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### DGM001178 (SM Scanner QS, ROTW) REVISION HISTORY



# Shelase / OptiScan / OptiScan TH

Laser Scanner







# Service Manual

DGM001178.05

3ev date 18/02/2021



In order to avoid any risks of dangerous faults, please <u>be sure that you carefully read this Service</u> Manual before starting any operation.

NOTE: Quanta System reserves the exclusive right to make changes and improvements at any time without prior notice, in case it was considered useful for the improvement of the product and/or of its use.

Some of the illustrations contained in this manual could be slightly different from the long in use.

Yours,

Quanta System S.p.A.

Tel.: +39 0331 376797 Fax.: +39 0331 367815 <u>www.quantasystem.com</u> <u>quanta@quantasystem.com</u>



Please fill in the following first start up form and send it back to Quanta System Service Dept.: via e-mail at <a href="mailto:service@quantasystem.com">service@quantasystem.com</a> (scanned version)

FIRST START-UP FORM

Model of the laser system: Optiscan / Optiscan TH / Shelase

Serial number: \_\_\_\_\_

Nominal Line Voltage \_\_\_\_\_ V, \_\_\_\_ Hz

Checks	Put x if performed	Comments
Visual check of the laser system		
Integrity and presence of the Accessories		
Integrity and presence of the Power cord		
Functioning of the Touchscreen		
Fill the Cooling system		
Presence of the Aiming beam out of the delivery system		
Absence of warnings or alarms		

General comments after the installation: \_\_\_\_\_

Distributor Company Name: \_\_\_\_\_

Country: \_\_\_\_\_

Check performed by: \_\_\_\_\_

Date / Signature:



# **Table of Contents**

DI	SCLAI	IMER	ER	4
1	IN	TRO	ODUCTION	5
2	GE	ENER	ERAL SAFETY INFORMATION	6
	2.1	V	Working Area	6
	2.2	E	Eye and skin exposure	7
	2.3	2.3 Interference with other devices		
	2.4	Ir	Instructions for the device disposal	7
3 DEVICE DESCRIPTION			8	
	3.1	V	Versions	8
3.2 Main parts			8	
	3.3	S	Shelase - Vaginal kit	
	3.	3.1	1 Optical adaptor	
	3.	3.2	2 Speculum and ring	
	3.	3.3	3 Diffusive element	
	3.4	S	Shelase - Vulvar kit	11
	3.4	4.1	L Optical adaptor	11
	3.	4.2	2 Ending tip	11
	3.5	C	OptiScan - Dermatological kit	11
	3.	5.1	L Optical adaptor	
	3.	5.2	2 Ending tip	12
	3.6	C	OptiScan TH - Dermatological kit	
	3.	6.1	l Optical adaptor	
	3.	6.2	2 Ending tip	12
	3.7	S	Scanner Features	13
4 OPERATING AND INSTALLATION INSTRUCTIONS			14	
	4.1	Т	Tip connections	14
	4.2	S	Scanner connections	16
	4.	2.1	Connections with Arm Holding probe	16
	4.	2.2	2 Diode fiber connections	
	4.	2.3	3 Thunder fiber connections	
	4.3	S	Start-up procedure	
	4.4	A	Alarm messages	
	4.5	S	Service mode	
	4.6	S	Service restart	20
5	OF	PTIC	CAL SYSTEM	21
	5.1	S	Scanner Intenzity	21



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#### DISCLAIMER

Quanta System service manuals are written specifically for use by Quanta System Service Engineers who have received formal training in the servicing of Quanta System equipment and by customers who have taken and passed a Quanta System Certification Service Training Course for the equipment being serviced. Information on certification service training courses program offered to customers can be obtained by contacting the Technical Service Training Coordinator by phone at +39-0331-376797 (Central European time 8:30am-5:30pm) or by email at *service@quantasystem.com*.

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Any servicing of Quanta System equipment by persons who have not passed a current Quanta System certification service training course for that equipment will void Quanta System's product warranty.

### Content of the Service Manual

This Service Manual provides service engineers/technicians with information on the following topics:

- Safety Information
- Device Description
- Installation Instructions
- Optical System
- Electronic System
- Maintenance
- Troubleshooting
- Customer Service

Service personnel are encouraged to familiarize themselves with the laser system and its operation. Make sure that all components within the laser can be identified. Follow the Troubleshooting Chapter to restore the performance of the laser if it does not meet or even exceeds the defined criteria.

The service manual includes the detailed descriptions of all the relevant components and procedures needed for the correct way of using this laser system along with additional electrical schematics and technical illustrations.

