



# DioBeam 830<sup>®</sup>

Low Level Laser 150mW



## MANUAL

CE 0543

# 1. Introduction

The DioBeam 830® is a medical device developed and manufactured in compliance with the MDD. The DioBeam 830® is to be used only by trained medical and dental personnel.

# 2. Safety-warnings

**IMPORTANT!** Before use of the equipment, the warnings shall be read thoroughly.

### CAUTION!

**USE OF CONTROLS, ADJUSTMENTS, OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED IN THIS MANUAL MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.**

1. When the laser is not used for treatment, the key should always be kept in a safe place away from the laser device. Store the laser in such a way, under lock, that no unauthorized person can reach it.
2. Laser light can be potentially damaging to the retina. Never shine the light directly in the eye, or look directly at the laser beam.
3. NOHD = Nominal Ocular Hazard Distance = 8.14 m.
4. Do not view directly at the laser aperture with optical instruments even from a distance. It can damage the retina.
5. When the laser is activated, it is mandatory that both patient and practitioner wear laser safety goggles effective in the wavelength spectrum of 800 to 850 nm.

We recommend NOT treating:

- Eye conditions.
- In the area over thyroidea or a pregnant uterus.
- A lesion suspected of cancer or a non diagnosed lesion.
- Conditions where the patient is light sensitive, especially in the area around 830nm.
- Where the patient is medicated with a pharmaceutical contraindicated to this form of light exposure.

### DISCLAIMER

Should any damage to a living being, any inventory or buildings be caused by using the device, and NOT having followed the safety precautions in this user manual, the manufacturer cannot be held responsible.

### 3. Product description



Illustration 1: Laser assembled, and ready for use.



Illustration 2: Laser taken apart consisting of: Part 1: Laser head, with laser diode build in and sealed. Part 2: Control part. Part 3: Battery part. Accessories: Light tip and coded key.

#### 3.1 Assembling and dismantling the laser

Place the battery in the battery part. Connect it to the control part by the screw cap, and screw it clockwise to a close fit with the battery part.

**Attaching the head:** Hold the two parts together, while aligning the three stainless steel pins of the head over the corresponding holes in the print end of the main control part. Screw the screw cap in a clockwise direction until fully tightened. Be careful not to strip the screw cap.

**Laser head is removed in the following way:** Hold the laser in one hand, and grab the laser head, while the other hand loosens the screw cap by screwing

it counter clockwise.

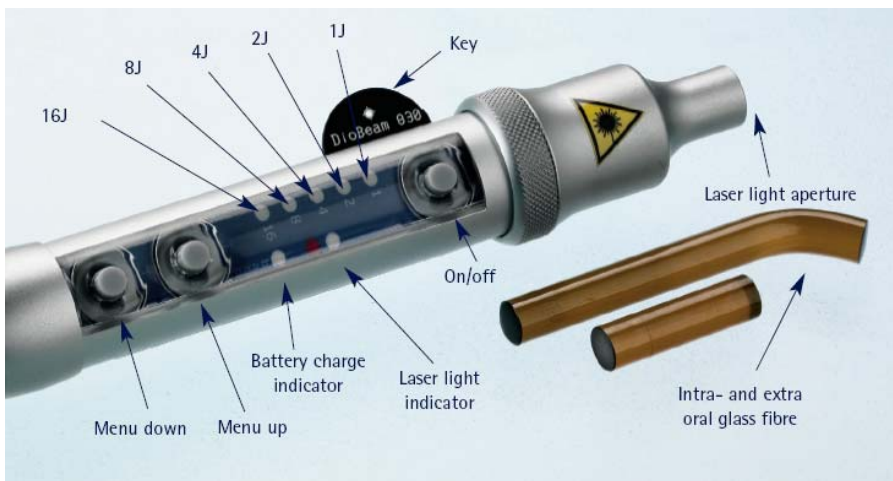
**Tips are attached and removed in the following way:** Simply attach or remove the tips from the head by inserting them straight into the head or by pulling them straight out. The tip is secured by two o-rings in the head. There is a mechanical stop before reaching the laser diode, so push the tip in completely.

On the side of the control part is a key whole. The key has to be correctly inserted as far as it can go into the slid. The two sides of the key are identical.

**Dismantling of the laser:** Remove the key by pulling it straight out. Remove the glass light guide. Loosen the screw cap by turning it counter clockwise till the laser head is loosened, and can be removed by pulling it straight out (do not twist or turn). The battery part is removed by turning it counter clockwise.

### 3.2 Laser head

Encapsulated in the metal cap are the active laser diode 830nm, and the LED in the spectrum of visible red colour. The LED works as a guiding light.



