# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. GENERAL WARNINGS</td>
<td>3</td>
</tr>
<tr>
<td>1.1 Foreword</td>
<td>3</td>
</tr>
<tr>
<td>1.2 Safety instructions</td>
<td>3</td>
</tr>
<tr>
<td>2. PACKAGING AND HANDLING</td>
<td>7</td>
</tr>
<tr>
<td>2.1 Handling and storage</td>
<td>7</td>
</tr>
<tr>
<td>2.2 Damage during shipment</td>
<td>7</td>
</tr>
<tr>
<td>3. PREINSTALLATION</td>
<td>9</td>
</tr>
<tr>
<td>4. DEVICE INSTALLATION AND CALIBRATION</td>
<td>11</td>
</tr>
<tr>
<td>4.1 Assembly instructions</td>
<td>11</td>
</tr>
<tr>
<td>4.1.1 Removal of packaging</td>
<td>11</td>
</tr>
<tr>
<td>4.1.2 Transport with cart</td>
<td>12</td>
</tr>
<tr>
<td>4.1.3 Wall mounting</td>
<td>12</td>
</tr>
<tr>
<td>4.1.4 Support base floor mounting instructions</td>
<td>13</td>
</tr>
<tr>
<td>4.1.5 Transport with handles</td>
<td>13</td>
</tr>
<tr>
<td>4.1.6 Safety screws removal</td>
<td>13</td>
</tr>
<tr>
<td>4.1.7 Patient arm installation</td>
<td>14</td>
</tr>
<tr>
<td>4.1.8 Electrical connections on Mainboard</td>
<td>17</td>
</tr>
<tr>
<td>4.1.9 Electrical connections on the PFC board</td>
<td>18</td>
</tr>
<tr>
<td>4.1.10 Ethernet connections and X-Ray emission key</td>
<td>19</td>
</tr>
<tr>
<td>4.1.11 CEPH arm installation</td>
<td>20</td>
</tr>
<tr>
<td>4.1.12 Electrical connections on Mainboard</td>
<td>25</td>
</tr>
<tr>
<td>4.1.13 Patient arm’s handles assembly</td>
<td>26</td>
</tr>
<tr>
<td>4.1.14 Check during the assembling</td>
<td>27</td>
</tr>
<tr>
<td>4.1.15 Checking after mechanical installation</td>
<td>27</td>
</tr>
<tr>
<td>4.2 Cover installation</td>
<td>29</td>
</tr>
<tr>
<td>4.3 PC configuration</td>
<td>41</td>
</tr>
<tr>
<td>4.3.1 System requirements</td>
<td>41</td>
</tr>
<tr>
<td>4.3.2 Preliminary operations</td>
<td>41</td>
</tr>
<tr>
<td>4.3.3 Operating system settings</td>
<td>41</td>
</tr>
<tr>
<td>4.3.3.1 Power management settings</td>
<td>43</td>
</tr>
<tr>
<td>4.3.3.2 Operating system optimization settings</td>
<td>45</td>
</tr>
<tr>
<td>4.3.3.3 Disabling “Windows Auto-Update Service”</td>
<td>48</td>
</tr>
<tr>
<td>4.3.3.4 Disabling Windows update sharing over the network (low data traffic)</td>
<td>50</td>
</tr>
<tr>
<td>4.3.3.5 Firewall Settings</td>
<td>51</td>
</tr>
<tr>
<td>4.3.3.6 “Windows Defender” settings</td>
<td>51</td>
</tr>
<tr>
<td>4.3.3.7 Device installation settings</td>
<td>54</td>
</tr>
<tr>
<td>4.3.4 PC-Device connection</td>
<td>58</td>
</tr>
<tr>
<td>4.3.4.1 Case 1 - Device-PC direct connection (Setting a static IP address on the network card)</td>
<td>58</td>
</tr>
<tr>
<td>4.3.4.2 Case 2 - Device-PC connection over the network (Setting a dynamic IP address on the network card)</td>
<td>60</td>
</tr>
<tr>
<td>4.3.5 “Intel Gigabit” network card configuration</td>
<td>62</td>
</tr>
<tr>
<td>4.3.6 “Acquisition Server Plus” software installation</td>
<td>67</td>
</tr>
<tr>
<td>4.3.7 “Acquisition Server Plus” configuration</td>
<td>69</td>
</tr>
<tr>
<td>4.3.7.1 Device search and connection</td>
<td>71</td>
</tr>
<tr>
<td>4.3.7.2 Sensor search and connection</td>
<td>74</td>
</tr>
<tr>
<td>4.3.8 CBCT panel installation (Only for 3D)</td>
<td>78</td>
</tr>
<tr>
<td>4.3.9 Pleora driver installation (Only for 3D)</td>
<td>78</td>
</tr>
<tr>
<td>4.3.10 Driver installation checks</td>
<td>83</td>
</tr>
<tr>
<td>4.3.11 NNT software installation and configuration</td>
<td>85</td>
</tr>
<tr>
<td>4.3.12 Onboard console connection</td>
<td>95</td>
</tr>
<tr>
<td>4.4 2D Calibration</td>
<td>99</td>
</tr>
<tr>
<td>4.4.1 Tube head warm-up</td>
<td>99</td>
</tr>
<tr>
<td>4.4.2 Preliminary actions</td>
<td>102</td>
</tr>
<tr>
<td>4.4.3 Machine configuration</td>
<td>104</td>
</tr>
<tr>
<td>4.4.4 Column calibration</td>
<td>106</td>
</tr>
<tr>
<td>4.4.5 PAN verify X-Ray alignment</td>
<td>110</td>
</tr>
<tr>
<td>4.4.5.1 Collimator manual rotation</td>
<td>118</td>
</tr>
<tr>
<td>4.4.5.2 Horizontal adjustment</td>
<td>121</td>
</tr>
<tr>
<td>4.4.6 PAN Verify Sensor Compliance</td>
<td>123</td>
</tr>
<tr>
<td>4.4.7 PAN Verify Sensor Calibration</td>
<td>125</td>
</tr>
<tr>
<td>4.4.8 PAN Verify Mechanical Centering</td>
<td>128</td>
</tr>
<tr>
<td>4.4.9 Laser Calibration</td>
<td>132</td>
</tr>
<tr>
<td>4.4.10 CEPH Verify X-ray Alignment</td>
<td>136</td>
</tr>
<tr>
<td>4.4.10.1 Manual rotation</td>
<td>144</td>
</tr>
<tr>
<td>4.4.10.2 Manual adjustment of vertical position</td>
<td>147</td>
</tr>
<tr>
<td>4.4.11 CEPH Verify Sensor Compliance</td>
<td>149</td>
</tr>
<tr>
<td>4.4.12 CEPH Verify Sensor Calibration</td>
<td>152</td>
</tr>
</tbody>
</table>
Appendix - Maintenance procedures for the device equipment

