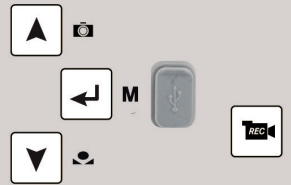


**TK** **TEKNO**<sup>®</sup> CAM HD NIR  
GERMANY



STANDBY



**TK** **TEKNO**<sup>®</sup> LIGHT NIR  
GERMANY



STANDBY



100 %



**VISO** **NIR**

# VISO NIR

*Discover the impressive world of fluorescence imaging with the multifunctional system VISO NIR. ICG (Indocyanine Green) combined with light at wavelengths in Near Infrared (NIR) opens up new possibilities and perspectives in the modern medicine. Perfect visualization of visceral perfusion, precise lymph node detection or the superior exposure of biliary anatomy are only a few advantages of this technology.*

*For maximum flexibility, the Camera Control Unit (CCU) for Near-Infrared Fluorescence Imaging (NIR FI) is available in 4K UHD or Full HD. Both camera types can be equipped with the specified camera head for NIR FI, which allows to work in GREEN, CONTRAST or INTENSITY MODE.*

*At any time the standard white light mode is available and can be activated via one button at the camera head. For image and video capture the cameras are equipped with a USB port at the front.*

*A powerful laser light source in combination with special light guides guarantees a perfect illumination in the detailed field of fluorescence imaging.*

*Optimized endoscopes for ICG complete the range of VISO NIR.*



## VISO NIR IMAGING SYSTEM



### VISO NIR

4K / UHD

tk 754-4000NIR\*

Camera Control Unit with capture

Centerpiece of a high-end 4K UHD endoscopic camera system and for NIR FI applications with NIR FI products.

#### **NIR FI – Near-infrared fluorescence imaging**

*NIR FI green mode: visualization of the NIR fluorescence signal as overlay onto a gray scaled white light image for high-contrast visualization of targeted tissue structures*

*NIR FI contrast mode: visualization of the pure NIR fluorescence signal indicated by the color white and all other areas of the image appear dark for maximum contrast*

*NIR FI intensity mode: visualization of the NIR fluorescence signal intensity indicated by a multi-color scale*  
*Picture out of Picture mode (PoP); displays images next to each other*

#### **NIR FI Light source control**

- Activation of NIR laser for best possible excitation for NIR fluorescence imaging
- Fully automatic light control through MIS-Bus interface

#### **Outstanding performance**

4K UHD imaging (3840 x 2160, 50 / 60p)  
BT2020, large 4K UHD color space

#### **Integrated photo capture and video recording on external storage media via USB**

#### **Video algorithms for white light imaging**

Color Shift, Selective Color Enhancement, Smoke Reduction, Grid Removal

#### **Multi-connectivity**

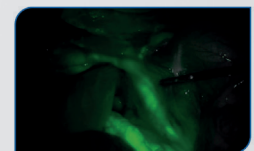
NIR FI: camera head NIR FI full HD zoom  
4K UHD: camera head 4K UHD zoom  
Full HD: camera head full HD zoom, full HD fix focal length, full HD 90° angled

#### **Footswitch**

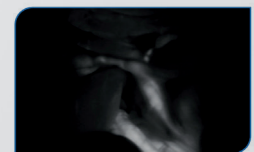
Control camera functionality

Fluorescence imaging only in combination with following products: NIR FI Camera Head Full HD Zoom, NIR FI Laparoscope 10 mm, 0° or 30°, NIR FI Light Source and NIR FI Light Guide

