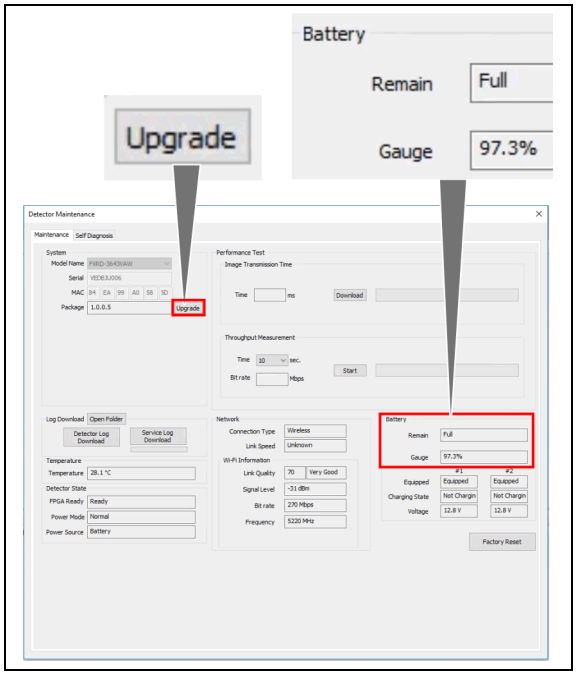


Figure 122

(13) A pop-up window with two progress bars opens for about 5 minutes.

Wait until the upper progress bar is on 100% and the pop-up window is closed.

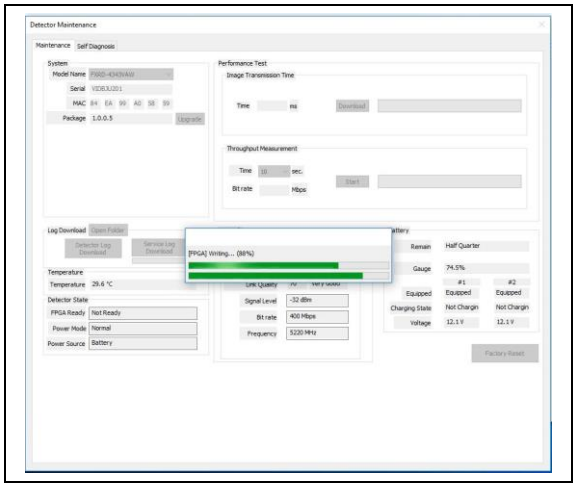


Figure 123

(14) Click **OK** when the message **`Upgrade complete`** appears. This should appear in less than a minute after the progress bar showed 100%.

(15) Close all windows.

(16) If no other verification method is listed in the related Service Bulletin: Perform a DR workflow. Refer to the SQT (Service Quality Test) instructions, Document ID 54513844.

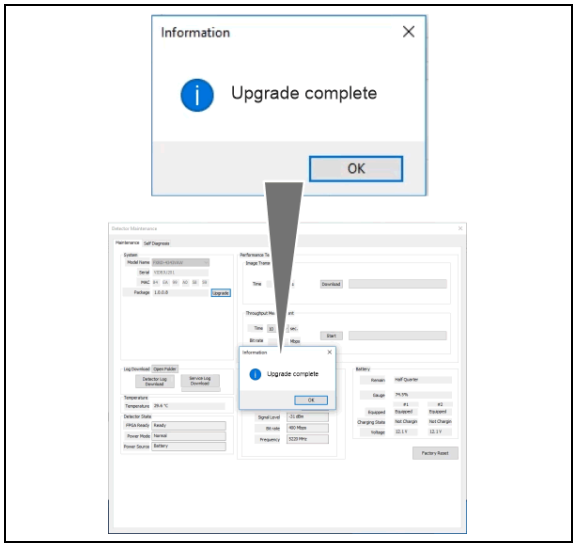


Figure 124

Result The Detector firmware is upgraded.

