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1. GENERAL WARNINGS

1.1 FOREWORD

The device described in this manual is manufactured by CEFLA s.c. - via Selice Provinciale 23/A - 40026 Imola (BO) Italia, which is the manufacturer, in compliance with the applicable European Directives detailed in the declaration of conformity.

These technical instructions are addressed to the personnel in charge of repair and/or maintenance operations of CEFLA s.c. equipment and contain all the necessary information.

CEFLA s.c. shall be responsible for the safety, reliability and efficiency of the equipment provided that:

• installation, any modifications, settings or repairs are made by authorised technical personnel using CEFLA s.c. original spare parts
• In case of installation in medical locations: the electrical installation of the relevant location complies with IEC 60364-7-710:2002 Standards (Standards on electrical installations of medical locations) or with the equivalent Standards in force in the country of installation
• the equipment is used as outlined in User Manual
• in case of installation of an X-ray unit: The room where the X-ray unit is installed complies with the official Directives on protection from radiation in the country of use

1.2 SAFETY INSTRUCTIONS

All the safety instructions that help prevent any hazardous situations and operate the equipment in a trouble-free manner are given in the user’s manual as explained below:

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Attention" /></td>
<td><strong>ATTENTION:</strong> General mandatory action sign</td>
</tr>
<tr>
<td><img src="image" alt="Glove" /></td>
<td><strong>ATTENTION:</strong> Wear protective gloves</td>
</tr>
<tr>
<td><img src="image" alt="Foot" /></td>
<td><strong>ATTENTION:</strong> Wear foot protection</td>
</tr>
<tr>
<td><img src="image" alt="Eyes" /></td>
<td><strong>ATTENTION:</strong> Use protective eyewear</td>
</tr>
<tr>
<td><img src="image" alt="Clothing" /></td>
<td><strong>ATTENTION:</strong> Use protective clothings</td>
</tr>
<tr>
<td><img src="image" alt="Earth" /></td>
<td><strong>ATTENTION:</strong> Connect an earth terminal to the ground</td>
</tr>
</tbody>
</table>
### GENERAL WARNINGS

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="attention.png" alt="Attention" /></td>
<td><strong>ATTENTION</strong>: Refer to instruction manual-booklet</td>
</tr>
<tr>
<td><img src="attention.png" alt="Attention" /></td>
<td><strong>ATTENTION</strong>: Disconnect mains plug from electrical outlet</td>
</tr>
<tr>
<td><img src="warning1.png" alt="Warning" /></td>
<td><strong>WARNING</strong>: See the technical manual</td>
</tr>
<tr>
<td><img src="warning2.png" alt="Warning" /></td>
<td><strong>WARNING</strong>: Failure to observe instructions may result in equipment damage or injury to the user</td>
</tr>
<tr>
<td><img src="warning3.png" alt="Warning" /></td>
<td><strong>WARNING</strong>: High voltage</td>
</tr>
<tr>
<td><img src="warning4.png" alt="Warning" /></td>
<td><strong>WARNING</strong>: Crushing of hands</td>
</tr>
<tr>
<td><img src="warning5.png" alt="Warning" /></td>
<td><strong>WARNING</strong>: Radioactive material or ionizing radiation</td>
</tr>
<tr>
<td><img src="warning6.png" alt="Warning" /></td>
<td><strong>WARNING</strong>: Keep clear of moving parts</td>
</tr>
<tr>
<td><img src="warning7.png" alt="Warning" /></td>
<td><strong>WARNING</strong>: Laser beam</td>
</tr>
<tr>
<td><img src="warning8.png" alt="Warning" /></td>
<td><strong>WARNING</strong>: Hot surface</td>
</tr>
<tr>
<td><img src="warning9.png" alt="Warning" /></td>
<td><strong>WARNING</strong>: Biological hazard</td>
</tr>
<tr>
<td><img src="warning10.png" alt="Warning" /></td>
<td><strong>WARNING</strong>: Sharp objects</td>
</tr>
<tr>
<td><img src="warning11.png" alt="Warning" /></td>
<td><strong>WARNING</strong>: Corrosive substances</td>
</tr>
</tbody>
</table>
**WARNING:** Combustible and flammable materials

**DANGER:** Tipping over

**DANGER:** Heavy object. Two persons are required

---

**WARNING!**

ALWAYS DISCONNECT power supply before performing any maintenance or cleaning operation.

The packed device must be handled using, where possible, suitable mechanical means (forklift, pallet truck, etc.) and following the indications on the package. In case of manual handling, the device must be lifted by several persons using the suitable available means and, if possible, it must be moved with a truck or similar means.

Wear the proper protections
2. PACKAGING AND HANDLING

2.1 HANDLING AND STORAGE

Indications regarding storage, handling and unpacking are given on the outside of the cardboard packaging.

These indications must be strictly observed.

1) The package must be kept upright in the direction indicated by the arrows at all times during handling and storage.

2) Avoid banging the package.

3) Keep the package free from damp.

4) Do not use hooks to handle the package.

5) A nameplate indicates the required ambient conditions for storage.
   a) temperature from -10° to +60° C.
   b) relative humidity from 10 to 90%
   c) atmospheric pressure from 710 to 1060 hPa.

It is recommended to transport and store the device at a temperature not lower than that indicated on the packing. A prolonged exposure to a low temperature can damage the device.

The packed device must be handled using, where possible, suitable mechanical means (forklift, pallet truck, etc.) and following the indications on the package.

In case of manual handling, it must be lifted by two or more persons using the suitable available means.

2.2 DAMAGE DURING SHIPMENT

When the device is received, check the packing container for any damage suffered.

If the packages are found to be damaged on delivery, accept them with reserve by signing the delivery note and indicating that the “CONTENTS ARE ACCEPTED BUT THEY NEED TO BE CHECKED”.

If the contents are actually damaged, notify the shipping agent and request insurance compensation for damage within five work days. The claim is to be made by the person who commissioned the shipping agent.

I.e.:

• if the goods are delivered “carriage forward”, the receiver shall notify the shipping agent
• if the goods are shipped “carriage free” or “free delivered”, the consigner shall notify the shipping agent and file a claim for damages. In this case, CEFLA s.c. shall be informed as soon as possible.

The damaged parts returned to CEFLA s.c. for replacement shall be placed inside the same damaged package.
Return to CEFLA s.c. shall be “carriage free” (at the expense of the consignor), while shipment back to the customers shall be at the expense of CEFLA s.c. (carriage free).
3. PREINSTALLATION

Follow instructions described in the supplied INSTALLATION PLAN.
4. DEVICE INSTALLATION AND CALIBRATION

4.1 ASSEMBLY INSTRUCTIONS

Installation of the device unit must be done by qualified technicians in accordance with the mechanical and electrical assembly instructions defined as follows. Check that the voltage indicated on the system info plate corresponds to that of the electrical system.

The following instruments are necessary to perform all the procedure properly:

- Allen wrench set
- Screwdrivers
- Scissors
- Spirit level
- Electric cable
- Threaded bars or bolts
- Network cables
- RJ12 telephone cable
- Calibration kit

4.1.1 REMOVAL OF PACKAGING

The device must be transported packaged as far as the characteristics of the building will allow. Remove the cardboard packaging outside the area/room where the device will be installed.

Cut the strapping band and store the boxes in a safe place. Remove the supports located on the column base and top in order to remove it from the pallet.
4.1.2 TRANSPORT WITH CART

Screw on the feet (if the device is installed without the base); secure the cart to the base of the device with the screws provided.

Place the cart’s brackets on top of the post’s metal base. If they are mounted under the base, they will be between the post and floor, making it impossible to remove them once the slide is lowered.

Lift the device so that it is vertical.

4.1.3 WALL MOUNTING

- Fit the attachment bracket onto the wall;

- **Important**: before lifting the device vertically, it is necessary to install the support feet at the base of the column;

- Bring the device up against the wall, place it on its feet and attach it, without tightening, to the bracket with the supplied nuts, as shown in figure;

<table>
<thead>
<tr>
<th>1</th>
<th>FLANGED M12 NUT FOR WALL BRACKET</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>CONVEX WASHER M12</td>
</tr>
<tr>
<td>3</td>
<td>CONCAVE WASHER M12</td>
</tr>
<tr>
<td>4</td>
<td>MEDIUM NUT UNI 5588 M12</td>
</tr>
</tbody>
</table>

- When the device is in installation position, lower the trolley by loosening the four screws that connect the brackets to the wheels;

- Check for proper levelling with a spirit level and if necessary adjust the feet;

- Complete attachment of the bracket;

- It is advisable to drill holes in the floor at the points of the service holes on the plate and fix the base to the floor using 2 expansion screws.
4.1.4 SUPPORT BASE FLOOR MOUNTING INSTRUCTIONS

- With the aid of a fork-lift, position the device above the support base; lower the device in line with the fixing holes;
- Fix the device to the support base using the five supplied bolts;
- Remove the fork-lift;
- Check for proper levelling with a spirit level and if necessary adjust the feet.

4.1.5 TRANSPORT WITH HANDLES

As an alternative to the fork-lift the device can be transported using the handles that, as shown in the diagram, can be fixed in three different positions.

4.1.6 SAFETY SCREWS REMOVAL

Before going on to the next installation steps, remember to remove the safety screws highlighted by the red labels.
4.1.7 PATIENT ARM INSTALLATION

1

2
4.1.8 ELECTRICAL CONNECTIONS ON MAINBOARD

Be particularly careful when laying the wires in the area around the mainboard. Use cable ties to secure the wires/leads on the holes in the metallic side member so that any excess loose wiring does not interfere with the mobile chain during rotation/transfer of the cinematic group.
4.1.9 ELECTRICAL CONNECTIONS ON THE PFC BOARD

For further information, see the supplied INSTALLATION DIAGRAM.
### 4.1.10 ETHERNET CONNECTIONS AND X-RAY EMISSION KEY

For further information, see the supplied INSTALLATION DIAGRAM.

