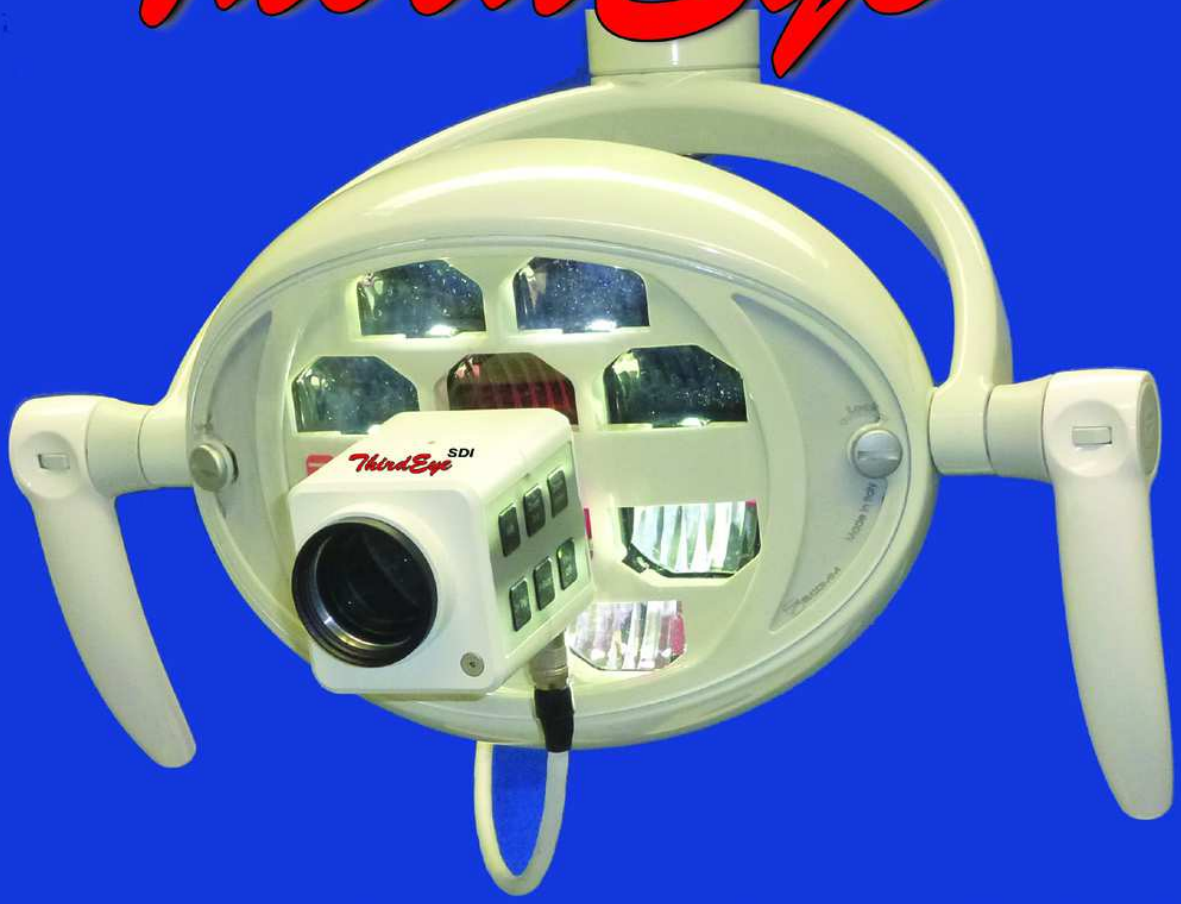
ThirdEye SDI



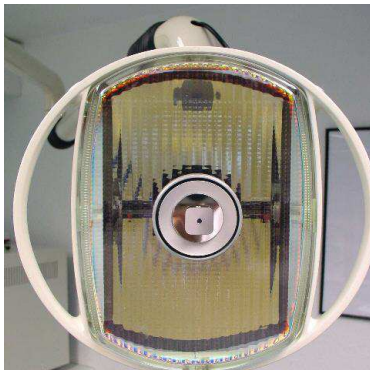
mounted on your dental light !