### 3.3 Control part

The control part contains of the dosage adjustment, on/off buttons and the key whole. Dosage of LLLT is expressed as energy in Joules.

Energy (Joule) = effect (Watt) x time (seconds)

Ex.: 1 J = 0,150W x 6.67 sec.

The energy setting is controlled by the two buttons marked MENU UP and MENU DOWN.

There are 5 settings:

1. 1 Joule (approx. 7 seconds of treatment)
2. 2 Joules (approx. 15 seconds of treatment)
3. 4 Joules (approx. 30 seconds of treatment)
4. 8 Joules (approx. 1 minute of treatment)
5. 16 Joules (approx. 2 minutes of treatment)

When the chosen dosage is reached, the laser turns off automatically, and it stays ready for use at the same dosage, until a new setting has been chosen.

The actual dosage necessary is determined after clinical evaluation of the condition. For further information and guidelines, see existing literature and/or visit our constantly up-dated website [www.cmsdental.com](http://www.cmsdental.com).

### **3.4 Key function**

The laser cannot be activated without the key being correctly inserted; it will instead give an audio signal, indicating failure. This is a safety pre-caution.

### **3.5 Sound indications**

When in standard mode, a repeating bleep indicates the laser light is activated. A longer beep signals the completion of the cycle. The repetitive bleep can be deactivated by simultaneously pressing the MENU UP and MENU DOWN buttons. The chosen sound mode is stored in memory until the battery is removed.

### **3.6 Light indications**

The red diode indicates that the LED and laser light is activated. The "batt" indicator diode lights when the battery should be re-charged soon. There will be approximately 10 minutes of treatment time remaining.

### **3.7 Battery part**

The battery part consists of an aluminium cover and a removable battery inside.

### 3.8 Combined battery re-charger, power meter and vertical holder



**Illustration 3:** The combined battery re-charger, power meter and vertical holder has a display and three openings (one small and two larger ones) at the front. On the side of the device, is a small opening to connect the jack plug attached to the power supply.

The combined battery re-charger, power meter and vertical holder consists of:

- A separate standard power supply, 9V DC 800 mA, when connected to main power.
- The combined re-charger and power meter. The device has a display and three openings (one small and two larger ones) at the front. On the side, is a small opening to connect the jack plug attached to the power supply.

To activate the battery re-charger, connect the power supply to the mains, and insert the jack plug into the battery re-charger. When the jack plug is inserted, for two seconds the display will show a message: "V x.x DioBeam" (example V 2.0 DioBeam = version 2.0 DioBeam). Afterwards the text changes to: "CMSDENTAL.COM".

#### **Function: Battery re-charger**

The first large opening is the battery re-charger. To recharge the battery, place the print board end of the battery towards the bottom of the opening with a firm pressure. When the battery is correctly placed, the display will show: "CMSDENTAL.COM C". "The C" indicates "charging". When the battery is fully charged, the display will say: "CMSDENTAL.COM F". "The F" means "full" (fully charged). The battery can stay in re-charger until it is to be used with no harm done to the battery life time. When the re-charger is not in use, unplug from the mains.

### Function: Power meter

The small opening is a power meter, which can be used to check the output power of the laser. Attach the short light tip to the laser head, and place the laser with the tip at the bottom of the measuring hole. Activate the laser, and keep it calm, and in the same position, while measuring. Do not twist the laser, as it can cause breaks of the laser tip.

Find the reading in the display. The output power should lie between 150mW +/- 20% (120-180 mW). If the result is not within the acceptable range, check that the light tip is correctly attached, clean and intact. If the result is still outside the accepted range, send the laser to your supplier for service. Note! The glass tip might be worn, and needs to be replaced.

### Function: Vertical holder

The opening to the left is a holder. When not in use, the laser can be placed in the holder.

## 3.9 Fault indication

- When fault is occurring during recharging, the display will for two seconds show "CMSDENTAL.COM E". The "E" means "error".
- When battery fault, the display will show a constant message "ERROR". This may occur if the battery is worn down.

## 4. Use




The DioBeam 830<sup>®</sup> is approved for treatment of tissue repair.

## 5. Labelling

**INVISIBLE LASER RADIATION  
AVOID EXPOSURE TO BEAM  
CLASS 3B LASER PRODUCT  
Max 200 mW, 830 nm, cw  
Only be used by doctors and dentists**

**Dio Beam 830 Low Level Laser**

Made in Denmark by:  
 CMS Dental,  
 DK-2300 Copenhagen S, info@cmsdental.dk

 2006   
 0543

SN-DBC-01-00163

SN = Serial number  
 DB = DioBeam  
 01 = Version number  
 00155 = Serial number

Symbol explanation:



Caution! Read the user manual following the device.



