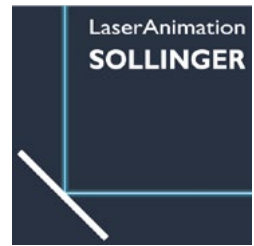


# USER'S MANUAL

Version 2023-08



## PHAENON accurate SERIES Full Color Laser Projector



ISO 9001:2015  
certified

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**L'utilisation est réservée à un usage professionnel selon décret n°2007-665 du 2 mai 2007 relatif à la sécurité des appareils à laser sortant!**

### Article 4 bis :

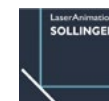
« Les usages spécifiques autorisés pour les appareils à laser sortant d'une classe supérieure à 2 sont les usages professionnels suivants : (...)

9° Spectacle et affichage :

Toutes les applications de trajectoire, de visualisation, de projection ou de reproduction d'images en deux ou trois dimensions. »



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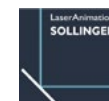


## I Contents of Package

Please make sure that all components were delivered correctly. Please also compare the separately supplied packing list. If something is missing, please contact your sales contact.

Name	No.	Picture
Laser projector	1	
powerCON TRUE1 / power cable	1	
Interlock bridge	1	
Flight case	1	
USB stick	1	
Manual	1	

The unit is carefully packed before shipping.  
If you discover damages to the device or the packing material due to improper transportation, please inform the shipping company and return the device to the supplier preferably in its original packing.



## 2 Safety Hints

### 2.1 General Hints

1. The laser projector is intended **only for proper use for projecting laser beams** onto a projection surface (walls, screens) or into space indoors or outdoors.
  2. The device may not be used when there is **visible damage** to the housing, the connectors in the rear, especially the electric power supply, or the connecting cables.
  3. The installation should be performed by **specially trained personnel**. The projector **should not be connected to the mains** during installation. **Please note the local safety regulations!**
  4. For operation of the laser unit at truss or on ceiling, the projector must be additionally secured by a **safety cable**. This cable must be appropriately designed according to the weight of the laser projector. The relevant accident prevention regulations of the professional associations must be observed.
  5. If the provided mains cable does not correspond with your existing mains supply please use an **appropriate adapter** for mains connection. Do not use any electronically controlled sockets, e.g. no dimmer or radio sockets, for mains connection of the laser projector.
  6. The laser unit has to be used according to this manual. LaserAnimation Sollinger GmbH does not assume liability for damages caused by non-observation of this manual.
  7. Before starting any maintenance or cleaning **remove the unit from the power supply!**
  8. In case of malfunctions please contact **your dealer and after consultation** send the device back **for inspection and repair** in its original packing. **Do not open the device!**
- Attention: Warranty is rendered void if the device is misused, damaged, modified in any way, or for unauthorized repairs or parts.**
9. The laser device is intended for use in a dry and sufficiently ventilated location. When used outdoors the device **has to be protected against humidity, overheating and excessively low temperatures**. Note the respective maximum and minimum ambient temperatures for operation specified in the technical details.
  10. When operating the device in humid or special outdoor conditions that can lead to condensation:





- a. Allow the device to acclimatize sufficiently at the place of use.
- b. Use LA.toolbox to check the internal temperature of the unit and the dew point.
- c. Do not operate the device if the dew point is > 20°C, as condensation can occur on the cooler components.
- d. Do not switch the device off between operating times, only to standby mode. This prevents the unit from cooling down, as all temperature control loops remain active.

11. The laser unit may not be operated in environments polluted with sand, dust or acrid fumes or gases.  
Fog machines must not be operated in the immediate vicinity of the laser projector. Do not point the fog nozzle directly at the laser projector.
12. Do not expose the laser unit to direct sunlight or other intensive light sources e.g. spot-light.



## 2.2 Hints for Laser Safety

**Caution – use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.**

**This laser product is designated as Class 4 during all procedures of operation, maintenance and service.**

**The local safety regulations for the application of Class 4 laser products must be observed!**

### 1. Eye Protection

- **Never look directly into the laser beam!**  
A laser beam is coherent, monochromatic light with very high energy. A laser beam retains its intensity even over very long distances. If a laser beam hits the human eye it can lead to irreparable damages to the cornea, the conjunctiva, the eye lens and the retina. **Avoid any reflections back into the laser to prevent damages to the laser system. Do not place any objects into the laser beam** because even diffusely reflected radiation can cause eye damages.  
Therefore remove any rings, watches or the like before you carry out work on the device and use only non-reflective tools.
- We strictly recommend wearing **laser protective glasses** for laser devices according to laser class 4.

### 2. Fire Protection

- The high energy density of the laser beam causes painful burns when it hits human skin. The beam may also burn holes into textiles.  
Therefore **never reach into the laser beam** and do not let other parts of the body get in the way of the laser beam.
- If the laser beam hits easily flammable materials such as paper, these will ignite and a fire can develop very quickly.  
Therefore make sure that **no flammable material is in the way of the beam** before activating the laser.

### 3. Audience Protection

- The operation of laser systems with class 4 lasers requires an emergency stop (E-Stop). Regardless of the way the laser is operated, **an E-Stop must always be connected!** Place the E-Stop so that you can reach it immediately in emergency situations. Run a test each time the laser is activated to ensure that it is turned off immediately by activating the E-Stop.
- Mark an area of about 3 to 4 m around the laser system as off limits to the audience.
- Only test the laser system as long as no audience is present.





- Never let the laser run unattended.
- Make sure that no unauthorized persons have access to your laser system.