1.920x1.080p full-hd SDI
autofocus, 10x zoom, freeze

intraoral shots from extraoral

Mounting the miniature camera stand

Independently of the type of dental light the miniature stand is mounted in the center of the dental light front.



Before glueing the miniature camera stand to your dental light all the adhesive surfaces of the light and stand baseplate must be cleaned and degreased with alcohol and a clean cloth.

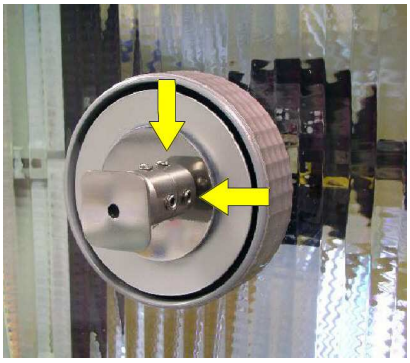
For the later adjustment of the camera stand on the dental light a cross from adhesive tape is stuck on the camera plate of the stand, so that all free ends of the tape exceed at least one centimeter over the stand baseplate.

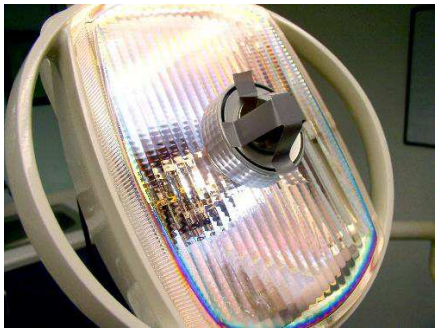
With a cement spatula a thin layer of Hylosil® silicone glue is spread onto the surface of the stand baseplate. For dental lights with a relief on their front side (e.g. Siemens M1, Sirona E, Pelton Crane etc.) the silicone layer must be somewhat thicker. The stand fed with silicone adhesive is put on the center of the light front and pressed on slightly, until some silicone outpours the baseplate at the edges.

Recommendation:

For temporary attachment of the miniature stand you can use a polyether impression material like e.g. Impregum®.

It is important to fix the stand in the correct positioning, so that the fixing screws are well attainable afterwards. For right handed persons the screws should show to the right and upward (with the view of the light front side)
Now the ends of the tapes are fixed at the light and the light screen is turned upward.





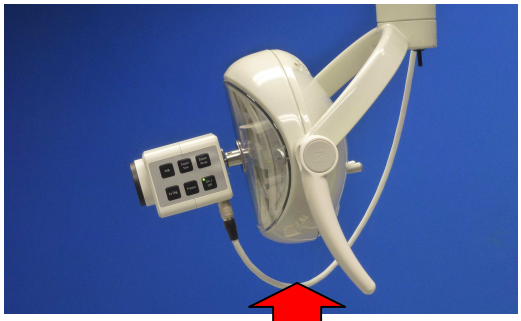
The curing of the silicone takes 4-12 hours depending upon thickness of the silicone joint (the more thickly the joint, the longer the hardening by precipitation phase). The hardening by precipitation can be accelerated however by warmth. For this reason the light should remain switched on for 3-4 hours.

Laying the camera cable

With its diameter of only 5,5 mm the camera cable can be laid inside the tubing linkage of most dental lights The outer diameter of the camera sided 6pin cable plug is 12 mm.

Please notice: For laying the camera cable inside the inner tube of the dental light one has to drill a small hole into the front side of the dental light tube (often plastic parts). This bore hole will lead your dental light to lose its registration and warranty (medical products law). We leave it up to you to drill this hole by yourself or have a technician from your dental supplier drill this hole and lay the cable for you.
A more comfortable, but less attractive way to lay the camera cable is through the use of cable clamps, cable channels or adhesive tape stuck to the outside of the dental light tubes.

Important: In order to ensure the full mobility of the light head, a cable reserve must be present. The best way to test the length of the necessary cable reserve is to attach the camera to the stand, connect the cable plug to the camera socket and hold the camera cable to that point, where the cable is to be laid into the light tube. Now move the light head to any possible direction. The cable should not be strained in any position or be in contact to hot surfaces of the dental light.
Note: The camera cable may be broken when squeezed or be laid in to close bends.