11.3 Running the LDG configurator

This step is only required, if a firmware update has been performed from below 1.0.6.0, and the Detector is listed in the Excel document “XD Panel SNs where LDG Configurator needs to be run.xls”, attached in section 4.4.5. For details refer to the VDI 4.1 release SB with Document ID 77994774 or offline replication.

(1) Stop NX and close the Vivix tool.

(2) Power on the Detector.

(3) Start the LDG Conigurator Tool:
C:\Agfa\Healthcare\XRDI\Panels\VDI\LDGconfigurator\LDG_Configurator.exe.

(4) Click **Refresh** if the Detector is not listed in the “Registered” pane.

(5) Select the Detector and click **Process**.

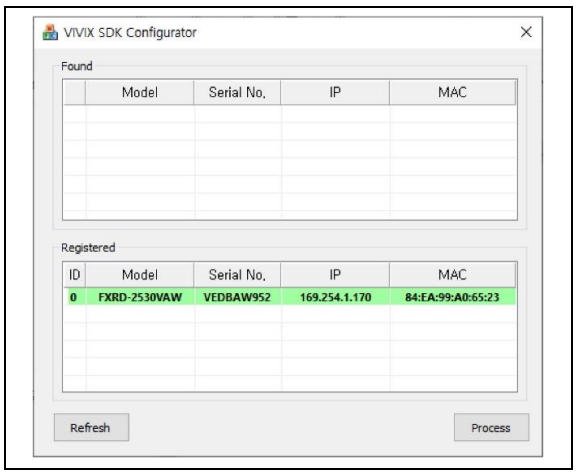


Figure 125

(6) Wait until message appears **`Process done successfully`**. This appears after a few seconds, if the firmware is up-to-date (V 1.0.6.0). If the firmware is not yet on V 1.0.6.0, this takes about 5 minutes, as also the firmware is installed.
If message **`Process failed. [Already processed]`** appears,.

(7) Click **OK**.

(8) Close the LDG Configurator.

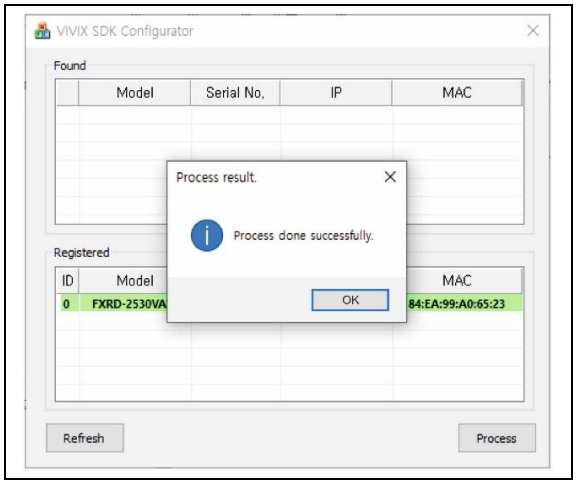


Figure 126

(9) Perform a Detector calibration. This is required as the LDG configurator changes image quality related parameters.

11.3.1 LDG configurator messages

The following table lists possible LDG configurator messages and related solutions.

LDG configurator message	Meaning	Solution
Failed to open detector	Unable to reach to the detector through network	Make sure that the Detector and Access Point is powered on. Check network settings are properly configured. After the issue is resolved, again press the “Process” button.
Package update failed	Unexpected network disconnection or network packet transmission timeout occurred	Make sure that the Detector and Access Point is powered on. Check network settings are properly configured. After the issue is resolved, again press the “Process” button.
Failed to reboot detector while updating the detector	detector reboot operation failed	Make sure that the Detector and Access Point is powered on. Check network settings are properly configured. After the issue is resolved, reboot the Detector manually and again press the “Process” button.
Failed to wait for detector reboot. Please check the device state	Reconnection after detector reboot operation failed	Make sure that the Detector and Access Point is powered on. Check network settings are properly configured. After the issue is resolved, reboot the Detector manually and again press the “Process” button.
Process failed. [Already processed]	LDG feature is already activated	No solution required: the LDG configurator has already been executed on this system, and nothing has been changed

