



# Nerites FX-I INSTRUCTION MANUAL

**INNOVASUB**

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**WARNING!**

**READ THIS MANUAL!** Carefully read this instruction manual in its entirety. Make sure that you fully understand the use, displays and limitations of the Nerites FX-I. Any confusion resulting from improper use of this device may cause diver to commit errors that may lead to serious injury or death.

**WARNING!**

Nerites FX-I is not a dive computer and does not replace a dive computer. It does not alert the diver in case of risk of Decompression Sickness (DCS). It does not alert the diver in case of low pressure of air or gas mix in the tank. Planning the descent/ascent rates and decompression stops is the responsibility of the diver and Nerites FX-I is not designed to assist the diver in this matter.

**WARNING!**

Never fly within 24 hours of your last dive. Further, the Divers Alert Network (DAN) advises as follows:

- A minimum surface interval of 12 hours would be required in order to be reasonably assured a diver will remain symptom free upon ascent to altitude in a commercial jetliner (altitude up to 2400 m [8000 ft]).
- Divers who plan to make daily, multiple dives for several days, or make dives that require decompression stops, should take special precautions and wait for an extended interval beyond 12 hours before flight. Further, the Undersea and Hyperbaric Medical Society (UHMS) suggests divers using standard air tanks and exhibiting no symptoms of decompression sickness wait 24 hours after their last dive to fly in an aircraft with cabin pressure up to 2400 m [8000 ft]. The only two exceptions to this recommendation are:
  - If a diver had less than 2 hours total accumulated dive time in the last 48 hours, then a 12 hour surface interval before flying is recommended.
  - Following any dive that required a decompression stop, flying should be delayed for at least 24 hours, and if possible, for 48 hours.

**WARNING!**

**ONLY DIVERS TRAINED IN THE PROPER USE OF SCUBA EQUIPMENT SHOULD USE THE NERITES FX-I!** No dive computer including nor the Nerites FX-I can replace the need for proper dive training. Insufficient or improper training may cause diver to commit errors that may lead to serious injury or death.

**WARNING!**

**PERFORM PRECHECKS!** Always activate and check the Nerites FX-I before diving in order to ensure that the device has not run out of battery power and all personal adjustments are correct.

**WARNING!**

NO PROCEDURE, DIVE COMPUTER OR DIVE TABLE WILL PREVENT THE POSSIBILITY OF DECOMPRESSION SICKNESS (DCS) OR OXYGEN TOXICITY! You must understand and accept that there is no procedure, dive computer or dive table that will totally prevent the possibility of a decompression accident or that oxygen toxicity will not occur, even within accepted limits. For example, the individual physiological make up can vary within an individual from day to day. The dive computer cannot account for these variations. As an added measure of safety, you should consult a physician regarding your fitness before diving with the dive computer. Decompression sickness can cause serious injury or death. DIVING WITH ENRICHED AIR MIXTURES (NITROX) EXPOSES THE USER TO RISKS DIFFERENT FROM THOSE ASSOCIATED WITH DIVING WITH STANDARD AIR. THESE RISKS ARE NOT OBVIOUS AND REQUIRE TRAINING TO UNDERSTAND AND AVOID. RISKS INCLUDE POSSIBLE SERIOUS INJURY OR DEATH. DO NOT ATTEMPT TO DIVE WITH ANY GAS MIX OTHER THAN STANDARD AIR WITHOUT FIRST RECEIVING CERTIFIED TRAINING IN THIS SPECIALTY.

**WARNING!**

THE NERITES FX-I SHOULD NEVER BE TRADED OR SHARED BETWEEN USERS WHILE IT IS IN OPERATION! Disconnecting the Nerites FX-I from the BC inlet and the Low Pressure hose will lead to gas loss from the tank and risk injecting water in the respiratory cycle.

**CAUTION!**

ENSURE THE WATER RESISTANCE OF THE DEVICE! Always check the water resistance of Nerites FX-I. Water leaking in the device will lead to its failure during the dive.

**CAUTION!**

Never open the Nerites FX-I. Nerites FX-I should only be opened by trained and approved maintenance personal. In case of failure or need of maintenance of Nerites FX-I, contact Innovasub.

