

Engineering Note: EN0056 - ORBA2 Installation and Calibration

Summary: ORBA2 - Installation and Calibration of Hydro-Probe Orbiter Ceramic Arm

Products affected: Hydro-Probe Orbiter / Hydro-Probe Orbiter II

Revision Date: December 2013 Author: P Rogers / A Smith

The ORBA2 Hydro-Probe Orbiter Ceramic Arm should be installed following the instructions in the Hydro-Probe Orbiter User guide. All operations for the ORBA2 are the same as installing a standard Orbiter arm.

NOTE: The metal part of the arm is not warranted against wear.

The Arm is fitted with two steel protection rings and a Hawiflex protection sleeve. These must be used at all times. The protection must be replaced when it wears and can no longer protect the metal arm. If necessary the Hawiflex sleeve may be cut to reduce its height but all metal parts of the arm exposed to wear must be protected.

Do not pressure wash the arms. Pressure washing can damage the seal between the ceramic and the metal of the arm.



ORBA2 with steel protection rings and Hawiflex protection sleeve fitted

The area immediately above the ceramic is subject to very high wear. In the event that the steel protection rings wear away too quickly, a ceramic protection ring may be purchased from Hydronix. This will offer better protection from wear but may not have the impact resistance of the steel rings. The ceramic ring should be monitored daily for signs of damage.



ORBA2 with ceramic protection ring.

Updating the Hydro-Probe Orbiter

If you are replacing an ORBA1 Metal Head arm with the ORBA2 Ceramic Head arm, the Hydro-Probe Orbiter Head Unit will need to have its configuration changed. The new arm must also be calibrated.