Upon request, Quanta System will provide additional circuit diagrams, component part lists, descriptions, calibration instructions, or other information not already contained within the technical guide, to assist the qualified technical personnel in resolving the issues.

Warning: Use of any controls, adjustments or performance procedures other than those specified herein may result in hazardous radiation exposure.



# **1** INTRODUCTION

Quanta System Shelase, OptiScan and OptiScan TH are laser scanners that deliver laser radiation to the patient when used in combination with the following Quanta System laser devices, respectively:

Shelase	OptiScan	OptiScan TH	
YOULASER Family:	YOULASER Family:	THUNDER Family:	
Youlaser MT	<ul> <li>Youlaser MT (not in US)</li> </ul>	Thunder	
• Youlaser CO <sub>2</sub>	• Youlaser CO <sub>2</sub>	Thunder MT	
		Thunder VT	
	DIODES Family:	Thunder HR	
	• 585		
	Multidiode Derma 532-6		
	Multidiode Derma 532-8		

Shelase is intended for gynecology, whereas OptiScan is intended for dermatology and aesthetic medicine use only.

Shelase and OptiScan are manufactured according to the Annex II of 93/42/CEE directive and are identified as follows:

Model names	Shelase OptiScan OptiScan TH
Category of the device	Class IIB
Manufactured by	Quanta System S.p.A. Via Acquedotto, 109 21017 - Samarate (VA) ITALY

As Shelase and OptiScan are not stand alone device, the intended use of the lasers they shall be used with must be considered.

# This device can be used only together with devices belonging to the families listed above, manufactured by Quanta System S.p.A.. Any different use is forbidden!

#### NOTE: In the present manual Shelase, OptiScan and OptiScan TH are generically named "Scanner".

Please, refer to the User Manual and Service Manual of the Laser Device which is used together with, for any information concerning:

- Indications for use
- Emission specifications
- Warnings, Safety Information and Working Area Requirements
- Troubleshooting
- Customer Service



## **2** GENERAL SAFETY INFORMATION

- For a safe use of the device it is necessary to know all the safety rules according to the International Standards.
- All the people operating with this equipment must understand the operation and safety instructions specified in this manual and in the laser device manual.
- Only authorized individuals with appropriate medical laser training and knowledge should operate the laser scanner.
- Only authorized Service personnel should access the internal/electrical components of the scanner.
- The User Manual must be available in the working area of the laser device.
- Quanta System S.p.A. disclaims any responsibility in case of use on patients younger than 18 years old. The use of this device on younger patient is under the sole responsibility of the operator/practitioner.
- The use of the Scanner is restricted to professional staff with experience in dermatology, aesthetic (for Thunder Family, Multidiode Derma 535 and 585) and gynecology (for Youlaser MT/CO2 only): they can decide, according to their experience, what is the right use of the device depending on the type of application.
- It is recommended that all the external staff, in contact with the device, is informed about all the safety rules and standards in order to reduce any risk related to the exposure to laser radiation.

# Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

**Caution:** Federal law restricts this device to sale by or on the order of a physician (or properly licensed practitioner).

#### 2.1 Working Area

# Please refer to the Working Area Safety information of the Laser device associated with the scanner.

Warning: This laser device is not intended for use in an Oxygen rich environment.

Warning: RESTRICTED ACCESS TO THE WORKING AREA.

#### The external personnel/visitors must also:

- Be guided by internal personnel
- Always wear the protective goggles if inside the working area when the laser is turned on
- Be instructed by internal personnel about laser, electrical and other risks related to the laser operation within the working area (laser radiation, electric shock etc.)

The entrance is absolutely FORBIDDEN IF there is no Operator inside the working area.



#### 2.2 Eye and skin exposure

The laser beam transmitted by this Device can cause vision loss. The laser operates at different wavelengths, both visible and invisible ones. Any energy transmitted by this Laser Device that enters the eye will be focused directly to the retina. Direct absorption of laser energy by retina can result in temporary clouded vision clouds, retinal lesion, long-term scotoma and long-term photophobia.

A risk exists in any case of:

- Direct laser radiation
- Reflected laser radiation
- Diffused laser radiation

**Warning:** All the personnel present in the laser working area must wear the protective goggles in order to avoid serious eye injuries.

Avoid direct look into the Scanner, even while wearing protective goggles. Use protective goggles according to the UNI EN 207 as reported in technical specifications (section 10).

#### Always check the goggles condition.

Before wearing the protection goggles, make sure that the goggles protection glass is in good condition.

The skin can resist high laser energies but it can be burned as well. If needed, suitable skin protection clothing should be used.

