HEALTHCARE
Imaging Services

Service Manual

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CR 10-X
Type 5151 / 100

1st Edition *

* For the revision status per chapter please refer to the latest version of the "Checklist for Completeness"
  in the Agfa HealthCare Library..

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AGFA
HealthCare

► ## Manufacturer

Agfa HealthCare N.V.

Published by

Agfa-Gevaert HealthCare GmbH
Tegernseer Landstraße 161
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Germany

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or its affiliates.

WARNING:

Improper operation or service activities may cause damage or injuries.

INSTRUCTION:

(1)   Read the "Generic Safety Directions" document
       (see Agfa HealthCare Library > General Info > Agfa HealthCare > Publications >
       Service Manual) prior to attempting any operation, repair or maintenance task on
       the equipment.

(2)   Strictly observe all safety directions within the "Generic Safety Directions" 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 HealthCare or one of its affiliates
or who are otherwise authorized by Agfa HealthCare or one of its affiliates to provide
such services.

NOTE:

To verify the latest version of a chapter of the Service Manual refer to the "Checklist for
Completeness" in the Agfa HealthCare Library.

► **Purpose of this Document**

This document provides information on the structure and contents of the Service Manual.

► **Document History**

Edition.Revision	Release Date	Changes
1.0	02-2012	Initial version

► ## Chapter Overview

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1	Controls, Connections and Set Up Procedures	
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	3.2 Machine specific Tools, Software Tools and Auxiliary Equipment	
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► Explanation of Notes

Safety relevant Notes		
Icon	**Signal Word**	**Situation**
(blue circle icon)	**CAUTION:**	Possible dangerous situation: Light injuries or damage to the equipment described in the manual and/or damage to any other equipment or goods and/or environmental pollution can be the consequence.
(yellow warning triangle)	**WARNING:**	Dangerous situation: Potential serious injury to a user, engineer, patient or any other person and possible mistreatment of patients can be the consequence.
(red warning triangle)	**DANGER:**	Direct, immediate danger: Death or serious injuries can be the consequence.

Not-safety relevant Notes		
Icon	**Name**	**Type of Information**
(blue instruction icon)	INSTRUCTION:	Indicates an instruction where it is important to follow literally the described actions.
(magnifier icon)	IMPORTANT:	Highlights very important actions which have to be carried out to prevent malfunction.
(green check icon)	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.

► Conventions

Highlighting of Tasks		
Task number	**Task Description**	**Remark**
(1)	Connect the cable.	Examples for working steps to be performed in the listed sequence.
(2)	Switch the machine on.	

Highlighting of Buttons, Functions and Names within a Task		
(1)	Press `<F9>` or double-click the `<Refresh>` button.	Examples are: Menu topics, keyboard keys, icons, device buttons, commands etc.
(2)	Enter `file name`.	In this example a file name has to be entered as term.

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1   About this Manual

1.1   Scope of this Manual

This Service Manual describes the service activity related items for following products:

- Digitizer CR 10-X, Type 5151, subtype 100
- Cassette Set CR MD 1.0 General (Cassette and image plate), 35x43 cm, Type 5188/100

This Service Manual is available on the Agfa HealthCare Library.

Refer to: Computed Radiography => CR Digitizers => CR 10-X

1.2   System Overview

The digitizer is part of the CR 10-X system, comprising:

- Digitizer
- Cassette(s) with image plate(s)
- NX Workstation
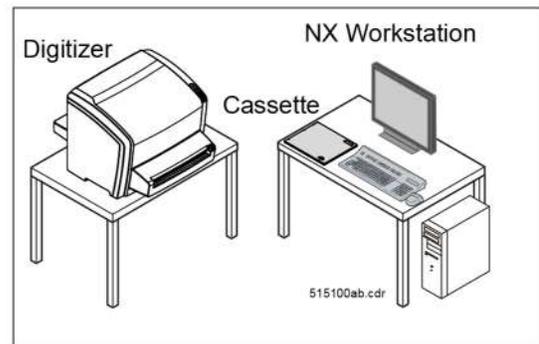
Figure 1

1.3   None Scope

- This Service Manual does not describe which combinations of versions of system components can be made in order to have a working and released system. For this purpose refer to following documents on the Agfa HealthCare Library:

    o CR/DR Interoperability Matrix, Document ID 31333326
       ([Intranet Link](#) / [Extranet Link](#))

    o Solution Structure Data, Document ID 30781759
       ([Intranet Link](#) / [Extranet Link](#))

- This Service Manual does not cover the NX Workstation, Type 4406/303. Refer to the Service Manuals available on the Agfa HealthCare Library path: Computed Radiography => CR Workstation Software

  For software versions of the NX Workstation type 4406/303 which can be used together with the CR 10-X digitizer, refer to the above mentioned CR/DR Interoperability Matrix.

  Status 02/2012:
  The released NX workstation software version is NX 2.0.8600/3.0.8600.

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Generic Safety Directions
for HealthCare Imaging Products

► ## Purpose of this Document

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

It is valid for all Agfa HealthCare Imaging Products and part of each Service Documentation as well as Installation Planning document.
The latest version is available via MedNet, GSO Library path:
General Info => Agfa HealthCare => Publications => Service Manual

► ## Document History

Edition. Revision	Release Date	Changes compared to previous Revision 1.2:
1.3	07-2009	• Updated table with laser classification to latest changes of the corresponding standard. See section 3.3. • Added section Environmental and occupational Safety Instructions. See section 9. • Added safety note concerning inroom installations of CR equipment and corresponding X-ray shielding. See section 17. • Added laser safety note and safety note concerning electrical checks after repairs. See section 19. • Added treatment for Lithium batteries in sections 19 and 21. • Updated information concerning the recycling pass. See section 24.

► ## Referenced Documents

Document	Title
Not applicable	Not applicable

Edition 1, Revision 3
07-2009   printed in Germany
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WARNING:

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INSTRUCTION:

(1) Read the "Generic Safety Directions" document
     (see MEDNET GSO => General Info => Agfa HealthCare => Publications =>
     Service Manual) prior to attempting any operation, repair or maintenance task on the
     equipment.

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

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1   Disclaimer

The installation and service of equipment described herein is to be performed by qualified personnel who are employed by Agfa HealthCare or one of its affiliates or who are otherwise authorized by Agfa HealthCare or one of its affiliates to provide such services.

Fitters, engineers and other persons who are not employed by or otherwise directly affiliated with or authorized by Agfa HealthCare or one of its affiliates are directed to contact one of the local offices of Agfa HealthCare or one of its affiliates before attempting installation or service procedures.

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Agfa HealthCare shall under no circumstances be liable for any damage arising from the use or inability to use any information, apparatus, method or process disclosed in this document.

Agfa HealthCare is not liable for resulting consequences, damages or injuries if you don't operate the product correctly or if you don't have it serviced correctly.

Agfa HealthCare reserves the right to change the product, the characteristics and its documentation without further notice to improve reliability, function or design.

NOTE:

In the United States, Federal Law stipulates that medical devices should only be sold to, distributed and used by or by order of a licensed physician.

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2   Used Icons

Icon	Name and Circumstances
❗	CAUTION: Possible dangerous situation: Light injuries or damage to the equipment described in the manual and/or damage to any other equipment or goods and/or environmental pollution can be the consequence.
⚠️	WARNING: Dangerous situation: Potential serious injury to a user, engineer, patient or any other person and possible mistreatment of patients can be the consequence.
🔺	DANGER: Direct, immediate danger: Death or heavy injuries can be the consequence.
📖	INSTRUCTION: If used <u>in combination</u> with the warning or caution sign: Indicates a specific instruction, which if followed exactly, avoids the subject of the warning or caution. If used without warning or caution sign: Indicates an instruction where it is important to follow literally as described.
🔍	IMPORTANT: Highlights very important actions which have to be carried out to prevent malfunction.
✓	NOTE: Indicates advice to facilitate the following step or action. Highlights unusual points. Indicates background information. Can be used to explain or highlight displays of the graphical user interface. Is additional information without influence on the action or step!

3   Labels

3.1   CE Mark

CE Mark $C\,E$	This product carries the CE Mark. The CE Declaration (CE Conformity) becomes invalid if the product is changed without explicit consent of the manufacturer! This applies to all parts, not only to safety elements.

3.2   System Labels

All system labels and software version number locations are referred to within this service document in the appropriate section.

Enclosed an overview of common labels, according to ISO 3864.

This list is not complete.

Hot Surface   Laser Beam   Magnetic Field   Ionizing Radiation

Obstacles   Corrosive Liquid   High Voltage   Hand Injuries
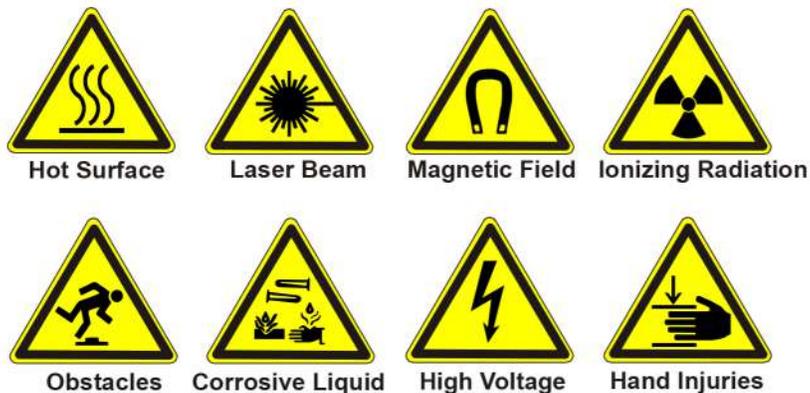
C&W_005.cdr

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3.3   System Labels concerning Laser Radiation

According to its classification, laser radiation can lead to eye and skin injuries.
Each laser source is classified from class 1 to class 4, based on standard
DIN EN 60825-1:2007.
The table below lists the meaning of the different laser classes. Note the detailed
instructions in the user manual and technical documentation.

Class #	Meaning	Example Label
Class 1:	Not dangerous to the human eye, even when using optical instruments. Can nevertheless produce irritating effects, especially with low ambient light conditions.	CLASS 1 LASER PRODUCT
Class 1 M:	Not dangerous to the human eye if no optical instruments (magnifying glass or binocular) are used. Can nevertheless produce irritating effects, especially with low ambient light conditions.	LASER RADIATION DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS CLASS 1M LASER PRODUCT
Class 2:	Dangerous to the human eye for intentional staring into the beam. Not dangerous for short term exposure < 0,25 seconds. Using optical instruments does not increase the risk of eye injury. Can even for short term exposure < 0,25 seconds produce dazzling and irritating effects, especially with low ambient light conditions.	LASER RADIATION DO NOT STARE INTO BEAM CLASS 2 LASER PRODUCT

Class #	Meaning	Example Label
Class 2M:	Dangerous to the human eye when staring into the beam or when using optical instruments (magnifying glass or telescope). No hazard for short term exposure < 0,25 seconds (aversion response of the eye) without use of optical instruments. Can produce dazzling and irritating effects even for short term exposure < 0,25 seconds, especially at low ambient light conditions.	LASER RADIATION DO NOT STARE INTO THE BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS CLASS 2M LASER PRODUCT
Class 3R:	Possibly dangerous to the human eye for direct view into the beam. Risks of an eye injury is increasing with duration of exposure. Can produce dazzling and irritating effects, especially with low ambient light conditions.	LASER RADIATION AVOID DIRECT EYE EXPOSURE CLASS 3R LASER PRODUCT
Class 3B:	Normally dangerous to the human eye for direct view into the beam. Viewing diffuse reflections is normally not dangerous. Risk of small skin injuries or ignition of explosive material if the power of the laser beam is close to the upper limits of class 3 B.	LASER RADIATION AVOID EXPOSURE TO BEAM CLASS 3B LASER PRODUCT
Class 4:	Dangerous to the human eye for direct view into the beam or viewing diffuse reflections. Very often class 4 lasers also implicate a fire hazard.	LASER RADIATION AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION CLASS 4 LASER PRODUCT

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4   Product Complaints

Any service person who has any complaints or has experienced any dissatisfaction in the quality, durability, reliability, safety, effectiveness or performance of this product must notify Agfa HealthCare by the Agfa HealthCare complaint procedure.

If the product malfunctions and may have caused or contributed to a serious injury of a patient or an accident or if there are any hazards which may cause an accident Agfa HealthCare must be notified immediately by telephone, fax or written correspondence to the following address:

Agfa Service Support - local support addresses and phone numbers listed on: www.agfa.com

Agfa – Gevaert N.V.

Septestraat 27

2640 Mortsel, Belgium.

Fax +32 3 444 4485

5   References

Technical Documentation is available via MedNet (PDF) and your local Agfa HealthCare support organisation (Paper).

Access to MedNet:

IntraNet: http://docs.agfanet/bu/mi/mednet/mednetcso.nsf
ExtraNet: http://extranet.agfa.com/bu/mi/mednet/mednetcso.nsf

6   Intended Use

This Agfa HealthCare product should only be operated in a hospital or clinical radiological environment by qualified staff.

It must only be operated according to its specifications and its intended use. Any operation not corresponding to the specifications or intended use may result in hazards, which in turn may lead to serious injuries or fatal accidents (for example electric shocks). AGFA will not assume any liability whatsoever in these cases.

Make sure that the product is constantly monitored in order to avoid inappropriate handling, especially by children.

The product must only be installed and put into operation under the specified conditions.

7   Intended User

This manual is written for Agfa trained Field Service Engineers and Clinical Application Specialists, trained users of Agfa HealthCare products and trained diagnostic X–Ray clinical personnel who have received proper training. Users are considered as the persons who handle the equipment as well as the persons having authority over the equipment.

8   Qualifications for Operation and Service Tasks

This Technical Documentation describes adjustments and routines which must only to be performed by qualified technical personnel.

The Agfa (trained) Field Service Engineers and Clinical Application Specialists must have received adequate Agfa HealthCare training on the safe and effective use of the product and applicable environmental and occupational safety matters before attempting to work with it. Training requirements may vary from country to country.

Agfa (trained) Field Service Engineers and Clinical Application Specialists must make sure that training is received in accordance with local laws or regulations that have the force of law.

Your local Agfa HealthCare representative can provide further information on training.

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9   Environmental and occupational Safety Instructions

Each Agfa (trained) Field Service Engineer and Clinical Application Specialist:

- Must make his or her personal contribution to improve safety and protect the environment.
- When working on a customers site, has a duty to take reasonable care to avoid injury to himself or herself or to others who may be affected by their acts or omissions.
- Is obligated to adhere strictly to regulations and instructions.
- Shall familiarise himself or herself with the provisions of the Agfa Healthcare Health, Safety and Environment Policy and any specific rules or procedures relating to occupational safety at work and the protection of the environment.
- Shall promptly report any near misses, accidents, incidents or dangerous occurrences to their line manager and co-operate fully in any investigation.
- Shall co-operate with company management on matters relating to health, safety and environment and, where appropriate, discuss with and / or assist their manager in resolving matters relating to health, safety and environment.
- Shall ensure that any company equipment issued to them, or, for which they are responsible, is correctly used and properly maintained.
- Shall wear protective equipment whenever instructed or if it is recommended to do so.
- Shall be responsible for good housekeeping in the area in which he or she is working.
- Shall report situations, which could put them at risk, on either company or customers' premises, to their manager or supervisor; and, if warranted, directly and in confidence, to the Health and Safety Co-ordinator, Global HSE Manager, or ultimately to the Managing Director.
- Shall report any injuries, diseases or dangerous occurrences to his or her line manager.
- Shall report any accidents, incidents or near misses to his or her line manager.
- Shall report any situation of which he or she is aware that is potentially dangerous.
- Shall comply with any health surveillance procedure instituted for his or her benefit or for compliance with regulations.

10   Connections to other Equipment

Agfa HealthCare equipment must only be used in combination with other Agfa HealthCare equipment or components if these are expressly recognized by Agfa HealthCare as compatible. A list of such equipment and components is available from Agfa HealthCare service on request.

Changes or additions to the equipment must only be carried out by persons authorized to do so by Agfa HealthCare. Such changes must comply with best engineering practice and all applicable laws and regulations that have the force of law within the jurisdiction of the hospital.

The Agfa HealthCare products are designed to communicate with other devices in the hospital network using DICOM protocols.

Connections to other equipment:

Warning:

Accessory equipment not complying with the safety requirements of this product may lead to a safety hazard.

INSTRUCTION:

Consult the Technical Documentation before making any connections to other equipment.

Consideration relating to the choice of accessory equipment shall include:

- Use of the accessory equipment in the patient vicinity.
- Evidence that the safety certification of the accessory equipment has been performed in accordance with the appropriate IEC 60601-1 and IEC 60601-1-1 harmonized national standard.

In addition all configurations must comply with the medical electrical systems standard IEC 60601-1-1. The party that makes the connections acts as system Configurer and is responsible for complying with the systems standard.

If required, contact your local service organization.

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11   Accessories and Spare Parts

Parts and accessories replacement:

WARNING:

Hazards may be introduced because of component failure or improper operation.

INSTRUCTION:

- Replace defective parts with Agfa HealthCare original spare parts.

- Use only tools and measuring instruments which are suitable for the procedure.

- Only approved Agfa HealthCare accessories must be used. For a list of compatible accessories contact your local Agfa HealthCare organization or www.agfa.com.

12   Compliance

Directive for HealthCare Imaging Products:
Council Directive 93/42/EEC of 14 June 1993 concerning medical devices
(OJ No L 169/1 of 1993-07-12)

- ANNEX I - ESSENTIAL REQUIREMENTS - GENERAL REQUIREMENTS The products are designed and manufactured in such a way that, when used under the conditions and for the purposes intended and, where applicable, by virtue of the technical knowledge, experience, education or training of intended users, they will not compromise the clinical condition or the safety of patients, or the safety and health of users.

- ANNEX II - EC DECLARATION OF CONFORMITY: Full quality assurance system ISO 13485

- ANNEX X - CLINICAL EVALUATION: The clinical evaluation follows a defined and methodologically sound procedure.

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Applied Standards for HealthCare Imaging Products

- IEC 60601-1, Ed. 3: Medical electrical equipment - Part 1: General requirements for basic safety and essential performance

- ISO 14971:2000, Medical devices – Application of risk management to medical devices

- IEC 60601-1-2, It specifies the MANUFACTURER of the ME EQUIPMENT or ME SYSTEM provides information to the RESPONSIBLE ORGANIZATION that is essential in determining the suitability of the ME EQUIPMENT or ME SYSTEM for the electromagnetic environment of use, and in managing the electromagnetic environment of use to permit the ME EQUIPMENT or ME SYSTEM to maintain BASIC SAFETY and provide its ESSENTIAL PERFORMANCE without disturbing other equipment.

Additional standards for documentation:

IEC 62079 Ed. 1: Preparation of instructions - Structuring, content and presentation

Harmonization:

Global Harmonization Task Force (GHTF) www.ghtf.org/

This document has been prepared to comply with Study Group 1 guidance document of the Global Harmonization Task Force (GHTF) www.ghtf.org/ to assist development of a consistent, harmonized definition for a medical device that could be used within a global regulatory model and would offer significant benefits to the manufacturer, user, patient or consumer, and to Regulatory Authorities and support global convergence of regulatory systems.

IECEE CB SCHEME

The IECEE CB (Certification Body) Scheme is the world's first truly international system for acceptance of test reports dealing with the safety of electrical and electronic products. It is a multilateral agreement among participating countries and certification organizations. Agfa has produced a CB test report and claims national certification in all other member countries of the CB Scheme.

Details see www.iecee.org

Radiation of radio frequency:

CAUTION: For USA only:

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the service manual, may cause interference to radio communication.

Note:

This product has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart B of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference.

The user will be required to take all necessary measures to correct the interference at his own expense.

13   Safety Directions for Operation

Accessibility of the mains power switch:

CAUTION:
Do not obstruct the mains power switch.

Position the Agfa HealthCare product so that it is possible to disconnect the mains power connection.

- Under certain conditions the Agfa HealthCare product will show a display containing a message. This message will show that either a problem or action has occurred or that a requested action is required or cannot be performed. The user must read these messages carefully they will provide information on what to do. This will be either performing an action to resolve the problem or to contact the Agfa HealthCare service organization. Details on the contents of messages can be found in this Technical Documentation.
- All images created using any image technology can show artifacts which could be confused with diagnostic information. If there is any doubt that the diagnostic information could be corrupted, additional investigations must be performed to get clear diagnostic information.
- Ventilation openings must not be covered.
- If you notice conspicuous noise or smoke, disconnect the product immediately from the mains.
- Do not pour water or any other liquid over the device.
- If a system malfunction causes an emergency situation involving the patient, operating personnel or any system component, activate the emergency stop for the system concerned. All motor driven system movements will be stopped.
- Do not store any magnetic media near or on devices, which produce magnetic fields, since stored data may be lost.

Explosive environment:

DANGER:

Risk of explosion.

Never operate this device in zones where there are flammable anesthetics or oxygen which may cause an explosion.

Usage of an un-interruptible power supply:

Warning:

Images can be lost due to power failure.

Connect the equipment to an un-interruptible power supply (UPS) or an institutional standby generator.

14 Radiation Protection

Only qualified and authorized personnel shall operate any X-Ray system. In this context qualified means those legally permitted to operate this X-Ray equipment in the jurisdiction in which the X-Ray equipment is being used, and authorized means those authorized by the authority controlling the use of the X-Ray equipment. Full use must be made of all radiation protection features, devices, systems, procedures and accessories.

Ionizing radiation can lead to radiation injuries if handled incorrectly. When radiation is applied, the required protective measures must be complied with.

15 Safety Directions for Cleaning and Disinfection

- Details about cleaning and disinfection or sterilization methods that may be used on SYSTEM parts or ACCESSORIES that can become contaminated through contact with the PATIENT or with body fluids, are referred to within the individual service documents.
- Disconnect the power supply from the equipment prior to cleaning the equipment.

16   General Safety Directions for Service Activities

- This system uses high voltage. Please consider the respective safety regulations.
- Electrical repairs and connections must only be performed by a qualified electrician.
- Mechanical repairs and connections must only be performed by a qualified technician.
- The safety directions for operation (see section 13) are also valid for all service activities.
- During all service activities observe prescribed local and country-specific requirements (e.g. occupational safety and accident prevention regulations).
- All existing screw connections must be tightened sufficiently firmly, but they may not be overstressed when tightening. There must always be compliance with stated torque values!
- Damaged or missing screws may be replaced only with the same screw types that have the specified hardness rating. Unless a different value is listed in the instructions, all Allen screws used must be hardness rated 8.8.
- All screws must be secured in accordance with the corresponding data.
  If "Loctite" has to be used to secure screws, this is stated in the text.
- Any Agfa service PC or tool which is to be connected via RS232, RJ45, USB or other interface to an Agfa device must not be connected to the mains but must be operated on its internal battery or indirect supply (low voltage).

- When handling printed circuit boards (abbr.: PCBs) the following points must be observed:
    o   Always switch off the equipment and unplug the power cord, before you disconnect or connect cables on printed circuit boards.
    o   When working on PCBs, always wear an anti-static wrist strap. Never touch any parts or components on PCBs with your bare fingers.
    o   PCBs have to be kept or transported in their protection bags. Never carry a PCB without protection bag and walk on carpet or plastic floor covering (electrostatic charge).
    o   Once the PCB is taken out of its protection bag, it has to be protected from electrostatic charge by a grounded mat.

Static discharge at electrical components:

 CAUTION:
Static discharge! Electrical components may be destroyed:

For the repair on electrical components, wear a grounding strap
(Order number: CM+9 9999 0830 0) around the wrist and connect the other end of this strap on a grounded conducting metal piece.

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17   Safety Directions for Installation Planning Activities

Protecting CR (Computed Radiography) Equipment against scattered X-Rays:

⚠️ **Warning:**

Image plate is sensitive for X-rays. Poor image quality possible.

The digitizer and the cassette storage shall be protected against X-ray radiation this way, that the annual dose equivalent at the installation place will not exceed 1 mSv.

Protecting Film-Screen Systems against scattered X-Rays:

⚠️ **Warning:**

Film is sensitive for X-rays. Poor image quality possible.

The film-screen system shall be protected against X-ray radiation this way, that the annual dose equivalent at the installation place will not exceed 1 mSv.

Accessibility of the power disconnection device:

⚠️ **Warning:**

Electrical device. Shock possible.

INSTRUCTION:

- Do not position Agfa EQUIPMENT so it is difficult to operate the disconnection device when an APPLIANCE COUPLER or separable plug is used as isolation.

- Local and International wiring regulations must be observed. Check all supplies and voltages, currents, trips and fuses with the Hospital facilities department or their engineers.

- The device complies with the EN 60601-1, 2006 standard for Information Technology. This means that, although it is absolutely safe, patients may not come in direct contact with the equipment. Therefore the operator console must be placed outside a radius of 1.5 m around the patient.
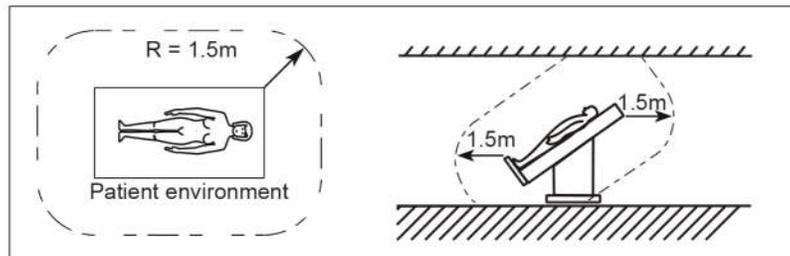
- This device should be installed behind the institution firewall for network security and anti-virus protection. No ongoing computer virus protection or network security for this medical device is provided (e.g. a computer firewall). Network security and anti-virus provisions are the ongoing responsibility of the user or institution.

Fixing equipment at the wall or floor:

Warning:

Unknown composition of wall or floor structure: Risk of injury or damage:

Hospital management is responsible for the position, location and fixing of all equipment.

Floor load:

CAUTION:

Heavy device may damage the floor covering.

Make sure that the floor covering is solid enough to stand the weight of the device.

Fixing equipment at the ceiling:

CAUTION:

Ceiling construction may be inadequate for fixing of equipment: Risk of injury or damage:

Hospital management is responsible for the position, location and fixing of all equipment.

18   Safety Directions for Installation Activities

- If not otherwise stated, installation and configuration is performed by Agfa HealthCare trained personnel.
- If damage of the package is visible from the outside contact your local AGFA representative.
- Apart from wearing the required protective clothing, e.g. safety boots and gloves, care must be taken that heavy loads are correctly lifted/carried to avoid injury. The relevant instructions must be complied with. Heavy or awkward loads must be moved by mechanical means or by several people.
- When installing the product be sure that there is either a mains plug or an all-cable disconnecting device in the internal installation fitted near the product and that it is easily accessible.
- Defective covers, sharp edges or protruding parts of equipment can cause injuries, if accidentally knocked into. Route cables and position equipment safely.
- This device should be installed behind the institution firewall for network security and anti-virus protection. No ongoing computer virus protection or network security for this medical device is provided (e.g., a computer firewall). Network security and anti-virus provisions are the ongoing responsibility of the user or institution.

Connection of the device to the power supply:

CAUTION:
Risk of damaging the device by using the wrong power supply:

INSTRUCTION:

Prior to connecting the device to the mains:

- Compare the power requirements indicated on the type label with the available power supply in the installation room.
- Check the service manual for the type of input voltage selection, manual or automatic: If manual, select the appropriate voltage and fuses.
- Confirm to use the correct socket and plug for the required power supply.
- Check the equipment will work with the power supply available.

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Ground potential differences:

⬤ **CAUTION:**

To comply with ISO 60601-1 (annex I) all computers and peripherals must be connected to the same power source.

INSTRUCTION:

- Always connect the associated monitor to the same Uninterruptible Power Source as the PC.

- When different combinations of equipment are used in various medical environments a potential difference (V) can exist between the protective earths in different localities. If the protective earthing fails this potential difference can cause a HAZARD for the OPERATOR or for the PATIENT.

19   Safety Directions for Maintenance and Repair Activities

- This Technical Documentation identifies the parts on which preventive inspection and maintenance shall be performed by Agfa HealthCare service personnel, including the periods to be applied.
- In general the device has to be switched off during service activities. Exception: If the device is switched on to perform tests pay particular attention to any hazards due to moving and rotating parts. Avoid lose clothing or finger traps. Switch off the device immediately after the tests.
- Do not turn motors manually. If required, first disconnect the motor from the motor control board.
- Make sure that the power cord does not show any signs of damage.
- After repair work always check that the integrated safety features are not overridden or disconnected.
- If there is any visible damage to the machine casing do not hand-over the product to the customer. First repair the machine casing.

Replacing batteries:

WARNING:

Battery can explode, causing chemical burns.

INSTRUCTION:

- Check that batteries are inserted with correct polarity.

- Only use batteries of the same type or an equivalent type as specified by the manufacturer.

- Dispose of empty batteries in compliance with the specifications of the manufacturer.

- When removing lithium batteries from the equipment take appropriate measures to avoid short circuit of the battery:
  Either use tape to cover the two poles of the battery or put the battery back in its original packing and secure the packing by tape.

Performing the electrical test according to national regulations:

WARNING:

Improper ground connections inside the device or too high leakage current may lead to electric shocks.

- After any work at the power supply or at any component connected to mains voltage inform the responsible organization[1] about the necessity of the electrical test according to national regulations.
  If specific national regulations do not exist: It is recommended to perform the electrical test according to IEC 62353.

- Make sure, that all grounding connections to metallic covers and all grounding connections inside the device are present.

NOTE:

On MedNet, GSO Library path "General Info => Agfa HealthCare => Publications => Service Manual" a form "IEC 62353:2007 Test Documentation" for CR Digitizers is available, to be handed out to the responsible organization (Intranet Link / Extranet Link).

---

[1] Responsible Organization:
Entity accountable for the use and maintenance of a medical equipment or a medical equipment system. The accountable entity can be, for example, a hospital or an individual clinician.

Performing service activities at devices emitting laser radiation:

WARNING:

Laser radiation. Eye injury possible.

INSTRUCTION:

- Strictly observe the warning notes in the service manual of devices emitting laser radiation (See service manual chapter describing Safety Guidelines / General Repair Instructions) and at the corresponding steps of instructions.

- Strictly observe the warning labels at the modules emitting laser light. For the meaning of the labels refer to section 3.3 in this document.

- Do not look into the laser beam.

- Do not open modules containing a laser. Only open modules containing a laser if explicitly instructed to do so.

- Do not keep tools in the laser beam unless explicitly instructed to do so.

- Make yourself familiar with the path of the laser light and the conditions, when the laser beam is switched on. Refer to the Functional Description in the corresponding service manual.

- Do not operate modules with laser outside the device.

Sharp edges:

CAUTION:

Sharp edges inside the device: Cut or abrasion possible.

Be careful at maintenance and replacement of parts.

Cleaning optical elements:

CAUTION:
Image artifacts possible after cleaning optical elements.

When cleaning optical elements follow the service manual precisely.

Secured screws:

CAUTION:

Opening screws secured by red lacquer may misalign important device adjustments:

Do not open screws that are secured by red lacquer.

Opening PCs and Workstations:

Warning:

Electrical shock and damage to the equipment possible.

- Only open the PC or workstation if explicitly stated in the service manual.
- Unplug before opening.
- Observe anti-static safety regulations.

Replacing fuses:

Warning:

Replacing fuses by wrong type may lead to fire hazard!

Use only fuses of the exact value and characteristics stated in the service manual or on the device.

20   Safety Directions for remote Service Activities

Remote Service Activities:

Warning:

During remote service activities images can be lost.

Inform the customer prior to remote service activities to finish the current work and to stop working on the system.

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21 Safety Directions for Transport and Shipment of Spare Parts, Accessories and Devices

- In compliance with transport regulations, all uninterruptible power supplies (UPS) must be shipped with batteries disconnected.
- Use the original packing when returning spare parts, accessories or devices.
- Before returning any spare part with a built in lithium battery remove it and dispose the batteries locally according to local waste regulations.

22 Safety Directions concerning Modifications

Modifications made in products/systems shipped by Agfa HealthCare must not be implemented without written permission from Agfa HealthCare.

This applies in particular to changes which may affect the mechanical and/or electrical safety or radiation-protection properties of a product (e.g. changing of safety distances, removal of locks/instructions etc.).

23 Safety Directions concerning Hazardous Materials

'Hazardous materials' is the designation for substances which can ignite or explode or which are toxic, injurious to health, corrosive or irritating. The "Hazardous Material" instructions must be read and the required protective measures must be complied with when performing work to avoid health risks.

Their properties together with the hazards and protective measures connected with them are identified clearly by symbols and described by the instructions appertaining to the hazardous substances.

24 Recycling

Agfa HealthCare has Recycling Passports available for all equipment. The Recycling Passport explains whether hazardous materials, special components and batteries are present, where they are located and how they can be removed at the end of the life cycle.

The Recycling Passports are meant to be used as information for waste treatment partners and companies that want to recycle end-of-life Agfa equipment.

To get a copy of the required Agfa HealthCare Recycling Passport please contact your local Sales organization.

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25   Waste Disposal

 On August 13, 2005, the European Directive on Waste Electrical and Electronic Equipment (WEEE) 2002/96/EC, amended by Directive 2003/108/EC, came into force.

The directive on Waste Electrical and Electronic Equipment (WEEE) aims to prevent the generation of electric and electronic waste and to promote the reuse, recycling and other forms of recovery. It therefore requires the collection of WEEE, recovery and reuse or recycling.
This directive has to be implemented into national law by the individual European countries by August 13th 2005.

Due to the implementation into national law, specific requirements can be different within the European Member States.

This symbol on the product, or in the manual and in the warranty, and / or on its packaging indicates that this product shall not be treated as household waste.

For more detailed information about take-back and recycling of this product, please contact your local Agfa service organization. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources.
If your equipment or replaced spare parts contain batteries or accumulators please dispose of these separately according to local regulations.

26   Erasing Protected Health Information (PHI)

AGFA HealthCare Field Service Personnel or its authorized affiliates are responsible for the removal of Protected Health Information (PHI) patient data from devices, modules or parts that are removed from the customer's site. This also applies to the exchange of spare parts, especially to parts that are returned to central warehouses for repair or refurbishing. Examples for parts or modules that may contain Protected Health Information (PHI) are: Computer hard disks, CD-ROMS, backup tapes, archive tapes.

Document No: DD+DIS155.11E

CR 10-X
Type 5151 / 100

▶ ## Purpose of this Document

This document describes:

- Location and function of the controls and connectors of the machine

- All routines necessary to put an unpacked machine in operation

▶ ## Document History

Edition. Revision	Release Date	Changes compared to previous version 1.1:
1.2	05-2012	• Adapted steps for CR 10-X configuration wizard. • Shifted previous steps for setup at NX 2.0.8600 / 3.0.8600 in the appendix, section 5.

▶ ## Referenced Documents

Document	Title
DD+DIS170.11E	CR 10-X Service Manual, Chapter 11 - Installation Planning
DD+DIS055.11E	NX 2.0.8600 / 3.0.8600 Service Manual, Chapter 4 - Installation and Configuration
DD+DIS044.12E	NX 2.0.8700 / 3.0.8700 Service Manual, Chapter 4 - Installation and Configuration

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AGFA
HealthCare

► ## Manufacturer

Agfa HealthCare N.V.

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WARNING:

Improper operation or service activities may cause damage or injuries.

INSTRUCTION:

(1)   Read the "Generic Safety Directions" document
(see Agfa HealthCare Library > General Info > Agfa HealthCare > Publications > Service Manual) prior to attempting any operation, repair or maintenance task on the equipment.

(2)   Strictly observe all safety directions within the "Generic Safety Directions" 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 HealthCare or one of its affiliates or who are otherwise authorized by Agfa HealthCare or one of its affiliates to provide such services.

NOTE:

To verify the latest version of a chapter of the Service Manual refer to the "Checklist for Completeness" in the Agfa HealthCare Library.

LIST OF CONTENTS

1   Introduction

IMPORTANT:

This document describes the installation and configuration of the digitizer including the NX workstation with software **NX 2.0.8700 / 3.0.8700** or higher version.

If the NX software is **NX 2.0.8600 / 3.0.8600**, refer to the appendix, section 5.

REQUIRED TOOLS

The required tools are part of delivery.

REQUIRED TIME:

The complete installation of the digitizer including installation and configuration of the workstation takes approximately 1 hour.

REQUIRED DOCUMENTS

Chapter 4 of the corresponding NX Workstation version in the Agfa HealthCare Library: Computed Radiography > CR Workstation Software

NOTE:

The **Installation Checklist** in section 6 of this chapter gives an overview of all steps of the digitizer installation and guides through the complete installation process.

2   Installation Preparation

Preparing the installation is split up into the following steps:

#	Task	Section
1	Check the installation site prerequisites.	2.1
2	Unpack the digitizer.	2.2
3	Unpack the workstation and monitor.	2.3
4	Check the shipment completeness.	2.4

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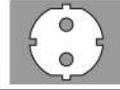
2.1   Checking Installation Site Prerequisites

(1)   Confirm that all prerequisites described in the "Installation readiness checklist" are fulfilled. See CR 10-X Service Manual chapter 11, Installation Planning.

2.2   Unpacking the Digitizer

(1)   Compare the labels on the boxes with the customers order list and the shipping papers.

(2)   Check the packing material for visible transport damage such as dented edges, damage on the box, torn fixing elements (metal straps).

(3)   Check the attached safety indicators on the packing boxes.

IMPORTANT:

If the device was tilted, the circle in the arrow head of the TILTWATCH changes from white to red.
If the device was subjected to shocks, the square field in the middle of the SHOCKWATCH changes from white to red.

White field is OK.
Red field is not OK.

Figure 1

- If damages are visible from the outside, inform the carrier. The damage must be noted down in the handover documents.

- If the device should be replaced, contact your local AGFA representative.

- If no damage is visible from the outside start installation.

WARNING:

The digitizer is heavy (30 kg; 66 lbs). Risk of injuries when lifting the digitizer.

Use proper foot and hand protection when lifting the digitizer.

WARNING:

The device is a table-top digitizer. The structure and stability of the table used need to be suitable in relation with the size and weight of the system. Do not use excessive force when inserting cassettes in the digitizer as the device may slip or drop off the table. Use a non-slip-mat below the digitizer or other anti-skid measures. The table should not be subject to excessive shock and vibrations from other sources, as this may disturb the operation of the digitizer.

