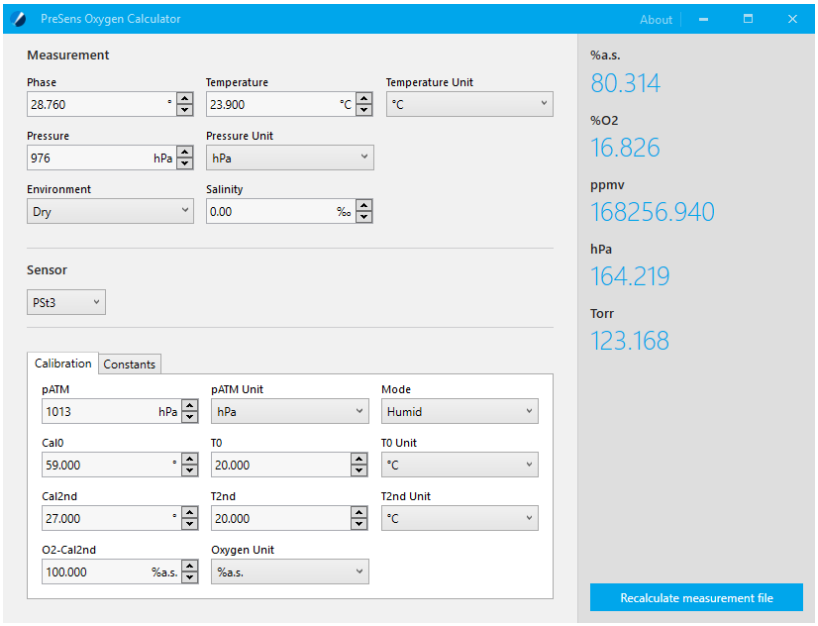
PreSens Oxygen Calculator Software

SYSTEMS

Instruction Manual



PreSens
PRECISION SENSING

PreSens Oxygen Calculator Software

Specification:

Oxygen Calculation Software for PreSens Devices

Version 3.0.0

Document filename: IM_OxyCal_dv4

Specifications may change without prior notice.

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1 Preface

You have chosen a new, innovative technology for measuring oxygen.

PreSens measurement devices are developed especially for small fiber optic oxygen sensors, flow-through cells and non-invasive sensors. They are based on a novel technology, which creates very stable, internally referenced measured values. This allows a more flexible use of these sensors in various fields of interest.

Optical oxygen sensors (also called optrodes) have several important features:

- They are small.
- Their signal does not depend on the flow rate of the sample.
- They can be physically divided from the measuring system which allows a non-invasive measurement.
- They can be used in disposables.

Therefore, they are ideally suited for the examination of small sample volumes, for highly parallelized measurements in disposables, and for biotechnological applications. A set of different oxygen minisensors, flow-through cells and non-invasive sensors is available to make sure you have the sensor which matches your application.
Please feel free to contact our service team to find the best solution for your application.

Your PreSens Team

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY BEFORE WORKING WITH THIS ITEM. WHEN DISREGARDING THESE INSTRUCTIONS THE SAFETY OF THE DEVICE CAN BE IMPAIRED.

2 Description of the PreSens Oxygen Calculator Software

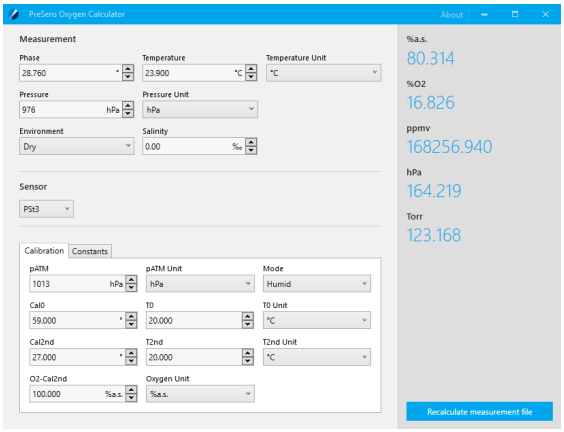


Fig. 1 PreSens Oxygen Calculator software

The PreSens Oxygen Calculator is a general oxygen calculation software for PreSens devices. It is provided as an implementation example for users creating their own customized software using the PreSens Oxygen Calculation Library or simply to get an oxygen value from raw values measured with a PreSens device. Raw data is entered manually and the software then transfers sensor data into an oxygen value, which is displayed in different units. Furthermore, data in a stored measurement file can be recalculated.