**CAUTION!**

Do not use compressed air to blow water off the Nerites FX-I. Do not use solvents or other cleaning fluids that might cause damage. Do not test or use the unit in pressurized air.

**WARNING!**

The Nerites FX-I functions at a maximum depth of 100m. Do not embed the Nerites FX-I to your equipment if you plan diving deeper than 100m. Do not dive deeper than 100m if the Nerites FX-I is embedded to your diving equipment.

**WARNING!**

Do not start a dive if the LOW BATTERY alarm is displayed by the USB/Battery LED. The Nerites FX-I may fail to function during the dive and this could lead to serious injury or death.

- 1. Welcome to Nerites FX-I System ..... 5
  - 1.1. What is it? ..... 5
  - 1.2. Components ..... 5
  - 1.3. Connecting Nerites FX-I to Your BC ..... 8
  - 1.4. Starting Nerites FX-I ..... 9
- 2. Modes ..... 9
  - 2.1. Surface Mode ..... 9
  - 2.2. Breathing Detection ..... 9
  - 2.3. Dive Mode ..... 9
  - 2.4. Alarms ..... 10
  - 2.5. USB Mode ..... 11
  - 2.6. Charge..... 11
- 3. USB Interface ..... 12
  - 3.1. Information Page ..... 12
  - 3.2. Download Dive Logs..... 13
  - 3.3. Parameters ..... 13
  - 3.4. Live Diagnostic ..... 15
  - 3.5. Firmware Update ..... 16
  - 3.6. Settings..... 17

## Table of Figures

- Figure 1 – Nerites FX-I Components..... 6
- Figure 2 - Nerites FX-I Components..... 6
- Figure 3 - Nerites FX-I LEDs ..... 7
- Figure 4 - Nerites FX-I Connected to BC..... 8
- Figure 5 - Nerites FX-I Connected to BC..... 8
- Figure 6 – Nerites - USB Interface – Information Page..... 12
- Figure 7 - Nerites - USB Interface – Download Dive Logs Page..... 13
- Figure 8 - Nerites - USB Interface – Parameters Page..... 14
- Figure 9 - Nerites - USB Interface – Live Diagnostic ..... 15
- Figure 10 - Nerites - USB Interface – Firmware Update ..... 16
- Figure 11 - Nerites - USB Interface – Live Diagnostic ..... 17

# 1. WELCOME TO NERITES FX-I SYSTEM

## 1.1. What is it?

Nerites FX-I is a patented technology that monitors the breathing of the diver. It will emit a loud sound underwater in case the diver stops breathing in order to alert his dive buddies and the surrounding divers.

Nerites FX-I is also a tool monitoring the performance of the regulator. It detects if the low pressure is within a set range, allowing detecting a regulator possible failure before it actually happens.

Nerites FX-I records the dive profile and the breathing profile of the dives, with a memory up to 9 hours. The dive and breathing profiles can be downloaded through USB and exported to the standard DL7 format (DAN dive log format).

## 1.2. Components

Nerites FX-I comprises 4 simple components:

- A button
- Three LEDs
- A USB Connector
- An inlet and an outlet connectors



**Figure 1 – Nerites FX-I Components**



**Figure 2 - Nerites FX-I Components**



**Figure 3 - Nerites FX-I LEDs**

### 1.3. Connecting Nerites FX-I to Your BC

Use the quick connectors of Nerites FX-I to plug it between the Low Pressure hose of your regulator and the BC inlet as displayed in the figures below. Do not open the tank pressure before ensuring that the Nerites FX-I is properly connected.



**Figure 4 - Nerites FX-I Connected to BC**



**Figure 5 - Nerites FX-I Connected to BC**



### **1.4. Starting Nerites FX-I**

To start the device, press the button once. Each LED should blink once, followed by a buzzer short sound. Your device is now running and ready for diving.

Nerites FX-I will turn off after 3 minutes of inactivity or if the button is pushed three times in a row.

## **2. MODES**

### **2.1. Surface Mode**

Nerites FX-I is started by pressing the button once. It then enters the surface mode. If no breathing is detected during 3 minutes or if the button is pressed three times in a row, it will turn off again.

In surface mode, you can check that the breathing is properly detected by breathing in your second stage regulator and observing the Status LED, which should blink at each inhalation.