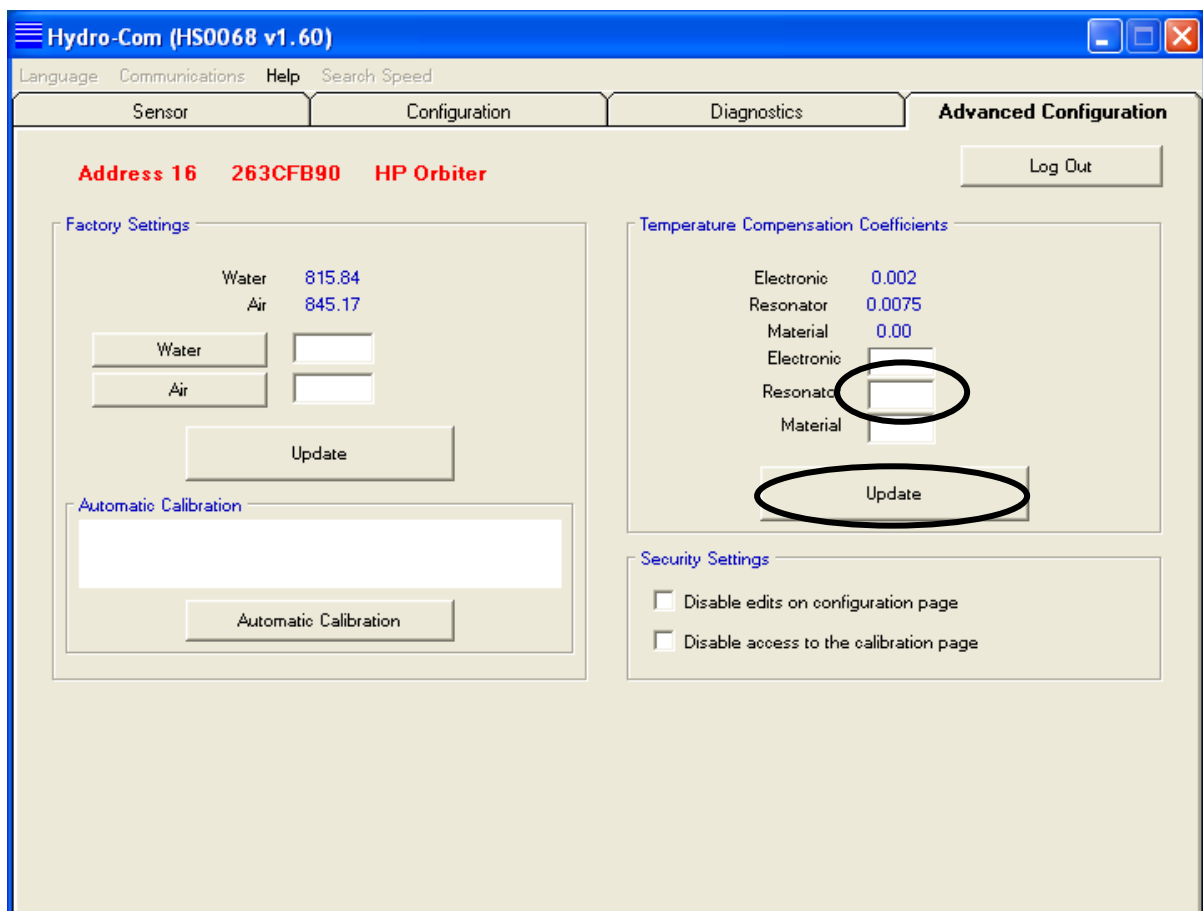
Updating Temperature Compensation

For the new arm to operate correctly, the temperature compensation coefficient for the resonator must be changed in the configuration settings. This is done using Hydro-com software, which can be downloaded free from the Hydronix website www.hydronix.com. This will require RS485 communications to the Orbiter so a suitable adapter such as the Hydronix USB to RS485 adapter will also be needed.

The temperature compensation coefficients should be changed to the values shown in the table below:

Product	Software Version	New Values			
		Electronics Frequency	Electronics Amplitude	Resonator Frequency	Resonator Amplitude
Orbiter I	HS0063	<i>No change</i>	<i>N/A</i>	+0.015	<i>N/A</i>
Orbiter II	HS0089	-0.0035	-0.15	+0.015	+0.036

This is done by typing the new value into the Electronics and Resonator boxes shown below, and then clicking on Update.



Hydro-Com (HS0068 v1.60)

Language Communications Help Search Speed

Sensor Configuration Diagnostics **Advanced Configuration**

Address 16 263CFB90 HP Orbiter Log Out

Factory Settings

Water 815.84
Air 845.17

Water []
Air []

Update

Automatic Calibration

Automatic Calibration

Temperature Compensation Coefficients

Electronic 0.002
Resonator 0.0075
Material 0.00

Electronic []
Resonator []
Material []

Update

Security Settings

Disable edits on configuration page
 Disable access to the calibration page

Calibrating the Arm

Once the resonator temperature compensation coefficient has been set the Hydro-Probe Orbiter can be calibrated.

Using Hydronix Hydro-Com Configuration Utility

The calibration is performed by making separate readings in both air and water. With the sensor connected to a computer the Hydro-Com utility can be used to make the measurements and update the sensor in the Advanced Configuration section.

The air reading should be made with the face-plate of the sensor clean, dry and free from obstructions. On the advanced configuration tab of the Hydro-Com press the Air button. The software will make a new air measurement.

The water reading should be carried out in a bucket filled with a clean brine solution. This solution should be made up from water with 0.5% by weight of salt (e.g. 10 litres of water to be mixed with 50gm of salt). The level of water needs to cover the ceramic face-plate, and at least 200mm of water is needed in front of the ceramic. It is suggested that the sensor is held in the bucket offset to one side with the face towards the centre of the bucket (see Figure 1), hence the measurement is carried out with a full bucket of water in front. Press the Water button. The software will make a new water measurement.

Once both readings are made, the sensor can be updated by pressing the update button in the Hydro-Com software and it is then ready for use.

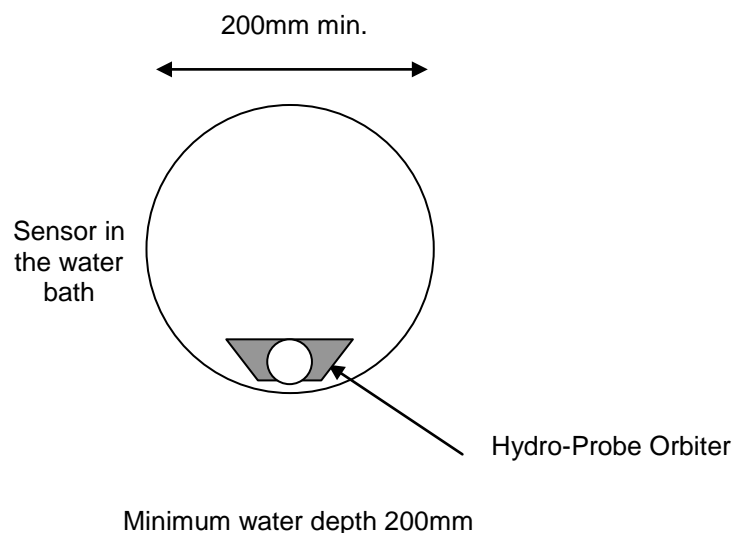


Figure 1: Water Calibration

Calibration of Recipes

NOTE: Once the alignment of the sensing arm is changed inside a mixer, the resultant density change of material passing the sensing head will have an effect on the