System requirements:

	System Requirements
Operating system	Microsoft® Windows® 7, 8, or 10 (32 or 64 Bit)
Processor	1 GHz Single Core Processor
RAM	512 MB
Memory Capacity	200 MB
Screen Resolution	1024 x 768

3 Operation

Install the PreSens Oxygen Calculator-3.x.x.x.exe on your PC / notebook. Close all other applications as they might interfere with the software and open it.

3.1 Calculate Oxygen Values

1. Select the **Sensor** type of your oxygen sensor in the drop-down menu (see Fig. 2). This will display and apply default calibration data and sensor constants.

   You can leave the calibration data and / or sensor constants at default values in case you do not have your sensor's calibration values at hand.

! Please be aware that calculated oxygen values will not be absolutely accurate with default calibration data.

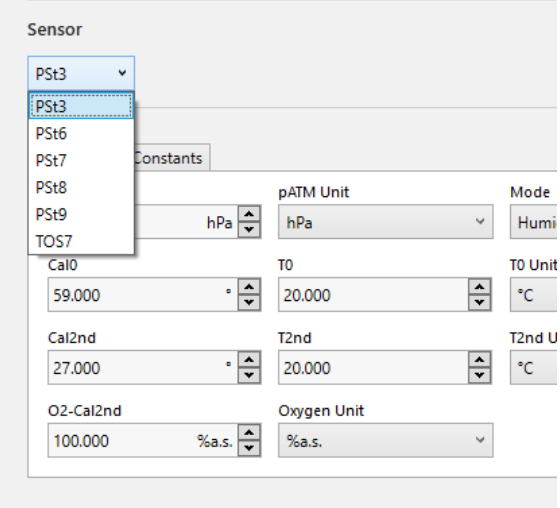


Fig. 2 Select the sensor type form the drop-down menu

2. Enter the currently applied **Calibration** data and sensor **Constants** (switch to the respective tab, see Fig. 5) of your oxygen sensor. You can get this information from the sensor's final inspection protocol FIP (see Fig. 3) or you can enter the calibration data you have determined and is currently applied for the sensor.
   Whenever you change the pressure or temperature unit, the previously entered value will automatically be recalculated in the selected unit.

Data

Atmospheric Pressure: 981 hPa
Calibration Mode Humid

	Phase signal	Valide range	Temperature	Valid range	Amplitude	QC-passed?
	[°]	[°]	[C°]	[C°]	[µV]	(ok / failed)
cal 0 **0 %a.s.**	**56.59**	52 - 58	**20.4**	18.0 - 22.0	387299.3	OK
cal 2nd **100 %a.s.**	**21.84**	18 - 26	**20.4**	18.0 - 22.0	147550.8	OK

Response time [t90]: < 60 s **Valid range:** < 60 s

Please type in these values into the software for "manual calibration"

Sensor Constants

f1 = 0.866	**dPhi1 = -0.02473**	**dKSV1 = 0.000269**
m = 13.69	**dPhi2 = -0.00006**	**dKSV2 = 0.000000**

Fig. 3 Example for a Final Inspection Protocol (FIP): Calibration data and sensor constants

! Make sure to set the correct unit for the **O2-Cal2nd**, **Temperature** and **Pressure** values and select the correct calibration **Mode** (Dry or Humid, see Fig. 4).

