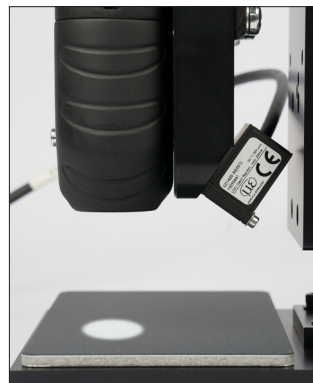
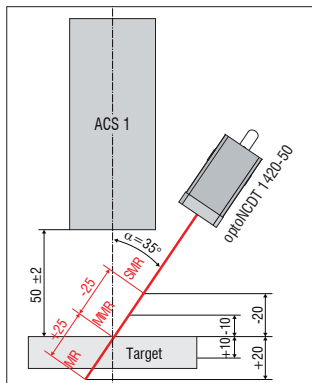


## ACS7000 color measurement with changing distances of specimens

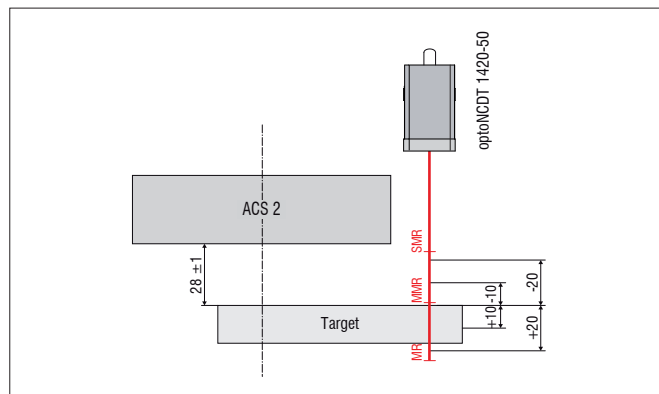
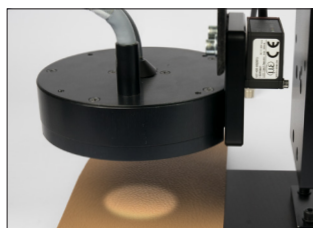
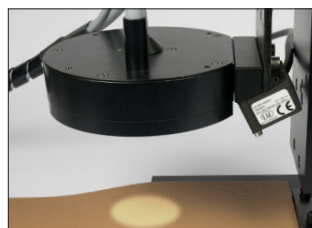
### Introduction

Spectral color measurement using the ACS7000 requires a constant distance of  $\pm 0.05\text{mm}$  between sensor and measurement object in order to obtain results according to the specification of the ACS7000. Different processes show fluctuating distances due to the position of the specimens. This TechNote should demonstrate the ACS7000 system structure combined with an optoNCDT 1420-50 sensor, a PLC and a handling system in order to be able to react to changing distances of the measurement objects.

### System design



### Color measurement with the ACS1 sensor head



(Dimensions in mm, not to scale)

### Color measurement with the ACS2 sensor head

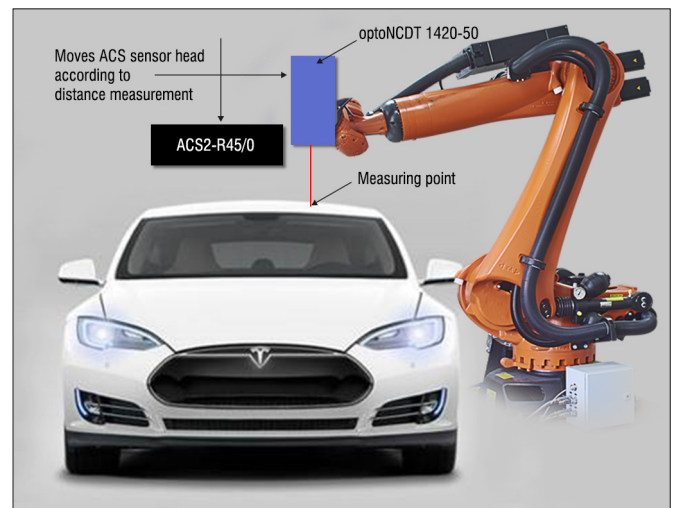
Depending on the sensor head used, different measurement arrangements are possible due to the sensor geometries. ACS1 allows for a distance measurement directly on the measurement spot of the color measurement. The optoNCDT 1420-50 is positioned at an angle of  $35^\circ$  next to the ACS1 sensor head. This is how a direct correction of the z axis is possible and the distance to the set point value can be regulated according to sensor specification.

When using the ACS2 sensor head with circular lighting, the distance measurement and the position correction must be effected in two steps. The ILD determines the distance to the specimen at the position to be inspected. Then, the ACS2 sensor head is, depending on the determined distance value, moved to this position.

### Distance correction

A PLC with downstream handling system (robot, moving unit,...) is necessary for correction. An analogue input terminal enables to read the distance value of the optoNCDT 1420-50 into the PLC. Afterwards, the handling system positions the color measurement sensor in the exact distance, and color measurement is triggered via PLC.

The optoNCDT 1420-50 laser triangulator should be positioned in such a way that the ideal distance for color measurement is in the midrange of the ILD.



Schematic arrangement of color and distance measurement

### Micro-Epsilon