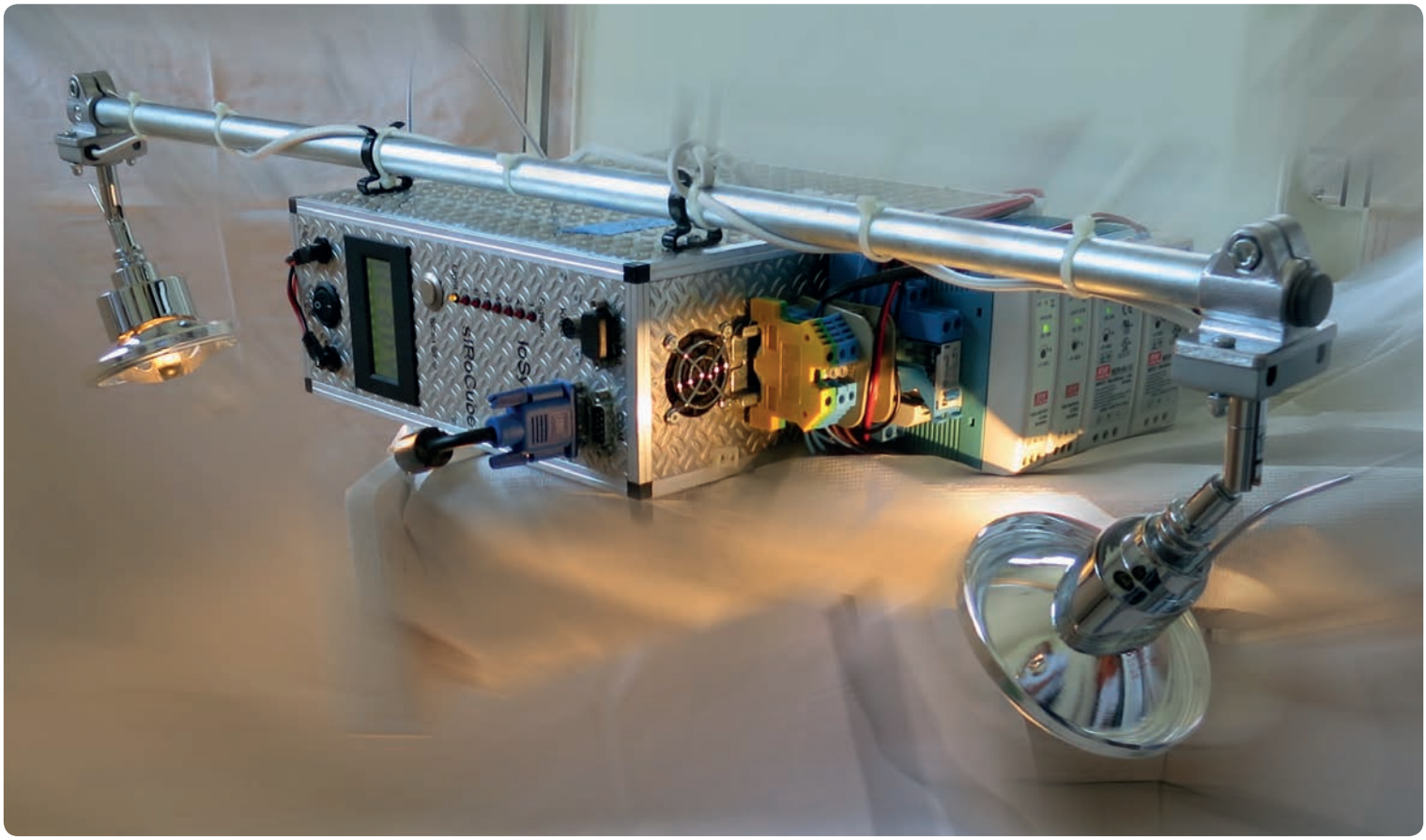
sIRoCube

The stationary modular NIR-Spectrometer for touchless measuring of plastics

GUT Environmental Technologies

Technology by **IoSys** – Europe's Leading Specialist for Plastic Detection



With the near infrared spectrometry (NIR) of the IoSys units it is possible to identify bigger plastic parts of the household-, engineering electronics fields. It allows direct analysis of non-dark-colored plastic parts and other materials like carpets and textiles.

The measuring principle is the diffuse near infrared reflection spectroscopy where the characteristic absorption patterns of different polymer types in a typical spectral region are used.
The polymer sample is radiated with infrared light and the reflected light of the measuring place is analyzed by a near infrared detector array.

For plastic identification the samples are quickly passing by below the optical focus lens, for instance using a conveyor belt. The light focus (ca. 4 - 6 cm) of the movable NIR light source can be adjusted for distances from 30 up to 60 cm.
By the integrated relay-inter-face board the identification result is also generated as output signal for sorting systems. Detected polymer types and the corresponding relay positions can be set individually. A 9-pole-SUB-D connector enables individual cable wiring. Additionally the online result can be shown on an external VGA screen.

The device includes the optical NIR-system and the computer, which controls and evaluates the identification process. Control and parameter settings like model selection can be set by the integrated LCD-touchscreen, by an external keyboard or by an external optional colour touchscreen. Additional connections like an USB-interface enables external data transfer. An LED array visualizing the identification result is available as an option as well as an external touchscreen.

The **sIRoCube** design enables to set up several units in parallel to measure the whole width of a conveyor belt.

The identification of different plastic types is the result of a trained pattern recognition with a specially developed neural network inside a database with several counterchecking. The result of the calculation is a list of the most probable polymer types identified within a probability between 0 and 100%. This comparison is necessary, since – contrary to metals – plastics have no norms and no standardizations!

Furthermore up to 7 pre-set polymer types can be programmed with corresponding external signal generation.

The software allows detailed spectra viewing, loading, saving and comparing. This possibility helps to develop own measuring applications besides the standard ranges.

Technical Data:

- Dimensions:	270 x 270 x 100 mm
- Weight:	ca. 2,7 kg
- Power Supply:	100 - 230 VAC, 50/60 Hz

Optional Accessories:

- External VGA-Screen for the display of results
- External touchscreen for display and operation
- External printer for result documentation
- LED-Array for the visual indication of the measuring results

Specifics of the unit:

- Identification of plastics from household-, packaging and engineering/electronics waste
- Contactless and non-destroying measurements
- Measuring time within few milliseconds
- Sample distance up to 60 cm
- Online setup for conveyer belt application
- Detailed spectra overview for easy comparison
- 7 individually programmable outputs for signal generation

Following plastic types are in the standard database:

PA6/PA66	PS	PC+ABS	ABS+PVC	PLA
PA12	PPO	PBT	PVC	Cellulose
PE	SAN	PET	PE+PA	
PP	PC+PET	PMMA	PE+PET	
ABS	PC	POM	PP+PET	

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