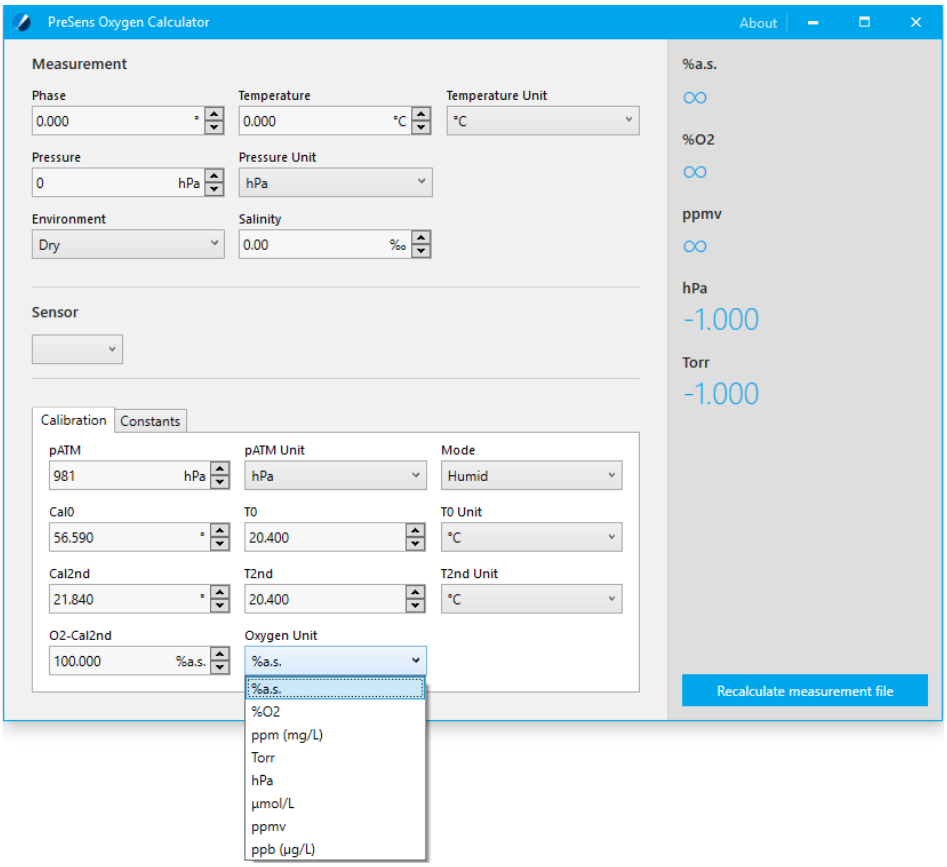


Fig. 4 Entering calibration data: Select the correct oxygen unit for O2-Cal2nd, Pressure and Temperature, and set the calibration Mode correctly.

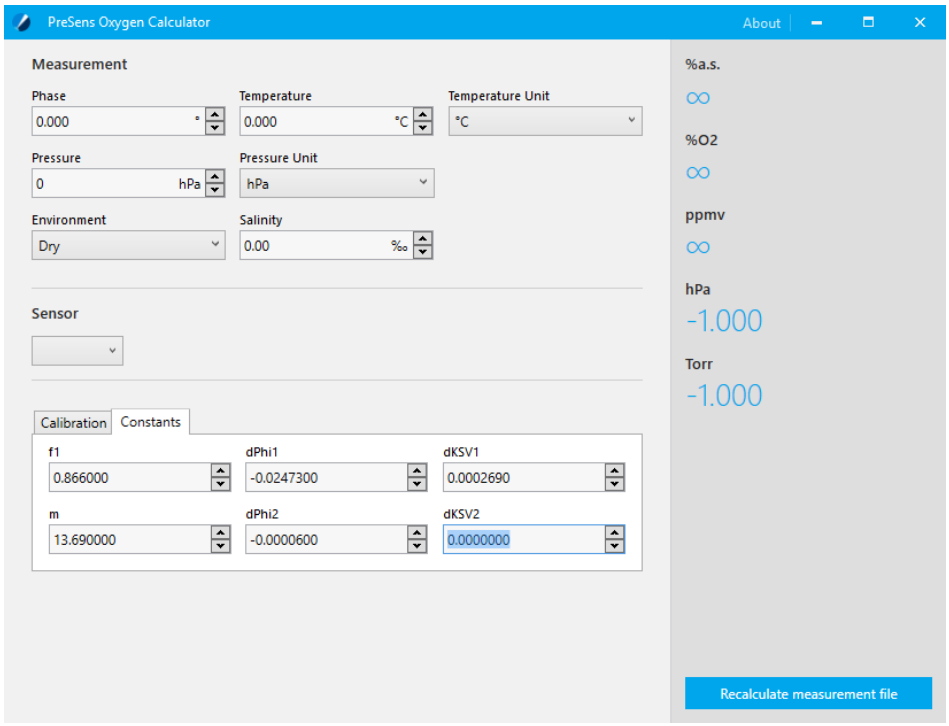


Fig. 5 Entering calibration constants: switch to the Constants tab

3. Then set the **Measurement Environment** (Dry or Humid), enter the **Salinity** in ‰ of your sample (if necessary), and change the **Temperature Unit** and **Pressure Unit** to the respective unit used during measurements. (Previously entered temperature and pressure values will automatically be recalculated in the newly selected unit.)

4. Enter the atmospheric **Pressure** during measurements with your PreSens oxygen sensor.

5. Type in a **Phase** value and corresponding **Temperature** value that had been measured by your PreSens oxygen sensor and device. The PreSens Oxygen Calculator converts this data into an oxygen value, which is displayed in different oxygen units in the **Output** field on the right.

