

Changes after Software Update from SPECTRO3-MSM-SLE-Scope V1.4 to V1.5

Change 1:

SET DP:

If an application involves both very bright and very dark surfaces, and the sensor is set such that it is not in saturation at the bright surfaces, the dark surfaces frequently provide only a very low signal.

Little variations with a very low signal lead to a large change in color space calculation (**C-SPACE**). To minimise this effect, the sensor in **PMODE = DOUBLE** automatically switches back and forth between 2 **DOUBLE PARAMETER sets**. Set 2 must be parameterised such that the signal is maximally amplified.

When the signal is too high (saturation), it automatically switches to set 1.

To get correct color space coordinates with set 2, a correction factor must be used for the signal.

The two **DOUBLE PARAMETER sets** must be set at the sensor in advance.

When you click on **SET DP** (Set Double Parameter) a window will open at the right side, where you can set two sets. A Double Parameter set is defined by **POWER, GAIN** and **INTEGRAL**.

The screenshot shows the software interface with the following components:

- TEACH / REC / CALIB / GEN / SCOPE** tabs at the top.
- CONNECT** / **PARA1** / **PARA2** sub-tabs.
- C SPACE** dropdown set to $L^* a^* b^*$ and **CALIB** set to **OFF**.
- POWER MODE** set to **DOUBLE** with a **SET DP** button.
- POWER (pm)** slider set to 781.
- GAIN** set to **AMP8** and **INTEGRAL 1** set to 3.
- AVERAGE** set to 1 and **LED MODE** set to **AC**.
- DIGITAL OUTMODE** set to **DIRECT HI**.
- START ASSISTANT**, **ASSIGN 1**, **ASSIGN 2**, **ASSIGN 3**, and **CLOSE** buttons.
- DOUBLE PARAMETER (DP)** table:

	POW	GAIN	INT 1
1	581	6	1
2	781	8	3
- XYZ VALUES** table:

	X	Y	Z
BRIGHT DP1	2998	2815	885
DARK DP1	160	155	47
DARK DP2	2502	2385	780
- CORRECTION VALUES** table:

	X	Y	Z
	15.63	15.38	16.59
- DOUBLE PARAMETER SET** value: 0.
- RAW X**: 2502 (red bar)
- RAW Y**: 2385 (green bar)
- RAW Z**: 780 (blue bar)
- ? DOUBLE PARAMETER** instruction window:

Push **START ASSISTANT** to adjust automatically proper **DOUBLE PARAMETERS**.

Follow these steps for manual setup:

Place the sensor to the brightest target. **POWER MODE** must be **SINGLE**.

Push **GO** and adjust a proper **POWER, GAIN** and **INTEGRAL** value so that the highest value of **X Y Z** is approximately 3000.

Push **ASSIGN 1** to assign the **DOUBLE PARAMETER** and **X Y Z** values of the bright target to the tables.

Now place a darker (not the darkest) target to the sensor.

Push **ASSIGN 2** to assign the **X Y Z** values of the darker target to the table.

After that adjust a proper **POWER, GAIN** and **INTEGRAL** value so that the highest value of **X Y Z** is approximately 3000.

Push **ASSIGN 3** to assign the **DOUBLE PARAMETER** and **X Y Z** values of the darker target to the tables.

Now select **POWER MODE=DOUBLE** and push **SEND** to send the parameters and correction values to the sensor.
- RAM**, **EE**, **FILE** checkboxes and **SEND**, **GET**, **GO**, **STOP** buttons.

Automatic setting of the DOUBLE parameter sets:

Pressing **START ASSISTANT** starts menu navigation for the automatic setting of the double parameter sets. Simply follow the instructions.

Manual setting of the DOUBLE parameter sets:

Set **CALIB=OFF** and **POWER MODE=SINGLE** on.

Place the brightest surface in front of the sensor and select a fitting **POWER, GAIN** and **INTEGRAL** value in such a way that the brightest channel is at c. 3000 digits.

Now press **ASSIGN 1** to accept the double parameter in the **DP** table in line 1.

The **X Y Z** values are also entered in the **XYZ VALUES** table.

Now place the dark surface in front of the sensor.

The dark surface should be constituted so that the weakest channel has a signal greater than 100 digits.

After pressing **ASSIGN 2**, the **X Y Z** values are accepted in line **DARK DP1** of the **XYZ VALUES** table.

