



Open-frame spectrometer  
for industrial applications  
**TRISTAN OEM**

## TRISTAN OEM



### Open-frame spectrometer for industrial applications

The TRISTAN OEM is an open-frame spectrometer designed for integration into existing hardware environments.

TRISTAN OEM comes as a basic package, focusing on professional spectroscopy:

The fully-equipped optical cell with entry slit and the calibration at our facility can be upgraded with the accessories required for individual applications.



- 14x2048 Pixel back-thinned CCD sensor / high resolution InGaAs detectors
- Open-frame device with RISC processor
- Optional Ethernet port

#### Latest sensor technology

The TRISTAN OEM is available for both the UV-VIS wavelength range as well as the NIR spectral range. Depending on the desired configuration, the optical engine comes with a back-thinned CCD sensor with 14 x 2048 pixels or an InGaAs NIR detector with 256 or 512 pixels. Every TRISTAN OEM is equipped with the latest sensor technology. This makes TRISTAN OEM the best choice for future-oriented design in industrial applications requiring spectroscopic measurement.

#### Designed for stand-alone operation

The TRISTAN OEM is controlled via PC with either the TRIWin software or by any other Windows application that supports the MyInstrument drivers. The TRISTAN OEM is designed for industrial applications and comes with a solid open-frame instead of a complete housing. It automatically turns on when the power supply is connected. The intelligence is based on a 32 bit RISC processor and a 14 bit A/D converter. It handles measurement results directly onboard and transfers them to the PC using the integrated interfaces. Auto-exposure timing, temperature and time sensitive dark current compensation, noise reduction, amplitude correction ... all are done automatically within the spectrometer. Even the m-u-t exclusive algorithms for dynamic extension and averaging through add cycles are integrated into the onboard electronics. With its onboard intelligence TRISTAN OEM can send corrected measurements directly to any serial interface, USB port or Ethernet without the need of a PC controlling it all the time. This makes TRISTAN OEM the perfect tool for integration into existing hardware environments.

#### NIR-Version

In addition to the professional desktop solution, TRISTAN NIR is available as an open-frame spectrometer for OEM applications as well. This OEM version brings latest NIR-technology directly to the medical and biological research markets with all the advantages of serial production.



TRISTAN OEM NIR



Back-thinned CCD detector

## Options

### Customized optical engine

The performance of any spectrometer is determined by the combination of wavelength range, resolution and sensitivity. Off-the-shelf spectrometers are targeted to the most frequently requested configurations. To meet your specific requirements the optical engine of all our TRISTAN spectrometers with back-thinned CCD arrays can be configured within a wide variety of specifications.

Please ask your local sales representative for further details.

### Optional Ethernet port

One main feature of TRISTAN spectrometers is their stand-alone capability. With their onboard processing unit they can work on their own. This feature makes them the perfect device for remote measurements via LAN. With the Ethernet option TRISTAN can communicate with every PC in your LAN directly. The Ethernet port replaces the USB port in this design.

### 2nd Order Filter

Every dispersive element produces a signal in the desired direction, and it also produces a small reflection of this signal in the direction of higher wavelengths. This effect is called second order signal. For spectrometers with high bandwidth it is possible that such a second order signal might appear within the measured wavelength range. m-u-t offers second order filters to reduce this effect mounted directly on the surface of the detector.

## Accessories

m-u-t offers a wide range of accessories for your spectroscopic measurement setup. These accessories help you to perform optical measurements without being an expert for optical measurement at all.

### Illumia light sources

m-u-t has developed a series of ready-to-use light sources for the most common applications. They are designed for easy handling, equipped with SMA 905 connector and a shutter with additional external trigger control.

### Fiber optic cables

Quality fiber optic cables are an essential component of a spectroscopy toolbox.

m-u-t offers a whole range of fiber optic cables which are optimized for use in spectroscopy.

### Sample presentation

m-u-t offers integrating spheres, cuvettes & sample holder, dip probes and other equipment which is required to handle the light in your measuring setup.

For further information please consult the datasheet about accessories.



Light source Illumia VIS/NIR

### Content of delivery

- Spectrometer, fully configured
- Installed entrance slit
- Calibration protocol and data



TRISTAN OEM 200 - 1100 nm



TRISTAN OEM NIR 900 - 2200 nm

## Technical specifications

Specifications	UV/VIS/NIR	UV/VIS	UV	VIS/NIR	NIR	exNIR
Spectral range in nm	200 – 1100	200 - 800	200 - 500	500 - 1100	900 – 1700	1000 - 2200
Grating in l/mm	300	600	1200	600	150	100
Slit size (w x h) $\mu\text{m} \times \text{mm}$	10 x 3	40 x 3	40 x 3	40 x 3	25 x 3	50 x 3
Detector	back-thinned CCD				InGaAs	InGaAs
Pixel	14x 2048				512	256
Optical design	Asymmetrical Czerny-Turner					
Connection type	SMA 905					
Focal length (Input/Output)	50 mm, 80 mm				85 mm, 100 mm	

### Performance

Resolution, optical	2 nm	1 nm	0.5 nm	1 nm	5 nm	15 nm
Stray Light	0.1 %	0.1 %	0.15 %	0.15 %	0.8 %	0.8 %
Dark noise	1.15 %	1.15 %	1.15 %	1.15 %	0.03 %	0.03 %
S/N (Detector, only)	400:1	400:1	400:1	400:1	2000:1	2000:1
Corrected linearity	> 95 %	> 95 %	> 95 %	> 95 %	> 95 %	> 95 %
Wavelength Accuracy	0.1 nm	0.1 nm	0.1 nm	0.1 nm	1.5 nm	2 nm

### General

A/D Converter	14 bit					
Computer interfaces	USB, RS232					
Power supplies	12 V DC					
Onboard processor	32-bit RISC					
Dimensions (w x h x d)	145 x 47 x 240 mm (6 x 2 x 10 in)				145 x 95 x 240 mm (6 x 4 x 10 in)	
Weight	1.4 kg (3 lb)				2.0 kg (4 lb)	

### Part numbers

30-105225	TRISTAN OEM exUV-U-H	200 – 500 nm
30-104947	TRISTAN OEM exUV/VIS-U-H	200 – 800 nm
30-105426	TRISTAN OEM exUV/VIS/NIR-U-H	200 – 1100 nm
30-106057	TRISTAN OEM VIS/NIR-U-H	500 – 1100 nm
30-104686	TRISTAN OEM NIR-HR-U	900 – 1700 nm
30-104873	TRISTAN OEM exNIR-U	1000 – 2200 nm

