Drystar 5500/5503

Reference manual

2900H EN 20071108

AGFA HealthCare

0413

Figure 1: CE-Label

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About this manual

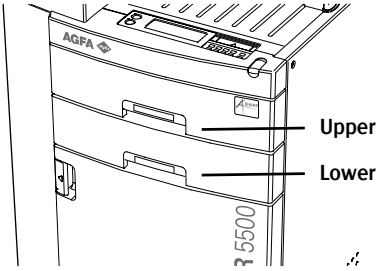
Scope

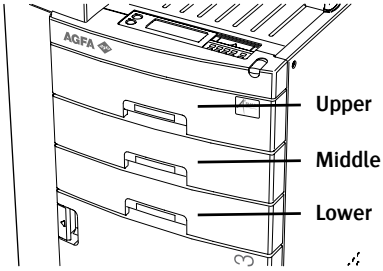
The Drystar 5500/5503 Reference manual is intended for both the Drystar 5500 and the Drystar 5503 printers.

The only difference between both printers is the number of input trays:

- The Drystar 5500 is fitted with two input trays, named Upper input tray and Lower input tray.
- The Drystar 5503 is fitted with three input trays, named Upper input tray, Middle input tray and Lower input tray.

The operation is identical for each input tray.





This manual only deals with the Drystar 5500 printer, equipped with two trays.

As the operation of the Middle input tray is identical to the Upper and Lower input tray, this manual is also applicable for the Drystar 5503 printer equipped with three trays.

ABC ordering codes

The table below lists the ordering codes for the Drystar 5500, Drystar 5503 and possible options.

Description	ABC code	Remark
Drystar 5500	EJ7SX	• standard two trays • A#sharp technology is included
Drystar 5503	ESKZV	• standard three trays • A#sharp technology is included
Mammo option for Drystar 5500	ER3N3	• applicable for Drystar 5500 • A#sharp technology is included
Mammo option for Drystar 5503	ER3O5	• applicable for Drystar 5503 • A#sharp technology is included
A#sharp kit for Drystar 5500	ERA2O	applicable for Drystar 5500 with a software version lower then 3.00
Cleaning roller tissue	EQU6Y	

Available Software versions

The table below lists the available software versions and the type of printer they require:

Software version (SW)	Printer
3.x	supports Drystar 5500
4.0.x	supports Drystar 5500
4.2.x	supports Drystar 5500 (RoHs compliant)
5.0.x	supports Drystar 5503
5.2.x	supports Drystar 5503 (RoHs compliant)
6.x	supports Drystar 5500 and 5503 (RoHs compliant)

Chapter 1

Introducing the Drystar 5500

This chapter introduces the Drystar 5500 to the user and draws attention to important safety precautions.

Drystar 5500 features

The Drystar 5500 is a **dry digital printer** for producing diagnostic images. It can print multiple formats (8x10", 10x12", 11x14", 14x14", and 14x17") of blue-based and clear-based film and offers crisp, dense grayscale images. The Drystar 5500 can be used for general radiography and optionally for the mammography application. It is designed for high-throughput and for use as a central printer.

The Drystar 5500 is a DICOM-only network printer.

The Drystar 5500 offers the following features:

- Dry technology for printing diagnostic quality hard copies in full daylight offers important advantages: no chemistry, no wet processing, simple cleaning procedures, no time-consuming adjustments, no darkroom and no chemical disposal costs. The consumables can be loaded in full daylight.
- With its compact design, the Drystar 5500 needs little work space and allows easy customer access. Maintenance and service activities are reduced to the minimum.
- The direct thermal printing system provides grayscale images with laser-like quality: 508 dots per inch resolution, each pixel with a 14 bit contrast resolution and an average optical density of 3.0 (DT 2 C) and 3.2 (DT 2 B) for general radiography applications and 3.8 for the optional mammography application (if an X-Rite 310 densitometer is used).
- The built-in image spooling on hard disk assures a high throughput. Printing time is kept to a minimum.
- Multiple film formats (8x10", 10x12", 11x14", 14x14", and 14x17") can be used. Any combination of two film formats can be used "on line". Both input trays can be adjusted for all film formats.
- The input trays of the Drystar 5500 are equipped with an RF-tag reader, which automatically traces the films used in the printer and protects the printer when detecting non-identified media.
- Number of input trays.

  The Drystar 5500 is delivered with 2 input trays. Both input trays can use multiple format (8x10" up to 14x17") films.

- Number of output trays

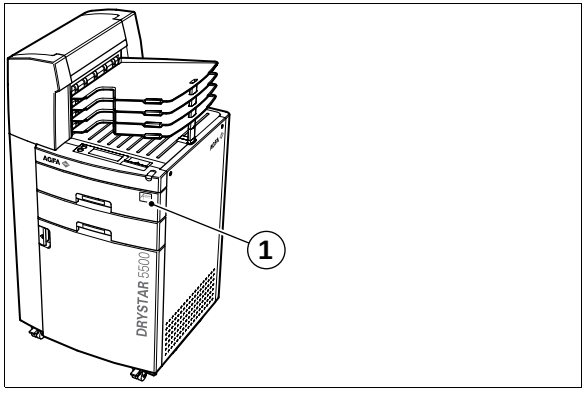
  The Drystar 5500 is delivered with 4 output trays, which can be assigned to modalities in any combination.

- A Quality Control software module is available for the Key-operator. The QC procedure for general radiography applications has been designed to comply with the grayscale reproduction constancy test, according to the international standard IEC 1223-2-4. For more information, refer to *'Quality control for general radiography applications (DT 2 B & DT 2 C)'* on page 141. The QC procedure for the optional mammography application has been designed to comply with the Mammography Quality Standards Act (MQSA) of the FDA. For more information, refer to *'Quality control for mammography application (DT 2 Mammo) (optional)'* on page 153.

- Integrated A#sharp technology

  A#sharp is a technology that enhances image sharpness for the Drystar 5500. An A#sharp label on the upper tray shows that the imager has been upgraded with this technology.

  The A#sharp technology is present in Software version 3.00 and higher.



1	A#Sharp label

Network features

- The modular design offers optimal application to your specific networking requirements.

  In a network configuration, the Drystar 5500 is fully compatible with Agfa's diagnostic imaging systems, including the ADC Compact and ADC Quality System software, the Paxport and the entire line of Impax Review Systems, Storage Stations and Transmitting Stations.

- The functionality of the Drystar 5500 is completely controlled via the network.

- You can control the working of the Drystar 5500 via the local keypad or via a remote PC featuring a browser functionality.

Customizable features

- Number of output trays.

  The Drystar 5500 is delivered with 4 output trays and a sorter.

- Consumables.

  The Drystar 5500 can handle DRYSTAR DT 2 B and DRYSTAR DT 2 C consumables (both are general radiography film types) in multiple formats (8x10" up to 14x17") and optionally DRYSTAR DT 2 Mammo (mammograpy film type) consumables, available in the formats 8x10", 10x12" and 11x14".

Software license information

- The Drystar 5500 printer uses software developed by the Apache Software Foundation (http://www.apache.org/licenses/LICENSE).

Safety precautions

The Drystar 5500 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 positively will not assume any liability in these cases.

All images created using any image technology can show artifacts which could be mixed up with diagnostic relevant information. If there is any doubt that the diagnostic information could not be absolutely true, additional investigations must be performed to get a clear diagnostic.

When operating or maintaining the Drystar 5500, always observe the following safety guidelines:

- Have electrical or mechanical defects repaired by skilled personnel only!
- Do not override or disconnect the integrated safety features.
- Ventilation openings may not be covered.
- Always switch off the Drystar 5500 and disconnect the power cord from the outlet before carrying out any maintenance work.

Film jam removal or Cleaning the printer thermal head can be done without switching the power off. Nevertheless, care should be taken and the following instructions should be respected:

Always take into account the markings provided on the inside and outside of the printer. A brief overview of these markings and their meaning is given below.

	Safety warning, indicating that the Drystar 5500 manuals should be consulted before making any connections to other equipment. The use of accessory equipment not complying with the equivalent safety requirements of this printer may lead to a reduced level of safety of the resulting system. 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 601-1 and IEC 601-1-2 harmonized national standard. In addition all configurations must comply with the medical electrical systems standard IEC 601-1-2. The party that makes the connections acts as system configurator and is responsible for complying with the systems standard. If required contact your local service organization.

	Caution hot: Keep hands clear from the thermal print head.
	In order to reduce the risk of electric shock, do not remove any covers.
	Type B equipment: Indicates that the Drystar 5500 complies with the limits for type B equipment.
	Supplementary protective earth connector: Provides a connection between the Drystar 5500 and the potential equalization busbar of the electrical system as found in medical environments. This plug should never be unplugged before the power is turned off and the power plug has been removed.
	Intergrounding connector: Provides a connection between the printer and other equipment which might exhibit minor ground potential differences. These differences may degrade the quality of communication between different equipment. Never remove connections to this terminal.
	Protective earth (ground): Provides a connection between the printer and the protective earth of the mains. Do not remove this connection, because this will have a negative influence on the leakage current.
	Power button: Note that the power cord has to be disconnected from the wall outlet in order to disconnect the unit entirely from the mains.
	Precautions for use in USA only: Make sure that the circuit is single-phase center-tapped, if the printer is connected to a 240 V/60 Hz source instead of a 120 V/60 Hz source.

Transport after installation

Before moving the printer, always switch off the machine. The user has to be very cautious concerning stability, when moving the printer. When doing this, he has to take into account the condition and the structure of the subsoil, obstructions and slopes. Also the user has to make sure that the brakes are loose. The appliance can only be transported with all covers closed. The appliance may not be transported continuously from one location to the other.

To prevent injuries, lock the brakes when the Drystar 5500 is in place at the right location.

Waste disposal and environmental regulations

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.

Instead it shall be handled over to the applicable collection point for the recycling of electrical and electronic equipment. 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 contains easy removable batteries or accumulators please dispose these separately according to your local requirements.

Restriction of the Use of Certain Hazardous Substances (RoHS)

The RoHS (Restriction of Hazardous Substances) Directive No 2002/95/EC of the European Union focuses on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Member States of the European Union (EU) shall ensure that, from 1 July 2006, new electrical and electronic equipment put on the market (EU countries), does not contain the following substances above specified concentrations at the homogeneous material level:

- Cadmium (0.01%)
- Hexavalent chromium (0.1%)
- Lead (0.1%)
- Mercury (0.1%)
- Polybrominated biphenyls (PBB) (0.1%)
- Polybrominated diphenyl ethers (PBDE) (0.1%)

At the date of preparation of this manual, Medical Devices are exempted of the RoHS Directive.

However Agfa HealthCare is committed to meet the requirements of the European RoHS Directive in case the exemption is cancelled.

If there is a RoHS label at the rear of the printer it means that the printer is RoHS compliant and does not contain the above listed substances above the mentioned concentrations at the homogeneous material level.

In case of questions or more detailed information do not hesitate to contact your local sales organization.

Security precautions

CAUTION (U.S.A. only): In accordance with U.S. Law, this device can only be sold to or ordered by a licensed physician.

Printed images should be treated as patient records and should only be viewed by authorized personnel.

It is good practice not to delete images from the modality, until they are correctly printed.

It is advisable to do a reprint when film artifacts are present in the image.

In case of general image quality degradation, please refer to *'Maintaining image quality and resolving Image quality problems'* **on page 220.**

Safety compliance

EMC issues

- USA: This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Reference manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at its own expense.
- If required, contact your local service organization.
- Canada: This class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
- EC: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Compliances

The Drystar 5500 has been tested and found to comply with the following international standards and regulations:

- The Medical Devices Directive 93/42/EEC
- CFR Part 21
- FDA 510K, FDA Part 820 Good manufacturing Practice for Medical devices
- The Quality Control test procedure for general radiography applications (refer to *'Quality control for general radiography applications (DT 2 B & DT 2 C)'* on page 141 complies with the grayscale reproduction constancy test, according to the international standard IEC 1223-2-4.
- The Quality Control test procedure for the optional mammography application (refer to *'Quality control for mammography application (DT 2 Mammo) (optional)'* on page 153) complies with the Mammography Quality Standard Act (MQSA) of the FDA.

Safety standards

- IEC 60601-1
- EN 60601-1
- UL 2601-1
- CSA 22.2 No. 601.1-M90
- GB4943

Radio-interference regulations (interference suppression)

- FCC Rules 47 CFR part 15 subpart B
- FCC Rules 47 CFR part 15 subpart C
- IEC 60601-1-2
- CISPR 11, class A
- CISPR 22, class A
- IEC 61000-4-3
- IEC 61000-4-4
- IEC 61000-4-5
- IEC 61000-4-6
- IEC 61000-3-2
- IEC 61000-3-3
- IEC 61000-4-11
- ETSI 300330
- GB9254, Class A
- GB17625.1

Labels

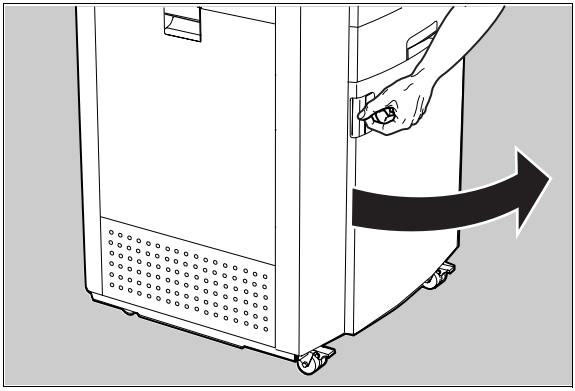
The Drystar 5500/5503 carries the CE, TÜV, cULus and CCC labels.

Labels Drystar 5500:

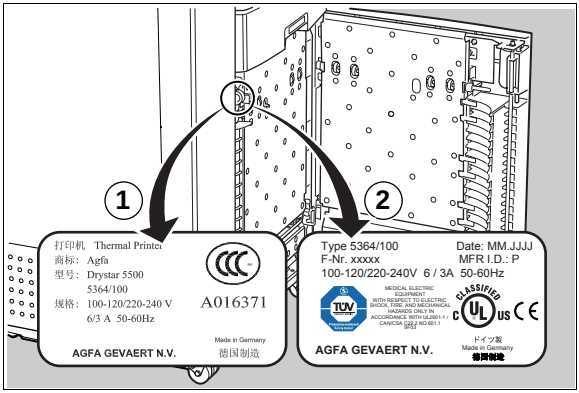
The following labels are located behind the front door:

1	CCC label
2	CE, TÜV and cULus labels

- Open the front door.



- The labels are visible inside the printer.

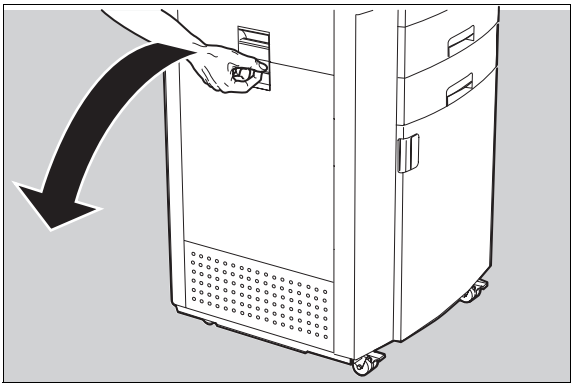


Labels Drystar 5503:

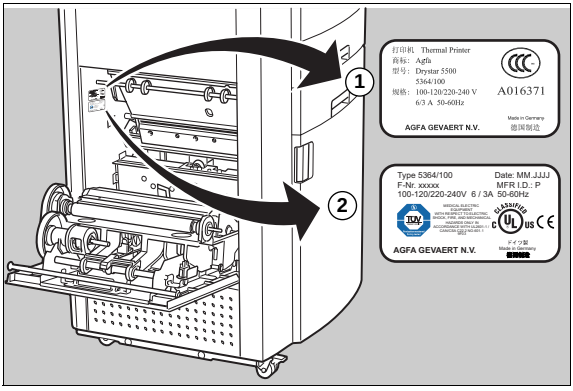
The following labels are located behind the drum compartment door:

1	CCC label
2	CE, TÜV and cULus labels

- Open the drum compartment door by pulling its handle.



- The labels are visible inside the printer.



Power cord regulations

- Use attached power cord set to the product.
- Do not use attached power cord set for other electric equipment.

Privacy and security

Within the healthcare industry, several standardization efforts are ongoing as a response to Privacy and Security legislation and regulations. The purpose of this standardization for hospitals and vendors is to enable information sharing, interoperability and to support the workflow of hospitals in a multiple vendor environment.

In order to allow hospitals to comply with HIPAA regulations (Health Insurance Portability and Accountability Act) and to meet the IHE standards (Integrated Healthcare Enterprise) some security features are included in the user interface of the Drystar 5500 (available via the web pages only: under 'Security tools'. Refer to Chapter 4, *'Controlling the Drystar 5500 via a remote PC (with browser)'*):

- Product Authentication: HIPAA supported products that communicate with DICOM use the Transport Layer Security (TLS) protocol. The TLS protocol uses public key certificates for client and server authentication (X.509).
- Product Accountability: HIPAA supported products require some level of user and system activity to be recorded. As a consequence of these actions, audit records are to be sent to and observed at an Audit Record Repository (ARR).
- Product User Authentication: 'User Authentication' of HIPAA products involves password protection for access to User, Key operator, Service Security/ Administrator and other user interfaces that allow access to protected health information (PHI). These interfaces include all user keypads, front panels displays and network connections.

The last two functions are available when access to the Administrator is granted (i.e. when the Administrator password has been entered correctly).

Node authentication, certificates and Certification Authority

Each device - connected to a network - will receive a unique identifier: the X.509 certificate, a digital passport. Any device on the network is only allowed to communicate with another node of which it is holding the certificate in a 'communication allowed' table.

A Certification Authority (CA) is responsible for creating a certificate. The CA can be the hospital, Agfa or a third party.

This CA distributes the certificate to the hospital security responsible or service technician, who for his part:

- Imports the device certificate, created by the CA.
- Imports the certificates of all peer devices with which communication is authorized, i.e. creates the list of 'communication allowed' device certificates.

Operating modes

The Drystar 5500 can be operated in five modes: operator mode, Key-operator mode, service mode, specialist mode, and administrator mode.

Operator mode

The operator mode groups all basic functions which are aimed at radiographers without special technical skills:

- Producing diagnostic usable hardcopies;
- Loading consumables;
- Ensuring normal operation of the printer.

All functions of the operator mode are described in both User and Reference manuals. Refer to Chapter 2, *'Basic operation (operator mode)'*.

Acces is possible via the local keypad and via a connected remote PC (password protected).

Key-operator mode

The Key-operator mode groups advanced functions which are aimed at technically skilled operators such as X-ray operators, network managers and service and hospital technicians.

The Key-operator mode is menu-driven. The Key-operator functions are described in the Reference manual only. Refer to Chapter 3, *'Advanced operation (Key-operator mode)'*.

Acces is possible via the local keypad and via a connected remote PC (password protected).

Service mode

The service mode functions are reserved for trained service personnel. The service mode is password protected.

Acces is possible via the local keypad and via a connected remote PC. In both cases the service personnel needs a password.

Specialist mode

The specialist mode functions are reserved for trained service personnel of the Agfa Customer Support Center. The specialist mode is password protected and is only accessible by browser via a remote PC.

Administrator mode

The Administrator mode functions are reserved for the System Administrator. The Administrator mode is password protected and is only accessible by browser via a remote PC. Refer to *'Privacy and security'* on page 22.

Control modes (local and remote)

You can control the working of the Drystar 5500 via the local keypad or via a network browser based remote PC.

The table below gives an overview of the operating modes you can access locally or via the remote PC.

Local	Password protected	Remote	Password protected
Operator mode	No	Operator mode	Yes
Key-operator mode	No	Key-operator mode	Yes
Service mode	Yes	Service mode	Yes
Specialist mode	No access	Specialist mode	Yes
Administrator mode	No access	Administrator mode	Yes

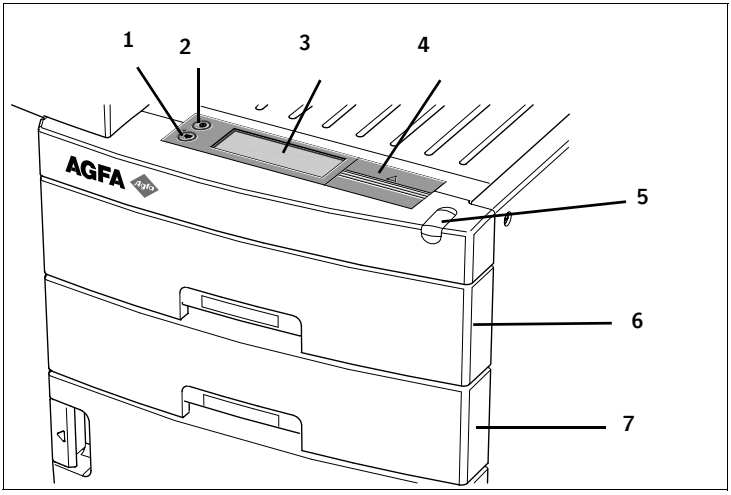
The manual describes the controlling of the Drystar 5500 via the keypad. When controlling the Drystar 5500 via a remote PC, the menus are structured in the same way. Refer to Chapter 4, *'Controlling the Drystar 5500 via a remote PC (with browser)'*.

The local user interface

The Drystar 5500 interfaces with the user via the following controls:

- Power button;
- Unlock button;
- a keypad and a display;
- a status indicator LED;
- audio signals.

Overview of user interface controls:



1	Unlock button
2	Power button
3	Display
4	Keypad cover
5	Status indicator LED
6	Film input tray (Upper input tray)
7	Film input tray (Lower input tray)

Never try to open the printer when the Drystar 5500 is busy printing a film. Always follow the instructions on the display!

The status indicator LED

At the right side of the display, a LED indicates the status of the Drystar 5500:

Color / Light		Status	Action
Green	**Constant**	Ready (stand-by)	Proceed.
	Blinking	Busy or in Key-operator mode	Wait.
Red	**Blinking**	Warning status	Check the display for messages. Refer to *'Checking the status indicator LED'* on page 195.
	Constant	Error status	

The control buttons

Two control buttons have been provided:

	**Unlock** button	• To safely unlock the printer for accessing the input trays or opening the covers.
	**Power** button	• To power on or off the printer.

Do NOT press the Power button without first following the procedure to stop printing when the Drystar 5500 is busy printing a film. Refer to *'Switching off the Drystar 5500'* on page 36.

Audio signals

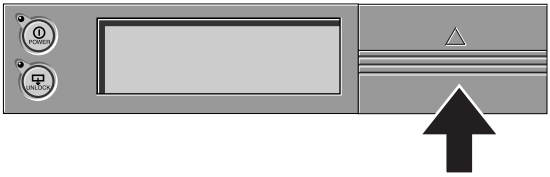
The Drystar 5500 gives status information via beeps. The length of the beep indicates the response of the system to a key command.

- A **short** beep means that Drystar 5500 has accepted the key command and is starting the operation.
- A **long** beep means that you have pressed a non-active key or that the Drystar 5500 has rejected the key command.

Certain conditions can cause an interval beep. An interval beep accompanies an error or warning message. Refer to 'Troubleshooting checklist' on page 194.

The keypad

To access the keypad, push the keypad cover backward.



The keypad is located under the keypad cover.

The Drystar 5500 keypad features the following keys:

	**Emergency** key	To rearrange the print queue: emergency jobs can be placed at the top of the queue to be printed with priority. Refer to *'Assigning emergency priority'* on page 41.
	**Delete** key	To delete print jobs. Jobs that are deleted will not be printed. Refer to *'Deleting print jobs'* on page 42.
	**Key-operator** key	To access the advanced functions of the Key-operator mode. Refer to Chapter 3, *'Advanced operation (Key-operator mode)'*.
	**Service** key	To access service-level functions. Reserved for trained service personnel.
	**Escape** key	To quit the current function or exit a menu without saving modifications.
	**Confirm** key	(In Key-operator mode) • To select a menu. • To accept an entry in a menu.

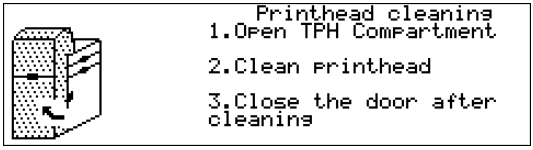
	**Up** key	• To move the cursor to the previous entry field. • To scroll upwards. • To increment the number in a(n) (alpha)numerical entry field.
	**Down** key	• To move the cursor to the next entry field. • To scroll downwards. • To decrement the number in a(n) (alpha)numerical entry field.
	**Left** key	• To scroll backwards through multiple choices within a field. • To move the entry position in a(n) (alpha)numerical entry field from right to left. • To toggle between values in a field.
	**Right** key	• To scroll forwards through multiple choices within a field. • To move the entry position in a(n) (alpha)numerical entry field from left to right. • To toggle between values in a field.

You can press and hold down an arrow key to scroll quickly through a list or a menu.

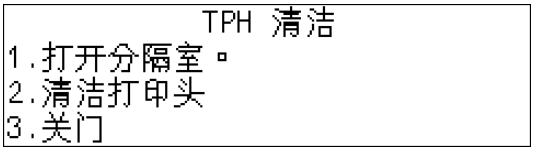
The display

The Drystar 5500 control panel has a backlit LCD display. We distinguish two panel types depending on the selected language:

- a backlit LCD display with 8 lines for Western languages (e.g. Dutch, French, Portuguese, Swedisch, ...).



- a backlit LCD display with 4 lines for all other languages (e.g. Greek, Chinese, Korean, Polish,...).



Whether a display is translated or not depends on the operating mode.

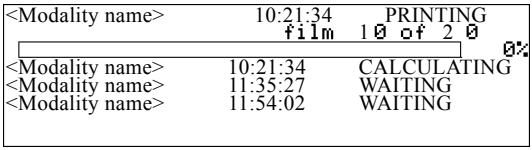
Contact Agfa for the latest Drystar 5500 language availability status.

Operator mode

In **operator mode**, appropriate information is displayed, in accordance with the status of the printer.

The operator basic screen looks as follows, indicating that the Drystar 5500 is ready for operation and that no job is currently being executed.

During printing, calculation and other processes, as the printer is busy with at least one job, the Print queue screen is displayed:



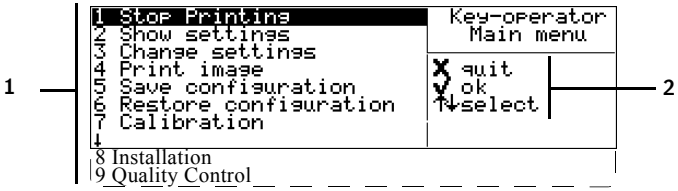
- The **progress indicator** keeps the user informed of the progress of a process (e.g., calculation of a bitmap, printing of a film, copying files). The line is gradually filled from left to right, from 0% to 100% as the process proceeds.

On the print queue screen the modality name defined during installation (nickname) will be used to refer to the corresponding modality. In case no nickname has been defined during installation, this AE-title will be used.

Refer to *'Managing the print queue'* on page 39.

Key-operator mode

In **Key-operator mode**, operation is menu driven. The menu displays the Key-operator functions and the active keys.



1	Key-operator main menu functions
2	Active keys

Data entry

When entering numerical or alphanumerical data, always adhere to the following principles:

- Only (alpha)numerical data can be entered.
- During the data entry, the field is displayed in reverse mode.
- Increment the number in a(n) (alpha)numerical entry field by pressing the Up key. Transition from 9 to 0 of one figure will also increment the next figure to the left, respecting the valid limits of the range.
- Decrement the number in a(n) (alpha)numerical entry field by pressing the Down key. Transition from 0 to 9 of one figure will also decrement the next figure to the left, respecting the valid limits of the range.
- Move the entry position in a(n) (alpha)numerical entry field from right to left by pressing the Left key.
- Move the entry position in a(n) (alpha)numerical entry field from left to right by pressing the Right key.
- Press and hold down a key to repeat arrow key actions.
- To accept an entry in a menu, press the Confirm key.
- A short beep acknowledges and terminates the entry.
- The Drystar 5500 will sound a long beep if you press a key that is not to be used at that moment.

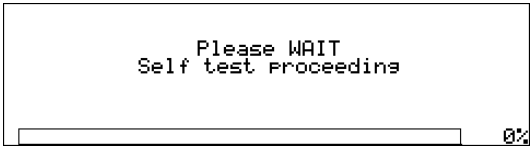
Switching on the Drystar 5500

Before switching on the Drystar 5500, read the safety instructions. Refer to *'Security precautions' on page 17*.

Follow the procedure below to ensure proper start-up of the Drystar 5500 and to check that everything is working correctly.

1 Check that the power cord is plugged in and then switch on the printer by pressing the **Power** button.

On the display, the following message is displayed. After a short while, a progress indicator will show the proceeding of the self test.

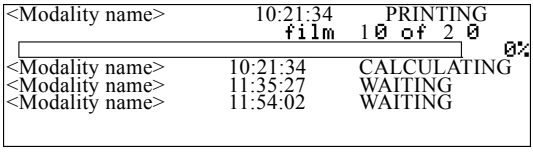


2 The printer is ready for operation:

- If, on the front panel display, the READY message is shown, *the status indicator LED is constant green.*

It takes 11 minutes before the Drystar 5500 can start printing. After 6 minutes the READY message appears and from then on you can send print jobs to the printer, but it will take another five minutes for the printer head to heat up. When you send print jobs to the Drystar 5500 during this five minutes, the printer will use that time to calculate the print job and the display will inform you that the printer is warming up.

- If, on the front panel display, the Print queue screen is shown, *the status indicator LED is green and blinking.*



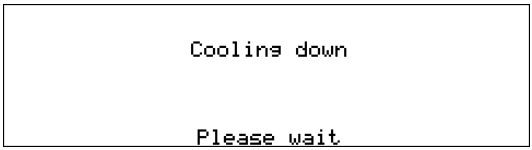
3 Make sure that the printer is loaded with appropriate consumables.

Refer to page 46 for detailed information on loading films.

If the job status holds a warning or error indication. Refer to 'Troubleshooting checklist' on page 194.

Cooling down the Drystar 5500

If owing to certain circumstances (e.g. extensive printing), the temperature rises too much, the Drystar 5500 will cool down automatically. The cooling down message will appaear on the display during the cooling down process.



Switching off the Drystar 5500

When you want to switch off the printer, it is recommended to follow the procedure as described below, to make sure that any pending jobs are correctly finished.

1 Make sure that the pending jobs are correctly finished. If necessary, follow the procedure to stop printing. Refer to *'Stopping the printing process'* on page 59.

2 Press the **Power** button to switch off the Drystar 5500.

In case the printer is ready, it shuts down immediately. Otherwise it can take up to 10 seconds to power down.

Chapter 2

Basic operation (operator mode)

This chapter will inform on how to manage the print queue, how to print films with priority and how to load new films.

Overview of operator functions

This section focuses on the basic operating principles of the Drystar 5500. After reading this chapter, the operator should be able to produce diagnostic usable hardcopies. No special technical skills are required.

All basic operator functions can be activated directly by pressing a single key on the keypad.

Function / Task	Description	Page
'Managing the print queue'	Jobs that have been received are put in a print queue, waiting to be printed.	39
'Assigning emergency priority'	To rearrange the order in which jobs are waiting to be printed. Jobs that have emergency priority are placed on top of the print queue.	41
'Deleting print jobs'	To remove print jobs from the print queue. Print jobs that are deleted will not be printed.	42
'Loading films'	Instructions for loading new films on the printer.	46

Managing the print queue

You can always check the status of the print jobs.

As long as the jobs are not yet submitted for printing (i.e. they are still in the 'waiting' status), you can assign emergency priority and delete individual print jobs.

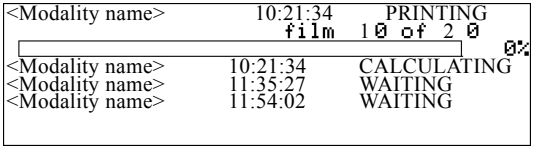
Keep in mind that one print job can hold several films to be printed. In accordance with the acquisition modality used, and the actual settings, films can be grouped in a folder to be submitted as one print job for the Drystar 5500. Refer to the User manual of the acquisition modality for more information.

Checking the print queue

If jobs have been transmitted from the network to the Drystar 5500, they are put in the print queue on a first in, first out schedule. New jobs that are added to the queue get the 'waiting' status.

As soon as the last film of a job is ejected in the output tray, the next job that has been calculated will be put in printing status.

Example of the Print queue screen:



- The first line shows information on the job that is currently being printed: modality name, a nickname (if defined), time of receipt of the job and the job status.
- The second line shows how many films are to be printed for the current job, and also what film from that total is currently being printed.
- On the third line you can watch the progress of the printing process. The progress indicator is gradually filled from left to right, from 0% to 100% as the process is completed. If no job is being printed, the progress indicator will show the proceeding of the calculation process of the next job.

The other lines give information on the jobs that are still waiting in the print queue. A description of the possible status of each job is listed in the table below:

Status	Description	Action
Printing	Printing of this job is in progress.	Wait.
Calculating	The necessary calculations are being made before printing of the job can be started.	
Waiting	The job has been put in the print queue, but no processing is yet being done.	Wait. • To put emergency jobs on top of the queue, refer to *'Assigning emergency priority'* on page 41. • To remove jobs from the queue, refer to *'Deleting print jobs'* on page 42.
Media size indication	No compatible media are loaded for the print job.	Make sure the correct media are loaded.

On the print queue screen the modality name defined during installation (nickname) will be used to refer to the corresponding modality. In case no nickname has been defined during installation, this AE-title will be used.

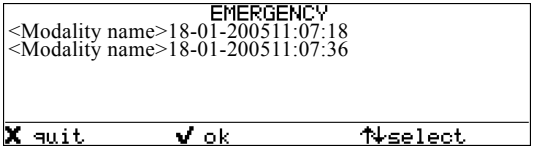
If the job status holds a warning or error indication, refer to 'Error messages while the printer starts up' on page 218.

Assigning emergency priority

You can assign emergency priority to jobs that need to be printed with urgency. Jobs that are marked for priority handling are placed at the top of the print queue for immediate processing. Emergency jobs will be printed before other jobs that were received previously. However, any pending jobs that are already being calculated or scheduled for printing will be finished first.

1 On the keypad, press the Emergency key.

The Emergency printing screen is displayed:



Only the jobs that have the 'waiting' status are displayed. Print jobs which already have an emergency status are blinking.

You can press the Escape key to return to the previous menu without making changes in the job order ('Quit').

2 Press the Down and Up keys to scroll through the jobs and press the Confirm key to select the job that must be printed with emergency priority.

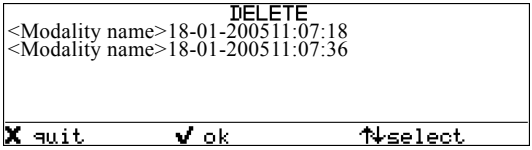
Printing will be resumed in accordance with the changed queue order.

Deleting print jobs

You can remove jobs from the print queue if they are in the 'waiting status'. Any pending jobs that are already being calculated or scheduled for printing will be finished. Such jobs can not be deleted.

1 On the keypad, press the Delete key.

The Delete print job screen is displayed:



Only the jobs that have the 'waiting' status are displayed.

On the print queue screen the modality name defined during installation (nickname) will be used to refer to the corresponding modality. In case no nickname has been defined during installation, this AE-title will be used.

You can press the Escape key to return to the previous menu without deleting print jobs ('Quit').

2 Press the Down and Up keys to scroll through the jobs and press the Confirm key to select the job that must be deleted.

The Confirm delete screen is displayed.

You can press the Escape key to return to the previous menu without deleting print jobs ('Cancel').

If you want to delete all jobs at once, press the up/down arrow keys to select 'All jobs', followed by the Confirm key. Proceed with the next step.

3 Press the Confirm key to delete the print job.

Printing will be resumed. The job that has been deleted will not be printed.

About Drystar 5500 consumables

The Drystar 5500 can handle blue-transparent DT 2 B, clear-transparent DT 2 C (both for general radiography) and optionally (refer to *'Options and accessories'* on page 235) the blue-transparent DT 2 Mammo (for the mammography application) films.

Available film formats for general radiography applications are 8x10", 10x12", 11x14", 14x14", and 14x17". Available film formats for the mammography application are 8x10", 10x12" and 11x14".

Both input trays can use all film formats.