In Surface Mode, the alarms are active but the buzzer is de-activated by default. You can allow the alarms to fire the buzzer while on surface by enabling the Surface Monitor parameter of Nerites FX-I on its USB Interface.

### **2.2. Breathing Detection**

A breathing is detected by the Nerites FX-I everytime the diver inhales from the second stage regulator. At each detection, the Status LED blinks.

Note: if the second stage regulator free flows, Nerites FX-I may interpret it as a breathing. If the diver takes a single, long inhalation, Nerites FX-I may detect two or more inhalation.

### **2.3. Dive Mode**

Nerites FX-I enters dive mode when the diver starts diving. In dive mode, the alarms are active and trigger the buzzer. At any time, the diver can ring a loud alert sound by pressing the button once and stop it by pressing the button again.

In dive mode, the dive profile and the breathing profile are recorded in Nerites FX-I memory. If the memory is full, the oldest dives will be automatically removed to free memory. If the dive itself lasts more than 9 hours, the Nerites FX-I will stop recording until next dive.

## 2.4. Alarms

The alarms are the primary and most important function of Nerites FX-I and are describe in the table below.

The alarms are active while Nerites FX-I is ON, meaning they can be triggered if their conditions are met. The buzzer sound triggered by the alarm can be turned off by pressing the button. But the Alarm LED triggered by the alarm will turn off only when Nerites FX-I returns to normal conditions.

In surface and USB mode, the buzzer can be triggered by the alarms if the Surface Monitor parameter is activated in the USB interface.

**Breathing High and Low Alarms:** if the diver doesn't breath for amounts of time T1 and T2 (default values 30 seconds and 60 sec), Nerites FX-I will emit a buzzer sound and blink the Alarm LED. T1 and T2 can be set through the USB interface.

**Regulator Low and High Pressure Alarms:** the regulator is designed to provide a pressure in the Low Pressure hose of 9 to 11 bar, usually near the 10 bar, above the ambient pressure. If the Low Pressure starts to be above or below the given range, it is an indicator that the regulator starts failing, which may lead to a critical situation for the diver's safety. When the Low Pressure is out of the given range, an alarm is triggered, enabling the Alarm LED and the buzzer.

**Battery Low and Very Low Alarms:** when the battery starts going low, the diver is informed by the USB/Battery LED blinking red. When the battery reaches a critical level, Nerites FX-I will be unable to monitor the breathing or the regulator performance and will not trigger any other alarm nor record any further the dive profile.

**Table 1 – Alarms Definition**

Alarm Name	Condition	Effect
Breathing Low Alarm	No Breathing for T1	Alarm LED blinks and low volume buzzer
Breathing High Alarm	No Breathing for T2	Alarm LED blinks and high volume buzzer
Regulator Low Pressure Alarm	Low Pressure too low	Alarm LED blinks and average volume buzzer
Regulator High Pressure Alarm	Low Pressure too high	Alarm LED solid and low volume buzzer
Battery Low Alarm	Battery Level is low	USB/Battery LED slow blink
Battery Very Low Alarm	Battery level is critical and Nerites FX-I will stop working soon	USB/Battery fast blink

## 2.5. USB Mode

USB Mode is activated when a USB cable is plugged to the Nerites FX-I and to a computer. The USB/Battery LEDs then turns green, blinking (battery in charge) or solid (battery full).

There is no need for the Nerites FX-I to be mounted on your diving equipment to activate the USB Mode, unless you are planning to run a live diagnostic.

The USB Mode enables you using the PC Interface to:

- Store and Read user information: name, address, medical information, etc.
- Download dive logs (dive and breathing profiles)
- Read and Set the parameters of Nerites FX-I
- Run a live diagnostic
- Run a firmware update of the Nerites FX-I

These functions are described in details in the paragraph USB Interface.

### **WARNING!**

Pay attention to properly closing the caps of the USB connector after exiting the USB Mode. Water may leak in and damage the Nerites FX-I on your next dive if the caps are not properly closed.

## 2.6. Charge

It is important to ensure a full charge of the battery before each dive. Do not start a dive with the Nerites FX-I if the USB/Battery LED is blinking red.

In order to charge the battery, plug a USB cable to the Nerites FX-I to either a PC or a USB charger adaptor. There is no need for the Nerites FX-I to be mounted on diving equipment for charging its battery.

