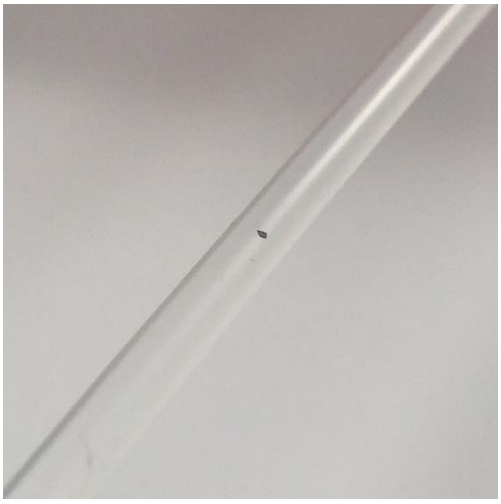
Presse Release Sensor Instruments

November 2024

Defect detection in a transparent hose

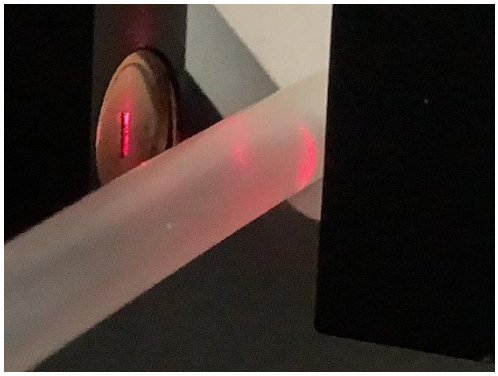
Monitoring of transparent plastic hoses with regard to possible contamination by black particles

18.11.2024. Sensor Instruments GmbH:



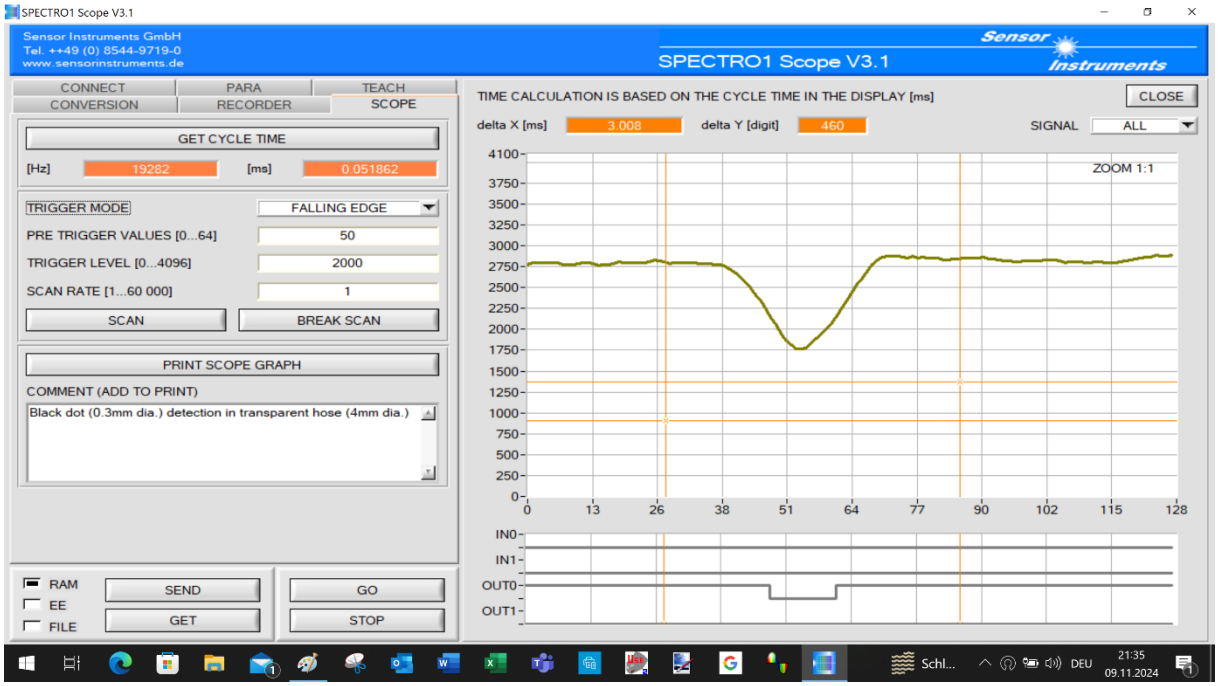
During the production of transparent plastic hoses, black particles (flakes) with a diameter of 0.3mm to 1mm may be deposited on the inner wall. The position of the particles is purely random. The plastic hoses should already be checked during production. The transparent hose (diameter 4mm and wall thickness 0.7mm) is produced at a speed of 270m/min.

In order for the black particles to be reliably detected, a correspondingly high scanning frequency of the sensor and the control electronics used is required.

