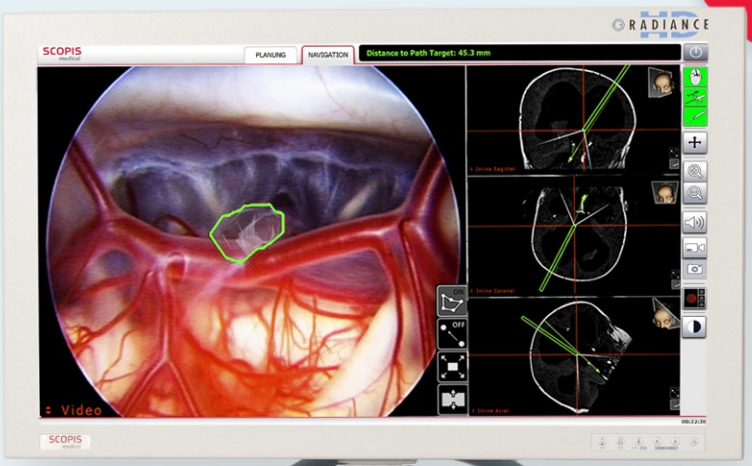
SCOPIS medical

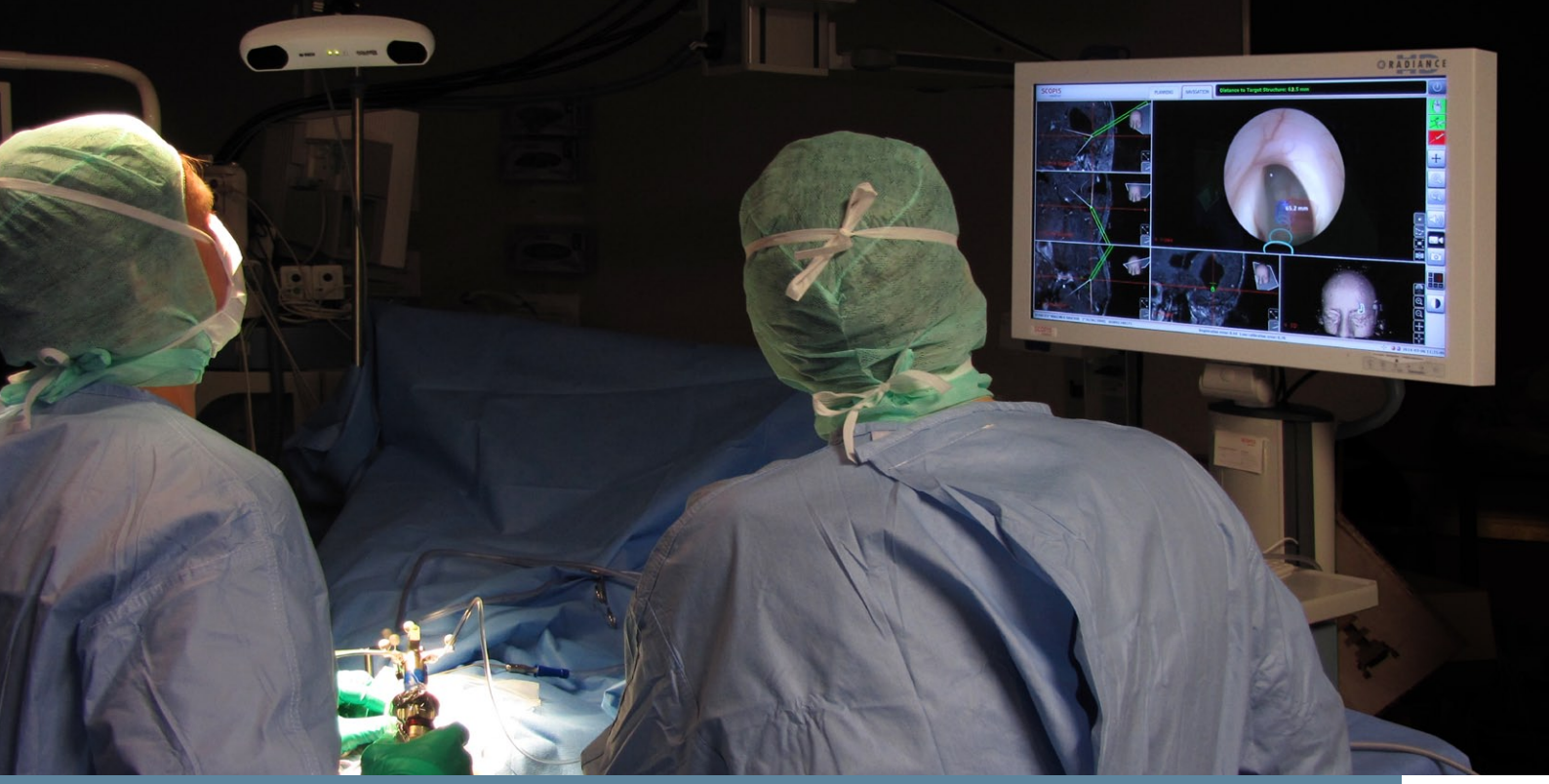
Scopis® Hybrid Navigation with Augmented Reality

Intelligent Navigation Systems for Cranial Surgery

Neurosurgery
ENT & CMF



www.scopis.com



Scopis® Hybrid Navigation

One System. Optical and electromagnetic measurement technology.

As the first interdisciplinary navigation platform Scopis® Hybrid Navigation unifies optical and electromagnetic measurement technologies in one system.

Scopis® Hybrid Navigation system enables surgeons to decide on the basis of indications which technology suits the particular procedure better and gives best possible support. It is possible to use both technologies during one procedure, simultaneously and seamlessly.