When connected to a PC, the USB/Battery LED will be green. When connected to a charger, it will be red. In either case, the LED blinks when the battery is being charged and it is solid when the battery is fully charged.

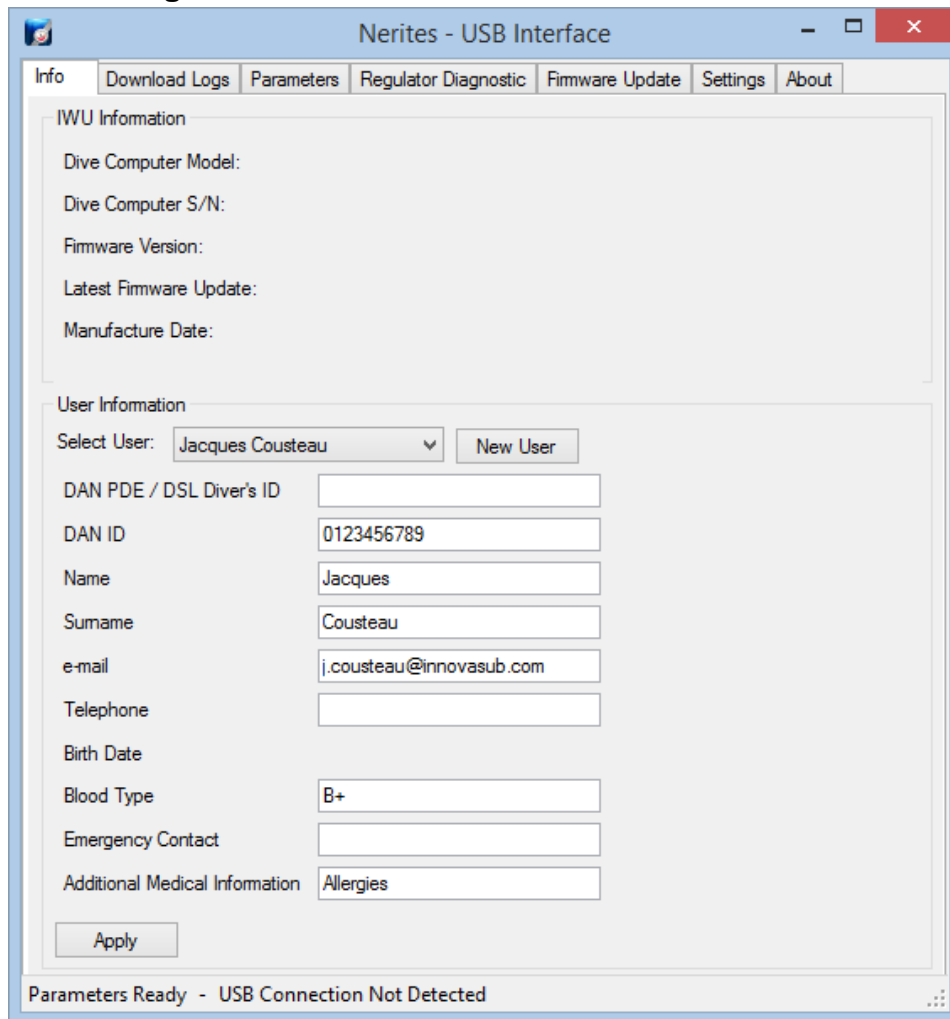
### 3. USB INTERFACE

The Nerites – USB Interface is an application software for Windows Vista, 7, 8 and 8.1. It enabled to:

- Store and Read user information: name, address, medical information, etc.
- Download dive logs (dive and breathing profiles)
- Read and Set the parameters of Nerites FX-I
- Run a live diagnostic
- Run a firmware update of the Nerites FX-I

The following paragraphs describe these functions.