(4)   Unpack the digitizer. The unpacking instructions are printed on the digitizer box. Figure 2 shows an example of the unpacking instructions.
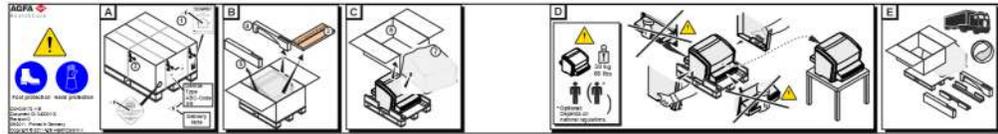

Figure 2

2.3   Unpacking the NX Workstation and Monitor

(1)   Unpack all boxes of the NX Workstation delivery.

2.4   Checking the Shipment Completeness

(1)   Compare the scope of delivery with the packing lists, where available.

Example for digitizer packing list:

Quantity	Description
1	Digitizer
1	Packing list for accessory
1	CE declaration of conformity
1	Installation Document
1	External power supply
1	Power cable, Europe 3.00 m
1	Power cable, US 3.00 m
1	Network cable 5 m / 16 feet long
1	1.5 mm CU filter
1	Torx key TX20
1	CD with User Manuals in all specified languages*

* Language: Bulgarian, Chinese simplified, Chinese traditional, Czech, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Latvian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Slovak, Slovenian, Spanish, Swedish, Thai, Turkish, Vietnamese

(2)   In case the delivery is not complete, escalate to the next support level.

3   Performing the Installation Steps as described in the Quick Installation Guide

(1)   Perform all steps as described in the Quick Installation Guide, which is part of delivery. The document is also available via Agfa HealthCare Library, Document ID 34000041 (Intranet Link / Extranet Link).

NOTE:

After the installation with the Quick Installation Guide, the mandatory connection and configuration steps for a standalone system are finished.
The system status is as follows:

Digitizer Status in the NX configuration menu:
`Devices → Digitizer Configuration → Digitizer`

#	Parameter	Value
1	Name:	DIG_DEFAULT
2	Enable Auto Cropping	Disabled
3	Device settings: IP Address	192.192.192.192
4	Device Settings: AE Title:	DIG_DEFAULT
5	Device settings: Default Router	192.168.0.1
6	Device settings: Subnet Mask	255.255.255.0

Figure 3

NX Status in the NX configuration menu: `General` → `General Settings`

#	Parameter	Value
1	ID station name (= Computer name)	DefaultNX
2	Performed Station AE Title	NX_DEFAULT
3	Processing station name	local host
4	Port	104
5	Default Modality	CR
6	Fast Preview Settings - AE Title	FAST_DEFAULT
7	Fast Preview Settings - Port number	3729
8	Fast ID - AE Title	IDEN_DEFAULT
9	Fast ID - Port number	3216
10	IP address	192.192.192.193 (fixed)

Figure 4

Users setup on NX workstation:

User	User Name	Password
Service user	Refer to web based training	
Standard NX user	Agfa	Agfa4CR10
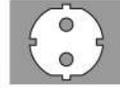
4   Finalizing the Installation

The following tables list the mandatory and optional steps to finalize the installation:

#	Mandatory Steps	Section
1	Perform further activities depending on local regulations.	4.7
2	Inform the customer about the digitizer system.	4.8

#	Optional Steps, depending on the local situation	Section
1	Add windows and NX users.	4.1
2	If required: Configure digitizer and NX for the local network.	4.2
3	Setup connectivity to additional system components (RIS, PACS, Hardcopy, etc.).	4.3
4	Customize system components according to customer preferences.	4.4
5	Finalize the workstation installation.	4.5
6	Check software version.	4.6

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4.1   Adding Windows and NX Users

NOTE:

After NX activation the NX workstation has one service user configured. The CR 10-X configuration wizard additionally installs a standard user (Agfa / Agfa4CR10).

The service user has Windows administrator rights as well as Service Engineer Rights on NX.

If required, create additional users with NX operator rights.
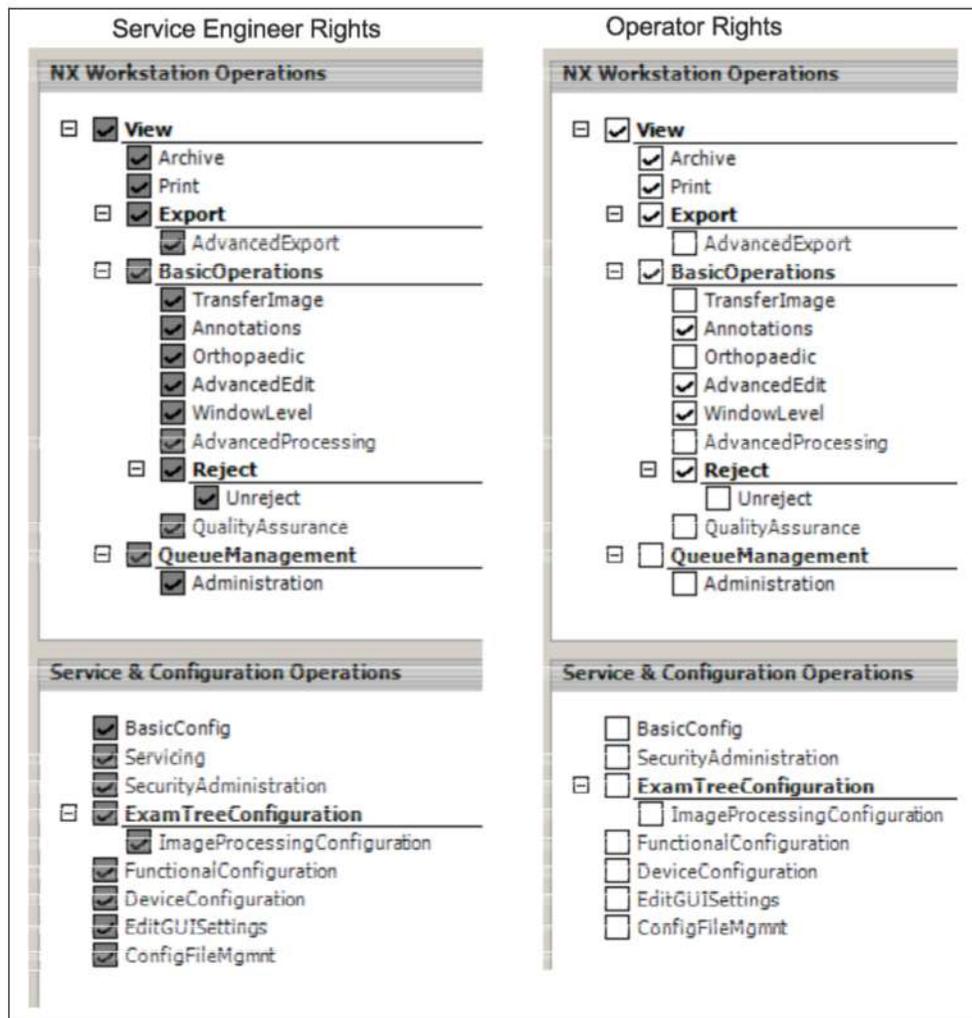
Figure 5

(1)   Add Windows users in following menu:
       `Start > Control Panel > Administrative Tools > Computer Management > Local Users and Groups > Users > New User`
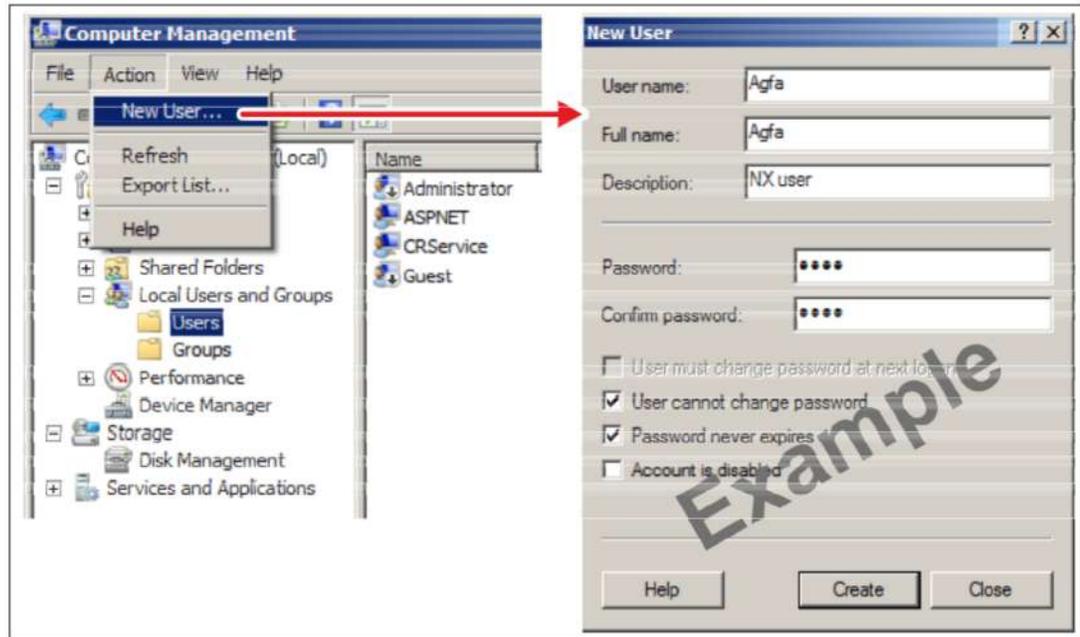
Figure 6

(2)   Start the NX Configurator (via Desktop Shortcut).

(3)   Select: `<Load active configuration>`

(4)   Select: `Security > Manage Users > Add User`

(5)   Add NX users and roles. For an example see Figure 7 and Figure 8.
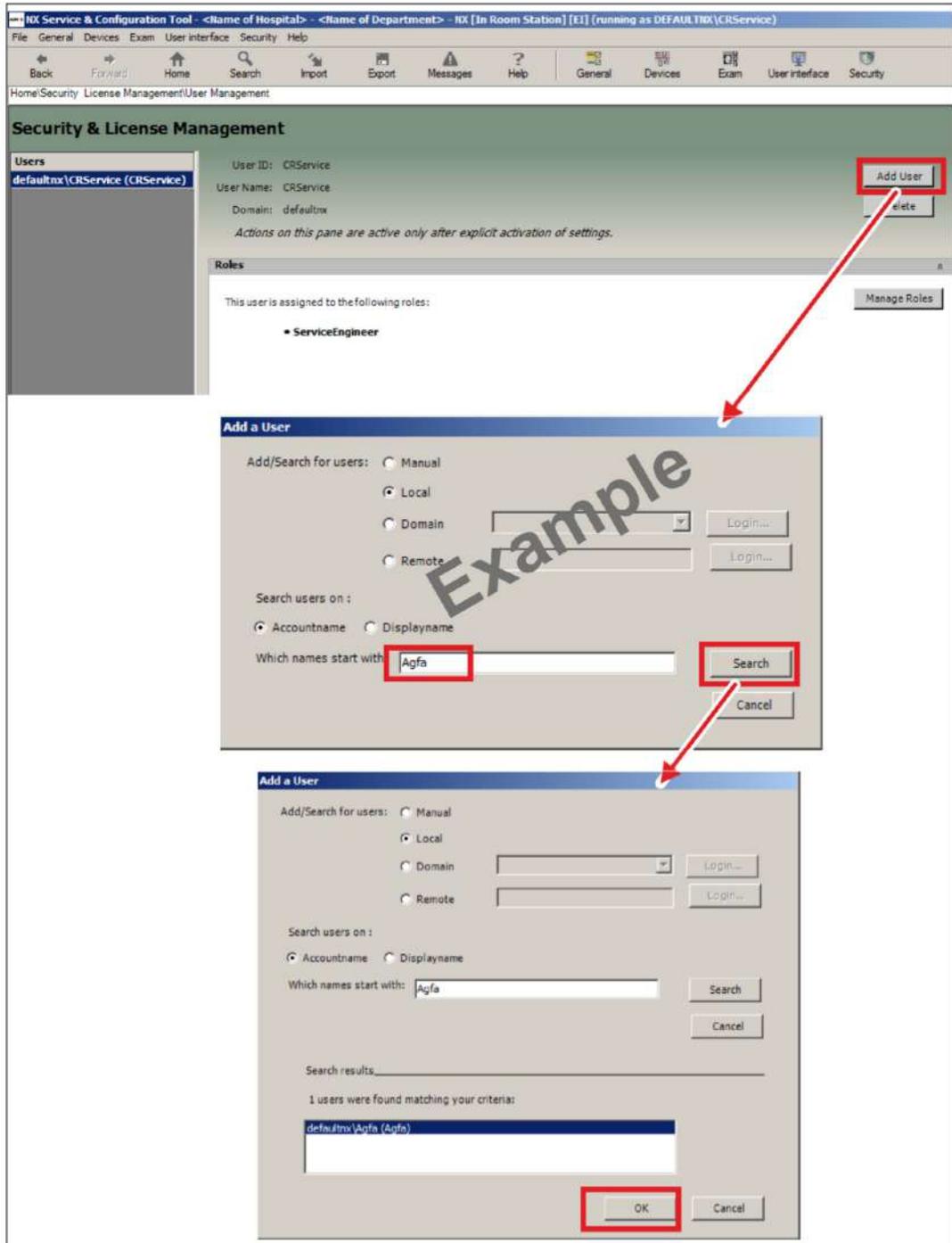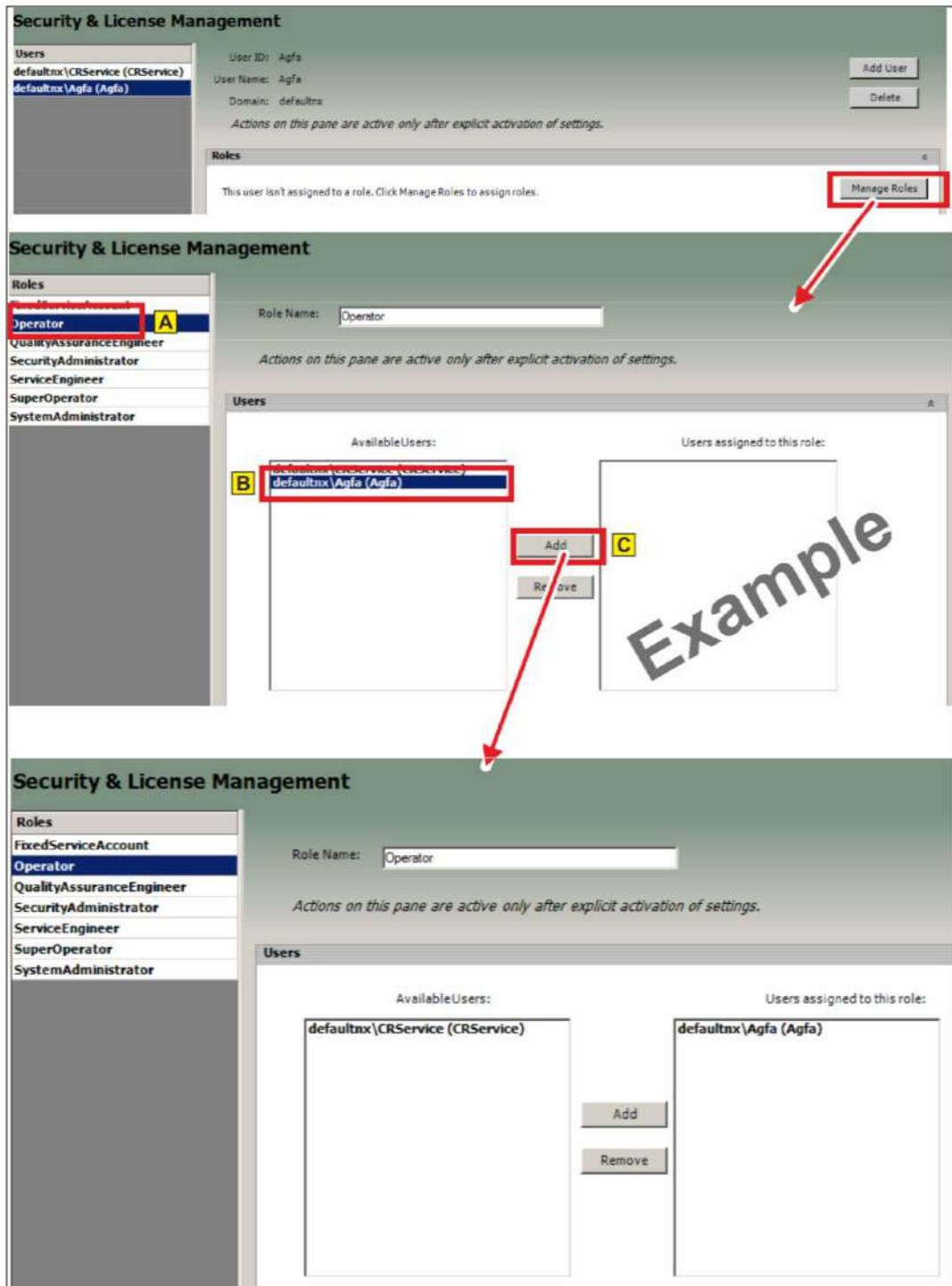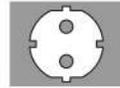
Figure 7

Figure 8

4.2   If required: Configuring Digitizer and NX for the local Network

Proceed as follows to integrate the system into to the local network:

(1)   Switch off the digitizer.

(2)   On the NX Workstation go to the Windows control panel and configure IP address, subnet mask and computer name with the information provided by the network administrator.
For detailed instructions refer to section 5.3.

(3)   Start the NX Configuration Tool.

(4)   Adapt the Workstation settings and the digitizer settings with the information provided by the network administrator.

(5)   Go to NX configurator screen:
`Devices → General Settings → Workstation Settings > IP Address .. Advanced`

(6)   De-select: `Store the selected IP Address in the NX Registry Entry`
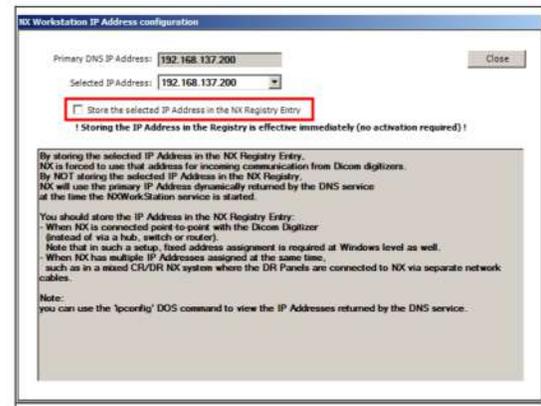
Figure 9

(7) Insert the digitizer USB flash drive into the USB Port of the NX Workstation.

(8) Go to NX configurator screen: `Devices → Digitizer Configuration → Digitizer`.

(9) Click on `<Create CPF>` and save the file on the USB flash drive root folder.

(10) Activate the configuration.

Figure 10

(11) Navigate to directory `\ARC_1103` (or higher version) on the USB flash drive.

(12) Double-click file `InstallCPF.cmd`

(13) Press any key to continue.

(14) Release the USB flash drive from the NX Workstation and insert it at the digitizer.

(15) Switch on the digitizer: The digitizer boots-up and resets automatically after approx. 3 minutes.

(16) Wait until the 2nd boot-up is finished.

Figure 11

(17) Connect NX workstation and digitizer to the local network.

(18) Switch on the digitizer.

(19) Enter the new digitizer IP address in the browser address window.
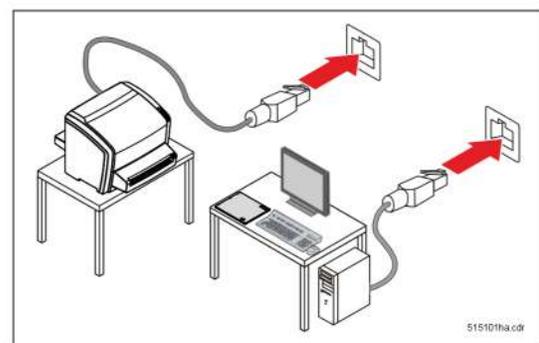
Figure 12

(20) In service menu `<Backup>` select: `<Complete backup>` and `<SAVE TO USB>`.

(21) Select: `<Logout>`

Backup

◉ Complete Backup   ○ Backup single Files only

Select single files (active if "Backup single Files only" selected):

☐ Infocounter   ☐ Logfiles
☐ Calibration Files ☐ HOT Report
                     ☐ Service Activity Log

[SAVE TO USB]

Figure 13

4.3 Setup of Connectivity to additional System Components

(1) Use the corresponding connectivity release documents for setup of additional system components, see Agfa HealthCare Library path*:
`<General Info → Connectivity & Application>`

4.4 Customizing System Components according to Customer Preferences

(1) Use the corresponding connectivity release documents and service manuals of the system components for instructions how to customize the system components.

4.5 Finalizing the Workstation Installation

(1) Finalize the workstation installation as described in NX Service Manual Chapter 4, sections "NX Configuration via Configuration Tool" and "Completing the Installation".
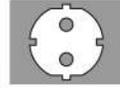
4.6   Checking Software Version

(1)   Select service menu **Device Info** and check the digitizer software version.

(2)   Perform a software update if a newer software is available. Refer to the instructions enclosed to the software ZIP file.

Device Info

Item	Value
Type Number:	5151
Subtype Number	100
Serial Number	1001
Manufacture Date:	02.01.2012
Installation Date:	15.01.2012
Software Version:	ARC_1013

EXAMPLE

Figure 14

NOTE:

The latest software is available from the Agfa HealthCare Library: Computed Radiography => CR Digitizer => CR 10-X => Software

4.7   Performing further Activities depending on local Regulations

Enclosed a list of possible activities depending on local regulations:

This list is just an example.

#	Activity	Reference
1	Electrical check	IEC 62353:2007 Test Documentation on the Agfa HealthCare Library (Extranet Link / Intranet Link)
2	Acceptance Test	Example for Germany: DIN6868

(1)   Contact your local service manager concerning the activities which are required due to local regulations.

4.8   Customer Training

(1)   Hand-over the user manuals.

(2)   Train the customer in following activities:

  •   Operating the digitizer, see section 4.8.1.

  •   Usage of plates and cassettes, see section 4.8.2.
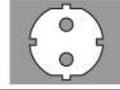
4.8.1 Training for Operating the Digitizer

Following items have to be part of the training for digitizer operation:

- The user interface (Error viewer at NX workstation)
- Switching on/off/reset the digitizer
- The function of the release button at the cassette unit. See also IMPORTANT note below.
- Power and network connector
- Boot-up procedure
- Basic workflow
- Erasing image plates
- Troubleshooting and errors during operation

IMPORTANT:

The Release Button is not blocked in situations where it should not be pressed.

Inform the customer to press the Release Button only if the status LED is constant green.

Exception: It is possible that an error situation can be solved only by removing the cassette. In this case the status LED is red blinking and the error viewer on the NX workstation instructs the user to remove the cassette.

constant green when idle

515101zh.cdr
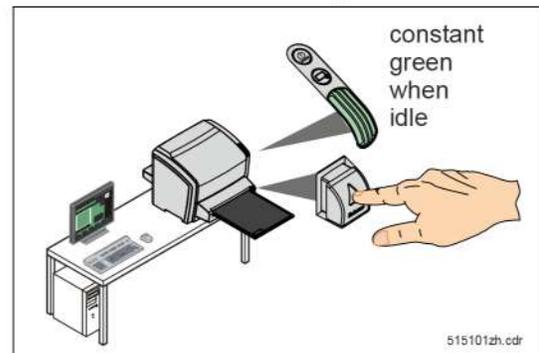
Figure 15

NOTE:

For more information refer to the CR 10-X User Manual.

For NX workstation specific training refer to the NX workstation user documentation.

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4.8.2   Training for Usage of Plates and Cassettes

Following items have to be part of the training for usage of plates and cassettes:

- Labels and functional elements of the cassettes
- First use and normal operation
- Storage and transport
- Operating conditions
- Cleaning

NOTE:

For more information refer to the CR Plates and Cassettes (CR MD 1.0 General) User Manual.

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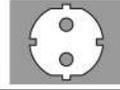
5 Appendix: Installation of the CR 10-X if the NX Workstation Software is NX 2.08600 / 3.0.8600

REQUIRED SOFTWARE

Model file for CR 10-X. Only required in combination with NX 2.0.8600 / 3.0.8600. The model file can be downloaded from the Agfa HealthCare Library: Computed Radiography > CR Digitizers > CR10-X

REQUIRED TIME:

The complete installation of the digitizer including installation and configuration of the workstation takes approximately 1 hour.

REQUIRED DOCUMENTS

Chapter 4 of the corresponding NX Workstation version in the Agfa HealthCare Library: Computed Radiography > CR Workstation Software

IMPORTANT:

The CR 10-X digitizer is supported as of **NX 2.0.8600 / 3.0.8600** only.

NOTE:

The **Installation Checklist** in section 6 of this chapter gives an overview of all steps of the digitizer installation and guides through the complete installation process.

IMPORTANT:

When using a direct network connection between digitizer and a NX workstation with software 2.0.8600 / 3.0.8600, follow this switch on sequence:
First switch on the digitizer, then the workstation. As alternative: With digitizer switched on select at NX workstation:
START > All Programs > Agfa > NX > Restart NX completely

Workarounds to avoid a switch-on sequence:

Possibility 1: Use a network switch to connect digitizer and NX workstation.

Possibility 2: Connect digitizer and NX to the local network. See also section 4.2.

Possibility 3: As of NX 2.0.8700 / 3.0.8700 it is possible to set a fixed IP address for the NX workstation. See NX service manual chapter 4, Installation.

5.1   Installation Preparation

(1)   Prepare the installation as described in section 2 of this document.

5.2   Connecting the Cables

NOTE:

The devices are delivered with power cables for US and Europe. If a different cable is needed, organize it locally. For cable specifications refer to:

- CR 10-X Service Manual, chapter 11, Installation Planning

- NX Workstation Service Manual, chapter 3, Installation Planning

(1)   Connect monitor, mouse, keypad and license dongle at the NX workstation.
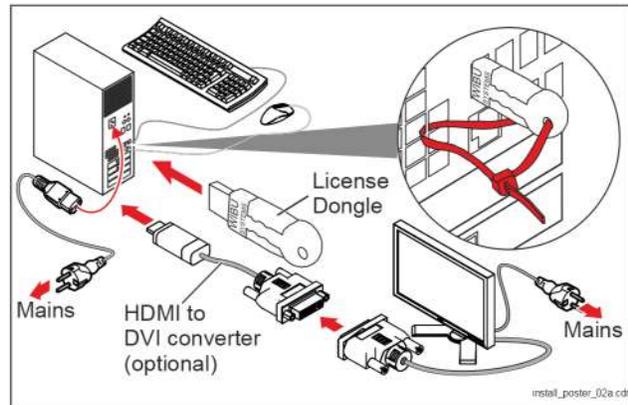
Figure 16

(2)   Connect the external power supply.

(3)   Connect the network cable directly between digitizer and NX workstation.

         See also important note on page 20.
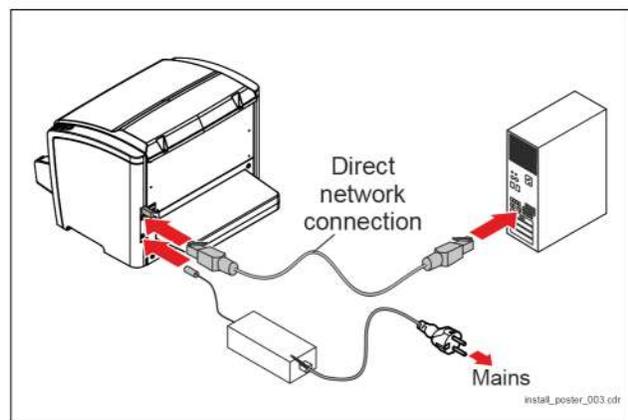
Figure 17
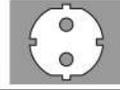
5.3   Performing Setup of the NX Workstation

NOTE:

With setup of the NX workstation:

- The operating system settings (date & time, network, language) are done.

- The license file is installed.

- The NX software is activated.

- The digitizer is configured on the NX workstation.

(1)   Switch on the digitizer.
        The red status LED starts flashing.

(2)   Switch on the NX Workstation.

(3)   Login with service user name and password obtained in the NX classroom training.
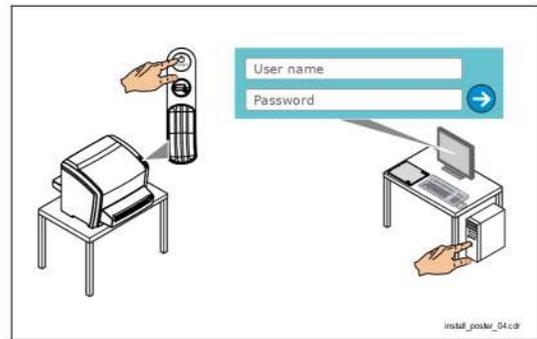
Figure 18

IMPORTANT:

With direct network connection observe the correct switch on sequence: First switch on digitizer, then the NX workstation.

To avoid a fixed switch on sequence with direct network connection, use one of the workarounds mentioned on page 20.
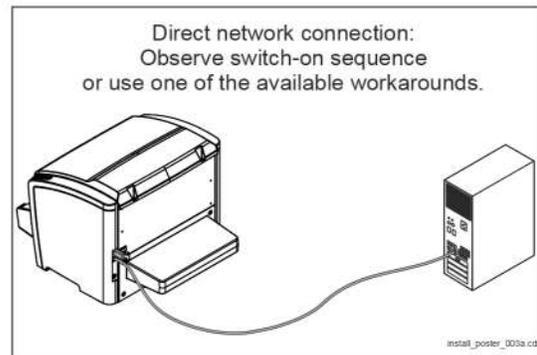
Figure 19
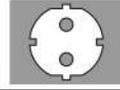
✓ NOTE:

The digitizer status is indicated via static or blinking blue, green and red LEDs.

For an explanation of LED modes refer to Service Manual chapter 3.4, Electrical and mechanical Codes, Fuses, LEDs.

For an explanation of the boot-up procedure refer to Service Manual chapter 2, Functional Description.
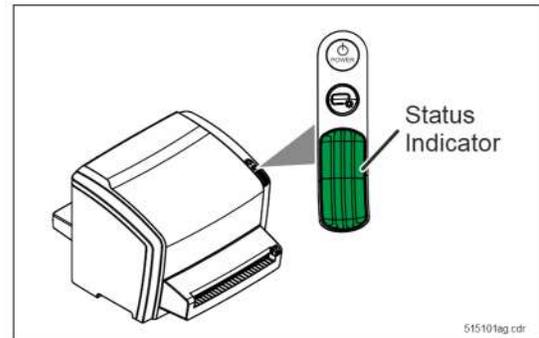
Figure 20

(4)   On the NX go to:
`Control panel`

Set:
`View by: Small Icons`

Figure 21

(5)   Select: `Control panel →`
`Date and Time.`

(6)   Adapt the time zone.

(7)   Adapt date and time.
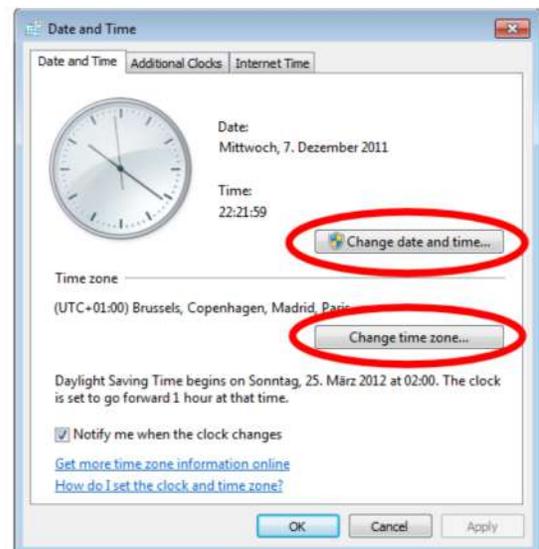
Figure 22
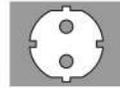
(8) Select `Control panel` →
`Network and Sharing`
`Center` → `Local Area`
`Connection`

Figure 23

(9) Select: `Properties`
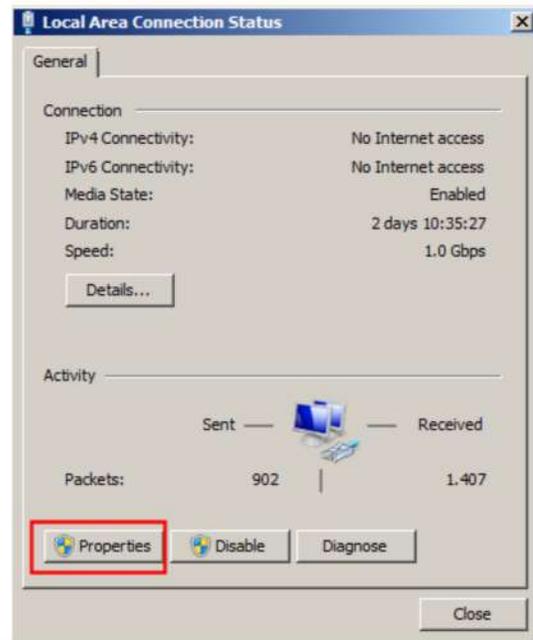
Figure 24

(10) Select: `Internet Protocol Version 4 (TCP/IPv4)`

(11) Click: `<Properties>`
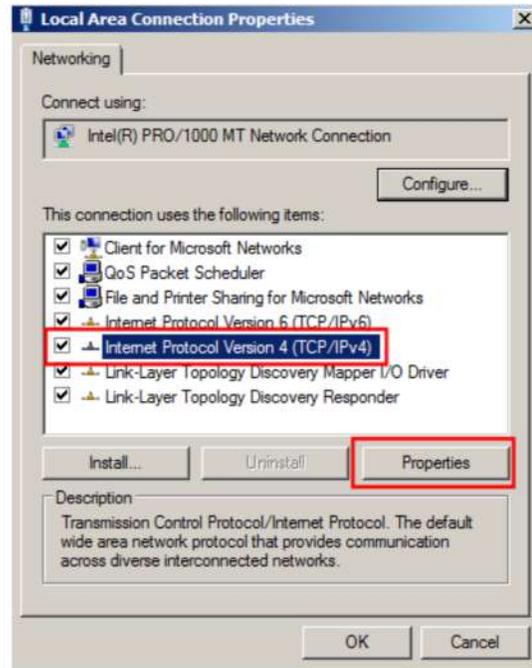
Figure 25

(12) Set:
- IP address: 192.192.192.193
- Subnet mask: 255.255.255.0
- Default gateway: 192.192.192.1

(13) Select: `<OK>` followed by `<close>` (2 times)
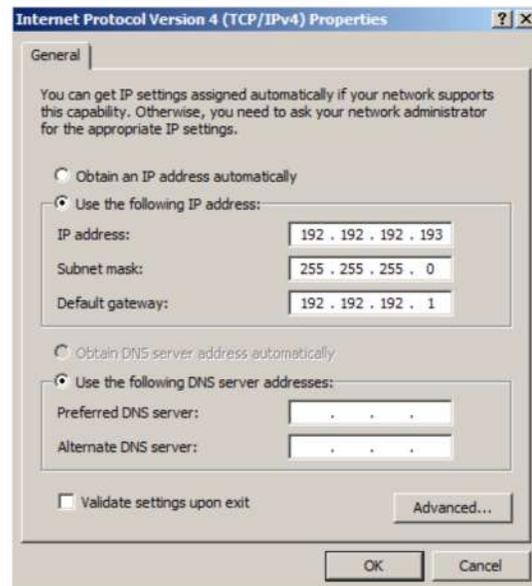
Figure 26
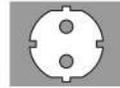
(14) Select: `Control panel →`
     `System → Change Settings`
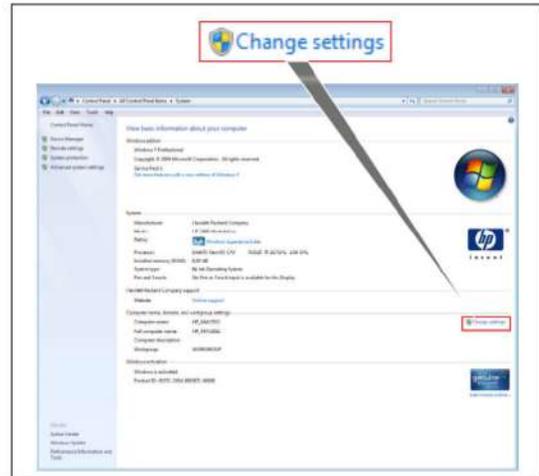
Figure 27

(15) Select: `Change`
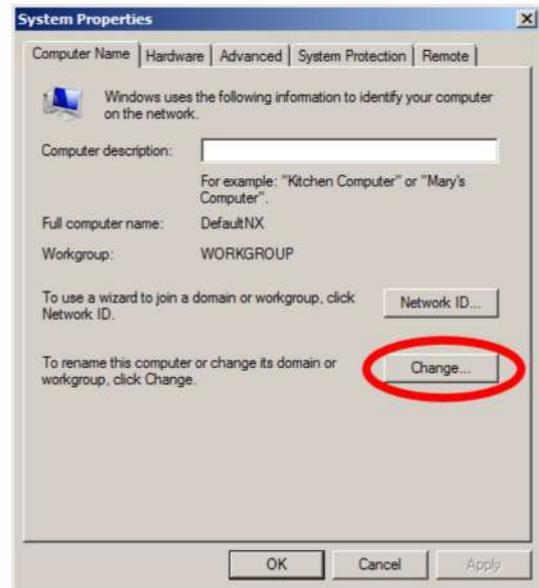
Figure 28

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(16) Set computer name: `DefaultNX`

(17) Select `<OK>`.

(18) Reboot the computer when requested.

(19) Login again using the service account.

