



## The Self-Calibration Advantage

Laser scan solutions from SCANLAB provide highly dynamic deflection and positioning of laser beams – which allows workpieces to be processed flexibly, precisely and quickly.

Along with speed, long-term repeatability is very important for many applications – for example, rapid prototyping in which the processing operation can span many hours.

SCANLAB offers a self-calibration option for scan heads that are targeted for such applications. The scan head is thereby equipped with an additional internal sensor system. This reference system makes it possible to calibrate the position detectors of the galvanometer scanners at any desired point of time.

If high repeatability over a long time is required, then drift effects – which may be caused, for example, by fluctuations of environmental conditions – can be reliably compensated with Automatic Self-Calibration.

Positioning accuracy is thus maintained over long periods of time. Remaining long-term drift effects are of the same order of magnitude as short-term repeatability.

## Principle of Operation

During calibration, the scan head automatically seeks several reference positions within the scannable area that are defined by the internal sensor system. The seek values are determined and compared with fixed reference values. From the resulting deviations, offset and gain compensation factors are calculated.

These compensation factors are immediately made available for use in all future positioning tasks.

The calibration routine can be initiated via a simple RTC<sup>®</sup> command that can be called any time re-calibration is deemed appropriate. During the calibration routine, the laser is switched off and no other commands are transferred to the scan head. The entire calibration procedure takes place in only 5 seconds.

## System Requirements

- Digital scan system with self-calibration option
- RTC<sup>®</sup> PC interface board

## Key Features

- Internal sensor system for automatic self-calibration
- Available for scan systems with apertures of 10 mm or greater
- High long-term repeatability achievable
- Reliable compensation of long-term and temperature drift-effects
- Simple operation via an RTC<sup>®</sup> PC interface board

## Typical Optical Long-Term Behavior with the Self-Calibration Option

<b>Remaining offset drift</b>	< 20 $\mu$ rad / K
<b>Remaining gain drift</b>	< 5 ppm / K
<b>Remaining long-term drift over 8 hours</b>	< 20 $\mu$ rad
(at constant environmental conditions)	

## Typical Applications:

- Micro-machining
- Rapid manufacturing
- Deep engraving
- Laser measurement techniques
- Structuring

