

# Aquatronica

Instruction Manual



## Low Range Conductivity Interface (Density) ACQ210N-MS



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**CHECK FOR ANY UPDATES ON THIS MANUAL ON THE WEBSITE**

The conductivity value is one of the most important parameters of a soft water aquarium for the survival of fish and plants. This value is usually expressed in  $\mu\text{S}/\text{cm}$  (if the value exceeds 10,000  $\mu\text{S}/\text{cm}$ , it is expressed in  $\text{mS}/\text{cm}$ ).

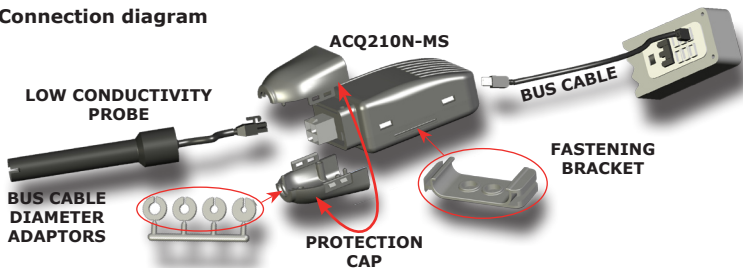
**Aquatronica's** Low-Range Conductivity Interface connects an Aquatronica conductivity probe to the "Aquarium Controller" system to measure and control the conductivity in aquariums.

## Pack contents

You will find:

- One low conductivity probe connection interface.
- One BUS cable for connecting the interface to the power unit
- One bag of accessories containing: 1 fixing bracket – 1 kit of cable diameter adaptor  
1 guard – 2 fixing screws

## Connection diagram

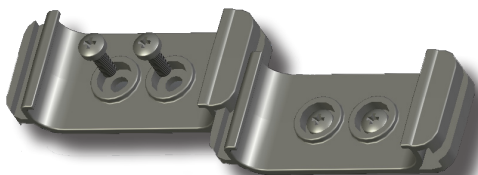


## Connection to "Aquarium Controller" system

1. Connect the low conductivity probe's connector to the interface (ACQ210N-MS).
2. Connect the ACQ210N-MS interface to the power unit (or HUB) using the provided BUS cable.

**NOTE:** Insert the correct end of the connector into the power unit; inserting it in the other direction can seriously damage the equipment.

Thanks to the special shape of the box and fixing bracket, the interface can be fitted with others simply and very quickly, as seen below.



New device connected

S01

Conductivity

(Fig. 1)

After connection, the control unit will display a Plug-In screen (Fig. 1), where a name can be assigned to the connected sensor.

It may take several seconds for the control unit to recognize the connected interface.

**NOTE: The sensor's name can be changed using the control unit's keypad.**

If more than one of these sensors is connected, the user may assign different names for each one to facilitate menu navigation.

Mon 11/06/07 15:05

PU01 A B C D E F G H

Conductivity 680  $\mu$ S

(Fig. 2)

## Displaying the read value

After the probe has been connected through the appropriate interface, the values read by the probe will be displayed on the main screen.

If several sensors were connected, their values can be checked in order by pressing the  $\uparrow$  and  $\downarrow$  keys.

## Conductivity

**Change Name**

Programs

Data Record

Alarm

Calibrate Sensor

(Fig. 3)

## Conductivity Menu

Once the probe and interface are connected, the "Conductivity" menu will appear in the "Main Menu", where all of its settings can be programmed.

All sensor menus have the same structure in order to make them more intuitive and simple.

Cond\_

(Fig. 4)

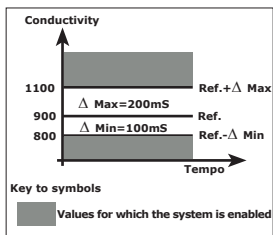
## Change Name

This option modifies the name given to the sensor (Fig. 4).