#### 3.1. Information Page

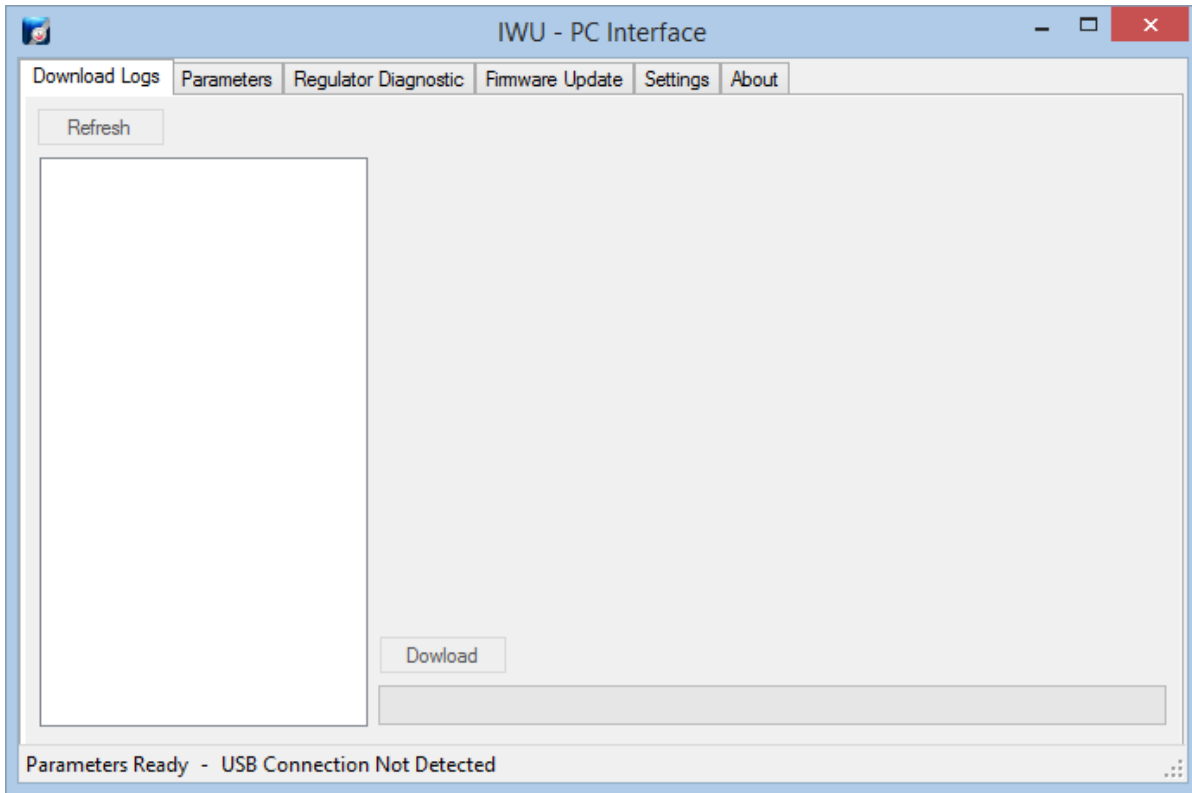


**Figure 6 – Nerites - USB Interface – Information Page**

The information page contains the information related to your Nerites FX-I and about its user (you). You can update the information or pick another diver from your database and click apply to load the information to you Nerites FX-I.

### 3.2. Download Dive Logs

The Download Logs page allows you to download the dive logs directly to your database. Select the dives you wish to download and click the Download button. The logs are directly included in your database.