8. CONNECTIVITY
8.1 Console IP address amendment ........................................... 233
8.2 2D sensors / 3D panel IP address amendment ...................... 234
8.3 Firmware upgrade .............................................................. 234
8.4 Remote support ................................................................. 236
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>![Attention]</td>
<td>ATTENTION: General mandatory action sign</td>
</tr>
<tr>
<td>![Attention]</td>
<td>ATTENTION: Wear protective gloves</td>
</tr>
<tr>
<td>![Attention]</td>
<td>ATTENTION: Wear foot protection</td>
</tr>
<tr>
<td>![Attention]</td>
<td>ATTENTION: Use protective eyewear</td>
</tr>
<tr>
<td>![Attention]</td>
<td>ATTENTION: Use protective clothings</td>
</tr>
<tr>
<td>![Attention]</td>
<td>ATTENTION: Connect an earth terminal to the ground</td>
</tr>
<tr>
<td>SYMBOL</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td><img src="image" alt="Attention Symbol" /></td>
<td><strong>ATTENTION:</strong> Refer to instruction manual-booklet</td>
</tr>
<tr>
<td><img src="image" alt="Attention Symbol" /></td>
<td><strong>ATTENTION:</strong> Disconnect mains plug from electrical outlet</td>
</tr>
<tr>
<td><img src="image" alt="Warning Symbol" /></td>
<td><strong>WARNING:</strong> See the technical manual</td>
</tr>
<tr>
<td><img src="image" alt="Warning Symbol" /></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="image" alt="Warning Symbol" /></td>
<td><strong>WARNING:</strong> High voltage</td>
</tr>
<tr>
<td><img src="image" alt="Warning Symbol" /></td>
<td><strong>WARNING:</strong> Crushing of hands</td>
</tr>
<tr>
<td><img src="image" alt="Warning Symbol" /></td>
<td><strong>WARNING:</strong> Radioactive material or ionizing radiation</td>
</tr>
<tr>
<td><img src="image" alt="Warning Symbol" /></td>
<td><strong>WARNING:</strong> Keep clear of moving parts</td>
</tr>
<tr>
<td><img src="image" alt="Warning Symbol" /></td>
<td><strong>WARNING:</strong> Laser beam</td>
</tr>
<tr>
<td><img src="image" alt="Warning Symbol" /></td>
<td><strong>WARNING:</strong> Hot surface</td>
</tr>
<tr>
<td><img src="image" alt="Warning Symbol" /></td>
<td><strong>WARNING:</strong> Biological hazard</td>
</tr>
<tr>
<td><img src="image" alt="Warning Symbol" /></td>
<td><strong>WARNING:</strong> Sharp objects</td>
</tr>
<tr>
<td><img src="image" alt="Warning Symbol" /></td>
<td><strong>WARNING:</strong> Corrosive substances</td>
</tr>
</tbody>
</table>
**GENERAL WARNINGS**

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Warning Symbol]</td>
<td><strong>WARNING:</strong> Combustible and flammable materials</td>
</tr>
<tr>
<td>![Danger Symbol]</td>
<td><strong>DANGER:</strong> Tipping over</td>
</tr>
<tr>
<td>![Danger Symbol]</td>
<td><strong>DANGER:</strong> Heavy object. Two persons are required</td>
</tr>
</tbody>
</table>

**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 consigner), 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.