To use this option, proceed as follows:

**Main screen**  $\Rightarrow$  **Main Menu**  $\Rightarrow$  **Conductivity**  $\Rightarrow$  **Change Name**.

• Select the letter to insert using the  $\uparrow$ / $\downarrow$  keys and move within the word using the  $\leftarrow$ / $\rightarrow$  keys. When finished, press "Enter".



## Programs

This option is used to create programs based on the Conductivity value.

To set up a program, the following must be established:

- A **reference value**, defined as the Conductivity for the tank, which the system will aim to maintain.

- A  **$\Delta$  Max value**, defined as the tolerance that must be observed with respect to values higher than the reference value.

For example: If the reference is set to 900mS and the  $\Delta$  Max is 200mS, the system will be enabled at values higher than 1100mS (see chart).

- A  **$\Delta$  Min value**, defined as the tolerance that must be observed with respect to values lower than the reference value.

For example: If the reference is set to 900mS and the  $\Delta$  Min is 100mS, the system will be enabled at values lower than 800mS (see chart).

To insert a program, proceed as follows:

**Main screen**  $\Rightarrow$  **Main Menu**  $\Rightarrow$  **Conductivity**  $\Rightarrow$  **Programs**.

- Select "**Insert**" using the  $\uparrow\downarrow$  keys and press "**Enter**" (Fig. 5).

## Conductivity

Insert

(Fig. 5)

## Insert

In this screen, the conductivity value to obtain can be chosen and a minimum and maximum tolerance can be set (Ex. Fig. 6).

To set this program, proceed as follows:

**Main screen**  $\Rightarrow$  **Main menu**  $\Rightarrow$  **Conductivity**  $\Rightarrow$  **Programs**  $\Rightarrow$  **Insert**.

- Select with the reference conductivity value using the  $\leftarrow\rightarrow$  keys and set the desired value using the  $\uparrow\downarrow$  keys.

- Set the " **$\Delta$ MIN**" and " **$\Delta$ MAX**" tolerances; select the desired parameter using the  $\leftarrow\rightarrow$  keys and modify the value using the  $\uparrow\downarrow$  keys.

- Select "**Sockets**" using the  $\leftarrow\rightarrow$  keys to choose how the outputs will function when the conductivity level goes above or below the set values. Then press "**Enter**".

- Select the output to be controlled using the  $\leftarrow\rightarrow$  keys. The selected output will blink on both lines.

The outputs on the upper line determine which devices must be enabled/disabled when the conductivity goes above the set maximum value (Ref. +  $\Delta$ MAX); the outputs on the upper line are set using the  $\uparrow$  key.

Programs	
Ref.	900mS
$\Delta$ MIN:	$\Delta$ MAX:
100 $\mu$ S	200 $\mu$ S
Sockets	Confirm

(Fig. 6)

Pump								
		$\mu\text{S}$						
PU01	A	B	C	D	E	F	G	H
		$\mu\text{S}$						
PU01	A	B	C	D	E	F	G	H

(Fig. 7)

The example in (Fig. 7) shows enabling of the pump on socket "C": pressing the  $\uparrow$  key once, the socket is highlighted and the  $\mu\text{S}$  symbol appears above it.


To disable a socket, press the  $\uparrow$  key a second time; in this case, only the  $\mu\text{S}$  symbol will appear above the selected socket.

The outputs on the lower line determine which devices will be enabled/disabled when the conductivity goes below the set minimum value (Ref. -  $\Delta$  MIN); the outputs on the lower line are set using the  $\downarrow$  key.

The example in (Fig. 7) shows disabling of the pump connected to socket "C"; only the symbol  $\mu\text{S}$  appears.

After the desired sockets have been set, press "Enter" to return to the previous menu (Ex. Fig. 6).

The "Confirm" field is automatically selected: by pressing "Enter" the inserted program is saved.

