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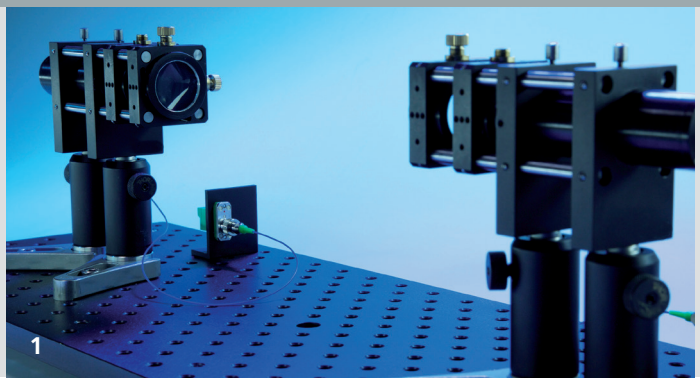


TeraTec
Application Center for Terahertz Technology

# FIBER-COUPLED TERAHERTZ SYSTEM

1 *FFiber-coupled terahertz modules: transmitter and receiver unit*

2 *Supply unit*

The terahertz frequency range opens up new possibilities for non-destructive and contact-free testing of non-metallic materials. Due to its comparatively low energy, terahertz (THz) radiation – unlike, for example, UV radiation or X-rays – causes no changes in the chemical structure of the materials to be tested. Terahertz radiation is non-ionizing and thus harmless to humans. No special radiation protection is necessary.

## The benefits

- Compact system for mobile application
- Robust and long-term stable construction
- Quick and simple switching between transmission and reflection configuration
- Simple integration into existing measuring systems via flexible fiber and cable connection
- Length of connecting cables freely selectable up to 15 m
- No special laser protection measures necessary due to complete fiber-coupling
- Operator-friendly user interface of the control software

## Our offer

- Comprehensive consultation
- Test measurements on existing systems
- Individual design of measurement modules and peripherals according to customer preferences
- Equipment rental
- Translational and rotational axes for surface scanning of samples including software integration optionally available

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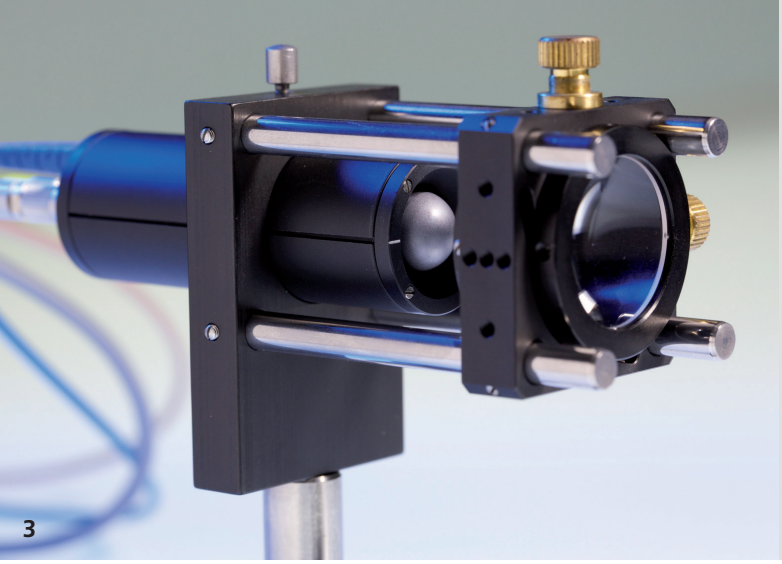

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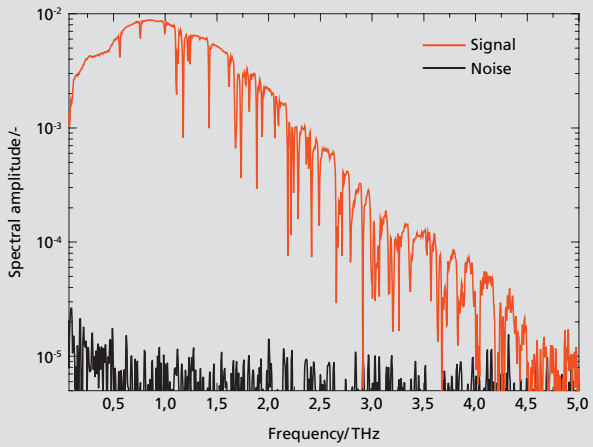


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**3** *Terahertz antenna module*

**4** *Spectrum of the fiber-coupled terahertz-system at:*
- *Measuring time: 200 ms*
- *Measuring rate: 5 measurements per second*
- *Scan range: 100 ps*
- *Configuration: transmission measurement with two parabolic mirrors*

## System specifications

- Pump wavelength: 1 550 nm
- Repetition rate: 80 MHz
- Connecting cable length: 5 m (up to 15 m optional)
- Dynamic range: >60 dB at maximum
- Online operation: >40 measurements per second
- High-resolution measurements (sub 5 GHz frequency resolution)
- Transmission and reflection measurements

**Transmission and reflection unit (fig. 3):**
- Dimensions: Ø 25 x L 70 mm
- Weight: approx. 200 g

**Measuring module (fig. 2 + 4) :**
- Measuring in reflection
- Dimensions: W 75 x H 75 x D 220 mm
- Weight: approx. 1.3 kg

**Supply unit:**
- 19“ rack
- Dimensions: W 420 x H 500 x D 265 mm
- Weight: approx. 33 kg
- Uninterruptible power supply (optional)

## Applications

**Contact-free inspection:** Layer thickness measurement, foreign particles detection, moisture measurement, inspection of hidden structures, delamination, adhesive joints, detection of inhomogeneities, inspection of packed and unpacked items.

**Non-destructive materials characterization:** Degree of purity, analysis of mixtures, conformation, polymorphism, isomers, amorphous/crystalline distinction, determination of charge-carrier mobility and concentration in semiconductors.

## Materials selection

**Transparent materials,** which permit looking inside or through the material, include ceramics, polymers, composite materials such as GFRP, chemicals, paints and varnishes, adhesives, semiconductors, textiles, and paper.

**Reflective materials,** which only allow surface or applied-coatings inspection, are metals and electrically conductive materials such as CFRP.

**Crystalline substances** can be detected specifically.

**Polar liquids,** such as water, do absorb strongly, non-polar liquids like gasoline only absorb slightly.