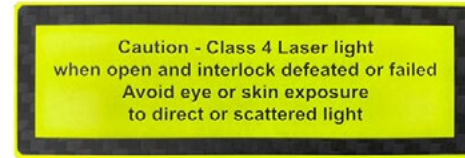
**The operation of laser equipment in the event sector with an audience requires an approval by a technical inspection authority in many countries!**

The following warning labels are placed on the laser device:

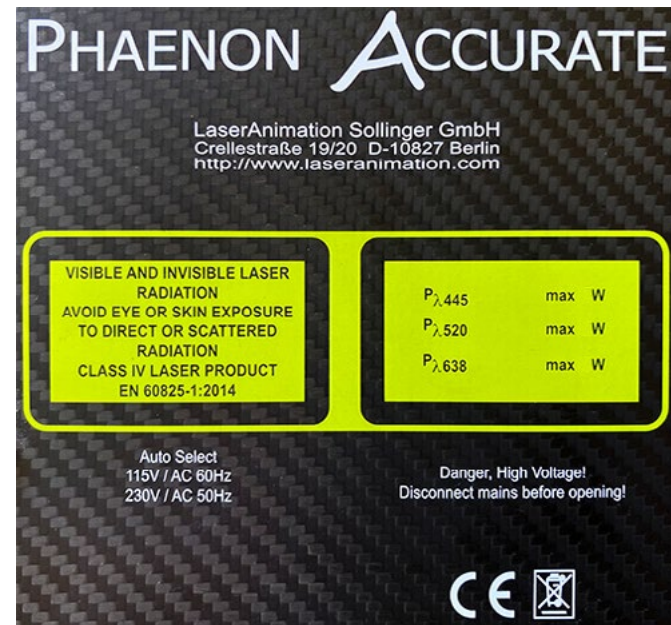
Next to emission laser window:



On the top cover:



Bottom part:



\*Maximum wattage depending on device

### 3 Device Connectors

#### 3.1 Overview

**All included signal cables are shielded. In case you use other cables (e.g. for remote control, Interlock, external key switch) it is essential to use shielded cables only.**

PHAENON accurate: Back panel



1. Power connector powerCON TRUEI 3-pole Universal input: 85VAC - 264VAC, 50 - 60Hz
2. LAN AVB RJ-45 XLR for connection to Ethernet network
3. Interlock: 7pin miniCON female for connection of
  - emergency stop (e-stop) via remote cable or
  - included Interlock plug to close the Interlock loop
4. ILDA: 12pin miniCON male for connection of an ILDA compliant signal source using the included ILDA adapter cable
5. OLED display plus LED indicates the operating status
6. Fans (make sure to not cover the fans inlets at any time.)