![Diagram of transport with cart]

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;

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>FLANGED M12 NUT FOR WALL BRACKET</td>
</tr>
<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. Assemble the patient arm to the device.

2. Secure the patient arm with the provided bolts and screws.
Mainboard
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
**DEVICE INSTALLATION AND CALIBRATION**

**Assembly instructions**
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>
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<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>
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</table>

<table>
<thead>
<tr>
<th>POWER SUPPLY CHECK</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Connection of power and earth leads</td>
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<tr>
<td>Power supply voltage</td>
<td>☐</td>
</tr>
<tr>
<td>Operation of main switch</td>
<td>☐</td>
</tr>
<tr>
<td>Check presence of power mains protection</td>
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<table>
<thead>
<tr>
<th>ANTI-ENTRAPMENT SAFETY DEVICE CHECKS</th>
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<tbody>
<tr>
<td>Anti-entrapment safety microswitch*</td>
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<table>
<thead>
<tr>
<th>MECHANICAL CHECKS</th>
<th></th>
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<tbody>
<tr>
<td>Balance of pantograph arm*</td>
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</tr>
<tr>
<td>Proper attachment and good condition of dental unit casing</td>
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</table>

<table>
<thead>
<tr>
<th>DEVICE CHECK AND CALIBRATION</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Software installation and configuration</td>
<td>☐</td>
</tr>
<tr>
<td>Control panel functions</td>
<td>☐</td>
</tr>
<tr>
<td>Collimator setting</td>
<td>☐</td>
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</table>

<table>
<thead>
<tr>
<th>INSTRUMENT CHECK AND CALIBRATION</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Curing lamp check*</td>
<td>☐</td>
</tr>
<tr>
<td>Camera functions and image quality check*</td>
<td>☐</td>
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</table>

<table>
<thead>
<tr>
<th>MULTIMEDIA</th>
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</thead>
<tbody>
<tr>
<td>Power on and monitor functions*</td>
<td>☐</td>
</tr>
<tr>
<td>Installation carried out in accordance with local law</td>
<td>☐</td>
</tr>
<tr>
<td>Check presence of Quick Guide</td>
<td>☐</td>
</tr>
</tbody>
</table>

* 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>

[Diagram of screw installation]
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
DEVICE INSTALLATION AND CALIBRATION » Cover installation
Cover installation
DEVICE INSTALLATION AND CALIBRATION » Cover installation
DEVICE INSTALLATION AND CALIBRATION » Cover installation
Cover installation

C x 2

DEVICE INSTALLATION AND CALIBRATION
DEVICE INSTALLATION AND CALIBRATION » Cover installation
» Cover installation
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

![Image of Control Panel settings]

Adjust your computer's settings

1. Control Panel
2. User Accounts

Security and Maintenance

Region

Remote app and desktop connections

Sound

Speech Recognition

Taskbar and Navigation

Sync Centre

System

Storage Spaces

Troubleshooting

Windows Firewall

Work Folders
4.3.3.1 POWER MANAGEMENT SETTINGS

1. **Power Options**

2. **High performance**
   - Favours performance but may use more energy.

3. **Change plan settings**
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

Define power buttons and turn on password protection

Choose the power settings that you want for your computer. The changes that you make to the settings on this page apply to all of your power plans.
4.3.3.2 OPERATING SYSTEM OPTIMIZATION SETTINGS

1. Choose which apps can run in the background
2. System settings

- Background settings
  - Change the picture on your lock screen
  - Remove Windows background images
  - Choose background, slideshow or solid colour as your background mode
  - Choose Windows Spotlight, picture or slideshow as your lock screen background

Define power buttons and turn on password protection

Choose the power settings that you want for your computer. The changes that you make to the settings on this page apply to all of your power plans.

Power and sleep button settings

- When I press the power button: Shut down
- When I press the sleep button: Sleep

Shut down settings

- [ ] Turn on fast start-up (recommended)
  - This helps start your PC faster after shut-down. Restart isn’t affected. Learn More
- [ ] Sleep
  - Show in Power menu.
- [ ] Hibernate
  - Show in Power menu.
- [x] Lock
  - Show in account picture menu.
DEVICE INSTALLATION AND CALIBRATION » PC configuration

1. Open the System Properties window.
2. Click on the "Performance" tab.
3. Click on the "Settings..." button.
5. Click on the "OK" button to apply the changes.
### 4.3.3.3 DISABLING “WINDOWS AUTO-UPDATE SERVICE”

1. Click on the Start button.
2. Select “Settings”.
3. Navigate to the “Apps & Features” section.
4. Click on the “Manage Startup” option.
5. Disable the “Windows Auto-Update Service” by selecting “Disable”.