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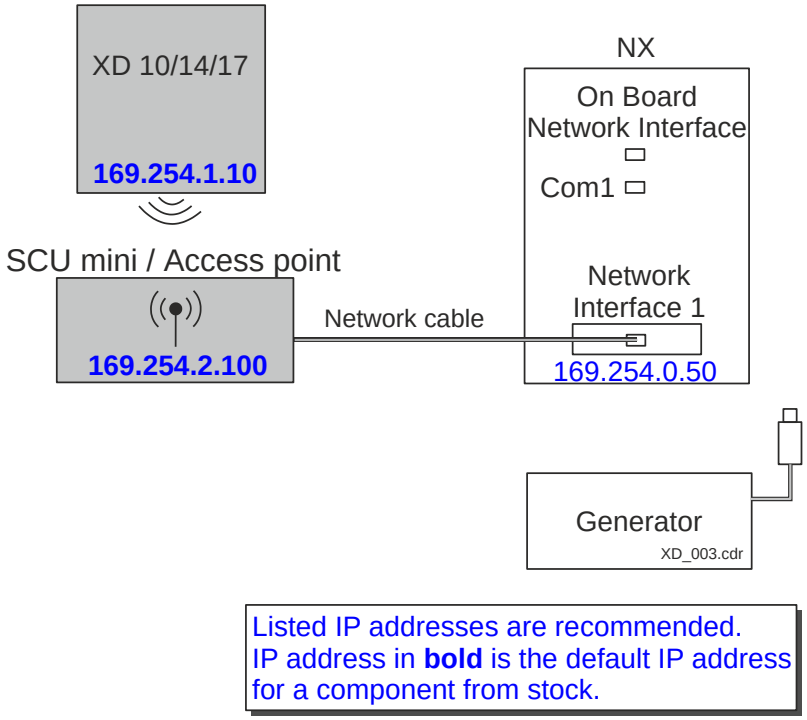
12 Spare parts

The Spare Parts List is not integrated in this Service Manual.
Refer to the following document:
Spare Parts List – XD Detectors, Document ID 75457035 or offline replication.

13 Wiring diagram

13.1 AED mode – desktop PC – wireless image transfer

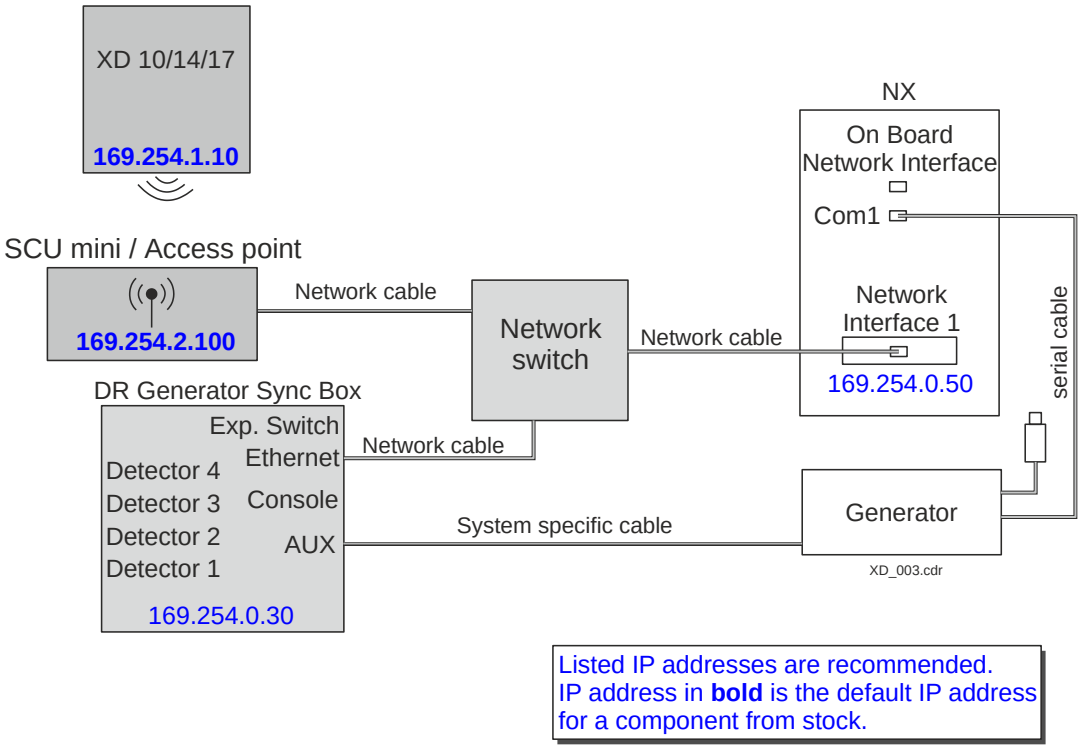
Typical example: DR Retrofit without Generator integration.



