

1. Super fast detection of holographic reference marks in the printing industry

In the printing industry reference marks are necessary to synchronize the printing process of consecutive print works to get a proper picture. One of the properties of holographic marks is the direct back reflection of collimated, parallel light under a certain angle. For most of the holographic marks this angle is equal to 45° and the collimated beam is directed perpendicular to the transport direction of the printed foil. This behavior of direct back reflection can be observed on transparent as well as on metalized holographic foils. The color sensor **SPECTRO-3-FIO-CL** in connection with an optical fiber **R-S-A2.0-(2.5)-1200-67°** and an optical frontend **KL-3** allows a precise and extremely fast detection of holographic marks. The spot size at a distance of 11 mm is approximately 1 mm. With another optical fiber **R-S-A1.1-(0.6)-1200-67°** and a frontend **KL-4** a spot size of 0.3 mm at a distance of 11 mm is possible. Even a rectangular spot of 2 mm x 0.2 mm can be realized with an optical fiber type **R-S-R1.1-(3x0.5)-1200-67°** and a frontend **KL-5** at the same distance. The scan frequency of the **SPECTRO-3-FIO-CL** is 40 kHz and the system comes with a switching frequency of 25 kHz.