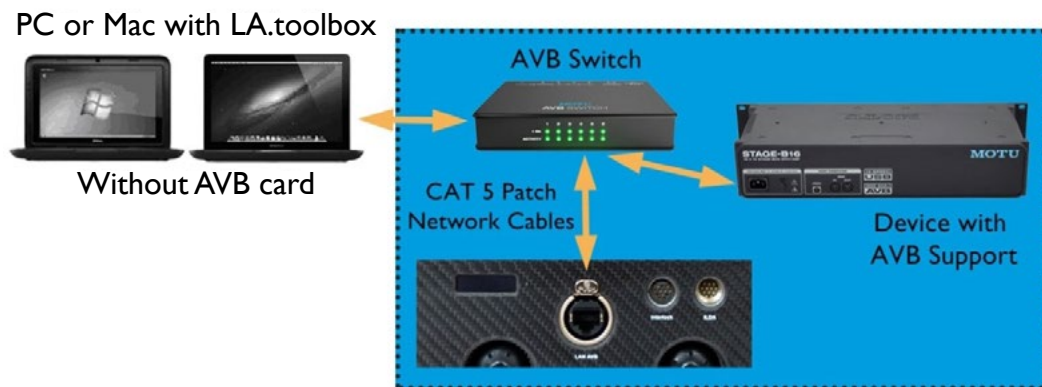
### 3.2 Connections

#### 3.2.1 LAN AVB Connection

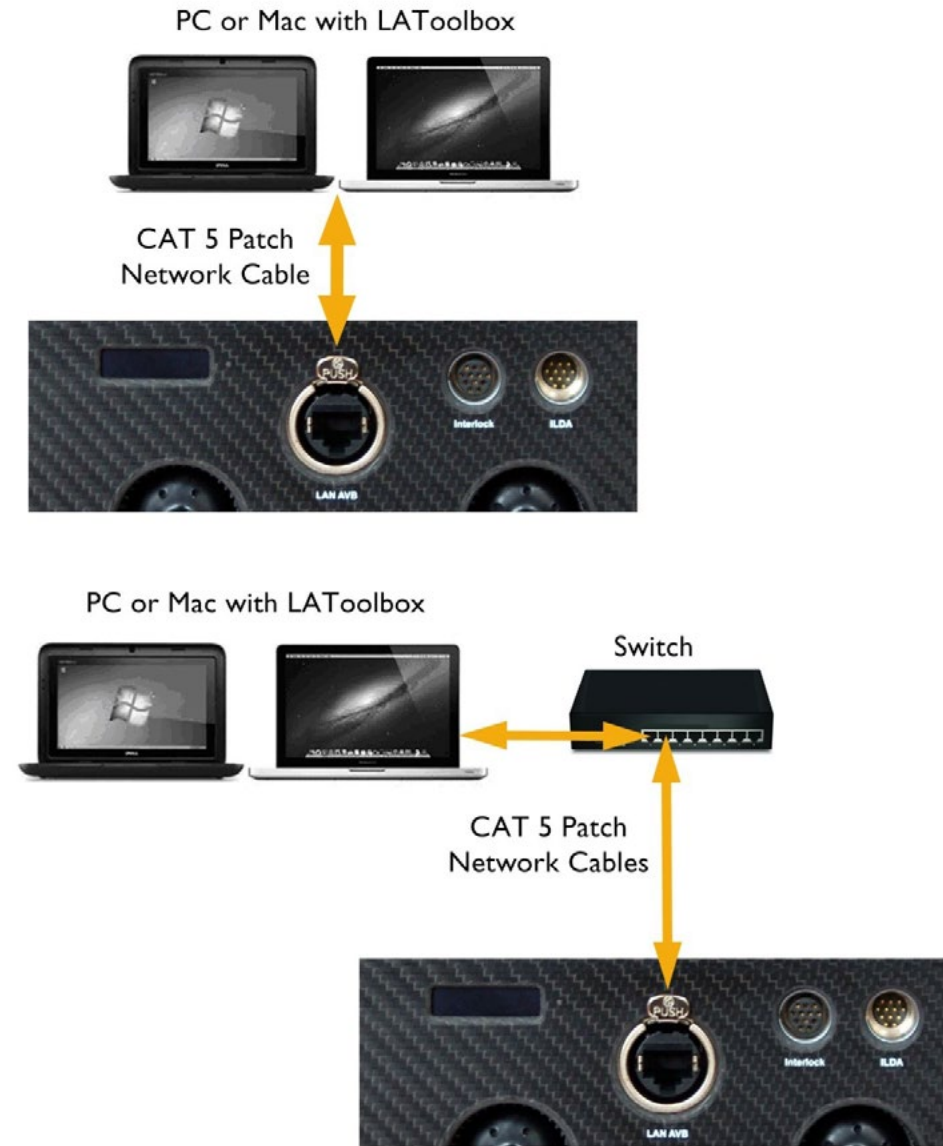
The PHAENON accurate can be integrated into an Ethernet network using the LAN AVB interface. Please use standard CAT 5 patch cables with RJ-45 connectors only for Ethernet connection. The PHAENON accurate supports the AVB (audio video bridging) function of Ethernet networks. This enables you to either connect devices with AVB support directly to the "LAN AVB" interface, or to use an AVB switch.



For connection of one or more AVB controlled device(s) and e.g. a PC or Mac with installed LA.toolbox software, an AVB switch has to be used:



If the LAN interface should only be used to control the projector using LA.toolbox software, the connection is as follows:



No AVB switch is necessary.



### 3.2.2 Interlock Connection

The operation of laser systems with lasers class 4 requires an emergency stop (e-stop). Regardless of the way the laser is operated, an e-stop must always be connected!

- Place the e-stop so that you can reach it immediately in emergency situations.
- Run a test each time the laser is activated to ensure that it is turned off immediately by activating the e-stop.
- After activating the e-stop (opening the interlock loop) your device is blocked from any laser emission. To return to normal mode once interlock is latched, following steps are required:
  - reset emergency stop
  - key switch cycle (move key switch of E-stop to OFF position and then to ON position again). Laser emission will resume after a short delay.

If no e-stop shall be used it is necessary that the included Interlock plug is inserted for closing the Interlock loop:



Without inserted Interlock plug there is NO laser output

### 3.2.3 Mains Connection

The projector can be operated with supply voltages of 85 VAC – 264 VAC / 50 - 60Hz.



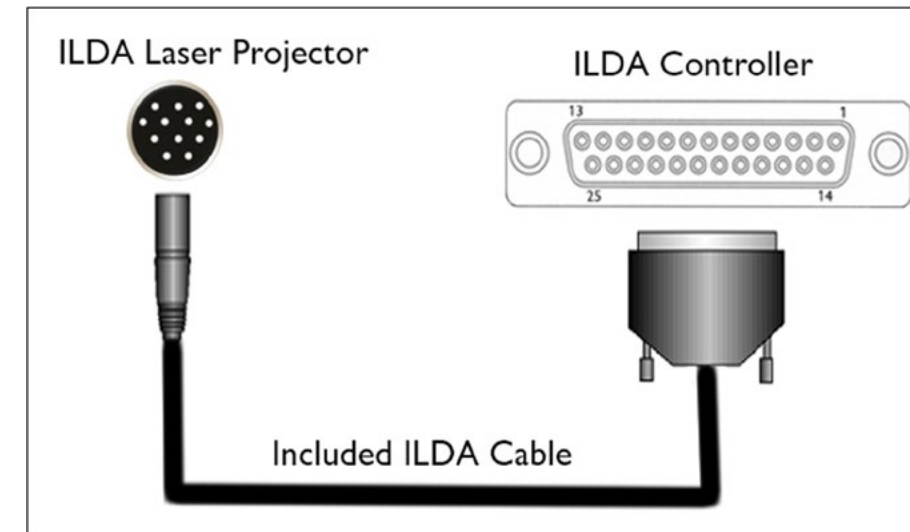
The projector must be operated with supply voltage with grounded protective conductor (PE)! The highly-efficient power supply allows discharging external and internal disturbances via the protective conductor (PE). Internal filters are ineffective without protective conductor (PE). Operation without grounded protective conductor (PE) can cause damage to the components of the power supply. For this we cannot provide any warranty!

Note: If no e-stop shall be used it is necessary that the included Interlock plug is inserted for closing the Interlock loop. To activate laser emission, operator needs to activate laser emission through our LA.toolbox control software.