The Key-operator can adjust the film size setting for both input trays.

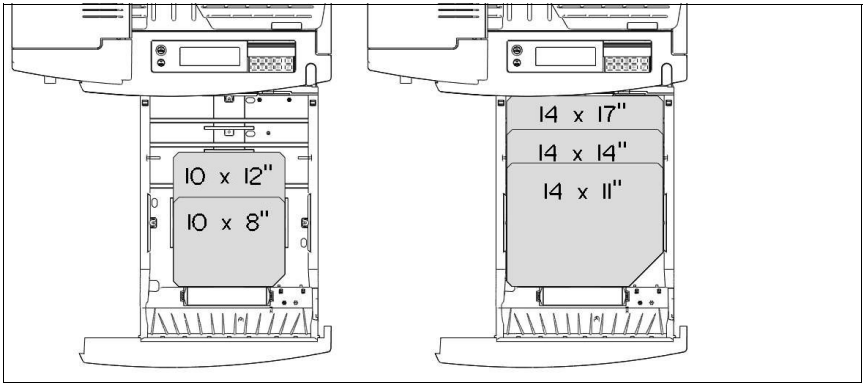
For more information about adjusting film size setting, refer to *'Changing the film format of the trays'* on page *180*.

Labeling the input trays

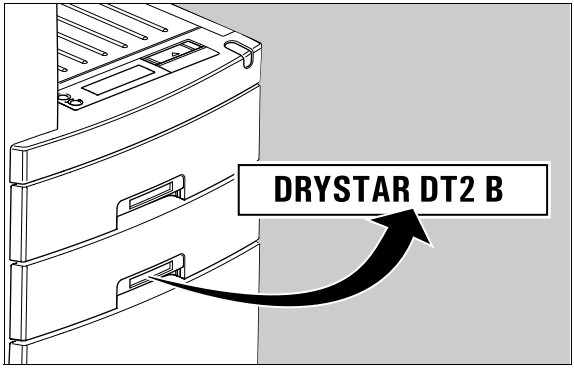
The following film types can be used:

DRYSTAR DT 2 B	8x10", 10x12", 11x14", 14x14", and 14x17"
DRYSTAR DT 2 C	8x10", 10x12", 11x14", 14x14", and 14x17"
DRYSTAR DT 2 Mammo (optional)	8x10", 10x12" and 11x14"

The different formats are configurated in following way in a tray:



Appropriate labels have been applied on the input tray(s) by the service personnel at installation of the printer, indicating the type of new film to be loaded when the tray is empty.



Loading films

Introduction

This section describes how to load the Drystar 5500 with appropriate films.

The Drystar 5500 can be loaded with 8x10", 10x12", 11x14", 14x14" and 14x17" films.

The Drystar 5500 can be loaded with new films in full daylight. Loading films is easy and can be done in no time. Follow the procedures as described in this section.

The Drystar 5500 will inform you in several ways that an input tray is empty:

- An audible signal,
- the Status indicator LED is flashing (red color),
- the Unlock button LED is flashing,
- the display screen shows a message informing you that either the upper or lower input tray is empty.

The film loading procedure is identical for both input trays. In the examples below, we will assume that the **lower** input tray is to be loaded.

The procedure is slightly different, depending on the fact wether the Drystar 5500 is printing/calculating or in the ready state.

When the printer is in the ready state, go to 'When the Drystar 5500 is in the ready state:' on page 49.

Never load an additional film sheet or film sheets to a film pack in use. Only load a new film pack when the current input tray is empty.

When the Drystar 5500 is printing or calculating:

1 The display shows the following message:

```
LOWER INPUT TRAY EMPTY

PRESS THE UNLOCK BUTTON TO
INITIATE LOADING PROCEDURE

INPUT TRAY IS LOCKED
```

2 Press the **Unlock button** to initiate the loading sequence.

3 Wait while the printer is finishing calculating/printing any current jobs.

```
<Modality name>          10:21:34      PRINTING
                          film  10 of  20
                                                0%

     LOADING SEQUENCE IS INITIATED

   Finishing current print job
DO NOT OPEN THE INPUT TRAY YET!
```

Blinking

When the film path is cleared, the following message is displayed:

```
LOWER INPUT TRAY EMPTY

PRINTER IS READY TO BE UNLOCKED
     PRESS UNLOCK BUTTON
```

4 Press the **Unlock button**.

The printer is ready to receive a new film pack when the following message appears:

```
LOWER INPUT TRAY EMPTY

INPUT TRAY IS UNLOCKED
   OPEN INPUT TRAY
```

Blinking

5 Open the lower input tray.

You have 5 seconds to open the input tray. If you do not open the tray within that time, the first screen (step 1 or 5 respectively) is presented again, or printing is resumed when a job is received for which media is available.

6 Load a new film pack.

Refer to *'Film loading procedure'* on page 50.

When the Drystar 5500 is in the ready state:

1 The display shows the following message:

```
LOWER INPUT TRAY EMPTY
PRESS THE UNLOCK BUTTON TO
INITIATE LOADING PROCEDURE
INPUT TRAY IS LOCKED
```

2 Press the **Unlock button** to initiate the loading sequence.

The printer is ready to receive a new film pack when the following message appears:

```
LOWER INPUT TRAY EMPTY
INPUT TRAY IS UNLOCKED
   OPEN INPUT TRAY
```

Blinking

3 Open the lower input tray.

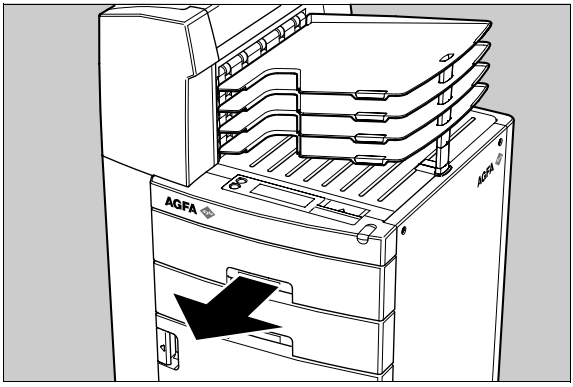
You have 5 seconds to open the input tray. If you do not open the tray within that time, the first screen (step 1 or 5 respectively) is presented again, or printing is resumed when a job is received for which media is available.

4 Load a new film pack.

Refer to *'Film loading procedure'* on page 50.

Film loading procedure

1 Open the empty input tray.



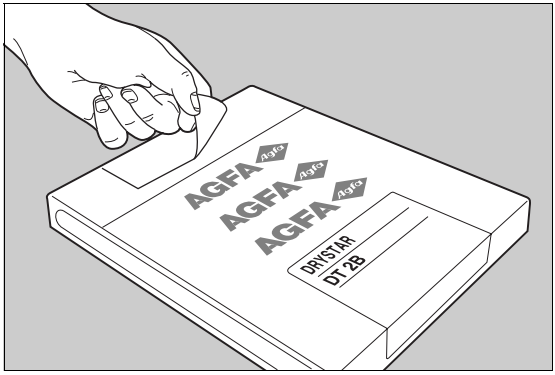
The display shows the following message:

```
Remove protective sheet from tray
        LOAD NEW FILM PACK
         Close input tray
```

2 Remove the white cover sheet.

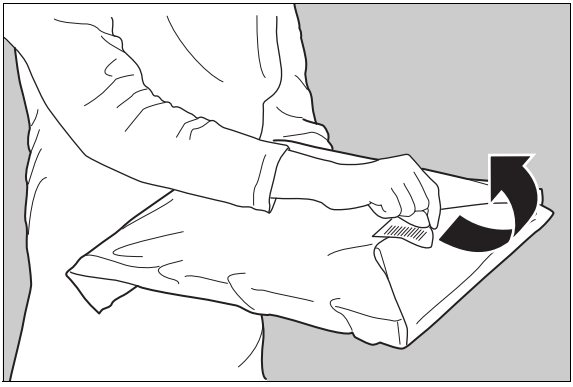
3 Take film pack, and open it.

Verify that the film type on the film pack corresponds with the sticker on the tray! If you do use an other film type, you are advised to change the label on the tray.

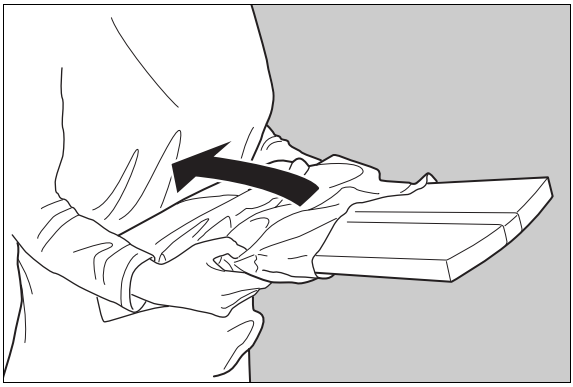


You can put the film pack onto a table to make manipulation easier. Before you do this, make sure that the table is dust-free!

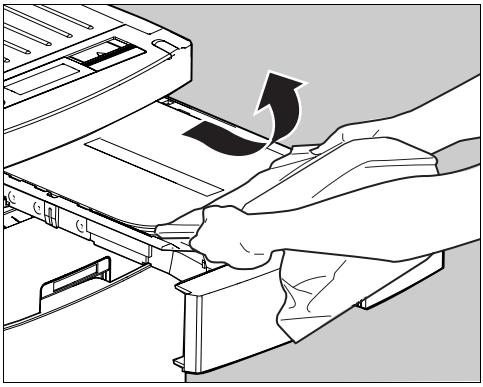
4 Remove the sticker from the film pack.



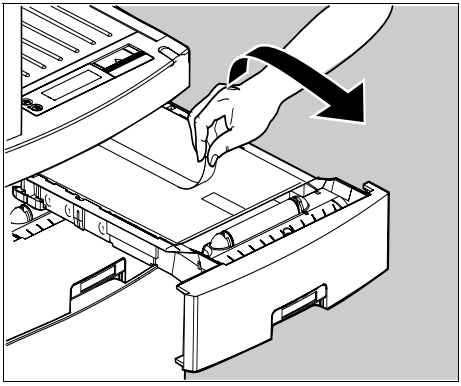
5 Remove the plastic film bag partially.



6 Slide the film pack into the input tray, and remove the plastic film bag completely.



7 Tear and remove the plastic tape from around the film pack.



8 Close the input tray.

The Drystar 5500 resumes printing as soon as the tray is closed.

Loading instructions are also available on the input tray cover.

Never load another film format when the input tray is not empty. Intermediate changing of film formats increases the risk for dust, which can damage the thermal print head (TPH).

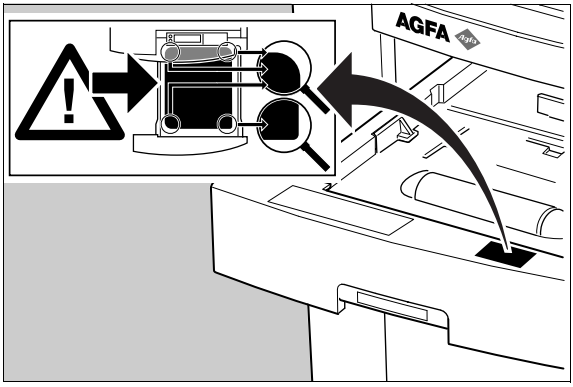
The system performs an automatic calibration when the film format has been changed.

Never reuse a jammed film. Refer to 'Clearing of film jams' on page 199.

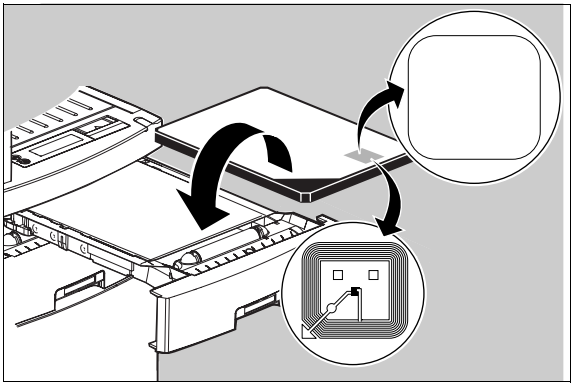
Only the Drystar 5503 is equipped with a "back side printing" detection mechanism.. This mechanism is acvtivated only when the software 6.x is installed and a wrongly inserted film sheet in the input tray is used for printing. In this case the user receives a warning. The Drystar 5500 does not have this feature.

Checking the correct position of a film in the input tray

You can verify that the film is properly loaded by watching the lower right corner of the films in the input tray. The rounding of this corner should be smaller than the other three corners. This is also indicated on the sticker at the right side of the input tray cover.



When closing the input tray, the Film Identification tag is read and the printer settings are automatically adjusted. The Film Identification tag is located on the protective sheet on the backside of the film pack. The figure below shows the film pack upside down.



For some new film types, the Film Identification tag will be covered by a sticker and therefore will not be visible.

Chapter 3

Advanced operation (Key-operator mode)

This chapter gives an overview of functions for the advanced user:

Overview of Key-operator functions

The Key-operator menus make it possible to use the Drystar 5500 advanced functions. If not specified otherwise, the functions are described in detail in this chapter.

For general information on the functions of the Drystar 5500 keys, refer to *'The local user interface'* on page 27.

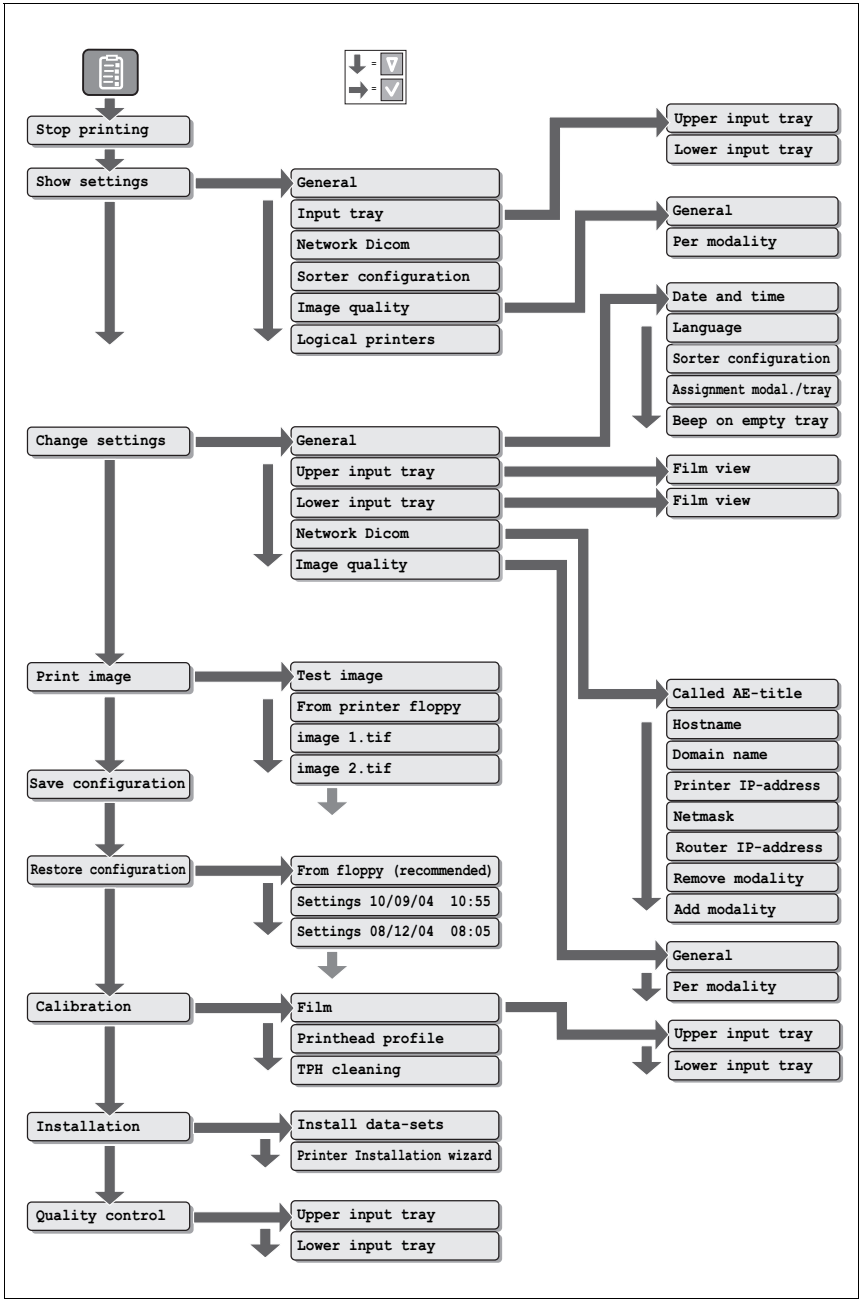
Overview

The Drystar 5500 features the following functions on the main menu level of the Key-operator mode:

Menu item	Function	Page
Stop printing	To halt the printing procedure	59
Show settings	To consult the current settings of the printer.	60
Change settings	To change the current settings of the printer.	69
Print Image	To print one of the standard Drystar 5500 test images. To load and print images from a floppy disk.	100
Save configuration	To make a back-up of the printer settings.	105
Restore configuration	To restore the back-up of the printer settings.	107
Calibration	To calibrate the printer.	111
Installation	To install the software with the installation wizard.	121
Quality control	To control with a daily procedure the image quality respectively of general radiography & mammography (optional) applications.	141 & 153

Refer to the indicated page for an explanation of the function and the appropriate procedures.

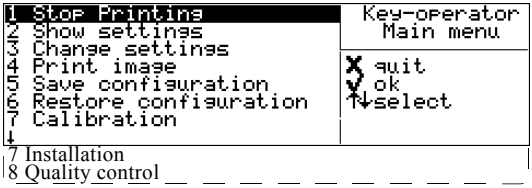
The menu structure



Accessing the Key-operator menus

- The Key-operator mode functions (i.e. the main menu level) can be accessed by pressing the Key-operator key on the front panel.

After pressing the Key-operator key the Main menu is displayed:



- You can scroll through the menu items by pressing the Down and Up keys and select a menu item by pressing the Confirm key.



- At any moment, you can press the Escape key on the main menu level to exit the Key-operator mode. If you press this key on a lower level menu you are returned to the higher level menu. If you press this key on a data screen after entering information, all changes on that screen are lost.

- A time-out function (default set to ten minutes) is foreseen. When this time-out is about to expire, the following screen is displayed:

Press the Confirm key to return to the Key-operator menu. Otherwise, the Key-operator menu will be closed.

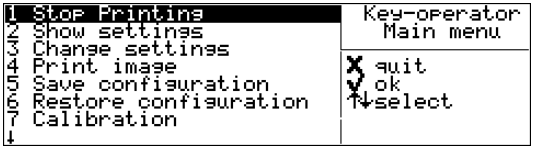
The Drystar 5500 will sound a long beep if you press a key that is not to be used at that moment.

Stopping the printing process

To stop the printing process on an adequate way, it is recommended to use the Stop printing menu.

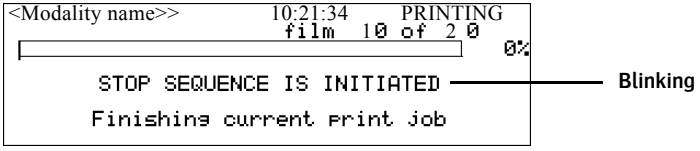
Accessing the Stop printing menu

1 Press the Key-operator key to enter the Key-operator mode.



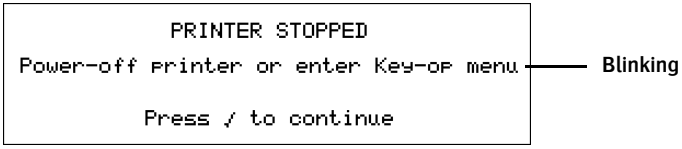
2 On the Key-operator main menu, press the Confirm key to select 'Stop printing'.

While the current print job is finished, the Stop Printing screen is displayed:



The modality name defined during installation will be used to refer to the corresponding modality. In case there is also a nickname (daily used name) defined during installation, the nickname is used.

After the current print job is completed, the following screen is displayed:



3 Press the Confirm key to resume printing or press the Escape key to return to the Key-operator main menu.

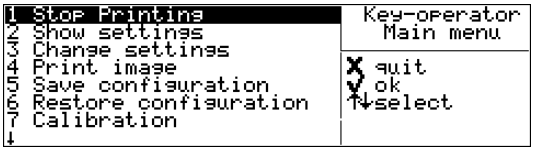
Viewing printer information

A number of data and parameter settings of the printer can be viewed by using the '**Show settings**' function:

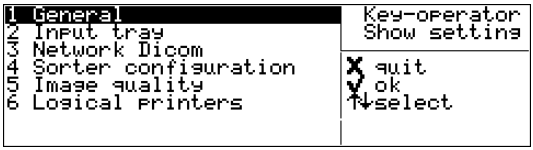
Accessing the Show settings menu

1 Press the Key-operator key to enter the Key-operator mode.

2 On the Key-operator main menu, press the Down key once, followed by the Confirm key to select 'Show settings'.



The Show settings menu is displayed:



This menu is the starting point for viewing printer information.

3 Press the Escape key to return to the Key-operator main menu.

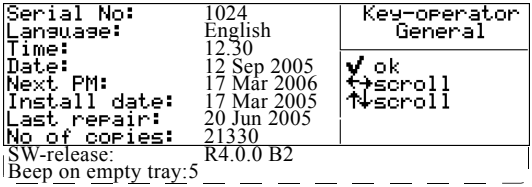
4 Press the Escape key to quit the Key-operator mode.

Viewing general information

1 Perform steps 1 and 2 of the *'Accessing the Show settings menu'* procedure, on page 61.

2 On the Show settings menu, press the Confirm key to select 'General'.

The 'General' info screen is displayed:



Use the Up and Down keys to scroll through the following items:

- the serial number of the printer,
- the language,
- the current time and date,
- the next preventive maintenance (PM) date,
- the install date,
- the last repair date,
- the total number of films printed,
- the currently installed software version,
- the beep on empty tray setting (No beep, 5 times, many).

3 Press the Escape key to return to the Show settings menu.

Viewing input tray information

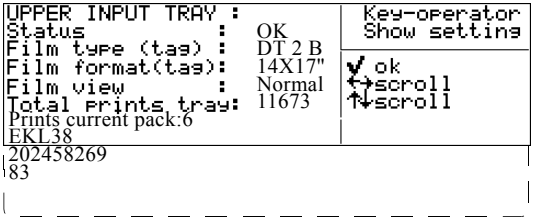
1 Perform steps 1 and 2 of the *'Accessing the Show settings menu'* procedure, on page 61.

2 On the Show settings menu, press the Down key once, followed by the Confirm key to select 'Input tray'.

The 'Input tray' screen is displayed:

3 Press the Up and Down keys followed by the Confirm key to select the desired input tray.

In case you have selected Upper input tray, the Upper input tray screen is displayed:



If you have selected lower input tray, a screen with similar information about the lower tray is shown.

For both input trays, the following information is displayed on the currently loaded film:

- the status (OK / disabled/overruled),
- the film type read from the Film Identification tag,
- the film format read from Film Identification tag,
- the film view,
- the total number of prints for the input tray,
- the number of prints for this film pack,
- the brand (ABC Code),
- the order number,
- the pack number.

4 Press the Confirm key to return to the Show settings menu.

Viewing network (DICOM) information

1 Perform steps 1 and 2 of the *'Accessing the Show settings menu'* procedure, on page 61.

2 On the Show settings menu, press the Down key twice, followed by the Confirm key to select 'Network (DICOM)'.

The 'Network (DICOM)' screen is displayed:

The following network (DICOM) parameters are displayed:

- AE-title,
- Host name,
- Domain,
- Printer IP-address,
- Netmask,
- Router,
- MAC address.

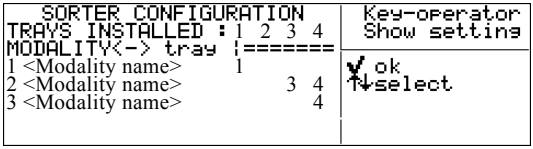
3 Press the Confirm key to return to the Show settings menu.

Viewing the sorter configuration

1 Perform steps 1 and 2 of the *'Accessing the Show settings menu'* procedure, on page 61.

2 On the Show settings menu, press the Down key three times, followed by the Confirm key to select 'Sorter Configuration'.

The 'Sorter Configuration' screen is displayed:



This screen gives an overview of:

- the installed trays and their positions (the upper tray has position one, the lower tray position 4).
- the assignment of the installed modalities and corresponding tray(s).

The previous screen is an example of a situation where only tray 1, 3 and 4 are installed and the second modality is a fast modality.

3 Press the Up and Down keys to select the modality of your choice.

4 Press the Confirm key to return to the Show settings menu.

Viewing general Image quality information

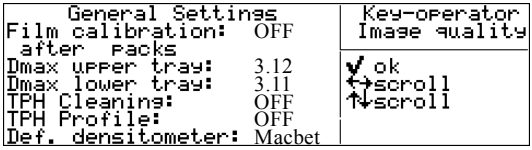
1 Perform steps 1 and 2 of the *'Accessing the Show settings menu'* procedure, on page 61.

2 On the Show settings menu, press the Down key four times, followed by the Confirm key to select 'Image quality'.

The following screen will appear:

3 Press the Confirm key to select 'General'.

The general Image quality settings are displayed:



The following info is displayed:

- Film calibration setting: OFF/ON with the number of film packs determining the calibration interval (if ON).
- Dmax upper tray: the maximum density for the upper input tray resulting from the automatic film calibration.
- Dmax lower tray: the maximum density for the lower input tray resulting from the automatic film calibration.
- TPH cleaning: the number of prints after the last thermal head cleaning, and the number of prints to go before a new cleaning session is necessary.
- TPH profile: the number of prints after the last thermal head profile calibration and the number of prints to go before a new thermal head profile calibration is necessary.
- Def. densitometer: shows the default densitometer that is used for the calibrations.

4 Press the Confirm key to return to the Image quality menu.

5 In the Image quality menu, press the Escape key to return to the Show settings menu.

Viewing Image quality information for a modality

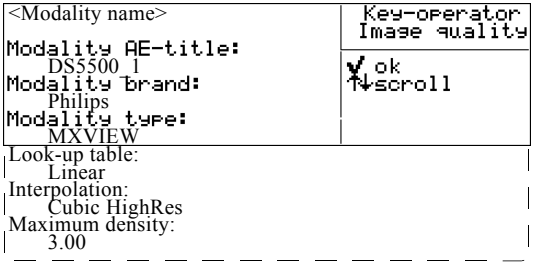
1 Perform steps 1 and 2 of the *'Accessing the Show settings menu'* procedure, on page 61.

2 On the Show settings menu, press the Down key four times, followed by the Confirm key to select 'Image quality'.

The following screen will appear:

3 Press the Up/Down arrow keys, followed by the Confirm key to select the desired modality.

4 Press the Confirm key to display the Image quality settings for the selected modality, or the Escape key to quit.



5 Press the Confirm key to return to the Image quality menu.

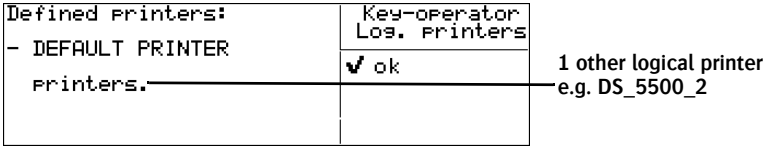
6 In the Image quality menu, press the Escape key to return to the Show settings menu.

Viewing the logical printers configuration

1 Perform steps 1 and 2 of the *'Accessing the Show settings menu'* procedure, on page 61.

2 On the Show settings menu, press the Down key five times, followed by the Confirm key to select 'Logical printers'.

The 'Logical printers' screen is displayed:



This screen gives an overview of the logical printers defined in the Drystar 5500.

The Logical printers information can be helpful when assigning a modality output to a particular Drystar 5500 profile. Configuring logical printers can only be done via a connected remote pc. Contact your local service organization for more information.

3 Press the Confirm key to return to the Show settings menu.

Changing the configuration settings

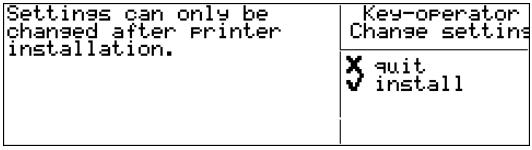
A number of data and parameters settings of the printer can be viewed and changed by using the '**change settings**' function.

Each time the settings have been changed, the new configuration is automatically stored on the hard disk of the printer. You will be asked to create a back-up floppy with the new settings.

Image quality	
'Changing general image quality settings - Film calibration'	91
'Changing general image quality settings - Default densitometer'	93
'Changing Image quality setting for a modality - Selecting a lookup table'	94
'Changing Image quality setting for a modality - Changing the Interpolation'	96
'Changing Image quality setting for a modality - Changing the maximum density (Dmax)'	98

Accessing the Change settings menu

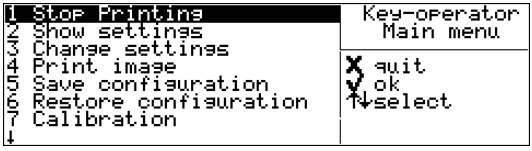
If the printer has not yet been installed, the 'printer installation wizard' should be executed first. In this case, the following screen is displayed:



Proceed as follows to access the 'Change settings' menu:

1 Press the Key-operator key to enter the Key-operator mode.

2 On the Key-operator main menu, press the Down key twice, followed by the Confirm key to select 'Change settings'.



The 'Change settings' screen is displayed:

3 Press the Escape key to return to the Key-operator main menu.

4 Press the Escape key to quit the Key-operator mode.

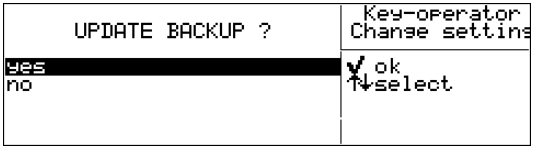
When the settings have been changed, the 'accept modifications' window is displayed:

Each time the settings have been changed and confirmed, an automatic back-up of the new configuration is made on the hard disk. You will also be asked to create a back-up floppy.

Select 'yes' if you wish to accept the changed settings. Press the Confirm key.

Select 'no' if you do not wish to accept the changed settings. Press the Confirm key. You will return to the Main menu.

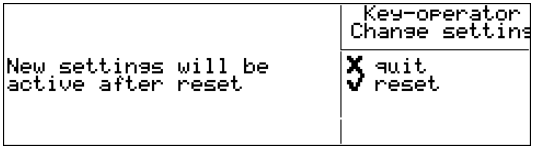
After selecting 'yes', the 'Update back-up' screen is displayed:



If you want to save the configuration on the back-up floppy, select 'yes' and press the Confirm key. The printer will now enter the *'Saving the current configuration'* (refer to page 105).

If you only want to save the configuration on the printer hard disk, select 'no' and press the Confirm key.

Next, the following screen is displayed:



Press the Confirm key to reset. After the reset, the new settings will be active.

Press the Escape key to quit the application. The old settings will remain active until the next reset.

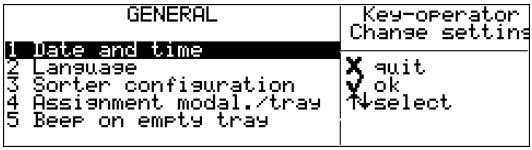
Changing the General settings

Changing the date and time

1 Perform steps 1 to 2 of the *'Accessing the Change settings menu'* procedure on page 70.

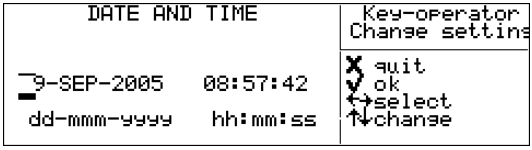
2 On the 'Change setting' screen, press the Confirm key to select 'General'.

The 'General' screen is displayed:



3 Press the Confirm key to select 'Date and time'.

The 'Date and time' screen is displayed:



4 Press the Up/Down arrow keys to increment/decrement the numbers. Press the Left/Right arrow keys to move through the digits.

For more info, refer to 'Data entry' on page 33.

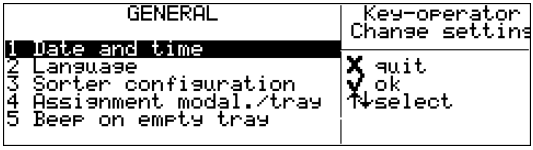
5 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

Changing the language

1 Perform steps 1 to 2 of the *'Accessing the Change settings menu'* procedure on page 70 to select the 'General' screen.

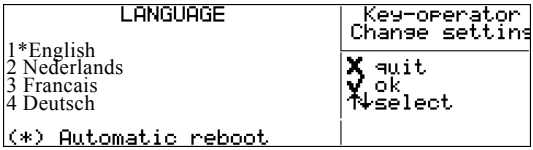
2 On the 'Change setting' screen, press the Confirm key to select 'General'.

The 'General' screen is displayed:



3 On the 'General' screen, press the Down key once, followed by the Confirm key to select 'Language'.

The 'Language' screen is displayed with the available languages. For example:



The current language is marked with an asterisk (*).

The number of displayed languages depends on the installed dataset. Contact your local Agfa service organization for the latest Drystar 5500 language availability status.

4 Press the Up/Down arrow keys, followed by the Confirm key to select the desired language.

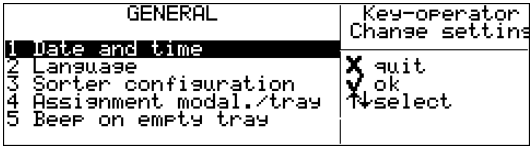
5 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

Changing the sorter configuration

1 Perform steps 1 to 2 of the *'Accessing the Change settings menu'* procedure on page 70 to select the 'General' screen.

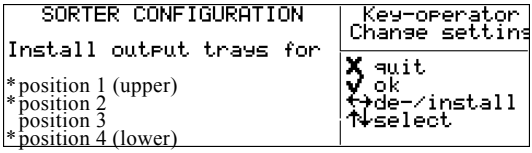
2 On the 'Change setting' screen, press the Confirm key to select 'General'.

The 'General' screen is displayed:



3 On the 'General' screen, press the Down key twice, followed by the Confirm key to select 'Sorter Configuration'.

The 'Sorter Configuration' screen is displayed:



An asterix left from an output tray indicates that the respective output tray is installed.

4 Use the Up and Down keys to select the output tray you wish to configure and press the Left/Right arrow keys to install/uninstall the output tray.

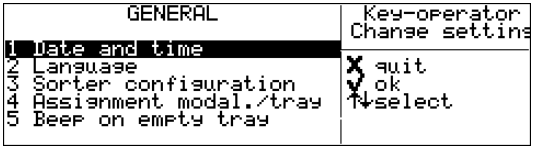
5 Click OK to install the indicated output tray.

Changing the assignment modality - output tray

1 Perform steps 1 to 2 of the *'Accessing the Change settings menu'* procedure on page 70 to select the 'General' screen.

2 On the 'Change setting' screen, press the Confirm key to select 'General'.

The 'General' screen is displayed:



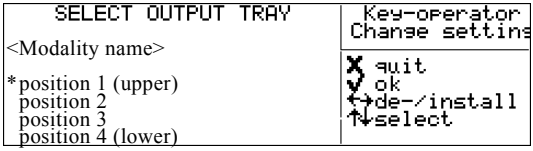
3 On the 'General' screen, press the Down key three times, followed by the Confirm key to select 'Assignment modal./tray'.

The 'Assignment modal./tray' screen is displayed:

4 Select a modality by using the select key and pressing Confirm.

The number of selections depends on the number of modalities defined.

The following window is displayed:



An asterix left from an output tray indicates that the respective output tray is installed.

5 Use the Up/Down arrow keys to select the output trays for the particular modality and press the Left/Right arrow keys to install button to uninstall/ install the output tray.

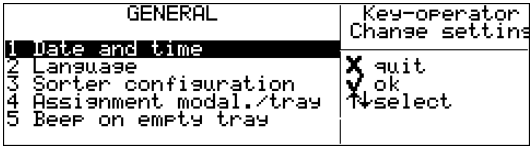
If you have selected more than one input tray, you must consecutively assign the output trays.

Changing the beep on empty tray settings

1 Perform steps 1 to 2 of the *'Accessing the Change settings menu'* procedure on page 70 to select the 'General' screen.