Figure 29

(20) Select: `Start → All Programs → Agfa → NX → Service → Installtools → HostName Synchronization Tool`

(21) Select: `<Synchronise>`

(22) Wait until message is displayed: "Synchronization of hostname succeeded"

(23) Close the tool.
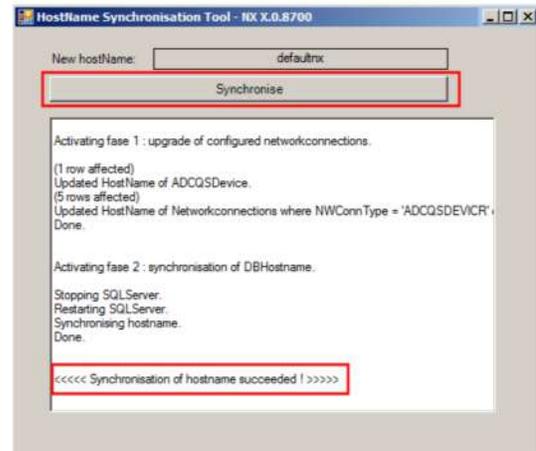
Figure 30

(24) Select: `Control panel →`
`Region and Language`

Check the country in the tab
`Formats`: It must be set to English.
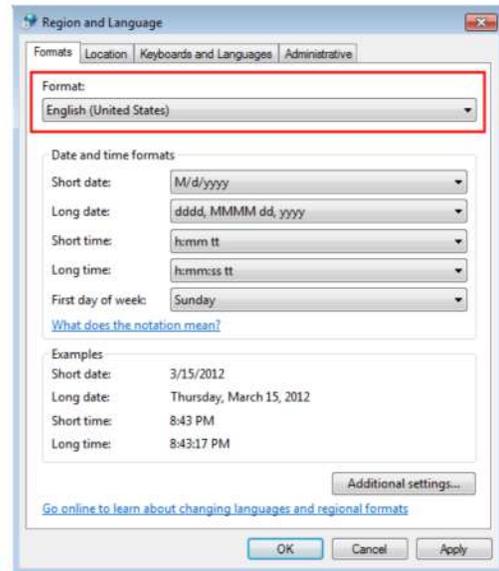
Figure 31

(25) Select tab: `Keyboard and Language`

(26) Click: `<Change keyboards>`
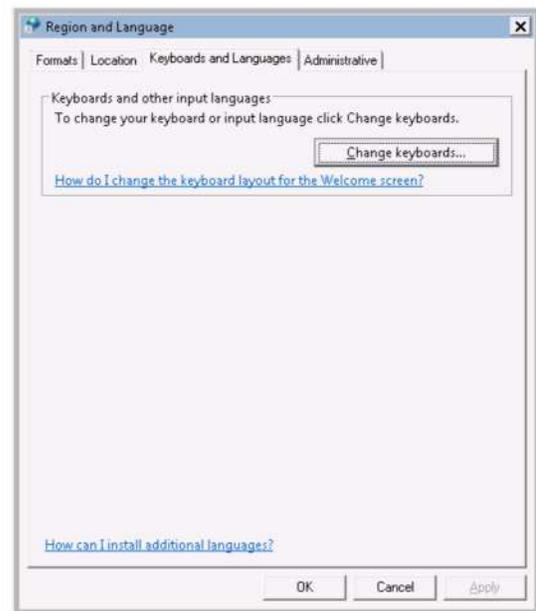
Figure 32

(27) If required: Add a keyboard.

(28) Select in the **Default Input Language** dropdown list the correct input language.

(29) Click: **<Apply>**

(30) Click: **<OK>**
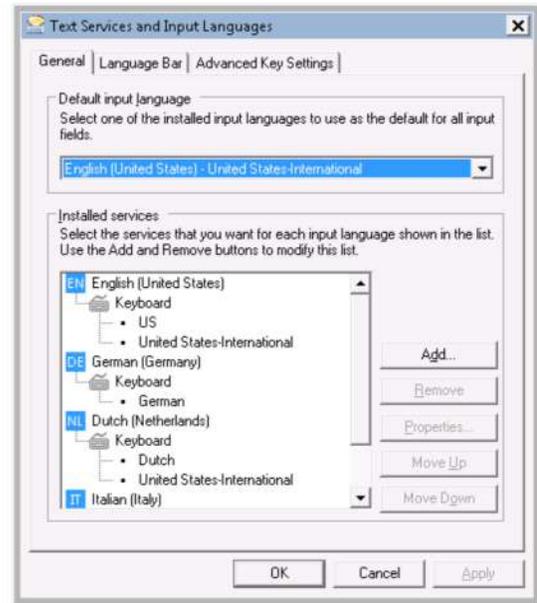
Figure 33

(31) Select tab: **Administrative**

(32) Select: **<Copy settings...>**
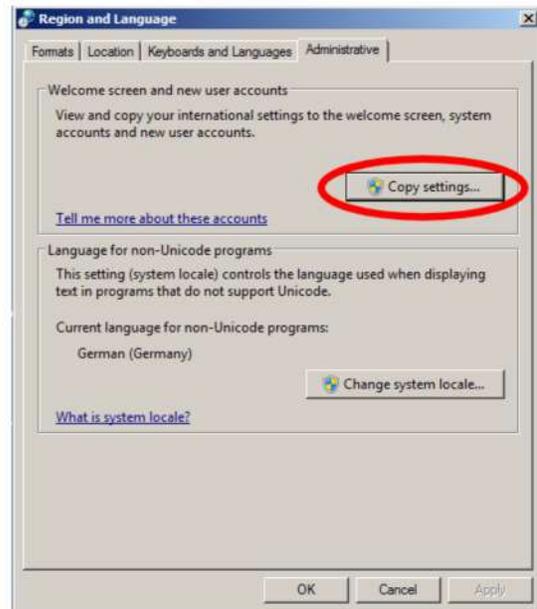
Figure 34

(33) Check both options:
- Welcome screen and system accounts
- New user accounts

(34) Select: <OK>

Figure 35

(35) Start the browser at the NX workstation (A).

(36) Enter the digitizer IP address **192.192.192.192** in the address window (B).

(37) Enter username and password obtained in the digitizer web based training.
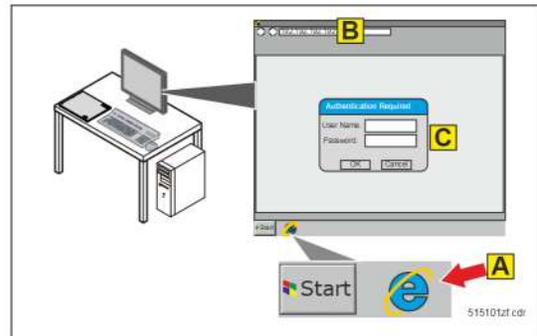
Figure 36

(38) If the installation wizard pops up: Select <cancel>

(39) Select service menu: **<Error Viewer Installation>**.

(40) Click: **<ErrorViewerInstaller.msi>**

(41) Click <run> to start the installation.

(42) Follow the further instructions to install the Error Viewer.

Error Viewer Installation

Click on following link and choose 'Run' to install the ErrorViewer Installer on the Processing Station.

ErrorViewerInstaller.msi

Attention: existing installation of Error Viewer has to be deinstalled beforehand.

Figure 37

(43) Copy the CR 10-X model file (CR 10-X.xml) to following directory: `C:\AGFA\Healthcare\NX\Bin\ DigitiserModels`

(44) Copy the application license file (ALF) to the NX workstation (e.g. directory `C:\AGFA\Healthcare\NX\ Configuration\Licensing`).

(45) Double-click the Licensing Manager icon on the desktop.

(46) Select `Add License` and browse to the folder where the ALF file is stored.
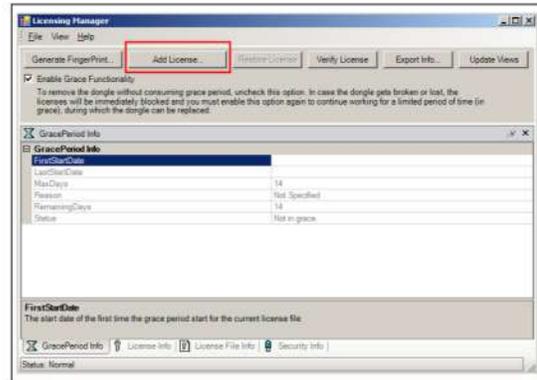
Figure 38

(47) Wait a few seconds until the message appears: The licenses have been updated.

(48) Close the License Manager.

Figure 39

(49) Double-click the NX Activation Utility icon on the desktop.

(50) During the "Activation process" change the "Available Dose Types" from `<LGM>` to `<EI>`.

(51) Select `<none>` as "Available Twain Digitizers".

(52) Click: `<Next>`
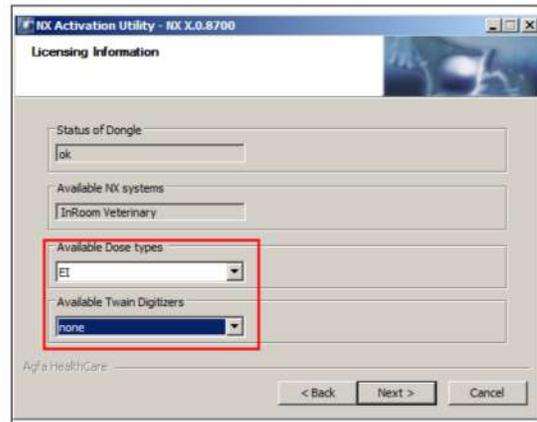
Figure 40
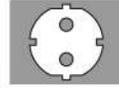
(53) Select the language:
This language setting will be used for the NX buttons, displays and user messages.

(54) Click: **<Next>** and follow the further instructions of the Activation Utility.
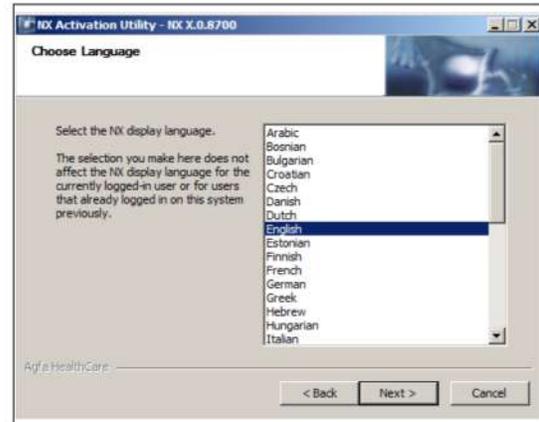
Figure 41

NOTE:

The activation takes several minutes. The NX components are installed depending on the available licenses.

Possible problems during activation are logged in the Activation Helper window.
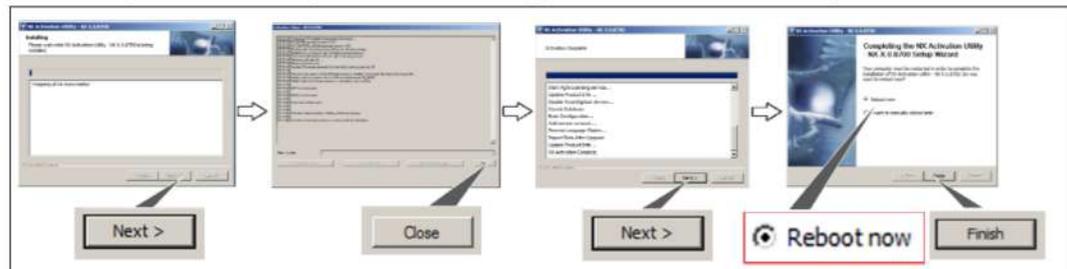
Figure 42

(55) After the reboot select OK at error message:
"No Digitizer configured ! ..."
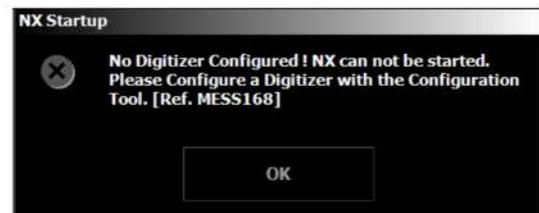
Figure 43

(56) Double-click the `Start NX Configurator` icon on the desktop.

(57) Select: `Load active configuration`
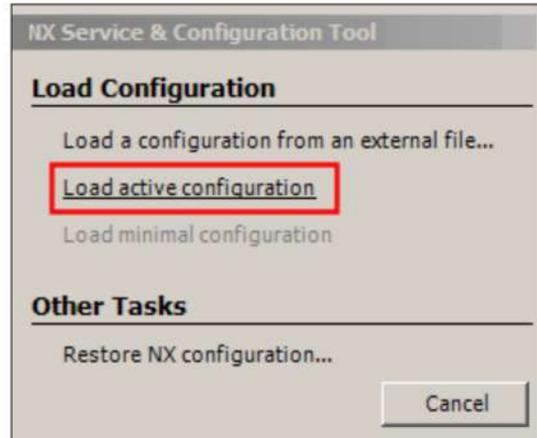
Figure 44

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(58) Enter following settings in the NX Configuration Tool Menu:
General → General Settings

Figure 45

Figure 46

| #	Parameter	Value
1	ID station name	DefaultNX
2	Performed Station AE Title	NX_DEFAULT
3	Processing station name	local host
4	Port	104
5	Default Modality	CR
6	Fast Preview Settings - AE Title	FAST_DEFAULT
7	Fast Preview Settings - Port number	3729
8	Enable Fast-ID	Checkbox must be activated
9	Fast ID - AE Title	IDEN_DEFAULT
10	Fast ID - Port number	3216

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(59) Select in the NX Configuration Tool Menu:
Devices → ID Tablet Configuration → ID Tablet

(60) Select: **<Delete>**
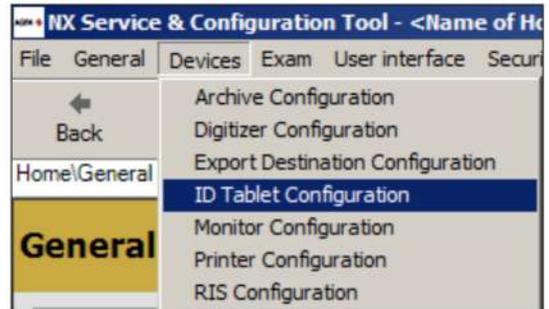
Figure 47
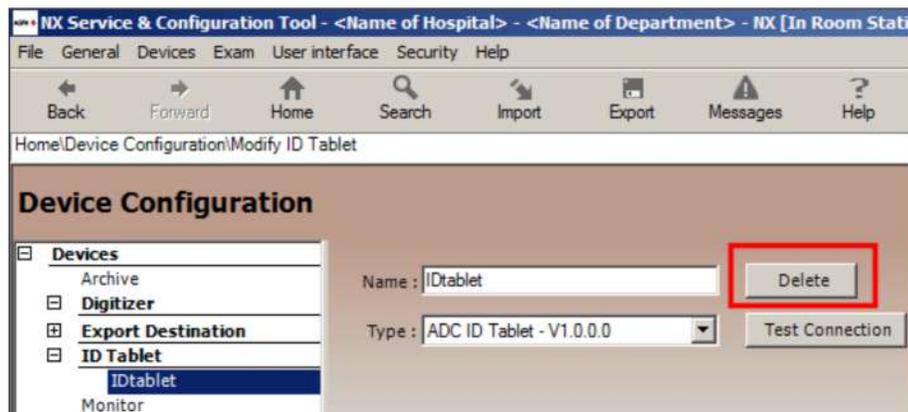
Figure 48

(61) Select in the NX Configuration Tool Menu:
Devices → Digitizer Configuration → Digitizer.

(62) Set the recovery exposure types. See NOTE next page.
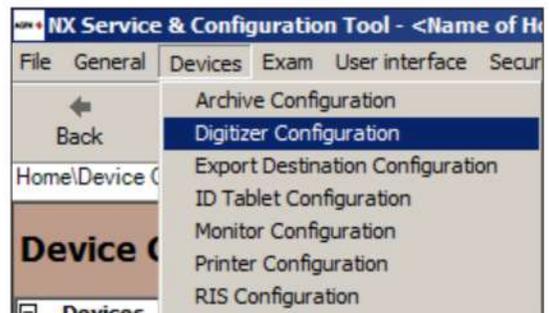
Figure 49
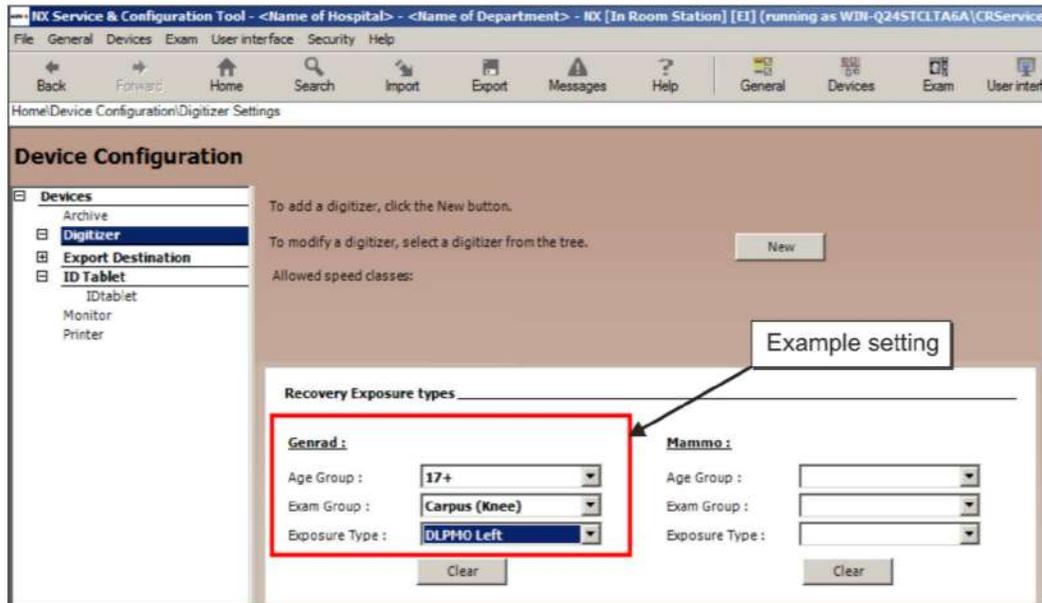
Figure 50

✓ NOTE:

In a system with just one digitizer and one NX the Recovery Exposure Type is not relevant. For more information refer to the Application Note "Functional Changes in NX 2.0.8500 / 3.0.8500 and NX 2.0.8600 / 3.0.8600", Document ID 32972652.

(63) In the same window select `<New>` to add a new digitizer.

(64) Enter following data in the "Add Digitizer" window.
- Name: DIG_DEFAULT
- Type: CR 10-X
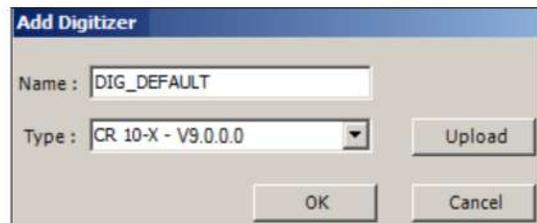
(65) See NOTE below if CR 10-X is not available in the drop down list.

Figure 51

✓ NOTE:

In software NX 2.0.8600 / 3.0.8600 the digitizer CR 10-X is not in the list of digitizer types. To add the CR 10-X in the list proceed as follows:

Step 1: In the "Add digitizer" screen (see Figure 51) select: `<upload>`.

Step 2: Browse to the folder where you have copied the model file
`(C:\AGFA\Healthcare\NX\Bin\DigitiserModels)`

(66) Enter following data in the Digitizer Settings window:

#	Parameter		Value
1	Name:		DIG_DEFAULT
2	Enable Fast ID		Checkbox must be activated
3	Device settings:	IP Address	192.192.192.192
4	Device Settings:	AE Title:	DIG_DEFAULT
5	Device settings:	Default Router	192.192.192.1
6	Device settings:	Subnet Mask	255.255.255.0

Figure 52

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(67) Enter the data in the `Device Configuration → Digitizer → Emergency Procedure` window according to the customer needs. The following table just shows examples:

#	Parameter	Value
1	Age Group:	17+
2	Exam Group:	Carpus (Knee)
3	Exposure Type:	DLPMO Left

(68) Select in the NX Configuration Tool Menu:
`User Interface → Viewing, Editing & Printing Configuration`

(69) Change value for Content: `LGM:(0018,1405)` to `EI:(0018,1411)`
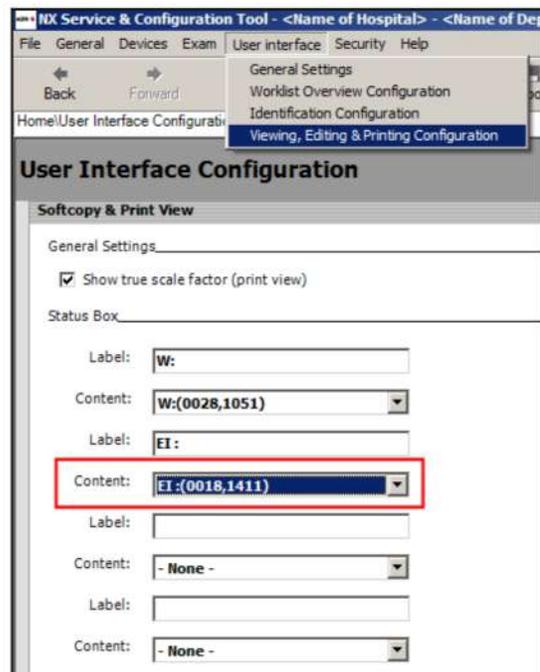
Figure 53

(70) Select in the NX Configuration Tool Menu:
`Exam → Exam tree Configuration`
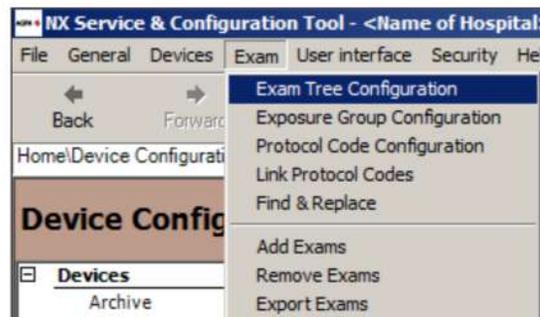
Figure 54
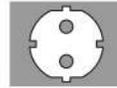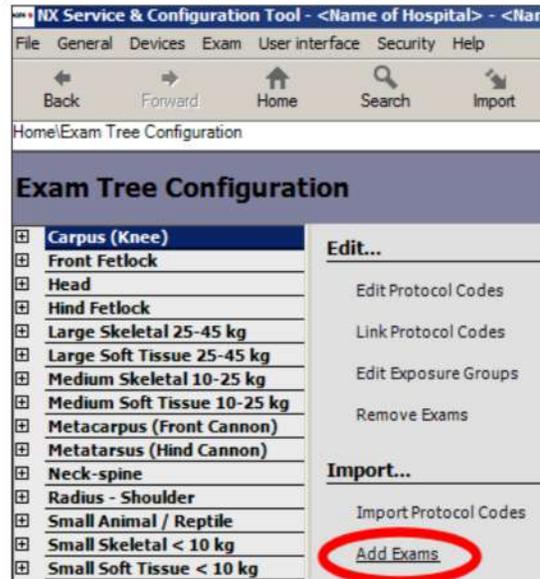
(71) Select: **<Add Exames>**

Figure 55

(72) Select file:
**Factory.Import.ExamTree.
SystemDiagnosis.xml**

(73) Click: **<Open>**
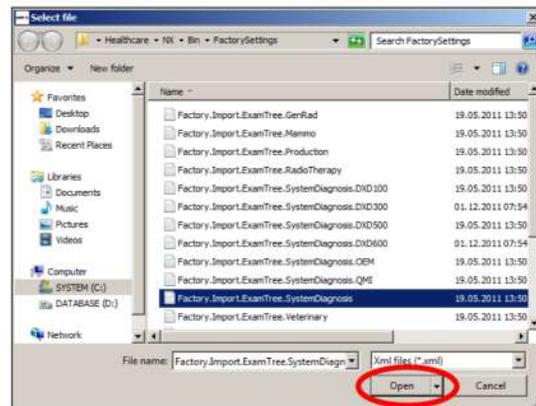
Figure 56

(74) Select the checkbox for SYSTEM
DIAGNOSIS GENRAD.

(75) Select: **<Import>**
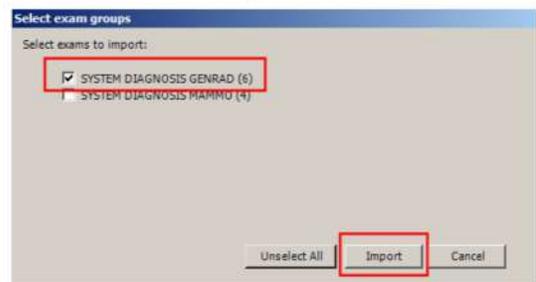
Figure 57

(76) Select `Activate Configuration` and follow the further instructions on the screen.
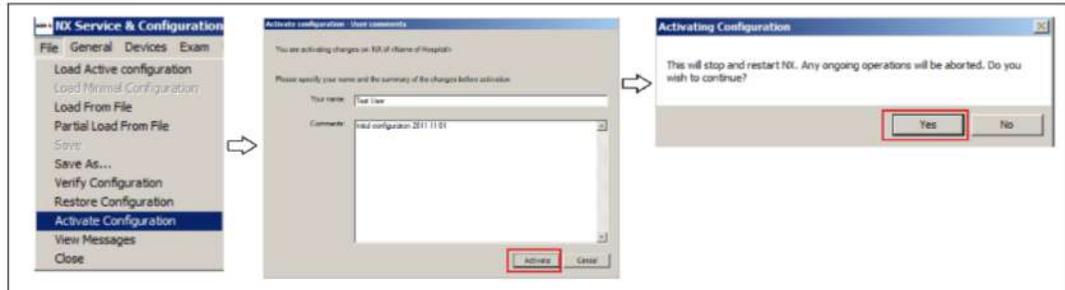
Figure 58

✓ NOTE:

After activation of the configuration the NX application software resets and starts up automatically. The digitizer status LED changes from red to green.
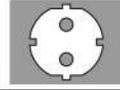
5.4   Verifying the Installation

NOTE:

Verifying the installation means: Expose a flatfield and evaluate the image quality.

Following items are verified with the check:

- The configuration was successful: Images arrive at the workstation.
- Image quality is OK.

(1)   Erase a cassette.

A   Press the "Erase" button.

B   Insert cassette with black side facing up.

C   Wait approx. 3 minutes.

D   Remove cassette.
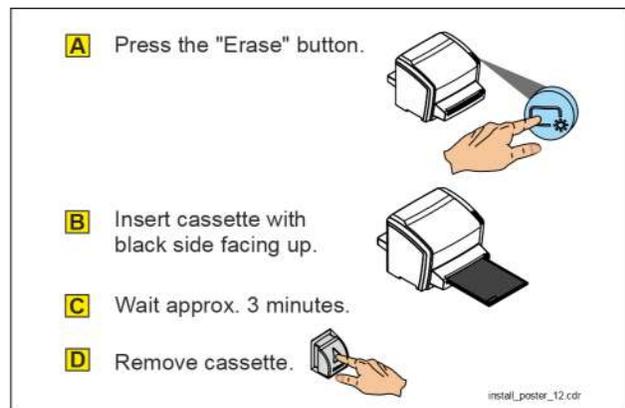
Figure 59

(2)   Use the erased cassette to expose a flatfield.

- The black cassette side must be facing up.
- The collimated area should be larger than the cassette.
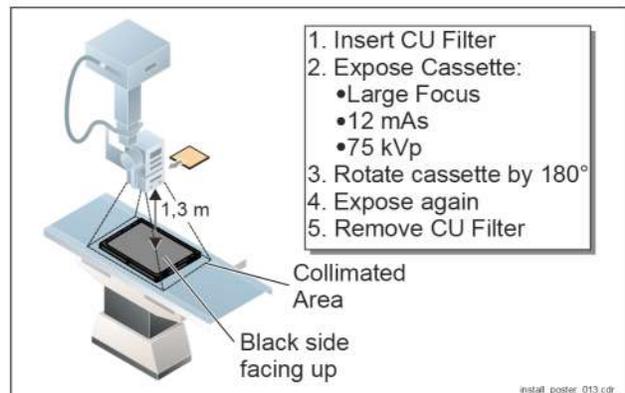
1. Insert CU Filter
2. Expose Cassette:
 - Large Focus
 - 12 mAs
 - 75 kVp
3. Rotate cassette by 180°
4. Expose again
5. Remove CU Filter

1,3 m

Collimated Area

Black side facing up
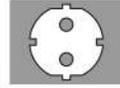
Figure 60

(3)   Create a new exam "System Diagnosis - Flatfield".

(4)   Scan the image.
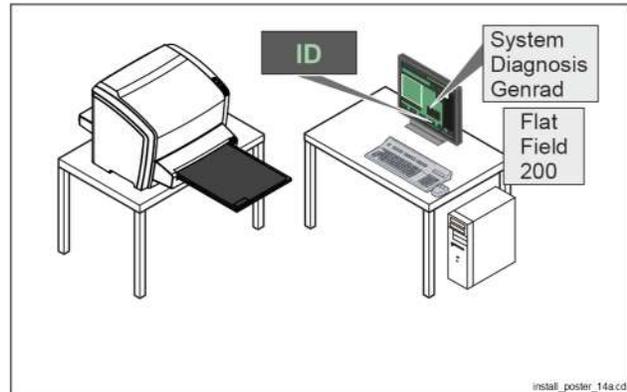
Figure 61

IMPORTANT:

By selection of examination type `<System Diagnosis → Flatfield>`, the correct settings for image processing of the flatfield are used.
Any other examination type gives a result which cannot be used for image evaluation.

(5)   Check the image for the following artifacts:

- Stripes in fast scan or slow scan direction

- Large area inhomogeneities

- Unacceptable number of white dots
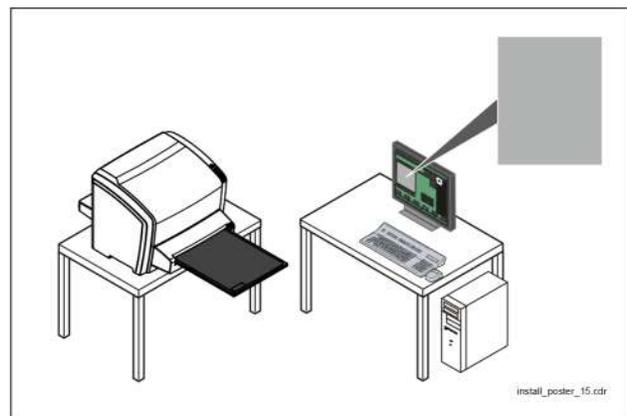
Figure 62

NOTE:

The slow scan direction is parallel to the long side of the image plate.
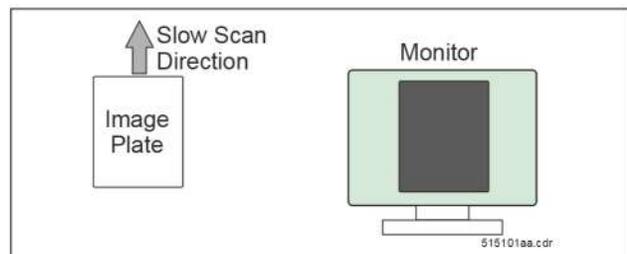
Figure 63

Evaluation:

- If the scanned flatfield does **not** show one of the artifacts, no further action is required.

- If the scanned flatfield shows one of the artifacts compare the flatfield with the limit pattern. For detailed instructions refer to chapter 3.3, Troubleshooting

5.5 Performing the Installation Wizard of the Digitizer

(1) Start the browser at the NX workstation (A).

(2) Enter the digitizer IP address `192.192.192.192` in the address window (B).

(3) Enter username and password obtained in the digitizer web based training.
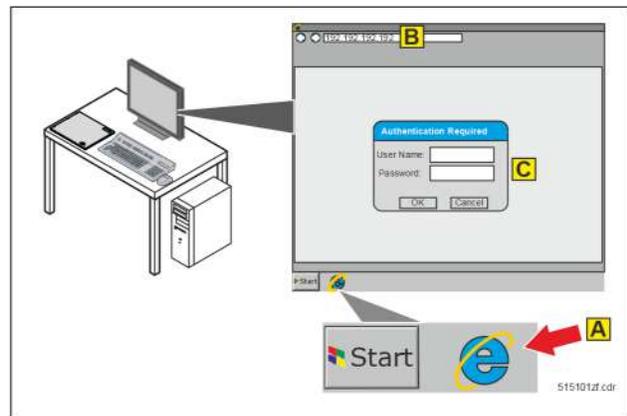
Figure 64

(4) Follow the installation wizard.
Do not change the digitizer network settings and the destination settings. This is done later, if required. See section 4.2.

Figure 65

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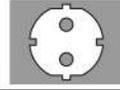
5.6   Performing a Backup

(1)   In service menu `<Backup>` select: `<Complete backup>` and `<SAVE TO USB>`

(2)   Select : `<Logout>`

Figure 66

5.7   Finalizing the Installation

Finalize the installation. For details refer to section 4.

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6   Installation Checklist

#	Step	Reference	Okay	Task code*
Installation Prerequisites				
1.	Check installation site prerequisites.	2.1	☐	PRI
2.	Unpack digitizer.	2.2	☐	INS
3.	Unpack NX workstation and monitor	2.3	☐	INS
4.	Check shipment completeness.	2.4	☐	INS
Performing The steps as described in the Quick Installation Guide				
5.	Perform the steps as described in the Quick Installation Guide.	3	☐	INS
Finalizing the Installation				
6.	Adding Windows and NX users.	4.1	☐	ASC
7.	If required: Configuring Digitizer and NX for the local Network	4.2	☐	ASC
8.	Setup of Connectivity to additional System Components	4.3	☐	ASC
9.	Customizing System Components according to Customer Preferences	4.4	☐	ASC
10.	Finalizing the Workstation Installation	4.5	☐	ASC
11.	Check digitizer software version	4.6	☐	ASC
12.	Performing further Activities depending on local Regulations	4.7	☐	ASC
13.	Customer Training	4.8	☐	ATR

* Task Code, only applicable for Agfa employees
PRI = **Pre**-Installation
Ins = **Ins**tallation task
ATR = Customer training
ABA = Acceptance Testing

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Document No: DD+DIS155.11E

CR 10-X

Type 5151 / 100

► Purpose of this Document

This document explains the functional principle including the functions of the individual assemblies under normal conditions.

► Document History

Edition. Revision	Release Date	Changes
1.0	02-2012	Initial version

► Referenced Documents

Document	Title
Not applicable	

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02-2012   printed in Germany
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WARNING:

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INSTRUCTION:

(1)   Read the "Generic Safety Directions" document
        (see Agfa HealthCare Library > General Info > Agfa HealthCare > Publications >
        Service Manual) prior to attempting any operation, repair or maintenance task on
        the equipment.

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

NOTE:

To verify the latest version of a chapter of the Service Manual refer to the "Checklist for
Completeness" in the Agfa HealthCare Library.

LIST OF CONTENTS

1   The CR 10-X System in a Nutshell

1.1   System Overview

The CR 10-X digitizer is part of the CR system, consisting of:

- Digitizer

- Cassette(s) with Image Plate, CR MD 1.0 General, format 35 x 43 cm

- NX Workstation as of software version 2.0.8600 / 3.0.8600
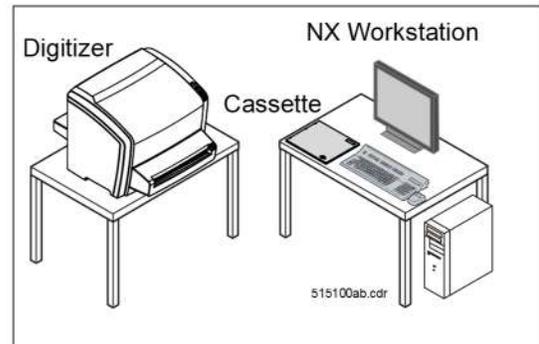
Figure 1

- One Processing Station and one digitizer always belong together.
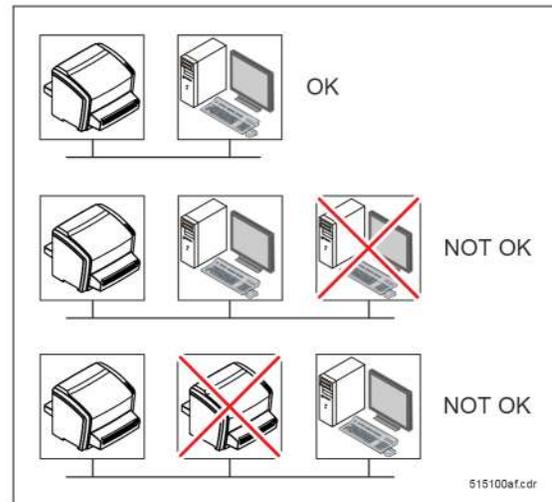
Figure 2

NOTE:

The digitizer can also be connected to other workstations.
Prerequisite: The workstation needs to support the Agfa proprietary DICOM protocol for image acquisition. Example for such a workstation: Agfa SE 2.0 Standalone.
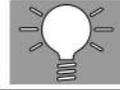
The system can be installed standalone or integrated in the network:

Standalone Installation:
The digitizer can be connected directly to the NX workstation. In this case no other network access to the NX workstation is possible.
The digitizer network settings are pre-configured for this setup.

Integrated Installation:
After network setup of digitizer and NX workstation the system can be integrated into the local network.
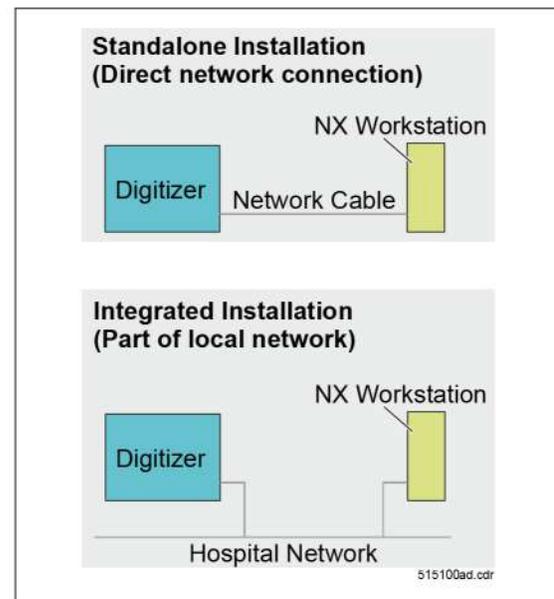
Figure 3

1.2   Applications

The CR 10-X system is intended for radiology environments. Examples: Small community hospitals, private practices, veterinary practices, orthopedic practices.

It supports all general radiography applications, including Full Leg Full Spine.