Programs	
Curve	
$\Delta$ MIN:	$\Delta$ MAX:
100 $\mu\text{S}$	200 $\mu\text{S}$
Sockets	Confirm

(Fig. 8)

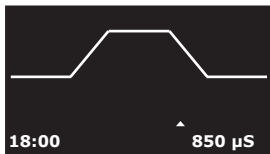
If different conductivity values are desired based on the time of day, these can be set graphically.

To set this function, proceed as follows:

**Main screen**  $\Rightarrow$  **Main menu**  $\Rightarrow$  **Conductivity**  $\Rightarrow$  **Programs**  $\Rightarrow$  **Insert**.

- Using the  $\leftarrow$  $\rightarrow$  keys, select the conductivity reference parameter (**Ref.**). Using the  $\uparrow$  $\downarrow$  keys, select "Curve" (Ex. Fig. 8).

Afterwards move to the  $\wedge$  $\vee$  $\vee$  $\wedge$  symbol and press "Enter".



(Fig. 9)

A screen opens where the desired conductivity value can be graphically modeled over 24 hours (Ex. Fig. 9).

- Using the  $\leftarrow$  $\rightarrow$  keys, select the time of day (in 2-hour intervals, lower left corner). Using the  $\uparrow$  $\downarrow$  keys, modify the conductivity value (lower right corner) for the selected time. When finished, press the "Enter" key.

Do you want to  
modify or delete?

**Modify**  
Delete Program

(Fig. 10)

Do you want to  
delete this  
program?

Enter: Confirm  
Esc: Cancel

(Fig. 11)

Do you want to  
delete all of the  
programs?

Enter: Confirm  
Esc: Cancel

(Fig. 12)

### View/Mod/Del

In this menu the inserted programs can be viewed (View), modified (Mod) or deleted (Del).

To use this function, proceed as follows:

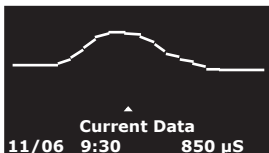
- Access the program to be modified or deleted by pressing "Enter" on the "View/Mod/Del" field.
- Use the  $\leftarrow$  $\rightarrow$  keys to view the desired program (Ex. Fig. 8).
- Press the "Enter" key. The specific screen appears on the display (Fig. 10).
- Select "Modify" using the  $\uparrow$  $\downarrow$  keys to modify the program or change the desired parameters. Then press "Enter" to confirm the change.
- Select "Delete Program" using the  $\uparrow$  $\downarrow$  keys to delete the program. The delete screen will appear (Fig. 11). Press "Enter" to delete or "Esc" to cancel.

### Delete All (Fig. 12)

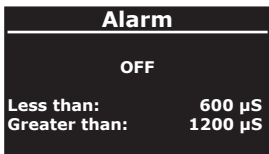
In this menu all of the programs inserted in the menu can be deleted at one time.

To use this function, proceed as follows:

- Select "Delete All" using the  $\uparrow$  $\downarrow$  keys and press "Enter". The delete screen will appear. Press "Enter" to delete or "Esc" to cancel.



(Fig. 13)



(Fig. 14)

## Data Record

The Data Record graphically displays variations in the conductivity during the previous 24 hours with a minimum interval of 30 minutes (Ex. Fig. 13).

To display the data, proceed as follows:

**Main screen** ⇨ **Main menu** ⇨ **Conductivity** ⇨ **Data Record**.

- Using the  $\uparrow\downarrow$  keys, select the maximum (MAX), minimum (MIN) or current conductivity. Using the  $\leftarrow\rightarrow$  keys, move within the chart to view the conductivity of a given time. Press **"Enter"** when finished.

## Alarm

A visual or acoustic alarm can be set to notify the user if the conductivity level goes below or above the **"Less than"** or **"Greater than"** values (Ex. Fig. 14).

If the conductivity value exceeds these limits, the conductivity value on the main screen will blink if the alarm is set to **"No Sound"**.

If the alarm is set to **"Sound"**, the value will blink, an acoustic signal will sound and the  $\text{🔊}$  icon will appear on the main screen.