Both the optical and the electromagnetic technologies offer continuous endoscope navigation with "Augmented Reality". This makes Scopis technology information directly visible on the endoscopic image. A landing and alarm system (ILS) ensures safe and quick navigation to anatomic targets before and during surgery. Deviations from the target trajectory and approaches to critical anatomic structures are signaled acoustically and visually.

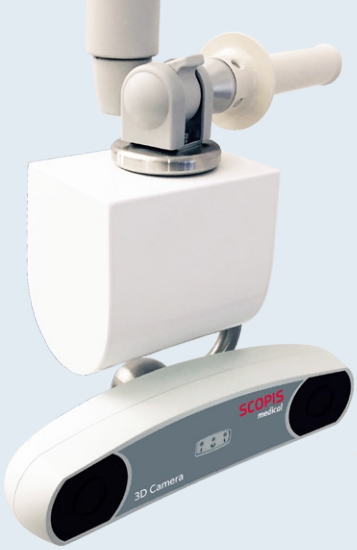
Compared to conventional navigation systems, Scopis Hybrid Navigation with Augmented Reality offers new concepts and solutions for existing clinical problems.

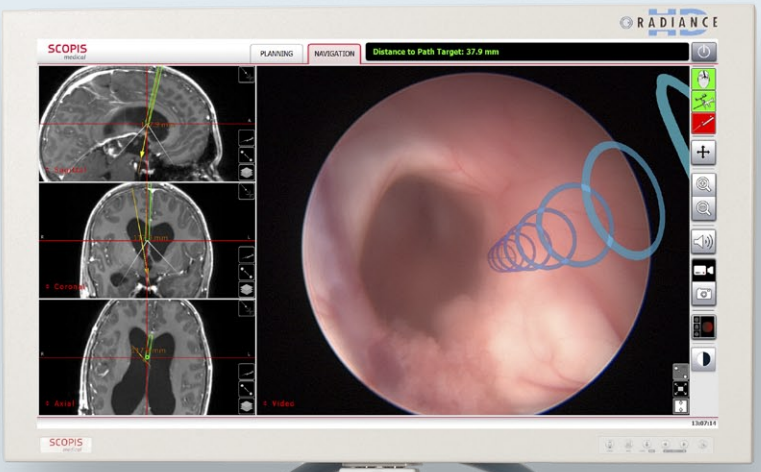
Combination of optical and electromagnetic measurement technology

Switch technology as needed during surgery

Interdisciplinary use in cranial neurosurgery, spinal surgery, ENT, CMF

Augmented Reality function visualizes planning data on top of the endoscope image





Compact

Due to its compact design, the system can be integrated into all common towers and is therefore ready for use at any time even in confined spaces.

Compatible

Whether connecting to existing equipment or evaluating radiological data – the system is equipped for all fields of application.

Intuitive

The software is easy to use and enables to operate the system safely and comfortably even to novice users. The flexible electromagnetic instruments offer the best possible handling for rapid interventions.

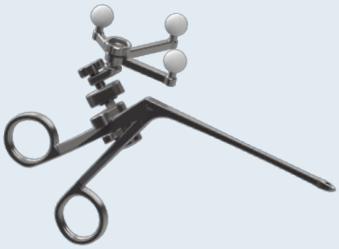
Innovative

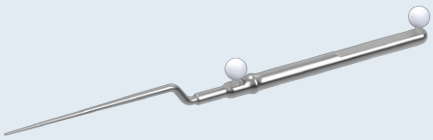
NOVA Augmented Reality (AR) provides supportive graphic overlays on the real endoscopic images. In addition, patented instrument clamps and adapters allow to navigate existing instruments and endoscopes.

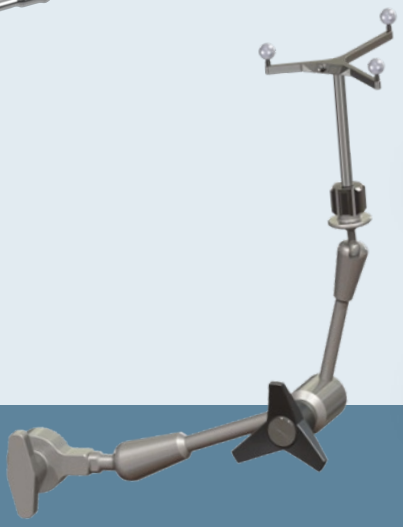
Safe

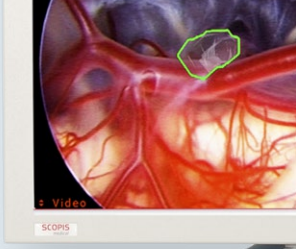
Continuous recording using videos and screenshots provides ideal support for documentation.

Scopis® Hybrid Navigation



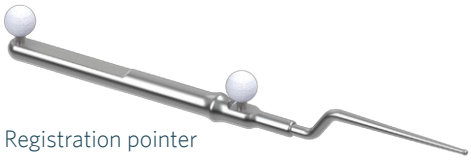




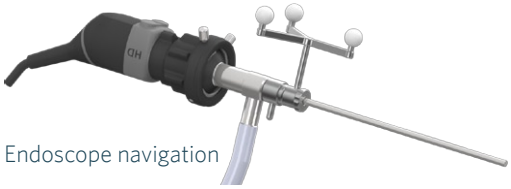


Optical Tracking

Highest precision. Large measurement range. Universal adapter system.