NOTE:
In the example shown here the subnet mask on all network devices must be set to 255.255.0.0.

13.2 Software sync with GSB – desktop PC – wireless image transfer

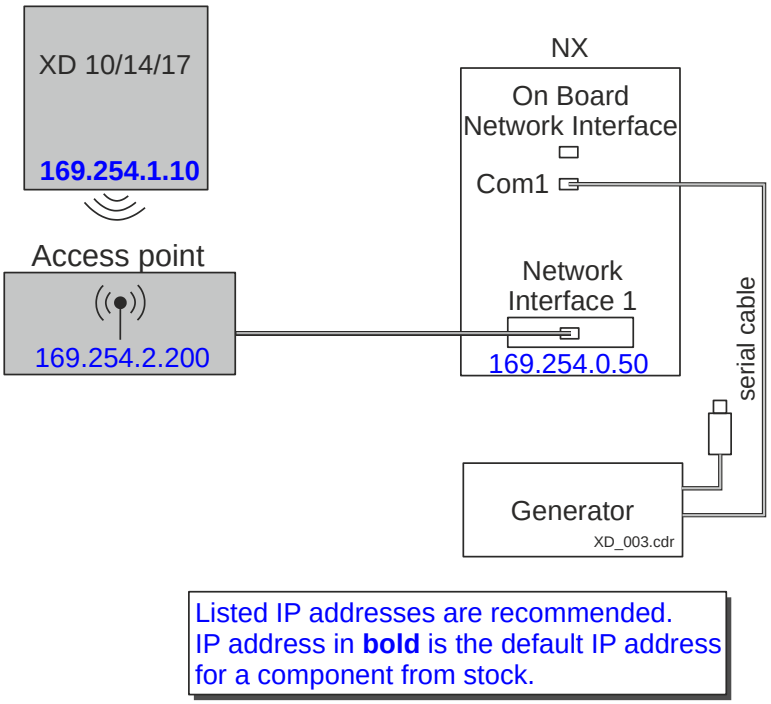
Typical examples: DR 400 (subtype 200), DR 600, DR 800, DX-D 400, DX-D 600



NOTE:
In the example shown here the subnet mask on all network devices must be set to 255.255.0.0.