Not supported Applications:
All application requiring 50 µm resolution, e.g. Mammography.
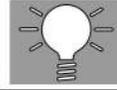
1.3   Main Components of the Digitizer

The digitizer consists of following main components:

#	Component Name	Purpose
1	Cassette Unit	Opens, closes and clamps the cassette.
2	IP-Drawer Module	Transports the image plate from cassette to slow scan drum and back.
3	Erasure Unit	Erases the image plate while it is driven back.
4	Slow Scan Unit	Drives the image plate continuously during scanning and erasure.
5	Optic Module	Creates the laser beam for scanning This beam stimulates the image plate to emit blue light.
6	PMT with Light Collector	Collects the emitted blue light and converts it into an electrical signal.
7	Power Board	Controls the actuators and sensors for the image plate (IP) run and the erasure unit.
8	PMI Board	Main board of the digitizer.
9	USB Flash Memory	Keeps the digitizer configuration data and logfiles.
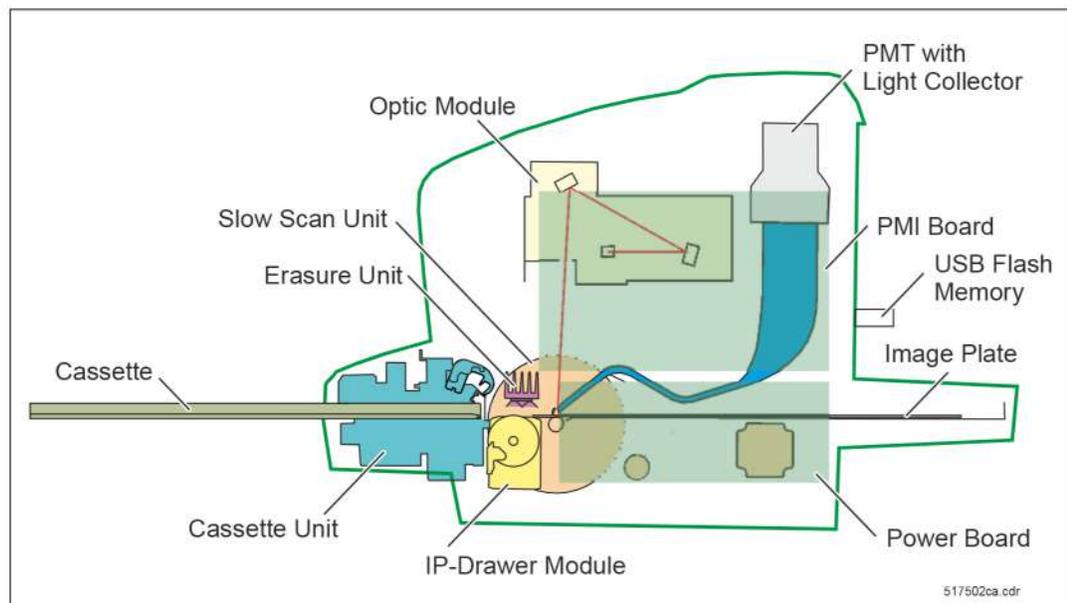
Figure 4
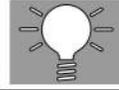
1.4   Main Components of the Cassette with Image Plate

The complete cassette consists of:

- Cassette, 35 x 43 cm
- Image Plate "MD1.0" (MD = media definition; 1.0 = version)
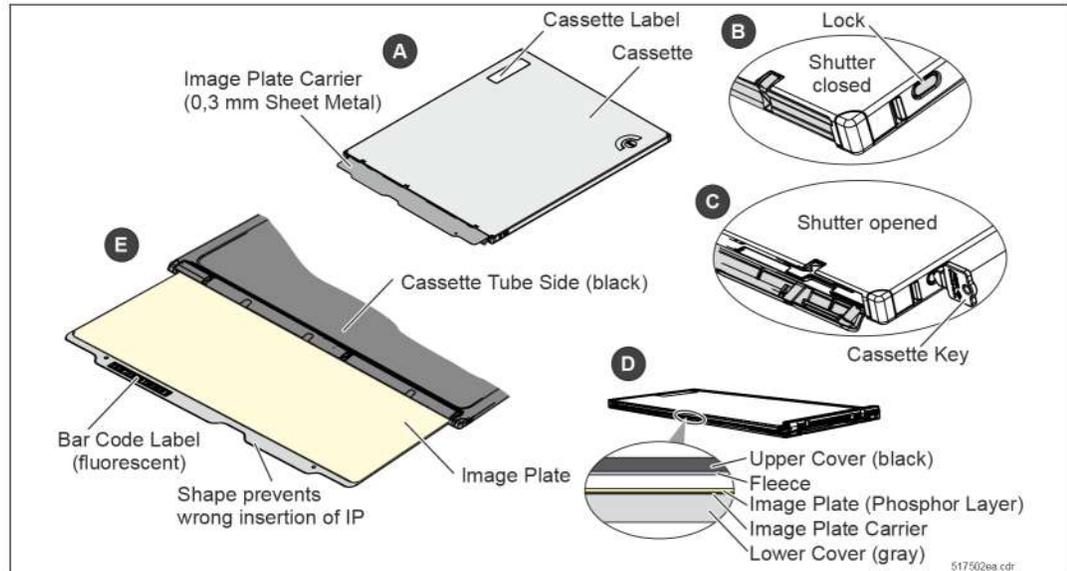
Figure 5

Cassette and image plate details:

#	Description
A	The image plate is glued to a 0,3 mm sheet metal carrier.
	The cassette has a cassette label attached allowing the user to label the cassette.
B	The shutter is unlocked by pushing the cassette lock.
C	The cassette lock is either opened manually via cassette key (part of cassette delivery) or by the cassette unit when inserting the cassette.
D	Backscatter protection is given by the IP carrier (sheet metal). This replaces the lead layer used in other Agfa CR cassettes
E	Each image plate carrier has a fluorescent label attached. Functions of the label:
	1. Indicate begin of scan (BOS) and begin of line (BOL) for scanning. This is done via the fluorescent surface.
	2. The barcode keeps image plate specific parameters which influence scanning.
	On the barcode label the expiration date of the image plate is written in human readable letters.
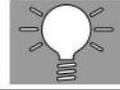
1.5   Main Functions of the NX Workstation

The NX Workstation is a CR workstation. It is used for:

- Acquiring images from the digitizer.
- Acquiring patient and examination data either by manual input or from a worklist provided by a RIS (Radiologic Information System).
- Combining patient and examination data with the acquired image.
- Performing automatic Musica (Multiscale Image Contrast Amplification) Image Processing based on predefined, examination based parameters
- Modifying the image appearance of acquired images
- Performing quality control of the images of the X-Ray department
- Transferring images for diagnosis to a hardcopy printer or softcopy station and to a PACS (Picture Archiving and Communication System) system for archiving
- Burning images on CD ROM
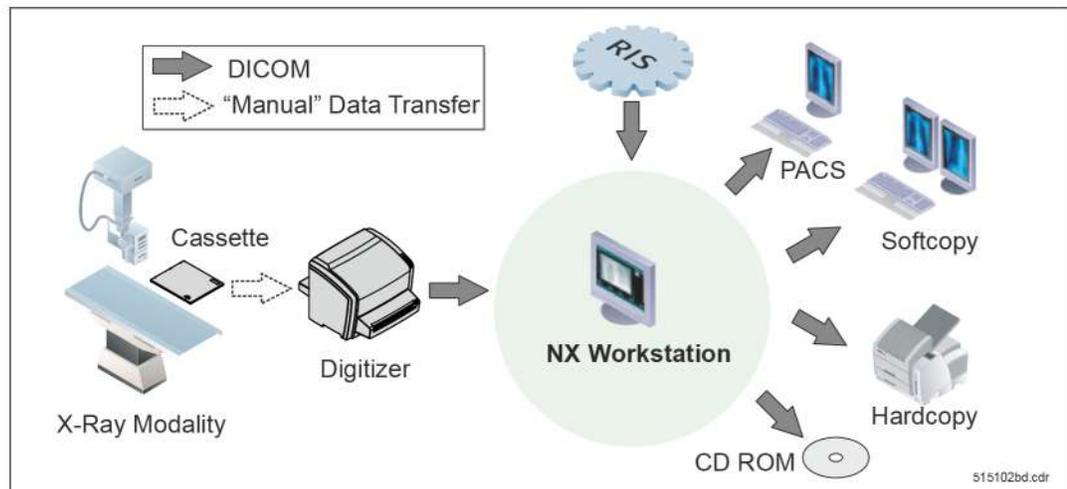
Figure 6

For more information refer to the NX workstation service manual.
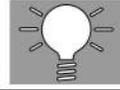
2   **Workflow of the CR 10-X System**

The following figure shows the workflow of a CR 10-X system:
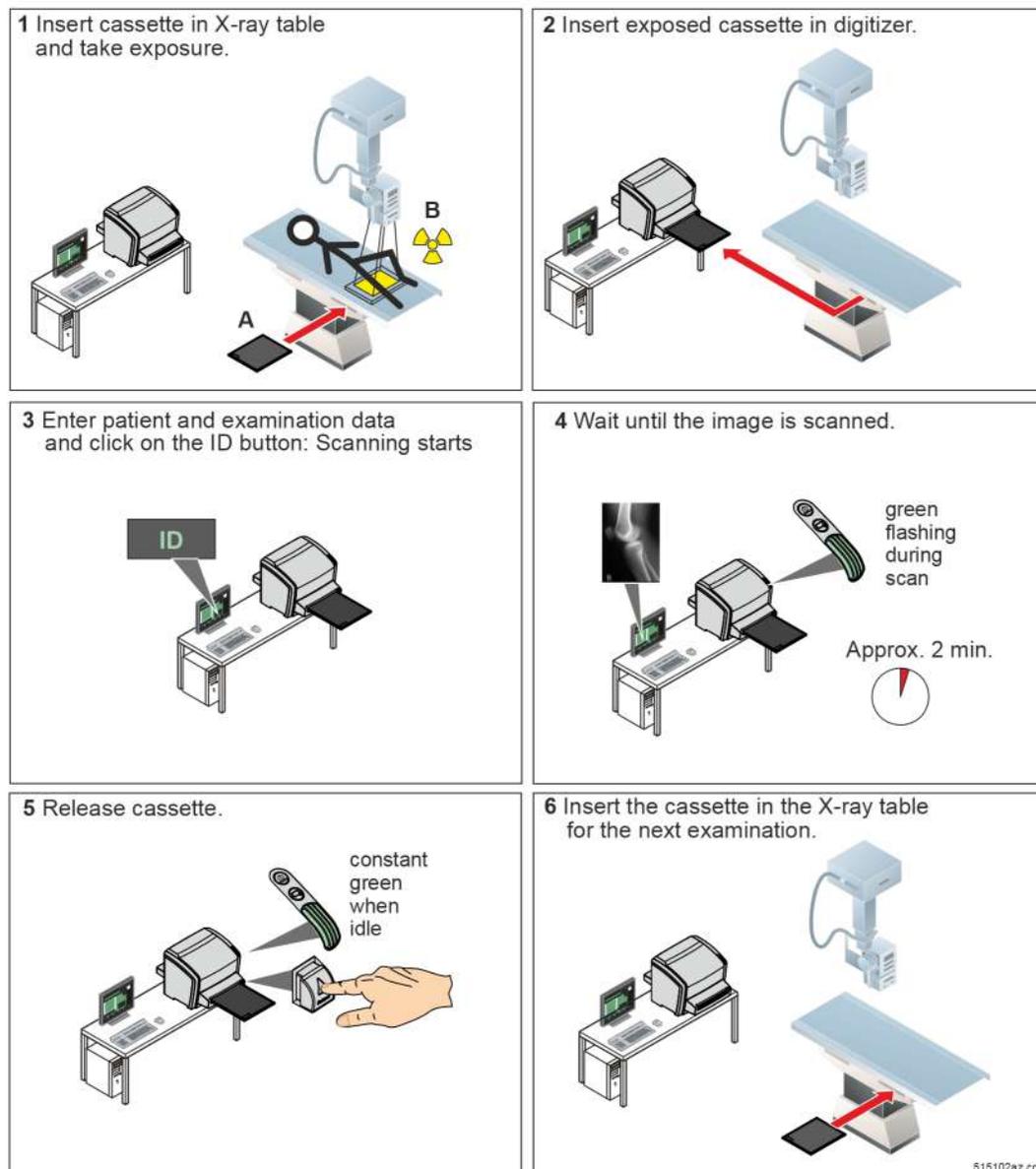
Figure 7
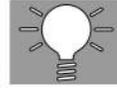
3   Hardware Components of the Digitizer

The following figure shows the hardware components of the digitizer.
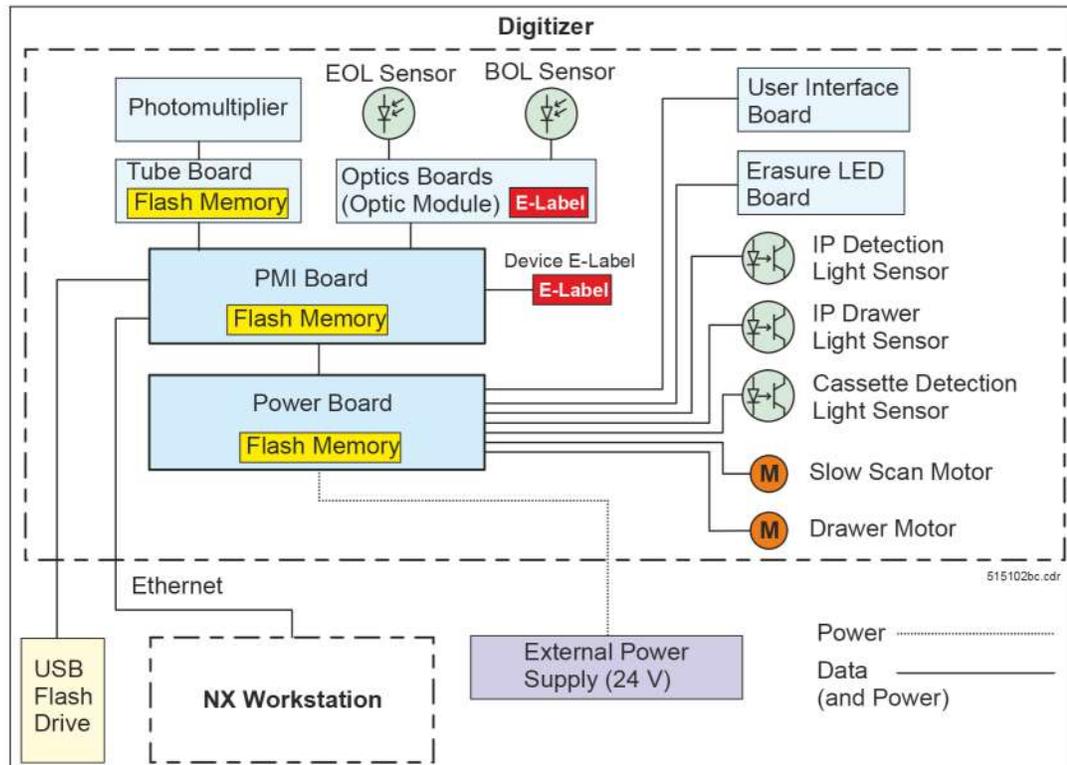
Figure 8

The following table lists the functions of the different components (in alphabetical sequence).

#	Component Name	Function
1	Cassette Detection Light Sensor	Detects that a cassette has been entered.
2	Device E-Label	Master E-label for device specific parameters like serial number and type number.
3	Drawer Motor	Transports the image plate from the cassette to the scan drum. Drives the image plate back into the cassette after scan.
4	Erasure LED Board	Keeps the LEDS of the Erasure Unit.
5	External Power Supply (24 V)	Supplies power for all consumers.
6	IP Detection Sensor	Detects the image plate approx. 24 cm after begin of scan.

#	Component Name	Function
7	IP Drawer Light Sensor	Detects the end position of the drawer unit.
8	Optics Boards (Part of the Optic Module)	Controls galvo motor and laser diode of the Optic Module. Has a BOL (Begin of Line) and EOL (End of Line) sensor connected to trigger the timing for digitizing of the scanned image.
9	Photomultiplier (PMT)	Collects the blue emitted light. Converts the emitted light into an electrical signal.
10	PMI Board (**Photom**ultiplier **I**nterface)	Main board of the digitizer. Controls scanning. Converts the analog voltage from the Tube Board into 20 bit linear and further 16 bit root compressed values. A flash memory on the PMI board keeps the digitizer software.
11	Power Board	Converts the 24 V input voltage from the power supply to the appropriate voltage for following consumers: • PMI Board • Photomultiplier incl. Tube Board • Optic Module Controls following functional elements: • All motors • Erasure Unit • User Interface Board • All light sensors
12	Slow Scan Motor	Drives the image plate during scan. Drives the image plate back after scan.
13	Tube Board	Interface board between Photomultiplier Tube (PMT) and PMI Board. A flash memory on the tube board keeps the shading calibration values. Is the interface for a blue LED glued to the light collector. This blue LED generates a reference signal for sensitivity correction.
14	USB Flash Drive	Keeps a copy of the E-Label data. Keeps infocounter and logfiles. IMPORTANT: The digitizer is working with inserted USB flash drive only. Figure 9
15	User Interface Board	Contains the LED of the user interface as well as power and erasure button.

4   Boot-up of the Digitizer

The following flowchart illustrates the boot-up of the digitizer:

CR 10-X Boot-Up

Approximate time in seconds

Time	Step
0	Digitizer Switch-On
17	Boot-up of PMI and Power Board
40	Send Self Test Signal to all SW modules ② ③
	Selftest okay? — NO → Error message in Error Viewer. Boot-up stops
	YES
43	IP Clean-up Cycle ⑤
	Cassette or IP found? — YES → Warning message in Error Viewer / Rescue Cycle: Digitizer tries to solve problem.
	NO
60	Adjust galvo
100*	Set drawer motor to HOME
	Initialization okay? — NO → Error message in Error Viewer. Boot-up stops
	YES
	NX Viewer running? ⑥ — NO → Wait till the Digitizer receives "ready for identification" message
	YES
105*	Digitizer idle

Visible / audible Effects

① LED red blinking

Message ④ "Digitizer start-up" (4198) in Error Viewer

Drawer Motor briefly audible

LED green on

① to ⑥: See comments next page.

515102bb.cdr

* time depends on galvo adjustment time. Can be up to 5 minutes.

Figure 10

#	Comment
①	After 1 second the status LED starts red blinking.
②	During these 23 seconds the digitizer performs following actions: • The internal logging and error messages are loaded. • The data in the E-labels are compared with the E-label data on the USB flash drive. The status LED stays red blinking. No audible actions. No message in the Error Viewer.
③	Send self test signal to all SW modules means: Check whether all consumers are connected. Click sounds of motors are audible. The galvo starts up.
④	Message "Digitizer start-up" is displayed in the Error Viewer. This message is generated by the digitizer and will not be displayed however, if the error viewer is not started-up yet. This is the case for example if digitizer and workstation are switched on simultaneously.
⑤	During the IP Clean-up cycle motors are audible.
⑥	If the NX viewer is not running following message appears in the Error Viewer: "Image processing software is not available. Restart the image processing software". The check whether the NX application is running is repeated each three seconds, even after successful connection. Exception: After a scan cycle, when the cassette is waiting to be removed by the customer, the digitizer does not check, whether the NX application is suntil running.

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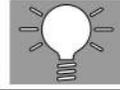
5   Description of the Image Plate Run

This section describes the Image Plate (IP) run of the digitizer for a default scan cycle.

Overview of the main steps:

- The user inserts the cassette.

- The cassette detection light sensor detects the cassette: The IP drawer pulls out the image plate towards the drum with four magnets and the magnetic IP drawer roller.

- The laser beam is switched on to read the bar code and the position of the label on the image plate carrier.

- The magnetic slow scan drum drives the image plate during scan. The IP detection light sensor detects the image plate.

- When the slow scan motor has reached the required number of motor steps, it changes direction: The image plate is transported back.

- The erasure unit erases the Image Plate during its movement back into the cassette.

- The last few centimeters of the way back, the IP drawer module drives the image plate into the cassette.

- The green status LED indicates the user to remove the cassette. When taking out the cassette, it is closed again.
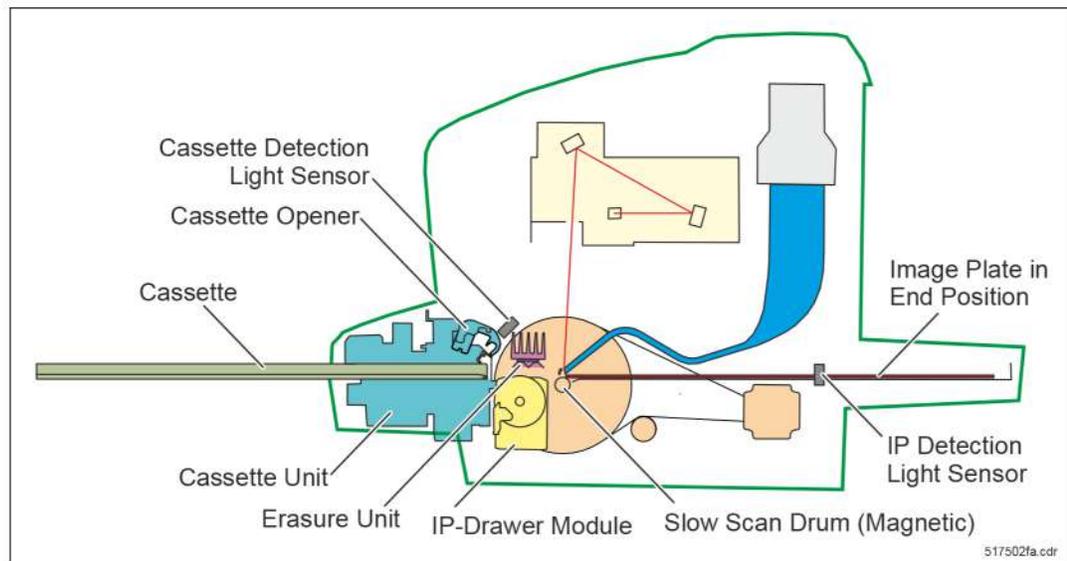
Figure 11
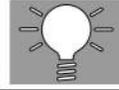
5.1 Image Plate Run Details

This section describes following details of the image plate run:

#	Description	See Section
1	Clamping, unlocking and opening the Cassette	5.1.1
2	Taking the Image Plate out of the Cassette	5.1.2
3	Scanning the Image Plate	5.1.3

5.1.1 Clamping, Unlocking and Opening the Cassette
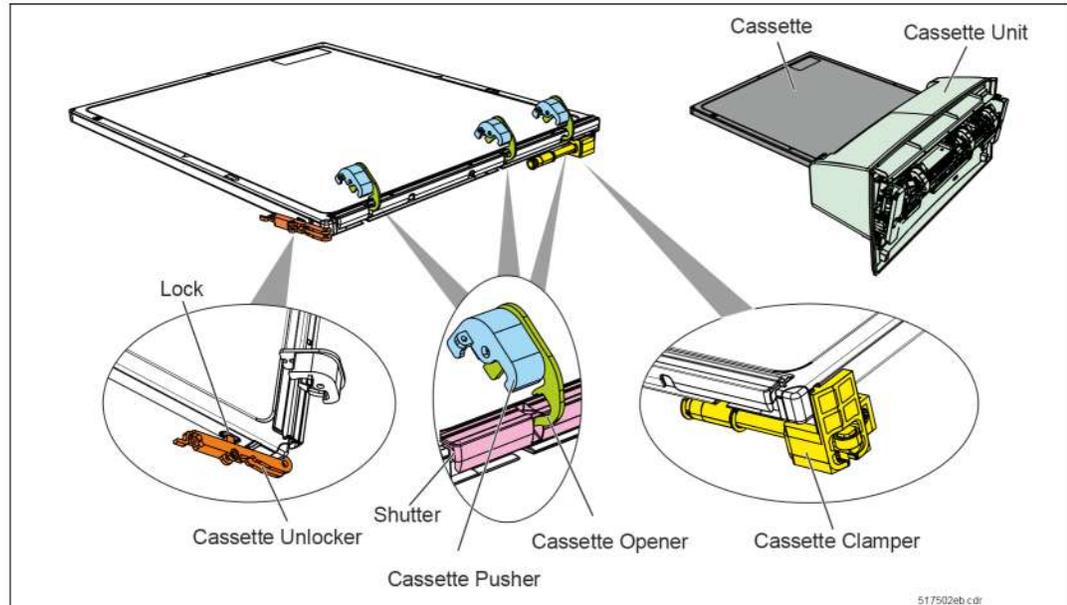
Figure 12

The user activates following mechanical actions by user inserting the cassette with a minimum required force of 40 N:

- The **cassette clamper** clamps the cassette.
- The **cassette unlocker** opens the lock of the cassette.
- The cassette opener opens the shutter of the cassette.

By pulling out the cassette the opposite actions are activated. In addition the **cassette pusher** supports closing the cassette.
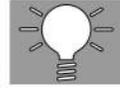
5.1.2   Taking the Image Plate out of the Cassette
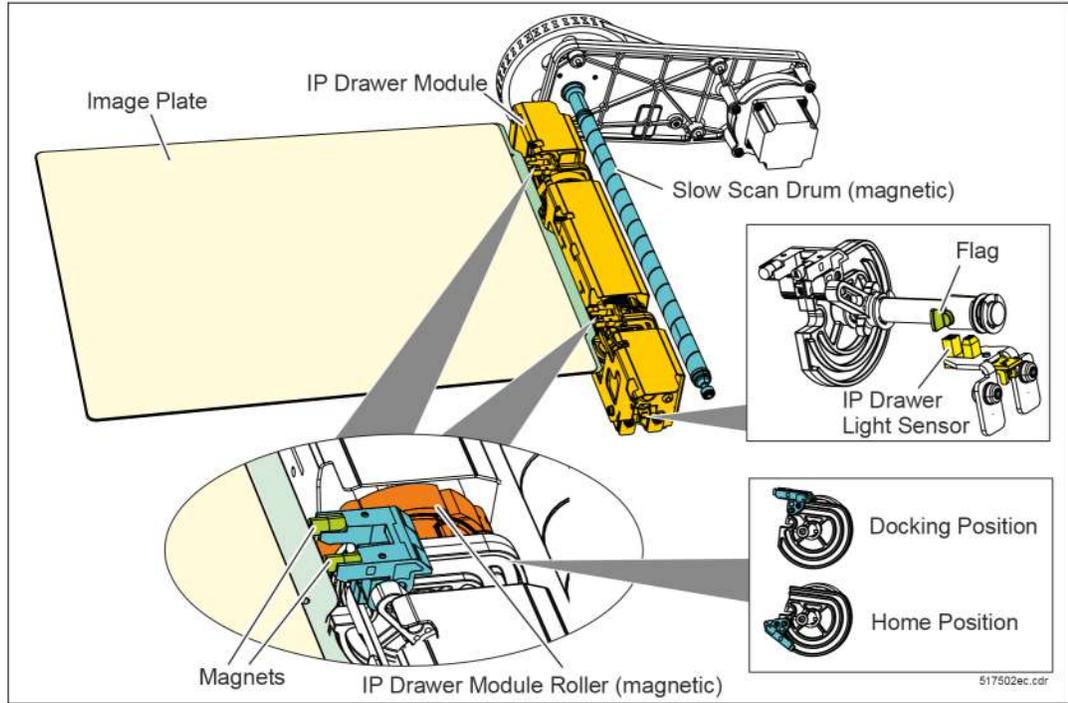
Figure 13
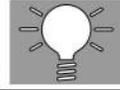
The digitizer performs following activities to transport the image plate towards the (magnetic) slow scan drum:

- The drawer motor drives the **magnets** from **home position** to **docking position**: The sheet metal of the image plate gets attracted by the four **magnets**.

- The drawer motor drives the image plate onto the magnetic **drawer unit rollers**.

- The magnetic **drawer unit rollers** take over the image plate and transport it towards the **slow scan drum**.

- When the image plate has reached the magnetic **slow scan drum**, the image plate is continuously driven by the drum and the drawer unit rollers together. During this step the barcode is read out.

- During this movement additionally the drawer drives back to end position: In this position it has no contact anymore with the image plate. The **IP drawer light sensor** detects the end position.

- The slow scan drive changes the direction and transports the image plate back towards cassette until it nearly leaves the roller.

- The slow scan drive changes direction again and speed up the the image plate for scanning. Thereby the barcode label is read again to detect the position of the image plate (begin of scan and begin of line).

- After recognizing begin of scan signal from barcode and a predefined distance the image acquisition starts.
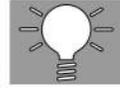
### 5.1.3 Scanning the Image Plate
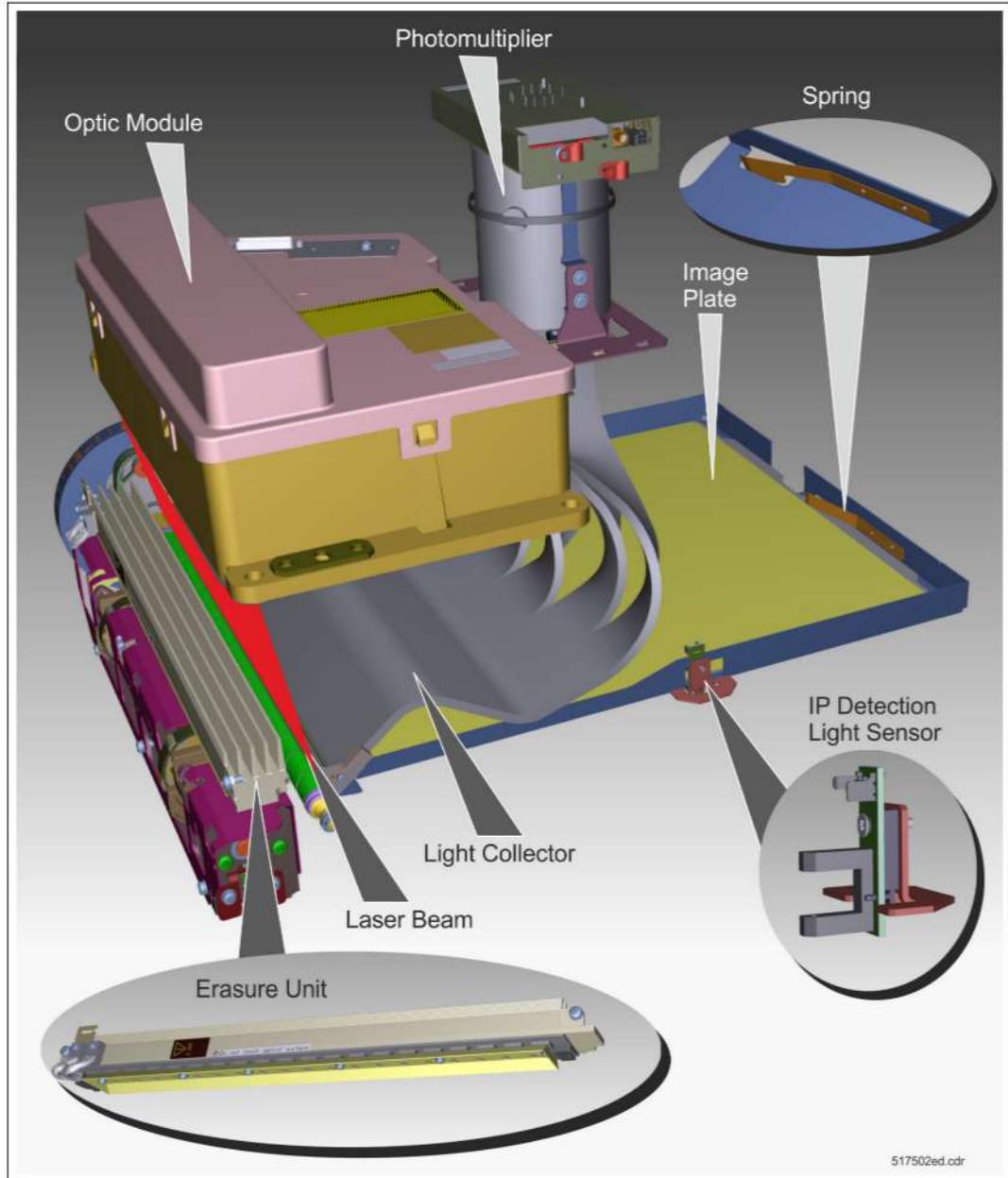
Figure 14

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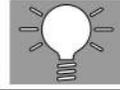
The digitizer performs following activities during scan:

- The **optic module** generates a red, oscillating laser beam.

- The **light collector** collets the blue light, which is emitted by the image plate.

- The **photomultiplier** converts the blue light into electrical current.

- The **IP detection light sensor** monitors the image plate during scan.

- A **spring** at the rear end of the IP guide plate shifts back the image plate after scan, in case out of any reason the contact from image plate to the slow scan drum gets lost.

- When the slow scan drum transports the image plate back, the **erasure unit** erases the image plate.

- The drawer unit performs the transport back into the cassette, after the drum has lost contact to the image plate.

- By a very fast movement back, the drawer magnets loose contact to the image plate.

- The cassette can be removed by the user: The status LED changes from green blinking to constant green.

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► Purpose of this Document

This document describes the product specific safety notes of the digitizer.

► Document History

Edition. Revision	Release Date	Changes compared to previous Version 1.0
1.1	04-2012	• Added safety notes for mobile application. • Added safety notes of enclosure documents for Slow Scan Drum with Pulley and IP Drawer Module.

► Referenced Documents

Document	Title
Not applicable	

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Service Manual) prior to attempting any operation, repair or maintenance task on
the equipment.

(2)　Strictly observe all safety directions within the "Generic Safety Directions" 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 HealthCare or one of its affiliates
or who are otherwise authorized by Agfa HealthCare or one of its affiliates to provide
such services.

NOTE:

To verify the latest version of a chapter of the Service Manual refer to the "Checklist for
Completeness" in the Agfa HealthCare Library.

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1 Intended Use

The digitizer is part of a CR system, further containing a cassette, image plate and modality workstation. The CR system is used in a radiological environment by qualified staff to read-out, process and route static X-ray radiographic images.

The cassette is used to protect the image plate from light and damages during X-ray exposure, transport and handling.

The image plate is used to capture the static X-ray radiographic images; the image plate is scanned by the digitizer.

The digitizer is used to scan an X-ray exposed Image Plate; it results into a digital image which is sent to the dedicated workstation.

The modality workstation is used to process and route the digital images from the digitizer.

2 Labels in and on the Device

2.1 Labels in the Rear
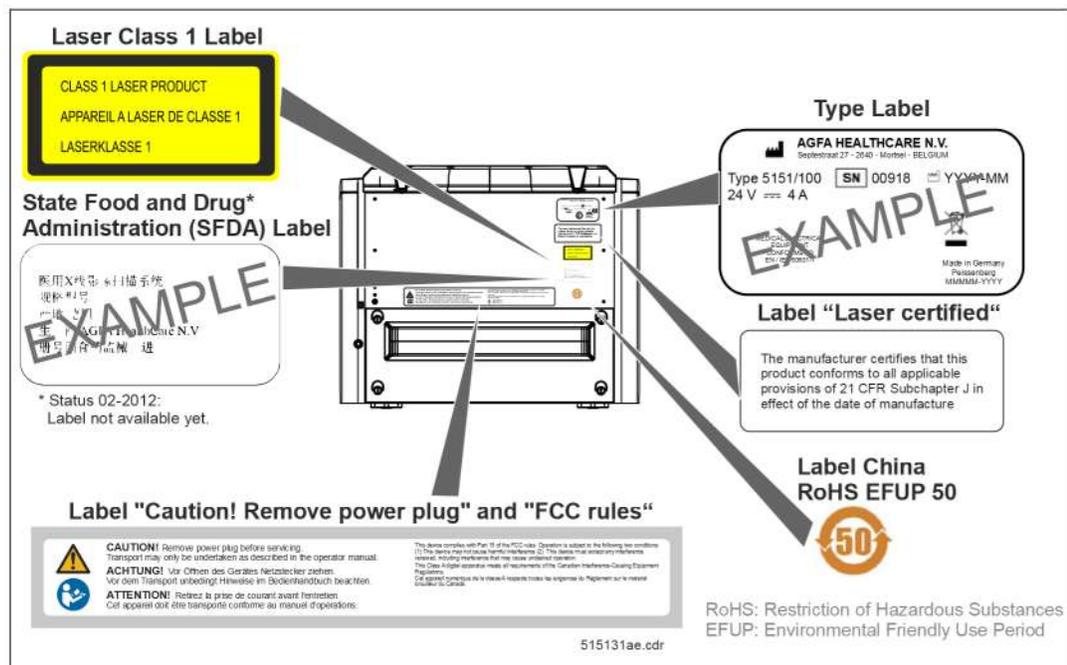
Figure 1

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2.2 Labels inside the Digitizer

2.2.1 Labels on the Erasure Unit

Warning Label:
Hot Area

Warning Label:
Optical Surface

Do not touch optical surface.

515131ag.cdr
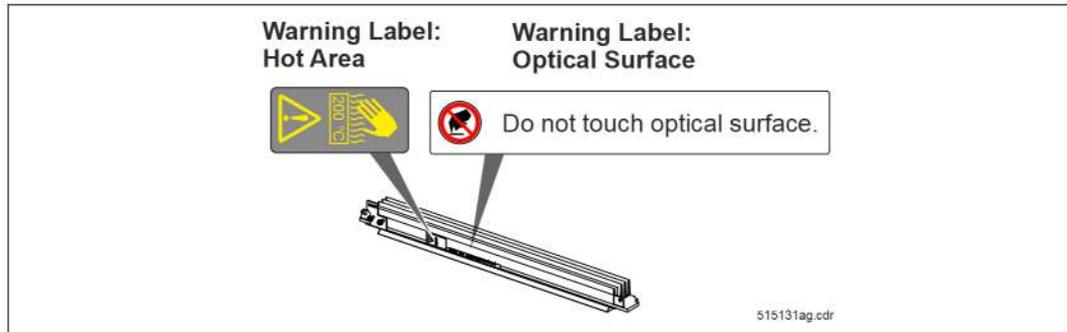
Figure 2

2.2.2 Labels on the Optic Module

Label "Danger: Laser Light"

DANGER

LASER LIGHT
AVOID DIRECT EXPOSURE
TO BEAM

DIODE LASER
120 mW MAX OUTPUT
at 640-670 nm

CLASS IIIb LASER PRODUCT

Label "Caution 3B Laser"

CAUTION!

CLASS 3B LASER RADIATION!
WHEN OPEN AVOID DIRECT
EXPOSURE TO THE BEAM!

CUIDADO!

RAYO LASER CLASE 3B:
EVITAR LA EXPOSICIÓN AL HAZ
CUANDO LA TAPA ESTÁ ABIERTA.

VORSICHT !