Hydronix

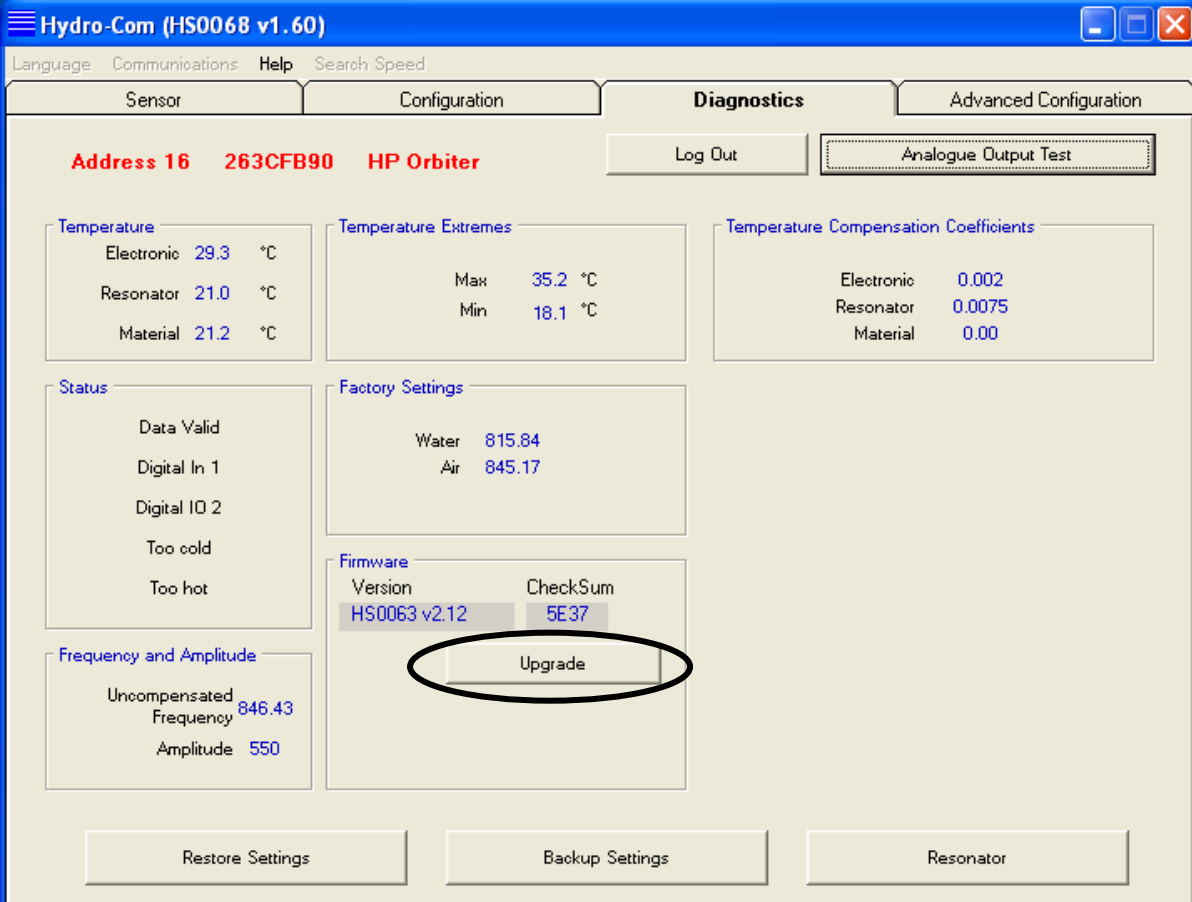
recipe. This would apply when a new arm is fitted, despite pointing the faceplate in the same approximate direction as the previous installed arm. It is therefore advisable to recalibrate the recipes before continuing batching.

Updating to use the Auto-Cal Facility

For users who wish to use the Auto-Cal facility either with the Hydro-Control V or VI, Hydro-Com or by using an Auto-Cal Dongle, the firmware in the Hydro-Probe Orbiter I will need to be upgraded to HS0063 Version 2.14 or later. Hydro-Probe Orbiter II with software HS0089 supports Auto-Cal in all versions.

The latest Hydro-Com sensor firmware file HS0074 should be downloaded from the Hydronix website and saved to a PC. The downloaded file should then be run to unzip the firmware file.

The firmware can then be upgraded using Hydro-Com. From the Diagnostics tab, press the Upgrade button as shown then select the Firmware Upgrade file from the location where it was saved. The Hydro-Probe Orbiter will then be upgraded. Do not disconnect the sensor during the upgrade process.