If somebody is hurt from the laser beam:

- Turn off the laser device
- Immediately ask for a physician's assistance
- Inform the responsible person in charge of laser maintenance and safety

#### 2.3 Interference with other devices

This Laser Device can be disturbed by the interference of external electromagnetic fields generated by other electrical devices in the closest proximity of the laser device.

**Warning:** Mobile phones and similar electrical devices must be switched off when the laser device is working.

#### 2.4 Instructions for the device disposal

The device is subject to the national regulation regarding the Waste Electrical and Electronic Equipment (WEEE). This device cannot be disposed as urban garbage. It must be separately collected according to the WEEE directive.



## **3 DEVICE DESCRIPTION**

Shelase and OptiScan are hand held devices which deliver laser radiation to the patient. They receive the laser radiation from the laser device as a uniform spot and deliver to the tissue in the form of dots pattern.

#### 3.1 Versions

The two versions of the Scanner include the following application tips:



Figure 3.1: The different Scanner versions, connected to the different tips.

#### 3.2 Main parts

The scanner is composed of the following main parts:

- Optical input connector, that receives the laser radiation from the laser device
- Optical output connector, to deliver the laser radiation to the patient through the tip
- Activation button, to emit the laser radiation
- Protection, to avoid unwanted emission
- The electic connector, to connect the electic cable coming from the laser device
- The display, to read and to set the parameters
- The handle, to hold the scanner
- Plastic Clips, to connect or disconnect the tips





#### 3.3 Shelase - Vaginal kit

It is composed by:

- An optical adaptor
- A diffusive element
- A speculum (two different lengths)
- A ring

Optical adaptor		
	-	Diffusive element with a golden plated prism
Two Speculums of different lengths		
Ring		

#### Vaginal kit components

#### 3.3.1 Optical adaptor

It holds delivery optics and has to be screwed to the Scanner connector.

#### 3.3.2 Speculum and ring

It is a stainless steel external frame where the diffusive element slides in. It is available in two versions, 9 cm long and 12 cm long. A stainless steel ring is also available, to allow the use of the tip without any speculum.

#### 3.3.3 Diffusive element

It is an aluminum cylinder where laser radiation passes in.

In its end a golden plated diffusive element is placed which reflects laser radiation perpendicularly to the cylinder axis.

It has a graduated scale marked on its external surface, in order to let the user know the length of the treated area.

It slides in the speculum, which does not move during the treatment.





Example of radiation reflection perpendicular to axis

#### 3.4 Shelase - Vulvar kit

It includes:

- An optical adaptor
- An ending tip



Vulvar kit components

#### 3.4.1 Optical adaptor

It holds delivery optics and has to be screwed to the Scanner optical output connector.

#### 3.4.2 Ending tip

It is a stainless steel spacer that comes in contact with the skin.

#### 3.5 OptiScan - Dermatological kit

It includes:

- An optical adaptor
- An ending tip



#### 3.5.1 Optical adaptor

It holds delivery optics and has to be screwed to the Scanner connector.

#### 3.5.2 Ending tip

Ii is a stainless steel spacer that comes in contact with the skin.



Dermatological kit components

#### 3.6 OptiScan TH - Dermatological kit

It includes:

- An optical adaptor
- An ending tip

#### 3.6.1 Optical adaptor

It holds delivery optics and has to be screwed to the Scanner connector.

#### 3.6.2 Ending tip



Dermatological kit components



#### 3.7 Scanner Features

The dots density, the pattern shape and dimension can be chosen by the user from the Scanner display directly.

From the Scanner display user can also switch from ready to standby mode and read the laser device database.

Scanner and the tip mounted are automatically recognized by the laser devices.

Emission parameters (energy per dot, frequency, and pulse length) can be set only through the laser device, please refer to next chapter about Operating instructions.



Quanta System Q1

#### 4.1 Tip connections

Screw the optical adaptor in the optical output connector. To plug (or unplug) the different tips use the black lateral scanner clips by pushing them together and match the tip with the scanner optic output. In the bottom of the tip there is a connector to allow the scanner to recognize it. Without the tip recognition, you cannot get laser emission.





Scanner Shelase with vaginal ending tip and speculum



Scanner Shelase with vulvar ending tip





Scanner OptiScan with dermatological ending tip



Scanner OptiScan TH with dermatological ending tip



#### 4.2 Scanner connections

Connect the cable coming from the device laser to the electric connector, please refer to the device user manual. To connect the cable it is necessary respect the connector notches.