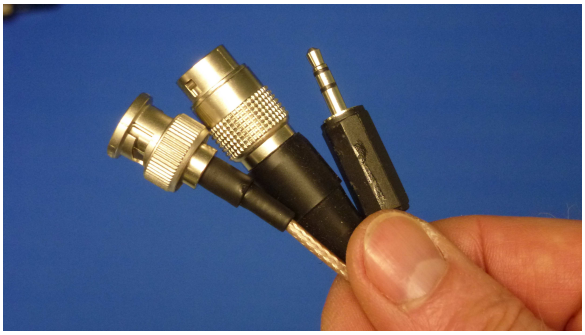


spare **cable**

Connecting the monitor

ThirdEye-SDI delivers an uncompressed HD-SDI video output signal (full-HD). We have choosen SDI output, because SDI cables are rugged regular RG59 video cables, which can be as long as 20 meters and the RCA connectors are more solid than HDMI plugs. HDMI cables have a maximum cable length of 10-15 meters.

Since SDI monitors used in broadcast tv still are very expensive, we deliber a SDI digital video recorder, which converts the SDI signal of the camera into an HDMI signal, which easily can be connected - using an HDMI cable - to any (medical) monitor or tv device



camera cable (far side):

SDI RCA plug
→ connect to the digital video recorder

stereo microphone plug
→ connect to the digital video recorder

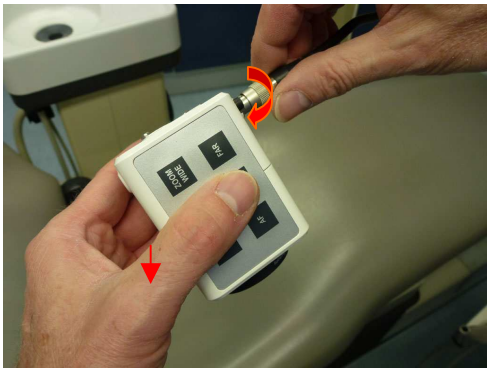
12 pin HIROSEplug
→ connect to the power supply.

SDI digital video recorder with remote control

- ✓ **SDI-input**
- ✓ **stereo-microphone input**
- ✓ **IR receiver to remote control recorder**
- ✓ **HDMI-output**
- ✓ **connector for USB2.0 flash drive or USB hard disk**
- ✓ **power supply**

Attachment of the camera

Once the camera cable is connected the digital video recorder, the HDMI-output of the digital video recorder is connected to the monitor/tv and the camera´s power plug (12pin HIROSE) is connected to its medical power supply, the camera can be attached to the dental light.



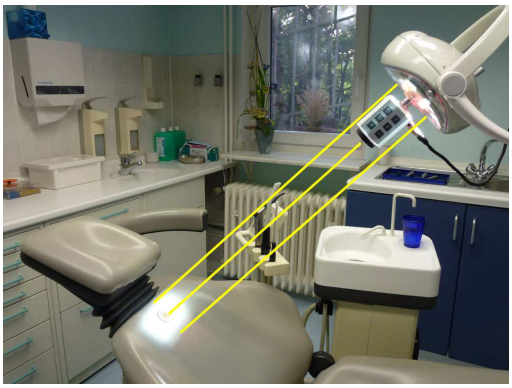
Please, at first connect the 6pin camera cable plug with the socket on the camera housing. Since this is possible in one position only, you should turn the camera in your left hand against the cable plug in your right hand in opposite directions, until the plug engages.

Now the camera with the groove on its rear side can be slided onto the disk of the miniature stand. Secure the position of the light´s head with your index finger.

Now, switch the monitor on.

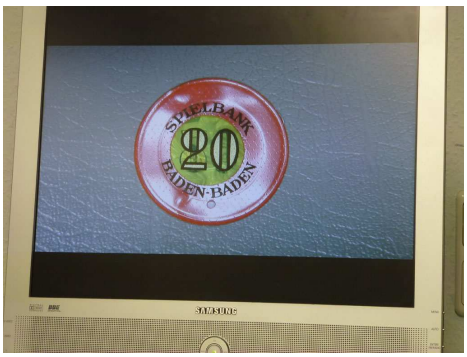
Adjustment of the camera

To get perfect illuminated and brilliant images it is crucial that the optical axis of the camera lens is perfectly aligned to the central beam of the dental light.