### 3.2.4 ILDA Connection

For connection of an external ILDA signal source you can connect your projector to the 25pin ILDA output of a laser show controller, e.g. a "Lasergraph DSP" or another controller with an ILDA compliant output.

Please use the supplied ILDA cable with 12pin miniCON to 25pin Dsub connector.



## 4 Installation and Commissioning

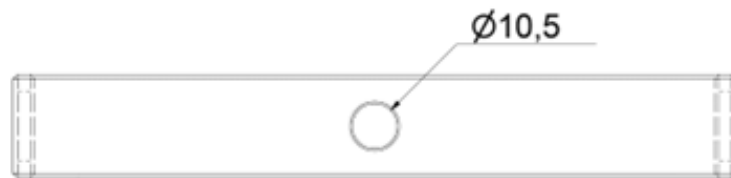
### 4.1 Installation

#### 4.1.1 Installation of the Projector

Make sure that the position for operation is sufficiently ventilated! Do not block the rear panel because the air circulation is done through the fans!



For hanging operation the projector is equipped with a yoke. You will need one C-clamp for mounting the projector to truss and a safety rope for protection.



Make sure that the projector is adequately secured by an additional safety cable during hanging operation. The manufacturer does not assume responsibility for damage to persons or to property due to faulty attachment.

For the attachment of a safety cable the laser unit contains a fixture on the rear site. Move up the fixture



and attach the safety cable.



You can also mount the device on a tripod using the yoke or place the projector in upright position on a platform.



### 4.1.2 Installing the LA.toolbox Software

This intuitive software allows you to monitor the important functions of the laser unit and adjust operating parameters.  
The LA.toolbox communicates via the LAN AVB interface with the laser projector.  
The LA.toolbox program is available in the different versions for Windows or Mac OS X. Please check availability on our website. On our website you can also download the latest version of LA.toolbox: <https://laseranimation.com/en/downloads/>  
The PC and Mac versions as well as the detailed LA.toolbox manual are stored on the included USB memory stick.



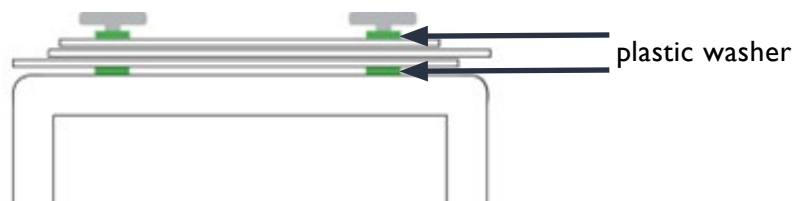
Install the "LA.toolbox" software on your PC or Mac (See LA.toolbox manual).

### 4.1.3 Mounting the optional Beam Blocker

The optionally available beam blocking set contains spacers, knurled screws and beam blocking shades. This convenient set can be used to blank the laser output in order to protect the audience in a certain area.



When mounting the beam blockers, make sure that there is a plastic washer between the panel set and the knurled screw as well as between the panel set and the yoke.



The yoke of the beam blocker is installed using the yoke clamping plate, yoke fastening plate, SCHNORR® safety washer and the yoke fixing screw.



Pay attention to the sequence of mounting:



## 4.2 Commissioning



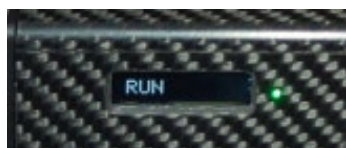
Never look into the emission window while turning the laser on! Make sure that no persons or highly combustible materials are located in the way of the laser beam.

The device is neither equipped with a power switch nor a key switch. The power supply is controlled by connecting or disconnecting the power cord to or from the mains of the device.

1. Connect the included power cord to the mains input of your device: Pull the slider, insert the connector and turn it clockwise until the connector is locked.



2. If mains power is available the laser will immediately boot up and make a quick fan check. After boot sequence, unit will remain in standby mode, waiting for operator action to place unit in "run" mode. This can be done using either our LAS Disable button (e-stop with key switch) or via our LA.toolbox. The LED at the back of the unit will show current operating mode.



Note: If an external key switch is connected you have to turn on the laser by turning this key to the right.

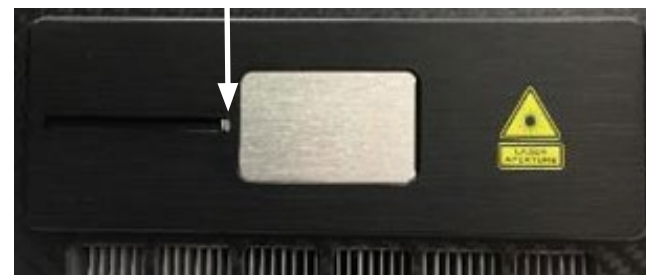


**The laser beam is emitted after ca. 7 seconds emission delay.**

3. The laser can instantly be turned off by turning the connector counterclockwise or by removing it from the mains input "Power" completely.

Note: The powerCON TRUE1 connector can be connected or disconnected under load.