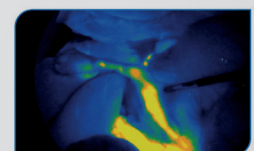
\* see order and REF numbers on page 15



NIR FI GREEN MODE



NIR FI CONTRAST MODE



NIR FI INTENSITY MODE

## VISO NIR IMAGING SYSTEM

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Fluorescence imaging modes	NIR FI Green(Green fluorescence signal overlaid onto grayscale white light image) NIR FI Contrast(White fluorescence signal with black background) NIR FI Intensity(Multicolored fluorescence signal overlaid onto grayscale white light image)
Operation control panel	On-Off, menu, white balance, photo, video
Video outputs 4K UHD Video outputs Full HD	1 x 4K / UHD 3840 x 2160p (4x 3G-SDI) 2 x 3G-SDI, 2 x DVI
Interfaces	1 x MIS-BUS 2 x Remote IN (e.g., foot control switch) 2 x Remote OUT (e. g., recorder, printer) 2 x USB (e. g., image / video capture – front, keyboard – back)
Dimensions	295 x 129.5 x 355 mm (W x H x D)
Weight	Approx. 7 kg
Standard compliance	IEC 60601-1
Electromagnetic compatibility	EC / EN 60601-1-2
Directive compliance	CE-mark
Supply voltage	100 - 240 V ~ 50 / 60 Hz
Power consumption	1.2 - 0.5 A
Degree of protection	IP 21
Protection class acc. to IEC 60601-1	Protection class 1
Classification within the meaning of applicable EU guidelines	Class 1, medical device
Classification as per IEC / CISPR 11	Group 1, Class A

## VISO NIR IMAGING SYSTEM



### VISO NIR

Full HD	tk 754-4001NIR*
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Camera Control Unit with capture

Centerpiece of a Full HD endoscopic camera system and for NIR FI applications with NIR FI products .

#### **NIR FI – Near-infrared fluorescence imaging**

*NIR FI green mode: visualization of the NIR fluorescence signal as overlay onto a gray scaled white light image for high-contrast visualization of targeted tissue structures*

*NIR FI contrast mode: visualization of the pure NIR fluorescence signal indicated by the color white and all other areas of the image appear dark for maximum contrast*

*NIR FI intensity mode: visualization of the NIR fluorescence signal intensity indicated by a multi-color scale Picture out of Picture mode (PoP); displays images next to each other*

*NIR FI Light source control*

*- Activation of NIR laser for best possible excitation for NIR fluorescence imaging*

*- Fully automatic light control through MIS-Bus interface*

#### **Outstanding performance**

*Latest sensor technology*

*Edge enhancement, automatic gain control, dynamic contrast function*

#### **Integrated photo capture and video recording on external storage media via USB**

#### **Video algorithms for white light imaging**

*Color Shift, Selective Color Enhancement, Smoke Reduction, Grid Removal*

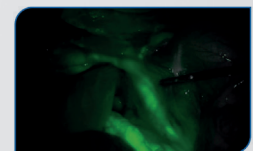
#### **Multi-connectivity**

*NIR FI: camera head NIR FI full HD zoom*

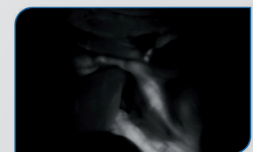
*Full HD: camera heads full HD 3CMOS zoom, full HD zoom, full HD fix focal length, full HD 90° angled*

#### **Footswitch**

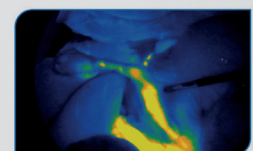
*Control camera functionality*



NIR FI GREEN MODE



NIR FI CONTRAST MODE



NIR FI INTENSITY MODE

Fluorescence imaging only in combination with following products: NIR FI Camera Head Full HD Zoom, NIR FI Laparoscope 10 mm, 0° or 30°, NIR FI Light Source and NIR FI Light Guide

\* see order and REF numbers on page 15



## VISO NIR IMAGING SYSTEM

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Fluorescence imaging modes	NIR FI Green(Green fluorescence signal overlaid onto grayscale white light image) NIR FI Contrast(White fluorescence signal with black background) NIR FI Intensity(Multicolored fluorescence signal overlaid onto grayscale white light image)
Operation control panel	On-Off, menu, white balance, photo, video
Video outputs HD	2 x 3G-SDI, 2 x DVI
Interfaces	1x MIS-BUS 2 x Remote IN (e.g., foot control switch) 2 x Remote OUT (e. g., recorder, printer) 2 x USB (e. g., image / video capture – front, keyboard – back)
Dimensions	295 x 100 x 355 mm (W x H x D)
Weight	Approx. 5.7 kg
Standard compliance	IEC 60601-1
Electromagnetic compatibility	IEC / EN 60601-1-2
Directive compliance	CE-mark
Supply voltage	100 - 240 V ~ 50 / 60 Hz
Power consumption	0.8 - 0.4 A
Degree of protection	IP 21
Protection class acc. to IEC 60601-1	Protection class 1
Classification within the meaning of applicable EU	Class 1 medical device
Classification as per IEC / CISPR 11	Group 1, Class A