<table>
<thead>
<tr>
<th>CONNECTOR</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
<td>VCC</td>
</tr>
<tr>
<td>BROWN</td>
<td>X-RAY Emission</td>
</tr>
<tr>
<td>WHITE</td>
<td>Green “Ready” LED</td>
</tr>
<tr>
<td>BLUE</td>
<td>Orange “X-Ray” LED</td>
</tr>
</tbody>
</table>
4.1.11  CEPH ARM INSTALLATION
2

**RIGHT**

![Diagram of RIGHT side with x4 markings and assembly instructions]

**LEFT**

![Diagram of LEFT side with x4 markings and assembly instructions]
4.1.12 ELECTRICAL CONNECTIONS ON MAINBOARD

Be particularly careful when laying the wires in the area around the mainboard. Use cable ties to secure the wires/leads on the holes in the metallic side member so that any excess loose wiring does not interfere with the mobile chain during rotation/transfer of the cinematic group.
4.1.13 PATIENT ARM’S HANDLES ASSEMBLY

1

2
4.1.14 CHECK DURING THE ASSEMBLING

<table>
<thead>
<tr>
<th>PREINSTALLATION CHECK</th>
<th>RESULT OK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intact external package</td>
<td></td>
</tr>
<tr>
<td>Check compliance of delivery documents</td>
<td></td>
</tr>
<tr>
<td>Check ID label/package labels match</td>
<td></td>
</tr>
<tr>
<td>Check place of installation and supplies*</td>
<td></td>
</tr>
</tbody>
</table>

**POWER SUPPLY CHECK**

| Connection of power and earth leads                                                  |           |
| Power supply voltage                                                                  |           |
| Operation of main switch                                                              |           |
| Check presence of power mains protection                                             |           |

**ANTI-ENTRAPMENT SAFETY DEVICE CHECKS**

| Anti-entrapment safety microswitch*                                                   |           |

**MECHANICAL CHECKS**

| Balance of pantograph arm*                                                            |           |
| Proper attachment and good condition of dental unit casing                           |           |

**DEVICE CHECK AND CALIBRATION**

| Software installation and configuration                                             |           |
| Control panel functions                                                              |           |
| Collimator setting                                                                   |           |

**INSTRUMENT CHECK AND CALIBRATION**

| Curing lamp check*                                                                   |           |
| Camera functions and image quality check*                                            |           |

**MULTIMEDIA**

| Power on and monitor functions*                                                      |           |
| Installation carried out in accordance with local law                                |           |
| Check presence of Quick Guide                                                        |           |

*if applicable

4.1.15 CHECKING AFTER MECHANICAL INSTALLATION

After mechanical installation, ensure to check the following points:

1) that the column has no clearance/end float relative to the fastening system used (stand or wall-mount) or relative to the metal base installed on the column. If this is not true, contact the manufacturer.
2) that the patient’s arm is properly fastened by means of the 4 supplied screws; make sure it has no clearance or end float.
3) that the cephalometry arm (if any) is assembled with the 2 support pins and that the 4 retaining screws are duly tightened; make sure there is no clearance or end float.
4.2 COVER INSTALLATION

*Screw kit*

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>T/BOMB M4x8</td>
</tr>
<tr>
<td>B</td>
<td>T/BOMB M4x14</td>
</tr>
<tr>
<td>C</td>
<td>TCEI M4x12</td>
</tr>
<tr>
<td>D</td>
<td>WASHER D 4.3 x9</td>
</tr>
<tr>
<td>E</td>
<td>TPSEI M4x16</td>
</tr>
<tr>
<td>G</td>
<td>CLIP M4 MAX 2.5 mm</td>
</tr>
<tr>
<td>H</td>
<td>TCEI SCREW M4X20 STAINLESS</td>
</tr>
</tbody>
</table>
Cover assembly tasks must be carried out in the order illustrated in the drawing above.

The screws C must only be placed in position: they must only be tightened after positioning the cover on the unit so these screws line up with the slots highlighted in the subsequent diagrams (in the second image they are not visible but they are analogous to those in the first image).
Cover installation
**Cover installation**

- **C x 1**
- **C x 2**
DEVICE INSTALLATION AND CALIBRATION » Cover installation

5

C
x 1
Cover installation
DEVICE INSTALLATION AND CALIBRATION » Cover installation
Cover installation

C x 2
Cover installation

CLICK!
DEVICE INSTALLATION AND CALIBRATION » Cover installation
4.3 PC CONFIGURATION

4.3.1 SYSTEM REQUIREMENTS

The device works with 2 Ethernet connections, one for generic communication with the PC (that can be connected to a local area network) and another one (which must absolutely be point-to-point) dedicated to image acquisition from the 3D panel, therefore connecting the device to the INTEL GIGABIT network card of the computer. The computer dedicated to image acquisition must have MANDATORY requirements. Refer to the user manual of the Imaging software for the minimum requirements of the pc clients not directly connected to the machine.

4.3.2 PRELIMINARY OPERATIONS

The PC supplied by Cefla is complete with hardware and software for the device operation. If another PC is chosen, it must comply with the specific requirements and the software must be installed on it autonomously. The 2 PC network cards manage, respectively, the communication between device and PC and the connection between sensors and PC. The latter is carried out by means of a dedicated network card (INTEL GIGABIT) that must be compulsorily used and needs a free PCI-E slot on the PC motherboard. The operating system of the PC is compulsorily WINDOWS 10 PRO 64 bit. Once installed, make sure that all the peripheral drivers are properly recognised. The INTEL GIGABIT is automatically detected by the operating system and installed with the corresponding drivers. The PC connected to the device needs an account with the administrator rights.

⚠ WARNING: for the video card drivers, use the pack available on the Extranet.

4.3.3 OPERATING SYSTEM SETTINGS

![Operating System Settings](image-url)
Choose when to be notified about changes to your computer

User Account Control helps prevent potentially harmful programs from making changes to your computer.

Tell me more about User Account Control settings

Always notify

Never notify

Never notify me when:
- Applications try to install software or make changes to my computer
- I make changes to Windows settings

Not recommended.
4.3.3.1 POWER MANAGEMENT SETTINGS

![Power Options settings](image)

1. Adjust your computer’s settings
2. Choose or customise a power plan
   - **High performance**: Favours performance but may use more energy.
3. Change plan settings

**Preferred plans**
- Balanced (recommended)
  - Automatically balances performance with energy consumption on capable hardware.
- Power saver
  - Saves energy by reducing your computer’s performance where possible.
Disabling “Fast start-up”

1. Choose what the power button does
2. Change settings that are currently unavailable
3. Turn on fast start-up (recommended)
   This helps start your PC faster after shut-down. Restart isn't affected. Learn More
4.3.3.2 OPERATING SYSTEM OPTIMIZATION SETTINGS

1. Choose background settings
2. Choose which apps can run in the background
3. Change the picture on your lock screen
4. Remove Windows background images
5. Choose background, slideshow or solid colour as your background mode
6. Choose Windows Spotlight, picture or slideshow as your lock screen background
Select which apps can run in the background

Choose which apps can receive info, send notifications and stay up to date, even when you're not using them. Turning background apps off can help conserve power.

- 3D Builder
- Alarms & Clock
- Calculator
- Calendar
- Camera
- Connect

Know your privacy options

Learn how this setting impacts your privacy.

Learn more

Do you have a question?

Get help

Make Windows better.

Give us feedback
PC configuration

3. Settings...

4. Adjust for best performance

5. OK
4.3.3.3 DISABLING “WINDOWS AUTO-UPDATE SERVICE”
2. Update & Security
   Windows Update, recovery, backup

3. Windows Update
   Check for updates

4. Advanced options
4.3.3.4 DISABLING WINDOWS UPDATE SHARING OVER THE NETWORK (LOW DATA TRAFFIC)

Choose how updates are delivered

Updates from more than one place

Download Windows updates and apps from other PCs in addition to Microsoft. This can help speed up app and update downloads.

Learn more

When this is turned on, your PC may also send parts of previously downloaded Windows updates and apps to PCs on your local network or PCs on the Internet, depending on what’s selected.

Off

Get updates from Microsoft, and get updates from and send updates to

PCs on my local network

PCs on my local network, and PCs on the Internet

Do you have a question?

Get help
4.3.3.5  FIREWALL SETTINGS

Firewall software programs (such as for example the one integrated into Windows) limit the network traffic between the PC connected to the device and the local network. We recommend to disable these firewall programs to prevent any problem in communicating with the device, downloading images and sharing software licences over the network.

In case they cannot be disabled, it is nevertheless necessary to add the following exceptions:

UDP PORT 12232: always allow incoming/outgoing traffic from the LAN for all the programs
UDP PORT 12233: always allow incoming/outgoing traffic from the LAN for all the programs
UDP PORT 12234: always allow incoming/outgoing traffic from the LAN for all the programs
TCP PORT 12235: always allow incoming/outgoing traffic from the LAN for all the programs
TCP PORT 12236: always allow incoming/outgoing traffic from the LAN for all the programs
TCP/UDP PORT 1947: always allow incoming/outgoing traffic from the LAN for all the programs
TCP PORT 13234: always allow incoming/outgoing traffic from the LAN for all the programs
TCP PORT 5790: always allow incoming/outgoing traffic from the LAN for all the programs

4.3.3.6  “WINDOWS DEFENDER” SETTINGS
Windows Defender

Windows Defender Antivirus protects your computer against viruses, spyware and other malicious software. Open Windows Defender Security Centre to use it.

Version info

<table>
<thead>
<tr>
<th>Feature</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-malware client version</td>
<td>4.18.1800.18062</td>
</tr>
<tr>
<td>Engine version</td>
<td>1.15100.1</td>
</tr>
<tr>
<td>Anti-virus definition</td>
<td>1.273.422.0</td>
</tr>
<tr>
<td>Anti-spyware definition</td>
<td>1.273.422.0</td>
</tr>
<tr>
<td>Network inspection system</td>
<td>1.15100.1</td>
</tr>
<tr>
<td>Engine version</td>
<td>1.273.422.0</td>
</tr>
</tbody>
</table>

Keep your PC safe

Windows Defender Security Center has options to help keep you protected online, maintain your device's health, run periodic scans, manage your threat-protection settings, and more.

Get more info about Windows Defender Security Centre

Windows Defender Security Centre

Virus & threat protection

View threat history, scan for viruses and other threats, specify protection settings, and get protection updates.

Scan history

No threats found.
Last scan: 27/07/2018 (quick scan)

0 37720

Threats found   Files scanned

Quick scan

Advanced scan

Virus & threat protection settings

No action needed.

Protection updates

Protection definitions are up to date.
Last update: 27 July 2018 08:02

DEVICE INSTALLATION AND CALIBRATION » PC configuration
Real-time protection
Locates and stops malware from installing or running on your device. You can turn off this setting for a short time before it turns back on automatically.