2 On the 'Change setting' screen, press the Confirm key to select 'General'.

The 'General' screen is displayed:



3 On the 'General' screen, press the Down key four times, followed by the Confirm key to select 'Beep on empty tray'.

The 'Audible alarm on empty tray' screen is displayed:

4 Use the Up/Down arrow keys to select the desired setting:

- Select 'No alarm' if you do not want an audible signal to warn you that a tray is empty.
- Select 5 times to hear 5 consecutive beeps at the moment a tray gets empty.
- Select 'While tray is empty' to hear a beep the whole time a tray is empty.

5 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

Changing the input tray settings (upper / lower)

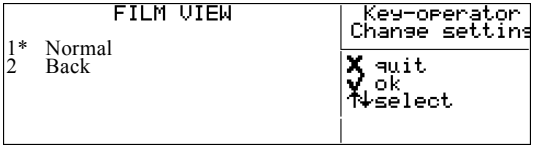
Changing the film view

In the procedure, we will assume that the film view for the upper input tray is to be changed. The procedure for the lower input tray is identical.

1 Perform steps 1 and 2 of the *'Accessing the Change settings menu'* procedure on page 70 to select the 'Upper input tray' screen.

2 In the 'Upper input tray' screen, press the Down key twice, followed by the Confirm key to select 'Film view'.

The 'Film view' screen is displayed:



The current film view is indicated with an *.

3 Press the Up/Down arrow keys to select the desired film view.

4 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

Changing Network (DICOM) configuration

Changing the Printer AE-title (Called AE-title)

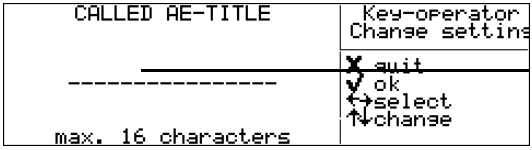
1 Perform steps 1 to 2 of the *'Accessing the Change settings menu'* procedure on page 70.

2 On the 'Change setting' screen, press the Down key three times, followed by the Confirm key to select 'Network Dicom'.

The 'Network Dicom' screen is displayed:

3 Press the Confirm key to select 'Called AE-title'.

The 'Called AE-title' screen is displayed:



e.g. DS5500

If the printer AE-Title has already been assigned, it will be shown on the display.

4 Change the printer AE-title by means of the arrow keys. Refer to *'Data entry'* on page 33. Make sure not to enter more than 16 characters.

Entries are case sensitive.

5 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

Changing the Hostname

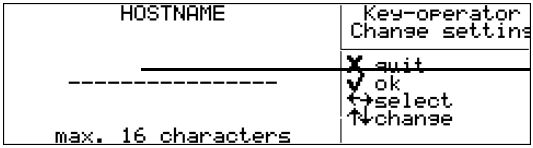
1 Perform steps 1 to 2 of the *'Accessing the Change settings menu'* procedure on page 70.

2 On the 'Change setting' screen, press the Down key three times, followed by the Confirm key to select 'Network Dicom'.

The 'Network Dicom' screen is displayed:

3 In the 'Network-Dicom' screen, press the Down key once, followed by the Confirm key to select 'Hostname'.

The 'Hostname' screen is displayed:



If the Host name has already been assigned, it will be shown on the display.

4 Change the hostname by means of the arrow keys. Refer to *'Data entry'* on page 33. Make sure not to enter more than 16 characters.

Entries are case sensitive.

5 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

Changing the Domain name

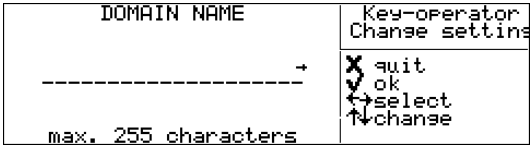
1 Perform steps 1 to 2 of the *'Accessing the Change settings menu'* procedure on page 70.

2 On the 'Change setting' screen, press the Down key three times, followed by the Confirm key to select 'Network Dicom'.

The 'Network Dicom' screen is displayed:

3 On the 'Network-Dicom' screen, press the Down key twice, followed by the Confirm key to select 'Domain name'.

The 'Domain name' screen is displayed:



If the domain name has already been assigned, it will be shown on the display.

4 Enter the domain name by means of the arrow keys. Refer to *'Data entry'* on page 33.

Entries are case sensitive.

5 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

Changing the Printer IP-address

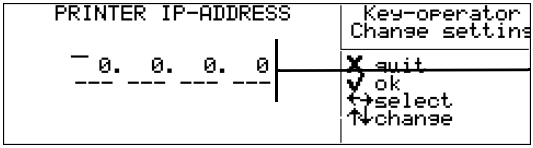
1 Perform steps 1 to 2 of the *'Accessing the Change settings menu'* procedure on page 70.

2 On the 'Change setting' screen, press the Down key three times, followed by the Confirm key to select 'Network Dicom'.

The 'Network Dicom' screen is displayed:

3 On the 'Network-Dicom' screen, press the Down key three times, followed by the Confirm key to select 'Printer IP-address'.

The 'Printer IP-address' screen is displayed:



e.g. 10.233. 93. 46

If the IP-address has already been assigned, it will be shown on the display.

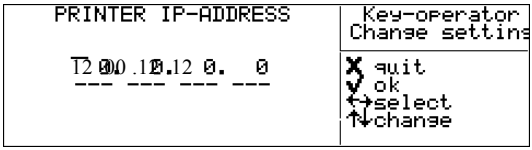
When no DHCP server is available and when the IP address of the printer has never been set, the printer IP address will be set to the address 169.254.10.10.

4 Press the Up/Down arrow keys to increment/decrement the numbers. Press the Left/Right arrow keys to move through the fields. Press the Confirm key to store the data.

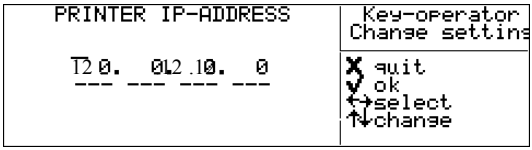
Refer to 'Data entry' on page 33.

Note that blank spaces will not be filled in (see examples on the next page).

Example: If the IP-address is 120.000.120.120, then the data entry should be as follows:



Example: If the IP-address is 120.0.120.120, then the data entry should be as follows:



5 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

Changing the Netmask

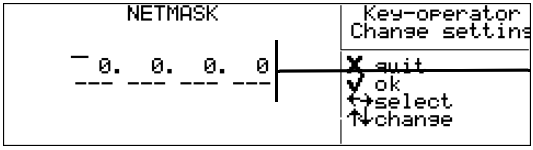
1 Perform steps 1 to 2 of the *'Accessing the Change settings menu'* procedure on page 70.

2 On the 'Change setting' screen, press the Down key three times, followed by the Confirm key to select 'Network Dicom'.

The 'Network Dicom' screen is displayed:

3 On the 'Network-Dicom' screen, press the Down key four times, followed by the Confirm key to select 'Netmask'.

The 'Netmask' screen is displayed:



e.g. 255.255.252. 0

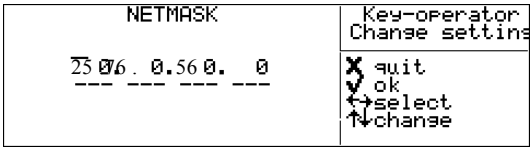
If the Netmask has already been assigned, it will be shown on the display.

When no DHCP server is available and when the subnet mask of the printer has never been set, the subnet mask will be set to the APIPA address 255.255.0.0.

4 Enter the Netmask by means of the arrow keys. Refer to *'Data entry'* on page 33.

Note that blank spaces will not be filled in (see examples on the next page).

Example: If the Netmask is 250.760.560. 0, then the data entry should be as follows:



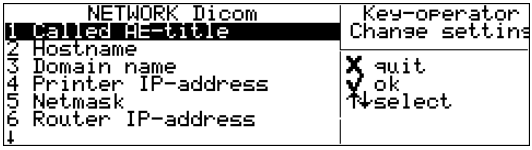
5 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

Changing the Router IP-address

1 Perform steps 1 to 2 of the *'Accessing the Change settings menu'* procedure on page 70.

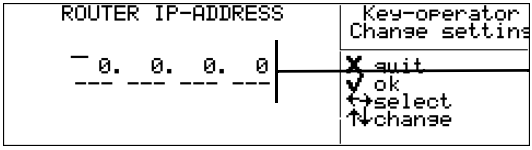
2 On the 'Change setting' screen, press the Down key three times, followed by the Confirm key to select 'Network Dicom'.

The 'Network Dicom' screen is displayed:



3 On the 'Network-Dicom' screen, press the Down key five times, followed by the Confirm key to select 'Router IP-address'.

The 'Router IP-address' screen is displayed:

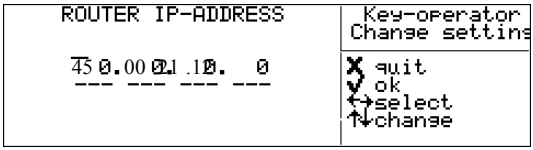


If the Router IP-address has already been assigned, it will be shown on the display.

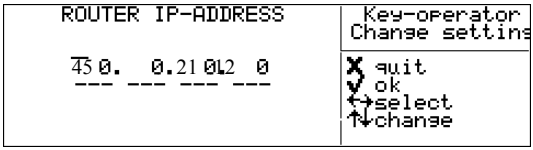
4 Enter the Router IP-address by means of the arrow keys. Refer to *'Data entry'* on page 33.

Note that blank spaces will not be filled in (see examples on the next page).

Example: If the Router IP-address is 450.000.210.120, then the data entry should be as follows:



Example: If the Router IP-address is 450.0.210.120, then the data entry should be as follows:



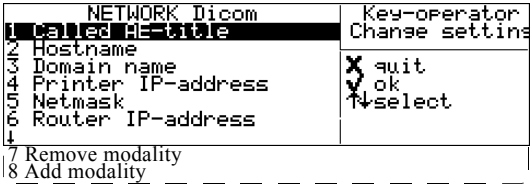
5 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

Removing a modality

1 Perform steps 1 to 2 of the *'Accessing the Change settings menu'* procedure on page 70.

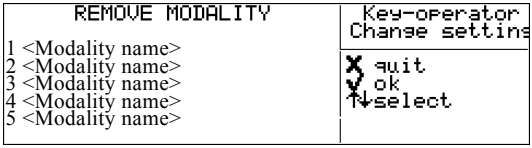
2 On the 'Change setting' screen, press the Down key three times, followed by the Confirm key to select 'Network Dicom'.

The 'Network Dicom' screen is displayed:



3 On the 'Network-Dicom' screen, press the Down key six times, followed by the Confirm key to select 'Remove modality'.

The 'Remove modality' screen is displayed:



The modality names, entered during installation of the printer, are shown in the list. If no names have been entered, the Called AE-titles are shown instead. In case there is also a nickname (daily used name) defined during installation, the nickname is used.

4 Select the modality which you wish to remove by means of the arrow keys.

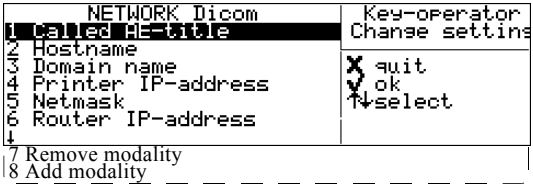
5 Press the Confirm key to remove the modality name from the list, or the Escape key to quit the procedure without any changes.

Adding a modality

1 Perform steps 1 to 2 of the *'Accessing the Change settings menu'* procedure on page 70.

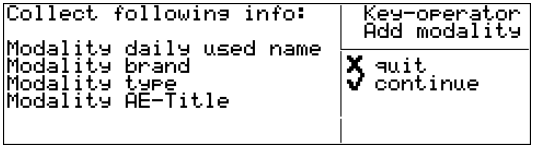
2 On the 'Change setting' screen, press the Down key three times, followed by the Confirm key to select 'Network Dicom'.

The 'Network Dicom' screen is displayed:



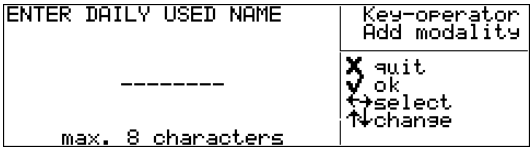
3 On the 'Network-Dicom' screen, press the Down key seven times, followed by the Confirm key to select 'Add modality'.

4 The 'Add Modality' screen is displayed, asking you to collect the appropriate info on the new modality (see your System Administrator if necessary):



5 Press the Confirm key to continue, or the Escape key to quit the procedure without any changes.

The 'Enter modality daily used name' screen is displayed:

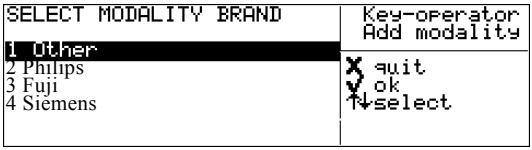


6 Enter the modality daily used name (nickname) by means of the arrow keys. Refer to *'Data entry'* on page 33. Make sure not to enter more than 8 characters.

A blank daily used modality name is not allowed.

7 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

The 'Select modality brand' screen is displayed:

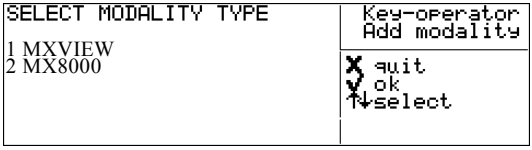


8 Press the Up/Down arrow keys to select the appropriate modality brand name.

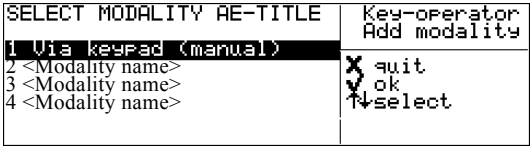
- In case you have selected 'Other', the Modality AE-title will be linked with the default settings. Proceed with step 10.

9 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

The 'Select modality type' screen is displayed:

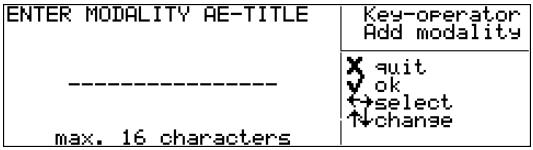


10 The 'select modality AE-title' screen is displayed:



11 Press the Up/Down arrow keys to select the appropriate modality AE-title.

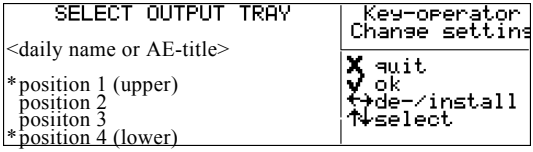
- In case you have selected '1 Enter via keypad (manual)', the 'Enter modality AE-title' screen is displayed:



Enter the Modality AE-title by means of the arrow keys. Refer to *'Data entry'* on page 33. Make sure not to enter more than 16 characters.

12 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

The 'Select output tray for <daily name or AE-title>' screen will appear:

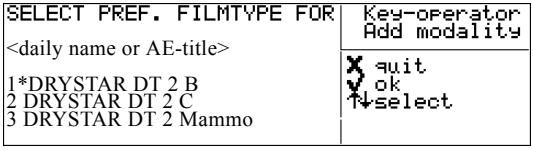


Press the Up/Down arrow keys to select the output tray. You can (de)activate the selected output tray with the Left/Right arrow keys.

*Activated output trays are marked with an *.*

13 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

The 'Select preferred film type for <daily name or AE-title>' screen will appear:

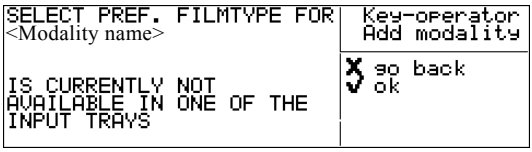


'DRYSTAR DT 2 Mammo' is only shown in the list when the option for the mammography application is activated. Refer to 'Options and accessories' on page 235.

You can find the film type on the film packaging, e.g. 'DRYSTAR DT 2 C'.

14 Press the Up/Down arrow keys to select the preferred film type for this modality.

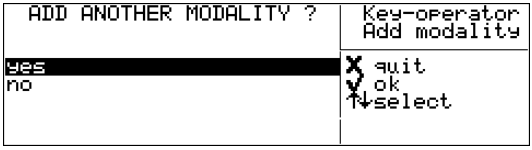
In case the current film type in the trays does not match the selected film type the following message is displayed:



15 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

The data entry for the new modality is finished now.

The printer will ask you if you want to add another modality:



16 If you wish to add another modality, select Yes and press the Confirm key. You will be taken back to step 4 to repeat the procedure.

17 If you do not wish to add another modality, select No and press the Escape key, or press the Escape key. The printer will return to the Network-Dicom menu.

Changing the image quality settings

Changing general image quality settings - Film calibration

1 Perform steps 1 and 2 of the *'Accessing the Change settings menu'* procedure on page 70.

2 On the 'Change setting' screen, press the Down key four times, followed by the Confirm key to select 'Image quality'.

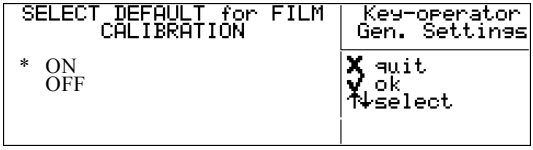
The following screen will appear:

3 Press the Confirm key to select 'General'.

The 'General settings' screen will appear:

4 Press the Confirm key to select 'Film calibration'.

The 'Select default for film calibration' screen is displayed:

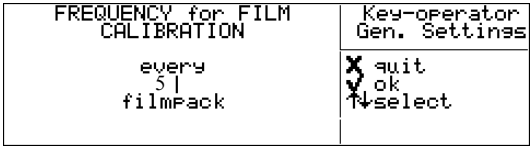


This setting is by default set to ON and will apply to every modality.

The current setting is marked with an *.

5 Press the Up/Down arrow keys to select the preferred film calibration default.

When the setting is ON, the Drystar 5500 will ask you to enter the calibration frequency:



Enter the calibration frequency by means of the Up/Down arrow keys. Refer to *'Data entry'* on page 33.

1 pack = 100 sheets

E.g., if the frequency is set to 5, this means that a film calibration is executed automatically every 5 packs or every 500 sheets.

You can specify to perform an automatic film calibration after loading every "n" film packs.

For more information on film calibration settings: refer to 'Understanding the calibration policy and the calibration initiation' on page 221.

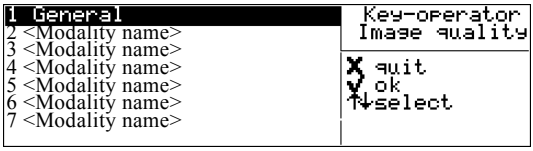
6 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

Changing general image quality settings - Default densitometer

1 Perform steps 1 and 2 of the *'Accessing the Change settings menu'* procedure on page 70.

2 On the 'Change setting' screen, press the Down key four times, followed by the Confirm key to select 'Image quality'.

The following screen will appear:

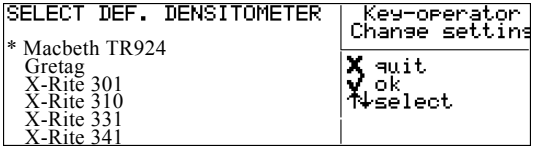


3 Press the Confirm key to select 'General'.

The 'General settings' screen will appear:

4 Press the Down key once, followed by the Confirm key to select 'Default densitometer'.

The 'Default densitometer' screen is displayed:



The current default densitometer is marked with an *.

5 Press the Up/Down arrow keys to select the default densitometer.

6 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

All shown densities will vary slightly according to the densitometer selection. Refer to 'Drystar media density response data' on page 237.

Changing Image quality setting for a modality - Selecting a lookup table

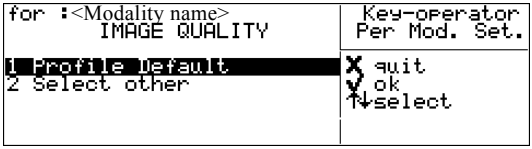
1 Perform steps 1 and 2 of the *'Accessing the Change settings menu'* procedure on page 70.

2 On the 'Change settings' screen, press the Down key four times, followed by the Confirm key to select 'Image quality'.

The following screen will appear:

3 Press the Up/Down arrow keys to select the modality for which you want to change the image quality settings.

The 'Image quality' screen for the selected modality is displayed:



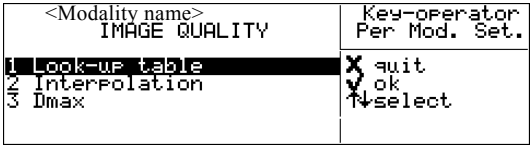
4 Do one of the following:

- If you want to attribute the default profile, select 'Profile default' and press the Confirm key.

  You return to the screen of step 2.
- If you want to add a custom profile, select 'Select other' and press the Confirm key.

  Proceed with step 5.

5 The 'Image quality' screen for the selected modality is displayed:



6 Press the Confirm key to select 'Look-up table'.

The 'Look-up table' screen for the selected modality is displayed:

<Modality name> LOOK-UP TABLE	Key-operator Per Mod. Set.
1 Kanamori 2 Linear 3 Kanamor-like (100)	✗ quit ✓ ok ↑↓select

7 Press the Up/Down arrow keys to select the desired lookup table.

8 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

- In case Kanamori-like is selected, change the Kanamori-value.
  An additional screen for the Kanamori-like value is displayed:

<Modality name> IMAGE QUALITY	Key-operator Per Mod. Set.
Enter Kanamori-like value 100| ---	✗ quit ✓ ok ←→select ↑↓change

All Kanamori-like curves are selectable starting from 75 until 220 in steps of 1 unit. The activated setting is marked with an *.

In case a number of settings for a modality were set via a remote computer, you will not be able to change the image quality information for this modality manually. If this is the case, the following screen will appear:

for :<Modality name> IMAGE QUALITY	Key-operator Per Mod. Set.
CONFIGURED WITH PREDEFINED MODALITY SETTINGS NOT ALLOWED TO CHANGE	✓ ok

In case the image quality parameters need to be changed for this modality, please use the DICOM Configuration tool, in the Specialist or Service mode (specialist mode available only via remote network PC). You can also delete this modality (refer to 'Removing a modality' on page 86) and create a new modality with the same name. For this new modality new parameters can be assigned via the local keypad.

Changing Image quality setting for a modality - Changing the Interpolation

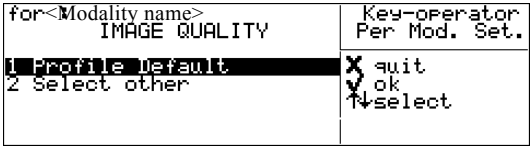
1 Perform steps 1 and 2 of the *'Accessing the Change settings menu'* procedure on page 70.

2 On the 'Change setting' screen, press the Down key four times, followed by the Confirm key to select 'Image quality'.

The following screen will appear:

3 Press the Up/Down arrow keys to select the modality for which you want to change the image quality settings.

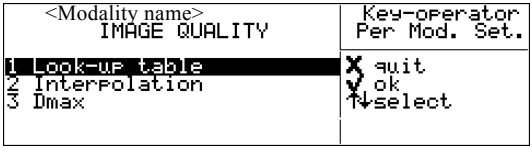
The 'Image quality' screen for the selected modality is displayed:



4 Do one of the following:

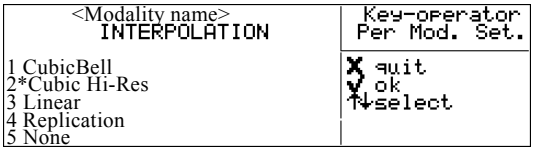
- If you want to attribute the default profile, select 'Profile default' and press the Confirm key.
  You will return to the screen of step 2.
- If you want to add a custom profile, select 'Select other' and press the Confirm key.
  Proceed with step 5.

5 The 'Image quality' screen for the selected modality is displayed:



6 On the 'Image quality' screen press the Down key once, followed by the Confirm key to select 'Interpolation'.

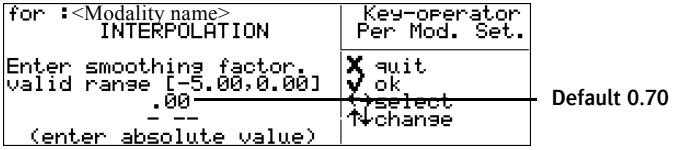
The 'Interpolation' screen for the selected modality is displayed:



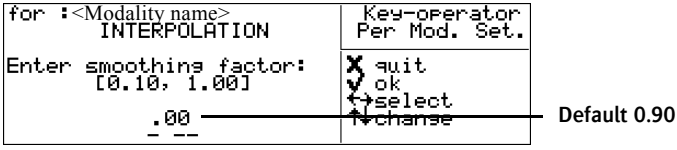
The current interpolation setting for the selected modality is marked with an *.

7 Press the Up/Down arrow keys to select the desired Interpolation setting for this modality.

- If you select "Cubic Hi-Res" the following screen will appear, allowing you to adjust the smoothing factor:



- If you select "CubicBell" the following screen will appear, allowing you to adjust the smoothing factor:



8 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

The user should be aware that the interpolation values differ when the A#Sharp feature is deactivated. The A#Sharp feature, which is a technology that enhances the image sharpness, is active by default. For more information about (de)activating the A#Sharp feature, refer to the Drystar 5500/5503 Service manual.

Changing Image quality setting for a modality - Changing the maximum density (Dmax)

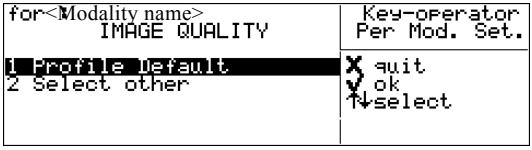
1 Perform steps 1 and 2 of the *'Accessing the Change settings menu'* procedure on page 70.

2 On the 'Change setting' screen, press the Down key four times, followed by the Confirm key to select 'Image quality'.

The following screen will appear:

3 Press the Up/Down arrow keys to select the modality for which you want to change the image quality settings.

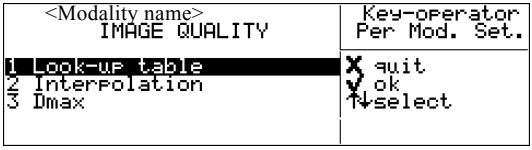
The 'Image quality' screen for the selected modality is displayed:



4 Do one of the following:

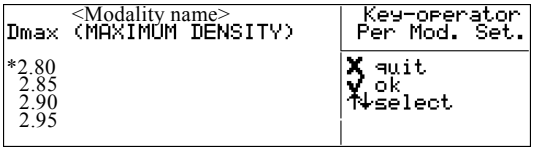
- If you want to attribute the default profile, select 'Profile default' and press the Confirm key.
  You will return to the screen of step 2.
- If you want to add a custom profile, select 'Select other' and press the Confirm key.
  Proceed with step 5.

5 The 'Image quality' screen for the selected modality is displayed:



6 On the 'Image quality' screen press the Down key twice, followed by the Confirm key to select 'Dmax'.

The 'Dmax (maximum density)' screen for the selected modality is displayed:



All maximum densities are selectable starting from 2.75 until 3.20 in steps of 0.05 units. The current setting for the selected modality is marked with an *.

The maximum density will be limited to the maximum density of the media.

7 Press the Up/Down arrow keys to select the desired Maximum Density setting for this modality.

8 Press the Confirm key to store the data, or the Escape key to quit the procedure without any changes.

Printing images

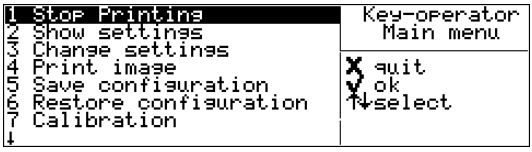
A number of 'test' images can be printed, either from floppy disk or from the hard disk:

Show settings	Page
Test image	
'Printing test images from the hard disk'	101
Floppy disk	
'Printing files from printer floppy'	102

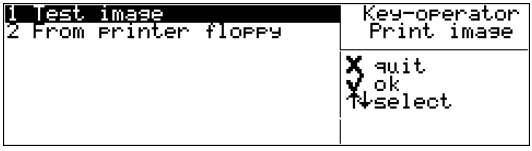
Accessing the Print images menu

1 Press the Key-operator key to enter the Key-operator mode.

2 On the Key-operator main menu, press the Down key three times followed by the Confirm key to select 'Print image'.



The Print image menu is displayed:



3 Press the Escape key to return to the Key-operator main menu.

4 Press the Escape key to quit the Key-operator mode.

Printing test images from the hard disk

Test images are useful for checking the print quality. The Drystar 5500 offers a number of built-in test images stored on the hard disk.

1 Perform steps 1 to 2 of the *'Accessing the Print images menu'* procedure on page 100 to select the 'Print image' screen.

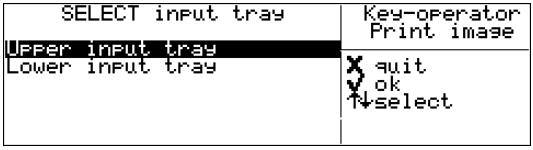
2 On the 'Print image' menu, press the Confirm key to select 'Test image'.

The 'Select test image' screen is displayed:

3 Press the Up/Down arrow keys to select the desired test image, followed by the Confirm key.

4 Define the input tray for printing.

The 'Select input tray' screen is displayed:



5 Press the Up/Down arrow keys to select the desired input tray, followed by the Confirm key.

The 'Number of copies' screen is displayed:

6 Press the arrow keys to increment/decrement the number. Press the Left/Right arrow keys to move through the field.

For more info, refer to *'Data entry'* on page 33.

7 Press the Confirm key to confirm the number of copies.

The 'Queuing file' screen will be shown to indicate to the operator that the printing action from floppy is accepted and in process:

QUEUEING FILE	Key-operator Print image
<filename>	
Please wait	

After about five seconds this screen will disappear.

Printing files from printer floppy

TIFF images stored on a floppy disk can be printed using the 'Print from floppy' function.

1 Perform steps 1 to 2 of the *'Accessing the Print images menu'* procedure on page 100 to select the 'Print image' screen.

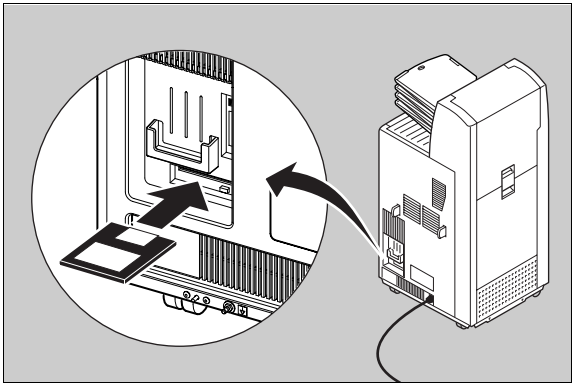
2 On the Print image menu, press the Down key once, followed by the Confirm key to select 'From floppy'.

The 'Print from floppy' screen is displayed:

PRINT FROM FLOPPY	Key-operator Print image
INSERT FLOPPY DISK	✗ quit ✓ ok

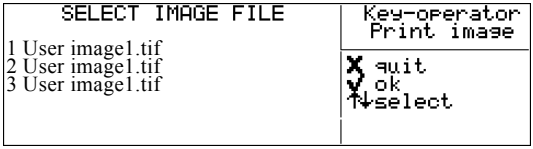
3 Insert the floppy disk containing the TIFF file(s) you want to be printed.

The drive is located at the rear of the printer.



4 Press the Confirm key to continue, or the Escape key to quit.

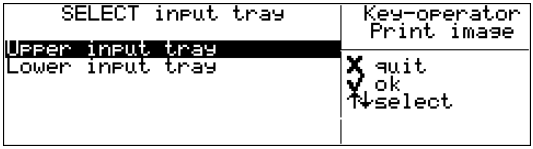
The 'Select image-file' screen is displayed:



5 Press the Up/Down arrow keys to select the desired .tif-file, followed by the Confirm key.

6 Define the input tray for printing.

The 'Select input tray' screen is displayed:



7 Press the Up/Down arrow keys to select the desired input tray, followed by the Confirm key.

The 'Number of copies' screen is displayed:

8 Press the arrow keys to increment/decrement the number. Press the Left/Right arrow keys to move through the field.

For more info, refer to 'Data entry' on page 33.

9 Press the Confirm key to confirm the number of copies.

The 'Copying and Queuing file' screen will be shown to indicate to the operator that the (printing) action is accepted and in progress:

COPYING and QUEUEING FILE	Key-operator Print image
<filename> Please wait	

After about 20 seconds the following screen appears:

PRINT FROM FLOPPY	Key-operator Print image
REMOVE FLOPPY FROM DRIVE	✔ ok

10 Remove the floppy disk from the drive and press the Confirm key to continue.

The print job is stored in the print queue.

Alternatively, you can print images directly from a connected Remote PC to the printer. Refer to 'Starting the remote session' on page 173.

Saving the configuration settings

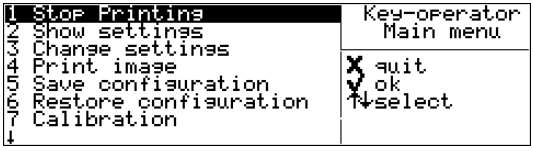
Each time the settings have been changed and confirmed, an automatic back-up of the new configuration is made on the hard disk. You will also be asked to create a back-up floppy.

It is also possible (and recommended) to regularly make a back-up of the printer settings to ensure safe restoring of the values when required.

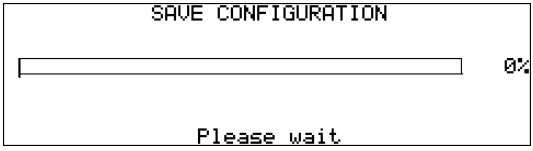
Saving the current configuration

1 Press the Key-operator key to enter the Key-operator mode.

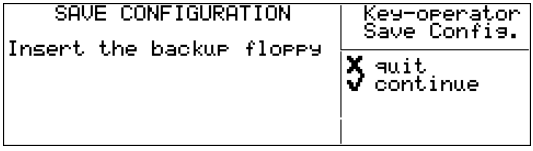
2 On the Key-operator main menu, press the Down key four times, followed by the Confirm key to select 'Save configuration'.



The following screen appears:

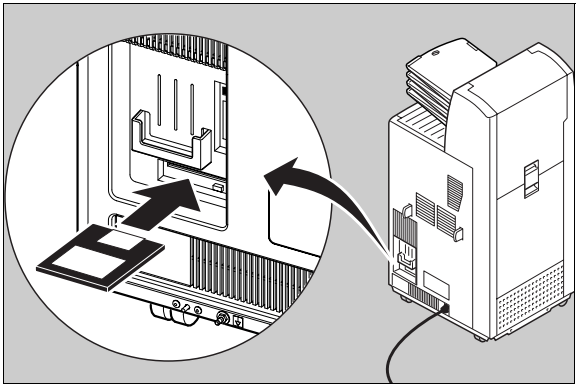


When 100% is reached, the following the 'Save configuration' screen is displayed:



3 Insert an empty floppy disk.

The drive is located at the rear of the printer.



For the back-up, an empty floppy disk is required (formatted, IBM-compatible, 2HD).

4 Press the Confirm key to continue.

A second 'Save configuration' screen is displayed.

```
SAVE CONFIGURATION

Copying...
D:/<path><filename>
   To
A:/<path><filename>

Please wait
```

The printer saves the configuration on the floppy disk.

The following screen is displayed:

```
SAVE CONFIGURATION          | Key-operator
                            | Save Config.
Remove the floppy from      |
the floppy drive            | ✔ confirm
```

5 Remove the floppy disk and press the Confirm key.

The following screen is displayed:

```
SAVE CONFIGURATION

Label floppy with data :
  "Backup floppy"
  "Serial number :  "
  "Date and time :     "

Press ✓ to continue
```

e.g.
1024
18-AUG-2005 11:07:18

6 Press the Confirm key. The program will return to the main Key-operator menu.

Restoring the configuration settings

When necessary, you can restore the configuration settings of the printer from a previously made back-up copy.

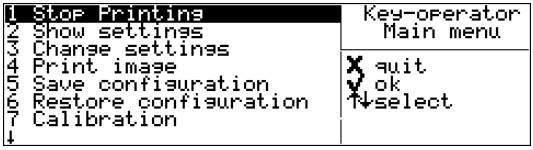
The following functions are provided for restoring a back-up copy of the configuration files:

- *'Restoring printer settings from the back-up floppy disk'* (page 108).
- *'Restoring printer settings from the hard disk'* (page 110).