Place a coin on the dental chair (or it´s neck restraint). Switch the dental light on and direct the light beam of the dental light towards the coin. Zoom-in (tele-shot) the camera so that all the monitor image is within the borders of the light beam.
The coin should be in the centre of the light beam.
Loosen the M2 fixing screws of the miniature camera mount with the enclosed Allen screw driver.

Guide the camera with your left hand till the coin appears in the center of the light beam on the monitor. If the coin appears both in the centre of the light beam and in the center of the monitor tighten the fixing screws of the miniature camera stand with your right hand with the allen screw driver *(this explanation is for right-handed dentists only)*



To prevent dazzling of your patient the coin should be placed something *above* the center of the light beam.
Check the stability of the camera by shaking the camera a bit. The image on the monitor always should remain fixed in the centre of the light beam of the dental light !

Finished!

ThirdEye-SDI buttons

1. WB → manual white balance
2. Zoom Tele → zoom-in = higher magnification
3. Zoom Wide → zoom-out = less magnification
4. 2x Dig → fast digital zoom (2fold magnification)
5. freeze → freezing the image
6. on/off power → switch camera on/off

The remote control

remote control

+ **zoom-in**

-- **zoom-out**

2x **2fold magnification**

freeze image

Focussing

The camera always is working in **autofocus** mode !
The autofocus mode has a certain delay (1-2 seconds), so that objects (fingers, instruments), which are in the way for a short period of time only, would *not* result in changing the camera´s focus.
The object to be filmed has to be in the *center* of the scene for the autofocus working correctly.

Manual white balance (WB)

White balance is very important to get optimal color reproduction and contrast. Since light and color temperatures are changing during the day (sunny, cloudy sky, night with tungsten light etc.) it is very important to adjust the white balance from time to time, so that the camera reproduces a white color as a white color and all other colors in a perfect manner.
To do the white balance take a white matt sheet of paper and put it in front of the camera lens in a distance of 40-50cm. Switch the dental light on and guide the light on the white paper sheet. Zoom-in (**TELE**), so that the camera image on the monitor is within the light beam of the dental light. Now push the manual white balance **WB** button for at least 2-3 seconds, till you see the colors switching. Check the colors with the test pattern or better with an intraoral scene.

Zoom

You can either zoom using the push buttons **TELE** or **WIDE** on the camera side or you better use the wireless remote control (zooming without any vibrations)

Using the close-up lenses

For working distances* closer than 80cm you need to use close-up lenses, because the camera in tele mode cannot focus at closer working distances than 80cm without using close-up lenses

- close-up lens # 1 (mounted) is for working distances* of 40-70 cm
- optional: close-up lens #2 is for working distances of 30-50 cm
- without close-up lens working distance should be > 80 cm

*distance between front lens of camera and object (e.g. patient´s mouth) to be filmed
all distances for the camera zoom being in max. telephoto-shot !
Keep in mind: the brighter the light intraorally and the wider the zoom the bigger the depth-of-focus

Technical Data for ThirdEye SDI

camera	
image sensor	1/3" CMOS Panasonic
CMOS total pixels	2 mega pixel
video resolution	1.920x1.080p (= full-HD)
video systems	1.080p/30 full HD NTSC 1.080p/25 full HD PAL
video signal	HD-SDI digital
signal-to-noise ratio	> 50 dB (ACG off)
camera iris	1/30 - 1/30.000 sec auto iris
white balance	AWB (automatic white balance) and one push manual white balance
power consumption	3,0 Watts
power supply	medical power supply 110-240 volts AC → 12 Volts DC +/- 10%
housing	
colour	white, stove enamel
material	aluminum anodized
dimensions (wxhxl)	60x55x57mm
weight	240 grams
zoom lens	
focal length / zoom	5.1-51mm (= 10x optical zoom) 12x digital zoom (= 120fold)
focussing	autofocus
working distance	35cm- 50cm (with close-up lens #2) 45cm- 80cm (with close-up lens #1) 80cm - infin. (w/o close-up lens)
delivery contents	
	miniature camera mount camera cable (length 6m) HD-SDI + power (far side) 6pin HIROSE plug (camera side) med. power supply 110-240V AC - 12V DC close-up lens # 1 (45-80cm) close-up lens # 2 (35-50cm) zoom remote control
optional accessories	
	camera cable (up to 20m) SDI to HDMI converter SDI digital video recorder (DVR) + stereo microphone for dvr HDMI-distributor/amplifier 1:2 (or 1:4) wireless zoom remote control