LASERSTRAHLUNG KLASSE 3B:
WENN ABDECKUNG GEÖFFNET
NICHT DEM STRAHL AUSSETZEN!

ATTENTION!

FAISCEAU LASER CLASSE 3B:
QUAND CAPOT OUVERT ÉVITER
DE S EXPOSER AU RAYON!

Label „Do not open"

AGFA OPTICS CENTER

DO NOT OPEN
No service / maintenance
parts inside

Label "OEM Product"

OEM PRODUCT
for system integration only

Type Label Optic Module

OPTIKBAUGRUPPE 800750
M-Nr. XXXX

515131ac.cdr

Figure 3

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04-2012

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3 Safety Notes for Service Activities

3.1 General Safety Notes for all Service Activities

CAUTION:

Sharp edges inside the digitizer: Cut or abrasion possible.

Be careful at any maintenance work.

CAUTION:

Image plate or cassette unit can be damaged.

Do not insert and pull out cassette as long as the digitizer is switched off.

WARNING:

120 mW Laser (Class 3B) in the Optic Module may cause eye injuries.

- Avoid direct and indirect eye contact.
- Do not keep tools in the laser beam when the device is switched on.
- Do not open the cover of the Optic Module.

3.2 Safety Notes for Installation Planning

Warning:

Images can be lost due to power failure.

Connect the equipment to an un-interruptible power supply (UPS) or an institutional standby generator.

WARNING:

When different combinations of equipment are used in various medical environments a potential difference (V) can exist between the protective earths in different localities. If the protective earthing fails this potential difference can cause a HAZARD for the OPERATOR or for the PATIENT.

- To comply with ISO 60601-1 (annex I) all computers and peripherals must be connected to the same power source.
- Always connect the associated monitor to the same Uninterruptible Power Source (UPS) as the PC.

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WARNING:

Electrical device. Shock possible.

INSTRUCTION:

- Position the Agfa products so that it is possible to disconnect the mains power connection if required.

- Local and International wiring regulations must be observed. Check all supplies and voltages, currents, trips and fuses with the Hospital facilities department or their engineers.

WARNING:

The device is a table-top digitizer. The structure and stability of the table used need to be suitable in relation with the size and weight of the system. Do not use excessive force when inserting cassettes in the digitizer as the device may slip or drop off the table. Use a non-slip-mat below the digitizer or other anti-skid measures. The table should not be subject to excessive shock and vibrations from other sources, as this may disturb the operation of the digitizer.

WARNING:

Image plate is sensitive for X-rays. Poor image quality possible.

The digitizer and the cassette storage shall be protected against X-ray radiation this way, that the annual dose equivalent at the installation place will not exceed 1 mSv.

3.3 Safety Notes for Installation

WARNING:

The digitizer is heavy (30 kg; 66 lbs). Risk of injuries when lifting the digitizer.

Use proper foot and hand protection when lifting the digitizer.

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3.4 Safety Notes for mobile Application

⚠ **WARNING:**
Excessive vibrations during scanning may decrease image quality.

The structure and stability of the used mounting platform need to be suitable in relation with the size and weight of the system. The mounting platform may not be subject to excessive shock and vibrations from other sources.

⚠ **WARNING:**

Unknown composition of mobile kit mounting platform: Risk of injury or damage.

The vehicle owner is responsible for the position, location and fixing of all equipment.

⚠ **WARNING:**
The digitizer is heavy (30 kg; 66 lbs). Risk of injuries when lifting the digitizer.
Use proper foot and hand protection when lifting the digitizer.

⚠ **WARNING:**
Injury or device damage possible.

Do not lift the digitizer at the Cassette Unit or the IP Guide Cover.
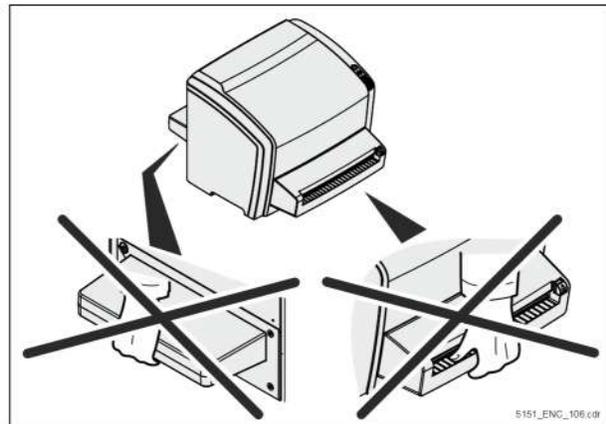
5151_ENC_106.cdr

Figure 4

3.5 Safety Notes for corrective Maintenance Work

3.5.1 Safety Notes when working at the Erasure Unit

WARNING:

During operation the Erasure Unit is hot: Risk of burns.

- Avoid contact with the Erasure Unit.
- Observe the relevant sticker on the Erasure Unit.

CAUTION:

Sensitive surface. Reduced image quality possible due to clouded reflector.

- Do not touch the reflector of the erasure unit by hand.
- Do not use cleaning agents to clean the reflector.
- Only use a lint-free cloth for cleaning.

3.5.2 Safety Notes when working at PMT with Light Collector

CAUTION:

The PMT light sensitivity decreases for a certain time (hours to days) if exposed to bright light.

Expose the light sensitive side of the PMT as little as possible to daylight.

CAUTION:

The light collector can break when mechanically stressed.

Handle the light collector with great care.

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CAUTION:

Finger prints on the mirror before the Light Collector may cause reduced image quality.

Be careful not to touch the mirror.
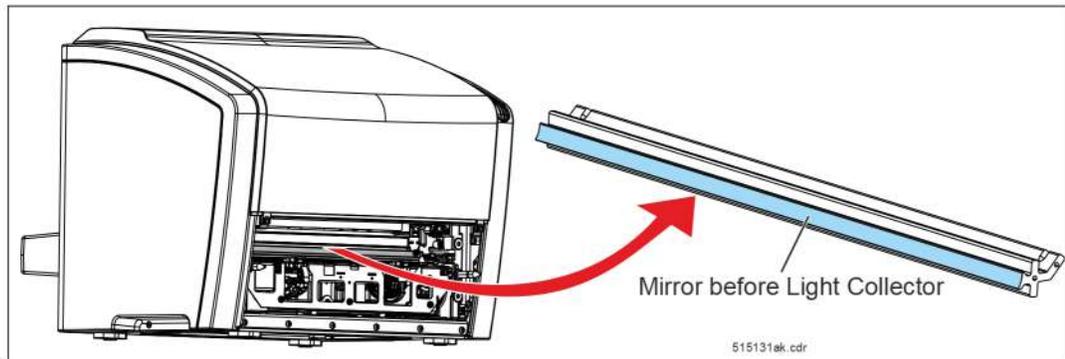
Figure 5

3.5.3   Safety Notes when working at the Slow Scan Drum

CAUTION:

The magnetic surface of the slow scan drum may damage sensitive parts or attract small metallic parts.

- Keep away all parts which are sensitive for strong magnetic fields, e.g. bank cards.
- Ensure that no small metallic parts stick at the slow scan drum, e.g. screws, metallic splinters.

CAUTION:

The Slow Scan Drum has a sensitive surface. Reduced image quality or image plate jams possible.

Handle the Slow Scan Drum carefully.

3.5.4   Safety Notes when working at the Drawer Unit

CAUTION:

The magnetic surface of the IP drawer module wheels may damage sensitive parts or attract small metallic parts.

- Keep away all parts which are sensitive for strong magnetic fields, e.g. bank cards.

- Ensure that no small metallic parts stick at the IP drawer module wheels, e.g. screws, metallic splinters.

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HEALTHCARE
Imaging Services

Chapter 3.2
Repair and Service
Tools and auxiliary Means

Document No: DD+DIS155.11E

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► ## Purpose of this Document

This document describes all tools (software, hardware), which are required for servicing of the digitizer.

► ## Document History

Edition. Revision	Release Date	Changes
1.0	02-2012	Initial Version

► ## Referenced Documents

Document	Title
DD+DIS155.11E	CR 10-X Service Manual, Chapter 3.6 - Adjustments and Calibrations

Edition 1, Revision 0
02-2012   Printed in Germany
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AGFA
HealthCare

► ## Manufacturer

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or its affiliates.

WARNING:

Improper operation or service activities may cause damage or injuries.

INSTRUCTION:

(1)   Read the "Generic Safety Directions" document
(see Agfa HealthCare Library > General Info > Agfa HealthCare > Publications >
Service Manual) prior to attempting any operation, repair or maintenance task on
the equipment.

(2)   Strictly observe all safety directions within the "Generic Safety Directions" 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 HealthCare or one of its affiliates
or who are otherwise authorized by Agfa HealthCare or one of its affiliates to provide
such services.

NOTE:

To verify the latest version of a chapter of the Service Manual refer to the "Checklist for
Completeness" in the Agfa HealthCare Library.

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1   Machine specific Tools

REQUIRED TOOLS:

Part of digitizer delivery:

TX20

1,5 mm Copper Filter
Spare part number*:
CM+9 5155 1015 2

Not part of digitizer delivery:

Polynit wipes
Spare Part Number*:
10+9 9999 1273 0

Or

CR Phosphor
Plate Cleaner
Spare part number*:
10+9 9999 1197 0

Lint free cloth

Multimeter
(Ohmmeter)

Service PC

Flash light

Antistatic
wrist strap
Spare part number*:
CM+9 9999 0830 0
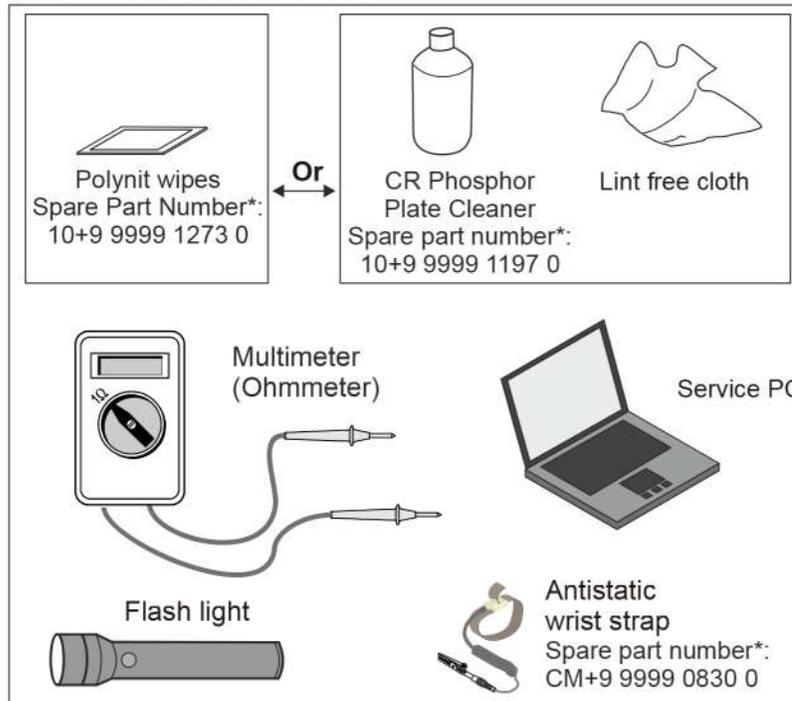
Figure 1

* 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.

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2   Digitizer Service User Interface

Access to the "Service User Interface" for the digitizer is available via browser (Internet Explorer or Firefox).

Any PC with network access to the digitizer can be used.

Figure 2: CR 10-X Service User Interface

It is recommended using the NX workstation to access the digitizer service user interface, as the NX workstation has the error viewer installed by default.

When using a different PC following service functions are not accessible, as they require confirmation in the error viewer:

- Diagnose Cycle
- Endurance Run Cycle
- Shading Calibration

For more information se also section 3, Remote Service.

Proceeding to access the Service User Interface:

(1)   Start the browser.

(2)   Enter the digitizer IP address (e.g. 192.192.192.192) in the browser address window.

(3)   Enter username and password which is provided during the web based training.

Proceeding to quit the Service User Interface:

(1)   Select: `<Logout>`

(2)   Follow the Logout wizard.

(3)   Close the browser window.

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Overview of the CR 10-X service user interface menus:

Menu	See Section
Logout	2.1
General Info	
Device Info	2.2.1
Network Info	2.2.2
Reporting	
Info Counter	2.3.1
Error Statistics	2.3.2
Service Activity Logfile	2.3.3
Install & Configure	
Software Installation	2.4.1
Digitizer Settings	2.4.2
Destination Settings	2.4.3
Site Specific Data	2.4.4
Installation Wizard	2.4.5
Error Viewer Installation	2.4.6
Log Settings	2.4.7
Diagnose & Repair	
Error Code Explanation	2.5.1
Device Test	2.5.2
Diagnose Cycle	2.5.3
Endurance Run Cycle	2.5.4
PMT High Voltage on/off	2.5.5
Reset Relative Counters	2.5.6
Maintain & Calibrate	
Shading Calibration	2.6.1
Backup / Restore	
Backup	2.7.1
Restore	2.7.2

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2.1 Logout

Purpose
- Asks for performed interventions, to make corresponding entries in the info counter.
- Asks to perform a backup of the device specific data if data have been changed during the service intervention.
- Closes the session.

Usage
(1) Select service menu: `<Logout>`

(2) Follow the logout wizard.

Figure 3

2.2 General Info

2.2.1 Device Info

Purpose Show the device specific data.

Usage (1) Select service menu:
`<Device Info>`

Figure 4

2.2.2   Network Info

Purpose   Show the network data of the digitizer and the destination (NX workstation).

Usage   (1)   Select service menu:
                 <Network Info>

Network Info

Digitizer Information

Hostname	DefaultDig
AE-Title	DIG_DEFAULT
IP Address	192.192.192.192
MAC Address	08:00:66:??:36:57
Subnet Mask	255.255.255.0
Default Router	192.192.192.1

Destination Information:

IP Address	192.192.192.193
Proc. Station Name	DefaultNX
AE Title (Image)	NX_DEFAULT
Port (Image)	104
AE Title (Preview)	FAST_DEFAULT
Port (Preview)	3729
AE Title (Fast ID)	FASTID_DEFAULT
NX Port (Fast ID)	3216
Digitizer Port (Fast ID)	3027

Figure 5

2.3 Reporting

2.3.1 Info Counter

Purpose The Info Counter provides device specific information and counters for troubleshooting and evaluation of device usage.

It is part of the complete backup (as `ICN_5151_<SN>.txt` file in the ZIP file) and can also be saved separately. See section 2.7.1.

Figure 6 shows a miniaturized infocounter example.

Use the Adobe reader zoom functionality to view details.

Usage (1) Select service menu: `<Info Counter>`

Figure 6

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2.3.2   Error Statistics

Purpose   The menu "Error Statistics" shows the frequency for all occurred errors for troubleshooting purposes.
The same information is also displayed at the end of the info counter.
See section 2.3.1.

Usage   (1)   Select service menu:
       <Error Statistics>

       (2)   Right-click on the link **<Save errorList.txt as ...>** to save it on the connected PC.

Figure 7

✓   NOTE:

For the explanation of the error codes use the function "Error Code Explanation".
See section 2.5.1.

2.3.3 Service Activity Logfile

Purpose   The menu Service Activity Log shows a logfile of all actions carried out with the help of the service user interface.

Usage   (1)   Select service menu:
`<Service Activity Log>`

(2)   Right-click on the link `<Save ServiceActivity.log as ...>` to save it on the connected PC.

Service Activity Log

Right-click on following link and choose 'Save Target As...' to save to PC.

Save 'ServiceActivity.log' as ...

```
2000-02-19  19:09:18  Switched to view 'Installation Wizard'
2000-02-19  19:09:41  Switched to view 'Home'
2000-02-19  19:12:22  Switched to view 'Digitizer Settings'
2011-11-23  08:24:00  new system time: 23-Nov-2011 08:24:00
2011-11-23  08:24:00  'NET.ADDRESS' set to '10.239.111.46'
2011-11-23  08:24:00  'NET.SUBNET' set to '255.255.240.0'
2011-11-23  08:24:00  'NET.ROUTE' set to '0 10.239.100.254'
2011-11-23  08:24:00  'NET.AE_TITLE' set to 'DEFAULT_DIG'
2011-11-23  08:24:00  'NET.HOSTNAME' set to '10.239.111.46'
2011-11-23  08:24:05  Complete Backup made to file ''.
2011-11-23  08:24:20  Switched to view 'Installation Wizard'
2011-11-23  08:44:22  Switched to view 'Home'
```

Figure 8

NOTE:

All "ServiceActivity.log" files are part of the backup.

When the logfile exceeds 1 MB, a new `ServiceActivity.log` file is created.

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2.4   Install & Configure

2.4.1   Software Installation

Purpose   The menu "Software Installation" allows to upload and install software for the digitizer.

IMPORTANT:

Software installation can be performed via USB flash drive (checked to be virus-free) or via any PC with network connection to the digitizer.

For software installation via USB flash drive:

Preferably use the USB flash drive which is connected in the rear of the digitizer. When using a different USB flash drive be aware that the digitizer only accepts USB flash drives with a certain specification (e.g. maximum size 4 GB).

Usage   For software update via network proceed as follows:

(1)   Select service menu **<Software Installation>** to perform the software installation via browser.

(2)   Follow the instructions which are enclosed to the digitizer software on the Agfa HealthCare Library.

Software Installation

Specify the location, where to find the software to be uploaded and installed!

Releasefile ("*.zip")   [   ]   Browse...

[Upload and Install Software]

Figure 9

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2.4.2   Digitizer Settings

Purpose   The menu "Digitizer Settings" allows entering data to modify:

- The local settings of the digitizer:
  - Date and Time
  - User interface language (language of the user messages displayed in the error viewer on the NX workstation)
- The digitizer network settings.

Usage   (1)   Select service menu: **<Digitizer Settings>**.

(2)   Perform the required settings. See also NOTE below.

(3)   Select **<Load Digitizer Network Data from USB>** to read out the data from an adc.cpf file on the digitizer USB flash drive.

Figure 10

This CPF file:

- Can be created with the CCM tool* or
- Can be exported from the NX configuration tool.

*The CCM tool (**C**onfiguration and **C**ustomization **M**anager) is by default installed on the NX workstation.

NOTE:

The configuration of the digitizer settings is described in the CR 10-X Service Manual, chapter 1, Controls, Connections and Setup Procedures.

2.4.3 Destination Settings

Purpose   The menu "Destination Settings" allows entering data to modify the destination network settings.

Usage   (1)   Select service menu:
        <Destination Settings>.
        Perform the required settings. See
        also NOTE below.

    (2)   Select **<Load Destination
        Network Data from USB>** to
        read out the data from an adc.cpf
        file on the digitizer USB flash drive.

        This CPF file:

        •   Can be created with the CCM
            tool* or

        •   Can be exported from the NX
            configuration tool.

    (3)   Select **<Test Communication>**
        to check the network connection to
        the NX workstation.

Destination Settings

Processing Station IP Address	192.192.192.193
Processing Station Name	DefaultNX
AE-Title (Image)	NX_DEFAU
Port (Image)	104
AE-Title (Preview)	NX_ST_DEFAULT
Port (Preview)	729
AE-Title (Fast ID)	FASTID_DEFAULT
NX Port (Fast ID)	3216
Digitizer Port (Fast ID)	3027

Load Destination Data from USB

Test Communication

*Parameter has no correspondent on the processing station.
Only change it if port 3027 is occupied on the processing station.

Figure 11

*The CCM tool (**C**onfiguration and **C**ustomization **M**anager) is by default installed on the NX workstation.

✓   NOTE:

    The configuration of the digitizer settings is described in the CR 10-X Service Manual, chapter 1, Controls, Connections and Setup Procedures.

2.4.4   Site Specific Data

Purpose   The menu "Site Specific Data" allows entering the site specific data for identification of the digitizer. The data are part of the Info Counter.

Must be filled-in during installation.

Usage   (1)   Select service menu: **<Site Specific Data>**

(2)   Enter the required data.

(3)   Click **<OK>** to save the entered data.

Figure 12

2.4.5   Installation Wizard

Purpose   The installation wizard guides through the setup of the digitizer.

It starts automatically at first connection to the service user interface.

It calls following screens, one after another:

- Digitizer settings
- Destination Settings
- Site specific Data
- Installation Date Confirmation

As long as the installation date is not confirmed, the installation wizard is automatically started when entering the service user interface.

The installation date is written to the configuration data of the digitizer (parameter "Installation date" in the "Device Info" screen. See section 2.2.1).

The installation date cannot be changed anymore.

Usage   (1)   Select service menu: `<Installation Wizard>`

(2)   Follow the further instructions.

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2.4.6   Error Viewer Installation

Purpose   The menu "Error Viewer Installation" allows to install the error viewer on the connected PC from the browser.

Usage   (1)   If the error viewer is already installed on the NX workstation, i.e. if the error viewer icon is present on the task bar:

De-install the error viewer in `Control Panel > Programs and features`

Error Viewer Installation

Click on following link and choose 'Run' to install the ErrorViewer Installer on the Processing Station.

ErrorViewerInstaller.msi

Attention: existing installation of Error Viewer has to be deinstalled beforehand.

Figure 13

     (2)   Select service menu: `<Error Viewer Installation>`

     (3)   Click: `<ErrorViewerInstaller.msi>`

     (4)   Follow the further instructions.

✓ NOTE:

The error viewer installation is also part of the installation procedure of the digitizer.

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2.4.7   Log Settings

Purpose   The menu "Log Settings" allows to change the default log settings. This may be required to trace sporadic problems.

Usage   (1)   Select service menu: **<Log Settings>**

(2)   Adapt the required settings:

- Log Level:
  Standard or Extended.
  Default: Standard.

- Hours until extended Log Level is automatically reset to standard.
  Default: 2

(3)   Click: **<OK>**

Log Settings

Log Level   ⊙ Standard
                                             ○ Extended

Days until extended Log Level   [2   ]
is automatically reset to standard

[OK   ]

Figure 14

✓   NOTE:

Only use the "extended logging" function if really required for troubleshooting: Extended logging reduces the performance of the system.

2.5 Diagnose & Repair

2.5.1 Error Code Explanation

Purpose   The menu "Explain Error Code" list the description for the digitizer error codes which are reported by the error viewer.

Usage   (1)   Select service menu: `<Explain error code>`

(2)   Enter the error code and click button: `<Get Error Description>` The error description is displayed.

Figure 15

✓ NOTE:

The digitizer issues two types of error codes:

Error Code Type	Example	Example code to be entered in the Service User Interface
Pure service message	ARC1001 (25613)	ARC1001*
R&D internal error code	24588	24588

*Also the internal error code (in this example "25613") can be looked up.

2.5.2   Device Test

Purpose   The menu "Device Test" allows to initiate a self test of the digitizer.

The self test is identical to the self test during boot-up of the digitizer.

Usage   (1)   Select service menu: **<Device Test>**

(2)   Click: **<Start Selftest>**

Device Test

Start SELFTEST

This initiates a reboot of the digitizer.
Be sure not to impact any other current work at the device.
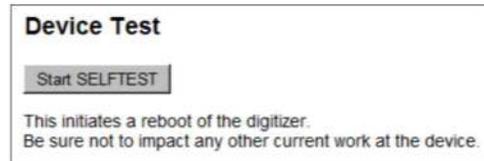
Figure 16

IMPORTANT:

Only perform this function, if nobody else is working at the digitizer.

2.5.3   Diagnose Cycle

Purpose   The menu "Diagnose Cycle" allows to perform a complete scan cycle manually step by step e.g. for troubleshooting purpose.

Usage   (1)   Select service menu: **<Diagnose cycle>**: The Error Viewer window opens.
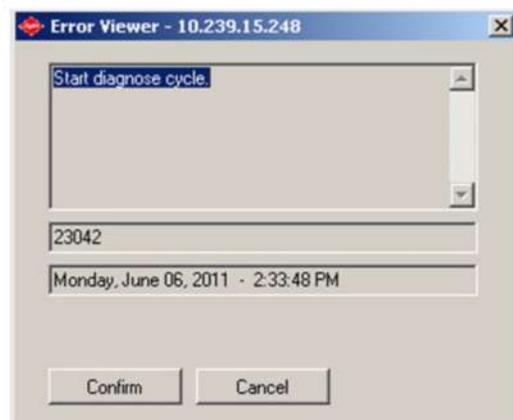
(2)   Click: **<Confirm>**

Error Viewer - 10.239.15.248

Start diagnose cycle.

23042

Monday, June 06, 2011 - 2:33:48 PM

Confirm   Cancel

Figure 17

(3)   Put a cassette into the digitizer.

(4)   Press the grey marked buttons to perform the required actions. See also NOTE below.
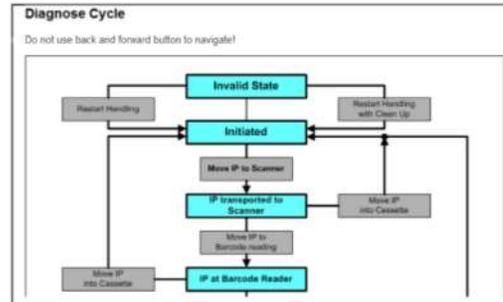
Figure 18

IMPORTANT:

- The Error Viewer and related confirm / cancel window only pops up at the NX workstation. This means, that in any case entering the diagnose cycle window needs to be confirmed at the NX workstation.

- Only leave the Diagnose Cycle window by the **CANCEL** button. Leaving it via browser back button requires a reboot of the digitizer to allow further service activities.

NOTE:

Description of the colored rectangles shown in the diagnose cycle overview:

- A light blue displayed rectangle shows other statuses of the complete cassette cycle.

- A green displayed rectangle shows the current status.

- A dark blue displayed rectangle shows the next possible action.

- A gray displayed rectangle shows the next possible action.

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2.5.4   Endurance Run Cycle

Purpose   The menu "Endurance Run Cycle" allows to run up to 300 cassette cycles with or without scanning and erasure:

This can be helpful when investigating sporadic image plate handling failures.

Usage   (1)   Select service menu: `<Diagnose cycle>`: The Error Viewer window opens.
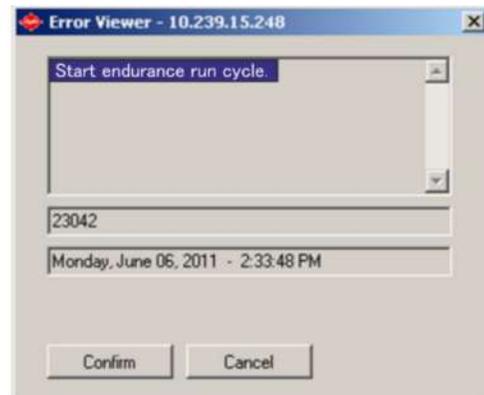
(2)   Click: `<Confirm>`

Figure 19

(3)   Enter the number of cycles

(4)   Select `<NO>` for Scanning (i.e. laser beam switched off during scan) and / or Erasure if required.

(5)   Put a cassette into the digitizer.

(6)   Click: `<Start>`

(7)   Click `<Stop>` to interrupt before the number of adjusted cycles is completed.
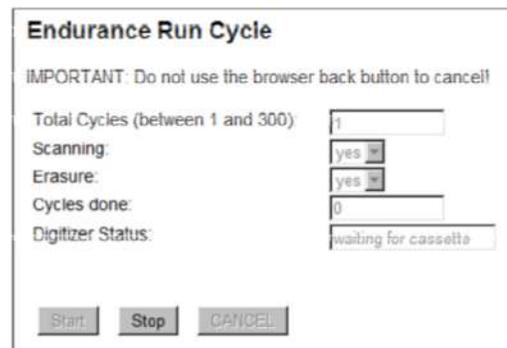
Figure 20

IMPORTANT:

• The Error Viewer and related confirm / cancel window only pops up at the NX workstation. This means, that in any case, entering the Endurance Run window needs to be confirmed at the NX workstation.

• Only leave the Endurance Run window by the **CANCEL** button. Leaving it via browser back button requires a reboot of the digitizer to allow further service activities.

2.5.5   PMT High Voltage on/off

Purpose   The menu "PMT High Voltage on/off" allows to switch on and off the high voltage at the PMT (Photomultplier).

To switch the high voltage off may be required, to observe the image plate run with open covers for troubleshooting. With PMT high voltage switched on (default situation) and with covers opened, the digitizer does not scan, as it detects incident of light.

Usage   (1)   Select service menu: `<PMT High Voltage on/off>`

(2)   Click `<Switch High Voltage off>` to switch PMT high voltage off: Now it is possible to observe the scan cycle with covers opened.

(3)   To switch it on again, click `<Switch High Voltage on>`.

PMT High Voltage on/off

High Voltage is on during scanning

Switch High Voltage **off**

PMT High Voltage on/off

High Voltage is off during scanning

Switch High Voltage **on**
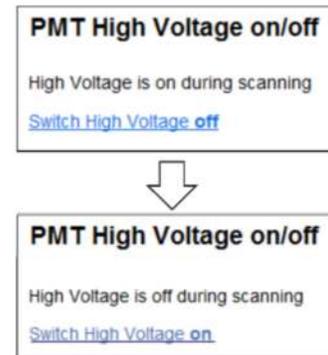
Figure 21

IMPORTANT:

Always switch the high voltage on before handing over the equipment to the customer.

With PMT high voltage switched off the digitizer scans images without error message, it does not record the image however.

NOTE:

By a reset of the digitizer (switch off / on) the high voltage for the PMT is switched on again.

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2.5.6   Reset Relative Counters

Purpose   With the menu "Reset Relative Counters" the relative counters* of the info counter are cleared.

This may be required to easily track new info counter entries after a service intervention.

* Number of test cycles per format; number of start-ups and resets; Retries; Incorrect User Handling; Cassette and IP jams; Error List; Warning List

Usage   (1)   Select service menu: **<Reset Relative Counters>**

(2)   Click: **<OK>**

Reset Relative Counter

Press OK to clear all relative counters.

    OK
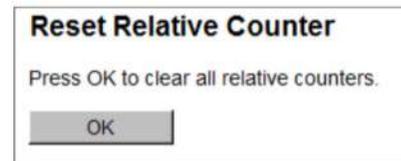
Figure 22

2.6   Maintain & Calibrate

2.6.1   Shading Calibration

Purpose   The menu "Shading Calibration" provides:

- Functionality to compensate image inhomogeneities caused by certain properties of the scanning system of the digitizer (Button "Calibrate").

- Possibility to view the current calibration curve (Link "Draw calibration line") for troubleshooting.

- Possibility to download the current calibration curve to PC (Link "Download calibration line") for troubleshooting. Note, that the calibration curve is also part of a complete backup.

A shading calibration has to be performed after replacement of following spare parts:

- Optic Module

- PMT with Light Collector

Usage To perform a shading calibration:

(1) Select service menu: `<Shading Calibration>`

(2) Follow the instructions on the screen and in CR 10-X Service Manual, chapter 3.6, Adjustments and Calibrations.

To view the current calibration curve for troubleshooting purpose:

(1) Select link: `<Draw calibration line>`

To copy the current calibration curve to PC for troubleshooting purpose:
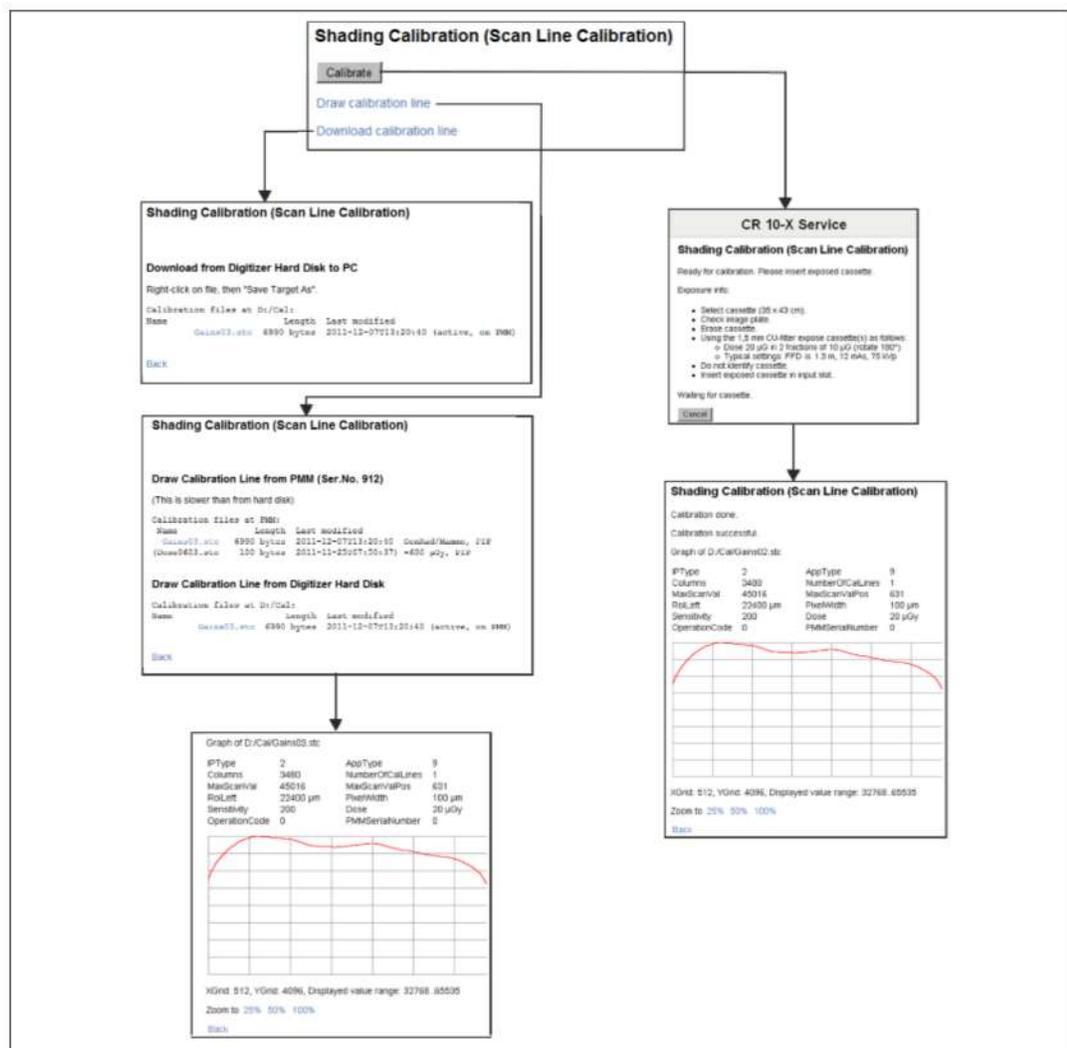
(1) Select link: `<Download calibration line>`

Figure 23

2.7   Backup / Restore

2.7.1   Backup

Purpose   The menu "Backup" allows storing device specific settings and other relevant data (e.g. info counter, logfiles etc.) in a backup Zip file (= Backup).

The backup file is one important part of the data to be provided when escalating a digitizer problem. It is saved with following syntax:
BAC_CR10-5151_<Serial Number>DDMMMYYYY_HH-MM-SS.ZIP

(1)   Select service menu: `<Backup>`

Figure 24

Usage Complete backup   Perform the following steps to create a complete external backup:

(1)   Choose option: `<Complete Backup>`

(2)   Click `<Save to USB>` or `<Save to PC>` to perform the complete backup.

(3)   Wait a few seconds until the message "Backup finished" is displayed.

Usage Backup of single files   Perform the following steps to create a backup of single files:

(1)   Choose option: `<Backup Single Files Only>`

(2)   Select the required files:

- Info counter and/or

- Calibration Files and/or

- Logfiles and/or

- Service Activity Log

(3)   Select `<Save to USB>` or `<Save to PC>` to perform the backup.

(4)   Wait a few seconds until the message "Backup finished" is displayed.

✓ NOTE:

It is recommended to perform in any case a "complete backup".

2.7.2   Restore

Purpose   The menu "Restore" is required to restore a certain configuration of the digitizer.

Usage   (1)   Select service menu: `<Restore>`

            (2)   Click: `<Read from USB>` or `<Read from PC>`

            (3)   Select the backup file. It is a file with following syntax:
                 BAC_CR10-5151_<Serial number>DDMMMYYYY_HH-MM-SS.ZIP
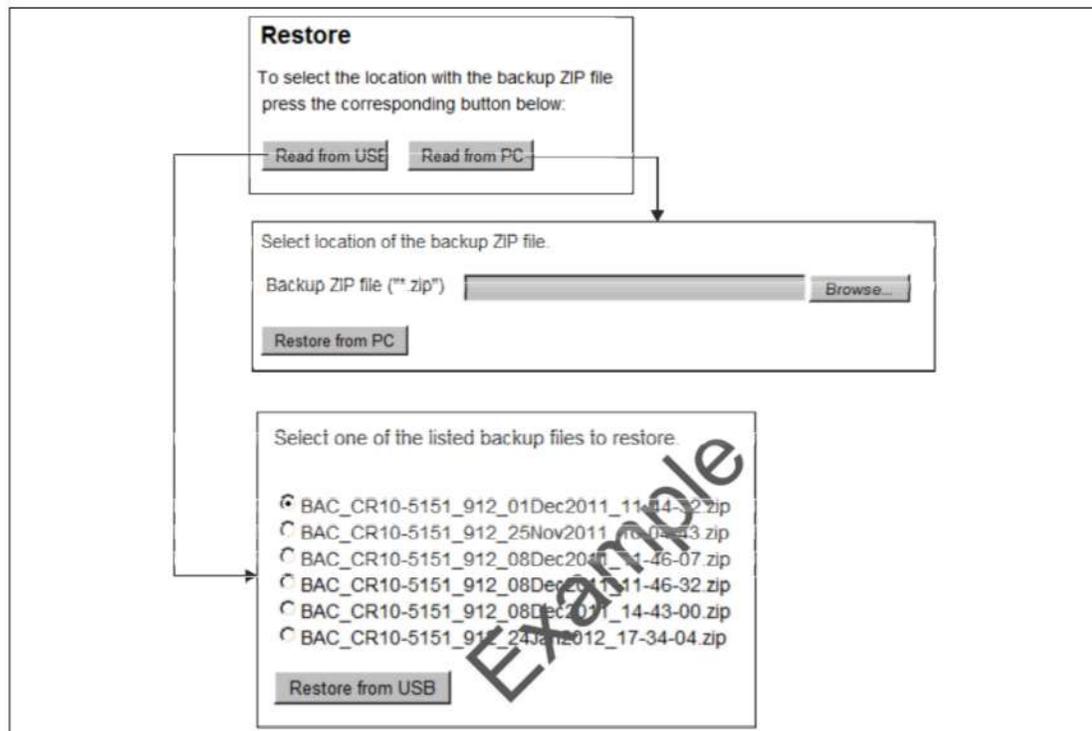
Figure 25

3 Remote Service

Purpose Remote connection to the digitizer means:
Connection via a PC in the local network or via internet.