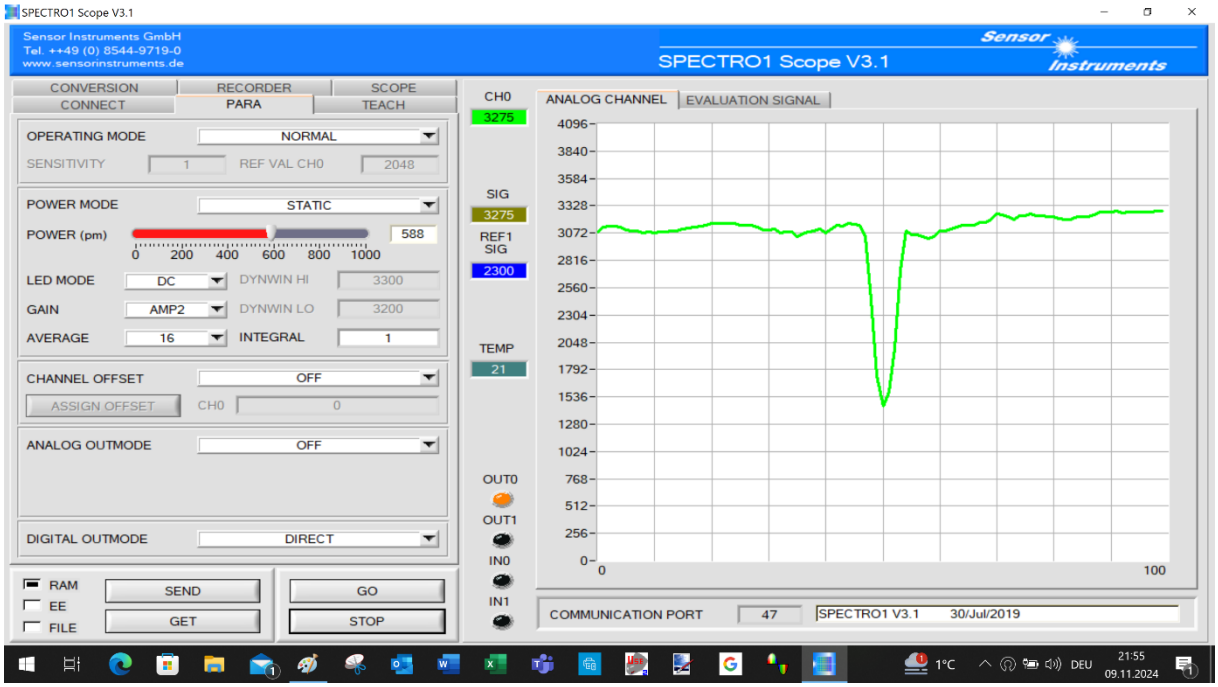


The **A-LAS-N-F08-10/50-3x0.5** laser analog light barrier in conjunction with the **SPECTRO-1-CONLAS** control electronics provides a unit that has the required scanning frequency (approx. 200 kHz) and the necessary laser light curtain (3mm x 0.5mm). Inspection and detection are carried out in transmitted light mode. If there is a black particle in the field of view, the amount of light on the receiver side is reduced, whereby the analog signal is compared with a comparator threshold that can be parametrized using the **SPECTRO 1 Scope V3.1** Windows® software after digitization.

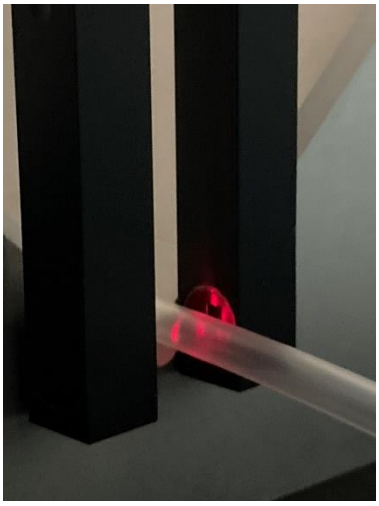
If the signal falls below this threshold, a signal change occurs at the digital output (0V / +24V). Furthermore, an analog signal proportional to the signal attenuation is output via the analog output (0V…+10V / 4mA…20mA). Furthermore, the firmware of the control electronics allows an additional increase in sensitivity with fast signal attenuations by means of a differentiator algorithm.



The laser power and the eight hardware amplifier stages can be adjusted to optimize the control electronics for the respective application. The SCOPE user interface provides a precise insight into how the respective defect is perceived by the control electronics.



As the black particles can adhere randomly to the inner wall of the transparent plastic hoses, it is necessary to monitor the entire circumference of the hoses. This requires three laser systems that are arranged at 120° angles to each other around the circumference of the hose. That ensures complete coverage of the inside of the respective hose.



Contact:

Sensor Instruments
Entwicklungs- und Vertriebs GmbH
Schlinding 15
D-94169 Thurmansbang
Telephone +49 8544 9719-0
Fax +49 8544 9719-13
info@sensorinstruments.de