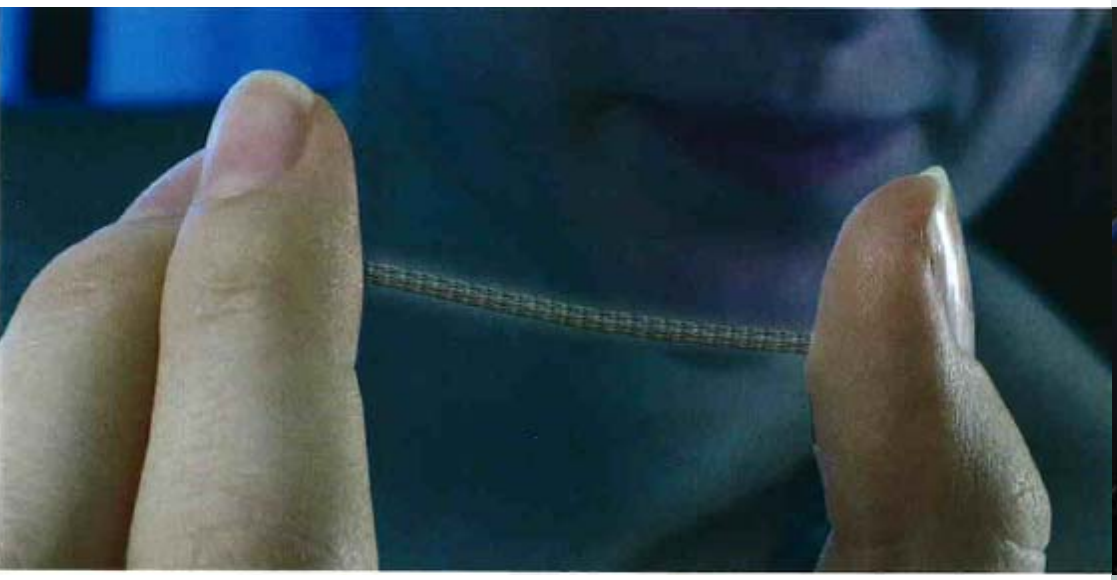
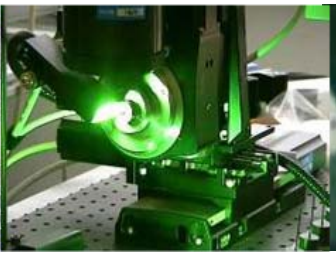
# StentIntegrity

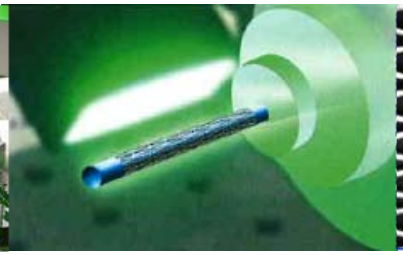


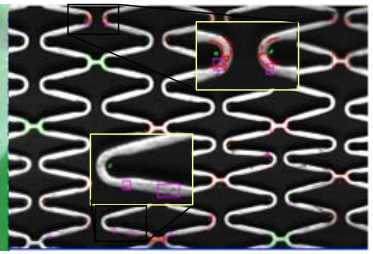
## automated & safe
## Stent Inspection

CTR
CARINTHIAN TECH RESEARCH

# **Catching defects** such as sharp edges, mouse bites, inconsistent laser cuts or polishing errors







CTR introduces a novel system for the **automated stent quality inspection** – StentIntegrity. It can automatically detect several classes of clinically significant and cosmetic defects such as boundary, geometrical as well as morphological defects within short inspection times. StentIntegrity offers a PC-based, easy to use user interface where the stent and its errors are being displayed and stored with a stent identity for validation or quality related documentation. The system can be applied to a variety of different stents since it offers an easy parameterization interface.

## Key Features

- Stent dimensions:
  length up to 2 cm
  diameter 1,6 … 1,8 mm
  other diameters on request
- Smallest detectable defect: 3 µm
- Inspection time: ~ 40 sec.
- Display of stent image
- Display of defects classification
- Stent image data storage
- Easy to use teach-in & parameterization interface

## Core Components

- Multi-axis system consisting of
  > 3D translational transport and
  > 1D rotational transport
  for different stent type
- Line-Scan Image Processing
- PC based analysis and User Interface

## Technical Specifications

| | |
|---|---|
| Dimensions: | 81x47x58 cm (HxWxD) |
| Power Supply: | 230 VAC, 50/60 Hz |

## Insection Principle

The heart of the StentIntegrity System is a high-resolution line-scan camera. In contrast to a conventional area camera it records only a line rather than a two-dimensional image of an object in one frame. For getting the whole image of an object either the camera has to be moved or the object itself while the camera continuously takes pictures of object lines. The lines can be combined to the full image of an object surface in a computer.

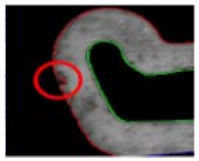
In this way a a flat, unrolled view of the stent can be generated while rotating the stent. Therefore the stent is fixed on a stent holder of a multi-axes scan mechanics system which rotates the stent while the camera is recording the stent line-by-line.

Additionally, to account for a variety of different stent dimensions the stent can be aligned with respect to the camera by a 3D translational transport system.

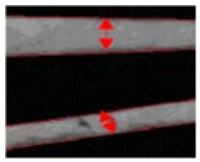
The result of this scanning process is a highly detailed picture of the stent which is then processed by a set of image processing algorithms to detect several kinds of defects of the structure or surface in comparison to definable references. A few seconds after the scanning has finished the stent image is displayed on a computer monitor along with the detected defects.

