

Optical sensors
for the **SOLAR INDUSTRY** made by



STM

Optical sensors for the solar industry

Complex manufacturing processes, a high level of automation and a very dynamic technical development characterize solar technology. The practical conditions of use also place particularly high demands on the sensor systems used. STM has the right answers for the optical sphere.

Whether it's minimal installation size in a cramped environment, dead-on optical precision or process-related suitability for use in a vacuum or high vacuum – STM manufactures a whole series of optical sensors that are tailored to the very specific requirements in the solar industry.

MICROmote® from STM Small dimensions – high performance

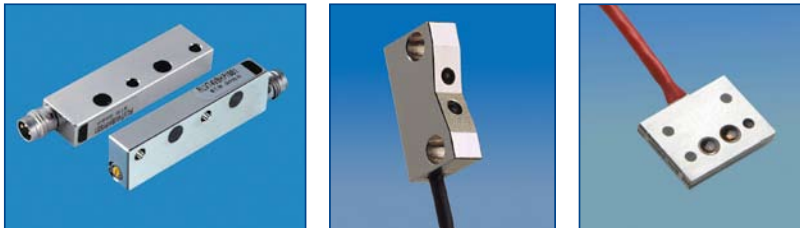
It was always the aim of STM to combine high optical precision with the smallest possible volume.



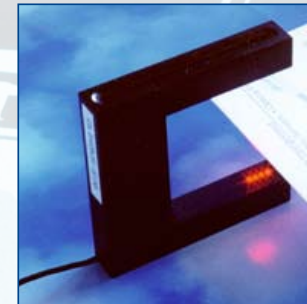
- ▶ MICROmote® optical sensors from STM are the only real alternative to fibre optics. But in many technical characteristics they are far superior: integrated micro-precision optics get the light right to the point. Exceptional flexibility of the electrical sensor cables, guarantees trouble-free laying compatibility and resistance to extreme flexural fatigue stress. Versatile sensor heads adapt easily in every environment. Selected materials are precisely coordinated with the conditions of use.
- ▶ Where installation space is very limited for process-related reasons and, despite these limitations, high optical precision is required, they are the right solution.

Optical detection of demanding surfaces

Optical monitoring of poorly reflecting surfaces, such as those on certain wafers or solar cells, is quite often a difficult undertaking.



- ▶ Signals that are generated with conventional reflective beam sensors are usually much too weak to be able to be reliably detected. Transmitter/receiver combinations often cannot be implemented due to reasons of space.
- ▶ For applications in semiconductor technology, STM has developed various sensors that work with the total reflection of obliquely impinging light beams on surfaces of low reflectivity.
- ▶ The process also delivers switch signals of high reliability even on transparent surfaces. Without troublesome diffused light.



Edge control

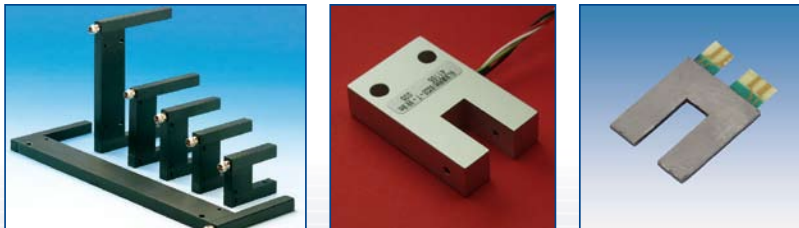
To monitor the position of a flat body during a transport process is a challenging application.

- ▶ With GLS40ZS, STM created a very compact and precise optical sensor for web edge detection. The edges of solar cells, for example, can thus be precisely monitored to within a hundredth of a millimeter during transport motion.
- ▶ A very homogeneous light band stretches between the transmitter and the receiver arm of the fork-shaped sensor. Coverage of this area is measured. An amplifier generates from this an analogue output signal.
- ▶ Thus the feed motions of drives can then be quite precisely controlled.

Fork light barriers

For all simple detections during feed processes, fork light barriers are a reliable and low cost solution. Easy to mount. Easy to set.

- ▶ We produce not only the usual standard forks with visible red light, infrared or laser. But when standard dimensions just aren't suitable, we also have a separate product line with a modular dimension system or with super-flat enclosures.
- ▶ For demanding ambient conditions, we offer variants made of resistant materials or with a high vacuum-proof design.



You can find additional information on this product line in our fork light barriers brochure.

Vacuum compatibility

A unique selling point of many STM optical sensors is their direct usability in a high vacuum. We have many years of experience with difficult applications in semiconductor and coating technology.

- ▶ Conventional optical sensors cannot easily be used in vacuum processes. Unsuitable materials outgas in a high vacuum and contaminate sensitive processes. Applications through inspection ports run the risk of fogging or unwanted reflections on the glass surfaces. Moreover, they usually require extremely precise alignment due to their relatively large distance from the object.
- ▶ Our sensors are designed for direct use in a high vacuum up to 10⁻⁹ mbar. Application-compatible design and suitable selection of materials make it possible. Without optical compromises.
- ▶ Vacuum applications, in particular, require exact clarification of the individual requirements. Please contact us beforehand. We are happy to support you in your project planning.



Minimal outlay for optimally adapted solutions

Every application has its distinctive features. Often they are not visible initially. Many times they arise only at an undesirable point during later operation. An exact measurement sheds light on the actual stability of a solution.



► We at STM are of the opinion that a sensor must adapt to the actualities of an application, and not vice versa. Standard sensors have certain fixed characteristics. They have been developed to fit as many applications as possible. Even slight deviations from the intended conditions can bring about very unpleasant effects.



► The strength of the STM concept is a highly modular product design for all our optical sensors. After testing in the laboratory, we can select the right sensor for you or adapt it with minimal outlay for your application, so that there won't be any surprises. It can be very easily done with our modular system. In the end, operational reliability ranks first.

The products shown are examples. You can find specific information about the products and their unique selling points on our Web site at: www.stmsensors.com

We consider extensive advising in the selection or, if applicable, adaptation of our products to be our most important task.

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We'll help you.

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