Cloud-delivered protection
Provides increased and faster protection with access to the latest Windows Defender Antivirus protection data in the cloud. Works best with automatic sample submission turned on.

⚠️ Cloud-delivered protection is off. Your device may be vulnerable.

Privacy statement

Automatic sample submission
Send sample files to Microsoft to help protect you and others from potential threats. We’ll prompt you if the file that we need is likely to contain personal information.

⚠️ Automatic sample submission is off. Your device may be vulnerable.

Privacy statement
Submit a sample manually

Exclusions
Windows Defender Antivirus won’t scan items that you’ve excluded. Excluded items could contain threats that make your device vulnerable.

Add or remove exclusions

Notifications
Windows Defender Antivirus will send notifications with critical information about the health and security of your device. You can specify which non-critical notifications you would like to receive.

Change notification settings
4.3.3.7 DEVICE INSTALLATION SETTINGS

1. Devices and Printers

AFTER SOFTWARE INSTALLATION (see paragraphs 4.3.6, 4.3.11)
Device installation settings

Do you want to automatically download manufacturers’ apps and custom icons that are available for your devices?

- Yes (recommended)
- No (your device might not work as expected)

Save Changes
Device Installation and Calibration » PC Configuration

1. Open the Run window.
2. Type `gpedit.msc` in the Run dialog box and press Enter.
4. Select `Windows Update`.
5. Configure the settings as required.
6. Click OK to save changes.
Enable this policy to not include drivers with Windows quality updates.

If you disable or do not configure this policy, Windows Update will include updates that have a Driver classification.

Options:

Comment:

Enabled

Disabled

Supported on:

At least Windows Server or Windows 10

Help:
4.3.4 PC-DEVICE CONNECTION

The device may be connected to a local area network or directly to the main workstation. In both cases, the Ethernet connection for sensors must be point-to-point and is always managed autonomously by the software and the machine.

Therefore, at this point of the installation, it is not necessary to set any IP address on the INTEL GIGABIT board, as it will be set autonomously during the software installation procedure described in the following chapters.

The network card dedicated to the communication with the device must be configured as follows:

4.3.4.1 CASE1-DEVICE-PCDIRECTCONNECTION(SETTINGASTATICIPADDRESSON THE NETWORK CARD)

It is necessary to set a static IP address for the network card dedicated to PC - device communication and it must be compatible with the device’s default address (192.168.1.160).
3. Click on "LAN" and then "Properties".

4. In the LAN Properties window, select "Internet Protocol Version 4 (TCP/IPv4)" and then click "Properties".
4.3.4.2 CASE2-DEVICE-PC CONNECTION OVER THE NETWORK (SETTING A DYNAMIC IP ADDRESS ON THE NETWORK CARD)

It is necessary to set a dynamic IP address for the network card dedicated to PC – device communication.

1. Open the network connection properties.
2. Click "ncpa.cpl" to open the network configuration options.
3. Click the LAN icon to open the network settings.
4. Click on "Properties" to configure the network settings.
5. Ensure that "Internet Protocol Version 4 (TCP/IPv4)" is checked and configured correctly.
6. Click on "Properties" to further configure the selected protocol.
4.3.5 "INTEL GIGABIT" NETWORK CARD CONFIGURATION
DEVICE INSTALLATION AND CALIBRATION » PC configuration
WARNING: maybe the “Receive Buffers” item is not displayed directly in this window. If it is not displayed, search for the “Performance Options” item and click on “Properties”. The “Receive Buffers” value is displayed there.

WARNING: maybe the “Interrupt Moderation” item is not displayed directly in this window. If it is not displayed, search for the “Performance Options” item and click on “Properties”. The “Interrupt Moderation” value is displayed there.
WARNING: maybe the “Interrupt Moderation Rate” item is not displayed directly in this window. If it is not displayed, search for the “Performance Options” item and click on “Properties”. The “Interrupt Moderation Rate” value is displayed there.
Avoid using 192.168.2.xxx subnet for other network adapters in the PC.

Use the following IP address:
- IP address: 192.168.2.11
- Subnet mask: 255.255.255.0

Validate settings upon exit

OK
4.3.6 “ACQUISITION SERVER PLUS” SOFTWARE INSTALLATION

1. Connect the acquisition server to the computer.
2. Select the language for the setup (English).
3. Proceed with the installation.
Confirm as requested by the installer to complete the installation.

⚠️ WARNING: Drivers for communication with 2D sensors will be installed during this installation.
4.3.7 “ACQUISITION SERVER PLUS” CONFIGURATION

USER MODE:

Acquisition Server Plus

Connection status: No device

Device
Status: undefined
DEVICE INSTALLATION AND CALIBRATION » PC configuration

Attention!
The application will be restarted to select new mode.
Are you sure you want to continue?

Choose Service mode:
- Click on "Service mode" button.

Enter password for SERVICE mode:
- Type "cefla" as the password.
- Click "OK" button.
SERVICE MODE:

Acquisition Server Plus

Connection status No device

Device Status undefined

4.3.7.1 DEVICE SEARCH AND CONNECTION

Settings

General
Language English
Current application mode SERVICE

Device
Find Device Connect Device Device Options Name
Specify fixed IP IP MAC
Auto connect device

Sensors
PAN Find Connect Sensor Pan Model SN
CEPH Find Connect Sensor Ceph Model SN

Advanced
Log verbose Multipart Enable (slower)
Show Margin Show preview while downloading
Return to preferred exam

User Shot Dose adjust Update Firmware

Close
DEVICE INSTALLATION AND CALIBRATION » PC configuration

11. Select a device
   - IP = 192.168.1.8
   - MAC = 08:00:39:4F:53:85
   - Name = 708HP407

12. Click OK

13. Settings menu
   - Language: English
   - Current application mode: SERVICE
   - Device: Find Device, Connect Device
   - Auto connect device

14. Checkmark

15. Close button
NOTE: should it be necessary to change the device IP address for any need, it is possible to change it from the menu “Settings -> Device Options”

A fixed IP can be set in this window in the field “Fall back Ip address”. Removing the tick from “DHCP” will make it impossible for the device to obtain a dynamic address by a router. Click on “OK”. The IP change becomes effective when the device is restarted.

It is necessary to repeat the device search and connection procedure.
4.3.7.2 SENSOR SEARCH AND CONNECTION

**Acquisition Server Plus**

- **Connection status**: PA14 - 172.20.32.75
- **Device**: No sensor selected
  - Sensor autoconnect will be deactivated
  - Configure a sensor before reactivate autoconnection

**Settings**

- **General**
  - Language: English
  - Current application mode: SERVICE

- **Device**
  - Find Device
  - Connect Device
  - Device Options
  - Specify fixed IP: 192.168.1.2
  - Auto connect device

- **Sensors**
  - PAN: Find
  - Connect Sensor Pan
  - Model
  - SN
  - CEPH: Find
  - Connect Sensor Ceph
  - Model
  - SN
  - Sensor Auto connect

- **Advanced**
  - Log verbose
  - Multiplan Enable (slower)
  - Show Margin
  - Show preview while downloading

  - User Shot
  - Dose adjust
  - Update Firmware

**Image**: Diagram of Acquisition Server Plus interface with highlighted options for sensor search and connection.
WARNING

IN CASE OF CEPH SENSORS: In case of a configuration with a mobile sensor, move it from “PAN” to “CEPH” position.
Under normal operating conditions, the lower box may be red: this does NOT indicate a connection problem since PAN/CEPH sensors are usually off. They are on only when they are being used.
4.3.8 CBCT PANEL INSTALLATION (ONLY FOR 3D)

WARNING: each panel is equipped with a specific installation CD, containing data that are not interchangeable with other units. Carefully keep the CD and make sure that at least one backup copy is available.

Run and complete the installation leaving the default settings.

4.3.9 PLEORA DRIVER INSTALLATION (ONLY FOR 3D)
3. Change Mode

4. Yes

5. Service mode

6. OK

7. Password for SERVICE mode

8. OK
DEVICE INSTALLATION AND CALIBRATION » PC configuration

1. Switch On CBCT Panel

2. CBCT Panel ON
DEVICE INSTALLATION AND CALIBRATION » PC configuration

Settings

General
- Language: English
- Current application mode: SERVICE

Device
- Find Device, Disconnect Device, Device Options, Name
- Specify fixed IP: 172.30.31.240
- Auto connect device

Sensors
- PAN: Find, Connect Sensor Pan, Model: C109000D-70, SN: SN_2DB38025
- QSPH: Find, Connect Sensor QSPH, Model: C10902D-70, SN: SN_24B45450
- Set up Address

CBCT Panel
- Switch On CBCT Panel

Advanced
- Log verbose
- Multiplan Enable (slider)
- Show Margin
- Show preview while downloading
- User Shot
- Dose adjust
- Update Firmware

Software Installation Folder

Virtual CF Updater
The installer will check whether a previous version of Pleora Driver is already present and will uninstall it if necessary.

**WARNING**: this procedure may take a long time, do not interrupt the process. During the procedure the PC will restart and resume installation. If this does not happen, it is necessary to manually run “Updater.exe” and reselect the installation steps which are not yet completed.

**WARNING**: During this procedure do not disconnect or switch off the device. Failure of panel firmware update may compromise its functionality. If dialogs appear, follow the instructions.

**INSTALLATION COMPLETED:**
4.3.10 DRIVER INSTALLATION CHECKS

1. Click on the network icon and select the network connection.
2. Right-click on the network connection and select "Properties".
3. Uncheck the "GigE Vision Filter Driver" and "GigE Vision Filter Driver 3a".
4. Click on "OK" to apply the changes.
**WARNING:** perform the procedures (1 -> 5) for all the network cards that may be present on the PC, except for the one dedicated to the communication with sensors (INTEL GIGABIT).
If items (8 -> 9) are missing, this indicates that the driver installation was not successful and it must be repeated.

Missing item 8 (only in case of 3D!): see chapter "Pleora driver intallation"
Missing item 9: see chapter "Acquisition Server Plus software installation"

4.3.11 Irys Software Installation and Configuration

The software used to manage the images downloaded from the device is iRYS, installed in the version MAIN WORKSTATION in case of 3D device, or in the version iRYS Station in case of 2D device only.
DEVICE INSTALLATION AND CALIBRATION » PC configuration

3a. iRY5 Station

3b. Hyperion X9 Pro main workstation

4. Next

5. Stand-alone (Recommended)
   This is the standard installation mode.
   It applies to both single and multiple users (in a network domain).