The following diagrams show the installation of ThirdEye-SDI

- ✓ **using the ThirdEye-SDI digital video recorder (= DVR, stand alone, no computer needed) to record on an USB3.0 flash drive or an external USB hard disk**

- ✓ **using your office computer together with the ThirdEye-SDI digital video recorder (= DVR) to record directly to your computer hard disk**

surgery room

ThirdEye-SDI
zoom & auto focus

camera cable
SDI/audio/power

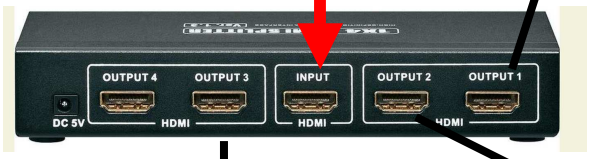
please check length of the camera cable from camera to DVR

ThirdEye-SDI digital video recorder

USB flash drive
or USB hard disk

HDMI distributor/amplifier

HDMI



HDMI

preview monitor in surgery room with HDMI-in

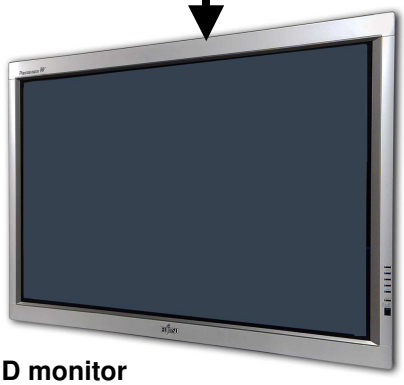
ThirdEye-SDI can be connected to an HDMI monitor via our **SDI digital video recorder** (which also converts the SDI signal into an HDMI signal)

or
if you want to connect more than one monitor or video projector, the camera signal can be distributed by using an ***HDMI distributor/amplifier*** (e.g. 1:4)

Maximum cable length of HDMI = 15m
The HDMI signal can be transmitted over longer distances by using an ***HDMI to CAT5/6 adapter***, via powerline or wireless (wireless HDMI)

seminar room

HDMI



full-HD monitor
HDMI-in

HDMI

full-HD video projector
HDMI-in

surgery room

ThirdEye-SDI
zoom & auto focus

camera cable
SDI/audio/power

please check length
of camera cable
from camera to dvr ?

HDMI

preview monitor in surgery room
with HDMI-in

ThirdEye-SDI digital video recorder

USB2.0 out

laptop or office desktop computer
(Windows/Mac) with USB2.0

ThirdEye-SDI can be connected to an HDMI monitor via our **SDI digital video recorder** (which also converts the SDI signal into an HDMI signal)

and at the same time

you can connect the camera to your office computer or any laptop with USB2.0 interface to **record directly to your computer hard disk** (using any video capture/editing software like VLC, Xsplit...)
or using the **media interface** of your dental office software.

CE

Declaration of Conformity

The manufacturer /importer

Dr. Benno Raddatz
Verlag Neue Medien
Rheinstr. 29
76448 Durmersheim
Germany

hereby declares, that the product

ThirdEye^{SDI} **camera**

is in conformity with the protection requirements of the following EC Council Directives

89/336/EEC EMC directive
Elektromagnetic compatibility
73/23/EEC LVS directive
Low voltage safety

based upon compliance of the product with the following harmonized norms/standards:

EN 50081-1:1992
EN 50082-1:1997
EN 55022:1998
EN 55024:1998
EN 60950:2000

Manufacturer/Importer

Durmersheim, 01/01/2019 Dr. Benno Raddatz, C.E.O.