Electric connector

#### 4.2.1 Connections with Arm Holding probe

Screw the adaptor parts to the scanner optic input; then inserting the arm holding probe into the adaptor; finally lock the bolt.

These operations must be carry out with the laser system OFF.



Connection Shelase (vaginal version)





Connection Shelase (vulvar version)

#### 4.2.2 Diode fiber connections

Screw the Fiber adaptor to the scanner Optical input connector.

To connect the fiber coming from the diode laser system, screw the Fixed fiber connector with the Fiber adaptor part, respecting its notch.

To remove the Removable fiber adaptor, unscrew the Fixed part and pull it off, holding both parts with the hands.



Removable adaptor





Then connect the electric cable to the electric connector.

Example of connection OptiScan with Diode

#### 4.2.3 Thunder fiber connections

Screw the Fiber adaptor to the Scanner Optical input connector.

To connect the fiber coming from the laser system, screw the Fixed fiber connector with the Fiber adaptor part, respecting its notch, then screw the ferrule.

To remove the Removable fiber adaptor, unscrew the ferrule and the Fixed part and pull them off; hold with the hands both the Fiber adaptor and the Fixed fiber connector.

Then connect the electric cable to the electric connector as described above.



Removable fiber adaptor

Any scanner connections must be carry out with the laser device turned off. For any connections, please read to the laser device user manual.

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#### 4.3 Start-up procedure

For the Operating instructions, please refer to the User Manual.

#### 4.4 Alarm messages

The alarm condition could be generated either by the Scanner or the laser device. For the alarm by the laser device refer to its manuals.

During alarm condition it is not possible switch/stay in Ready status and consequently it is not possible emit laser radiation.

Here below the list of the Scanner alarm messages and their meaning:

Alarm message	Description/meaning	
CONF.ABSENT	The IC inside the tip is not configured or it lost the configuration	
MOTOR ERROR	The Scanner Intenzity motor is not in the right position	
UNCONNECT TO LASER	The communication between the Scanner and the laser device is absent	
NO OPTICAL DEVICE	The tip is not connected or not recognized	
FLASH CRC ERROR!!	The Flash memory is damaged; this error appears also after a FW update	
EEPROM CRC ERROR!!	The EEPROM memory is damaged	
TOUCH ERROR!!	The capacitor touch pad is damaged	

For all the alarm message turn off the laser device, check the electric and mechanical connections and restart the laser device. If the alarm stays, please refer to the Troubleshooting chapter.

#### 4.5 Service mode

At startup the following screen appears; to enter in the service mode, press the angles with the following sequence; the correct pressure is confirmed by the buzzer sound.







In the User Service Menu you can:

- Set Offset X, Y
- Set the rotation
- See the tip type and check its recognition
- Verify the power with the beam in the central position
- Verify the power with the beam in the lateral position

#### 4.6 Service restart

After a FW update a "FLASH CRC ERROR!!" appears.

To cancel this error, turn off the laser device and restart it.

If the error remains, carry out the service restart procedure by pressing the angles with the following sequence <u>two times</u>; the correct pressure is confirmed by the buzzer sound.





## **5 OPTICAL SYSTEM**

#### 5.1 Scanner Intenzity



The Scanner Intenzity is the main optic part; it is located in the middle of the Scanner. The Scanner Intenzity deflects the beam laser coming from the laser device to the patient through the lens of the optical adaptor and the tip, according to the selected modalities. It needs a factory setting, in case of trouble it is necessary to contact the factory.

#### 5.2 Optical adaptor

Every tip is associated to an optical adaptor as described in the chapter 3. In case of trouble it is necessary check the cleaning status and none scratches or crack are present. In case of damage, please contact the factory.



# **6 ELECTRONIC SYSTEM**

The electronic parts are:

- The touch pad, connected to X3 QSMM1401.
- The display with the board QSMM1401.
- The main board QSMM1402.
- The Hirose main connector, connected to X3 QSMM1402.
- The Scanner Intenzity, connected to X1 QSMM1402.
- The actuator/switch, connected to X2 QSMM1402.
- The micro switch and tip sensor, connected to QSMM1401.

The following diagram scheme shows the different boards, connected in a sandwich mode.





**Quanta System 01** 

# **7** DISASSEMBLING / ASSEMBLING OPERATION

#### 7.1 Scanner assembling

To access to the internal parts, open the covers as follow:

- Unscrew the 3 screws with a hexagonal key (2,5mm size).
- Remove the covers, beginning from the top cover, then the right one.
- If necessary, disassembly the main block by unscrewing the 2 screws M4 with a hexagonal key (3mm size).
- If necessary unscrew the actuator support by unscrewing the 2 screws M3 with a hexagonal key (2,5mm size).