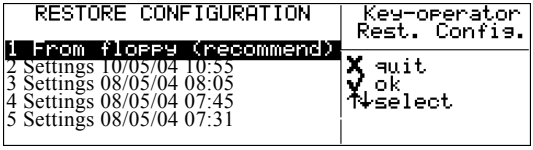
Accessing the restore configuration menu

1 Press the Key-operator key to enter the Key-operator mode.

2 On the Key-operator main menu, press the Down key five times, followed by the Confirm key to select 'Restore configuration'.



The 'Restore configuration' screen is displayed:



This menu is the starting point for restoring printer settings (see below).

3 Press the Escape key to return to the Key-operator main menu.

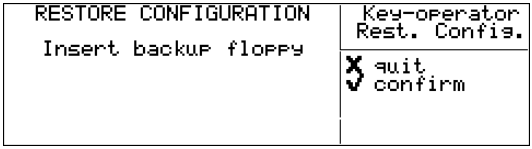
4 Press the Escape key to quit the Key-operator mode.

Restoring printer settings from the back-up floppy disk

1 Perform steps 1 to 2 of the *'Accessing the restore configuration menu'* procedure on page 107 to select the 'Restore Configuration' screen.

2 Press the Confirm key in the 'Restore configuration' screen to select 'From floppy (recommend)'.

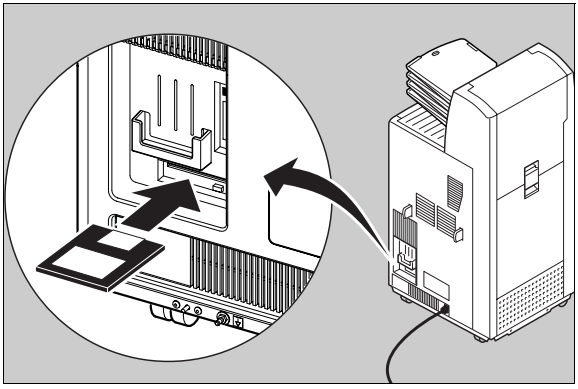
The following screen is displayed:



3 Insert the floppy disk which contains a back-up of the printer settings.

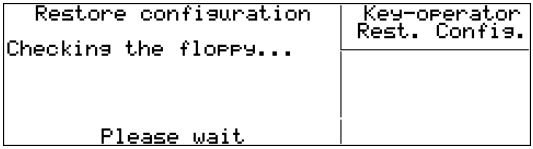
Make sure that you insert the correct floppy disk, containing the printer settings you want to restore.

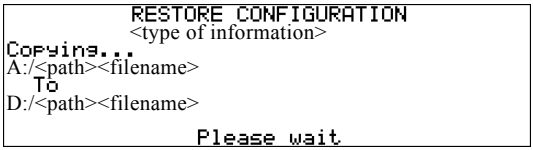
The drive is located at the rear of the printer.



4 Press the Confirm key to continue.

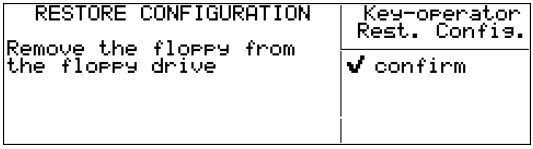
The following screens appear successively:





The printer restores the configuration on the hard disk.

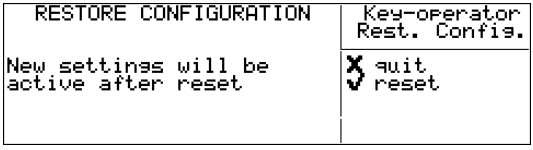
The following screen is displayed.



5 Remove the floppy disk.

6 Press the Confirm key to continue.

The following screen is displayed.

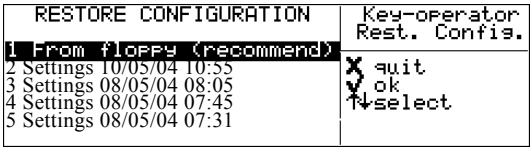


Press the Confirm key to reset the printer. After the reset, the new settings will be active.

Press the Escape key to quit the application. The old settings will remain active until the next reset.

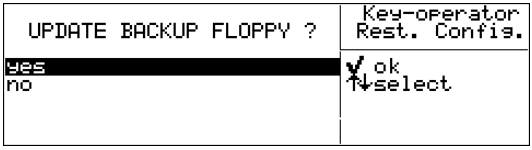
Restoring printer settings from the hard disk

1 Perform steps 1 to 2 of the *'Accessing the restore configuration menu'* procedure on page 107 to select the 'Restore Configuration' screen:



2 Press the Up/Down arrow keys in the 'Restore configuration' screen to select the required printer settings from the hard disk, followed by the Confirm key.

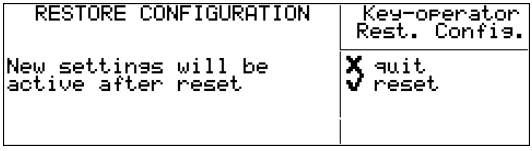
The following screen is displayed.



If you want to restore the configuration on the back-up floppy, select 'yes' and press the Confirm key. The printer will now enter the *'Saving the current configuration'* (refer to page 105).

If you only want to restore the configuration on the printer hard disk, select 'no' and press the Confirm key.

After the restore operation, the following screen is displayed.



Press the Confirm key to reset the printer. After the reset, the new settings will be active.

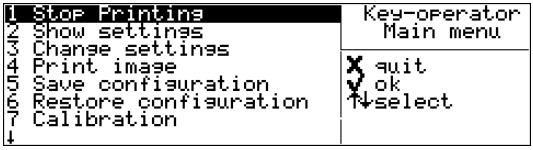
Press the Escape key to quit the application. The old settings will remain active until the next reset.

Performing the calibration procedures

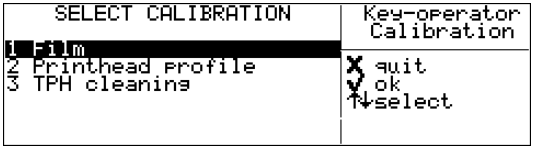
Accessing the calibration menu

1 Press the Key-operator key to enter the Key-operator mode.

2 Press the Down key six times, followed by the Confirm key to select 'Calibration'.



The 'Select Calibration' screen appears:



In case the printer is in printing mode, a screen will be presented that the calibration cannot be done now, but has to be reactivated later.

3 Press the Escape key to return to the Key-operator main menu.

4 Press the Escape key to quit the Key-operator mode.

Film calibration

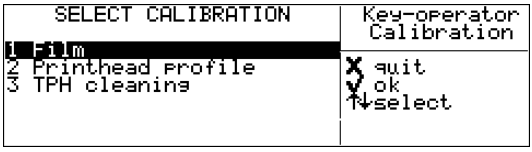
The film calibration combines Dmax and sensitometry calibration, and is activated as one single procedure. Separate Dmax and sensitometry calibration steps are not required.

For more general information on maintaining image quality, refer to *'Maintaining image quality and resolving Image quality problems'* on page 220.

In the procedure, we will assume a film calibration on the upper input tray. The procedure for the lower input tray is identical.

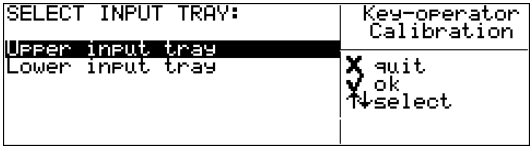
To start the film calibration:

1 Perform step 1 to 2 of the *'Accessing the calibration menu'* procedure on page 111 to select the 'Calibration' screen.



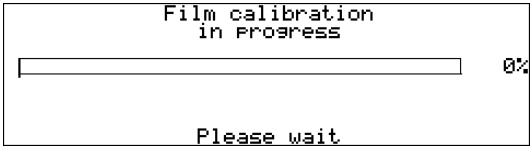
2 Press the Confirm key to select 'Film'.

The 'Select input tray' screen appears:



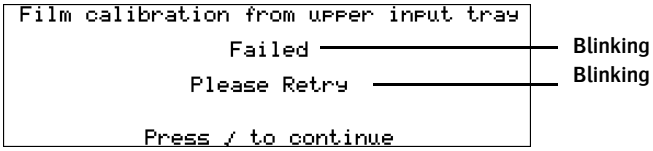
3 Press the Up/Down arrow keys to select an input tray, followed by the Confirm key (e.g. choose upper input tray).

The 'Film calibration in progress' screen appears:



The counter indicates the progress of the calibration process. The calibration film is measured automatically by the built-in MDM (Macro DensitoMeter). The Drystar 5500 is being calibrated during the printing process.

4 In case the film calibration has failed, the following message will appear.

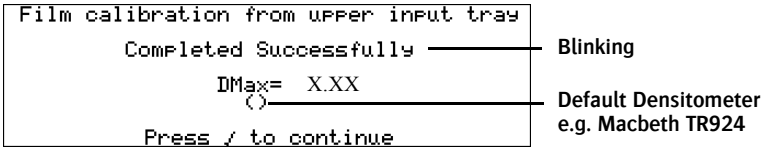


Press the Confirm key to retry the calibration.

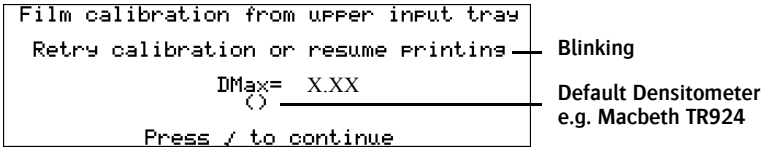
5 When the film calibration has completed succesfully, this indicates that the calibration procedure has been executed succesfully. This does not always mean that the result of the calibration is succesful.

Three cases are possible:

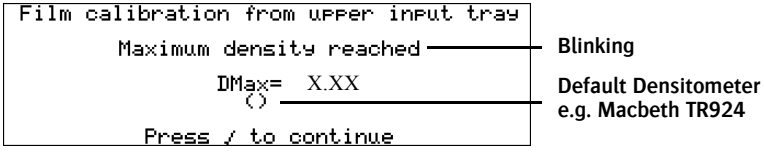
- Calibration successful, results OK.
  The obtained Dmax (x.xx) after calibration is displayed:



- Calibration successful, but Dmax differs more than 2% from the target value.
  The obtained Dmax (x.xx) after calibration is displayed:



- Calibration procedure succesful, but limited by film-Dmax. The obtained Dmax does not meet the required system Dmax and is limited by the film sensitometry.
  The obtained Dmax (x.xx) after calibration is displayed:

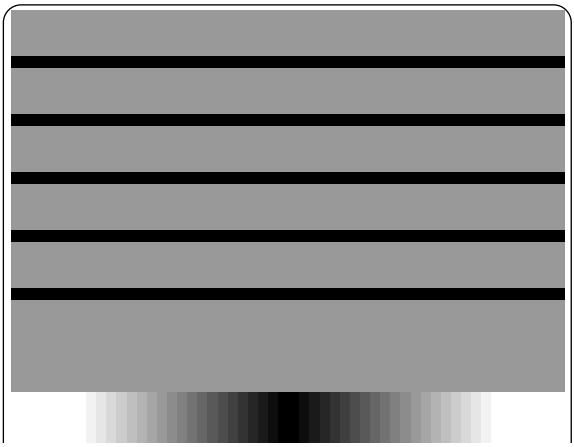


6 Press the Confirm key to return to the Calibration menu.

When the calibration process is interrupted, you will have to start the calibration procedure again. Otherwise, the old calibration parameters will be used.

7 Check the printed test film.

The test film must be similar to the image below.



The calibration film must be free of dust particles or any other artifacts. If this is not the case, clean the print head and restart the calibration procedure.

Density response of Drystar media

Different densitometers can give different results when measuring the same density area. This is due to spectral differences between the densitometers.

The density values used in this manual are based on the X_Rite 310 densitometer. Values measured with another densitometer can vary from these values.

It's possible to change the default densitometer. Refer to Changing general image quality settings - Default densitometer on page 93. You can also compare the density values from different densitometers with each other. Refer to *'Drystar media density response data'* on page 237.

Non-calibrated or badly calibrated densitometers can result in even larger differences.

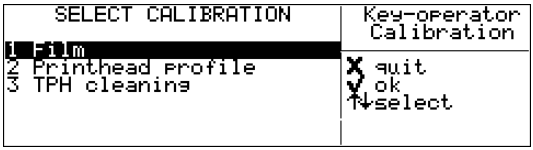
To give the user an idea of the differences given by the most frequently used densitometers, you can find the measurements for an SMPTE pattern on the DRYSTAR DT 2 B, DRYSTAR DT 2 C and DRYSTAR DT 2 Mammo films in Appendix B on page 237.

Print head cleaning

Print head cleaning must be done when image quality problems occur. For more information on maintaining image quality, refer to *'Maintaining image quality and resolving Image quality problems'* on page 220.

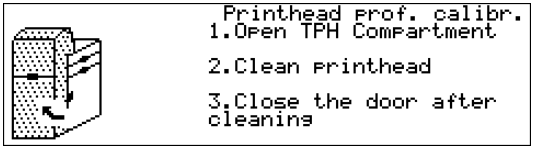
To clean the print head:

1 Perform step 1 to 2 of the *'Accessing the calibration menu'* procedure on page 111 to select the 'Calibration' screen.

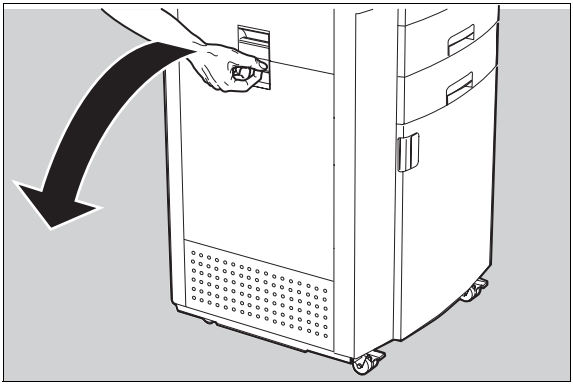


2 Press the Down key twice to select 'TPH cleaning' and press the Confirm key. The printer will automatically shut down.

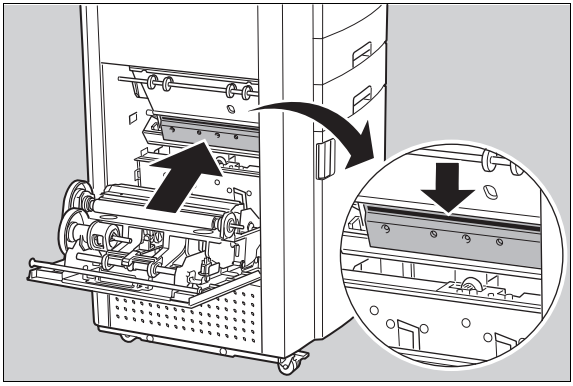
3 The 'print head cleaning' screen will give instructions on what to do:



4 Open the drum compartment door by pulling its handle.

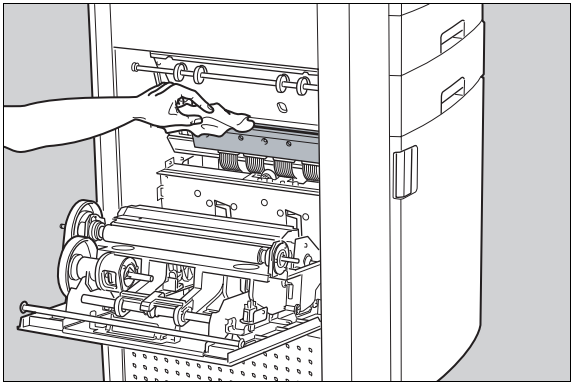


5 Locate and check on sight the print head resistor line.



Be careful not to touch the print head resistor line.

6 Clean the print head resistor line.



Gently pass over the resistor line a few times with a lint free cloth, slightly moistened with Isopropyl alcohol or Ethanol. **Do this in only one direction, i.e. from left to right, without lifting the cloth**.

Do not apply any pressure on the print head because this pressure may cause damage on the interconnections underneath the print head.

7 Close the drum compartment door.

After you have cleaned the print head resistor line and closed the drum compartment door, the printer will restart automatically.

*If residue dust is present as part of the cleaning procedure it will disappear after a few prints. However, if dust lines persist even after a few prints, the dust rollers need to be cleaned. Proceed with 'Cleaning the dust rollers' on page **188**.*

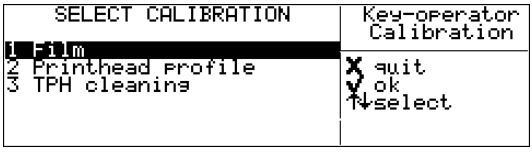
Print head profile calibration

Print head profile calibration must be done whenever the profile of the print head needs to be improved (manual print head profile calibration). For more information on maintaining image quality, refer to *'Maintaining image quality and resolving Image quality problems'* on page 220.

In the procedure, we will assume a print head profile calibration on the upper input tray. The procedure for the lower input tray is identical.

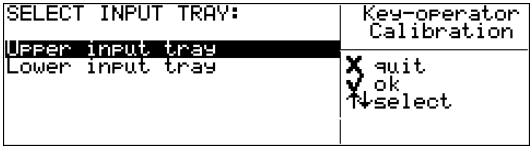
To start the manual print head profile calibration:

1 Perform step 1 to 2 of the *'Accessing the calibration menu'* procedure on page 111 to select the 'Calibration' screen.



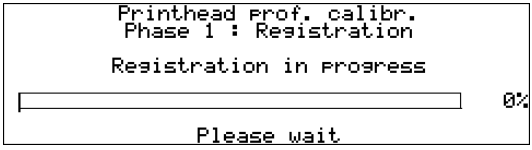
2 Press the Down key once to select 'Printhead profile', and press the Confirm key.

The 'Select input tray' screen appears:



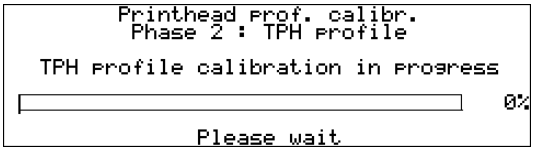
3 Press the Up/Down arrow keys to select an input tray, followed by the Confirm key (e.g. choose upper input tray).

The system will start with Phase 1 of the calibration: Registration:



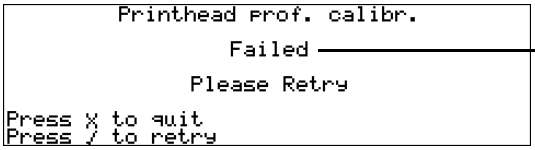
As a result, the 'Registration' print out appears.

4 After registration, the system will continue with Phase 2 of the calibration: the print head profile calibration:



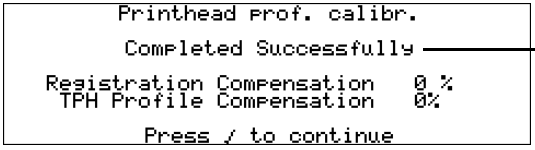
As a result, the 'TPH profile' print out appears.

5 In case the print head profile calibration has failed, the following message appears:



Press the Confirm key to retry the calibration, or the Escape key to quit.

6 In case the film calibration has completed successfully, the following message appears:



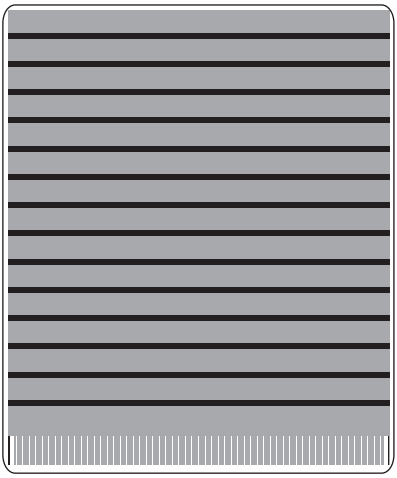
- The percentage for the 'Registration compensation' reflects the degree to which the system had to compensate for incorrect horizontal positioning of the built-in densitometer (100% compensation = maximal correction).
- The percentage for the 'print head profile compensation' reflects the degree to which the system had to compensate for density variations in the print head profile (100% compensation = maximal correction).

Both values are important for the service technician.

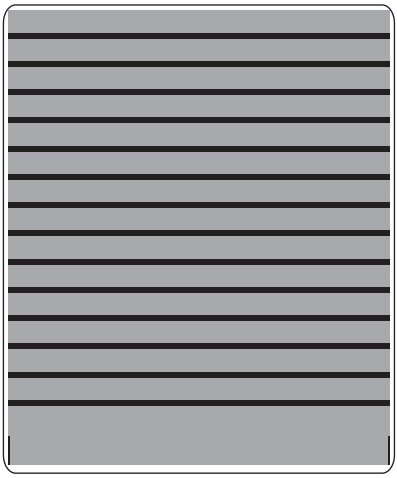
When the calibration process is interrupted, you will have to start the calibration procedure again. Otherwise, the old calibration parameters will be used.

7 Check the printed test films.

The test films must be similar to the images below.



Registration



TPH profile

Remark: the calibration film must be free of dust particles or any other artifacts. If this is not the case, you must restart the calibration procedure.

If the printed test film does not look similar to the image above, repeat the print head profile calibration until the result is satisfactory.

Installation

Upgrading the software

It is possible to install new software or new software components from a floppy disk onto the hard disk.

Different software (components) can be installed:

- language files,
- modality specific files,
- calibration files,
- ...

The new software will be activated after the Installation procedure. The previously installed software components will be automatically removed when installing new software or new data.

1 Press the Key-operator key to enter the Key-operator mode.

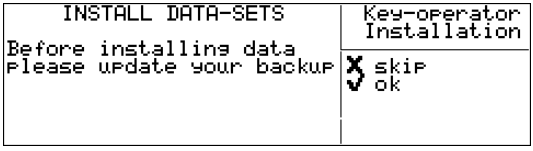
2 On the Key-operator main menu, press the Down key seven times, followed by the Confirm key to select 'Installation'.

The 'Installation' screen will be displayed:

3 Press the Confirm key to select 'Install data-sets'.

Before the procedure starts, the system suggests you to update your back-up copy of the current configuration. It is highly recommended to do this, so you can always restore it in case something should go wrong.

The following screen is displayed:



If you do not wish to update your back-up copy, press the Escape key and go to step 10.

4 Press the Confirm key to confirm the back-up.

The following screens appears successively:

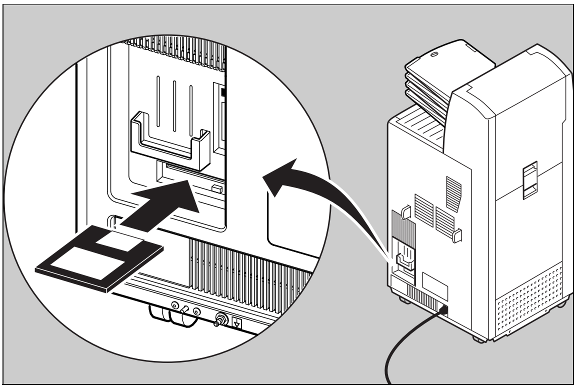
```
            SAVE CONFIGURATION

[                                        ]  0%

              Please wait
```

5 After saving, the printer asks you to insert the back-up floppy.

```
    SAVE CONFIGURATION       | Key-operator
                             | Save Config.
Insert the backup floppy     |--------------
                             | X quit
                             | ✓ continue
```

6 Insert the back-up floppy disk.

The drive is located at the rear of the printer.



7 Press the Confirm key to continue.

The following screen is displayed:

```
            SAVE CONFIGURATION

Copying...
D:/<path><filename>
   To
A:/<path><filename>
              Please wait
```

The printer saves the configuration on the back-up floppy disk.

When the writing process has finished, the following screen is displayed:

```
SAVE CONFIGURATION          | Key-operator
                            | Save Config.
Remove the floppy from      |
the floppy drive            | ✓ confirm
```

8 Remove the floppy disk and press the Confirm key.

The following screen is displayed:

```
SAVE CONFIGURATION

Label floppy with data :
  "Backup floppy"
  "Serial number : "      "
  "Date and time : "      "

Press ✓ to continue
```

e.g.
1024
18-AUG-2005 11:07:18

9 Press the Confirm key.

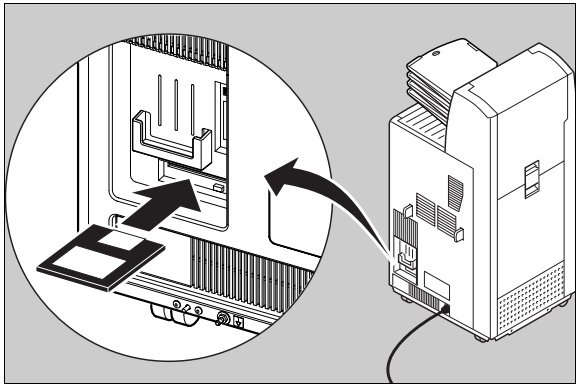
The back-up is finished and the system will now proceed with the actual upgrade.

10 The 'Install data-sets' screen is displayed:

```
INSTALL DATA-SETS           | Key-operator
                            | Installation
Insert the first floppy     |
                            | ✗ quit
                            | ✓ continue
```

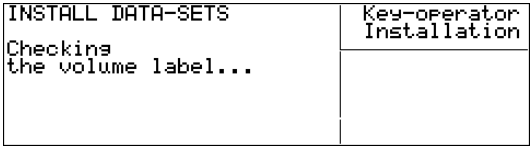
11 Insert the (first) floppy disk.

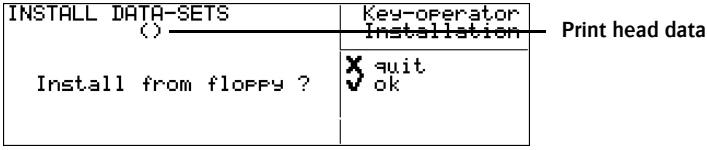
The drive is located at the rear of the printer.



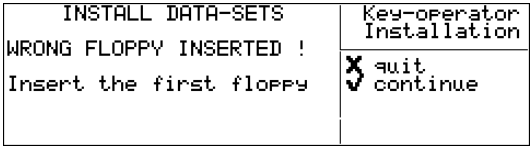
12 Press the Confirm key to continue.

The following screens appear successively:

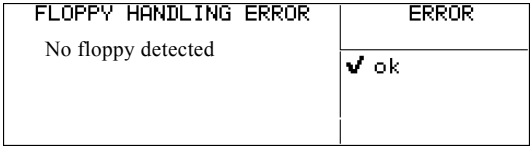




In case a wrong disk has been inserted, the following message is displayed:



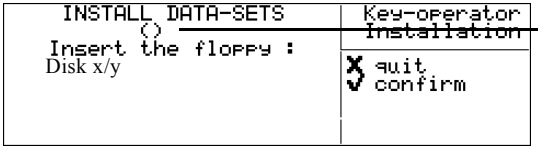
In case no floppy has been inserted, the following message is displayed:



13 Press the Confirm key to continue, or the Escape key to quit.

The printer will copy the new software data onto the hard disk.

14 When the contents of the floppy is copied onto the hard disk, the following message asks you to insert the next floppy (if a next one is required):



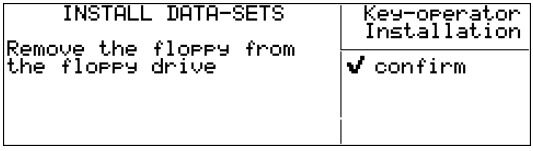
Print head data

15 Remove the floppy disk and insert the next floppy disk ('disk x/y') when necessary. Press the Confirm key to continue.

The printer will copy the new software data onto the hard disk.

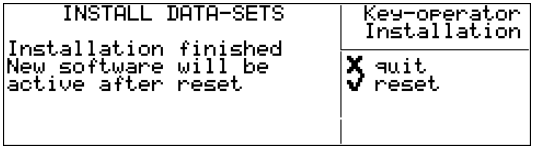
16 Repeat steps 14 and 15 until all floppy disks have been copied onto the hard disk.

When all the files have been copied from the last floppy disk, the following screen is displayed:



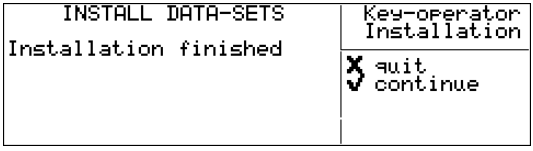
17 Remove the last floppy disk and press the Confirm key.

In case the software requires a reset, the following screen will be displayed:



18 Press the Confirm key to reset the printer.

In case the software requires no reset, the following screen will be displayed:



19 Press the Confirm key to continue. You will return to the 'Installation' screen.

Using the installation wizard

In case the display software has been updated (e.g. when installing language files), the 'Updating display software' screen is displayed during the downloading of the display software:

When you install the Drystar 5500, the installation wizard will guide you through the complete installation procedure.

The Installation wizard consists of three steps:

- *'Entering the printer network settings'* (page *130*),
- *'Entering modality-specific settings'* (page *135*),
- *'Saving the configuration'* (page *139*).

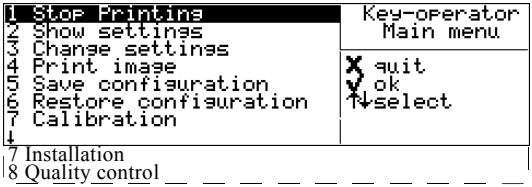
When you have entered the required data, the installation is complete.

Although the Installation wizard consists of three separate steps, these steps cannot be performed separately.

To change the settings once the installation has completed, refer to 'Changing the configuration settings' on page 69.

Starting the Installation wizard

1 Press the Key-operator key to enter the Key-operator mode.

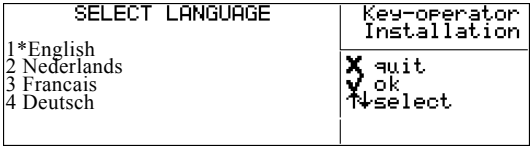


2 On the Key-operator main menu, press the Down key seven times, followed by the Confirm key to select 'Installation'.

The 'Installation' screen will be displayed:

3 Press the Down key once, followed by the Confirm key to select 'Printer instal. wizard'.

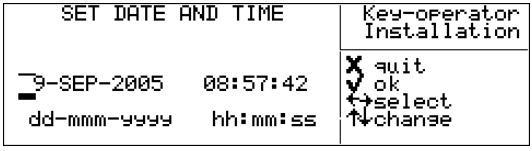
The 'Select language' screen is displayed:



The number of displayed languages depends on the installed dataset. Contact your local Agfa service organization for the latest Drystar 5500 language availability status.

4 Press the Up/Down arrow keys to select the desired language, followed by the Confirm key.

The 'Set date and time' screen is displayed:



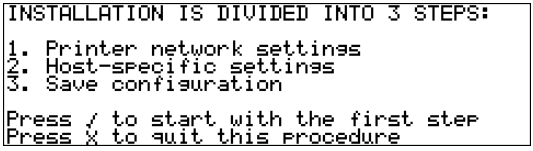
5 Press the Up/Down arrow keys to increment/decrement the numbers. Press the Left/Right arrow keys to move through the fields. Press the Confirm key to store the data.

Refer to 'Data entry' on page 33.

The 'Printer installation wizard' screen will appear:

6 Press the Confirm key to continue.

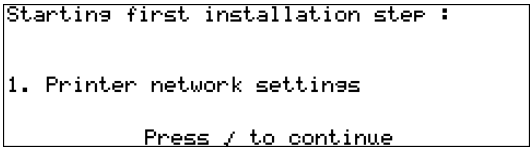
A screen with information on the sequence of the steps will appear:



7 Press the Confirm key to start with the first step or press the Escape key to quit the procedure.

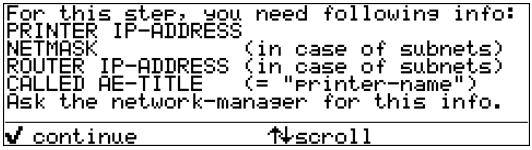
Entering the printer network settings

The following introduction screen will appear:



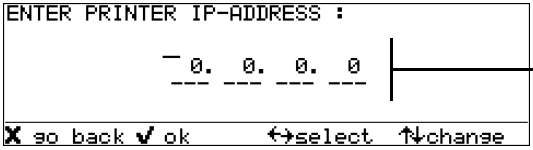
1 Press the Confirm key to continue.

An instruction screen will show the information you need to complete this part of the installation:



2 Press the Confirm key to continue.

The 'Enter printer IP-address' screen is displayed:



If the IP-address has already been assigned, it will be shown on the display.

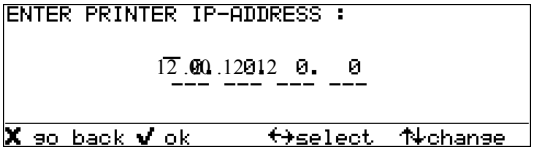
When no DHCP server is available and when the IP address of the printer has never been set, the printer IP address will be set to the APIPA address 169.254.10.10.

3 Press the Up/Down arrow keys to increment/decrement the numbers. Press the Left/Right arrow keys to move through the fields.

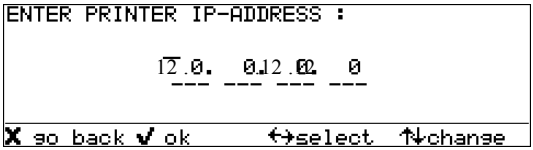
Refer to 'Data entry' on page 33.

Note that blank spaces will not be filled in.

Example: If the IP-address is 120.000.120.120, then the data entry should be as follows:

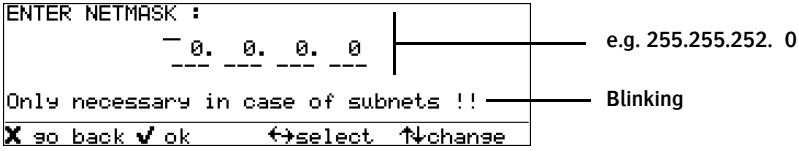


Example: If the IP-address is 120.0.120.120, then the data entry should be as follows:



4 Press the Confirm key to continue, or the Escape key to return to the previous step.

The 'Enter Netmask' screen is displayed:



If the net mask has already been assigned, it will be shown on the display.

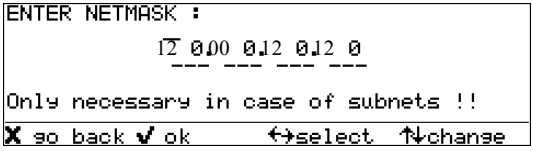
When no DHCP server is available and when the subnet mask of the printer has never been set, the subnet mask will be set to the APIPA address 255.255.0.0.

5 Press the Up/Down arrow keys to increment/decrement the numbers. Press the Left/Right arrow keys to move through the fields.

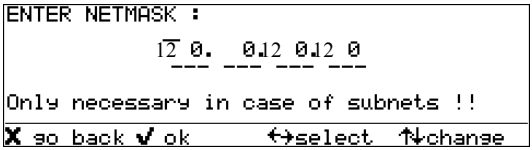
Refer to 'Data entry' on page 33.

Note that blank spaces will not be filled in.

Example: If the netmask is 120.000.120.120, then the data entry should be as follows:

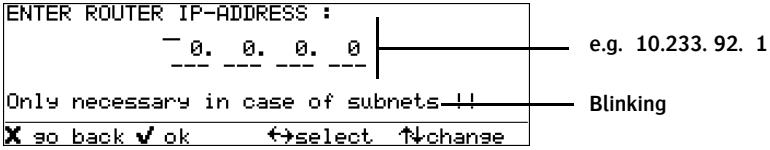


Example: If the netmask is 120.0.120.120, then the data entry should be as follows:



6 Press the Confirm key to continue, or the Escape key to return to the previous step.

The 'Enter Router IP-address' screen is displayed:



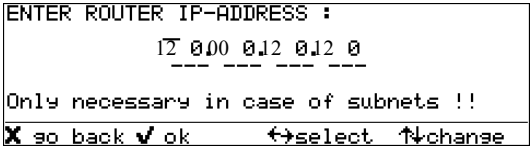
If the Router IP-address has already been assigned, it will be shown on the display.

7 Press the Up/Down arrow keys to increment/decrement the numbers. Press the Left/Right arrow keys to move through the fields.

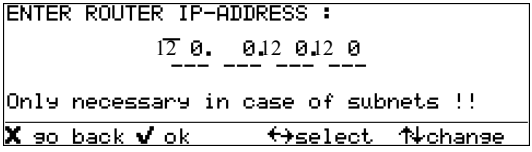
Refer to 'Data entry' on page 33.