Registration pointer



Endoscope navigation

Biopsy guide with needle

Universal adapter system for conventional instruments

Highest precision

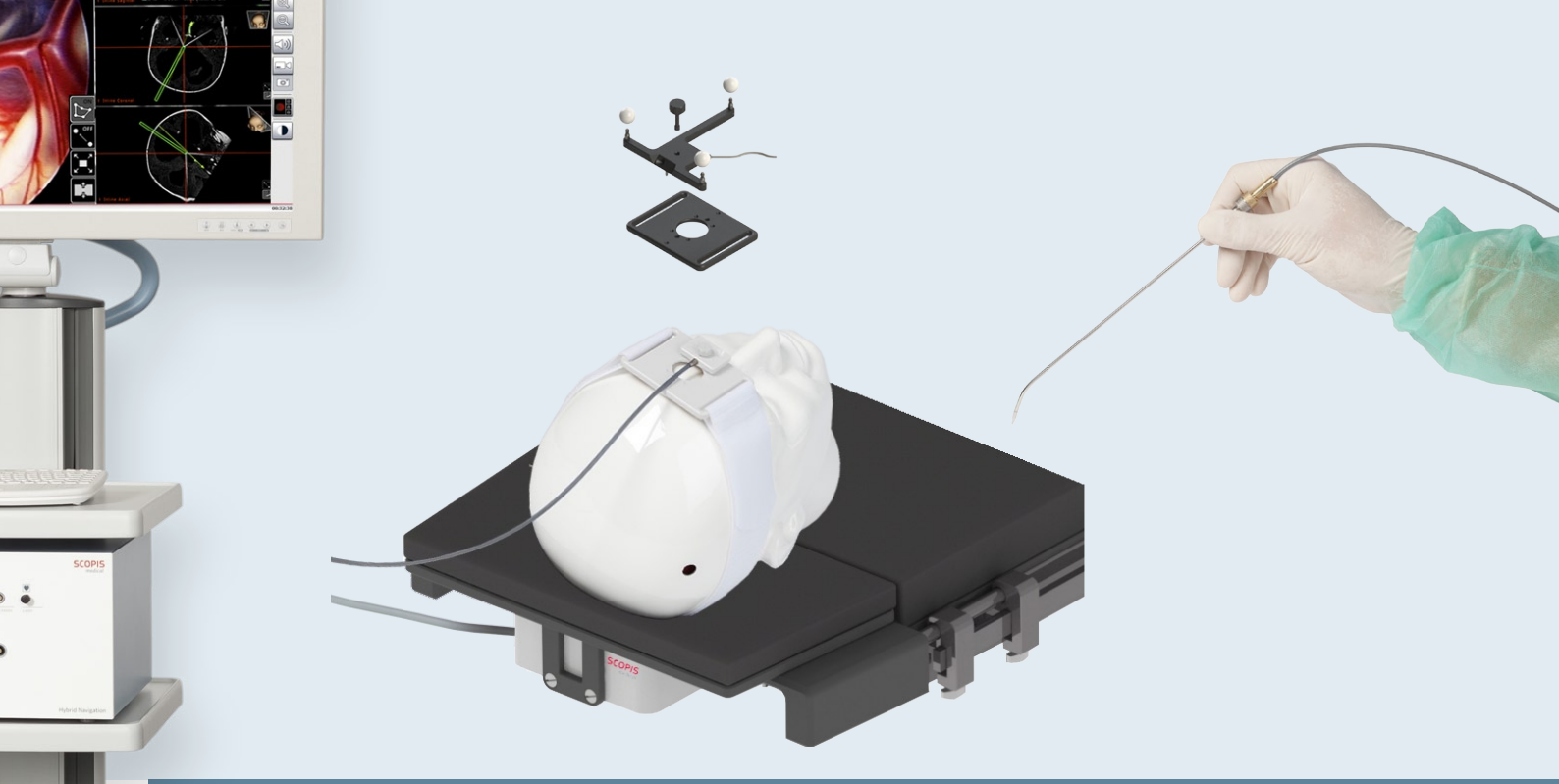
Based on the market-leading technology the optical tracking offers the highest precision of measurement in the range of 0.3 to 0.5 mm and keeps costs for consumables low.

Large measurement range

The optical tracking is characterized by its large range of measurement which makes it possible to position the camera at a distance of up to two meters. As a result the placement becomes flexible for all cranial interventions and work methods such as endoscopy and microscopy. When setting up surgeries the optical tracking system is easy to integrate and manage.

Universal adapter system

Optical trackers can be attached to conventional instruments by means of special fixtures. Existing instruments such as suction tubes, chisels or Blakesley forcepses can therefore be used comfortably for navigation. The patented adapter system is not only suitable for passive instruments but also for active ones such as shavers and drills.



Electromagnetic Tracking

Easy to use. Flexible instruments. Intuitive workflow.

Easy to use

The slim design of the instruments offers complete freedom of action and allows to reach any cavity in area of surgery. As a result of the integration of the field generator into the headrest the electromagnetic tracking system is never in the way of the surgeon.

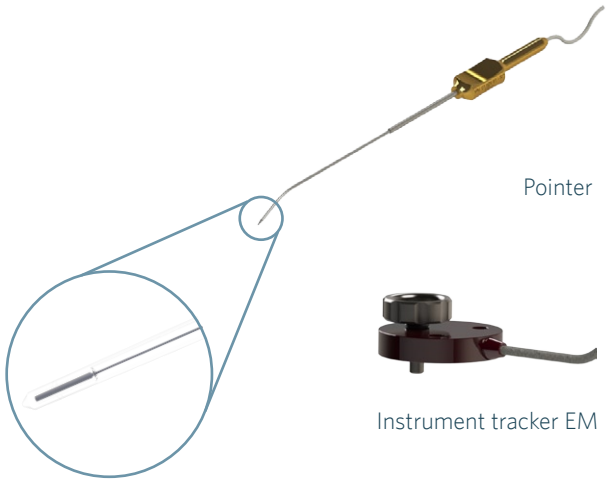
Flexible instruments

The electromagnetic instruments are made of highly flexible material with high-precision sensors in the tip to bend them into shape as required. Therefore it is possible to cover a wide range of operational scenarios with an economical number of instruments.