Now **POWER, GAIN** and **INTEGRAL** must be set in such a fashion that the strongest value lies at c. 3000.

Press **ASSIGN 3** to accept the Double Parameter in the **DP** table in line 2 and to accept the **X Y Z** values in the **XYZ VALUES** table.

The correction value is calculated automatically and entered in the **CORRECTION VALUES** table.

INFO!

The double parameter sets are first activated after pressing **SEND!**

The tables are for display purposes only. They cannot be edited.

The **DOUBLE PARAMETER SET** and **DP SET** displays show the double parameter sets with which the sensor is currently working.

If the display shows 0, the sensor in **POWER MODE = SINGLE** works with the settings in the **PARA1** tab.

DP SET

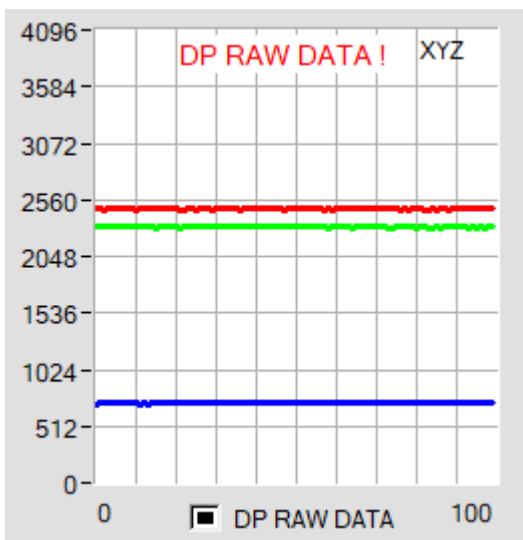
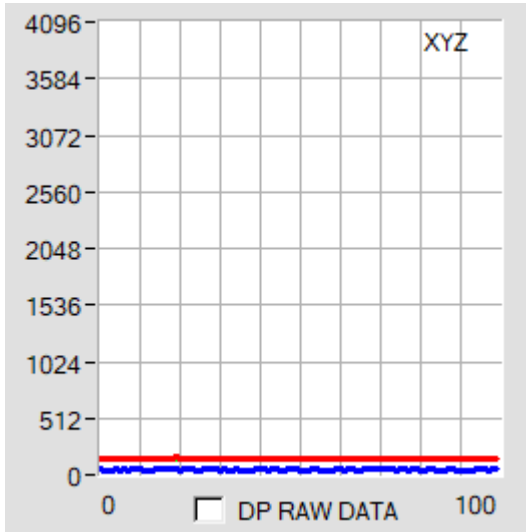
2

In order to understand with which **X, Y** and **Z** values the sensor works in parameter set 2, you can display this raw data in the display **XYZ** using the **DP RAW DATA** check box.

As mentioned above, the colour space coordinates are calculated using the raw data **X, Y** and **Z** received with parameter set 2.

At the end of the calculation, they are divided using the correction factor.

This method avoids rounding errors in the calculation and thus maintains accuracy.



Change 2:

With **START CALIBRATION ASSISTANT** you can start an assistant that guides you through the calibration.

The following three conditions must be met:

1. You need **one** reference card. This is either the card RAL 9003-P, RAL 9010-P, or RAL 9016-P.
2. You need different RAL colors RAL from the *RAL CLASSIC* or *RAL DESIGN SYSTEM plus* series. These are available from the sensor supplier.
3. You need a file in which the L*a*b* values for the different RAL cards are stored. This file is also available from the supplier.

The screenshot shows the 'START CALIBRATION ASSISTANT' software interface. The main window is titled 'CALIB REF' and contains several data tables and control elements.

REFERENCE SETVALUE

L*	a*	b*
0.0000	0.0000	0.0000

ACTUAL XYZ VALUE OF REF

X SI	Y SI	Z SI
0	0	0

CALCULATED XYZ OF REF

X	Y	Z
0.0000	0.0000	0.0000

Xn Yn Zn

Xn	Yn	Zn
95.05	100	108.9
4096	4096	4096

On the right side, there is a vertical status bar with the following values:

- RAW X: 0 (red background)
- RAW Y: 0 (green background)
- RAW Z: 0 (blue background)

At the bottom left, there are control buttons for RAM, EE, and FILE, along with SEND, GET, GO, and STOP buttons.