Note that blank spaces will not be filled in.

Example: If the Router IP-address is 120.000.120.120, then the data entry should be as follows:

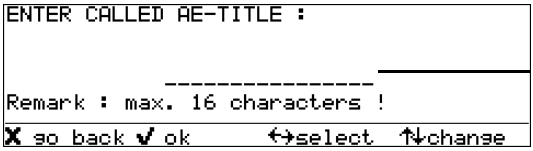


Example: If the Router IP-address is 120.0.120.120, then the data entry should be as follows:



8 Press the Confirm key to continue, or the Escape key to return to the previous step.

The 'Enter Called AE-title' screen is displayed:



e.g. DS5500

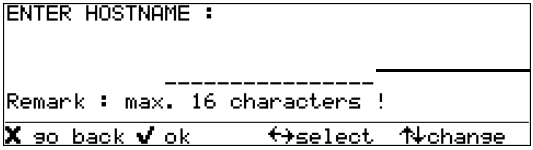
9 Enter the Called AE-title by means of the arrow keys.

Refer to 'Data entry' on page 33.

Make sure not to enter more than 16 characters.

10 Press the Confirm key to continue, or the Escape key to return to the previous step.

The 'Hostname' screen is displayed:



e.g. ds5500

11 Enter the Hostname by means of the arrow keys.

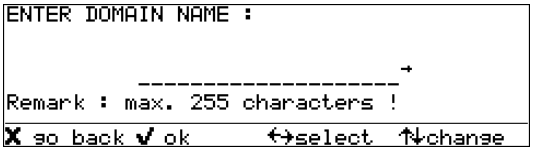
Refer to 'Data entry' on page 33.

Make sure not to enter more than 16 characters.

Note that blank spaces will not be filled in.

12 Press the Confirm key to continue, or the Escape key to return to the previous step.

The 'Enter Domain Name' screen is displayed:



13 Enter the Domain name by means of the arrow keys.

Refer to 'Data entry' on page 33.

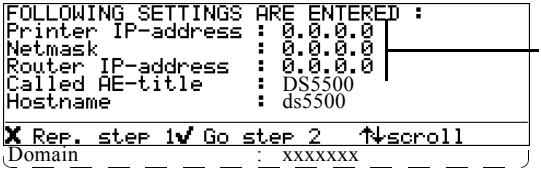
Make sure not to enter more than 255 characters.

Note that blank spaces will not be filled in.

14 Press the Confirm key to continue, or the Escape key to return to the previous step.

15 Press the Confirm key to continue, or the Escape key to return to the previous step.

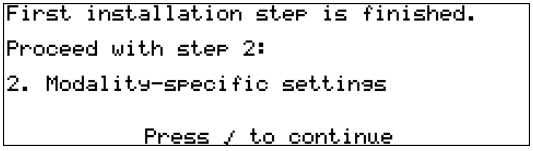
A screen will appear summarizing the information you have entered:



e.g.
Prt IP-ad:123.123.123.123
Netmask:255.255.255.255
Router:123.123.123.123

16 Press the Confirm key to go to step 2 of the installation wizard or press the Escape key to repeat step 1.

- When you have pressed the Confirm key, the following screen will appear:



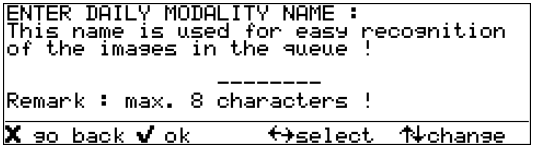
17 Press the Confirm key to continue.

Entering modality-specific settings

An instruction screen shows the information you need to complete this part of the installation:

1 Press the Confirm key to continue or press the Escape key to skip this step.

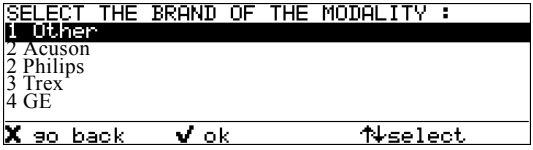
- When you have pressed the Confirm key, the 'Enter daily modality name' screen will appear:



2 Enter the modality nickname by means of the arrow keys. Refer to *'Data entry'* on page 33. Make sure not to enter more than 8 characters.

3 Press the Confirm key to continue, or the Escape key to return to the previous step.

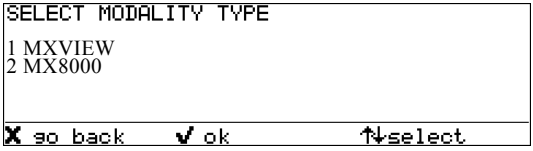
The 'Select modality brand name' screen is displayed:



4 Press the Up/Down arrow keys to select the appropriate modality brand name.

5 Press the Confirm key to continue, or the Escape key to return to the previous step.

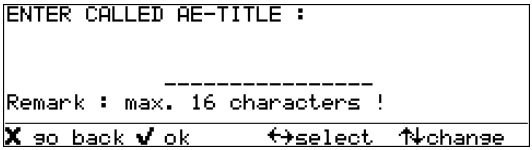
The 'Select modality type' screen will be displayed:



6 Press the Up/Down arrow keys to select the appropriate modality type.

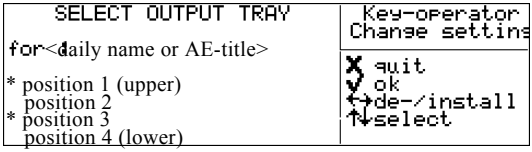
7 Press the Confirm key to continue, or the Escape key to return to the previous step.

The 'Enter Called AE-title' screen is displayed:



8 Enter the Called AE-title by means of the arrow keys. Refer to *'Data entry'* on page 33. Make sure not to enter more than 16 characters.

The 'Select output tray for <daily name or AE-title>' screen will appear:



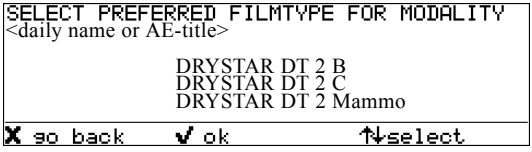
Press the Up/Down arrow keys to navigate and (de-)install output trays with the Left/Right arrow keys. You can install several output trays.

*Each installed output tray are marked with an *.*

9 Press the Confirm key to install the chosen output trays, or the Escape key to quit the procedure without any changes.

10 Press the Confirm key to continue, or the Escape key to return to the previous step.

The 'Select preferred film type for modality' screen will appear:



'DRYSTAR DT 2 Mammo' is only shown in the list when the option for the mammography application is activated. Refer to 'Options and accessories' on page 235.

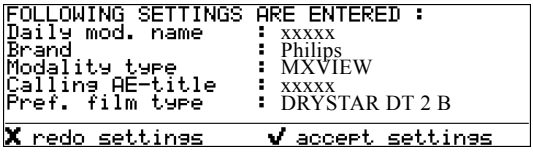
You can find the film type on the film packaging, e.g. 'DRYSTAR DT 2 C'.

In case the current film type in the trays does not cover the selected film type of the selection a message is displayed:

11 Press the Up/Down arrow keys to select the appropriate film type.

12 Press the Confirm key to continue, or the Escape key to return to the previous step.

A screen will appear summarizing the entered information:

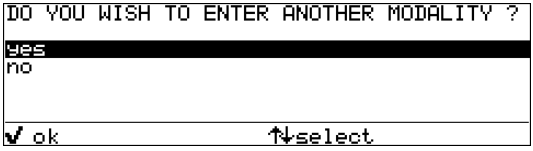


The following appear in the list:

- Daily modality name
- Brand
- Modality type
- Calling AE-title
- Preferred film type

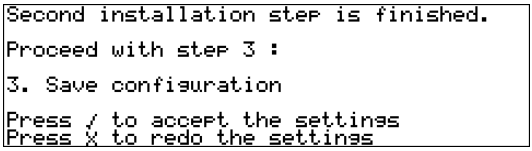
13 Press the Confirm key to accept the settings, or the Escape key to redo the settings for the current modality.

The following screen will appear, asking if you want to enter another modality:



14 Press the Up/Down arrow keys to select your choice, followed by the Confirm key.

- If you select Yes, step 2 of the Setup wizard will be repeated for the next modality. Go back to *'Entering modality-specific settings'* on page 135.
- If you select No, the second step of the installation is finished. The following screen will appear:



15 Press the Confirm key to continue.

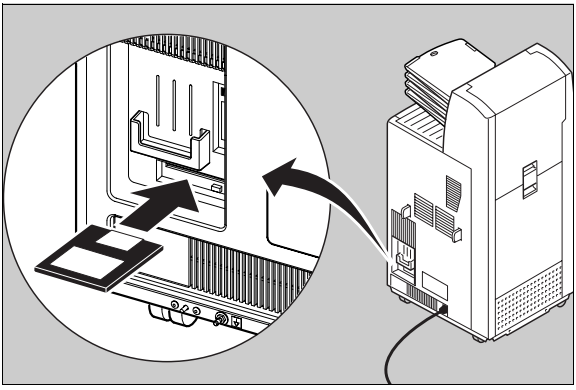
Saving the configuration

A screen will ask you to insert the back-up floppy:

```
INSERT THE BACKUP FLOPPY

Press ✓ to continue
```

1 Insert the floppy disk.

The drive is located at the rear of the printer.



For the back-up, a blank floppy disk is required (formatted, IBM-compatible, 2HD).

2 Press the Confirm key to continue.

The 'Saving configuration' screen is displayed.

```
SAVING CONFIGURATION

Copying...
D:/<path><filename>
   To
A:/<path><filename>

Please wait
```

The printer saves the configuration on the floppy disk.

When the writing process has finished, the following screen is displayed:

```
REMOVE FLOPPY FROM DRIVE

Press ✓ to continue
```

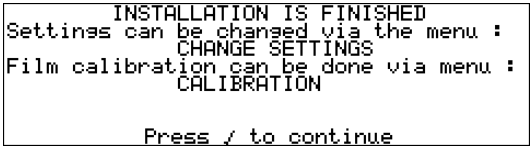
3 Remove the floppy disk and press the Confirm key.

The following screen is displayed:

4 Press the Confirm key.

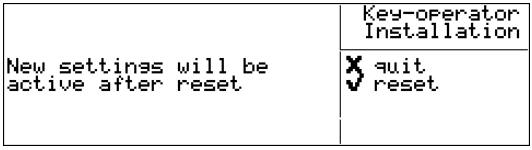
The installation is now finished.

The following screen is displayed:



5 Press the Confirm key.

The following screen is displayed:



6 Press the Escape key if you want to reboot the printer later. Press Confirm key to reboot the printer.

The Drystar 5500 will now restart, and the new settings will be active.

Quality control for general radiography applications (DT 2 B & DT 2 C)

In order to establish and maintain consistent image quality, a regular evaluation of the image quality is advised.

The Drystar 5500 contains an automatic QC procedure for general radiography applications and has been designed to comply with the grayscale reproduction constancy test, according to the international standard IEC 1223-2-4. If the option for the mammography application is activated, another QC procedure is available for the mammography application (refer to *'Quality control for mammography application (DT 2 Mammo) (optional)'* on page 153). This QC procedure has been designed to comply with the Mammography Quality Standards Act (MQSA) of the FDA (refer to *'Safety compliance'* on page 18). In this chapter we will discuss how to control the quality of general radiography applications.

Local Regulations may require other procedures.

The Drystar 5500 Hard Copy quality control procedures consist of two main steps:

- Before initial use, establishing a number of reference values that will be used for further follow-up and verifying initial image quality.
- After establishing these values, performing regular daily, weekly and annual quality tests.

Repeat the two main steps of the Hard Copy quality procedures for each input tray loaded with DT 2 B and/or DT 2 C films.

The results of these tests are recorded on Quality Control Charts.

The QC image (Refer to the *'QC general radiography test image'* on page 146) has several additional fields where the QC data can be filled in. This image should be filed as part of the QC procedure.

For more information, please refer to *'Quality Control Charts'* on page 241.

Establishing the reference values and verifying image quality for general radiography applications (DT 2 B and DT 2 C)

After installation of a new Drystar 5500 and before initial use you must establish Quality Control aim values. These values will be used as the base line for comparison when daily Quality Control is done. These values should be determined again after major service, repair or software update.

The following Quality Control aim values must be determined:

- The daily operating density levels. Refer to *'Establishing the daily operating reference density levels for general radiography applications (DT 2 B and DT 2 C)'* on page 143.
- Drystar 5500 image geometry. Refer to *'Establishing the image geometry reference values for general radiography applications (DT 2 B and DT 2 C)'* on page 146.

Once Quality Control aim values are established you must evaluate the Spatial Resolution, the Artifact Levels and the Low Contrast Visibility to determine if the image quality is acceptable. Refer to *'Verifying Acceptable Spatial Resolution, Artifact Levels and Low Contrast Visibility for general radiography applications (DT 2 B and DT 2 C)'* on page 148.

The Quality Control aim values, the Spatial Resolution and Artifact Levels and the Image Geometry values are all recorded on the Quality Control charts. Refer to *'Charts for general radiography QC'* on page 242.

On these charts, the following test conditions are also recorded:

- The type and serial number of the Drystar 5500.
- The type and emulsion number of the film used to determine the reference values.
- The type of densitometer used.
- The time (day, month, year) that the values were established.

Before you can establish the daily operating levels, the Drystar 5500 must be switched on for at least 15 minutes and it must be calibrated as well.

Refer to *'Switching on the Drystar 5500'* **on page 34 and** *'Performing the calibration procedures'* **on page 111.**

Establishing the daily operating reference density levels for general radiography applications (DT 2 B and DT 2 C)

This procedure enables you to establish the base line values for:

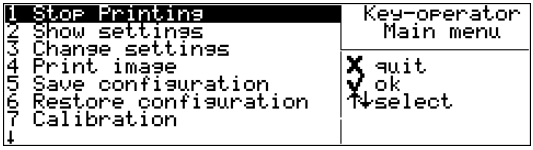
- Low density
- Mid density
- High density

The densitometer of the Drystar 5500 is calibrated at installation. Authorized service personnel should recalibrate the densitometer annually or after major service or repair.

To establish the daily operating levels, proceed as follows:

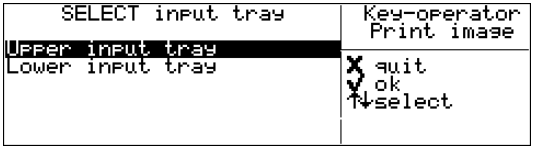
1 Press the Key-operator key to enter the Key-operator mode.

The 'Key-operator main menu' screen appears:



2 Press the Down key eight times, followed by the Confirm key to select 'Quality Control'

The 'Select input tray' screen appears:



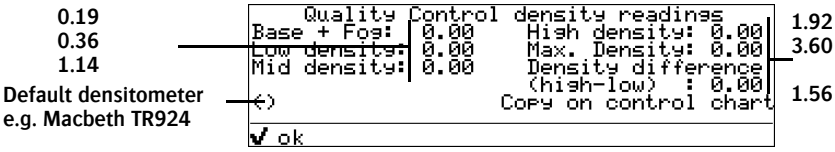
When controlling the Drystar 5500 via a remote PC, The 'Select input tray' screen is preceded by a screen, which allows you to:

- *Start the quality control procedure immediately,*
- *Edit additional data for the last quality control measuring.*

3 Press the Up/Down arrow keys to select the proper input tray, followed by the Confirm key.

The Drystar 5500 will automatically print the QC general radiography test image.

4 After the image is printed, the system will display all measured optical density values:



The displayed values (that have to be monitored) represent the following steps on the test film:

Operating Level		Value (Macbeth units) (according IEC 1223-2-4 or better)
Low density	the density value of the Low density step	0.4 ± 0.05
Mid density	the density value of the Mid density step	1.2 ± 0.15
High density	the density value of the High density step	2.0 ± 0.20

If the mid density value does not meet or exceeds the recommended values, the cause must be found and the problem solved before any further clinical films can be printed.

Refer to *'Maintaining image quality and resolving Image quality problems'* on page 220 and *'Preventive maintenance schedule'* on page 186, or call your local Agfa service organization.

5 Record the density levels on Chart 1 ('Drystar 5500/5503: Determination of Operating Levels'). Refer to *'Charts for general radiography QC'* on page 242.

6 Press the Confirm key to return to the main menu.

7 Repeat steps 1 through 6 once a day for five consecutive days, as indicated on the Drystar 5500 Chart 1.

8 Calculate the average value of the densities from the five images. These values represent operating levels or aim values, for each density.

9 Record the respective aim (average) values as the 'Operating levels' on Charts 2a and 2b ('Drystar 5500/5503 Daily Density Control Chart'). Refer to *'Charts for general radiography QC'* on page 242.

The calculated 'Operating levels' should be as follows:

Operating Level	Value (Macbeth units) (according IEC 1223-2-4 or better)
Low density	0.4 ± 0.05
Mid density	1.2 ± 0.15
High density	2.0 ± 0.20

10 These charts will be used for the daily quality test. For more information, refer to *'Performing the daily QC test for general radiography applications (DT 2 B and DT 2 C)'* on page 149.

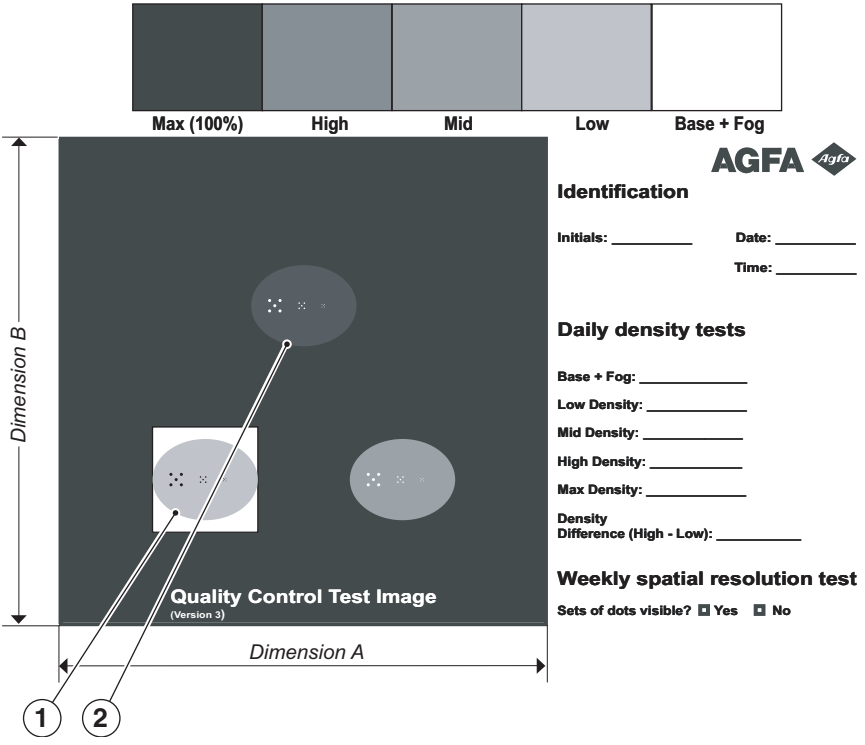
Establishing the image geometry reference values for general radiography applications (DT 2 B and DT 2 C)

To establish the image geometry reference values, proceed as follows:

1 Print the QC general radiography test image or use the previously printed test image.

You should obtain an image looking like this (without the dimensions A and B):

QC general radiography test image



2 To determine the reference values for geometry, measure the distances A and B of the geometric square on the test image.

Make sure to measure distance A from the left edge of the left line to the right edge of the right line and distance B from the upper edge of the upper line to the lower edge of the lower line.

We strongly recommend using a 30 cm (12 inch) machinist scale with 0.5 mm divisions (1/64 inch).

3 Record these values as reference dimensions A_{ref} and B_{ref} on Chart 4 ('Drystar 5500/5503 Geometric Consistency Control Chart'). Refer to *'Charts for general radiography QC'* on page 242.

These charts will be used for the annual quality test. For more information, refer to *'Performing the Annual QC tests for general radiography applications (DT 2 B and DT 2 C)'* on page 152.

4 Save this film for future reference.

Verifying Acceptable Spatial Resolution, Artifact Levels and Low Contrast Visibility for general radiography applications (DT 2 B and DT 2 C)

Good viewing conditions are important for the correct interpretation of both diagnostic and test images. Make sure that the light box intensity (luminance) is between 2000 and 4000 cd/m² (4500 and 6500 °K) for general radiography. Use a magnifying glass and use shutters to collimate. Make sure the ambient light is low.

To verify acceptable spatial resolution, artifact levels and low contrast visibility, proceed as follows:

1. Print the QC general radiography test image or use the previously printed QC general radiography test image used to establish the daily operating density levels.

2. Visually check the QC general radiography test image for artifacts: no significant disturbing artifacts should be visible.

3. Check the spatial resolution in each of the three ovals. Within each oval there are three groups, each having five dots. All five dots of each group must be visible with a magnifying glass. The smallest cluster of 5 dots is only visible if the viewing conditions are good.

4. Check the Low Contrast Visibility at both the high (100 / 95%) and low end (0 / 5%) of the density scale. You should be able to see the circle in the square (refer to item 1 on the *'QC general radiography test image'* on page 146) and the upper circle (refer to item 2 on the *'QC general radiography test image'* on page 146).

5. Record these values at the top of Chart 3 ('Drystar 5500/5503 Artifacts and Spatial Resolution Control Chart'). Refer to *'Charts for general radiography QC'* on page 242.

6. These charts will be used for the weekly quality test. For more information, refer to *'Performing the Weekly QC tests for general radiography applications (DT 2 B and DT 2 C)'* on page 151.

In case of significant artifacts or insufficient spatial resolution, the cause must be found and the problem solved before any further clinical films can be printed.

Refer to *'Maintaining image quality and resolving Image quality problems'* on page 220 and *'Preventive maintenance schedule'* on page 186, or call your local Agfa service organization.

Performing quality control (QC) tests for general radiography applications (DT 2 B and DT 2 C)

The following procedures must be performed daily, weekly or annually as indicated. When used in a mobile application it is required to perform QC after every move.

The reason for performing quality control tests is to determine if any significant image quality variation or deterioration has occurred which may require corrective action. Comparing the results of the tests with the reference values previously established does this.

This procedure allows the operator to take the necessary preventive actions before any image quality loss can take place.

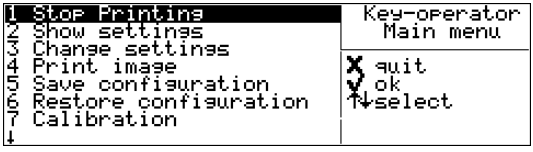
Performing the daily QC test for general radiography applications (DT 2 B and DT 2 C)

This test must be performed every day before any clinical film can be processed.

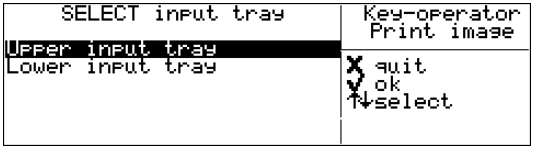
1 Turn on the Drystar 5500 and wait at least for 15 minutes. Refer to *'Switching on the Drystar 5500'* on page 34.

2 Press the Key-operator key to enter the Key-operator mode.

3 Press the Down key eight times, followed by the Confirm key to select 'Quality Control'.



The 'Select input tray' screen appears:



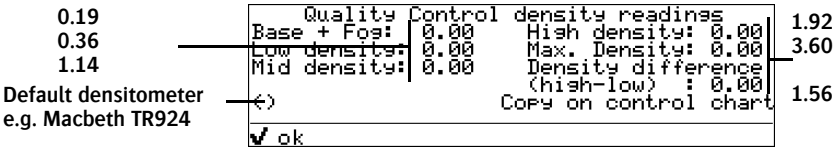
When controlling the Drystar 5500 via a remote PC, The 'Select input tray' screen is preceded by a screen, which allows you to:

- *Start the quality control procedure immediately,*
- *Edit additional data for the last quality control measuring.*

4 Press the Up/Down arrow keys to select the proper input tray, followed by the Confirm key.

The Drystar 5500 will automatically print the QC general radiography test image.

5 After the image is printed, the system will display all measured optical density values:



6 Record the low, mid and high density values on Charts 2A and 2B ('Drystar 5500/5503 Daily Density Control Chart'). Also record the date and time of the test on the charts and on the QC general radiography test images. Refer to *'Charts for general radiography QC'* on page 242.

7 Press the Confirm key to return to the main menu.

In case the measure results are not within the aim values, the reason for the unacceptable density variations must be identified and resolved before any further clinical films can be processed. This may include repeating the film calibration procedure.

For possible causes of non-compliance and the respective actions, refer to *'Maintaining image quality and resolving Image quality problems'* on page 220 and *'Preventive maintenance schedule'* on page 186.

Performing the Weekly QC tests for general radiography applications (DT 2 B and DT 2 C)

Spatial Resolution, Artifact Test and Low Contrast Visibility

To identify artifacts and verify spatial resolution you must perform the following test weekly or as needed for troubleshooting image quality problems.

Good viewing conditions are important for the correct interpretation of both diagnostic and test images. Make sure that the light box intensity (luminance) is between 2000 and 4000 cd/m² (4500 and 6500 °K) for general radiography. Use a magnifying glass and use shutters to collimate. Make sure the ambient light is low.

1 First, print out the QC general radiography test image. Refer to *'Performing the daily QC test for general radiography applications (DT 2 B and DT 2 C)'* on page 149.

2 Check the QC general radiography test image visually for artifacts: no significant disturbing artifacts should be visible.

3 Check the spatial resolution.

The test film also shows three squares which each contains an oval. These 3 ovals contain 3 groups, each having 5 dots. All five dots of each group must be visible with a magnifying glass. The smallest cluster of 5 dots is only visible if the viewing conditions are good.

4 Check the Low Contrast Visibility at both the high (100 / 95%) and low end (0 / 5%) of the density scale. You should be able to see the circle in the square (refer to item 1 on the *'QC general radiography test image'* on page 146) and the upper circle (refer to item 2 on the *'QC general radiography test image'* on page 146).

5 Record these values on Chart 3 ('Drystar 5500/5503 Artifacts and Spatial Resolution Control Chart'). Refer to *'Charts for general radiography QC'* on page 242.

In case of significant artifacts, insufficient spatial resolution or failure of any other recommended QC tests, the cause of the problem must be identified, and corrective action must be taken before the Drystar 5500 can be used for any further clinical imaging.

Refer to *'Maintaining image quality and resolving Image quality problems'* on page 220 and *'Preventive maintenance schedule'* on page 186, or call your local Agfa service organization for assistance.

Performing the Annual QC tests for general radiography applications (DT 2 B and DT 2 C)

Geometric Consistency Test

To be able to notice fluctuations in image size and aspect ratio, you must perform this procedure once a year.

1 First, perform the daily test.

2 Measure the distances A and B of the geometric square on the QC general radiography test image. Refer to *'Establishing the image geometry reference values for general radiography applications (DT 2 B and DT 2 C)'* on page 146.

Make sure to measure distance A from the left edge of the left line to the right edge of the right line and distance B from the upper edge of the upper line to the lower edge of the lower line.

We strongly recommend using a 30 cm (12 inch) machinist scale with 0.5 mm divisions (1/64 inch).

3 Record these values as measured distances A and B on Chart 4 ('Drystar 5500/5503 Geometric Consistency Control Chart'). Refer to *'Charts for general radiography QC'* on page 242.

4 Compare the measured A and B dimensions with the reference dimension values, A_{ref} and B_{ref} on Chart 4 ('Drystar 5500/5503 Geometric Consistency Control Chart'). Refer to *'Charts for general radiography QC'* on page 242.

The differences between the measured dimensions of A and B and the reference values A_{ref} and B_{ref} should be less than or equal to 1.0%.

5 Check for image distortion.

6 Calculate the aspect ratio by dividing A by B.

The result must be 1 +/- 0.01

If the image size or distortion values exceed the limits, contact Agfa service to resolve the problem.

Quality control for mammography application (DT 2 Mammo) (optional)

In order to establish and maintain consistent image quality, a regular evaluation of the image quality is advised.

The Drystar 5500 contains an automatic QC procedure for general radiography applications (refer to *'Quality control for general radiography applications (DT 2 B & DT 2 C)'* on page 141) and has been designed to comply with the grayscale reproduction constancy test, according to the international standard IEC 1223-2-4. If the option for the mammography application is activated, another QC procedure is available for the mammography application. This QC procedure has been designed to comply with the Mammography Quality Standards Act (MQSA) of the FDA (refer to *'Safety compliance'* on page 18). In this chapter we will discuss how to control the quality of general radiography applications.

Local Regulations may require other procedures.

The Drystar 5500 Hard Copy quality control procedures consist of two main steps:

- Before initial use, establishing a number of reference values that will be used for further follow-up and verifying initial image quality.
- After establishing these values, performing regular daily, weekly and annual quality tests.

Repeat the two main steps of the Hard Copy quality procedures for each input tray loaded with DT 2 Mammo films.

The results of these tests are recorded on Quality Control Charts.

The QC image (Refer to the *'QC mammography test image'* on page 158) has several additional fields where the QC data can be filled in. This image should be filed as part of the QC procedure.

For more information, please refer to *'Quality Control Charts'* on page 241.

Establishing the reference values and verifying image quality for mammography application (DT 2 Mammo) (optional)

After installation of a new Drystar 5500 and before initial use you must establish Quality Control aim values. These values will be used as the base line for comparison when daily Quality Control is done. These values should be determined again after major service, repair or software update.

The following Quality Control aim values must be determined:

- The daily operating density levels. Refer to *'Establishing the daily operating reference density levels for mammography application (DT 2 Mammo) (optional)'* on page 155.
- Drystar 5500 image geometry. Refer to *'Establishing the image geometry reference values for mammography application (DT 2 Mammo) (optional)'* on page 158.

Once Quality Control aim values are established you must evaluate the Spatial Resolution, the Artifact Levels and the Low Contrast Visibility to determine if the image quality is acceptable. Refer to *'Verifying Acceptable Spatial Resolution and Artifact Levels and Low Contrast Visibility for mammography application (DT 2 Mammo) (optional)'* on page 160.

The Quality Control aim values, the Spatial Resolution and Artifact Levels and the Image Geometry values are all recorded on the Quality Control charts. Refer to *'Charts for mammography QC (optional)'* on page 247.

On these charts, the following test conditions are also recorded:

- The type and serial number of the Drystar 5500.
- The type and emulsion number of the film used to determine the reference values.
- The type of densitometer used.
- The time (day, month, year) that the values were established.

Before you can establish the daily operating levels, the Drystar 5500 must be switched on for at least 15 minutes and it must be calibrated as well.

Refer to *'Switching on the Drystar 5500'* on page 34 and *'Performing the calibration procedures'* on page 111.

Establishing the daily operating reference density levels for mammography application (DT 2 Mammo) (optional)

This procedure enables you to establish the base line values for:

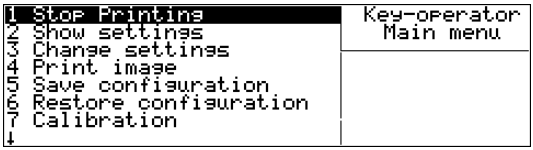
- Base + Fog density
- Low density
- Mid density
- High density

The densitometer of the Drystar 5500 is calibrated at installation. Authorized service personnel should recalibrate the internal densitometer annually or after major service or repair.

To establish the daily operating levels, proceed as follows:

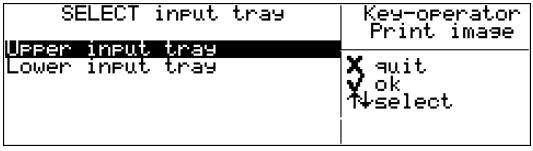
1 Press the Key-operator key to enter the Key-operator mode.

The 'Key-operator main menu' screen appears:



2 Press the Down key eight times, followed by the Confirm key to select 'Quality Control'.

The 'Select input tray' screen appears:



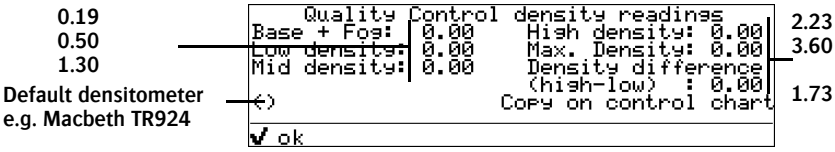
When controlling the Drystar 5500 via a remote PC, The 'Select input tray' screen is preceded by a screen, which allows you to:

- *Start the quality control procedure immediately,*
- *Edit additional data for the last quality control measuring.*

3 Press the Up/Down arrow keys to select the proper input tray, followed by the Confirm key.

The Drystar 5500 will automatically print the QC mammography test image.

4 After the image is printed, the system will display all measured optical density values:



The displayed values (that have to be monitored) represent the following steps on the test film:

Operating Level		Value (Macbeth units) (according to NEMA standards XR 23-2006)
Base + Fog	the density value of the Base + Fog step	0.22 ± 0.03
Low density	the density value of the low density step	0.52 ± 0.07
Mid density	the density value of the mid density step	1.35 ± 0.15
High density	the density value of the high density step	2.35 ± 0.15

If the mid density value does not meet or exceeds the recommended values, the cause must be found and the problem solved before any further clinical films can be printed.

Refer to *'Maintaining image quality and resolving Image quality problems'* on page 220 and *'Preventive maintenance schedule'* on page 186, or call your local Agfa service organization.

5 Record the density levels on Chart 1 ('Drystar 5500/5503: Determination of Operating Levels'). Refer to *'Charts for mammography QC (optional)'* on page 247.

6 Press the Confirm key to return to the main menu.

7 Repeat steps 1 through 6 once a day for five consecutive days, as indicated on the Drystar 5500 Chart 1.

8 Calculate the average value of the densities from the five images. These values represent operating levels or aim values, for each density.

9 Record the respective aim (average) values as the 'Operating levels' on Charts 2a and 2b ('Drystar 5500/5503 Daily Density Control Chart'). Refer to *'Charts for mammography QC (optional)'* on page 247.

The calculated 'Operating levels' should be as follows:

Operating Level	**Value (Macbeth units) (according to NEMA standards XR 23-2006)**
Base + Fog	0.22 ± 0.03
Low density	0.52 ± 0.07
Mid density	1.35 ± 0.15
High density	2.35 ± 0.15

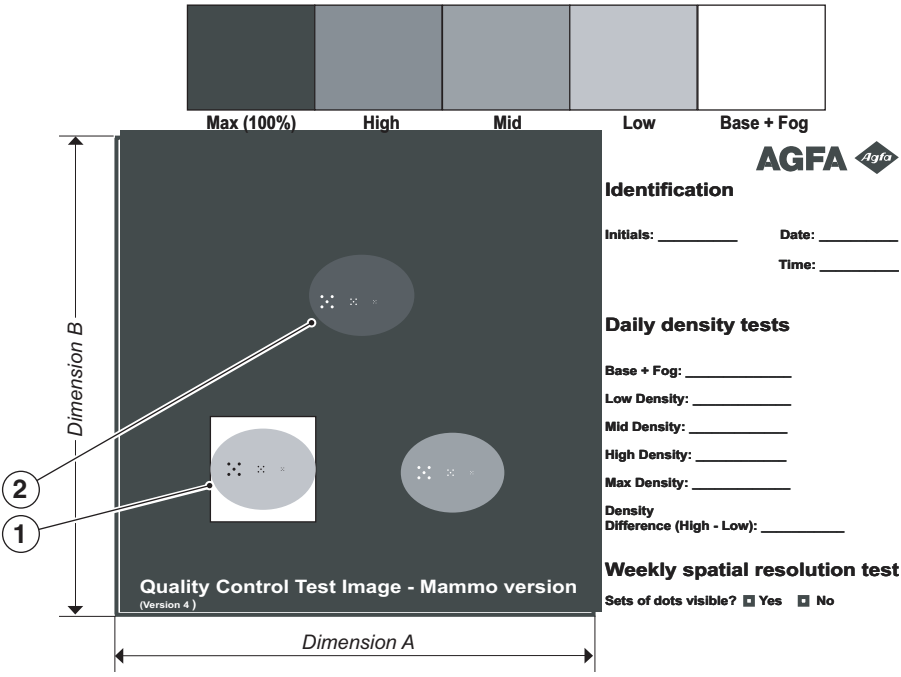
10 These charts will be used for the daily quality test. For more information, refer to *'Performing the daily QC test for mammography application (DT 2 Mammo) (optional)'* on page 161.