![Image of Task Manager with highlighted steps](image-url)
4.3.3.4 **DISABLING WINDOWS UPDATE SHARING OVER THE NETWORK (LOW DATA TRAFFIC)**

Set the option to **Off**.

- Choose how updates are delivered

Options include:

- **Off**
- **PCs on my local network**
- **PCs on my local network and PCs on the Internet**

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.
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
DEVICE INSTALLATION AND CALIBRATION » PC configuration

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

Anti-malware client version: 4.38.1806.18062
Engine version: 1.3.15100.1
Anti-virus definition: 1.273.422.0
Anti-spyware definition: 1.273.422.0
Network inspection system engine version: 1.3.15100.1
Network inspection system definition version: 1.273.422.0

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 Center

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
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)
- [x] No (your device might not work as expected)

5. Save Changes
DEVICE INSTALLATION AND CALIBRATION » PC configuration

1. Open the Run command by pressing `WIN + R`.

2. In the Run dialog, type `gpedit.msc` and press `OK`.

3. In the Local Group Policy Editor, navigate to `Computer Configuration > Administrative Templates > Windows Components > Windows Update`.

4. Double-click on `Windows Update` to open the settings.

5. Configure the desired settings for Windows Update as per the manual instructions.

6. Click `OK` to close the settings and return to the Local Group Policy Editor.

7. Click `Close` to exit the Local Group Policy Editor.
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.
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 CASE 1 - DEVICE-PC DIRECT CONNECTION (SETTING A STATIC IP ADDRESS ON 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 the LAN icon in the Network Connections window.

4. Click on "Properties" in the dropdown menu.

5. In the LAN Properties window, select "Internet Protocol Version 4 (TCP/IPv4)" and click "Properties".

6. In the Properties window for Internet Protocol Version 4 (TCP/IPv4), you can configure the settings as needed.
4.3.4.2 CASE 2 - 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.
3. Click on the network icon (LAN) and select "Properties".

4. In the LAN Properties window, click on the "Networking" tab.

5. Under "Connect using:" select "Intel(R) Gigabit CT Desktop Adapter" and click "Configure...".

6. In the configuration settings, ensure that "Internet Protocol Version 4 (TCP/IPv4)" is selected and click "Properties" to adjust settings if necessary.
4.3.5 "INTEL GIGABIT" NETWORK CARD 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

Use the following DNS server addresses:
- Preferred DNS server: 
- Alternative DNS server: 

Validate settings upon exit

Click OK.
4.3.6 “ACQUISITION SERVER PLUS” SOFTWARE INSTALLATION

1. Click on "Acquisition Server Plus".
2. Select "English" as the setup language.
3. Click "OK".

Software

Acquisition Server Plus

Acquisition Server Plus
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:

Connection status: No device

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

Acquisition Server Plus

Select server mode
- Factory mode
- Service mode
- User mode
- Superuser mode

Don't ask me again

Password for SERVICE mode: cefla

OK
SERVICE MODE:

Acquisition Server Plus

Connection status No device

Device

Status undefined

4.3.7.1 DEVICE SEARCH AND CONNECTION

![PC configuration screenshot]

EN

DEVICE INSTALLATION AND CALIBRATION » PC configuration
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

![Image of Acquisition Server Plus interface]

- 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, Name
  - Specify fixed IP: 192.168.1.2
  - Auto connect device

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

- **Advanced**
  - Log verbose, Multispan Enable (slower), Show Margin, Show preview while downloading
  - Return to preferred exam
  - User Shot, Dose adjust, Update Firmware
DEVICE INSTALLATION AND CALIBRATION » PC configuration

Select a sensor:

1. SN_23857680  Vendor = Hamamatsu  Model = C10500D-70  Pan Type = v3.36

» OK

Sensor is Off
Power ON sensor?

» OK

Acquisition Server Plus 6.2....

Close
WARNING

IN CASE OF CEPH SENSORS: In case of a configuration with a mobile sensor, move it from “PAN” to “CEPH” position.

![Diagram of sensor configuration settings]

1. In case of a configuration with a mobile sensor, move it from “PAN” to “CEPH” position.

2. Select a sensor:

   - SN_24847562, Vendor = Hamamatsu, Model = C10503D-70, CephType = 1.10

3. Click OK.
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)
DEVICE INSTALLATION AND CALIBRATION » PC configuration

1. **Select server mode**:
   - Factory mode
   - Service mode
   - User mode
   - Superuser mode

2. **Enter password**:
   - Password for SERVICE mode: cellal

3. **Change mode**
4. **Yes/No**
5. **Service mode**
6. **OK**
7. **OK**
8. **Exit**
DEVICE INSTALLATION AND CALIBRATION » PC configuration
NewTom GiANO HR - TECHNICAL MANUAL

DEVICE INSTALLATION AND CALIBRATION » PC configuration
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:**