## VISO NIR IMAGING SYSTEM

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### VISO NIR FULL HD CAMERAHEAD

1 CMOS

tk 754-4010NIR\*

*incl. Zoom Adapter*

*Exceptionally ergonomic Full HD zoom camera head for NIR FI applications with NIR FI products.*

#### **NIR FI – Near-infrared fluorescence imaging**

*Sensitive in the visible and near-infrared spectrum to intraoperatively detect NIR fluorescence with indocyanine green*

*Powerful sensor with improved NIR sensitivity*

*Switch to NIR FI imaging modes by single press of a button*

*Suitable for white light imaging without any limitations*

#### **Outstanding performance**

*Full HD sensor resolution*

*Integrated lens for optimal use in laparoscopy*

*2 x optical zoom / 3 x digital zoom*

*Lockable endoscope connection*

#### **Individually programmable and illuminated function buttons**

#### **Time saving and useful presets**

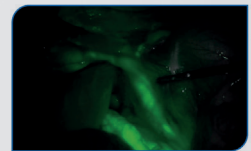
*Optimized application settings by using button presets to switch in / between picture modes*

#### **Low temperature sterilization**

*Sterrad 100NX / NX / 100s*

*STERIS V-PRO®, V-PRO® 1, V-PRO® 1 Plus, V-PRO® maX, V-PRO® maX 2, V-PRO® 60, V-PRO® s2*

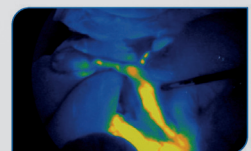
*Compatible to NIR FI CCU 4K UHD and NIR FI CCU Full HD*



NIR FI GREEN MODE



NIR FI CONTRAST MODE



NIR FI INTENSITY MODE

*Fluorescence imaging only in combination with following products: NIR FI Camera Head Full HD Zoom, NIR FI Laparoscope 10 mm, 0° or 30°, NIR FI Light Source and NIR FI Light Guide*

*\* see order and REF numbers on page 15*

## VISO NIR IMAGING SYSTEM

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Image sensor	1/3" CMOS, progressive scan
Sensor resolution	1920 x 1080, 50 / 60p
Optical transmission	Visible and near-infrared spectrum
Function buttons	3 individually programmable and illuminated buttons
Endocoupler	For standard ocular, lockable
Parfocal zoom	f = 14.25 - 28 mm
Protection type	IP X7
Applied part as per IEC 60601-1	Type CF, defibrillation-proof
Standard compliance	IEC 60601-1
Electromagnetic compatibility	IEC / EN 60601-1-2
Directive compliance	CE-mark
Classification within the meaning of applicable EU guidelines	Class 1 medical device
Waterproof connection plug	Yes
Length camera cable	3.5 m
Weight camera head (without cable)	330 g



## VISO NIR IMAGING SYSTEM



VISO NIR 4K/UHD Camera



VISO NIR FULL HD Camera



TEKNO VISO N101 -  
NIR ZOOM-CAMERAHEAD

**tk 754-4010NIR\***

**tk 754-4010NIR\***

Following camera heads are compatible to above mentioned cameras, but only for use in white light mode and not for ICG/NIR



TEKNO VISO 401 - 4K/UHD ZOOM-CAMERAHEAD

**tk 754-4011\***

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TEKNO VISO 301 - 3CMOS FULL HD ZOOM-  
CAMERAHEAD

-

**tk 754-4012\***



TEKNO VISO 101 - 1CMOS FULL HD  
ZOOM-CAMERAHEAD

**tk 754-4013\***

**tk 754-4013\***



TEKNO VISO 191 - FULL HD CAMERAHEAD 90°  
ANGLED

**tk 754-4014\***

**tk 754-4014\***

Fluorescence imaging only in combination with following products: NIR FI Camera Head Full HD Zoom, NIR FI Laparoscope 10 mm, 0° or 30°, NIR FI Light Source and NIR FI Light Guide

\* see order and REF numbers on page 15

## VISO NIR IMAGING SYSTEM



VISO NIR LASER LIGHT SOURCE

Automatic | tk754-4002NIR\*



VISO NIR LASER LIGHT GUIDE

4.8mm x 3000mm | tk39570-30NIR\*

**NIR FI LED light source** with NIR laser for optimal ICG excitation and with high color rendering index (CRI) for white light operation.