Establishing the image geometry reference values for mammography application (DT 2 Mammo) (optional)

To establish the image geometry reference values, proceed as follows:

1 Print the QC mammography test image or use the previously printed test image.
You should obtain an image looking like this (without the dimensions A and B):

QC mammography test image



2 To determine the reference values for geometry, measure the distances A and B of the geometric square on the test image.

Make sure to measure distance A from the left edge of the left line to the right edge of the right line and distance B from the upper edge of the upper line to the lower edge of the lower line.

We strongly recommend using a 30 cm (12-inch) machinist scale with 0.5 mm divisions (1/64 inch).

3 Record these values as reference dimensions A_{ref} and B_{ref} on Chart 4 ('Drystar 5500/5503 Geometric Consistency Control Chart'). Refer to *'Charts for mammography QC (optional)'* on page 247.

These charts will be used for the annual quality test. For more information, refer to *'Performing the Annual QC tests for mammography application (DT 2 Mammo) (optional)'* on page 164.

4 Save this film for future reference.

Verifying Acceptable Spatial Resolution and Artifact Levels and Low Contrast Visibility for mammography application (DT 2 Mammo) (optional)

Good viewing conditions are important for the correct interpretation of both diagnostic and test images. Make sure that the light box intensity (luminance) is between 3000 and 6000 cd/m² (4500 and 6500 °K) for mammography. Use a magnifying glass and use shutters to collimate. Make sure the ambient light is low.

To verify acceptable spatial resolution, artifact levels and low contrast visibility, proceed as follows:

1. Print the QC mammography test image or use the previously printed QC mammography test image used to establish the daily operating density levels.

2. Visually check the test image for artifacts: no significant disturbing artifacts should be visible.

3. Check the spatial resolution in each of the three ovals. Within each oval there are three groups, each having five dots. All five dots of each group must be visible with a magnifying glass. The smallest cluster of 5 dots is only visible if the viewing conditions are good.

4. Check the Low Contrast Visibility at both the high (100 / 95%) and low end (0 / 5%) of the density scale. You should be able to see the circle in the square (refer to item 1 on the *'QC mammography test image'* on page 158) and the upper circle (refer to item 2 on the *'QC mammography test image'* on page 158).

5. Record these values at the top of Chart 3 ('Drystar 5500/5503 Artifacts and Spatial Resolution Control Chart'). Refer to *'Charts for mammography QC (optional)'* on page 247.

6. These charts will be used for the weekly quality test. For more information, refer to *'Performing the Weekly QC tests for mammography application (DT 2 Mammo) (optional)'* on page 163.

In case of significant artifacts or insufficient spatial resolution, the cause must be found and the problem solved before any further clinical films can be printed.

Refer to *'Maintaining image quality and resolving Image quality problems'* on page 220 and *'Preventive maintenance schedule'* on page 186, or call your local Agfa service organization.

Performing quality control (QC) tests for mammography application (DT 2 Mammo) (optional)

The following procedures must be performed daily, weekly or annually as indicated. When used in a mobile application it is required to perform QC after every move.

The reason for performing quality control tests is to determine if any significant image quality variation or deterioration has occurred which may require corrective action. Comparing the results of the tests with the reference values previously established does this.

This procedure allows the operator to take the necessary preventive actions before any image quality loss can take place.

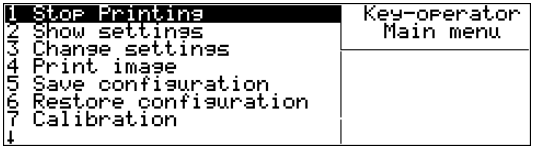
Performing the daily QC test for mammography application (DT 2 Mammo) (optional)

This test must be performed every day before any clinical film can be processed.

1 Turn on the Drystar 5500 and wait at least for 15 minutes. Refer to *'Switching on the Drystar 5500'* on page 34.

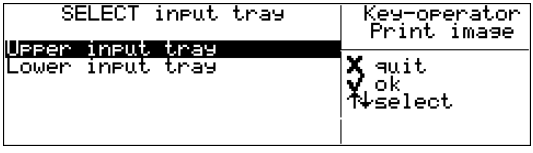
2 Press the Key-operator key to enter the Key-operator mode.

The 'Key-operator main menu' screen appears:



3 Press the Down key eight times, followed by the Confirm key to select 'Quality Control'.

The 'Select input tray' screen appears:



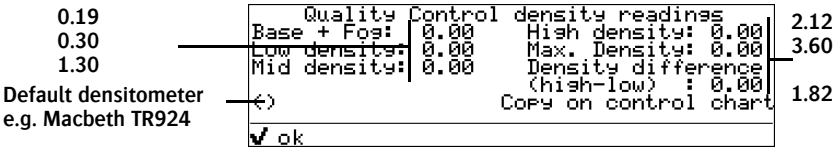
When controlling the Drystar 5500 via a remote PC, The 'Select input tray' screen is preceded by a screen, which allows you to:

- *Start the quality control procedure immediately,*
- *Edit additional data for the last quality control measuring.*

4 Press the Up/Down arrow keys to select the proper input tray, followed by the Confirm key.

The Drystar 5500 will automatically print the QC mammography test image.

5 After the image is printed, the system will display all measured optical density values:



6 Record the Base + Fog, the Mid density, the Maximum density and the Density Difference values on Charts 2A and 2B ('Drystar 5500/5503 Daily Density Control Chart'). Also record the date and time of the test on the charts and on the QC mammography test images. Refer to *'Charts for mammography QC (optional)'* on page 247.

7 Press the Confirm key to return to the main menu.

8 Press the ok key to return to the main menu.

In case the measure results are not within the aim values, the reason for the unacceptable density variations must be identified and resolved before any further clinical films can be processed. This may include repeating the film calibration procedure.

For possible causes of non-compliance and the respective actions, refer to *'Maintaining image quality and resolving Image quality problems'* **on page 220** **and** *'Preventive maintenance schedule'* **on page 186.**

Performing the Weekly QC tests for mammography application (DT 2 Mammo) (optional)

Spatial Resolution, Artifact Test and Low Contrast Visibility

To identify artifacts and verify spatial resolution you must perform the following test weekly or as needed for troubleshooting image quality problems.

Good viewing conditions are important for the correct interpretation of both diagnostic and test images. Make sure that the light box intensity (luminance) is 3000 and 6000 cd/m² (4500 and 6500 °K) for mammography. Use a magnifying glass and use shutters to collimate. Make sure the ambient light is low.

1 First, print out the QC mammography test image. Refer to *'Performing the daily QC test for mammography application (DT 2 Mammo) (optional)'* on page 161.

2 Check the test image visually for artifacts: no significant disturbing artifacts should be visible.

3 Check the spatial resolution.

The test film also shows three squares which each contains an oval. These 3 ovals contain 3 groups, each having 5 dots. All five dots of each group must be visible with a magnifying glass. The smallest cluster of 5 dots is only visible if the viewing conditions are good.

4 Check the Low Contrast Visibility at both the high (100 / 95%) and low end (0 / 5%) of the density scale. You should be able to see the circle in the square (refer to item 1 on the *'QC mammography test image'* on page 158) and the upper circle (refer to item 2 on the *'QC mammography test image'* on page 158).

5 Record these values on Chart 3 ('Drystar 5500/5503 Artifacts and Spatial Resolution Control Chart'). Refer to *'Charts for mammography QC (optional)'* on page 247.

In case of significant artifacts, insufficient spatial resolution or failure of any other recommended QC tests, the cause of the problem must be identified, and corrective action must be taken before the Drystar 5500 can be used for any further clinical imaging.

Refer to *'Maintaining image quality and resolving Image quality problems'* on page 220 and *'Preventive maintenance schedule'* on page 186 or call your local Agfa service organization for assistance.

Performing the Annual QC tests for mammography application (DT 2 Mammo) (optional)

Geometric Consistency Test

To be able to notice fluctuations in image size and aspect ratio, you must perform this procedure once a year.

1 First, perform the daily test.

2 Measure the distances A and B of the geometric square on the QC mammography test image. Refer to *'Establishing the image geometry reference values for mammography application (DT 2 Mammo) (optional)'* on page 158.

Make sure to measure distance A from the left edge of the left line to the right edge of the right line and distance B from the upper edge of the upper line to the lower edge of the lower line.

We strongly recommend using a 30 cm (12-inch) machinist scale with 0.5 mm divisions (1/64 inch).

3 Record these values as measured distances A and B on Chart 4 ('Drystar 5500/5503 Geometric Consistency Control Chart'). Refer to *'Charts for mammography QC (optional)'* on page 247.

4 Compare the measured A and B dimensions with the reference dimension values, A_{ref} and B_{ref} on Chart 4 ('Drystar 5500/5503 Geometric Consistency Control Chart'). Refer to *'Charts for mammography QC (optional)'* on page 247.

The differences between the measured dimensions of A and B and the reference values A ref and B ref should be less than or equal to 1.0%.

5 Check for image distortion.

6 Calculate the aspect ratio by dividing A by B.

The result must be 1 +/- 0.01

If the image size or distortion values are outside of limits, contact Agfa service to resolve the problem.

Chapter 4

Controlling the Drystar 5500 via a remote PC (with browser)

This chapter will inform on how to control the functions of the Drystar 5500 via the browser on a remote PC.

Features

- All functions that can be accessed via the local keypad and display can also be accessed via a remote PC via the network.

  Brief: LOCAL corresponds with MAIN features.

- All functions that can be accessed via a remote connection are not necessarily available via the local keypad.

  Brief: REMOTE corresponds with ALL features.

- This remote access allows controlling multiple printers from a networked central PC.

- The prerequisites for remote access are:
  - A PC (Windows 2000 is advised),
  - Browser software (preferably Microsoft Internet Explorer 6.0),
  - A network adapter,
  - A **cross-link Ethernet cable** (for a direct link between PC and Drystar 5500) or a **straight Ethernet cable** (for a connection via an existing network).

- Using the remote PC, you have access to five operating modes of the Drystar 5500: Operator mode, Key-operator mode, Service mode, Specialist mode, and Administrator (Security) mode.

  Depending on the operating mode, you will need a password to have access:

Need password	Local	Remote
Operator	No	Yes
Key-operator	No	Yes
Service	Yes	Yes
Specialist	No access	Yes
Administrator	No access	Yes

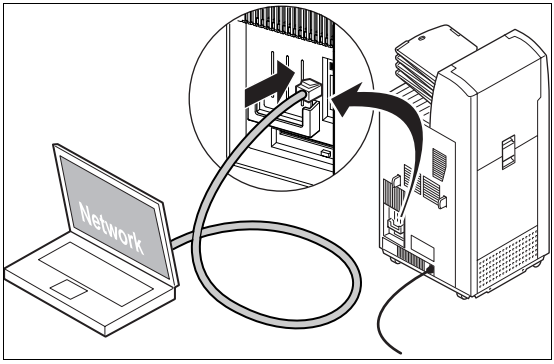
Setup

The Drystar 5500 and the remote PC can be set up in two ways:

- using a crossed network cable, or
- using a straight network cable.

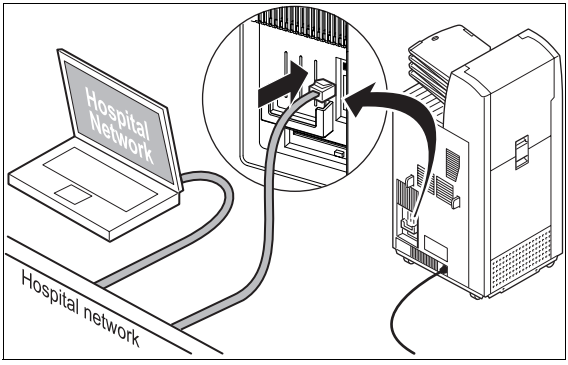
Configuration with crossed network cable

In this configuration, a crossed network UTP cable is used to connect the PC directly to the printer.



Configuration with straight network cable

In this configuration, the PC is connected to the network with a straight network cable.



Setting up the connection

Setting up a direct link (configuration with crossed network cable)

To set up a direct link, you have to follow two procedures:

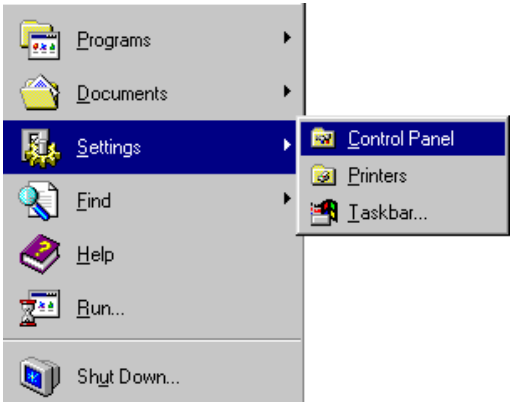
- Attribute a fixed IP address to the PC,
- Switch off all proxy setting in the browser.

When setting up a link, bare in mind the following important hints:

- Always make the physical connection first,
- Depending on the PC and/or Operating System, a reboot may be necessary in order to make the new configuration work.

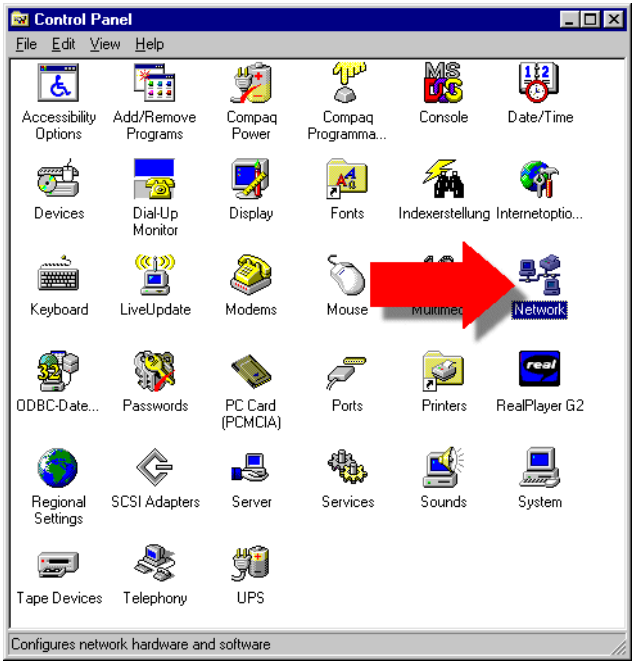
Attributing a fixed IP address to the PC

1 Go to Settings via the Start menu of Windows and click Control Panel.

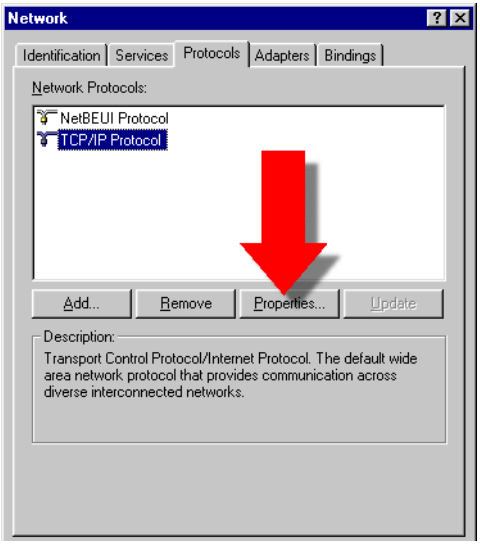


The Control Panel menu will appear.

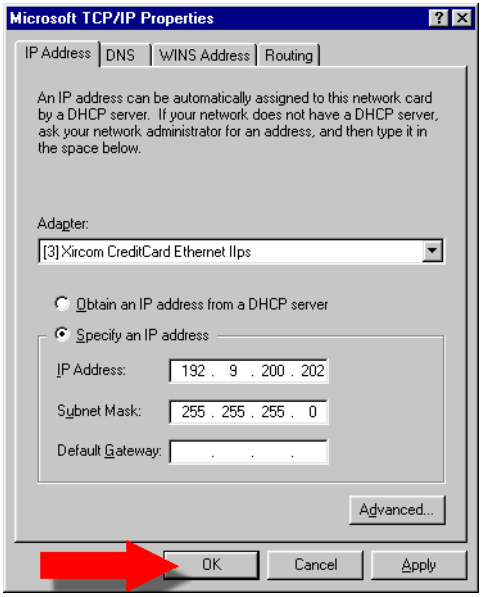
2 In the Control Panel menu, click Network.



3 In the Network window, select TCP/IP protocol, select the Protocols tab, and click Properties.



4 Specify IP address and subnet mask and click OK.



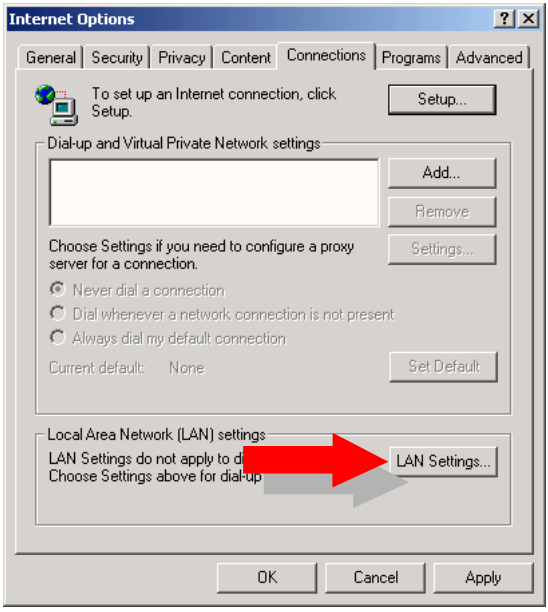
In case of APIPA assigned addresses, set the printer IP address to 169.245.10.10 and the printer subnet mask to 255.255.0.0.

Switching off the proxy settings of the browser

1 Open the browser.

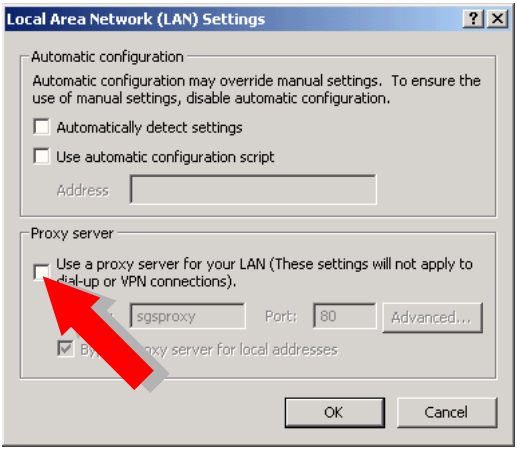
2 In the Tools menu, click Internet options.
The Internet Options window will appear.

3 In the Internet Options window, go to the connection tab and click LAN settings.



The Local Area Network (LAN) Settings window will appear.

4 Switch off all proxy settings of the browser and click OK.



The PC is ready to make a connection. Refer to *'Starting the remote session'* on page 173 for more information.

Setting up a link through a network (configuration with straight network cable)

Attribute a fixed and available IP-address on the network to your PC. Refer to *'Attributing a fixed IP address to the PC'* on page 168.

The PC is ready to make a connection. Refer to *'Starting the remote session'* on page 173 for more information.

Starting the remote session

Starting the remote session

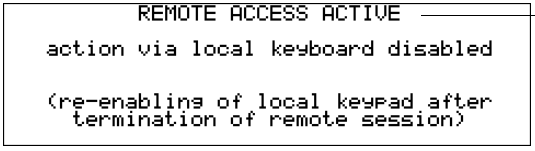
When starting the remote session, make sure the printer is in 'Ready' mode.

To start the remote session, enter the IP address of the printer in the Address bar of the browser.

The Browser welcome page appears:

There are five access levels: operator, Key-operator, service engineer, specialist and security administrator. Each level, except the operator level, has its own user name and password.

A remote session disables the local keypad and display. While you work remotely, the following screen is displayed:



Entering the operator level

To enter the operator level, enter the following user name and password:

- User name: Operator
- Password: Operator

This level enables the operator to follow print jobs and perform common tasks.

Entering the Key-operator level

To enter the Key-operator level, enter the following user name and password:

- User name: Drystar
- Password: 5500

You now have access to the functions in the Key-operator mode.

Only one session is active at one time on one printer.

Mostly, the menu structure and the browser screens are structured in the same way as the local display of the printer. Sometimes they differ slightly as in following example:

The screens are in English only.

The functionality of some features is extended via Remote access. For example, you can also print TIF-images which are "residing" on the Remote PC.

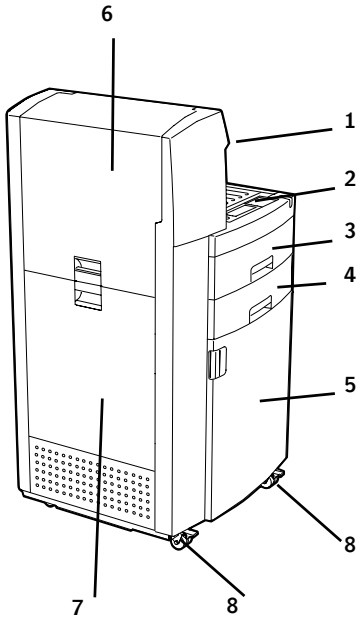
Do not use the Back and Forward buttons of your browser. Use the different links on the pages instead.

Chapter 5

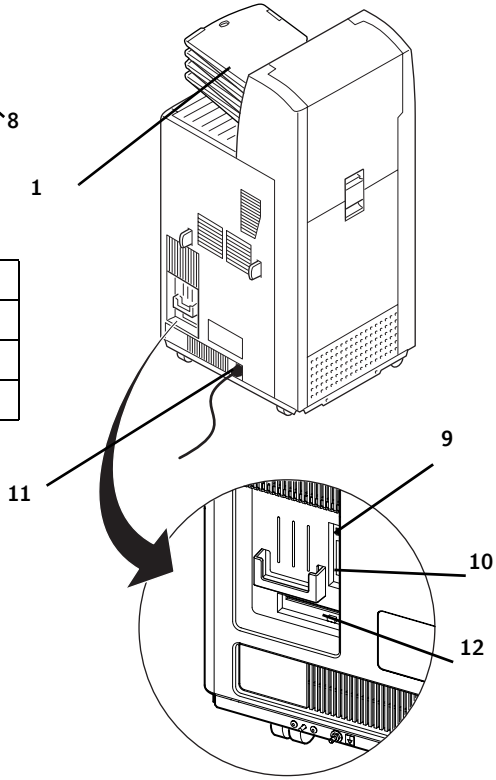
System description

In this informative chapter you will find mechanical and functional descriptions.

Main components



1	Output tray
2	User interface
3	Upper input tray
4	Lower input tray
5	Front door
6	Top door
7	Drum compartment door
8	Wheels with brakes



9	Network connector
10	PC connector
11	Power connector
12	Floppy disk drive

Functional description

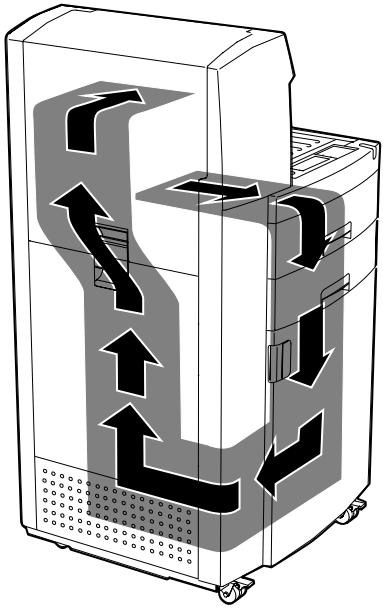
The Drystar 5500 consists of two functional blocks: a controller and a print engine.

The **controller**

- captures the incoming digital data via the network and stores the data on a hard disk,
- composes the different images, and
- generates the appropriate print engine control signals.

The **print engine** receives the image data from the controller, drives the film through the device and makes grayscale prints.

The diagram below shows how the film is transported through the printer (gray section in the drawing below).



Changing the film format of the trays

The Key-operator can adjust the film size setting of both the input trays and the output tray (8x10" up to 14x17" film sizes).

First, the Key-operator has to perform a mechanical modification. After this modification, the 'film format' parameter is automatically read from the Film Identification tag when the new film pack is loaded.

Never load another film format when the input tray is not empty. Intermediate changing of film formats increases the risk for dust, which can damage the thermal print head (TPH).

The system performs an automatic calibration when the film format has been changed.

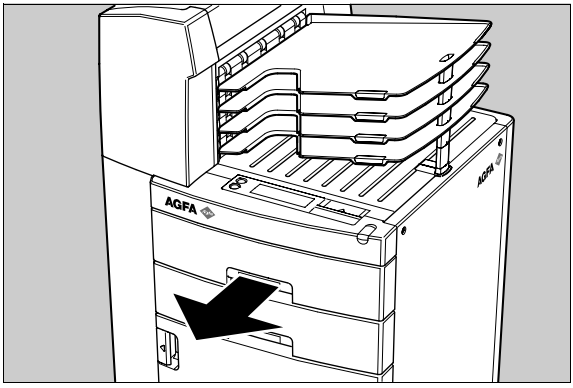
Proceed as follows to perform the mechanical modification:

1 Make sure that the printer is in 'Ready' mode.

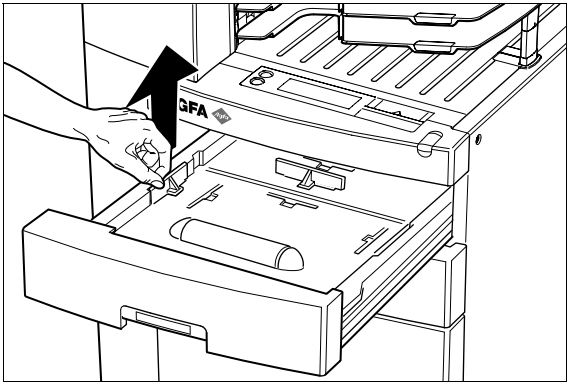
2 Press the **Unlock button** to unlock the trays.

You have 5 seconds to open the input tray. If you do not open the tray within that time, the first screen (step 1 or 5 respectively) is presented again, or printing is resumed when a job is received for which media is available.

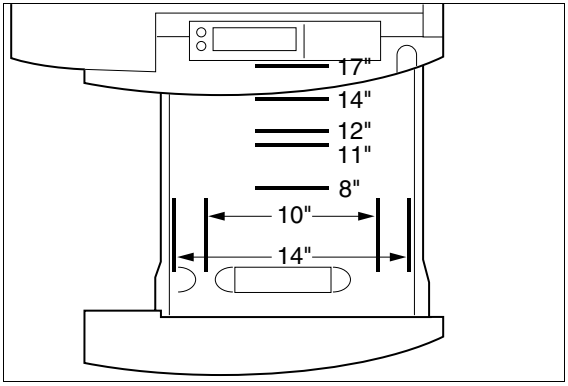
3 Open the input tray you want to adapt.



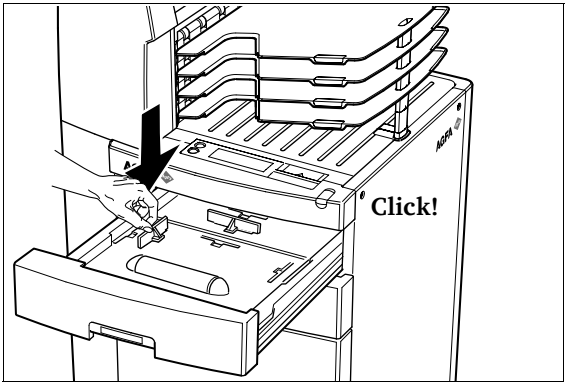
4 Remove the film position tab.



5 Locate the correct tab position for the desired film format.



6 Put the film position tab in place and push it down until it locks.

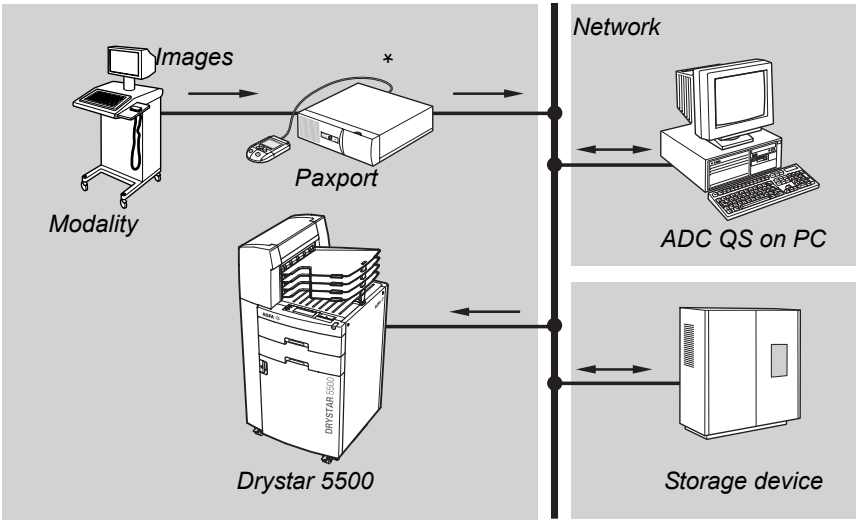


7 Load a new film pack. Refer to *'Loading films'* on page 46.

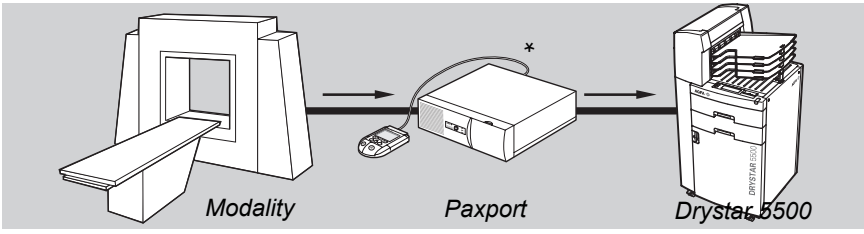
Drystar 5500 network configuration

In a network configuration, the Drystar 5500 is fully compatible with Agfa's diagnostic imaging systems, including the ADC Compact and ADC Quality System software, the Paxport and the entire line of Impax Review Systems, Storage Stations and Transmitting Stations.

The Drystar 5500 serves as a standard network printer. Acquisition, storage, transmission and printing are completely controlled by network modalities. As network protocols the standard Agfa protocol or the optional DICOM protocol can be used.



Example of the Drystar 5500 in a network configuration



Example of a Drystar 5500 in a point-to-point configuration

* Paxport is required if the modality is not a DICOM modality.

Transport after installation

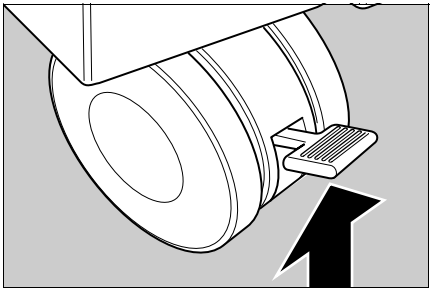
The Drystar 5500 is equipped with wheels so that moving the printer over a short distance - if required - can be done in a convenient way.

Refer to 'Safety precautions' on page 13.

Always keep in mind the following safety guidelines:

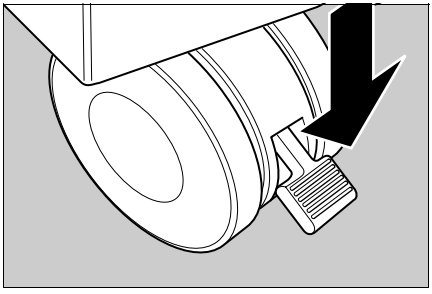
- During movement of the Drystar 5500 take care that stability is always ensured. Special attention should be paid to possible obstructions, and to uneven or slant surfaces.
- Never transport the Drystar 5500 with open doors.
- Make sure that both front wheel brakes are unlocked.

1 Unlock both wheel brakes on the right and left hand sides.



2 Move the Drystar 5500 to its destination.

3 Relock the wheels by pressing the brakes down.



Chapter 6

Preventive maintenance and replacements

This chapter guides the user through maintenance and cleaning tasks which require no special skills, tools nor training:

- Preventive maintenance schedule
- Cleaning the exterior
- Cleaning the dust rollers
- Cleaning the cooling air flow holes

Preventive maintenance schedule

The Drystar 5500 is designed for trouble-free operation. Maintenance and cleaning involve only some minor user tasks. Refer to the following pages for the appropriate cleaning procedure.

Interval	What to do?	Page
Ad hoc	*'Cleaning the exterior'*	187
Ad hoc	*'Print head cleaning'*	115
Ad hoc	*'Cleaning the dust rollers'*	188
Each 6 months (or more if required).	*'Cleaning the cooling air flow holes'*	192
When image quality tends to degrade.	*'Print head profile calibration'*	118

Safety guidelines

To prevent damage to the printer while performing maintenance, observe the following safety precautions:

- Do not lubricate the printer.
- Do not attempt to disassemble the printer.
- Do not touch the resistor line of the print head.
- Always switch off the Drystar 5500 and disconnect the power cord from the outlet before carrying out any maintenance work.

Film jam removal or cleaning the printer head can be done without switching the power off.

Cleaning the exterior

1 Switch off the Drystar 5500 by following the procedure as described in *'Switching off the Drystar 5500'* on page 36.

2 Remove the power plug from the socket.

3 Remove the network cable.

4 Wipe the exterior of the printer with a clean, soft, damp cloth.

Use a mild soap or detergent if required but never use an ammonia-based cleaner. Be careful not to get any liquid in the power cord port.

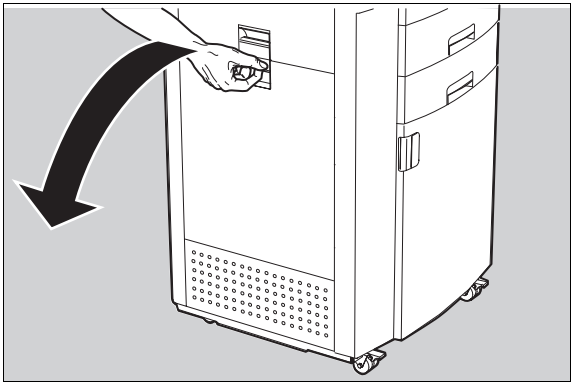
5 Plug in the printer and switch it on by following the procedure as described in *'Switching on the Drystar 5500'* on page 34.

Cleaning the dust rollers

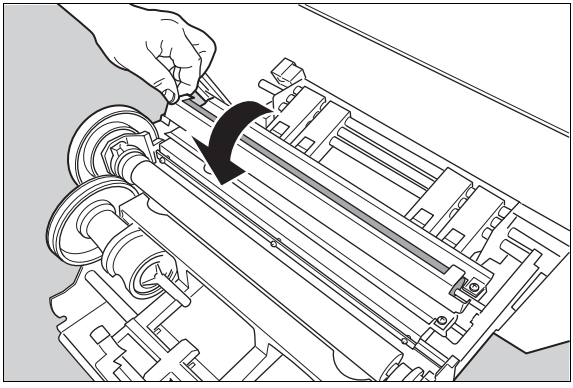
Cleaning the dust rollers must be done when white lines appear on the prints. For more information on maintaining image quality, refer to *'Maintaining image quality and resolving Image quality problems'* **on page 220.**

To clean the dust rollers, proceed as follows:

1 Open the drum compartment door by pulling its handle.



2 Open the sheet metal cover of the dust rollers.

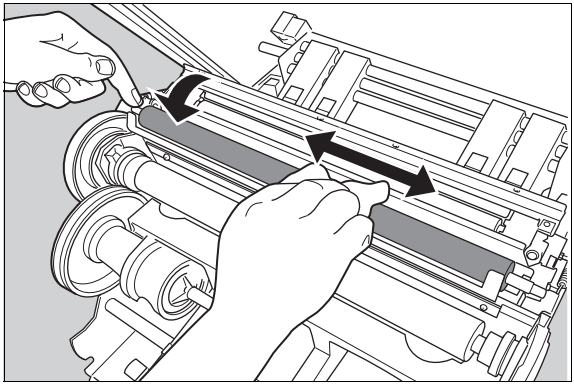


Grab the cover at left side to avoid pinching of fingers.

Do not touch the discharge brushes!

Keep all the other covers closed as much as possible to avoid extra dust into the printer.