6. Next
Confirm as requested by the installer to complete the installation.

**Installation complete**

iRYS was successfully installed

Remove any disks from their drives, and then click REBOOT to complete setup.
Application mode setup

To improve user experience, please choose the predefined application mode that better suits the practice:

- Imaging Center, Maxillofacial
- Oral and Maxillofacial Surgery
- Enables Sharp2D options
- Enables TMJ options
- ENT Specialties

10

Checkmark: Ok
Crossmark: Cancel

Before starting...

WARNING:

The system is a medical radiological device subject to the applicable international standards and to local safety regulations.

It is responsibility of the user that the system is operated in accordance with its intended indication of use and operational instructions, and the local safety regulators.

It is responsibility of the user that the system is duly maintained and serviced, as per the instructions provided in the User and Service Manuals.

Failure to comply with the a.m. instructions, and unauthorized alterations of the systems, may cause incidents that are the exclusive responsibility of the user in control of the system, and may lead to voiding the product warranty.

11

Checkmark: I agree
Crossmark: I do not agree
Enter Service Mode:

**METHOD 1**
METHOD 2

13

Start error log viewer...
Send log file via e-mail...
Configure automatic dispatch of log files...
Scanner tests

Insert password

14

Create new image template...
Select image template...

306090

Ok

15

336699

Ok

16

3D ONLY

DEVICE INSTALLATION AND CALIBRATION » PC configuration

EN
DEVICE INSTALLATION AND CALIBRATION » PC configuration

17. Browse for Folder

18. Ok

19. Insert password

2D - 3D
DEVICE INSTALLATION AND CALIBRATION » PC configuration

Select a device

1  IP = 172.30.34.38  MAC = 08:39:30:F7:62  Name = 21
DEVICE CONNECTED
Under normal operating conditions, the lower box may be red: this does NOT indicate a connection problem since PAN/CEPH sensors are usually off. They are on only when they are being used.
4.3.12 ONBOARD CONSOLE CONNECTION

Device not authorized

1 SETTINGS  DEMO
DEVICE INSTALLATION AND CALIBRATION » PC configuration

5. Acquisition Server Plus

Connection status: X9PRO - 192.168.1.2

Device: PAN Sensor connected (2D mode)

6. List devices that require authorization

<table>
<thead>
<tr>
<th>Hostname</th>
<th>Username</th>
<th>Authorized</th>
</tr>
</thead>
<tbody>
<tr>
<td>onboard console</td>
<td>58:05:56:00:ED:0C</td>
<td>☐</td>
</tr>
</tbody>
</table>
4.4 2D CALIBRATION

REQUIRED INSTRUMENTS

Calibration kit, including:

- Support plate
- Dentition phantom
- Aluminium filter
- Laser reference sheet
- Allen wrench set
- Screwdriver set
- Pliers

4.4.1 TUBE HEAD WARM-UP

PERFORM THIS OPERATION ONLY IF THE DEVICE REMAINS UNUSED FOR MORE THAN THREE MONTHS
Perform Daily Check (see paragraph 4.5.2)
4.4.2 PRELIMINARY ACTIONS

1. Settings

2. Change Mode

Acquisition Server Plus

Connection status

Device
PAN Sensor connected (2D mode)

Settings

General
Language +English
Current application mode SERVICE

Device:
Find Device Connect Device Device Options Name
Specify fixed IP IP MAC
Auto connect device

Sensors
PAN Find Connect Sensor PAN Model SN
CEPH Find Connect Sensor Ceph Model SN
Sensor Auto connect

Advanced
Log verbose Multiburn Enable (slower) Show Margin Show preview while downloading
Return to preferred exam

User Shot Dose adjust Update Firmware
Attention!
The application will be restarted to select new mode.
Are you sure you want to continue?

3. Yes

4. Service mode

5. OK

6. Password for SERVICE mode: cefla

7. OK

Acquisition Server

8. Calibration
4.4.3 MACHINE CONFIGURATION

![Calibration Steps](image)

- **Calibration step**:
  - Machine Configuration
  - Column Calibration
  - PAN Verify XRay Alignment
  - PAN Verify Sensor Compliance
  - PAN Verify Sensor Calibration
  - PAN Verify Mechanical Centering
  - Laser Calibration
  - CEPH Verify XRay Alignment
  - CEPH Verify Sensor Compliance
  - CEPH Verify Sensor Calibration
  - CEPH Verify Mechanical Centering
  - Headrest Calibration
  - Nasion Calibration

- **Status**:
  - Green check mark for completed
  - Red cross for failed

- **Report PDF**
- **Data**:
  - Backup calibration data to file
  - Restore calibration data from file

- **Close** button
4.4.4 COLUMN CALIBRATION

1. Click on Column Calibration.

2. Click on the green checkmark to complete the calibration.
Manually move the column to the lower end position. Insert the measured value. Press OK to confirm.

Manually move the column to the lower end position. Insert the measured value. Press OK to confirm.
Manually move the column to the upper end position
Insert the measured value
Press OK to confirm
Set SW limits: these values add a further tolerance to the limit switch: it is recommended to remove 10 mm from the upper limit and add 10 mm to the lower one.
4.4.5 PAN VERIFY XRAY ALIGNEMENT

[Image: A screenshot of a calibration software interface showing the 'PAN Verify XRay Alignment' step highlighted with a green checkmark.]
MOTORISED HORIZONTAL COLLIMATOR: with the first acquisitions, the procedure searches for sensor sides and asks to evaluate the correct rotation; then it refines lower and upper collimation.

NON-MOTORISED HORIZONTAL COLLIMATOR: the horizontal adjustment, if necessary, must be performed as in paragraph "Horizontal Adjustment".
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
If one of these situations occurs, it is necessary to manually rotate the collimator (See paragraph “Manual rotation of the collimator”).
DEVICE INSTALLATION AND CALIBRATION » 2D calibration

11. Dark zone must be centered in white zone as shown on the image on the left.

12. Select action:
   - [ ] Rotate - Manually rotate primary collimator then press OK
   - [ ] Edge Found

13. Press Xray button to calibrate.
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
Dark zone must be centered in white zone as shown on the image on the left.

**Select action:**
- ☒ Rotated - Manually rotate primary collimator then press OK
- ☑ Centered
- ☒ Not Centered - Fine adjust

**Warning:**
X-ray Alignment procedure completed
4.4.5.1 COLLIMATOR MANUAL ROTATION

*(TO BE PERFORMED WHEN STRICTLY NECESSARY)*
1. Rotate the primary collimator 1/2 turn clockwise.

2. Ensure the collimator is aligned.

3. Confirm the edge has been found.

4. Select action:
   - Rotate: Manually rotate the primary collimator then press OK.
   - Edge found: Verify the edge has been located.

5. Press OK to complete the calibration.
4.4.5.2 HORIZONTAL ADJUSTMENT

2D ONLY

DEVICE INSTALLATION AND CALIBRATION » 2D calibration
TARGET

DEVICE INSTALLATION AND CALIBRATION » 2D calibration
4.4.6 PAN VERIFY SENSOR COMPLIANCE

![Diagram of calibration interface]

- **Calibration Steps**
  - Advanced
  - Machine Configuration [✓]
  - Column Calibration [✓]
  - PAN Verify XRay Alignment [✓]
  - PAN Verify Sensor Compliance [✗]
  - PAN Verify Sensor Calibration [✗]
  - PAN Verify Mechanical Centering [✓]
  - Laser Calibration [✓]
  - CEPH Verify XRay Alignment [✓]
  - CEPH Verify Sensor Compliance [✗]
  - CEPH Verify Sensor Calibration [✗]
  - CEPH Verify Mechanical Centering [✓]
  - Headrest Calibration [✓]
  - Nasion Calibration [✓]

- **Status**
  - PAN Verify Sensor Compliance: ✗
  - PAN Verify Sensor Calibration: ✗

- **Report PDF**
- **Data**
  - Backup calibration data to file
  - Restore calibration data from file
Before start procedure remove any object between XRay source and sensor and position aluminium filter.

Press XRay button.

Sensor compliance procedure completed.
4.4.7 PAN VERIFY SENSOR CALIBRATION

![Calibration Steps](image)

- **Calibration Steps**
  - Machine Configuration
  - Column Calibration
  - PAN Verify XRay Alignment
  - PAN Verify Sensor Compliance
  - PAN Verify Sensor Calibration
  - PAN Verify Mechanical Centering
  - Laser Calibration
  - CEPH Verify XRay Alignment
  - CEPH Verify Sensor Compliance
  - CEPH Verify Sensor Calibration
  - CEPH Verify Mechanical Centering
  - Headrest Calibraton
  - Nasion Calibration

- **Status**
  - Checkmark for successful calibration
  - X for failed calibration

Click on **PAN Verify Sensor Calibration** to verify the sensor calibration.
Before starting the procedure, remove any object between the X-ray source and sensor.

2. Start the procedure.

3. Select "Gain Acquisition" and click "START PROCEDURE."
ATTENTION!!! DANGEROUS PROCEDURE
Verify safety devices before proceed

WARNING: During procedure Xrays will be emitted automatically

CALIBRATING
WAIT... 12'

Gain Acquisition procedure completed
4.4.8 PAN VERIFY MECHANICAL CENTERING

![Calibration Steps Diagram]

**Calibration Steps**

- Machine Configuration: 
- Column Calibration: 
- PAN Verify XRay Alignment: ✔️
- PAN Verify Sensor Compliance: ✗
- PAN Verify Sensor Calibration: ✗
- PAN Verify Mechanical Centering: ✔️
- Laser Calibration: ✔️
- CEPH Verify XRay Alignment: ✔️
- CEPH Verify Sensor Compliance: ✗
- CEPH Verify Sensor Calibration: ✗
- CEPH Verify Mechanical Centering: ✔️
- Headrest Calibration: ✔️
- Nasion Calibration: ✔️

**Report PDF**

**Data**

- Backup calibration data to file
- Restore calibration data from file

**Close**
Before start calibration procedure remove any object between X-ray source and sensor and position technical phantom.
### DEVICE INSTALLATION AND CALIBRATION » 2D calibration

#### Mark R Point
- Click on the center where it shows R.
- Click on the center where it shows OK.

#### Mark Center Point
- Click on the center where it shows C.
- Click on the center where it shows OK.

#### Mark L Point
- Click on the center where it shows L.
- Click on the center where it shows OK.
<Hyperion X9 Pro - Technical Manual>

**DEVICE INSTALLATION AND CALIBRATION - 2D calibration**

IF

**Warning**

Out of range

CHECK!