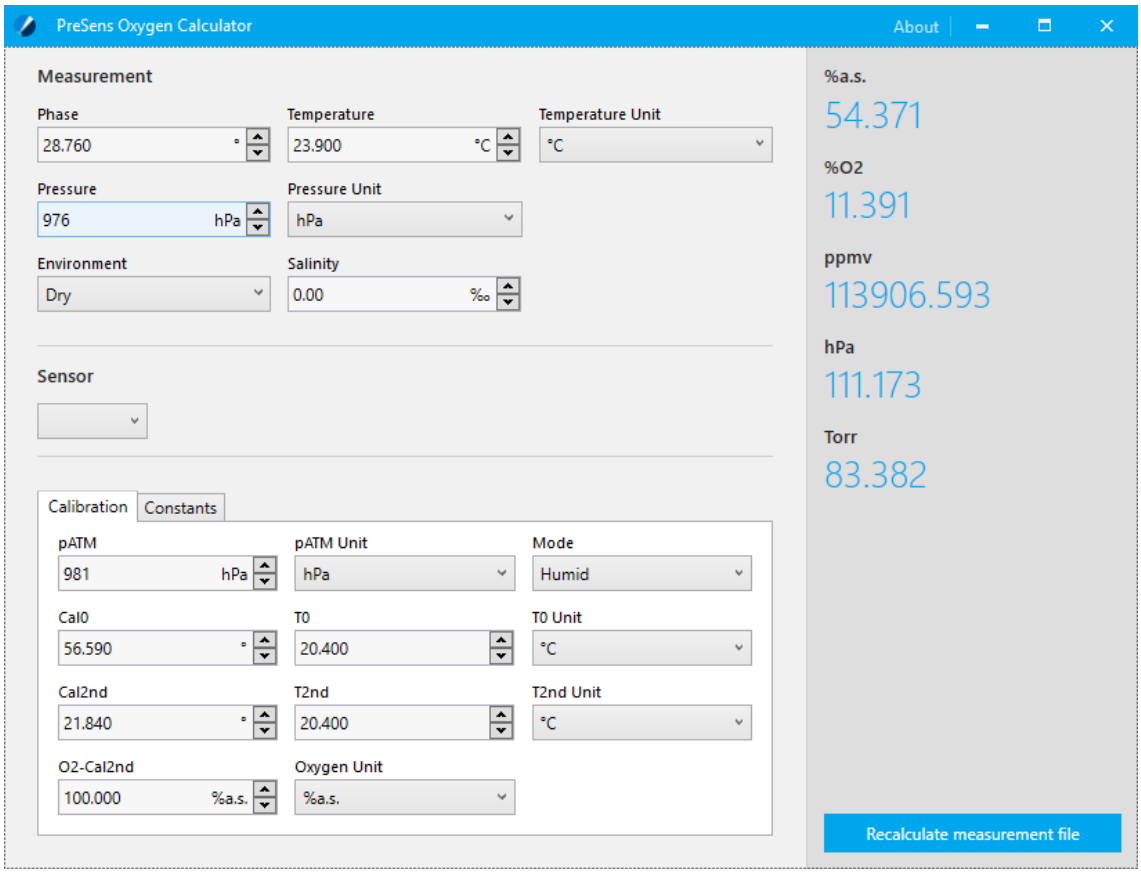


Fig. 6 Measurement data has been entered; the PreSens Oxygen Calculator shows the respective oxygen value in different units on the right.

3.2 Recalculate a Measurement File

The oxygen calculator also allows to recalculate values in a previously stored measurement file (from the PreSens Measurement Studio 1 / Data Manager, PreSens Measurement Studio 2, and EOM-STS), e. g. when wrong calibration data was entered before measurement, a wrong measurement mode was selected, or the recorded values should be shown in another oxygen unit.

1. Enter the new calibration data (if necessary) and measurement data in the respective units you want to use for recalculating your previously stored measurement. You only have to enter the values you want to use for recalculation (see also Fig. 8).