3 Clean the upper roller



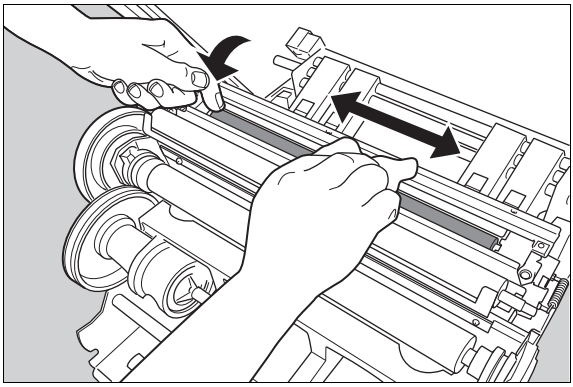
Use a dust roller cleaning tissue to clean the roller. Turn the roller at its axle during cleaning and rub in the length direction of the roller.

Refer to 'ABC ordering codes' for the ABC code of the dust roller cleaning tissue.

As the rollers are sticky it's very important to use a lint free cloth!

Never clean the roller with water or soap.

4 Clean the lower roller



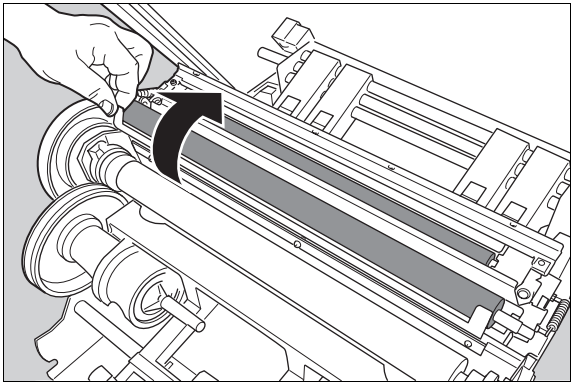
Use a dust roller cleaning tissue to clean the roller. Turn the roller at its axle during cleaning and rub in the length direction of the roller.

Refer to 'ABC ordering codes' for the ABC code of the dust roller cleaning tissue.

As the rollers are sticky it's very important to use a lint free cloth!

Never clean the roller with water or soap.

5 Close the sheet metal cover of the dust rollers.



Grab the cover at left side to avoid oppressing of hands.

6 Close the drum compartment door.

After you have cleaned the dust rollers and you have closed the drum compartment door, the printer will restart automatically.

After the cleaning the level of dust stripes can be slightly increased depending on the amount of dust coming into the printer during the repair work. The level of dust stripes usually improves after several prints (max. 1 film pack).

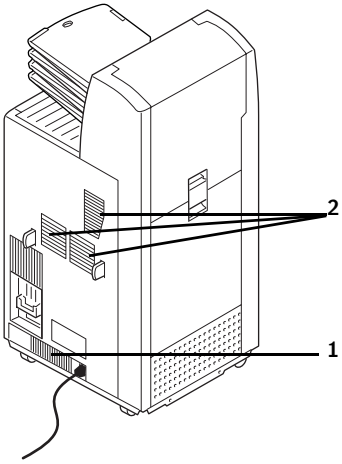
Cleaning the cooling air flow holes

1 Switch off the Drystar 5500 by following the procedure as described in *'Switching off the Drystar 5500'* on page 36.

2 Remove the power plug from the socket.

3 Remove the network cable.

4 With a vacuum cleaner, clean the cooling air flow holes (item 1 and 2 on the drawing below) , especially the CPU/power supply area (item 1).



5 Plug in the printer and switch it on by following the procedure as described in *'Switching off the Drystar 5500'* on page 36.

Chapter 7

Troubleshooting

This chapter serves as a guide to identify and solve possible problems you may encounter.

Troubleshooting checklist

General problems

The table below lists some general problems which can occur when working with the Drystar 5500.

- The Drystar 5500 does not print.

Action	Refer to	Page
Check the Drystar 5500	*'The Drystar 5500 does not print'*	196
Remove a jammed film	*'Film input tray feed jams'*	200
	'Film transport jams in the front section'	203
	'Film transport jams in the print section'	205
	'Film transport jams in output section'	209
	'Unauthorized opening of the printer'	213
Resolve error messages	*'Checking error messages'*	196
Handle floppy disk error	*'Checking floppy disk error messages'*	198

- The quality of the printed images is bad (printing remains possible).

Action	Refer to	Page
Resolve film quality problems	*'Maintaining optimal Image Quality'*	220
	'White dots or lines appear in the transport direction'	*223*
	'Low frequency banding'	*223*
	'Scratches appear on film'	*224*
Resolve warning messages	*'Warning messages'*	225

Have electrical or mechanical defects repaired by skilled personnel only!

Checking the status indicator LED

The LED on the front panel indicates the Drystar 5500 operating status. Use the following table to determine the status of your printer.

Color	Light	Status	Receive jobs?	Printing OK?	Action
Green	**Constant**	Ready (standby)	Yes	Yes	Proceed.
	Blinking	Start-up sequence	No	No	Wait.
		Receiving jobs	Yes	Yes	
		Calculating	Yes	Yes	
		Printing	Yes	Yes	
		Calibrating	Yes	No	
		Installation	No	No	Proceed with the activity.
		Key-operator	Yes/No	Yes/No	
Red	**Blinking**	Service mode	No	No	
		Upper/Lower Input tray empty	Yes	Yes/No	Refer to *'Loading films'* on page 46.
		Film jam	Yes	No	Refer to *'Clearing of film jams'* on page 199.
		Warning	Yes	Yes	Refer to *'Warning messages'* on page 225
	Constant	Error status	No	No	Refer to *'Checking error messages'* on page 196.

The Drystar 5500 does not print

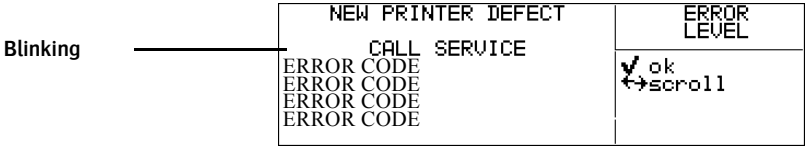
Proceed as follows when the Drystar 5500 does not print:

Checking error messages

1 Check the display messages

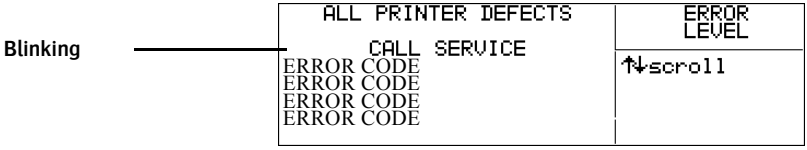
If the Drystar 5500 is not printing your job, you should check the front panel display to see if the Drystar 5500 is indicating an error status.

The operator is notified of the situation by means of an Error screen and a beep:



2 Acknowledge the new error condition.

A new Ready screen will appear, holding all error messages. With the Up and Down keys you can scroll through the error messages:



3 Call the service operator.

An error message is different from a warning message. A warning means that an event occurred which might result in a decreased image quality. Printing is still possible, which is not the case when an error message appears.

Checking the connections

If no error messages are displayed and you are unable to get the printer to respond, the problem may be caused by a fault in the connections. In this case, check that all connectors and cables are firmly attached to the printer.

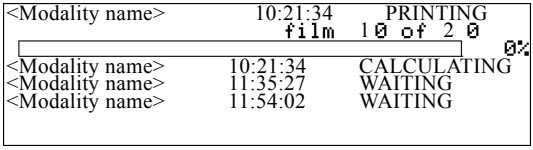
- If the connections are OK, reset the Drystar 5500.
- If the Drystar 5500 still does not print, consult your local service organization.

Regularly check all electrical connections. When interference occurs with other devices, consult your local service organization.

Call your local service organization in case cables are disconnected. The user is not allowed to add or remove any connectors.

Checking the print queue

If no error message is displayed, you should check the print queue:



For each line of the queue, the status can be:

- printing,
- calculating,
- waiting,
- warning,
- error.

A warning or error status indicates that there is a print queue problem.

For more information, refer to 'Warning messages' on page 225 and 'Start-up errors' on page 218.

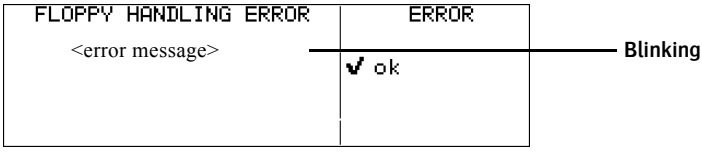
For more information about the print queue status, refer to 'Managing the print queue' on page 39.

Checking floppy disk error messages

If the Drystar 5500 is not printing your job, you should check the front panel display to see if the Drystar 5500 is indicating an error status.

A floppy disk error can occur when the inserted floppy disk is full, write protected or when no floppy disk is inserted.

1 Correct the error following the error message on the screen:



After you have corrected the action the screen will disappear.

Clearing of film jams

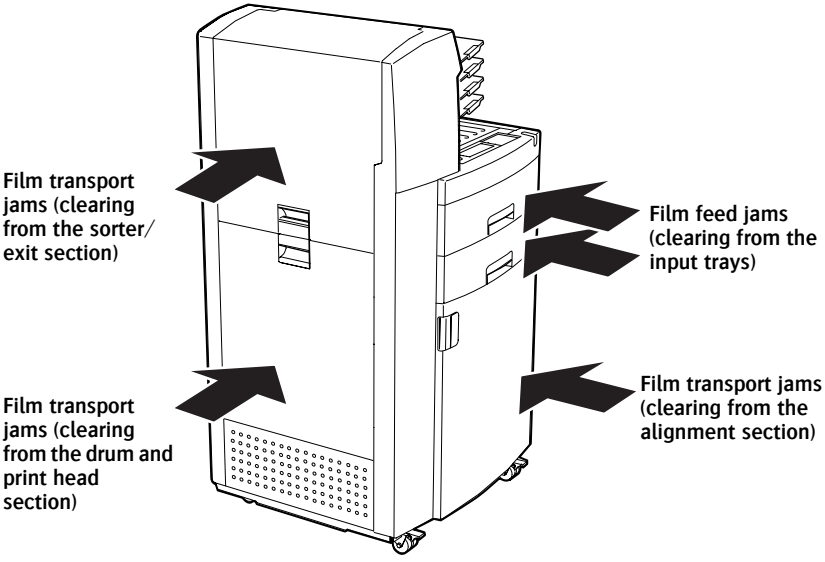
A film jam can be situated either:

- In the input tray section. Refer to *'Film input tray feed jams'* on page 200.
- In the alignment section. Refer to *'Film transport jams in the front section'* on page 203.
- In the drum and print head section. Refer to *'Film transport jams in the print section'* on page 205.
- In the sorter/exit section. Refer to *'Film transport jams in output section'* on page 209.

Jams can be caused by:

- Loading consumables in a wrong way, e.g. loading film upside down.
- Opening the printer door(s) or input tray(s) while a film is actually being printed. Refer to *'Unauthorized opening of the printer'* on page 213.

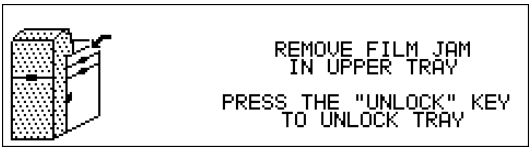
Overview of sections:



A pictogram on the display depicts where the film jam is situated in the printer.

Film input tray feed jams

The following screen indicates that a jam occurred in the feed section of the input tray(s):



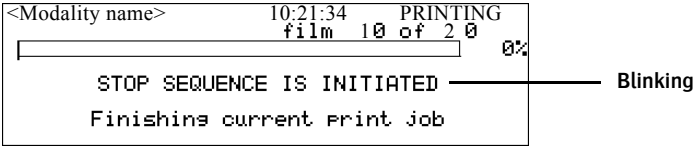
A message will inform you if either the **upper** or **lower** input tray is jammed.

To remove a jammed film in the input tray (e.g. upper input tray):

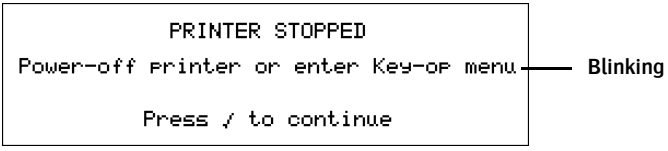
In the procedure, we will assume that the upper input tray is to be cleared. The procedure for the lower input tray is identical.

1 Start the procedure to stop printing as described in *'Stopping the printing process'* on page 59.

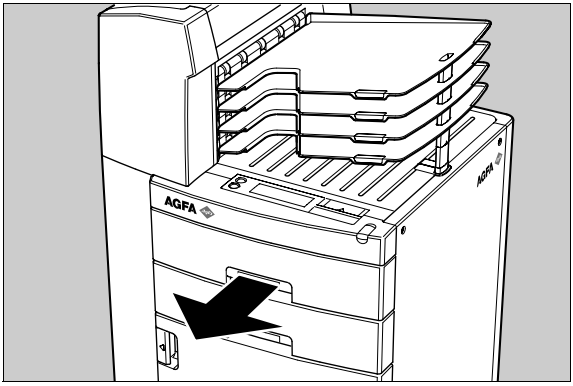
2 Wait while the printer is finishing printing any current jobs.



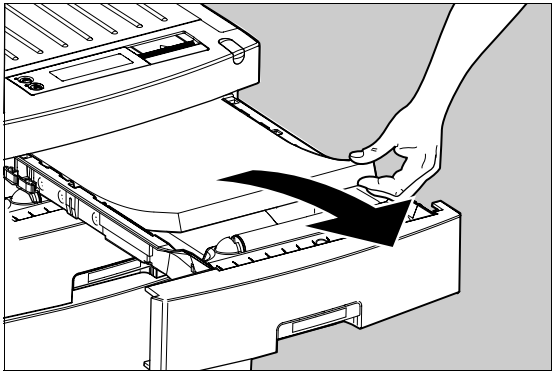
The printer is ready when the following message appears:



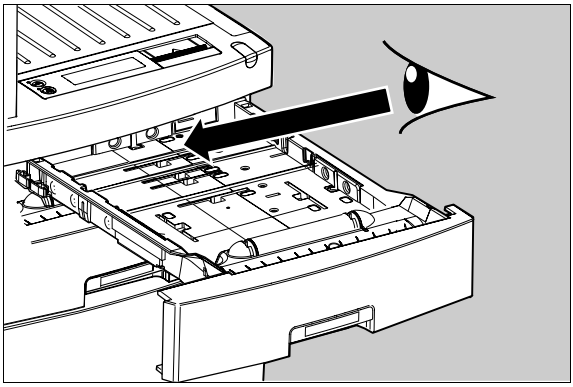
3 Open the film input tray.



4 To get a clear view, remove any remaining film sheets.



5 Check the film feed section of the input tray.



If a film is jammed, gently remove the sheet. Reposition the film stack in the input tray, making sure that all the sheets are kept correctly in place (refer to *'Loading films'* on page 46).

Never use force to clear the jammed film. If it is not possible to gently remove the jammed film, call your local service organization.

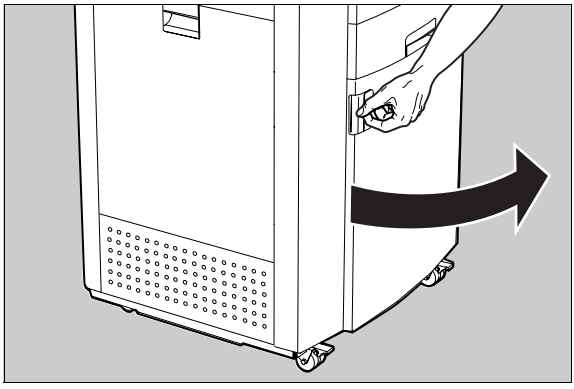
Never reuse a jammed film. This may cause damage to the thermal head and/or dust problems.

Film transport jams in the front section

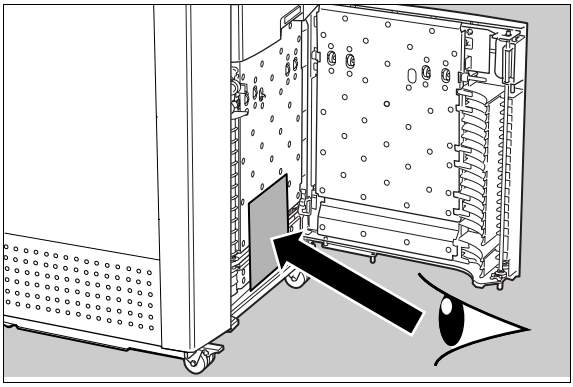
The following screen indicates that a jam occurred in the front section of the film transport system.

To remove a jammed film in the front section of the transport system:

1 Pull the front door open.



2 Check the interior for film sheets.



In many cases, the film will fall out of this section after you have opened the front door.

3 Remove the film sheet.

NEVER reuse a film that you got back from a jamming situation, it may damage the print unit.

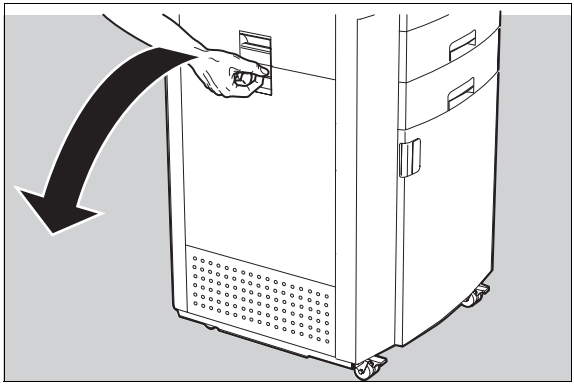
4 Close the front door and continue.

Film transport jams in the print section

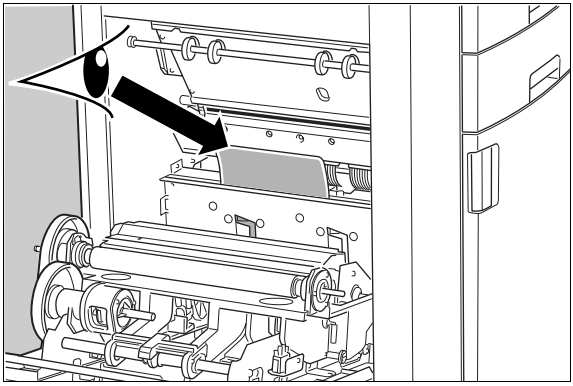
The following screen indicates that a jam occurred in the print section of the film transport system.

To remove a jammed film in the print section of the transport system:

1 Open the drum compartment door by pulling its handle.

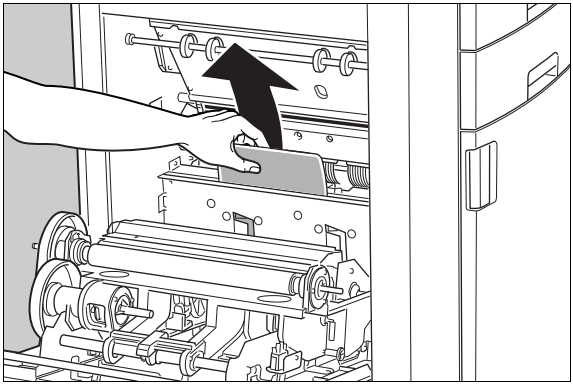


2 Check if you can locate a film visually between the vertical lift and the print head.

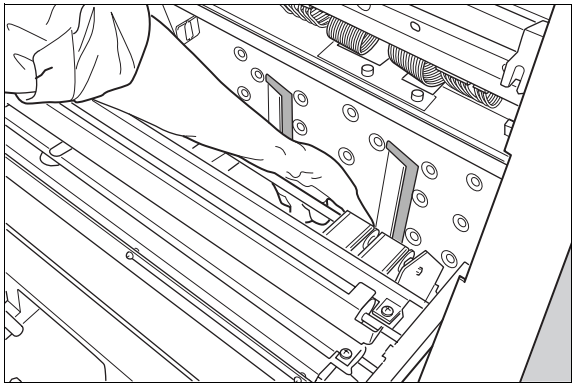


- If the film is visible,
  proceed with step 3.
- If the film is not visible, it has fallen behind the vertical lift.
  Proceed with step 4.

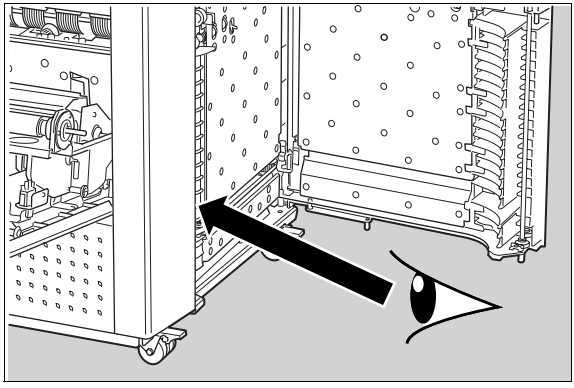
3 carefully remove the film and proceed with step 8.



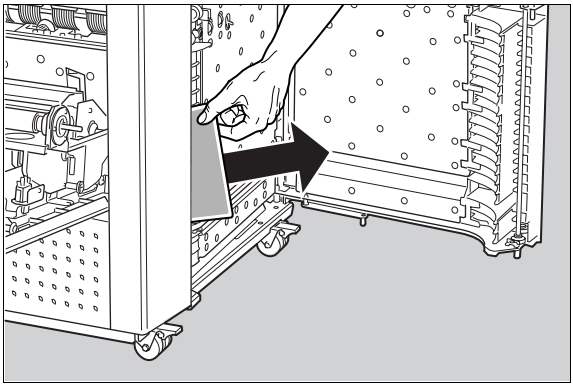
4 Locate the film through the holes of the vertical lift and move it to the right.



5 Open the front door and check the area behind the vertical lift.



6 Remove the film via the front compartment, as indicated below.



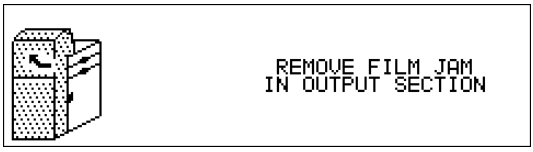
NEVER reuse a film that you got back from a jamming situation, it may damage the print unit.

7 Close the front door.

8 Close the drum compartment door and continue.

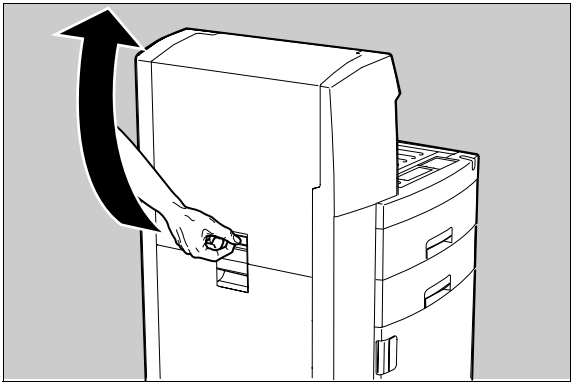
Film transport jams in output section

The following screen indicates that a jam occurred in the output section of the film transport system.



To remove a jammed film in the output section of the transport system:

1 Open the top door.



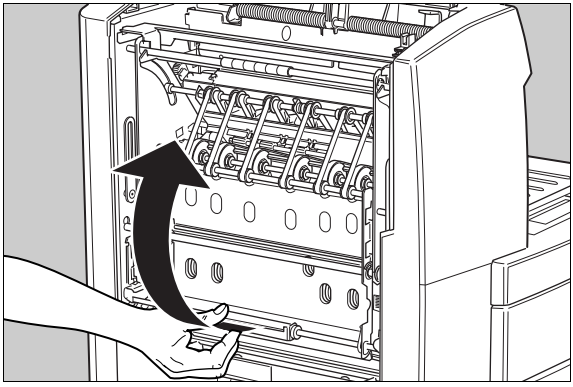
Mind your head when the top door is open.

2 Visually check where the film is jammed.

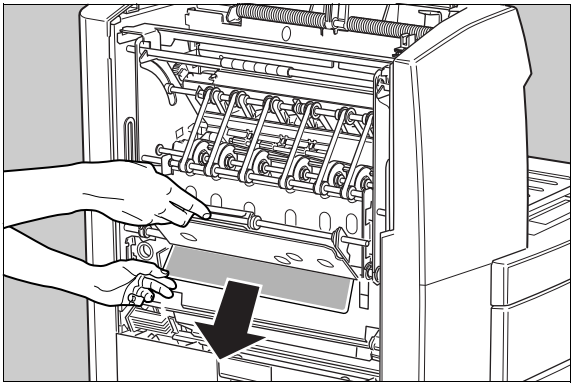
- If the film is jammed in the canting guide plate section, proceed with step 3
- If the film is stuck in the sorter section, proceed with step 7.

3 Locate the film. First try to use the transport buttons to help clearing the jammed film.

4 If the transport buttons do not clear the film, lift the guide plate as shown below:



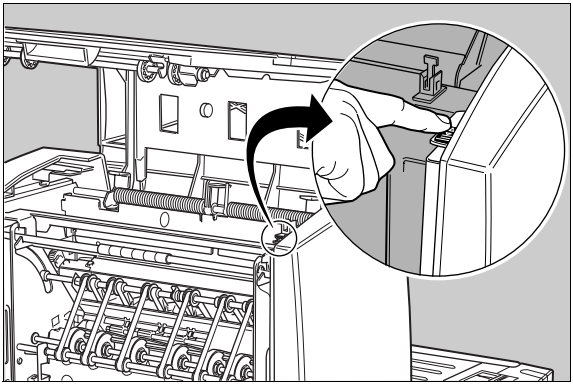
5 Remove the film.



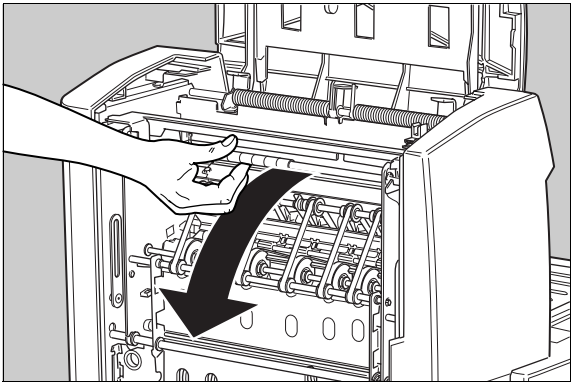
6 Close the guide plate.

Go to step 11.

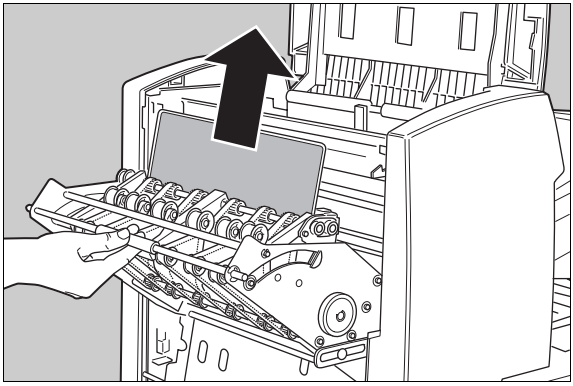
7 Locate the film. First try to use the transport buttons to help clearing the jammed film.



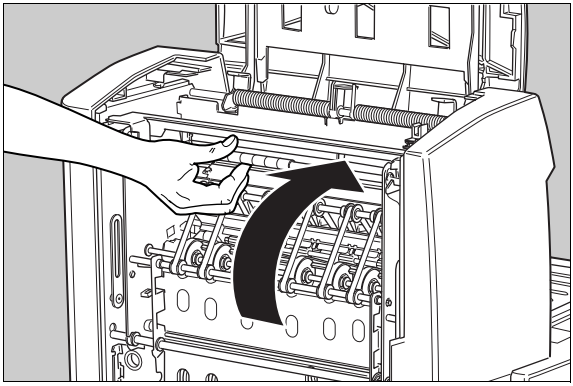
8 Open this sorter unit as follows:



9 Remove the jammed film.



10 Close the section.



11 If the film jam has been cleared, close the printer.
You can resume work.

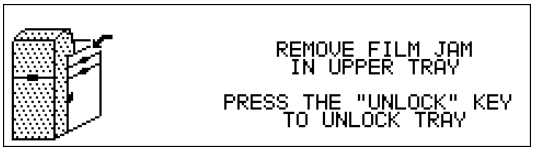
If the jam is not cleared at this moment, call you local service organization.

NEVER reuse a film that you got back from a jamming situation, it may damage the print unit.

Unauthorized opening of the printer

A jam can be caused by opening the printer doors while a film is actually being printed.

The following screen indicates that a jam has occurred.

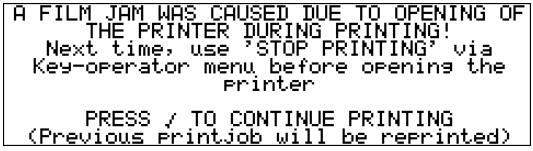


Proceed as follows:

1 Remove the jammed sheet.

Refer to *'Clearing of film jams'* on page 199.

After removal of the jammed film, the user is informed that he caused the film jam by opening the printer without using the appropriate procedure to stop printing.



2 Make sure to follow carefully the procedures as described in this manual before attempting to open the printer.

Refer to *'Switching off the Drystar 5500'* on page 36.

Refer to *'Loading films'* on page 46.

Film identification problems

When you load a new film pack, the new Film Identification tag is read and the tray film format and type are set based upon the info in the Film Identification tag (RF-tag).

This tag is only readable when the film pack is inserted in the correct way.

There are four possible error messages regarding film identification:

- No identification code detected
- Identification code error for upper/lower input tray
- Identical identification code detected in upper/lower input tray
- Film overrun from current pack

The following sections descibe the solution for each of these problems in more detail.

No identification code detected

This error message appears when the Film Identification tag is not readable.

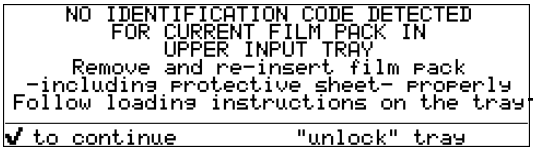
There are two possible solutions for this problem:

- Reload the current film pack or load another film pack
- Overrule the Film Identification tag of the film pack

To reload the current or another film pack

1 In case the Drystar 5500 does not start printing after re-inserting a film pack, first check if this film pack is inserted correctly.

If the Drystar 5500 still does not resume printing, the following message will appear:



2 Press the Unlock button to initiate the loading sequence and check again if the film pack is inserted correctly. If you re-insert the film pack, the Drystar 5500 will perform the same check-sequence until printing is resumed.

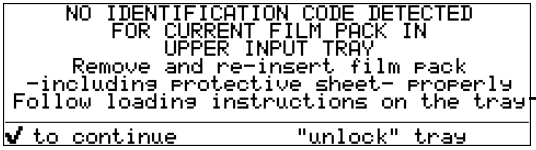
To overrrule the Film Identification tag of the film pack

If the "Overrule RF-tag Reading" setting is active, you can overrule the Film Identification tag setting of the current film pack. In this case you can continue printing using a limited Maximum Density.

Only your local service organization has the possibility to enable the "Overrule RF-tag Reading" setting!

1 In case the Drystar 5500 does not start printing after inserting a new film pack, check if this film pack is inserted correctly.

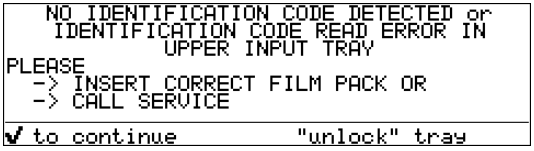
If the film pack is inserted correctly and the Drystar 5500 does not resume printing, the following message will appear:



Blinking

2 To continue with the current (not identified) film pack, press the Confirm button.

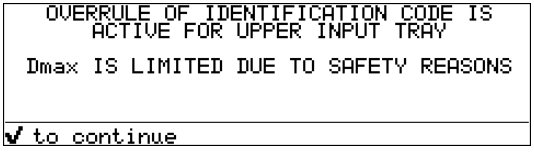
The following message is displayed:



If you wish, you can try again to re-insert the current or an other film pack. Press the Unlock button to initiate the loading sequence. If you re-insert a film pack, the Drystar 5500 will perform the check-sequence.

3 Press the Confirm button.

If the "Overrule RF-tag Reading" Setting is active, the following message is displayed:



If the "Overrule RF-tag Reading" Setting is not activated, the following message will be displayed:

```
NO VALID IDENTIFICATION CODE DETECTED
   PRINTING FROM UPPER INPUT TRAY
          IS DISABLED

 Re-enable printing from this tray by
      inserting correct media
✔ to continue
```

In this case, press the Confirm key to initiate the loading procedure again or call your local service organization to enable the "Overrule RF-tag Reading" Setting.

4 Press the Confirm key again to resume printing using a limited Maximum Density.

Identification code error for upper/lower input tray

```
  IDENTIFICATION CODE ERROR FOR UPPER
              INPUT TRAY

  -> INSERT CORRECT FILM PACK OR
  -> CALL SERVICE
✔ to continue          "unlock" tray
```

This identification code error appears in the following cases:

- you insert a new film pack with a encryption error in the Film Identification tag,
- you have loaded a Mammo film pack or a Mammo film, whereas the Mammo license is not activated.

Call your local service organization to resolve this problem. You can unlock the tray to insert another film pack.

Identical identification code detected in upper/lower input tray

In case you have loaded a film pack with a non-unique Film Identification tag (meaning that the current tag has been used with a previous film pack), the following message is displayed:

```
IDENTICAL IDENTIFICATION CODE DETECTED
          IN UPPER INPUT TRAY

     Remove and re-insert film pack
 -including protective sheet- properly
Follow loading instructions on the tray
✔ to continue          "unlock" tray
```

Proceed as follows:

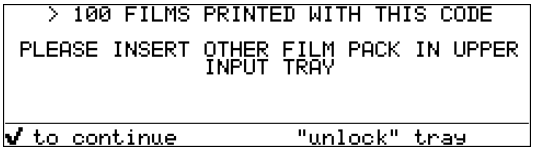
1 Press the Unlock button to initiate the loading sequence.

2 Reload a new film pack.

The Drystar 5500 will resume printing.

Film overrun from current pack

The following message is presented when more than 100 copies have been printed from the current film pack:



Proceed as follows:

1 Press the Unlock button to initiate the loading sequence.

2 Reload a new film pack.

The Drystar 5500 will resume printing.

Start-up errors

Error messages while the printer starts up

The table below lists the possible error messages which can appear on the display of the control panel while the printer starts up.

Error message	Cause of error
Error display failure (Firmware)	*'Key selftest failed'*
Error system failure	*'Key selftest failed due to no communication between Key and CPU'*
Error self test failure (Firmware)	*'Software selftest failed'*

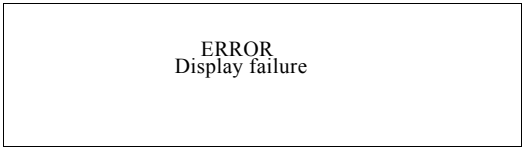
Contact your local service organization in case the selftest fails.

Error messages can also appear when the printer has already started up. Refer to 'Checking error messages' on page 196.

After starting up the Drystar 5500, the printer performs a selftest. A progress indicator will show the proceeding of this self test. During the self test, a number of messages can appear, meaning that the selftest has failed.

Key selftest failed

In case the Key selftest has failed, following message appears:

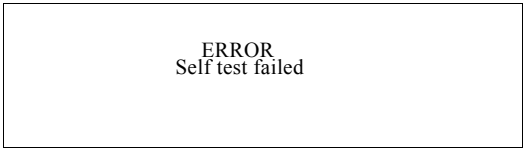


Key selftest failed due to no communication between Key and CPU

In case the Key selftest has failed due to no communication between Key and CPU, following message appears:

Software selftest failed

In case the software selftest has failed, following message appears:



Maintaining image quality and resolving Image quality problems

In general, when you follow the procedure *'Maintaining optimal Image Quality'* below, you should rarely encounter quality problems on printed films.

However, should any problems occur, the paragraphs *'White dots or lines appear in the transport direction'* on page 223, *'Low frequency banding'* on page 223 and *'Scratches appear on film'* on page 224 provide some specific remedies.

Maintaining optimal Image Quality

Calibration is necessary to maintain optimal Image Quality. This is required in the following situations:

- Before initial use of a film,
- When loading new films into the input trays,
- After a certain number of copies have been printed,
- After the replacement of the thermal head.

