

# SPECTRO1-Scope: Changes after Software Update from SPECTRO1-Scope V3.0 to V3.1

This manual summarises the changes that were made with the software update from SPECTRO1 V3.0 to V3.1.

**!!! It is not possible to perform a software update from V1.x or V2.x to V3.x and vice versa.**

A software update (downgrade) from V3.x to V3.1 can be performed quite easily.

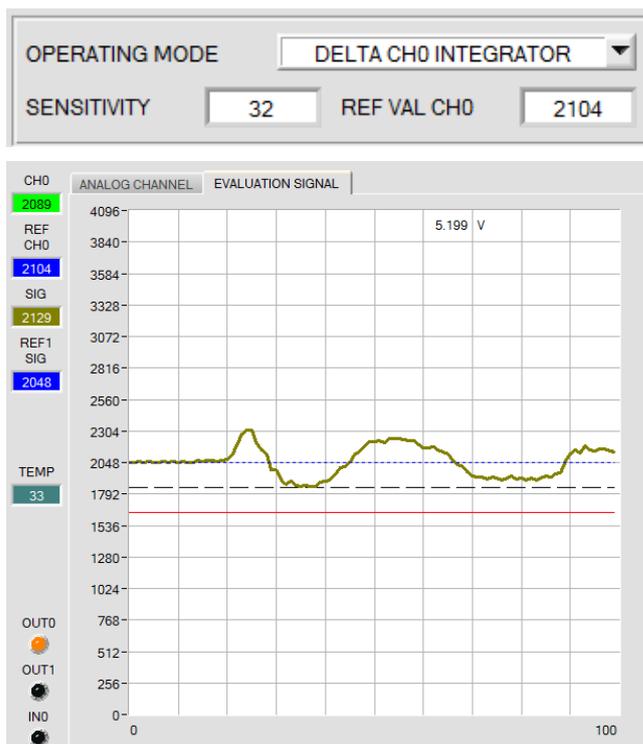
All you need is the FirmwareLoader V1.1 and the firmware files for version V3.1.

The FirmwareLoader V1.1 can be found on the software DVD that is provided with the sensor or can be downloaded from our homepage.

The firmware files are available from your sensor supplier.

The respective procedure is exactly described in the "[Manual FirmwareLoader V1\\_1](#)" file.

## Change 1:



**OPERATING MODE = DELTA CH0 INTEGRATOR** has been added

With the **DELTA CH0 INTEGRATOR**, the deviation of **CH0** to a reference value for **CH0** (**REF VAL CH0**) is determined, standardised to 4096 and added with 2048.

$$\text{SIG} = ((\text{REF CH0} - \text{CH0}) * 4096 / \text{REF CH0}) + 2048$$

The reference value for CH0 is displayed in display **REF CH0**. This value is usually **REF VAL CH0**. If **EXTERN TEACH = DIRECT** or **DYN** is set, then the value actually measured during the learning procedure will change from **CH0** to **REF CH0**.

A summation factor **REF CH0 - CH0** is determined with **SENSITIVITY**.

Example:

If e.g. **Sensitivity=32** has been set, 32 detected values **REF CH0 - CH0** will be added.

The sum is standardised to 4096.

The standardised value is added with 2048.

You receive a value of 2048 for **SIG** if the sum of **REF CH0 - CH0 = 0**.

If e.g. the clearance to the surface or the surface property changes, you will receive a peak below or above 2048.

This mode can be used e.g. with a transmitted light system, with which a spray jet is to be controlled. Normally, this produces only a small signal effect. This effect can be amplified with **SENSITIVITY**.

The addition with 2048 was performed so that the signal evaluation can be performed as usual,

i.e. the calculation of the threshold, threshold tracing, external teaching etc. function as in **OPERATING MODE = NORMAL**.

## Change 2:

SIG  
1733

The display **SIG** was introduced to improve understanding. Proceeding from **SIG**, the switching threshold and the hysteresis threshold are calculated. Depending on **OPERATING MODE**, **SIG** is calculated as follows.

**NORMAL:**  
**SIG=CH0**

**DIFFERENTIATOR:**  
**SIG = mean of CH0 via number SENSITIVITY values – current value of CH0 + 2048**

$$\text{SIG} = \frac{\sum_0^{\text{Sensitivity}} \text{CH0}}{\text{Sensitivity}} - \text{CH0} + 2048$$

**DELTA CH0 INTEGRATOR:**  
**SIG=(((REF CH0 – CH0) via number SENSITIVITY values) \* 4096 / REF CH0) + 2048**

$$\text{SIG} = \frac{\sum_0^{\text{Sensitivity}} (\text{REF CH0} - \text{CH0})}{\text{REF CH0}} * 4096 + 2048$$

REF  
CH0  
2048

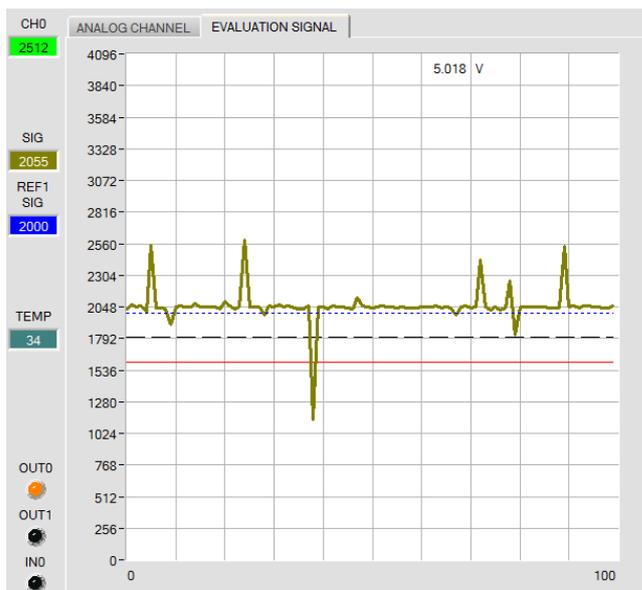
The display **REF CH0** has been added. It is used with **DELTA CH0 INTEGRATOR**. See change1

REF1  
SIG  
2215

The display **REF1** was renamed. It is now called **REF1 SIG**, so that the name indicates that this reference relates to the Teach Signal **TEACH VAL1 SIG**.

TEACH VAL1 SIG 2000

**TEACH VAL1 SIG** was also renamed. Previously it was called **TEACH VAL 1**.



The graph now has tabs. The value recorded by the receiver CH0 is displayed in the ANALOG CHANNEL tab. The signal SIG calculated from CH0 is displayed in the EVALUATION SIGNAL tab with the appendant switching settings.

### Change 3:

In addition to **CH0**, the signal value **SIG** is transferred in the SCOPE tab.  
You can choose which signal(s) are shown in the graph via **SIGNAL**.

