DORADO
MOVING LASER SYSTEM FOR PATIENT ALIGNMENT IN RT
The characteristic features of LAP laser systems are sophisticated technology, quality and design for more than 30 years. This level of excellence has made us the global market leader for patient alignment in radiotherapy.

Precise patient marking, accurate planning and exact positioning are key factors for a successful treatment. Patient marking takes place during CT simulation (virtual simulation) and is required for reproducible treatment positioning on the LINAC.

Our DORADO laser system together with the LAP laser control supports this crucial and important marking process and conforms to your department’s workflow. You select the mounting version, the laser color and the control system. Offering various configurations and mounting options the DORADO laser system is perfectly suited to meet any and all room requirements.

LAP – WE KNOW PATIENT ALIGNMENT
- Since 1984
- Global market leader
- In-house hardware and software development
- Scientific collaborations
- Worldwide service network
- Certified in accordance to ISO 9001 and ISO 13485
- Made in Germany
PROJECTION COLORS AVAILABLE: RED, GREEN

PRECISE
LAP ULTRALINE is the result of advanced mechanical components and unique optoelectronics used to generate and align laser lines for medical applications. The ultrafine and very long lines meet the high quality requirements for linearity and brightness distribution.

DISTORTION-FREE
LAP laser systems are fitted with unbreakable, specially flattened glass windows. This minimizes scattering and guarantees ultrafine lines at all transition angles.

FAILSAFE
LAP moveable laser modules will not switch on until they are definitely placed at their prescribed positions. A linear encoder continuously verifies the position of the stepper motor to compare the laser modules actual position to its nominal position.

COMPREHENSIVE
In order to achieve consistent precision of the laser line across the entire 600 mm travel range the mechanical components are manufactured to near-zero tolerance and are perfectly aligned.

• Proven technology
• Worldwide standard for isocenter and reference point marking
• More than 7500 systems
• 3 Systems available:
  DORADO 1 - the basic solution
  DORADO 3 - the gold standard
  DORADO 4 - the advanced system
## SYSTEM OVERVIEW

<table>
<thead>
<tr>
<th>DORADO 1</th>
<th>DORADO 3</th>
<th>DORADO 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="DORADO 1 Diagram" /></td>
<td><img src="image2" alt="DORADO 3 Diagram" /></td>
<td><img src="image3" alt="DORADO 4 Diagram" /></td>
</tr>
</tbody>
</table>

**Mounting versions**
- WALL-CEILING-WALL
- WALL-CEILING-POST
- POST-CEILING-WALL
- POST-CEILING-POST
- BRIDGE

**Features**
- **Moveable lasers**: 1 plane (Sagittal)
- **Moveable lasers**: 2 planes (Sagittal & Horizontal)
- **Moveable lasers**: 3 planes (Sagittal, Transverse & Horizontal), Isocenter marking without table movement

**Projected body planes**
- **SAGITTAL PLANE**
  - One movable laser line from the ceiling rail
- **TRANSVERSE PLANE AND HORIZONTAL PLANE**
  - One fixed laser line from the ceiling rail and one fixed crosshair laser line from each side

**PROJECTED BODY PLANES**

The DORADO laser system projects the desired coordinates to mark the patient in all three planes.

### LAP LASER CONTROL

DORADO laser systems are operated by special LAP laser control systems, consisting of hard- and software. With CARINAsim and CARINAnav, LAP provides you two different control systems to move the lasers and interact with your RT planning system. Once connected to your RT planning or virtual simulation system the data can be imported via LAP file format or DICOM.

### FEATURES
- Touchscreen operation
- Individual workflow support
- Easy navigation, intuitive laser control
- Status and position feedback
- Data import via LAP file format or DICOM
- Data security, protection and privacy

### OPTIONS

- **CARINAsim**: Operated by an All-in-One Touch PC CARINAsim acts as the laser control and an interface between the RT planning software and laser system. A 3D patient view displays the laser projection on the skin surface.

- **CARINAnav**: CARINAnav’s tablet PC is an independent wireless laser control system offering maximum freedom in a compact design. Patient data are imported via Bluetooth or Wi-Fi interface.
### TECHNICAL DATA

<table>
<thead>
<tr>
<th>Laser color</th>
<th>red (635 nm), green (532 nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser class</td>
<td>2</td>
</tr>
<tr>
<td>Line width up to 4 m distance</td>
<td>&lt; 1 mm</td>
</tr>
<tr>
<td>Line length at 3 m distance</td>
<td>3 m</td>
</tr>
<tr>
<td>Positioning accuracy</td>
<td>± 0.1 mm</td>
</tr>
<tr>
<td>Projection accuracy</td>
<td>± 0.5 mm at a projection distance of 4 m</td>
</tr>
<tr>
<td>Travel range</td>
<td>600 mm</td>
</tr>
<tr>
<td>Travel speed</td>
<td>up to 200 mm/s</td>
</tr>
<tr>
<td>Power supply</td>
<td>100 … 240 V AC</td>
</tr>
</tbody>
</table>

### SYSTEM

<table>
<thead>
<tr>
<th>System</th>
<th>DORADO 1</th>
<th>DORADO 3</th>
<th>DORADO 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (W × H × D)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceiling</td>
<td>1392 × 184 × 165 mm</td>
<td>1392 × 184 × 165 mm</td>
<td>1284 × 1284 × 168 mm</td>
</tr>
<tr>
<td>Wall</td>
<td>221 × 110 × 101 mm</td>
<td>1392 × 184 × 165 mm</td>
<td>1392 × 184 × 165 mm</td>
</tr>
<tr>
<td>Post</td>
<td>1400 × 184 × 127 mm</td>
<td>1796 × 264 × 207 mm</td>
<td>1796 × 184 × 127 mm</td>
</tr>
<tr>
<td>Post</td>
<td>Width [customized] 2000–5000 mm (78.7″–196.9″)</td>
<td>Width [customized] 2000–5000 mm (78.7″–196.9″)</td>
<td>–</td>
</tr>
<tr>
<td>Bridge</td>
<td>Height [customized] 2300–3000 mm (90.6″–118.1″)</td>
<td>Height [customized] 2300–3000 mm (90.6″–118.1″)</td>
<td>–</td>
</tr>
<tr>
<td>Weight</td>
<td>Ceiling 26 kg</td>
<td>Ceiling 26 kg</td>
<td>Ceiling 100 kg</td>
</tr>
<tr>
<td></td>
<td>Wall 23 kg</td>
<td>Wall 26 kg</td>
<td>Wall 26 kg</td>
</tr>
<tr>
<td></td>
<td>Post 17 kg</td>
<td>Post 30 kg</td>
<td>Post 30 kg</td>
</tr>
<tr>
<td></td>
<td>Bridge approx. 100 kg</td>
<td>Bridge approx. 100 kg</td>
<td>–</td>
</tr>
</tbody>
</table>

LAP DORADO®, CARINAsim® and CARINAnav® are registered trademarks of LAP GmbH Laser Applikationen. Further designations of products or services may be registered trademarks of LAP GmbH or other organizations; their use by third parties may infringe the rights of the respective owners.