## Stent Defects

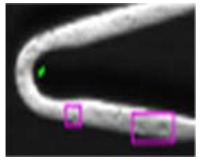
The following defect classes can be detected with the StentIntegrity system:



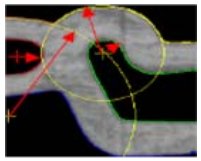
Boundary defect (mouse bit)



Boundary defect (width)



Morphological defects (polishing failures)



Geometrical defect

### Boundary defects

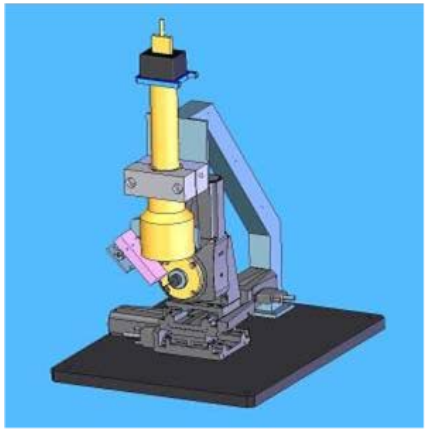
Boundary defects are associated with the boundary or edges of the stent structure. They are divided into local (dimensions < 1mm) and global (dimensions > 1mm) defects. The dimension threshold is adjustable. Typical boundary defects are “mouse bits” or insufficient width of the stent wire.

### Morphological defects

Morphological defects are connected to the surface of the stent structure. Polishing errors laser burning and scratches on the structure surface are typical morphological defects.

### Geometrical errors

Geometrical errors refer to irregularities in the stent structure compared to reference structures such as for instance non-nominal distances of centers of curvatures.



## Customization

The system is adjustable to particular customer needs. Reference structures can be taught in and the inspection parameters can be adjusted.

Further developments for 3D-scanning as well as quality control of pharmaceutical coatings using Spectral Imaging technology or fluorescence spectroscopy are possible.

Please contact us for details.

*CTR has several years of experience in the development of optical inspection systems and photonic microsystems.*

*Ask for your customized StentIntegrity solution!*

# StentIntegrity

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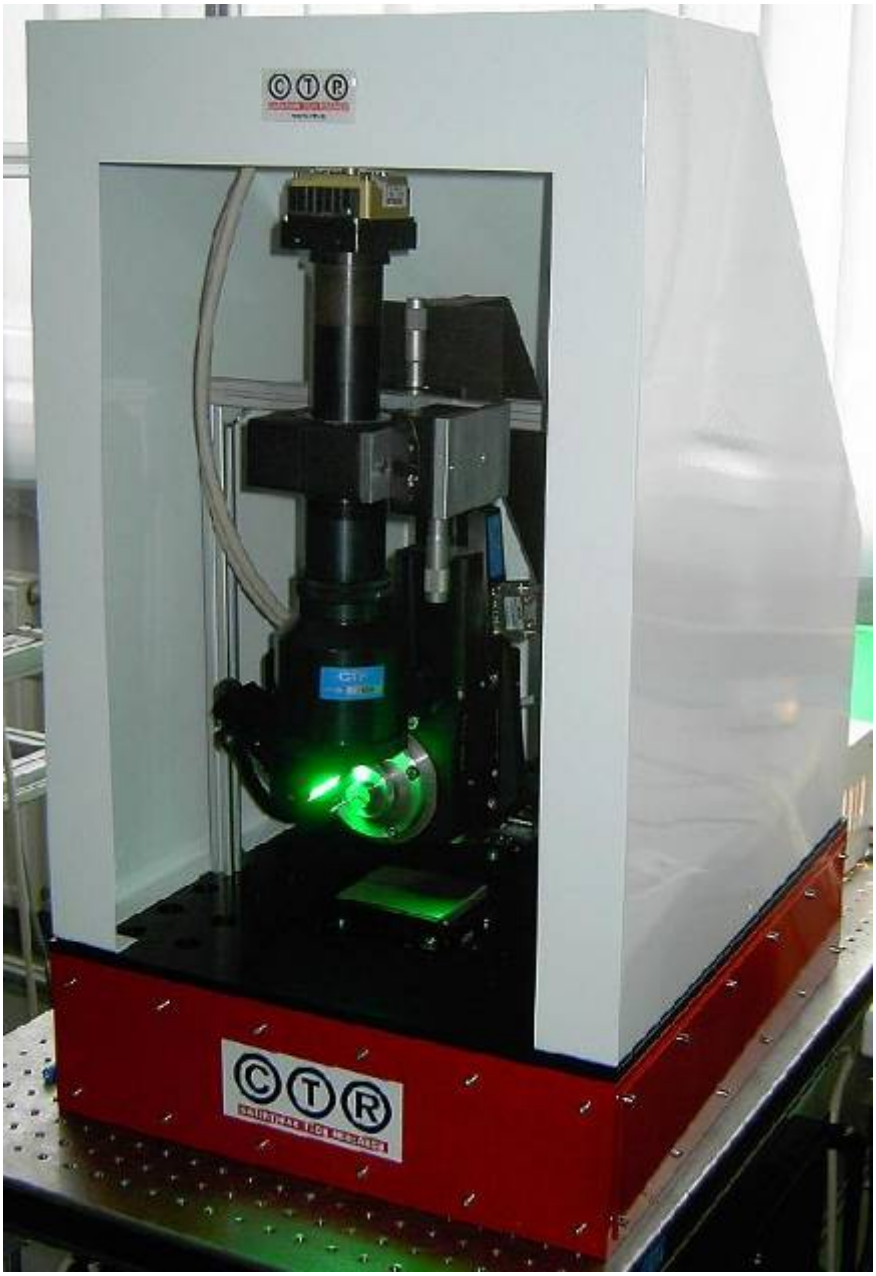

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