Year of manufacture



Patient part, type BF



Laser irradiation



See section 9, "Waste disposal within the EU"

Labelling battery re-charger, power meter and vertical holder

**DioBeam Meter & Recharger**

**9V. Max 7,2VA** 

Made in Denmark by:  
 CMS Dental ApS  
 DK-2300 Copenhagen S.  
 www.cmsdental.com

 2006   


SN-DBMC-02-00178



See section 9, "Waste disposal within the EU"

## 6. Maintenance

The tips may be autoclaved (132 °C) or disinfected with standard dental disinfectants for glass items. All mechanical parts, including the laser head may be cleaned using a tissue or cloth moistened with 70% isopropyl alcohol.

**Warning!** Never clean while the charger or any parts are connected to the mains.

## 7. Warranty

CMS Dental offers a two year warranty on laser head, control body and the re-charger/power meter. Light guides and batteries are NOT covered by the guarantee. Warranty service must be provided only by distributors and dealers given a written authorization by CMS Dental.

If there has been an attempt to open/repair, or the device has been opened/ repaired, by a person with no authorization given by CMS Dental, the warranty will no longer be valid. Within the warranty period the customer shall in this respect cover transportation costs to CMS Dental, and CMS Dental will cover transportation costs back to the customer. All repairs or complaints from dealers/distributors shall be returned with a RMA report (Return Material Authorization). The RMA report is to be found, and can be downloaded from the website, [www.cmsdental.com](http://www.cmsdental.com) after log-in. If the product is received without the RMA, the product will be placed in a quarantine area until the RMA report has been forwarded to CMS Dental.

## 8. Service

Calibration is recommended every two years. For repair and service return the device to the manufacturer: CMS Dental, 21 Njalsgade, DK-2300 Copenhagen S.

## 9. Waste disposal within the EU

1. WEEE (Waste of electrical and electronical equipment) cannot be disposed with normal household waste.
2. WEEE (Waste of electrical and electronical equipment) has to be collected separately.
3. The equipment has to be returned to the manufacturer.
4. The equipment cannot be reused after its lifetime has ended.

5. WEEE (Waste of electrical and electronic equipment) is polluting the environments and thereby damaging the health of living beings.



Illustration symbol means: WEEE (Waste of electrical and electronic equipment) cannot be disposed with normal household waste.

## 10. Technical specifications

### Technical specifications for laser:

Diode:	SONY GaAlAs SLD302V-3
Wavelength:	830 nm
Laser output:	Maximum 200 mW
Laser class:	3B
Frequency:	Continuous wave/No pulse
Lens:	Collimation lens gives a divergence of 0,86°
Power consumption:	375 mA
Power consumption (stand-by mode):	<25 mA
Length:	220 mm
Diameter:	22 mm
Weight:	240 g
Power supply:	Lithium Ion rechargeable battery
Voltage:	3,6 - 4,2 V
Capacity:	1850 mA
Recharging time:	90 minutes
Working time:	100 minutes

### Technical specifications for re-charger, power meter and holder:

Power Consumption:	Max 7,2 VA
Dimensions (LxWxH):	220 mm x 50 mm x 25 mm
Weight:	340 g
Power Supply:	9V DC/ 800 mA

### Technical specifications for the laser goggles:

Model:	DI2 CE
Wave length:	790-830 nm
%LT	61

Instructions and data sheet is provided with the protective goggles.

## 11. Accessory products

Accessory products can be ordered online at [www.cmsdental.com](http://www.cmsdental.com).

Description	Item no.
DioBeam 830® laser head	DB-200-01
Control part	DBC-01
Key	DBKEY-01
Battery part (cabinet)	DBAM-01
Separate battery	DBT-03
Intra oral light guide 60 degrees (8 mm)	DIO8-02
Extra oral light guide straight (8 mm)	DEO8-01
Power Meter	DBPW-01
Re-charger	DREC-01
Power supply	DADP-02
Goggles	DB/SAFETY

## 12. Manufacturer

The DioBeam 830® is manufactured by:

CMS Dental  
21 Njalsgade 21  
DK-2300 Copenhagen S

Tel.: +45 32 57 30 00  
Fax: +45 32 57 10 23

[info@cmsdental.dk](mailto:info@cmsdental.dk)  
[www.cmsdental.com](http://www.cmsdental.com)

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**CMS Dental**

21 Njalsgade · DK-2300 Copenhagen S  
Tel.: +45 32 57 30 00 · Fax: +45 32 57 10 23  
info@cmsdental.dk · www.cmsdental.com