Intuitive workflow

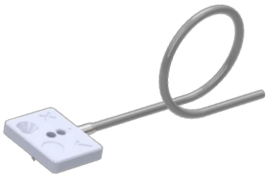
The number of preparatory and operational steps has been consistently reduced to a minimum and represents the best possible solution for use in surgery at short notice. The system is operational in less than 5 minutes, ideal for urgent applications.

Navigated suction tube



Pointer

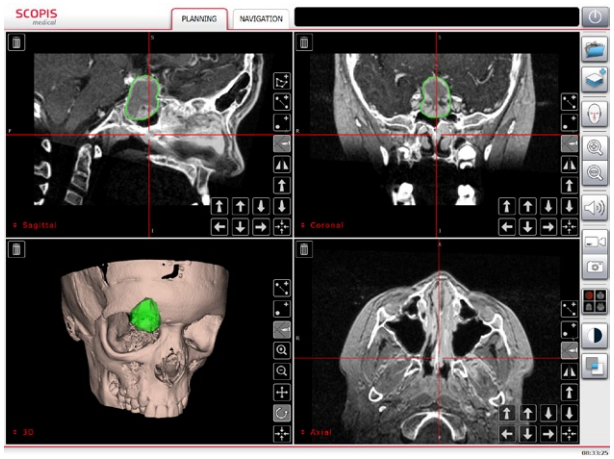
Instrument tracker EM



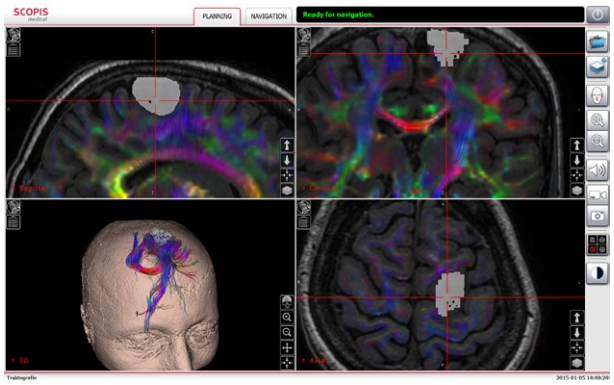
Patient tracker EM

Planning Station and Augmented Reality

Future-proof. Innovative.



Tumor segmentation (3D)



Visualization of Diffusion Tensors

For more challenging surgeries or also for training purposes it is sensible to be able to plan the intervention before the surgery. The Scopis external planning software enables you to do so outside the operating theater at any work station.

By means of a network connection to radiology or other departments it is possible to access PACS.

In addition to simply setting planning points and trajectories, a wide range of planning functions is available particularly for use in neurosurgery.

Scopis navigation software supports advanced cranial planning functions such as diffusion tensor imaging with fiber tracking, functional neuro imaging (fMRI) and tumor segmentation.

With the unique segmentation tool, tumors can be marked and measured quickly and easily.

Scopis planning software NOVA PLAN in use

With the Augmented Reality (AR) software module, Scopis exclusively offers the possibility to overlay marked anatomical structures directly on the endoscopic image during surgery.

Both individual points and 3D objects (e.g. tumors) can be marked. In addition, surgical approaches can be defined as planning trajectories.

The orientation in the situs is facilitated by overlaying additional information onto the endoscopic image, which also increases safety.

The extensive recording options not only take account of documentation requirements but can also be used for training and qualification purposes.

After successful planning, data can be easily exported to the navigation system via network and USB.

- Navigation in the endoscopic image
- Distance display and alarm functions
- Various documentation options
- Videos and screenshots in HD 1080
- Extensive planning functions
- Rapid segmentation
- Up to 8 parallel fusion items
- Export of implant templates

NOVA PLAN external planning station

Optimized Clinical Workflow

Fast. Flexible. Intuitive.

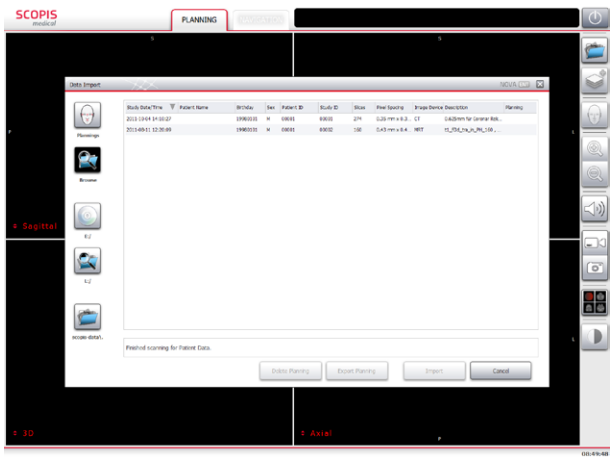
- Support of current storage media (CD, DVD, USB)
- Network connection
- Import of data in less than 60s
- Automatic selection of usable data
- Three types of registration
- Patient registration in less than 90s
- Sterile and unsterile workflow

In order to avoid disruption of efficient workflow in the operating theater the shortest possible preparation time for the use of navigation is essential.