**NIR FI – Near-infrared fluorescence imaging**

805 nm NIR laser for optimal ICG excitation

**Outstanding light quality with CRI > 90 for best color rendering**

**LCD display showing luminance level and status information**

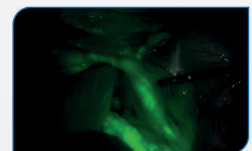
**Very silent device only producing 25 dB (typical) of noise, virtually inaudible**

**Fully automatic light control by NIR and VISO cameras through MIS-Bus interface**

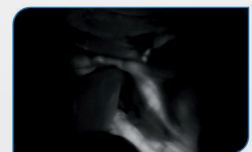
**NIR FI light guide**

Specified equipment for NIR laser activation

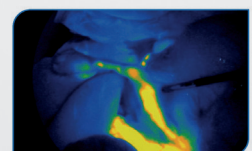
Class 3R laser output at distal end



NIR FI GREEN MODE



NIR FI CONTRAST MODE



NIR FI INTENSITY MODE

Fluorescence imaging only in combination with following products: NIR FI Camera Head Full HD Zoom, NIR FI Laparoscope 10 mm, 0° or 30°, NIR FI Light Source and NIR FI Light Guide

\* see order and REF numbers on page 15

## VISO NIR IMAGING SYSTEM

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### NIR FI LIGHT SOURCE

Illumination type	High power white LED
Color Rendering Index	CRI Ra > 90
Color temperature	5.600 K
Luminous flux	1.420 lm
Lifetime of the illuminant	> 30.000 h
<b>LASER OPERATION</b>	
Laser wavelength	805 nm (NIR)
Maximum laser output	77 mW
Laser aperture for NIR radiation emission	Light guide end and endoscope tip
Laser Class as per IEC60825-1	Class 3R (light guide end) Class 1M (endoscope tip)

### LIGHT SOURCE IN GENERAL

Operation control panel	LCD Display with illuminated buttons
Standard compliance	IEC 60601-1
Electromagnetic compatibility	IEC/EN 60601-1-2
Directive compliance	CE mark
Dimensions	295 x 130 x 355 mm (W x H x D)
Weight	8 kg
Supply voltage	100 - 240 V ~ 50 / 60 Hz
Power consumption	1.6 - 0.6 A
Degree of protection	IP 21
Protection class acc. to IEC 60601-1	Protection class 1
Classification within the meaning of applicable EU	Class 1 medical device
Classification as per IEC / CISPR 11	Group 1, Class A
Applied part as per IEC 60601-1	Type CF defibrillation-proof

### NIR FI LIGHT GUIDE

Length	3.000 mm
Active diameter	4.8 mm
Classification within the meaning of applicable EU	Class 1 medical device
Applied part as per IEC 60601-1	CF

## VISO NIR IMAGING SYSTEM



### VISO NIR ENDOSCOPES

0°, Ø 10.0mm, 344mm	tk 700-400NIR*
30°, Ø 10.0mm, 344mm	tk 700-403NIR*

*Especially designed laparoscopes for NIR FI applications.*

#### **NIR FI – Near-infrared fluorescence imaging**

*Notch Filter at 805 nm*

*AR coating for optimal NIR transmission*

*Class 1M laser output at distal end in combination with VISO NIR FI SYSTEM*

#### **Optical system based on the FlexiLux 4 UHD Laparoscopes featuring:**

*High depth of field*

*Sharp images to the edges*

*High-contrast image*

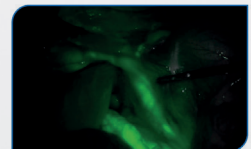
#### **Furthermore the laparoscopes feature:**

*Homogenous illumination in the entire image area*

*Strain free fastened illumination fibers*

*Gold soldering of the plan glass which increases tightness and durability*

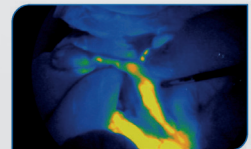
*Low cost of ownership due to long life cycle*



NIR FI GREEN MODE



NIR FI CONTRAST MODE



NIR FI INTENSITY MODE

*Fluorescence imaging only in combination with following products: NIR FI Camera Head Full HD Zoom, NIR FI Laparoscope 10 mm, 0° or 30°, NIR FI Light Source and NIR FI Light Guide*