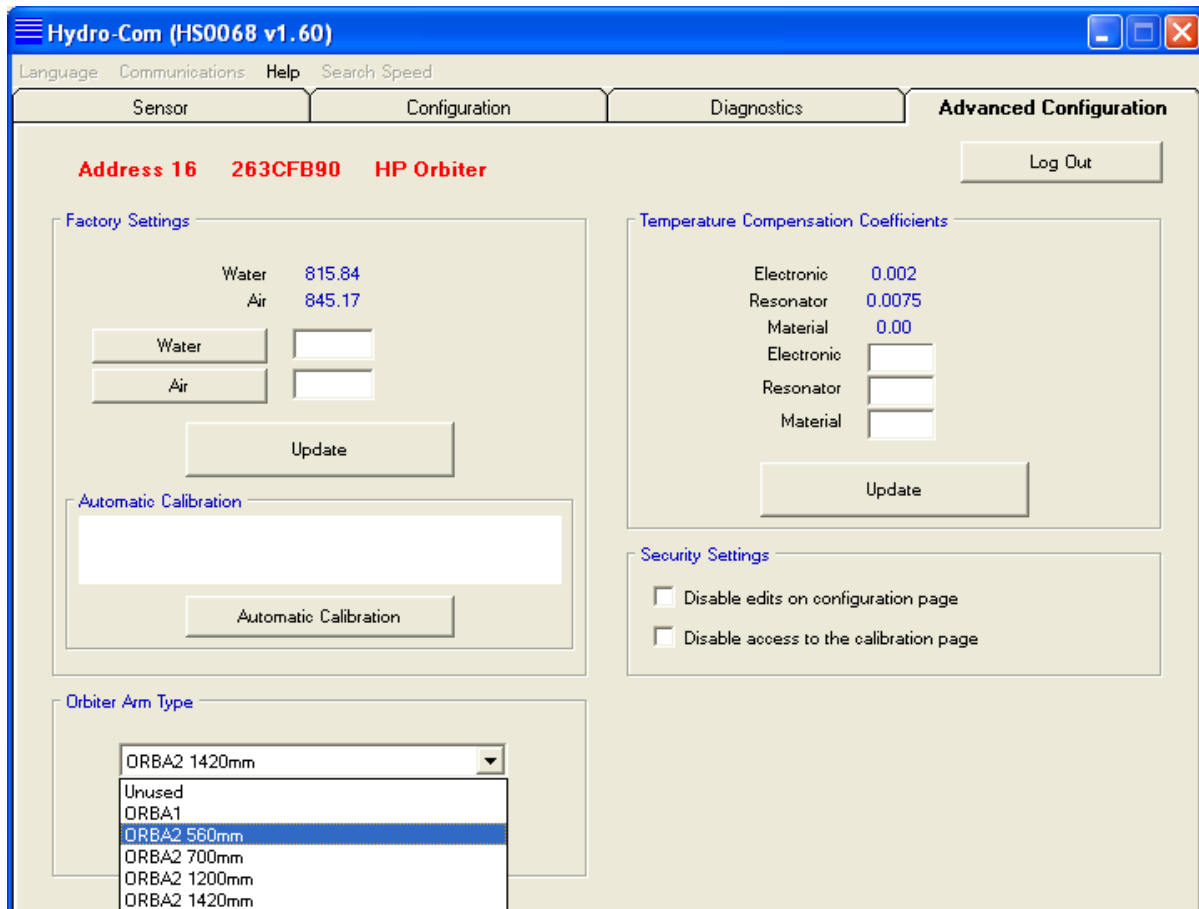


The screenshot shows the Hydro-Com (HS0068 v1.60) software interface. The 'Diagnostics' tab is selected, displaying various sensor parameters and a circled 'Upgrade' button.

Parameter	Value	Unit
Electronic	29.3	°C
Resonator	21.0	°C
Material	21.2	°C
Max	35.2	°C
Min	18.1	°C
Electronic	0.002	
Resonator	0.0075	
Material	0.00	
Water	815.84	
Air	845.17	
Version	HS0063 v2.12	
Checksum	5E37	
Uncompensated Frequency	846.43	
Amplitude	550	

Setting the Arm Type

When swapping the Arm, it is important that the head unit knows what type of arm is fitted. This is done via an option in the Advanced Configuration tab of Hydro-Com. This will allow you to select which type of Orbiter arm you have installed in the Orbiter.



Select the type of Orbiter Arm that you have installed and then press the Write button. The Arm information will be saved into the Orbiter and the parameters that control the Auto-Cal facility will be adjusted accordingly. Thereafter the Auto-Cal facility will correctly Auto-Cal the Orbiter when instructed.

NOTE: If the Orbiter Arm is changed again at a later date then you must ensure that both the resonator temperature compensation co-efficient and the Orbiter Arm Type are set correctly for the new arm.