Image is correctly centered

» 4.1.7

EN
4.4.9   LASER CALIBRATION

![Laser Calibration Screen]

- Machine Configuration: [✓]
- Column Calibration: [✓]
- PAN Verify XRay Alignment: [✓]
- PAN Verify Sensor Compliance: [✗]
- PAN Verify Sensor Calibration: [✗]
- PAN Verify Mechanical Centering: [✓]
- CEPH Verify Sensor Calibration: [✗]
- CEPH Verify XRay Alignment: [✓]
- CEPH Verify Sensor Compliance: [✗]
- CEPH Verify Mechanical Centering: [✓]
- Headrest Calibration: [✓]
- Nestion Calibration: [✓]
Laser alignment

Laser Calibration

2

Start calibration

Put mechanical template for laser in correct position and press Start button

Laser ON
OFF
STOP
Exit

Acquisition Server Plus 6.2.2.6

Remove carter. The device will automatically move to position of laser calibration. Press OK to Continue

3

OK
Cancel

DEVICE INSTALLATION AND CALIBRATION » 2D calibration
If the laser turns off, any of the movement buttons of the column can be pressed to turn it on again.
2D calibration

Put mechanical template for laser in correct position and press Start button.
4.4.10 CEPH VERIFY X-RAY ALIGNMENT

(ONLY IF CEPH ARM IS PRESENT)
2D calibration

Before start procedure remove any object between XRay source and sensor

Start

Cancel
If one of these situations occurs, it is necessary to manually rotate the collimator (See paragraph "Manual rotation of the collimator").
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
If the image is not vertically centred, follow the instructions in paragraph “Manual adjustment of vertical position”
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
4.4.10.1 MANUAL ROTATION

(TO BE PERFORMED ONLY IF INDICATED IN THE CALIBRATION PHASE)
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
4.4.10.2 MANUAL ADJUSTMENT OF VERTICAL POSITION


2. Repeat the process until the desired position is achieved.
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
4.4.11  CEPH VERIFY SENSOR COMPLIANCE

(ONLY IF CEPH ARM IS PRESENT)
Before start procedure remove any object between XRay source and sensor.
4

![Warning]

Sensor compliance procedure completed

OK

» 2D calibration
## 4.4.12 CEPH Verify Sensor Calibration

*(ONLY IF CEPH ARM IS PRESENT)*

### Calibration Steps

<table>
<thead>
<tr>
<th>Calibration Step</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine Configuration</td>
<td>✓</td>
</tr>
<tr>
<td>Column Calibration</td>
<td>✓</td>
</tr>
<tr>
<td>PAN Verify XRay Alignment</td>
<td>✓</td>
</tr>
<tr>
<td>PAN Verify Sensor Compliance</td>
<td>✗</td>
</tr>
<tr>
<td>PAN Verify Sensor Calibration</td>
<td>✗</td>
</tr>
<tr>
<td>PAN Verify Mechanical Centering</td>
<td>✓</td>
</tr>
<tr>
<td>Laser Calibration</td>
<td>✓</td>
</tr>
<tr>
<td>CEPH Verify XRay Alignment</td>
<td>✓</td>
</tr>
<tr>
<td>CEPH Verify Sensor Compliance</td>
<td>✗</td>
</tr>
<tr>
<td>CEPH Verify Sensor Calibration</td>
<td>✗</td>
</tr>
<tr>
<td>CEPH Verify Mechanical Centering</td>
<td>✓</td>
</tr>
<tr>
<td>Headrest Calibration</td>
<td>✓</td>
</tr>
<tr>
<td>Neilon Calibration</td>
<td>✓</td>
</tr>
</tbody>
</table>
Before starting the procedure, remove any object between the X-ray source and sensor.

Gain Acquisition

START PROCEDURE

ATTENTION!!! DANGEROUS PROCEDURE
Verify safety devices before proceed

WARNING: During procedure X-rays will be emitted automatically.
CALIBRATING
WAIT... 12’

Warning
Sensor compliance procedure completed
OK

DEVICE INSTALLATION AND CALIBRATION » 2D calibration
4.4.13  CEPH VERIFY MECHANICAL CENTERING

(ONLY IF CEPH ARM IS PRESENT)
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
TARGET

IF

CHECK!

» 4.1.11
or

If the image is not horizontally centred, follow the instructions to manually adjust the settings.

1. Press the X-ray button.
2. Evaluate the centering.
3. Change parameters and take new image.
4. Repeat steps 1 to 3 until the image is centered.

TARGET

Evaluate Centering

Image Centered

Change parameters and take new image

OK
DEVICE INSTALLATION AND CALIBRATION » 2D calibration

1. Set the height to 1.75 mm.
2. Repeat the process.
3. Change parameters and take new image.
4. Confirm centered.
5. Press X-ray button.

TARGET

CHECKLIST

Confirm centered.
Change parameters and take new image.
OK
4.4.14 HEADREST CALIBRATION

(ONLY IF CEPH ARM IS PRESENT)
**Headrest Calibration**

- **Step 2**: Start Procedure
  - Close position: 93.60
  - Open position: 175.60

- **Step 3**: Close headrest
  - Press OK to confirm

- **Step 4**: OK

---

**DEVICE INSTALLATION AND CALIBRATION**

» 2D calibration
2D calibration

OPEN headrest
Press OK to confirm

Acquisition Server Plus 5.2.2.6

Headrest calibration procedure completed
4.4.15 NASION CALIBRATION

(ONLY IF CEPH ARM IS PRESENT)
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
4.4.16 BACKUP CALIBRATION DATA TO FILE
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
4.4.17 ALIGNING THE EAR GUIDE RINGS

To check the correct alignment it is possible to take the image by using a CEPH mechanical positioning window or by launching the virtual keyboard and performing a CEPH LL examination.

**HORIZONTAL ALIGNMENT**
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
VERTICAL ALIGNMENT
4.5 3D CALIBRATION

Required instruments

3D calibration kit, including:

- cylinder with two rows of metal spheres.
- support plate

⚠️ All covers must be assembled.

4.5.1 BEAM LIMITER TEST
173

DEVICE INSTALLATION AND CALIBRATION » 3D calibration
DEVICE INSTALLATION AND CALIBRATION » 3D calibration
TARGET

[13 x 8] FOV area

11a  
11b  
11c
Up 15.5 ±0.5

Up 15.7 ±0.1

Acquisition

13

[13 x 6] FOV area

12
When passing from one FOV to the next, remove the tick from “Enable Manual Tuning” to allow the collimator to reposition itself according to the chosen FOV.

4.5.2 BLANK ACQUISITION AND DAILY CHECK

**IMPORTANT:** If requested by the customer, select menu “Tools-->Force always use dead man button for automated procedure” to force the use of ray button both for Daily Check and for Blank Acquisition.
DAILY CHECK

TEST 1  Set up device for CBCT / 3D exam
TEST 2  Detector initialization
TEST 3  X-Ray source calibration
TEST 4  Verification of stability - consistency of emitted/measured dose
TEST 5  Verification of consistency of images acquired at different frame rates
TEST 6  Verification of the background image (without RX) of detector
DEVICE INSTALLATION AND CALIBRATION » 3D calibration
4.5.3 CYLINDRICAL TEST PHANTOM ACQUISITION ("MATTARELLUM")
DEVICE INSTALLATION AND CALIBRATION » 3D calibration
The software has a certain tolerance: even if the spheres are not inside the respective positions, the important thing is that the Mattarellum does not generate a software error and that it is therefore possible to proceed with calibration.
TARGET

This page contains images of a target and software interface for 3D calibration. The images show a target with a checkmark, indicating successful calibration. The software interface displays a warning symbol and a message to press the X-ray button to start the X-ray process and acquire a test image. The interface also shows a button with a label indicating that the X-ray button has been pressed.

DEVICE INSTALLATION AND CALIBRATION » 3D calibration
Depending on the device model, 1, 2 or 3 acquisitions will be performed.
### 4.5.4 3D CALIBRATION BACKUP

1. **File**

   ![File Menu](image1.png)

2. **Settings backup...**

   ![Settings Backup](image2.png)
Backup 3D
DEVICE INSTALLATION AND CALIBRATION » 3D calibration
4.5.5 QA PHANTOM SCAN (OPTIONAL)

Check for evaluation of 3D images quality.
DEVICE INSTALLATION AND CALIBRATION » 3D calibration

7. X-ray Flash

8. PRESS XRAY BUTTON

button pressed
FIRST SCOUT QA PHANTOM POSITIONING
Center the QA phantom for the first scout view acquisition and verify the positioning by performing a single acquisition with the X Ray Flash button. Then press "Next".
(Press 'CTRL' to enable the patient positioning tuning)
a. Ctrl

b. Ctrl

c. hyperion X9 pro - TECHNICAL MANUAL

DEVICE INSTALLATION AND CALIBRATION » 3D calibration
DEVICE INSTALLATION AND CALIBRATION » 3D calibration
SECOND SCOUT QA PHANTOM POSITIONING

Now, center the QA phantom for the second scout view orientation. The 'X-ray Flash' button again. At the end, to verify first scout positioning press 'Back', else press 'Next'...