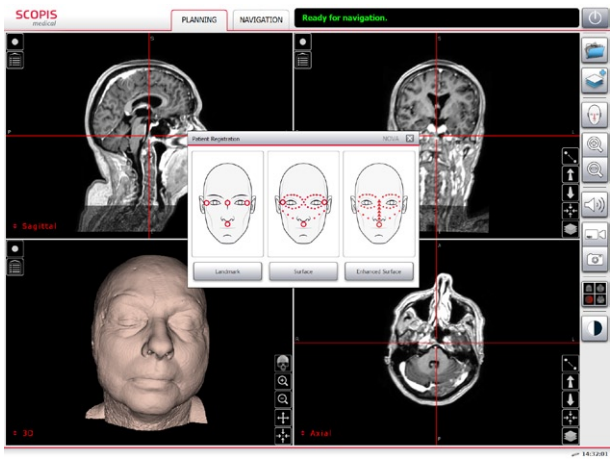
From import of data, preparation of the patient and instruments to patient registration as little time should elapse as possible.

Scopis Hybrid Navigation ensures this through intelligent algorithms, intuitive operation and simple handling.

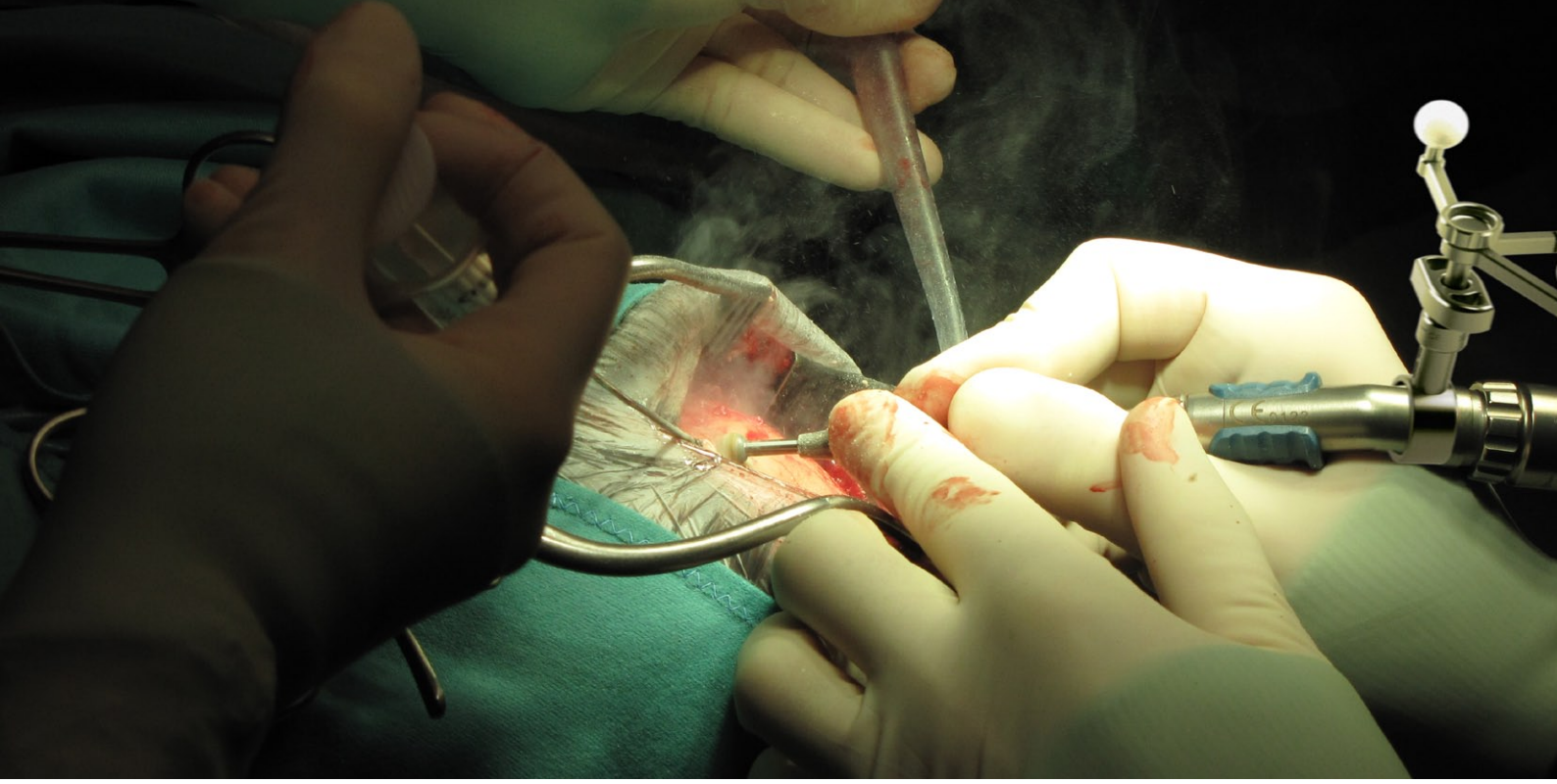
Workflow in 4 steps



1 Loading image data



2 Selecting registration type and planning



Navigated active instruments with Scopis universal adapters

With the unique combination of both technologies in one device you can now decide during the surgery whether you want to navigate optically or electromagnetically. A switch between the two procedures is also possible during the operation with no effort.