2. Click the **Recalculate measurement file** button at the lower right and a dialog will open.

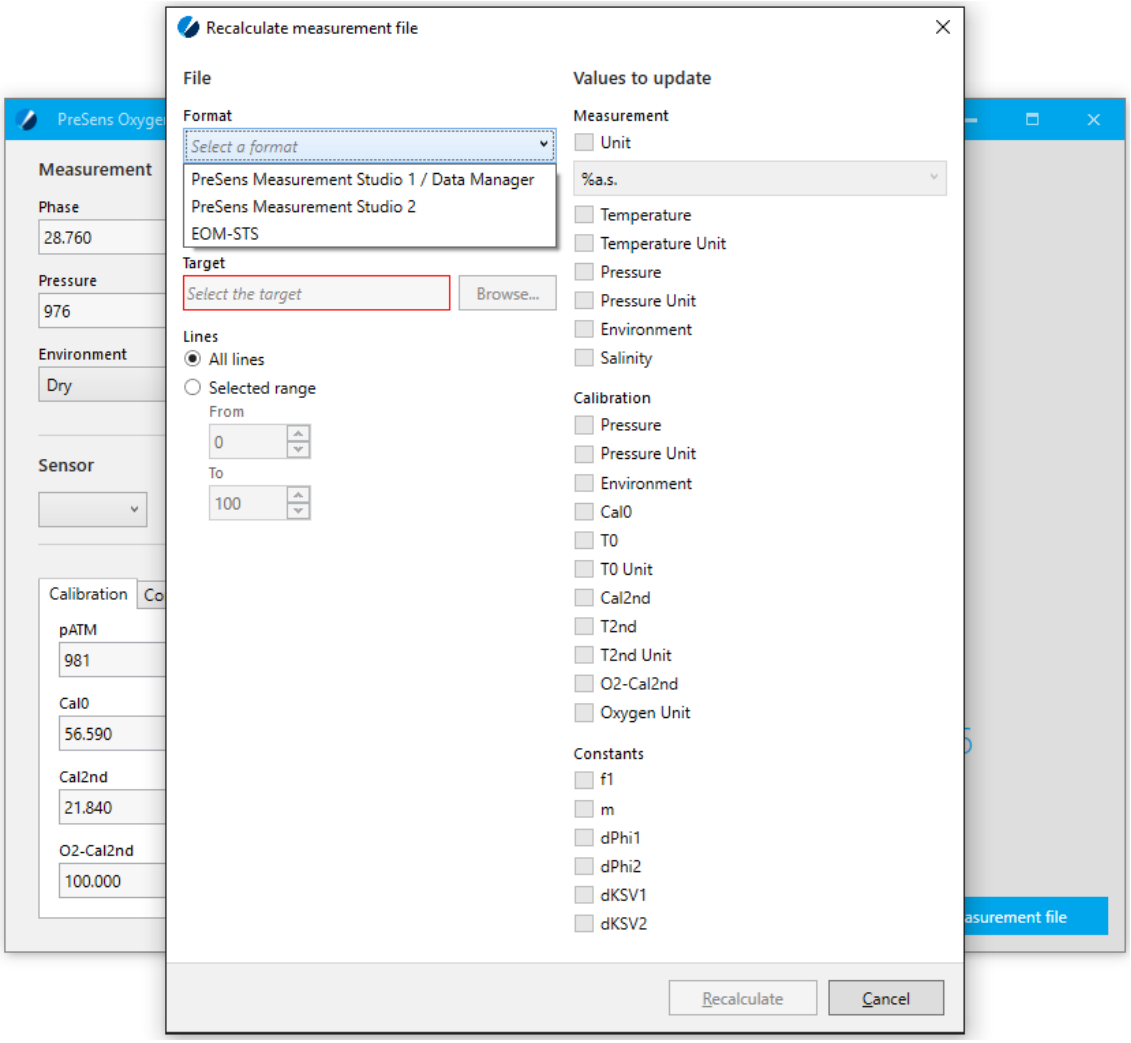


Fig. 7 Recalculate measurement file dialog: different file formats can be selected

3. Select the **Format** of the measurement file you want to recalculate (PreSens Measurement Studio 1 / Data Manager, PreSens Measurement Studio 2, EOM-STS). Then click the Browse button next to **Source**, and select the respective measurement file from a directory on your PC.

4. Click the Browse button next to Target to select a directory the recalculated file should be stored in. The file will automatically be saved with the original file name and the suffix _cor. In case you want to change the file name click into the Target input field and enter a new file name.

5. You can either recalculate **All lines** of the measurement file you have selected or just a **Selected range** of lines you can define in the input boxes below (see Fig. 8).