PRESS XRAY BUTTON

Button pressed
SECOND SCOUT QA PHANTOM POSITIONING

Now, center the QA phantom for the second scout view acquisition, try 'Next' button again. At the end, verify first wood positioning prior to 'Next'... (Press [Esc] to cancel the current positioning timing)

WARNING:
Press [Start] to start the scan, [Stop] to abort the process...
# QA Phantom Report - 1 / 3

Software version: 8.5.83  
Scan date: 13/04/2018 - 16:03

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAP [-1.00 - 1.00 degrees]</td>
<td>0.42</td>
</tr>
<tr>
<td>ALL [-1.00 - 1.00 degrees]</td>
<td>0.02</td>
</tr>
<tr>
<td>Scan duration [26.10 ÷ 26.70 sec.]</td>
<td>27.20</td>
</tr>
<tr>
<td>RNS % [0.00 - 3.50]</td>
<td>0.67</td>
</tr>
<tr>
<td>HDE [59.30 ÷ 60.50 mm]</td>
<td>59.87</td>
</tr>
<tr>
<td>HDI [55.50 ÷ 56.70 mm]</td>
<td>56.26</td>
</tr>
<tr>
<td>VDE [59.30 ÷ 60.50 mm]</td>
<td>59.87</td>
</tr>
<tr>
<td>VDI [55.50 ÷ 56.70 mm]</td>
<td>56.25</td>
</tr>
<tr>
<td>H FWHM [≤ 0.41 mm]</td>
<td>0.28</td>
</tr>
<tr>
<td>V FWHM [≤ 0.41 mm]</td>
<td>0.47</td>
</tr>
<tr>
<td>HFD [44.70 ÷ 45.70 mm]</td>
<td>45.25</td>
</tr>
<tr>
<td>VFD [26.50 ÷ 27.50 mm]</td>
<td>26.93</td>
</tr>
<tr>
<td>Min Level (*)</td>
<td>960.87</td>
</tr>
<tr>
<td>Max Level (*)</td>
<td>3290.82</td>
</tr>
</tbody>
</table>

(*) Reserved for internal use

13/04/2018 - 16:08

Signature ____________________

---

File View Window Help

DE@

3D calibration

EN

DEVICE INSTALLATION AND CALIBRATION » 3D calibration

201
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software version</td>
<td>8.5.03</td>
</tr>
<tr>
<td>Scan date</td>
<td>13/04/2018 - 16:03</td>
</tr>
<tr>
<td>Device Number</td>
<td>PA08</td>
</tr>
<tr>
<td>FOV [13 x 8]</td>
<td>Best quality</td>
</tr>
<tr>
<td>AAP [-1.00 - 1.00 degrees]</td>
<td>0.42</td>
</tr>
<tr>
<td>ALL [-1.00 - 1.00 degrees]</td>
<td>0.02</td>
</tr>
<tr>
<td>Scan duration [26.10 - 26.70 sec.]</td>
<td>26.41</td>
</tr>
<tr>
<td>RNS % [0.00 - 3.50]</td>
<td>0.67</td>
</tr>
<tr>
<td>HDE [59.30 - 60.50 mm]</td>
<td>59.87</td>
</tr>
<tr>
<td>HDI [55.50 - 56.70 mm]</td>
<td>58.26</td>
</tr>
<tr>
<td>VDE [59.30 - 60.50 mm]</td>
<td>59.67</td>
</tr>
<tr>
<td>VDI [55.50 - 56.70 mm]</td>
<td>56.25</td>
</tr>
<tr>
<td>H FWHM [&lt; 0.41 mm]</td>
<td>0.28</td>
</tr>
<tr>
<td>V FWHM [&lt; 0.41 mm]</td>
<td>0.27</td>
</tr>
<tr>
<td>HFD [44.70 - 45.70 mm]</td>
<td>45.25</td>
</tr>
<tr>
<td>VFD [26.50 - 27.50 mm]</td>
<td>28.93</td>
</tr>
<tr>
<td>Min Level (*)</td>
<td>960.87</td>
</tr>
<tr>
<td>Max Level (*)</td>
<td>3290.82</td>
</tr>
</tbody>
</table>

(*) Reserved for internal use

13/04/2018 - 16:08

Signature ____________________
The number of available FOV will vary from 2 to 6, depending on the device model.
5. CONTROL PANELS AND DISPLAY SYMBOLS

5.1 CONSOLE ONBOARD THE MACHINE

**VERTICAL LASER POSITIONING (FORWARD)** for 2D projections

**CRANIOSTAT MOVEMENT (UPWARD)** for 3D projections

**VERTICAL LASER POSITIONING (BACKWARD)** for 2D projections

**CRANIOSTAT MOVEMENT (DOWNWARD)** for 3D projections

**CONFIRMATION**

**COLUMN UPWARD MOVEMENT**

**COLUMN DOWNWARD MOVEMENT**

**X-RAY EMISSION**

**ON**

**STANDBY**

**X-RAY READY**

**INTERLOCK**
5.2 PUSHBUTTON PANEL ON CEPH ARM

- **ON**
- **STANDBY**
- **X-RAY READY**
- **INTERLOCK**

COLUMN UPWARD MOVEMENT
COLUMN DOWNWARD MOVEMENT
6. SERVICE MENU

Method 1
Method 2

1. Click on the Tools tab.
2. Select "Insert password".
3. Enter the password "306090" and click "Ok".
7. CIRCUIT BOARDS

IMPORTANT: Before carrying out any maintenance work on electronic boards or wiring it is necessary to switch off the machine and wait until all the LEDs on the boards go out. Do not disconnect/reconnect wires or leads with the machine on.

7.1 UNIT BLOCK DIAGRAM
### 7.2.1 Connector List

<table>
<thead>
<tr>
<th>CONNECTOR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1</td>
<td>12/48V power supply towards CONVERTER</td>
</tr>
<tr>
<td>K2</td>
<td>X axis motor</td>
</tr>
<tr>
<td>K3</td>
<td>PAN Synchronization signal</td>
</tr>
<tr>
<td>K4</td>
<td>CAN for converter</td>
</tr>
<tr>
<td>K5</td>
<td>X limit switch</td>
</tr>
<tr>
<td>K8</td>
<td>Y axis motor</td>
</tr>
<tr>
<td>K9</td>
<td>Y limit switch</td>
</tr>
<tr>
<td>K10</td>
<td>LAN towards workstation</td>
</tr>
<tr>
<td>K13</td>
<td>CAN for Inverter board</td>
</tr>
<tr>
<td>K14</td>
<td>R axis motor</td>
</tr>
<tr>
<td>K15</td>
<td>R limit switch</td>
</tr>
<tr>
<td>K16</td>
<td>Patient arm keyboard</td>
</tr>
<tr>
<td>K19</td>
<td>Column potentiometer</td>
</tr>
<tr>
<td>K20</td>
<td>CEPH motor</td>
</tr>
<tr>
<td>K21</td>
<td>Patient arm laser</td>
</tr>
<tr>
<td>K22</td>
<td>CEPH limit switch</td>
</tr>
<tr>
<td>K30</td>
<td>Gigabit switch power supply</td>
</tr>
<tr>
<td>K34</td>
<td>24V power supply towards INVERTER</td>
</tr>
<tr>
<td>K36</td>
<td>CEPH Synchronization signal</td>
</tr>
<tr>
<td>K39</td>
<td>MYRAY logo</td>
</tr>
<tr>
<td>K42/K47</td>
<td>CEPH keyboard</td>
</tr>
<tr>
<td>K43</td>
<td>24V power supply towards PFC</td>
</tr>
<tr>
<td>K44</td>
<td>Connector for Emergency button</td>
</tr>
<tr>
<td>K48</td>
<td>Chin rest motor</td>
</tr>
<tr>
<td>K49</td>
<td>Chin rest limit switch</td>
</tr>
</tbody>
</table>

### 7.2.2 Diagnostic LEDs

<table>
<thead>
<tr>
<th>NAME</th>
<th>COLOUR</th>
<th>SCREEN PRINTING</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL1</td>
<td>Yellow</td>
<td>CAN1</td>
<td>CAN communication: normally flashing. Problems on CAN bus if off or on steady</td>
</tr>
<tr>
<td>DL2</td>
<td>Red</td>
<td>ERR</td>
<td>ON if board error</td>
</tr>
<tr>
<td>DL3</td>
<td>Green</td>
<td>CPU</td>
<td>CPU status: normally flashing</td>
</tr>
<tr>
<td>DL4</td>
<td>Yellow</td>
<td>MOT.ENABLE</td>
<td>ON if motors enabled</td>
</tr>
<tr>
<td>DL5</td>
<td>Green</td>
<td>SYNC PAN</td>
<td>It flashes upon each synchronism pulse</td>
</tr>
<tr>
<td>DL7</td>
<td>Green</td>
<td>X MOT</td>
<td>X axis motor (ON if active)</td>
</tr>
<tr>
<td>DL8</td>
<td>Green</td>
<td>Y MOT</td>
<td>Y axis motor (ON if active)</td>
</tr>
<tr>
<td>DL9</td>
<td>Green</td>
<td>H MOT</td>
<td>CEPH motor (ON if active)</td>
</tr>
<tr>
<td>DL10</td>
<td>Green</td>
<td>R MOT</td>
<td>R axis motor (ON if active)</td>
</tr>
<tr>
<td>DL11</td>
<td>Green</td>
<td>PROG</td>
<td>On if FPGA programmed</td>
</tr>
<tr>
<td>DL12</td>
<td>Green</td>
<td>RUN</td>
<td>Flashing if FPGA ok</td>
</tr>
<tr>
<td>DL13</td>
<td></td>
<td>SYNC</td>
<td>Not used</td>
</tr>
<tr>
<td>DL14</td>
<td>Green</td>
<td>ENABLE</td>
<td>ON if converter enabled</td>
</tr>
<tr>
<td>DL15</td>
<td></td>
<td>ACK</td>
<td>Not used</td>
</tr>
<tr>
<td>DL16</td>
<td>Yellow</td>
<td>XRAY</td>
<td>On during emission</td>
</tr>
<tr>
<td>DL18</td>
<td>Yellow</td>
<td>ACT</td>
<td>Flashing if LAN is broadcasting</td>
</tr>
<tr>
<td>DL19</td>
<td>Green</td>
<td>LINK</td>
<td>Flashing if LAN is connected</td>
</tr>
<tr>
<td>DL22</td>
<td>Green</td>
<td>3.3V</td>
<td>ON if 3.3V power supply present</td>
</tr>
<tr>
<td>DL23</td>
<td>Green</td>
<td>24V</td>
<td>ON if 24V power supply present</td>
</tr>
<tr>
<td>DL24</td>
<td>Green</td>
<td>5.0 V</td>
<td>ON if 5V power supply present</td>
</tr>
<tr>
<td>DL25</td>
<td>Green</td>
<td>1.2V</td>
<td>ON if 1.2V power supply present</td>
</tr>
<tr>
<td>DL29</td>
<td>Green</td>
<td></td>
<td>ON if CEPH fuse OK</td>
</tr>
<tr>
<td>DL30</td>
<td>Green</td>
<td></td>
<td>CEPH limit switch (ON if darkened)</td>
</tr>
<tr>
<td>DL32</td>
<td>Green</td>
<td></td>
<td>ON if R axis fuse OK</td>
</tr>
<tr>
<td>DL33</td>
<td>Green</td>
<td></td>
<td>R limit switch (ON if darkened)</td>
</tr>
<tr>
<td>DL35</td>
<td>Green</td>
<td></td>
<td>ON if X axis fuse OK</td>
</tr>
<tr>
<td>DL36</td>
<td>Green</td>
<td></td>
<td>X limit switch (ON if darkened)</td>
</tr>
<tr>
<td>DL38</td>
<td>Green</td>
<td></td>
<td>ON if Y axis fuse OK</td>
</tr>
<tr>
<td>DL39</td>
<td>Green</td>
<td></td>
<td>Y limit switch (ON if darkened)</td>
</tr>
<tr>
<td>DL41</td>
<td>Green</td>
<td>SYNC CEPH</td>
<td>It flashes upon each synchronism pulse</td>
</tr>
<tr>
<td>DL43</td>
<td>Green</td>
<td>SNS_IN PAN</td>
<td>ON if PAN sensor active</td>
</tr>
<tr>
<td>DL44</td>
<td>Green</td>
<td>SNS_IN CEPH</td>
<td>ON if CEPH sensor active</td>
</tr>
<tr>
<td>DL46</td>
<td>Green</td>
<td>PAN ON</td>
<td>On if PAN sensor powered</td>
</tr>
<tr>
<td>DL47</td>
<td>Green</td>
<td>CEPH ON</td>
<td>On if CEPH sensor powered</td>
</tr>
<tr>
<td>DL49</td>
<td>Green</td>
<td>48V</td>
<td>ON if 48V power supply present</td>
</tr>
<tr>
<td>DL56</td>
<td>Green</td>
<td>OUT</td>
<td>Not used</td>
</tr>
<tr>
<td>DL57</td>
<td>Green</td>
<td>S MOT</td>
<td>Chin rest motor (ON if active)</td>
</tr>
<tr>
<td>DL60</td>
<td>Green</td>
<td></td>
<td>ON if chin rest fuse is OK</td>
</tr>
<tr>
<td>DL61</td>
<td>Green</td>
<td></td>
<td>Chin rest limit switch (ON if darkened)</td>
</tr>
<tr>
<td>DL67</td>
<td>Green</td>
<td>AUX1</td>
<td>ON if inverter enabled</td>
</tr>
<tr>
<td>DL68</td>
<td>Green</td>
<td>AUX2</td>
<td>Not used</td>
</tr>
<tr>
<td>DL69</td>
<td>Green</td>
<td>SWITCH</td>
<td>ON if Gigabit switch power supply present</td>
</tr>
<tr>
<td>DL70</td>
<td>Green</td>
<td>5V CAN1</td>
<td>ON if CAN isolated power supply OK</td>
</tr>
<tr>
<td>DL73</td>
<td>Green</td>
<td>DRIVE</td>
<td>ON if PFC enabled</td>
</tr>
<tr>
<td>DL74</td>
<td>Red</td>
<td>EMG</td>
<td>ON if machine emergency pressed</td>
</tr>
</tbody>
</table>
7.3 PFC (97661806)
### 7.3.1 CONNECTOR LIST