To assemble the whole parts, repeat the previous steps in opposite sense.







7.2 Vaginal prism disassembling / assembling



To replace the prism (or golden plated mirror) the following items/tools are necessary:

- a new prism
- a new pin d.2x20 h8 ISO 2338
- an hammer (500 1000 g)
- a pin tool (dedicated to remove a pin d.2mm)
- a screwdriver 2 mm
- pliers

Place the tip on a stable and cleaned surface or on a support; be careful to not damage the tip surface.





Point the pin tool at the pin extremity and carefully with a hammer try to remove the pin.





Use pliers to remove the pin.

When the pin is out, you can remove the cap and to have access at the screws.

Remove the six lateral screws with a screwdriver 2 mm.





After that you have access to the prism and its support. Unscrew the two central screws to remove the prism.



Follow the procedure in the opposite sense to assembly the <u>new prism</u>. Be careful at the reference notches of the: prism, its support and cap. Screw the prism with its support, but fix strongly after fixed the prism support at the tip.

Fix the cap and insert with the pin tool and the hammer a <u>new pin</u>.

At the end clean the tip as written in the User Manual Maintenance chapter.



# **8 TROUBLESHOOTING**

Issue	Possible cause	Solution
The device cannot start up	<ul> <li>Power cable is not connected</li> <li>Laser device is turned OFF</li> </ul>	<ul> <li>Check the cable connections at both sides.</li> <li>Check the cable is not damaged.</li> <li>Check the laser device is turned ON.</li> <li>Substitute damaged parts</li> </ul>
The tip is connected but there is the "CONF.ABSENT" or "NO OPTICAL DEVICE" alarm messages	<ul> <li>The tip is not connected in the right way</li> <li>The tip connector is broken</li> <li>The IC inside the tip connector is broken or not programmed</li> </ul>	<ul> <li>Check the connections</li> <li>Check the external condition</li> <li>Try to restart the laser device</li> <li>Try with another tip, if possible</li> <li>Substitute damaged parts</li> </ul>
"MOTOR ERROR" alarm message	<ul> <li>Scanner internal cable is not connected</li> <li>Self-protection due to optic problems</li> <li>Scanner Intenzity is broken</li> </ul>	<ul> <li>Check the connections</li> <li>Check the external condition</li> <li>Check the conditions of output lens, Galvo mirror and protective window</li> <li>Substitute damaged parts</li> </ul>
"UNCONNECT TO LASER" alarm message	Power cable is not properly connected or it damaged	<ul><li>Check the connections</li><li>Substitute damaged parts</li></ul>
"FLASH CRC ERROR!!" alarm message	<ul><li>FLASH memory is broken</li><li>There has been a FW update</li></ul>	<ul> <li>Restart the laser device or carry out the service restart procedure (§ 4.9)</li> <li>Substitute damaged parts</li> </ul>
"EEPROM CRC ERROR!!" alarm message	EEPROM memory is broken	<ul><li>Restart the laser device</li><li>Substitute damaged parts</li></ul>
The touch pad doesn't work and or the "TOUCH ERROR!!" alarm message is present	<ul> <li>The touch pad is not connected</li> <li>The touch pad is broken</li> <li>•</li> </ul>	<ul> <li>Check the connections</li> <li>Check the external condition</li> <li>Try to restart the laser device</li> <li>Substitute damaged parts</li> </ul>
Pushing the actuator, there is not laser emission	<ul> <li>The laser is not in Ready status</li> <li>Actuator is damaged or not connected to the electronic boards</li> </ul>	<ul> <li>Check the laser status</li> <li>Check the actuator condition</li> <li>Remove the covers and check the actuator connections</li> <li>Substitute damaged parts</li> </ul>
The laser emission stops suddenly	<ul> <li>Different causes, see the display messages from both the scanner and from the laser device</li> </ul>	<ul><li>Check the connections</li><li>Check the external condition</li><li>Substitute damaged parts</li></ul>
The power laser seems lower	<ul> <li>Laser device is fault</li> <li>Scanner Intensity lens is damaged</li> <li>Optical adaptor lens is damaged</li> <li>Vaginal tip prism surface is ruin</li> </ul>	<ul> <li>Check the laser power: refer to its Service Manual.</li> <li>Check the lens condition</li> <li>Check the prism surface condition</li> <li>Substitute damaged parts</li> </ul>



# Appendix A: Electric schemes

See/Require Scanner Electric Schemes: **SE\_SCANNER\_X**\*

<sup>\* &</sup>quot;X" means the release version.