To prevent that service actions initiated via service user interface interfere with the operation by the customer, two safety levels are built in the software:

- Level 1: When executing the function (e.g. software installation), the digitizer status indicator changes to red constant. The user cannot scan an image.
Note, that the status indicator only changes to red, when the function is really executed (e.g. the user presses OK). Just by opening the menu, the safety level 1 is not yet activated.

- Level 2: The user has to confirm in the error viewer (installed on the NX workstation), that the function can be executed.

The table below shows the safety level per service menu:

Service Menu Name	Reference	Level 1: Scanning blocked	Level 2: Confirmation required
Logout	2.1	no	no
Device Info	2.2.1	no	no
Network Info	2.2.2	no	no
Info Counter	2.3.1	no	no
Error Statistics	2.3.2	no	no
Service Activity Logfile	2.3.3	no	no
Software Installation	2.4.1	**yes**	no
Digitizer Settings	2.4.2	**yes**	no
Destination Settings	2.4.3	**yes**	no
Site Specific Data	2.4.4	no	no
Installation Wizard	2.4.5	**yes**	no
Error Viewer Installation	2.4.6	no	no
Log Settings	2.4.7	no	no
Error Code Explanation	2.5.1	no	no
Device Test	2.5.2	**yes**	no
Diagnose Cycle	2.5.3	**yes**	**yes**
Endurance Run Cycle	2.5.4	**yes**	**yes**

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Service Menu Name	Reference	Level 1: Scanning blocked	Level 2: Confirmation required
PMT High Voltage on/off	2.5.5	**yes**	no
Reset Relative Counter	2.5.6	no	no
Shading Calibration	2.6.1	**yes**	**yes**
Backup	2.7.1	no	no
Restore	2.7.2	no	no

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HEALTHCARE
Imaging Services

Chapter 3.3
Repair and Service
Troubleshooting

Document No: DD+DIS155.11E

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▶ **Purpose of this Document**

This document provides troubleshooting information.

▶ **Document History**

Edition. Revision	Release Date	Changes
1.0	02-2012	Initial version

▶ **Referenced Documents**

Document	Title
Referenced documents are listed in the respective sections.	

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WARNING:

Improper operation or service activities may cause damage or injuries.

INSTRUCTION:

(1)   Read the "Generic Safety Directions" document
      (see Agfa HealthCare Library => General Info => Agfa HealthCare =>
      Publications => Service Manual) prior to attempting any operation, repair or
      maintenance task on the equipment.

(2)   Strictly observe all safety directions within the "Generic Safety Directions" 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 HealthCare or one of its affiliates
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such services.

NOTE:

To verify the latest version of a chapter of the Service Manual refer to the "Checklist for
Completeness" in the Agfa HealthCare Library.

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1 General Symptom Classification

The troubleshooting procedure depends on the symptom of the fault:

Symptom	Reference Section
An error is displayed in the error viewer	2
No error displayed: • Status LED does not turn green • No motor audible during boot-up	3
No error displayed: • Status LED does not turn green • Motor audible during boot-up	4
Image artifacts parallel to image plate run.	5
Image artifacts vertical to image plate run.	6

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2   Faults with Error Codes

Symptom   The digitizer error viewer on the NX workstation displays an error code, e.g. ARC1001 (25613).

✅ NOTE:

Meaning of the error codes ARCXXXX (YYYYY):

- The error code ARCXXXX is the service message number.
- The error code (YYYYY) is the R&D internal error code.

Cause   The digitizer software detected a malfunction of the digitizer.

Solution   Solve the problem as described in the service description of the error code.

To look-up a digitizer error code (e.g. ARC1001) proceed as follows:

A) Look-up the error "online" (Access to NX Workstation available):

(1) On the NX Workstation start the internet browser.

(2) Enter the IP address of the digitizer in the address window.

(3) Login with username and password provided in the web based training.

(4) Look-up the error (e.g. ARC1001) in menu "Explain Error Code".

B) Look-up the error "offline" (No access to NX Workstation):

(1) Download the latest CR 10-X software file from the Agfa HealthCare Library.

(2) Unzip the CR 10-X Software File.

(3) Unzip the ARC_XXXX.zip* file.

(4) Using Excel, look-up the error in file "errors.csv".

    * XXXX represents the software version.

✅ NOTE:

The R&D internal error codes YYYYY can also be looked up in menu "Explain Error Code" or the file "errors.csv". The error descriptions are however not prepared for the service user.

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3 No Error Code - Status LED does not turn green - No Motor audible

Symptom   No error displayed:

- Status LED does not turn green (red blinking or off)

- No motor audible during boot-up

- "Digitizer start-up" message is **not** shown approximately 40 seconds after switch on.

NOTE:

For a default boot-up sequence refer to the digitizer service manual chapter 2, Functional Description.

Cause 1   Power supply defective.

Solution 1   Check green LED or 24 V output. If green LED is off or 24 V output not available: Exchange the power supply.

NOTE:

Depending on the power supply version, the 24 V output are available at 6 or 8 pins. One half of the pins has positive polarity, the other half has negative polarity.

Cause 2   Power board defective.

Solution 2   Check the status of the LEDs on the PMI board indicating that power is available:

If one or more of following LEDs does **not** light up green, exchange the Power Board:

LD1, LD3, LD5, LD7, LD9, LD10, LD11, LD12, LD13, LD16

See chapter 3.4, Electrical and mechanical Codes, Fuses, LEDs for the location and meaning of the LEDs.

Cause 3   PMI board defective.

Solution 3   Exchange the PMI board

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Cause 4   In general: Selftest of digitizer hardware (boards, motors, sensors) is not successful.

Solution 4   Use the "Boot Problem Analyzer" to get more info about the problem.

Instructions:

(1)   Switch off the digitizer.

(2)   Remove the digitizer USB flash drive and insert it at the Service PC.

(3)   Copy the content of folder "`ARC_1103*/BootProblemAnalyzer`" (*or higher version) to the root of the USB flash drive. See Figure 1.
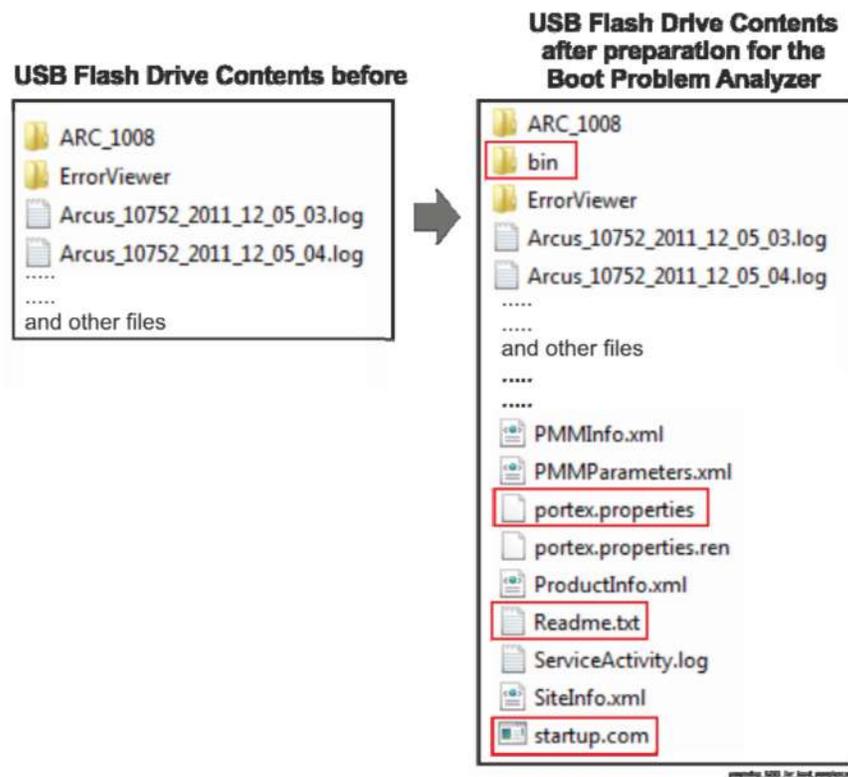
Figure 1

(4)   Release the USB flash drive from the Service PC and insert it at the digitizer.

(5)   Switch on the digitizer.

(6)   After approximately 1 minute remove the USB flash drive: The log files to analyze the boot-up have been written to directory `\log`.

(7)   Check the `portex.properties.log` file for wrong network settings.

If the network settings are OK, zip the logfiles and forward them to the next support level.

(8)   Re-mount the digitizer USB flash drive at the digitizer.

4   No Error Code - Status LED does not turn green - Motor audible

Symptom   Status LED is red blinking. More than five minutes after switch on the status LED does not turn green.

Motors have been briefly audible during the boot-up procedure.

No error message in the error viewer. "Digitizer start-up" message is **not** shown approximately 40 seconds after switch on.

Cause 1   Network cable connected directly between digitizer and workstation **and** NX workstation software is NX 2.0.8600/3.0.8600.

Solution 1   Possibility 1: Use a network switch to connect digitizer to the NX workstation.

Possibility 2: Observe switch on sequence for the setup mentioned under "Cause 1": First switch on the digitizer, then switch on the NX workstation.

As alternative: With digitizer switched on select at NX workstation:
`START > All Programs > Agfa > NX > Restart NX completely`

Possibility 3: Configure digitizer and NX workstation for the local network and connect both to the local network.

Cause 2   Network cable not connected or defective.

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Solution 2 • Check network interface LEDs at NX workstation: They should light up (constant or intermittently).

• Check network interface LEDs at the digitizer: They should light up (constant or intermittently).

If the network LEDs on both sides do not light up, try another network cable.

Cause 3 Network interface defective at NX Workstation or digitizer.

Solution 3 Checking the network interface at the NX workstation:

(1) Connect the Service PC via network cable to the NX workstation (Service PC IP address configuration not required).

(2) Check whether the network LEDs at the NX workstation light up.

If the network LEDs on the NX workstation does not light up, exchange the network interface at the NX workstation.

Checking the network interface at the digitizer:

(3) Connect the Service PC via network cable to the digitizer (Service PC IP address configuration not required).

(4) Check whether the network LEDs at the digitizer light up.

If the network LED on the digitizer does not light up, exchange the PMI board.

Cause 4 Wrong configuration settings on digitizer and/or NX Workstation.

Solution 4 Following settings must be correct on the digitizer and the NX Workstation to allow communication (see table below):

#	Setting on Digitizer	Setting on NX (correspondent parameter)
1	Destination IP Address	NX Workstation IP address (Windows setting)
2	Destination Name	NX Workstation "Processing Station Name" (Configuration Tool menu "General Configuration → Configure Workstation settings → General Settings")
3	AE title (Image)	NX Workstation "Performed Station AE Title" (Configuration Tool menu "General Configuration → Configure Workstation settings → General Settings")
4	Digitizer IP Address	IP address in digitizer device configuration. As alternative also the digitizer host name can be used.

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#	Setting on Digitizer	Setting on NX (correspondent parameter)
5	Digitizer AE title	AE title in digitizer device configuration.
6	Digitizer Hostname	Host Name in digitizer device configuration. As alternative also the digitizer IP address can be used.
7	Digitizer Type "CR 10-X"	Has to be selected when adding a new digitizer with the NX Configuration Tool. Is later on displayed as "Type" in the Device Configuration Settings.

Cause 5   Digitizer IP address or subnet mask configured wrong (e.g. due to a typing error):

Accessing the digitizer service pages is not possible anymore, as the network settings are unknown.

Solution 5   Reset the IP address to default. Proceeding:

(1)   Switch off the digitizer.

(2)   Remove the USB flash drive and insert it at the Service PC.

(3)   Go to folder `\ARC_1103` (or higher version) on the USB flash drive.

(4)   Double click on: `<RestoreDefaultAddress.cmd>`

- A Command Line Window opens for a short time.

- The file startup.com is written to the root of the USB flash drive.

(5)   Release the USB flash drive from the Service PC and re-insert it at the digitizer.

(6)   Switch on the digitizer.

(7)   Wait until the boot-up is finished (approximately 1 minute).

After bootup of the digitizer the network settings are as follows:

IP Address:	192.192.192.192
Subnet Mask:	255.255.255.0
Gateway IP Address:	192.192.192.1
Digitizer AE Title:	DIG_DEFAULT
Digitizer Hostname:	192.192.192.192

NOTE:

After a reset of the network settings it is required to configure the network settings again. Refer to Service Manual Chapter 1, "Controls, Connections, and Setup Procedures".

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5   Image Faults parallel to Image Plate Run

5.1   Calibration Lines

Symptom   Calibration lines are visible in the clinical image or a flatfield image.
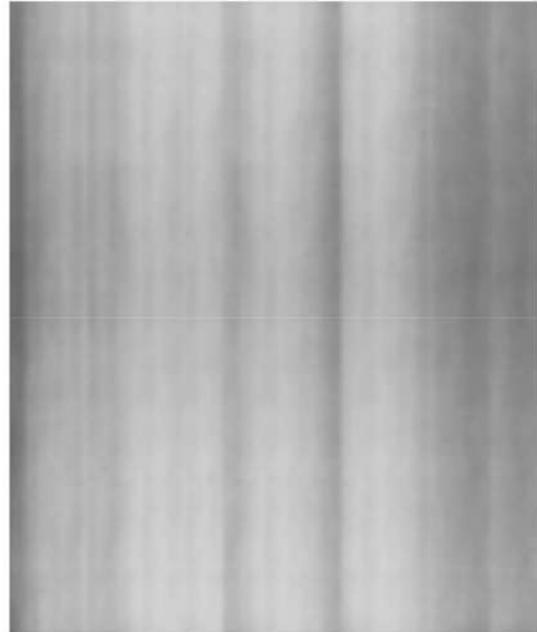
Figure 2: Example for calibration lines

Cause   Digitizer not calibrated after exchange of optic module or PMT with light collector.

Solution   Perform a shading calibration. Refer to chapter 3.6, Adjustments and Calibrations

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5.2   Dust Stripes

Symptom   Dust stripes are visible in the clinical image or a flatfield image.
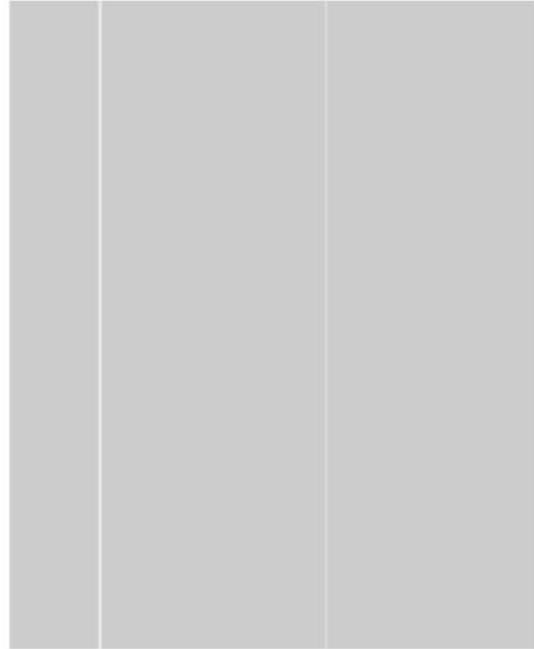
Figure 3: Example for dust stripes

Cause   Dirt or dust in the scan path.

Solution   (1)   Use the cleaning brush to clean the mirror and the entrance surface of the light collector by moving the brush a few times. For instructions refer to the digitizer user manual.

(2)   Expose and scan a flatfield and evaluate again.
For instructions how to create a flatfield image refer to chapter 3.6, Adjustments and Calibrations

(3)   If unacceptable image flaws suntil occur: Escalate to the next support level.

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6 Image Faults vertical to Image Plate Run

6.1 Banding

Symptom   Banding stripes are visible in the clinical image or a flatfield image.
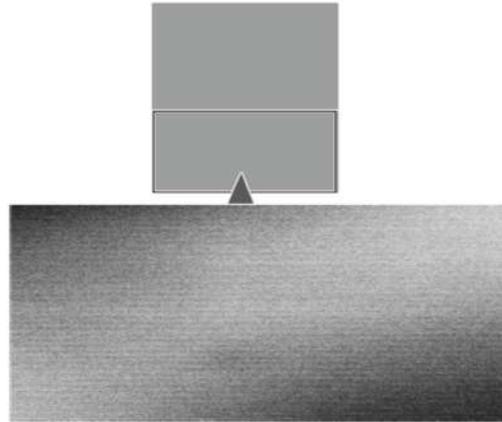
Figure 4: Example for banding

Cause   Inhomogeneous movement of the slow scan drive.

Solution   (1)   Check the table where digitizer is positioned. It must be a fixed position. No vibrations may disturb the scanning.

(2)   If no vibrations from the table are transferred to the digitizer:
Escalate to the next support level.

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7   Appendix: Using the Limit Pattern to judge Image Flaws

The limit pattern shows the limit of acceptable image quality concerning stripes parallel and vertical to the image plate run. It is available on the digitizer USB flash drive.

7.1   Preparation

(1)   Create a flatfield image as described in chapter 3.6, "Adjustments and Calibrations". Main steps:
- Check the image plate.
- Erase the cassette.
- Expose the image plate.
- Scan the image.

(2)   Check the image.

7.2   Comparing the Flatfield with the Limit Pattern

(1)   Switch off the digitizer.

(2)   Remove the USB flash drive and insert it at the NX workstation.

(3)   On the NX workstation select the Main Menu.

(4)   Select `<import images>`.

(5)   Browse to the USB flash drive to select the limit pattern in directory `\Limit Pattern`.

(6)   Wait until the image is imported (approx. 15 seconds).

(7)   Select the examination menu.

(8)   Visually compare the flatfield with the limit pattern.

(9)   Evaluate as follows:

- If the scanned image visually looks as good as or better than the limit pattern, the image quality is okay.

- If there are unacceptable effects see sections 5 and 6 of this document.

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HEALTHCARE
Imaging Services

Chapter 3.4
Repair and Service
Electrical and mechanical Codes, Fuses, LEDs

Document No: DD+DIS155.11E

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► ## Purpose of this Document

This document describes the location and meaning of the LEDs and switches on the printed circuit boards for repair activities.

► ## Document History

Edition. Revision	Release Date	Changes compared to previous Version:
1.1	05-2012	Added meaning of the red status indicator blinking frequency. See section 3.

► ## Referenced Documents

Document	Title
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INSTRUCTION:

(1)   Read the "Generic Safety Directions" document
(see Agfa HealthCare Library > General Info > Agfa HealthCare > Publications >
Service Manual) prior to attempting any operation, repair or maintenance task on
the equipment.

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

IMPORTANT:

The installation and service of the product(s) described herein is to be performed
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or who are otherwise authorized by Agfa HealthCare or one of its affiliates to provide
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NOTE:

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1 PMI Board

Figure 1: Location of switches and LEDs on the PMI Board

IMPORTANT:

Fuses are **not** displayed on purpose.

Do not replace any fuse. In case of a broken fuse, replace the board instead.

1.1 Switches on the PMI Board

Switch	Meaning
S1	Reset of CPU. For R&D purposes only.
S2	Reset Hardware. For R&D purposes only.

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1.2 LEDs on the PMI Board

LED	Status Indicator			Meaning
LD1	Green	Constant	ON*	5 V for USB ok
			OFF	5 V for USB missng
LD3	Green	Constant	ON*	24 V for Galvo OK
			OFF	24 V for Galvo missing
LD5	Green	Constant	ON*	3,3 V for on board components OK
			OFF	3,3 V for on board components missing
LD7	Green	Constant	ON*	5 V for on board components OK
			OFF	5 V for on board components missing
LD9	Green	Constant	ON*	Supply voltages for Optics OK
			OFF	Supply voltages for Optics missing
LD10	Green	Constant	ON*	1,8 V and 1,4 V for CPU and SDRAM OK
			OFF	1,8 V and 1,4 V for CPU and SDRAM missing
LD11	Green	Constant	ON*	Supply voltages for PMT OK
			OFF	Supply voltages for PMT missing
LD12	Green	Constant	ON*	Analog supply voltages OK
			OFF	Analog supply voltages missing
LD13	Green	Constant	ON*	CAN Bus enabled
			OFF	CAN Bus error
LD14	Red	Constant	ON	FPGA not configured
			OFF*	FPGA configured
LD15	Yellow	Constant	ON**	Ethernet traffic
			OFF	No Ethernet traffic
LD16	Green	Constant	ON*	1,2 and 2,5 V for FPGA OK
			OFF	1,2 and 2,5 V for FPGA missing

* Default during operation

** On only if there is ethernet traffic
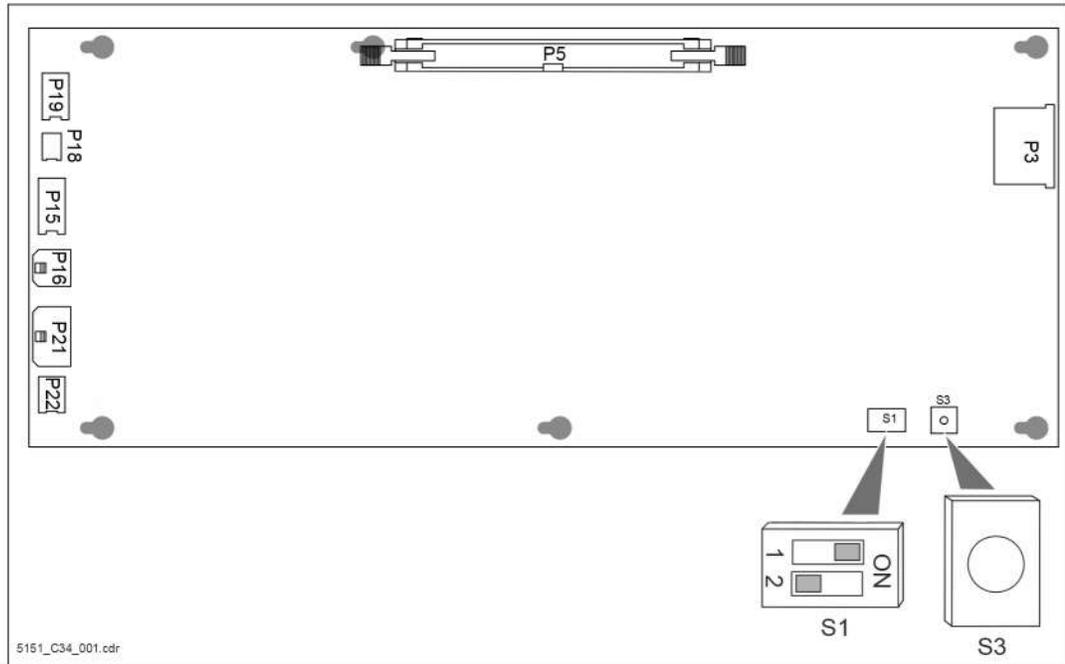
2 Power Board

Figure 2: Location of switches on the Power Board

IMPORTANT:

Fuses are **not** displayed on purpose.

Do not replace any fuse. In case of a broken fuse, replace the board instead.

2.1 Switches on the Power Board

Meaning	
S1/1	Not used.
S1/2	Not used.
S3	Board reset. Only for R&D purpose.

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3 Status Indicator on the User Interface Board

The digitizer status is indicated via static or blinking blue, green and red LEDs. See table below.

Status Indicator

515101ag.cdr
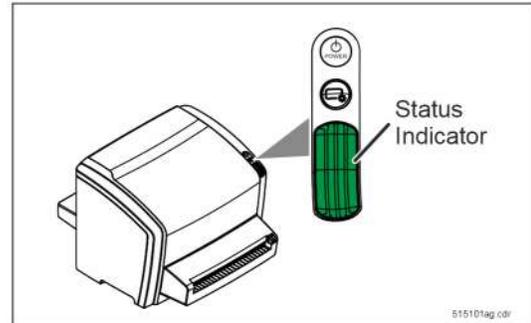
Figure 3

Status Indicator	Digitizer Status	Meaning
Constant blue	Ready for erasure cycle	When entering the next image plate it will be erased.
Blue blinking	Erasure cycle	Image plate gets erased.
Constant green	Stand-by mode (READY)	Ready for scanning.
Green blinking	Busy	Scan cycle active.
Constant red	• Fatal digitizer error • Service mode active (e.g. shading calibration)	Scanning not possible: • Service intervention required or • Service function is called up by the field service engineer which blocks scanning. For a list of service functions which block scanning refer to Service Manual chapter 3.2, Tools and auxiliary Means.
Slow red blinking (≈ 1 / sec.)	• Boot-up • Digitizer warning or error	Scanning not possible: • User has to wait until boot-up is finished or • User intervention required to continue.
Fast red blinking (≈ 3 / sec.)	No connection to Error Viewer on PC	Scanning not possible: Error Viewer not up-to-date or not started up.
Triple blinking (≈ 3 / sec. + 1 sec. off)	No network connection to PC	Scanning not possible: Ping sent from digitizer to NX workstation with IP address configured in digitizer failed.

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05-2012

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HEALTHCARE
Imaging Services

Chapter 3.5
Repair and Service
Replacements / Repair Procedures

Document No: DD+DIS155.11E

CR 10-X
Type 5151 / 100

► **Purpose of this Document**

This document informs about the availability of replacement instructions:

- The replacement instructions are enclosed to the digitizer spare parts as printout.

- They are also available as PDF documents on the Agfa HealthCare Library: Computed Radiography => CR Digitizers => CR 10-X => Service Enclosures

NOTE:

On the Agfa HealthCare Library always the latest released spare part enclosure document is available.

Due to logistical reasons it is possible, that the document versions on the Agfa HealthCare Library and the printout provided with the spare part are different.

► **Document History**

Edition. Revision	Release Date	Changes
1.0	02-2012	Initial version

Edition 1, Revision 0

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(2) Strictly observe all safety directions within the "Generic Safety Directions" and on
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02-2012

CR 10-X
Type 5151 / 100

Chapter 3.5 / Page 2 of 2
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Document No: DD+DIS155.11E

CR 10-X

Type 5151 / 100

► **Purpose of this Document**

This document describes all adjustments and calibrations that may be required during corrective and preventive maintenance.

► **Document History**

Edition. Revision	Release Date	Changes
1.0	02-2012	Initial version

► **Referenced Documents**

Document	Title
None	

Edition 1, Revision 0

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Document Node ID: 33998938
eq_03-6_adjustments_e_template_v07
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LIST OF CONTENTS

1   Overview of Adjustments and Calibrations

The following tables give an overview of adjustments and calibrations for the digitizer.

Adjustment Type	Use Case	Section
None	Not applicable: After spare parts exchange no adjustment is required.	--

Calibration Type	Use Case	Section
Shading calibration	• After replacement of the PMT with Light Collector • After replacement of the Optic Module • Whenever stripes in image plate run direction are visible which cannot be removed by cleaning with the cleaning brush	2

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2 Shading Calibration

Purpose Determine the sensitivity of the scanning system for each pixel of the scan line: A flatfield is scanned. For each pixel a sensitivity factor is stored in a flash memory on the Photomultiplier (PMT).

Use Case Perform a shading calibration in following cases:

- After replacement of the Photomultiplier (PMT) with Light Collector

- After replacement of the Optic Module

- Whenever stripes in image plate run direction are visible, which cannot be removed by cleaning of the scan line with the cleaning brush

REQUIRED TOOLS:

1,5 mm Copper Filter**
Spare part number*:
CM+9 5155 1015 2

Polynit wipes***
Spare Part Number*:
10+9 9999 1273 0

CR Phosphor Plate Cleaner***
Spare part number*:
10+9 9999 1197 0

Lint free cloth***

* 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.
** The Cu filter is part of digitizer delivery.
*** For cleaning of an image plate either use CR Phosphor plate cleaner (poured on a lint free cloth) or Polynit wipes.

REQUIRED TIME:
Approximately 30 minutes

2.1 Checking and Erasing the Image Plate

(1) Select one of the available cassettes.

(2) Open the cassette and check that the image plate (IP) is free of contamination and without any signs of wear or defects like scratches or split off parts.
If any particles are detected, clean the IP according to the cleaning procedure.
If any defects are detected, inform the customer about the defect and use another artifact free IP.

(3) Erase the IP.

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NOTE:

For CR MD1.0 General image plates only use AGFA CR Phosphor Plate cleaner and a soft lint-free cellulose cloth or Polynit wipes to clean the image plate.

For more information refer to the user manual "AGFA CR Plates and Cassettes (CR MD 1.0 General)". This manual is part of digitizer delivery and is available on the Agfa HealthCare Library.

IMPORTANT:

When using CR Phosphor Plate Cleaner: Do **not** put the CR Phosphor Plate Cleaner directly on the image plate. Always put the CR Phosphor Plate Cleaner on the lint-free cloth.

2.2   Exposing the Cassette

(1)   Mount the 1,5 mm Cu-filter at the modality.

(2)   Place the cassette with the black side facing up.

(3)   Ensure that the entire image plate is fully exposed. The collimated field must be larger than the image plate.
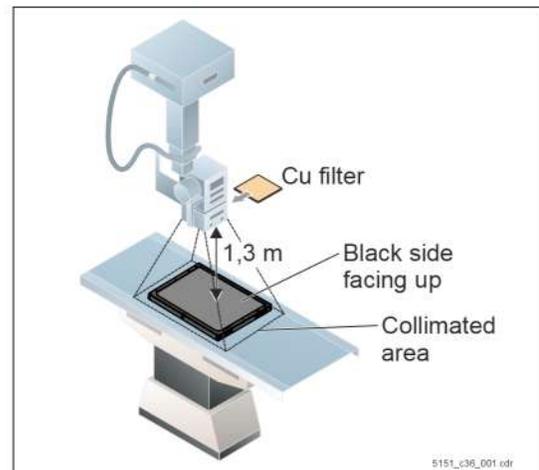
Figure 1

(4)   Select the following exposure parameters to obtain a dose of 10 µGy:

- 12 mAs
- 75 kVp
- 1.3 m (51,2") distance
- Large focus

(5)   Expose the cassette.

(6)   Turn the cassette 180° (black side still facing up).

(7)   Expose the cassette again.
       After the second exposure the cassette has been exposed in total
       with a dose of approximately 20 µGy.

(8)   Remove the Cu-filter from the X-ray device.

2.3   Scanning the Image Plate

(1)   On the NX workstation log-off the current user and log-in as "crservice".

(2)   Open the Internet Explorer.

(3)   Enter the digitizer IP address in the address window. See also NOTE below.

NOTE:

If the digitizer IP address is not known, look it up in the NX configuration tool:

- Double-click the icon `<Start NX Configurator>` on the desktop.

- Select: `Load active configuration`

- Go to: `Devices > Digitizer Configuration`
  This page shows the digitizer IP address.

- Quit the NX Configurator (Close without saving any changes).

(4)   Enter username and password (obtained during the web based training).

(5)   Select the service menu: `<Shading Calibration>`

(6)   Select calibrate.

Figure 2

(7)   Press `<confirm>` in the error viewer, when the Service user interface shows following message: `Please confirm at system to continue. Waiting for confirm ...`
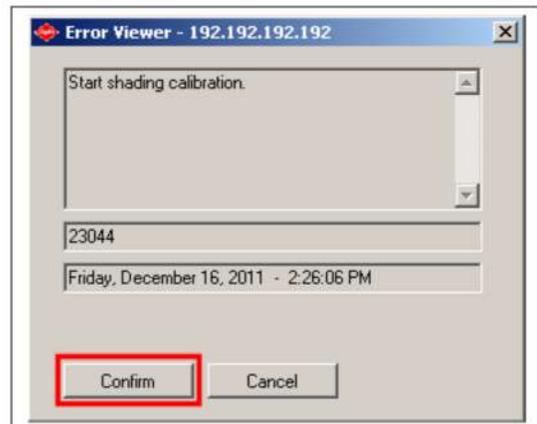
Figure 3

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(8) A screen with instructions is displayed.
Enter the exposed cassette in the digitizer: Scanning starts.

Shading Calibration (Scan Line Calibration)

Ready for calibration. Please insert exposed cassette.

Exposure info:

- Select largest available Genrad NP / PM cassette (35 x 43 cm).
- Check image plate(s).
- Erase cassette(s).
- Using the 1,5 mm CU-filter expose cassette(s) as follows:
  - Dose 20 µG in 2 fractions of 10 µG (rotate 180°)
  - Typical setting: FFDist. 1.3 m, 12 mAs, 75 kVp
- Do not identify cassette(s).
- Do not use PLUS cassette.
- Insert exposed cassette in input slot.

Waiting for cassette.

Cancel

Figure 4

(9) Wait until scanning is finished.

A static red status LED indicates scanning.
A static green status LED indicates that scanning is finished: The shading calibration curve is displayed.

Shading Calibration (Scan Line Calibration)

Calibration done.

Calibration successful.

Graph of D:/Cal/Gains02.stc

IPType	2	AppType	9
Columns	3480	NumberOfCalLines	1
MaxScanVal	45016	MaxScanValPos	631
RoiLeft	22400 µm	PixelWidth	100 µm
Sensitivity	200	Dose	20 µGy
OperationCode	0	PMMSerialNumber	0

XGrid: 512, YGrid: 4096, Displayed value range: 32768..65535

Zoom to 25% 50% 100%

Back

Figure 5

IMPORTANT:

If a message pops up which indicates a failed shading calibration (e.g. "Underexposed - too low pixel values …") refer to section 2.5 for possible remedies.

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(10) Remove the cassette from the digitizer.

(11) Select menu `<Logout>` and follow the logout wizard.

(12) Close the browser.

2.4   Verifying a successful Shading Calibration

Verification (1)   Expose a flatfield. Use the same exposure parameters like for the shading calibration.

(2)   Identify and scan the image. Use exam type: `System diagnosis →` `Flatfield`

IMPORTANT:

By selection of examination type `System diagnosis → Flatfield` the correct settings for image processing of the flatfield are used.

Any other examination type may give a result which cannot be used to evaluate the flatfield image.

(3)   Visually check the image for homogeneity in IP run direction and vertical to the IP run direction.

Evaluation:

*   If the scanned flatfield image does not show any lines or stripes or large area inhomogeneities no further action is required.

*   If there are unacceptable effects, see service manual chapter 3.3, Troubleshooting.

Result   The shading calibration is finished.

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2.5   Appendix: Possible Reasons for a failed Shading Calibration

There are following main reasons for a failed shading calibration:

- Particles in the optical path → Use the cleaning brush to clean the optical path. For instructions refer to the digitizer user manual.

- Contamination and/or any defects on the image plate → Clean the image plate according to the cleaning procedure or use another image plate.

- Cassette wrong exposed (too high / low dose) → Check exposure parameters.

- Cassette not exposed on its entire area (wrong collimation) → Ensure the cassette is entirely exposed.

- PMT exposed to intensive light before calibration (in this case PMT has lower sensitivity) → wait until the PMT has back the normal sensitivity (time depends on duration and brightness of the light exposure).

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Document No: DD+DIS155.11E

CR 10-X

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▶ ## Purpose of this Document

This document describes the released software version with their features and limitations.

▶ ## Document History

Edition. Revision	Release Date	Changes
1.0	02-2012	Initial version

▶ ## Referenced Documents

Document	Title
DD+DIS033.12E	Service Bulletin No. 01, Digitizer CR 10-X released for Delivery

Edition 1, Revision 0
02-2012   Printed in Germany
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02-2012   Type 5151 / 100   Agfa Company Confidential

1 Software Release ARC_1103

Release Date	02/2012
Digitizer SNs	Type 5151 / 100: SN ≥ 1000
Availability	On the Agfa HealthCare Library always the latest available software release can be downloaded.
	The installed digitizer software is also available on the digitizer USB flash drive.
Prerequisites	The NX workstation connected to the digitizer requires software ≥ NX 2.0.8600 / 3.0.8600.
	If the digitizer is connected to NX 2.0.8600 / 3.0.8600: Model file for CR 10-X is required for configuration. See Agfa HealthCare Library > Computed Radiography > CR Digitizers > CR10-X
	For additional system component compatibility information refer to following documents:
	• Solution Structure Data Document, Document ID* 30781759 (Intranet Link / Extranet Link)
	• CR/DR Interoperability Matrix, Document ID* 31333326 (Intranet Link / Extranet Link)
Reference Document	DD+DIS033.12E, Service Bulletin No. 01, Digitizer CR 10-X released for Delivery (Intranet Link / Extranet Link)

1.1 Features of Software ARC_1103

Software ARC_100X contains all features which are required to perform the functions as specified in the "Intended Use" statement.

For more information to the "Intended Use" statement refer to CR 10-X Service Manual chapter 3.1, Safety Guidelines / General Repair Instruction.

1.2 Known Software Bugs

In some cases wrong or incomplete error messages are displayed.

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HEALTHCARE
Imaging Services

Chapter 4

Reference and Circuit Diagrams

Document No: DD+DIS155.11E

CR 10-X

Type 5151 / 100

► Purpose of this Document

This document contains:

- Reference diagram for identification of functional elements and covers
- Circuit diagrams of the digitizer on printed circuit board level

► Document History

Edition. Revision	Release Date	Changes
1.0	02-2012	Initial Version

► Referenced Documents

Document	Title
Not applicable	

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02-2012 Printed in Germany

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1   Reference Diagram

Figure 1

|		
1 External Power Supply	**8** IP Drawer Module	**15** PMI Board
2 Cassette Unit	**9** IP Drawer Light Sensor	**16** USB Flash Drive
3 Top Cover	**10** Cassette Detection Light Sensor	**17** Power Board
4 Right Cover	**11** Optic Module	**18** User Interface Board
5 Left Cover	**12** PMT with Light Collector	**19** Slow Scan Drum with Pulley
6 IP Guide Cover	**13** IP Guide Plate	**20** Slow Scan Plate with Belt Tensioner
7 Erasure Unit	**14** IP Detection Light Sensor	**21** Slow Scan Motor
		22 Slow Scan Belt

2 Circuit Diagrams

On the following pages the circuit diagrams of the digitizer are attached.

Wiring Diagram Page 1 of 3

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Do not replace any fuse.

***NOTE:**
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Spare Parts List and other Service Documents.
Other displayed names are coming from the Agfa internal
Product Lifecycle Management System.
The displayed part numbers are no spare part order numbers:
These are Agfa internal numbers.

Rear view

PMI-Bd.
E-Label

ATUBE-Bd.

Auto-Cal

to /Optic-Module 1A
to AOPTICS-Power

#26

A602464.
A602426.