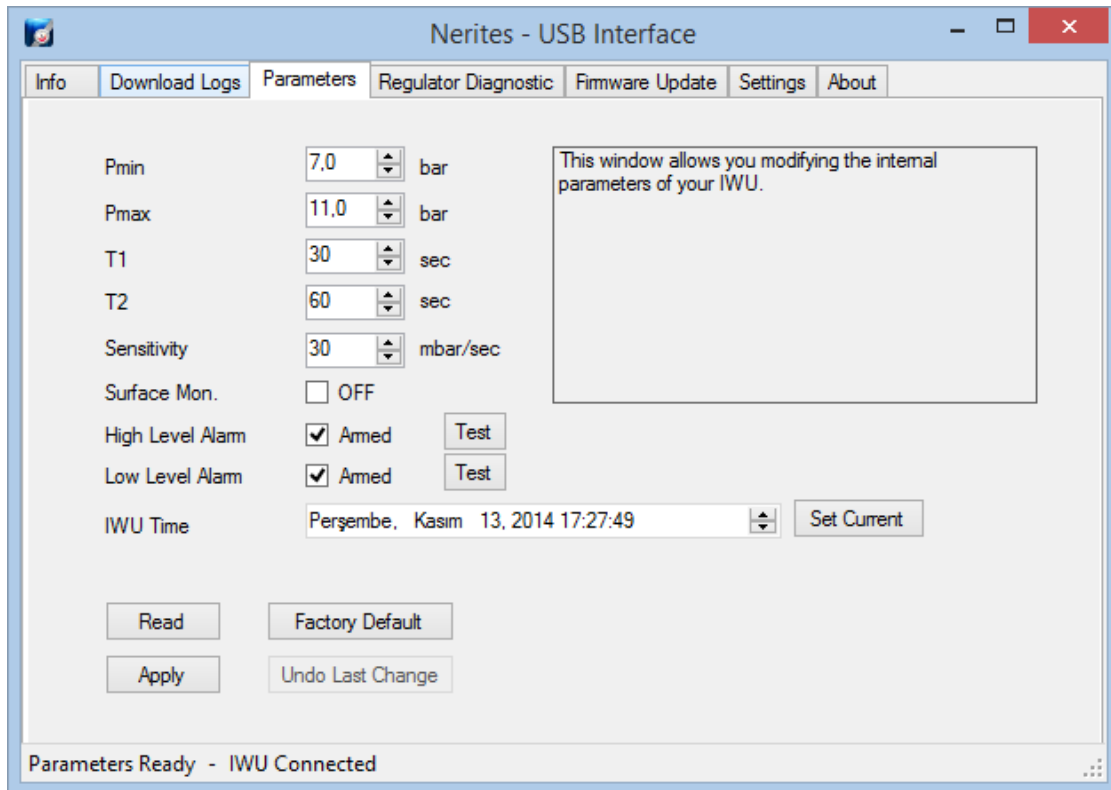
**Figure 7 - Nerites - USB Interface – Download Dive Logs Page**

### 3.3. Parameters

The USB Interface allows you to modify the parameters for the use of Nerites FX-I. Namely:

- **X1**: the time without breathing before the Breathing Low Alarm triggers
- **X2**: the time without breathing before the Breathing High Alarm triggers
- **Pmin**: the minimum pressure the Low Pressure should be before triggering a Reg. Low Pressure Alarm.
- **Pmax**: the maximum pressure the Low Pressure should be before triggering a Reg. High Pressure Alarm.

- **High and Low level armed / disarmed:** allows you to arm or disarm the triggering of the Breathing High and Low Alarms. It is greatly recommended letting these parameters to Armed.
- **Sensitivity:** the level of pressure difference at which breathing should be detected. You are advised adjusting this value to your regulator performance. A value too high will not allow detecting breathing whereas a value too low will detect breathing even when there is none. It is important that you adjust and test the correct value for your regulator. The default value is set to 30 mbar/sec.
- **Surface Monitor:** when set, the alarms when triggered on surface or USB modes also activate the buzzer.
- **Time:** keeps a track of date and time. It is important for the date and time of the dive logs.