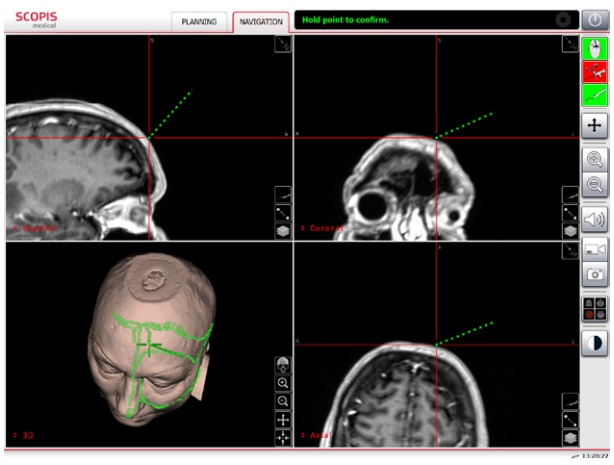
With the new Scopis Hybrid generation, there is no need to commit to one technology at the time of purchase. The advantages of both systems are available in one device.

Optical tracking

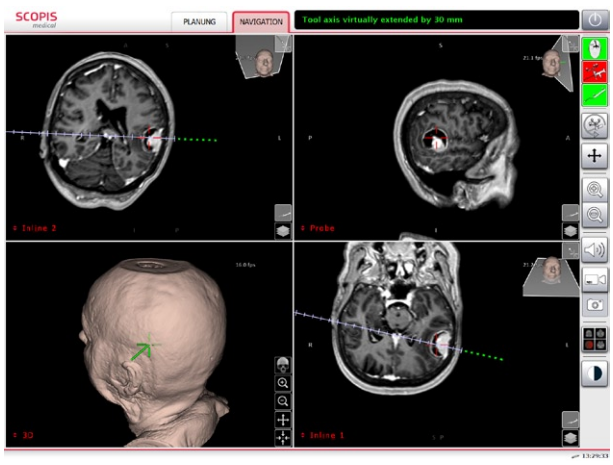
Highest precision
Special endoscope tracker
Navigation of active instruments

Electromagnetic tracking

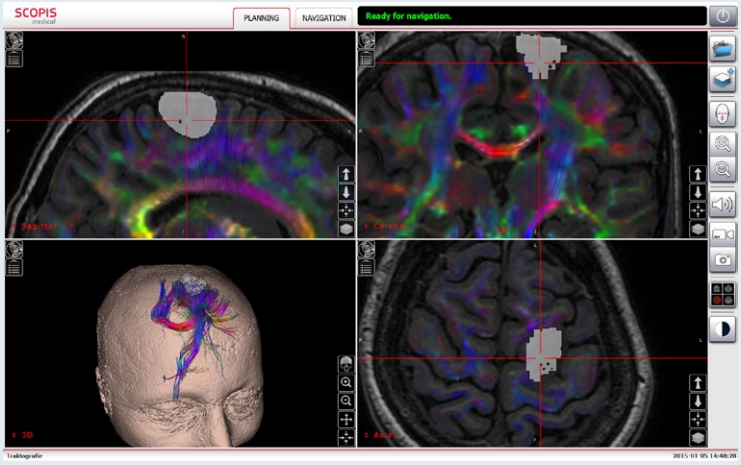
Simple handling
Flexible instruments
Rapid deployment



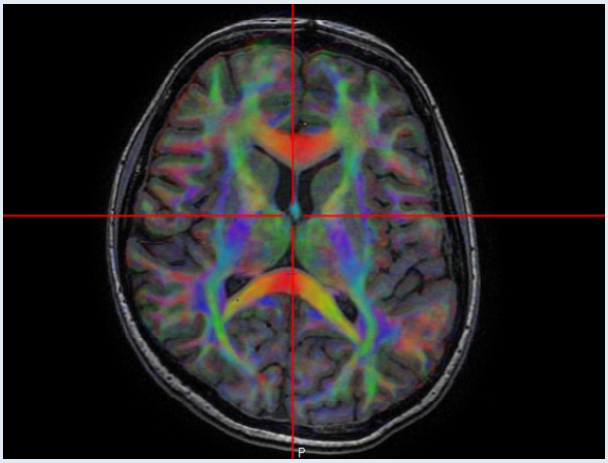
3 Performing patient registration



4 Navigation



Advanced Image Fusion - Fibers around tumor



Diffusion main directions represented by colors merged with CT image data.

Diffusion Tensor Imaging & Advanced Image Fusion

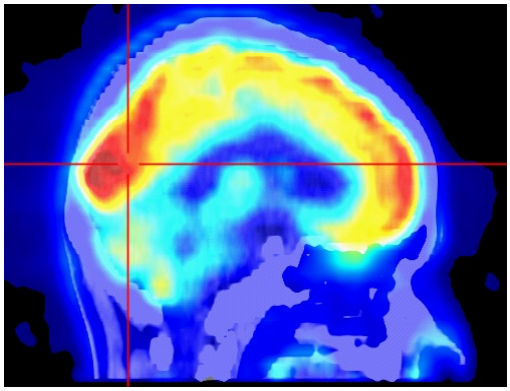
Color MR Integration for Scopis® Hybrid Navigation

- Automatic fusion
- Up to 8 parallel fusion items
- Flexible color palette
- Active region segmentation
- Automatic DWI to DTI conversion
- Advanced tractography extension
- Highly interactive fiber mapping
- Target region planning
- Fiber brush and fiber tracing
- Path intersection

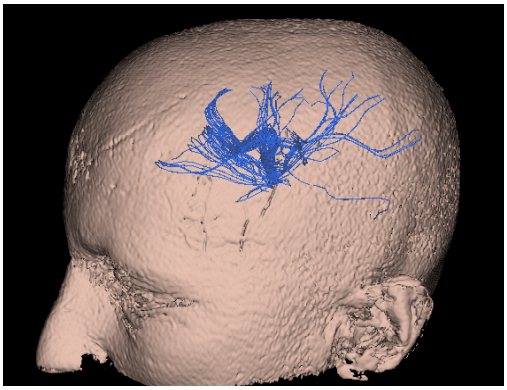
The Scopis NOVA software supports merging image data from fMRI, PET-CT, SPECT and precomputed fiber tracks directly into the patient's 3D model.