![Installation Complete](image-url)
4.3.10 DRIVER INSTALLATION CHECKS

1. Click on the LAN device to open the properties.
2. Select Properties.
3. Uncheck the GigE Vision Filter Driver.
4. Click OK.
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 installation”
Missing item 9: see chapter “Acquisition Server Plus software installation”

4.3.11 NNT SOFTWARE INSTALLATION AND CONFIGURATION

The software used to manage the images downloaded from the device is NNT, installed in the version MAIN WORKSTATION in case of 3D device, or in the version NNT Station in case of 2D device only.
### Setup Type
Select the setup type to install.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NNT Station 3a</td>
<td>2D ONLY</td>
</tr>
<tr>
<td>NewTom VGi main workstation</td>
<td></td>
</tr>
<tr>
<td>NewTom VGi evo main workstation</td>
<td></td>
</tr>
<tr>
<td>NewTom GiANO main workstation</td>
<td></td>
</tr>
<tr>
<td>NewTom 5G XL main workstation</td>
<td></td>
</tr>
<tr>
<td>NewTom 5G 3D main workstation</td>
<td></td>
</tr>
<tr>
<td>Giano HR main workstation 3b</td>
<td>3D ONLY</td>
</tr>
</tbody>
</table>

**Description**
Workstation connected to a GiANO HR device

**InstallShield**

![Next button](image)

---

### Select installation mode:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stand-alone [Recommended]</td>
<td>This is the standard installation mode. It applies to both single and multiple users (in a network domain).</td>
</tr>
<tr>
<td>For partnering software</td>
<td>The application will be driven by a certified third-party software. For more information, contact your local distributor.</td>
</tr>
</tbody>
</table>

**InstallShield**

![Next button](image)
Confirm as requested by the installer to complete the installation.

**Installation complete**

NNT 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
- Medical Specialties
- VET Imaging

10

Ok
Cancel

Before starting...

WARNING:

This 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 regulations.

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

I agree
I do not agree
Enter Service Mode:

METHOD 1
METHOD 2

13. Insert password

14. Configure automatic dispatch of log files ...

15. Enter password 306090 and click Ok.

16. Enter password 336699 and click Ok.
DEVICE INSTALLATION AND CALIBRATION » PC configuration

17 Browse...

18 OK

2D - 3D

19 Insert password

12345

OK
NewTom GiANO HR - TECHNICAL MANUAL

DEVICE INSTALLATION AND CALIBRATION » PC configuration

- Select a device
- Name = 21
- IP = 172.20.34.38

- Devices configuration
  - Configurations:
    - PA14
  - Selected configuration properties:
    - Name: PA14
    - Scanner2D type:
      - NewTom GiANO
      - NewTom GO
      - NewTom GiANO HR
    - Auto-import 2D images:
      - Yes
    - IP address: 172, 20, 34, 42
    - Use DHCP

- Find 20
NewTom GiANO HR - TECHNICAL MANUAL

DEVICE INSTALLATION AND CALIBRATION » PC configuration
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.
ONBOARD CONSOLE CONNECTION

Device not authorized

NewTom GiANO HR
DEVICE INSTALLATION AND CALIBRATION  »  PC configuration
Acquisition Server Plus

Connection status: Giano_HR_PV - 192.168.1.160

Device
PAN Sensor connected (2D mode)

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>
Server
PC - HP

Static IP Mode

FIND ACQUISITION SERVER

WELL DONE!
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
Device Installation and Calibration

» 2D Calibration
Perform Daily Check (see paragraph 4.5.2)
4.4.2 PRELIMINARY ACTIONS

1. Open the Acquisition Server Plus settings panel.

2. Change the language to English and select the 'Change Mode' option.
Attention!
The application will be restarted to select new mode.
Are you sure you want to continue?

3 Yes
No

4 Service mode
Factory mode
User mode
Superuser mode
Don't ask me again

5 OK
Cancel

6 Password for SERVICE mode cefla

7 OK

Acquisition Server

Connection status PA05 - 172.20.31.195

Device
PAN Sensor connected (2D mode)
### 4.4.3 MACHINE CONFIGURATION

![Calibration Steps](image.png)

<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>Nasion Calibration</td>
<td>✔️</td>
</tr>
</tbody>
</table>

**Report PDF**

**Data**

- Backup calibration data to file
- Restore calibration data from file
### Machine Config

#### Machine Configuration

<table>
<thead>
<tr>
<th>Machine name</th>
<th>PA05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>CHECK 3D Model / 2D Model</td>
</tr>
<tr>
<td>Tube type</td>
<td>0</td>
</tr>
<tr>
<td>Collimator type</td>
<td>0</td>
</tr>
</tbody>
</table>