4. Open / Close the front window slider (beam attenuator)



slider closed

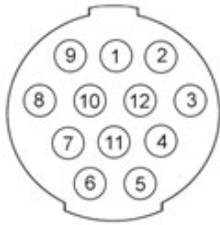


slider open

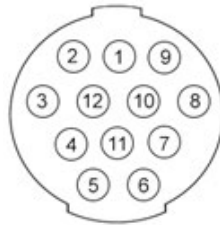
## 5 Pin Assignments

### 5.1 ILDA

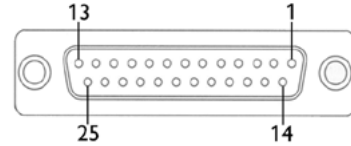
Projector  
12pin miniCON male



ILDA Cable  
12pin miniCON female



25pin Dsub male

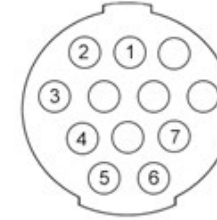


Pins 12pin miniCON	Pins 25pin Dsub	Signal	Level	Meaning
1	1	X+	+/- 10V measured against X-	Beam Position +10V: right 0V: center -10V: left
2	14	X-	Return lead for X+ signal	
3	2	Y+	+/- 10V measured against Y-	Beam Position +10V: top 0V: center -10V: bottom
4	15	Y-	Return lead for Y+ signal	
5	5	Red+	0V ... +5V against Red-	0V: 0% red 5V: 100% red
6	18	Red-	Return lead for Red+ signal	
7	6	Green+	0V ... +5V against Green-	0V: 0% green 5V: 100% green
8	19	Green-	Return lead for Green+ signal	
9	7	Blue+	0V ... +5V against Blue-	0V: 0% blue 5V: 100% blue
10	20	Blue-	Return lead for Blue+ signal	
11	3	Intensity	0V or 5V	0V: Beam off / blanked 5V: Beam on
12	25	GND		

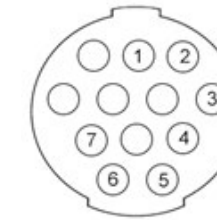
## 5.2 Interlock

### 5.2.1 Remote Cable

Projector  
7pin miniCON female



Remote Cable  
7pin miniCON male



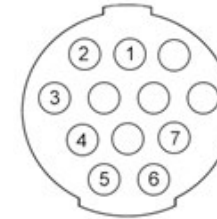
7pin XLR female



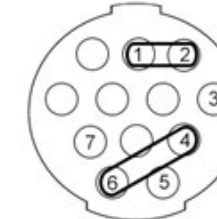
Pins 7pin miniCON	Pins 7pin Dsub	Signal	Meaning
1	1	Interlock A	Interlock loop, Interlock ON - if both Interlock lines are connected to each other
2	2	Interlock B	
3	3	reserved	
4	4	Remote Key	Key ON (external key switch) - if connected to VCC (pin 6)
5	5	reserved	
6	6	VCC +24V	+24V max. 250 mA
7	7	GND	

### 5.2.2 Interlock Plug

Projector  
7pin miniCON female



Plug  
4pin miniCON male



Pins 7pin miniCON	Pins 4pin miniCON	Signal
1	1	Interlock A
2	2	Interlock B
3	3	reserved
4	4	Remote Key
5	5	reserved
6	6	VCC +24V
7	7	GND



## 6 Maintenance Hints

### 6.1 Housing



Turn the laser off and disconnect the device from the power grid before doing any maintenance!

Please check the ventilation grilles on the rear side of the projector on a regular basis.



Depending on the operating environment, amounts of dirt can accumulate on the grilles. These must be removed to guarantee trouble free operation!

Remove any dust using a vacuum cleaner or an oil-free compressed air cleaner.

The laser emission window is not to be touched and should be covered after every use. With time, it can be polluted through various environmental conditions (fog machines etc.).

A polluted window can reduce the laser output power and influence the beam quality.

We recommend that the laser output window is cleaned from time to time. Please use methanol (against finger prints) and/or acetone and lens paper for cleaning. Be careful during cleaning and do not touch the cleaning surface of the lens paper with your fingers.

Methanol and acetone are hazardous materials: Please observe the related precautions!

The housing of the device may be cleaned with a soft fluff-less cloth and a mild detergent (e.g. spirit).

### 6.2 Beam Adjustment



Important! Before opening the projector, it is essential to disconnect the device from the power supply! Remove the powerCON connector from the device!

The superposition of the beams is optimally preset in the factory.

If the projection shows a color separation in the projected image you can adjust the superposition of the mixed color beam. The device needs to be opened for this.

Loosen the following screws on the left side of the unit (a total of 2 screws):

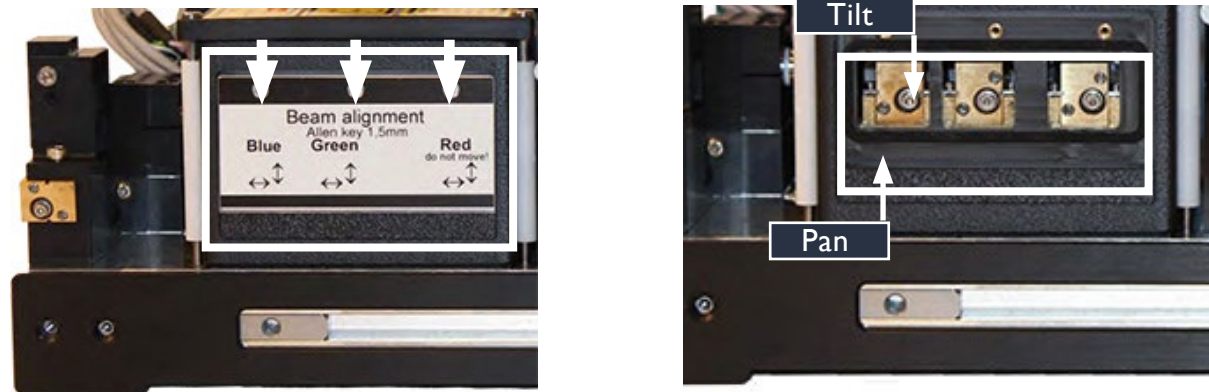


Carefully pull out the lid and lift it off:

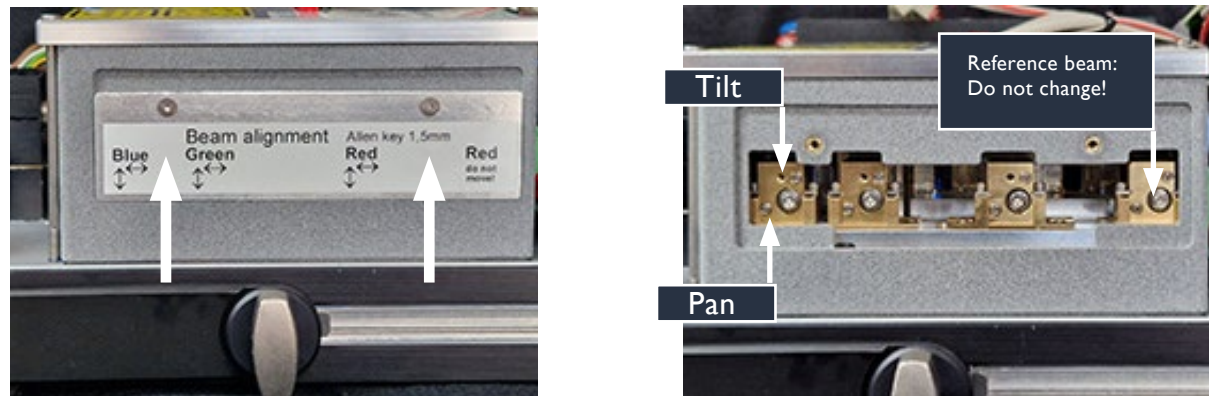


The laser module provides information on how to adjust the beam superposition, see pictures.

PHAENON accurate 7:



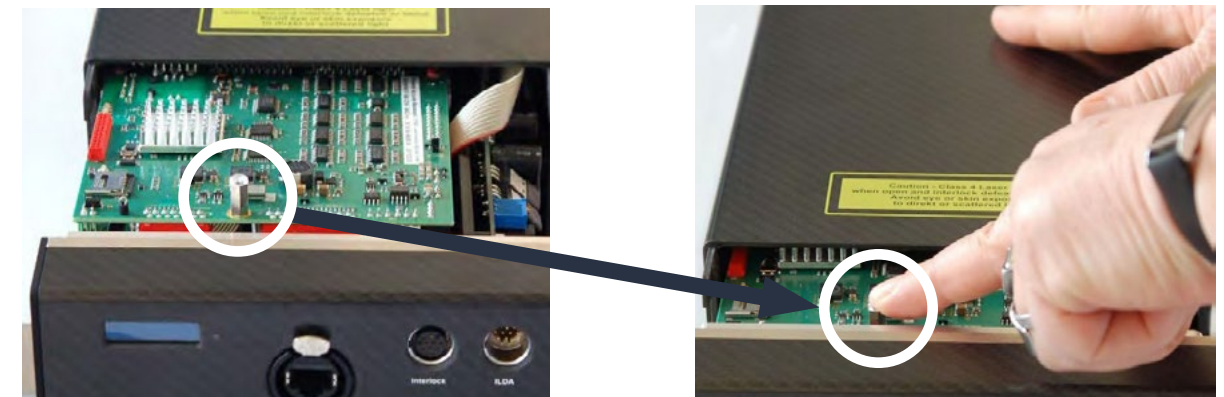
PHAENON accurate 10:



Setting the beam superposition should be performed by specially trained personnel only! We recommend wearing laser protective glasses during the adjustment procedure.

- Open the screws of the cover plate and adjust the beams via Pan and Tilt to the respective color::
- Turn on the device. Set the laser power approximately to 10% (using LA.toolbox software)
- PHAENON accurate 7: The red beam acts as reference beam. Its position must not be changed!  
PHAENON accurate 10: The reference beam is located on the outer right side and must not be changed
- It is possible to adjust blue + green, but they have to be superposed to red. You can set the beam superposition for Pan and Tilt using the included 1.5 mm Allen key on the adjustment screws.
- **Important:** Turn the screws only slightly! Turning them too far may result in the respective beam no longer hitting the beam reflector and the beam becoming invisible.

If the adjustment is finished, disconnect the projector from the power grid before attaching the lid. Carefully insert the lid and slightly press the board downward during moving the lid as shown in the pictures:



Then attach the lid using the screws. Your PHAENON accurate is ready for operation again.

## 7 Operation with UPS

The power supply at events may be “contaminated” due to a large number of connected devices (e.g. dimmers etc.) and can lead to voltage peaks. or adverse conditions this could cause problems in the operation of the laser projector.



To ensure safe operation of the laser anytime it is highly recommended to run the laser with the aid of a UPS (Uninterruptible Power Supply). It is always a good idea to protect your valuable laser equipment with a cheap, readily available device!

The UPS can be obtained from any supplier for electric appliances or computers. It is set up between the power supply and the mains connector of the laser projector and ensures a clean AC voltage.

The best choice is a “double-conversion” or “online” UPS – double conversion means Voltage Frequency Independent (VFI). It protects your high-value equipment against power failures, voltage drops or spikes and frequency fluctuations.

We recommend the online UPS type: “APC Smart-UPS SRT 2200 VA, 230 V SRT2200XLI” by APC Schneider Electric Inc.

