Technical Note TN0001

How to achieve maximum sample rates with the oxygen meter FireStingO2

(A) With the PC software Pyro Oxygen Logger

The fiber-optic oxygen meter FireStingO2 can under certain conditions obtain sampling rates up to 20 samples per second. In order to achieve this, the settings in the Pyro Oxygen Logger software must be adjusted as follows:

(1) Activate in the settings only a single oxygen channel. Activating e.g. 2 oxygen channels will lower the maximum sample rate by 50%:
→Settings→Channels 2-4: switch off "Activate" button

(2) Enable high-speed option:
→Settings→Options→enable "Enable High Speed-Sampling"

(3) Select highest USB communication speed:
→Settings→Options→set "USB Speed" to 115200

(4) Disable humidity-, pressure- und analog In- measurements:
→Settings→Options→switch off the three "Activate" buttons

(5) Disable automatic temperature compensation of the oxygen measurement:
→Settings→Channel 1→Conditions in the Sample→select "Fixed Temperature"

(6) Disable any temperature measurement:
→Settings→Temperature→disable all "Activate" buttons

(7) Choose advanced sensor settings:
→Settings→Channel 1→set "Sensor Settings" to "Advanced"

(8) Adjust the oxygen measuring time as short as possible for the required noise level. Varying this parameter has essential influence on the maximum sample speed possible. However, too low values will increase siginificantly the noise level of the oxygen measurement:
→Settings→Channel 1→adjust "Oxygen measuring time" to e.g. 15ms

(9) Adjust the sample rate:
→Main Window→e.g. set "Sample Interval" to 0.1s for obtaining 10 samples per second

(B) Additional settings for the Auto-Mode

If the auto-mode (operation of the FireStingO2 without any PC connected) should be used, you need to adjust further things in Settings→Options→Advanced Auto-Mode:

(1) Choose "Interval Auto-Mode"
(2) Enable only "oxygen", disable "Temperature", "Humidity", "Pressure", "Analog In"
(3) Set the Interval e.g. to 0.1s for 10Hz
(4) Set "Ref. Count" to e.g. 600, this means that the internal reference LED is measured only every 600th oxygen measurement. This reference LED measurement is needed

for compensating e.g. longterm temperature drifts of the optoelectronics. When this reference LED is measured, you will see a slight delay in the oxygen measurements.

Please note, that the standard specifications given by Pyro Science for optical oxygen sensors are only valid for measurements in the default mode (i.e. Basic Settings, default measuring mode, no high speed sampling activated). These specifications (especially the noise level and therfore the resolution of the oxygen measurement) do not apply for these extreme settings as described above.