This makes planning more precise and extends the surgeon's unterstanding of patient anatomy even further.

Functional neuroimaging combined with Augmented Reality makes complicated cranial structures accessible and lead to better surgical results.



PET and SPECT imaga data shows areas of high metabolic activitiy which can indicate tumors.



Tractographic reconstruction of neural connections merged with 3D model

Navigated Ultrasound

Intra-operative ultrasound for optical and electromagnetic navigation

Scopis Navigated Ultrasound upgrades any Scopis Navigation System to take advantage of intra-operative ultrasound imaging.

The Scopis Navigated Ultrasound is fully integrated into the navigation workflow for needle guidance, 3D reconstruction, measuring functions and Scopis Augmented Reality.

The navigation without preoperative images is available.

Both optical and electromagnetic navigation can be used for a wide range of ultrasound probes.

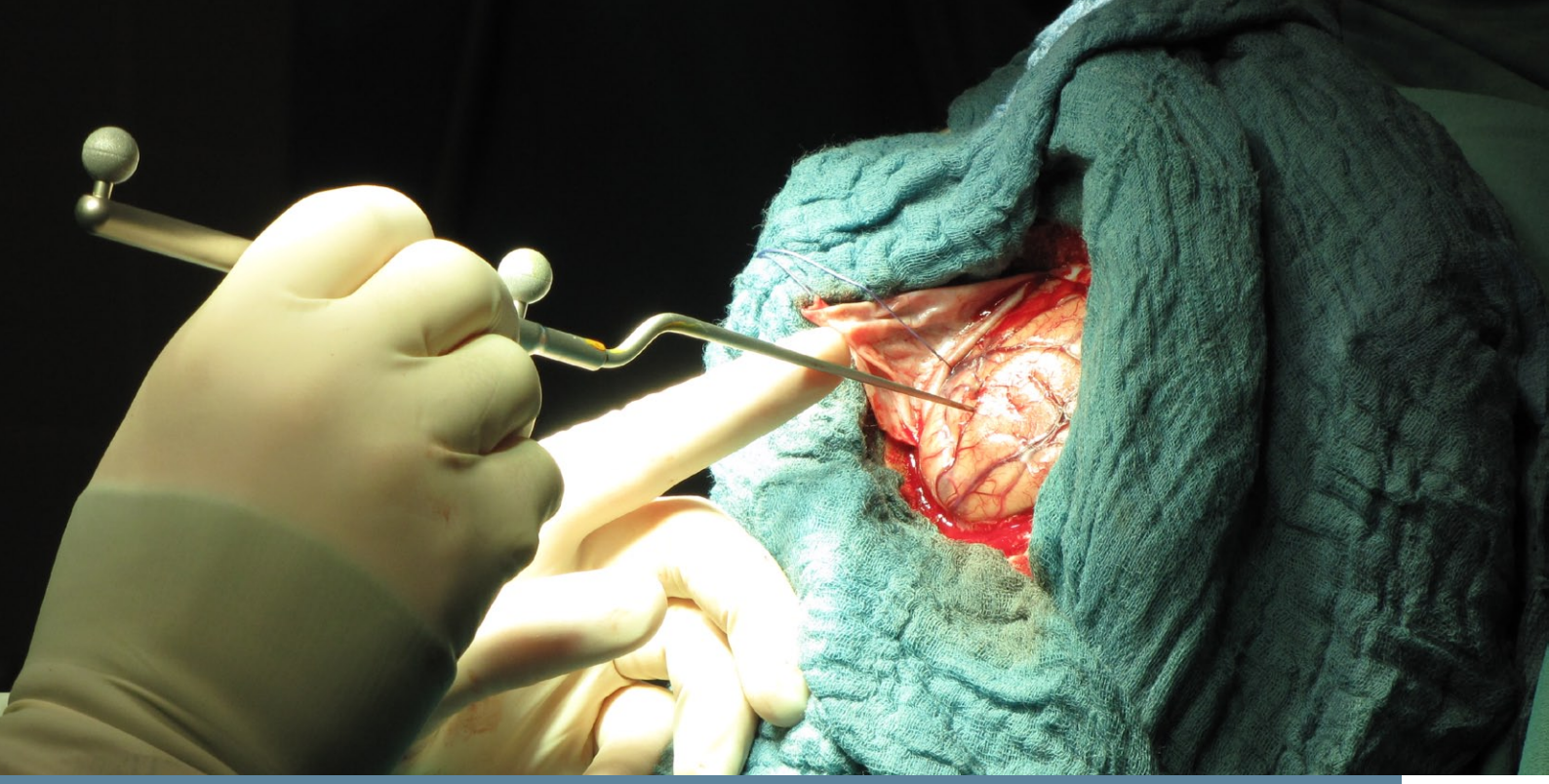
- High quality, real-time beamformer
- 8 image enhancement modes
- Doppler and B-Mode
- 3D reconstruction
- Fusion CT/Ultrasound
- EM and optical navigation
- Linear, convex, phased array
- Overlaid with CT and MRI scans
- Measuring functions

Linear probe 40 mm

Convex probe 60 mm

Phased Array 90°

Scopis® Ultrasound Module



Biopsy Guide

Allows high precision alignment of compatible biopsy needles.