To program this function, proceed as follows:

**Main screen** ⇨ **Main menu** ⇨ **Conductivity** ⇨ **Alarm**.

- Select the desired option using the  $\uparrow\downarrow$  keys:  
**OFF** = alarm disabled  
**Sound** = alarm and acoustic signal enabled  
**No Sound** = alarm enabled and acoustic signal disabled
- Select **"Less than"** using the  $\leftarrow\rightarrow$  keys and then **"Greater than"** and with the  $\uparrow\downarrow$  keys program the desired conductivity to set the limits beyond which the alarm will be enabled.  
 After programming the various settings, press **"Enter"**.

## Calibrate Sensor

New  
Reset

(Fig. 15)

### Calibrate Sensor

This menu allows you to calibrate the Conductivity probe through the interface. By using the keys  $\uparrow\downarrow$ , you may choose whether to perform a new calibration by selecting "New", or to delete a previous one and reset the interface to the default settings by selecting "Reset" (Fig. 16). A calibration should be performed when the interface is first connected to the system.

**Note:** Before performing the calibration, the probe must be rinsed using tap water, dried carefully and inserted in the Aquatronica conductivity solution.

Do you want to return to  
default calibration values?

Enter: Confirm  
Esc: Cancel

(Fig. 16)

In order to correctly calibrate the sensor, proceed as follows:

**Main screen**  $\Rightarrow$  **Main menu**  $\Rightarrow$  **Conductivity**  $\Rightarrow$  **Calibrate Sensor**  $\Rightarrow$  **New**.

**1)** Select the function "New" by using the keys  $\uparrow\downarrow$  then press "Enter" (Fig 15).

**2)** Using the keys  $\uparrow\downarrow$  set the value of the standard solution next to "Calib. Value" (Fig. 17).

**3)** Wait 10 minutes in order to allow the probe's read value to stabilize. The read value may stabilize on a value that is slightly different than the reference.

**4)** Once 10 minutes have elapsed, press "Enter".

**5)** The controller will display the calibration result (Fig. 18); rinse the probe and insert in aquarium

**Note:** the calibration may be cancelled at any time by pressing "Esc". This will return the calibration parameters to those of the last completed calibration.

Set reference and  
wait for adjustment

Read Value 1390  $\mu$ S  
Calib. value 1410  $\mu$ S  
1/1

(Fig. 17)

Calibration OK

Press any key to  
continue

(Fig. 18)

## Aquatronica

FW version: x.y

Press any key to  
continue

(Fig. 17)

## Device Disconnected

S01: Conductivity

(Fig. 18)

Mon 11/06/07 15:05

PU01 A B C D E F G H

Conductivity ?

?

(Fig. 19)

## Conductivity

Change Name  
Programs  
Alarm

Disconnect

(Fig. 20)

## Disconnect

Conductivity

Enter: Confirm

Esc: Cancel

(Fig. 21)

### About

Provides information on the control unit's firmware version.

To use this function, proceed as follows:

**Main screen** ⇨ **Main menu** ⇨ **Conductivity** ⇨ **About**.

### Disconnect

If the conductivity interface is disconnected, a message will appear on the display (Fig. 18). Press **"Enter"** to indicate that the message has been read.

On the main screen the **"?"** icon will appear next to the name of the **"Conductivity"** sensor and in the lower left corner (Fig. 19).

If the conductivity interface is reconnected, the control unit will automatically begin displaying the read value again.

To definitively eliminate the conductivity sensor from the system, after disconnecting it, proceed as follows:

**Main screen** ⇨ **Main menu** ⇨ **Conductivity** ⇨ **Disconnect**.

The **"Data Record"** and **"Calibrate Sensor"** functions disappear from the **"Conductivity"** menu (Fig. 20) and the **"Disconnect"** function appears.

- Select this function using the  $\uparrow\downarrow$  keys and press **"Enter"**.

- The disconnection screen will appear (Fig. 21). Press **"Enter"** to disconnect or **"Esc"** to cancel.