-ST17
*26/26
-P4
*26/26

-ST7
*/4
-P8
*/4
#4

Device E-L-Label*

E-Label
Addr#1
F8.9499.8360
-B20

-ST8
*/4
-BU1
*/4

PMI Board*

-F31 5.0VD_PMT_IF 250mAF
-F30 HV Module 0.5AT
-F25 RS232 debug 0.5AT
-F24 Elabel2 250mAF
-F6 +24V_GALVO 0.5AT
-F3 +12V_OPT 1AT
-F2 -12V_OPT 1AT
-F1 3.3VD 2.5AT

-F32 -9V_PMT_IF 250mAF
-F33 +20V_PMT_IF 250mAF
-F34 +5V_Tube 250mAF
-F35 USB 0.5AT

-LD1 USB
-LD3 24V Galvo OK
-LD5 3.3V OK
-LD7 5.0V OK
-LD9 OPT OK
-LD10 OPU PWR OK
-LD11 PMT OK
-LD12 ANALOG OK
-LD13 CAN_NOK
-LD14 CONF_DONE
-LD15 RECEIVE
-LD16 FPGA PWR OK

APMI
A800151.
-B3

-S2 Abort debounced switch
-S1 Reset debounced switch

-P2 *50/50
-BU12 *50/50
A602431.
from AP-Power
/Handling 1F

-P5 *64/64
-P6 *10/10
-P7 *10/10
-P23 *10/10
-P40 *43/43
-P42 *43/43
-P43 *43/43
-P48 *43/43
-P46 USB */4
-P3 LAN *8/8

HV !!

-P49 18/18 18/18 -ST11
-ST9 9/9 9/9 -ST10
A602424.

-P47 1/5 1/5 -ST15
-P10 1/5 1/5 -ST16
A602466.

"Tube Board*"

HV !!

ATUBE
A800232.
-B9

-P14
-BU45
YE 1/4 1/4
BN 2/4 2/4
OG 3/4 3/4
RD 4/4 4/4

A602520.

-MC1 -MC2
Auto_Cal

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Optic Module* - Do not open - No maintenance parts inside

AGALVO-CONNECT
A800234.
-B11

-P1 -ST20
*4/4 *4/4

ALD-MODULATOR
A800235.
-B12

-P1 -ST22
*12/12 *12/12

A602429.
*4/4

A602430.
*12/12

-ST19 *4/4
-ST21 *12/12

-P5 *4/4
-P1 *12/12

-BU1 eLabel

AOPTICS-POWER
A800236.
-B13

Galvo Voltage -F1
125mAF

EOL
-P4
-ST26

BOL
-P3
-ST24

-P2 *2/626

-BU10 *2/626

A602464.

from APMI
/Scanning.1F

A602427.
-ST25
-P1 EOL

ALINE-DETECT
A800149.
-B21
rechts

A602428.
-ST23
-P1 BOL

ALINE-DETECT
A800149.
-B14
links

Top view

Front

ALD-MODULATOR

ALINE-DETECT EOL

AGALVO-CONNECT

AOPTICS-POWER

ALINE-DETECT BOL

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IMPORTANT
Single boards of Optic Module are shown for information
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HEALTHCARE
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Spare Parts List

Document No: DD+DIS154.11M

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

WARNING:

**Hazards may be introduced because of component failure or improper
operation.**

INSTRUCTION:

- Replace defective parts with Agfa HealthCare original spare parts.
- Use only tools and measuring instruments which are suitable for the procedure.
- Only approved Agfa HealthCare accessories must be used. For a list of
  compatible accessories contact your local Agfa HealthCare organization or
  www.agfa.com.

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Edition 1, Revision 0   CR 10-X   Chapter 5 / Page 2 of 14
02-2012   Type 5151/100   Agfa Company Confidential

▶ ## Document History

Edition, Revision	Release Date	Changes compared to previous Version
1.0	02-2012	Initial Release

DISCLAIMER:
Actual delivered spare parts may differ (in appearance) from the images shown and/or ordered spare parts.
The codes of the ordered spare parts can vary from the code of the delivered spare parts.
Agfa HealthCare warrants that the delivered spare parts have at least the same functionalities.
Agfa HealthCare reserves the right to deliver compatible or alternative spare parts.
Prices may differ from the original order as these spare parts will be invoiced at current prices.

NOTE:
Repaired Spare Parts are indicated with Prefix RF+.
Repaired Spare Parts may differ in lifetime.

NOTE:
Recycling of the electronic and electrical waste equipment will ensure safety of the human health and the environment.
For information about electronic and electrical waste equipment disposal, recovery and collection points, please contact your local waste disposal service or the producer / distributor of this equipment.
If your equipment contains removable batteries or accumulators please dispose of these separately according to local regulations.

▶ ## Contact

Spare Parts ordering   Europe: Orderprocessing-europe@matrium.net

                                   Overseas: Orderprocessing-overseas@matrium.net

Spare Parts returns   Worldwide: Returns@matrium.net

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▶ ## Contents
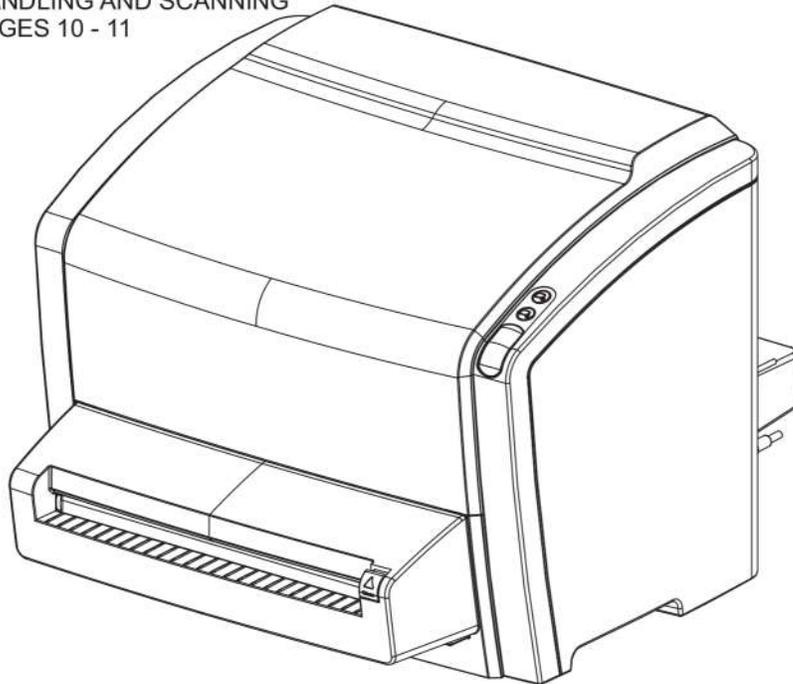
► ## How to navigate the Spare Parts List online with the Acrobat Reader

(1)   Open Bookmarks.

(2)   Click on "CONTENTS".
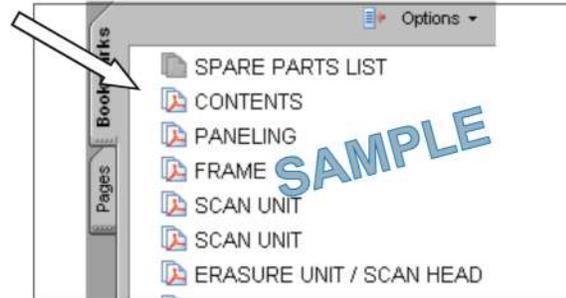

(3)   See overview of the modules.

(4)   Click on requested module.
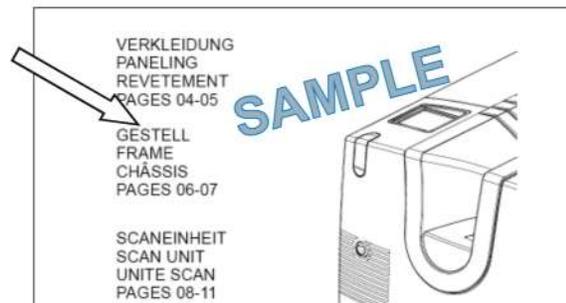
(5)   Appropriate page opens.
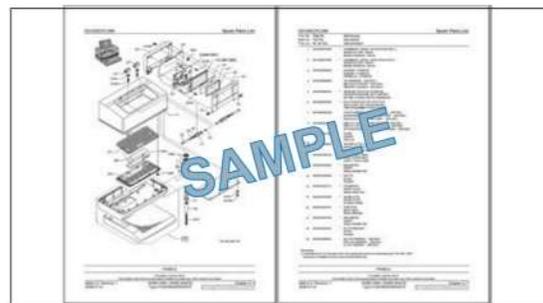
(6)   Click on green arrow to navigate back to the overview of the modules.

01*

02*

06*

03*

04

05*
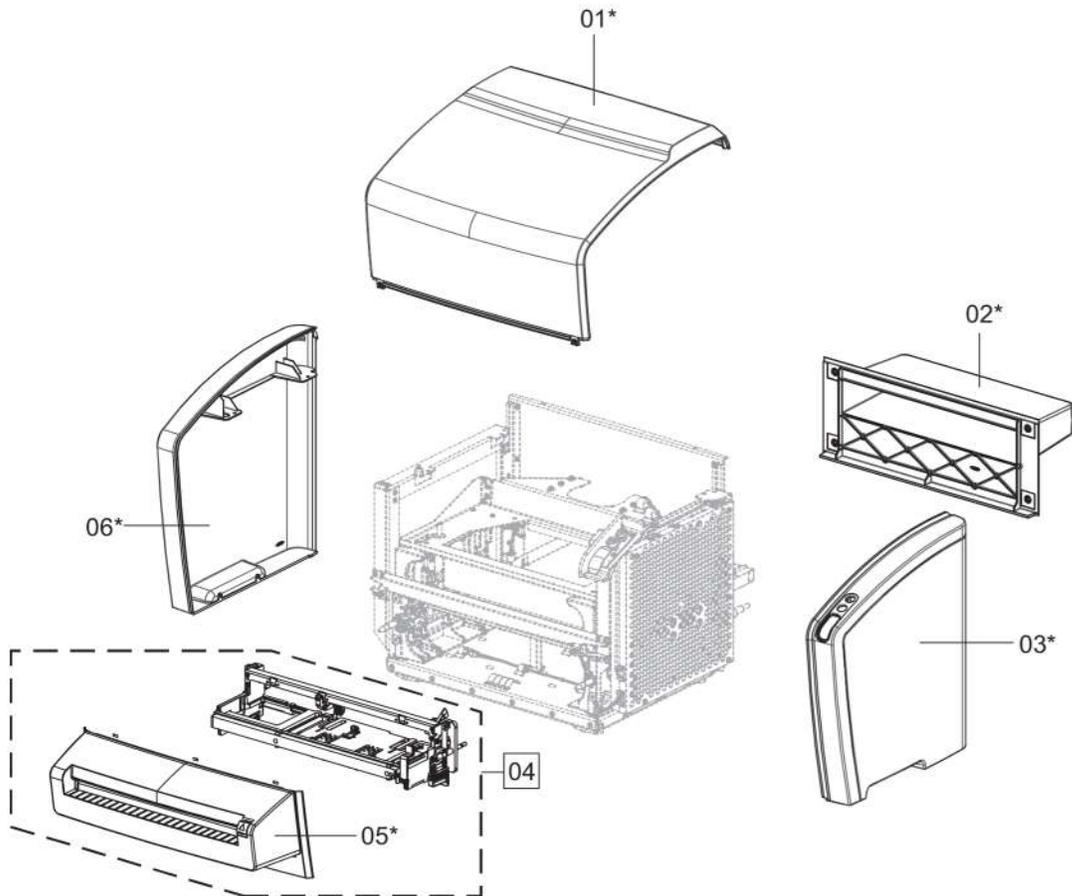
5151_CHAP05_01_M.CDR

COVER

Edition 1, Revision 0
02-2012

CR 10-X
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Chapter 5 / Page 6 of 14
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Pos. Nr. Item no. Pos. no.	Teile-Nr. Part No. Nr. de Ref.		Benennung Description Denomination
1	CM+6040580	*	VERKLEIDUNG OBEN TOP COVER REVETEMENT EN HAUT
2	CM+6040570	*	IP GUIDE ABDECKUNG IP GUIDE COVER CAPOT IP GUIDE
3	CM+6040590	*	VERKLEIDUNG RECHTS RIGHT COVER RÊVETEMENT DROITE
4	CM+6040460		KASSETTENEINHEIT CASSETTE UNIT UNITE DE CASSETTE
5	CM+6040610	*	VERKLEIDUNG KASSETTENEINHEIT COVER CASSETTE UNIT RÊVETEMENT UNITE DE CASSETTE
6	CM+6040600	*	VERKLEIDUNG LINKS LEFT COVER RÊVETEMENT A GAUCHE

□ = Assembly
* = Spare Part standardly is not kept in stock, extended delivery time is possible.
99 = Spare Part is not shown in Exploded Views.
RF+: Repaired Spare Parts

COVER

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01*
02*
03*
04*
05
06
07
08
09
10*
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12*
13
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16
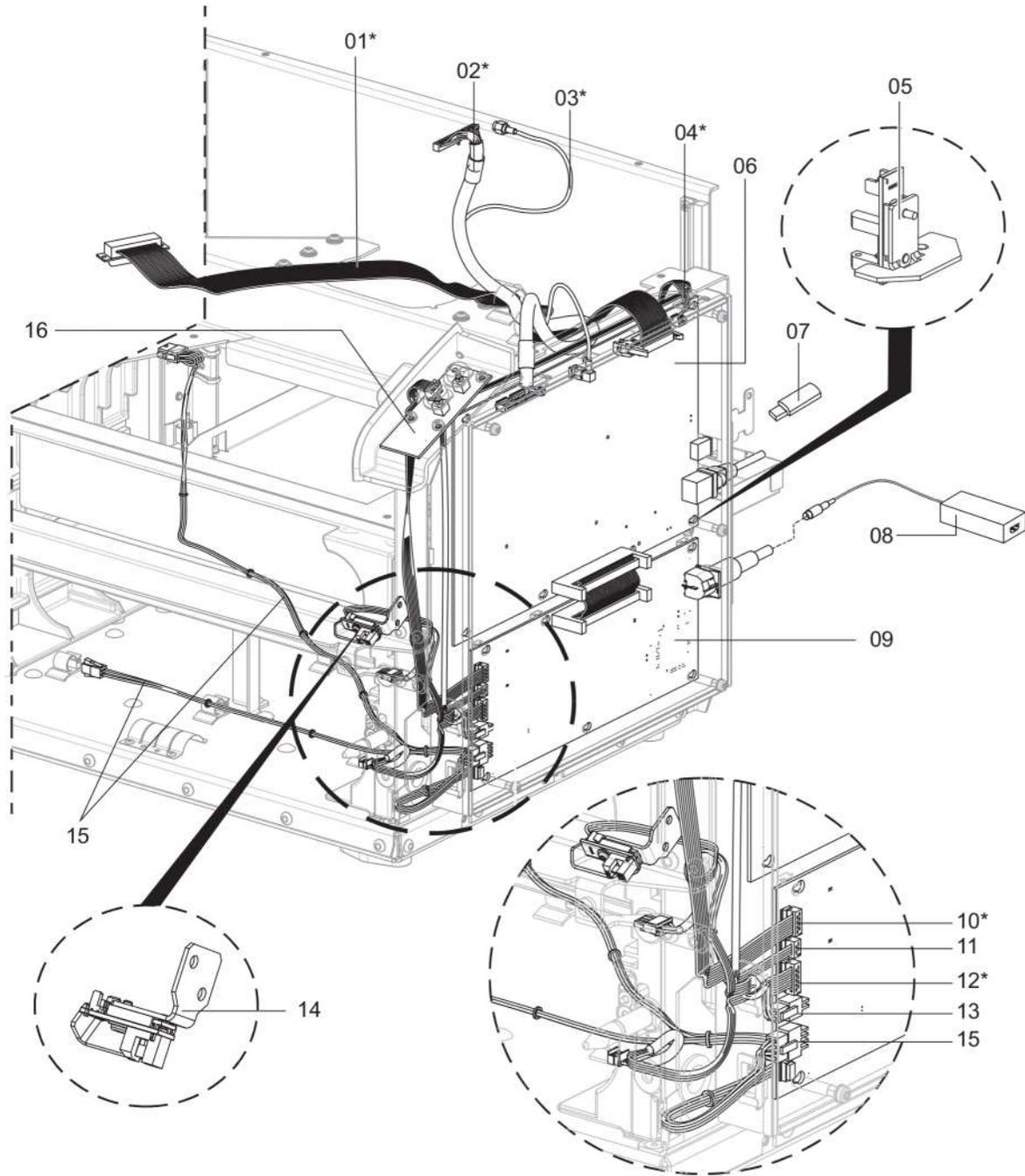
5151_chap05_02_m.cdr

ELECTRICS AND CABLES

Pos. Nr.	Teile-Nr.		Benennung
Item no.	Part No.		Description
Pos. no.	Nr. de Ref.		Denomination

1	CM+6041160	*	KABEL PMI BOARD - OPTIKBAUGRUPPE
			CABLE PMI BOARD TO OPTIC MODULE
			CABLE PMI BOARD - ENSEMBLE OPTIQUE
2	CM+6041140	*	DATENKABEL PMI BOARD - TUBE BOARD
			DATA CABLE PMI BOARD TO TUBE BOARD
			CABLE DE DONNEES PMI BOARD - TUBE BOARD
3	CM+6041150	*	SIGNALKABEL PMI BOARD - TUBE BOARD
			SIGNAL CABLE PMI BOARD TO TUBE BOARD
			CABLE SIGNAL PMI BOARD - TUBE BOARD
4	CM+6041170	*	DEVICE E-LABEL - PMI BOARD KABEL
			CABLE DEVICE E-LABEL TO PMI BOARD
			CABLE DEVICE E-LABEL - PMI BOARD
5	CM+6040450		LICHTSCHRANKE IP ABTASTUNG
			IP DETECTION LIGHT SENSOR
			CELLULE DÉTECTEUR IP
6	CM+6040540		PMI BOARD
			PMI BOARD
			PMI BOARD
7	CM+6040630		USB FLASH DRIVE
			USB FLASH DRIVE
			USB FLASH DRIVE
8	CM+6040560		EXTERNES NETZTEIL
			EXTERNAL POWER SUPPLY
			ALIMENTATION EXTERNAL
9	CM+6040530		POWER BOARD
			POWER BOARD
			POWER BOARD
10	CM+6041210	*	KABEL POWER BOARD - USER INTERFACE
			CABLE POWER BOARD TO USER INTERFACE
			CABLE POWER BOARD - USER INTERFACE
11	CM+6041200		POWER BOARD - IP DETECTION LS KABEL
			CABLE POWER BOARD TO IP DETECTION LS
			CABLE POWER BOARD - IP DETECTION LS
12	CM+6041190		Y-KABEL POWER BOARD - DRAWER/CASS. LS
			Y-CABLE POWER BOARD TO DRAWER/CASS. LS
			Y-CABLE POWER BOARD - DRAWER/CASS. LS
13	CM+6041220		KABEL POWER BOARD - LÖSCHEINHEIT
			CABLE POWER BOARD TO ERASURE UNIT
			CABLE POWER BOARD - UNITE D'EFFACEMENT
14	CM+6040440		LICHTSCHRANKE KASSETTENABTASTUNG
			CASSETTE DETECTION LIGHT SENSOR
			CELLULE DÉTECTEUR CASSETTE
15	CM+6041180		Y-KABEL POWER BOARD - MOTORS
			Y-CABLE POWER BOARD TO MOTORS
			Y-CABLE POWER BOARD - MOTORS
16	CM+6040550		USER INTERFACE BOARD
			USER INTERFACE BOARD
			USER INTERFACE BOARD

☐ = Assembly
* = Spare Part standardly is not kept in stock, extended delivery time is possible.
99 = Spare Part is not shown in Exploded Views.
RF+: Repaired Spare Parts

ELECTRICS AND CABLES
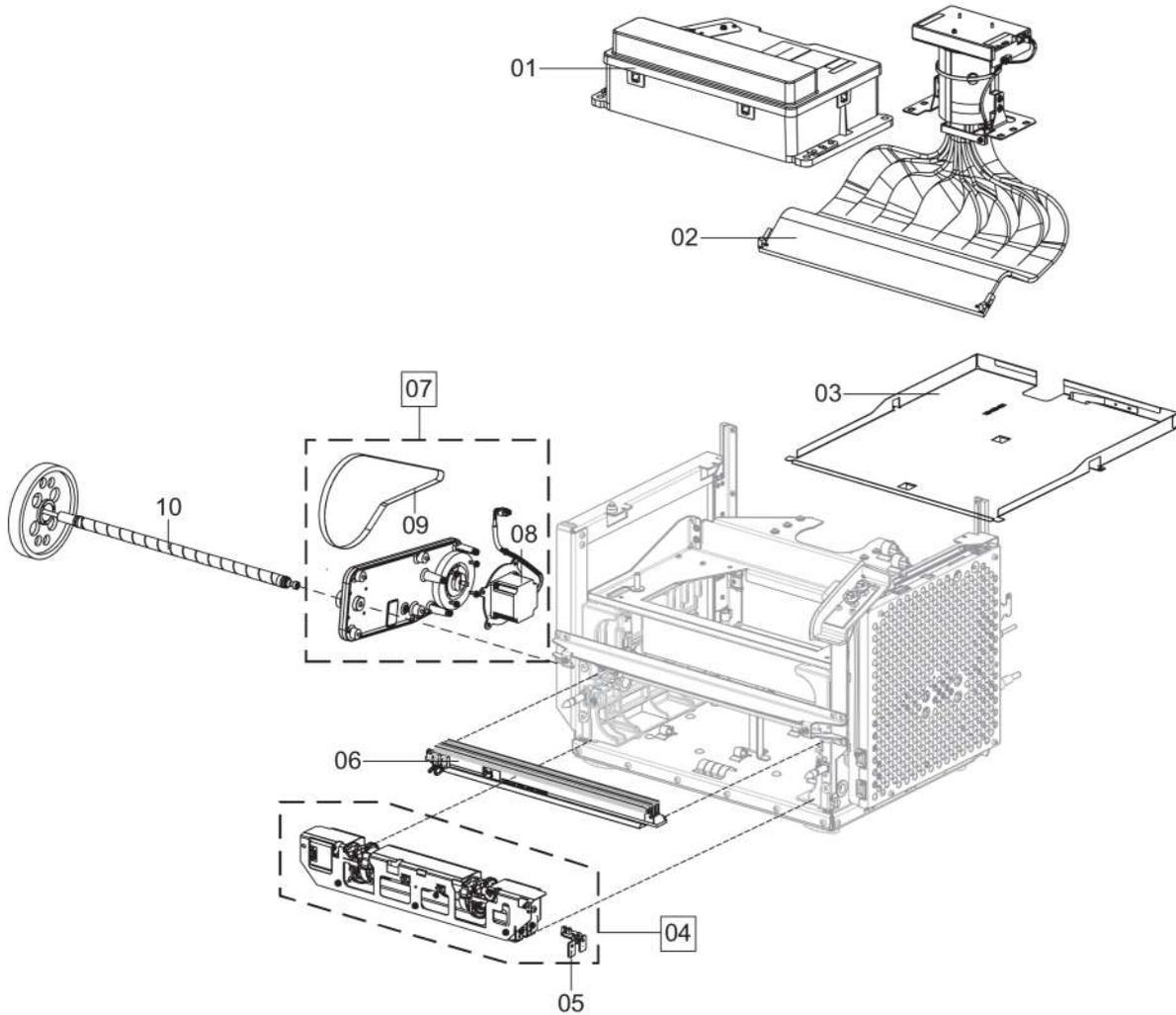
5151_CHAP05_03_M.CDR

HANDLING AND SCANNING

Pos. Nr. Teile-Nr.	Benennung
Item no. Part No.	Description
Pos. no. Nr. de Ref.	Denomination

1	CM+6040410	OPTIKBAUGRUPPE
		OPTIC MODULE
		ENSEMBLE OPTIQUE
2	CM+6040420	PMT DETECTOR MIT LICHTSAMMLER
		PMT WITH LIGHT COLLECTOR
		DETECTEUR AVEC COLECTEUR DE LUMIÈRE PMT
3	CM+6045490	IP GUIDE PLATTE
		IP GUIDE PLATE
		PLAQUE IP GUIDE
4	CM+6040470	IP EINSCHUB
		IP DRAWER MODULE
		TIROIR IP
5	CM+6040480	LICHTSCHRANKE IP SENSOR
		IP DRAWER LIGHT SENSOR
		CELLULE DÉTECTEUR TIROIR
6	CM+6040430	LÖSCHEINHEIT
		ERASURE UNIT
		UNITE D'EFFACEMENT
7	CM+6040520	SLOW SCAN PLATTE MIT RIEMENSPANNER
		SLOW SCAN PLATE WITH BELT TENSIONER
		SLOW SCAN PLATE AVEC COURROIE TENSION
8	CM+6040500	SLOW SCAN MOTOR
		SLOW SCAN MOTOR
		MOTEUR SLOW SCAN
9	CM+6040510	SLOW SCAN RIEMEN
		SLOW SCAN BELT
		SLOW SCAN BELT
10	CM+6040490	SLOW SCAN TROMMEL MIT RIEMENSCHEIBE
		SLOW SCAN DRUM WITH PULLEY
		TAMBOUR SLOW SCAN AVEC POULIE

☐ = Assembly
 * = Spare Part standardly is not kept in stock, extended delivery time is possible.
99 = Spare Part is not shown in Exploded Views.
RF+: Repaired Spare Parts

HANDLING AND SCANNING

01

02

03
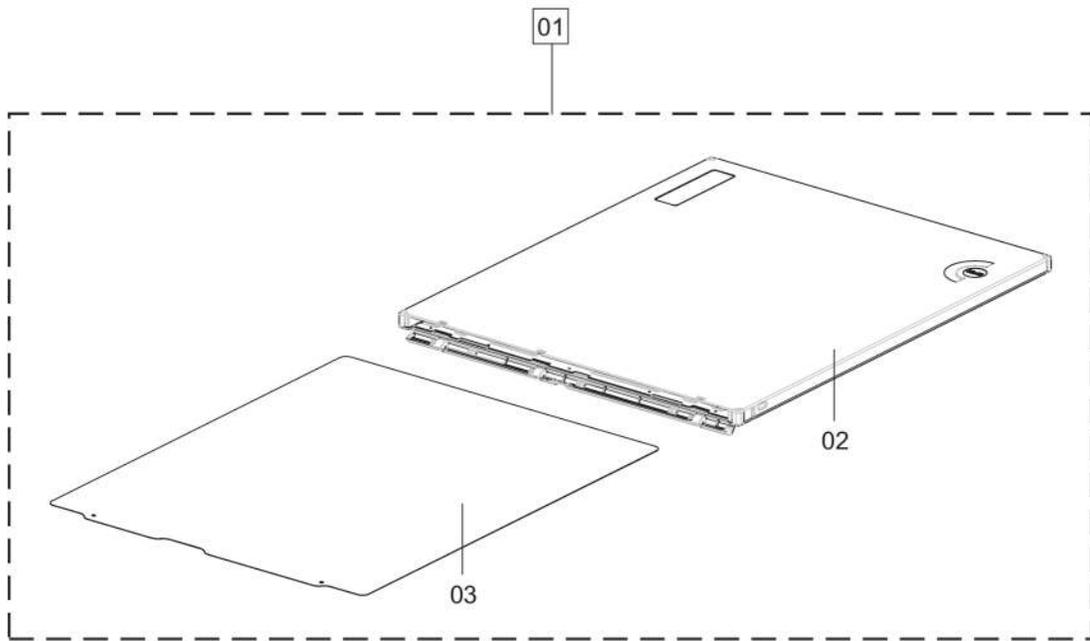
5151_CHAP05_04_M.CDR

CASSETTE CR MD1.0

Pos. Nr. Item no. Pos. no.	Teile-Nr. Part No. Nr. de Ref.	Benennung Description Denomination
☐ 1	CM+6040660	CASSETTE SET CR MD1.0 GENERAL CASSETTE SET CR MD1.0 GENERAL CASSETTE SET CR MD1.0 GENERAL
2	CM+6040650	CASSETTE CR MD1.0 GENERAL CASSETTE CR MD1.0 GENERAL CASSETTE CR MD1.0 GENERAL
3	CM+6040640	IMAGE PLATE MD 1.0 IMAGE PLATE MD 1.0 IMAGE PLATE MD 1.0

☐ = Assembly
* = Spare Part standardly is not kept in stock, extended delivery time is possible.
99 = Spare Part is not shown in Exploded Views.
RF+: Repaired Spare Parts

CASSETTE CR MD1.0

▶ ## Type Overview

This spare parts list is valid for the following machine type(s):

Device Name	Type Number	Specification
CR 10-X	5151/0100	5R3EQ

▶ ## Accessory Overview

Following accesssories are separately available:

Accessory	Order Number
CASSETTE SET MD 1.0	5R3JY

Document No: DD+DIS169.11E

CR 10-X
Type 5151 / 100

► ## Purpose of this Document

This document describes the preventive maintenance tasks.

It is intentionally left blank, as the CR 10-X does not require preventive maintenance by the service engineer.

► ## Document History

Edition. Revision	Release Date	Changes
1.0	02-2012	Initial version

Edition 1, Revision 0

02-2012   printed in Germany
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HealthCare

► ## Manufacturer

Agfa HealthCare N.V.

Published by

Agfa-Gevaert HealthCare GmbH
Tegernseer Landstraße 161
D - 81539 München
Germany

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WARNING:

Improper operation or service activities may cause damage or injuries.

INSTRUCTION:

(1)   Read the "Generic Safety Directions" document
       (see Agfa HealthCare Library > General Info > Agfa HealthCare > Publications >
       Service Manual) prior to attempting any operation, repair or maintenance task on
       the equipment.

(2)   Strictly observe all safety directions within the "Generic Safety Directions" 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 HealthCare or one of its affiliates
or who are otherwise authorized by Agfa HealthCare or one of its affiliates to provide
such services.

NOTE:

To verify the latest version of a chapter of the Service Manual refer to the "Checklist for
Completeness" in the Agfa HealthCare Library.

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Document No: DD+DIS155.11E

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► **Please note**

Service Bulletins are not part of the Service Manual for Download.

Please download the Service Bulletins from the Agfa HealthCare Library:

Agfa HealthCare Library → Computed Radiography → CR Digitizers →
CR 10-X → Service Bulletin *

* For external partners: Please ask your local Agfa representative for access.

Edition 1, Revision 0
03-2012   Printed in Germany
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HEALTHCARE
Imaging Services

Chapter 11
Installation Planning

Document No: DD+DIS170.11E

CR 10-X

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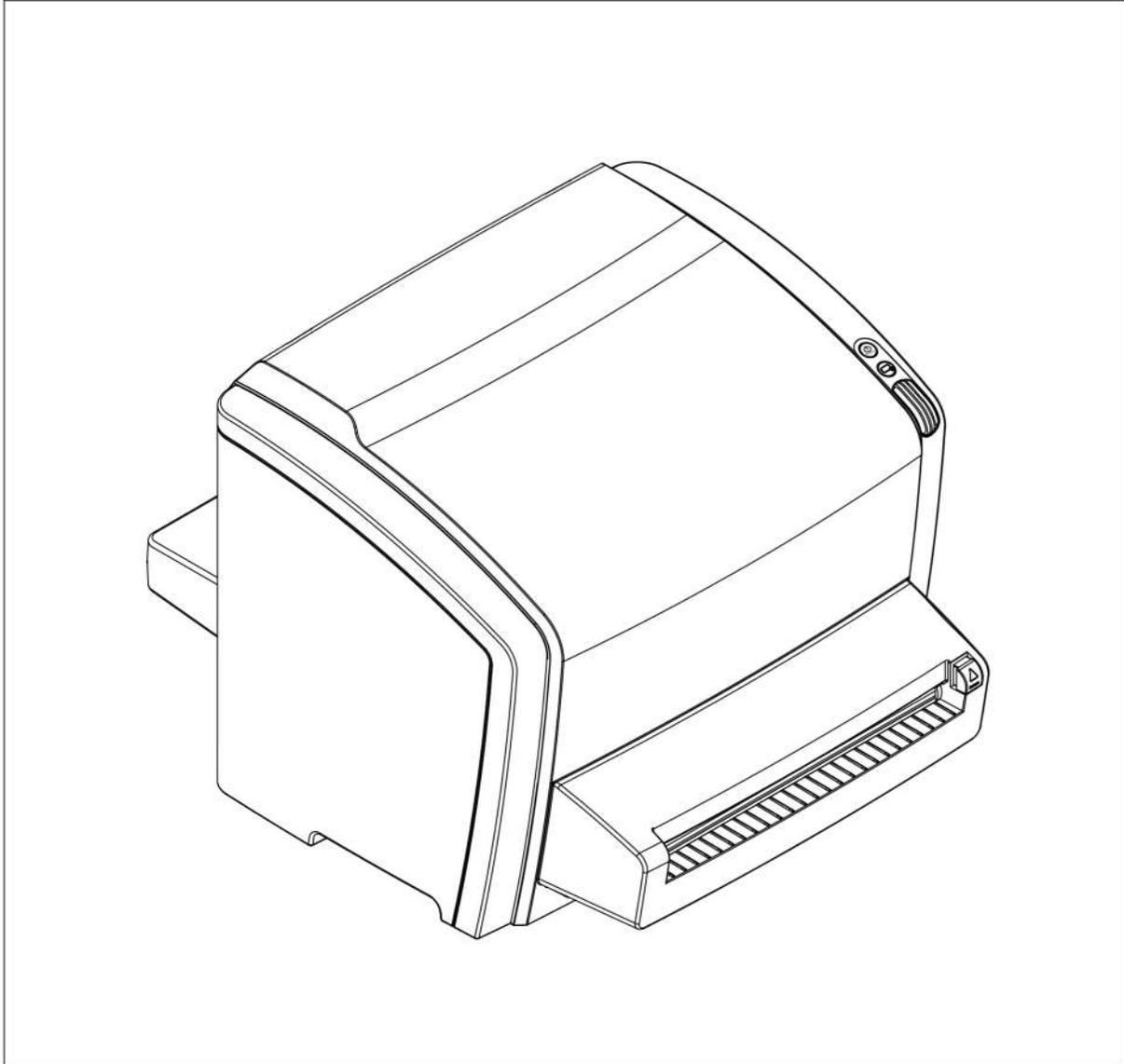
This document is separately available. Order number: DD+DIS170.11E

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02-2012   Printed in Germany
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Document Node ID: 33998940
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such services.

NOTE:

To verify the latest version of a chapter of the Service Manual refer to the "Checklist for
Completeness" in the Agfa HealthCare Library.

► ## Purpose of this Document

This document contains all planning data and describes the required measures to be carried out on site prior to the machine delivery.

► ## Document History

Edition. Revision	Release Date	Changes
1.0	02-2012	Initial Version

► ## Referenced Documents

Document	Title
Not applicable	

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1   Product Description

This document describes the installation planning of the CR 10-X digitizer.

For the installation planning of the complete system it is additionally required to perform all steps described in the NX Workstation Installation Planning document.

Refer to the Agfa HealthCare Library:

Computed Radiography → CR Workstation Software

1.1   System Overview

The CR 10-X digitizer is part of the CR system, consisting of:

- Digitizer

- Cassette(s) with Image Plate, CR MD 1.0 General, format 35 x 43 cm

- NX Workstation as of software version 2.0.8600 / 3.0.8600
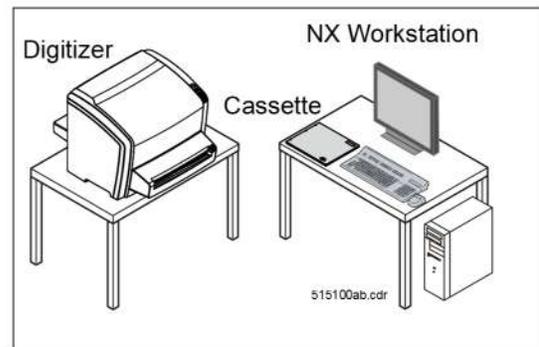

Figure 1

- One Processing Station and one digitizer always belong together.
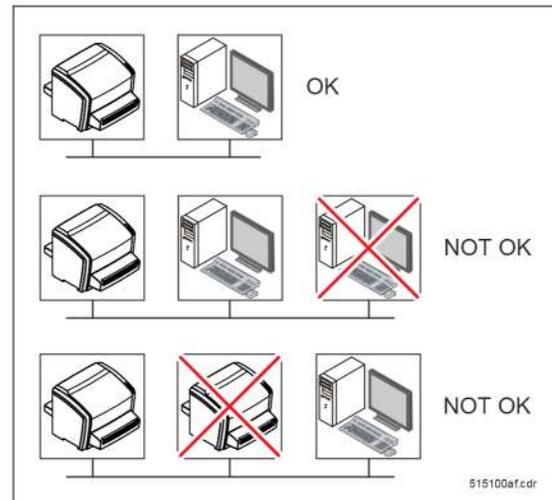
Figure 2

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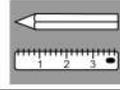
1.2   Workflow of a CR 10-X System

The following figure shows the workflow of a CR 10-X system:
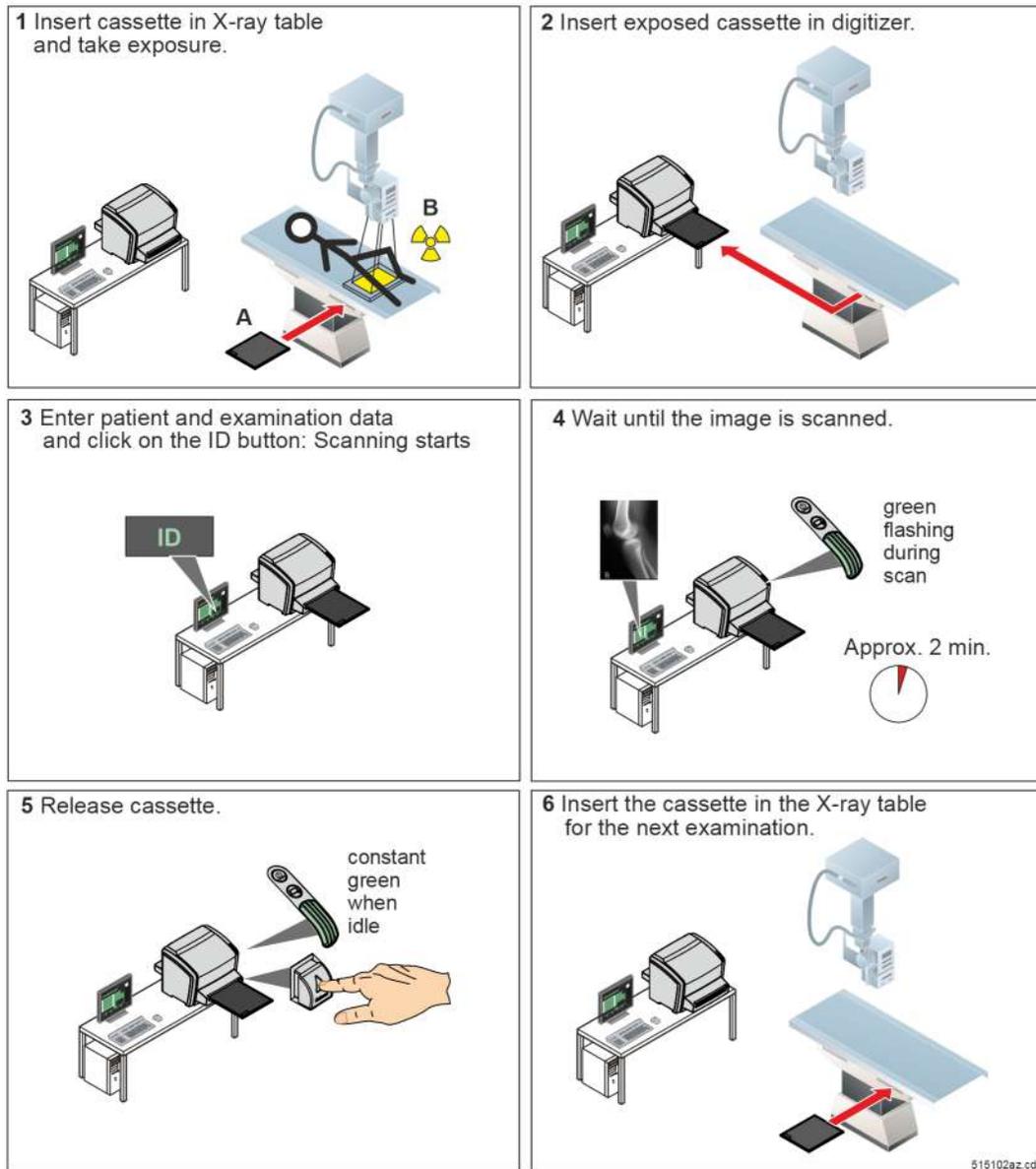
1 Insert cassette in X-ray table and take exposure.