<table>
<thead>
<tr>
<th>CONNECTOR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1</td>
<td>395V power supply connection</td>
</tr>
<tr>
<td>K2/K3</td>
<td>Main switch</td>
</tr>
<tr>
<td>K4</td>
<td>Single-phase 115-240 Vac 50/60 Hz general power supply</td>
</tr>
<tr>
<td>K5</td>
<td>Connector for X-ray command</td>
</tr>
<tr>
<td>K6</td>
<td>External interlock input connection</td>
</tr>
<tr>
<td>K7</td>
<td>Connector for External Emergency button</td>
</tr>
<tr>
<td>K8</td>
<td>External lamps connection (pin 1-2 ready, 3-4 emission)</td>
</tr>
<tr>
<td>K9</td>
<td>24V power supply towards INVERTER</td>
</tr>
<tr>
<td>K10</td>
<td>CAN towards INVERTER</td>
</tr>
</tbody>
</table>

### 7.3.2 DIAGNOSTIC LEDS

<table>
<thead>
<tr>
<th>NAME</th>
<th>COLOUR</th>
<th>SCREEN PRINTING</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL1</td>
<td>Yellow</td>
<td>CAN</td>
<td>CAN communication: normally flashing. Problems on CAN bus if off or on steady</td>
</tr>
<tr>
<td>DL2</td>
<td>Red</td>
<td>ERR</td>
<td>ON if board error</td>
</tr>
<tr>
<td>DL3</td>
<td>Green</td>
<td>CPU</td>
<td>CPU status: normally flashing</td>
</tr>
<tr>
<td>DL4</td>
<td>Green</td>
<td>VCC CAN</td>
<td>ON if isolated 5V present</td>
</tr>
<tr>
<td>DL5</td>
<td>Green</td>
<td>OUT</td>
<td></td>
</tr>
<tr>
<td>DL6</td>
<td>Green</td>
<td>DRIVE</td>
<td>ON if MAIN enabling present</td>
</tr>
<tr>
<td>DL7</td>
<td>Yellow</td>
<td>RDYL</td>
<td>Yellow ON if ready lamp active</td>
</tr>
<tr>
<td>DL8</td>
<td>Yellow</td>
<td>XRYL</td>
<td>Yellow ON if x-ray on lamp active</td>
</tr>
<tr>
<td>DL9</td>
<td>Green</td>
<td>BUT</td>
<td>Green ON if button pressed</td>
</tr>
<tr>
<td>DL10</td>
<td>Yellow</td>
<td>ILK</td>
<td>Yellow ON if external interlock active</td>
</tr>
<tr>
<td>DL11</td>
<td>Red</td>
<td>EMG</td>
<td>Red ON if external emergency pressed</td>
</tr>
<tr>
<td>DL12</td>
<td>Yellow</td>
<td>ON</td>
<td>ON if power active</td>
</tr>
<tr>
<td>DL13</td>
<td>Yellow</td>
<td>PC</td>
<td>ON if pre-load over</td>
</tr>
<tr>
<td>DL14</td>
<td>Yellow</td>
<td>VAC</td>
<td>ON if network present and RL3 OK</td>
</tr>
<tr>
<td>DL15</td>
<td>Yellow</td>
<td>VDC</td>
<td>ON if 395V present. WARNING: wait for switching off before handling</td>
</tr>
<tr>
<td>DL16</td>
<td>Green</td>
<td>12V EXT</td>
<td>ON if accessible 12V present</td>
</tr>
<tr>
<td>DL17</td>
<td>Green</td>
<td>24V</td>
<td>ON if 24V present</td>
</tr>
<tr>
<td>DL18</td>
<td>Green</td>
<td>12V</td>
<td>On if driver 12V is present</td>
</tr>
<tr>
<td>DL19</td>
<td>Green</td>
<td>3.3V</td>
<td>ON if 3.3V present</td>
</tr>
<tr>
<td>DL20</td>
<td>Green</td>
<td>FUSE</td>
<td>ON if fuse OK. WARNING: wait for switching off before handling</td>
</tr>
<tr>
<td>DL21</td>
<td>Red</td>
<td>FUSE</td>
<td>ON if fuse interrupted. WARNING: wait for switching off before handling</td>
</tr>
</tbody>
</table>

### 7.3.3 FUSES

<table>
<thead>
<tr>
<th>NAME</th>
<th>DESCRIPTION</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>FH1 - FH2</td>
<td>390V toward Inverter board (for column)</td>
<td>FUSE 8 AF 600VDC 10.3X38</td>
</tr>
<tr>
<td>FH3 - FH4</td>
<td>Main Power supply protection</td>
<td>FUSE 15 AF 250V 6.3X32 115V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FUSE 10 AF 250V 6.3X32 230V</td>
</tr>
</tbody>
</table>
7.4 INVERTER (97661954)
CIRCUIT BOARDS
7.4.1 CONNECTOR LIST

<table>
<thead>
<tr>
<th>CONNECTOR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>J12</td>
<td>CAN Connector towards PFC</td>
</tr>
<tr>
<td>J15</td>
<td>CAN Connector towards Main Board</td>
</tr>
<tr>
<td>K2</td>
<td>24V towards console power supply</td>
</tr>
<tr>
<td>K3</td>
<td>24V power supply towards MAIN</td>
</tr>
<tr>
<td>K4</td>
<td>Motor Hall sensor connector</td>
</tr>
<tr>
<td>K6</td>
<td>Motor power supply connector</td>
</tr>
<tr>
<td>K7</td>
<td>Motor thermal connector</td>
</tr>
<tr>
<td>K8/K9</td>
<td>Motor limit switch</td>
</tr>
<tr>
<td>X1</td>
<td>390 VDC towards CONVERTER</td>
</tr>
<tr>
<td>X2</td>
<td>390 VDC from PFC</td>
</tr>
</tbody>
</table>

7.4.2 DIAGNOSTIC LEDS

<table>
<thead>
<tr>
<th>NAME</th>
<th>COLOUR</th>
<th>SCREEN PRINTING</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL1</td>
<td>Green</td>
<td>3.3V</td>
<td>ON if 3.3V present</td>
</tr>
<tr>
<td>DL2</td>
<td>Red</td>
<td>ERR</td>
<td>ON if board error</td>
</tr>
<tr>
<td>DL3</td>
<td>Green</td>
<td>CPU</td>
<td>CPU status: normally flashing</td>
</tr>
<tr>
<td>DL4</td>
<td>Green</td>
<td>24V</td>
<td>ON if 24V present</td>
</tr>
<tr>
<td>DL6</td>
<td>Green</td>
<td>VCC</td>
<td>On if 5V CAN power supply present</td>
</tr>
<tr>
<td>DL8</td>
<td></td>
<td>OUT</td>
<td>Not used</td>
</tr>
<tr>
<td>DL10</td>
<td>Green</td>
<td>16V</td>
<td>On if driver 16V is present</td>
</tr>
<tr>
<td>DL14</td>
<td>Yellow</td>
<td>CAN</td>
<td>CAN communication: normally flashing. Problems on CAN bus if off or on steady</td>
</tr>
<tr>
<td>DL37</td>
<td>Green</td>
<td>SPD</td>
<td>Green flashing upon each motor rotation</td>
</tr>
<tr>
<td>DL38</td>
<td>Green</td>
<td>EMG</td>
<td>ON if MAIN enabling present</td>
</tr>
<tr>
<td>DL39/DL40</td>
<td>Green</td>
<td></td>
<td>ON if motor limit switches darkened</td>
</tr>
</tbody>
</table>
7.5 CONVERTER (97661807)
## 7.5.1 CONNECTOR LIST