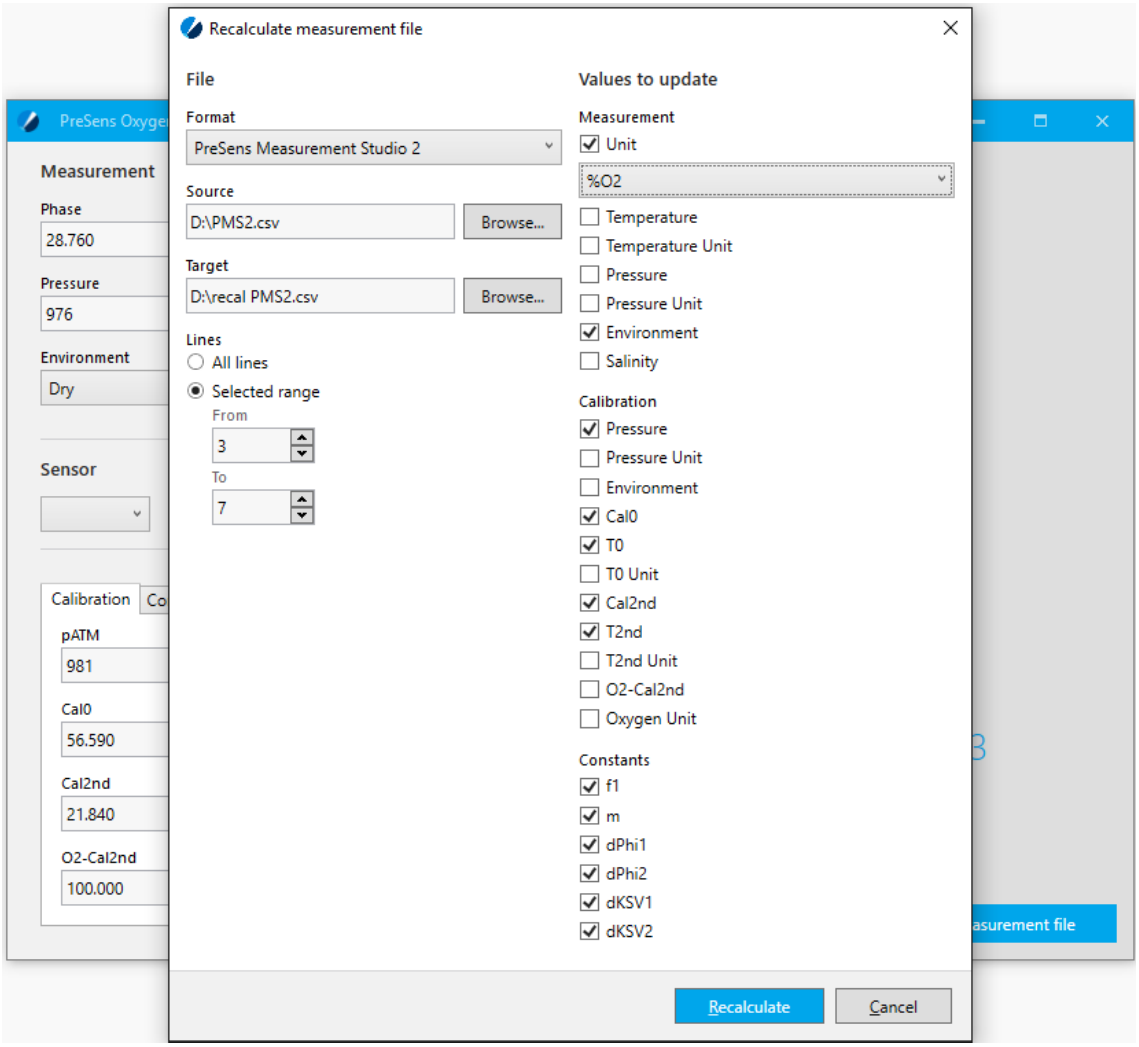
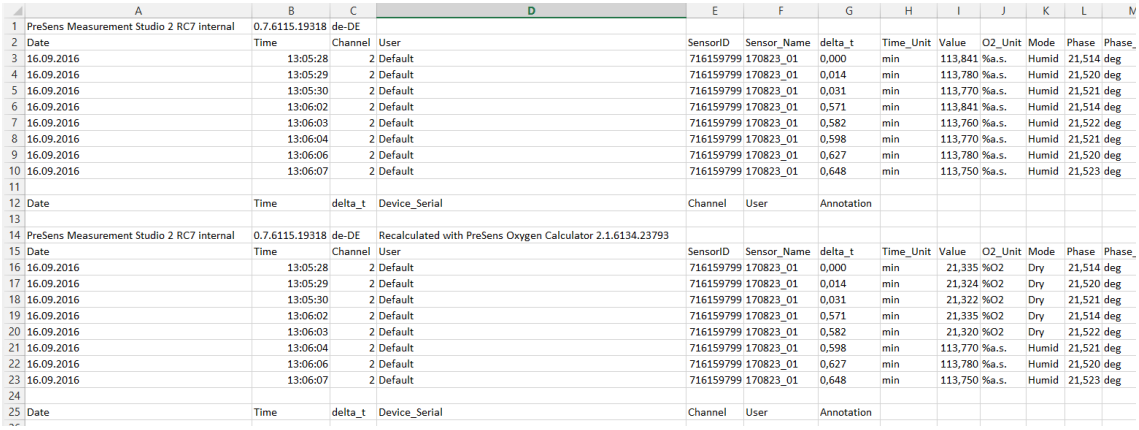