2 Insert exposed cassette in digitizer.

3 Enter patient and examination data and click on the ID button: Scanning starts

4 Wait until the image is scanned.

green flashing during scan

Approx. 2 min.

5 Release cassette.

constant green when idle

6 Insert the cassette in the X-ray table for the next examination.

515102az.cdr

Figure 3
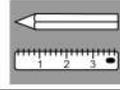
2   Scope of Delivery and Accessories

2.1   Scope of Delivery

Quantity	Description
1	Digitizer
1	Packing list for accessory
1	CE declaration of conformity
1	Installation Document
1	External power supply
1	Power cable, Europe 3.00 m
1	Power cable, US 3.00 m
1	Network cable 5 m / 16 feet long
1	1.5 mm CU filter
1	Torx key TX20
1	Velcro strip to fixate USB flash drive
1	CD with User Manuals in all specified languages*

* Language: Bulgarian, Chinese simplified, Chinese traditional, Czech, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Latvian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Slovak, Slovenian, Spanish, Swedish, Thai, Turkish, Vietnamese

IMPORTANT:

- The digitizer is ordered and delivered with a dedicated NX workstation.

- At least one Cassette Set "CR MD 1.0 General" has to be ordered.

- The digitizer is delivered with two power cables for US/Europe. If digitizer is installed outside the US or Europe, organize a power cable for your country locally. For detailed specifications refer to section 6, Electrical Connections.
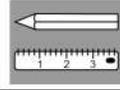
2.2   Accessories

The following accessories are available for the CR 10-X:

Item	ABC Code	Comment
Cassette set with Image Plate "CR MD 1.0 General", 35x43 cm (Genrad & FLFS)	5R3GU	Number of cassettes / image plates are depending on the individual order
CR Full Body Cassette Holder	EAUGV	Required for Full Leg / Full Spine option only
Optional CR Anti-scatter grid version 2	EMUXJ	
Optional CR EasyLift	EJ8V8	
UPS Powerware 5115, 120 V Version	EGPSE	Can be used for digitizer and NX. For technical specifications refer to section 8.
UPS Powerware 5115, 220 V Version	EGPTG	
Mobile Kit for CR 10-X	Refer to marketing information	To be used in earthquake areas and in mobile usage. May not be used in military vessels.
Monitors and PC Hardware	See comment	The released monitors and PC hardware is listed in following document on the Agfa HealthCare Library: CR/DR Interoperability Matrix, Document ID 31333326 (Intranet Link / Extranet Link). For sales ABC codes refer to the relevant sales information.
NX Licenses	See comment	The available NX licenses are published on the Agfa HealthCare Library. Example document: Licensing NX 8600, Document ID 33595319 (Intranet Link / Extranet Link)
Remote Service	Not applicable	In general it is possible to diagnose and repair the digitizer to a certain extent remotely. Remote Access is established via the Agfa own Secure Remote Service System (SRSS). For more information to the SRSS see Agfa HealthCare Library*: `<Technical Services → Service Delivery → SRSS>`
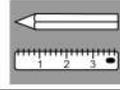
3 Installation Site Size Requirements

3.1 Minimum required free Space for Operation and Maintenance

- The footprint of the digitizer is 42 cm (width) x 32 cm (depth). See also NOTE below.
  To have a safety margin of 10 cm at each side a table size of minimum 62 cm (width) x 52 cm (depth) is required.

- When placing the table at the wall with the rear side, the minimum table depth is 52 cm.

- For operation a free space of minimum 62 cm x 80 cm in front of the digitizer is recommended.

- For corrective maintenance the digitizer can be carried to a place with sufficient space if required.
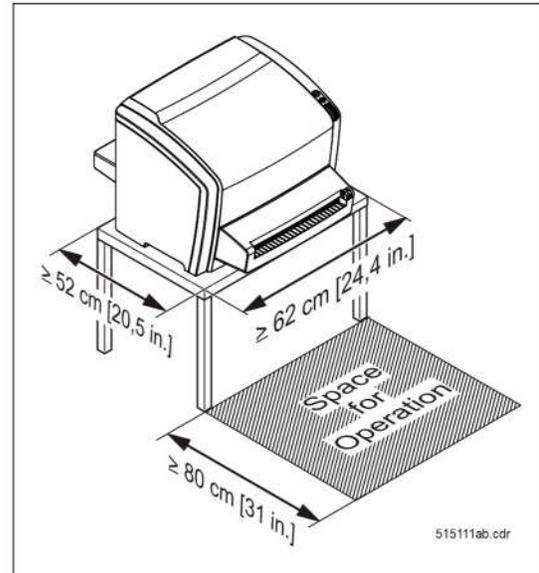

Figure 4

NOTE:

Figure 5 shows the footprint of the digitizer.
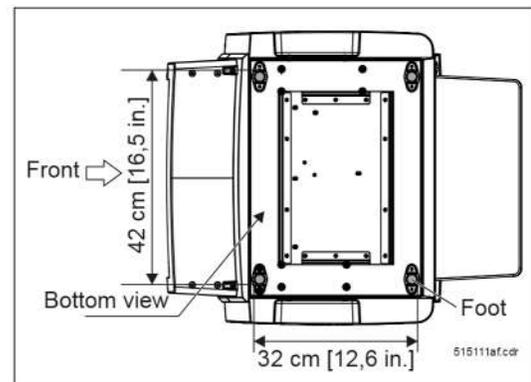
Figure 5

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Agfa Company Confidential
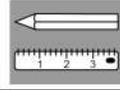
3.2   Guidelines for Placing the Digitizer

Observe following guidelines for the installation place of the digitizer:

- Recommended table height: 75 cm
- Due to the workflow* of the system it is recommended to install digitizer and NX workstation close together.

   * The operator has to go from digitizer to the NX workstation and back to the digitizer for each scan cycle.

WARNING:

The device is a table-top digitizer. The structure and stability of the table used need to be suitable in relation with the size and weight of the system. Do not use excessive force when inserting cassettes in the digitizer as the device may slip or drop off the table. Use a non-slip-mat below the digitizer or other anti-skid measures. The table should not be subject to excessive shock and vibrations from other sources, as this may disturb the operation of the digitizer.

4   System Integration

The system can be installed "standalone" or can be integrated into the local network:

- Standalone Installation:
  The digitizer can be connected directly to the NX workstation. In this case no other network access to the NX workstation is possible. The digitizer network settings are pre-configured for this setup.

- Integrated Installation:
  After network setup of digitizer and NX workstation the system can be integrated into the local network.

Figure 6

The following table lists the information which is required if the digitizer is integrated into the local network.

Parameter:	Default value:	Value:
IP Address:	192.192.192.192	....
Subnet Mask:	255.255.255.0	....
Gateway IP Address*:	192.192.100.1	....
AE Title:	DIG_DEFAULT	....
Hostname:	192.192.192.192	....

* Only required if a network gateway is used on site.
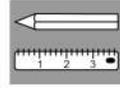
5   Ambient Conditions during Transport, Storage and Operation

5.1   Climatic Conditions

	Climatic Classification	Related Temperature Values	Related Humidity Values
Transport in package	2K2 according IEC 721-3-2	-25° C to + 55°C -13° F to + 140° F	0 % to 75 %
Storage in package	1K4 according IEC 721-3-1	-25° C to + 55°C -13° F to + 131° F	10 % to 100 %
Operation	3K2 according IEC 721-3-3	+ 15° C to + 35°C +59° F to + 95° F	10 % to 75 %
Transport in mobile X-Ray room	5K1 according IEC 721-3-5	+5° C to + 40° C +41° F to + 140° F	10 % to 75 %
Operation in mobile X-Ray room	3K2 according IEC 721-3-3	+15 ° C to + 35°C -59° F to + 95° F	10 % to 75 %

5.2   Mechanical Conditions

	Mechanical Classification
Transport in package	2M3 according IEC 721-3-2
Storage in package	1M2 according IEC 721-3-1
Operation	See warning in section 3.2.
Transport in truck for mobile X-Ray	5M3 according IEC 721-3-5
Operation in truck for mobile X-Ray	See warning in section 3.2.

5.3   Light Conditions

The digitizer may not be operated in direct sun light. No influence on image quality is guaranteed if operated in ambient light of maximum 2500 Lux.

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Edition 1, Revision 0   CR 10-X   Chapter 11 / Page 13 of 25
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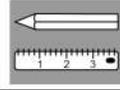
5.4 X-Ray Radiation Conditions

Observe following warning for the installation place of the digitizer and the storage location of the cassettes with image plates:

⚠️ **WARNING:**

Image plate is sensitive for X-rays. Poor image quality possible.

The digitizer and the cassette storage shall be protected against X-ray radiation this way, that the annual dose equivalent at the installation place will not exceed 1 mSv.

6 Electrical Connections

⚠️ **Warning:**

Images can be lost due to power failure.

Connect the equipment to an un-interruptible power supply (UPS) or an institutional standby generator.

⚠️ **WARNING:**

When different combinations of equipment are used in various medical environments a potential difference (V) can exist between the protective earths in different localities. If the protective earthing fails this potential difference can cause a HAZARD for the OPERATOR or for the PATIENT.

- To comply with ISO 60601-1 (annex I) all computers and peripherals must be connected to the same power source.

- Always connect the associated monitor to the same Uninterruptible Power Source (UPS) as the PC.

⚠️ **WARNING:**

Electrical device. Shock possible.

INSTRUCTION:

- Position the Agfa products so that it is possible to disconnect the mains power connection if required.

- Local and International wiring regulations must be observed. Check all supplies and voltages, currents, trips and fuses with the Hospital facilities department or their engineers.

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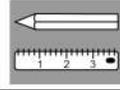
## 6.1   Electrical Connections at the Digitizer
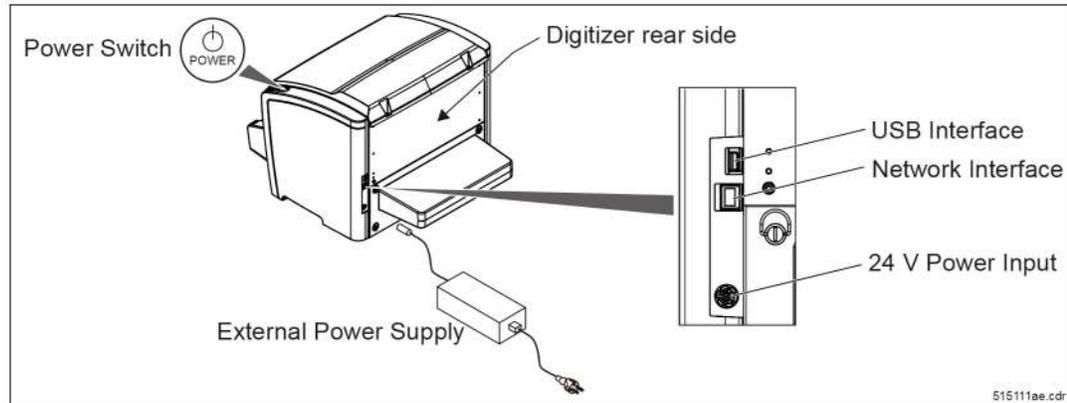
Figure 7

IMPORTANT:

The external power supply is part of delivery. Do not use another power supply than the one delivered with the digitizer or available from spare parts stock.

6.2   Installation Guidelines for electrical Installations in the Installation Room

Electrical installations have to be done in accordance with national regulations or statutory requirements, e.g.:

VDE: (Germany)   Electrical installations in the installation room must be in compliance with the regulations IEC 364, VDE 0100 and VDE 0107.

UL: (US)   Electrical installations in the installation room must be in compliance with the regulations: "National Electrical Code" (NEC) (NFPA70).

## 6.3   Mains Connection in the Installation Room

Mains connection has to be available in accordance with national regulations or statutory requirements, e.g.:

VDE: (Germany)   Double earthed pin outlet in compliance with DIN 49441 and with CEE 7 standard cover V II.

UL: (US)   Earthed contact outlet for the NEMA 5-15 P plug
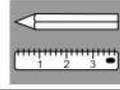
Upon digitizer installation, it must be ensured that either the mains connector or an all-pole circuit breaker for the installation on site is located close to the machine and easily accessible.

6.4　　　**Mains cable**

Following cables are part of delivery:

Euro-Version:　CEE7/7 - H05VV - F3G1 - 3 x 1 mm² with IEC C13 plug (female); cable length 3 m

Figure 8

US/CAN-Version:　NEMA 5-15P - SJT, 3 x AWG 18 with IEC C13 plug (female); Cable length 3 m, Hospital grade (HG)

Figure 9

NOTE:

The digitizer is delivered with two power cables for US and Europe. If a different cable is needed, organize it locally but keep attention to country specific requirements.
Example:
Power cable to be organized locally for US/CAN, if a connection to a 240 V-outlet instead of the standard 120 V-outlet is needed:
NEMA 6-15P - SJT, 3 x AWG 18 with IEC C13 connector (female); Hospital grade (HG)
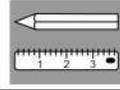
6.5   Electrical Connections of the optional UPS

Powerware Type 5115 - 750i (230 V Version)

Cable #	Cable	Comment
A	Extension cable IEC C13 plug female, IEC C13 plug male, 1.8 m	2 cables are part of UPS delivery. See als IMPORTANT note below.
B	Serial cable	Part of UPS delivery
C	Mains cable	Part of digitizer delivery

IMPORTANT:

If digitizer, monitor and NX shall be connected to the UPS, organize a third extension cable (IEC C13 plug female, IEC C13 plug male, 1.8 m) locally.

Powerware Type 5115 - 750 (120 V Version)

| Cable #	Cable	Comment
B	Serial cable	Part of UPS delivery
D	Mains cable with with NEMA 5-15 P plug	Part of delivery digitizer, monitor, NX delivery
E	SJT, 3 x AGW 18 with NEMA 5-15 P plug, 1.8 m	Fixed cable connection
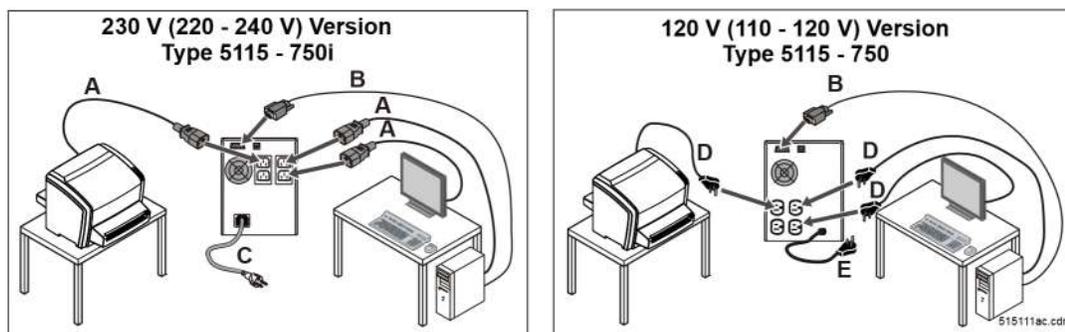
Figure 10
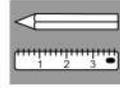
7   Digitizer Dimensions and Weight

7.1   Digitizer Dimensions

Dimensions in cm [inch]

47 [18,5]

515111ad.cdr

70 [27,6]   58 [22,8]
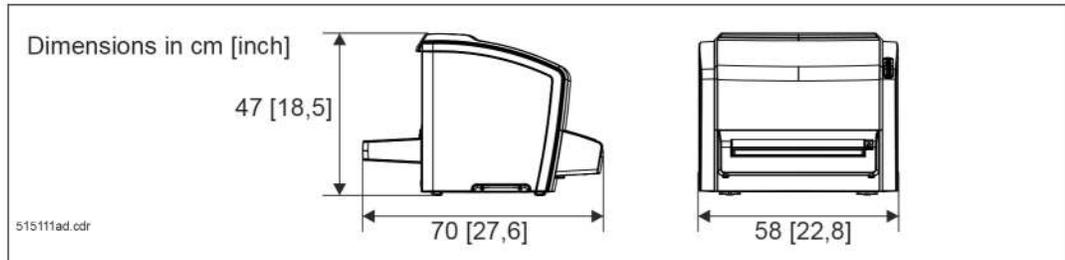
Figure 11

Length (cm / inch)	70,0 / 27,6
Width (cm / inch)	58,0 / 22,8
Height (cm / inch)	47,0 / 18,5

7.2   Dimensions of the Digitizer Packaging incl. Pallet

Length (cm / inch)	83 / 32,6
Width (cm / inch)	75 / 29,5
Height (cm / inch)	72 / 28,3

7.3   Dimensions of the Pallet

Length (cm / inch)	83 / 32,6
Width (cm / inch)	75 / 29,5
Height (cm / inch)	15 / 5,9

7.4   Weight of the Digitizer

Digitizer alone (kg / lb)	30 / 66
Digitizer with packing inclusive palette (kg / lb)	50 / 111
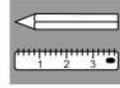
8   Specifications

8.1   Type Overview

Type	ABC Code	Serial Number
5151 / 100	5R3EQ	≥ 1.000

8.2   Functional Data

Throughput [Cassettes per hour, 35 x 43 cm]	30
Bits per pixel / number of grey steps	16 / 65535
Scan Resolution [µm]	100
Image Buffer [MB]	128

8.3   Electrical Data of Digitizer

Rated voltage [~V]		100 – 240 AC (autosensing)
Frequency [Hz]		50/60
Power consumption [W]	Standby:	30
	Peak:	85
Fuse [A]		Europe max. 16
		USA max. 15
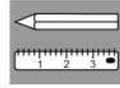
8.4   Functional Data of the optional UPS

Rated voltage [~V] UPS Powerware 5115-750 (ABC Code: EGPSE)*	120 = Default 110 = User adjustable via rear panel DIP switches
Rated voltage [~V] UPS Powerware 5115-750i (ABC Code: EGPTG)*	230 = Default 220 or 240 = User adjustable via rear panel DIP switch
Frequency [Hz]	50/60 (autosensing)
Battery runtime [min]	> 5
Output Power [W]	750
Dimensions (HxWxD) [mm/in]	192 x 150 x 270 / 7.6 x 5.9 x 10.6
Weight [kg/lb]	7.8 / 17.2
More info	Refer to www.powerware.com

8.5   Heat Emission

Heat emission [W / BTU per hour]	Standby:	30 / 102
	Peak:	85 / 219

8.6   Acoustic Noise Level

Acoustic Noise Level according ISO 7779	During scanning:	65 dB(A) maximum

8.7   Boot-up Time and Warm-up Time

Boot-up time and Warm-up time	Approximately 3 minutes
Warm-up time "cold start"	Image quality within specification after boot-up time
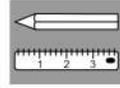
8.8 Interface Data

Interface to NX workstation	Via Ethernet 10/100 Base Ethernet (auto-negotiate)*

* Gigabit Ethernet is not supported.

8.9 Service Data

Info counter	Yes
Error diagnostics built in	Yes
Remote / preventive service capable	Yes

8.10 Functional Data Image Plates

Image plate type		CR MD1.0
Image retention	Within 1 hour	Recommended readout time
	After 2 hours	70 % of the stored energy is still present with no visible loss of information upon readout.
	After 24 hours	Image retention still exceeds 45 %. Slightly reduced image quality
Image plate Usage		Image plate expires after 5 years or 15.000 cycles
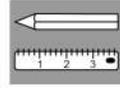
9   Safety Standards

The digitizer complies with:

|	**North American Standards** Federal Communications Commission Canadian Standards Association Underwriters Laboratories Code of Federal Regulations	**European Norm and International Standards** European Norm International Electrotechnical Commission
EMC*	• CSA 22.2 No. 601.1.2 • FCC part 15	• EN 60601-1-2:2007 • EN 300 330-2 V1.1.1:2001 • EN 301 489-1 V1.3.1:2001 • EN 540: 1993 • EN 980: 2003 • EN 1041: 1998 • ISO 18906: 2000 • EN ISO 13485: 2003
Safety	• UL60601-1:2003 • CSA C 22.2 No. 601.1:1990 + S1:1994 + A2:1998 • CFR parts 1040.10 and 1040.11 • CSA-E60825-1-03	• IEC 60601-1:1988 + A1:1991 + A2:1995 • IEC 60601-1-1:2000 / EN 60601-1-1:2001 • IEC 60601-1-4:1999 / EN 60601-1-4:1996 + A1:1999 • IEC 60601-1-2: 2001 / EN 60601-1-2:2001 • IEC 60825-1:1993 + A1:1997 + A2:2001

* EMC = Electromagnetic Compatibility

The leakage current limits for which this device is tested, excludes installation in the patient vicinity. Therefore the equipment must be placed outside the patient vicinity according to the local valid regulation (UL 60601-1 or EN 60601-1).
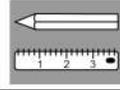
The patient vicinity is defined as follows:

- UL 60601-1:
  - 1.83 m (6 feet) beyond the perimeter of the bed (examination table, dental chair, treatment booth, and the like)
  - Vertical 2.29 m (7.5 feet) above the floor

- EN 60601-1:
  - 1.5 m (4.9 feet) beyond the perimeter of the bed (examination table, dental chair, treatment booth, and the like)
  - Vertical 2.5 m (8.2 feet) above the floor

R = 1.5 m / 4.9 feet (EN 60601-1) or 1.83 m / 6 feet (UL 60601-1)
h = 2.5 m / 8.2 feet (EN 60601-1) or 2.29 m / 7.5 feet (UL 60601-1)
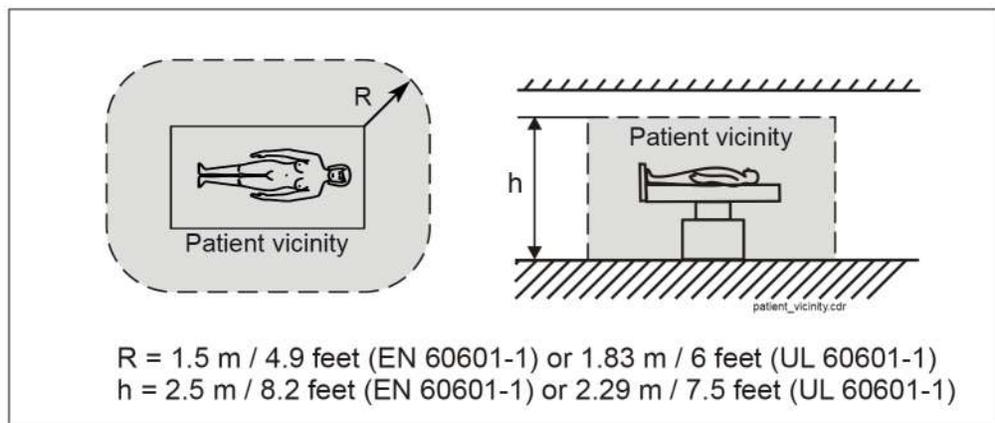
Figure 12

- Other equipment that is in contact with the patient is not connected directly to the Agfa system without additional protective measures.

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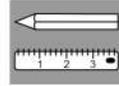
10 Installation Planning Checklist

10.1 Installation Planning Checklist

NOTE:

For AGFA employees only: Book the pre-installation tasks under task code "PRI".

#	Step	Goal	Section	OK
1.	Ask the Agfa sales representative for a contact person in the site.	To schedule an installation date with the customer. To get the list of ordered equipment that needs to be installed. To have a contact person for checking the requirements for the installation site.	-	☐
2.	Make yourself familiar with the system overview and the system workflow.	To see in which environment the digitizer will be installed.	1	☐
3.	Make yourself familiar with the scope of delivery and accessories.	Basic information, to see whether additional, site specific material for installation might be required.	2	☐
4.	Make yourself familiar with the installation site size requirements.	To see whether the planned installation site fits to the size of the digitizer.	3	☐
5.	Check the documents and parameters that are required for system integration.	To have all documents and data available which are required for system integration.	4	☐
6.	Pass the required ambient conditions to the customer and the forwarder.	To ensure that the transport, storage and operating conditions meet the requirements.	5	☐
7.	Check the required electrical connection.	To ensure that the required outlets and required cables are available.	6	☐
8.	Check the digitizer dimensions.	To ensure transport path and installation site correspond to the required size.	7	☐
9.	Pass the specifications and safety standards to the customer.	To inform the customer about technical details of the product.	8 and 9	☐

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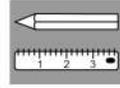
10.2   Installation Readiness Checklist

In order to guarantee an effective and smooth installation process within the targeted time frame, the following tasks of the checklist below must be carried out prior to the installation of the device.

Name of Field
Service Engineer: _____ Checking date: _____

Client name: _____

Client address: _____

Contact person,
name and title: _____

Client phone
number: _____ Extension: _____

Type of systems: _____ Order / OGT*
number: _____

* OGT = **O**rder **G**eneration **T**ool, only applicable for Agfa employees

Task	OK
Installation date scheduled with the customer.	☐
Tasks of Installation Planning Checklist performed successfully. Details see section 10.1:Installation Planning Checklist	☐
Installation Site ready for Installation	☐

Remarks:

Signature of Field Service Engineer: _____

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HEALTHCARE
Imaging Services

Chapter 12
Glossary

Document No: DD+DIS155.11E

CR 10-X
Type 5151 / 100

► Purpose of this Document

This document contains explanations of product specific terms and abbreviations used in the service manual.

► Document History

Edition. Revision	Release Date	Changes
1.0	02-2012	Initial version

► Referenced Documents

Document	Title
Not applicable	

Edition 1, Revision 0

02-2012   Printed in Germany

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AGFA
HealthCare

► ## Manufacturer

Agfa HealthCare N.V.

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or its affiliates.

WARNING:

Improper operation or service activities may cause damage or injuries.

INSTRUCTION:

(1)   Read the "Generic Safety Directions" document
(see Agfa HealthCare Library > General Info > Agfa HealthCare > Publications >
Service Manual) prior to attempting any operation, repair or maintenance task on
the equipment.

(2)   Strictly observe all safety directions within the "Generic Safety Directions" 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 HealthCare or one of its affiliates
or who are otherwise authorized by Agfa HealthCare or one of its affiliates to provide
such services.

NOTE:

To verify the latest version of a chapter of the Service Manual refer to the "Checklist for
Completeness" in the Agfa HealthCare Library.

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1   Glossary

Term	Short Description
μGy	Micro Gray: X-ray dose
AE – title	Application Entity title. DICOM expression.
BOL	Begin Of Line
BOS	Begin Of Scan
Browser	A program that provides an interface to the World Wide Web, e.g. Netscape Navigator, Microsoft Internet Explorer
CAS	Clinical Application Specialist
CCM	Configuration and Customization Manager: Tool to edit the configuration file *adc.cpf*
Collimation	Determination of the region of the interesting data in the image. On that region the image processing is applied.
CPF – file	Customization Parameter File; file that contains settings for all parameters that can be modified to configure a CR System according to local needs.
CR	Computed Radiography
CU-Filter	Copper plate (chemical symbol: **CU**) used for exposure of a flatfield.
DICOM	Digital Imaging and Communications in Medicine
Dose, x-ray dose	= kV x mA x sec see also μGy = Micro Gray
Fast Scan Direction	Scan direction: This is vertical to the "Slow scan direction" (= Transport direction of Image Plate through the scan unit).
FSE	Field Service Engineer
GenRad	General Radiology
Infocounter	Software tool that collects information about the status of the digitizer (installed SW-version, IP cycles, errors). It is accessible via the browser interface.
IP	For CR: Image Plate (phosphor plate)
IP	Internet Protocol: Internet software that divides data into packets for transmission over the Internet. Computers must run IP to communicate across the Internet.
IP address	(Internet Protocol address) The address of a computer attached to a TCP/IP network.

| Term	Short Description
Jitter	A flicker or fluctuation in a display image. To "jitter a pixel" means to place it off side of its normal placement by some random amount in order to achieve a more natural antialiasing effect.
Laser	**L**ight **A**mplification by **S**timulated **E**mission of **R**adiation
LED	**L**ight **E**mitting **D**iode; Semi conductor emitting light.
Pixel	Smallest addressable point to be scanned on the film or plate.
Shading calibration	Sensitivity calibration; calibration of each pixel in a line
Slow-scan direction	Transport direction of Image Plate through the scan unit.
Throughput	A value representing the number of image plates, a digitizer can scan in a certain time frame.
UPS	**U**ninterruptible **P**ower **S**upply. Backup power used when the electrical power fails or drops to an unacceptable voltage level.
URL	**U**niform **R**esource **L**ocator. The address that defines the route to a file on the Web or any other Internet facility. URLs are typed into the browser to access Web pages, and URLs are embedded within the pages themselves to provide the hypertext links to other pages.
UTP - cable	**U**nshielded **T**wisted **P**air (Network transfer medium) cable. Cable to connect to a computer network.

CR 10-X

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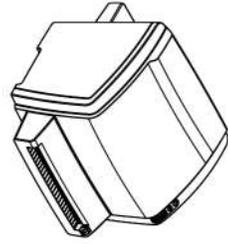
1st Edition

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► Purpose of this Document

This document describes how to

- add the "order list for documentation".
- print.
- add comments.

► Document History

Edition. Revision	Release Date	Changes compared to previous Version 1.1
1.2	06-2008	Added how to integrate the order list for documentation in a printed manual. See section 1.

Edition 1, Revision 2
06-2008   printed in Germany
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AGFA
HealthCare

1   Integrating the Order List for Documentation

IMPORTANT:

The "order list for documentation" is not part of the service manual for download.

Purpose of the "order list for documentation":
To verify the latest level and completeness of your Service Manual.

(1) In the MEDNET GSO library select the product of your interest.

(2) Select "Order list and Front page → *PRODUCT* - Chapter 00 - Order List for Documentation".

(3) Download the "order list for documentation" to your computer.

(4) When creating a paper manual:
Print the order list and put it behind the cover sheet.

2   Printing single Pages, Chapters or the complete Manual

IMPORTANT:

Preferably print this manual double-sided:
This PDF manual contains empty pages at the end of several chapters, to have the next chapter starting with an uneven page number when printed doubles-sided.
If printed one-sided, dispose these empty pages.

Preferably print circuit diagrams on a DIN A3 or ANSI B (Ledger) printer, if available.
Some pages – especially circuit diagrams for equipment – have been created on paper size larger than DIN A4/Letter. Printing these pages on DIN A4/Letter may result in reduced legibility. It is recommended to print these pages separately on a DIN A3 or ANSI B (Ledger) printer.

2.1 Printing single Pages or Chapters

To print single chapters or pages of a chapter proceed as follows:

(1) Click the bookmark of the desired chapter.

(2) Write down or remember the shown PDF page number. See Figure 1.
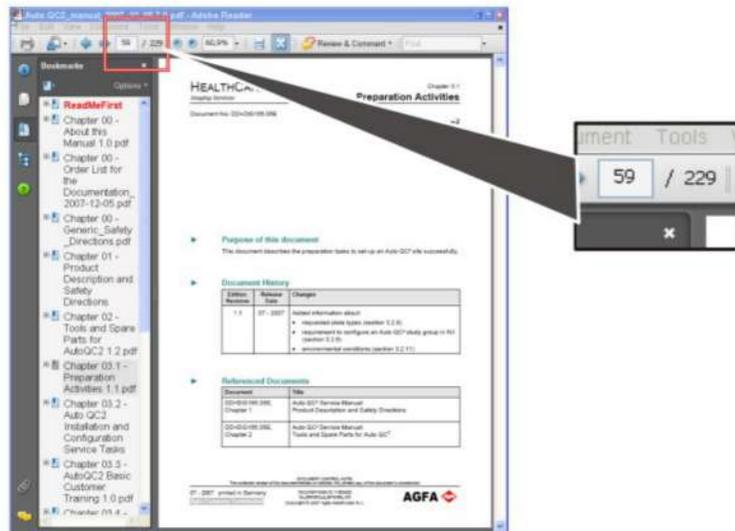
Figure 1: PDF page number in the Adobe reader toolbar

(3) Go the end of the section or desired range of pages.

(4) Select "Print".

(5) Select the page range.

(6) Select "Reduce to printer margins" and "Auto-rotate and Center".

(7) Select "OK".
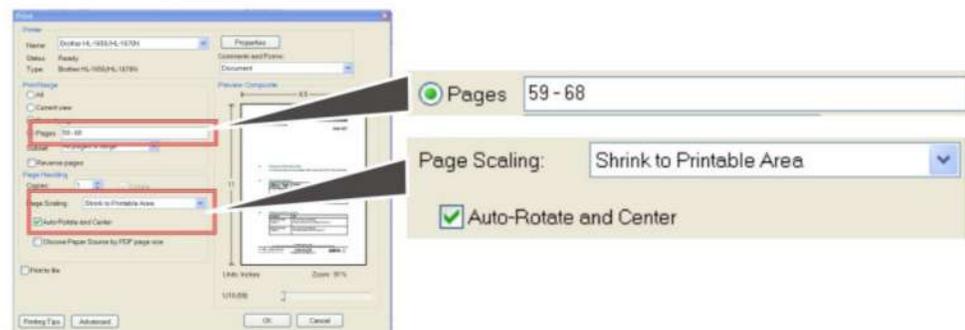
Figure 2: Print dialogue for printing single pages or chapters

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NOTE:

"Shrink to printable area" may be named on other Adobe Reader versions "reduce to printer margins" or "shrink oversized pages to paper size".

2.2 Printing the complete Service Manual

To print the complete service manual proceed as follows:

(1) Select "Print".

(2) Select "All".

(3) Select "shrink to printable area" and "Auto-rotate and Center" (see NOTE above).

(4) Select "OK".
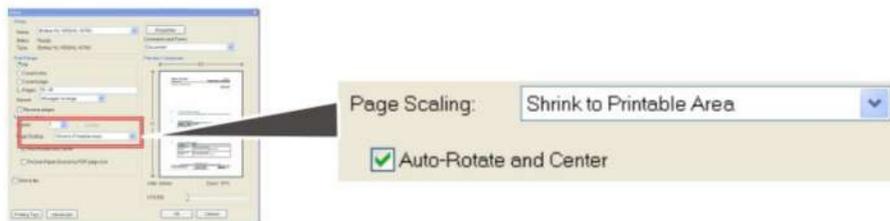
Figure 3: Print dialogue for printing the complete manual

3 Adding Comments

- If you open this file in an Adobe Reader version ≥ 7, the comment toolbar will show-up.

- This allows adding comments, to highlight or underline text and many more text manipulations.
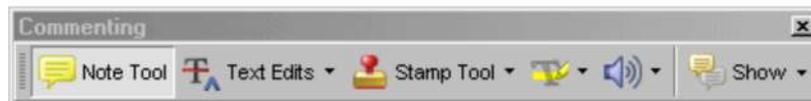
Figure 4: Adobe Reader comments toolbar

3.1 Exporting your Comments

✓ NOTE:

Exporting your comments allows importing them again in a next version of the manual.

(1) In the drop down menu "Comment & Markup" select "Show comments List".
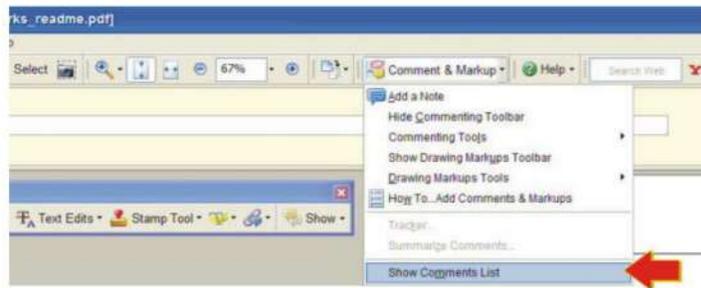
Figure 5: Drop down menu "Comment & Markup"

(2) Select the desired comments: Press the CTRL-key for multiple selections.

(3) Select "Options - Export Selected Comments".

(4) Save the file with any name.

3.2 Importing Comments

(1) In the drop down menu "Comment & Markup" select "Show comments List".

(2) Select "Options - Import Comments".

(3) Browse for the comments file and press "select".

✓ NOTE:

The imported comments possibly appear on different pages, if the file where the comments have been imported has a different number of pages.