#### SN MACHINE

<table>
<thead>
<tr>
<th>SN MACHINE</th>
<th>PA05</th>
<th>Device Serial No. = Device Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>SN MAIN BOARD</td>
<td>1234567</td>
<td>just 1 sensor = NULL</td>
</tr>
<tr>
<td>SN CONVERTER BOARD</td>
<td>1234567</td>
<td>pan 2d</td>
</tr>
<tr>
<td>SN PFC BOARD</td>
<td>1234567</td>
<td>pan 2d</td>
</tr>
<tr>
<td>SN INVERTER BOARD</td>
<td>1234567</td>
<td>ceph 2d</td>
</tr>
<tr>
<td>SN XRAY TUBE</td>
<td>1234567</td>
<td>ceph 2d</td>
</tr>
<tr>
<td>SN SENSOR 1</td>
<td>1234567</td>
<td>ceph 2d</td>
</tr>
<tr>
<td>SN SENSOR 2</td>
<td>1234567</td>
<td>ceph 2d</td>
</tr>
<tr>
<td>SN PANEL CBCT</td>
<td>1234567</td>
<td>ceph 2d</td>
</tr>
<tr>
<td>SN INTERFACE SENSOR PAN</td>
<td>1234567</td>
<td>ceph 2d</td>
</tr>
<tr>
<td>SN INTERFACE SENSOR CEPH</td>
<td>1234567</td>
<td>ceph 2d</td>
</tr>
<tr>
<td>SN INTERFACE PANEL CBCT</td>
<td>1234567</td>
<td>ceph 2d</td>
</tr>
<tr>
<td>SN COLUMN</td>
<td>1234567</td>
<td>ceph 2d</td>
</tr>
</tbody>
</table>

### Columns

- Column 10: always
- Collimation motorized X: only 3D device
- Collimation motorized Y: always

### Parking

- Parking X: -70,00
- Parking Y: 0,00
- Parking R: -90,00
- Parking H: -175,00

### Devices

- Ceph Enable: device with CEPH arm
- Ceph_Sx: device with left CEPH arm
- NRT SCOUT: always
- NRT POT: always
4.4.4 COLUMN CALIBRATION

1. Click on Column Calibration.

2. Click on AVVISIO PROCEDURA.
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

![Diagram showing calibration steps and status]

- **Status**:
  - 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**
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
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
4.4.5.1 COLLIMATOR MANUAL ROTATION

*(TO BE PERFORMED WHEN STRICTLY NECESSARY)*
NewTom GiANO HR - TECHNICAL MANUAL

DEVICE INSTALLATION AND CALIBRATION » 2D calibration

Select action

1. Rotate - Manually rotate primary collimator then press OK
2. Edge found

Next page: OK
NEWTON GIANO HR
- TECHNICAL MANUAL

DEVICE INSTALLATION AND CALIBRATION » 2D CALIBRATION

1. Press X-ray button
2. Calibrate device
3. Repeat steps 1 and 2
4. Ensure calibration is accurate
5. Align target
6. Confirm alignment
7. Proceed with calibration
4.4.5.2 HORIZONTAL ADJUSTMENT
Not Centered - Manually move collimator then press OK to take another image.

PRESS XRAY BUTTON

button pressed

TARGET

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

![Image showing calibration steps](image)

**Calibration Steps**

- Advanced

**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**

1. PAN Verify Sensor Compliance

**Report PDF**

**Data**

- Backup calibration data to file
- Restore calibration data from file
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
4.4.7 PAN VERIFY SENSOR CALIBRATION

The image shows a calibration interface with various options. The highlighted section focuses on the "PAN Verify Sensor Calibration" step, which is marked as failed (red checkmark). The other calibration steps such as "Machine Configuration," "Column Calibration," "PAN Verify XRay Alignment," "PAN Verify Sensor Compliance," "CEPH Verify Sensor Calibration," and "CEPH Verify Mechanical Centering" are all marked as successful (green checkmarks).
DEVICE INSTALLATION AND CALIBRATION » 2D calibration

Before starting the procedure, remove any object between X-ray source and sensor.

1. **Start**
2. **Cancel**

Gain Acquisition

- **Sensor Calibration Gain**

START PROCEDURE

Step 0 of 26

0%

Exit
ATTENTION!!! DANGEROUS PROCEDURE
Verify safety devices before proceed

WARNING: During procedure X-rays will be emitted automatically

CALIBRATING... WAIT... 12'

Gain Acquisition procedure completed

OK
4.4.8 PAN VERIFY MECHANICAL CENTERING

![Calibration Steps](image)

- Advanced

**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**
- ✔
- ❌
- ✔

**Report PDF**

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

**Close**
Before start calibration procedure remove any object between XRay source and sensor and position technical phantom.
4.1.7 CHECK!

