

Optical Measurement Products and Services for the Medical Industry

## Atracsys: High Precision, Speed and Quality



High speed, Low Latency

Sub-millimetric Accuracy

High Resolution

Open Systems

Simultaneous Hybrid Tracking

Swiss Made Quality

Highly Customisable

# Our Tracking Devices

Atracsys off-the-shelf tracking device portfolio includes the fusionTrack family and the spryTrack.

## fusionTrack family

**Real-time** high-speed 335 Hz<sup>(1)</sup> and low latency 4 ms

**High-precision** 90 µm RMS up to 2 m<sup>(1)</sup>

**Ethernet connection** for both data and power (PoE+)

**Open system** complete access to images and data

**Active and passive markers** tracked simultaneously

(1) fusionTrack 500



## spryTrack

**Compact & Mobile** slightly longer than a pencil

**Sub-millimetric precision** 130 µm RMS up to 1 m

**Bluetooth direct link to a tablet** (iOS, Win, Android)

**USB 3.0 type C** complete access to images and data

**Active and passive markers** tracked simultaneously

## Accessories

Atracsys proposes a vast choice of passive and active markers designed and manufactured using the best available materials. Superior manufacturing ensures higher tip precision for the instrument, probe or tool. Multiple fixing points, clamps and other accessories make it easy to fix the markers to specific tools or instruments. Passive and active markers are available both disposable and reusable. Passive markers are available in carbon and titanium. Selected models can be sterilized in an autoclave, are medically certified and bio-compatible. Active markers are either available in a wireless version (polymer, stainless steel) or wired version (medically compatible polymer).

**Passive markers with reflective spheres** - Atracsys proposes 5 different high-quality markers with unique geometries, a calibration marker, and several accessories (clamps, probe, sterilization basket). The geometry of our markers is pre-integrated into the provided SDK, so no configuration is required to use them.

**Passive markers with reflective disks** - Thanks to Atracsys Navex patented technology, build your own passive markers with disposable reflective disks. It takes just minutes to integrate them into your application using the SDK marker calibration application.

**Active wireless/wired markers with IR-LEDs** - With no additional hardware, the device can track wireless or wired active markers. The wireless marker development kits enable custom built wireless active markers that perfectly fit your requirements.



# Our Customised Solutions

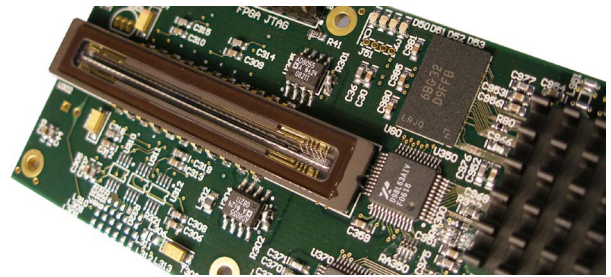
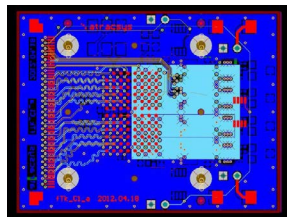
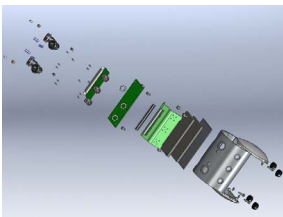
Atracsys provides engineering, consulting and integration services.

Atracsys is your development partner for demanding embedded systems. With a wide knowledge in electronics, FPGA, optics, mechanics, high- and low- level software programming, we turn your project into a finished product.

Atracsys can cover all phases in your project flow:

- Feasibility study and fundamental research
- Product specifications
- Hardware / electronics development
- Embedded software development
- Mechanical / optical design
- Product preparation for mass production
- Extensive testing
- Certifications

With the same level of quality, reliability and robustness, our experienced engineers develop customer-specific hardware and software (precision level, acquisition speed, working volume, extensions).



Some custom development examples:

## Wireless markers for image guided surgery

Electronic development of proprietary high-speed wide range IR communication. Implementation in low-power electronics using 8-bit assembler programmed micro-controllers.

## Measurement system for railway track lining and leveling

FPGA based optical triangulation system using high-speed linear CCD.

## Obstacle detection system for mobile robotics

CMOS imager and line-laser based obstacle detection system with real-time processing in FPGA. Gigabit Ethernet communication.

# Atracsys Know-How

## Electronics

- Design of analog, digital and mixed signals circuits
- PCB schematics and routing
- Multilayer PCB, Flex-Rigid, Microvias
- High-speed signaling (signal integrity, controlled impedance)
- USB 3.1, Gigabit Ethernet, I2C, 1-Wire, SPI, LVDS, IR, RS232/485, Bluetooth ...

## Embedded software

- Assembler on 8..32-bit micro-controllers
- FPGA with softcore
- SoC with ARM embedded Linux
- 8051

## Simulation

- Matlab
- Finite elements

## Certification

- EMC, Electrical safety
- CE
- FDA

## Mechanics

- 3D development and modeling
- Thermal sensitive design
- Tooling, extrusion, molding, sheet metal manufacturing by network partners in Switzerland and abroad
- Rapid-prototyping
- Industrial design partner network

## PC software

- C, C++, C#, Assembler
- WPF, DirectX, OpenGL, Qt
- Windows, Linux, Real-time OS
- Direct scripting interface for control and debugging of embedded systems

## Industrialization

- Prototyping
- Small production
- Manufacturing transfer
- Quality insurance

## Project management

- R&D
- Feasibility studies
- Design, development
- Manufacturing

## FPGA

- Real-time applications on FPGAs
- VHDL
- Qsys Avalon-bus based processing blocks
- Massive parallelism for high-speed image processing
- Simulation

## Optics

- Zemax
- Geometrical calibration of optical measurement systems
- Temperature-compensation calibration
- Triangulation

## Quality management

- ISO 9001
- ISO 13485

# About us

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Atracsys is a Swiss based global engineering and manufacturing company providing cutting edge optical tracking technology to the medical industry. The company is organized in two main activities:

- Product manufacturing of either off-the-shelf or customised tracking solutions
- Engineering services including consulting and integration support

Atracsys solutions combine utmost measurement accuracy, speed and reliability. Atracsys technology is entirely designed, engineered, manufactured and verified in Switzerland and follows the ISO 13485 medical quality system.

Atracsys aims at continuously helping surgeons all around the world to guide their instruments with sub-millimetric precision for better patient outcomes.

## Our history

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- 2004** Atracsys was established in 2004, capitalizing years of research at the Swiss Federal Institute of Technology in Lausanne (EPFL). Its name is an acronym for Advanced Tracking Systems, and that's what Atracsys started out with: developing high-precision optical measurement solutions for medical surgery.
- 2007** Atracsys launched in 2007 the accuTrack, its first medically certified product which is currently used on a day-to-day basis for implant placement.
- 2008** Atracsys developed its first passive tracking system: the infiniTrack. It enables integrator to have access to low-level information and data in order to offer more security and ergonomics compared to existing tracking system.
- 2010** Atracsys has successfully developed an optical measurement system in the mobile robotics industry for Kiva systems, now belonging to Amazon. Almost 50'000 of these sensors are produced every year.
- 2015** Atracsys launched the fusionTrack 250 and fusionTrack 500 tracking systems. This last generation of tracking systems is dedicated to Robotics Assisted Surgery RAS applications as well as Computer Assisted Surgery CAS applications requiring more flexibility and/or high precision.
- 2017** Atracsys launched the spryTrack 180 compact tracking system, ideally suited for surgeons needing a mobile and compact solution.

## Our office

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