For neurosurgical applications

Allows high precision alignment of compatible biopsy needles

Attachment to star-bust connectors

2 hinges for flexible positioning

2 hinges for extra precision

Frameless biopsy option

The Scopis Biopsy Guide supports the accurate guide of Navigated biopsy needles in neurosurgery.

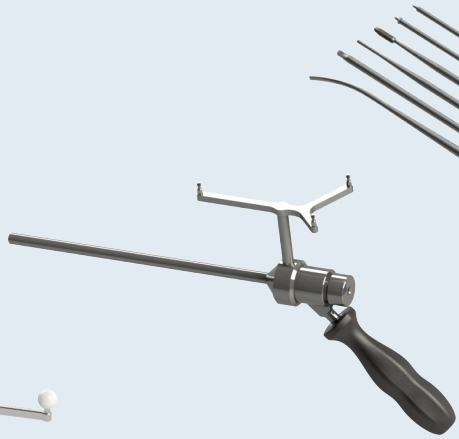
The flexible arm of the Biopsy Guide is rigidly connected with the Mayfield clamp and following this, the alignment of the guide on the target is navigated and fixed.

The product is an accessory for clinical navigation systems of the Scopis Navigation Systems series.

Navigated Biopsy Guide

Navigated Biopsy Guide with needle

Spine clamp radiopaque with patient tracker and Spine pointer



Navigated drill guide

Scopis® Basic Spine Instruments

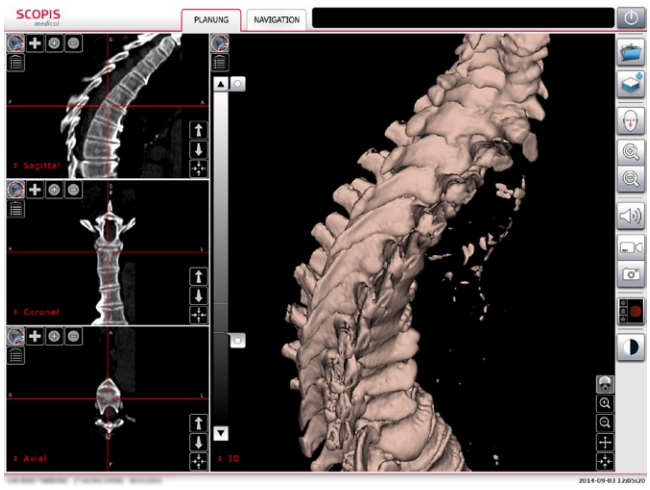
Navigated Spinal Instruments

For cervical, thoraric and lumbar spinal procedures and posterior stabilization.

Scopis Navigated Spinal Instruments upgrade any Scopis Navigation system for use in spinal neurosurgery and orthopedic spinal procedures.

Scopis Navigated Spinal Instruments combine a wide range of navigated instruments such as taps, awls, probes, drills and screwdrivers with Scopis innovations such as Hybrid Navigation and Augmented Reality.

- Extension module Spinal Surgery
- For placement of particle screws
- Percutaneous and open spine
- Color coded trackers
- Modular bits and handle system
- Instrument clamps available
- Precalibrated awls, probes, taps
- Screw driver and drill guide



Scopis® Navigation software NOVA Spinal

Scopis® Basic Spine Instrument Set

Navigated Microscopy Interface

Augmented Reality. Focus point navigation. Image Injection.

For NOVA with compatible microscope

Carl Zeiss Pentero, Vario S88, NC4, Möller-Wedel HiR-1000/700, Leica M500N

Enables Augmented Reality Injection

video navigation, video Augmented Reality

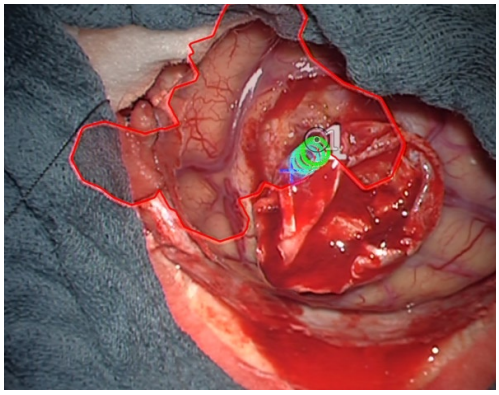
Focus tracking and focus navigation

Just in time manufacturing: allow 10 weeks for delivery

The navigated microscopy interface enables the insertion of planning data directly into the microscopy image.

This enables first class Augmented Reality for compatible microscope with navigation interface such as Carl Zeiss Pentero, Vario S88, NC4, Möller-Wedel HiR-1000/700, Leica.

The functionality varies based on type of microscope.



Navigated Microscope Augmented Reality

Navigated Microscope tracker

Integration into the Operating Theatre

Various ways of integration provide flexibility where it is needed most.

Scopis provides several integration options that give the opportunity to find the optimal way to place the Navigation System in the OT.

The position sensor can be placed above the monitor which results in a very compact system.

A classic stand with integrated cord wrap can be easily set up and operated with one hand.

With our motorized 3D camera mount combined with a ceiling mounted arm full flexibility is realized through self adjusting of the position sensor.

Ceiling mounting system

Motorized 3D camera mount
- Self adjusting
- Highest degrees of freedom

Height adjustable camera stand
- One handed operation

3D camera monitor integration

Scopis® 3D camera monitor integration

Scopis® motorized 3D camera mount

Scopis GmbH
Heinrich-Heine-Platz 10
10179 Berlin
Germany

Tel: +49 (30) 201 69 38 0
Fax: +49 (30) 201 69 38 20

info@scopis.com
www.scopis.com