13.3 Software sync without GSB – desktop PC or AIO PC – wireless image transfer

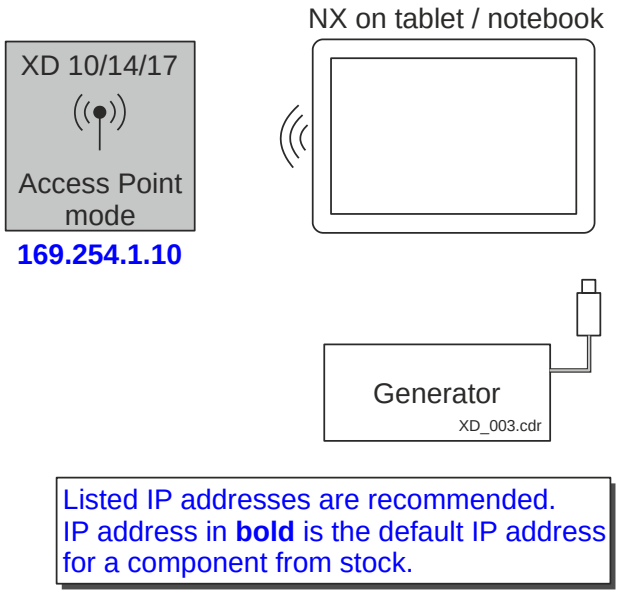
Typical examples: DR 100e, DR 100s, DX-D 100 Wireless, DX-D 300, Valory



NOTE:
In the example shown here the subnet mask on all network devices must be set to 255.255.0.0.

13.4 AED mode – notebook or tablet – wireless image transfer

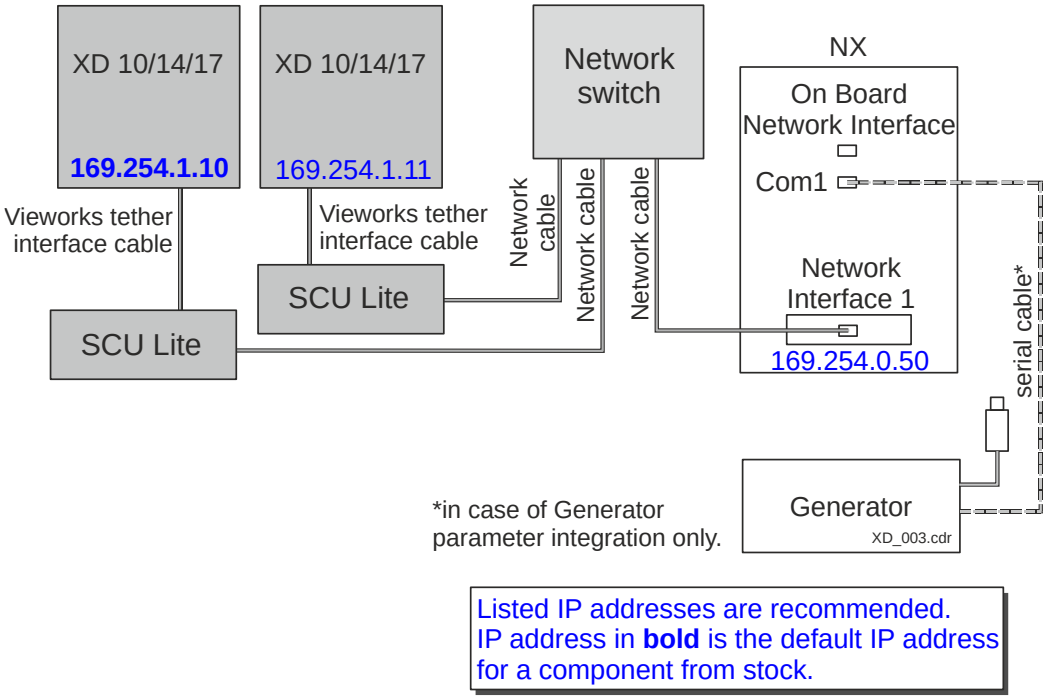
Typical example: Ultra mobile DR, also known as DR mobile Retrofit



NOTE:
The IP address of the WiFi module on the tablet or notebook must stay on “obtain IP address automatically” (= default).

