

Monitoring of Toxins in Drinking Water by the ToxProtect64 fish monitor

*Data interface for the integration of
different sensor signals (Deliverable
3.4.12)*

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Title

Data interface for the integration of different sensor signals

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1 INTRODUCTION

The ToxProtect64 fish monitor is used to detect toxins in the drinking water quickly and robustly by registering the movements of the fish using an array of light barriers. The system triggers/emits an alarm when the movement of the fish changes / stops due to toxins in the water.

Additional sensor can be used to confirm the data of the ToxProtect and to obtain more information in case of an alarm. The appearance of toxins can be accompanied by changes in signals of additional sensors. These signals enable the observer to fathom the cause of the death of the fish. Sudden death and a significant change of signals of sensors like redox or pH at the same time confirm the assumption that toxins are released in the water distribution system.

Additionally, the data acquisition system of the ToxProtect can be used for other sensors. This makes it cheap and easy to obtain more information about the water.

The ToxProtect is equipped with suitable possibilities to send alarms, to operate the system remotely and to evaluate the data. This is as independent as possible from the site of operation. There are various possibilities to access the fish monitor and to operate additional sensors via different communication paths in order to adapt it to the needs of different applications and sites of operation. Beyond the standard outputs such as a potential-free contact and optical alarm indicator, enhanced communication via GSM / LAN is integrated.

For storage and evaluation of data sets the software has been developed to allow the transfer of data to a PC for the sake of visualisation as well as printing and exporting.

The data evaluation software allows the user to transfer the data from the fish monitor to a PC. This can be done either continuously or in a batch process (if there is no continuous access to the instrument). The software is also able to collect, store and compare the data from different instruments.

Additional sensors can be integrated in the software without additional programming. The results will be stored in the database as well as the data of the fish monitor.

The sensors can be combined to virtual sensors in the software. This means that mathematical formulas can be applied to one or more measurement results.

2 METHOD

Additional sensors can be added via a CAN Bus interface. The PC in the ToxProtect64 is equipped with such a Can Bus.

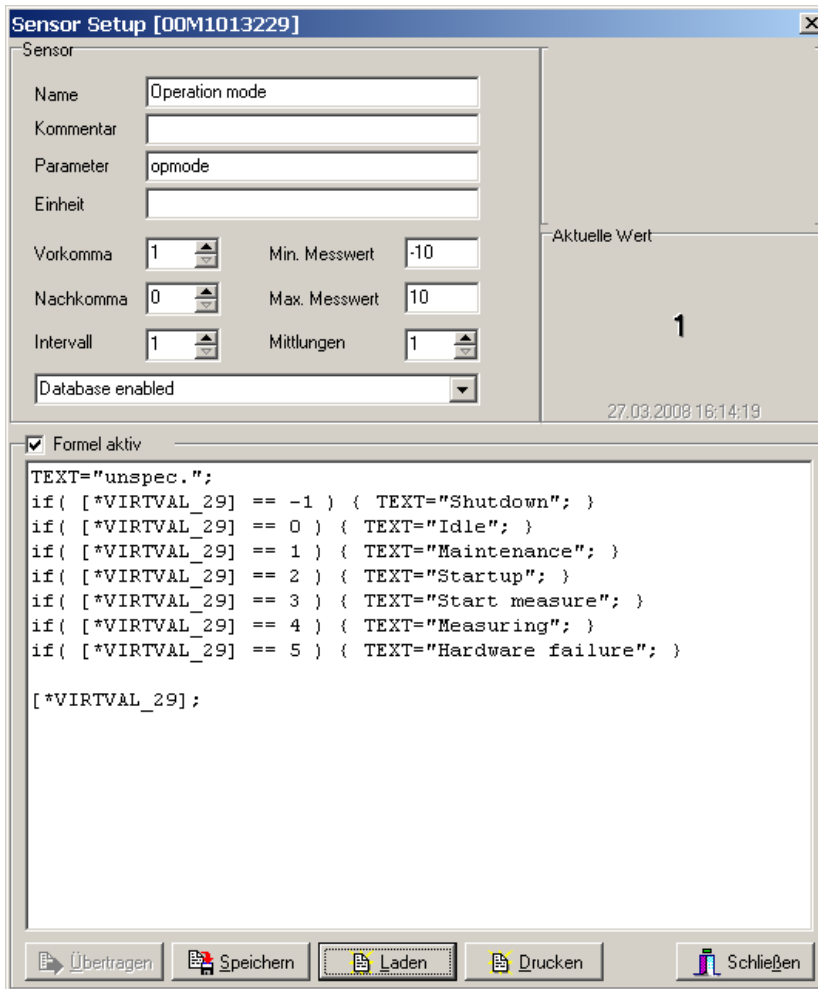
Sensors need to have a CAN Bus interface as well to be connected to the system. For sensors without such a CAN Bus, interface boards are available.

Once attached to the CAN Bus, the configuration of the sensors can be carried out via PC.

3 RESULTS

Connecting the sensors

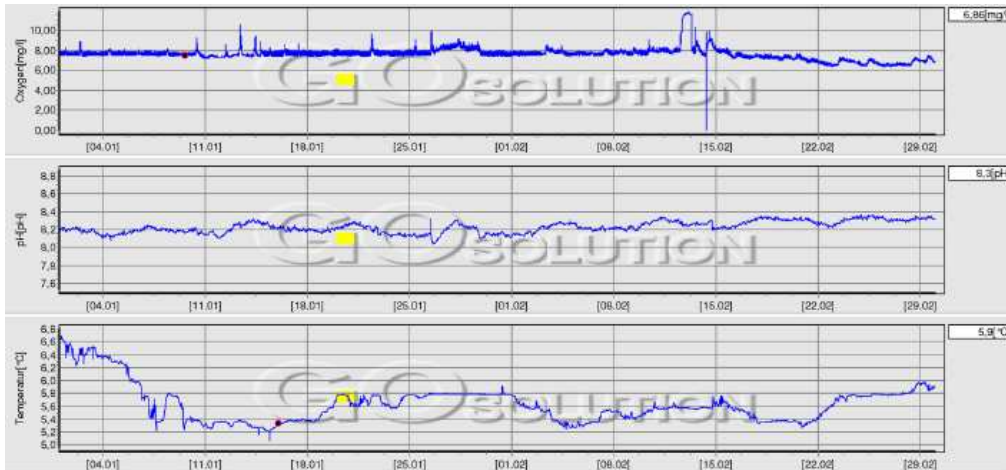
The sensors redox potential, oxygen, chlorine are connected to the small internal PC via a bus system. The data are stored in the internal data base as well as the configuration data and the calculations for virtual sensors.



Sensor configuration of a virtual sensor (operation mode).

Database access:

For access to the database of the fish monitor, special software is available. The data from the fish monitor are transferred to a database on the operator's PC or on a server. It is possible to manage several instruments with one PC/server. It can be used for continuous or periodical transfer and the display of the data.



Screenshots of the long term behaviour of additional sensors: Data observation and evaluation in parallel to the data uptake of the fish monitor can help to confirm alarms and prevent false alarms. Sudden changes in any of the additional physical sensors confirm the change of water quality and therefore the correctness of the signals from the biomonitor.

4 Conclusions

The aim to provide the user of the ToxProtect64 fishmonitor with a flexible and comprehensive tool for remote control and data visualisation has been achieved by integrating additional sensors in the ToxProtect64 instrument. Additionally, the signals of further parameters can be used and displayed. This helps to verify possible alarms because the sensors can show whether the quality of the water has changed in general or not.