**Figure 8 - Nerites - USB Interface – Parameters Page**

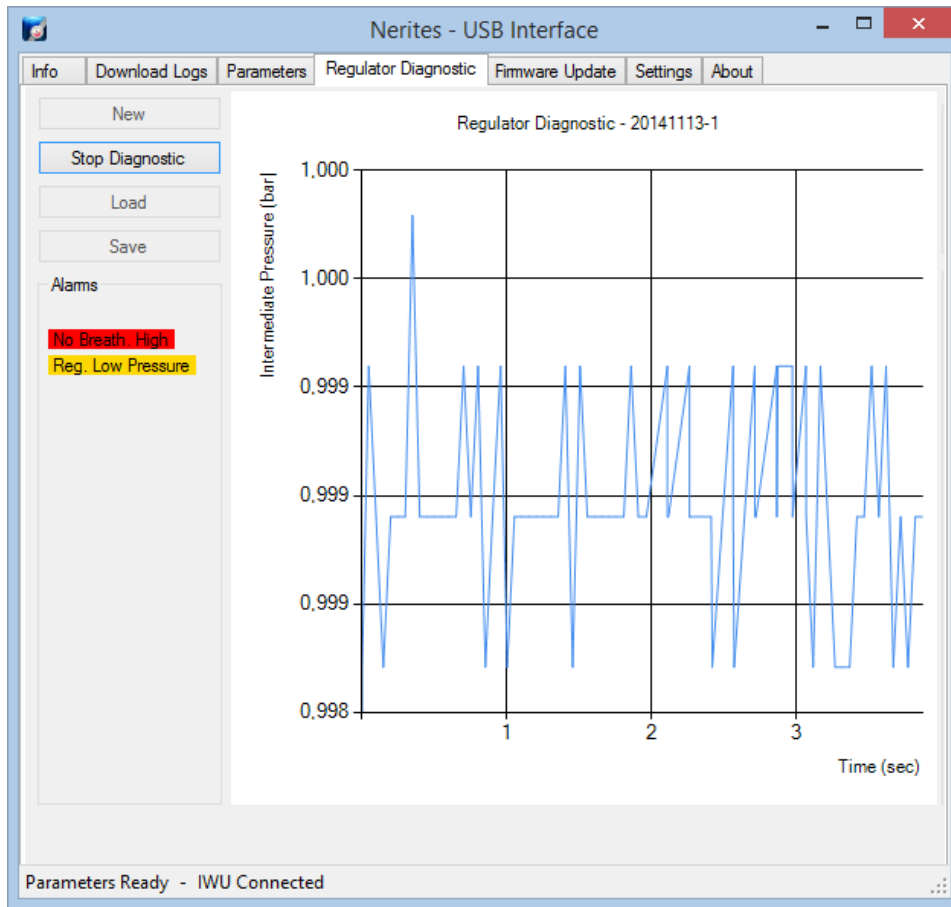
The Test buttons allow triggering the buzzer for testing the volume of the alarms.

You can adjust the values of the parameters on this page and press Apply to apply the new values to the Nerites FX-I.

### 3.4. Live Diagnostic

The Nerites FX-I must be mounted on a BC, connected to a scuba regulator hose and the tank pressure must be open (as if ready to dive) in order to run a live diagnostic.

The live diagnostic allows you to run live measures on the Low Pressure hose and check whether the Low Pressure is within the desired range. It enables you to monitor the proper working of your regulator and detect early of possible failure before it actually happens. It also allows you to see and adjust the breathing detection.



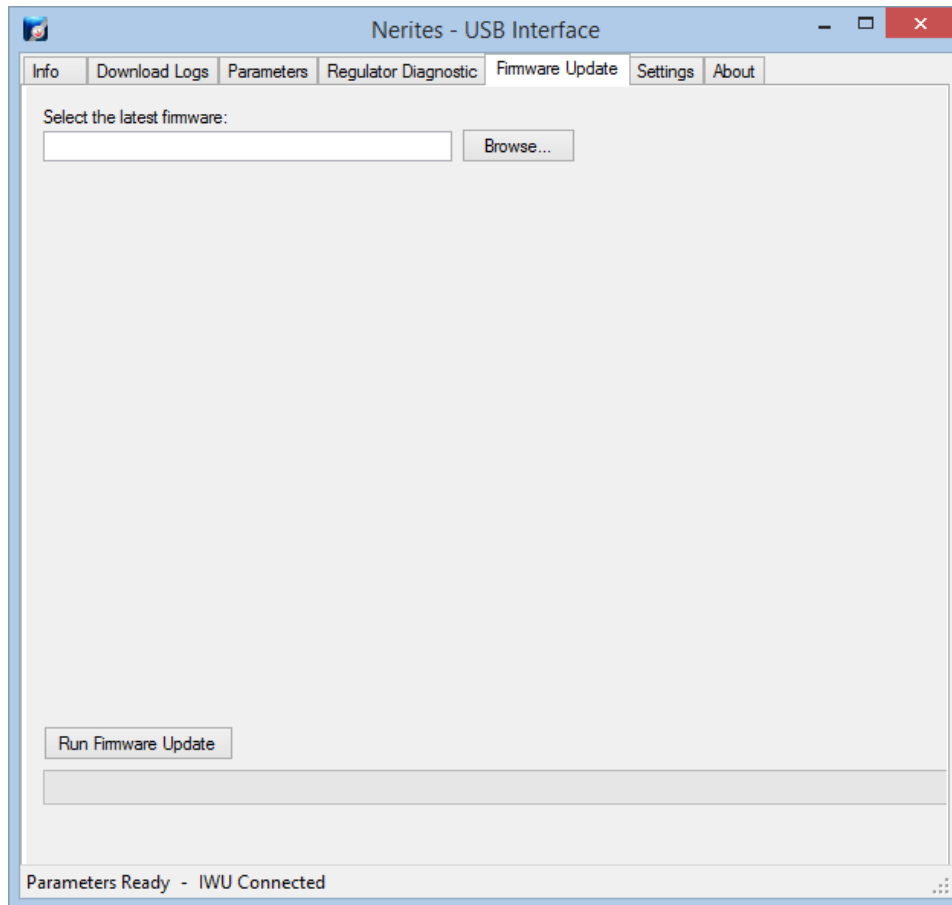
**Figure 9 - Nerites - USB Interface – Live Diagnostic**