Overview of calibration functions

Three calibration functions are provided for the Drystar 5500.

	Calibration	Purpose	When?
1	*'Film calibration'*	• To measure and set the system density of the printer. • To measure and set the film sensitometry values.	• Automatic. • After an explicit action of the operator.
2	*'Print head cleaning'*	To eliminate white dots or lines in transport direction.	• When image quality problems occur.
3	*'Print head profile calibration'*	To reduce vertical density irregularities on the film.	• After an explicit action of the operator.

Some calibration functions are interrelated, so do not perform any of the above calibration functions as an isolated procedure.

Before performing a calibration, read the general guidelines as described in 'Understanding the calibration policy and the calibration initiation' on page 221.

Understanding the calibration policy and the calibration initiation

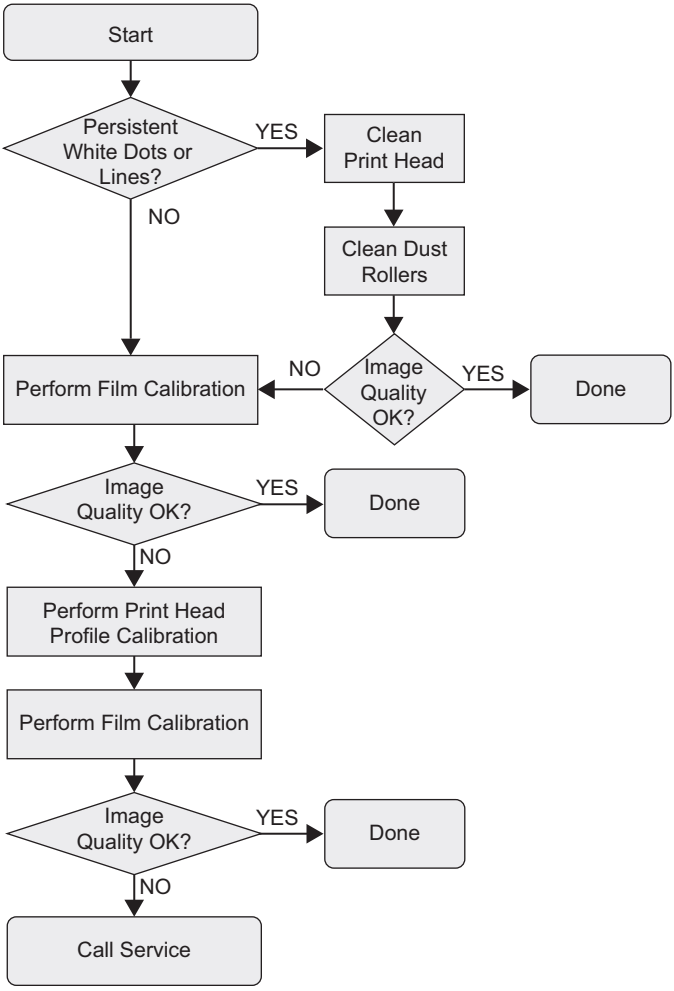
You should regularly perform a film calibration to assure that the image quality remains optimal.

Film calibration can be initiated in 2 ways:

- Automatically, i.e. after loading every 'x' new film packs (automatic initiation),
- Manually, i.e. you decide for yourself when to perform a film calibration, e.g. daily, once a week, or only when the image quality tends to degrade.

For setting automatic or manual film calibration initiation, refer to *'Changing general image quality settings - Film calibration'* on page 91.

The following flowchart will assist you in determining the correct operation in order to maintain the optimal image quality from your printer:



White dots or lines appear in the transport direction

If fine white dots and one or more fine white lines appear in the transport direction (mostly due to dust infiltration), try the following remedies:

1 Clean the print head resistor line.

Use a lint free cloth, slightly moistened with Isopropyl alcohol or Ethanol.

Refer to *'Print head cleaning'* on page 115.

2 If dust stripes remains visible, clean the dust roller.

Refer to *'Cleaning the dust rollers'* on page 188.

As the rollers are sticky it's very important to use a lint free cloth!

Never clean the roller with water or soap.

3 Print a few test sheets using the 'Print test image' function.

Refer to *'Printing test images from the hard disk'* on page 101.

4 If the white lines are still visible, contact your local service organization.

Low frequency banding

If you notice density non uniformity (low frequency banding) in the print head direction, perform print head profile calibration.

Refer to *'Print head profile calibration'* on page 118.

Scratches appear on film

If you notice scratches on the film in the print head direction, this may be due to the fact that a film sheet has been placed upside-down in the input tray.

Verify the correct position of the films in the input trays.

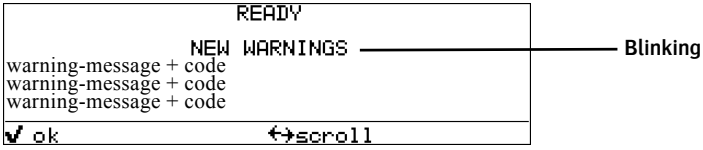
Refer to *'Checking the correct position of a film in the input tray'* on page 54.

Warning messages

A warning message is different from an error message. A warning means that an event occurred which might result in a decreased image quality. Printing is still possible.

This section will inform you what to do when warning messages appear. A warning message is displayed when an event has occurred that might decrease image quality.

The Warning screen is displayed:



1 Press the Confirm key to acknowledge the new warning condition.

The Ready screen will appear, holding all warning conditions:

2 Contact your local service organization.

Appendix A

Equipment information sheet

Specifications

Product description	
Type of product	Printer
Commercial name	Drystar 5500, Drystar 5503
Original seller/manufacturer	Agfa HealthCare N.V.
Labelling	
TÜV-, cULus-Certification Mark, CE-marking	
CCC Mark	
A#Sharp Mark	
Dimensions	
Dimensions (approx. values in cm)	• Unpacked: width 74, length 72, height 142 • Packed: width 90, length 83, height 160
Weight Drystar 5500/5503	• Unpacked: approx. 189.4 kg / 192.4kg • Packed: approx. 239 kg / 242 kg
Hard disk capacity	18 GByte or higher
Floppy disk capacity	2HD 1.44 Mbyte floppy disks
RAM memory	2x256 MB
Floppy disk container	Four 2HD 1.44 Mbyte floppy disks

Electrical connection	
Operating voltage	100-120 V; 220-240 V AC
Rated current	4/2 A
Mains fuse protection	
220-240 V operation	16/15 A slow blow, max.
100-120 V operation	16/15 A slow blow, max.
Mains frequency	50/60 Hz
Network connectivity	
Ethernet / connectors	RJ45 twisted pair for 10/100Base-TX; Serial RS232 connection
Network protocols (TCP/IP services)	FTP, Telnet, HTTP, SNMP, LPD
Image formats	DICOM (Default) TIFF
Power consumption - heat dissipation	
During operation	450 W - 1620 kJ/h
In standby	200 W - 720 kJ/h
Peak power (absolute max. rating)	700 W - 2520 kJ/h
Protection against	
Electrical shocks	Class 1 (grounded)
Ingress of water	IPXØ
Environmental conditions (operation)	
Room temperature	Between +15°C and +30°C
Relative humidity	Between 20% and 75% Note: Films may not become wet!
Atmospheric pressure	70 kPa - 106 kPa

Environmental storage conditions	
	*Climate conditions for storage are in accordance with EN60721-3-1-class 1K4.*
Room temperature	Between -25°C and 55°C (storage)
Relative humidity	Between 10% and 100%
Absolute humidity	Between 0.1 g/m^3 and 35 g/m^3
Rate of change of temperature	1°C/min
Atmospheric pressure	70 kPa - 106 kPa
Environmental transport conditions	
	*Climate conditions for transport are in accordance with EN60721-3-2-class 2K4.*
Temperature	Between -40°C and 70°C (transport)
Relative humidity not combined with rapid temperature changes	95% at +45°C
Total acoustic A-weighted noise power (method of measurement in accordance with ISO 3746:1995)	
During operation	67 dB (=6.7B)
During stand-by	57 dB (=5.7B)
Consumables	
DRYSTAR DT 2 B and DRYSTAR DT 2 C	8x10” up to 14x17” film sizes
DRYSTAR DT 2 Mammo (optional)	8x10”, 10x12” and 11x14” film sizes
Film throughput	
14x17”	> 100/h
Access time	
1 film 14x17”	Max. 90 sec.
4 films 14x17”	Max. 200 sec.
Print technology	
Direct thermal printing	

Reliability	
Estimated product life (if regularly serviced and maintained according to Agfa instructions)	> 5 years and > 150,000 films
Service interventions	Max. 2 interventions / 3 years
Earthquake (standard)	Meets the CA requirements

Imaging Array - Diagnostic area - General radiography				
8x10”	**8” dimensions**		**10” dimensions**	
	pixels	**mm**	**pixels**	**mm**
	3852	192,6	4880	244
10x12”	**10” dimensions**		**12” dimensions**	
	pixels	**mm**	**pixels**	**mm**
	4880	244	5860	293
11x14”	**11” dimensions**		**14” dimensions**	
	pixels	**mm**	**pixels**	**mm**
	5376	268,8	6922	346,1
14x14”	**14” dimensions**		**14” dimensions**	
	pixels	**mm**	**pixels**	**mm**
	6882	344,1	6882	344,1
14x17”	**14” dimensions**		**17” dimensions**	
	pixels	**mm**	**pixels**	**mm**
	6922	346,1	8368	418,4

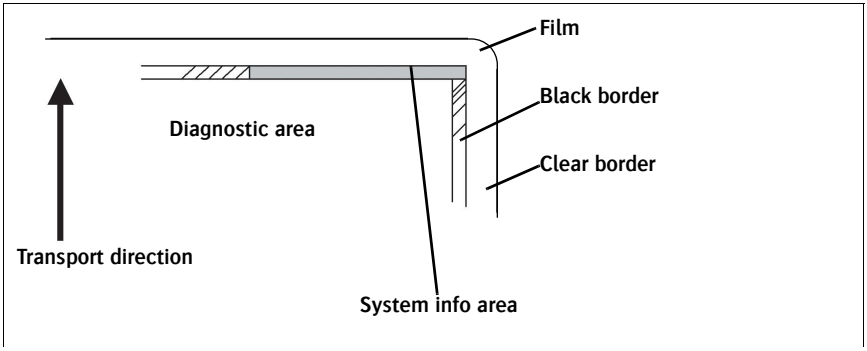
Imaging Array - Diagnostic area - Mammography (optional)				
8x10”	**8” dimensions**		**10” dimensions**	
	pixels	**mm**	**pixels**	**mm**
	3828	191,4	4958	247,9
10x12”	**10” dimensions**		**12” dimensions**	
	pixels	**mm**	**pixels**	**mm**
	4892	244,6	5810	290,5
11x14”	**11” dimensions**		**14” dimensions**	
	pixels	**mm**	**pixels**	**mm**
	5376	268,8	6922	346,1

Viewing the System info area on a film

General radiography applications

On the top right corner of each film, a “System info” area will be printed.

This info can only be read using a magnifying glass.



The System info area contains info about:

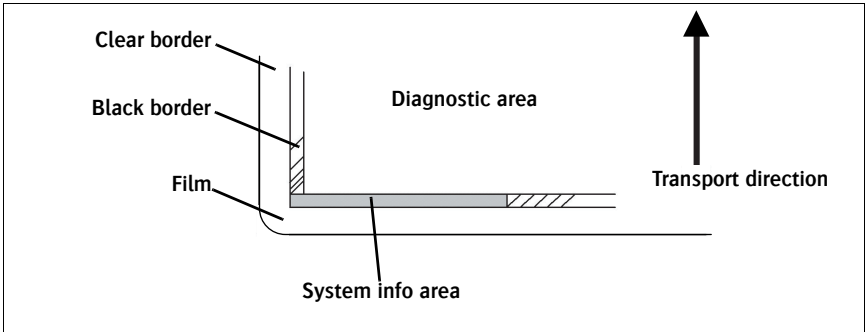
- The printer: (serial number, densitometer info, film counts, software version, etc.),
- The controller (image source, date, time, etc.).

For more detailed information, refer to the Drystar 5500 Service documentation.

Mammography application (optional)

On the bottom left corner of each film, a “System info” area will be printed.

This info can only be read using a magnifying glass.



The System info area contains info about:

- The printer: (serial number, densitometer info, film counts, software version, etc.),
- The controller (image source, date, time, etc.).

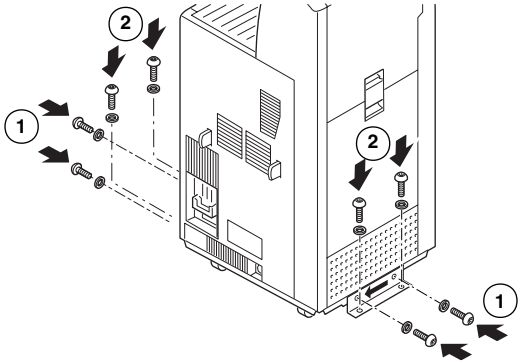
For more detailed information, refer to the Drystar 5500 Service documentation.

Options and accessories

Mobile installation kit

The default installation kit allows you to use the Drystar 5500 (Mammo inclusive) in mobile applications (e.g. a van), or in unstable environments.

Safe transportation is ensured by two fixation bars that lock the Drystar 5500 to its location (see illustration below). The fixation bars are included in the default installation kit.



For more information, refer to the "Remove Drystar 5500 from pallet" instructions of the Drystar 5500 Plug & Play Installation manual (document 2903I or 2903J).

Mammography application

The Drystar 5500 can be used for printing mammography application films. For this option, a license has to be activated by an Agfa service technician.

The feature comes with a QC procedure that complies with the Mammography Quality Standards Act (MQSA) of the FDA. For more information, refer to *'Quality control for mammography application (DT 2 Mammo) (optional)'* on page 153.

Contact your local service organization for more information.

Connectivity

Drystar 5500-5503 must only be used in combination with other equipment or components if these are expressly recognized by Agfa as compatible. A list of such equipment and components is available from Agfa service on request.

Changes or additions to the equipment must only be carried out by persons authorized to do so by Agfa. 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.

Drystar 5500-5503 is a Dicom printer and can therefore be connected to Agfa equipment and all modalities supporting Dicom. Although, to ensure optimal operation and image quality, Agfa has made the effort to test and release the Drystar 5500-5503 with most of modalities on the market. For the complete list or if you want to check on a specific modality, contact your Agfa representative.

Appendix B

Drystar media density response data

DRYSTAR DT 2 B

dens.	MacBeth TR-924	Gretag D200-2	X-rite 301	X-rite 310	X-rite 331	X-rite 341
0%	0.22	0,18	0.18	0,24	0.19	0.19
10%	0,51	0,48	0,48	0,54	0,49	0,49
20%	0,80	0,76	0,76	0,83	0,78	0,77
30%	1,09	1,05	1,06	1,13	1,08	1,07
40%	1,37	1,32	1,33	1,42	1,36	1,35
50%	1,67	1,62	1,62	1,72	1,65	1,64
60%	1,96	1,92	1,91	2,02	1,95	1,94
70%	2,25	2,20	2,19	2,31	2,23	2,23
80%	2,55	2,50	2,48	2,61	2,53	2,53
90%	2,83	2,79	2,76	2,90	2,81	2,81
100%	3,11	3,08	3,05	3,20	3,11	3,10

DRYSTAR DT 2 C

dens.	MacBeth TR-924	Gretag D200-2	X-rite 301	X-rite 310	X-rite 331	X-rite 341
0%	0,11	0,09	0,08	0,10	0,08	0,08
10%	0,39	0,38	0,36	0,39	0,38	0,37
20%	0,68	0,66	0,65	0,68	0,67	0,66
30%	0,96	0,94	0,93	0,97	0,95	0,94
40%	1,25	1,21	1,20	1,26	1,22	1,22
50%	1,52	1,49	1,47	1,55	1,50	1,50
60%	1,81	1,78	1,75	1,84	1,79	1,78
70%	2,09	2,06	2,03	2,13	2,07	2,07
80%	2,37	2,33	2,31	2,42	2,35	2,35
90%	2,65	2,62	2,59	2,71	2,63	2,63
100%	2,94	2,91	2,88	3,00	2,92	2,92

DRYSTAR DT 2 Mammo (optional)

dens.	MacBeth TR-924	Gretag D200-2	X-rite 301	X-rite 310	X-rite 331	X-rite 341
0%	0,22	0,18	0,20	0,22	0,18	0,19
10%	0,57	0,52	0,54	0,58	0,52	0,54
20%	0,91	0,86	0,88	0,94	0,86	0,88
30%	1,25	1,19	1,20	1,29	1,19	1,21
40%	1,60	1,54	1,54	1,65	1,54	1,55
50%	1,94	1,88	1,88	2,01	1,88	1,89
60%	2,28	2,21	2,20	2,36	2,21	2,22
70%	2,62	2,56	2,54	2,72	2,55	2,56
80%	2,97	2,90	2,88	3,08	2,89	2,90
90%	3,32	3,24	3,21	3,44	3,23	3,25
100%	3,66	3,59	3,55	3,80	3,58	3,59

Appendix C

Quality Control Charts

Charts for general radiography QC

Quality Control for

Chart 1

General radiography applications

Drystar 5500/5503: Determination of Operating Levels

Imager Type: _____ Serial #: _____ Date _____

Film Type: _____ Emulsion #: _____ Input Tray: _____

Densitometer: _____ (default selection)

Step 1: Print QC Test images on five consecutive days. Record the optical densities measurements in the tables below. After five days, average the values to determine the reference levels for each of the parameters.

	Day 1	Day 2	Day 3	Day 4	Day 5
Month					
Day					
Initials					

Low Density					
Average of 5 Values = calculated reference ìLow Densityî level					

Mid Density					
Average of 5 Values = calculated reference "Mid Density" level					

High Density					
Average of 5 Values = calculated reference ìHigh Densityî level					

Step 2: Copy the calculated reference levels to Charts 2A/B ('Daily Density Control Chart')

Quality Control for

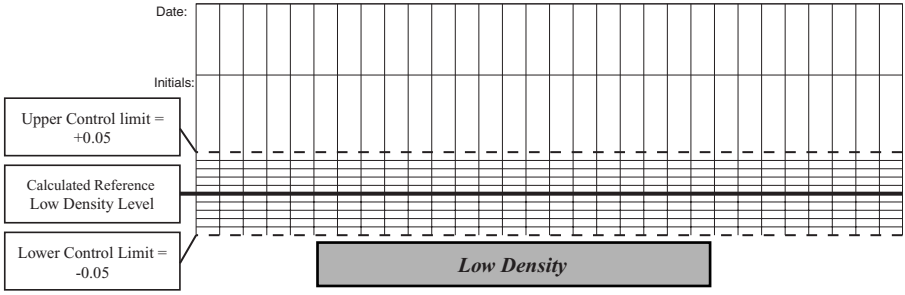
General radiography applications

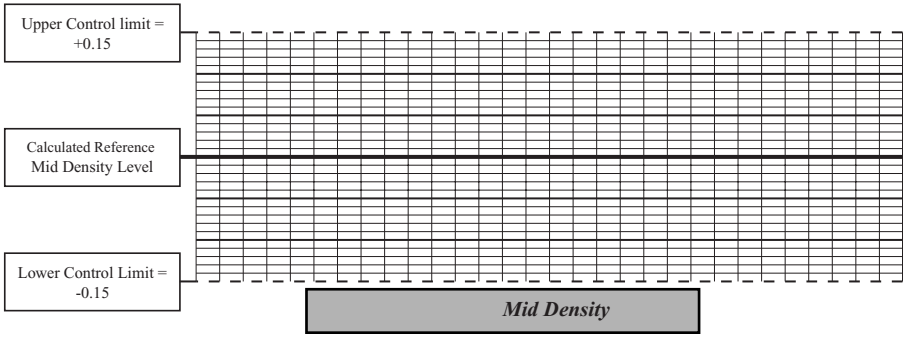
Chart 2A

Drystar 5500/5503 Daily Density Control Chart

Imager Type: _____ Serial #: _____ Film Type:_____ Emul #:_____

Densitometer Internal: _____ (default selection) Input Tray: _____





Quality Control for

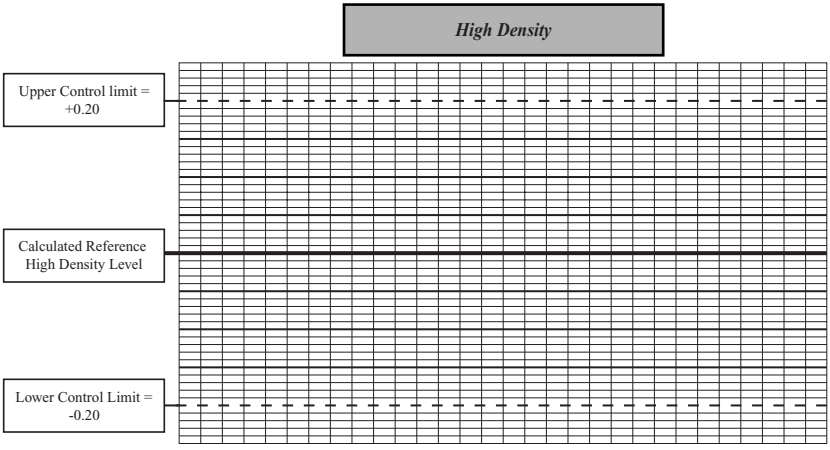
Chart 2B

General radiography applications

Drystar 5500/5503 Daily Density Control Chart

Imager Type: _____ Serial #: _____ Film Type:_____ Emul #:_____

Densitometer Internal: _____ (default selection) Input Tray: _____



Quality Control for

Chart 3

General radiography applications

Drystar 5500/5503 Artifacts and Spatial Resolution Control Chart

Test Frequency: Weekly

Drystar 5500/5503 Serial # _____________

Input Tray: ____________

Initial Reference Test Date	
Initial Reference Artifacts	
Initial Reference Dot Visibility	
Initial Reference Low Contrast	

Month					
Day					
Artifacts					
Visibility of all Dots					
Low Contrast Visibility					

Month					
Day					
Artifacts					
Visibility of all Dots					
Low Contrast Visibility					

Month					
Day					
Artifacts					
Visibility of all Dots					
Low Contrast Visibility					

Month					
Day					
Artifacts					
Visibility of all Dots					
Low Contrast Visibility					

Month					
Day					
Artifacts					
Visibility of all Dots					
Low Contrast Visibility					

Quality Control for

General radiography applications

Chart 4

Drystar 5500/5503 Geometric Consistency Control Chart

Test Frequency: Annually or as required

Drystar 5500/5503 Serial # _____

Input Tray: _____

Reference Dimensions Date:		Measured Dimensions Date:		Consistency		Aspect Ratio	
A_{ref}		A:		A/A_{ref}		A/B	
B_{ref}		B:		B/B_{ref}			

Reference Dimensions Date:		Measured Dimensions Date:		Consistency		Aspect Ratio	
A_{ref}		A:		A/A_{ref}		A/B	
B_{ref}		B:		B/B_{ref}			

Charts for mammography QC (optional)

Quality Control for

Chart 1

Mammography applications

Drystar 5500/5503 : Determination of Operating Levels

Imager Type: _____ Serial #: _____ Date _____

Film Type: _____ Emulsion #: _____ Input Tray: _____

Densitometer: _____ (default selection)

Step 1: Print QC Test images on five consecutive days. Record the optical densities measurements in the tables below. After five days, average the values to determine the reference levels for each of the parameters.

	Day 1	Day 2	Day 3	Day 4	Day 5
Month					
Date					
Initials					

Base + Fog						
Average of 5 values = calculated reference "**Base + Fog**" level						

Low Density						
Average of 5 values = calculated reference "**Low Density**" level						

Mid Density						
Average of 5 values = calculated reference "**Mid Density**" level						

High Density						
Average of 5 values = calculated reference "**High Density**" level						

Step 2: Copy the calculated reference levels to Charts 2A/B ('Daily Density Control Chart')

Quality Control for

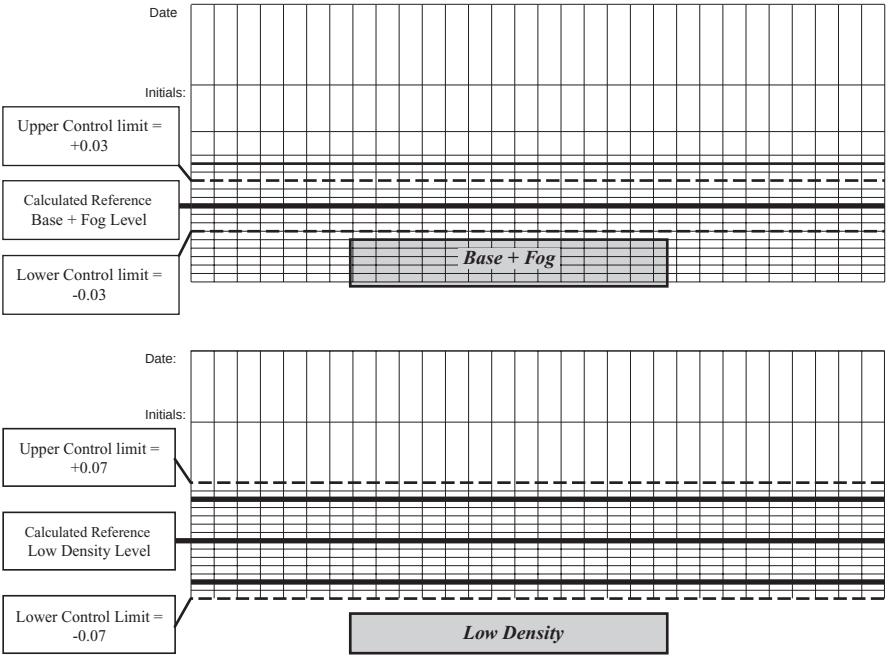
Mammography applications

Chart 2A

Drystar 5500/5503 Daily Density Control Chart

Imager Type: _____ Serial #: _____ Film Type:_____ Emul #:_____

Densitometer: _____ (default selection) Input Tray: _____



Quality Control for

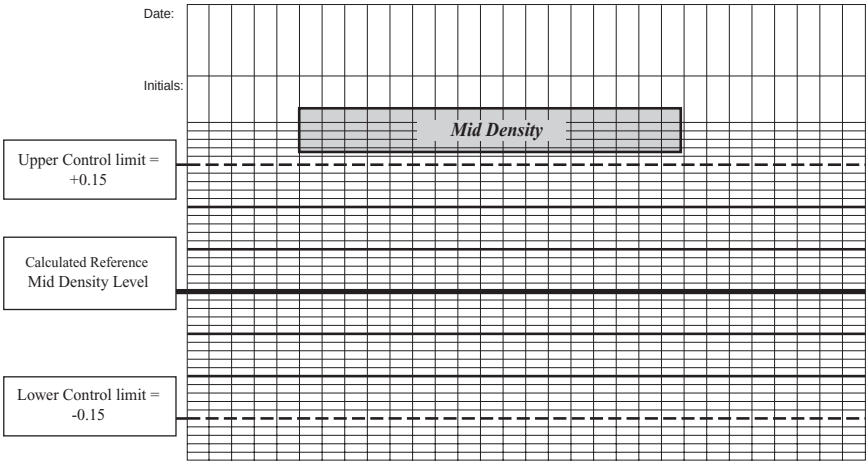
Mammography applications

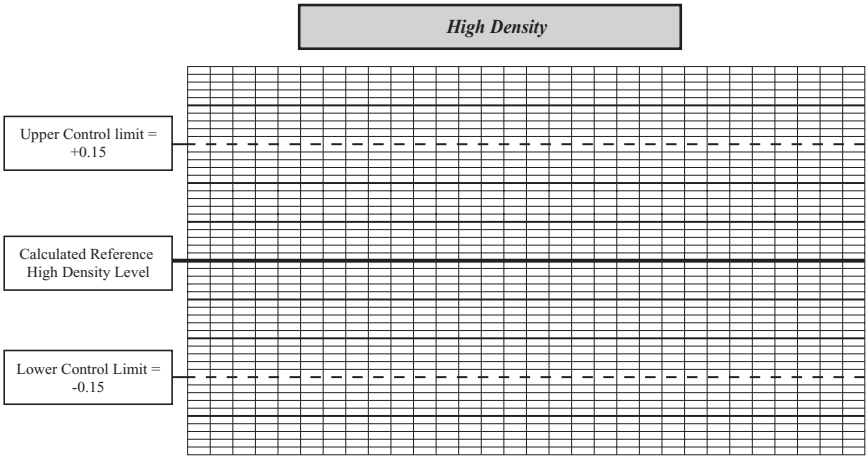
Chart 2B

Drystar 5500/5503 Daily Density Control Chart

Imager Type: _____ Serial #: _____ Film Type:_____ Emul #:_____

Densitometer: _____ (default selection) Input Tray: _____





Quality Control for

Chart 3

Mammography applications

Drystar 5500/5503 Artifacts and Spatial Resolution Control Chart

Test Frequency: Weekly

Drystar 5500/5503 Serial # _____________

Input Tray: ____________

Initial Reference Test Date	
Initial Reference Artifacts	
Initial Reference Dot Visibility	
Initial Reference Low Contrast	

Month					
Day					
Artifacts					
Visibility of all Dots					
Low Contrast Visibility					

Month					
Day					
Artifacts					
Visibility of all Dots					
Low Contrast Visibility					

Month					
Day					
Artifacts					
Visibility of all Dots					
Low Contrast Visibility					

Month					
Day					
Artifacts					
Visibility of all Dots					
Low Contrast Visibility					

Month					
Day					
Artifacts					
Visibility of all Dots					
Low Contrast Visibility					

Quality Control for

Mammography applications

Chart 4

Drystar 5500/5503 Geometric Consistency Control Chart

Test Frequency: Annually or as required

Drystar 5500/5503 Serial # _____

Input Tray: _____

Reference Dimensions Date:		Measured Dimensions Date:		Consistency		Aspect Ratio	
A_{ref}		A:		A/A_{ref}		A/B	
B_{ref}		B:		B/B_{ref}			

Reference Dimensions Date:		Measured Dimensions Date:		Consistency		Aspect Ratio	
A_{ref}		A:		A/A_{ref}		A/B	
B_{ref}		B:		B/B_{ref}			

Appendix D

Remarks for HF-emission and immunity

Remarks for HF-emission and immunity

This device is intended for operation in the electromagnetic environment given below. The user of the device should ensure that it is used in such an environment.

Transmission Measurements	Agreement	Electromagnetic Environment Guidelines
High frequency transmissions in accordance with CISPR 11	Group 1	The device uses high frequency energy exclusively for its internal functions. For this reason, its high frequency transmission is very low and it is improbable that neighboring electronic equipment will be disrupted.
High frequency transmissions in accordance with CISPR 11	Class A	The device is intended for use in an environment that do not include living areas and in areas directly connected to a public supply network that also supplies buildings that are used for domestic purposes
Excess oscillations in accordance with IEC 61000-3-2	Class A	
Voltage fluctuations / flickering in accordance with IEC 61000-3-3	Fulfilled	

This device was tested for a normal hospital environment as described above. Nevertheless the HF-emission and immunity can be influenced by connected data cables depending on length and the manner of installation.

This device is intended for operation in the electromagnetic environment given below. The user of the device should ensure that it is used in such an environment.

Resistance to Jamming Test	IEC 60601 Test Level	Level of Agreement	Electromagnetic Environment Guidelines
Discharge of static electricity in accordance with IEC 61000-4-2	± 4 kV contact discharge ± 8 kV air discharge	± 6 kV contact discharge ± 8 kV air discharge	Floors should consist of wood, concrete or ceramic tiles. The relative humidity must be at least 30%, if the floor is made of synthetic material.
Fast transient electrical disturbance variables / bursts in accordance with IEC 61000-4-4	± 1 kV mains ± 0,5 kV data lines	± 1 kV mains ± 0,5 kV data lines	The quality of the voltage supplied should correspond to a typical commercial or clinical environment.
Impulse voltages (surges) in accordance with IEC 61000-4-5	± 1 kV push-pull voltage ± 2 kV common mode voltage	± 1 kV push-pull voltage ± 2 kV common mode voltage	The quality of the voltage supplied should correspond to that of a typical commercial or clinical environment.
Voltage breakthroughs, short term interruptions and variations in the voltage supplied in accordance with IEC 61000-4-11	• < 5% U_r (> 95% breakthrough of U_r) for ½ period • 40% U_r (> 60% breakthrough of U_r) for 5 periods • 70% U_r (30% breakthrough of U_r) for 25 periods • < 5% U_r (95% breakthrough of U_r) for 5 s	• < 5% U_r (> 95% breakthrough of U_r) for ½ period • 40% U_r (> 60% breakthrough of U_r) for 5 periods • 70% U_r (30% breakthrough of U_r) for 25 periods • < 5% U_r (95% breakthrough of U_r) for 5 s	The quality of the voltage supply should correspond to that of a typical commercial or clinical environment. If the user wants the device to work continuously, even when the energy supply is interrupted, it is recommended to use an energy supply free of interruptions or a battery.
Magnetic field at the supply frequency (50/60 Hz) in accordance with IEC 61000-4-8	3 A/m	10 A/m	Magnetic field at the network frequency should correspond to the typical values as they are in a commercial and clinical environment.
• REMARK : U_r is the alternating current in the network before the application of the test level.			

This device is intended for operation in the electromagnetic environment given below. The user of the device should ensure that it is used in such an environment.

Tests of Resistance to Disruption	IEC 60601 Test Level	Level of Agreement	Electromagnetic Environment
			Use portable and mobile radio sets at a safe distance from the device (including the leads) not closer than the recommended protective distance, which is calculated according to the equation suitable for the transmission frequency. Recommended protective distance:
Conducted high frequency disturbance variables in accordance with IEC 61000-4-6	3 V_{eff} 150 kHz to 80 MHz	10 V_{eff}	$d = 1.2 \sqrt{P}$
Radiated high frequency disturbance variables in accordance with IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	10 V/m	$d = 1.2 \sqrt{P}$ 80 MHz to 800 MHz
			$d = 2.3 \sqrt{P}$ 800 MHz to 2.5 GHz
			With P as the rated power of the transmitter in watts (W) in accordance with the manufacturer information on the transmitter and d as the recommended protective distance in metres (m). The field strength of stationary radio transmitters is lower than the level of the agreement[a] at all frequencies in accordance with an on-site investigation[b]. Disruptions are possible near devices that carry the following symbol: 

- REMARK 1: The higher value will apply at 80 MHz and 800 MHz.
- REMARK 2: These Guidelines may not apply to all situations. The dispersion of electromagnetic waves is influenced by absorption and reflections from buildings, objects and people.

a. The field strength of stationary transmitters, such as base stations of radio telephones, mobile broadcasts for rural areas, amateur stations, and AM and FM radio transmitters, cannot be precisely predetermined theoretically. An investigation of the location is recommended, to ascertain the electromagnetic environment as a result of stationary high frequency transmitters. If the field strength of the device exceeds the level of agreement given above, the device must be observed with regard to its normal operation at each place of use. In case of unusual performance characteristics, it can be necessary to take additional measures, such as the re-orientation of the device, for example.
b. The field strength will be lower than 3 V/m above the frequency range from 150 kHz to 80 MHz.

This device is intended for operation in an electromagnetic environment in which the radiated high frequency disturbance variables are monitored. The user of the device can help to prevent electromagnetic disruptions by maintaining the minimum distances between portable and mobile high frequency communication equipment (transmitters) and the device as recommended below, in accordance with the maximum output power of the communications equipment.

Recommended Protective Distances between Portable and Mobile High Frequency Communication Equipment and the Device			
Rated Power of the Transmitter W	Protective Distance in accordance with Transmission Frequency m		
	150 kHz to 80 MHz $d = 1.2 \sqrt{P}$	80 MHz to 800 MHz $d = 1.2 \sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3 \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

The distance can be determined through the equation for each respective column.
P is the rated power of the transmitter in watts (W) according to the manufacturer information on the transmitter, only for transmitters where the rated power is not mentioned in the above table.

- REMARK 1 : An additional factor of 10/3 has been used to calculate the recommended protective distance of transmitters in the frequency range from 80 MHz to 2.5 GHz, to reduce the probability that mobile portable communication equipment unintentionally brought into the area of the patients will lead to a disruption.
- REMARK 2 : These Guidelines may not be relevant in all situations. The dispersion of electromagnetic waves is influenced by absorption and reflections from buildings, objects and people.

Chapter E

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