13.5 AED mode – desktop PC – cabled image transfer

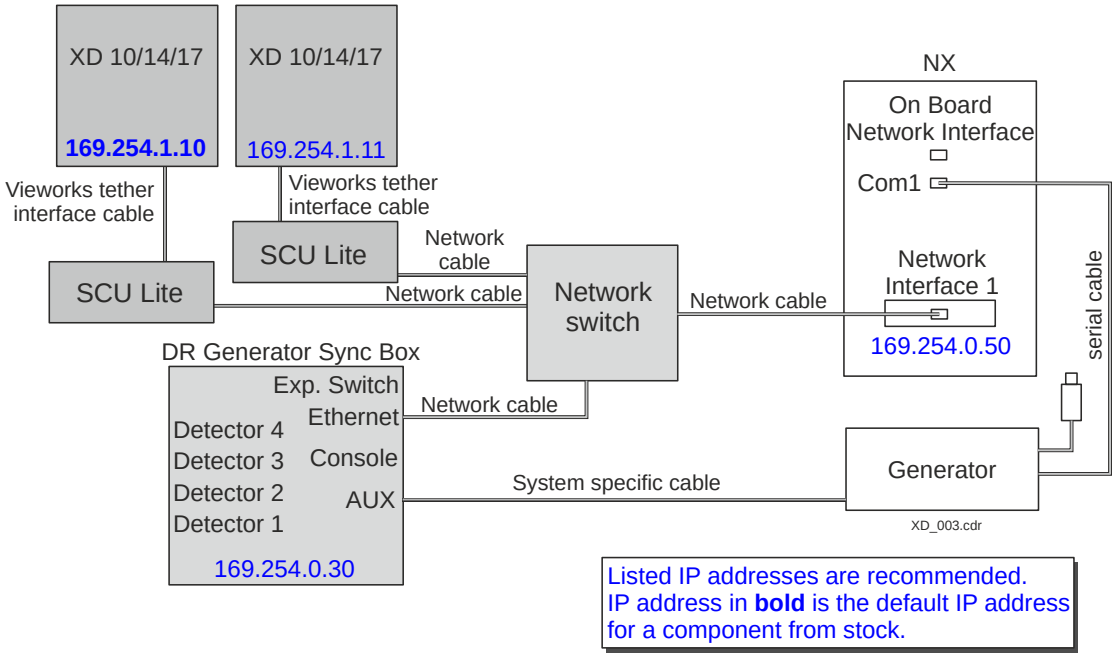
Typical Example: DR Retrofit without Generator integration with cabled Detector connection



NOTE:
In the example shown here the subnet mask on all network devices must be set to 255.255.0.0.