### 3.5. Firmware Update

The firmware update can be done when Innovasub notifies you of a major update for the Nerites FX-I firmware. In such case, you will receive or will have downloaded a firmware file provided by Innovasub.

In the Firmware Update of the USB Interface, you will need to select the firmware file and click Run Firmware Update.

After the operation, you are recommended unplugging the Nerites FX-I and closing the USB Interface and starting it again.

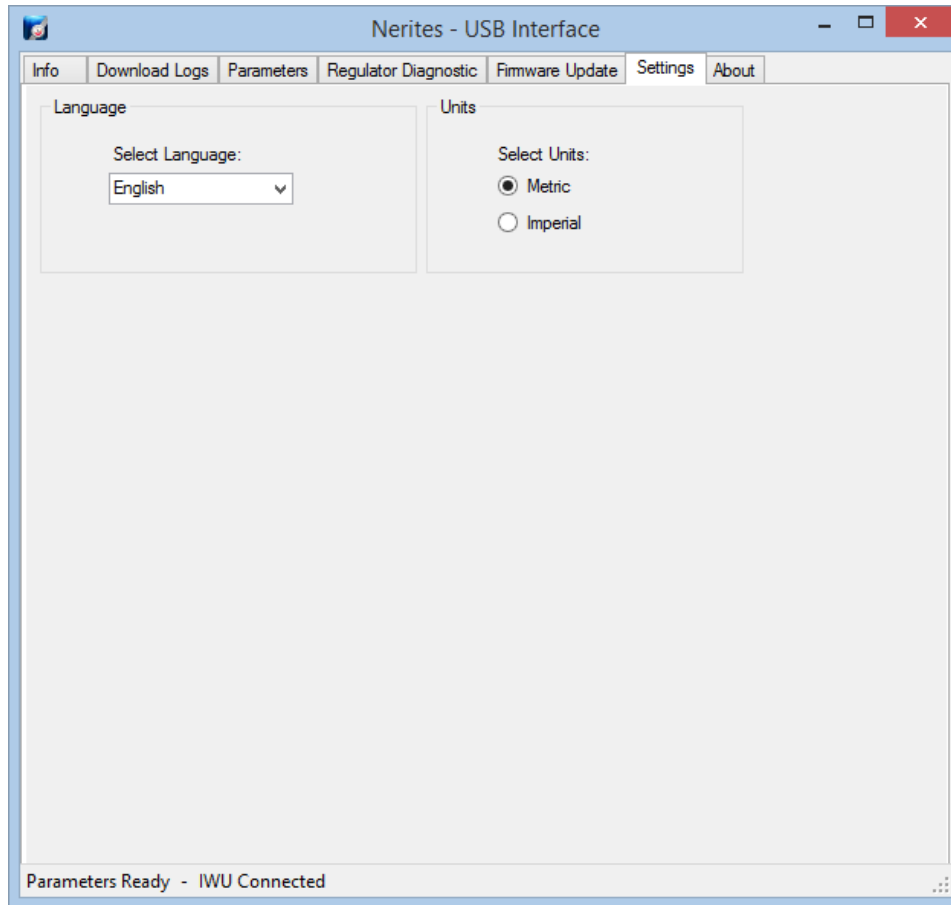


**Figure 10 - Nerites - USB Interface – Firmware Update**



### 3.6. Settings

The settings allow you using Metric or Imperial units and selecting the software language.



**Figure 11 - Nerites - USB Interface – Live Diagnostic**