**IF**

- Warning: Image is correctly centered

**CHECK!**

- Warning: Out of range

**4.1.7**
4.4.9 LASER CALIBRATION

![Calibration steps window](image)

1. Click on the "Laser Calibration" button in the calibration steps window.

- Calibration steps:
  - Machine Configuration: Checked
  - Column Calibration: Checked
  - PAN Verify XRay Alignment: Checked
  - PAN Verify Sensor Compliance: Unchecked
  - PAN Verify Sensor Calibration: Unchecked
  - PAN Verify Mechanical Centering: Checked
  - CEPH Verify XRay Alignment: Checked
  - CEPH Verify Sensor Compliance: Unchecked
  - CEPH Verify Sensor Calibration: Unchecked
  - CEPH Verify Mechanical Centering: Checked
  - Headrest Calibration: Checked
  - Nasion Calibration: Checked

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

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

Remove carter. The device will automatically move to position of laser calibration. Press OK to Continue.
If the laser turns off, any of the movement buttons of the column can be pressed to turn it on again.
**Target**

**Laser Alignment**

- **Laser Calibration**

  - **Start calibration**

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

- **Laser ON**
- **OFF**
- **STOP**

**4**

**Exit**
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
DEVICE INSTALLATION AND CALIBRATION » 2D calibration

1. Warning
   Headrest in wrong position. Rotate it to AP position before continue procedure

2. PRESS XRAY BUTTON
   4
   OK

3. DARK zone must be centered in white zone as shown on the image on the left
   5

4. Select action

   - Rotate - Manually rotate primary calibrator then press OK
   - Edge not found - move to another image

5. OK

6. PRESS XRAY BUTTON
   6
   OK

7. DARK zone must be centered in white zone as shown on the image on the left

8. DARK zone must be centered in white zone as shown on the image on the left
   8

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

Warning

X-ray Alignment procedure completed

OK
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

1. Position the target on the device.
2. Align the target with the device's sensor.
3. Ensure the target is centered.
4. Press the X-ray button.
5. Confirm the X-ray image is taken.
6. Verify the calibration is successful.

Note: Ensure all safety protocols are followed during X-ray procedures.
4.4.10.2 MANUAL ADJUSTMENT OF VERTICAL POSITION

1. Adjust the C 1/2 screw.
2. Repeat the process until the vertical position is aligned.

DEVICE INSTALLATION AND CALIBRATION » 2D calibration
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DEVICE INSTALLATION AND CALIBRATION » 2D calibration

1. Press X-ray button.
2. 2D calibration.
3. Repeat step 2.
4. Final adjustment.
4.4.11 CEPH VERIFY SENSOR COMPLIANCE

(ONLY IF CEPH ARM IS PRESENT)
Before start procedure remove any object between XRay source and sensor
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
4.4.12 CEPH VERIFY SENSOR CALIBRATION

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

**2D calibration**

1. **START PROCEDURE** to begin.

2. **Gain Acquisition** window is displayed.

3. **ATTENTION!!! DANGEROUS PROCEDURE**
   - Verify safety devices before proceed.
   - **WARNING:** During procedure Xrays will be emitted automatically.

4. Confirm and proceed.

Device Installation and Calibration » 2D calibration
CALIBRATING
WAIT... 12’
4.4.13 CEPH VERIFY MECHANICAL CENTERING

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

NEWTON🔹

2D calibration

IF

CHECK!

» 4.1.11
If the image is not horizontally centred, follow the instructions to manually adjust the settings.
DEVICE INSTALLATION AND CALIBRATION » 2D calibration
4.4.14 HEADREST CALIBRATION

(ONLY IF CEPH ARM IS PRESENT)
DEVICE INSTALLATION AND CALIBRATION

2D calibration

Headrest calibration procedure completed

OK
4.4.15 Nasion Calibration

*(ONLY IF CEPH ARM IS PRESENT)*

![Calibration Steps Diagram]

- 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
4.4.16 BACKUP CALIBRATION DATA TO FILE

![Image of calibration software interface]

- Click on the highlighted button to backup calibration data to file.
Backup data selection

Data Backup selection

- [x] Device data
- [x] PAN sensor data
- [x] EPH sensor data
- [x] Tubehead calibration data

[ ] Statistics

3. OK

4. Select Directory for backup data

Directory: Calibration Backup
Files of type: All Files (*)

5. Choose
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
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DEVICE INSTALLATION AND CALIBRATION » 3D calibration
DEVICE INSTALLATION AND CALIBRATION » 3D calibration
TARGET

11

11a  Enable manual tuning

11b  Positioning

11c
Up 15,5 ±0,5 Up 15,7 ±0,1

13

Acquisition

12

[13 x 6] FOV area

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

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[Image of a diagram showing 3D calibration process with points labeled a, b, c, d, and corresponding movements: Up, Down, Left, Right, and FOV options like [15 x 6], [13 x 10], [13 x 8], [10 x 10], [10 x 8], [10 x 6], [8 x 8], [8 x 6], [7 x 6], [6 x 8], [4 x 4].]
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.
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Device Installation and Calibration » 3D calibration