Fig. 8 Data for recalculation selected, the oxygen unit will be changed into % O2.

6. Select the values and units for **Measurement**, **Calibration** and **Constants** you have entered before and now want to use for recalulating by checking the respective box. For all unchecked items the values from the original measurement file selected in Source will be used.

   (An EOM-STS file will always be recalculated with the temperature unit °C and the pressure unit hPa. Therefore, the respective Unit-Checkboxes are deactivated.)

   In Fig. 8, for example, new calibration values and calibration constants will be used for recalculating the measurement file, the Environment settings will be changed from Humid to Dry, and a new oxygen unit is selected, so the values will be shown in % O2. Fig. 9 shows the original and the recalculated measurement file according to the settings made in Fig. 8.



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	PreSens Measurement Studio 2 RC7 internal	0.7.6115.19318	de-DE										
2	Date	Time	Channel	User	SensorID	Sensor_Name	delta_t	Time_Unit	Value	O2_Unit	Mode	Phase	Phase_
3	16.09.2016	13:05:28	2	Default	716159799	170823_01	0,000	min	113,841	%a.s.	Humid	21,514	deg
4	16.09.2016	13:05:29	2	Default	716159799	170823_01	0,014	min	113,780	%a.s.	Humid	21,520	deg
5	16.09.2016	13:05:30	2	Default	716159799	170823_01	0,031	min	113,770	%a.s.	Humid	21,521	deg
6	16.09.2016	13:06:02	2	Default	716159799	170823_01	0,571	min	113,841	%a.s.	Humid	21,514	deg
7	16.09.2016	13:06:03	2	Default	716159799	170823_01	0,582	min	113,760	%a.s.	Humid	21,522	deg
8	16.09.2016	13:06:04	2	Default	716159799	170823_01	0,598	min	113,770	%a.s.	Humid	21,521	deg
9	16.09.2016	13:06:06	2	Default	716159799	170823_01	0,627	min	113,780	%a.s.	Humid	21,520	deg
10	16.09.2016	13:06:07	2	Default	716159799	170823_01	0,648	min	113,750	%a.s.	Humid	21,523	deg
11													
12	Date	Time	delta_t	Device_Serial	Channel	User	Annotation						
13													
14	PreSens Measurement Studio 2 RC7 internal	0.7.6115.19318	de-DE	Recalculated with PreSens Oxygen Calculator 2.1.6134.23793									
15	Date	Time	Channel	User	SensorID	Sensor_Name	delta_t	Time_Unit	Value	O2_Unit	Mode	Phase	Phase_
16	16.09.2016	13:05:28	2	Default	716159799	170823_01	0,000	min	21,335	%O2	Dry	21,514	deg
17	16.09.2016	13:05:29	2	Default	716159799	170823_01	0,014	min	21,324	%O2	Dry	21,520	deg
18	16.09.2016	13:05:30	2	Default	716159799	170823_01	0,031	min	21,322	%O2	Dry	21,521	deg
19	16.09.2016	13:06:02	2	Default	716159799	170823_01	0,571	min	21,335	%O2	Dry	21,514	deg
20	16.09.2016	13:06:03	2	Default	716159799	170823_01	0,582	min	21,320	%O2	Dry	21,522	deg
21	16.09.2016	13:06:04	2	Default	716159799	170823_01	0,598	min	113,770	%a.s.	Humid	21,521	deg
22	16.09.2016	13:06:06	2	Default	716159799	170823_01	0,627	min	113,780	%a.s.	Humid	21,520	deg
23	16.09.2016	13:06:07	2	Default	716159799	170823_01	0,648	min	113,750	%a.s.	Humid	21,523	deg
24													
25	Date	Time	delta_t	Device_Serial	Channel	User	Annotation						

Fig. 9 Original (top) and recalculated (bottom) measurement data opened in Excel. Only measurement lines 3 – 7 have been selected for recalculation.