*\* see order and REF numbers on page 15*

## VISO NIR IMAGING SYSTEM

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WORKING Ø	WORKING Length	DIRECTION OF VIEW	FIELD OF VIEW
10 mm	344 mm	0°	wide angle
10 mm	344 mm	30°	wide angle

### TECHNICAL DATA

Standard compliance	IEC / EN 60601-1 IEC / EN 60601-1-2 IEC / EN 60601-1-2-18 IEC / EN 60825-01
Directive compliance	CE-mark
Notch filter	805 nm

*Delphi study about the influence of ICG in fluorescence guide surgeries (FGS)*

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FGS ARE **SAFE**  
AND **EFFECTIVE**

*Fluorescence Guides Surgeries (FGS)*  
**significantly enhances** patient outcomes

FGS SHOULD  
BE **ROUTINE**  
**PRACTICE**

*FGS will **dramatically** alter the way*  
*surgeries are performed in the future*

FGS **REDUCE**  
**PATIENT RISKS**  
DURING SURGERIES

*Indocyanine Green (ICG) is the **most***  
***effective** visualization tool used in FGS*

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**95% of surgeons surveyed believe visualization of anatomical structures and blood flow is a major benefit when using Fluorescence Imaging**

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*Source: „Consensus Conference Statement on the General use of Near Infrared Fluorescence Imaging and Indocyanine Green Guided Surgery: Results of a modified Delphi Study“ published in Annals of Surgery*

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## VISO NIR IMAGING SYSTEM

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*TEKNO ORDER NUMBERS REFER TO FOLLOWING SCHÖLLY REF. NUMBERS:*

*TEKNO VISO NIR 4K/UHD CCU tk754-4000NIR ≅ REF. NO. 95-3985, TEKNO VISO NIR FULL HD CCU tk754-4001NIR ≅ REF. NO. 95-3981, TEKNO VISO N101 - NIR ZOOM-CAMERAHEAD tk754-4010NIR ≅ REF. NO. 95-3908, TEKNO VISO NIR LASER LIGHT SOURCE tk754-4002NIR ≅ REF. NO. 05-0761NIR, NIR LIGHT GUIDE CABLE, 4.8MM D., 3000MM tk39570-30NIR ≅ REF. NO. 05-0094L-NIR, LAPAROSCOPE 10MM D., 0°, 344MM, NIR tk700-400NIR ≅ REF. NO. 11-0131NIR, LAPAROSCOPE 10MM D., 30°, 344MM, NIR tk700-403NIR ≅ REF. NO. 11-0143NIR, TEKNO VISO 401 - 4K/UHD ZOOM-CAMERAHEAD tk754-4011 ≅ REF. NO. 95-3905, TEKNO VISO 301 - 3CMOS FULL HD ZOOM-CAMERAHEAD tk754-4012 ≅ REF. NO. 95-3906, TEKNO VISO 101 - 1CMOS FULL HD ZOOM-CAMERAHEAD tk754-4013 ≅ REF. NO. 95-3901, TEKNO VISO 191 - FULL HD CAMERAHEAD 90° ANGLED tk754-4014 ≅ REF. NO. 95-3903*

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**TEKNO-MEDICAL** Optik-Chirurgie GmbH  
Sattlerstrasse 11 - 78532 Tuttlingen, Germany - [www.tekno-medical.com](http://www.tekno-medical.com)  
Phone +49 (74 61) 17 01-0 - Fax +49 (74 61) 17 01-50 - [mail@tekno-medical.com](mailto:mail@tekno-medical.com)

TEKNO VISO NIR products are exclusively manufactured for TEKNO-MEDICAL by  
SCHÖLLY FIBEROPTIC GMBH, Robert-Bosch-Str. 1-3, 79211 Denzlingen / Germany

END-FL0001



**TEKNO-MEDICAL** Optik-Chirurgie GmbH  
Sattlerstrasse 11 - 78532 Tuttlingen, Germany - [www.tekno-medical.com](http://www.tekno-medical.com)  
Phone +49 (74 61) 17 01-0 - Fax +49 (74 61) 17 01-50 - [mail@tekno-medical.com](mailto:mail@tekno-medical.com)