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

Daily check

<table>
<thead>
<tr>
<th>Test</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test n° 1</td>
<td>Running...</td>
</tr>
<tr>
<td>Test n° 2</td>
<td></td>
</tr>
<tr>
<td>Test n° 3</td>
<td></td>
</tr>
<tr>
<td>Test n° 4</td>
<td></td>
</tr>
<tr>
<td>Test n° 5</td>
<td></td>
</tr>
<tr>
<td>Test n° 6</td>
<td></td>
</tr>
</tbody>
</table>

Technique factors

kV : 90
mAs : 3.00
mA : 6.00
s : 0.500

EN

DEVICE INSTALLATION AND CALIBRATION » 3D calibration
Daily check

Test        Status
Test n° 1   Completed
Test n° 2   Completed
Test n° 3   Running...
Test n° 4   
Test n° 5   
Test n° 6   

Technique factors

kV : 90
mA : 3.00
mAs : 6.00
s : 0.500

Stop

Daily check

Test        Status
Test n° 1   Completed
Test n° 2   Completed
Test n° 3   Completed
Test n° 4   Completed
Test n° 5   Completed
Test n° 6   Completed

Technique factors

kV : 90
mA : 3.00
mAs : 6.00
s : 0.500

Stop
DEVICE INSTALLATION AND CALIBRATION » 3D calibration
4.5.3 CYLINDRICAL TEST PHANTOM ACQUISITION ("MATTARELLUM")
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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.
DEVICE INSTALLATION AND CALIBRATION » 3D calibration
DEVICE INSTALLATION AND CALIBRATION » 3D calibration

Press 'X' NEXT to start the X-ray source and acquire a test image.

Please wait...

Moving gentry. Please wait...
Depending on the device model, 1, 2 or 3 acquisitions will be performed.
### 4.5.4 3D CALIBRATION BACKUP

1. **File**
2. **Settings backup...**
Backup 3D
RESTORE Backup 3D Software

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
DEVICE INSTALLATION AND CALIBRATION > 3D calibration
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)
DEVICE INSTALLATION AND CALIBRATION » 3D calibration

a) Ctrl

b) Ctrl

c) Ctrl

d) Ctrl

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

Now, center the QA phantom for the second scout view acquisition, use `X Ray Flash` button again. At the end, to verify first scout positioning press `Back`, else press `Next`.

PRESS XRAY BUTTON

Button pressed
DEVICE INSTALLATION AND CALIBRATION

» 3D calibration
### QA Phantom Report - 1 / 3

**Software version**: 8.5.83  
**Device Number**: PA07  
**Scan date**: 13/04/2018 - 16:03  
**FOV**: [13 x 8] Best quality

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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</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 [&lt; 0.41 mm]</td>
<td>0.28</td>
</tr>
<tr>
<td>V FWHM [&lt; 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>980.87</td>
</tr>
<tr>
<td>Max Level (*)</td>
<td>3290.82</td>
</tr>
</tbody>
</table>

(*) Reserved for internal use

13/04/2018 - 16:08

Signature

---

13/04/2018 - 16:08

---

Conditions (Reserved for Service) ---
### QA Phantom Report - 1 / 3

Software version: 8.5.03  
Scan date: 13/04/2018 - 16:03  
Device Number: PA08  
FOV: [13 x 8] Best quality

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<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>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>56.26</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 [＜0.41 mm]</td>
<td>0.28</td>
</tr>
<tr>
<td>V FWHM [＜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>
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<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

**COLUMN UPWARD MOVEMENT**

**CONFIRMATION**

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

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

**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. Select "Tools" from the top menu.

2. Choose "Insert password." 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 MAINBOARD (97661808)
### 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>Not used</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.ENG</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>Green</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>Green</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)
### 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 if 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>
<tr>
<td>DL65</td>
<td>Green</td>
<td>10V</td>
<td>ON if driver power supply present</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>------</td>
<td>----------------------------------</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 CONSOLE POWER SUPPLY (97662070)
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>
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

5-Port Switch
CIRCUIT BOARDS
8. CONNECTIVITY

8.1 CONSOLE IP ADDRESS AMENDMENT

Current IP address: 10.0.2.15
Network is UP: YES
MAC Address: 08:00:27:A2:17:F4

1. Edit Network Settings

Continue

Network settings:

- Automatically assigned IP address (DHCP)
- Static IP address

IF DHCP fails:

2. IP: 192 168 1 161
   Net Mask: 255 255 255 0

3. Apply
   Cancel

4. SERVICE MENU
8.2 2D SENSORS / 3D PANEL IP ADDRESS AMENDMENT

8.3 FIRMWARE UPGRADE
8.4 REMOTE SUPPORT

1. Click on the mouse twice.

2. Click on Help, then Remote Support...

3. Input the ID and password provided by Service.

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

**APPLY GREASE (TUTELA MR3)**

1. [Image of application point 1]
2. [Image of application point 2]
3. [Image of application point 3]
VERIFY WEAR CONDITIONS OF THE BELTS

1. Check the wear conditions of the belts.

2. Verify the condition of the belt.

3. Ensure the belt is in good condition.

4. Cross-check the belt condition.