## Suggestions for an accurate reading of the Conductivity

Precise readings depend greatly on proper maintenance of the connected probe. Beyond its intrinsic qualities, how the sensor is cared for is particularly important. This will, in fact, provide reliable readings. Below is a list of some simple suggestions for optimum conductivity readings in aquariums:

- Handle the probe with care.
- If the probe is stored out of the water, it must be thoroughly dried to prevent oxidation of the electrodes.
- Periodically clean the probe with tap water.
- Periodically calibrate the instrument (approximately every month as indicated to previous pages) to correct any reading imperfections due to probe wear.
- Never use calibration solutions that have been left open or have expired.
- Before calibration, rinse the probe with tap water and dry it carefully.
- Replace the probe after a period of approximately 15-18 months.
- Do not install the interface in direct contact with wet or damp parts.
- Position the probe in the tank or sump away from strong currents to prevent excessive oxygenation inside the latter.
- Do not immerse the probe completely in water. The cable's seam must always be approximately 2 cm above the water.

### IMPORTANT

**For reliable conductivity readings, use only AQUATRONICA electrodes. The use of other brands of electrodes could cause incorrect readings of the instrument.**

**NOTE: in case of malfunctions or any doubts about the use of this interface, please contact AQUATRONICA'S free Technical Assistance.**

## DISPOSAL OF ELECTRIC AND ELECTRONIC PARTS

Pursuant to Article 13 of Legislative Decree No. 151 of 25 July 2005, "Implementation of **Directives 2002/95/CE, 2002/96/CE and 2003/108/CE, regarding the reduction in use of dangerous substances in electrical and electronic equipment, as well as waste disposal**":



Products bearing the barred dustbin symbol must be disposed of separately from other waste.

The user must therefore dispose of the product in question at suitable recycling centers for electronic and electro-technical waste, or he/she must turn over the used product to the retailer when buying a new equivalent product, on a one-to-one basis.

Separate waste collection allows used equipment to be recycled, treated and disposed of without negative consequences for the environment and health, and it allows the materials in the equipment to be recycled. Illegal dumping of the product by the user entails the administrative sanctions stated in Legislative Decree No. 22/1997 (Article 50 et seq of Legislative Decree No. 22/1997).



Separate collection of used products and packaging allows materials to be recycled and used again. Reuse of recycled materials helps prevent environmental pollution and reduces the demand for raw materials.

Local regulations may provide for the separate collection of household appliances at municipal waste sites or retailers when a new product is purchased.



# Declaration of Conformity

## DECLARATION OF CONFORMITY



Standard of reference ISO/IEC Guide 22 and EN 45014

**Number of conformity: 005-2007/E**

Name of the manufacturer: **Aquatronica division of A.E.B. srl**  
Address: via dell'Industria, 20  
Corte Tegge  
42025 Cavriago (RE) Italy

### DECLARES THAT THE ELECTRONIC UNITS

Code: **ACQ210N-RX** (REDOX sonde interface)  
**ACQ210N-PH** (PH sonde interface)  
**ACQ210N-TL** (temperature and level sonde interface)  
**ACQ210N-MS** (conductibility sonde interface)  
**ACQ210N-D** (density sonde interface)  
**ACQ210N-WL** (water-leakage sonde interface)

### ARE IN COMPLIANCE WITH THE FOLLOWING PRODUCT SPECIFICATIONS:

FIELD	Directive	Description	References	Test Result
EMC	2004/108/EC	EMC directive	Official Journal of the European Union L390 December 31 2004	applied

**THEREFORE THEY ARE IN COMPLIANCE WITH THE REQUISITES OF THE CE MARK**  
*The equipment was checked in a typical working configuration*

Place of issue: **Cavriago (RE) Italy**

Date of issue: **12/04/07**

**The A.E.B. srl legal representative**  
*Paterlini Ivan*

# **Aquatronica**



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