4 Concluding Remarks

Dear Customer,

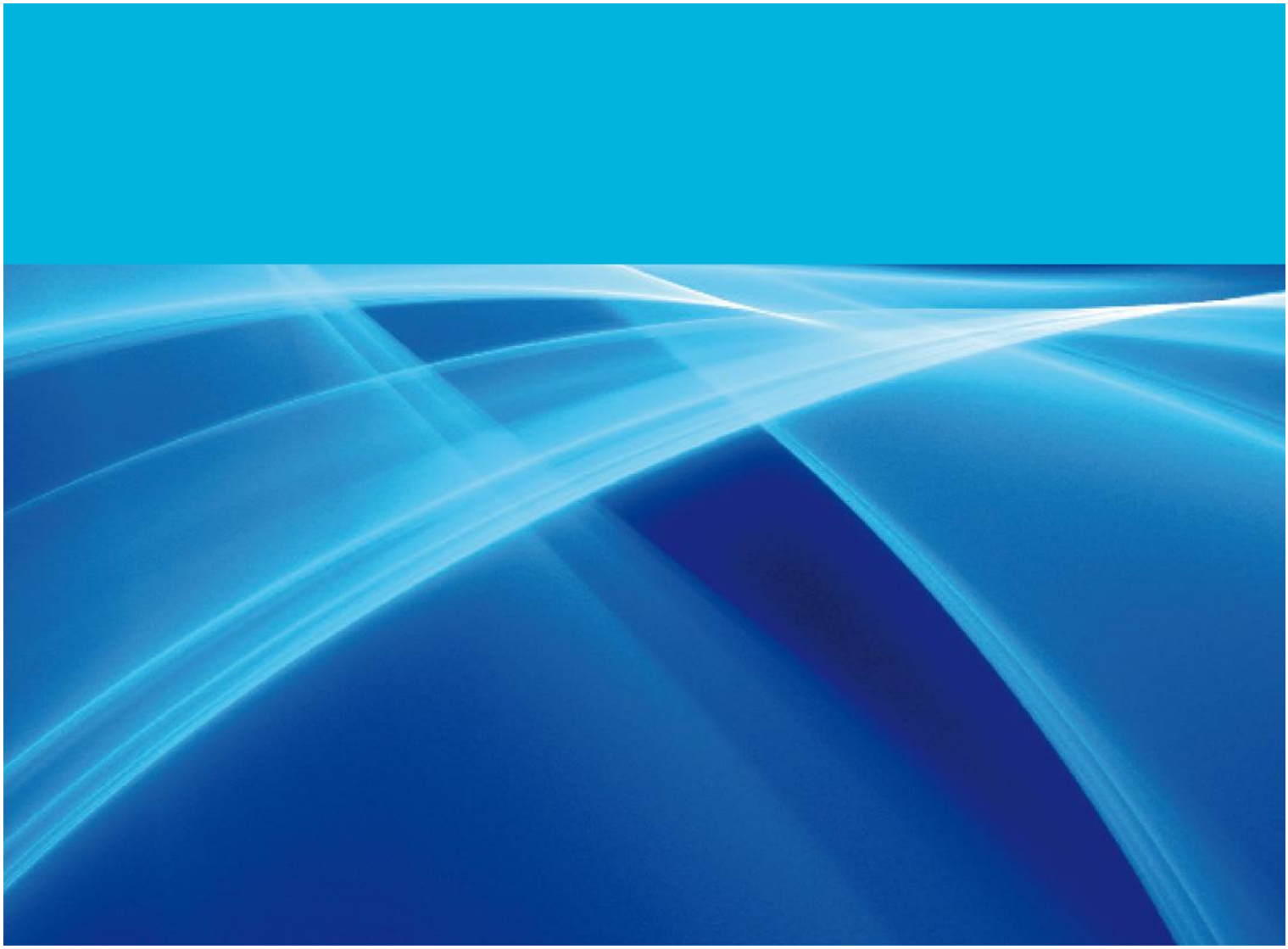
With this manual, we hope to provide you with an introduction to work with the PreSens Oxygen Calculator.

This manual does not claim to be complete. We are endeavored to improve and supplement this version.

We are looking forward to your critical review and to any suggestions you may have.

With best regards,

Your PreSens Team



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