It is essential to check if protective earth (PE) is available at the connection side of the UPS, because the best UPS doesn't help without protective earth (PE). Please set the following parameters of the UPS as specified:

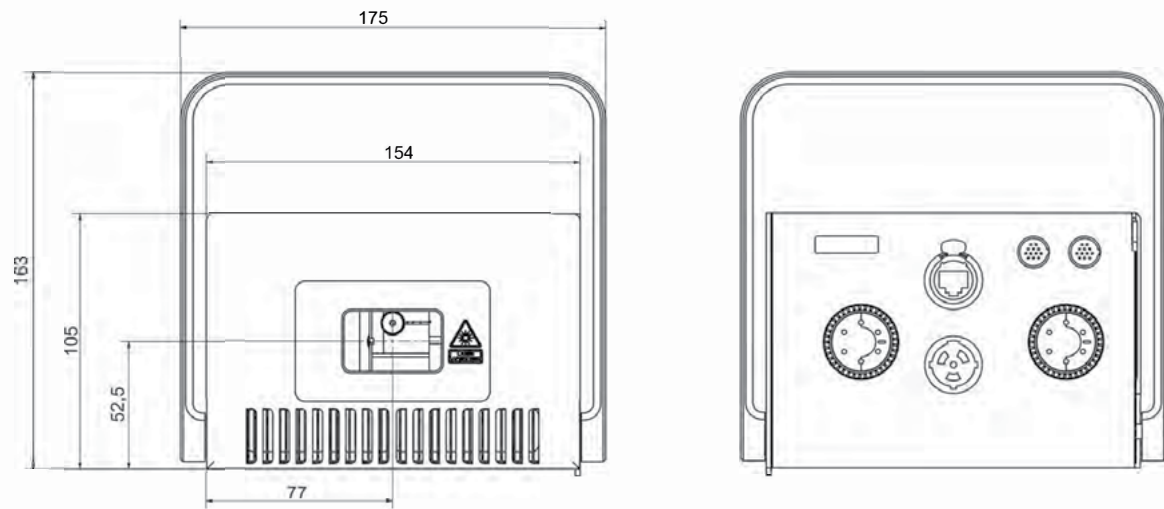
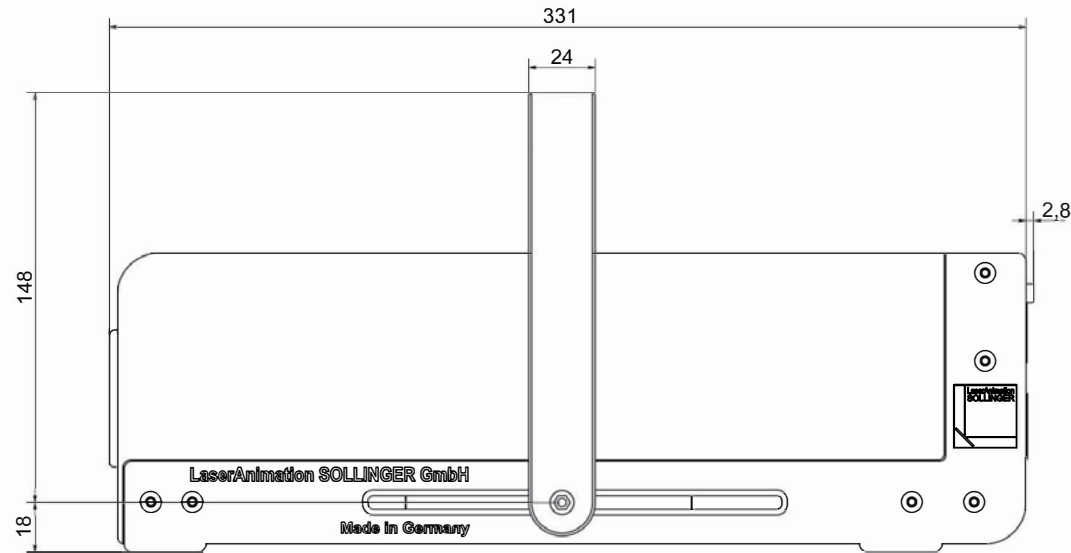
Bypass: Disabled  
Frequency: Fixed 50Hz  
Voltage: Fixed 230VAC



8 Technical Drawings

PHAENON accurate  
Technical Drawing

PHAENON Accurate  
Drawing 1, created 2016-07-26  
Dimensions in mm  
© LaserAnimation SOLLINGER GmbH