<table>
<thead>
<tr>
<th>CONNECTOR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>K2</td>
<td>Primary horizontal collimator motor</td>
</tr>
<tr>
<td>K3</td>
<td>3D panel Synchronization signal</td>
</tr>
<tr>
<td>K5</td>
<td>Horizontal collimator limit switch</td>
</tr>
<tr>
<td>K8</td>
<td>Primary vertical collimator motor</td>
</tr>
<tr>
<td>K9</td>
<td>Vertical collimator limit switch</td>
</tr>
<tr>
<td>K14</td>
<td>Revolver motor</td>
</tr>
<tr>
<td>K15/K17</td>
<td>Revolver limit switch</td>
</tr>
<tr>
<td>K28</td>
<td>Monoblock High voltage</td>
</tr>
<tr>
<td>K29</td>
<td>Monoblock filament power supply</td>
</tr>
<tr>
<td>K30</td>
<td>390 VDC at input</td>
</tr>
<tr>
<td>K31</td>
<td>Monoblock feedback</td>
</tr>
<tr>
<td>K32/K34/K37</td>
<td>Monoblock laser</td>
</tr>
<tr>
<td>K35</td>
<td>24V/48V power supply towards MAIN</td>
</tr>
<tr>
<td>K36</td>
<td>CAN towards MAIN</td>
</tr>
</tbody>
</table>

## 7.5.2 DIAGNOSTIC LEDS

<table>
<thead>
<tr>
<th>NAME</th>
<th>COLOUR</th>
<th>SCREEN PRINTING</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL5</td>
<td>Green</td>
<td>USR_SYNC</td>
<td>It flashes upon each synchronism pulse of 3D panel</td>
</tr>
<tr>
<td>DL22</td>
<td>Green</td>
<td>3V3</td>
<td>ON if 3.3V present</td>
</tr>
<tr>
<td>DL23</td>
<td>Green</td>
<td>24V</td>
<td>ON if 24V present</td>
</tr>
<tr>
<td>DL24</td>
<td>Green</td>
<td>5V</td>
<td>On it 5V power supply present</td>
</tr>
<tr>
<td>DL32</td>
<td>Green</td>
<td></td>
<td>On if revolver fuse is OK</td>
</tr>
<tr>
<td>DL33/DL34</td>
<td>Green</td>
<td></td>
<td>Revolver limit switch (ON if darkened)</td>
</tr>
<tr>
<td>DL35</td>
<td>Green</td>
<td></td>
<td>On if horizontal collimator fuse is OK</td>
</tr>
<tr>
<td>DL37</td>
<td>Green</td>
<td></td>
<td>Horizontal collimator limit switch (ON if darkened)</td>
</tr>
<tr>
<td>DL38</td>
<td>Green</td>
<td></td>
<td>On if vertical collimator fuse is OK</td>
</tr>
<tr>
<td>DL39</td>
<td>Green</td>
<td></td>
<td>Vertical collimator limit switch (ON if darkened)</td>
</tr>
<tr>
<td>DL42</td>
<td></td>
<td>EXP-OK</td>
<td>Not used</td>
</tr>
<tr>
<td>DL43</td>
<td>Green</td>
<td>SNS-IN</td>
<td>ON if 3D panel present</td>
</tr>
<tr>
<td>DL46</td>
<td>Green</td>
<td>SNS-ON</td>
<td>ON if 3D panel powered</td>
</tr>
<tr>
<td>DL51</td>
<td></td>
<td>USR_ENB</td>
<td>Not used</td>
</tr>
<tr>
<td>DL52</td>
<td>Yellow</td>
<td>CAN</td>
<td>CAN communication: normally flashing. Problems on CAN bus if off or on steady</td>
</tr>
<tr>
<td>DL53</td>
<td>Red</td>
<td>ERR</td>
<td>ON if board error</td>
</tr>
<tr>
<td>DL54</td>
<td>Green</td>
<td>CPU</td>
<td>CPU status: normally flashing</td>
</tr>
<tr>
<td>DL55</td>
<td>Yellow</td>
<td>MOTORS</td>
<td>ON if motors enabled</td>
</tr>
<tr>
<td>DL56</td>
<td></td>
<td>SYNC</td>
<td>Not used</td>
</tr>
<tr>
<td>DL57</td>
<td>Green</td>
<td>ENB</td>
<td>ON if MAIN enabling present</td>
</tr>
<tr>
<td>DL58</td>
<td></td>
<td>ACK</td>
<td>Not used</td>
</tr>
<tr>
<td>DL59</td>
<td>Yellow</td>
<td>DRV</td>
<td>ON if inverter enabled</td>
</tr>
<tr>
<td>DL60</td>
<td>Green</td>
<td>48V</td>
<td>On if 48V power supply present</td>
</tr>
<tr>
<td>DL61</td>
<td>Yellow</td>
<td>VDC</td>
<td>On if 395V present. WARNING: wait for switching off before handling</td>
</tr>
<tr>
<td>DL64</td>
<td>Green</td>
<td>-5VA</td>
<td>On if -5V power supply present</td>
</tr>
</tbody>
</table>
7.6 CONSOLE POWER SUPPLY (97662070)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DL65</td>
<td>Green</td>
<td>10V</td>
<td>ON if driver power supply present</td>
</tr>
<tr>
<td>DL66</td>
<td>Green</td>
<td>+5VA</td>
<td>On if +5V power supply present</td>
</tr>
<tr>
<td>DL68</td>
<td>Green</td>
<td>15V</td>
<td>ON if driver power supply present</td>
</tr>
<tr>
<td>DL69</td>
<td>Green</td>
<td>VCC CAN</td>
<td>ON if isolated 5V present</td>
</tr>
</tbody>
</table>
7.6.1 CONNECTOR LIST

<table>
<thead>
<tr>
<th>CONNECTOR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1</td>
<td>Console board power supply</td>
</tr>
<tr>
<td>K2</td>
<td>24V from inverter board</td>
</tr>
<tr>
<td>K3</td>
<td>LAN switch power supply</td>
</tr>
</tbody>
</table>

7.6.2 DIAGNOSTIC LEDS

<table>
<thead>
<tr>
<th>NAME</th>
<th>COLOUR</th>
<th>SCREEN PRINTING</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL1</td>
<td>Green</td>
<td>SWITCH</td>
<td>ON if LAN switch power supply present</td>
</tr>
<tr>
<td>DL2</td>
<td>Green</td>
<td>VCC</td>
<td>ON if 15V power supply present</td>
</tr>
<tr>
<td>DL3</td>
<td>Green</td>
<td>HUI</td>
<td>On if console power supply is present</td>
</tr>
</tbody>
</table>

7.7 CEPH TERMINAL BLOCK (97661913)
### 7.7.1 Connector List

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1/K11</td>
<td>Main board connection</td>
</tr>
<tr>
<td>K12</td>
<td>Ear guides potentiometer</td>
</tr>
<tr>
<td>K13</td>
<td>Nasion potentiometer</td>
</tr>
<tr>
<td>K14</td>
<td>Cephalostat drum sensors</td>
</tr>
</tbody>
</table>

---

**SCHEDA MAIN 97661808 K7**

**97522217**

**PCB97661913-1**

**LS**

**SCHEDA MAIN 97661808 K42**

**97522217**
7.8 CONSOLE (97662111)
### 7.8.1 CONNECTOR LIST

<table>
<thead>
<tr>
<th>CONNECTOR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CN2 (LAN)</td>
<td>LAN towards switch Gigabit</td>
</tr>
<tr>
<td>CN14 (POWER)</td>
<td>Power supply from K1 on console power supply board</td>
</tr>
</tbody>
</table>
7.9 SENSOR INTERFACE (97661579)
### 7.9.1 CONNECTOR LIST

<table>
<thead>
<tr>
<th>CONNECTOR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1</td>
<td>Sensor synchronisation / supply from CONVERTER</td>
</tr>
<tr>
<td>K2</td>
<td>24V DC Panel supply</td>
</tr>
<tr>
<td>K3</td>
<td>Sensor synchronisation</td>
</tr>
</tbody>
</table>

### 7.9.2 DIAGNOSTIC LEDS

<table>
<thead>
<tr>
<th>NAME</th>
<th>COLOUR</th>
<th>SCREEN PRINTING</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL1</td>
<td>Green</td>
<td>VIN</td>
<td>48V from CONVERTER board</td>
</tr>
<tr>
<td>DL2</td>
<td>Green</td>
<td>VCC</td>
<td>Analog 5V towards sensor</td>
</tr>
<tr>
<td>DL3</td>
<td>Green</td>
<td>VDD</td>
<td>Digital 5V towards sensor</td>
</tr>
</tbody>
</table>
7.10  5-PORT SWITCH
1
(SWITCH GIGABIT)

- PAN SENSOR (GLAN4)
- CEPH SENSOR (GLAN5)
- 3D PANEL (GLAN3)
- PC - INTEL GIGABIT (GLAN1)

from K30 - MAINBOARD

2
(SWITCH LAN)

- MAIN (LAN4)
- CONSOLE (GLAN3)
- PC - COMMUNICATION (LAN)

from K3 - CONSOLE POWER SUPPLY BOARD
8. CONNECTIVITY

8.1 CONSOLE IP ADDRESS AMENDMENT

1. Edit Network Settings

2. Network settings:
   - Automatically assigned IP address (DHCP)
   - Static IP address

3. IF DHCP fails:
   - IP: 192 168 1 161
   - Net Mask: 255 255 255 0

4. Apply
   - Cancel
8.2 2D SENSORS / 3D PANEL IP ADDRESS AMENDMENT

8.3 FIRMWARE UPGRADE
8.4 REMOTE SUPPORT

1. Click x2

2. Help
3. Remote Support...

REMOTE SUPPORT

Please contact Service and provide them ID and Password in order to enable the remote session

ID: 697 531 928
Password: 1609

Ready to connect (secure connection)

www.teamviewer.com

SERVICE
In order to ensure the operational safety and functional reliability of the equipment installed, at least once a year.

**APPLY GREASE (TUTELA MR3)**
VERIFY WEAR CONDITIONS OF THE BELTS

1. Check the wear conditions of the belts.
2. Ensure the belts are in good condition.
3. Confirm the belts are not damaged or worn.
4. Verify the integrity of the belt mechanism.

Appendix - Maintenance procedures for the device equipment

EN