13.6 Software sync – desktop PC – cabled image transfer

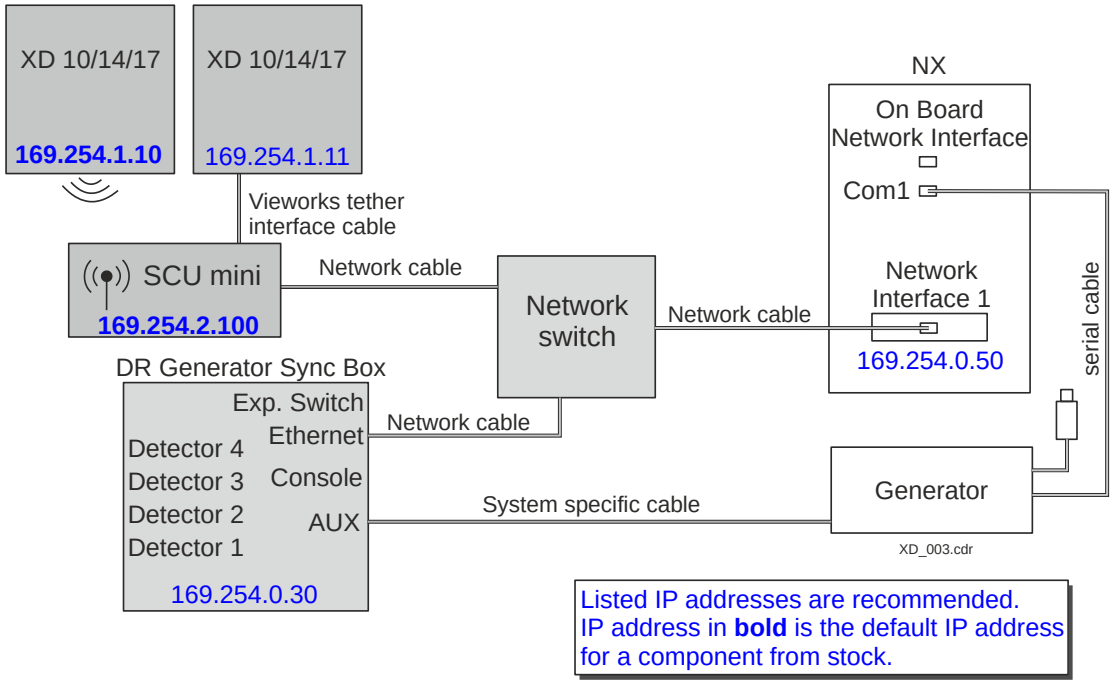
Typical Example: DR Retrofit with Generator integration with cabled Detector connection



NOTE:
In the example shown here the subnet mask on all network devices must be set to 255.255.0.0.

13.7 Software sync – desktop PC – cabled and wireless image transfer

Typical Example: DR Retrofit with Generator integration with cabled Detector connection and wireless Detector



14 Glossary

Term	Short description
AED	Automatic exposure detection
AP	Access point
CSI	Cesium Iodide
DC	Direct current
DR	Direct Radiography
ELMS	Electronic license management system
GHz	Giga Hertz
GRF	Ghost removal function
GSB	Generator Sync Box
GUI	Graphical User Interface
HW	Hardware
ICU	Intensive care unit
IP address	Internet protocol address, an identifying number that is associated with a specific computer or computer network
LED	Light emitting diode
Medimg	Medical imaging
NIC	Network Interface Card
NX	**N**ew E**x**perience. Software on MUSICA Acquisition Workstation
OLED	Organic Light-Emitting Diode
PCIe	PCI Express (Peripheral Component Interconnect Express), officially abbreviated as PCIe, is a high-speed serial computer expansion bus standard.
PSK	Pre-shared key, also named passphrase or key
RFBC	Retrofit Box Control. Software interface for the control of the DR Generator Sync Box via Ethernet.
SCU	System Control Unit
SDL	Sedecal Generator Component. Software interface for the control of the Sedecal Generator.
SMS	Siemens Generator Component. Software interface for the control of the Siemens Generator.

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Term	Short description
SPM	Spellman Generator Component. Software interface for the control of the Spellman Generator.
SQT	Service Quality Test
SSC	Sedecal Soft Console. Software interface for the control of the Soft console on NX (right part of the Graphical User Interface (GUI)) and for control of the Sedecal Generator.
SSID	Service Set Identifier. A unique identifier that wireless networking devices use to establish and maintain wireless connectivity
SW	Software
TCP/IP4	Transmission Control Protocol/Internet Protocol version 4
THS	Technix Generator Software. Software interface for the control of the Technix (DR 100s) Generator.
THX	Technix Generator Component. Software interface for the control of the Technix (DR 100e) Generator.
USB	Universal Serial Bus
VDI	Vieworks Detector Interface. Software interface for image and control data of the XD Detectors.
WiFi	Wireless Fidelity
XRDI	X-ray device interface. Generic software component which interfaces between the NX application software and other, system specific software interfaces.
µGy	Microgray – X-ray dose 1 Gy= 0.87 x 10^{-2} J/kg

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