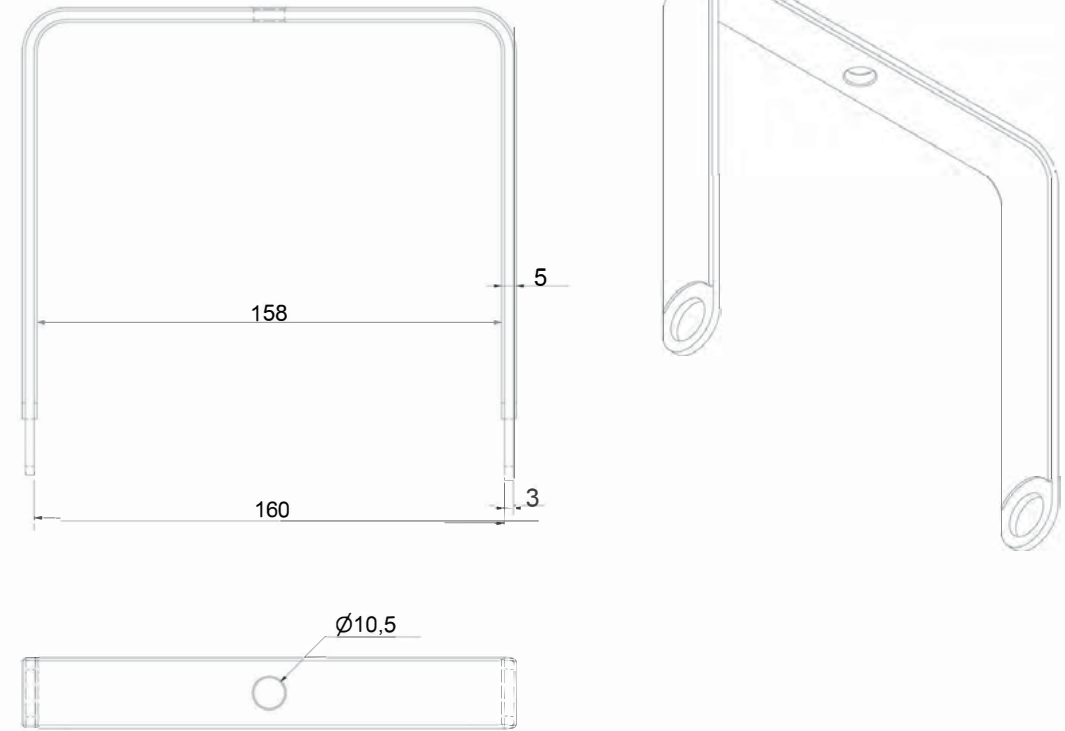


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PHAENON accurate  
Technical Drawing

PHAENON Accurate  
Drawing 3, created 2016-11-30  
Dimensions in mm  
© LaserAnimation SOLLINGER GmbH



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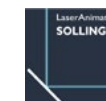
## 9 Technical Specifications

Laser			
Laser Source	Diode (red / green / blue)		
Type	CW analog modulated, laser class 4		
Typical wavelengths	638 nm	520 nm (P. accurate 7) 525 nm (P. accurate 10)	445 nm
Scanner	CT 6210 - Turboscan XD		
Scan angle	max. 80°, 50° typical		
Operation mode	AVB / TSN interface, AIFF player function, stand-alone player, ILDA		
Power supply	85 VAC – 264 VAC, 50 - 60 Hz, universal		
Operating temperature	- 5°C - +50°C		
IP rated	IP54		
Device-dependent laser specifications			
PHAENON accurate 7			
Total power* (after optics)	6000 mW		
Power per color	1600 mW (Red)	2000 mW (Green)	4000 mW (Blue)
Beam divergence*	< 0.5 mrad*		
Beam diameter	4 mm		
Power consumption	260 W		
Dimensions (L x W x H)	331 x 154 x 105 mm (w/o bracket)		
Weight (net)	5.2 kg		
PHAENON accurate 10			
Total power* (after optics)	8000 mW		
Power per color	3200 mW (Red)	2800 mW (Green)	4000 mW (Blue)
Beam divergence*	< 0.5 mrad*		
Beam diameter	4 mm		
Power consumption	320 W		
Dimensions (L x W x H)	331 x 154 x 105 mm (w/o bracket)		
Weight (net)	5.3 kg		

\*FWHM average depending on model



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## Final statement

All our products and their packaging are individually checked and leave our facilities in a flawless and proper condition. If you notice any damage or defects when receiving the product, please contact your dealer immediately. Damages caused by improper handling are not subject to the manufacturer's or dealer's responsibility and no liability or warranty is assumed for it. The operator of the device must follow the local safety regulations and the warnings in the manual. If changes are made to this manual, we cannot inform you. Please contact your dealer for service and any other questions. Only use original spare parts.

Subject to change without notice. No warranty can be given for the correctness of the information.

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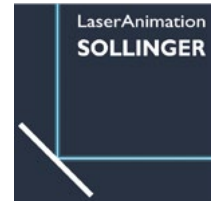
Place of Business: Berlin, Germany | Registry Court: Amtsgericht Charlottenburg, HRB 45888 | Managing Director: Martin Werner | VAT-ID: DE154202159

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## EU Declaration of Conformity

### Manufacturer:

LaserAnimation Sollinger GmbH

### Product Name:

PHAENON accurate 7  
PHAENON accurate 10

### Products covered by this declaration: Laser display systems

We here declare that the product described above is in conformity with the following directives:

- 2014/35/EU Low Voltage Directive
- 2014/30/EU Electromagnetic Compatibility Directive
- 2014/53/EU Directive for harmonisation of the laws of the Member States relating to the making available on the market of radio equipment


The following harmonized standards have been applied:

- DIN EN IEC 61000-6-1:2019-11 VDE 0839-6-1:2019-11  
Electromagnetic compatibility (EMC)  
Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
- DIN EN IEC 61000-6-2:2019-11 VDE 0839-6-2:2019-11  
Electromagnetic compatibility (EMC)  
Part 6-2: Generic standards - Immunity for industrial environments
- DIN EN IEC 61000-6-3:2022-06 VDE 0839-6-3:2022-06  
Electromagnetic compatibility (EMC)  
Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments
- DIN EN IEC 61000-6-4:2020-09 VDE 0839-6-4:2020-09  
Electromagnetic compatibility (EMC)  
Part 6-4: Generic standards – Emission standard industrial environments
- DIN EN 60825-1 VDE 0837-1:2015-07  
Safety of laser products  
Part 1: Equipment classification and requirements
- DIN EN 55032 VDE 0878-32:2022-08  
Electromagnetic compatibility of multimedia equipment - Emission Requirements

The included technical documents (files) demonstrate that the product has been produced according to the requirements of the abovementioned directives.

The EU declaration of conformity is available for inspection by the market surveillance authorities at any time.

Berlin, 28.03.2023



Martin Werner



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